

Digirig with the Barrett 2050 & 4050 ALE/Selcall Transceivers

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One of the things I do regularly is use ALE to establish a link with another station and then run a different modem, e.g. fldigi, to transfer messages and data. This requires that the computer be able to send and receive audio, and actuate the PTT. On my Icom F8101 this is easy because the F8101 has a built in audio CODEC and serial port multiplexed on a single USB connection. The Barrett 2050 and 4050 do not offer that form of interface so I needed to use an external "Sound Card" to interface fldigi to the radio.

The soundcard I used is the Digirig Mobile (<http://digirig.net>). It is a very nice little less-than-1"-cubical module that is audio+RS232 on one side, and USB-C on the other. The "Audio" jack is a 4 conductor 1/8" TRRS connector with RX audio, TX audio, PTT, and ground. The Serial jack is also 1/8" TRRS with TX data, RX data, +3.3V, and ground. RTS on the serial port is used to key the PTT line to the radio.

I dispensed with transformers and used half the balanced in/out against ground on the radio's aux connector for unbalanced audio in and out. This works well for receive audio but works better with TX audio if the unused balanced input is grounded to provide a ground reference. (See the pinout below.)

I requested and received a TRRS cable from digirig with a TRRS plug on one end and nothing on the other. I made my own cable. The cable from Digirig Mobile has the color code as listed in Table-1.

Table 1

TRRS Connector	Color	DB25 Aux Connector Pin	Signal (at Barrett transceiver)
Tip	Green	12	Balanced RX audio out +
Ring 1	White	11	Balanced TX audio in +
Ring 2	Black	9	PTT
Shell	Red	13	Ground
		Pin 13 to 24	Balanced TX audio in - (tied to ground)

Digirig Audio Cable wiring for 2050/4050

Table 2

TRRS Connector	Color	DB25 Aux Connector Pin	Signal (at Barrett transceiver)
Tip	green	2	RS-232 data input (RxD)
Ring 1	White	3	RS-232 data out (TxD)
Ring 2	Black	N/C	(3.3V from digirig, not used)
Shell	Red	1	Ground

Digirig Serial Cable Wiring for 2050/4050

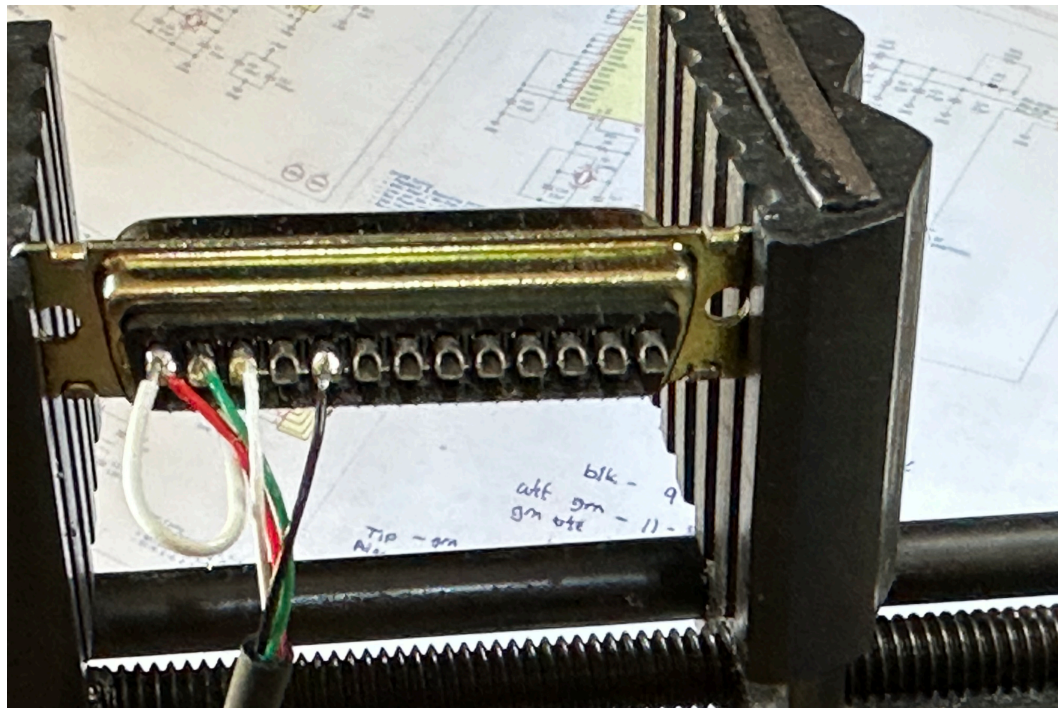
The audio level coming from the radio is too high even at its lowest output setting (-12dBm) so the extra 20dB pad in the Digirig Mobile must be used to reduce the audio level. To enable the 20dB pad you must cut the ATT pad on the underside of the Digirig Mobile board. Unplug all the cables.

1. Remove the four screws on one end of the digirig module.
2. Slide the board out of the enclosure.
3. Locate the two ATT pads on the underside of the board.
4. With a sharp razor knife (X-Acto, boxcutter, etc.) cut the trace connecting the two pads.
5. Reassemble the digirig module.

On the 4050 you can set the line levels precisely. I found that 0dBm works for both the Line Out and Line In levels. If you are planning to use fldigi, I found those worked fine and I was able to set the transmit level in fldigi to -5 to drive the transmitter to full output. Generally speaking, set the output level on fldigi to the lowest setting that will provide full output so as not to actuate the transmit audio AGC in the radio as that can AM the modem signal (not a desirable thing).

These instructions should work with the 2050 as well but I have not tested it.

In the connector picture below you will note that the RS232 port is not yet wired. I have not gotten that far because I don't need RS232 control of the Barrett 4050 transceiver. The 4050 is nearly always running ALE and needs to control itself for proper operation. The only thing needed for digital modes enabled after an ALE link is established are audio in/out, and PTT. I will add RS232 some time in the future.



DB-25 connector on cable from digirig to Barrett auxiliary connector