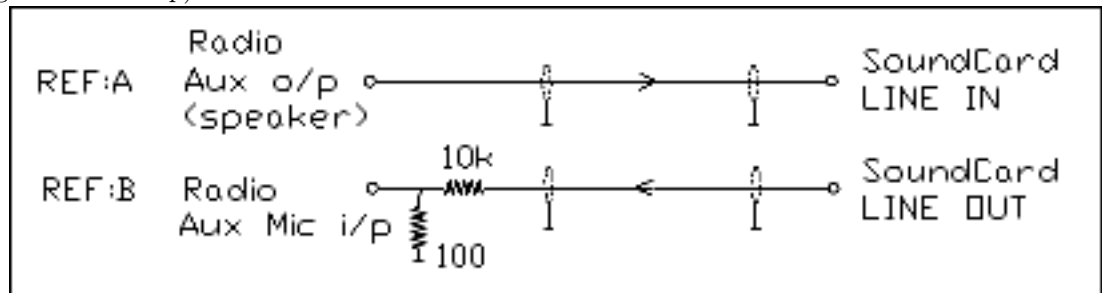


How not to design and build a computer radio interface for Amateur radio

I've been wanting to build up a computer interface for my radio for a few years now even to the point of suggesting it as a club project, there has always been some excuse come up to not just sit down and do it. Well, this month I decided to do exactly that, I mean, how hard can it be? It's just two pairs of wires in and out right? Well, maybe.

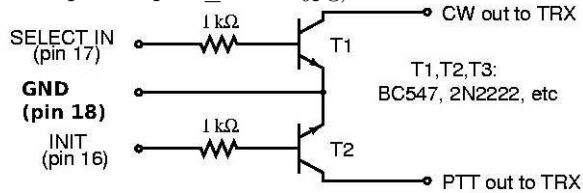
One of the early design decisions I made was not to use the front panel microphone connector, that would have meant finding that odd connector (TS-2000X) and moreover finding panel connectors for it too if I wanted to build a pass through box so I would not have to connect and disconnect the microphone; besides Kenwood had provided a connector for the back panel Accessory (ACC) connector so why not use it? For many months, I made do with a single audio cable from the radio ACC audio to the computer input, it seemed to work fine for recording and psk31 decode so I figured all I really needed to do was add the transmit side. I looked around for information on the web and soon discovered wm2u's psk31 page, (<http://www.qsl.net/wm2u/psk31.html>). it seemed it wasn't that simple. I had to voltage divide the output from the sound card quite a bit so it wouldn't overdrive things and splatter. Since I had a few 10 turn trimmers around, I put a 2k 10 turn in instead of the 100 ohm resistor. (fig. 1 audio setup)



Amazingly to me, looking at the the output of the soundcard with a scope, it clipped before it even reached the microphone voltage divider. It is rather important it not be a square wave before it reaches the ACC audio input, so I cranked the computer mixer output down to about 10%.

The other problem was finding audio cable small enough, as it turns out, I had a junk box full of old computer headsets, it seems I run the chair over the cable and they become deadsets. By salvaging some cable from the deadsets and using a bit of perf board, I put together a simple interface. Audio from the radio worked as it always had, but what happened to the VOX ? Other amateurs had assured me that all I needed was the audio and then I could just use the VOX from the radio. It appears the VOX is disabled for the ACC input, I had to build up something to control the PTT line. No problem! I will just add a couple of keying transistors and since I have no spare serial port but I have a spare parallel port, I'll use that. I had already built a parallel interface for cwdaemon (open source cw program, <http://www.qsl.net/pg4i/>) to key cw

so I will just combine it all into my interface. I also did not want to cut apart my nice moulded cable to see if that will work or build up a piggyback set of connectors. I didn't bother wiring up the band switch, I only needed the CW keying line and PTT line. I also don't bother with the pin 1 select, I have found it works fine keying directly to ground. I may add that back later but I will then need to use an optoisolator. (fig.2 transistor switches, modified from cwdaemon schematic paralleport_circuit.jpg)



The box looks like a deranged octopus at this point. CW key line in, parallel port line in, radio line to the ACC jack on radio, cw key line to the radio, cable for the audio on the computer. But it all worked with my parallel port testjig (running on FreeBSD <http://www.pcbsd.org>) and with my scope probes etc. I was set to try the actual program for psk31 on it.

I get it all set up and discover fldigi (<http://www.w1hkj.com/Fldigi.html>) has no code to drive the parallel port. No problem, I rewrote the code in fldigi (Oh the joys of open source) so it will drive a parallel port or the original serial port and e-mailed the patches to the fldigi people. Finally, it all works and I've made 2 psk contacts on 20m so far!

- 73 Diane VA3DB