Subject: VHF/UHF TVI Filter

From: G8MNY@GB7CIP.#32.GBR.EU
To : TECH@WW

By G8MNY (BATC's CQTV 160, & RSGB's Radcom 6/93 p75.) (Updated Packet Jan 05)

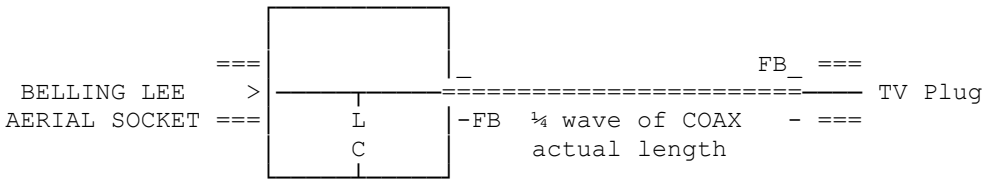
I have run up to 400W on 70cm & have found this filter design very effective. It is basically a suck out filter "T" to the aerial socket, & with effective UHF braid breaker. It is different than using a 1/4 wave coax stub on 144MHz also works on 3x @ 432MHz, but unwanted notch @ 5x 720MHz.

This filter has been made on the spot once, out of a "cat food tin lid" with a few components, to successfully solve a 25W ERP 70cms Packet Node TVI case. The problems were at a distant neighbour (50M away) to a remote node, were the TVI had been caused by a so called "satellite expert" who had added an unfiltered high gain UHF booster amplifier to get TV signals around the house.

This design suits all UHF & VHF bands, just change the number of turns etc...

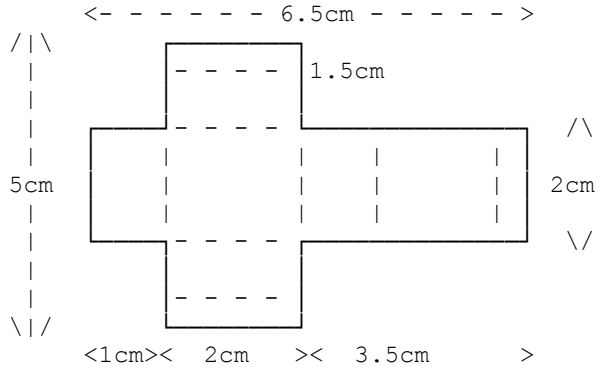
Band	Turns	
6M	8	
4M	7	
2M	5	
70cm	3	
23cm	1	make C a 0.5-5pF

Parts
- Tin Plate (Steel drinks can!).
- Belling Lee TV Plug.
- Belling Lee Chassis TV socket (solderable metal type).
- 1/4 wave (12cm) 75 ohm TV Coax.
- 2 Coax sized ferrite cores.
- a few cm of 22swg Silver/enamel copper wire.
- 2-10pF trimmer.
- Paint (to make it more presentable).



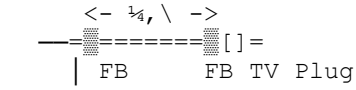
Construction
It is made in the smallest box possible to keep the UHF TV impedance mismatch losses down. If you use a bigger box (e.g. so U can get several band filters in) then the I/P & O/P will have to be properly 75Û coax fed to the common sickout T point.

1/ Cut tin plate (cleaned old can) into a cross shape (with tabs to solder up) so that it can be folded up into a box 2 x 2 x 1 cm. WARNING SHARP EDGES!



2/ Drill/pinch hole to mount the TV Socket on one of the 1cm sides. (Solder in)

3/ Connect Plug on coax, feed on the 2 ferrite rings, on the coax 1/4 wave apart at the frequency of the filter (or lowest) (no velocity factor correction!). This ensures neither are at a voltage maximum, where they would have no effect on outer current.



4/ Cut a hole for coax in corner of box, & solder the coax outer to the tin can, connect the core to the socket centre.

5/ Wind wire to make coil, approx 5mm dia. & solder to socket centre.

6/ Make a tuning hole in the tin, & mount trimmer from coil to ground (shaft earthed).

7/ Fold up box, just tack solder a few tabs. It becomes a very solid box.

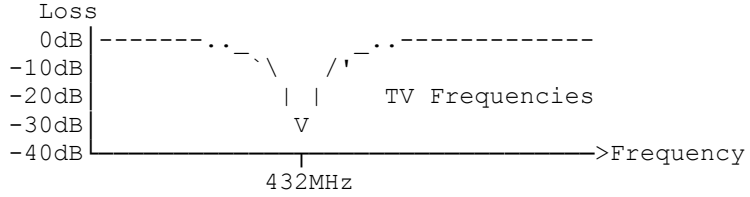
8/ Connect to an aerial (or sig gen) (50Û does not matter too much), & your Ham Rx. Null out a Rx signal with the trimmer C.

9/ If all is OK, solder it up properly, Glue coax firmly in place (heat clue), fix the ferrite rings tight to plug & Box (heat glue).

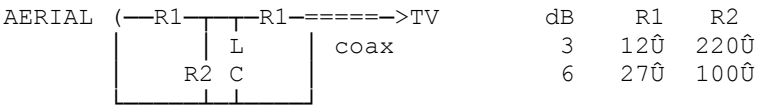
10/ Paint up the box, & label "xx MHz TRAP" (for thick TV eng!).

11/ Retune for best dip again, & cover trimmer hole.

CONCLUSION
I have measured 30dB rejection on the best one, with only about 1.5dB insertion loss @ 550MHz.



In strong signal areas an attenuator can be all that is needed to reduce QRM. Also improved interference performance is obtained with this filter if a "T" attenuator (3-6dB) is included in the box & the suck out connected across the middle "T" section. This is because the bad SWR of the aerial system will not then de-tune the filter.



dB	R1	R2
3	12Û	220Û
6	27Û	100Û

IN USE
See where the filter is needed, some times in front of the VCR.

Aerial/loft boosters are bad news, as they are really just broadband mixers 1st & linear RF amplifiers 2nd. But filters in front of one may cure a problem if you can get to it!

Try to educate your neighbours so that if they move away, they leave the trap for the next tenant & do not take it with them where it will do no good.

Date/Time : 31-Dec 14:54 From: G6OHM@GB7HOL.#22.GBR.EU
I set about building a 4m, 2m, 70cm compound suck out filter in a tobacco tin. I added as suggested 75ohm coax inside the box, & soldered it to the box & where the coax comes into the box. I wound each coil on a pencil and soldered each coil to the coax socket. Next I soldered the variable caps to each coil & soldered the other end of cap to tin box. I fitted it to my tv set this morning & played around until I found the best spot between the TV antenna coax & the digital box. Each band has tuned up very well.

I now have no EMC from 4m,2m or 70cm. For the first time in years I went onto 2m SSB and had contacts without the xyl yelling at me you are patterning the TV. Thanks Andy G6OHM @ GB7HOL

Why don't U send an interesting bulletin?

73 de John G8MNY @GB7CIP