

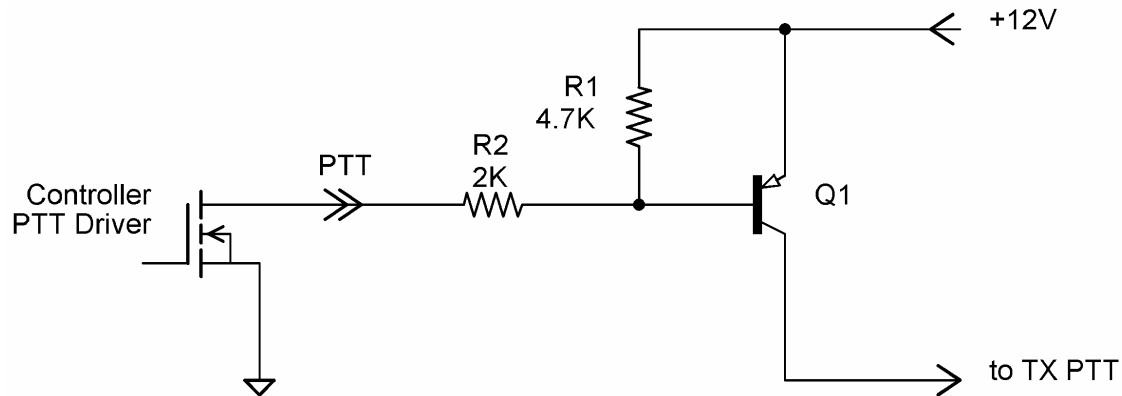
A Positive Voltage Transmitter Keying Circuit

Different transmitters have different PTT (push-to-talk) circuits. We'll call it a sink-type PTT if grounding the PTT line causes the transmitter to key and removing the ground causes the transmitter to unkey (although some transmitters work the other way around). We'll call it a source-type PTT if applying +12V to the PTT line causes the transmitter to key and removing the +12V causes the transmitter to unkey.

Nearly all controllers have sink-type PTT outputs because:

- (1) The low PTT sink current of a modern transmitter is easily handled by a small NPN transistor or power MOSFET. (On the other hand, tube-type transmitters use a PTT relay that may have a high coil current. Check the controller and transmitter PTT specifications when interfacing this type of transmitter.)
- (2) If a controller were designed to support a source-type PTT, it would have to be capable of sending a hefty current to the transmitter's PTT line. The controller's power supply would have to be sized to support the extra load and would have to be current limited to prevent damage to the controller from a PTT short to ground.

Here's a circuit that will interface a typical controller's sink-type PTT output to a source-type transmitter PTT. While a simple reed relay would also do the job, this circuit uses a PNP transistor as a solid-state equivalent to a relay. The controller PTT should be configured for low-active operation.



How it works: For any transistor to conduct, its base-emitter junction must be forward-biased. Being a PNP, Q1 conducts when the voltage at its emitter is higher than the voltage at its base.

When not keying the transmitter, the controller's PTT driver is off and its PTT output is not grounded. R1 keeps Q1's base at the same voltage as its emitter (+12V), so Q1 is off. With no current from Q1, the transmitter doesn't key.

When keying the transmitter, the controller's PTT driver is on and its PTT output is grounded. Q1's emitter stays at +12V but its base voltage is lower, so it's turned on. Current from Q1 causes the transmitter to key.

Q1 can be a 2N2904 if the transmitter PTT draws less than 500 mA. For up to 1A, use a TIP30 for Q1 and change R2 to a 470 ohm, 1 watt resistor.