

Programmable Frequency Match & Crossover Module Resistor Values

AudioControl products use resistor modules for frequency programming (crossover or PFM frequency). All modules are constructed the same, with the exception of the actual value of the resistors used. In each module, ALL resistor values are equal. The resistor value for any given frequency is chosen (applies both to home as well as autosound products) according to the following equation:

$$\text{Resistor (kilohms)} = 7200 \div \text{frequency (Hz)}$$

Example: To find the resistors needed for 1000 Hz.

$$R \text{ (kilohms)} = 7200 \div 1000$$

$$R \text{ (kilohms)} = 7.2$$

$$R = 7.2 \text{ K} = 7200 \text{ ohms}$$

Frequencies by Resistor Value

Five-percent resistors are available in 24 standard values per decade (this means that from 10 to 100 ohms, there are 24 values). The following table lists the crossover frequencies that result from using these standard 5% values.

Frequency	Value	Frequency	Value	Frequency	Value	Frequency	Value
7.9 KHz	910 Ω	1.7 KHz	4300 Ω	362 Hz	20 KΩ	79 Hz	91 KΩ
7.2 KHz	1000 Ω	1.5 KHz	4700 Ω	329 Hz	22 KΩ	72 Hz	100 KΩ
6.6 KHz	1100 Ω	1.4 KHz	5100 Ω	301 Hz	24 KΩ	66 Hz	110 KΩ
6.0 KHz	1200 Ω	1.3 KHz	5600 Ω	268 Hz	27 KΩ	60 Hz	120 KΩ
5.6 KHz	1300 Ω	1.2 KHz	6200 Ω	241 Hz	30 KΩ	56 Hz	130 KΩ
4.8 KHz	1500 Ω	1.1 KHz	6800 Ω	219 Hz	33 KΩ	48 Hz	150 KΩ
4.5 KHz	1600 Ω	965 Hz	7500 Ω	201 Hz	36 KΩ	45 Hz	160 KΩ
4.0 KHz	1800 Ω	822 Hz	8200 Ω	185 Hz	39 KΩ	40 Hz	180 KΩ
3.6 KHz	2000 Ω	795 Hz	9100 Ω	168 Hz	43 KΩ	36 Hz	200 KΩ
3.3 KHz	2200 Ω	723 Hz	10 KΩ	154 Hz	47 KΩ	33 Hz	220 KΩ
3.0 KHz	2400 Ω	658 Hz	11 KΩ	142 Hz	51 KΩ	30 Hz	240 KΩ
2.7 KHz	2700 Ω	603 Hz	12 KΩ	129 Hz	56 KΩ	27 Hz	270 KΩ
2.4 KHz	3000 Ω	556 Hz	13 KΩ	117 Hz	62 KΩ	24 Hz	300 KΩ
2.2 KHz	3300 Ω	482 Hz	15 KΩ	106 Hz	68 KΩ	22 Hz	330 KΩ
2.0 KHz	3600 Ω	452 Hz	16 KΩ	96 Hz	75 KΩ	20 Hz	360 KΩ
1.9 KHz	3900 Ω	402 Hz	18 KΩ	88 Hz	82 KΩ	15 Hz	470 KΩ

Standard Module Frequencies

The following are standard modules available from AudioControl:

18 dB/octave (14 pin)		24 dB/octave (16 pin)	
Frequency	Frequency	Frequency	Frequency
20 Hz	200 Hz	50 Hz	250 Hz
25 Hz	270 Hz	60 Hz	350 Hz
35 Hz	350 Hz	70 Hz	450 Hz
40 Hz	500 Hz	80 Hz	500 Hz
45 Hz	725 Hz	90 Hz	750 Hz
50 Hz	950 Hz	100 Hz	950 Hz
60 Hz	1.5 KHz	120 Hz	1.5 KHz
65 Hz	2.0 KHz	150 Hz	2.5 KHz
70 Hz	2.6 KHz	170 Hz	3.5 KHz
80 Hz	3.0 KHz	200 Hz	4.5 KHz
90 Hz	3.5 KHz		
100 Hz	4.0 KHz		
120 Hz	4.5 KHz		
130 Hz	5.5 KHz		
150 Hz	6.0 KHz		
170 Hz			

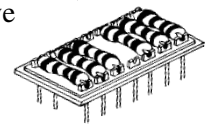
Note:
Center Resistor is
absent.

Building Modules

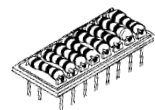
18 dB per octave modules require 6 resistors mounted on a 14-pin DIP header. 24 dB per octave modules require 8 resistors mounted on a 16-pin DIP header. In the 14-pin modules, the middle resistor position is unused and may be left unconnected. We recommend 5% ¼ watt carbon film resistors, or if you really want to be spot-on, 1% metal-film resistors (difficult to get).

Richter Scale modules always use 1% resistors.

The DIP headers are available from Radio Shack or other electronic parts distributor. Radio Shack seems to carry more 16-pin headers than 14-pin, so you may have to manufacture a 14-pin unit by cutting off the last 2 pins. It will make things easier if you buy a 16-pin IC socket as well. You can chuck the socket in your vise and have a handy fixture to hold the header while you solder.



18 dB



24 dB

Note: All resistors in a given module must be the same value. The crossover design derives its high-pass and low-pass outputs from the same set of frequency-determining resistors. It is not possible to overlap or underlap crossover frequencies with any AudioControl crossover. Besides, this is something better handled with an equalizer.