This is a updated collection of easy projects for radioamateurs and swl's. See all of my projects at OLDER POSTS down on this blog. Enjoy,73 John

Saturday, November 12, 2016

DIY kits 70W SSB linear HF Power Amplifier For YAESU FT-817 KX3

It's time for a new project. eBay link to the seller

My first impression : High quality PCB (100 x 50mm) , all parts in the kit including 2 power FETs type IRF530N. Capacitors are 10nF instead of 100nF as shown in the schematic but that's not a problem. The 0.5 turns windings are on the PCB by means of the tubes inside the toroids. Supports for the transformers need to be cut out of the pcb. Construction is easy but a lowpass filter for each band is mandatory. I used the low pass data from W3NQN for a 7 element Chebyshev with standard value silver mica capacitors and T68-6 toroids. The provided wire for the power chocke (2 turns) has a weak coating . It's better to replace it to avoid shortcuts .Start soldering the small parts and end with the transformers. Turn the potentiometer anti clockwise and slowly adjust the bias to aprox. 3.7V. I replaced the FETs by a pair of IOR IRF530N resulting in more stabillety en less input SWR however the input swr is highly effected by the drive power . At 5 Watt the swr mounts to over 1:3... . Best results with this PA are obtained on CW and FM .
The test was in the original configuration at 13.8V and 5Watt FM input from my FT-817. Max. power was 80 Watt . At 3 Watt input the output was about 50 Watt at 20m. but the modulation was as expected distorded in ssb mode at the recommended 2.7V bias voltage.

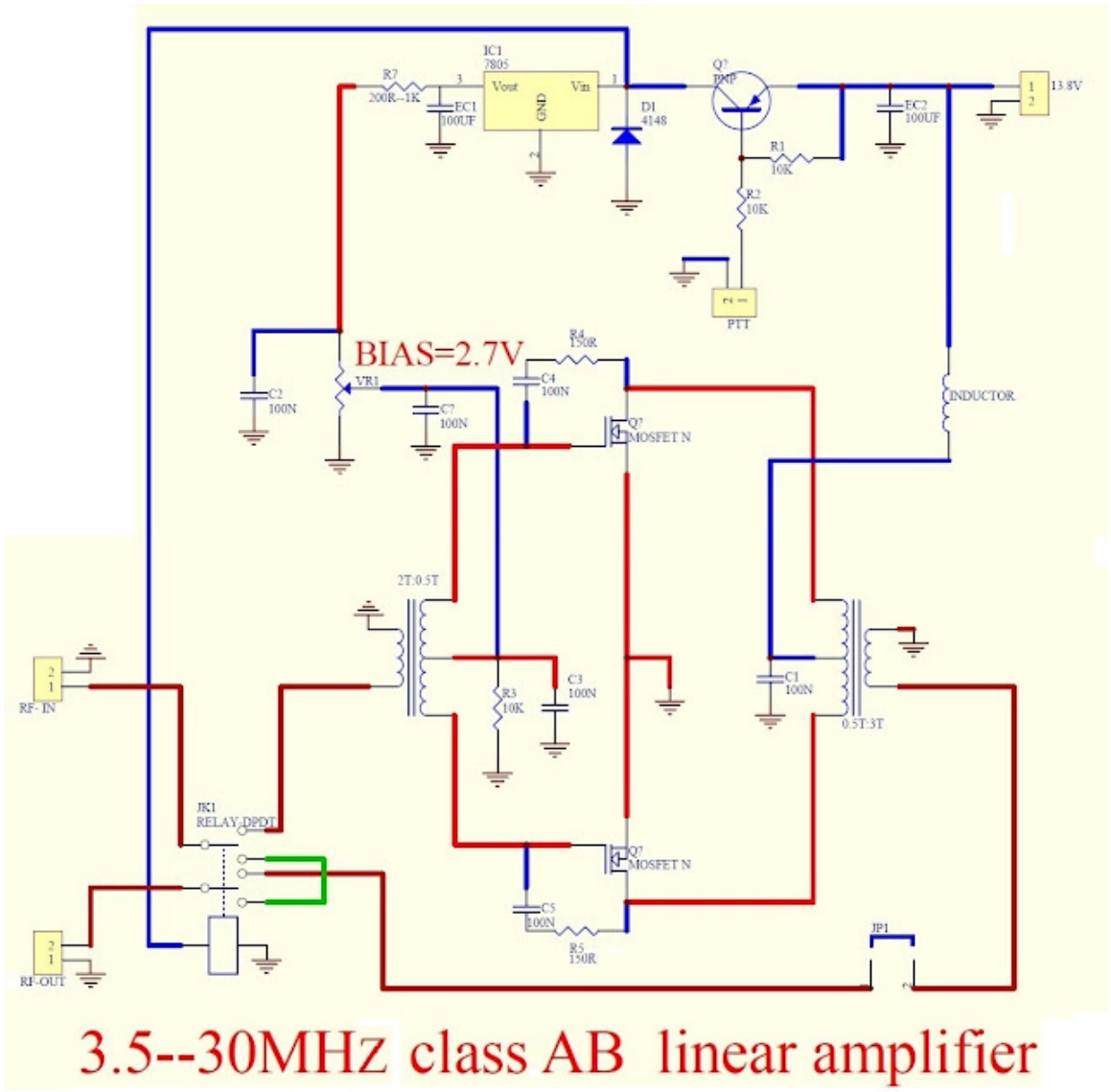
At 3.7V (gate) bias the modulation is acceptable but far from perfect. The 150 Ohm resistors over the FETs heat up strongly at full power FM. It's better to reduce the drive power to 2 Watt when working 12V FM/AM . Don't reduce the drive by reducing the Bias voltage for this results in a distorted modulation in SSB mode. Better use a power attenuator : Power att. calculator PA1B
Unfortionally the seller often forgets to add the documentation, the picture shows a copy of the original pdf file.
A You Tube impression by KC2IRV : Overall impression of the amplifier
Testing the PA
Visit the blog of John DK9JC for a nice test : Link

Conclusion : This is a nice kit with acceptable results for a low price. For best results reduce the drive power to 2.5 Watt.
swr at 5 Watt input : 1:3+. swr at 2.5 Watt input 1:1.8 with more than 50 Watt output. This is more than enough for fieldwork.

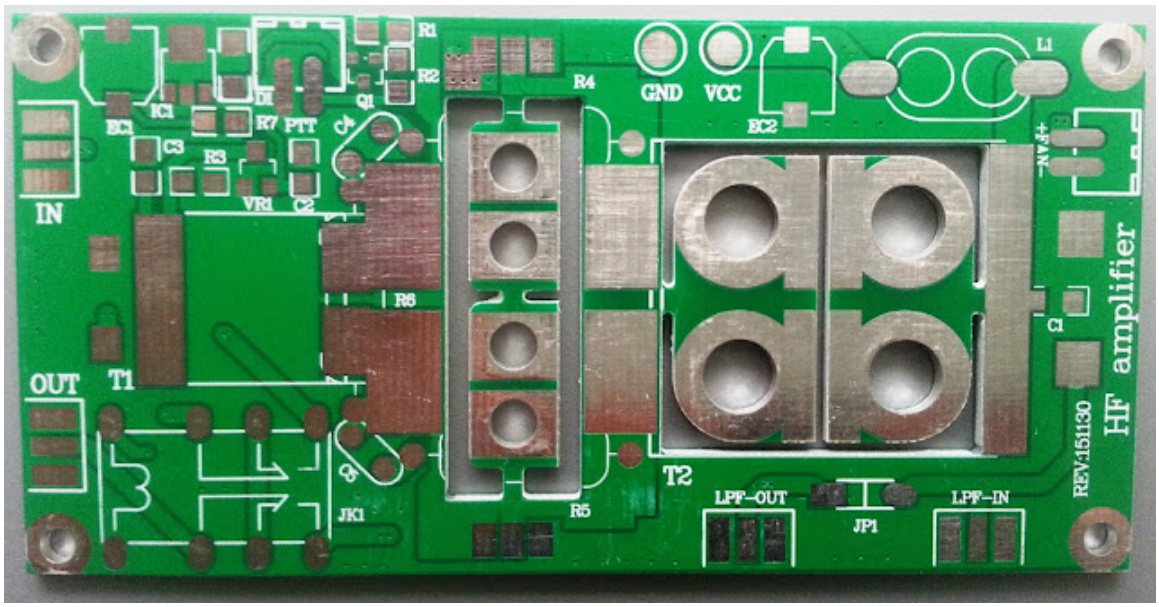
Better input swr update by OE1CGS : Link I had a 18 Ohm 3 Watt resistor in stock, the swr is near perfect on 20m. at 5 Wattt input (-: The output has dropped to 50 Watts , more than enough on a good antenna.
OE1CGS found these values for the missing R6 over the input transformer for a low input swr. Use a carbon or metal foil resistor .

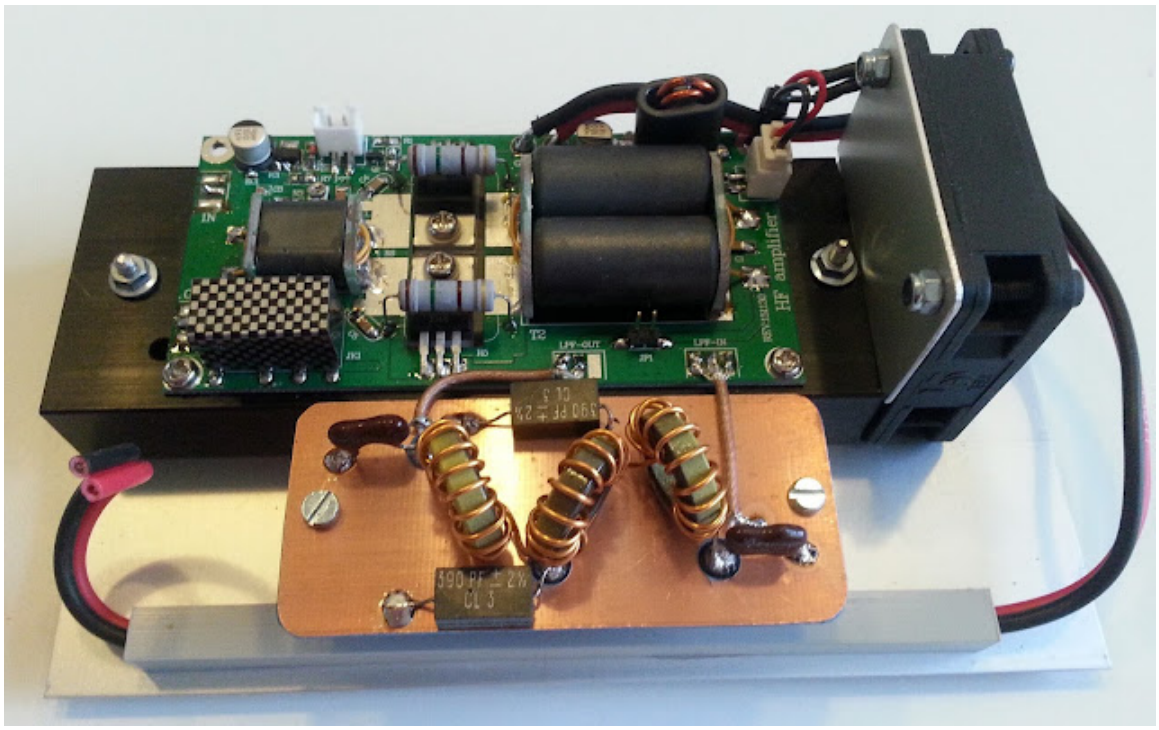
Band\R6=	10 Ω	12 Ω	15 Ω	18 Ω	22 Ω
80m	2,1	2,0	2,0	2,1	2,3
40m	1,6	1,4	1,3	1,3	1,4
30m	1,5	1,3	1,1	1,1	1,3
20m	1,4	1,2	1,1	1,2	1,4
17m	1,3	1,3	1,4	1,5	1,6
15m	1,4	1,5	1,6	1,8	1,9

Input swr measurements by OE1CGS



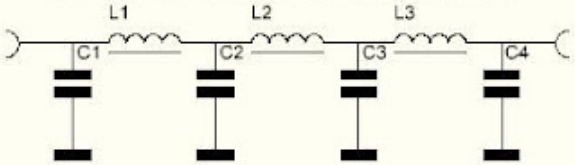
copy of the original pdf file




HF amplifier
T2
LPF-OUT
LPF-IN
390 PF ± 2%
CC 3


PA 20-70

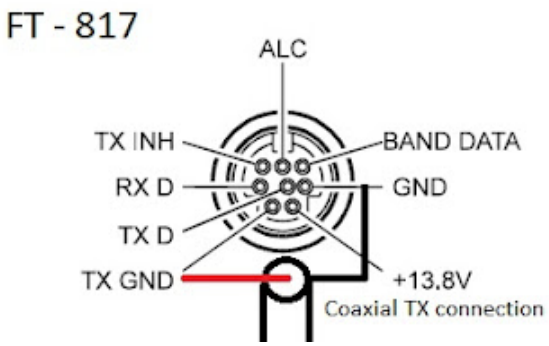
7 element Chebyshev with standard value silver mica capacitors and T68-6 toroids



	c1 c4 pF	c2 c3 pF	L1 L3 uH	L2 uH
80m	510	1300	2.637	3.261
40m	330	750	1.508	1.789
30m	180	470	0.952	1.188
20m	180	390	0.773	0.904
15m	130	270	0.526	0.606
10m	82	180	0.359	0.421

I used 0,8 mm transformer wire

A second amplifier was build without cooling fan . You can clearly see the 7 element filter for 20m .The enclosure comes from eBay : Link
The heatsink also comes from eBay: Link



35mm cooling fans installed with LM-317 speed controll.

Geplaatst door PD7MAA op 2:39 PM

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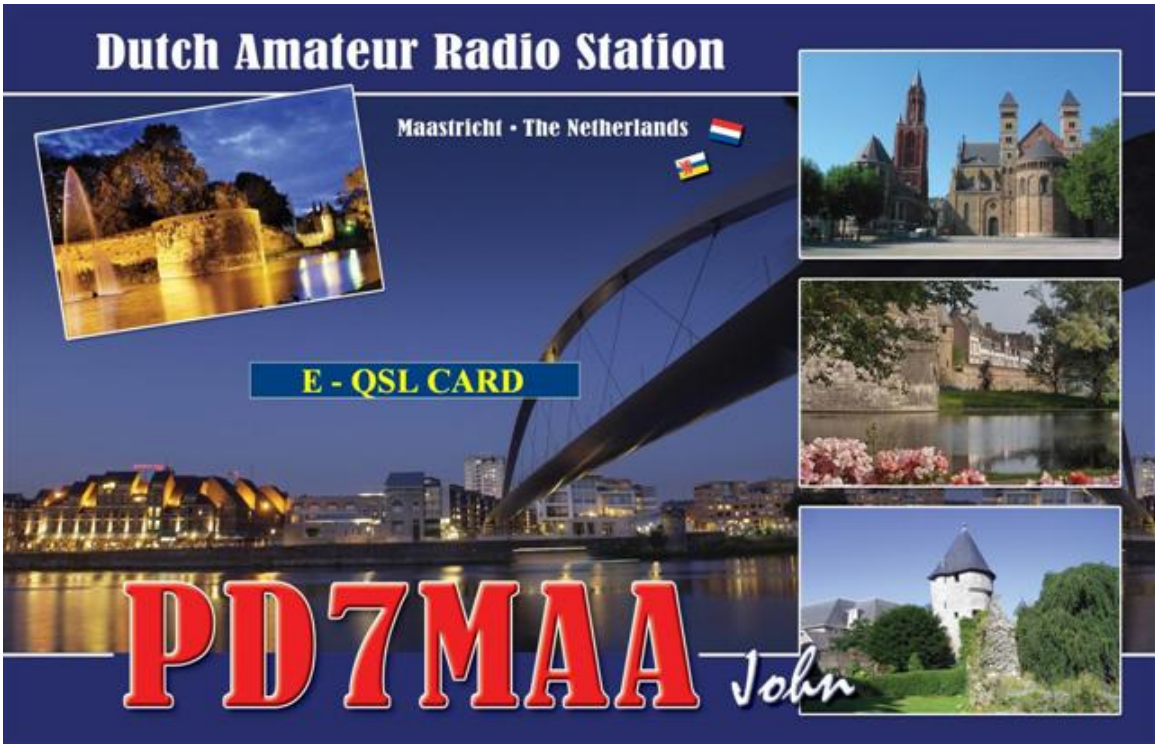

Blog Archive

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