

The Electro-Voice T250 is a theatre type, permanent magnet, dynamic, compression driver for use as a treble reproducer in conjunction with recommended acoustic loads such as the Electro-Voice 6HD or 8HD diffraction horns. The T250 employs molded, phenolic, impregnated woven fiber diaphragm to eliminate the radial buzzing and splitting common to metal diaphragms. The voice coil is wound edgewise of flat aluminum wire for a gain in efficiency of 18% over round wire. The resin impregnated coil is bonded directly to the diaphragm thus greatly increasing the strength and ruggedness of the moving assembly.

The T250 has an EIA (RETMA) sensitivity rating of 60 db and is designed for use with maximum efficiency systems employing complementary drivers of comparative sensitivity ratings. (These efficiencies are found in such systems as the Electro-Voice Patrician, Georgian and Cardinal.)

THEORY OF OPERATION: 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 1B.)

The permissible mass of the diaphragm does not allow sufficient stiffness to avoid this breakup in large dome type diaphragms used in many treble drivers. Very importantly the driven point of the structure is a great distance from the center of the piston area.

The Electro-Voice Model T250 treble driver utilizes a different form of construction (Figure 1C) and employs an annular diaphragm. The construction permits great stiffness of the piston area without the undesirable increase in mass; no part of the piston area is far from the driven point; deformation does not occur readily and the resultant sound is notably smooth in curve and listening character.

The dome type diaphragm (Figure 1A) also has the effect of creating a large air chamber and the requirement of counteracting the inherent compliance of this air together with the actual mass of the diaphragm reduces efficiency of the unit. It can be seen that the annular construction avoids a large air chamber with a resultant increase in efficiency.

SPECIFICATIONS

Nominal Impedance:	16 ohms
DC Resistance:	7 ohms
EIA (RETMA) Sensitivity Rating:	60 db
Power Rating:	When operated at no lower than 600 cps (when used on 6HD horn) or 800 cps (when used on 8HD horn) with 12 db per octave attenuation below crossover, the T250 can be used in a system where the continuous program power input is 50 watts and reaches intermittent steady state levels of 100 watts RMS maximum.
Horn Coupling Diameter:	7/8 inch
Voice Coil Diameter:	2 inches
Coil Wire Length:	650 cm.

Active Diaphragm Area:	13.8 sq. cm.
Throat Area:	2.6 sq. cm.
Magnet Weight:	3 lbs.
Flux Density in Gap:	18,000 gauss
Total Flux in Gap:	100,000 lines
Frequency Range:	6HD horn, 400 to 13,000 cps 8HD horn, 600 to 13,000 cps (See Fig. 3)
Size:	5-7/16" H x 6-1/4" W x 5-1/32" D
Weight:	13-1/2 lbs. Net, 14-1/2 lbs. Shipping

Packing List: Contained in the T250 carton are the following accessories: Check for completeness:

- 1 Model T250 Driver Unit
- 2 10-32 x 1" bolts
- 1 Guarantee Card

INSTALLATION AND OPERATION

Read completely the following instructions before installing the driver.

Mounting on Flat Surfaces—Horizontal or Vertical: The driver unit has integral legs by which it may be secured to any flat surface. Screws are provided - holes required are 5-1/8" on centers. Insure that the red plastic thread protecting cap is removed and that the diffraction horn being used (Electro-Voice Model 6HD or 8HD) is threaded into place before screwing driver unit into place. If the attachment of the horn is left until after mounting driver it will be found to be impossible to rotate the diffraction horn into the threads.

Phasing: The T250 is color coded at the terminals to permit correct phasing. The terminal marked RED is the "positive" or "T1" connection while the BLACK terminal is "negative" or "T2". Upon applying a positive voltage to a T1 or the RED terminal, the diaphragm will move compressively or away from the magnetic structure forwards. Driver units in a direct radiator multiway system should be wired so that all units are IN PHASE - All "common" or "negative" leads connected to BLACK or T2. All positive leads to RED or T1. For systems employing indirect bass radiation (Phase loading and Klipsch "K" systems) refer to diagrams supplied with the system.

Grille Cloth: The dull black finish of the horn mouth and mounting bracket prevents these assemblies from being seen through a grille cloth. Use at least 60/40 open mesh. A more dense grille cloth will attenuate the higher frequencies. The new plastic grille cloths are not only decorative but strong and will not stretch or tear. These may be purchased from your distributor in many patterns and colors.

Wiring and Impedance Matching: Reference to Figure 4 will show the method of wiring to an existing speaker system. Use No. 22 fixture wire or larger to connect the two terminals on the driver to the AT37 level control, and the AT37 to the output terminals on the crossover network. The 16 ohm impedance of the driver unit is a standard EIA (RETMA) rating. A mismatch by as much as 100% may be made without noticeably affecting the reproduction or efficiency of the unit.

Adjustment of Level Control: The usual high-quality driver employing from 3 to 6 lbs. of Alnico V magnet material has a sensitivity rating of about 50 db. This means that the T250 will be too efficient for a proper musical balance unless a loss pad, preferably variable (such as the Electro-Voice AT37), is employed. This extra efficiency in the treble driver is necessary in order to provide the high magnetic damping necessary to affect smooth and extended response.

If the T250 is used with drivers of lower magnet weight than the types mentioned above, the AT37 control should seldom be opened more than half-way. The subjective effect with the "shelved-up" treble range will manifest itself in a "gurgling" character being given to the signal. The moment the bass response is increased or the treble is decreased, the ear will recognize the critical point instantly if the input signal is clean and extended in range. Thus the user may control musical balance with absolute precision regardless of local conditions.

It may be seen from the considerations just given that absolute settings for the "Presence" control cannot be stated. The exact

setting will vary with the absorption coefficient of the room as controlled by rugs, drapes and overstuffed furniture.

Amplifier Damping Control Setting: If your amplifier has a variable damping control, as do all Electro-Voice units, set this control in accordance with the setting shown in the instructions for the LF driver. Damping factor controls do not affect significantly treble driver reproduction above 1000 cps.

CAUTION NOTES

Test Precautions: A tone from an oscillator, such as is used for test purposes, may be employed on the units for sustained periods with up to 20 or 25 watts of power. Sustained signals of this kind are never remotely approached in program material.

Precautions in Tape Machine Operation: If the speed of a tape machine is advanced beyond the normal speed, high-frequency power is increased at the rate of 6 db per octave over normal for each doubling of tape speed. On fast forward or rewind supersonic energy of great magnitude may be generated, even though the head gate is open. Always reduce volume during this process, even though the signal is inaudible. This is especially important in fast editing procedures, where the gate is frequently only partially opened so that the tape traverse can be cued audibly.

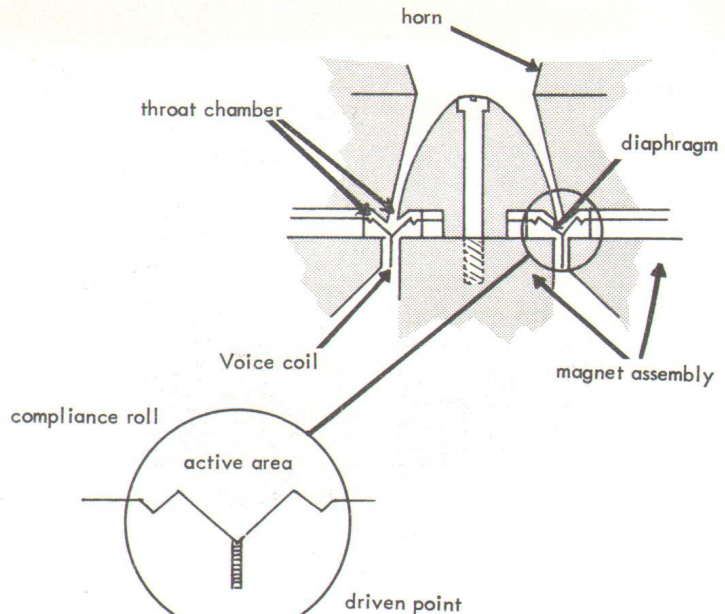
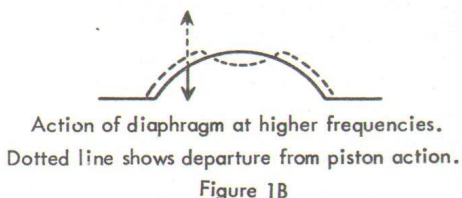
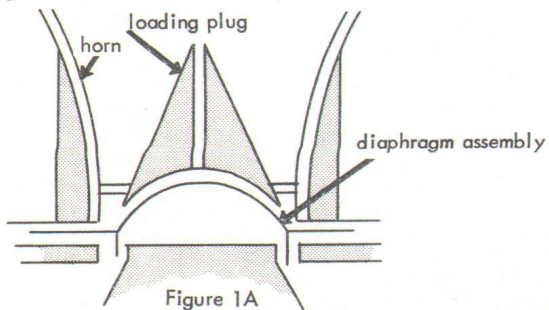
Unstable Amplifiers: Supersonic oscillation may occur in an amplifier whereby high power inaudible sine wave signals may generate damaging heat in the driver units. Such oscillation may be detected with an oscilloscope, or by the presence of heat in the driver unit by feeling the potstructure of the driver. This can be corrected in some cases by using low-capacity television twin-lead between the amplifier and the speaker system.

Changing Tubes While Amplifier is on: Another cause of excessive power application is the changing of amplifier tubes in low-level stages while the system is operating, when the volume control is advanced. The removal or plug-in of the tube generates a tremendous surge, many times in excess of the rated amplifier power. This will damage sensitive treble and VHF drivers, and sometimes cone speakers. Defective switching units in the amplifier can cause a similar effect.

Feedback: Feedback frequently occurs when the input and output leads of an amplifier are brought into proximity with each other. This feedback often is inaudible, occurring at supersonic frequencies. Under such conditions, high overloads occur and, therefore such feedback should be guarded against.

Acoustic feedback, resulting when the speaker feeds back into a microphone, microphonic tubes, and feedback caused by mechanical vibration from a speaker adjacent to the pickup or turntable, should be avoided. Feedback of this nature will build up at a continuously accelerating rate until some link in the reproducing chain fails, the amplifier "flat tops", or the power is reduced below the point of critical excitation. Because damage to treble and VHF units may transpire, due caution should be exercised.

Warranty: The Electro-Voice Model T250 treble driver is guaranteed against defects in workmanship and material.



Enlarged single section of annular diaphragm
Figure 1C

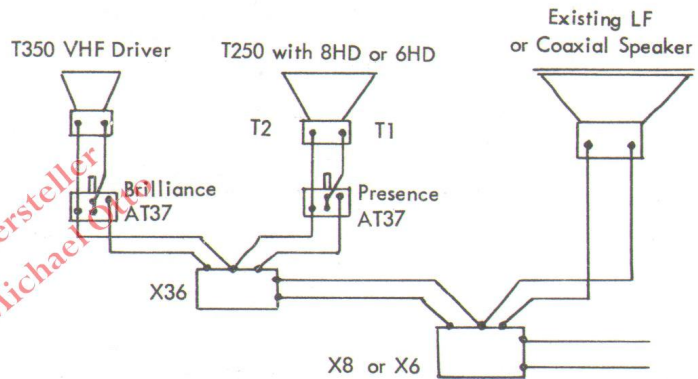


Figure 2
An example of correct wiring for a direct radiator multiway system connection
red pos. black neg.

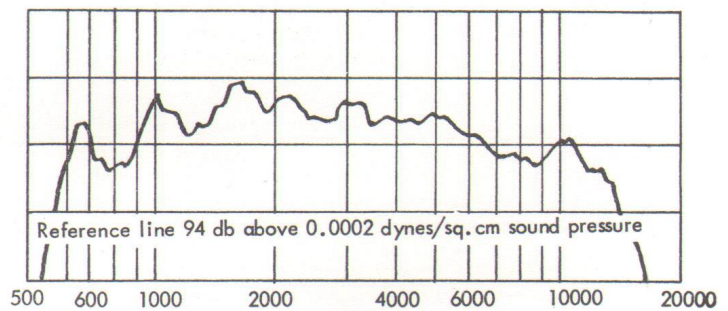


Figure 3
Frequency response Model T250 with Model 8HD horn