

ICOM CAT INTERFACING

In order to connect your Icom radio to a computer for CAT control you will need a converter that is capable of converting RS232 levels to Icom's 5v open collector bus line. There are several ways to go about this, ranging from a very basic two-transistor interface to Icom's own CT-17 interface. This document aims to present you with enough information to enable you to choose the interface that is most suited to your requirements.

The obvious answer is to purchase Icom's CT-17. At the moment of writing this interface cost 99 pounds (or 145 euro) in the UK; about \$140 in the US. This cannot be considered inexpensive by any standards. It is relatively simple to build the interface from the circuit found in the CT-17 manual. This is the design used by HB9DRV and PH1PH when testing Ham Radio Deluxe. Total building costs were around \$25 - including cast aluminium boxes and connectors.

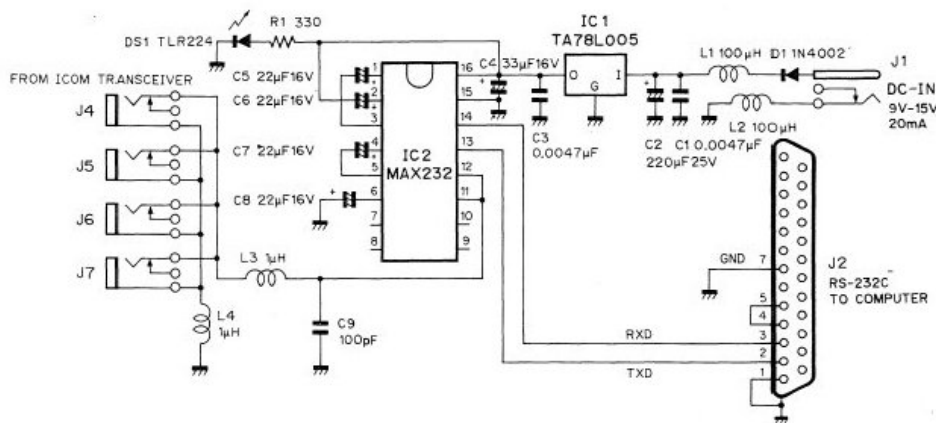


Figure 3: Icom CT-17 circuit

There are even simpler designs available, such as this opto-isolated model by Gary Dion N4TXI:

Gary writes: "Being the paranoid type I decided to design my own electrically isolated version. I figure it would be preferred in a field day situation with questionable rig grounding."

The biggest challenge was powering the optos on the radio side. The 8v line coming from the 706 can source at most 10 mA (per spec). This design pulls an average of less than 0.5 mA. The power supply can be taken from either the ACC connector or the microphone jack. Many isolated audio interface designs already exist, so I decided not to include that on the schematic".

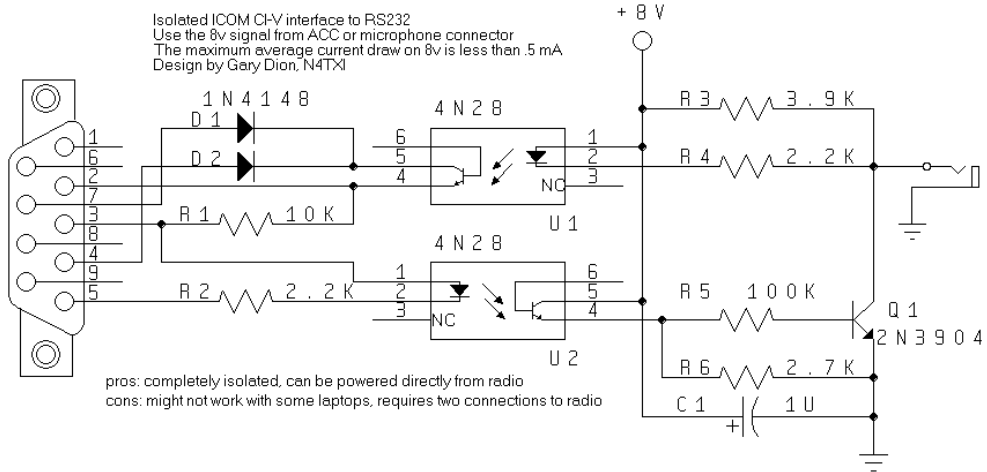


Figure 4: N4TXI opto-isolated circuit

This proven design by KG7SG is recommended by Dave, AA6YQ, and has the advantage that it takes its power from the computer's DTR/RTS lines. It may not work on all notebooks, however, because many do not have true RS232-compliant comports.

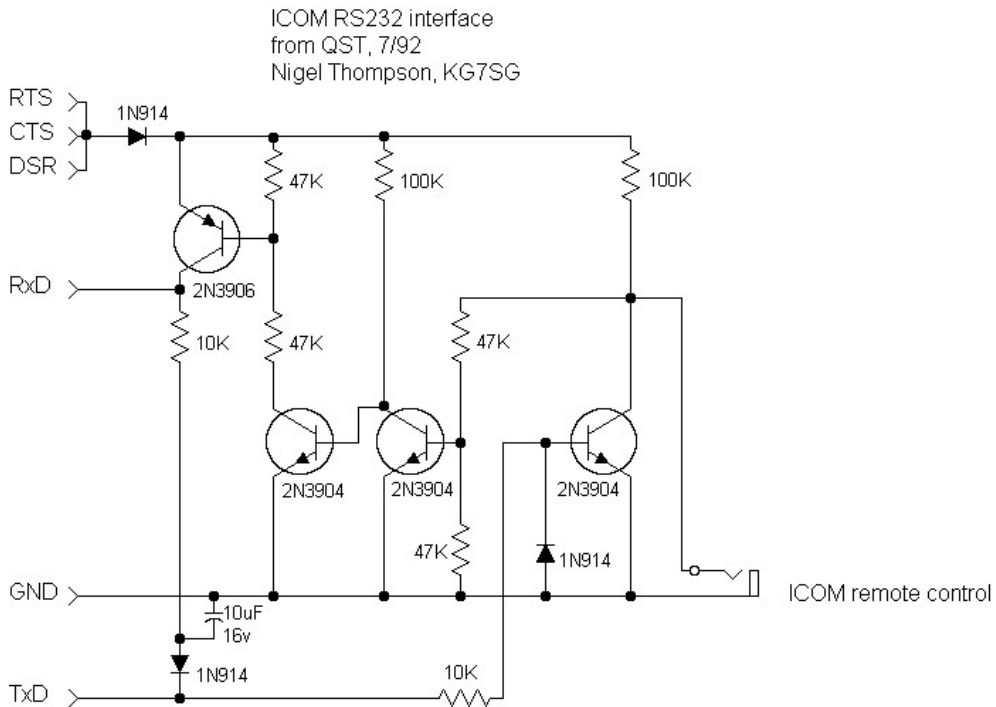


Figure 5: KG7SG's interface

If you want to keep things simple, there is this one by OK2WY. This is a really bare-bones design.

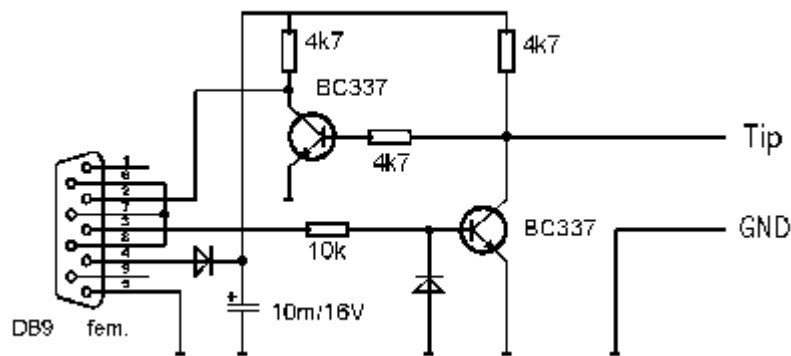
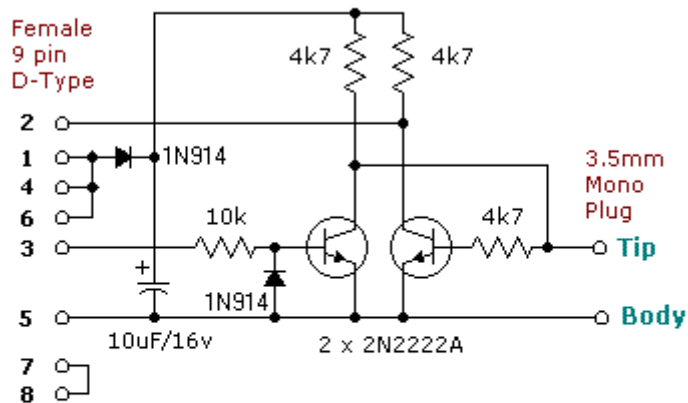


Figure 6: OK2WY barebones interface

G3VGR has added PTT keying for use with other software in this variation on OK2WY's design.

Icom CI-V Interface



Additional Circuitry to provide PTT from RTS

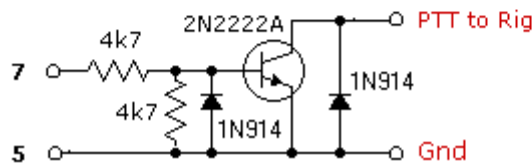
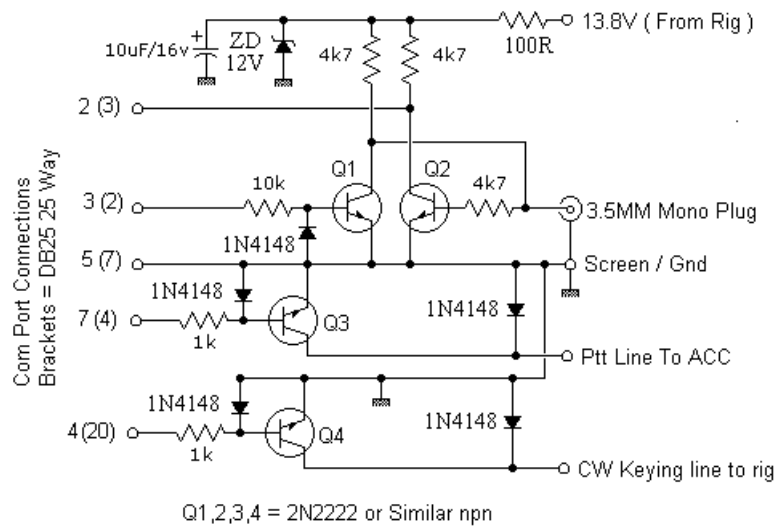


Figure 7: G3VGR's simple interface

Icom CI-V Interface. With Ptt, And CW Keying G3VFP



Of Course I accept no responsibility for anyone using this circuit. You do so at your own risk.

Figure 8: G3VFP circuit

One thing that is common to all except the original Icom design is the lack of RF filtering on the output. A 1uH choke in series which is bypassed by a 100pF capacitor will help keep any stray RF at bay.

The ARRL Radio Amateurs Handbook (post '95) contains a CAT circuit design that is suitable for both Icom and Yaesu radios. This interface is based on the original CT-17 circuit but has a couple of refinements. Both the article and PCB layouts are available in .PDF format from the ARRL members-only website.

KENWOOD CAT INTERFACING

This interface design by IK2BCP offers complete electrical isolation of rig and computer. Basically similar to his Yaesu design, this offers a cheap and useful alternative to any commercial offering.

SS232K - Simple and Safe RS232 interface for Kenwood radios - by IK2BCP

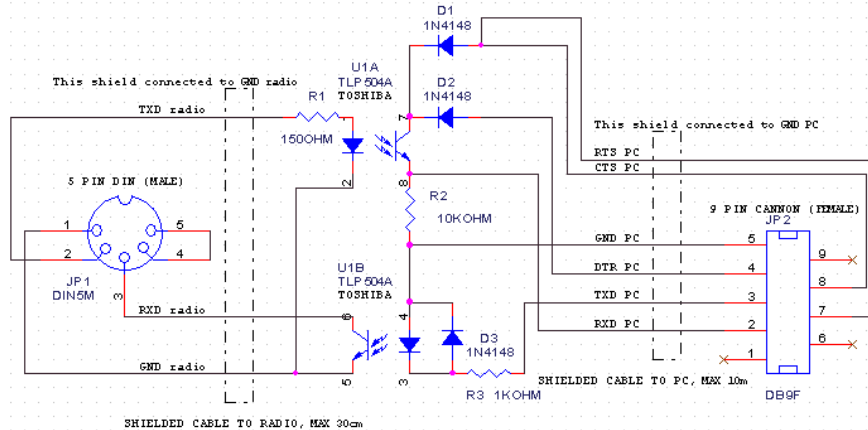


Figure 9: IK2BCP Kenwood interface

I can't remember where I found this anonymous design: it looks useful too.

Kenwood - PC interface built around MAX 232

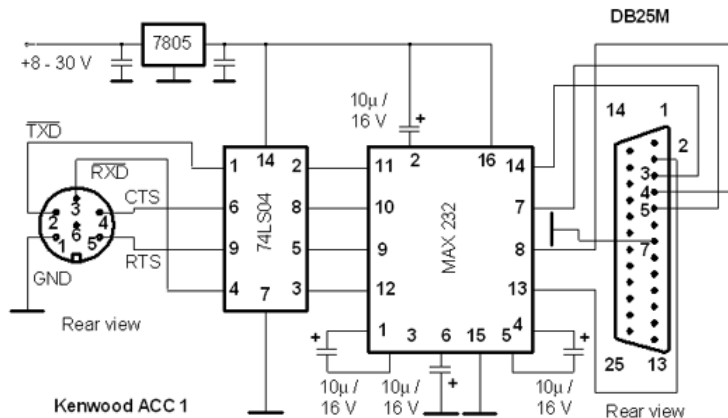


Figure 10: Yet another MAX232 design

YAESU CAT INTERFACING

Yaesu CAT interfacing can be done using the Icom CT-17 circuit mentioned earlier. The only modification needed here is to separate the signals at pins 11 and 12 of the MAX232 and connect them to the Yaesu DATA IN and DATA OUT lines. For use with the FT-100/FT-817/857/897 series you can also use Yaesu's stock CT-62 CAT cable. This has the advantage of being very compact, and gets its power supply from the rig's ACC connector. The FT-847 does not require an interface - a null-modem serial cable is all you need here. Older Yaesu rigs use a FIF-232C which appears to be basically similar to Icom's CT-17. Unfortunately for us the only picture I could find of the circuit was extremely vague and not worth showing here.

IK2BCP has designed this opto-isolated interface that should also work with Icom radios by connecting the RXD Radio and TXD Radio lines:

OPTOCAT - Simple and Safe RS232 interface for Yaesu CAT by IK2BCP

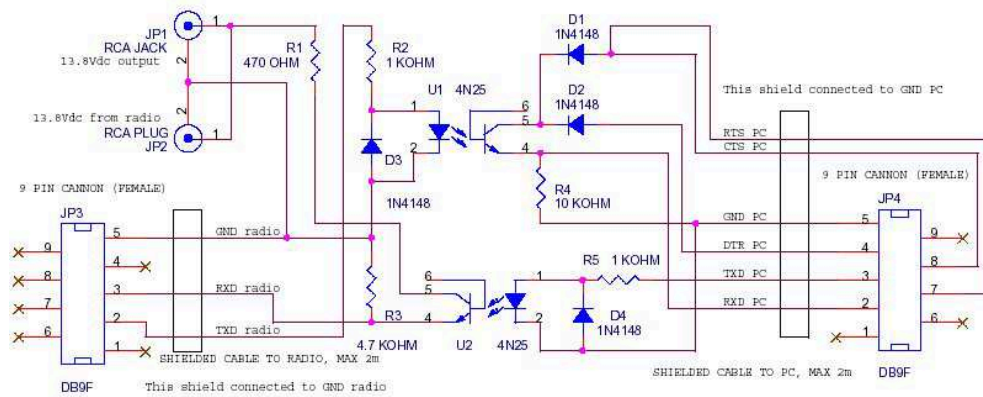


Figure 11: IK2BCP Yaesu interface

DK7IN has come up with this opto-isolated circuit with CW keying and PTT: if you are only interested in CAT applications the portion in the dotted box can be omitted.

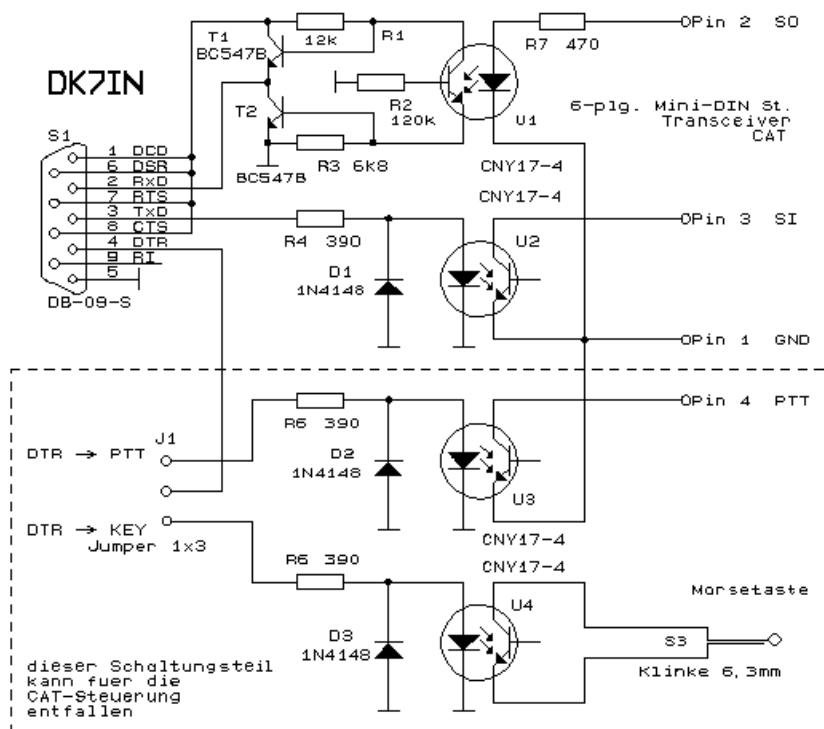


Figure 12: DK7IN's design

Rolf says of this interface: "It is important that the opto-coupler has a high current transfer ratio, otherwise the switching is not perfect and a current flows through both transistors T1 and T2. The CNY17-4 has about 300% transfer ratio. You should measure the output voltage at pin 2 of the DB-9 connector. It should be under 0.5V when applying +5V via a resistor of 1k to Pin 2 (SO) of the mini DIN connector and over 2.5V with the input voltage removed. R1, R2 and R3 should be adjusted for the used opto-coupler.