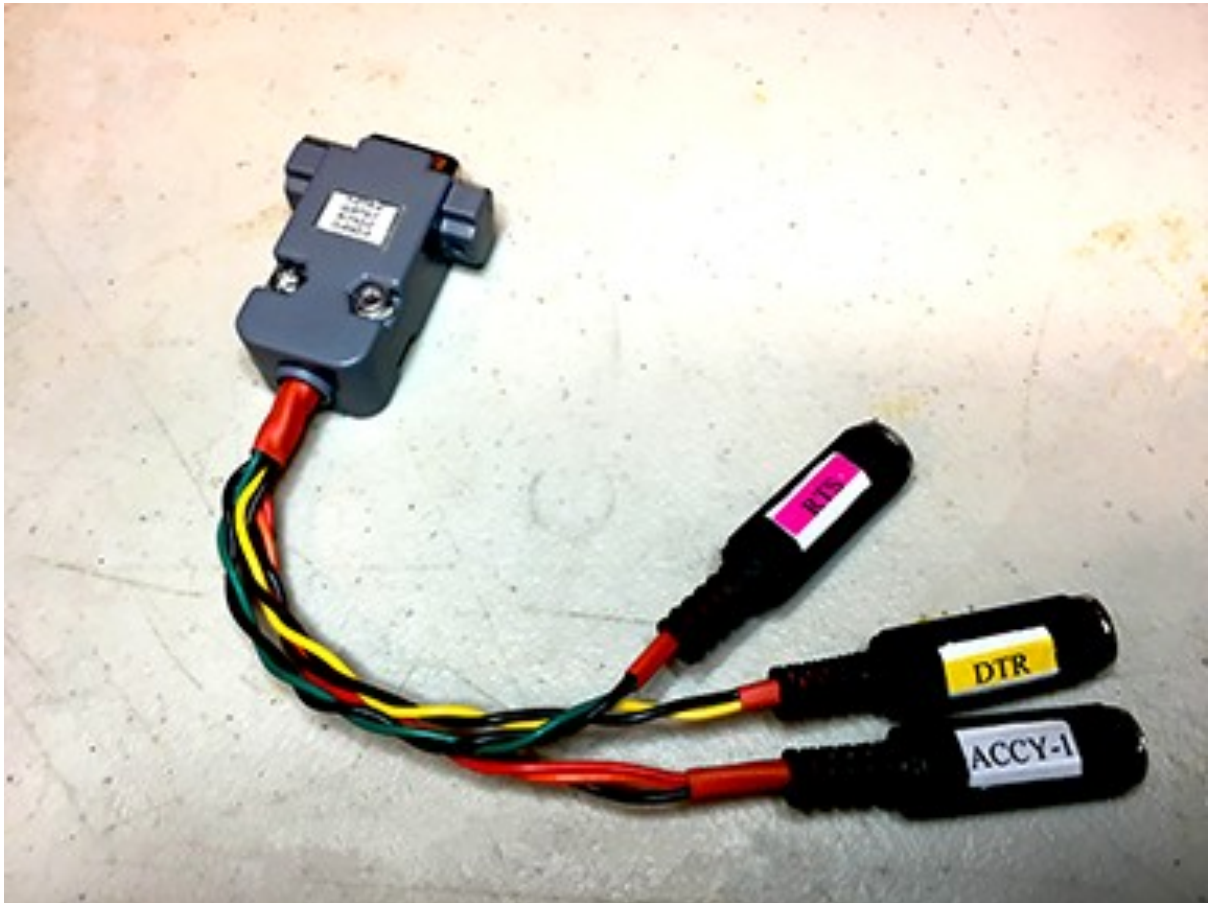


Serial Port Expander

for Elecraft KX2/KX3 Transceiver



By Bill Conkling (NR4C)

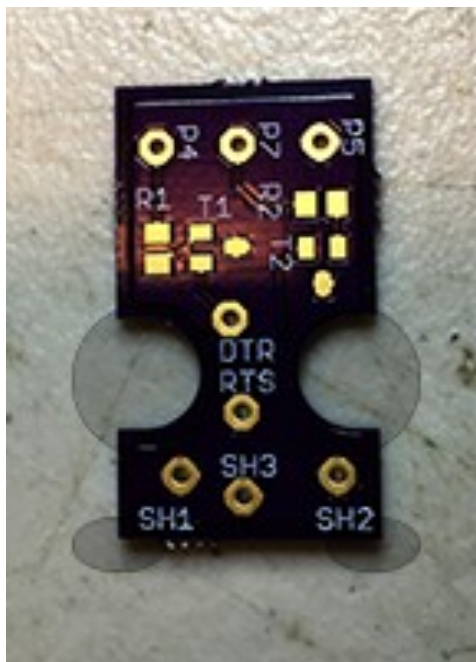
I purchased a KX3 kit within hours of the announcement that Elecraft was taking orders. I really liked the little radio, but a few years later, I sold it to buy a K3s. While waiting for the KX3 kit to arrive, I began acquiring the accessories I knew I would need to make it my own. I enjoy digital modes and the little radio didn't have dedicated audio in or out. I designed a neat little interface to provide serial port expansion and audio in/out to mimic a K3 to my logging software.

Later on, I found that I needed the serial port functions but not necessarily the audio so I designed a serial port expander. This used discreet thru hole transistors and resistors and was a bit of a challenge to assemble inside the DE-9 plastic shell. Then Elecraft developed the KX2 transceiver, and there was a lot of list traffic about the serial port and how nice it would be if... I replied to several people with a quick schematic of my interface and received good response.

Next I began looking into a revised design using a PCB and SMD components. This is the subject of this document.

First, we need to acquire some needed parts.

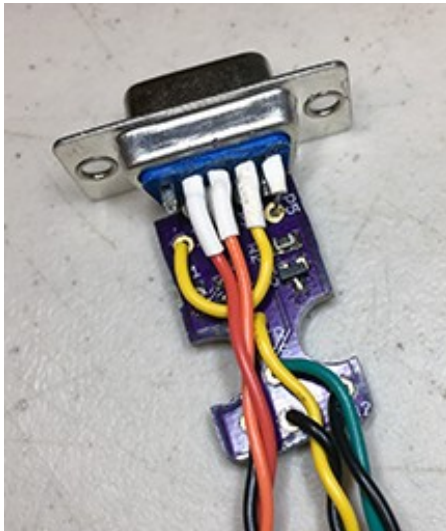
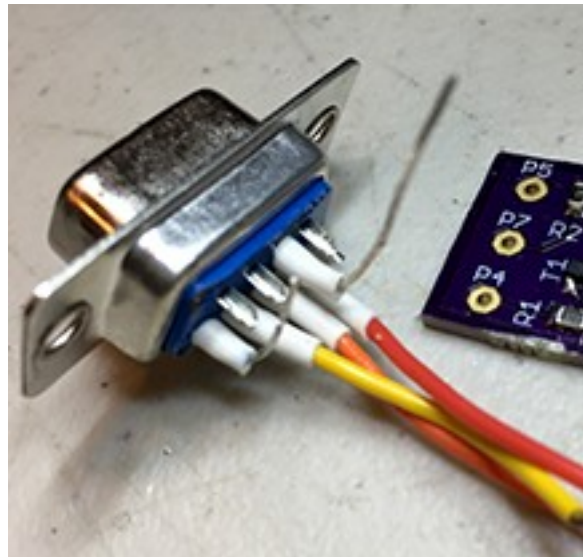
- The PCB (www.OSHPARK.com)
- 2-1.2K Resistors (805 SMD resistors)
- 2-MMBT2222alt1g (SOT-23 SMD Transistors)
- 1-DE9-F Connector w/Plastic Shell
- 2-TS Mono Female Inline Jacks (3.5mm)
- 1-TRS Stereo Female Inline Jack (3.5 mm)
- 3-ea Black #26 Stranded Wire (6 in)
- 1 ea Red, Orange, Yellow, Violet #26 Stranded Wire (6 in)
- 1 ea Yellow #26 Stranded Wire (1 in)
- 2-ea Buss wire, solid (½ in)
- Length of Shrink Tubing, Small



Next you should prepare the PCB. Use a flat file to clean up the edges of the PCB. Then round the two corners indicated by the shaded ovals. Use a round file to slightly open up the circular cutouts indicated by the shaded circles so the PCB fits nicely into the plastic DE-9 shell half.

The next step is to solder the resistors and transistors to the PCB. Be careful and don't sneeze, as these parts are very small and will scatter in a light breeze. I used paste solder and a Hot Air rework station to perform this step, but a small iron and lots of care (and steady hands) will work as well.

Now take two short pieces of bus wire and solder them into pins 5 and 7 on the DE-9F connector, and bend them toward the bottom of the connector as shown in the photo at right. Solder a 1 inch piece of Yellow wire to pin 4, and a 6 inch length of red to pin 2 and orange to pin 3 as in photo at right.



Now we can mate the connector to the PCB, carefully guiding the wires in pins 5 and 7 into the corresponding holes (P5 and P7) in the PCB. The yellow wire in pin 4 wraps around and solders into hole P4.

Complete this step by soldering a 6 inch length of yellow wire into hole DTR and a similar length of violet (not having violet, I used green) into hole RTS. Now add 6 inch pieces of black wire to the holes marked SH1, 2, and 3 at the end of the PCB. Note that I used short lengths of shrink tubing to isolate the connector pins. This is not absolutely necessary but still a good idea.

The photo at right shows the finished PCB nestled into the plastic shell with a piece of shrink tubing to hold all the wires together and make a better fit into the opening in the plastic shell.

I twisted the wires together into three cables. One, with the red, orange and a black for the ACCY-1 port on the KX3. The yellow and a black for the DTR cable and the violet and black for the RTS cable. I elected to use female inline jacks so that I could use the nice cables that Elecraft sells with straight plug on one end and a right angle plug on the other to connect to the radio. Note that the ACCY-2 jack on the KX3 is a 2.5 mm and the tip and shield can be used for PTT for digital work so you might want to look into this option.



Now close up the shell, and plug in your cables and give it a try. You can use similar settings for the KX3 with this setup as with a K3 in n1mm and other logging software.

Enjoy!

Notes:

The PCB can be ordered from oshpark.com for \$3.40 for 3 boards:

[!\[\]\(2bdfe261b986065ee0ac76460d6528c9_img.jpg\)](https://oshpark.com/shared_projects/OgPOsjNZ)

The SMD resistors can be ordered from Mouser:

[https://www.mouser.com/Search/ProductDetail.aspx?
R=ESR10EZPJ122virtualkey65430000virtualkey755-ESR10EZPJ122](https://www.mouser.com/Search/ProductDetail.aspx?R=ESR10EZPJ122virtualkey65430000virtualkey755-ESR10EZPJ122))

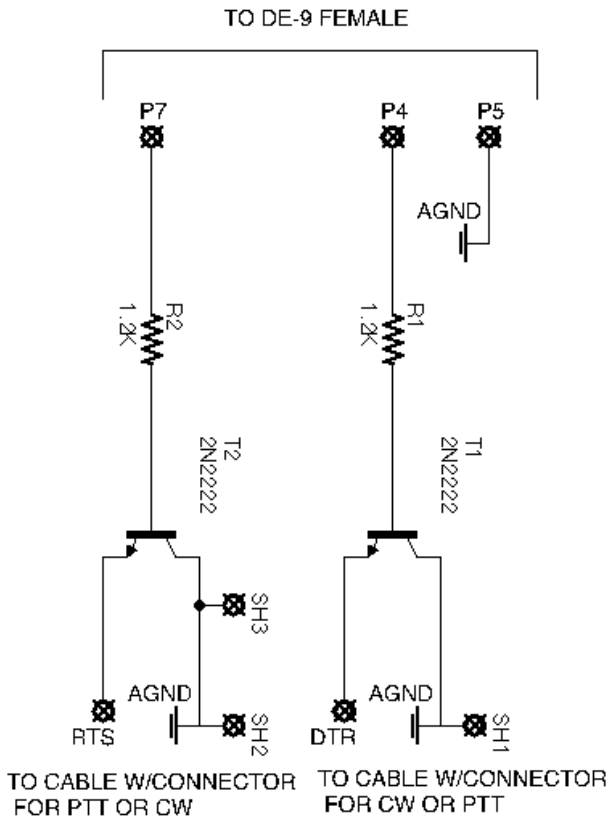
The transistors can be ordered from Mouser:

[https://www.mouser.com/Search/ProductDetail.aspx?
R=MMBT2222ALT1Gvirtualkey58410000virtual
key863-MMBT2222ALT1G](https://www.mouser.com/Search/ProductDetail.aspx?R=MMBT2222ALT1Gvirtualkey58410000virtualkey863-MMBT2222ALT1G))

IN ADDITION TO THE CIRCUIT BELOW,
ADD A 3.5mm plug and cable wired
as follows:

- Pin 3 to TIP
- Pin 2 to Ring
- Pin 5 to Sleeve

This plugs into the ACC Jack on the
KX3 or use proper cable for KX2
(sorry, don't have one).



PARTS LIST

- R1, R2 1/2K Ohm, 1/4 W resistor
- T1, T2 2N2222 NPN transistor
- DE-9 Female connector w/shell
- Cables to fit radio PTT and CW Key jack

SERIAL SWITCHING CIRCUIT FOR KX2 OR KX3

Carefully wire this circuit to DE-9 Female
connector and cover with standard
plastic shell. Use proper cable for
your radio.
Borrowed from many sources by
Bill Conkling/nr4c 2016