

DFD2-520 instructions.

After completing assembly, carefully inspect all of your solder connections, and the polarity of the diodes, voltage regulator, the electrolytic capacitor, and the IC's.

Adjust the contrast control fully counter-clockwise. Apply power from 8 to 18VDC. You should see some frequency displayed. Adjust the contrast control for the desired effect.

The top zero ohm jumper selects 100Hz resolution (jumper off) or 10Hz resolution (jumper on)

The bottom zero ohm jumper selects display format (where USB is used as an example of the operating mode display):












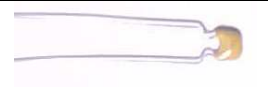


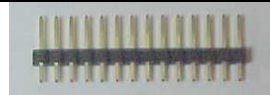
10 Hz resolution: 12.345.67MHz USB (jumper off) or 12.345.670 USB (jumper on)

100Hz resolution: 12.345.6 MHz USB (jumper off) or 12.345.600 USB (jumper on)

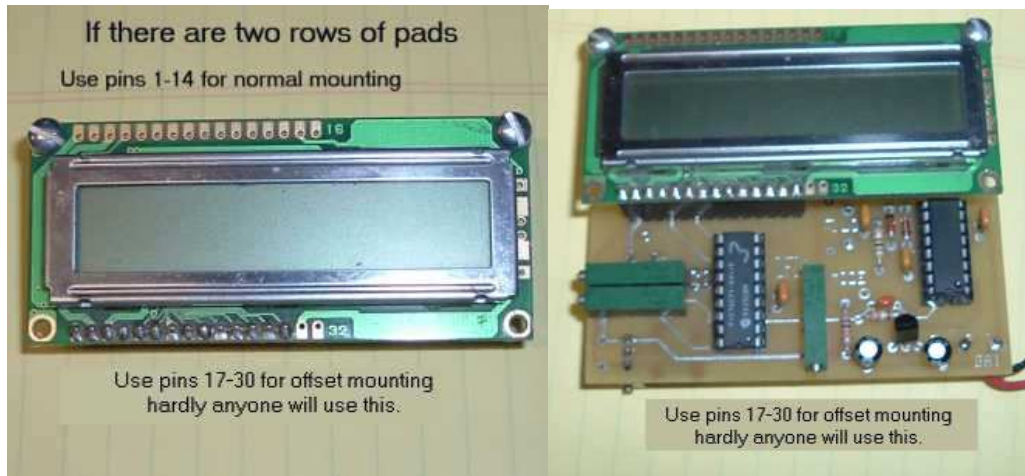
Using the LED back-lit display [\(see diagram below\)](#)

The back-lit module has a block of LEDs behind the LCD display. It is powered from terminals A (anode) and K (cathode) with A being plus and K being minus (usually ground). The voltage drop across the LEDs is 4VDC. The current can range from 20ma. To 150ma. The dropping resistor required is $R = (V-4)/I$ where I is the desired current and V is the supply voltage.

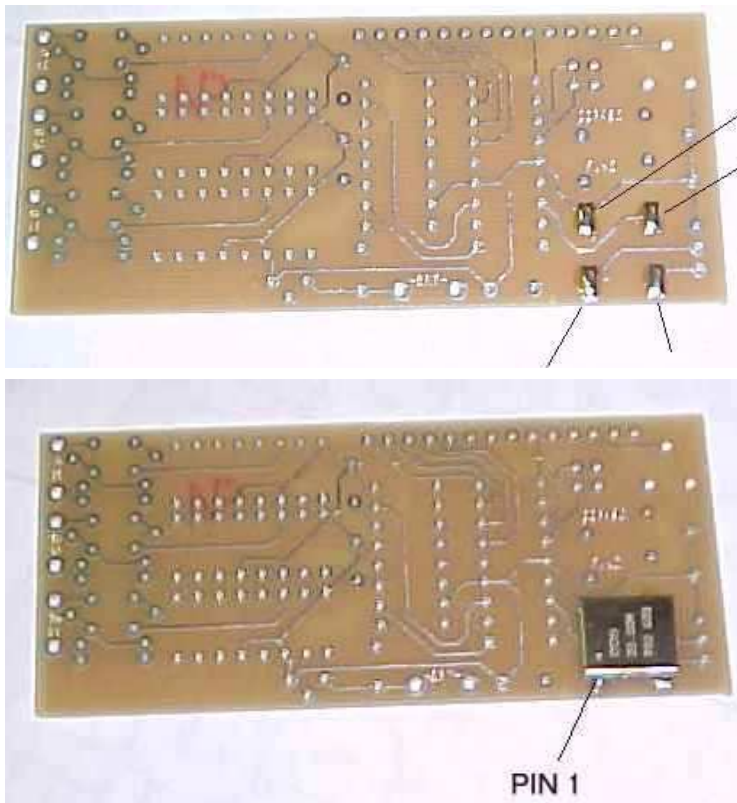
PARTS LIST

D1, D2, D3, D4, D5, D6	1N4148		U1, U2, U3	74HC4046	
R1	100ohms Brown-black-brown		U4	74HC153	
R2, R3	1000 ohms brown-black-red		U5	PIC16C71 Labeled according To the model DFD2	
			U6	78L05 Voltage regulator	
R4	10K trimpot contrast control adjust fully CCW		U7	20MHz TCXO	
	25 Turn trimpot value may vary		H1	2 pin header 2 Pin jumper	
C1, C2, C3 C4, C5, C6 C7, C8, C11	.1uF C1, 4 and 6 Misabeled on schematic		J1	Female connector	
C12	10uF		P1	Male connector	

Use pins 1-14 of the display module. If 16 pins are available, last two are not used. Backlit option is powered by supplying current (a current limiting resistor **MUST** be used) from the A(anode) to K(cathode) connections on the edge of the module. See **schematic for details**.



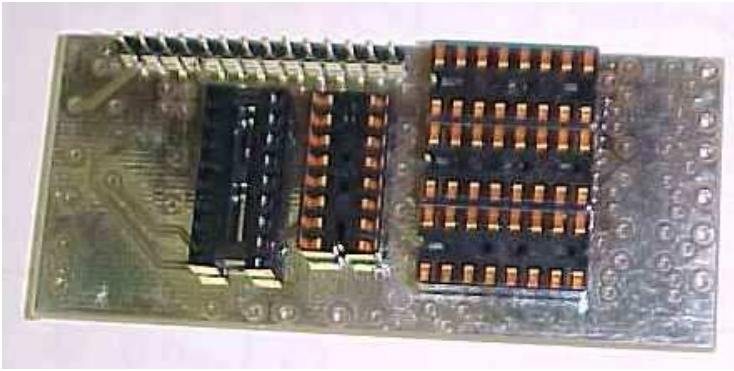
DFD2 assembly instructions.



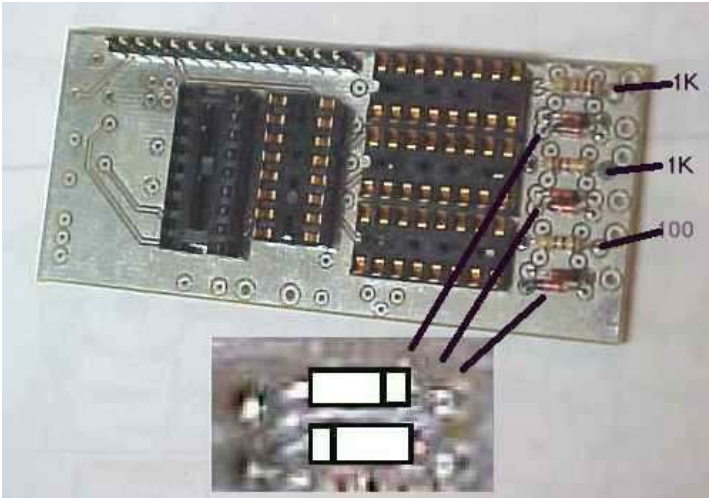
Begin by placing solder globs on the four rectangular pads for the surface mount TCXO.

If I pre-installed the TCXO, I could not test it. If unit displays only 8 black squares then check and reflow the solder on its four corners.

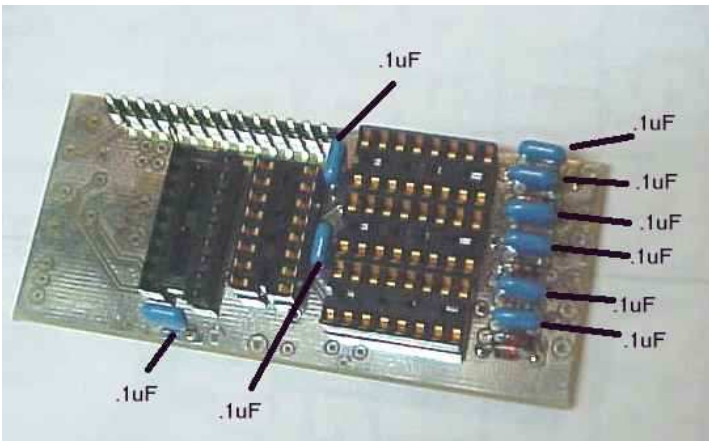
Carefully Position the TCXO with pin 1 as shown and remelt the solder globs while pushing down on that side of the device until all four pads of the TCXO are soldered. You can check by looking at the edge view to verify that solder has flowed onto the TCXO terminals. If later the unit shows only 8 black squares on the display it may be because one or more of these terminals did not properly reflow solder.



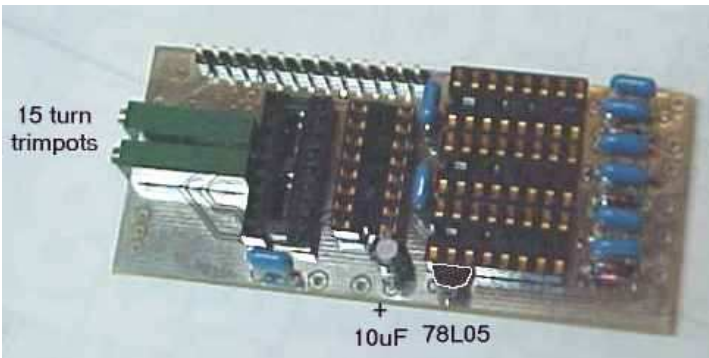
Next mount the IC sockets and display header.



Next install and solder all resistors and the six back to back diodes.

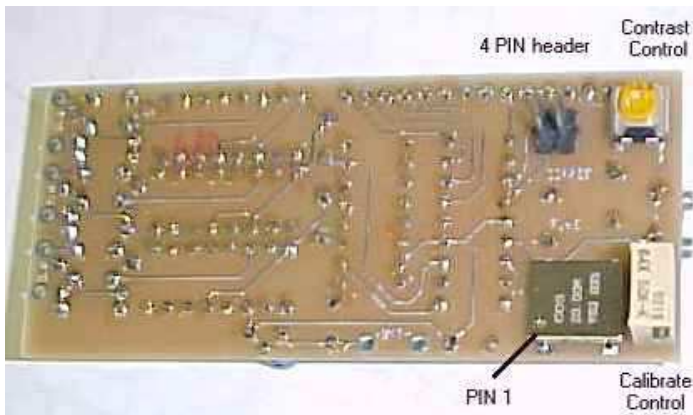


Then install and solder 9 each .1 uF capacitors **Caps can be blue or brown.**

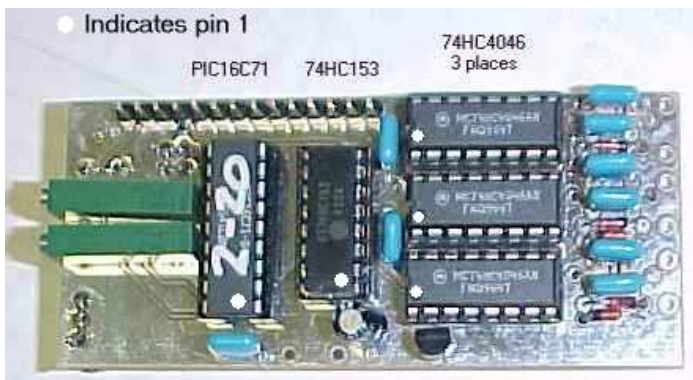


Next install the 78L05 voltage regulator, the 10uF. **The two 15 turn trim pots are not used with The DFD2-520**

+ Terminal of 10uF electrolytic in hole closest to edge of PCB. Flat side of 78L05 toward IC sockets.



On the back side of the PCB install and solder the 10K contrast control (**adjust it fully CCW**) and the 25K calibration control.



Next, Install the ICs. **If this is a general purpose DFD2 then leave the 74HC4046 chips off until you have set the IF offset. This will insure that the input frequencies are all zero.**



Mount the 14 pin female header on the display module soldering only one pin. Then verify the connector is at a right angle to the module, remelting the soldered pin and adjusting the connector if necessary.

Then solder the remaining pins.

Plug the module into the DFD2 PCB.

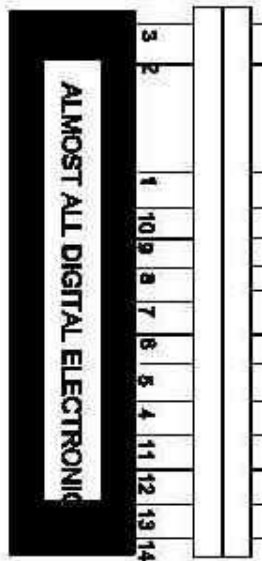
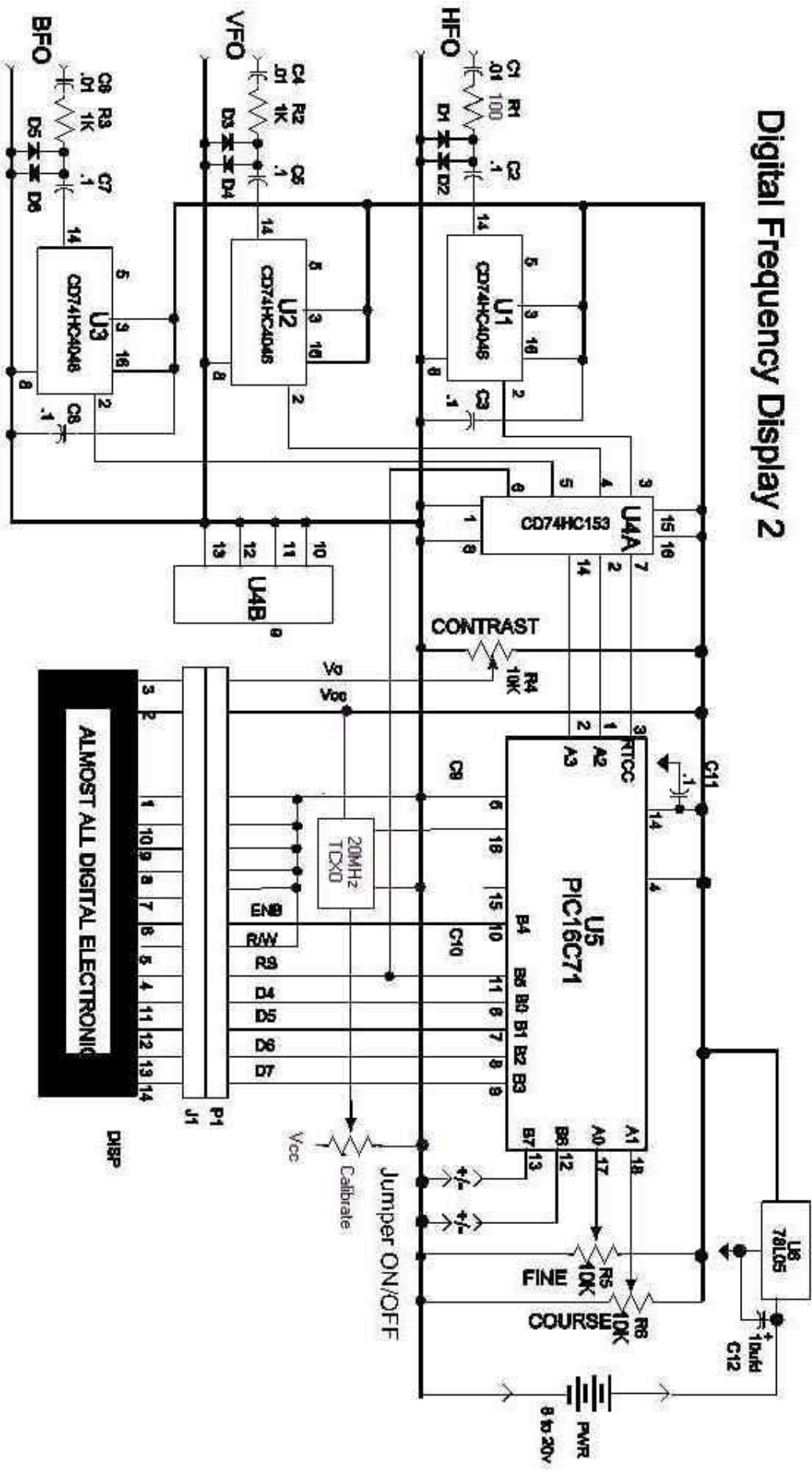
At this point you can plug the counter board into the module and power them with a 9 volt battery.

You should see something displayed.

What you see at this point is not important as some inputs are still floating until final assembly in your enclosure. **Set the IF offset by adjusting the 15 turn trim pots. Then install the 74HC4046 chips.**

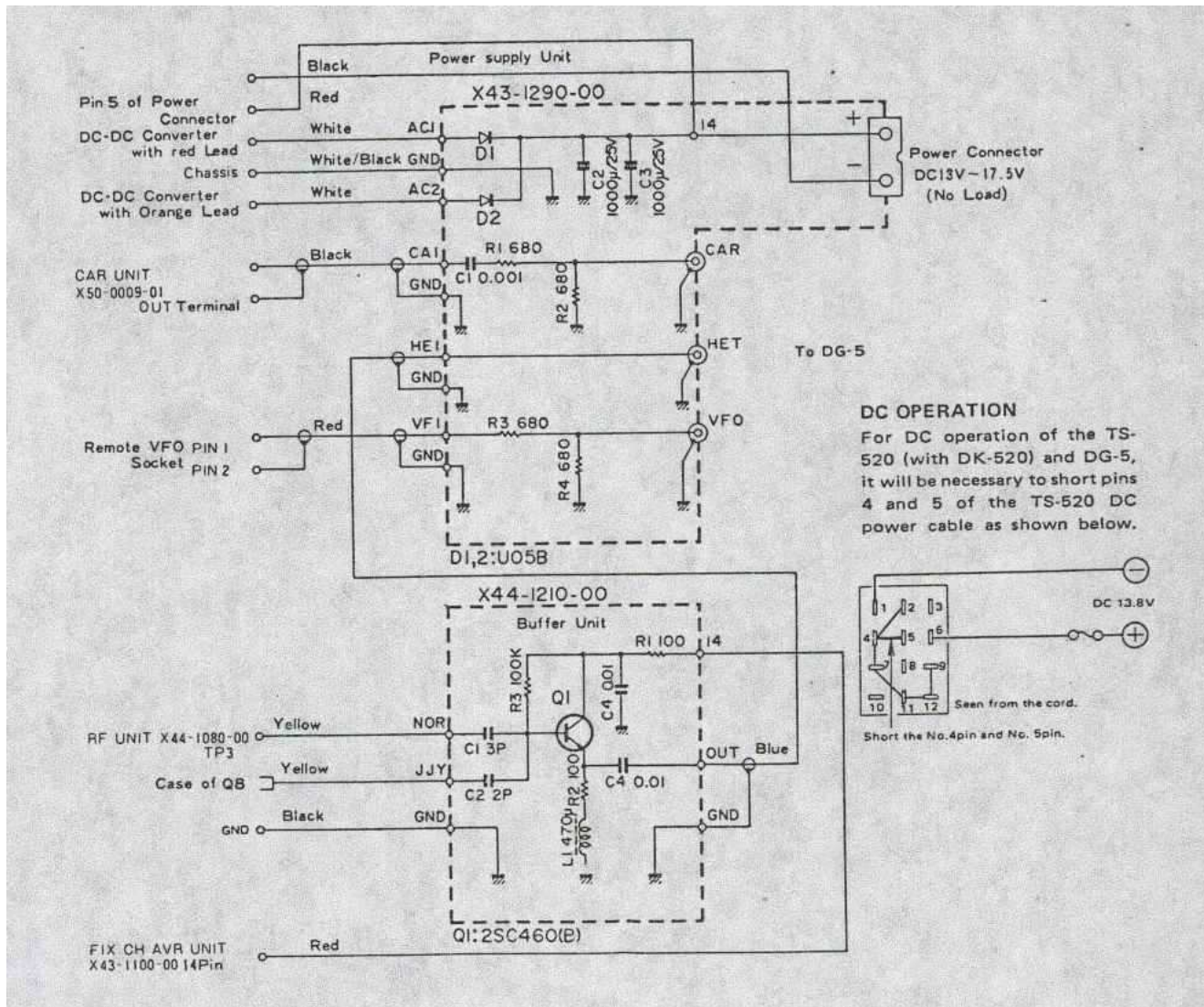
If only 8 black squares appear, either the TCXO has not been soldered on all 4 points or there is a solder problem on the circuits between the 18 pin chip and the display connector, or on the display module connector.

Digital Frequency Display 2

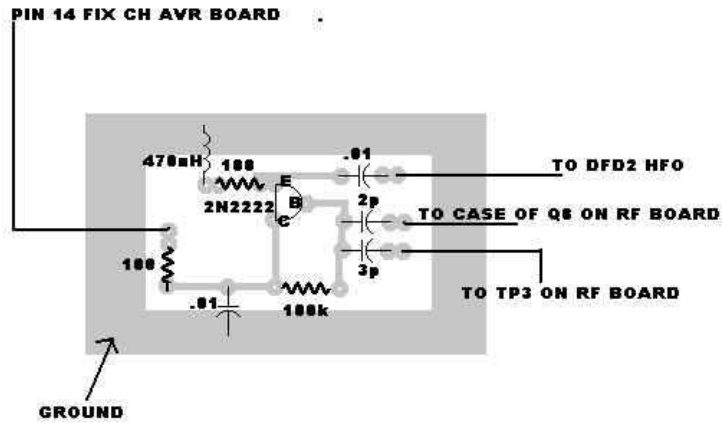
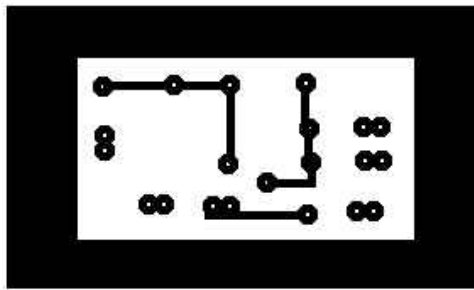


DISP

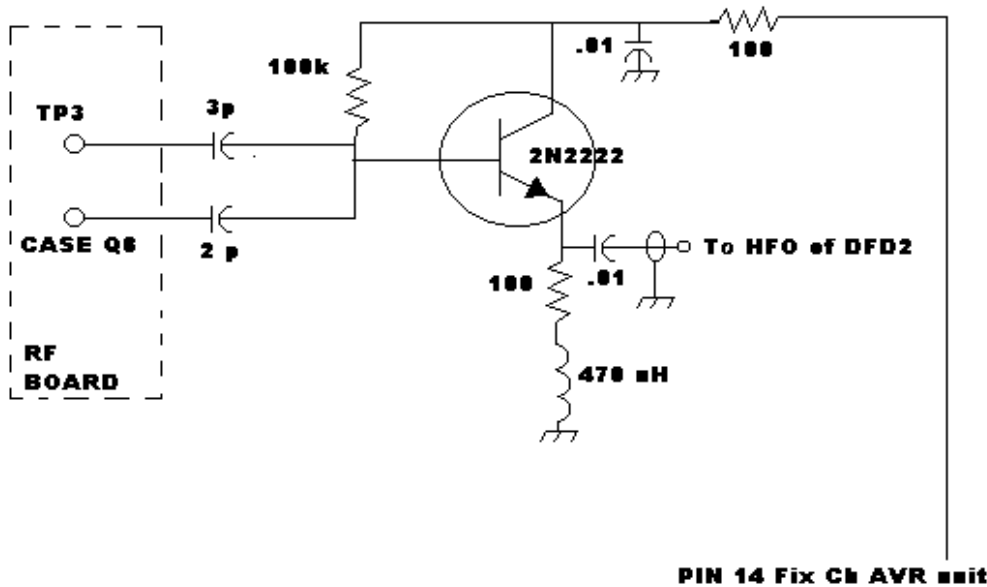
The TS-520 (not the TS-520S) requires an emitter follower to buffer the HFO. An adapter was available to allow the DG-5 to be used with the TS-520, called the DK-520. Its schematic is shown here:



All you really need is the emitter follower shown below with a little circuit board for it (you could use dead-bug construction or vector board construction easily). You don't need the little resistor / capacitor combinations for the carrier and VFO inputs as these can go directly to the C-520 digital dial. The VFO input connects to pin 1 of the remote VFO connector and gnd to pin 2. The Carrier input connects to the OUT terminal of carrier unit X50-0009-01.



PRINTED CIRCUIT BOARD



Thanks to WA4PJP for supplying this information.

Some useful comments from a customer for the C-520 or DFD2-520.

Hi Neil

Just wanted to mention that my C-520 frequency display - two line, blue - arrived July 27/06. I hooked it up, but only the blue display light came on. I opened it up - and in shipping one of the boards that plugs into the other board had become detached. I plugged it back in and it worked. I wanted to mention this for your future reference in case others have a similar problem - it is a very easy fix. **I usually put a rubber band to hold the two boards together but sometimes forget.**

Initially there was a problem with the digits bouncing around - but this was resolved simply by grounding my TS-520SE as it should be. Now the display is very stable. Again, if others were to have a similar problem, this would be a good starting place for them to check - make sure your transceiver is grounded as it should be.

I found using a small alligator clip with a rubber boot worked great for tapping off the power for the C-520 from the TS-520SE power socket.

I am very impressed by the C-520 display - very nicely constructed inside and out and works very, very well.

Many thanks for an excellent product!

Phil