ALTEC LANSING®

909-8A & 909-16A HIGH FREQUENCY COMPRESSION DRIVERS

DESCRIPTION

The Altec Lansing 909-8A and 909-16A high frequency compression drivers have been designed for use in professional sound reinforcement systems where a wide frequency range at substantial power levels is required. When used with Altec Lansing sectoral or Mantaray® high frequency horns, these drivers provide uniform response to the upper limits of human hearing. As part of a full range system including Altec Lansing low frequency loudspeakers and enclosures, the smooth reproduction of speech and music is insured for all types of installations in churches, auditoriums, hotels, and restaurants.

Combining modern materials and adhesives with a proven dome and compliance geometry has resulted in a driver with a new Pascalite™ diaphragm assembly with a one and three quarter inch dome and voice coil. The result is a driver capable of high electrical power handling and large acoustic power outputs.

An efficient magnetic structure utilizing a 2.5 lb (1.1 kg) ferrite magnet provides a 1.8 Tesla gap flux density. A Tangerine® radial phasing plug is used to maximize the sound power delivered to the throat over the entire frequency range of the driver.

As with every Altec Lansing compression driver, the diaphragm/voice coil assembly can be replaced in the field without the use of special tools. The voice coil is rim centered precisely in the magnetic gap. The model 909-8A provides a minimum impedance of eight ohms; the model 909-16A, sixteen ohms.

The outstanding performance characteristics of these drivers make them ideal as the high frequency component for small and medium size sound system designs.

SPECIFICATIONS

Pressure Sensitivity: 144 dB SPL (1W, 500 Hz — 3.15 kHz, re: 20 μPa, see Note 1)
108 dB SPL on an MR 994A horn

Frequency Response: 500 Hz — 20 kHz (see Figure 1, Note 3, Figures 3, 4, Note 4)

Power Handling: 30 watts, 500 Hz — 5 kHz, AES method, (displacement limit, see Note 6)
60 watts, 500 Hz — 5 kHz, continuous program, (see Note 9)
120 watts, 500 Hz — 5 kHz, peak power, (see Note 10)
40 watts, 800 Hz — 8 kHz, AES method, (thermal limit, see Note 6)
80 watts, 800 Hz — 8 kHz, continuous program, (see Note 9)
160 watts, 800 Hz — 8 kHz, peak power, (see Note 10)

Maximum Long Term Output: 122 dB SPL on an MR 994A horn (30 watts input, 1m, re: 20 μPa, see Note 7)

Impedance: 8Ω minimum, 909-8A, 16Ω minimum, 909-16A (see Figures 1, 3, 4, Note 8)

Voice Coil Resistance: 6.5Ω, 909-8A; 12.0Ω, 909-16A

Input Connection: Screw terminals with .250 inch lugs for push on connectors, positive terminal marked with a plus sign

Diaphragm Construction: Hydropneumatically formed all metal dome and tangential compliance driven by a 1.75 inch (4.4 cm) diameter voice coil of edge wound aluminum ribbon

Displacement Limit: ±0.023 inch (0.58 mm), mechanical limit when diaphragm dome strikes phasing plug

Thermal Data After Power Handling Test: Voice coil temperature, 96° C (30 watts), measured by resistance change
Magnetic structure temperature, 42° C (30 watts), measured with electronic thermometer

Dimensions: 5.5 inches (14.0 cm) diameter
2.7 inches (6.9 cm) depth, less mounting studs

Replacement Diaphragms: Model 26420, 8 ohms
Model 26421, 16 ohms

Net Weight: 6.4 lb (2.9 kg)

Shipping Weight: 7.2 lb (3.3 kg)

Finish: Gray polyurethane paint

Mounting Data: Two ¼ — 20 studs on a 3.00 inch diameter bolt circle

Accessories: Altec Lansing: MR994A and MR931-12 Mantaray® horns,

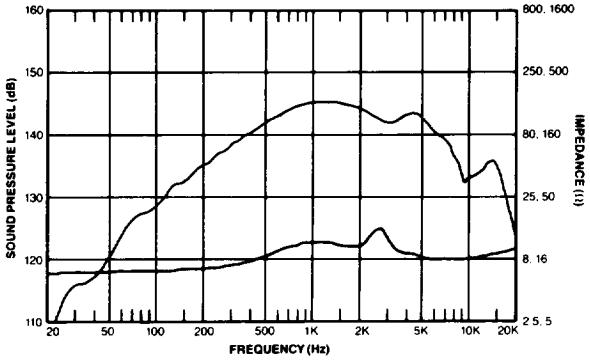

Figure 1. Plane Wave Tube Frequency Response and Magnitude of Impedance (See Notes 3, 8)

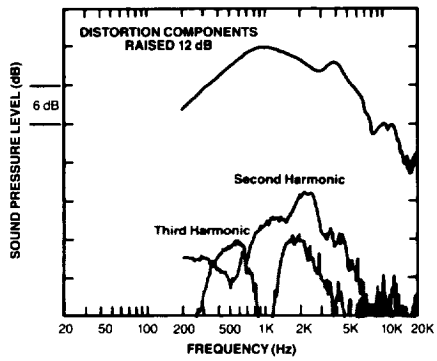

Figure 2. Plane Wave Tube Harmonic Distortion at 0.1 Rated Power (3 watts, See Note 5)

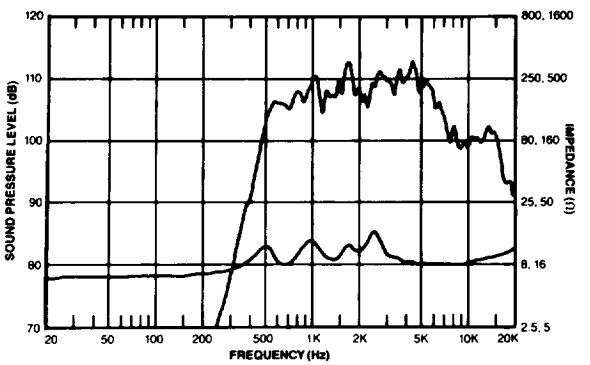

Figure 3. Frequency Response and Magnitude of Impedance on MR944A horn (See Note 4)

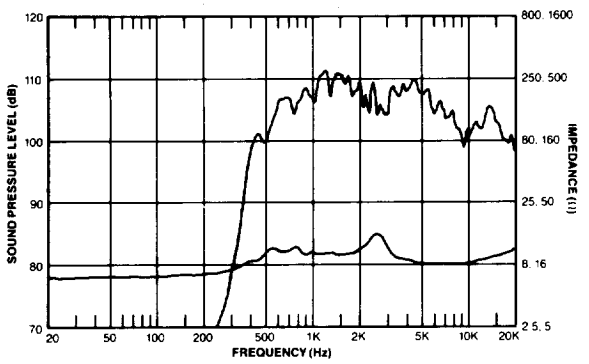

Figure 4. Frequency Response and Magnitude of Impedance on 511B horn (See Note 4)

NOTES ON MEASUREMENT CONDITIONS

1. Pink noise signal, one watt calculated using $E^2/Zmin$, one inch (2.5 cm) diameter plane wave tube measurement.
2. On axis, pink noise signal, one watt calculated using $E^2/Zmin$, 3.16 meter measurement distance referred to one meter.
3. One watt calculated using $E^2/Zmin$, one inch (2.5 cm) diameter plane wave tube measurement.
4. On axis, one watt calculated using $E^2/Zmin$, 3.16 meter measurement distance referred to one meter.
5. Distortion components invalid above 10 kHz. The percentage distortion of a harmonic at any given frequency may be found by graphically taking the difference between the fundamental and harmonic, adding 12 dB, and applying the formula: percentage distortion = $100 \times 10.^{-\text{dB change}/20}$
6. Test made on a horn with loading to 500 Hz, pink noise signal with 6 dB crest factor, power calculated using $E^2/Zmin$, 12 dB/octave filter slopes, for two hours.
7. This measurement made under the same conditions as Pressure Sensitivity, but at rated power, and takes into account any power compression effects due to nonlinearities in the device.
8. Minimum impedance occurs in frequency between 6 kHz and 7 kHz. Maximum production variation in mimimum impedance is ±15%.
9. Continuous program is defined as 3 dB greater than the AES rating using a pink noise signal with 6 dB crest factor.
10. Peak power is defined as 6 dB greater than the AES rating using a pink noise signal with 6 dB crest factor.

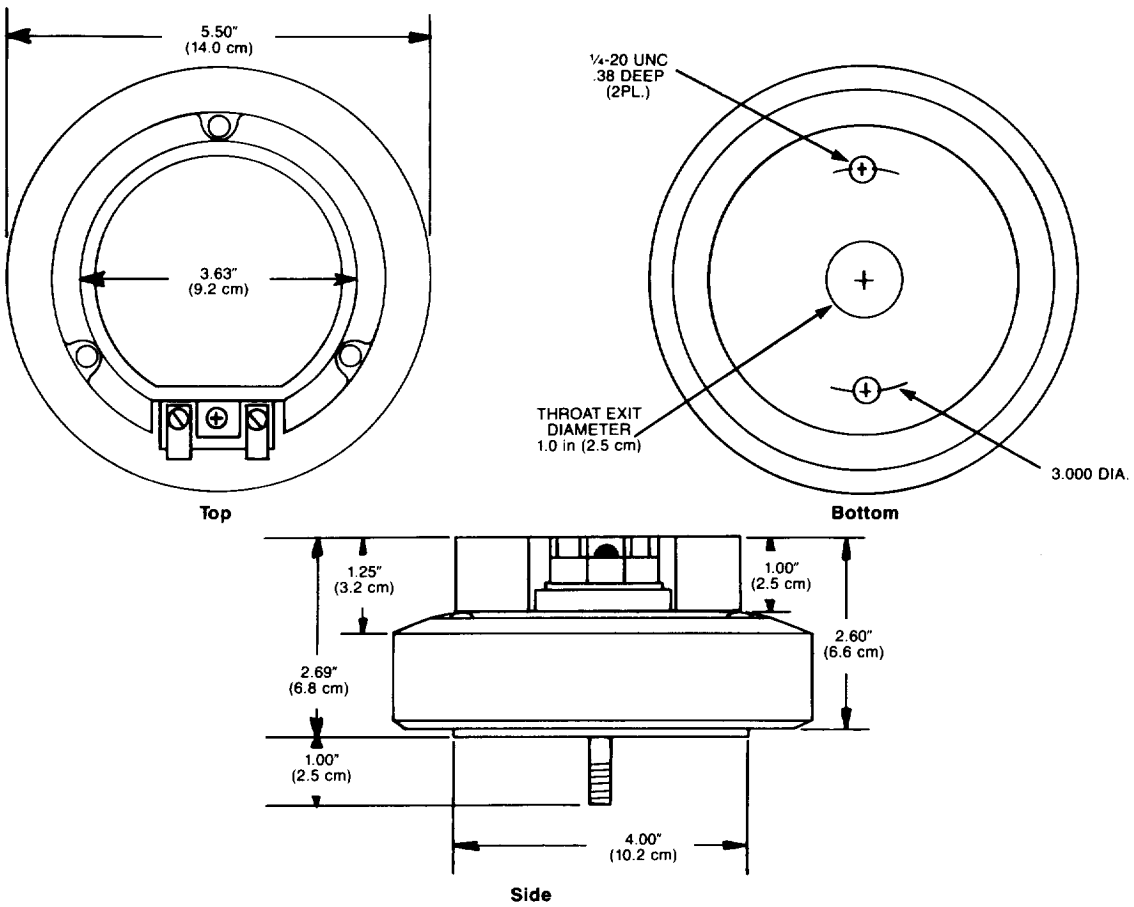

Figure 5. Mounting Information and Dimensions

ARCHITECT'S AND ENGINEER'S SPECIFICATIONS

The compression driver loudspeaker shall meet the following criteria. Power handling: 30 watts continuous pink noise, band limited from 500 Hz — 5 kHz, when mounted on an Altec Lansing 500 Hz horn. Frequency response, uniform from 500 Hz — 20 kHz. Pressure sensitivity shall be 108 ± 1 dB SPL when measured at one meter on axis from the mouth of an Altec Lansing Mantaray® MR994A horn with one watt input of pink noise, band limited from 500 Hz — 3.15 kHz. Minimum impedance: 8 ohms (909-8A); 16 ohms (909-16A). The voice coil shall be 1.75 inches (4.4 cm) in diameter, of edge wound aluminum ribbon, and shall operate in a magnetic gap having a flux density of 1.8 T derived from a 2.5 pound (1.1 kg) Ferrite V magnet. The dome and tangential compliance shall be of Pascalite™ all metal construction. A Tangerine® phasing plug with eleven radial acoustic slots shall provide the proper phase relationship between sound emanating from the center and edges of the dome. The entire diaphragm and voice coil assembly shall be field replaceable without requiring special tools. The driver shall be 5.5 inches (14.0 cm) in diameter by 2.7 inches (6.9 cm) deep (excluding one inch (2.5 cm) depth of mounting studs), and shall weigh 6.4 pounds (2.9 kg).

The compression driver loudspeaker shall be the Altec Lansing Model 909-8A or the Altec Lansing Model 909-16A.

ALTEC® LANSING

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TECHNICAL INSTRUCTIONS

**DIAPHRAGM AND VOICE COIL REPLACEMENT
PREVENTION OF STATIC AND RF CHARGE**

DIAPHRAGM AND VOICE COIL ASSEMBLY REPLACEMENT FOR DRIVERS

The diaphragm and voice coil assembly in HF drivers is extremely delicate and must be handled with care. Prior to starting the replacement procedure, select a work area that is clean and free from iron dust or chips. Cover the surface with a few layers of clean paper. The area must be free from drafts to prevent iron dust particles in the air from being magnetically attracted to and lodged in the voice coil gap of the HF driver. Replace the diaphragm and voice coil assembly in accordance with the following procedures.

1. Remove leads from external binding posts (see Figure 1). Note electrical phasing (polarity) as leads are removed.

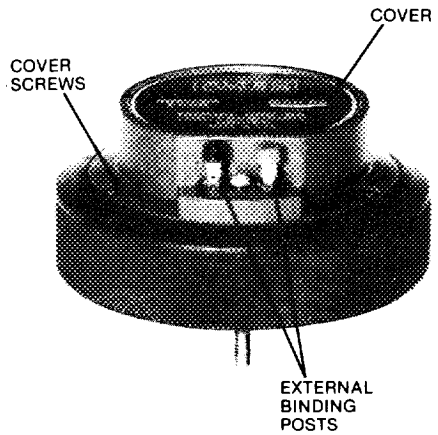

Figure 1. Typical Driver

2. As appropriate to the installation, remove driver loudspeaker and/or horn from enclosure or mounting, and take removed assembly to prepared work area.

NOTE

Where easy access to the driver is available, the replacement procedure may be completed without removing the driver loudspeaker and/or horn.

3. Remove screws securing driver cover (see Figure 1).

4. Lift cover from driver and remove two leads from internal binding posts; set cover aside. Note that the driver is equipped with an acoustical loading cap (Figure 2).

CAUTION

The diaphragm is extremely delicate. Use care to prevent damage. Avoid physical contact with diaphragm. Keep screwdriver away, as strong magnetic field may attract screwdriver into diaphragm.

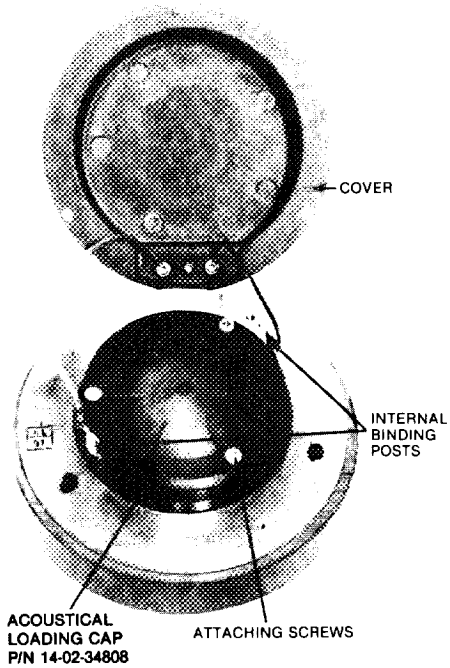

Figure 2. Driver with Acoustical Loading Cap

5. Remove three screws securing acoustical loading cap (Figure 2) and set aside loading cap.

6. Carefully work diaphragm and voice coil assembly free. Remove assembly (see Figure 3).

7. Clean foreign material from voice coil gap with a short strip of masking tape

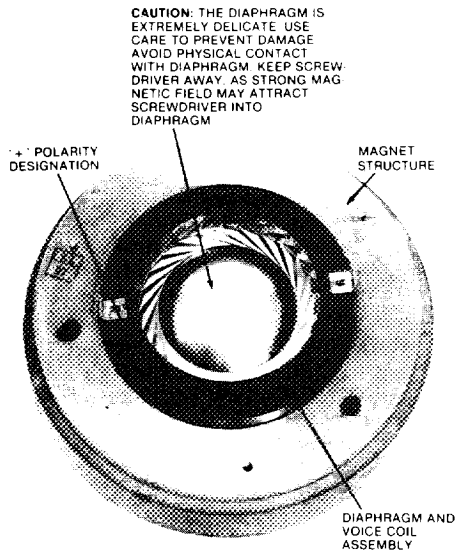

Figure 3. Diaphragm and Voice Coil Assembly

one-inch wide. Fold tape back to form a strip with adhesive exposed on both sides. Insert edges of folded tape into voice coil gap to full depth, and wipe clean completely around circular perimeter of Tangerine phasing plug® and top plate (see Figure 4). Repeat cleaning procedure several times with fresh tape until tape is clean when withdrawn.

8. Carefully place new diaphragm and voice coil assembly in proper position to align screw holes. Use care to avoid damaging edge and sides of voice coil while positioning it in voice coil gap. Be sure voice coil/diaphragm assembly is fully seated.

9. Install acoustical loading cap, using screws removed in Step 5. Tighten screws securely.

CAUTION

If new screws are required to secure the acoustical loading cap and/or the voice coil/diaphragm assembly, use brass screws *only*.

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

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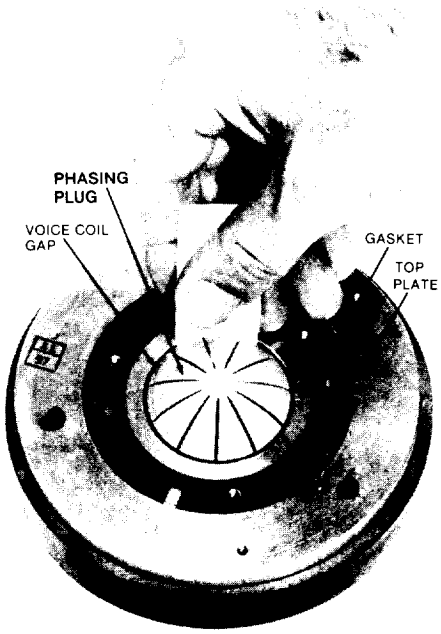

Figure 4. Cleaning Voice Coil Gap

10. Connect two leads of driver cover to internal binding posts. Connect red lead to post designated +, and black lead to opposite post. Tighten screws securely. When installing a new diaphragm in older drivers (such as 802 or 808 types), the Altec "Diaphragm Kit" will be required.

11. Install cover of driver, securing with screws removed in Step 3.

12. Return driver to service; connect external leads to binding posts. Take care to maintain electrical phasing (polarity) as originally wired.

Prevention of Possible Speaker Damage from RF and Static Charges

The 70-volt lines leading to outdoor speaker installations may develop a substantial voltage to ground at radio frequencies, owing to the proximity of high power radio and radar transmitting stations. Ungrounded speaker lines are also subject to accumulated static charges under atmospheric conditions. A discharge in the voice coil gap, from either of these causes, may be prevented by the following means; such means are recommended whenever the speakers are mounted on an insulated support (e.g., a telephone pole or wooden tower).

1. When the 70-volt line is *'floating'* (i.e., no ground connection exists at either side of the amplifier output to the speaker line):

   A 0.005 μF, 200-volt ceramic capacitor should be connected from each side of the 70-volt transformer primary to the frame of the horn or driver, to bypass the 70-volt speaker line (see Figure 5).

   Each speaker line should be bypassed in this manner at one speaker of the array. A wire, 12 gauge or larger, should be connected between the horn frames or driver housings of all horns. After all horns are interconnected in this manner, a single wire, 12 gauge or larger, is run from one horn or driver housing to ground (earth—by means of a suitable driven ground). A 10,000-ohm resistor is then connected between one of the 70-volt output terminals and ground at the amplifier location (see Figure 6).

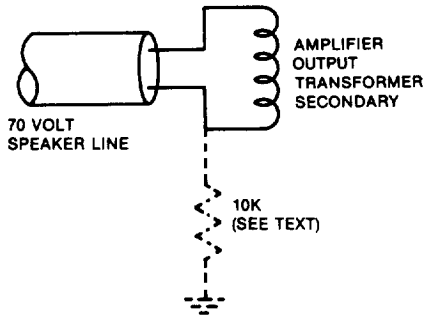

Figure 6. Grounding 70-Volt Output Terminal

2. When the 70-volt speaker line is already grounded at the amplifier output:

   The preceding instructions continue to apply, with regard to the RF bypass within the speaker housing itself and the grounding of the horn frame or driver housing of each horn; however, the 10,000-ohm resistor at the amplifier location may be omitted.

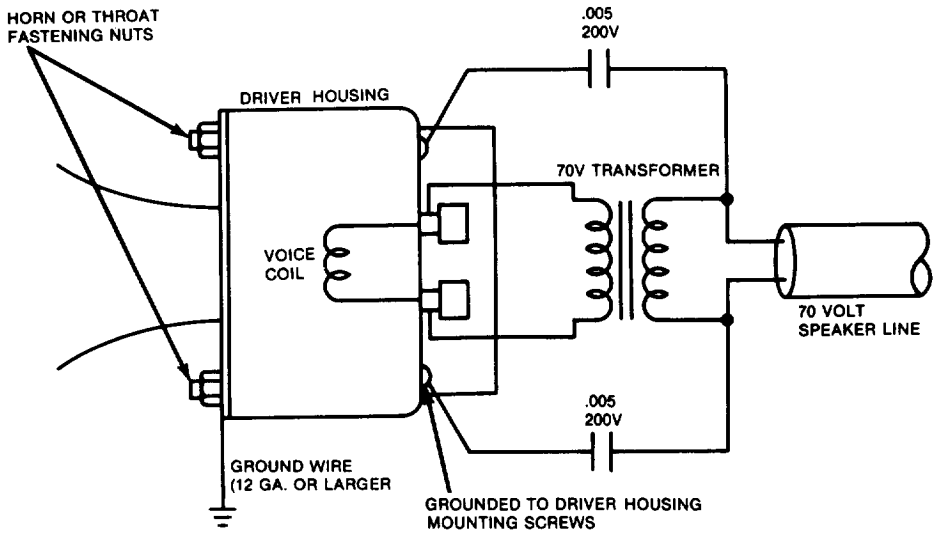

Figure 5. Preventing Damage from RF and Static Charges