Barrett 900 series HF Transceiver Control Software Manual

BCM95001/1

Head office:
Barrett Communications Pty Ltd
10 Port Kembla Drive, Bibra Lake WA 6163
P O Box 1214, Bibra Lake WA 6965
AUSTRALIA
Toll Free Tel: 1800 999 570
Tel: (61-8) 9 434 1700
Fax: (61-8) 9 418

European office:
Barrett Europe Limited
19 Lenten Street
Alton, Hampshire
GU34 1HG
UNITED KINGDOM
Tel: (44) 1420 542254

Introduction

Barrett 900 series SSB transceivers are 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.

Software Control Guide

Introduction

This software control manual describes all of the commands available for controlling the transceiver via RS232.

Minimum Hardware requirements

IBM 486 AT/compatible or better
MS-DOS 5.1 or later
RS-232 serial communications port
Hard disk with a minimum of 10 Mb of disk space
VGA monitor

pin outs for interface cable - transceiver to computer 9 pin 'd' connector.

Transceiver end 25 pin 'd' connector male			computer end 9 pin 'd' connector female	
pin			pin	
2	Rx data	<---	Tx data	2
3	Tx data	--->	Rx data	3
7	GND	---	GND	5

pin outs for interface cable - transceiver to computer 25 pin 'd' connector.

Transceiver end 25 pin 'd' connector male			computer end 25pin 'd' connector female	
pin				pin
2	Rx data	<---	Tx data	2
3	Tx data	--->	Rx data	3
7	GND	---	GND	7

Setting Up

The RS232 port must be set to the following parameters:

Data BAUD Rate	:	9600
Parity	:	None
Data Bits	:	8
Stop Bits	:	1

The 950 transceiver uses an XON / XOFF protocol to control data flow from the transceiver to the pc. When a carriage return is received by the transceiver an XOFF is transmitted. Once the command received has been processed an XON is transmitted to tell the PC that the transceiver is ready for the next command.

Computer Control - Software Commands

Notational conventions

<command verb><expression list>[<expression list parameters>]<cr>

< > items enclosed in angle brackets **must** be supplied.
[ ] items enclosed in square brackets are **optional**.
<cr> means carriage return (all commands must be terminated with <cr>, all received data is terminated with <cr>)

<command verb> is one of the following :-

'**P**'	-	programming commands
'**E**'	-	editing commands
'**I**'	-	interrogation commands
'**X**'	-	execute commands

**** note:-** do not use the angle or square brackets when typing in a command.

Program current channel characteristics

Program channel command is used to program channel parameters. This command is the full channel program command. Short form commands, described later, are used to program or edit each parameter in the channel program command individually without the need to enter the full command syntax.

Syntax:

<P>[<C><chan>][<R><rx frequency>][<T><tx frequency>]

[<Z><selcall enabled/disabled>][<S><scan enabled/disabled>]

[<H><rf power level>][<B><mode select>] [<L><label number>][<A><alarm type>]

Purpose:
Program channel parameters.

Comments:
The command parameters can be entered in any order once the P has been sent. (NB: the <C> command is optional, without it the current channel will be programmed. However, if the channel number is going to be programmed then the <C> command must be immediately following the <P> command byte)

<chan>	-	**must** be a 4 digit integer number representing the channel to be programmed.
<rx frequency>	-	**up to** 8 digit integer number representing the new receive frequency.
<Tx frequency>	-	**up to** 8 digit integer number representing the new transmit frequency.
<selcal enabled/disabled>	-	single letter as follows:- Y - selcall enabled N - selcall disabled
<scan enabled/disabled>	-	single letter as follows:- Y - scan enabled N - scan disabled
<power>	-	single letter as follows:- H - high power set L - low power set
<mode select>	-	is the mode to change to. Valid mode selection options are as follows:- L - J3E - LSB mode selected U -J3E - USB mode selected A -H3E - mode selected F - F1B - mode selected C - J2A - mode selected

-<label number> - channel use label number. This number is an integer between 1 and the number of labels already programmed (must be 3 digits).

<alarm type> - single letter as follows:-
M - marine alarm
R - RFDS alarm
U - user defined alarm
N - no alarm

Returns:
Okay if successful.
E0, E6, E7, E8, ED or EE on error.

Examples:
PC0001R12365000T06850000ZYSNHHBAI015AN

This is a full program command which will:-

channel	-	1
receive frequency	-	12365 kHz
transmit frequency	-	6850 kHz
selcall	-	enabled
scan	-	disabled
power	-	high
mode	-	H3E
label number	-	15
alarm	-	none

PL013T3265:-

This is an abbreviated program command that will set the current channel to the following:-

label number	-	13
transmit frequency	-	3265 kHz

All other parameters remain unchanged.

PR08932500ZNSYHLBU

This is an abbreviated program command that will set the current channel to the following:-

receive frequency	-	8932.5 kHz
selcall	-	disabled
scan	-	enabled
power	-	low
mode	-	J3E - USB

All other parameters remain unchanged.

Editing commands

Command:
Set clarifier

Syntax:
<E><F><sign><clarify value>

Purpose:
Program new clarifier value for current channel.

Comments:

<sign>	-	"-" for a negative clarifier, "+" for a positive clarifier value
<clarify value>	-	new clarifier value in Hz. This number is an integer value between 0 and 1023 inclusive.(0 to 1023 Hz.)

Returns:
Okay if successful.
E0, ea or EC on error.

Example:
EF+856
This will change the clarifier value to plus 856hz.

Command:
Set RF power level

Syntax:
<E><H><power>

Purpose:
Set RF power level to high power -100/125 watts or low power 10 watts.

Comments:

<power>	-	H - high power enabled L - low power enabled

Returns:
Okay if successful.
E0 or E4 on error.

Example:
EHH
Sets RF power of transceiver to high power- 100/125 watts.

Command:
Select noiseblanker state

Syntax:
<E><N><state>

Purpose:
Selects noiseblanker on or off.

Comments:
<state> - Y - noiseblanker on
N - noiseblanker off
Example:
ENY
This will turn the noiseblanker on.

Command:
Set auto tune state

Syntax:
<E><W><state>

Purpose:
Sets auto tune on or off.

Comments:
<state> - Y - auto tune on
N - auto tune off
Example:
EWY
This will turn the auto tune feature on.

Command:
Set selcall ID

Syntax:
<E><Z><selcall ID>

Purpose:
Set selcall ID number (4 digit number).

Comments:
<selcall ID> - new selcall ID of the radio. ID **must** be a 4 digit integer number between 0000 and 9999 inclusive.
Returns:
Okay if successful.
E0 on error.

Example:
EZ1234
Changes the transceivers selcall ID to 1234.

Command:
Clear selcall received flag

Syntax:
<E><Z><C>

Purpose:
Clear the selcall received flag.

Comments:
-

Returns:
Okay if successful.
E0 on error.

Example:
EZC
Clears the selcall received flag.

Command:
Set selcall preamble length

Syntax:
<E><Z><P><preamble>

Purpose:
Set selcall preamble length

Comments:
<preamble> - new selcall preamble length. Value **must** be a 2 digit integer number between 01 and 10 inclusive. (1 second = 1)

Returns:
Okay if successful.
E0 on error.

Example:
EZP05
Changes the selcall preamble length to 5 seconds.

Interrogate commands

Command:
Return current channel number

Syntax:
<I><C>

Purpose:
Returns current channel number in use..

Comments:
-

Returns:
Current channel number (4 digits).
E0 on error.

Example:
IC
If the current channel is 22 then the returned value will be 0022<cr>.

Command:
Return receive frequency

Syntax:
<I><R>

Purpose:
Returns current receive frequency in use.

Comments
-

Returns:
Current receive frequency (8 digit integer).
E0 on error.

Example:
IR
If the current receive frequency is 6850kHz then the returned value will be 06850000<CR>.

Command:
Return mode

Syntax:
<I><B>

Purpose:
Returns current mode.

Comments:

Returns:
Mode code as follows:-

BL	-	J3E - LSB
BU	-	J3E - USB
BA	-	H3E
BF	-	F1B
BC	-	J2A

E0 on error.

Example:
IB
If the current mode is USB the returned value will be BU<CR>.

Command:
Return channel data

Syntax:
<I><D><C><channel number>

Purpose:
To return channel data of individual channels programmed in the transceiver.

Comments:
<channel number> - the channel number required. (Valid range is 1 to 9999 inclusive)

Returns:
Frequencies for each channel in the transceiver.
The data received for each channel has the following form:-

CCCCRRRRRRRRTTTTTTTT

Where:

CCCC	=	is the channel number.
RRRRRRRR	=	is the receive frequency in Hz.
TTTTTTTT	=	is the transmit frequency in Hz.

E0, E5, or E6 on error.

Example:
IDC0104
This will return all channel data for channel 104.
ie. 01040377600006850000
This is decoded as :
channel number is 104
receive frequency is 3776.0kHz
transmit frequency is 6850.0kHz

Command:
Return all channel use labels

Syntax:
<I><D><L>

Purpose:
Returns all channel labels currently programmed.

Comments:
-

Returns:
Channel labels as ASCII.
E0 on error.

Example:
IDL
Return all the labels with a <CR> to finish.

Command:
Return selcall preamble length

Syntax:
<I><Z><P>

Purpose:
Returns current selcall preamble length

Comments:
-

Returns:
Pre-amble length in one hundredth of a second increments.
E0 on error.

Example:
IZP
If the current pre-amble length is 5 seconds the transceiver returns the selcall preamble length as 0500<CR>.

Command:
Return transmit frequency

Syntax:
<I><T>

Purpose:
Returns current transmit frequency .

Comments:
-

Returns:
Current transmit frequency (8 digits).
E0 on error.

Example:
IT
If the current channel is 6850kHz the returned value will be 06850000<CR>.

Command:
Return label

Syntax:
<I><L>

Purpose:
Returns the label number for the current channel.

Comments:
-

Returns:
Current label number (2 digit integer).
E0 on error.

Example:
IL
If the current channel label is 5 the returned value will be 05<CR>.

Command:
Return clarifier value

Syntax:
<I><F>

Purpose:
Returns the clarifier value for the current channel.

Comments:
-

Returns:
Clarifier value (sign and 4 digit integer).
E0 on error.

Example:
IF
If the clarifier value is plus 105hz. the returned value will be +0105<CR>.

Command:
Return mute state

Syntax:
<I><M>

Purpose:
Returns current mute state.

Comments:
-

Returns:
Mute state in the form of a one character code:-

<N> - audio mute selected
<A> - signal strength mute selected
<S> - selcall mute selected
<O> - no mute selected

E0 on error.

Example:
IM
If selcall mute is selected the returned value will be S<CR>.

Command:
Return input power supply voltage

Syntax:
<I><Y>

Purpose:
Returns Rx and Tx input supply voltage.

Comments:
Tx voltage is calculated from the last PTT.

Returns:
Voltage in 8 digits, 4 digits for Rx and 4 digits for Tx. The digits are returned with the least significant digits first and the most significant digits second.
E0 on error.

Example:
IY
If input voltage level is 13.6 volts in Rx and input voltage level is 13.4 in Tx then the string returned is 36013401<CR>.

Command:

Return selcall ID

Syntax:
<I><Z>

Purpose:
returns transceiver's selcall ID.

Comments:
-

Returns:
Selcall ID (4 digits).
E0 on error.

Example:
IZ
If the selcall ID is 5678 the returned value will be 5678<CR>.

Command:
Return software version number

Syntax
<I><V>

Purpose
returns software version number

Comments
-

Returns
four digit software number if successful
E0 on error.

Example
IV
if the software version is 1.0 the returned value will be 1.00<CR>.

Command:

Return selcall history

Syntax

<I><D><Z>

Purpose

Returns the full selcall history.

Comments

-

Returns

Selcall history records available with a length of 46 characters. These records are broken down as follows :-

No. of characters	Purpose		
4	Channel selcall received on		
4	Selcall destination address		
4	Selcall origin address		
2	Type of selcall. ie:-	117	normal
		102	telcall
		104	hangup
		106	pagecall
32	Pagecall/Statcall/GPS information		

Command:
Return last selcall history record

Syntax

<I><Z><L>

Purpose

Returns the last selcall received data record.

Comments

-

Returns

The last selcall history record. See **interrogate commands - return selcall history** for a break down of the returned data

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Execute commands

Command:

Select channel

Syntax

<X><C><channel number>

Purpose

Change current channel.

Comments

<channel number> - new channel number . This number is an integer value between 1 and 9999 inclusive.

Returns

OK if successful.
E0 or E2 or E5 on error.

Example

XC32
this will change the current channel to channel 32.

-_____

Command:

Select mode

Syntax

<X><B><mode selection>

Purpose

select new operating mode.

Comments

<mode selection> - mode to change to :-

L	-	JE3 - LSB
U	-	J3E - USB
A	-	H3E
F	-	F1B
C	-	J2A

Returns

OK if successful.
E0 on error.

Example

XBU
selects J3E - USB mode.

Command:

Set scrambler state

Syntax

<X><S><scrambler state>

Purpose

set scrambler on or off

Comments

<scrambler state>-1- scrambler on 0- scrambler off

Returns

OK if successful
E0 on error

Example

XS1
selects scrambler on

Command:

Select mute state

Syntax

<X><M><mute selection>

Purpose

selects new mute state.

Comments

<mute selection> - mute state required as follows :-

<N> - audio mute selected
<A> - signal strength level mute selected
<S> - selcall mute selected
<O> - no mute selected

Returns

OK if successful.
E0 on error.

Example

EMA
selects audio mute on.

Command:

Select Tx/rx

Syntax

<X><P><PTT state>

Purpose

sets transceiver to transmit or receive mode (toggles).

Comments

PTT state - 1 - PTT on 0 - PTT off

Returns

OK if successful.
E0 or E6 on error.

Example

XP1
sets transceiver to transmit.

Command:
Transmit pagecall

Syntax

<X><Z><M><destination><m><message>

Purpose

send a pagecall to a remote transceiver.

Comments

<destination>	-	selcall ID of the station being called. This ID **must** be a 4 digit number between 0000 and 9999 inclusive.
<message>	-	message to sent to the called station. The message can be up to 32 characters long.

Returns

OK if successful.
E0 or E6 on error.

Example

XZM1234MCALL BASE
sends 'call base' message to station with ID 1234.

Command:
Transmit selcall

Syntax

<X><Z><N><destination>

Purpose

initiates selcall transmission.

Comments

<destination>	-	selcall ID of the station being called. This ID **must** be a 4 digit number between 0000 and 9999 inclusive.

Returns

OK if successful.
E0 on error.

Example

XZN1234
transmits a selcall to station with ID 1234.

Command:

Transmit status request

Syntax

<X><Z><S><destination>

Purpose

get the status of a remote transceiver.

Comments

<destination> - selcall ID of the station being called. This ID **must** be a 4 digit number between 0000 and 9999 inclusive.

Returns

remote unit's status bytes in the following format :

V111ITOR2222T3333S44F55W66L7777

where :

V111 is the remote units software version number.
ITO is the option fitted and radio type. (o is the option fitted, t is the radio type 5 for a 950 and 3 for a 930)
R2222 is the receive battery level. (e.g. 0132 is 13.2 volts)
T3333 is the transmit battery frequency.
S44 is the signal strength level.
F55 is the forward power level.
W66 is the SWR level.
L7777 is the last caller received selcall ID number.

E0 or E3 on error.

Example

XZS1234
transmits a status request to station with ID 1234.
If the call is successful the transceiver will return the destination units status.

Command:

Transmit GPS position request.

Syntax

<X><Z><G><destination><R>

Purpose

get a GPS fix on a remote transceiver.

Comments

<destination> - selcall ID of the station being called. This ID **must** be a 4 digit number between 0000 and 9999 inclusive.

Returns

remote transceivers GPS position bytes in the following format :

L00000.000dl11111.111DV

where :

L00000.000 is the **latitude** position.
D is the latitude **direction**. (N for north, s for south)

L11111.111 is the **longitude** position.
D is the longitude **direction**. (E for east, w for west)

V is the validation byte. (space for no errors, I for possible errors in the data, p for parity errors in the data)

E0 or E3 on error.

Example

XZG1234R
transmits a GPS position request call station with ID 1234.
If the call is successful the transceiver will return the destination units position.

Command:

Transmit telcall

Syntax

<X><Z><T><destination><P><phone number>

Purpose

initiates telcall transmission.

Comments

<destination>	-	selcall ID of the station being called. This ID **must** be a 4 digit number between 0000 and 9999 inclusive.
<phone number>	-	telephone number required. Up to 16 digits.

Returns

OK if successful.
E0 on error.

Example

XZT1234P4341700
initiate a telcall to station 1234 (telephone interconnect ID), to telephone number 4341700.

Error messages

Error number	error message	
E0	syntax error	The command received was either mistyped or does not exist.
E1	not an alarm channel	An attempt was made to initiate an alarm sequence on a channel that doesn't have an alarm enabled.
E2	no selcall history available.	
E3	no response to selcall request. (i.e. GLL or status request)	
E4	low power error	An attempt was made to change a from low power to high power on a channel programmed for low power only.
E5	channel not found	Attempting to edit a channel not previously programmed.
E6	command too long	The number of digits/characters sent as part of a command exceeded the length allowed.
E7	invalid frequency	Attempting to set a frequency outside the frequency range allowed.
E8	invalid label number	Label number selected was greater than the number of programmed labels.
E9	e²rom full	New data sent to the transceiver to be saved cannot be saved because the radio's memory is full.
EA	invalid clarify	Attempting to set a clarifier value outside the clarifier allowed.
EB	PTT error	Attempt to PTT on a channel with an invalid transmit frequency. (i.e. Tx is 0.0kHz)

Error number	Error message
EC	Function not allowed in selcall.
ED	Pre-programmed channels protected. Attempting to over- write a protected pre-programmed channel.
EE	Transmit frequency program disabled. Attempting to change the transmit frequency when transmit frequency programming is disabled.
EF	GPS not fitted. Attempt to request GPS data from a 950 transceiver without a GPS unit fitted.
EG	No response from GPS Destination unit timed out during GPS data acquisition, causing it to send back a no response message.
EH	Data checksum bad. GPS data received from the destination unit has got a bad checksum.
EI	No labels. There are no labels programmed.
EJ	In PTT mode. No commands accepted because the transceiver is in PTT.
EK	No channels programmed. No channels available to be dumped out.
EL	No scan channels available. There are no channels with scan enabled on them.

Command summary

Program current channel characteristics
<P>[<C><CHAN>][<R><RX FREQUENCY>][<T><TX FREQUENCY>]
[<Z><SELCALL ENABLED/DISABLED>][<S><SCAN ENABLED/DISABLED>]
[<H><RF POWER LEVEL>][<B><MODE SELECT>][<L><LABEL NUMBER>]
[<A><ALARM TYPE>]

Set clarifier	<E><F><sign><clarify value>
Set RF power level	<E><H><power>
Set noiseblanker state	<E><N><state>
Set autotune state	<E><W><state>
Set selcall ID1	<E><Z><selcall ID>
Set selcall ID2	
Clear selcall recieved flag	<E><Z><C>
Set selcall preamble length	<E><Z><P><preamble>
Return current channel number	<I><C>
Return recieve frequency	<I><R>
Return mode	<I><B>
Return channel data	<I><D><C><channel number>
Return all channel use labels	<I><D><L>
Return key function locks	<I><K><group>
Return selcall preamble length	<I><Z><P>
Return transmit frequency	<I><T>
Return label	<I><L>
Return clarifier level	<I><F>
Return mute state	<I><M>
Return input power supply level	<I><Y>

Return selcall ID	<I><Z>
Return software version number	<I><V>
Return selcall history	<I><D><Z>
Return last secall history record	<I><Z><L>
Select channel	<X><C><channel number>
Select mode	<X><B><mode selection>
Select scramble state	<X><S><scrambler state>
Select mute state	<X><M><mute selection>
Select Tx/rx	<X><P><PTT state>
Transmit pagecall	<X><Z><M><destination><M><message>
Transmit selcall	<X><Z><N><destination>
Transmit status request	<X><Z><S><destination>
Transmit GPS position request	<X><Z><G><destination><R>
Transmit telcall	<X><Z><T><destination><P><phone number>