

External Amplifier Keying from the IC-706

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Icom's IC-706 compact transceiver is intended for mobile use, but its small size also appeals to DXpeditioners. Unfortunately, Icom designers decided against installing a T/R (transmit/receive) control line output for interfacing an external power amplifier. The circuit presented here provides that interface.

A 13-pin DIN connector on the rear panel of the rig has a bidirectional control pin named HSEND (HF Send). In receive mode, it is pulled to +8V through approximately 1.2k Ω . When transmitting, HSEND is about zero volts. Since it is bidirectional, grounding HSEND externally will also place the transceiver in transmit mode. The characteristics of this pin prevent its use as a direct T/R signal for most amplifiers—it only sinks about 6mA, and most amplifier control lines pull higher than 8V. Directly connecting HSEND to a typical amplifier could damage the IC-706.

This circuit is designed to switch amplifiers using up to 40V and 200mA on its T/R control line. It is a double inverter that isolates the amplifier's T/R voltage from the more "delicate" HSEND, with Q1 buffering HSEND and Q2 switching the amplifier.

I built this circuit inside the hood of the 13-pin DIN, with a length of RG-174 coax running to the amplifier. If your amplifier relay needs more than 200mA of current or voltage greater than 40V, replace Q2 with a suitable power transistor.

The IC-706 now keys my amplifiers, but it gives the Alpha fits—not because of the T/R switching, but because the Alpha is a fully-protected high gain amp, and the IC-706 has an awful, full power leading edge spike that trips the overdrive protection. Even when the IC-706 is adjusted to the 40W or so needed to drive the Alpha to 1500W of output, a several millisecond 100+ watt RF pulse is output at initial key down. This is a major design fault with the ALC circuitry inside the IC-706. It prevents using the Alpha with the IC-706 in all modes except SSB, and occasionally faults even on initial voice peaks in that mode. The unprotected, lower gain AL-1200 requires all available drive power from the '706, and does not flinch. Other unprotected high-gain amplifiers will not shut down, but might suffer severely reduced tube life from the overdrive. I do not recommend using the IC-706 with any amplifier requiring less than 100W of drive.

The two-transistor circuit described allows keying power amplifiers from the IC-706. It is small and simple, and may be built inside the connector hood of the interface cable. An Icom design flaw prevents using the IC-706 with high gain amplifiers, however.

