Referring back to Equation (5.2.8) for the transfer function of a 3rd order high pass and subtracting it from the original signal yields the following:

$$T_L(S) = 1 - T_H(S) \qquad (5.2.14)$$

$$T_L(S) = 1 - \frac{S^3}{S^3 + 2S^2 + 2S + 1}$$

$$T_L(S) = \frac{2S^2 + 2S + 1}{S^3 + 2S^2 + 2S + 1} \qquad (5.2.15)$$

Analysis of Equation (5.2.15) shows it has two zeros and three poles. The two zeros are in close proximity to two of the poles and near cancellation occurs. The net result is a low pass filter that exhibits only −6dB rolloff and rather severe peaking (~ +4dB) at the crossover point. For low frequency drivers with extended frequency response, this is an attractive design offering lower parts count, easy adjustment, no crossover hole and without gradual phase shift.

Figure 5.2.8 shows the circuit design for an asymmetrical filter, and Figure 5.2.9 gives its frequency response.

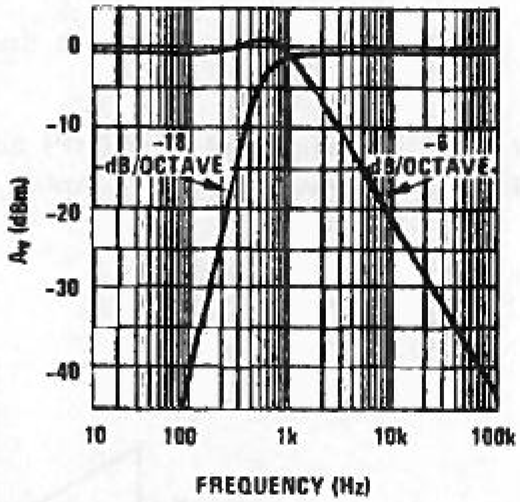

FIGURE 5.2.9 Frequency Response of Asymmetrical Filter Shown in Figure 5.2.8