TV NOTCH FILTER

Channels 2 thru 22
Also 'Snooper' & 'Bullet'

CAUTION;
DO NOT CONNECT THIS FILTER TO YOUR SYSTEM UNTIL YOU HAVE NOTIFIED YOUR LOCAL CABLE OPERATOR AND OBTAINED PERMISSION IN WRITING TO USE THIS FILTER.

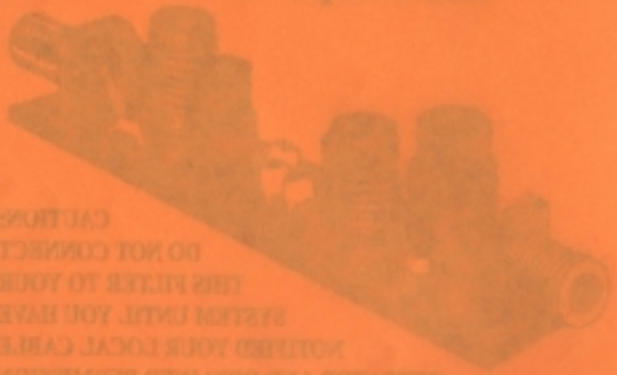
RAINBOW KITS

5/29/96

ELECTRONIC RAINBOW

317-291-7262
Electronic Rainbow Inc.
6227 Coffman Rd.
Indianapolis, IN 46268

INTERNET:
www.rainbowkits.com



ATTENTION KIT BUILDER

Before soldering board, make sure that you have the ability to completely assemble this kit properly.

RETURN POLICY:

Electronic Rainbow will refund the purchase price on any unopened kit LESS postage and a 15% restocking fee.

NO REFUNDS WILL BE MADE ON ANY KITS THAT HAVE BEEN TOUCHED WITH SOLDER.

Electronic Rainbow will repair any of it's kits sent back for the following costs, which includes return postage to the customer:

NO REPAIR WILL BE LOOKED AT UNTIL REPAIR COST IS RECEIVED.

THE COST TO REPAIR YOUR DF-222 IS $8.50

It doesn't work – now what?
If assembled properly all kits work. ALMOST all of the kits we receive for repair have assembly errors.

Here are some of the more common errors we find.

1. **Parts in the wrong holes.**
2. **Solder shorts.**
3. **Parts in backwards.**
4. **Parts which are not soldered or have cold solder joints.**
5. **Wires which are "frayed" and touching other parts.**

It is very difficult to objectively check your own work. Have some one else look over your completed kit. This can save a lot of time, frustration and money. If you need technical assistance you are welcome to call or write.

For repair send your kit to:
Electronic Rainbow Ind., Inc.
6227 Coffman Rd. Indianapolis, IN 46268

Phone **317-291-7262** FAX 317-291-7269
INTERNET: www.rainbowkits.com

*If you must return your kit for repair we must charge for our technicians time. If a part is defective there is **NO CHARGE**. However we cannot warrant the kit builders ability, only the parts.*

CHART OF FREQUENCIES
4 - POLE FILTER FREQUENCIES

Channel	Video	Color	Audio
2	55.25	58.83	59.75
3	61.25	64.83	65.75
4	67.25	70.83	71.25
5	77.25	80.83	81.75
6	83.25	86.83	87.75
Bullet	103 MHz to105.5 MHz		
Snooper	107.997 MHz		

CHART OF FREQUENCIES
3 - POLE FILTER FREQUENCIES

Channel	Video	Color	Audio
14	121.25	124.83	125.75
15	127.25	130.83	131.75
16	133.25	136.83	137.75
17	139.25	142.83	143.75
18	145.25	148.83	149.75
19	151.25	154.83	155.25
20	157.25	160.83	161.75
21	163.25	166.83	167.75
22	169.25	172.83	173.75
7	175.25	178.83	179.75
8	181.25	184.83	185.75
9	187.25	190.83	191.75
10	193.25	196.83	197.75
11	199.25	202.83	203.75
12	205.25	208.83	209.75
13	211.25	214.83	215.75

NOTCH FILTER THEORY OF OPERATION

The low frequency version (channel 2 to 6 - 55 MHz to 90 MHz) of this kit has 4 poles. Each pole has approximately 11 to 14 dB of attenuation at the resonant frequency. The high frequency version channels 14 to 22 and channels 7 to 13 (100 MHz to 215 MHz) has 3 poles, each pole has approximately 13 to 18 dB of attenuation at the resonant frequency, The bandwidth (notchwidth) is approximately 300 to 500 KHz for each pole of either filter design. Since each pole may be adjusted independently the notch depth and width are somewhat variable and adjustable. If all poles of the filter are set to the same resonant frequency the overall depth will be 45 to 55 dB and the notchwidth will be approximately 0.5 MHz. However if you set each pole of your filter to a different frequency the overall depth will be approximately 15 dB and the notchwidth will be 1.0 to1.5 MHz.

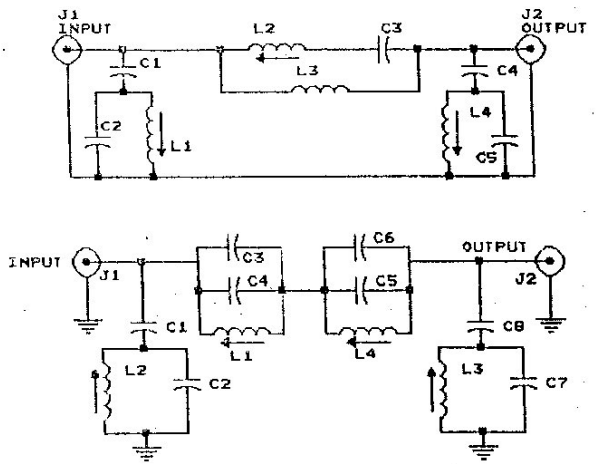
If you want to 'trap-out' an unwanted carrier it is normal to adjust all poles to the same frequency. You could 'trap-out' a carrier which has been placed within a TV channel between the color-burst signal and the audio carrier, without any appreciable affect 0n either of the desired signals. This carrier that you might want to remove normally causes a annoying beeping sound, and causes the picture to be unwatchable. By removing only the unwanted carrier, you can restore a good picture.

PARTS LIST

Note: *The capacitors used in this kit may be disk or monolithic.*

( )	3ea	2.2 pF cer disk cap (2.2, 2R2, 229)
( )	1ea	3.3 - cer disk cap (3.3, 3R3, 339)
( )	1ea	4.7 pF cer disk (4.7, 479, 4R7)
( )	2ea	5.6 pF cer disk cap (5.6, 5P6, 5R6, 569)
( )	2ea	8.2 pF cer disk cap (8.2, 8R2, 829)
( )	2ea	10 pF cer disk (marked 10D, 100, 10)
( )	2ea	12 pF cer disk (marked 12 or 120)
( )	2ea	18 pF cer disk (marked 18 or 180)
( )	2ea	22 pF cer disk (marked 22 or 220)
( )	2ea	27 pF cer disk (marked 27 or 270, 27K)
( )	2ea	33 pF cer disk (marked 33 or 330)
( )	2ea	56 pF cer disk (marked 56 or 560)
( )	2ea	5 1/2 turn slug tuned coil (alum core) .16 to.24 uH
( )	3ea	3 1/2 turn slug tuned coil (alum core) .06 to .09 uH
( )	1ea	2 1/4 turn air coil 5/32" dia.
( )	1ea	1 1/2 turn coil 5/32" dia.
( )	2ea	P C mount 'F' connectors
( )	1ea	P C board (080-00212A)

SCHEMATIC



ALIGNMENT

Alignment procedure for removing an unwanted carrier on channels 2 to 6

1. Adjust L1 so the sound starts to clear.
2. Adjust L4 for the best sound the picture should start to clear also.
3. Adjust L2 for the best picture and sound.
4. Adjust L3 for the best picture and sound.
5. Repeat steps 1 to 4 several times, the adjustments are critical and' touchy' be patient and be careful.

Alignment procedure for removing an unwanted carrier on channel 7 to 22

1. Adjust L1 so the sound starts to clear
2. Adjust L4 for the best sound and picture
3. Adjust L2 for the best picture and sound
4. Repeat steps 1 to 3 several times, the adjustments are critical and' touchy' be patient and careful.

Alignment procedure for 'Snooper' and 'Bullet'

The 'Bullet and Snooper' are best aligned with a sweep generator or spectrum analyzer. You must know the exact frequency that is used on your system, and the filter must be calibrated to that frequency.

BLOCK A CHANNEL

If you want to remove an unwanted channel you would need to use 2 of these filters. One filter would be adjusted to remove the video information and you would use the other filter to remove the audio and color information. Most of the video information is contained within a 600 KHz bandwidth, therefore one filter will provide approximately 40 dB of attenuation with a notchwidth of about 600 KHz. Typically you will adjust 3 poles of a 4 pole filter or 2 poles of a 3 pole filter for a frequency about 100 KHz above the video frequency of the desired channel and the remaining pole would be adjusted to a frequency approximately 400 KHz higher than the video frequency.(see chart of frequencies for channels 2 to 22).

BULLET;

The "BULLET" is a signal used to turn on and off cable services. The signal is used in some systems to remotely activate / de activate the premium services supplied by the operator without, actually having to go to each location.

SNOOPER;

There is a signal inserted in the cable on some systems that is used to detect cable leaks and unauthorized equipment, to detect this signal you use a device called a snooper

PART SELECTION CHART

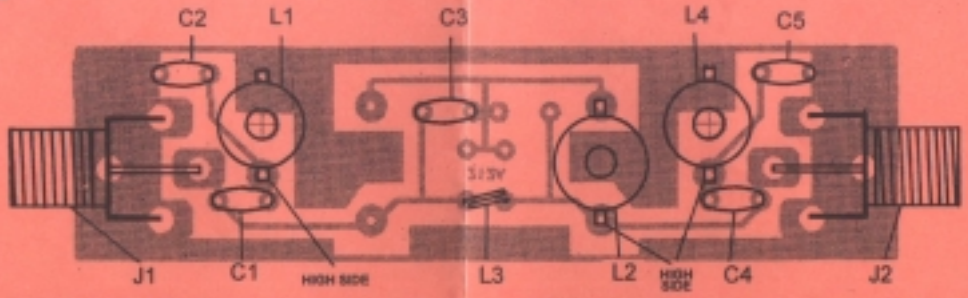
PART #	CHANNEL 2-3	CHANNEL 4	CHANNEL 5-6	CHANNEL 7-8	CHANNEL 9-10	CHANNEL 11-13	CHANNEL 14-16	CHANNEL 17-19	CHANNEL 20-22	BULLET SNOOPER
C1	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF
C2	33 pF	22 pF	18 pF	8.2 pF	8.2 pF	5.6 pF	18 pF	12 pF	10 pF	27 pF
C3	22 pF	8.2 pF	12 pF	5.6 pF	4.7 pF	4.7 pF	4.7 pF	3.3pF	2.2 pF	8.2 pF
C4	56 pF	56 pF	33 pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF	2.2pF
C5	56 pF	56 pF	33 pF	8.2 pF	8.2 pF	5.6 pF	18 pF	12 pF	10 pF	27 pF
C6	22 pF	8.2 pF	12 pF	••••	••••	••••	••••	••••	••••	••••
C7	33pF	22 pF	18 pF	••••	••••	••••	••••	••••	••••	••••
C8	2.2pF	2.2pF	2.2pF	••••	••••	••••	••••	••••	••••	••••
L1	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN
L2	5.5 TURN	5.5 TURN	5.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	5.5 TURN	5.5 TURN	5.5 TURN	5.5 TURN
L3	5.5 TURN	5.5 TURN	5.5 TURN	2 1/4 A	2 1/4 A	1 1/2 A	2 1/4 A	2 1/4 A	2 1/4 A	2 1/4 A
L4	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN	3.5 TURN
J1&J2	INSERT AND SOLDER J1 & J2 IN PRINTED CIRCUIT BOARD									

NOTE: L3...Some coils in L3 location are marked 2 1/4 A or 1 1/2 A this indicates a wire wound air coil 5/32" dia. made with enameled wire.

•••• All capacitors and coils must be inserted into printed circuit board so the body touches the PC board with very short leads.

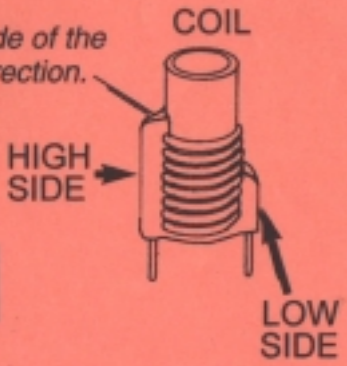
•••• Insert all parts on fiber side and solder on silver side.

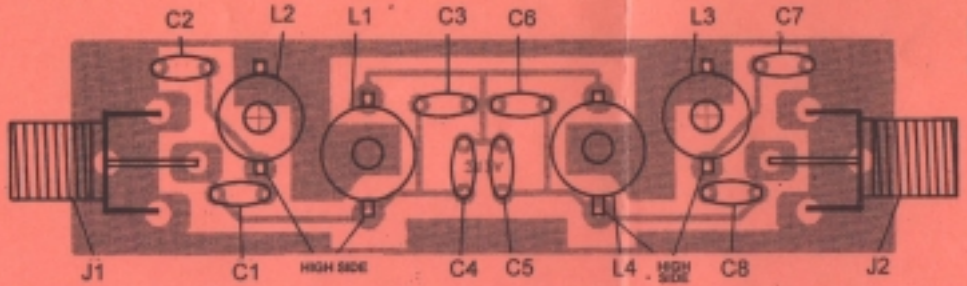
DF-222



CHANNEL 7 THRU 22
ALSO SNOOPER & BULLET.

NOTE;
Always have the high side of the coils facing the same direction.





CHANNELS 2 THRU 6