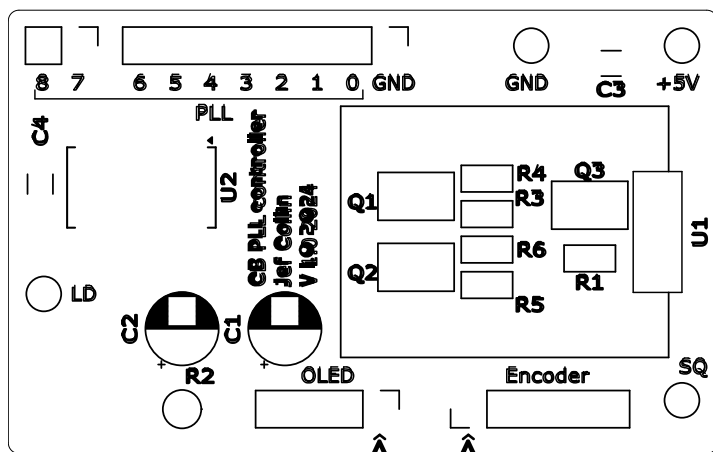# Mounting instructions PLL controller Cybernet PTBM048AOX

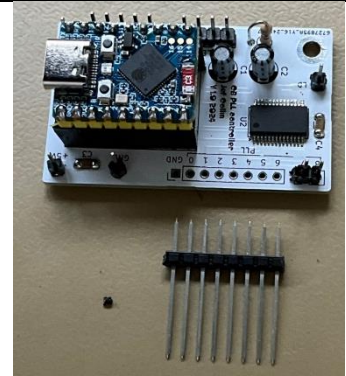
Version 3/10/2024 © Jef Collin

Important: these instructions are for Cybernet PTBM048AOX platform (as used in many old CB radio's under many brand names) and similar ones using a PLL02A. Although the concept might work in many others the software needs to be adapted to match channels and/or PLL. Basic electronic skills are implied, don't do this installation if you cannot distinguish a resistor from a capacitor or lack decent soldering skills. I am not responsible for what you build and how you use it.

The software is designed for 240 channels, -120 to +120, the actual range will depend on the VCO range and adjustments to transmitter and receiver circuit. The VCO will probably need adjustment to go beyond the 40 standard channels and the transmitter/receiver coils might need adjustment. Be very careful, the ferrite cores break easily, use a nonmagnetic screwdriver. Once the actual range is determined you can set the limits in the menu (refer to the user guide).
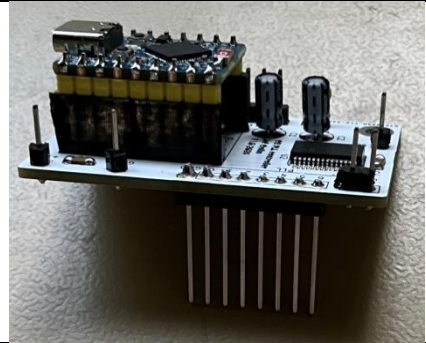
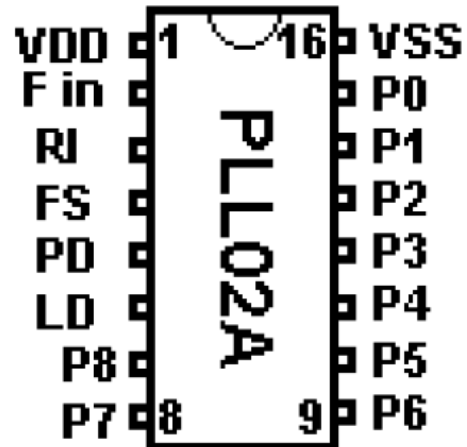|	
Prepare OLED, rotary encoder and PCB with connector pins except PLL 0-6&GND mounted. Clip the ends of the header pins on the OLED display so they can't touch the metal frame of the radio after mounting. Use a rotary encoder with debounce components fitted. Note that some encoders work backwards, in that case switch pins S1 and S2 or change pin allocations in the source code.	

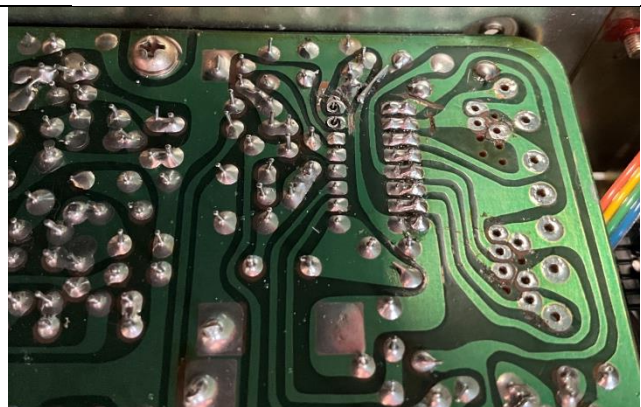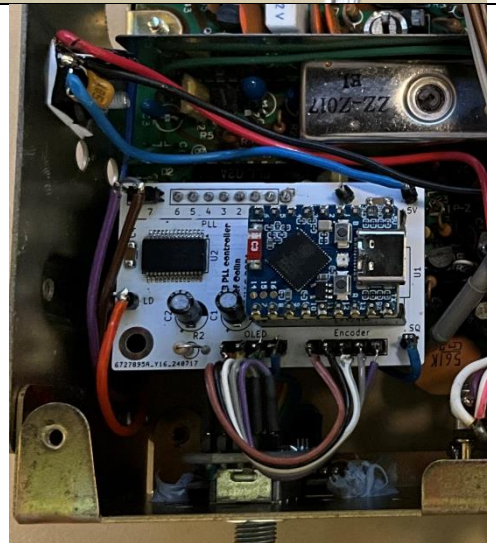|		
Use long header pins for PLL 0-6&GND.		
Solder long header pins to PLL 0-6&GND.		
Pinout of PLL02A. We will be using P0-P8, LD and VSS (ground).		
Prepare the CB radio, remove the channel switch and display. Isolate pins 7, 8 and 9 of PLL02A by cutting traces. At pin 9 cut far away from the PLL to leave the extra hole next to it connected to the PLL pad.		

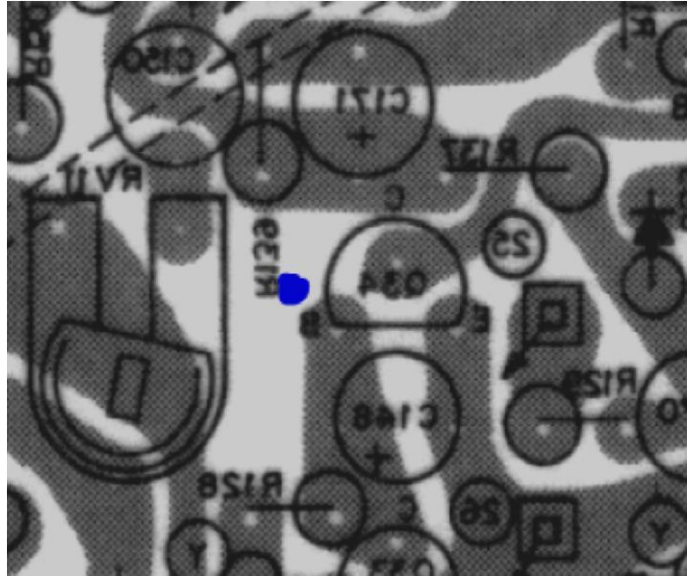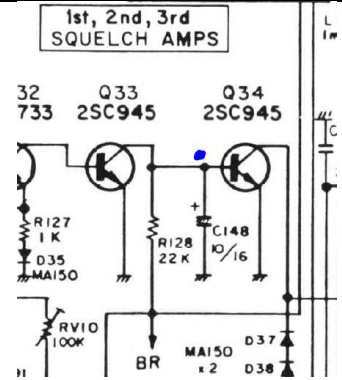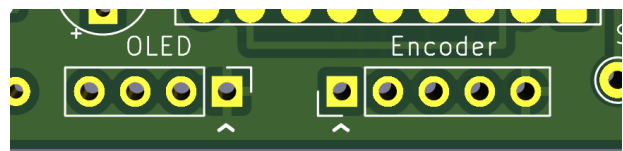|	
Make sure the row of holes in front of PLL02A pins 9-16 are free of solder. Use a 0.9mm drill bit to enlarge these holes to fit the long header pins. Clean up the flux around the area when this preparation work is done.	
Mount the OLED display to the back of the frame, connecting pins facing away from the PCB, align to center and glue at the sides with TEC7 or similar. Mount the rotary encoder in the channel switch location, pins facing up. TP2 in front of the VCO might be in the way, trim it to half.	
Solder the PCB to the main PCB at the row of holes next to PLL02A pins 9-16, these match up with PLL 6-0 and GND. The long headers should allow the PCB to be clear of any parts below and to support the PCB.	
Connect PLL 7 to PLL02A pin 8. Connect PLL 8 to PLL02A pin 7. Connect LD to PLL02A pin 6.	
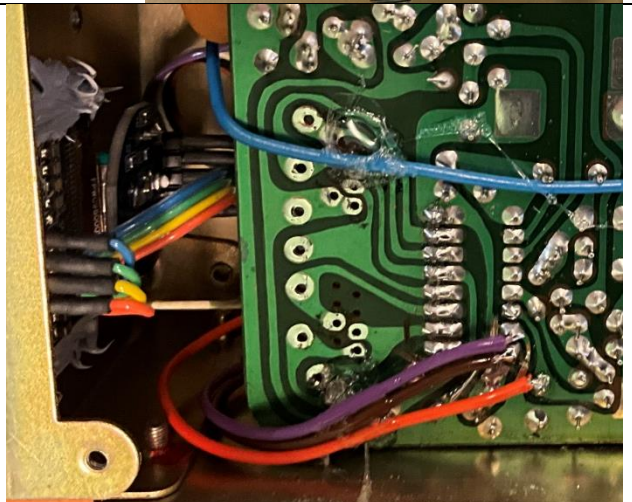
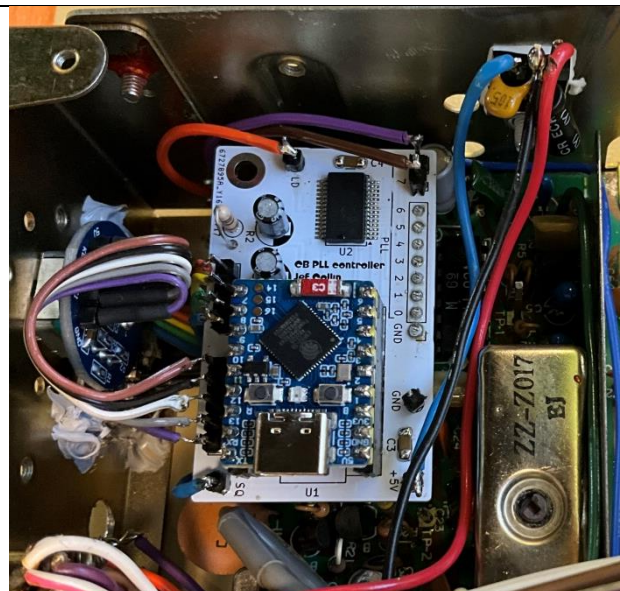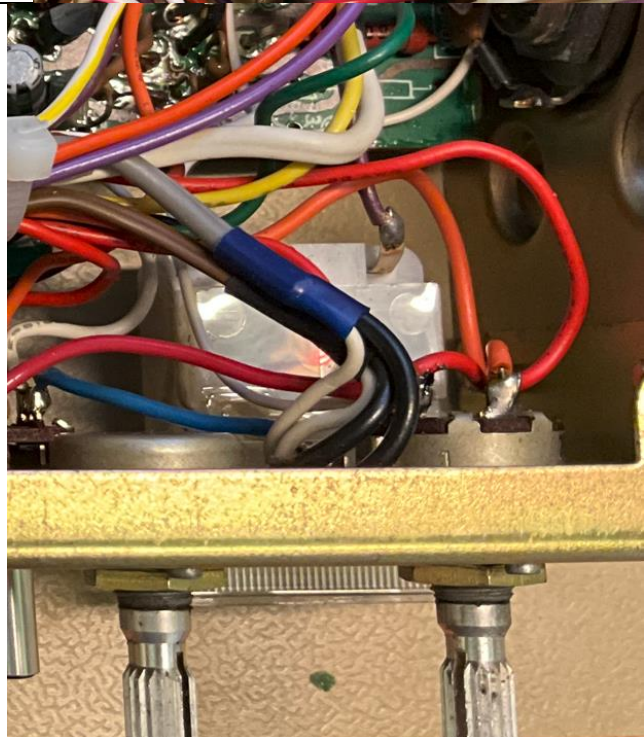|	
Connect SQ (Squelch) to base of Q34.	
Connect OLED and encoder, note the locations of pins 1. Wires of OLED and encoder line up directly with the pins if mounted as instructed.	
The PLL board needs a 5V power supply. Drill a hole of 3,5mm and mount a 7805 regulator using an insulating pad, plastic collar and thermal paste. Connect a capacitor of 10uF 35V between input and ground, note the polarity of the capacitor. Connect a multilayer non polarised capacitor (or elco) of 1uF between output and ground.	
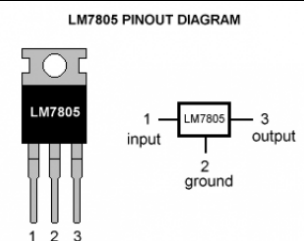
Connect 5V output of the regulator to the +5V pin of the PCB. Connect ground of the regulator to a closeby ground on the main PCB. The GND pin on the PLL board does not need to be connected since the GND pin next to it is already connected to ground via PLL02A pin 16.	
Connect 12V to the input of the regulator, solder it to the power switch on the volume potmeter.	
Double check all wiring before power on. Adjust VCO as required.	

There is a function in the software to make it easier to mark the extends of the display in case you need to cut out a window in the front panel. Press and hold the encoder whole turning on the radio will show a white screen.
The software will go in a hold loop forever, power off when done.