

# A Cheap Relay for QRO 6 meter Amplifiers

Ray Rector WA4NJP EM84dg

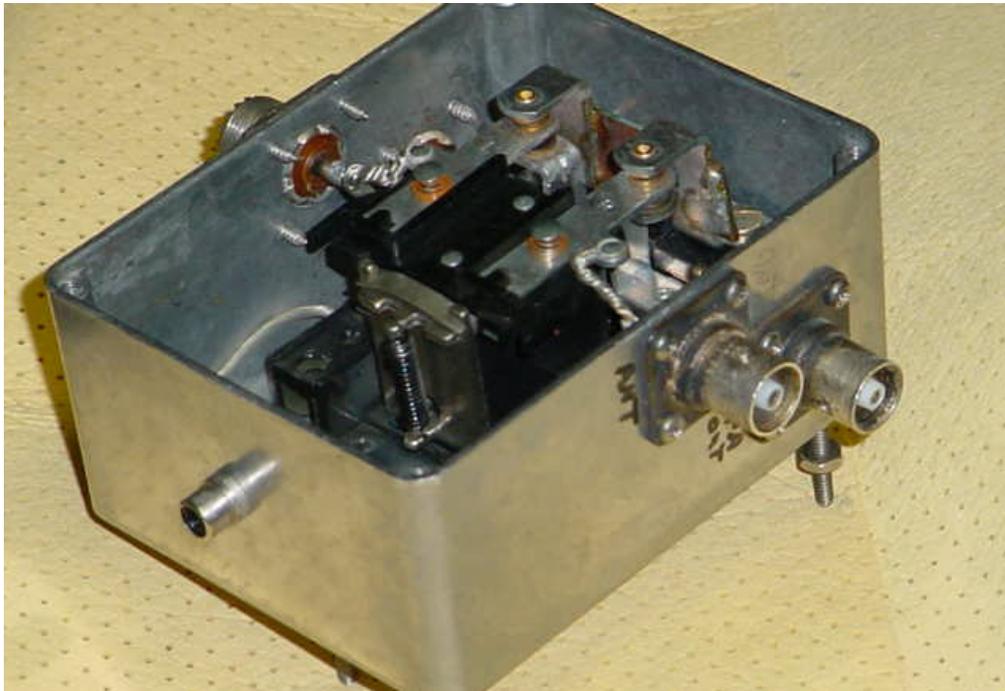
Often times we have a specific need for a part for a specific application. When I decided to build a high power Amplifier for 50 MHz, one of the components needed was a transfer relay. The ability to be able to take the amplifier out of the line without having to disconnect cables, and of course being able to transfer between RX and TX.

I tried several surplus relays on hand and found that they would get hot and did not give much useful life. I decided to build my own. The relay had to be able to handle high power continuous, low loss and provide good isolation. The relay needed to be DPDT in it's contact arrangement and have a coil voltage that would fit my RX/TX scheme.

After looking at most of the available relays, I decided to use a universal power relay. This relay is manufactured by several company and they all look like they came from the same old Potter and Broomfield mold. The one I found was made by Magnecraft, mfg part number W199AX-13 or Siemens PRD 11AYO can be use. These relays are available in almost any voltage AC and DC. The contacts are rated at 30 amps and have a 2200 volts insulation rating between conductive elements. Several of these can be built for the price of some of the high power vacuum relays that are on the market.

As I examined this relay it was easy to see how this unit could be modified and placed in operation as a bypass relay for my new high power amplifier.

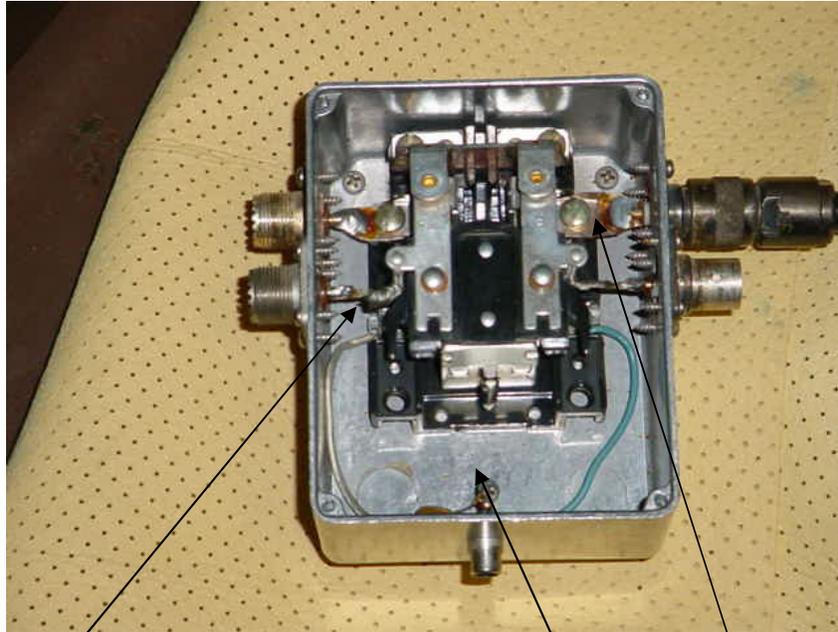
Photo 1



Complete and assembled relay as used at today WA4NJP

As can be seen in Photo 2 the relay is mounted off centered into a Bud die cast box. Bud CU-234. Appropriate input and output connectors are mounted to the outside and a phono plug is mounted to supply voltage for the coil.

Photo 2



1) Notice lead removed from screw terminal and connected directly to RF connector.

2) Phono plug for PTT

3) low inductance strap Lead to RF connector

1) By removing the common terminal flexible lead from the normal screw mount and connecting it directly to the appropriate RF connector the amount of series inductance will be reduced greatly.

2) A small bypass capacitor is placed across the phono plug for spike reduction.

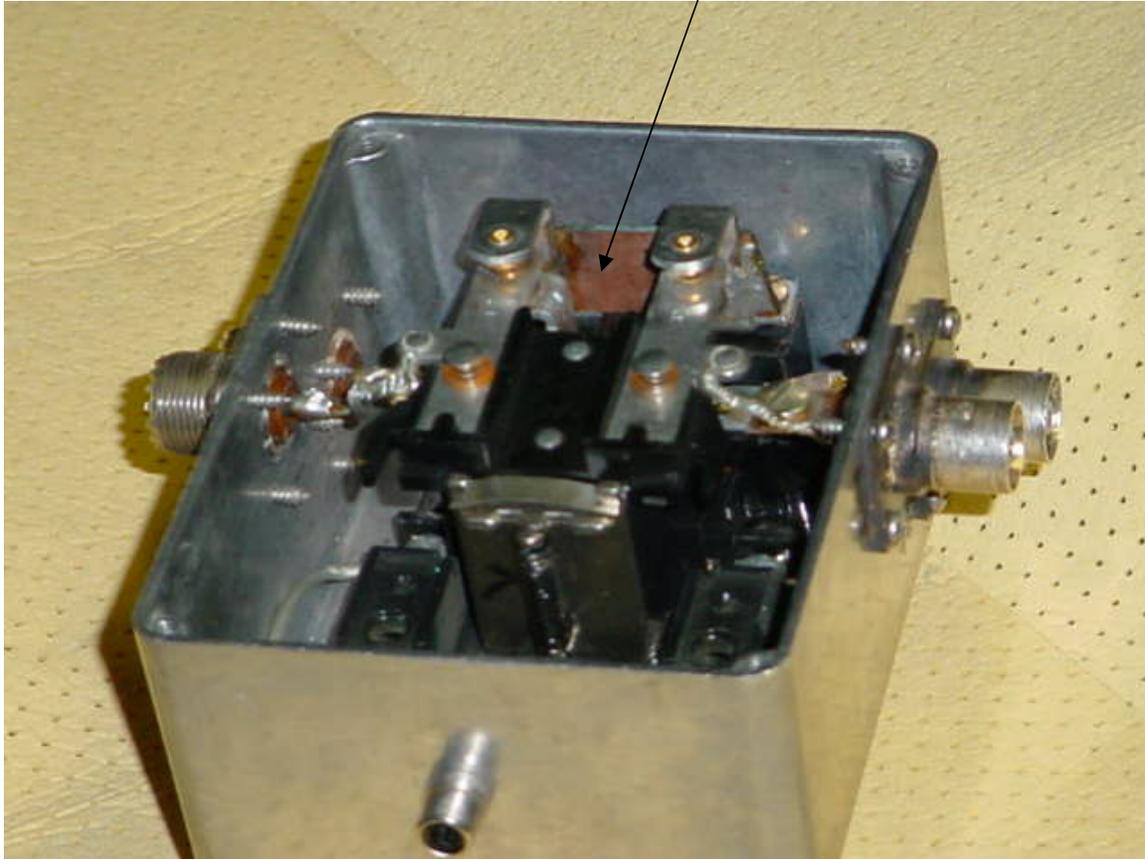
The relay was too tall to mount in the box with the lid installed so about 1/8 inch of the plastic base was removed. This was accomplished with a saw and then sanded smooth and flat with sand paper.

3) I also used a flat strap lead from normally open screw terminal to input and output terminals to reduce the lead inductance.

Connector choice was chosen to suit my needs.

*Low inductance copper strap soldered between the NC contact support pieces*

Photo 3



This relay has been in use for about 5 years and has never given any problems. I can't give exact specifications to the loss through it, but I can say at 10 watts with a Bird Wattmeter and good dummy load you can not measure any loss at 6 meters. Now I do know that there is some loss because when I run the 6 meter station hard in CW on EME for several hours it does get warm (maybe 10 C rise above ambient). I do have this relay in the receive chain and can not tell when it is in use. The isolation of this relay is good and I would estimate it at 40-50 dB. I think that the lead length is just adequately short to work on 6 meters and would do nice at lower frequencies but not at 144 or above. It has been tested at 50 MHz with a  $>66$  dBm power level and no problems found. It has been run on JT44 for hours on end at 1.5 KW also with no problem.

This completed relay has given me confidence that I have proper transfer of power to the antenna and good receiver protection at all times.