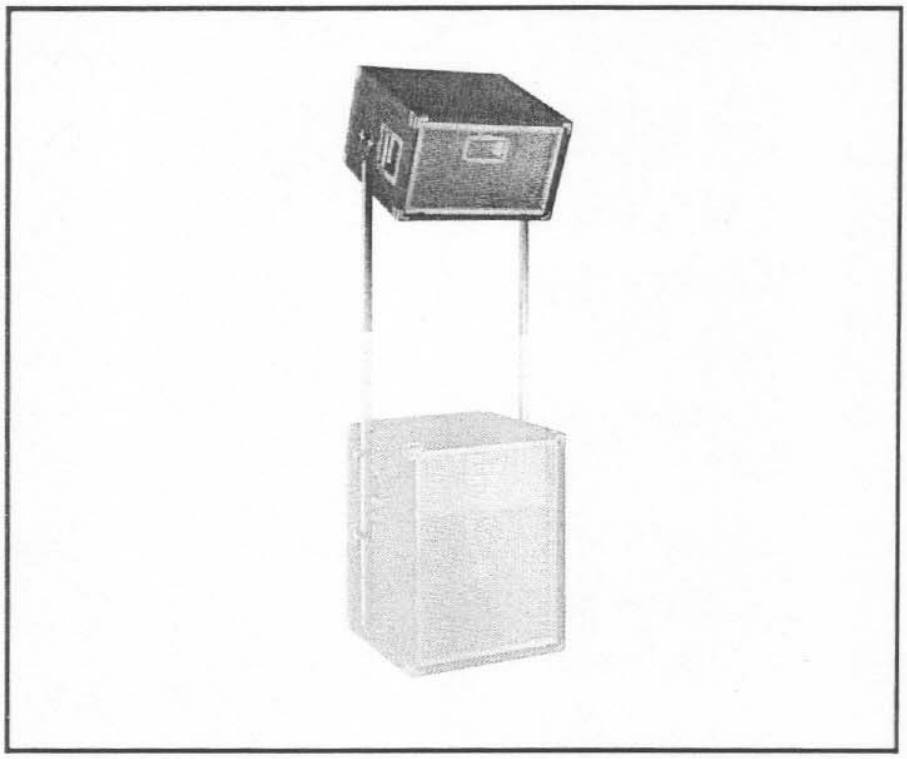

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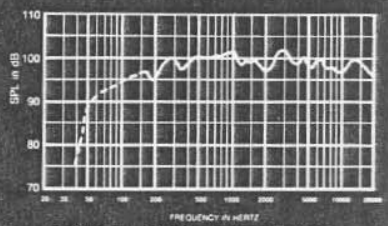


FIGURE 1 — Axial Amplitude Response (4 volts/10 feet)

Model SH-1810H-ER Horn-Loaded Mid/High Module

SPECIFICATIONS

Frequency Response, 10 Feet on Axis, Swept ⅓-Octave, Half-Space Anechoic Environment (see Figure 1):
250-20,000 Hz
Low-Frequency 3-dB-Down Point:
250 Hz
Half-Space Reference Efficiency:
6.2%
Long-Term Average Power Handling Capacity per EIA Standard RS-426A (see Power Handling Capacity section):
300 watts
Sound Pressure Level at 1 Meter, 1 Watt Input, Anechoic Environment, Band-Limited Pink Noise Signal, 250 to 2,000 Hz:
105 dB
Dispersion Angle Included by 6-dB-Down Points on Polar Responses, Indicated ⅓-Octave Bands of Pink Nose,
600-16,000 Hz Horizontal (see Figure 3):
60° (+15°, −10°)
800-16,000 Hz Vertical (see Figure 3):
45° (+35°, −15°)
Directivity Factor R_θ (Q), 800-16,000 Hz Median (see Figure 4):
17.3 (+11.7, −10.1)
Directivity Index D_i, 800-16,000 Hz Median (see Figure 4):
12.1 dB (+2.5 dB, −3.5 dB)
Distortion, 0.1 Full Power Input,
Second Harmonic,
1,000 Hz: 0.6%
10,000 Hz: 6%
Third Harmonic,
1,000 Hz: 0.6%
10,000 Hz: 2%
Distortion, 0.01 Full Power Input,
Second Harmonic,
1,000 Hz: 0.4%
10,000 Hz: 4%
Third Harmonic,
1,000 Hz: 0.4%
10,000 Hz: 0.7%
Transducer Complement,
High-Frequency:
DH3 titanium diaphragm driver
Mid-Frequency:
DL10X
Crossover Frequencies:
250 Hz and 2,500 Hz
Impedance,
Nominal:
8 ohms
Minimum:
6 ohms
Input Connections:
Parallel ¼-in. phone jacks (allows paralleling of multiple speakers)
Enclosure Materials and Colors:
Black carpet covered ¾-in. void-free plywood
Perforated metal grille
Enclosure Dimensions,
Height: 42 cm (16.4 in.)
Width: 63 cm (24.8 in.)
Depth: 62 cm (24.6 in.)
Shipping Dimensions,
Height: 86 cm (34.0 in.)
Width: 65 cm (24.8 in.)
Depth: 65 cm (24.8 in.)
Net Weight,
Mid/High Unit: 42 kg (89 lb)
Mounting Unit: 6 kg (14 lb)
Shipping Weight,
Mid/High Unit: 44 kg (95 lb)
Mounting Unit: 7 kg (16 lb)
Accessories:
SH-1810P mounting system

DESCRIPTION

The Electro-Voice SH-1810H-ER is a two-way Extended Range™ module which reproduces mid and high frequencies. The module is intended for use with a bass unit to provide a main speaker system. The SH-1810L-ER* is a bass unit which has been specifically designed for the task. Other units can be used, but it is unlikely that they will be able to take full advantage of its unique mounting system. This mounting system allows the Mid/High module to be elevated above the SH-1810L-ER and aimed for optimum audience coverage. The 1810P mounting system is available separately, and consists of two vertical poles and six thumbscrews to attach the poles to the enclosures.

In any audio system the most critical frequencies are in the midband. The strength of the SH-1810H-ER is how it deals with these critical frequencies between 250 and 2,500 Hz. They are covered by one driver/phase plug combination. The identical combination is used in the MT-4 concert system. A DL10X professional driver is combined with a proprietary aperiodic phase plug (U.S. patent no.4,718,517). The phase plug automatically compensates for loudspeaker "beaming"—the tendency for

*Additional information is available on the SH-1810L-ER

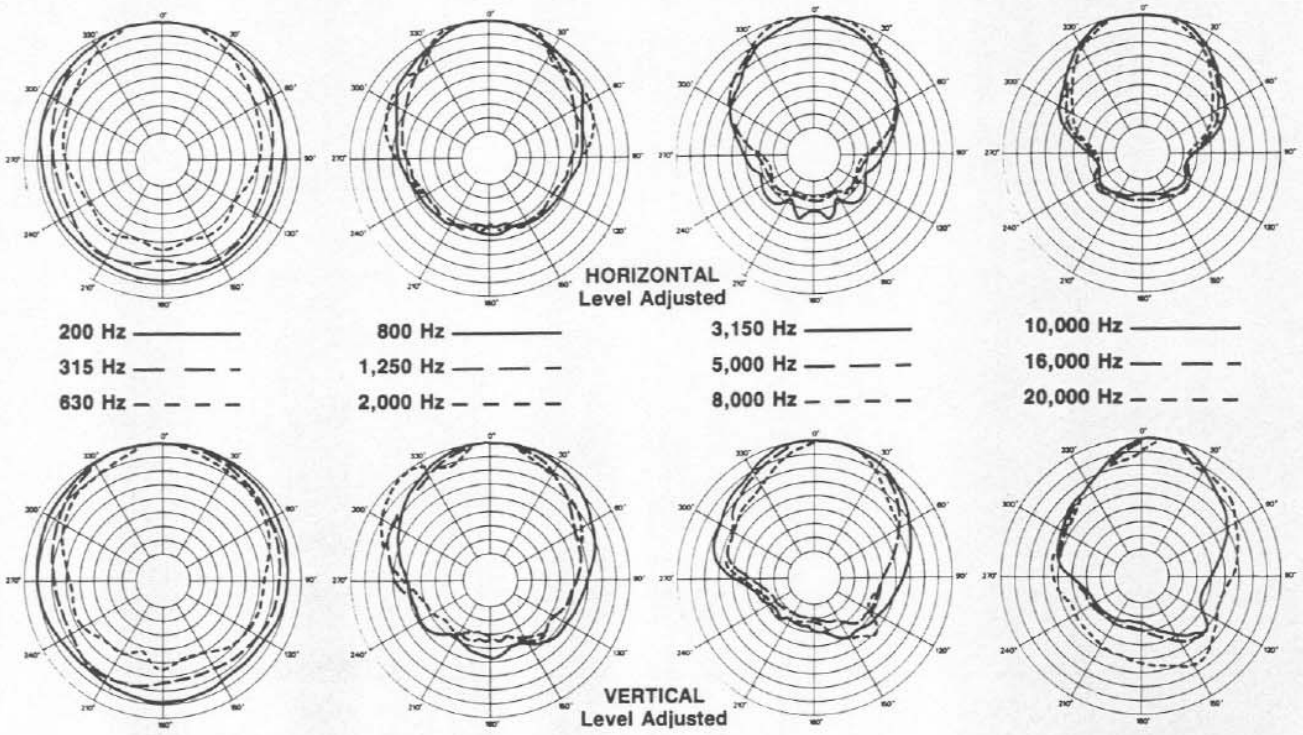


FIGURE 2
Polar Response

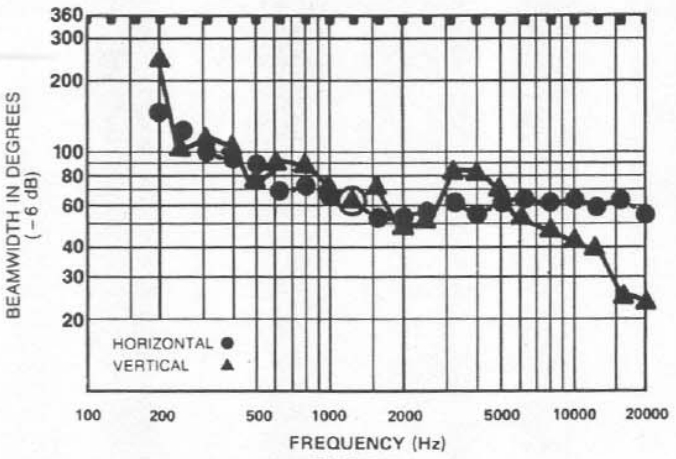


FIGURE 3
Beamwidth vs. Frequency

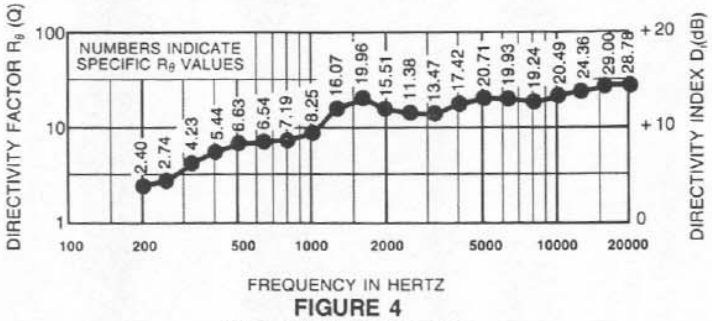


FIGURE 4
Directivity Factor and
Directivity Index vs. Frequency

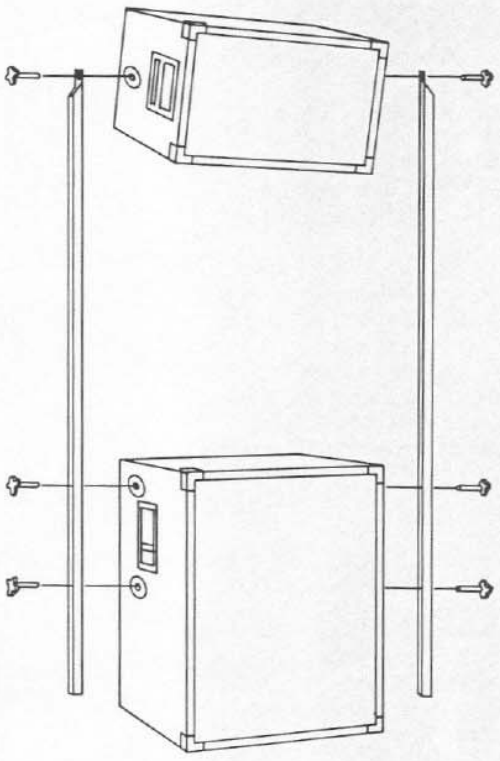


FIGURE 5 — System Set-Up

higher frequencies to radiate from the center of the cone area at a constantly narrowing coverage angle. The integral 60° x 40° horn is therefore fed a consistent acoustic input, resulting in a wide uniform sound field.

The DH3 high-frequency driver, which is also used in the MT-4 concert system, provides the SH-1810H-ER with smooth, extended response. The DH3 consists of a 1.25-inch titanium diaphragm with a Time Path™ convex phase plug (U.S. patent no. 4,525,604).

The driver's output exits into a revised 60° x 40° constant-directivity horn, which is centrally mounted within the mouth plane of the midrange horn. This mounting position encourages stable sound projection and horizontal pattern control through the critical crossover region.

ASSEMBLY WITH THE SH-1810L-ER

Refer to Figure 5 for the following assembly instructions.

1. Attach support beams to each side of the subwoofer cabinet using two thumbscrews per side. Tighten thumbscrews until snug. Note, there are several sets of mounting holes in the sides of the support beams to allow height adjustment of the mid/high unit. The overall height of the system may be adjusted from 7 to 8 feet.
2. Install a thumbscrew into each side of the mid/high unit until the head of the thumbscrew is approximately ½-inch from the cabinet.
3. Mount the mid/high unit onto the support beams by positioning the thumbscrews into the slots in the support beams.
4. Adjust the vertical aiming of the mid/high unit and then tighten both thumbscrews until snug.
5. Electrically connect the mid/high unit to the subwoofer via the ¼-inch jacks marked "Low Out" on the module and "Input" on the subwoofer. An appropriate cable should be used.

BI-AMPING

Bi-amping is an option that may be used when full use of the extra power handling of the bass section is required. It may also be used when additional bass units (such as the SH-1810L-ER*) are used in large venues or outdoors. Bi-amping is activated by the use of the switch at the rear of the module. Set this switch to "Bi-Amp" mode and use an external active crossover (please refer to manufacturer's instructions for exact details). The crossover frequency should be 250 Hz and have a slope of at least 12 dB per octave. The subwoofer and module can be accessed, in this mode, by the use of the ¼-inch phone jacks marked "Input."

MULTIPLE USE

The SH-1810H-ER can be used in multiples from one amplifier by the use of the parallel ¼-inch phone jacks provided on all the inputs. Care must be taken not to "abuse" the amplifier by connecting impedances that are too low (see amplifier specifications). This feature is of particular interest when used in the "Bi-Amp" mode with additional subwoofer units.

TWEETER PROTECTION

The SH-1810H-ER module has been built with professional grade components of outstanding power handling and durability. To provide additional performance, a solid-state, self-resetting protection device for the DH3 has been incorporated into the crossover. This device permits short-term transients to pass but gently attenuates long-term signals which would exceed the thermal limits of the DH3. This means none of the musical highs are lost while the long-term power handling is not compromised.

FREQUENCY RESPONSE

The combination of the midrange horn/driver and the high-frequency tweeter provides the wide and smooth overall response shown in Figure 1. This response was measured at ten feet, using a four-volt input in an anechoic chamber, and was measured using a swept ⅓-octave pink noise signal. No external equalization was used.

DIRECTIVITY

The polar response of the SH-1810H-ER speaker system at selected ⅓-octave bandwidths is shown in Figure 2. These polar responses were measured in an anechoic environment at 20 feet using ⅓-octave pink noise inputs. The frequencies selected are fully representative of the polar response of the system. Beamwidth of the system utilizing the complete ⅓-octave polar data is shown in Figure 3. R_θ (Q) and directivity index (D_i) are plotted in Figure 4.

ENCLOSURE CONSTRUCTION

The Mid/High module is built to last on the road. It is ruggedly constructed of ¾-inch void-free plywood. All joints are dado cut and the cabinet is finished with a densely-woven, abuse-resistant carpet that is both attractive and highly durable. It is protected by an acoustically transparent perforated metal grille and metal corners. The input panel is positioned below the surface to protect the connectors and the cables. The handles are positioned to aid easy transport.

POWER HANDLING CAPACITY

To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test related to real-life conditions. First, a random noise input was used because it contains many frequencies simultaneously, just like a real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than the typical program, adding an extra measure of relability. Third, the test signal includes not only the overall "long-term average" or "continuous" level — which our ears interpret as loudness — but also short-term peaks which are many times higher than the average, just like the actual program. The long-term average level stresses the speaker thermally (heat). The instantaneous peaks test mechanical reliability (cone and diaphragm excursion). Note that the sine wave test signals sometimes used have a much less demanding peak value relative to their average level. In actual use, long-term average levels exist from several seconds or greater, but we apply the long-term average for several hours, adding another extra measure of reliability. Specifically, the SH-1810H-ER is designed to withstand the power test described in the EIA Standard RS-426A. The EIA test spectrum is applied for eight hours. To obtain the spectrum, the output of a white noise generator (white noise is a particular type of random noise with equal energy per bandwidth in Hz) is fed to a shaping filter with 6-dB-per-octave slopes below 40 Hz and above 318 Hz. When measured with the usual constant-percentage bandwidth analyzer (⅓-octave), this shaping filter produces a spectrum whose 3-dB-down points are at 100 Hz and 1,200 Hz with a 3-dB-per-octave slope above 1,200 Hz. In the nomal (passive) mode, this shaped signal is sent to the power amplifier with the continuous power set at 300 watts into the 6.9 ohms EIA equivalent impedance, (45.6 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 1,200 watts peak (91.2 volts peak).

WARRANTY (Limited) —

Electro-Voice Speakers and Speaker Systems (excluding active electronics) are guaranteed for five years from date of original purchase against malfunction due to defects in workmanship and materials. If such malfunction occurs, unit will be repaired or replaced (at our option) without charge for materials or labor if delivered prepaid to the proper Electro-Voice service facility. Unit will be returned prepaid. Warranty does not extend to finish, appearance items, burned coils, or malfunction due to abuse or operation under other than specified conditions, including cone and/or coil damage resulting from improperly designed enclosures, nor does it extend to incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee. A list of authorized warranty service agencies is available from Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107 (AC/616-695-6831); and/or Electro-Voice West, 8234 Doe Avenue, Visalia, CA 93291 (AC/209-651-7777). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, MI 49107.

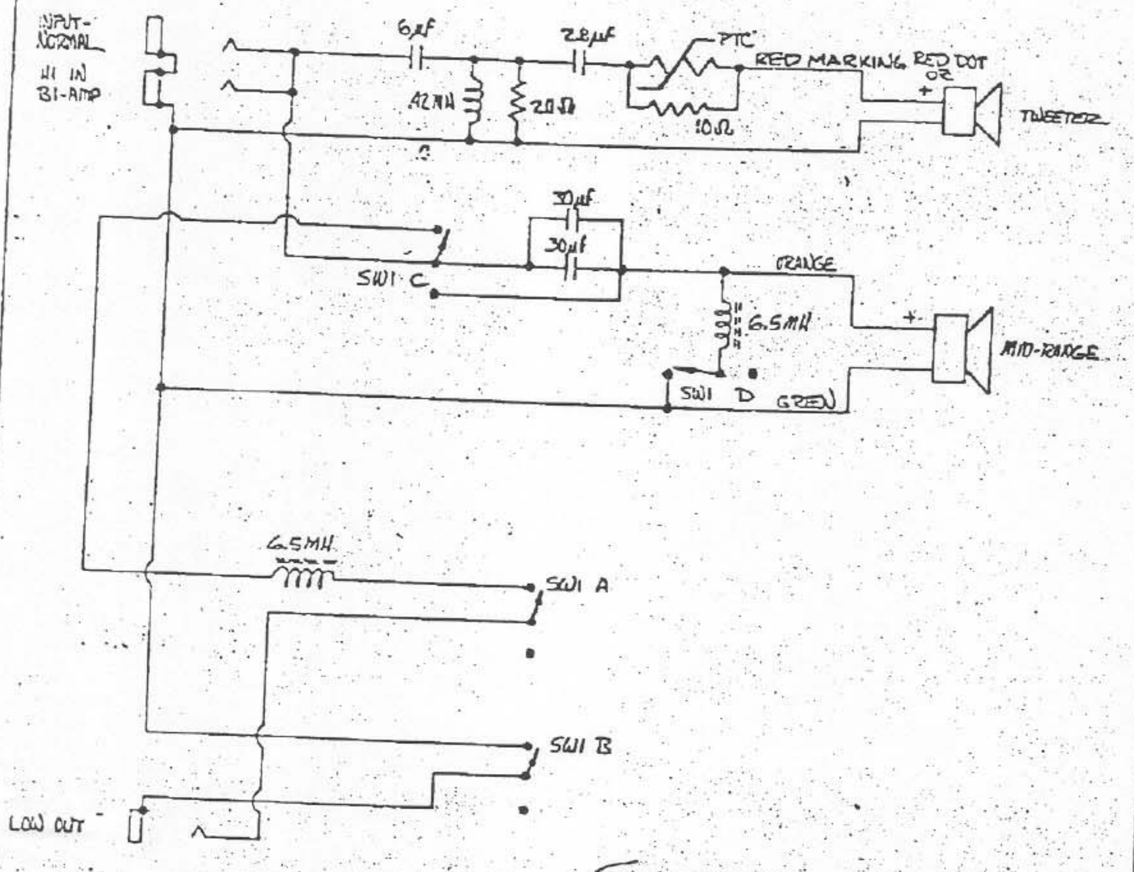
Specification subject to change without notice.

81787

REV.	DESCRIPTION	APPROV. & DATE
A	UNCHARTED ITEM 26 ON 81787	
B		
C		
D		
E		
F		
G		

Post-it™ brand fax transmittal memo 7671 | # of pages ▸

To Robert | From Jessica
Co. | Co.
Dept. | Phone #
Fax # 952-736-4582 | Fax #



SCHEMATIC
SHOWN IN "NORMAL" MODE

(28)

ITEM	PART NO.	REQ'D	DESCRIPTION
29	38780	1	WASHER, EXTERNAL TOOTH
28	38743-AP	1	WASHER, FLAT
27	98063	1	WIRE TIE
26	531175	1	LABEL, INPUT
25	59643	3	PHONE JACK S/A
24	16429-13	1	WIRE, GREEN, 30" LG.
23			
22	16704-1	1	RIPCORD, 36" LG.
21	16430-13	1	WIRE, ORANGE, 30" LG.
20	70759	3	RETAINER, SOCKET, PLASTIC
19	63012	5	SCREW, 6-15 X ½" HEX WHR HD SLTD STL. TYPE A
18	62549	4	SCREW, 6-15 X ¾" HEX WHR HD SLTD STL. TYPE A
17	56202	1	SWITCH, 4 PDT
16	56208	1	SWITCH, POLY. PTC RESIST.
15	46815	1	RESISTOR, 10Ω, 10%, 20W POWER
14	46793	1	RESISTOR, 20Ω, 10%, 20W
13	42589	2	CAPACITOR, 30 MFD, 18V
12	42489	1	CAPACITOR, 6 MFD, 50V
11	35484	2	COIL, 6.5 MH
10	29039-77	2	TAPE, TESIMAL, 6" LG.
9	28039-69	2	TAPE, TESIMAL, 7" LG.
8	27389	1	TERMINAL STRIP, 1 LUG, MANDEX
7	A 27323	2	TERMINAL STRIP, 7 POST, XP GRADE
6	16597-17	2	WIRE, #18 AWG. STRND COPP. RED, 5" LG.
5	16586-18	2	WIRE, #18 AWG. STRND COPP. BLACK, 5" LG.
4	16430-04	1	WIRE, #18 AWG. STRND COPP. ORANGE, 5" LG.
3	4234	1	CAPACITOR, 2.8 MFD, 100V
2	3574	1	COIL, 42 MH, #18 COPPER
1	69070	1	BOARD, MOUNTING

BILL OF MATERIAL FOR ONE COMPLETE UNIT

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS IN INCHES EXCEPT METRIC IN [MM]
TOLERANCES
DO NOT SCALE DRAWING

ELECTRO-VOICE, INC.
600 CECIL ST., BUCHANAN, MICH. 49107

TITLE: CROSSOVER S/A
SCALE: 1/1
MODEL FIRST USED ON: SH-1810H-ER
PRODUCTION NO.: 81787
REV: G
DATE: 7/24/86
RELEASED TO PRODUCTION: 7-30-86

SH 1810H-ER