T41 V12 Display Driver – Combo 3.3V and 5V - Assembly Manual

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INTRODUCTION

The Teensy 4.1 processor on the T41 Main board connects to the display via the SPI communication bus. This bus runs at a very high speed (in the may show a tendency to

INVENTORY AND PREWORK

Before you begin, inventory the parts against the latest V012 Display Driver BOM to make sure you have everything you need to complete the adapter board.   The BOM is available below and on the GITHUB: T41/T41_V012_Files/T41_V012_Assembly_Manuals at main · DRWJSCHMIDT/T41

Quantity	Part Decription	Part Designator
1	0.33uF 16V SMD 1206 Capacitor	C1
1	0.1uF 50V SMD 1206 Ceramic Capacitor	C2
1	IDC 2x5 Female PCB Socket	J1
1	IDC 2x5 Keyed Male PCB Socket	J2
2	4.7K Ohm SMD 1206 Resistor	R1, R2
1	ISO7241MDWR or CDWR	U1
1	UA78L033AIPKR2	U2
1	K9HZ Display Driver PCB	

BUILDING THE BOARD

1. Find a place where you can spread out your work, including printouts of the schematic and BOM. Your workstation should be such that you can leave it overnight without having to "clean up". The workspace should also be kid- and cat-proof. If you get tired, stop. Come back to it tomorrow. Rushing the assembly rarely works out saving time.

2. Start by cleaning the bord with IPA (Iso-propyl or "rubbing" alcohol) to make sure it's clean:
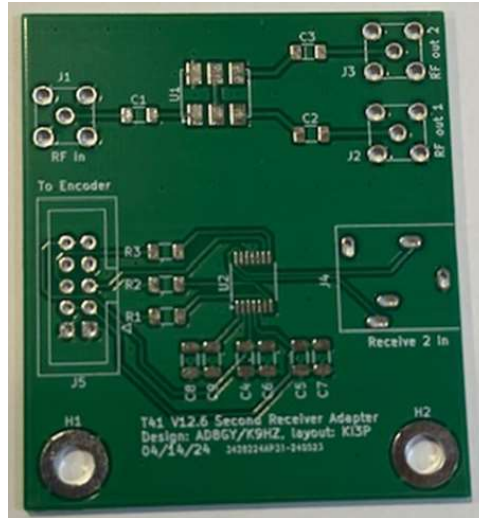
3. Next, place the hardest part on the board… U2, the PCM1808PWR. It's hard to see the pin 1 mark on some of the ICs. In the picture above, its at the lower left-hand corner of U2.

4. Do the "low-lying" SMDs next (e.g., caps and resistors). Place and solder C1-C9 and R1-R3.

5. Add U1, the transformer to the board. Make sure the orientation is correct (the print on the part should read normally when placed on the board above in its current orientation. If the print is upside-down, it's the wrong way).

6. Finally add the five connectors to the board J1-J5.

7. The board is now complete. Use IPA again to clean the flux off the board.

USING THE BOARD

First, this adapter can only be used when the K9HZ front panel boards are used. This is because the 10-pin "Encoders" connector on the main board is connected to the 10-pin "Encoders" connector on the adapter. The RF-in connector is connected to the receiver antenna output on the LPF board. This signal is split into two channels, one for each receiver. These signals go to the input of the RX and second RX's BPFs. Finally, the second Rx's I/Q stream input is plugged into the 1/8" phono jack J4. See this diagram:

Well, the ISO7241 is a specially designed SPI buss buffer/ isolator/ driver chip…, it plugs into the T41 display socket on the main board (close to the Teensy) and the display cable plugs into it. We know that the problem with the display lines are the poor SPI line driver transistors on the Teensy. This essentially puts a much higher power (lower impedance) driver/ buffer after, but close to those transistors… PS thinks this was genius… I'm thinking it was more desperation in searching for and finding it.   Short J3 and leave U2 off if the display is 3.3V. Leave J3 open and add U2 if its 5V. Super simple.
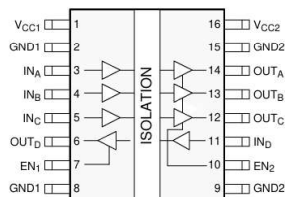

Figure 4-3. ISO7241C and ISO7241M DW Package
16-Pin SOIC Top View