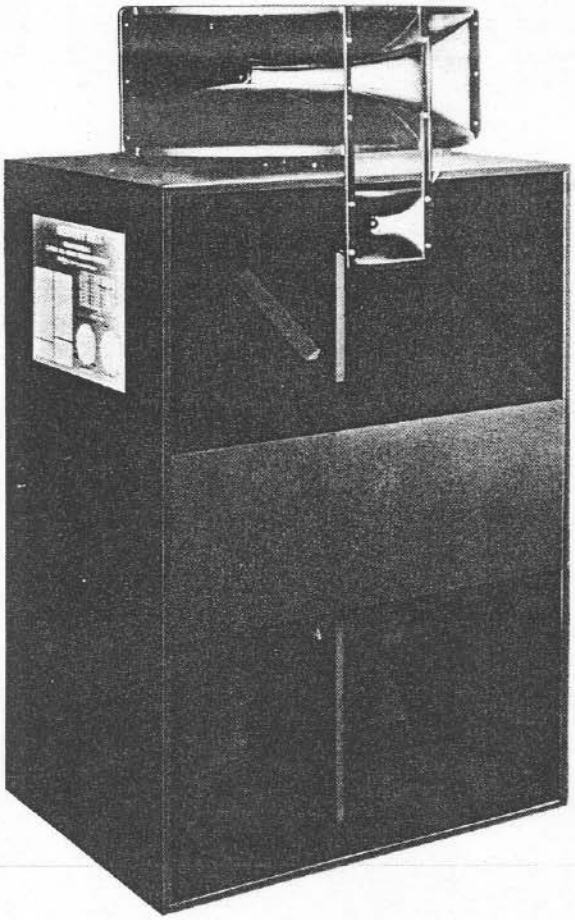
Electro-Voice®

SERVICE MANUAL



SENTRY IVA PROFESSIONAL LOUDSPEAKER SYSTEM

a Gulton COMPANY ELECTRO-VOICE, Inc., 600 CECIL ST., BUCHANAN, MICH. 49107
MANUFACTURING PLANTS AT ■ BUCHANAN, MICH. ■ NEWPORT, TENN. ■ SEVIERVILLE, TENN. ■ GANANOQUE, ONT.
Form No. 1435
Litho in U. S. A.

SPECIFICATIONS

Frequency Response:	50 to 18,000 Hz
EIA Sensitivity (on axis measurement):	52 dB
Sound Pressure Level (4' on axis, 50 W):	117 dB
Impedance:	8 ohms nominal
Power Handling Capacity:	(See Fig. 1)
Finish:	Utility Black
Size:	27¼"w. x 20-5/8"d. x 50¾"h. (in normal configuration)
Weight:	148 pounds

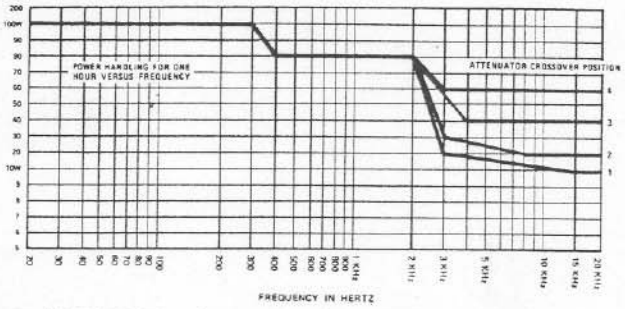


FIGURE 1 – Power Handling Chart (average sine wave power, nominal 8 ohm load)

SERVICING PROCEDURE

The Electro-Voice Sentry IVA professional loudspeaker system has been carefully designed to assure maximum trouble-free service but with ease of repair if required.

WARRANTY

The Electro-Voice Sentry IVA studio monitor speaker system is guaranteed for two years against malfunction due to defects in workmanship and materials. If malfunction from this cause occurs, the product will be repaired or replaced (at our option) without charge for materials or labor, if delivered to Electro-Voice or its authorized service agency. The unit will be returned prepaid. Warranty does not cover finishes or malfunction due to abuse or operation at other than specified ratings. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

Send all price requests, parts orders, and requests for instructions on return for repair and locations of authorized service facilities to: Service Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (Phone: 616/695-6831).

TEST EQUIPMENT:

Audio-Sweep Generator (Low Distortion)
AC VTVM
Amplifier (8 ohms)
Phone Jack (two-connector)

8-ohm non-inductive load resistors.
(5-Watt minimum rating)

LFSA SERVICING

Access to the Sentry IVA air chamber is made by removing the twenty baffle wood screws (9) and removing the enclosure back cover. NOTE: Check the condition of the Tesamol strip air seal (7). The air chamber cavity must be properly sealed to provide low distortion and wide frequency response. Critical points are the Tesamol stripping, speaker phone jack and speaker gasket seal.

BASS SPEAKERS

Remove defective bass speaker(s) and return the speaker(s) to Electro-Voice for service. Speaker wire leads are soldered to the speaker terminals. It is important to maintain proper speaker phasing when removing a speaker from the Sentry IVA system.

The bass speakers are connected in series with the phone plug tip corresponding to the positive terminal (red dot), while the sleeve is the negative terminal. The bass speakers are connected in-phase with the amplifier input terminals on the crossover network.

VOICE COIL DC RESISTANCE

The DC Voice Coil resistance for each bass speaker is 3.5 to 4.5 ohms.

ACOUSTIC QUALITY TEST

The acoustic quality of the LFSA may be tested by applying 10 volts rms to the bass speakers through the phone jack (5) and frequency sweep from 20–500 Hz. No cabinet buzzes, rattles, or speaker distortion should be heard.

HFSA SERVICING

1823M MIDRANGE DRIVER
ST350A TWEETER

Refer to the Service Data Sheets on these models for servicing information. Special Parts:

Diaphragm Assemblies

1823M	A87203 (Special Midrange)
ST350A	A84293

The 1823M midrange driver and ST350A tweeter are connected out-of-phase with the amplifier input terminals on the crossover assembly. It is important to maintain proper speaker phasing when removing and replacing either of these speakers from the system.

CROSSOVER ASSEMBLY

SPECIFICATIONS

CROSSOVER FREQUENCIES:
400 Hz
3,500 Hz
CROSSOVER SLOPE:
12 dB per octave

BI-AMP HIGH FREQUENCY INPUT JACK–

Disables 400 Hz passive crossover to allow insertion of high end amplifier to drive midrange and tweeter only.

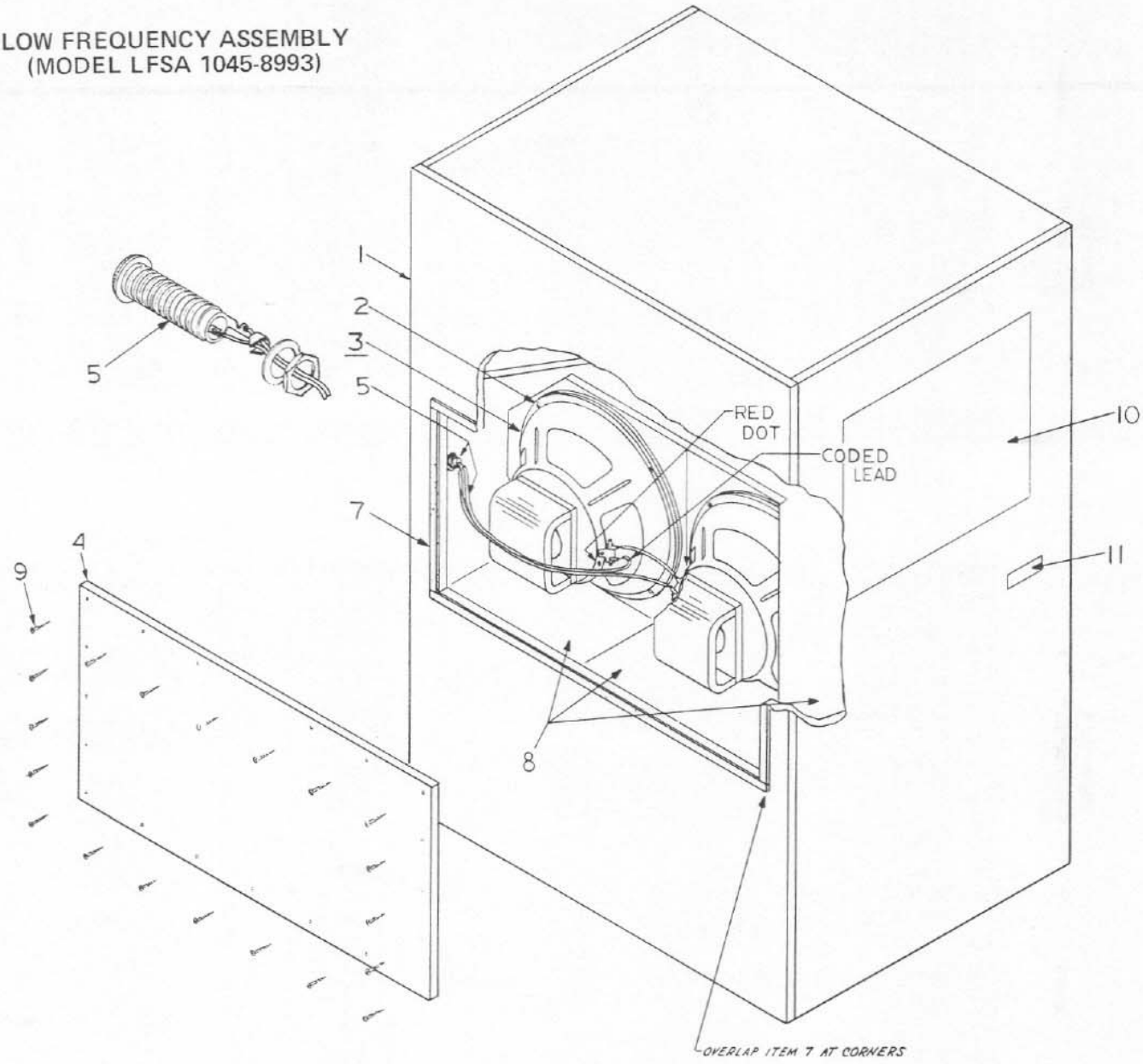
HIGH FREQUENCY ROLLOFF SWITCH S1–

Selects roll off characteristics above 1000 Hz for increased power handling. See engineering data sheet for details!

CROSSOVER CHECKOUT

1. Load Impedance ..... 8 ohms.
2. Input ..... 2 volts @ 1000 Hz.
3. Test unit with power through terminal strip (16) input and through Bi-Amp input jack J1.
4. Roll off switch in position 1.
5. Sweep input from 50 to 18,000 Hz and check crossover output roll off characteristics stated above.
6. Set input to 10,000 Hz and check high frequency roll off (Switch S1) attenuation:
   Position 1–2 ..... 3 dB
   Position 2–3 ..... 3 dB
   Position 3–4 ..... 6 dB

LOW FREQUENCY ASSEMBLY
(MODEL LFSA 1045-8993)



PICTORIAL 1

PARTS LIST

REF NO.	PART NO.	DESCRIPTION
1†	87798	Enclosure Assembly
2	B608224-AY	Screw-Rd Phillips (10-32 x 1½)
3	1802-8838	Speaker-Woofer (12-inch)
4	69002	Back Cover
5	87708	Jack, Clip & Wire Assy.
	17180	Jack-Switchcraft 151
6	27222	Receptacle-Spade Clip
7	28039-72	Tesamol Stripping (Seal)
8	77119	Fiberglass (12" x 6" x 3-5/8")
9	62836	Screw-Flat Wood Phillips (10 x 1-1/8)
10	535403	Label-Dispersion/Bi-Amping
11	535251	Label-Caution

AVAILABLE INFORMATION

Form 1382 Service Data Sheet ST350A
Form 1421 Service Data Sheet 1823 (See HFSA Servicing on 1823M)

PACKING PARTS

96020	Carton & Fillers (LFSA)
96019	Carton & Fillers (HFSA)
79056	Foam Block (HFSA)
535404	Engineering Data Sheet
79275	Bag-Plastic (29 x 32 x 65)

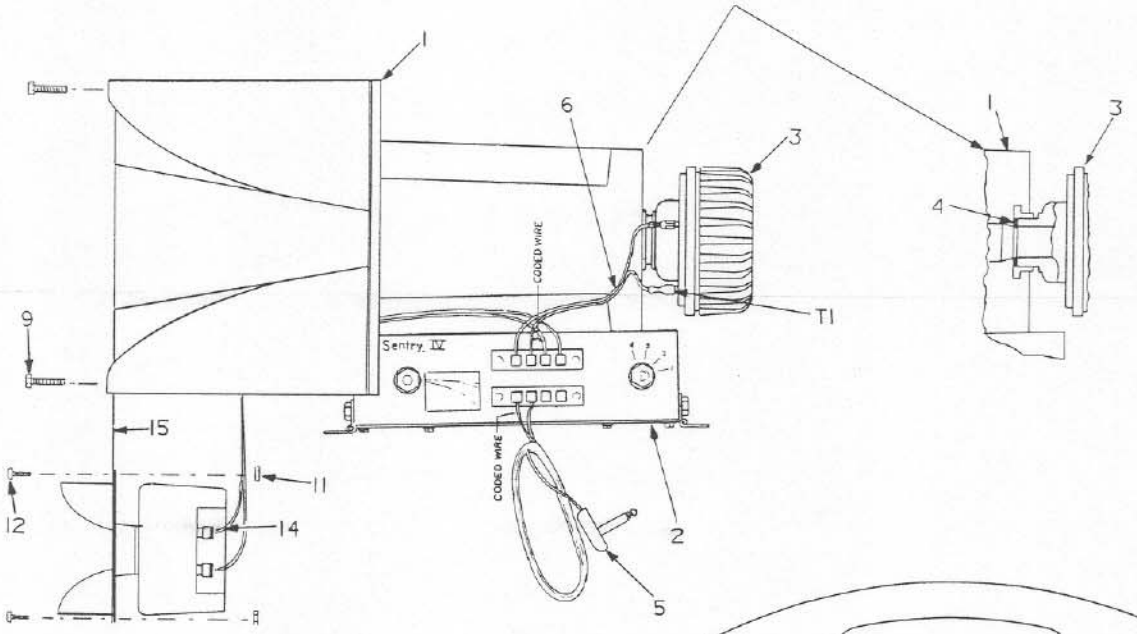
† The Sentry IVA enclosure assembly is only available as a replacement item. A damaged enclosure must be returned to Electro-Voice or one of its authorized service stations for replacement.

ENCLOSURE PROTECTION KIT (SPK)

PART NO.	DESCRIPTION
514-8943	Protection Kit—Complete
20037	Corner-Enclosure
20038	Handle-Enclosure
20039	Glide-Furniture
62295-AP	Screw-Wood (6 x ½ ph. Rd Hd)
62789-AP	Screw-Wood (12 x 1 ph. flat hd)
535363	Instruction Sheet

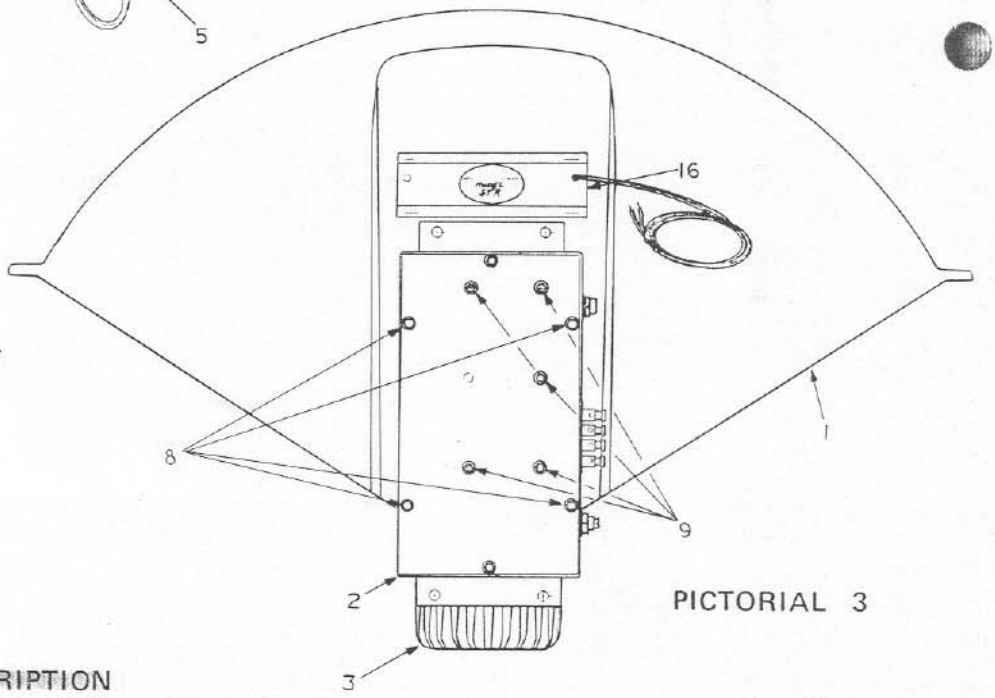
ENCLOSURE—ROAD KIT (SRK)

PART NO.	DESCRIPTION
515-8944	Road Kit—Complete
79154	Caster (Shepherd 2740 BC)
62859-AY	Screw—Caster (14 x ¾ Rd Hd)



PICTORIAL 2

HIGH FREQUENCY ASSEMBLY MODEL HFSA (E-V 1857-8994)



PICTORIAL 3

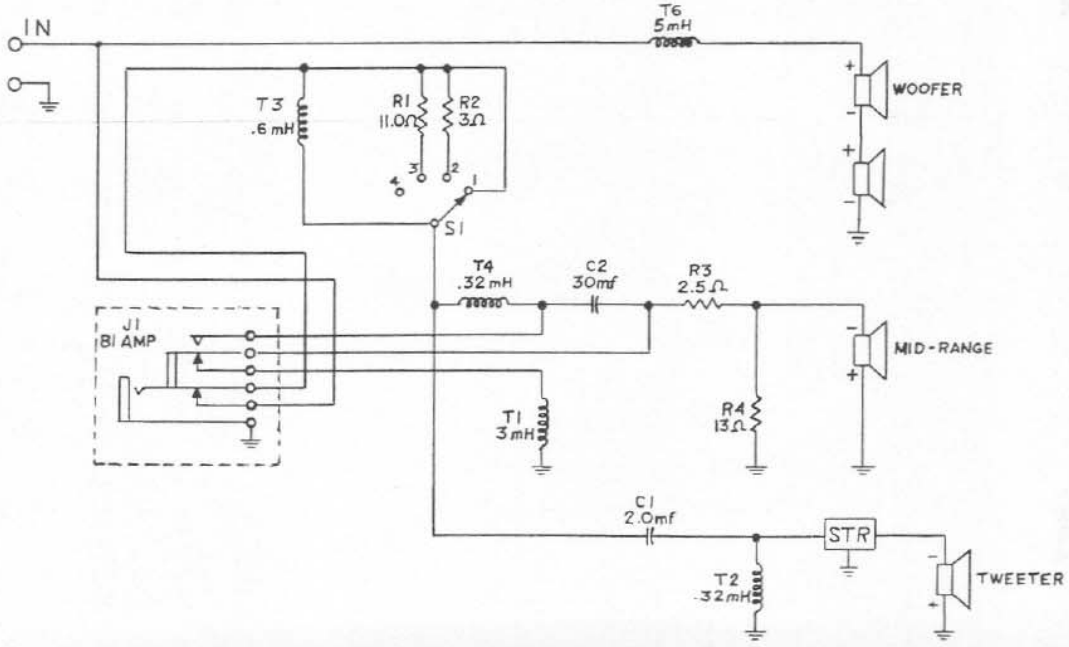
PARTS LIST

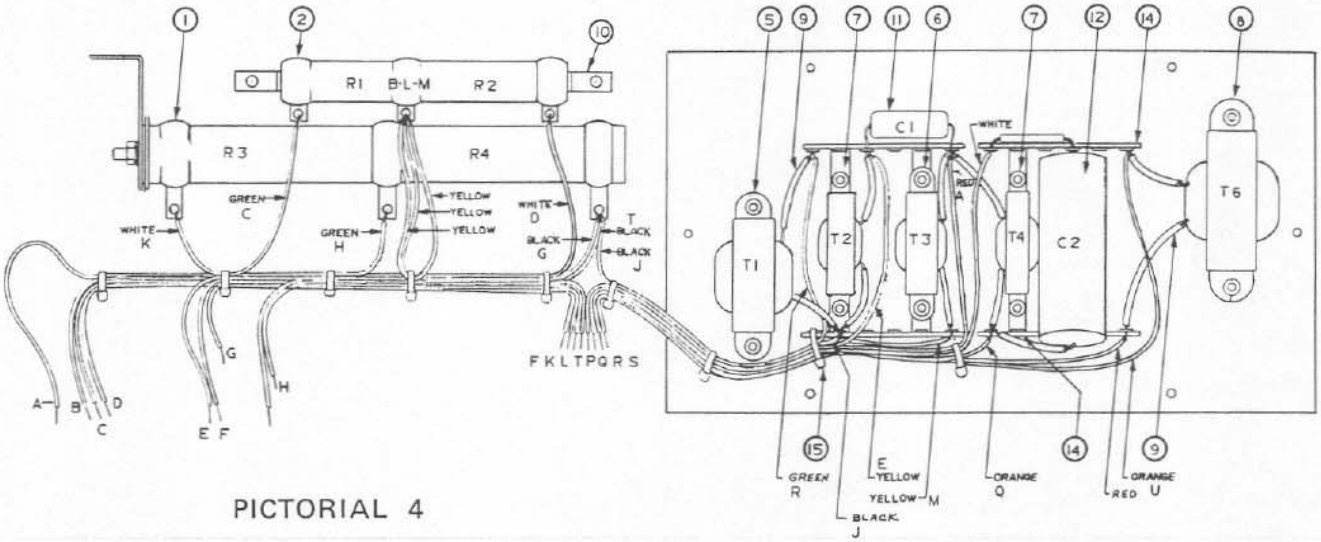
REF NO.	PART NO.	DESCRIPTION
1	A78872-HT	Horn-Sectoral Midrange
2	87799	Crossover Assy.-Complete
3	1823-8575	Midrange Driver Assy. (1823M)
	A87203	Diaphragm Assy. (1823M)
4	38489	Gasket (1-5/16 Velutex)
5	87268	Wire & Plug Assy.
	17055	Phone Plug (Switchcraft 220)
6	87267	Wire & Lug Assembly
	27261	Lug-Flat Spade
8	62440-AY	Screw-Crossover Cover (6 x 3/8 Hex Hd)
9	62849-BX	Screw-Crossover Mounting (10 x 1 Pan Hd)
11	20118-CC	Stopnut (10-32)
12	B60828-CC	Screw-(10-32 x ½ Rd Hd)
14	829-8575	Tweeter (ST350A)
	A84293	Diaphragm Assy. (ST350A)
15	78873-JD	Bracket-Mounting (2)
16	517-8968	Tweeter Protector (STR)

CROSSOVER ASSEMBLY (E-V 87799)

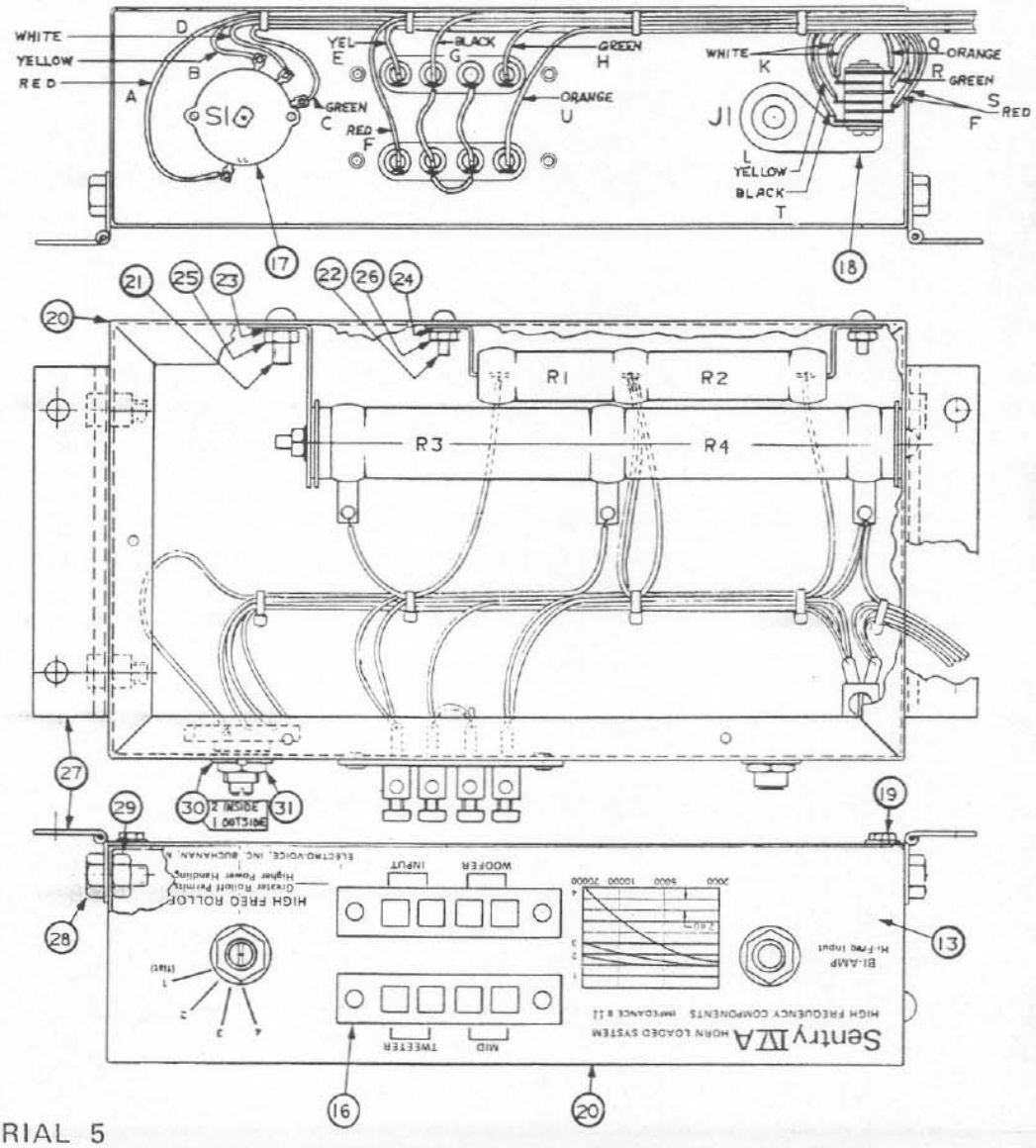
PARTS LIST

REF NO.	PART NO.	DESCRIPTION
1	46593	Resistor—Power Tap 2.5 & 13Ω 40 watt 5% (R3 & R4)
2	46592	Resistor—Power Tap11.0 & 3.0Ω 10W & 20W 5% (R1 & R2)
5	15254	Inductor—3 mH (T1)
6	15270	Inductor—0.6 mH (T3)
7	15271	Inductor—0.32 mH (T2 & T4)
8	15269	Inductor—5 mH (T6)
9	6615	Tubing
10	78939	Bracket—R1/R2 Mounting
11	42596	(C1) Capacitor—Metalized Mylar 2 μF/100V ± 5%
12	42589	(C2) Capacitor—Metalized Mylar 30 μF/70V ± 10%
13	535252	Label—Crossover (Sentry IV)
13	535405	Label—Crossover (Sentry IVA)
14	27253	Terminal Strip (6T)
15	98063	Wire Tie (Nylon)
16	27315	Terminal Strip—Push
17	56132	Switch (S1)
18	17205	Phone Jack (J1)
19	62440-AY	Screw—Cover (6 x 3/8 Hex Hd)
20	78893-JD	Chassis Enclosure
21	B60826-AD	Screw-Mounting (10-32 x 3/8 Rd Hd)
22	B60526—AY	Screw-Mounting (6-32 x 3/8 Rd Hd)
23	3998-AD	Lockwasher (No. 10)
24	3873-AD	Lockwasher (No. 6)
25	20343-AD	Nut-Hex (10-32)
26	2025-AD	Nut-Hex (6-32)
27	20116-BX	Hinge
28	62812-AY	Screw-Hinge (¼-20 x ½ Hex Hd)
29	20111-AY	Nut-Lock (¼-20)
30	2080-AD	Nut-Hex (3/8-32)
31	4053-AP	Flat Washer (3/8)





PICTORIAL 4



PICTORIAL 5

Electro-Voice® SERVICE DATA

TWEETER PROTECTION CIRCUIT ASSEMBLY (MODEL STR)

SERVICING

The Electro-Voice Model STR has been carefully designed to assure maximum trouble-free service but with ease of repair, if required.

WARRANTY

The Electro-Voice Model STR tweeter protector is guaranteed for two years from date of purchase against failures due to defects in workmanship and materials. If such failure occurs, unit will be repaired or replaced (at our option) if delivered to Electro-Voice or its service agency. There will be no charge for parts or return freight during the entire length of the warranty period; no charge for labor will be made during the first year of the warranty period. Warranty does not cover finishes or failures due to abuse or operation at other than specified ratings. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

Send all price requests, parts orders, and requests for instructions on return for repair and locations of authorized service facilities to: Service Department, Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (Phone: 616/695-6831).

DISASSEMBLY

Carefully pry the Extruded Cover (3) out of the grooves at each end of the extruded base (1). Work the wire leads out of extruded cover.

The printed circuit board assembly slides out of the extruded base.

TWEETER PROTECTOR STR

STR CHECK OUT

1. Load Impedance ..... 8 ohms. (Use non-inductive load resistor—5 watt rating)
2. Input (5 watts) .....6.5V ±5% @ 3000 Hz. Test unit by slowly increasing input voltage to 6.5 Volts ±5%. Relay should energize and disconnect output circuit. Adjust 75 ohm control (4) to activate relay at above voltage if necessary.
3. Decrease the input voltage level to 3.0 Volts ± 5%. The relay should de-energize connecting the output circuit.

The two above AC voltage levels set the correct operating parameters for the STR within the music spectrum.

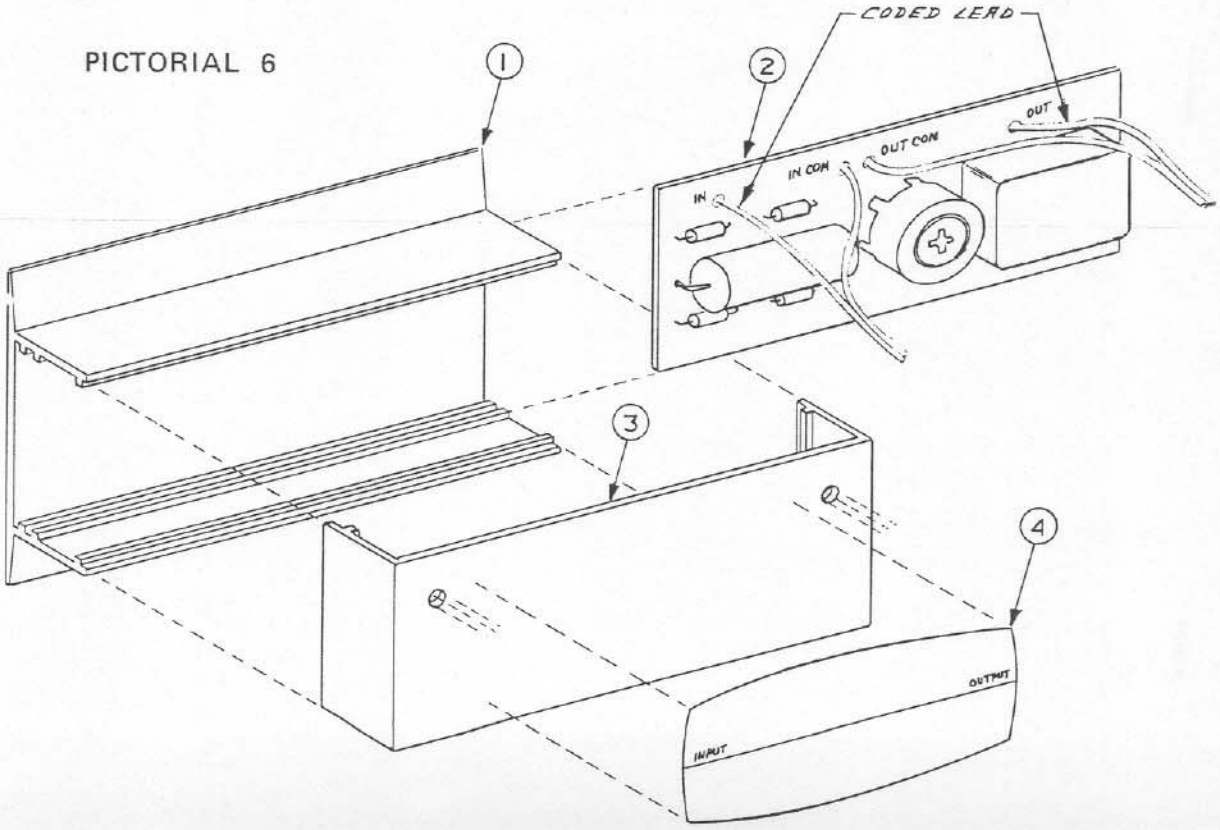
PARTS LIST

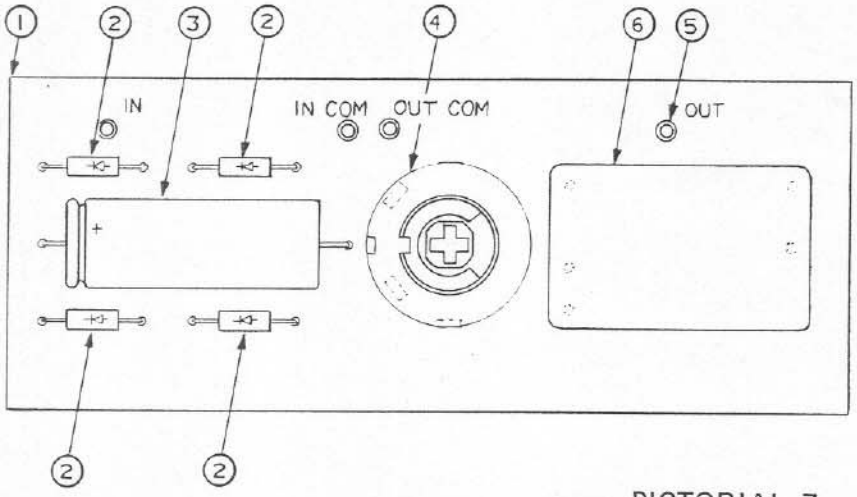
REF NO.	PART NO.	DESCRIPTION
1	79204	Base-Extruded Enclosure
2	87780	Printed Circuit Board Assy.
3	79203	Cover-Extruded
	535391	Label
	517-8968	Tweeter Protection Circuit (Complete)

PACKING PARTS

29649	Carton
535390	Sheet—Engineering Data

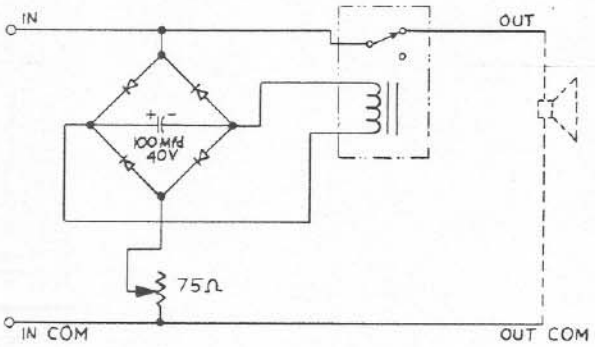
PICTORIAL 6





TWEETER PROTECTION CIRCUIT BOARD ASSEMBLY (87780)

PICTORIAL 7



PARTS LIST

REF NO.	PART NO.	DESCRIPTION
1	87780	PCB Assembly (Complete)
2	A43067	Diode
3	42418	Capacitor—Electrolytic 100 μF/40V
4	46618	Resistor-Variable 75 Ω
5	27259	Terminal (Malco)
6	56141	Relay—AM Zetter (AZ 535-11-2)

TECHNICAL DATA MODEL STR

An exceedingly high number of ST350A and other Electro-Voice manufactured tweeters returned to Electro-Voice for repair have open voice coils resulting from operating the units above the specified ratings. Horn type tweeter speakers are highly efficient and do not require the high power levels of bass speakers or even midrange speakers. Tweeter speakers, by their very nature of design, cannot withstand applied high power levels directly across their terminals for other than very short durations of time. Tweeters, when employed in a speaker system, are normally equalized, allowing for more applied power to the system in the tweeter frequency range than the tweeter itself could take. This is the case with the Sentry IV's ST350A.

Damage to tweeter speakers often is a situation where accidental high input level surges occur. In recording studios where high levels are dealt with and occasionally tapes are fast wound or fast rewound with tape lifters partially down, the tweeter may receive excessive high power in its spectrum, picked up from the fast moving tape.

A second source of tweeter damage may be the result of an oscillating transistor amplifier. Oscillating transistor amplifiers are capable of supplying their rated output power limits at an inaudible frequency such as 30 kilohertz (kHz). Such energy applied across a tweeter can destroy its voice coil. Transistor amplifier oscillations are generated in the driver and output circuits of the amplifier—normally a result of poor components or poor design within the amplifier itself.

The Electro-Voice Model STR, with its electrical and mechanical design, will greatly aid in protecting tweeter speakers from excessive currents in their frequency spectrum. However, due to the vast number of musical inputs possible, a tweeter protector cannot be a 100% guarantee against tweeter burnout. In use, the E-V Model STR will trip when any excessive damaging power is applied to the tweeter speaker, thus protecting the tweeter's voice coil.

INSTALLING STR TWEETER PROTECTOR ON MODEL SENTRY IV

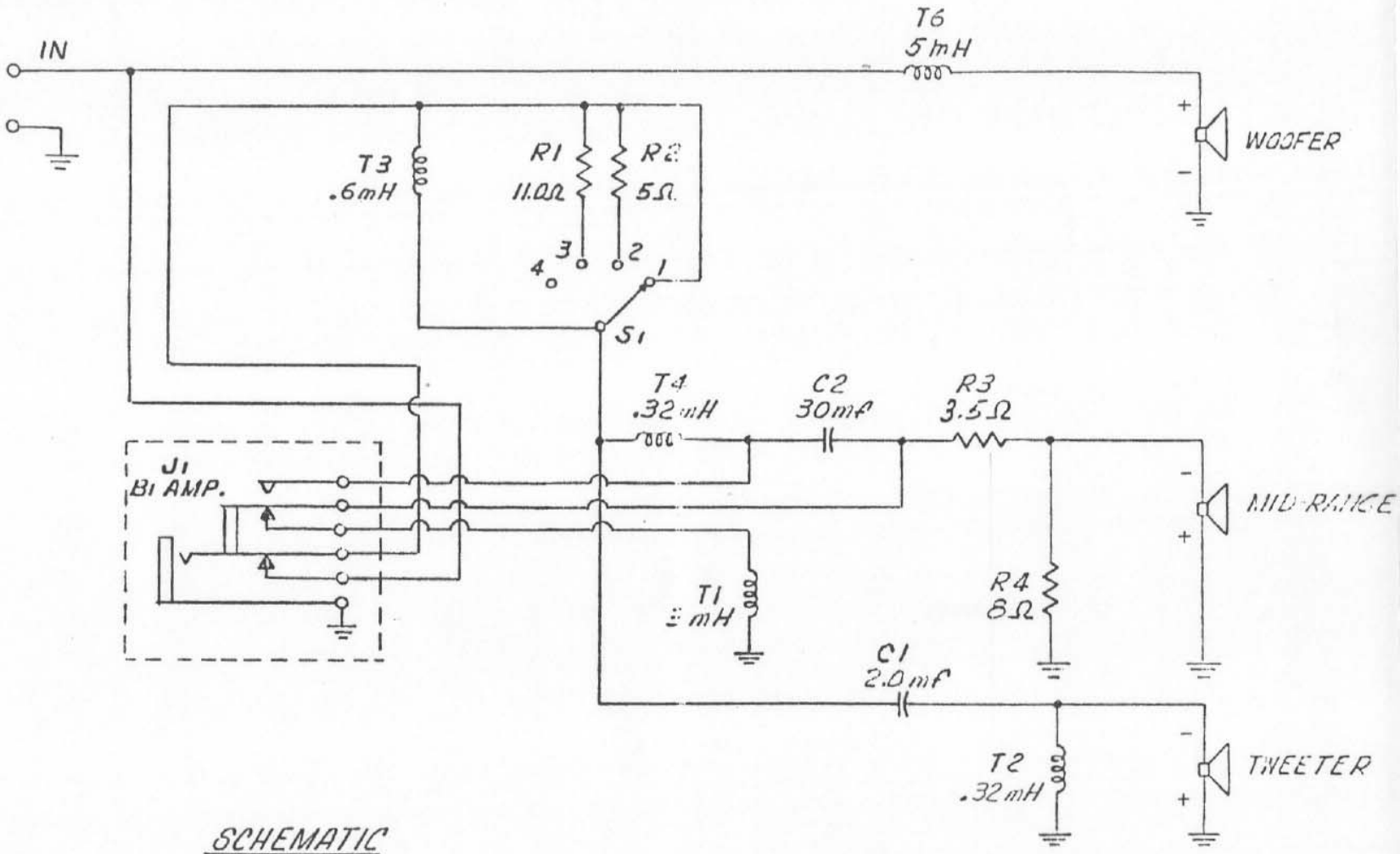
MOUNTING:

Locate the Model STR on the midrange horn adjacent to the crossover assembly (Pictorial 3). Use four (4) small wood or self-tapping screws. Drill holes in STR case and Sentry IV midrange horn using the proper size drill.

CONNECTIONS:

The Sentry IV Tweeter is wired REVERSE PHASE with respect to the bass speakers. Refer to the Sentry IVA system schematic and follow instructions carefully.

1. Remove wire lead between Sentry IV crossover network tweeter output terminals and the input terminals on the ST350A tweeter.
2. Connect the STR input coded striped lead to the RED crossover tweeter output terminal.
3. Connect the STR input plain lead to the BLACK crossover output terminal.
4. Connect the STR output coded strip lead to terminal T2 on the ST350A tweeter.
5. Connect the STR output plain lead to terminal T1 on the ST350A tweeter.



SCHEMATIC
SENTRY IV.B