



**BARRETT
COMMUNICATIONS**

USER MANUAL

BARRETT 550 HF TRANSCEIVER

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Version 1.2

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1.0 INTRODUCTION

The BARRETT 550 SSB Transceiver is a sophisticated yet easy to use synthesised transceiver covering the frequency range 1.6 to 30 MHz. It utilises the superior Direct Digital Frequency Synthesis (DDFS) system to ensure ultra stable operation.

Designed to operate from 12 Volt (13.8 VDC) DC supplies it has a 500 channel capacity. Useful receiver performance down to 500 kHz is a feature in RX free-scroll mode. The transmitter is rated at 100 Watt PEP when excited by a standard two tone signal of 700 and 2300 Hz. When using the microphone the normal peak envelope power developed by the transceiver is about 130 Watt rising to nearly 150 Watt on frequencies between 2 and 8 MHz. Not less than 12.6 VDC @ 20 Amp peak supply is necessary to achieve full performance.

Using up to date design techniques the 550 has been designed to dramatically increase the average transmitted power resulting in stronger signals. Significantly this gives the 550 the "talk power" of a transceiver of up to 4 times its rated PEP!

The 550 supports features such as Selcall, Telephone call interfacing, GPS location transmission, data transmission and remote diagnostic modes to make this transceiver the most modern transceiver, in its class, in the world today. The increased use of data type transmissions has been catered for by providing a real FSK input port, high speed switching from Tx to Rx and designing for 100% duty cycle. The incorporation of an optional fan on the heat sink provides for 100% duty cycle operation even in high ambient operating temperatures.

The 550 is protected from over-voltage as well as reverse voltage application. Available in local and remote control styles the 550 can be controlled from multiple positions, simultaneously if required.

All 500 channels are available to be field or workshop programmable. Auxiliary features such as Selcall, Telcall, Scanning, Mute status, Alarm system etc. can be individually enabled or disabled for every channel as required to suit your operation.

The controls are fabricated from a user friendly tactile rubber based material to give them a crisp pleasant "feel". The modern styling of the 550 coupled with its rugged extruded chassis construction makes it extremely strong and light.

When used with BARRETT accessories such as the auto-tune antenna, power supplies and modems the 550 transceiver leads the way in HF communications towards the year 2000.

2.0 INSTALLATION

Detailed installation instructions are available in the Installation Guide. Please ensure that all details are carefully observed to ensure that the transceiver will operate correctly. Particular emphasis should be given to ensuring adequate power sources and antenna/ground systems are employed.

Mounting

Your transceiver must be mounted in a position which allows for the free flow of air around the cooling fins. Avoid direct sunlight as this can raise the internal temperature of the transceiver to unacceptable limits. Take care not to run power cables under mats where chairs or foot traffic can crush them.

Grounding

Proper grounding of transceivers mounted in fibreglass vehicles is essential for stable transmitter operation. A good low impedance ground is essential. Your supplier should be able to advise you regarding the provision of an adequate ground system.

Power

In battery powered situations always run the power directly from the battery to the transceiver using high quality copper leads of adequate rating. 6 or 8mm cross sectional area required depending on length.

TO ENSURE CORRECT TRANSMITTER OPERATION YOUR POWER SYSTEM MUST BE ABLE TO PROVIDE PEAK CURRENT AT THE TRANSCEIVER WHILST MAINTAINING NOT LESS THAN 12.6V DC AT THE TRANSCEIVER TERMINALS.

FAILURE TO PROVIDE AN ADEQUATE POWER SUPPLY MAY RESULT IN SEVERE TRANSMITTER DISTORTION OR DAMAGE TO THE TRANSCEIVER.

The transceiver is negative ground reverse polarity protected. It is also protected from the application of incorrect power voltage such as 24V DC.

DO NOT CONNECT IT DIRECTLY TO 115 OR 240V AC SYSTEMS - SEVERE DAMAGE WILL OCCUR. If you wish to run from mains power the BARRETT 522 Power Supply is strongly recommended. It is a low cost highly efficient power supply giving the correct power that the transceiver requires. The use of other power supplies may result in poor voltage regulation and distortion.

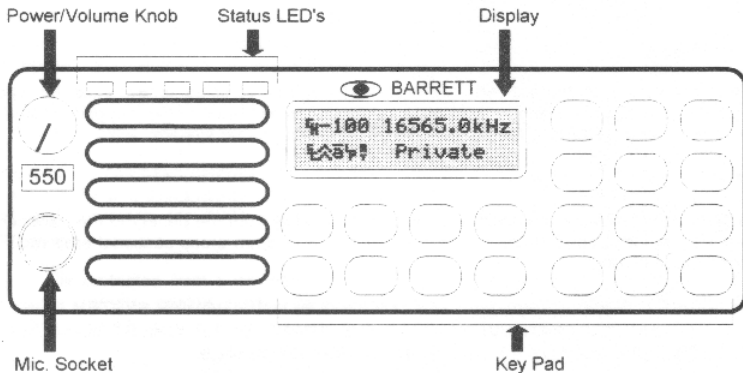
Cable runs with remote control:

If using the 550R Remote Control Head with the transceiver ensure that antenna cables are not run parallel and adjacent to the control interface cable. Failure to observe this directive may result in unstable transmitter operation. In fibreglass vehicle installations a separate ground to the control head may be required.

3.0 OPERATION

Prior to delivery your supplier should have programmed frequencies and options into your BARRETT 550 Transceiver. You therefore should not need to concern yourself with features other than those required for your operation. The following description of functions covers all possible features, be aware therefore that your transceiver may be characterised for only some of these features. Consult with your supplier if you are in doubt about your enabled features.

3.1 FRONT PANEL DESCRIPTION



Power/Volume Knob

The BARRETT 550 Transceiver is turned on by rotating this control clockwise. Turn the control clockwise until volume is set to correct level.

Mic. Socket

The microphone supplied with the BARRETT 550 is inserted here.

Status LED's

This group of LED's indicates the mode currently in use.

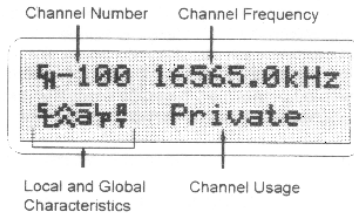
When receiving, the green RX LED is illuminated.

When transmitting, the red TX LED is illuminated.

The operating mode of the transceiver is indicated by the remaining LED's. (ie. USB, LSB, AM(DSB)).

FRONT PANEL DESCRIPTION Con't....

Display



The BARRETT 550 uses a Supertwist 2 line by 16 character liquid crystal display (LCD).

The LCD provides the user with current status information of the transceiver including:

Channel Number Channel Frequency Channel Usage

Local Characteristics (parameters unique to the channel in use.)

Global Characteristics (parameters that affect all channels.)

Key Pad

There are 20 keys on the keypad. Most keys have multiple functions assigned to them depending on when the key is pressed. Key functions are listed below followed by a detailed description of their functions.

Key	Primary Function	Secondary Function (in conjunction with other keys)
RESET	Selcall alarm reset	Menu access, Send request status
2182	2182 marine distress	
SEL TEL	Selcall/Telcall initiate	Selcall history
ALARM	Alarm	Alarm test
CHN SEND	Direct channel change	Send selcall/telcall

Keypad Con't...

MUTE	Mute select	Send GPS position request
PRG END	Programming channel	Hang-up Telcall
TUNE	Tune mode	Send GPS position data
CHN ^ 1	Channel up	General scroll key
CHN v 4	Channel down	General scroll key
CLFY ^ 2	Clarifier up	General scroll key
CLFY v 5	Clarifier down	General scroll key
FRQ ^ 3	Receiver tune up	General scroll key
FRQ v 6	Receiver tune down	General scroll key
AUTO 7	Enable/disable autotuning	
MODE 8	Mode select	
TX FQ 9	Monitor transmit frequency	
SCAN 0	Start scan	Enable/disable scan when programming
CLEAR	Delete character, abort function	
PWR	High/Low power setting	

IMPORTANT:

Some key functions may be disabled during customising

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3.2 CHANNEL CHANGE

Channel Up/Down

Pressing the channel up key will scroll up to the next programmed channel. Pressing the channel down key will scroll down to the next programmed channel. Holding down either of the keys will cause the rate of the channel scroll to increase until the maximum scroll rate is reached. If the key is released then pressed again the scroll rate returns to the minimum scroll rate. The channel up/down keys on the microphone have the same function as the channel up/down keys on the keypad.

Direct Channel Entry Steps

- i) Press the channel change key (CHN/SEND)
- ii) Enter the channel number required
Channel range is from 1 to 9999 inclusive
Channel zero cannot be selected
- iii) Press the channel change key

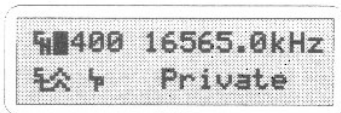
Example :

Using direct channel entry to select channel 101.

Press :



Display :

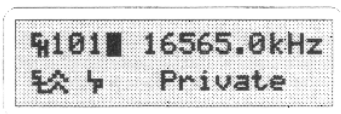


Press :



CHANNEL CHANGE Con't...

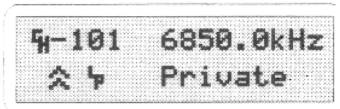
Display :



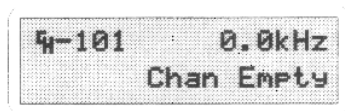
Press :



Display :



If the channel selected has not been programmed then the display is:



3.3 MUTE FUNCTIONS

Pressing the mute key will select the mute function required. A character indicating the mute function selected is positioned on the second line of the display at the 3rd column from the left.

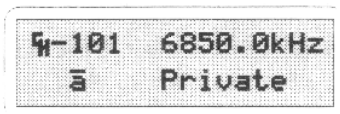
Audio Mute

When the audio mute is enabled the mute opens only when speech is detected.

Mute Character



Display



MUTE FUNCTIONS Con't...

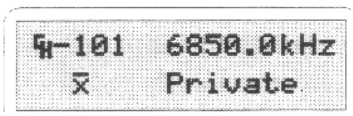
Selcall Mute

When the selcall mute is enabled the mute opens after a selcall sent to the unit has been received and decoded successfully.

Mute Character

⌘

Display



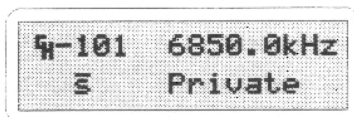
Signal Strength Mute

When the SSL mute is enabled the mute only opens when the received signal strength exceeds the nominated threshold level (see "Menu Functions - Set SSL Level").

Mute Character

≡

Display



3.4 TRANSMIT FREQUENCY

Monitoring

The 550 can "listen" to the transmit frequency of a dual frequency channel by pressing the following key :

TX FQ
9

Once the key has been released the transceiver reverts to the normal mode of operation.

Power Level

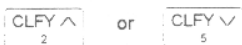
The 550 transceiver can be set to transmit at the maximum output power level (up to 100W) or at the minimum output power level (approx 10W).

To toggle between high and low transmit power, hold down the PWR key for approximately 2 seconds.

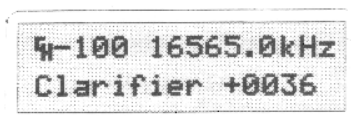
3.5 CLARIFIER

The clarifier is used to compensate for received signals that are off frequency.

The receiver can be clarified in steps of 1Hz between -1kHz and +1kHz¹. To scroll the clarifier use one of the following keys :



Pressing either of the above keys once will display the clarifier as follows



Release the key pressed then press it again to begin scrolling the clarifier. Holding the key down will accelerate the scroll until maximum scroll rate is achieved or the clarifier limit is reached.

To clear the clarifier value, first bring up the clarifier then press the **CLEAR** key to zero the value.

3.6 ALARM FUNCTIONS

All channels on the BARRETT 550 can be assigned one of three alarm signals available to the user, these are:-

1. **International Marine Radiotelephone Two-tone Alarm** - Alternating 2200Hz/1300Hz, 500ms Cycle, 50% Duty cycle.
2. **RFDS Alarm** Two-tone alarm 880Hz +1320Hz continuous. (Australian use only)
3. **User Defined Alarm**² - User defined alarm, installed by an authorised BARRETT dealer.

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¹ The range of the clarifier depends on the clarifier limit set. See "Menu Mode Functions - Clarifier Limit".

² This is available in the international version of the Barrett 550 Transceiver. In Australia this alarm is the **Royal Flying Doctor Service Two-tone Alarm** (880Hz + 1320Hz continuous)

ALARM FUNCTIONS Con't...

Testing The Alarm

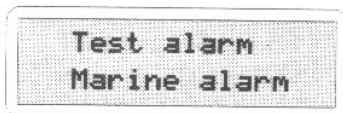
To test the alarm encoder press and release the alarm key, within two seconds the appropriate alarm will be heard through the speaker.

Example:

Press : less than 2 seconds



Display :



Sending The Alarm

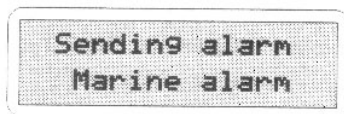
To transmit the alarm hold in the alarm key for a period greater than two seconds.

Example:

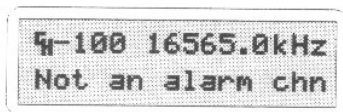
Press : longer than 2 seconds



Display :



When an alarm transmit or test request is made on a channel that has not been assigned an alarm system. No alarm is generated and the display is:-



To cancel alarm :- Press any other button or key.

3.7 2182 MARINE DISTRESS CHANNEL SELECT

2182 Marine Distress Channel Select³

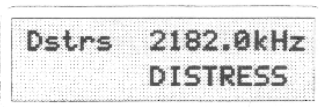
Pressing the 2182 key will automatically select the international 2182.0kHz distress frequency in AM mode.

Example:

Press :



Display :



3.8 TUNE FUNCTIONS

The BARRETT 550 provides support for both manual and automatic antenna tuning.

Manual Tuning

When the BARRETT 550 is in manual tune mode and the tune key is pressed the radio will transmit carrier on the channel selected. When the tune key is pressed, the SWR level will be shown on the display.

Automatic Tuning

The transceiver can be toggled between fully and semi-automatic tune modes for use with the 511 automatic tuner or 510 automatic tuning mobile antenna. In fully automatic mode the transceiver will retune if the tune key is pressed or when a new channel is selected and PTT is activated. In the auto mode the antenna is retuned when the transceiver answers a selcall. The following character below will be displayed when in fully automatic mode:-

**A
T**

In semi automatic mode the radio only retunes after the tune key has been pressed. To toggle between fully and semi automatic tuning press the auto key. Pressing the tune key in either mode will cause the transceiver to retune. When used with the 511 automatic tuner and the 510 automatic tuning antenna the manual tune mode is automatically upgraded to semi-automatic mode.

³ This function is only enabled in Barrett 550 transceivers programmed for use in the marine service.

TUNE FUNCTIONS Con't...

Auto Tune Enable/Disable

To enable or disable the auto tune function on the transceiver, hold the AUTO key down for approximately 2 seconds.

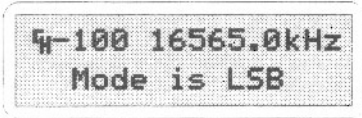
3.9 MODE FUNCTIONS

Mode Select

The mode key selects the mode of operation eg LSB,USB,AM,CW,FSK. The mode key will temporarily set the mode for a selected channel, until the channel is changed, or the radio is turned off.

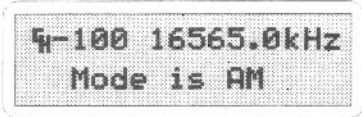
There are 5 modes available for each channel. They are :

LSB Mode



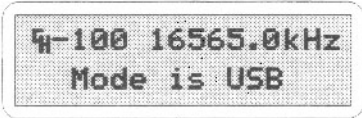
4-100 16565.0kHz
Mode is LSB

AM Mode



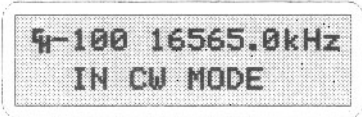
4-100 16565.0kHz
Mode is AM

USB Mode



4-100 16565.0kHz
Mode is USB

CW Mode



4-100 16565.0kHz
IN CW MODE

FSK Mode

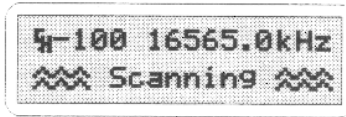


4-100 16565.0kHz
IN FSK MODE

3.10 SCANNING FUNCTION

The BARRETT 550 can be programmed to scan up to 500 channels. Pressing the scan key initiates scanning. Only channels that have been enabled will be scanned.

When the scan function is initiated, the display will show the following:-



To abort scanning press PTT or any other key other than the scan key. Press the scan key to immediately scan to the next scan enabled channel.

The BARRETT 550 will halt scanning for the following reasons:-

The channel has selcall enabled and a selcall signal is received.

Signal Strength Level mute is enabled and a signal with a level greater than the pre-set threshold level is received.

Normal mute is set and a voice signal is detected.

Selcall Scan

In any mute state, when a selcall signal is detected, and the channel has selcall enabled, the transceiver will stop scanning and decode the selcall signal. If the decoded selcall destination ID is for the radio then it is treated as a normal selcall function and the radio is alerted⁴.

Once selcall processing is completed the transceiver will revert to scan mode unless PTT or any other key besides the scan key is pressed during the selcall decode process. Once scan resumes the display will toggle between the "Call Received" message and the "Scanning" message. The "Call Received" message and beep will continue after scanning has been aborted until the call has been acknowledged. Once scanning is aborted, the channel that the last selcall was received on becomes the current working channel.

Enabling Scan

Select the channel you wish to enable in the scan table. Press the program key, press the scan key, press the program key again. The channel is now scan enabled. To de-select the channel from the scan table repeat this procedure.

⁴ See "Selective Call Function".

SCANNING FUNCTION Con't...

Signal Strength Scan (SSL Scan)

If the Signal strength mute is active and a signal with a level greater than the pre-set threshold is received the scan will halt. Scan will remain halted while the signal level stays above the preset threshold. Once the signal decreases below the pre-set threshold level, for a period greater than the scan dwell period, scanning will resume.

Audio Scan

If the audio mute is active and the mute is opened scanning will halt. Scanning will remain halted while the audio mute is open. Once the mute closes, for a period greater than the scan dwell period, scanning will resume.

3.11 SELECTIVE CALL FUNCTION

Selcall is a digital system of signalling between HF transceivers. Each transceiver is assigned an individual ID and can be called using this ID.

Sending a Selcall

The steps involved in sending a selcall are as follows:-

- i) Select the channel on which to send the selcall.
- ii) Listen for traffic on that channel, if no traffic then continue.
- iii) Press the selcall key.
- iv) Enter the desired destination ID⁵ (details below).
- v) Press the send key.
- vi) Wait for the selective call to be sent.
- vii) Listen for reverive tone from the called station that indicates the call was successful.

Entering the desired destination ID (step iv)

Destination ID range is from 0000 to 9999⁶ inclusive.

All Call This will be decoded by stations X000 - X999 (up to 1000 stations)

Group Call This will be decoded by stations XX00 - XX99 (up to 100 stations)

Sub Group Call This will be decoded by stations XXX0 - XXX9 (up to 10 stations)

⁵ The default destination ID is the last received selcall callers ID or the last selcall sent ID.

⁶ The destination ID **must** be 4 digits long.

SELECTIVE CALL FUNCTION Con't...

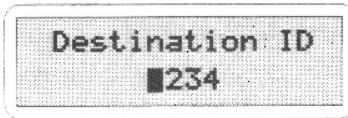
Example:

Make a call to station 4321.

Press :



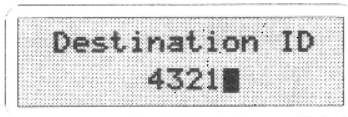
Display : default ID is 1234



Press :



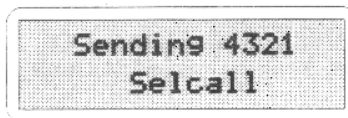
Display :



Press :



Display :



SELECTIVE CALL FUNCTION Con't...

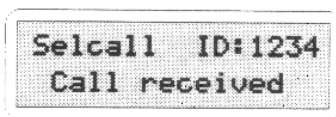
Receiving a Selcall

When the transceiver is on a selcall enabled channel the transceiver monitors incoming selective calls. (If more than one channel needs to be monitored then the scan function should be used.⁷)

The state of the mute will always return to its state prior to a selcall being received.

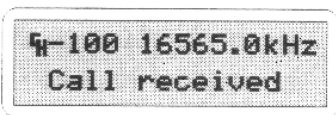
Call for Unit

If an incoming selcall's destination ID matches the unit's selcall ID an audible alarm is sounded, mute is opened and the display shows the call as follows:



Selcall ID:1234
Call received

The alarm will sound for sixty seconds and then time out. To stop the alarm before the time out and acknowledge the call press PTT or any key. If the alarm times out the message "Call Received" will be displayed periodically on the bottom line of the display as follows:



100 16565.0kHz
Call received

To cancel the "Call Received" message either press the clear key or send a selcall back to the calling transceiver.

⁷ See "Scanning Function".

SELECTIVE CALL FUNCTION Con't...

All Call

If the first digit of the incoming call's destination ID is the same as the unit's selcall ID and the last three digits of the destination ID are all zero (eg: 9000) then the mute is opened and the display shows the following:



Selcall ID:1234
All Call

The mute will stay open for 20 seconds then time out. Once timed out the "Call Received" message will not be displayed.

Group Call

If the first two digits of the incoming call's destination ID are the same as the first two digits of the unit's selcall ID and the last two digits of the destination ID are zero then an audible alarm is sounded, the mute is opened and the display shows the call as follows:



Selcall ID:1234
Group Call

The alarm will sound for 5 seconds, then leave the mute open for an additional 20 seconds then time out. To stop the alarm and/or the mute open press PTT or any key. Once timed out the "Call Received" message will not be displayed.

Sub Group Call

If the first three digits of the incoming call's destination ID are the same as the first three digits of the unit's selcall ID and the last digit of the destination ID is zero then an audible alarm is sounded, the mute is opened and the display shows the call as follows:



Selcall ID:1234
Sub Group Call

The alarm will sound for 5 seconds, then leave the mute open for an additional 20 seconds then time out. To stop the alarm and/or the mute open press PTT or any key. Once timed out the "Call Received" message will not be displayed.

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3.12 TELCALL FUNCTION

Transceivers equipped with Telcall can direct dial Telephone Numbers and receive calls from telephone users through a BARRETT 660 telephone interconnect system. The 660 is a radio telephone interface, designed specifically for HF use. The 660 allows any BARRETT transceiver fitted with a Telcall selective calling facility to access the telephone network without operator assistance.

Beacon Mode

Channel selection is a critical factor in using the 660 telcall system. To enable channels to be evaluated the 660 telephone interconnect has a beacon facility which allows a station in an HF network to send a special selcall code that causes the 660 to send a beacon signal. The quality of the beacon signal received by the HF out-station is indicative of the quality of communication that can be expected on the channel in use.

The beacon mode is activated by selcalling the 660 interconnect with the selcall ID XX99. XX being the first two digits of the 660's self ID. When the 660 Telephone Interconnect receives and decodes this selcall it will transmit a beacon. By requesting beacons on different channels a decision can be made as to which channel provides the best path.

Sending a Telcall

Dialling Methods:-

There are 2 levels of access available to the 660 interconnect system. They are:-

Preset Dialling

To access preset telephone numbers on the BARRETT 660 a standard selcall is transmitted from the BARRETT 550. The first two digits of the destination ID must be the same as the first two digits of the 660 self ID being called. The second two digits correspond to one of the 98 preset numbers stored in the 660 Telephone Interconnect.

- i) Select the channel to be used to make the call(see "**Beacon Mode**", above)
- ii) Listen for traffic on that channel, if no traffic then continue
- iii) Press the selcall key
- iv) Enter the selcall number corresponding to the preset telephone number desired
- v) Press the send key
- vi) Listen for revertive tones that indicate the call was successful.
- vii) If the call was successful then wait for a telephone connection to be made. When the call has been answered, the user can talk as normal.
- viii) After the call is complete or the line is busy the user should hang up the line. (see "**Hanging Up**")

TELCALL FUNCTION Con't...

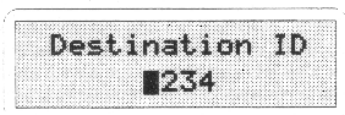
Example:-

Make a preset dialled call, to preset telephone number 90, via a 660 interconnect whose ID is 60XX.

Press :



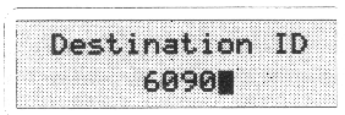
Display :



Press :



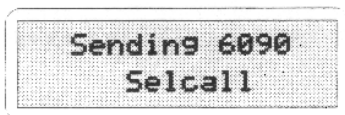
Display :



Press :



Display :



TELCALL FUNCTION Con't...

Direct Dialling

To access the direct dialling facility of the BARRETT 660 telephone interconnect the transceiver must be fitted with telcall.

- i) Select the channel to be used to make the call (see "Beacon Mode", refer page 21)
- ii) Listen for traffic on that channel, if no traffic then continue
- iii) Press the selcall key
- iv) Enter the 660 destination ID
- v) Press the selcall key
- vi) Enter the telephone number to dial
- vii) Press the send key
- viii) Listen for reverive tones that indicate the call was successful.
- ix) If the call was successful then wait for telephone connection to be made. When the call has been answered, the user can talk as normal.
- x) After the call is complete or the line is busy the user should hang up the line. (see "Hanging Up")

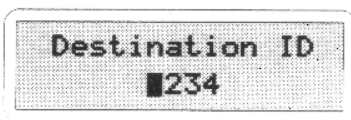
Example:-

To make a direct dial call to telephone number 4341700, via a 660 Telephone Interconnect whose ID is 6099.

Press :



Display :



Press :



TELCALL FUNCTION Con't...

Display :

Destination ID
6099

Press :

SEL
TEL

Display :

Enter Phone No.

Press :

CHN∨
4

FRQ∧
3

CHN∨
4

CHN∧
1

AUTO
7

SCAN
0

SCAN
0

Display :

Enter Phone No.
4341700-----

Press :

CHN
SEND

Display :

Sending 6099
Telcall

TELCALL FUNCTION Con't...

Last Number Redial

To use the last number redial facility press the selcall key twice, the last telephone number sent will now be displayed, now press the send key to complete the redial.

Hangup Selcall

When a call has been completed the caller must "hang up" by sending the hang up code to the BARRETT 660.

- i) Press the selcall key
- ii) Enter the selcall ID of the 660 being called
- iii) Press the end key
- iv) Listen for Hangup revertive signal

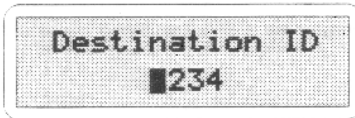
Example:-

Hanging up the 660, example: 660 with ID of 6099

Press :



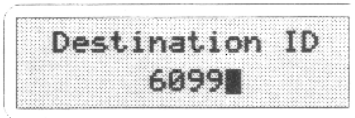
Display :



Press :



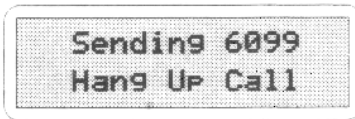
Display :



Press :



Display :

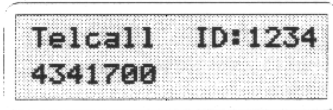


TELCALL FUNCTION Con't...

Telephone Number Lodging

BARRETT 550 transceivers, fitted with Telcall facilities have the capability of receiving and storing telephone numbers from 660 interconnect units.

When a telephone number is received the display shows the call as follows:



The alarm will sound for thirty seconds and then time out. To stop the alarm before the time out and acknowledge the call press PTT or any key. If the alarm times out the message "Call Received" will be displayed periodically⁸.

To dial back the telephone number received press the selcall key, enter the selcall ID of the BARRETT 660, press the selcall key then press send to complete the call.

Receiving Telcalls via a 660 interconnect

Calls received from a transceiver via a 660 Telephone Interconnect are handled as normal selcall calls.

⁸ See "Receiving a Selcall - Call for Unit".

Beacon Call Addendum

The "Beacon Call" function allows the user to determine the signal quality between two transceivers fitted with the selcall function.

Sending a Beacon Call

The steps involved in transmitting a beacon call are as follows:

- i) Select the channel on which to send the beacon call.
- ii) Listen for traffic on that channel, if no traffic then continue.
- iii) Press the selcall key.
- iv) Enter the desired selcall destination ID.
- v) Press the power key.
- vi) Wait for the beacon call to be sent.
- vii) Listen for the beacon revertive tones.
- viii) Repeat steps i) to vii) until the channel with the best signal path is found.

Note:- The beacon revertive tones are a series of 4 long tones.

Receiving a Beacon Call

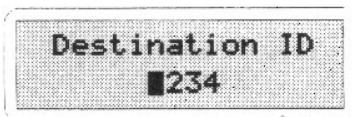
When a transceiver receives a beacon request call it responds by transmitting the beacon call revertive tones. The beacon request call is not saved in the selcall history buffer.

Example:- Make a beacon request to station 4321.

Press:



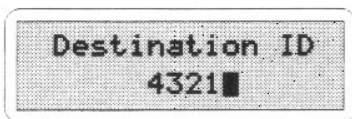
Display: Default ID is 1234



Press:



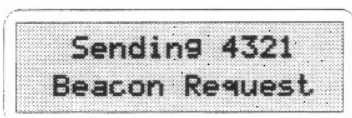
Display:



Press:



Display:



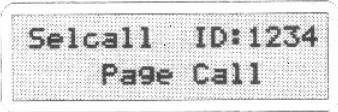
3.13 PAGECALL FUNCTION

Pagecall

Pagecall is a system that allows messages of up to 32 characters to be sent to a BARRETT 550 transceiver from a BARRETT 550 transceiver connected to a PC fitted with pagecall software.

Receiving a Pagecall

Upon successfully decoding of an incoming Pagecall an audible alarm is sounded, the mute is opened and the display shows the call as follows:



Selcall ID:1234
Page Call

This display is held for 3 seconds then the message received is shown.

The alarm will sound for thirty seconds and then time out. To stop the alarm before the time out and acknowledge the call, press PTT or any key. If the alarm times out the display will flash the "Call Received" message on the bottom line of the display periodically⁹.

To clear the "Call Received" message press the clear key.

Sending a Pagecall

Pagecalls are initiated through the computer control interface.

⁹

See "Receiving a Selcall - Call for Unit".

3.14 GPS INFORMATION CALL

The BARRETT 550 transceiver can be equipped to interface to a GPS (Global Positioning System) receiver. This system allows mobile position information to be accessed by base stations or mobiles to send their positions, in case of an emergency, to the base station..

Fitted with the GPS interface, the 550 transceiver can be connected to any GPS receiver that transmits the NMEA 0183 V2.0 standard GLL (Geographic - Latitude - Longitude) command. For information on compatible GPS units contact your local BARRETT dealer. Alternatively, BARRETT Communications can supply an internal fit GPS receiver module to the 550 transceiver.

Sending GPS Data to another transceiver

- i) Select the channel on which to send the call.
- ii) Listen for traffic on that channel, if no traffic then continue.
- iii) Press the selcall key.
- iv) Enter the desired destination ID
- v) Press the tune key.
- vi) Wait for unit to download the GPS data. If the GPS data is not present or an error in the GPS data occurs an error message will be displayed.
- vii) Wait for the GPS selective call to be sent.
- viii) Listen for revertive tone from the called station that indicates the call was successful.

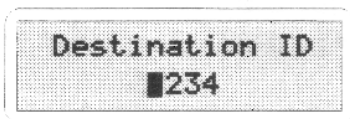
Example:

Make a GPS call to station 4321.

Press :



Display : default ID is 1234

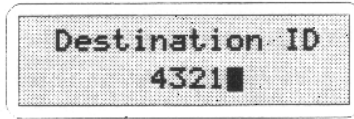


Press :



GPS CALL Con't...

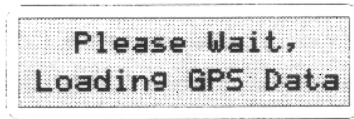
Display :



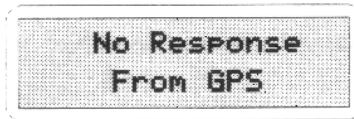
Press :



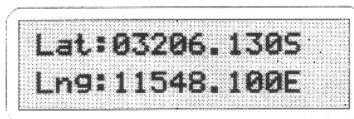
Display :



If no data is received from the GPS the display will be as follows :



If data is received from the GPS the display will be as follows :



Note : There is a possibility that a data position or parity error may occur during data retrieval. If this happens an error letter will appear on the top right corner of the display. A 'P' for a parity error or an 'I' for invalid position data.

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Requesting GPS Data from another transceiver

The steps involved in sending a GPS Data request call are as follows:-

- i) Select the channel on which to send the call.
- ii) Listen for traffic on that channel, if no traffic then continue.
- iii) Press the selcall key.
- iv) Enter the desired destination ID
- v) Press the mute key.
- vii) Wait for the selective call to be sent.
- viii) Wait for the destination unit to send back its position data or error message. If the unit times out before the position is received an error message will also be displayed.

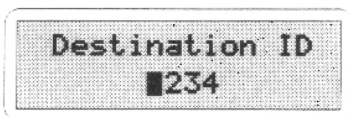
Example:

Make a GPS call to station 4321.

Press :



Display : default ID is 1234

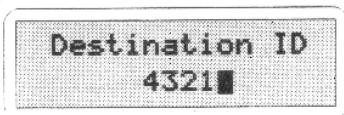


Press :



GPS CALL Con't...

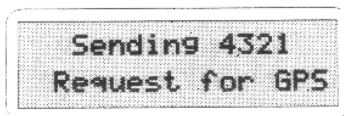
Display :



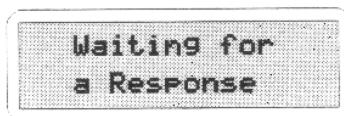
Press :



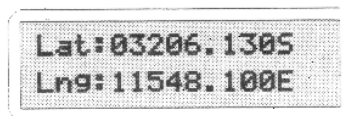
Display :



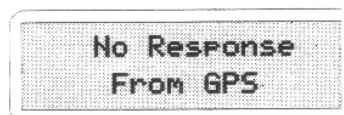
Once the call has been sent the display will be as follows:



If GPS data is received from the destination unit the display will be as follows :



If the destination unit has got a GPS unit and a timeout occurs in the destination unit a 'no response' call be sent back, it will be displayed as follows:



GPS CALL Con't...

Sending GPS Data Request

If the destination unit isn't fitted with a GPS unit it will send back a 'not fitted' message, displayed as follows :



**GPS Not Fitted
in Destination**

Responding to a GPS Data Request

When a request for GPS data has been received by the transceiver it will automatically respond to the request. Data is loaded and sent without any noticeable change in the 550's operation.

If the destination transceiver is unable to receive the call and subsequently does not send back the GPS selcall response the following message is displayed:



**No Response From
Destination Unit**

3.15 SELECTIVE CALL HISTORY FUNCTION

Whenever a selcall, telcall, all call, group call, sub group call or pagecall is received the callers selcall ID and the channel number the call was received on are stored in the selcall history buffer. Up to twenty calls can be stored on a first in first out basis.

Accessing Selcall History

To access the selcall history buffer hold down the selcall key for approximately 2 seconds.

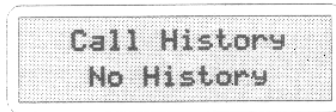
Example:

Press :



For at least 2 seconds.

Now release the selcall key and the transceiver will be in selcall history mode. Use the general scroll keys to scroll through the available selcall history. If there is no selcall history then the following message will appear on the display:



To escape from the selcall history mode press PTT or the clear key. If there is selcall history the top line of the display shows the channel the call was received on, the selcall ID of the calling unit and the history buffer count.

To clear selcall history, again enter selcall history, then press reset.

SELECTIVE CALL HISTORY FUNCTION Con't...

Making a call from History Buffer

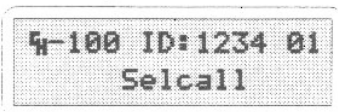
To make a call when scrolling through the selcall history buffer perform the following steps:

- i) Scroll to the call to be answered
- ii) Press the send key

The BARRETT 550 transceiver will change to the channel the logged call was received on and initiate a call sequence.

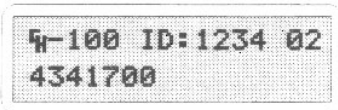
Types of Selcall History

Normal selcalls, all calls, group calls and sub group calls are all displayed in the following format in selcall history :-



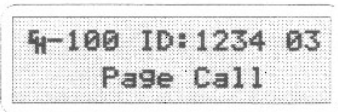
H-100 ID:1234 01
Selcall

Telcalls are displayed as follows :-



H-100 ID:1234 02
4341700

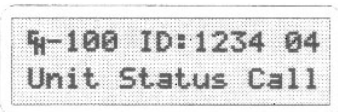
Pagecalls are displayed as follows :-



H-100 ID:1234 03
Page Call

When this display appears, pressing the selcall key will display the pagecall message.

Statcalls are shown as follows:



H-100 ID:1234 04
Unit Status Call

When this display appears, pressing the selcall key will display status data in the same format as when a normal statcall is received.¹⁰

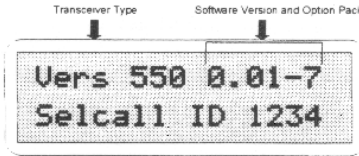
¹⁰ See "Status Selcall - Receiving a Status Revert".

3.16 MENU MODE FUNCTIONS

The reset key is used to enter menu mode. The menu is used both to set or display transceiver parameters. The scroll keys are used to select the options available. To edit the option required press the reset key, or press the clear key to exit the menu. When the option selected has been modified press the reset key to save the change or press the clear key to abort the modification. If the transceiver is left in menu mode the transceiver will, after a preset time, sound an audible alarm, flash the message "Use scroll keys" and eventually time-out back to normal operating mode. The options available are :-

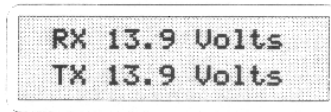
Identification

This displays the transceiver model, software version number, the option pack fitted and the transceiver selcall ID¹¹ as follows :-



Battery Level

This displays the battery level in receive and transmit¹² modes as follows :-



¹¹ Selcall ID shown only if selcall option fitted.

¹² The TX level is recorded from the last time the transceiver was in transmit.

MENU MODE FUNCTIONS Con't...

Display Options

This option allows the user to set the display configuration. The scroll keys are used to select one of the four following configurations :-

- 1) **RX use TX use Display**
The option displays the channel information in both receive and transmit.
- 2) **RX SSL TX use Display**
The option displays the signal strength level in receive and the channel information in transmit.
- 3) **RX use TX FWP Display**
The option displays the channel information in receive and the forward power level in transmit.
- 4) **RX SSL TX FWP Display**
The option displays the signal strength level on receive and forward power level on transmit.

Note:- SWR indication is displayed when pressing "TUNE"

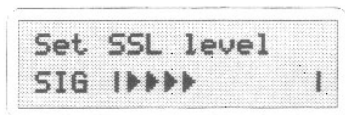
Backlight Options

This option allows the user, using the scroll keys, to select one of the four display Backlight modes:

Backlight Mode	Length of Backlight
Short Time-out	3 seconds
Long Time-out	30 seconds
Always On	until power down
Always Off	no Backlight

Set Signal Strength Level

This menu item is used to select the level at which scan stop is activated during SSL scan. The level is set by adjusting the number of signal strength arrows on the display. The SSL level is displayed as follows:



MENU MODE FUNCTIONS Con't...

Noise Blanker

This menu item allows the user to enable or disable the noise blanker on the transceiver. The noise blanker is used to reduce repetitive impulse noise.(eg vehicle ignition noise)

To switch the noise blanker ON/OFF:-

- i) Press the RESET key
- ii) Using the scroll keys, scroll to "NOISE BLANKER"
- iii) Press the RESET key
- iv) Scroll to select "NOISE BLANKER ON" or "NOISE BLANKER OFF"
- v) Press the RESET key
- vi) Press the CLEAR key to exit menu mode

Scrambler

This menu item allows the user to enable or disable the voice scrambler if the scrambler hardware option is fitted.

To switch the scrambler ON/OFF:-

- i) Press the RESET key
- ii) Using the scroll keys, scroll to "SCRAMBLER"
- iii) Press the RESET key
- iv) Scroll to select "SCRAMBLER ON" or "SCRAMBLER OFF"
- v) Press the RESET key
- vi) Press the CLEAR key to exit menu mode

MENU MODE FUNCTIONS Con't...

3.17 ENTERING A RECEIVE ONLY CHANNEL

To program any blank channel with a receive only frequency.

Programming steps

- i) Select a blank channel (see below)
- ii) Press the programming key (PRG/END)
- iii) Enter the frequency required
- iv) Press the programming key (PRG/END) three times

Selecting a blank channel (step i)

To find the next blank channel, select the first occupied channel then advance through the available channels, using the channel scroll key, until the next channel is not consecutive with the last (e.g. 99,100,110) The next vacant channel in this case is 101) Select this channel by direct channel entry (Press CHN/SEND, enter 101, press CHN/SEND)

Note:- This function is only available if the facility was enabled during programming.

3.18 TUNING RECEIVER MODE

The 550 transceiver can be used as a tunable receiver. The receiver can be tuned in steps ranging from 1Hz up to 10MHz.

Keys Allowed And Their Function



Function: Select tuning step left.



Function: Select tuning step right.



Function: Tune up.



Function: Tune down.



Function: Select the mute function required. The mute will revert to original setting once the tuning receiver mode is cancelled.



Function: Select mode required (USB,LSB,AM), mode will revert to original setting once the tuning receiver mode is cancelled.



Function: Start scanning a frequency range, set frequency scan ranges and frequency scan step.



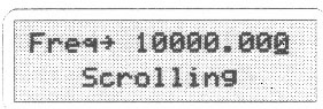
Function: Aborts tuning receiver mode and exits to current channel.

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TUNING RECEIVER MODE Con't...

Entering Tuning Receiver Mode

To place the transceiver into tuning receiver mode press either one of the FRQ keys. In tuning receiver mode the following will be displayed



Tuning

To tune the receiver use the clarifier keys to position the cursor under the digit representing the frequency increment required then use the frequency up or down key to tune the receiver at the increment selected.

Example:

Tune receiver from 10000.000Hz to 10500.000Hz

Press

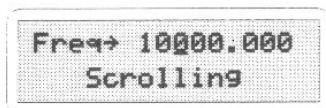


or



(Until cursor is under the 6th digit from the left)

Display

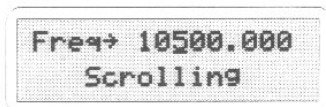


Press



(Until 5 is displayed in the digit position above the cursor)

Display



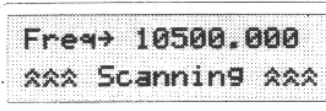
To return to the previous operating channel press Clear.

TUNING RECEIVER MODE Con't...

Scanning the tunable receiver

The BARRETT 550 can scan any range of frequencies from 500kHz to 30MHz with a frequency step down to 1Hz. Pressing the scan key will initiate frequency scanning.

When the scan function is initiated, the display will show the following:



```
Freq→ 10500.000
*** Scanning ***
```

To abort scanning press PTT or any other key other than the scan key. Press the scan key to immediately scan to the next frequency.

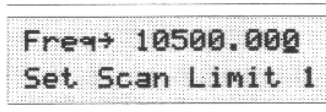
The transceiver will halt scanning for the following reasons¹³:

SSL mute is enabled and a signal with a level greater than the pre-set threshold is received.

Audio mute is set and a voice signal is detected¹⁴.

Setting Up Scan Frequencies

To set up the frequency scan parameters on the BARRETT 550 hold down the scan key until the following is displayed:



```
Freq→ 10500.000
Set Scan Limit 1
```

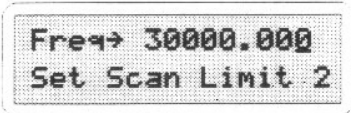
Con't...

¹³ Selcall is disabled during frequency scroll mode therefore the scan function will not halt if a selcall signal is received.

¹⁴ See "SSL Scan Stop" or "Voice Scan Stop" for information on how the scan stop is handled.

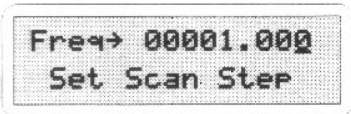
TUNING RECEIVER MODE Con't...

Following the same principles as tuning the receiver set the frequency of the first scan limit boundary. Press the scan key to enter the second scan limit boundary



Freq -> 30000.000
Set Scan Limit 2

Following the same principles as tuning the receiver set the frequency of the second scan limit boundary. Press the scan key to enter the scan step size. The following will be displayed



Freq -> 00001.000
Set Scan Step

Move the cursor to the digit representing the scan increment required (cursor to the far right represents 1Hz. steps). Press the scan key to save the scan parameters. The display will revert to the normal tuning receiver display. Pressing the scan key will cause the receiver to scan within the limits set and at the step size.

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5.0 AUXILIARY CONNECTOR

(25 pin female "D" connector on rear panel)

Pin	Name	Description of function	Level	Option required to activate
1	Ground	Ground	0V	None
2	Rx data	RS-232 data input *note 1 & 3	True RS-232	RS-232/BCO55005
3	TX data	RS-232 data output *note 1 & 3	True RS-232	RS-232/BCO55005
4	RTS	Request to send input *note 1 & 3	True RS-232	RS-232/BCO55005
5	CTS	Clear to send output	True RS-232	RS-232/BCO55005
6	Tuned in	Ant.tune complete input from 510/511 *note 3	Low going pulse	None
7	RS-232 Gnd.	RS-232 ground	0V	RS-232/BCO55005
8	ALC input	Automatic Level Control from linear Amp.	0-10v	None
9	Aux PTT in	Auxiliary PTT input	Low to activate	None
10	Scanstop in	Scanstop input	Low to activate	None
11	Bal Aud in	Balanced external Tx audio input (with pin 24)	600 Ohms OdBm.	None
12	Bal Aud out	Balanced un-muted Rx audio output (with pin 25)	600 Ohms OdBm.	None
13	Ground	Ground	0V	None
14	ANT0 out	Channel no. output Octal bit 0 *note 2	Active low	None
15	ANT1 out	Channel no. output Octal bit 1 *note 2	Active low	None
16	ANT2 out	Channel no. output Octal bit 2 *note 2	Active low	None
17	Alarm out	Home/latched alarm out (seicall activated) *note 3	Active low	Alarm/BCO55001/3/5
18	13.8V int.	Interrupted 13.8 V for 510 Auto. Antenna *note 3	13.8V-0V	None
19	ANT0 out	As above pin 14	Active low	None
20	FSK in	Frequency shift keying digital input	High-2000/Low-1000	None
21	Ext. speaker	External speaker output *note 3	8 ohms 2 Watt	None
22	CW key in	CW key input *note 3	Low to activate	None
23	+13.8V	13.8V switched and fused *note 3	13.8V @ 3 Amp.	None
24	Bal Aud in	Balanced external Tx audio input (with pin 11)	600 Ohms OdBm.	None
25	Bal Aud out	Balanced un-muted Rx audio output (with pin 12)	600 Ohms OdBm.	None

Note 1:- If the GPS BCO55004 is fitted and the jumpers are configured on the audio board the the functions of these pins are as follows :-

2	GPS out	GPS NMEA 1803 input (listener) (with pin 4)	NMEA levels	GPS/BCO55004
3	GPS in	GPS NMEA 1803 output (talker) (with pin 5)	NMEA levels	GPS/BCO55004
4	GPS out	GPS NMEA 1803 input (listener) (with pin 2)	NMEA levels	GPS/BCO55004
5	GPS in	GPS NMEA 1803 output (talker) (with pin 3)	NMEA levels	GPS/BCO55004
13	Ground	-13.8V for GPS power supply requirement	-13.8V @ 3 Amp.	None
23	+13.8V	+13.8V for GPS power supply requirement	+13.8V @ 3 Amp.	None

Note 2:- These outputs provide channel information for use in linear Amplifier band switching and for use with antenna select units such as the BARRETT 516. The outputs are octal coded 0 to 7 representing the least significant digit of the channel number selected. i.e. octal 0 for channels 10,20,30 etc., octal 1 for channels 1,11,21 etc., octal 2 for channels 2,22,32 etc. Channels should be programmed in the correct sequence to provide the correct antenna or linear Amplifier band selection.

Note 3:- If more than one of the following items are to be fitted to the transceiver then an ancillary interface unit (BARRETT P/N BCA50016) that plugs into the DB25 ancillary connector should be used:-

CW Key	BARRETT P/N BCA50015
Operators Headset OR External Speaker	BARRETT P/N BCA50006 BARRETT P/N BCA50011
External alarm	Seicall/Telcall options P/NBCO55013/4/5 with either Siren P/N BCA50009 or rotating beacon P/N BCA50008
511 Automatic Antenna Tuner OR 510 Automatic Tuning Mobile Antenna	BARRETT P/N BC51100 BARRETT P/N BC51000
GPS interface	BARRETT P/N BCO5504 with either seicall options P/N BCO55000/1 or Telcall options P/N BCO55002/3