

Philips FX5000 - digital repeater ex UK Police

The ex UK Police FX5000 sold on www.eBay.co.uk are digital repeater with conventional RX , TX , Power amplifier and Power supply modules.

The main differences with respect to the conventional repeater are in the Control module and in the Backplan interconnection board, in addition the ex UK Police repeater uses an external 5MHz high stability oscillator installed on the rear panel.

The way to bring back the '5000 in life is to completely remove the boards in the control module and to use the main bus to hook up an external controller, we can also remove the external 5MHz oscillator and use the internal crystal oven oscillator of the RX and TX modules.

The main bus comes from the backplan interconnection board to the digital control module and its interface is a Cannon DB50 male connector.

We can reuse the control module box to fit a repeater controller and reusing in place the card with the DB50 female connector , in this way is it possible to make the connection with wire soldered on the circuit board or on the DB50 female connector pins.

At the end we will have the control module box containing the controller without major mechanical modification of the unit and we can add if necessary CTCSS tone encoder-decoder board, DTMF remote control and CW ID to complete the repeater assembly.

To start with the modification we have to dismount the 5MHz high stability oscillator installed on the rear panel and remove the backplan interconnection board enclosure fixed to the repeater assembly by 4 screws.

Since on the main bus DB50 connector there isn't a power supply line, we need to route a wire on the backplan card from the output of 7812 DC regulator installed on it to a free pin of the main bus, for this purpose I selected the pin 16 but you are free to make your choice.

In the next tables is reported the main bus pin function of the RX and TX lines.

Note that I found a strange pin number sequence on the DB50 male bus connector with respect to the standard Cannon DB50 connectors.

The standard connectors have the pin numbers placed in row in sequence (1,2,3,4 and so on), the DB50 main bus connector has the pin numbers placed in vertical order so following the pin row you have 1,4,7,10 and so on.....please don't ask me why, I don't know but this is the situation I found!

In the tables there are also the pin number of standard connectors just in case you need to make an additional cable or connector adapter.

TX signals

DB15 TX module	Main Bus – DB50 male	Std. DB50 conn.
1 CH0	30	27
2 CH2	29	43
3 CH4	27	26
4 CH6	25	9
5 Power Supply OK	18	23
6 TX Alarm	<i>not connected</i>	
7 -Vcc	1	1
8 GND-Chassis	<i>not connected</i>	
9 CH1	28	10
10 CH3	26	42
11 CH5	24	25
12 Modulation Monitor	<i>not connected</i>	
13 PTT	36	29
14 Audio TX	4	2
15 +18 Vcc	<i>not connected</i>	

RX Signals

DB15 RX module	Main Bus – DB50 male	Std. DB50 conn.
1 GND - Chassis	<i>not connected</i>	
2 -Vcc	1	1
3 RX Volt	19	7
4 COS	8	36
5 CH6	25	9
6 CH4	27	26
7 CH2	29	43
8 CH0	30	27
9 +18 Vcc	<i>not connected</i>	
10 Audio RX	5	35
11 Noise	<i>not connected</i>	
12 Injection	31	11
13 CH5	24	25
14 CH3	26	42
15 CH1	28	10

Now we have the repeater ready to be hooked up to an external controller.

Talking about the RX and TX modules, they are conventional units and can be programmed and tuned into the required frequencies as well known, we have just to remove the small PCB from the EPROM sockets on both units, pick a pair of 27C256 and program them with a file generated by the software we can download from the groups.

The only remark I have about the software is that the .HEX file generated and called FX5000.HEX is an Intel Hex files that needs to be converted in .BIN files (I used WinHex software).

At this point the new converted .BIN files is too big to fit in the C256 EPROM so I removed the first part of the file starting at 0000h ending at 7FFFh since the useful data for the PLL start at 8000h.

I put the previous 8000h at 0000h and the result was OK.

Personally I will fit in the Control module box also an VHF receiver to be used as remote control of the repeater.

As soon as I have finished the work I will post an overall picture of the unit.

Best '73

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