

# Simple Radio PTT To Computer Interface Circuits

SSTV, PSK31, RTTY, CW, EchoLink, eQSO etc.

By Peter G4KQU

Digital communication modes represent one of the fastest growing areas of interest in amateur radio, with the past decade seeing many developments. Over the past few years data modes like SSTV and PSK31 have become popular.

In digital transmissions such as SSTV, PSK31 or even RTTY, the ability of your own computer and radio to send and receive various digital modes is a real plus.

An interface unit allows one to transmit and receive these modes without the expense of purchasing a separate TNC or DSP device. A regular sound card, as found in most of today's computers, can easily handle DSP functions. Conveniently, these interfaces are designed to operate without an external power supply.

There are various circuits to enable you to build your own interface. I have included here some simple designs that I have built, tested and which work very well considering their simplicity and economy. These circuits will also perform well if you intend to run an Internet gateway using eQSO or EchoLink software. Software for these modes is freely available via the Internet, especially on the links page of [www.g4kqu.co.uk](http://www.g4kqu.co.uk) !

Other PTT techniques make use the vox for PTT - but don't forget to disconnect it or the inevitable Microsoft beep or late night mp3 might create a surprise or two. It is best to avoid VOX switching but Many new PCs have no RS232 either so I think we are soon going to have to find another way to drive our radios.

Digital modes can have a long transmitter duty cycle .Try to keep your output power to 10 - 20 % of the max rated power. Disable all the rig compressors, DSP noise reduction etc.

## Isolated Interface

Circuit 1 incorporates two 600-ohm audio transformers (T1&T2) and an RS232 powered optocoupler IC1. Preferably use an IC socket for IC1, for possible quick replacement!

The purpose of the transformers and an optocoupler is to isolate the transceiver from the computer, keeping the interference from the PC to a minimum. Ensure that the screening on the radio and the screening on the PC are not connected together.

Stereo 3.5 mm plugs connect the line in and out on the computer soundcard. Use the tip and earth only as in this application the sleeve is not used.

- To control the radio PTT an isolated signal from the computers RS232 RTS line is used.
- If you have an available DB9 connector on your computer, use RTS, which is Pin 7 and ground, which is Pin 5.

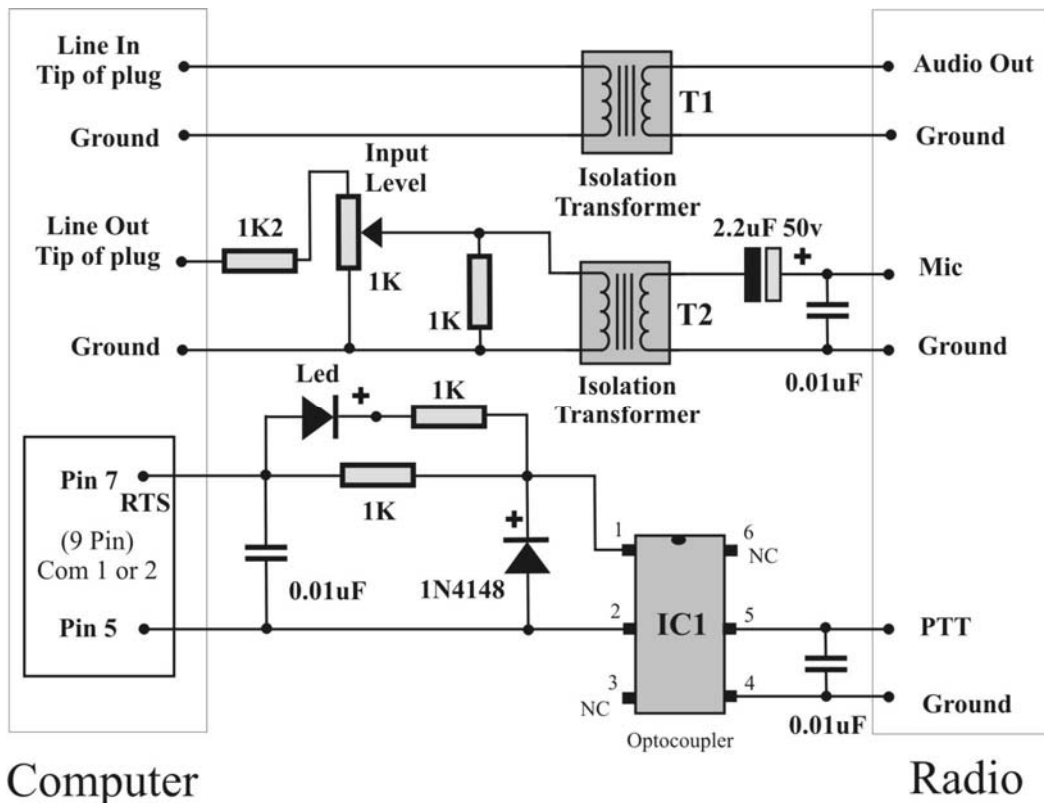
- If you have a DB25 connector on your computer, use RTS, which is Pin 4 and ground, which is pin 7.

VR1 is a 1K linear potentiometer used to control the amount of audio going to the mic and is adjusted for correct audio drive to the radio, usually converting line (0.5v) to mic (10mV) levels. The 1.2k resistor (from the Line Out) can be changed to a greater value if you are troubled by the pot always being at the bottom or top of the range or alternately by adjusting computers audio out slider till the correct level is achieved.

Operationally, audio levels are adjusted by the computer level controls or are incorporated in the software you will be using.

The LED (high sensitivity type) is used as an indicator when the interface is in the transmit mode.

It is suggested that the finished interface is put in a metal box and that the grounding is taken from the radio side of the circuit.



Circuit 1

### Components for Circuit 1

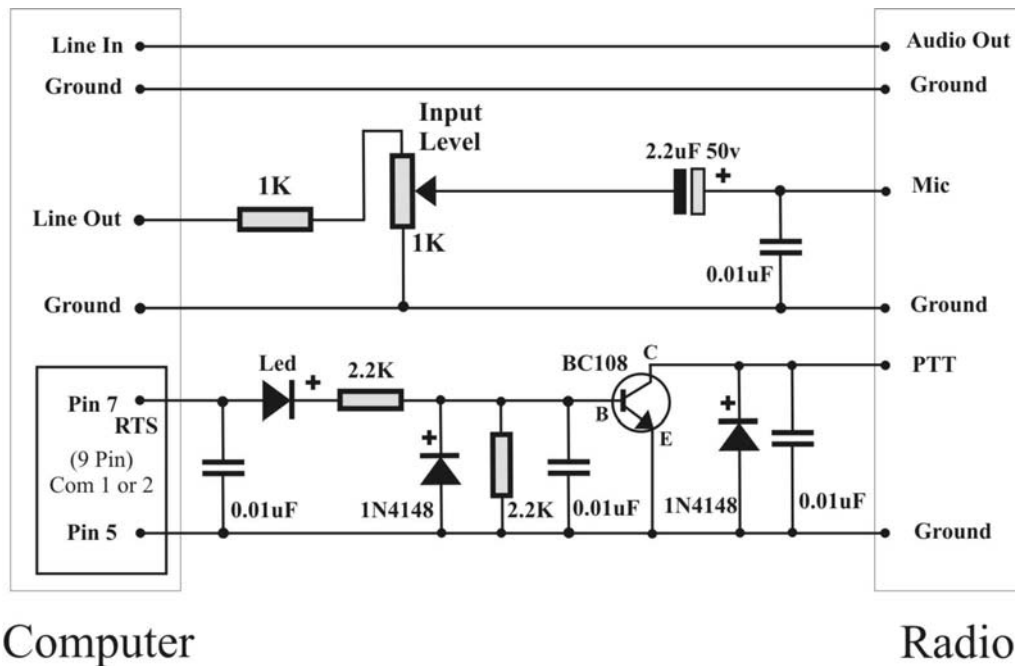
- 3 x 1k ¼ watt resistors - 1 x 1.2k ¼ watt resistors
- 1 x 1k Potentiometer lin - 1 x 2.2uF 50v capacitor - 3 x 0.01uF capacitors
- 2 x (T1 & T2) 600 ohm transformers type 9000 RS Number 208-822
- 1 x IC1 optocoupler 4N25 RS Number 597-289
- 1 x Red LED (High sensitivity type) - 1 x Diode 1N4148 - 2 x 3.5mm Stereo plugs
- 1 x 9 Pin D plug ( Com port 1 or 2) & cover
- Screened cable - Project Box

## Simple Interface

This circuit is very similar to Circuit 1 except it does not use audio transformers or the optocoupler, but performs splendidly.

In this circuit RTS drives an open collector for the PTT.

You can use any general NPN transistor instead of a BC108.



Circuit 2

### Components for Circuit 2

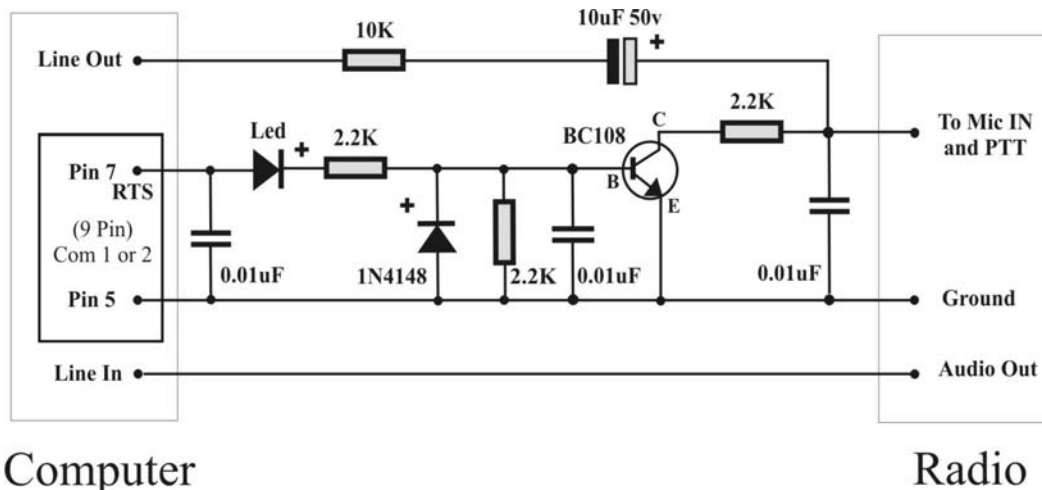
- 1 x 1k ¼ watt resistors - 2 x 2.2k ¼ watt resistors
- 1 x 1k Potentiometer Lin - 1 x 2.2uF 50v capacitor - 4 x 0.01uF capacitors
- 1 x Red LED (High sensitivity type) - 2 x Diode 1N4148 - 2 x 3.5mm Stereo plugs
- 1 x BC108 Transistor - 1 x 9 Pin D plug ( Com port 1 or 2) & cover
- Screened cable - Project Box

## Simple Interface for Handheld Radios

A handheld's mic and PTT are normally combined, hence circuit 3 was designed and works admirably.

Audio levels can only be adjusted by the computer's level control.

Stereo 3.5 mm plugs connect the line in and out on the computer soundcard. Use the tip and earth only as, in this application, the sleeve is not used.



Circuit 3

### Components for Circuit 3

3 x 2.2k ¼ watt resistors - 1 x 10k ¼ watt resistor - 1 x 10uF 50v capacitor  
 1 x 2.2uF 50v capacitor - 3 x 0.01uF capacitors - 1 x Red LED - 1 x Diode 1N4148  
 2 x 3.5mm Stereo plugs - 1 x BC108 Transistor  
 1 x 9 Pin D plug ( Com port 1 or 2) & cover  
 Screened Cable - Project Box

All the components can be obtained from Mode Components.

Peter G4KQU web site [www.g4kqu.co.uk](http://www.g4kqu.co.uk)

EchoLink web site [www.echolink.org](http://www.echolink.org)

eQSO web site [www.eqso.org](http://www.eqso.org)

Mode Components web site [www.modecomponents.co.uk](http://www.modecomponents.co.uk)

### Glossary

DB9	9 pin connector (Found on computer COM ports)
DSP	Digital Signal Processing
Echo Link	Internet radio linking software
EQSO	Internet conference by radio software
PSK31	Phase Shift Key 31
RTS	Ready to Send
RTTY	Radio Teletype
SSTV	Slow Scan Television
TNC	Terminal Node Controller