



Bias T for Antenna Mounted Preamps

This application note describes a method of supplying DC power up through the coax to power an antenna mounted preamp from the ham shack. This way, no extra wires need to be run which could possibly deteriorate and short out. The DC power for the preamp is supplied by running two wires, typically ground and +13.8 Vdc, to the feedthru cap and adjacent ground lug. The DC is then fed through two inductors and a 100 Ohm limiting resistor to the antenna or preamp side of the bias T. One inductor is the .22 uH which is good for 70 cm and the other is actually made by winding 1 full turn on each end of the 100 Ohm resistor. A .156 diameter drill is used as a form to wind the turns. These two 1 turn inductors are good for the 900 and 1200 MHz bands to isolate the feedthru cap from the coax at the RF frequencies but pass the DC to the center of the coax. A 33 pF disc cap passes the RF but blocks the DC from the downconverter input. A kit is available from us.

Construction:

Drill 3 .156 dia holes in the metal can. Two of them which are pilot holes for the BNC's, are drilled 1/2" in from each side in two corners. The hole for the feedthru cap is drilled 1/2" in from the opposite side from the BNC's and centered. The two holes for the BNC's are then drilled to 3/8". Debur all three holes and check for fit. Mount the BNC's and feedthru cap (solder lug on the outside) and tighten down the nuts. Wrap the leads of the 33 pF caps to the respective center of the BNC jack pin and making the lead as straight and short as possible from the cap body, then solder. Wind the 1 turn on each end of the 100 Ohm resistor and form for attaching to the feedthru cap center wire and .22 uH inductor. Wrap one end of the resistor wire around one end of the .22 uH as close to the .22 uH body as possible and solder. Then wrap and solder to the antenna/preamp BNC jack center pin and to the feedthru cap. Check for shorts, then connect two wires (typically red is + and black ground so you don't accidentally reverse power) to your power supply. Check for operation before putting the lid on, and mark which BNC is which. If all is working well, put the lid on and tack solder in the 4 corners in case you later have to get back inside - lightning has been known to zap the coupling cap or resistor as well as an accidental coax short which can make the resistor act like a fuse. Make and run a short 50 Ohm coax to the downconverter.

