

## TR-1b 70 cm T/R RELAY BOARD SYSTEM

The TR-1b is designed to provide RF transmit/receive switching between the VM-70X, KPA5 or TXA5 series of ATV transmitters and a downconverter. The module mounts directly to a flange type N UG58 chassis RF connector to minimize connection losses. A parallel tuned circuit consisting of a stripline inductor and a 1-9 pF trimmer cap (Ca) fine tunes out any small reactive mismatch from the coax connections as well as giving some out of band strong signal rejection. The PC board also has 50 Ohm strip lines between the external coax connections and the RF relay. The relays operate from any 12 to 14 Vdc source and draws about 110 mA. A relay also switches the applied DC Voltage between a receiver or downconverter and a 1.5 watt transmitter or exciter drawing no more than 1 Amp - use an external DC power relay or switch for higher power amps like the PA5. The RF relay will handle up to 20 watts pep ATV. A relay also switches the input video between a video monitor jack and transmitter video modulator input to enable camera focus and set up in receive, and detected video to the monitor in transmit. This relay could also be used instead to switch 13.8V up to 3A wired in parallel.

### CONNECTIONS:

- ANT** 50 Ohm antenna input. Connect and solder the board to a UG58 type N flange type chassis connector as shown below after pre-wiring all the other wires and coax.
- +** +12 to 14 Vdc input. Run a wire from the TR-1b to an on-off power switch. The applied power must go through a fuse with a 1N4745A 16 Vdc 1 watt zener connected from the equipment side to ground.
- PTL** Key input - Push To Look. Run a wire to a transmit/receive toggle switch and/or push to talk mic jack.
- +TX** +12 to 14 Vdc output when keyed into transmit. 3 solder pads are available to connect to transmitter board, or exciter and sound boards and 12V transmit indicator lamp. Total current draw up to 1A.
- +R** +12 to 14 Vdc output to downconverter when unkeyed in receive.
- T** Connection from transmitter - Use 50 Ohm RG174 coax. Cut outer insulation back 1/4", fold back and twist the braid over the outer insulation. Cut the inner dielectric back 1/8". Solder center conductor to the pad and then the braid to the ground plane. Quickly solder using minimum heat and time and no mechanical bend or force within 6" of the end of the coax, then let cool before moving so as not to melt and short through the dielectric. Verify that there are no shorts with an ohmmeter.
- R** RG174 coax from downconverter. Dress and solder as above. The ohmmeter will show a short until the relay is keyed.
- CV** RG174 or shielded wire from camera video.
- TM** RG174 or shielded wire from transmitter board monitor output if available.
- MV** Wire to monitor output jack.

**MOUNTING:** Note sketch below. Drill and punch a 5/8" dia. hole for the UG58 type N RF jack in your chassis, then mark, drill and debur the four .140 dia. holes for the 4-40x.5" screws. Prewire all connections to the board and cut short any wire protrusions. Ground all coax shield braids to the TR-1b board ground plane. Fasten the jack on the chassis with the screws, internal tooth lock washers and nuts. The nuts should be finger tight. Place the TR-1b over the connector and center conductor pin, work down over the screws, then tighten with a screw driver while putting pressure on the nuts with the board. Then fasten the board with the lock washers and nuts. Check for any solder or wire protrusions that may be shorting out to the chassis. Solder the connector center pin to the board being careful of the iron angle so as not to melt the plastic relay covers. Quickly peak the trimmer cap Ca for maximum RF power out on a RF power meter - key down time should not exceed 20 seconds while peaking. 33 or 23 cm transmitters can also be used by shortening the stripline inductor with braid.

