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3 Mods for the 6BPF's

de N8RA

The first try to use these filters was the past WWDXCW. KD1EU and I set up two radios here, each equipped with a 6BPF. The filtering performance was great, but that first use did suggest a few things that could be enhanced.

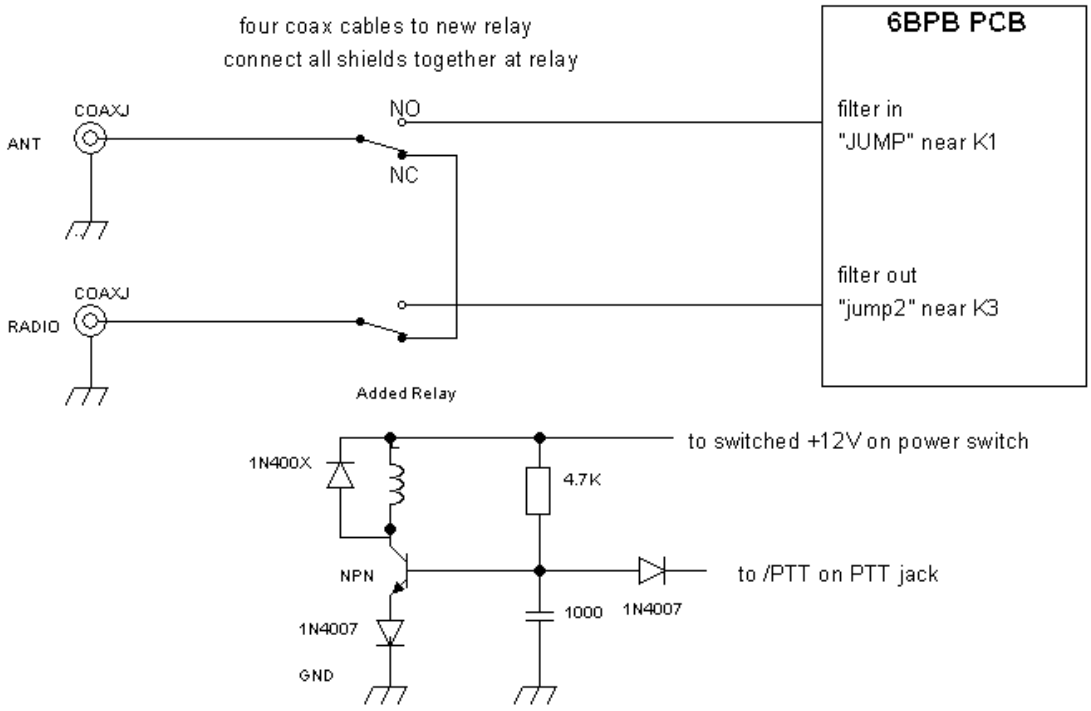
Mod 1: Front Panel LEDs Too Bright

The 6 LED's indicating the band setting of the 6BPF were too bright when the filter was sitting on top of the radio. The fix was to increase their series resistance by adding a 4.7K ohm resistor in series with each existing 490 ohm one. An easy way to do this is to heat the bottom of one of the solder pads of the existing resistor while gently pulling out the corresponding lead on the top of the board. Then trim one lead of the new 4.7K resistor to 1/8", and while heating the same bottom pad again, insert this short end into the hole. The free ends of the two resistors can then be joined together above the PCB.

Mod 2: Lower SWR through the filter when it is turned off

On the second day of the WWDX contest, I started to notice an intermittent in the switching of the T/R bypass operation of the 6BPF. When coming back to receive, sometimes the band would appear dead, but a quick cycling of the 6BPF bypass relays with the front panel power on/off switch or the ptt would bring it back. I think (without any proof) that the relay contacts were damaged by hot switching them when I used the "TUNE" button on the Orion. This TUNE is independent of the delay I had set in the N1MM logger, and RF comes out of the radio very soon after its PTT-OUT switches. So I now have a flaky 6BPF; what to do? Well I could replace the relays but that looks like major surgery. Another desire has been to change the bypass switching arrangement to lower the swr thru the filter when it is powered off. Taking care of both of these needs has turned out to be easy by adding another relay. I used an open frame one with 10A contacts and a 12V coil. If I ever damage the contacts again, I can now clean them. N1MM will say I made lemonade.

This schematic shows how to do it:



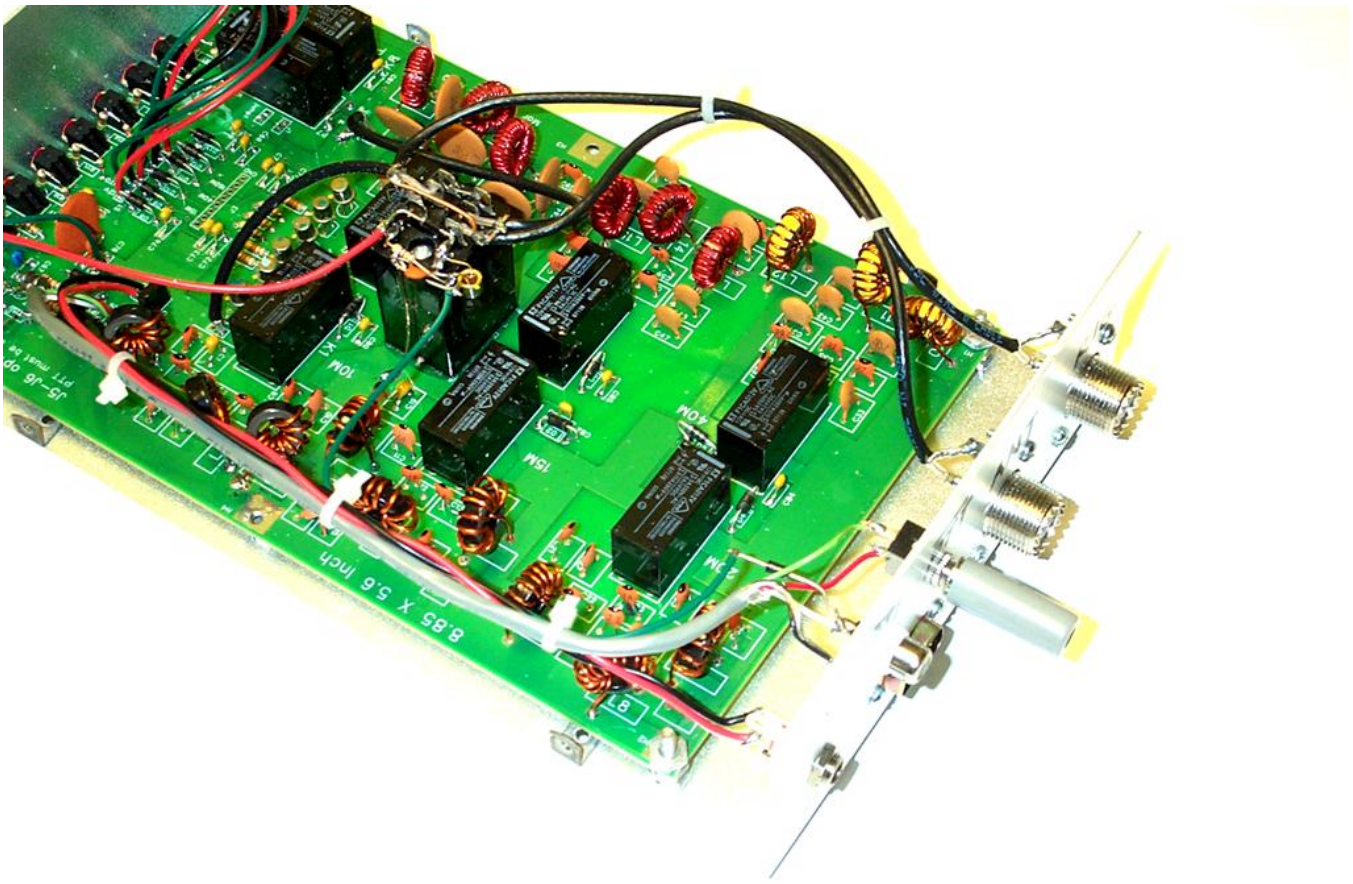
With this arrangement, when the power is off, or when PTT is asserted, the relay is de-energized and bypasses the filter. Because of the short connections, the swr thru the filter is now less than 1.3 to 1 from 160-10M when it is off. When the power is turned on, the relay is energized, and the filter will be “in-line”.

I epoxied a dpdt relay to the center of the PCB and routed the existing coax lines from the antenna and radio back panel SO239’s so they now go to the poles of the new relay. Add a wire across the normally closed relay contacts. When the relay is not energized the filter PCB is completely out of the line.

Then wire the input and the output of the filter to the appropriate normally open contacts on the relay. Specifically, route a coax from the filter input, labeled “JUMP” near K1, and one from the filter output labeled “jump2” between K7 and K3 to the relay’s NO antenna and radio contacts. Solder the coax shields of these 4 coaxes together at the relay.

To control the relay, add a transistor switch for the coil and tie it into the existing PTT wiring in the 6BPF. I built this circuitry right on the relay coil contacts. The connection to common was made with a bare wire going down to the PCB and soldered to the topside ground foil after scraping away a bit of the solder-mask.

Finally, cut the control line PCB trace to the former T/R relays K3 and K8 since they are no longer used. I cut this trace on the top of board where it runs by R12 and R13.



The photo above shows where I put the relay.

Mod 3) Adding an Aux Receive Antenna Input

The 6BPF works great when you receive and transmit on the same antenna. Sometimes you may want to use it with an aux receive antenna, like a beverage, to benefit from the filtering and receiver front end protection. This is easy. Add another small coaxial connector (like a phono) to the back panel with a coax going from it to a new SPDT switch added to the front panel. Cut the coax going to the filter input labeled “jump” and stretch it, or use two longer pieces that go to the new spdt switch. Wire the SPDT switch to allow selection of either the transmit or the aux antenna feeding the input of the filter. This is also a good way to add an aux antenna input to a radio that does not have one.