

# **Description**

Model VR7-FM-8 HT is a custom configured multiple notch filter for FM frequency signals. It contains four VR7-FM HTs that can be preset for eight individual 10 dB notches, four 30 dB notches, two 60 dB notches, or one +90 dB notch with notch width 1.0 MHz. These notches are combined with internal cables that can skew notches to minimize loss to adjacent signals. Individual notches are frequency adjustable (frequency range is 88 to 108 MHz, or Fo ± 3 MHz "best range". Best range refers to frequency range where notch has optimized selectivity. Single notches provides 7 to 12 dB attenuation; combined notches at same frequency can provide up to 90 dB attenuation (see table 2). Operating bandwidth is 5 to 200 MHz (for FM systems). Add option "E" for 5 to 1000 MHz bandwidth for Off-the-Air, and Cable TV systems.

# **Applications**

- Remove FM interference—attenuate spurs and strong FM signals causing interference (low impact on adjacent signals).
- Equalize Broadband FM signal reduce level of stronger channels to reduce difference between strong and weak channels for more balanced signal distribution.
- High FM Signal Rejection combine notches for highly selective signal rejection, e.g., five 10 dB notches for >60dB rejection with 3dB BW ± 0.55 MHz
- Specific FM Spectrum rejection combine notches for >50 dB rejection of up to 2 MHz segment of FM spectrum, with low impact on adjacent signals.

### **SPECIFICATIONS**

- User specify notch frequencies (MHz) and depth (dB)
- Notch depth >12 dB requires two notches
- Operating bandwidth: 5-200 MHz. Add option "E" for 5-1000 MHz bandwidth
- Thru loss: 1.0 dB (5-200 MHz)
- Thru loss with option E: 1.5 dB (5-1000 MHz)
- VR7-FM-8 HT Notch type: Helical Resonator
- Notch frequency tuning: Adjust self locking screw
- Notch selectivity: 3dB BW ± 0.25 MHz for 10dB notch
- Notch width: 20 KHz; Multiple notch width: 30-50
- Internal Jumper Cables between two notches can be "optimized" for "balanced" or "skewed" 3dB BW, e.g., "skewed" notch has uneven 3 dB BW.
- Connectors & Impedance: F-type female, 75 ohms
- Connectors Options: BNC, N, sma (female), 50 ohms
- Operating Temperature: 10 to +40 ° C (20-120 ° F)
- Power pass: 1amp, 60 AC max
- Mounting: Wall (6.5" x 19") or Rack space (3.5 "x 19")

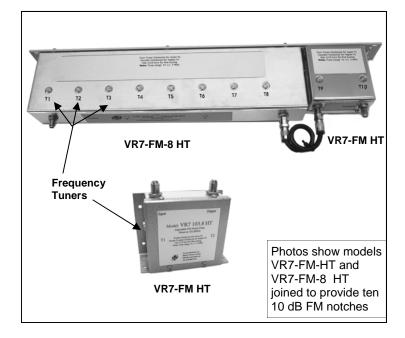


Table 1: Example VR7-FM-8HT Single notch selectivity

Frequency (Fo -MHz):	88	99	108
Attenuation (dB):	7/10	8 / 11	8 / 12
3dB BW (MHz):	±0.25 / ±0.3	±0.3 / ±0.35	±0.35/ ±0.40

Tuning range: 88 to 108 MHz or "Best" range: Fo ±3 MHz

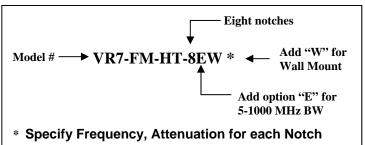
Notch width is approx. 20 KHz for 10 dB notch

Notch bandwidth is approx. 10 KHz single / 20 KHz double

**Table 2:** VR7-FM-8 HT Multiple Notch Selectivity

Notches combined *	2	3	4	5	6	7	8
Attenuation	25dB	40 dB	50 dB	60 dB	70 dB	80dB	90dB
3 dB BW	±.25	±.35	±.45	±.55	±.65	±.75	± 1.0
Notch Width	20 kHz	25 Hz	30 kHz	35 kHz	40 kHz	50 kHz	60 kHz
* Figures are for 10 dB notches tuned to 108 MHz							

# Order Information







# **VR7-FM-8 HT Notch Adjustments & Graphs**

# **General Notch Adjustment Instructions**

It is recommended Each notch is factory pre-set to User's requirements. Internal cabling may skewed notch to favor upper or upper side. To make frequency adjustment of notch turn the screw tuner that corresponds to the notch:

**Turn Tuner** counter-clockwise (to left) for higher frequency;

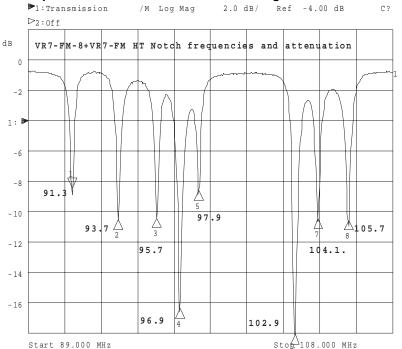
Turn Tuner clockwise (to right) for lower frequency

Note: Lower notch frequency has lower notch depth.

Recommend: For best results adjust notch with RF analyzer with frequency response viewed at 3 to 5 MHz span at Fo. Note: Notch adjustment without suitable equipment is not recommended.

# Tuners for VR7-FM-8 HT (T1 thru T8 ) are normally marked with the User pre-set frequencies Tuners for VR7-FM-8 HT (T1 thru T8 ) are normally marked with the User pre-set frequencies Tuners for VR7-FM-8 HT (T1 thru T8 ) are normally marked with the User pre-set frequencies Caution: Do not tune screws beyond the FM frequency range

### Graph 2 Shows 10 notches for 8 different signals

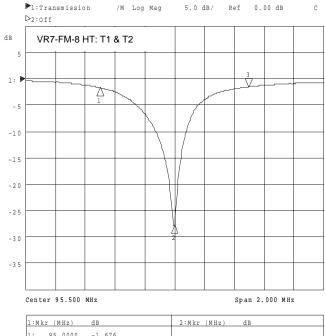


**VR7-FM-8 HT** single notch depth is 7 to 12 dB, for greater depth two or more notches must be combined (graph 1 show two 10dB notches combined).

**Combining Multiple Notches**—tune each notch to target frequency, one at a time. Make fine adjustments\* to each tuner to combine notches in the way to obtain desired attenuation and/or notch depth.

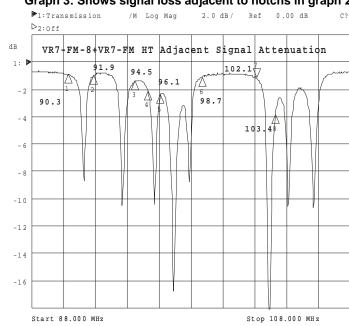
\* Fine adjustment means turning screw very slightly (<1/10 turn) in either direction.

**Graph 1** example two combined VR7-FM-8 HT notches



1:M	kr (MHz)	dB	2:Mkr	(MHz)	dB	
1:	95.0000	-1.676				
2:	95.5000	-27.672				
3 >	96.0000	-1.469				

## Graph 3: Shows signal loss adjacent to notchs in graph 2



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