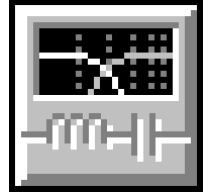


# Custom Three-Way Crossover Network Design

By Dr F. Mark Carter, Walberswick Studios



## 3-Way Crossover Network

Low-Pass (LP) Filter: 1 required

Type: 4th-Order All-Pass (APC)

Desired Corner Frequency: 250 Hz

Band-Pass (BP) Filter: 1 required

Type: 2nd-Order All-Pass (APC)

Desired Lower Corner Freq: 250 Hz

Desired Upper Corner Freq: 2000 Hz

High-Pass (HP) Filter: 1 required

Type: 2nd-Order All-Pass (APC)

Desired Corner Frequency: 2000 Hz

C1 = 6  $\mu$ F, , 0 ohms

C2 = omitted

C3 = 15  $\mu$ F, , 0 ohms

C4 = 30  $\mu$ F, Polypropylene, 0.00135 ohms

C5 = 10  $\mu$ F, Polypropylene, 0.00255 ohms

L1 = 0.4 mH, (#), 0 ohms

L2 = omitted

L3 = 1.2 mH, (#), 0 ohms

L4 = 8 mH, Air Core (#16), 0.927 ohms

L5 = 1 mH, Air Core (#16), 0.616 ohms

## Tweeter

### 4.44 dB L-Pad

Rp1 = 2 ohms

Rp2 = 8 ohms

## Midrange

### Impedance EQ

Req = 5 ohms

Ce = 25  $\mu$ F

Rm = 1.5 ohms

Cm = 1.2 mF

Lm = 8.5 mH

## Woofers

### Impedance EQ

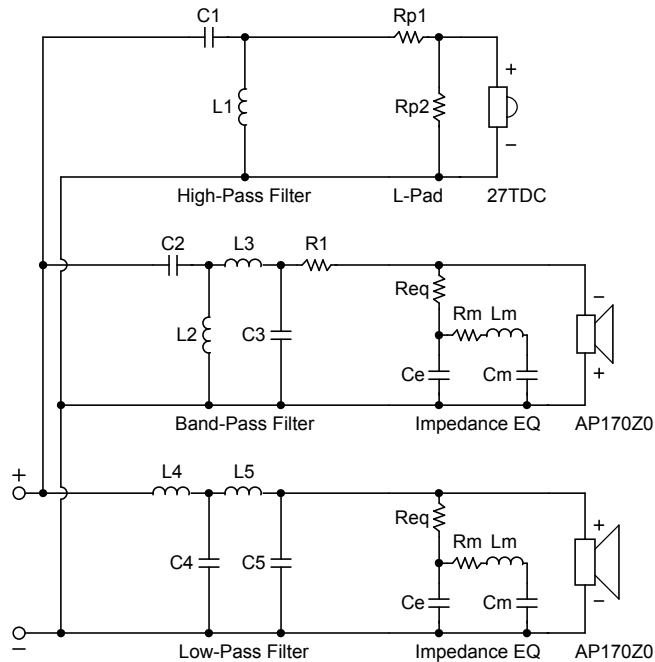
Req = 5 ohms

Ce = 25  $\mu$ F

Rm = 1.5 ohms

Cm = 1.2 mF

Lm = 8.5 mH





### Tweeter Properties

--Driver Description--  
 Name: 27TDC  
 Type: Standard one-way driver  
 Company: Seas Fabrikker A.S.  
 Comment: H 1149  
 Piston: 27 mm precoated fabric dome.  
 Suspension: Wide, soft polymer surround.  
 Voice Coil: 26 mm diameter. Aluminum former.  
 Magnet: 0.25 kg magnet.

#### --Driver Configuration--

**No. of Drivers = 1**

#### --Driver Parameters--

Fs = 550 Hz  
 Qms = 0.972  
 Mms = 0.3 g  
 Xmax = 0.25 mm  
 Sd = 7 sq.cm  
 Qes = 0.41  
 Re = 4.8 ohms  
 Le = 0.05 mH  
 Z = 6 ohms  
 BL = 3.5 Tm  
 Pe = 55 watts  
 Qts = 0.29  
 1-W SPL = 90 dB

### Midrange Properties

--Driver Description--  
 Name: AP170Z0  
 Type: One-way open back driver  
 Company: Audax Industries  
 --Driver Configuration--  
**No. of Drivers = 1**  
 --Driver Parameters--

Fs = 48.5 Hz  
 Qms = 1.61  
 Vas = 24.65 liters  
 Cms = 0.996 mm/N  
 Mms = 10.82 g  
 Rms = 2.05 kg/s  
 Xmax = 3 mm  
 Sd = 132.7 sq.cm  
 Qes = 0.5  
 Re = 5.3 ohms  
 Le = 0.74 mH  
 Z = 6 ohms  
 BL = 5.76 Tm  
 Pe = 60 watts  
 Qts = 0.38  
 1-W SPL = 89.3 dB

### Woofers Properties

--Driver Description--  
 Name: AP170Z0  
 Type: Standard one-way driver  
 Company: Audax Industries  
 --Driver Configuration--  
**No. of Drivers = 1**  
 --Driver Parameters--

Fs = 48.5 Hz  
 Qms = 1.61  
 Vas = 24.65 liters  
 Cms = 0.996 mm/N  
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 Rms = 2.05 kg/s  
 Xmax = 3 mm  
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 Qes = 0.5  
 Re = 5.3 ohms  
 Le = 0.74 mH  
 Z = 6 ohms  
 BL = 5.76 Tm  
 Pe = 60 watts  
 Qts = 0.38  
 1-W SPL = 89.3 dB

Graph Key: — LP — BP — HP — Net

