

Yaesu FT-817 to Computer Interface

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After recently purchasing a new Yaesu FT-817 all mode QRP transceiver, I immediately saw the opportunity for interfacing the radio to a computer for PSK31 operation and rig control, using the PSK31 Deluxe and Ham Radio Deluxe programs written by Simon Brown – HB9DRV and tested by Peter Halpin – PH1PH – G7ECN. The website for these programs can be found at <http://hb9drv.ham-radio.ch/> This is free software and very high quality.

I researched the Internet for various circuits to build which would provide the ability to be running the Ham Radio Deluxe rig control program while being able to also run in PSK31 mode using the same COM port. This design would simplify the hookup arrangement and make operating the system easier. The circuits shown here came from the Interfacing Guide put out by the Ham Radio Deluxe software team.

In my design for the rig control portion of the circuit (Figure 16), I selected a circuit using the popular MAX232 level converter chip. This chip converts the 12 VDC signal levels from the computers COM port down to the 5 VDC level used by the radios accessory port. The audio interfacing (Figure 13) from the computer soundcard to the radios data port is designed to provide level control and isolation for prevention of potential RF looping problems. Take note, **the radio ground and PC ground are separate**. If you elect to tie both the audio circuit and rig control circuit together using the same DB-9 connector, eliminate diode D1 and it's associated connections to pins 7 & 8 of the DB-9 connector and to R1. That will leave pin 7 of the DB-9 connector available to connect the feed for LED1 of the audio circuit. Ease of securing building components and size were all considerations in the design. All of the components for this interface can be found at electronic supply stores, Radio Shack, your junk box and computer stores. The full circuit was built and housed in a 2 3/8" x 3 3/4" x 7/8" Altoids container and does not require an external power supply.

I elected to build the interface in a small metal container due to the desire for good RF shielding, portability and storage. Your building skills and techniques will somewhat determine the final design if you build this circuit. You can build the interface in a larger container if you feel more comfortable doing so.

Alignment of the PSK31 send and receive audio levels can be easily accomplished by on-the-air reports, and by following the instructions on page 39 in the Yaesu FT-817 Operators Manual and the Help files in the PSK31 Deluxe program. Be sure to set the radio to the 'Digital' mode, plus menu #25, the Digital Mic Gain control, to between 35 and 50, and menu #26 to 'PSK-31U'. The ALC meter on the radio should only show 1 or 2 bars when transmitting. If you are not getting any audio output from the soundcard, check to make sure the volume control for the earphone/speaker port is really on. In some cases, you may find something like the 'Wave' volume control is really driving the output for the speakers, and not the control marked 'Volume'. You should see measurable RF on a wattmeter or the radios display when sending a signal.

An alternate power source for this interface can be supplied from pin 1 of the accessory plug on the FT-817. To do this you would need to insert a 78L05 voltage regulator between the radio and pin 16 of the MAX232 chip with a 100 uf, capacitor on both sides of the regulator for proper filtering. There is a bit of a drawback to this method in the fact it does consume power from the radios power source and requires more cables and components. If you're using internal batteries in the radio it will cause them to deplete faster. Also, if the radio is connected to the computer interface when not in use, and you're running off of the internal radio batteries only, even with the radio turned off the internal batteries will run down in a few hours. Pin 1 of the accessory plug always has voltage available even in the power off condition. If you use this method to power the interface you should insert a SPST switch in this voltage line to turn the interface off when not in use. The simplest method of supplying power is to build the circuit as shown and draw the power from the computer, but in a few cases, the computer may not be able to adequately supply enough voltage to properly run the circuit. This will depend on the design of the computers serial port. Unfortunately not all serial ports are the same.

Note: in the schematic for the audio interface, the diagram for the Data Socket is shown upside down from the actual view looking at the back of the radio. Don't get the wiring wrong on this plug.

Always double check your work before connecting the interface to the radio and computer. You don't want to damage either device due to a connection being wired incorrectly.

Good luck and hope to see you on PSK-31.

Part List

- 1 – 78L05 Voltage Regulator – Debco Electronics, Inc. (www.debcoelectronics.com) (Optional part – see above comment on power source)
- 2 – 100 uf capacitors – Radio Shack #272-1044 or 272-1028 (1 is optional – see above comment)
- 5 – 1.0 uf capacitors – Radio Shack # 272-1434
- 1 - .0047 or .005 uf capacitor
- 1 – 1K ohm resistor – Radio Shack # 271-1321 or 271-1118
- 1 – 2.2K ohm resistor – Radio Shack # 271-1325 or 271-1121
- 1 – 100 ohm resistor – Radio Shack # 271-1108
- 2 – 1K ohm potentiometers. 5 K ohm potentiometers can be used as an alternate. Radio Shack # 271-280
- 2 – 600 ohm, 1:1 audio transformers. Radio Shack #273-1374.
- 1 – 16 pin I.C. socket – Radio Shack #276-1998
- 1 – 8 pin I.C. socket – Note: Only 6 pins are used on this socket. Pins 4 & 5 are not used during construction. Radio Shack # 276-1995

- 1 – 4N25 optoisolator. – Debco Electronics, Inc.
- 1 – MAX232CPE Level Converter I.C. – Debco Electronics, Inc
- 2 – Ferrite beads
- 1 – shielded stereo cable with 1/8” stereo plugs on each end. Cut into two equal pieces with a plug on each end. Radio Shack # 42-2387A.
- 1 – Perfboard - Radio Shack # 276-150.
- 1 - 2 3/8” x 3 3/4” x 7/8” Altoids container or anything you feel comfortable housing the interface in. Should be metal for RFI shielding.
- 1 – 1N4148 diode – Radio Shack #276-1122
- 1 – DB9 Female solder type connector – Radio Shack # 276-1538
- 1 – DB9 Connector Hood – Radio Shack # 276-1513
- 1 – 3 ft. shielded cable with 3 center wires. For serial port cable use.
- 4 – rubber grommets
- 1 – MAC to Serial Printers cable. Micro Center Computers item QVS CC522-10 cable. Cut cable in two. Will only use one end for this interface for the accessory port connection.
- 1 – PS/2 Keyboard/Mouse cable. Micro Center Computers item QVS CC389-105. Cut cable in two. Will only use one end for this interface for the Data port connection.