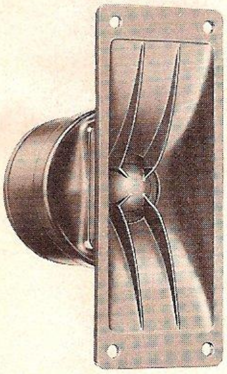
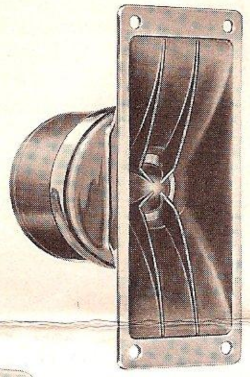
Electro-Voice®

ELECTRO-VOICE, INC.
BUCHANAN, MICHIGAN

Specifications and Instructions Models T35B, T35 and T350

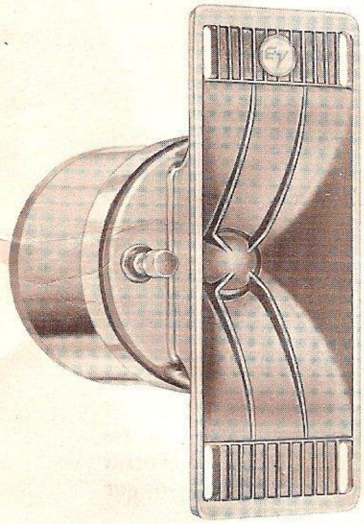


Model T35B



Model T35

Model T350



The human ear delights in the variety of sounds resulting from the widest range reproduction. This wide range response delivers also the subjective illusion of reality. Extended high-frequency response in the last audibile octaves is made necessary still more in the accomplishment of musical balance with the augmented bass range of present speaker systems of the folded corner horn and phase loaded type. Here fundamentals of the first audible octave require flat response in the high range to the limit of audibility, or aesthetic appreciation of the source material suffers from unconscious listener fatigue caused by the imbalance.

These needs have resulted in intensive research by Electro-Voice physicists and engineers to the end that new principles and new techniques have evolved a superior series of VFH drivers which have overcome range and sensitivity limitations.

The improved T35B, T35 Super-Sonax, and the T350 Ultra-Sonax very-high-frequency drivers are designed to complement all Electro-Voice speaker systems, and systems of alternative manufacture, when smooth, efficient, extended response is desired past 3500 cps. These drivers have specialized integral horns of the diffraction type which afford wide dispersion. This dispersion characteristic is especially valuable in stereo or binaural reproduction, where even distribution of sound energy throughout the listening area is a requisite to preserve the proper aural horopter.

THEORY OF OPERATION

THE AVEDON SONOPHASE THROAT DESIGN – Figure No. 1A shows the cross section of a conventional high-frequency driver. Response is flat up to 4 or 5 kc after which destructive interference results from inability of the diaphragm to act as a piston. Increasingly higher frequencies cause the phase of sound produced at the diaphragm periphery to shift with respect to sound produced by the diaphragm center due to diaphragm deformation (Figure No. 1B).

In the Sonophase design, Figure No. 2, sound from the central portion of the diaphragm is delayed by the longer pathlength, restoring proper phase relationship and level as the frequency increases. The importance of the Sonophase configuration is paramount above 12 kc, where sound must be taken from the center of the diaphragm and the outer periphery simultaneously; this is accomplished without destructive interference or cancellation within the sound chamber. At lower frequencies, where the diaphragm is a piston, and no phase shift is required in the path configuration, the longer central path length does not appreciably change the phase due to the longer wavelength involved.

Through these means, frequency response is sustained ±2 db to 20 kc, with response down only 8 db at 40 kc. 8 db is considered to be the half-loudness point, if it were to be considered that 40 kc could be heard under any condition.

THE HOODWIN DIFFRACTION HORN – All Electro-Voice drivers employ diffraction horns as the recommended method of achieving the best dispersion. In stereo work especially, a 3 db concentration of sound in one portion of the room is sufficient to cause apparent displacement of the subject, with resultant distortion of the "solid" or stereo effect. This changes the aural perspective so necessary to the preservation of the illusion of reality, and smooth dispersion insures duplication of the original sound source depth and width. The spatial relationship of the original sound source to the axis of the two ears is termed the aural horopter, and an even sound distri-

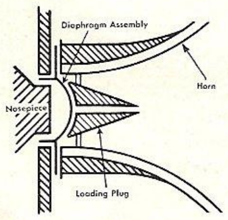
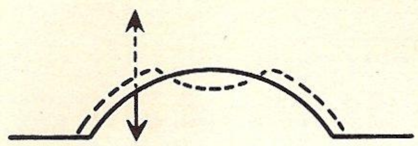


Figure 1A



Action of diaphragm at higher frequencies. Dotted line shows departure from piston action.

Figure 1B

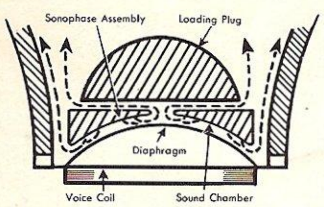


Figure 2

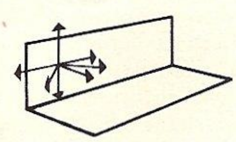


Figure 3A

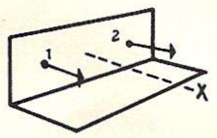


Figure 3B

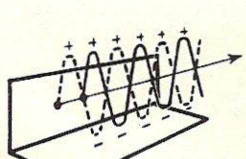


Figure 3C

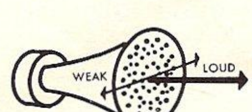


Figure 3D

bution, coupled with balancing the levels of both right and left speakers is insured through the diffraction principle.

The Hoodwin diffraction principle is best illustrated by reference to the figures.

FIGURE 3A — This shows how sound disperses equally in all directions from a single point source.

FIGURE 3B — In this figure two sound sources are shown. On the axis, at point "x", double the sound power results as the resultant pressures are in phase.

FIGURE 3C — But in this figure, if the distance between the two sources is ½ wavelength or greater, the sound from the two sources will be considerably out of phase for points off the axis resulting in decreased sound pressure.

FIGURE 3D — This figure will show the deficiencies in horns of wide lateral dimensions compared to the wavelength being emitted. Any horn mouth can be considered as a group of small point sources of sound. They *must* beam the sound down the axis by their very nature.

FIGURE 3E — In this figure are shown representative horns, illustrating that horns must have a certain length, as well as cross sectional area along this length and at the mouth to load the driver diaphragm down to the lowest frequencies to be reproduced. The lower we go, the longer must be the horn and the greater the mouth area. This physical fact shows that large horn mouths necessarily beam the high frequencies.

FIGURE 3F — This figure shows that narrowing the horizontal area and extending the vertical dimension of the horn mouth preserves the loading area necessary for good low end response, disperses the sound perfectly in the horizontal direction where it is so necessary, and keeps interfering reflections off the floor and ceiling.

Corollary advantages of Hoodwin diffraction are much greater efficiency due to elimination of the viscous resistivity of the air caused by a multiplicity of horn throats, as in cellular horns; elimination of losses due to friction caused by lens assemblies, and the obvious compactness of diffraction horns when contrasted to other media.

VOICE COIL ASSEMBLY — By using a diaphragm assembly of practically indestructible phenolic-impregnated linen, radial splitting, buzzing and modular breakup are eliminated. Because reproduction of the extreme high frequencies is mass-controlled, the self-supporting voice coil has no heavy coil form and is therefore practically weightless, providing extended high-frequency response.

SPECIFICATIONS

	T35	T35B	T350
Frequency Response:	±2 db 3.5 kc to 19 kc	±2 db 3.5 kc to 18 kc	±2 db 3.5 kc to 21 kc
Recommended Crossover:	3500 cps	3500 cps	3500 cps
RETMA Sensitivity Rating:	57 db	54 db	60 db
Polar Pattern:	180° dispersion	180° dispersion	180° dispersion
Power Handling Capacity:			
Program Material	50 watts	50 watts	50 watts
Peak	100 watts	100 watts	100 watts
Nominal Impedance:	16 ohms	16 ohms	16 ohms
Voice Coil Diameter:	1 inch	1 inch	1 inch
Magnet Weight:	7 oz	4 oz	1 lb
Gauss	13,500	9000	20,000
Size:			
Horn	5¼ in. long x 2 in. wide	5¼ in. long x 2 in. wide	7½ in. long x 2⅞ in. wide
Pot Diameter	2¼ in. maximum	2¼ in. maximum	3½ in. maximum
Depth	3¼ in. overall	3 in. overall	4¼ in. maximum
Mounting:	See diagrams	See diagrams	See diagrams
Baffle Opening:	1¾" x 4¼"	1¾" x 4¼"	4⅞" x 2⅜"
Net Weight:	2¼ lbs.	2 lbs.	7 lbs.
Shipping Weight:	3½ lbs.	3 lbs.	9½ lbs.
Price: Net	$35.00	$22.00	$60.00

Recommended Accessories: X36 crossover network, Price, Net: 9.50. AT37 level control, Price, Net: $3.90