R535 Interface

Commands and Usage

There are five commands available for controlling the R535, each command is sent with the first byte being 02h (ctrl-B / STX) followed by the two letter command name, then followed by any information needed by the command. There are three possible responses to commands, which are:

1. 15h (ctrl-U / NAK) sent to any command if something is wrong.
2. 06h (ctrl-F / ACK) acknowledgment for commands that do not return a frequency.
3. A frequency sent as a 4 digit hexadecimal number. (see description later).

The commands are:

FSxxxx	Frequency Set	Sets the frequency but does not update the display.
FDxxxx	Frequency Display	Sets the frequency and displays it.
FG	Frequency Get	Returns the current frequency.
CGcc	Channel Get	Returns the channel frequency.
CScexxxx	Channel Set	Sets the memory channel frequency.

cc = Channel number 0 to 59 sent as a 2 character hex digit 00 to 3B.

xxxx = Frequency sent as a 4 digit hex number and is calculated from the following formulae:

To convert frequency in MHz to number required by R535:

If frequency is between 108 MHz and 143 Mhz

$$NUMBER = \frac{(frequency - 108) \cdot 1000}{5}$$

else If frequency is between 220 MHz and 380 Mhz

$$NUMBER = \frac{(frequency - 220) \cdot 1000}{25} + 8192$$

NB. if 32768 (8000H) is added to NUMBER the channel will be locked out.

To convert the NUMBER back to a frequency just reverse the process, (when reading channel information if frequency is greater than 32767 then the channel is locked out).

Examples

To set the frequency to 131.050 MHz :-

    N = (131.050 - 108) * 1000 / 5
      = 23.05 * 1000 / 5
      = 23050 / 5
      = 4610
      = 1202H Therefore to set the frequency you would send

(ctrl-b)FD1202(return)   The response should be (ctrl-F)

Computer to Interface Connections

The interface has a 25 pin D-type female connector for the RS232 signals. It has been wired so that most computers' serial cables will work with it. The table below shows the pin, description and the corresponding computer signal.

Computer Signal	Interface Pin	Description
Transmit Data	2	Data from computer
Receive Data	3	Data to computer
Ground	7	Signal Ground
an output (RTS)	4	Used to select manual/external mode.
an input (CTS)	5	Used for squelch output.

Pin 4 only needs to be connected if the link on the board is set to the control position. This allows you to switch between manual mode or computer control. If the link is in the select position then you will only be able to use the receiver if you unplug the interface from the R535. As an alternative you could connect an external switch to the select connections so that you can switch between computer and manual mode without the computer.

Pin 5 has the squelch output which will be either high or low. It is only needed if you wish to monitor the squelch line.

Both pins 4 and 5, if used, require you to be able to directly read and write to the RS232 output of your computer; an ordinary terminal program will not be able to use these lines correctly. See the demonstration program on how to use these lines on an IBM PC or compatible.

The Demonstration Program

The program was written in Microsoft BASIC for an IBM PC or compatible. The machine specific bits are related to the control and use of the RS232 port. The OPEN command and all the PRINT# / INPUT# and the INP and OUT commands are used to control the interface. Apart from this, the three subroutines should be usable on most computers, with only minor changes on some. If you have a knowledge of BASIC, the two conversion subroutines should make the section on sending and receiving frequencies a bit clearer.

```
10 REM *******************************************************************
20 REM *                                                                 *
30 REM *  LOWE ELECTRONICS LTD.      2/89   K.B.                         *
40 REM *                                                                 *
50 REM *  Program to demonstrate usage of the R535 interface for remote  *
60 REM *  control of the receiver.                                       *
70 REM *                                                                 *
80 REM *******************************************************************
90 CLS
100 TRUE = 1: FALSE = 0: CNTRL = &H3FC: SQLCH = &H3FE
110 RS232$ = "com1:1200,n,8,2,BIN,CS0,DS0,CD0"
120 OPEN RS232$ FOR RANDOM AS #1
```