K9HZ Dual Encoder Board - Assembly Manual

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WJ Schmidt - K9HZ

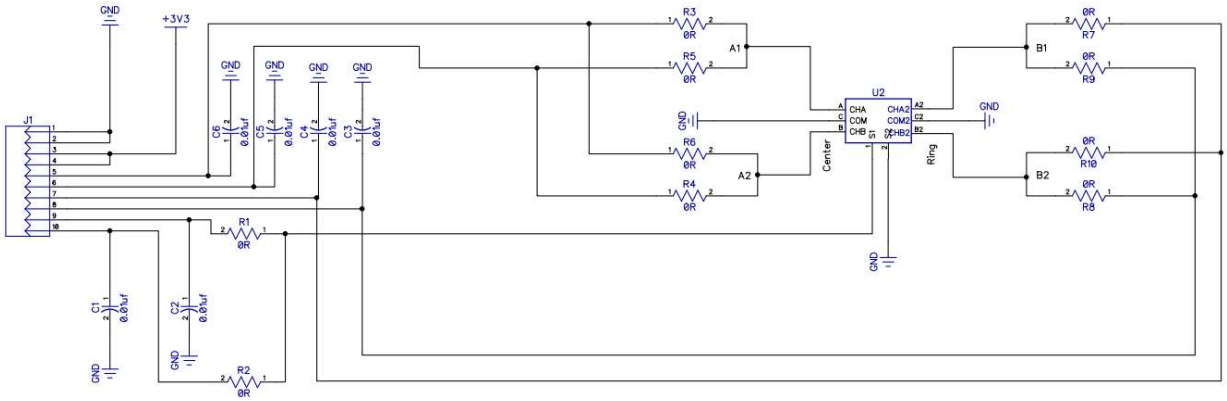
INTRODUCTION

The Dual Encoder (DE) board is a simple way to interface dual encoders to electronics like the T41-EP Radio. The board is generic in that it was designed accommodate several different brands of dual encoders like the Bourns PEC11D series. Data line routings for the individual encoders can be reversed easily by positioning shorting resistors in the right places on the board for clockwise and counter-clockwise sequence quadrature generation. Connections are also available for the push switch on the center encoder shaft is used.

INVENTORY AND PREWORK

Before you begin, inventory your parts against the Dual Encoder board BOM to make sure you have everything you need to complete the adapter board. The BOM and Schematic are shown:

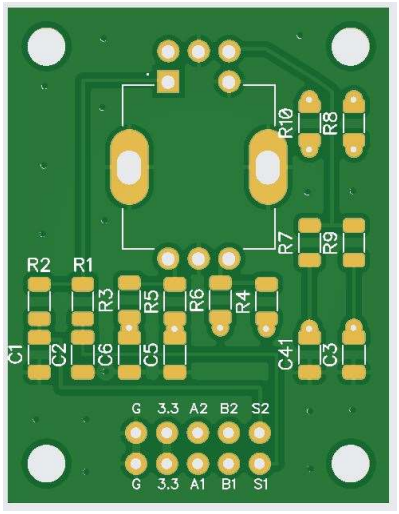
Quantity	Part	Description
6	C1-C6	0.01uf 50V X7R 1206 Capacitor
6	R1-R10	0 Ohm 1/4W SMD 1206 Resistor
1	J1	IDC 2x5 Male Indexed PCB Connector
1	U2	PEC11D Encoder
1	PCB	K9HZ Dual Encoder PCB



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. Pin 1 of the ribbon cable connector is the pin on the above board on the lower left hand side (the lower “G” designator). The encoder is set up such that:

ENCODER CENTER PINS 5 & 6
ENCODER RING PINS 7 & 8
ENCODER SWITCH PINS 9 OR 10

In addition to Ground on pins 1 and 2, and +3.3V on pins 3 and 4.

4. Install “0” Ohm resistors in the following positions depending upon the clockwise or counter-clockwise quadrature generation nature of the encoder shown below:

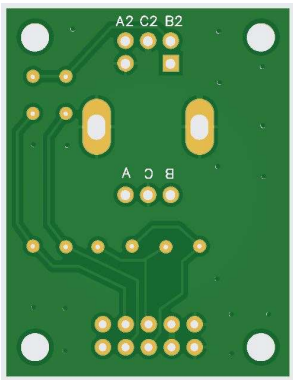
ENCODER	DIRECTION	R3	R4	R5	R6	R7	R8	R9	R10
CENTER	CW	0R	0R	-	-	-	-	-	-
CENTER	CCW	-	-	0R	0R				
RING	CW	-	-	-	-	0R	0R	-	-
RING	CCW	-	-	-	-	-	-	0R	0R

5. Install the 0.01uF capacitors in positions C1-C6 on the PCB board.

6. Install a “0” Ohm resistor in position R1 or R2 depending on which pin should be used for the switch:

SWITCH	R1	R2
ON PIN 9	0R	-
ON PIN 10	-	0R

7. Install the encoder on the back side of the board:



8. Finally, Install the 2x5 Female IDC connector on the board as shown here:

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

USING THE BOARD

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