

I tested a large number of different chokes to find the best choke suitable for the WF. The test was done using my spectrum analyzer. The generator port and the input is 50 ohms, the choke is connected between the center pin, so the circuit is a PI network with 50 ohms input and 50 outputs and the choke in series.

The attenuation of one resistor in series with the two inputs can be used to understand the resistance of the choke; I don't have a meter to measure over 1500 ohms.

1 000 ohms = - 20 db

2 700 ohms = - 30 db

10 000 ohms = - 40 db

1 – One FT 140-77 20 turns RG-174 or RG316 (Teflon)

ONE

1.8 MHz = - 40 db 10 000 ohms (excellent)

3.8 MHz = - 30 db 2 700 ohms (very good)1

30 MHz = - 20 db 1 000 ohms bellow 30 MHz, quite good.

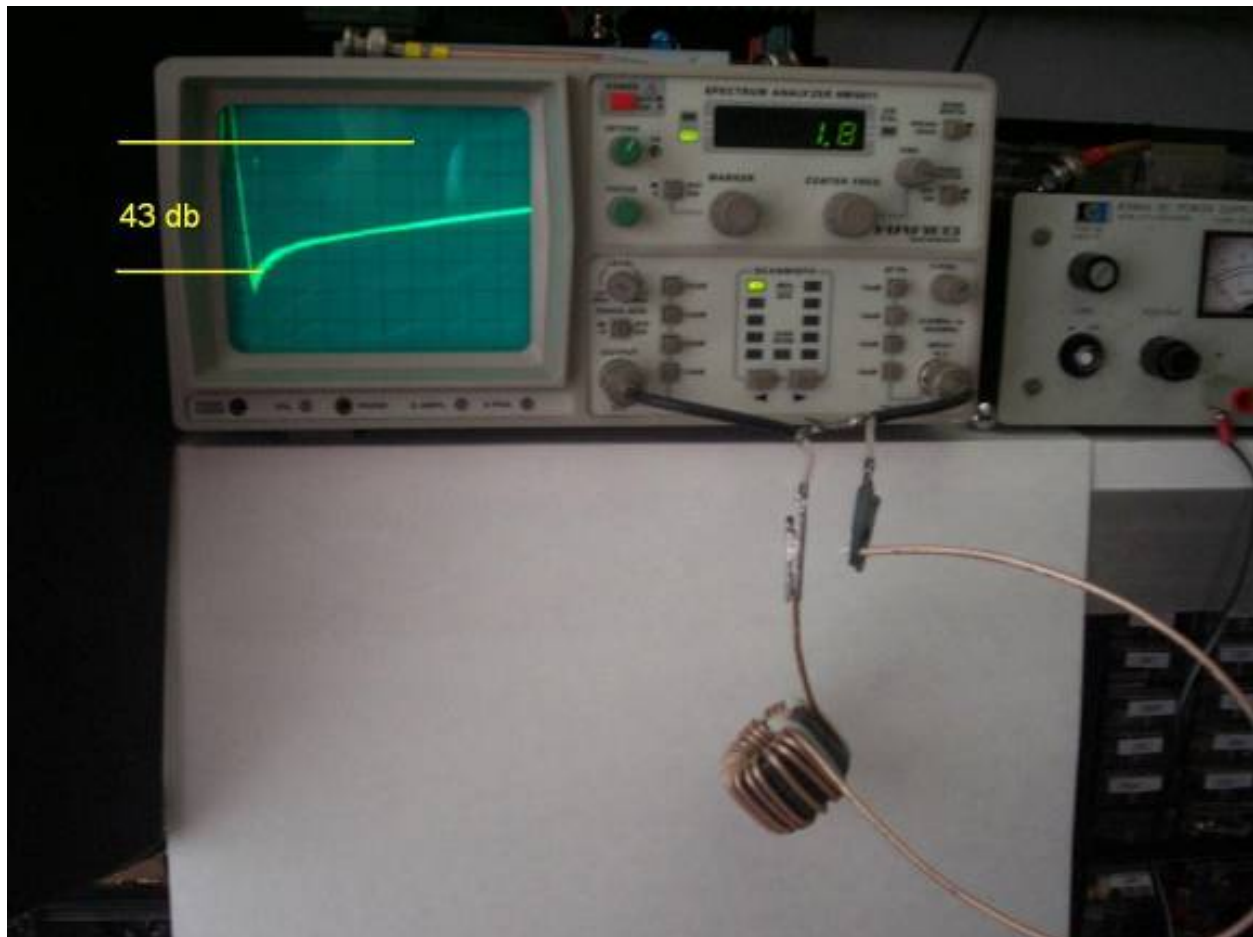
TWO

43 db

35 db

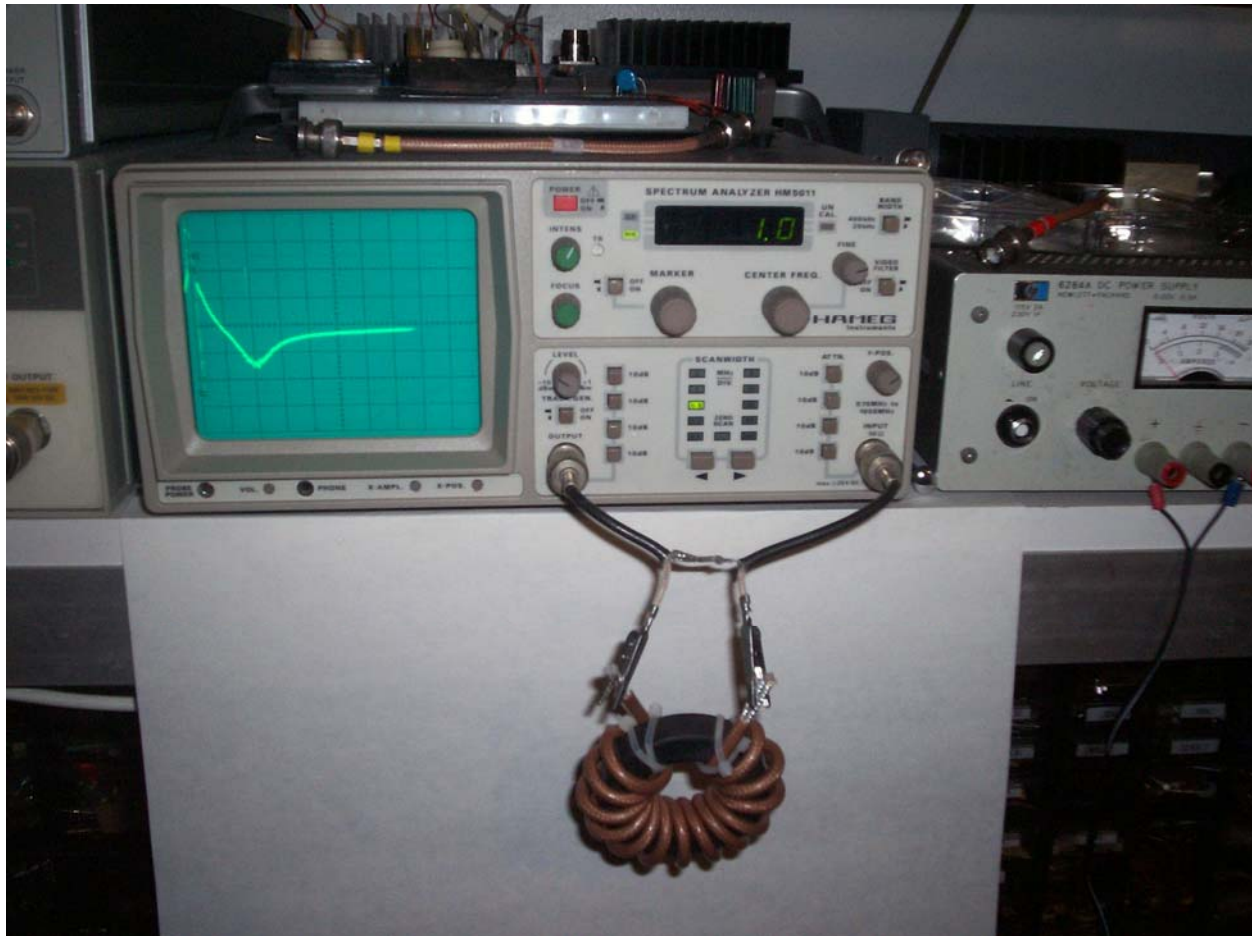
25 MHz = - 20db

*Conclusion; Double the number of toroids increases the attenuation by 3 db*



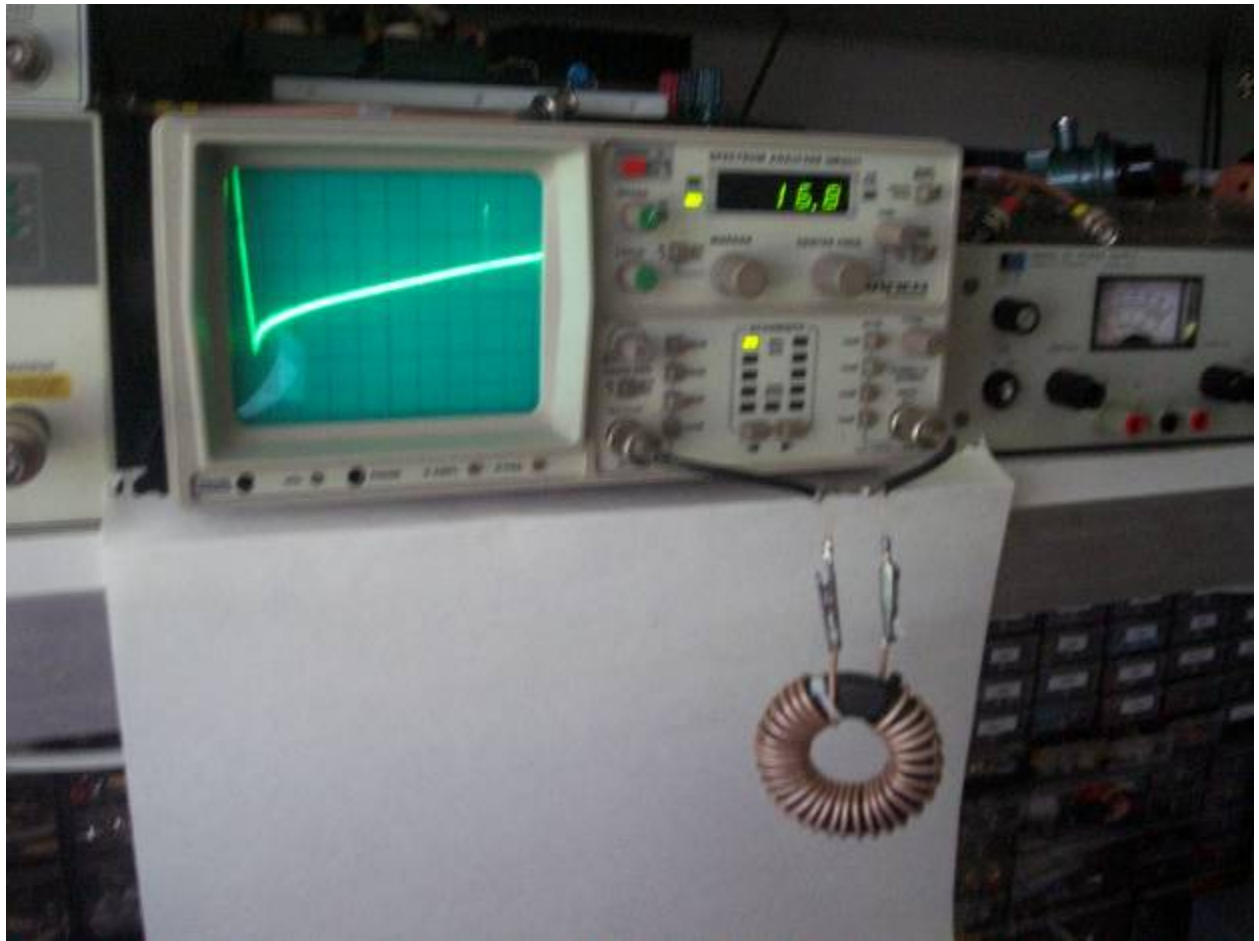
2 – One FT240-77 13 turns RG142 or RG 58 (1m or 3 ft of cable)

13 turns RG142 or RG58	30 turns RG316 or RG174
1.8 MHz = - 32 db	-38 db
4.2 MHz = - 30 db	-34 db
30 MHz = - 20 db	17 MHz = -20db



In the picture above the max attenuation is – 45 db at 1 MHz

This type of chokes has a deep attenuation on 1 MHz and very usable with 1K ohms until 30 MHz.

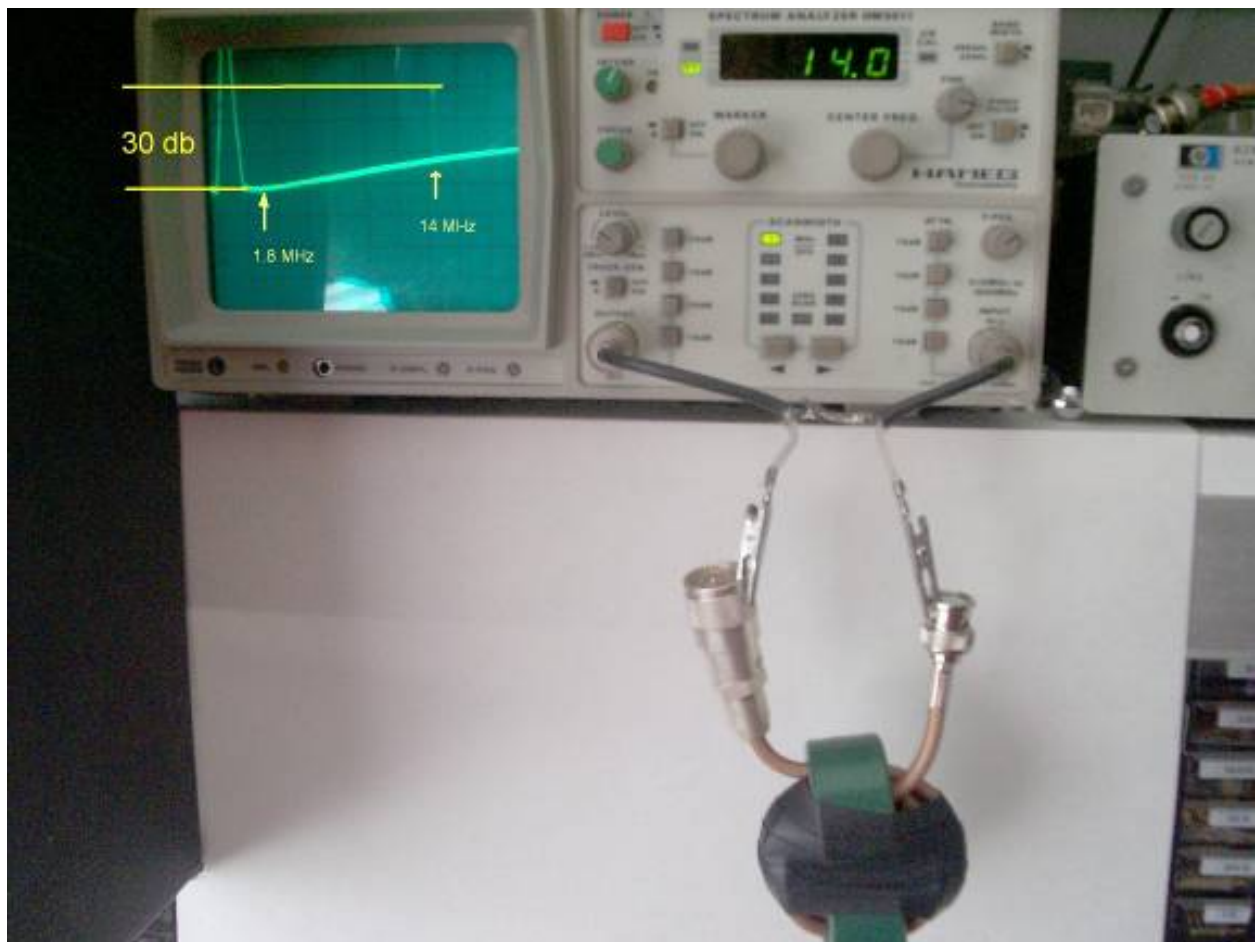


# Binocular

I have several types of surplus toroids coming from switching power supply, and one kind of tick wall 1"OD 1/2"ID 1" high, I have one type with 1" high and another laminar with 1 1/4 high. I am not sure the material on those toroids. The 1/2 inch is enough to 4 turns of RG142 or RG-58 The surplus has OD 1 1/2" ID 1" and 1"high, it fits almost 10 turns. I made the binocular with two toroids side by side on several configurations as bellow.

1 - Two 1.4 x 1" w/ 12 turns RG142

	GREEN		BLACK
800 KHz – 1800 KHz	-30 db	2700 ohms	-28 db
4 MHz	-28 db		-27 db
17 MHz	-20 db	1000 ohms	15 MHz -20db



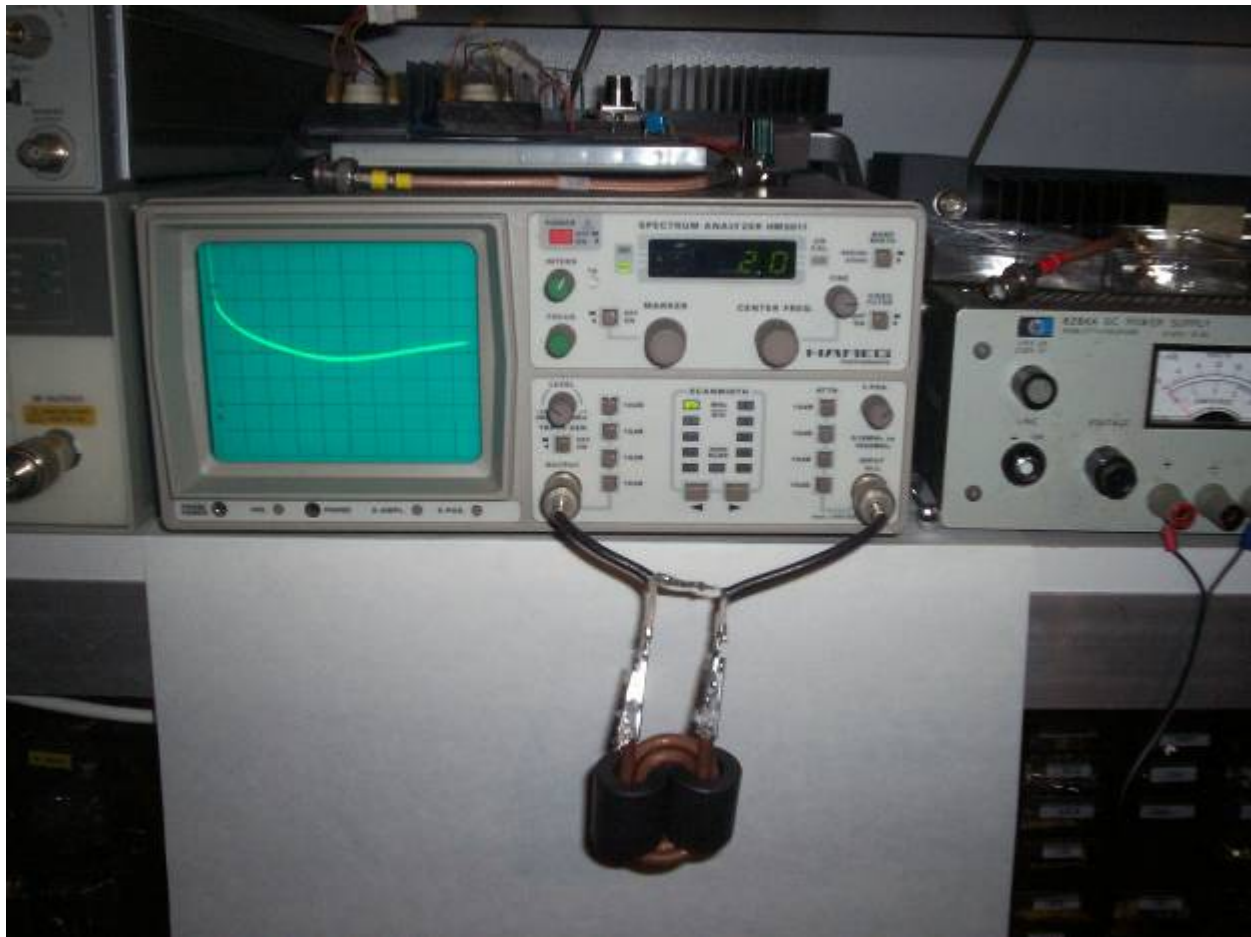
2 – Two 1 ¼ x 1” high 4 turns RG 142

1 ¼ high

1 high (small)

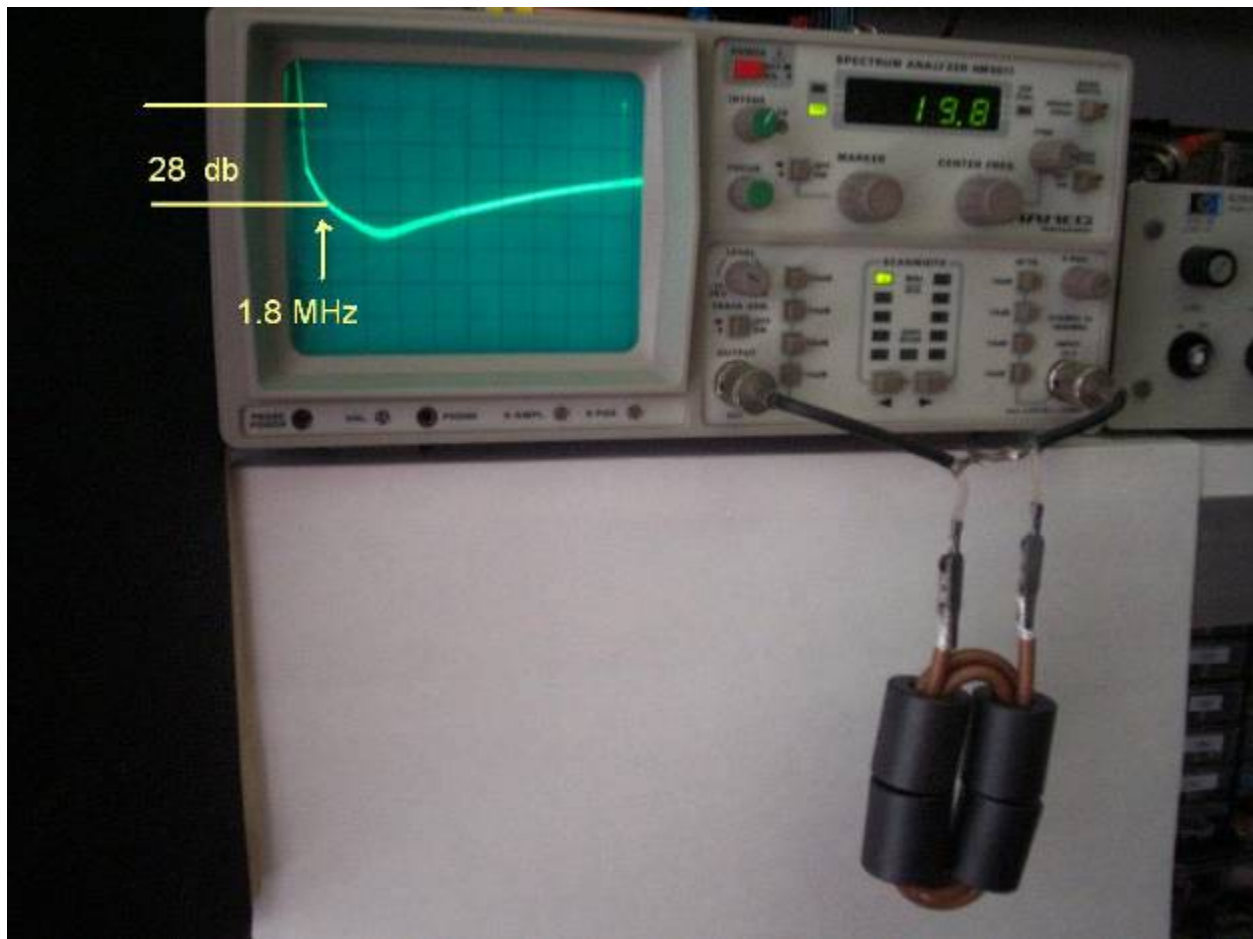
1.8 MHz = - 19 db  
3.8 MHz = - 20 db      1000 ohms  
10 MHz = - 32 db (max attenuation)

1.8 MHz = - 16 db  
4 MHz = - 18 db (max att.)  
10 MHz = - 16 db



3 – Four small cores in pair making a big binocular core. (2 ft of cable)

1 ¼ “		1 (small)	
1.8 MHz	= - 28 db	1.8 MHz	= - 22 db
3.8 MHz	= - 34 db	3.8 MHz	= - 24 db (max)
5 MHz (max)	= - 38db	10 MHz	= - 22 db
20 MHz	= - 20 db		

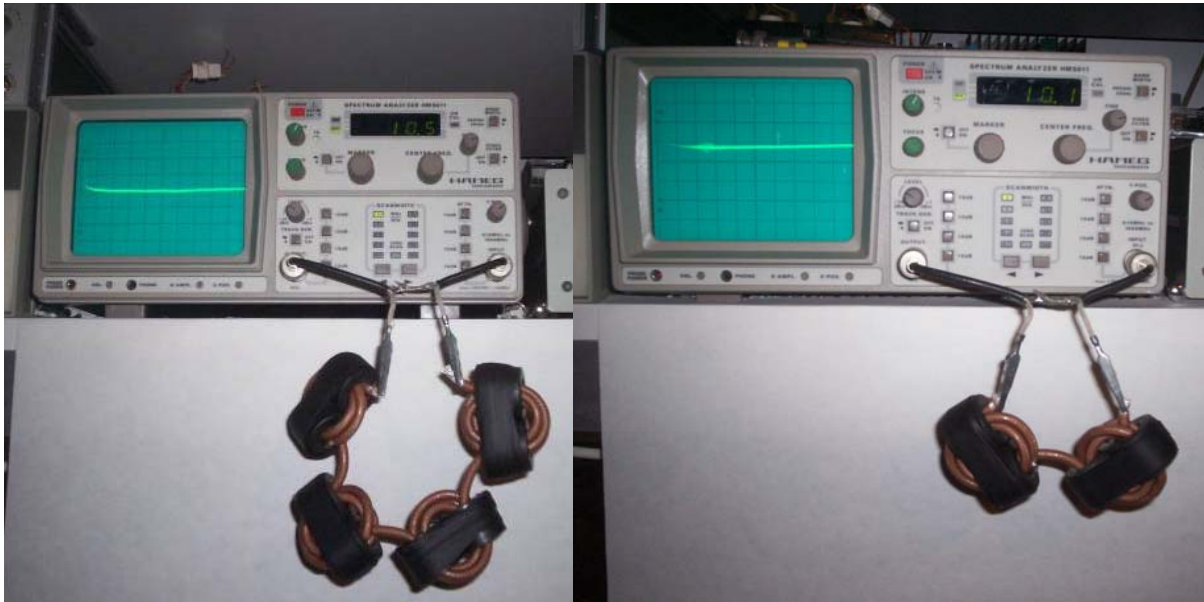


*Conclusion for binocular core:*

*Double the number of toroids increases the attenuation by 6 db on 160m*

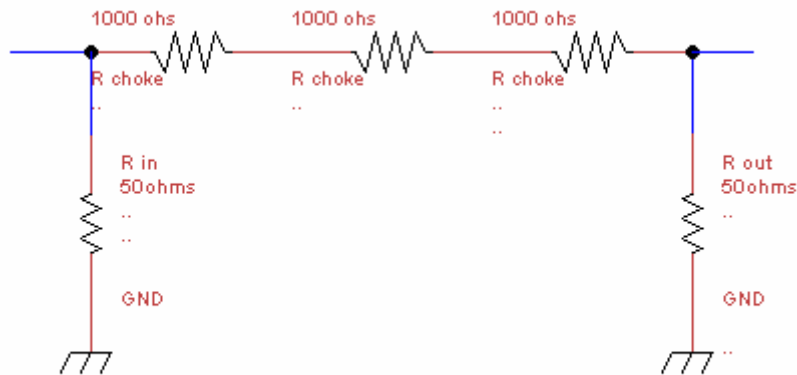
#### 4 – Array of binocular

- 4 sets of small binocular cores = flat - 30 db 1 – 50 MHz
- 3 sets of small = flat - 26db
- 2 sets of small = flat - 24 db
- 1 set = -16 db on 1.8 MHz almost flat 1 – 18 MHz



#### *Conclusion for binocular core:*

*Array of toroids increases the attenuation -3 db for each set on 160m. The resistance each set has will add in the PI network as a voltage divider against the 50 ohms input/output. Binocular chokes has flat response*



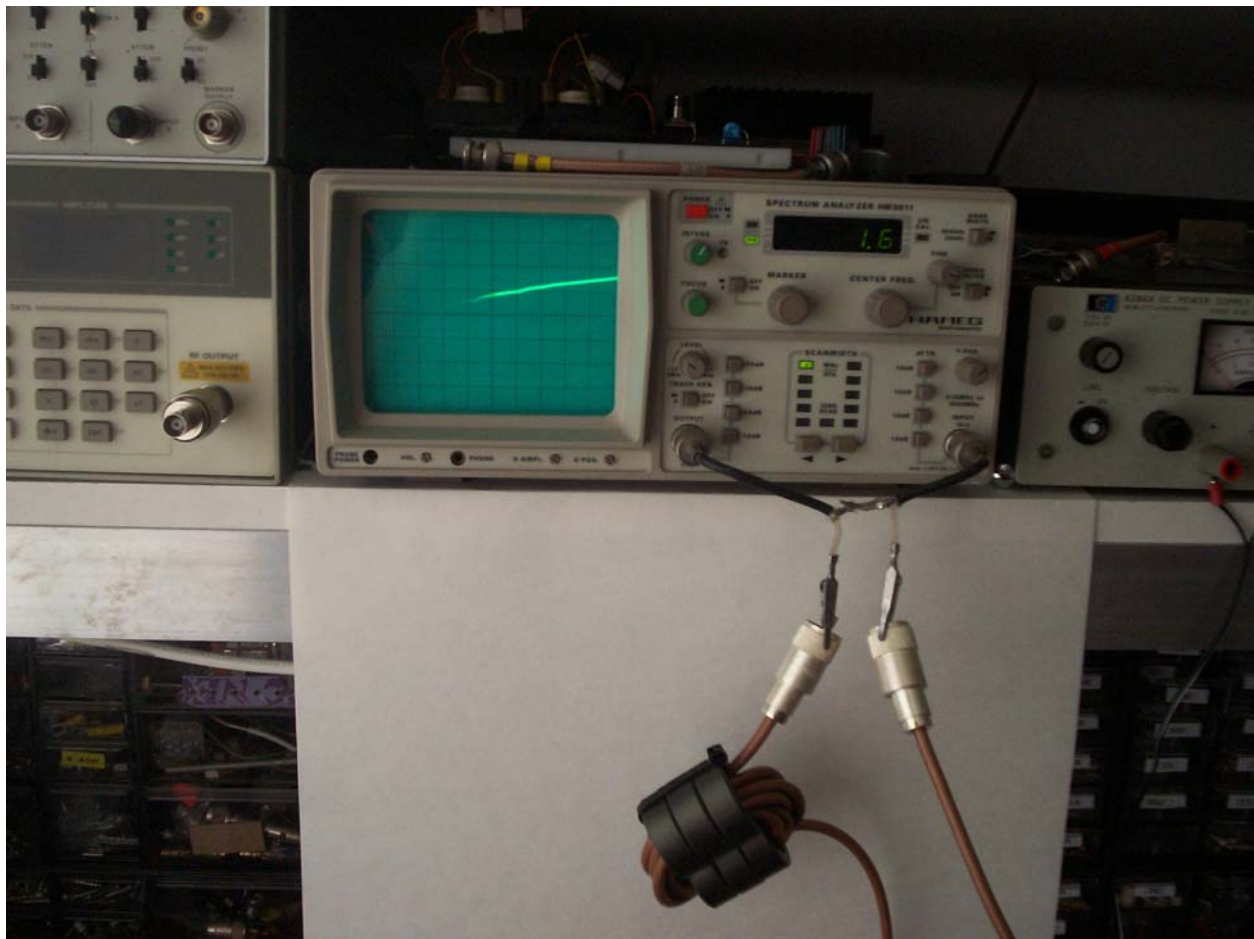
## 5- Six cores FT-144-77 with RG-142

I'm using this choke at the IC-7800 TX port to avoid common mode BC signals entering the radio, the isolation between ports is  $\sim 50$  db. The signal from my vertical is very strong, the BC on 1700 KHz has a  $s9+50$ db so even with 50 db isolation I can copy a strong signal liking from the TX port, with this choke I eliminate common mode but not the isolation problem, The solution is a external relay with high isolation to avoid this leakage,

1.8 MHz = - 38 db

3.8 MHz = - 30 db

12 MHz = - 20 db



6 – Small binocular with 4 FT50B  $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$

One of the best solutions is to use 4 FT50B with 8 turns of RG316 or RG174,

1.8 MHz	= - 40 db (max attenuation)
3.8 MHz	= - 36 db
9.0 MHz	= - 30 db
25 MHz	= - 20 db

I think this is the best solution and less expensive, easy to accommodate inside a small box.

