CROSSOVER NETWORK CHANGED

Every so often this subject of crossover networks has to crop up. The latest syndrome has been the rash of blown tweeters. My own earliest break with tradition was in 1942 when reducing the crossover slope improved performance.

The basic argument that 6 dB slope is enough is based on the fact that the spectrum above 6000 Hz contains less than 1% of the total energy in the spectrum. This is based on measurements of symphony, vocal and rock recordings using a spectrum analyzer. The data showed the spectrum above 6000 Hz to be more than 25 dB down referred to the 250-500 Hz octave where maximum power is involved. A slope of 6 dB per octave puts over 20 dB loss between the 6000 Hz frequency and the 250-500 Hz octave. But tweeters blow from accidental causes -- switching and disconnect transients -- rather than from program material. Zener diode protection reduced but did not eliminate the destruction of tweeters.

The 3-element constant-k network would impose 18 dB per octave loss, and this slope would closely match the natural cutoff of the midrange system. Since the constant-k network design is based on a generator impedance equal to that of the load, a 6 dB insertion loss would exist. An assymetrical circuit permitting zero generator impedance was examined (Butterworth 3 pole) and a series of experiments conducted with typical low-impedance amplifiers and actual tweeter loads. The outcome was a circuit that looks like a constant-k network and behaves like a Butterworth.

Response curves of network alone, network and tweeter, and network with complete speaker indicate a slight overall improvement in amplitude-frequency-response, and an inaudible difference on listening test compared with our previous standard.

This circuit will be incorporated in Klipsch TYPE A networks and the new networks denoted TYPE AA. With Zener protectors they will be used in all KLIPSCHORN, BELLE KLIPSCH and LA SCALA speaker systems.

Naturally the price will have to be adjusted soon.

If you have had tweeter failures, exchange from Type A to Type AA is suggested. Exchange price is estimated at $22.00 at dealer cost.

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