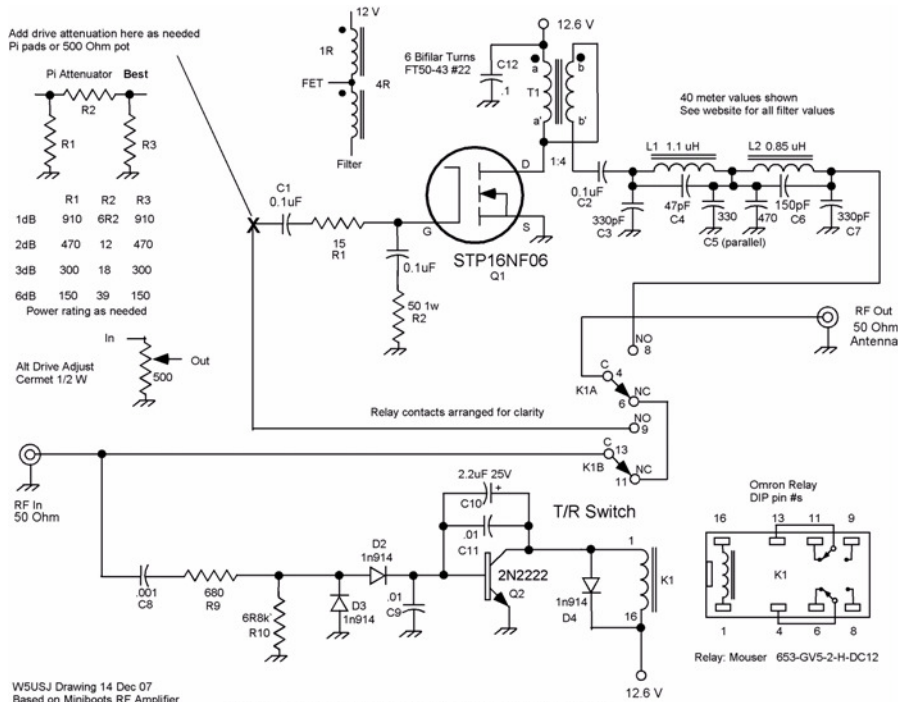


Preliminary



W5USJ Drawing 14 Dec 07
Based on Miniboosts RF Amplifier
by Wayne McFee, NB6M, 2002
Revision 18 Mar '08

<http://www.w5usj.com/TxTopperQRPamp.html>
TxTopper QRP Amp for T/TT2-40, DC40 and "Mites Etc.

Version 1 of the TX Topper does not have good input matching with a return loss (RL) of about 2 and SWR over 8:1 on all bands. (Note that high RL values indicate low SWR values.)

This condition was pointed out to me by Jim Kortge, K8IQY, when I sent the prototypes to him for evaluation.

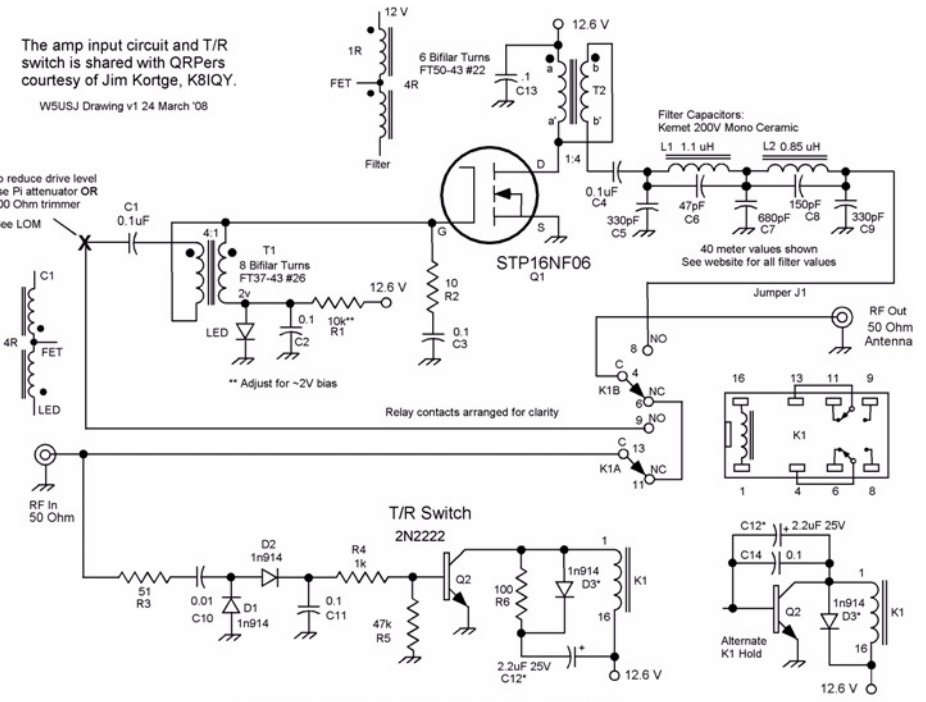
This Input condition causes instability and with the 40m Rock-Mites an additional matching circuit was needed for proper operation. However, drive levels for 5W output were as low as 250mW on 40/80.

A slightly improved version is shown above where the input to the FET is swamped with a 50 Ohm load resistor. Drive levels are higher for this version.

Using the MFJ-259B in advanced mode, measurements of RL/SWR and Z were made of the circuit shown above with power applied.

Freq	RL	SWR	Z
1.8	19	1.2	
3.5	14	1.4	
7	10	1.9	
14	6.4	2.8	
21	4.9	3.5	
28	4.9	3.5	

Although the MFJ-259B is a useful instrument, the measurements obtained are not the equivalent of laboratory grade test equipment. However they are useful for indicating the relative quality of the circuits. Compare to the K8IQY circuits above right.



The amp input circuit and T/R switch is shared with QRPer courtesy of Jim Kortge, K8IQY.
W5USJ Drawing v1 24 March '08

To reduce drive level use Pi attenuator OR 500 Ohm trimmer See LOM

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K8IQY's design shown above provides much improved front end matching across the bands and is also more stable.

No special impedance matching circuits are needed. The RM/40s that needed a T match between the units before worked fine with either of the two circuits shown here.

The bias circuit for the FET input uses an LED as a voltage regulator. The LED used above provided 1.96V with the 10k resistor used at 12.6 Volts. Adjust R1 to make limited voltage changes

Jim also suggested a more sensitive and faster operating T/R switch. Adjusting the value of C12 allows changing the switch timing for character or word dropout.

As shown in the table below, the input impedance is uniform over most of the frequency range. The dropoff at 28 MHz is consistent with Jim's model predictions.

Freq	RL	SWR	Z
1.85	25	1.1	46
3.56	26	1.0	46
7.1	25	1.1	46
14.1	23	1.1	44
21.1	19	1.2	44
28.1	15	1.3	45

Input attenuation shown in the drawing above left can be used as needed. Impedance matching is maintained with the Pi circuit. Variable adjustment with the 500 Ohm pot is useful when used with various rigs and power ranges.