

CROSSOVER UNITS

QUARTER SECTION TYPES

	Cross Over	Impedance	Connections
Type A	1000 c/s	7 to 16 ohms	Terminals
" B	"	" "	Tags
" C	"	2 to 6 ohms	Terminals
" D	"	" "	Tags
Type E	3000 c/s	7 to 16 ohms	Terminals
" F	"	" "	Tags
" G	"	2 to 6 ohms	Terminals
" H	"	" "	Tags

Maximum Input 30 watts

A crossover unit is a device for dividing the bass and treble between two loudspeakers at low impedance, thus eliminating intermodulation distortion between treble and bass, and permitting the most suitable mounting and placing of each speaker.

The two loudspeakers should be fitted with magnets of similar flux density. The treble unit may be the same size as, or preferably smaller than, the bass unit.

The total impedance remains the same as a single speaker. For instance, two 3-ohm speakers give a load of 3 ohms; and two 15-ohm speakers give a load of 15 ohms. In view of the fact that the impedance tends to rise at frequencies above 1000 c/s, it is quite satisfactory to use a nominal 10-ohm treble unit with a 15-ohm bass speaker.

The maximum rate of attenuation is 6 dB per octave with $\frac{1}{4}$ section types.

The crossover at 3000 c/s (Types E to H) is intended for use with a small treble unit, a Ribbon speaker or a small horn-loaded pressure unit, where it is necessary to limit the input of the lower frequencies to avoid overloading. In such

cases it is also necessary to extend the range of the bass speaker in order to maintain full output in the region between 1000 and 3000 c/s, where the acoustic efficiency of small units begins to fall off.

PHASING

With a $\frac{1}{4}$ section network and a crossover at 1000 c/s, the treble speaker should be placed 3 in. or 4 in. behind the frontal plane of the bass speaker. At 3000 c/s the wavelengths are so small that the phase effects can be ignored.

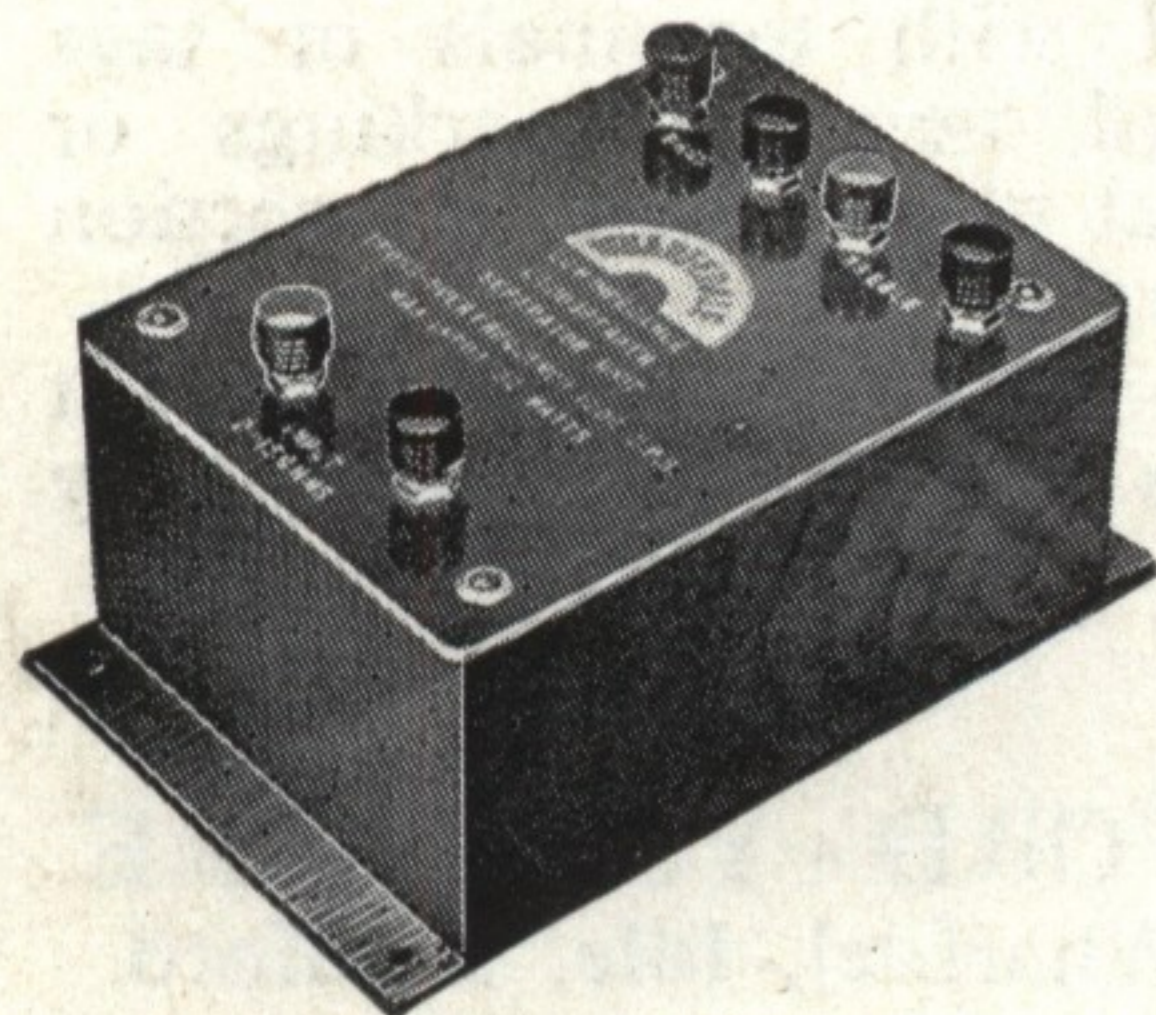
THREE SPEAKERS

Where a two-speaker 15-ohm system with crossover network is already in use, a third speaker for the highest frequencies may be added, with a capacitor of about 2—4 mfd. in series.

With a 3-ohm top speaker the value of the coupling condenser would be increased to 8 or 12 mfd.

ASSEMBLY

The boxes are filled with wax to keep out damp or moisture, and the units are suitable for tropical use.



$\frac{1}{4}$ SECTION
TYPES

Size : 7" x 4" x 3 $\frac{3}{4}$ ".

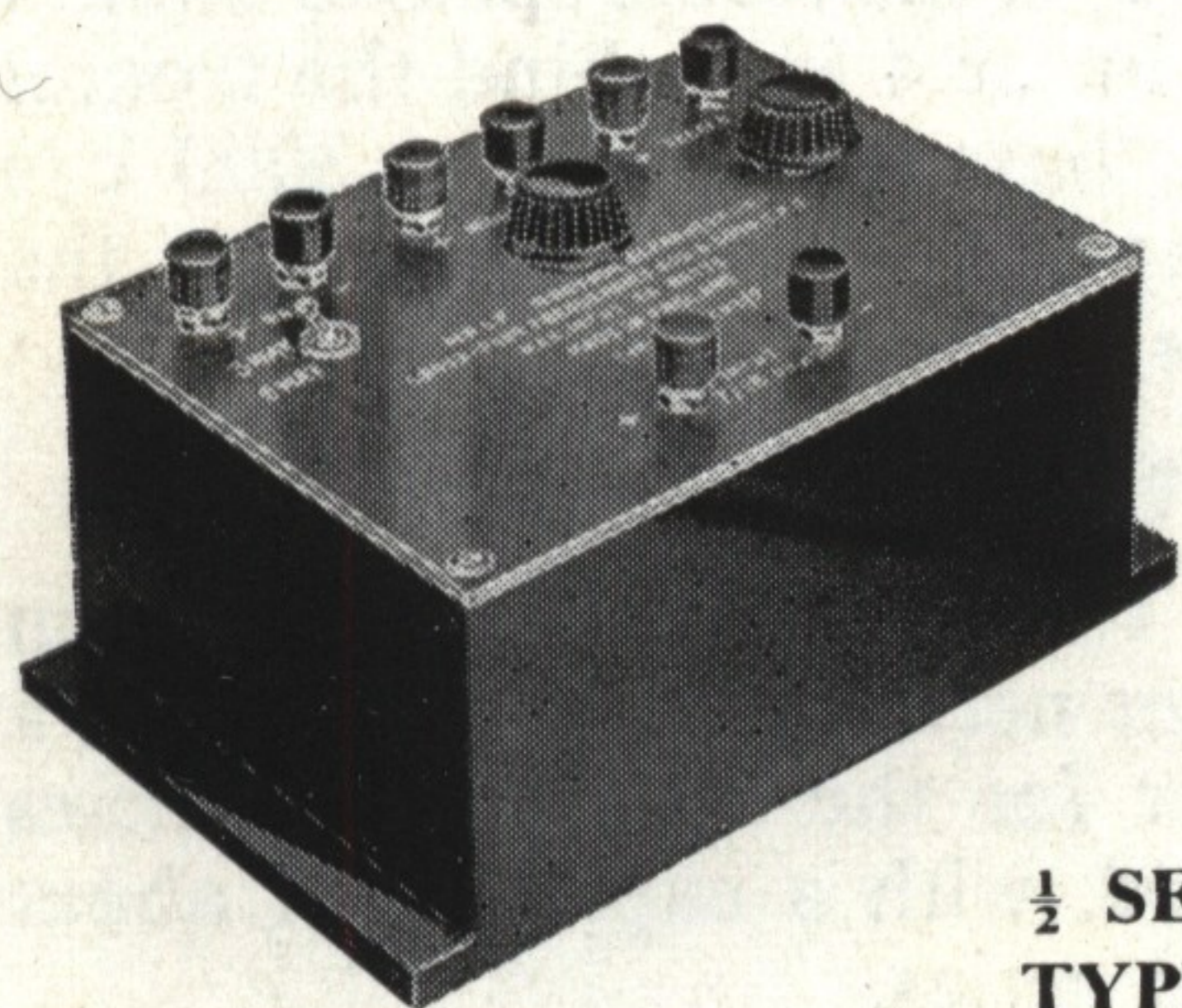
Weight : 2 to 2 $\frac{1}{2}$ lb.
depending on type.

HALF SECTION TYPES

There are two types in production:—

1. **HS/CR3/2.** $\frac{1}{2}$ section 3-way separator with crossover frequencies at 800 and 5000 c/s. Available for 7-16 ohms or 2-6 ohms. This type is suitable for use with large reflex enclosures.
2. **400/CR3/2.** $\frac{1}{2}$ section 3-way separator with crossover frequencies at 400 and 5000 c/s. Available for 7-16 ohms only. For use with folded bass horns and specially recommended for stereo installations using omni-directional middle and treble speakers. It is most important to make sure that the middle speaker responds adequately down to at least 400 c/s; for instance, with baffle mounting, a diameter of not less than 15 in. is necessary, to avoid a trough in the response in the 400-800 c/s region.

These separator units give an attenuation of about 12dB per octave from the main crossover frequency. Volume controls are fitted in the middle



$\frac{1}{2}$ SECTION
TYPES

Size 9" x 6" x 5".
Weight 6 $\frac{1}{2}$ -7 lb.
Maximum input 30 watts.

With a $\frac{1}{2}$ section crossover network it is important that the bass and middle speakers are connected up in phase. This can be checked by reversing the leads to one of the speakers. If the speakers are out of phase there will be a loss of output around the region of the crossover frequency. The phasing of the tweeter is unimportant.

Wharfedale $\frac{1}{2}$ section crossover units are wired to give correct phasing when their positive terminals are connected to the positive of the respective speakers.

and treble speaker circuits to assist in balancing the three units and to compensate for room acoustics. The treble control is particularly useful in minimising surface noise from old records.

An inductor of 0.7-0.9 mH is inserted in series with the middle speaker to gradually reduce the output above 2 kc/s. This is helpful in overcoming possible resonances in the 3-6 Kc/s region which are noticeable on some records when using certain pickups. This inductor may be switched out when not required as in some cases the results are preferred without it. In general, the better the pickup, the less need there will be for additional filtering.

The three loudspeakers should be of similar sensitivity. The bass speaker should be as large as possible, the middle speaker 8-10 in. diameter, and the treble unit should be capable of performing up to at least 16 Kc/s.

TWO SPEAKERS

These 3-way crossover units can be used as 2-way $\frac{1}{2}$ section networks by ignoring the treble terminals and putting the shorting switch to the 2-way position.

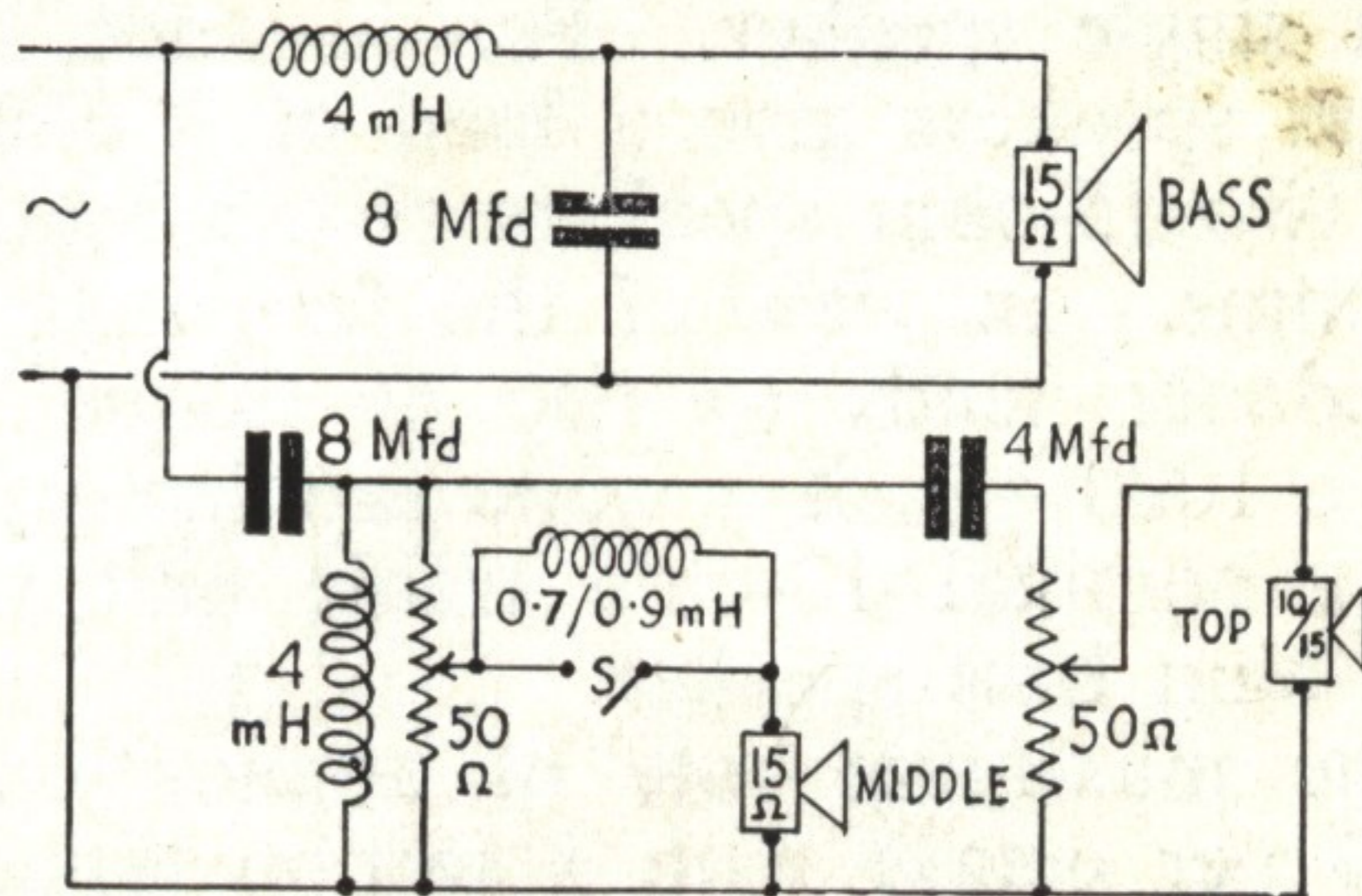


Diagram of HS/CR3/2 for 7-16 ohms

PHASING

The connections to the input terminals of a crossover network have no bearing on the question of phase; reversing the input leads makes no difference to results.

All Wharfedale loudspeakers and crossover units are now fitted with terminals or tags showing positive and negative markings or colours, so that correct phasing with a $\frac{1}{2}$ section network is easily arranged.

(With a $\frac{1}{4}$ section network the phase shift is only 90° and this cannot be corrected by merely reversing the leads.)

Made and Guaranteed by

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