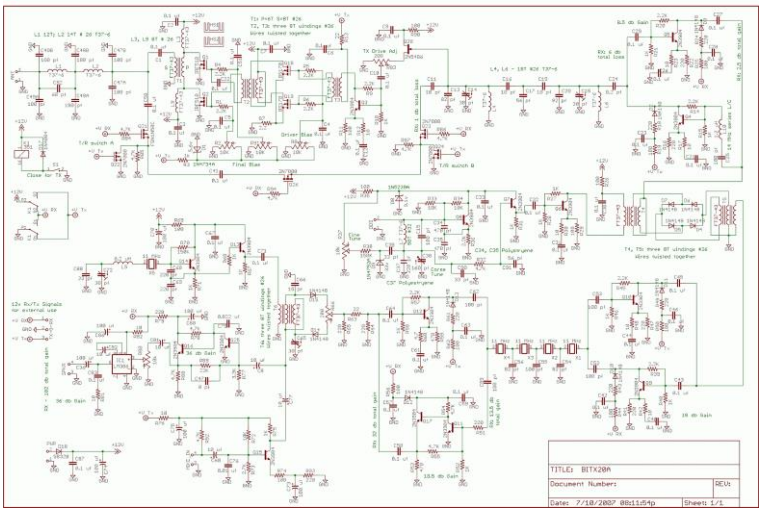
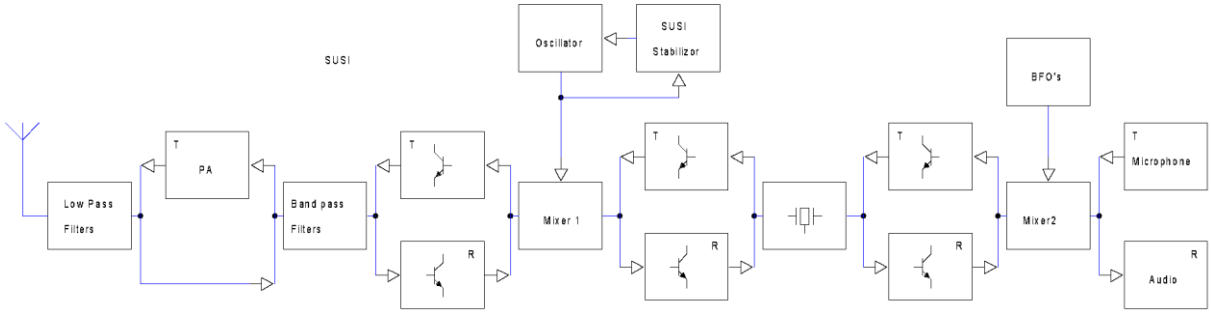
On1mws SSB transceiver.



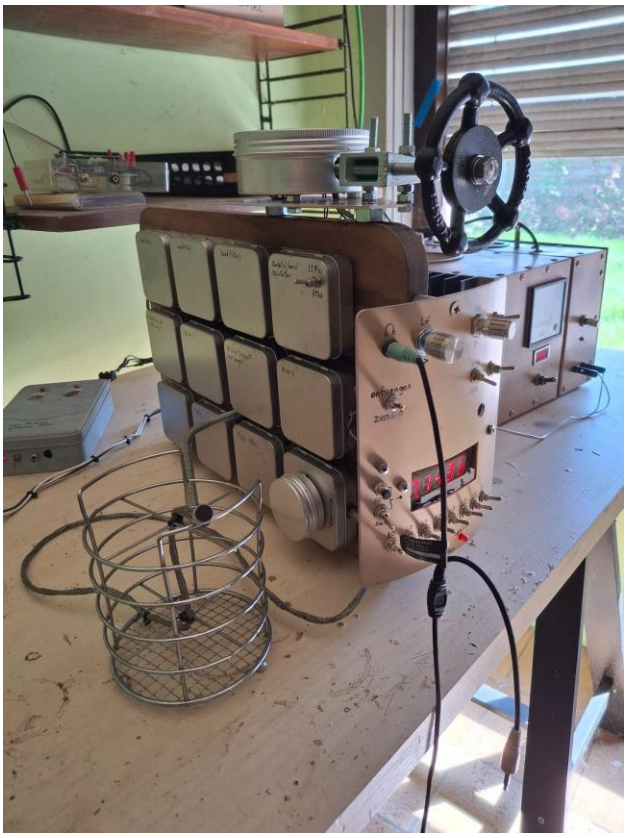
The transceiver is based on the 2007 Bitx20A (above) I immediately like the bi-directional circuit. What I also like is that the circuit uses readily available cheap components. Many links on the net describe how the circuit works. Later on, I based other rigs on the BITX20A circuit and found it is easy to build for the average homebrewer and pretty good in performance. Much better than any NE602/LM386 circuit.

My version is all-band. Also, it features another audio circuit and a different oscillator with SUSI stabilization.

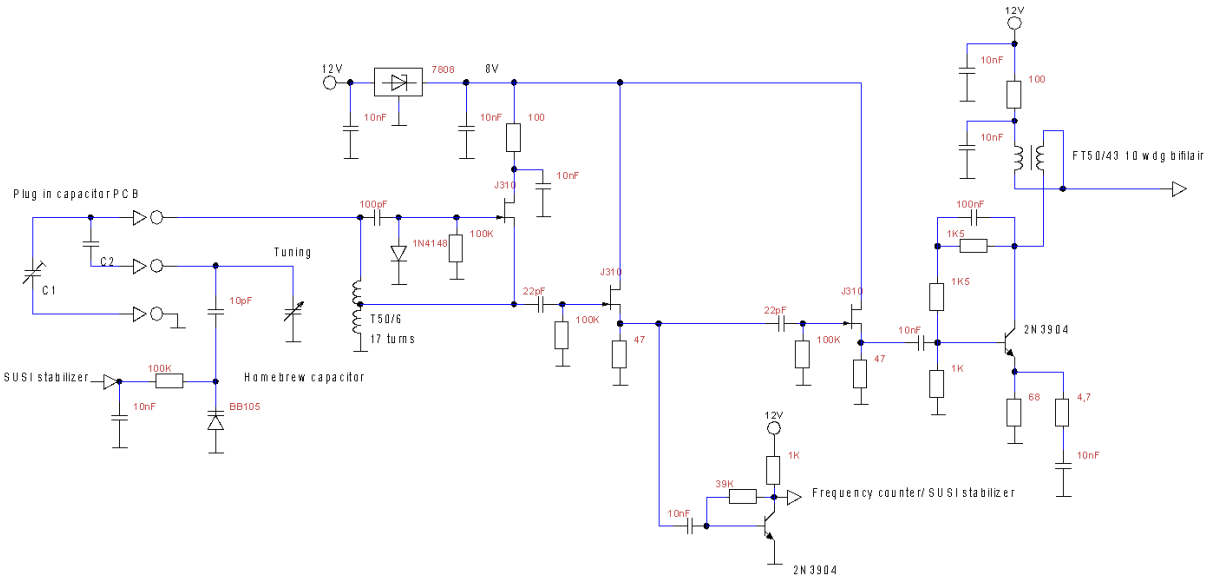


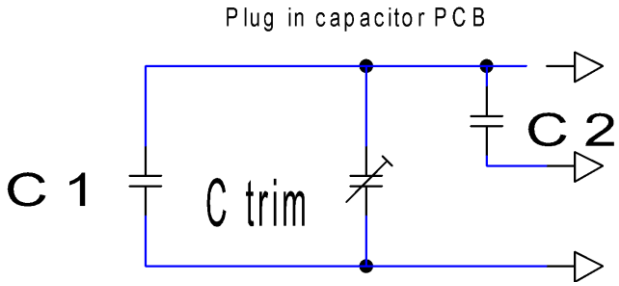
80M to 20M=downconversion, 17M to 10M=upconversion.

To avoid an oscillator that needs to run on high frequencies, the upper bands are upconversion instead of the usual downconversion. So far I can only claim QSO's on 40 and 20M and one QSO on 80M. It should work on the higher bands but I don't have a antenna to do it. This project is soldered in tin boxes and discarded 'normal' enclosures.



yfyy


12V
7808
8V
10nF
10nF
100
10nF
J310
100pF
1N4148
100K
Plug in capacitor PCB
C2
C1
Tuning
10pF
T50/6
17 turns
22pF
J310
100K
47
SUSI stabilizer
100K
10nF
BB105
Homebrew capacitor
12V
10nF
100
10nF
FT50/43 10 wdg bifilair
100nF
1K5
1K5
J310
22pF
100K
47
10nF
2N3904
1K
68
4,7
10nF
12V
1K
39K
Frequency counter/ SUSI stabilizer
10nF
2N3904



Tuning bandspread is always about 300KHZ.

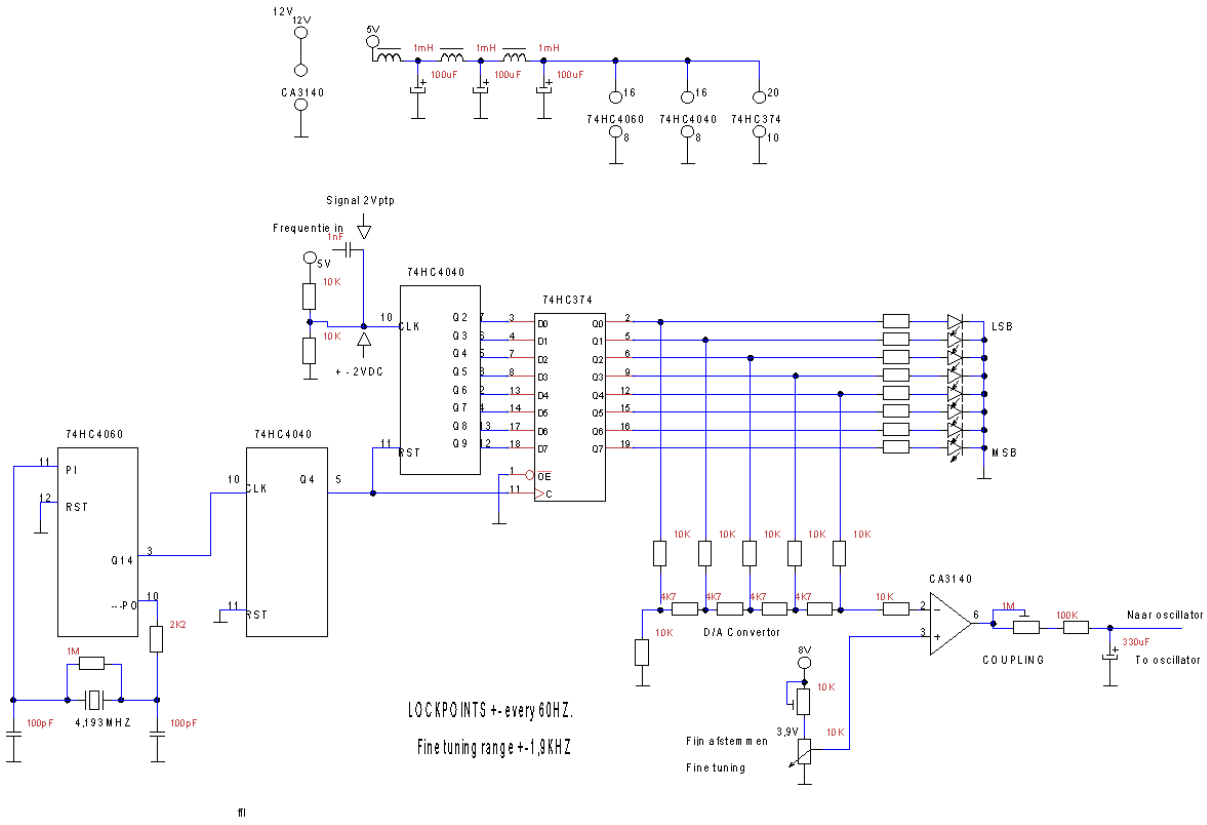
	Ctrim	C1	C 2	Frequency +-	IF
80 and 12M	40p	47p	47p	14,5MHz	11 Mhz
40 and 10m	40p	/	10p	18Mhz	11 Mhz
20M	22p	/	5p	25MHz	11 Mhz
17M	60p	220p	470p	7MHz	11 Mhz
15M	40p	47p	47p	13Mhz	8 Mhz

The oscillator features a homebrew tuning capacitor.

The hot side of the capacitor is a steel tube with an inner diameter of 12mm. The ground is a M8 threaded rod. As the rod gets turned in or out the tube, the capacitance changes. The capacitance is

about 10pF. The rod is driven through a steel beam bracket. This bracket has two M8 holes on both sides. The bracket provides a 54:1 gear ratio.

The homebrew capacitor works very well. It is just as good as a commercial one but a lot cooler.

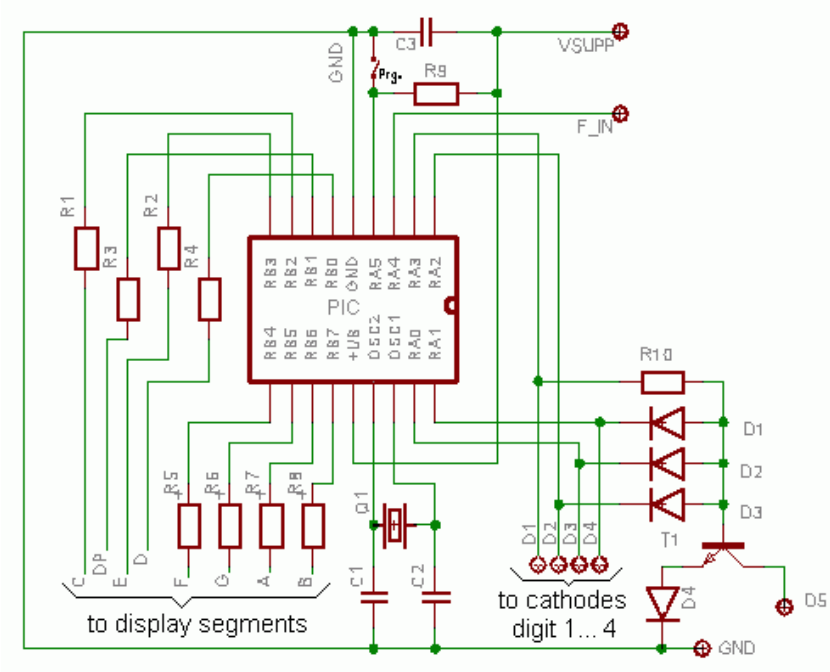


Frequentie stabelisator on1mws

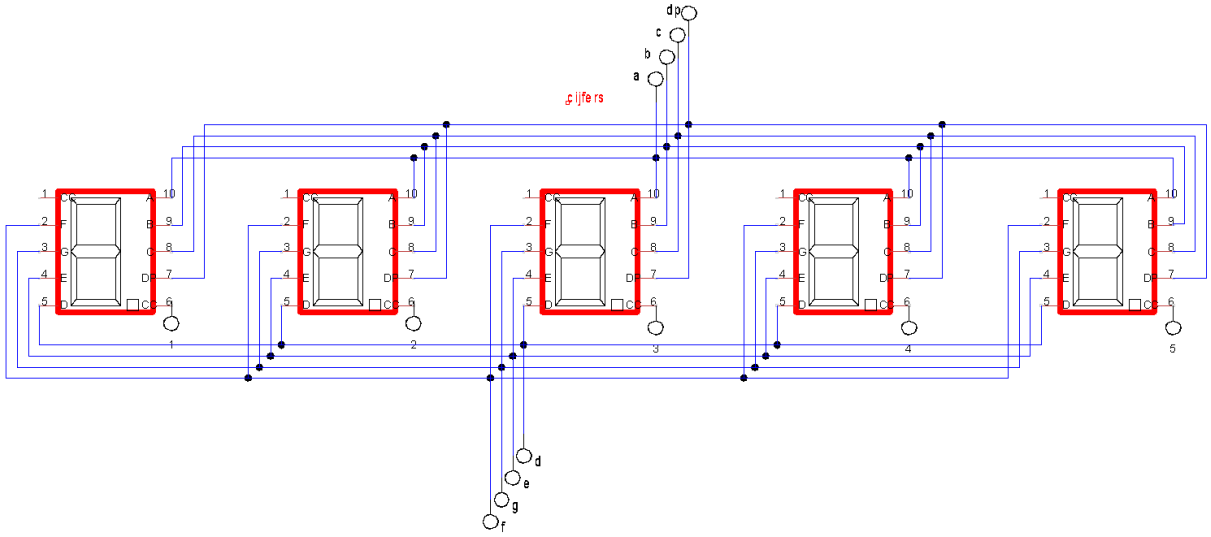
This stabilizer is described is in my opinion easier to build than a Huff and Puff stabilizer and also superior. A discription of the circuit given in another PDF. The lockpoints are spaced about 60HZ apart. Link below.

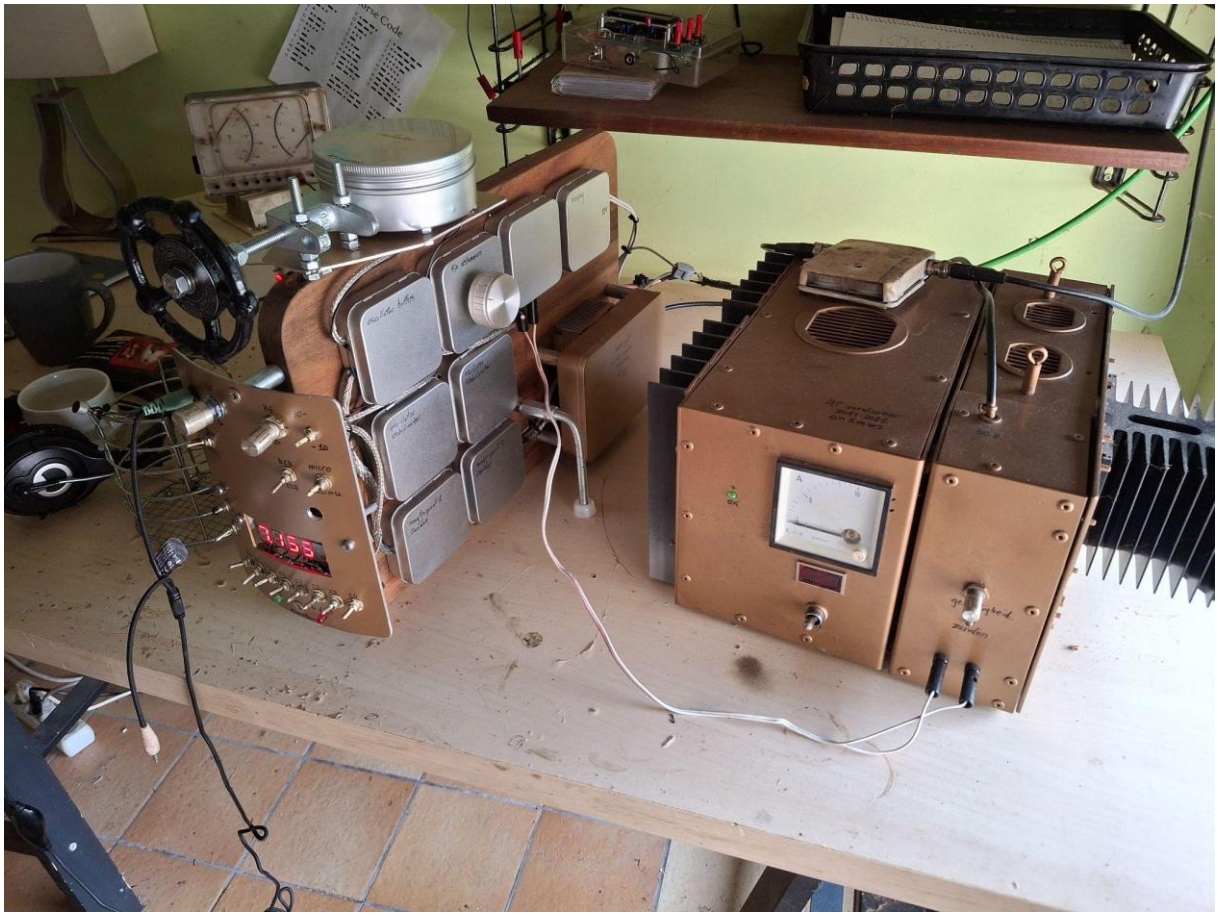
https://www.qsl.net/on1mws/frequentie%20koppelus.pdf

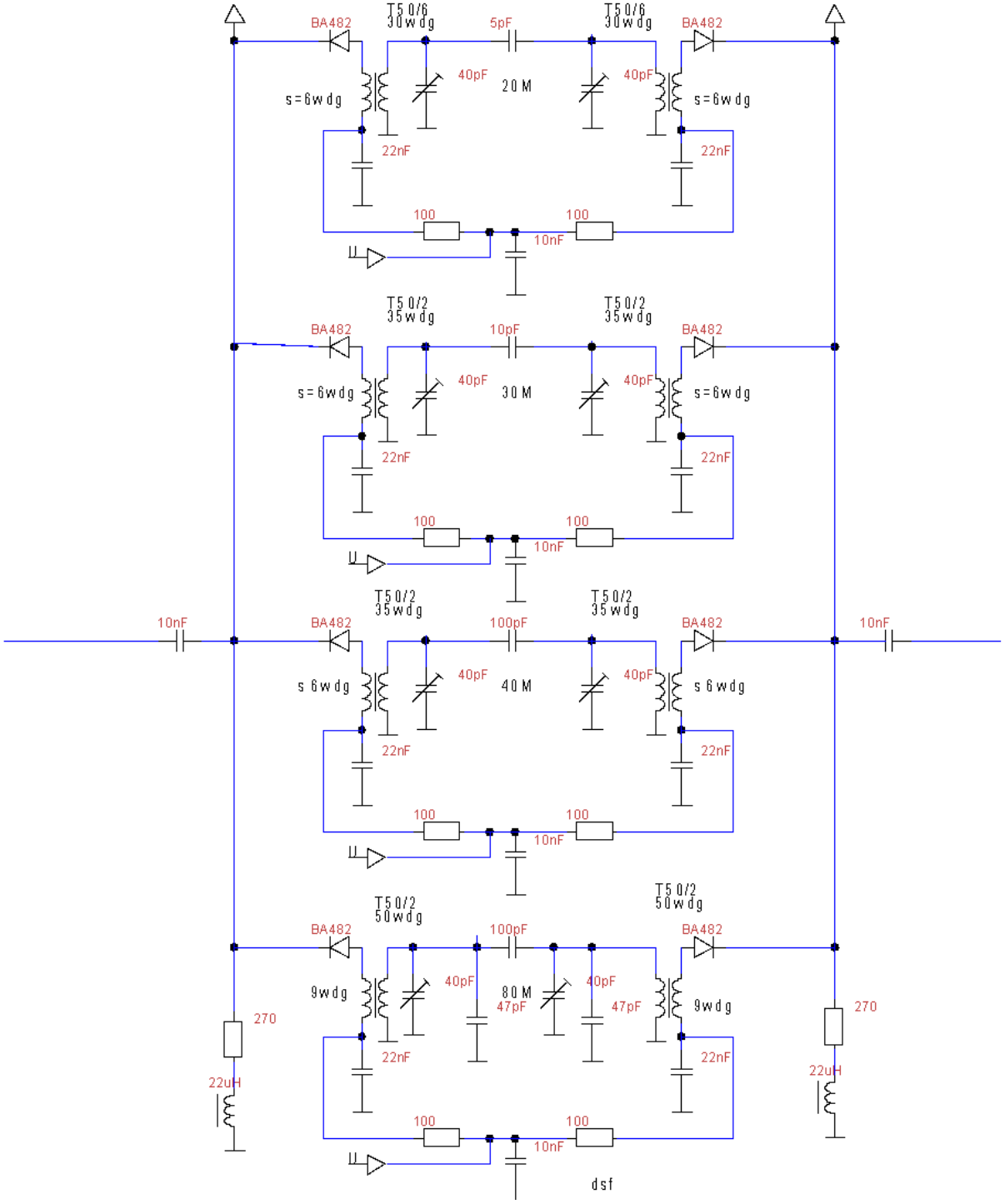
Frequency counter dl4yhf.

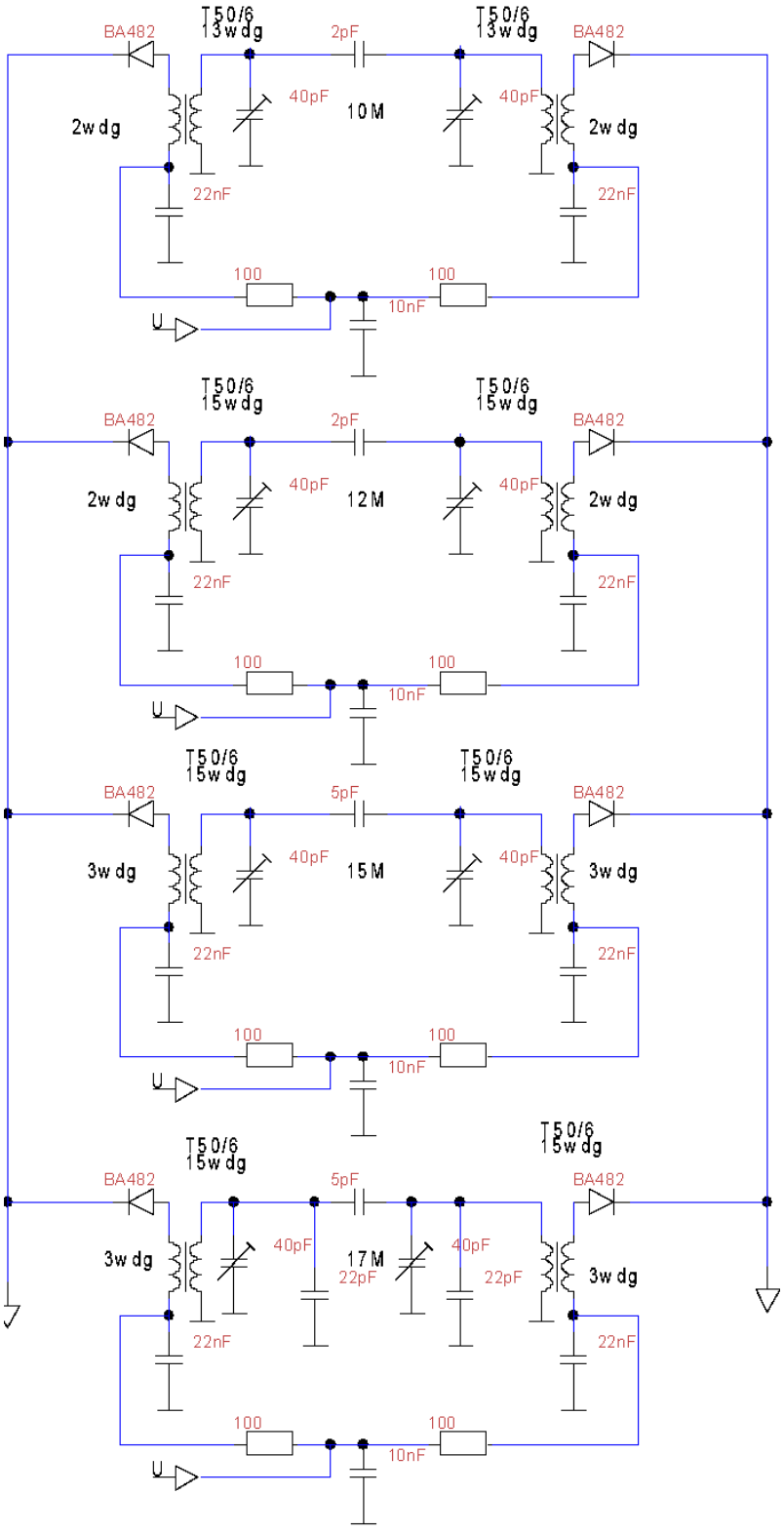


Component values for variant 2 (as shown above): R1...R8 = 1k, R9=R10=10k, D1..D4=1N4148, T1=BC547 or similar, C1=C2 about 22pF (select them to tune the crystal to exactly 20 MHz), C3=100nF, Q1=20 MHz, PIC: 16F628 programmed with firmware "counter2.hex".

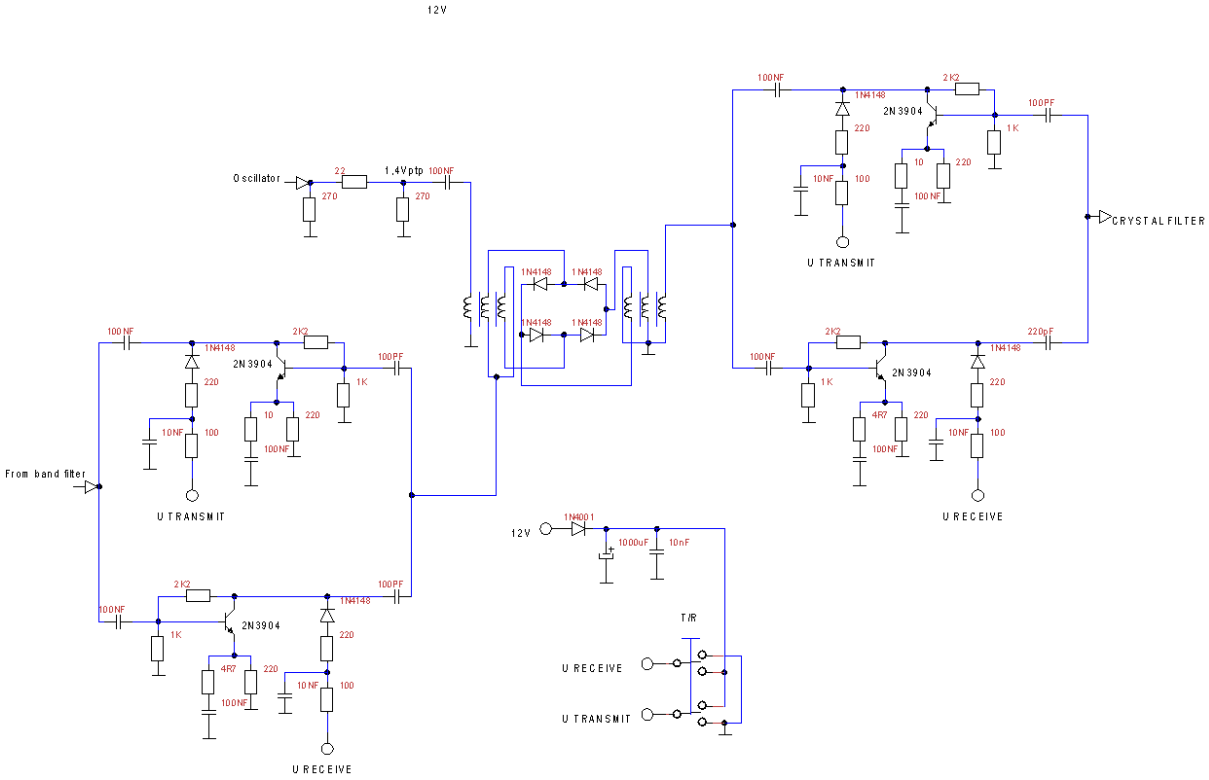

dp
c
b
a
cijfers
d
e
g
f



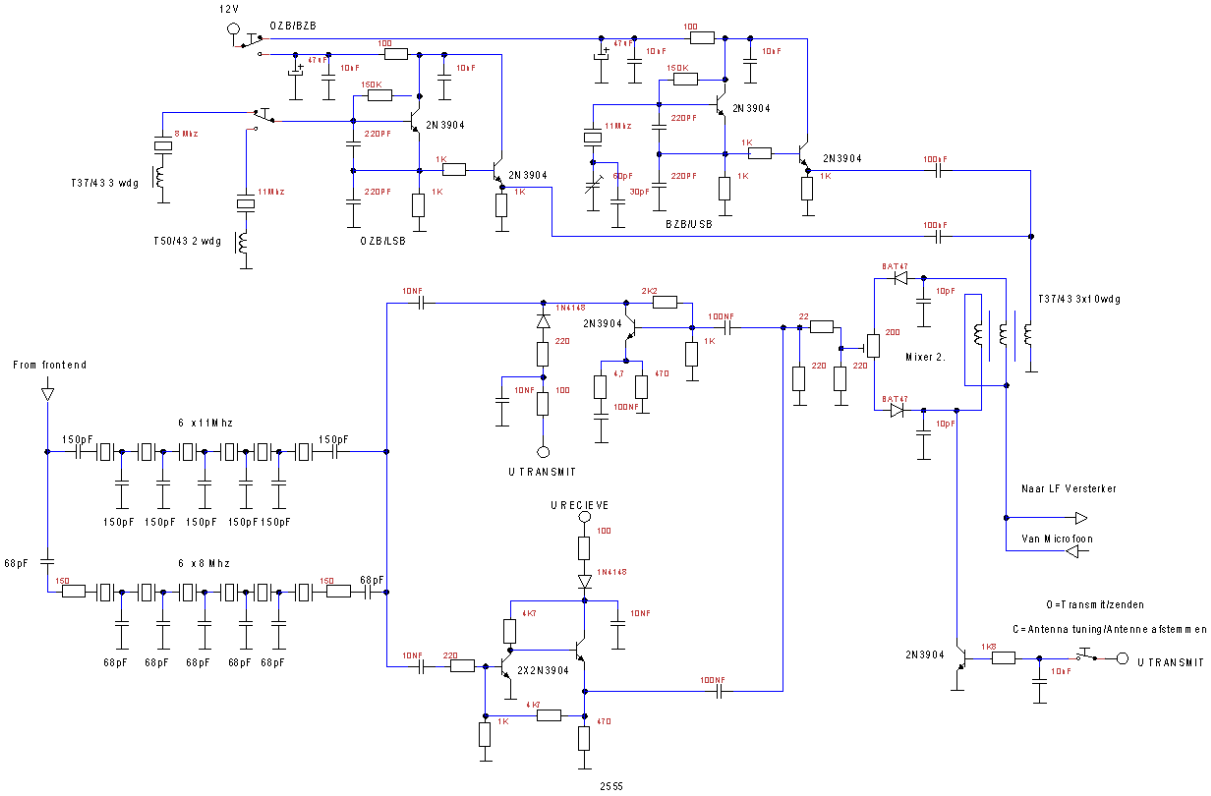

T50/6
30wdg
BA482
5pF
T50/6
30wdg
BA482
40pF
20M
40pF
s=6wdg
s=6wdg
22nF
22nF
100
100
10nF
T50/2
35wdg
T50/2
35wdg
BA482
10pF
BA482
40pF
30M
40pF
s=6wdg
s=6wdg
22nF
22nF
100
100
10nF
T50/2
35wdg
T50/2
35wdg
10nF
BA482
100pF
BA482
10nF
40pF
40M
40pF
s 6wdg
s 6wdg
22nF
22nF
100
100
10nF
T50/2
50wdg
T50/2
50wdg
BA482
100pF
BA482
40pF
80M
40pF
9wdg
47pF
47pF
9wdg
270
270
22nF
22nF
22uH
22uH
100
100
10nF
dsf


T50/6
13w dg
BA482
2pF
40pF
10M
2w dg
22nF
100
10nF
T50/6
15w dg
12M
5pF
15M
3w dg
17M
22pF

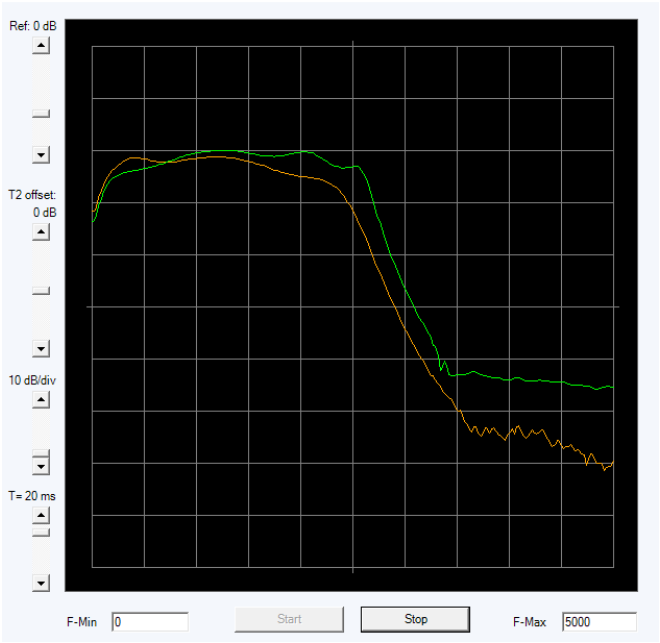
dsf



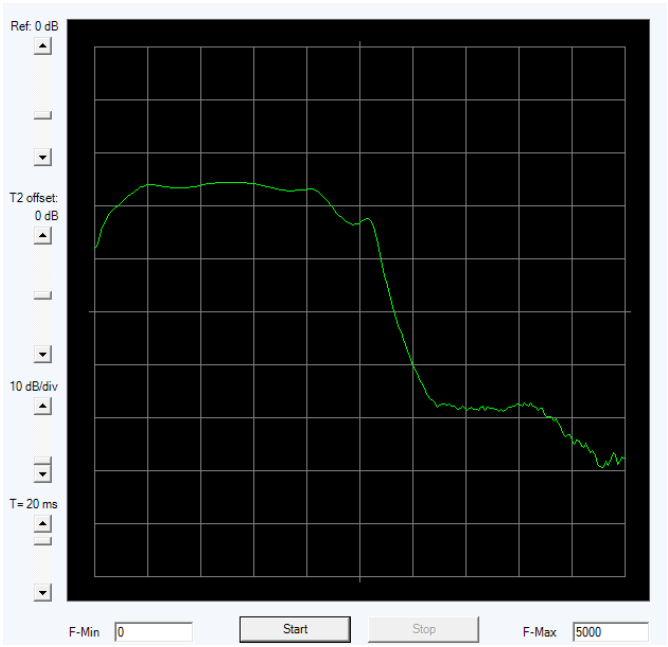
Exact copies for the HF amplifier, mixer and IF amplifier of the Bitx scematic.



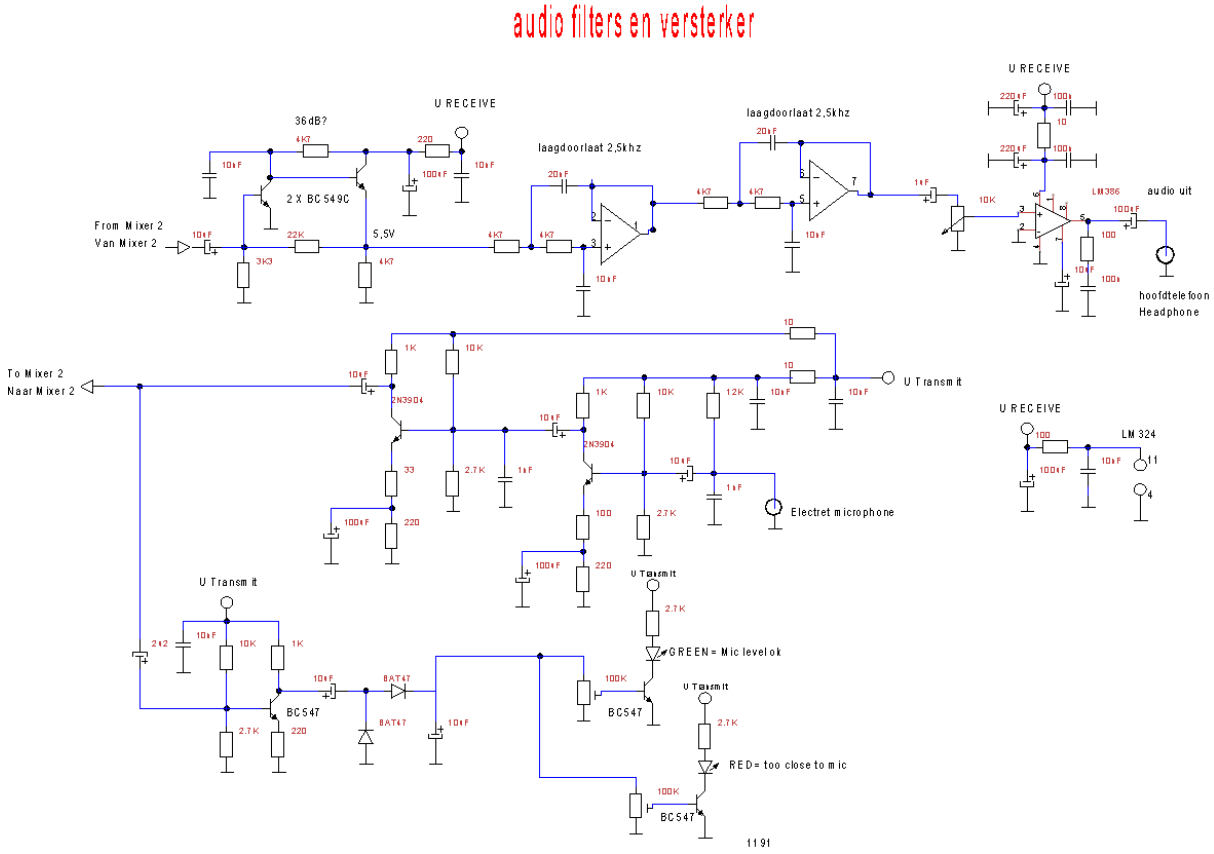
The amplifiers are exact copies of the Bitx scematic. However because the transceiver is all-band there is also a USB side-band oscillator. the itermediate frequency is 11 Mhz, however this did not work out for 15M. For 15M the LSB sideband oscillator is set on 8Mhz and the signal goes throug the 8Mhz crystal filter. As I found out, the two crystal filters can be connected parrallel without switches.



Bandpass 11Mhz. USB groen/ LSB oranje.



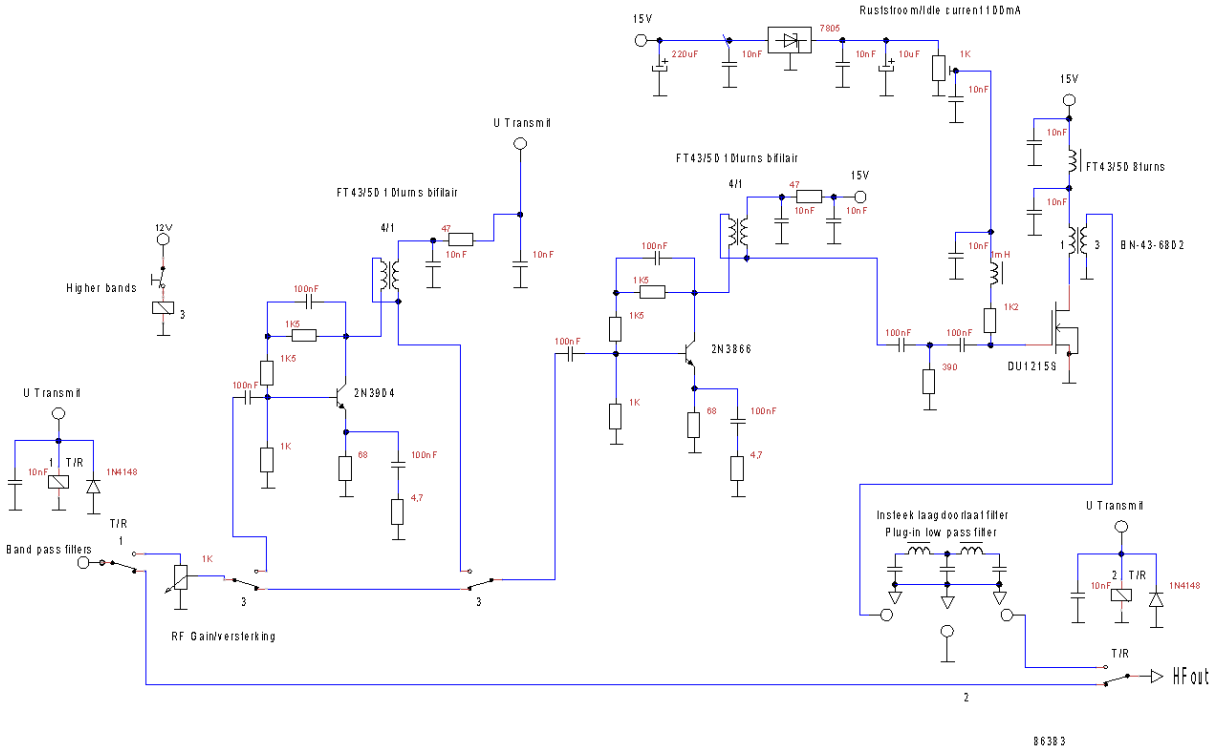
Bandpass 8Mhz. LSB.



Nothing special about the audio sections. I did however needed more microphone amplification than the Bitx schematic suggested.

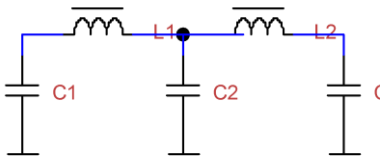
Also there is a very simple two LED VU meter. When I speak into the microphone at the right distance the green LED lights up. But when I start to speak to loud or too close to the microphone (and clip the signal), the red LED lights up to warn me. In my opinion a very necessary feature.

The microphone was salvaged from a 1980s cassette player…



The RF power amplifier. About 7 Watt. The DU1215S is unfortunately horribly expensive. To keep it simple the low pass filters are plug in PCB. Much simpler and cheaper than a relay arrangement. So far I have not being able to make a QRP SSB QSO. Luckily I have a matching 70 W RF linear.

Plug in low pass filters.



80M = C1,C3= 660pF C2= 1600pF. L1, L2= 20 windingen/turns op T50/2 (rood).

40M = C1,C3= 430pF C2= 860pF. L1, L2= 15 windingen/turns op T50/2 (rood).

20M = C1,C3= 220pF C2= 440pF. L1, L2= 12 windingen/turns op T50/6 (geel).

17M en 15M = C1,C3= 110pF C2= 150pF. L1, L2= 9 windingen/turns op T50/6 (geel).

12M en 10M = C1,C3= 95pF C2= 190pF. L1, L2= 8 windingen/turns op T50/6 (geel).

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