

Electro-Voice®

a MARK IV company

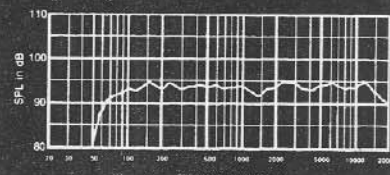


FIGURE 1
Axial Frequency Response 4 Volts/10 Feet

Model S-1503ER Biampable Three-Way Stage System

SPECIFICATIONS

Frequency Response, 10 Feet on Axis,
Swept 1/3-Octave, Half-Space Anechoic
Environment (see Figure 1):

62-20,000 Hz

Low-Frequency 3-dB-Down Point:

62 Hz

Usable Low-Frequency Limit

(10-dB-down point):

40 Hz

Half-Space Reference Efficiency:

4.5%

Long-Term Average Power Handling
Capacity per EIA Standard RS-426A
(see Power Handling Capacity section),

Full Range: 300 watts

Low Frequency: 400 watts

High Frequency: 125 watts

Maximum Woofer Acoustic Output:

18 watts

Sound Pressure Level at 1 Meter,
1 Watt Input, Anechoic Environment,
Band-Limited Pink-Noise Signal,

300-2,000 Hz:

100 dB

Dispersion Angle Included by
6-dB-Down Points on Polar Responses,
Indicated One-Third-Octave Bands

of Pink Noise,

250-20,000 Hz Horizontal

(see Figure 3):

120° ± 60°

250-20,000 Hz Vertical

(see Figure 3):

100° ± 60°

Directivity Factor R_0 (Q), 800-16,000 Hz
Median (see Figure 4):

10.7 (+9.0, -8.6)

Directivity Index D_i , 800-16,000 Hz

Median (see Figure 4):

10.3 dB (+2.6 dB, -7 dB)

Distortion, 0.1 Full Power Input

Second Harmonic,

100 Hz: 8.9%

1000 Hz: 0.8%

10,000 Hz: 11%

Third Harmonic,

100 Hz: 2.2%

1000 Hz: 2.0%

10,000 Hz: 3.1%

Distortion, 0.01 Full Power Input

Second Harmonic,

100 Hz: 5.5%

1000 Hz: 0.5%

10,000 Hz: 3.8%

Third Harmonic,

100 Hz: 1.0%

1000 Hz: 1.0%

10,000 Hz: 0.5%

Transducer Complement,

High-Frequency:

DH2010A driver

HT94 horn

Mid-Frequency:

Vented midrange

Low-Frequency:

High excursion, EVM-15B Pro-Line

Box Tuning Frequency:

44 Hz

Crossover Frequencies:

600 Hz & 4,000 Hz

Crossover Slope:

12-dB-per-octave

Impedance,

Nominal:

8 ohms

Minimum:

5.2 ohms

Input Connections:

Parallel Neutrik Speakon™ NL4MPR

Use Neutrik Speakon™ NL4FC for cable

Enclosure Materials and Colors:

Black carpet covered Road-Wood™

Dimensions:

75.5 cm (29.7 in.) high

37.6 cm (14.8 in.) deep

63.0 cm (24.8 in.) wide

Net Weight:

44 kg (97 lb)

Shipping Weight:

47 kg (103 lb)

DESCRIPTION

The Electro-Voice S-1503ER is a 300-watt, three-way, high-efficiency stage system. It combines professional quality components, highlighted by the VMR® vented midrange speaker, with an unusually durable Thiele-Small-aligned vented enclosure. The system may be bi-amplified or mono-amplified using the internal passive crossover. The result is clear and articulate high-quality sound.

The enclosure is constructed of Road-Wood™, a structural material made of layered and selectively oriented hardwood strands strongly bonded together with phenolic resins. This high-strength shell (U.S. Patent #4,624,338) is covered with densely woven, abuse-resistant black carpeting.

The high-frequency section of the S-1503ER utilizes a 90° x 40° constant-directivity horn driven by a one-inch-throat, wide-bandwidth, titanium diaphragm driver. This driver uses a unique convex drive Time Path™ phasing plug structure (U.S. Patent #4,525,604) for smooth and extended high-frequency performance. The voice coil is coupled to the diaphragm with EV's exclusive Resonant Drive™ technology (patent pending). This increases and smooths the high-frequency response and reduces the amount of internal equalization required for flat frequency response.

A self-resetting, high-frequency protection circuit has been added to the S-1503ER to prevent against accidental overdrive and to

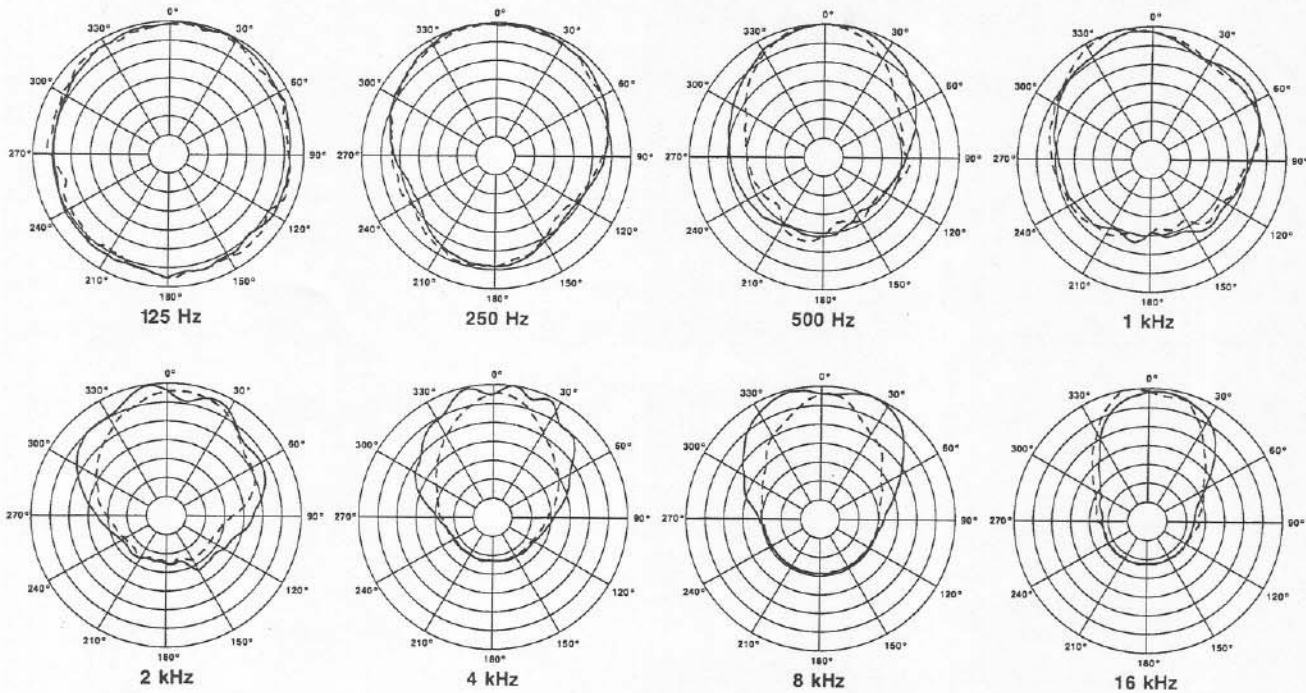


FIGURE 2
Polar Response
 ($\frac{1}{3}$ -octave pink noise, 4 volts/10 feet)

HORIZONTAL ———
 VERTICAL - - - -

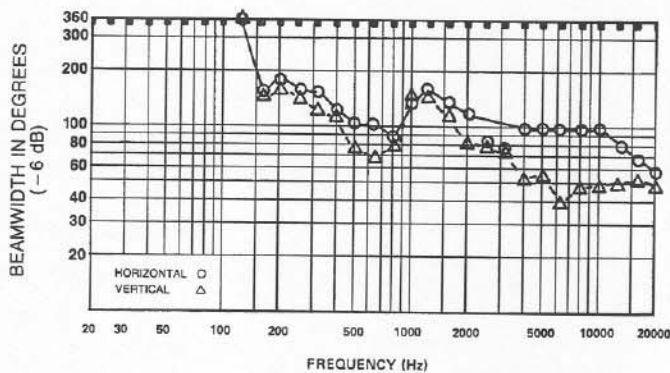


FIGURE 3
Beamwidth vs. Frequency
 Whole Space (anechoic)

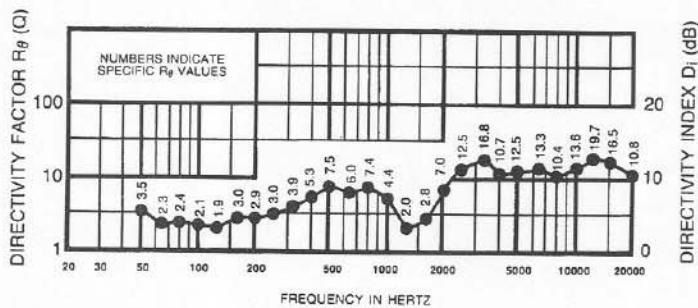


FIGURE 4
Directivity vs. Frequency
 Whole Space (anechoic)

improve system reliability. If the input power to the high-frequency driver exceeds the nominal rating, the protection circuit is activated and reduces the power delivered to the driver by 6 dB. The system will remain in this mode of operation until the input power is reduced to a safe level.

The bass section of the S-1503ER is designed using Thiele-Small parameters for efficient performance to below 60 Hz. The 15-inch woofer is a high-excursion EVM-15B Pro-Line unit featuring beryllium copper lead wires with an extended-length edgewound voice coil further protected by the unique EV Thermo Inductive Ring (TIR™). The part of the magnetic structure adjacent to the coil is insulated using the exclusive EV PROTEF™ process (U.S. Patent #4,547,632). The coil is driven by a massive (16 lb) magnetic structure.

THE VENTED MIDRANGE

An unusual feature of this system is the vented midrange used to bridge the frequency region between the woofer and the tweeter. This EV innovation represents a unique way of providing high acoustic output and efficiency from a compact direct-radiator form of loudspeaker. It is capable of providing large amounts of acoustic output from a small package that can be gracefully integrated into a medium size loudspeaker system. It does so without having the "honky" sound quality and upper-range beaminess often associated with small-format horn transducers used to cover midrange frequencies with a bandpass beginning below 1,000 Hz. It contributes to providing natural high-quality sound in a musical instrument loudspeaker system.

ENCLOSURE CONSTRUCTION

The S-1503ER enclosure utilizes a structural material that combines the strength of high-quality plywood with the density and acoustic damping of particle board without brittleness. Road-Wood uses the same principle of crossbanding veneers, as in plywood, in order to achieve its very high rigidity. A tough liquid-phenolic resin is blended with long, narrow strands of hardwood. Alternate layers are perpendicularly bonded under intense heat and pressure to form panels of superior uniformity. Unlike many grades of plywood, Road-Wood is dimensionally stable, water-resistant and free from voids.

A combination of dado-cut joints, tough adhesives, and proper bracing ensure a sonically dead enclosure free from panel resonances.

The densely-woven, industrial-grade, abuse-resistant carpeting provides a finish that is both attractive and highly durable. Large, heavy-duty metal corner protectors, firmly secured rubber feet, and recessed handles complete the enclosure and ensure that the S-1503ER speaker system is ideally suited to a long and reliable life "on the road."

FREQUENCY RESPONSE

The combination of 15-inch woofer, vented midrange and high-frequency tweeter provide the wide and smooth overall response shown in Figure 1. This response was measured at ten feet, using a 4-volt input in an anechoic chamber, and was measured using a swept 1/3-octave signal. No external equalization was used.

DIRECTIVITY

The polar response of the S-1503ER speaker system at selected 1/3-octave bandwidths is shown in Figure 2. These polar responses were measured in an anechoic environment at 10 feet using 1/3-octave pink-noise inputs. The frequencies selected are fully representative of the polar response of the system. Beamwidth of the system utilizing the complete 1/3-octave polar data is shown in Figure 3. R_p (Q) and directivity index (D_i) are plotted in Figure 4.

BI-AMPING

The S-1503ER may be easily converted for bi-amp operation. On the rear connector panel there are two 11 pin plugs and sockets with exposed jumper wires. For normal operation the 4 wire jumper is to the left. Reversing the plugs puts the S-1503ER in the bi-amp mode. The crossover frequency for bi-amp operation should be between 600 and 800 Hz with either a second-order Butterworth (12-dB-per-octave slopes), a third-order Butterworth (18-dB-per-octave slopes), or a fourth-order Butterworth (24-dB-per-octave slopes) response characteristic. For flattest response in the crossover region when a second-order or fourth-order crossover is used, the polarity between the woofer and high-frequency sections should be the same, i.e., the positive output terminal of the low-frequency amplifier should go to the positive woofer input on the S-1503ER and the positive output terminal of the high-frequency amplifier should go to the positive high-frequency input on the S-1503ER. This instruction assumes of course, that there is no polarity shift between the high- and low-frequency amplifier channels. *When a third-order crossover is used, the polarity between the woofer and high-frequency section should be reversed.*

CONNECTIONS

The S-1503ER is equipped with Neutrik Speakon™ NL4MPR connectors. Two connectors are installed in parallel allowing additional S-1503ERs to be installed. One mating Speakon™ connector NL4FC is supplied with each system. These connectors are locking, self-polarizing and capable of 30 amps rms continuously. Additional connectors and cables can be purchased from your dealer.

If you experience any difficulty in obtaining cables, connectors, or wiring accessories the following companies can be contacted.

Neutrik USA, Inc.
1600 Malone Street
Millville, NJ 08332

Pro Co Sound, Inc.
135 E. Kalamazoo Ave.
Kalamazoo, MI 49007

Whirlwind Music Distributors, Inc.
P.O. Box 1075
Rochester, NY 14603

The pin arrangements are:

Full Range:

- 1 - = IN (-)
- 1 + = IN (+)
- 2 - = Not used
- 2 + = Not used

Bi-Amp:

- 1 - = LF (-)
- 1 + = LF (+)
- 2 - = HF (-)
- 2 + = HF (+)

POWER HANDLING CAPACITY

To our knowledge, Electro-Voice was the first U.S. manufacturer to develop and publish a power test closely related to real-life conditions. First, we use a random noise input signal because it contains many frequencies simultaneously, just like real voice or instrument program. Second, our signal contains more energy at extremely high and low frequencies than typical actual program, adding an extra measure of reliability. Third, the test signal includes not only the overall "long-term average" or "continuous" level — which our ears interpret as loudness — but also short-duration 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 on up, but we apply the long-term average for several hours, adding another extra measure of reliability.

Specifically, the S-1503ER is designed to withstand the power test described in the revised 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 (one-third-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. This shaped signal is sent to the power amplifier with the continuous power set at 300 watts into the 7.7 ohms EIA equivalent impedance, (48.1 volts true rms). Amplifier clipping sets

instantaneous peaks at 6 dB above the continuous power, or 1200 watts peak (96.1 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

GRILLE REMOVAL

The grille assembly of the S-1503ER is fastened to the enclosure using four sturdy dual-lock fasteners. The grille assembly can be removed quickly and easily, allowing access to the drivers, by firmly pulling on the two black polyester ribbon loops provided.

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); 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, Michigan 49107.

Specifications subject to change
without notice.

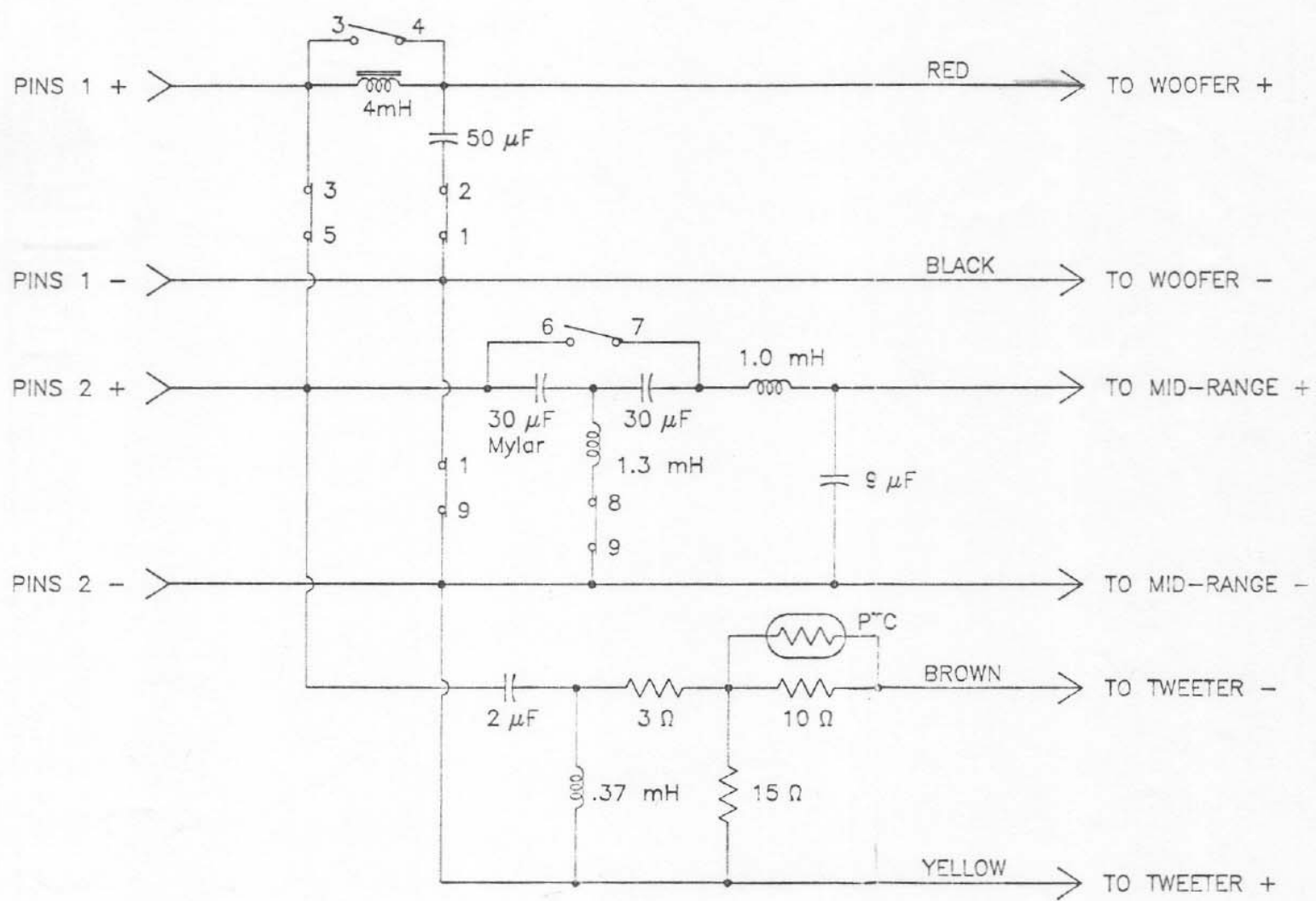


ELECTRO-VOICE, INC., 600 Cecil Street, Buchanan, Michigan 49107

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SCHEMATIC DIAGRAM
SHOWN IN NORMAL POSITION

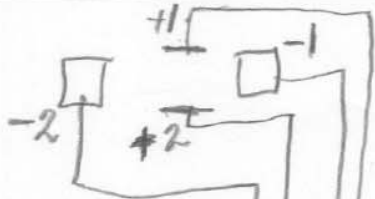


WIRING DIAGRAM
EXPLODED FOR CLARITY

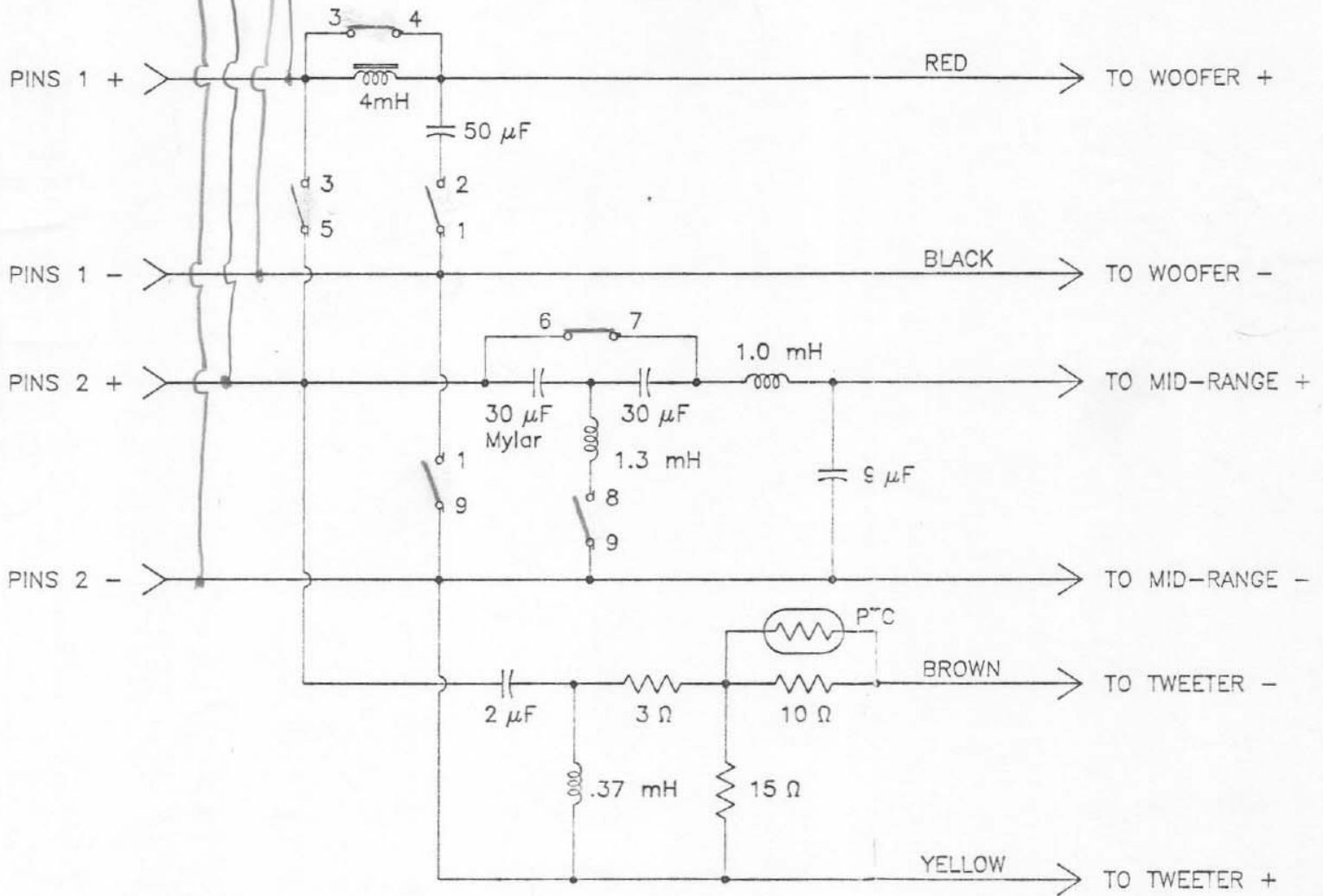
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SCHEMATIC DIAGRAM
 SHOWN IN ~~NORMAL~~ POSITION
 BI-AMP



S1503 ER
WIRING DIAGRAM