

Codan 8525B Arduino VFO

This document is to explain how to add an Arduino driven VFO to the Codan 8525B radio for fully tunable frequency coverage.

The unit I started with had the front panel 2 digit LED channel display.

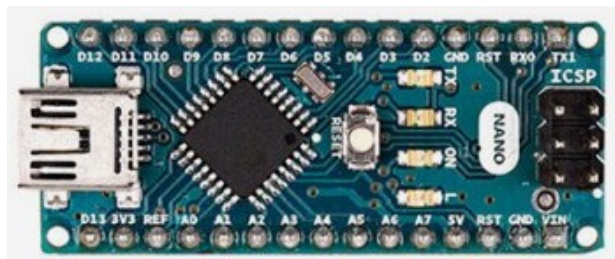


The 8525A is similar, but the control chips are different. This will only apply to the 8525B, although it will be modifiable to suit the 8525A.

I do not know the differences to the 8525S or the 8528, but it may work in them too.

Originally the intention was to remove the CPU and EPROM and drive the existing PLLs, but it worked out a lot easier to have the Arduino Nano controlling an Si5351 triple VFO instead.

This modification is fully reversible as it involved 3 cuts and 2 links.



This is the “brain” of the system. The Arduino Nano board.

It is a pretty versatile board, and pretty easy to use. The Arduino programming environment is downloadable for free.

<https://www.arduino.cc/en/Main/Software>

There are many courses to teach how to use it. I recommend you have a look at..

<https://randomnerdtutorials.com/> for very good instructions.

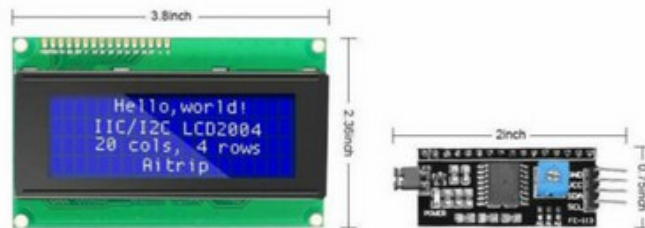
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The three signals required, first mixer, second mixer and sideband generator are all produced from this little board.



The outputs can be taken from pins 0, 1 and 2, but I use coax cables screwed to the connectors supplied, and they solder to the CLK0 – CLK2 positions.

A couple of display options are available.
First, a 20x4LCD.



Or an OLED display.



Both use I2C 2 wire communication driven from the Arduino.

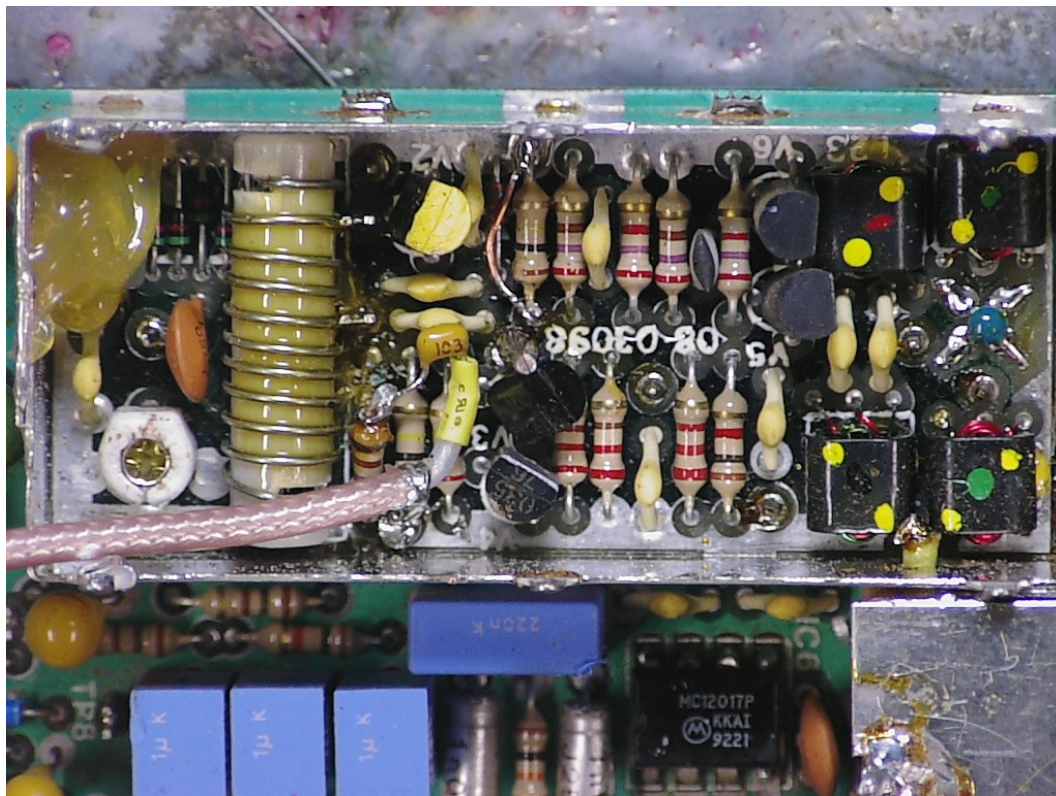
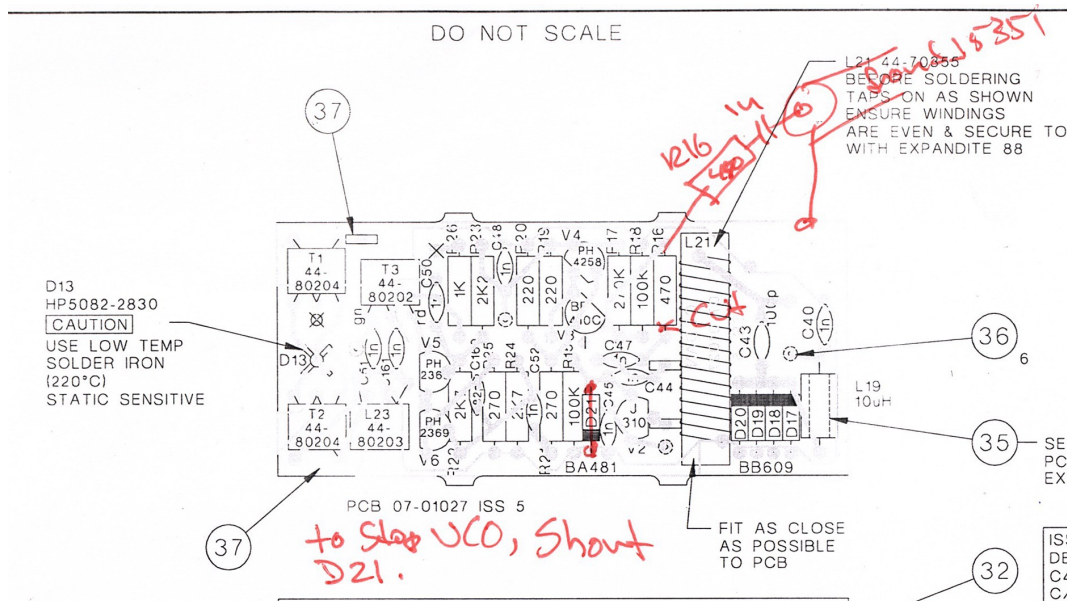
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These mods are best to be done on the board with it removed from the case. It has to be removed for a following step anyway. I find it is a good idea to take a number of photos to remember where the wires go.

To prepare the Codan 8525B, the original PLL VCOs must be disabled.

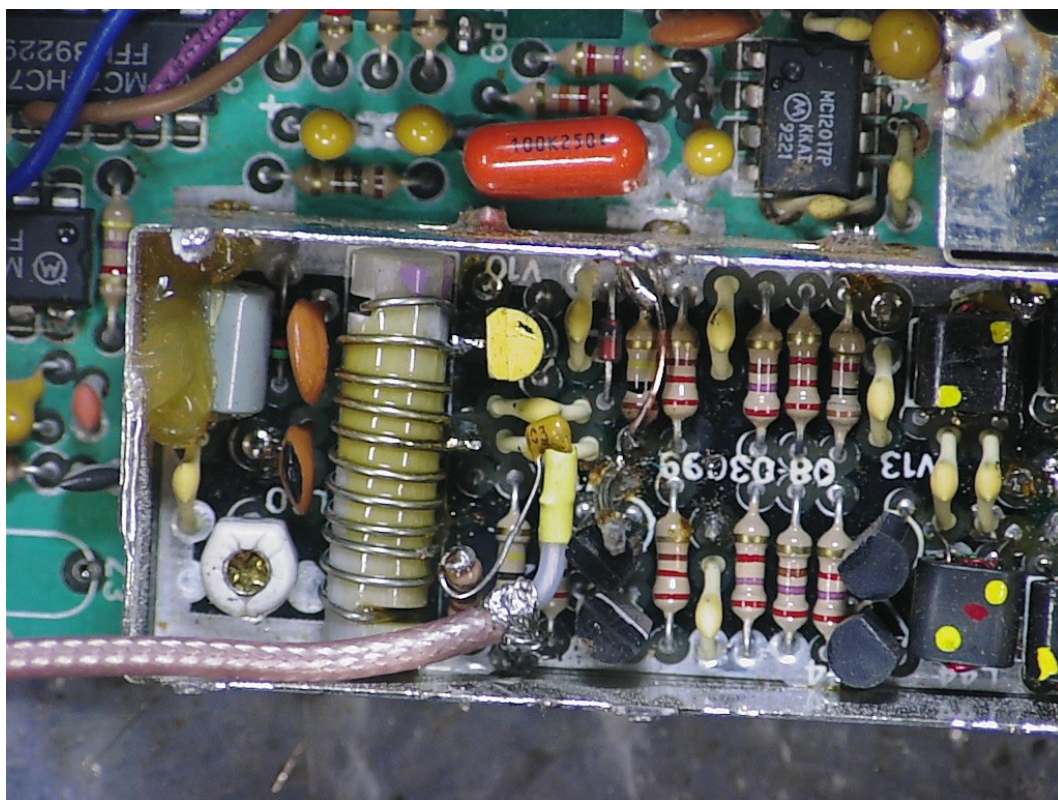
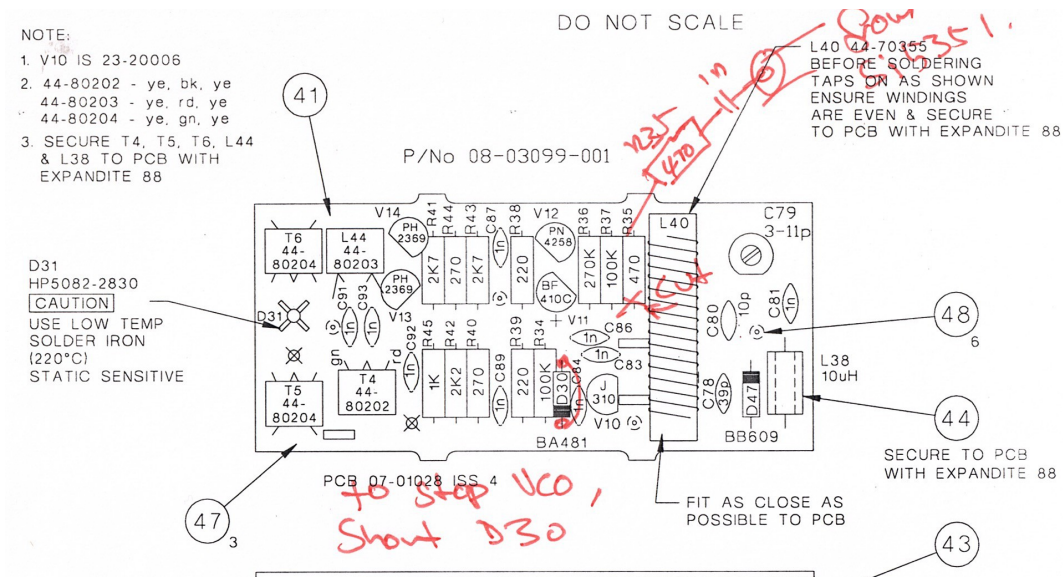
This is done by removing the top covers of the PLL enclosures, shorting the VCO FET gate to 0V, and cutting and lifting one end of the buffer input resistor. A 10nF cap is soldered onto this resistor free end, and connected to the coax from the Si5351 board.

The first PLL is as follows...



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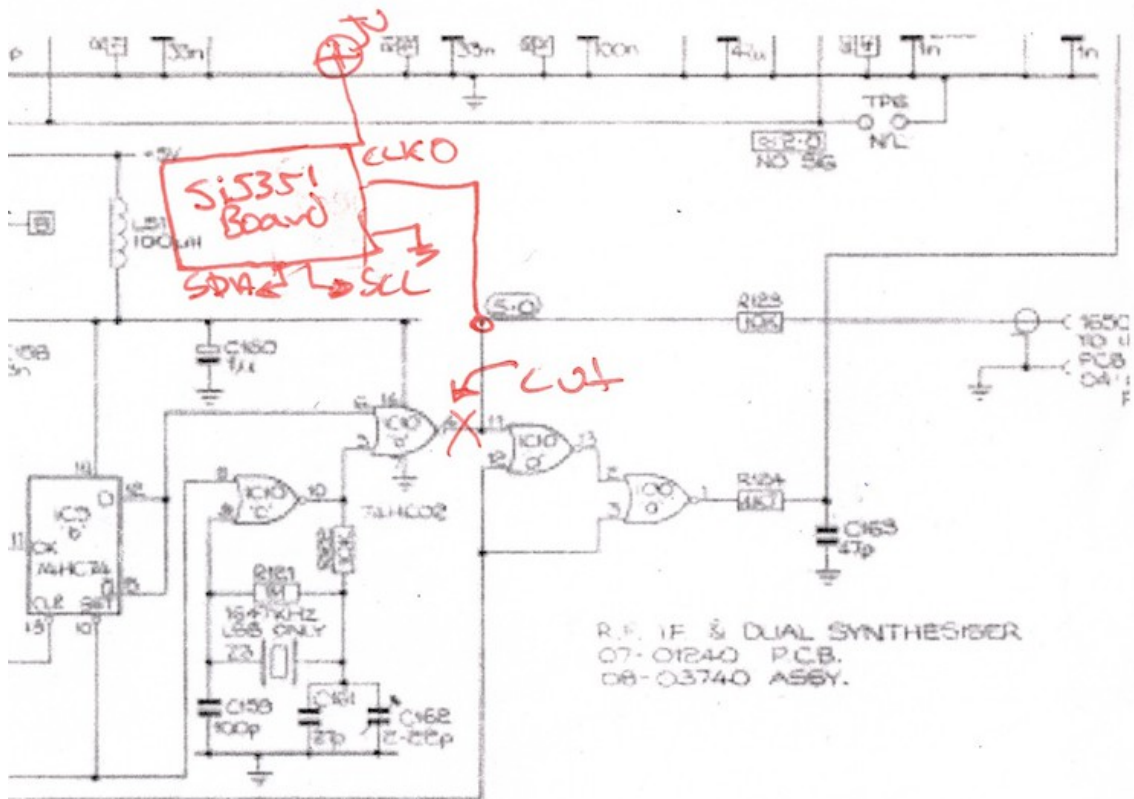
And the second one is just the same.



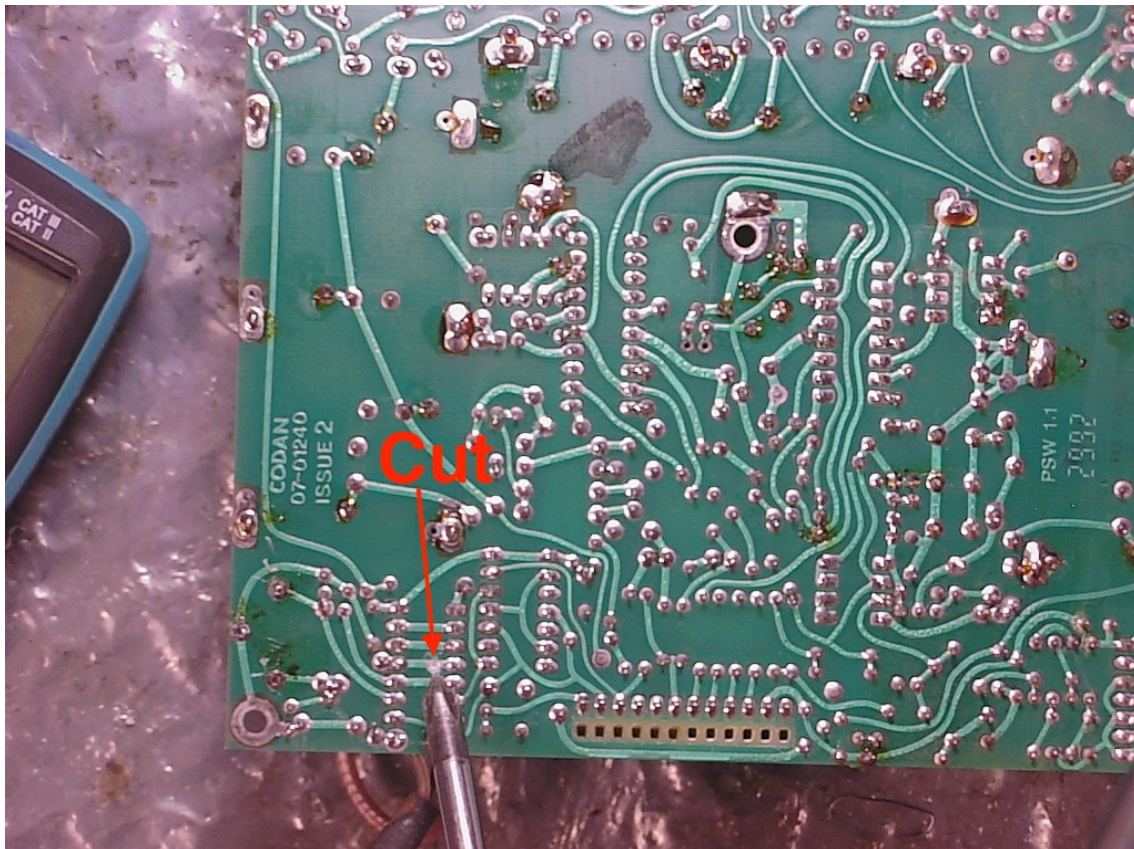
The coax cables are fed out the original tuning hole in the lids. Then the lids are re-soldered to the cases.

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Under the PCB, a cut needs to be made.



This is to disable the side band oscillator.

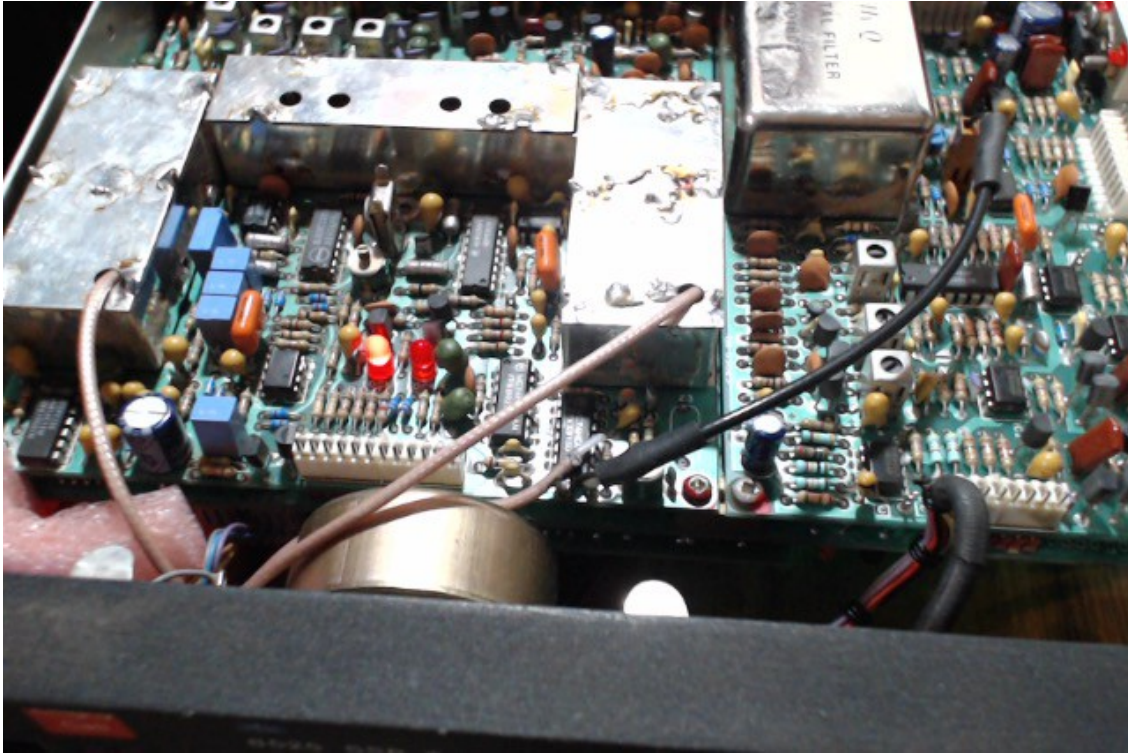


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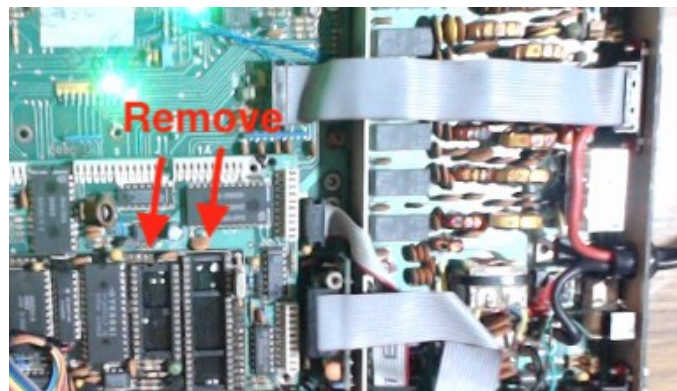
A coax is then soldered to IC10, pin 11. The shield goes to the gnd pin of the other (black) coax. Or to IC10 pin7 if you prefer.

Re-install the board, but take care to get the pins into the holes from under the PCB. It can be a bit tricky.

The board will now look like this.



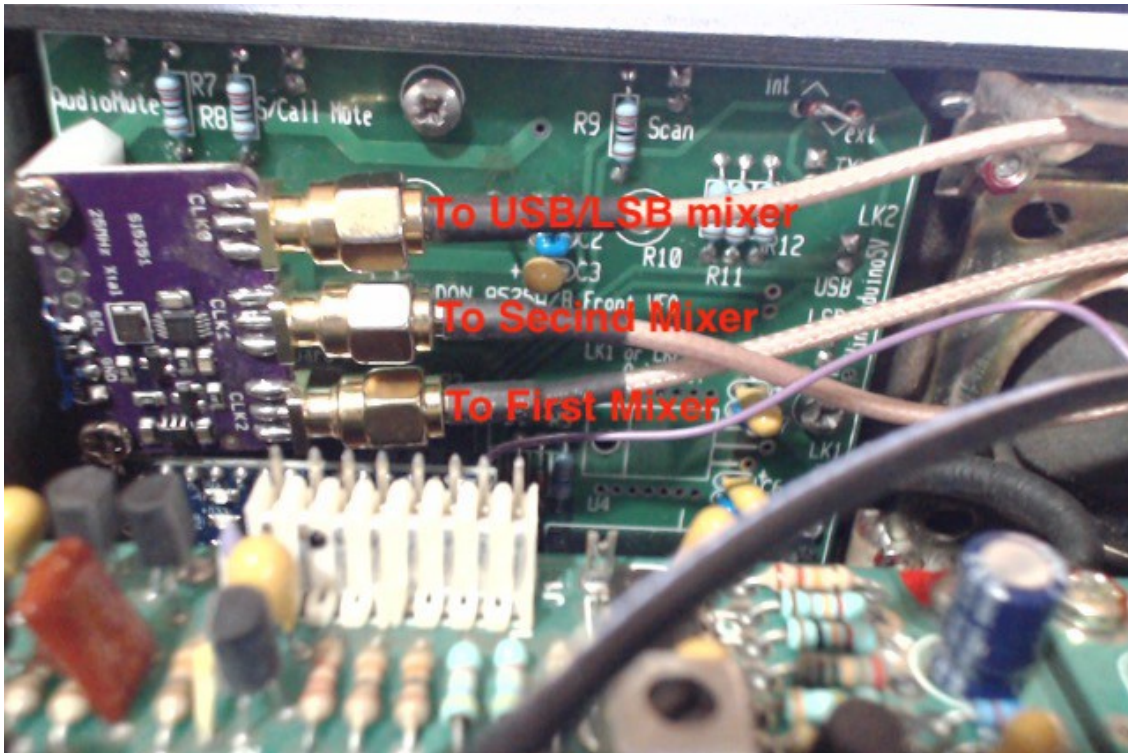
Now, remove the CPU and EPROM if you have not already done that, and store them in some anti static foam in a safe place.



Also, remove the front panel so the original display board can be discarded (in the safe place with the CPU and EPROM).

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The VFO PCB mounts in place of the old front panel, and has the Arduino Nano with the Si5351 VFO board on one side, and the OLED display and indicator LEDs on the other.

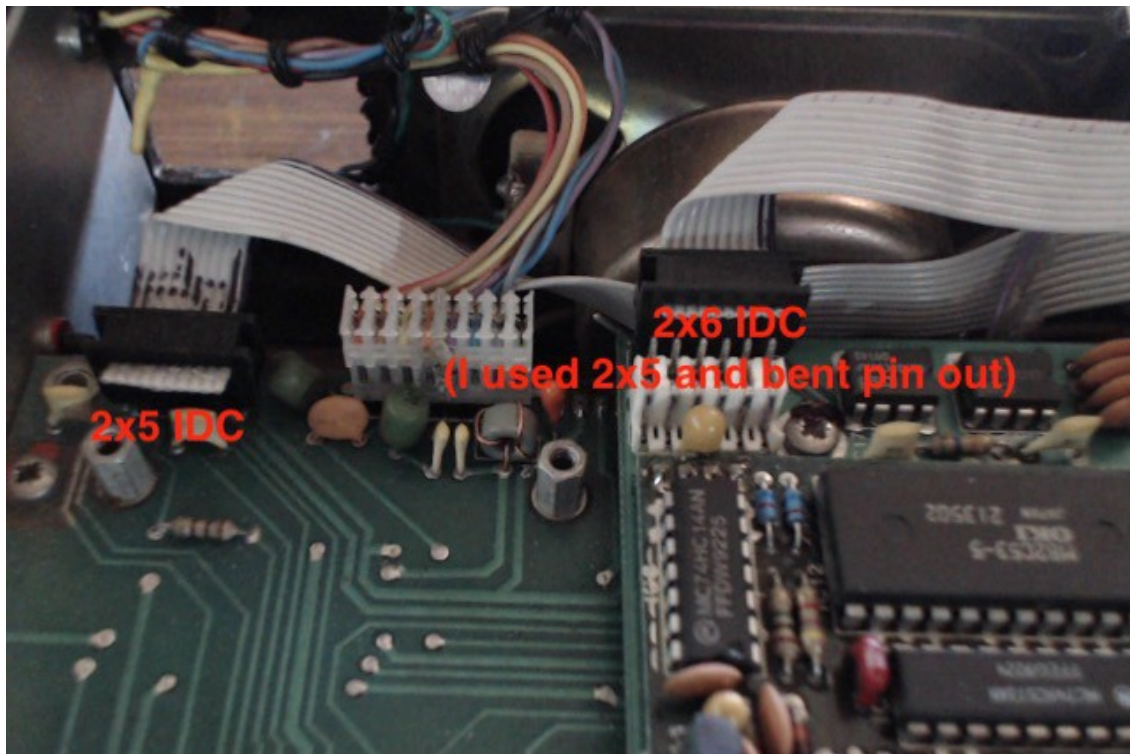


There is wire running from the VFO to the Codan controller board for the Tune signal. It is just pushed into the connector as below.

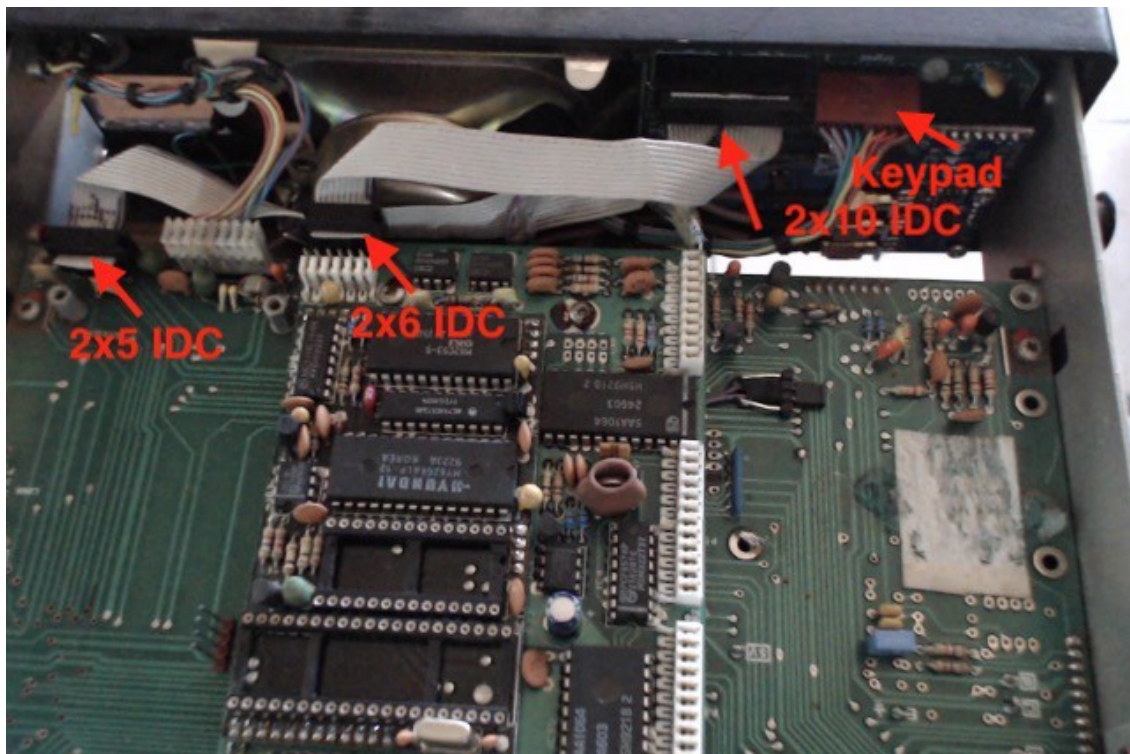


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Connections from the VFO board back to the Codan are all on the 2x10 IDC lead. This is split to one 2x5 IDC plus that goes to the Codan main board “P5”, and a 2x6 IDC plug for the Codan “P1” (The picture shows a 2x5 and one pin bent out off the way as I did not have a 2x6 IDC plug handy).



Here is the overall view, showing the 2x10 IDC and the Codan keypad connections.



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The “Clarifier” buttons are used for the band selection now., while “Channel” is the tuning. “Scan” and “S/Call Mute” are the digit select < and > respectively.

At this time, “Emergency Call” and “Call” buttons are not used.

Using the “Channel” keys, the frequency can be stepped up and down in steps selected by the digit keys, so the minimum step is x100Hz. Holding the “Channel” keys down auto repeats so the band can be quickly tuned.

USB/LSB works as it should, as does the Power OnOff, Audio Mute and Mute Off.

Work still to come is maybe a meter, based on another OLED display mounted in the old thumbwheel switch hole, to show power and S meter etc.

Boards will be made available shortly, along with the source code.

Please feel free to modify the code as you want.

The intention is to get this working for both the 8525A and 8525B.

Denys

VK3ZYZ

Codan 8525B Arduino VFO

