



## T53

### Biampable Three-Way Stage System

- PRO™ circuit provides HF driver protection
- Constant-directivity 90° x 40° die-cast horn
- Roadworthy enclosure with metal corners and grille, and heavy-duty handles
- High-excursion, DL15T 15-in. woofer, specially designed for use in a trapezoidal enclosure
- Biampable system, with LF power handling of 400 watts (1,600 watts peak) and HF power handling of 200 watts (800 watts peak)
- Professional Neutrik Speakon® connectors for biamp or full-range operation

#### SPECIFICATIONS

Frequency Response, 1 Watt/1 Meter on Axis, Swept Sine-Wave Input, Half-Space Anechoic Environment (see Figure 1):

63-20,000 Hz

Low-Frequency 3-dB-Down Point:

63 Hz

Usable Low-Frequency Limit

(10-dB-down point):

43 Hz

Half-Space Reference Efficiency:

3.4%

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:

200 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):

90° ±50°

5,000-20,000 Hz, Vertical (see Figure 3):

50° ±10°

Directivity Factor  $R_s(Q)$ , 800- to 16,000-Hz

Median (see Figure 4):

13.6 (+5.2, -10.7)

Directivity Index  $D_s$ , 800- to 16,000-Hz

Median (see Figure 4):

11.3 dB (+1.4 dB, -6.7 dB)

Distortion, 0.1 Full Power Input,

Second Harmonic,

100 Hz:

8.9%

1,000 Hz:

0.8%

10,000 Hz:

11%

Third Harmonic,

100 Hz:

2.2%

1,000 Hz:

2.0%

10,000 Hz:

3.1%

Distortion, 0.01 Full Power Input,

Second Harmonic,

100 Hz:

5.5%

1,000 Hz:

0.5%

10,000 Hz:

3.8%

Third Harmonic,

100 Hz:

1.0%

1,000 Hz:

1.0%

10,000 Hz:

0.5%

Transducer Complement,

High Frequency:

DH2010A driver; HT94 horn

Mid Frequency:

DL10X (10 in.)

Low Frequency:

DL15T high-excursion woofer (15 in.)

Box Tuning Frequency:

55 Hz

Crossover Frequencies:

600 Hz, 2,200 Hz

Crossover Slope:

12 dB per octave

Impedance,

Nominal:

8 ohms

Minimum:

5.4 ohms

Input Connections:

Two paralleled Neutrik Speakon® NL4MPR

jacks for full-range or biamp operation and

a single 1/4-inch phone jack for full-range

operation (use Neutrik Speakon® NL4FC

for cable)

Enclosure Materials and Colors:

Black carpet-covered Road-Wood™

Dimensions,

Height:

112 cm (43.9 in.)

Width:

48.3 cm (19.0 in.)

Depth:

39.6 cm (15.6 in.)

Net Weight:

44.5 kg (98 lb)

Shipping Weight:

49.0 kg (108 lb)

#### DESCRIPTION

The Electro-Voice T53 is a trapezoidal-shaped, 300-watt, three-way, high-efficiency stage system. It combines professional-quality components, highlighted by the DL10X midrange speaker. The system may be biampified or used full range with 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 cov-

FIGURE 1 — T53 Axial Frequency Response, 1 Watt/1 Meter

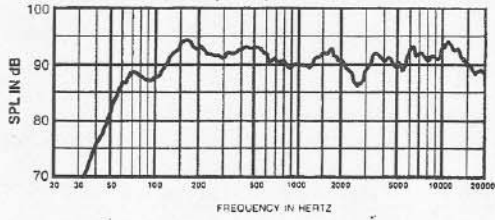


FIGURE 3 — T53 Beamwidth vs. Frequency, Whole Space (anechoic)

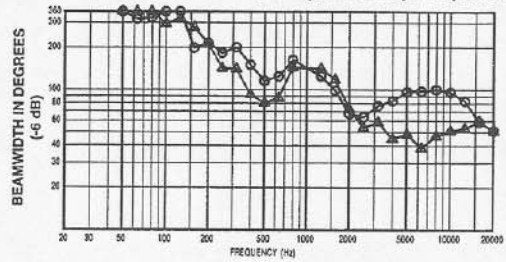


FIGURE 2 — T53 Polar Response (one-third-octave pink noise, 4 volts/10 feet)

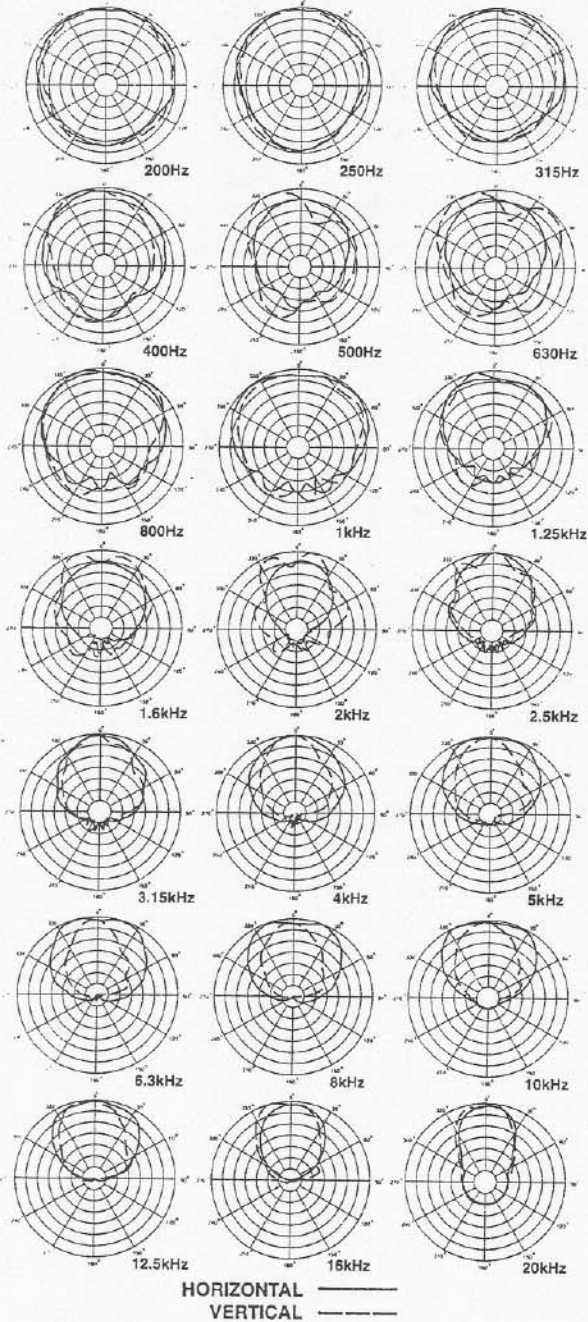
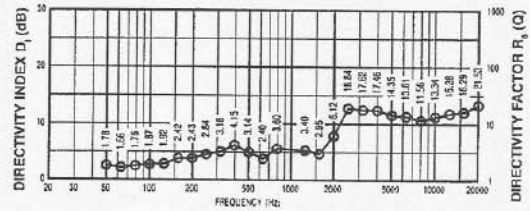


FIGURE 4 — T53 Directivity vs. Frequency, Whole Space (anechoic)



ered with densely woven, abuse-resistant black carpeting.

The high-frequency section of the T53 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. This increases and smooths the high-frequency response and reduces the amount of internal equalization required for flat frequency response.

EV's self-resetting PRO™ circuit is built into the crossover network to guard the compression driver from damage. If input power to the driver exceeds the nominal rating, the PRO circuit is activated, reducing the power delivered to the driver by 6 dB. The system will remain in this mode of operation until input power is reduced to a safe level.

The optimally vented bass section of the T53 is designed using Thiele-Small parameters for efficient performance to below 63 Hz. The DL15T high-excursion 15-inch woofer is specially designed for use in a trapezoidal enclosure. It features beryllium copper lead wires with a low-mass, extended-length, edge-wound voice coil and high-temperature materials. EV's unique Thermo Inductive Ring (TIR™) is placed on top of the pole piece, where the extended-length voice coil would normally be exposed, placing metal in close proximity to the coil and providing a major heat-transfer path that helps keep the voice coil cool. Also, the part of the magnetic structure adjacent to the coil is insulated from any rubbing contact induced by high power inputs, using EV's exclusive PROTEF™ coating (U.S. Patent #4,547,632). The coil is driven by a massive, 14-lb magnetic structure.

#### ENCLOSURE CONSTRUCTION

The T53 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 ensures 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 T53 speaker system is ideally suited for a long and reliable life "on the road."

#### FREQUENCY RESPONSE

The combination of a DL15T 15-inch woofer, DL10X midrange, DH2010A wide-bandwidth high-frequency driver and an equalized crossover results in the wide and smooth overall response shown in Figure 1. The T53's axial frequency response was measured in Electro-Voice's large anechoic chamber at a distance of 10 feet with a swept sine-wave input of 4 volts. Figure 1 has been averaged and corrected for 1 watt/1 meter.

#### DIRECTIVITY

The polar response of the T53 speaker system at selected one-third-octave bandwidths is shown in Figure 2. These polar responses were measured in an anechoic environment at 10 feet using one-third-octave pink-noise inputs. The frequencies selected are fully representative of the polar response of the system. Beamwidth of the system utilizing the complete one-third-octave polar data is shown in Figure 3.  $R_p$  and directivity index (D) are plotted in Figure 4.

#### BIAMPING

The T53 may be easily converted for biamp operation using the switch provided on the rear input panel. The crossover should be at 600 Hz with slopes of 12 dB per octave or greater.

#### CONNECTIONS

The T53 is equipped with Neutrik Speakon® NL4MPR connectors. Two connectors are installed in parallel allowing additional T53's to be installed. One mating Speakon® NL4FC connector 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. An additional 1/4-inch phone jack is provided for full-range operation.

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 Avenue  
Kalamazoo, MI 49007

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

Full-range pin arrangements are:

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

Biamp pin arrangements are:

- 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 be-

cause 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 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 T53 is designed to withstand the power test described in 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 an analyzer having the usual constant-percentage bandwidth (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-ohm EIA equivalent impedance (48.1 volts true rms). Amplifier clipping sets instantaneous peaks at 6 dB above the continuous power, or 1,200 watts peak (96.1 volts peak). This procedure provides a rigorous test of both thermal and mechanical failure modes.

#### ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The loudspeaker system shall be a three-way, full-range design consisting of a 38.1-cm (15-inch) woofer in a vented, trapezoidal-shaped enclosure, a 25.4-cm (10-inch) midrange speaker, a high-frequency compression driver mounted on a 90° x 40° constant-directivity horn, and a passive crossover/equalizer network, of which the lower frequency may be bypassed for use with an external low-level active dividing network with a corner frequency of 600 Hz. The loudspeaker shall meet the following performance criteria: frequency response of 63-20,000 Hz, -3 dB; full-range power handling of 300 watts long term and 1,200 watts short term with a shaped random-noise input per EIA Standard RS-426A; low-frequency power handling below 600 Hz in the biamp mode of 400 watts long term and 1,600 watts short term with a shaped random-noise input per EIA Standard RS-426A; high-frequency power handling above 600 Hz in the biamp mode of 200 watts long term and 800 watts short term with a shaped random-noise input per EIA Standard RS-426A; sensitivity of 100 dB SPL at 1 meter with a 1-watt, 300- to 2,000-Hz pink-noise input; 6-dB-down horizontal coverage angle of 90° ±50° in the



250- to 20,000-Hz range; 6-dB-down vertical coverage angle of  $50^{\circ} \pm 10^{\circ}$  in the 5,000- to 20,000-Hz range; crossover frequencies of 600 and 2,200 Hz; nominal impedance of 8 ohms; and minimum impedance of 5.4 ohms. Input connections shall be two paralleled Neutrik Speakon® NL4MPP jacks for full-range and biamp operation and a paralleled 1/4-inch phone jack for full-range operation. The enclosure shall be constructed of Road-Wood™, a structural hard-wood composite material, covered in black carpet and fitted with a black steel grille, metal corner protectors, rubber feet and two recessed carrying handles. Dimensions shall be 112 cm (43.9 in.) high x 48.3 cm (19.0 in.) wide x 39.6 cm (15.6 in.) deep. Net weight shall be 44.5 kg (98 lb).

The loudspeaker system shall be the Electro-Voice T53.

#### **WARRANTY (Limited)**

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The

product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831) and/or Electro-Voice West, at 8234 Doe Avenue, Visalia, CA 93291 (209/651-7777 or 800/825-1242). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall

not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Electro-Voice Speakers and Speaker Systems** are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Electro-Voice active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

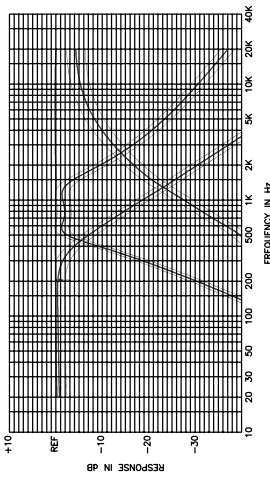
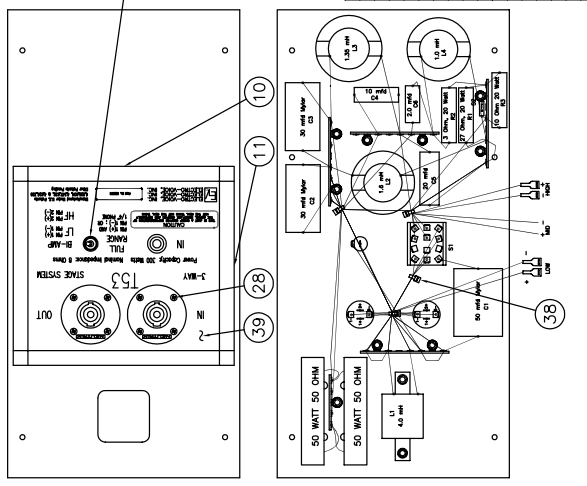
Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.



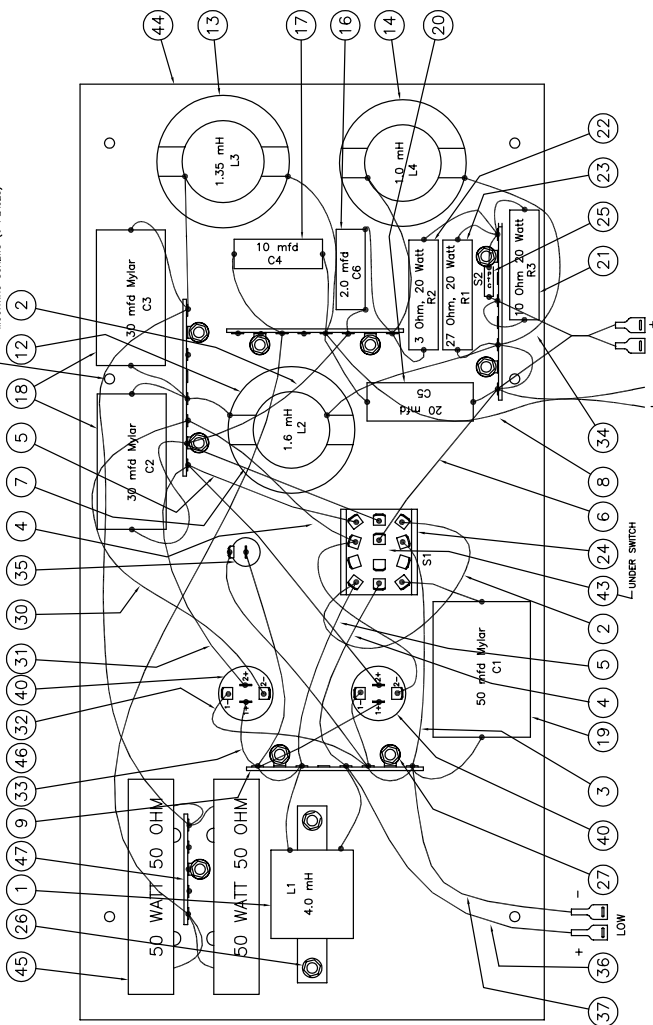
**ELECTRO-VOICE** a MARK IV company 600 Cecil Street, Buchanan, Michigan 49107  
MANUFACTURING PLANTS AT ■ BUCHANAN, MI ■ NEWPORT, TN ■ SEVIERVILLE, TN ■ OKLAHOMA CITY, OK ■ GANANOQUE, ONT.  
© Electro-Voice, Inc. 1993 ■ Litho in U.S.A. Part Number 532072 — 9338

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A	1	RELEASED TO PRODUCTION	11-14-93	F. DIGIROLOMO
B	1	ADDED ITEM 41	9-16-93	B.M.
B	2	REVISED NOTE 1		
B	3	REVISED NOTE 2		
B	4	CORRECTED WIRE THE VIEW.		
C	1	ADDED 39790	1-26-94	B.M.
C	2	ADDED 39790	3-07-94	B.M.
D	1	NOTE 4 WAS NOTE 5.	8-22-95	L.S.
D	2	NOTE 4 WAS NOTE 5.	8-22-95	L.S.
E	1	16714-21 WAS 16714-08	10-16-96	T.W.
E	2	16714-21 WAS 16714-08	10-16-96	T.W.
F	1	ITEM 23 QTY. WAS 2.	10-23-96	
F	2	ADDED VOLTAGE TRANSFER.		
F	3	UPDATED SCHEMATIC.		
F	4	UPDATED SCHEMATIC.		
F	5	UPDATED SCHEMATIC.		
F	6	UPDATED SCHEMATIC.		
F	7	UPDATED SCHEMATIC.		
F	8	UPDATED SCHEMATIC.		
F	9	UPDATED SCHEMATIC.		
F	10	UPDATED SCHEMATIC.		

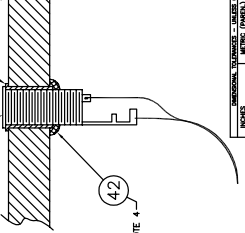


VOLTAGE TRANSFER

WIRING DIAGRAM EXPLODED FOR CLARITY



- NOTES:
- ITEM 44 USING RY (EV # 37289) ITEM 41.
  - FIL ITEMS 12, 13, AND 14 TO ITEM 42 USING HOT MELT (EV# 97576) ITEM 42.
  - SOLDER ALL CONNECTIONS.
  - SECURE ITEM 38 USING HOT MELT (ITEM 42).



SEE NOTE 4

ITEM	PART NO.	QTY.	DESCRIPTION
47	27238	1	TERMINAL STRIP
46	16586-26	2	WIRE, HOOKUP, YELLOW 18 GA., 12' LG.
45	46840	2	RES. 50 OHM, 50 WATT 10%
44	69190	1	BOARD, MOUNTING
43	39790	1	WASHER, LOCK, 3/164 EXT TOOTH
42	97276	1	RETD HOT MELT, HIGH TEMP.
41	97289	1	RETD RY (EV# 37289) WHITE NON-CORROSI
40	39790	2	WASHER, LOCK, 3/164 EXT TOOTH
39	532076	1	TABLE MOUNT PANEL
38	89885	4	THE CABLE, 6F-350
37	89885	1	WIRE & RECEPT S/A, 24", BLACK
36	89884	1	WIRE & RECEPT S/A, 24", RED
35	89843	1	PHONE JACK S/A
34	83012	1	WIRE & RECEPT S/A
33	82170	2	WIRE S/A, RED, 6"
32	82169	2	WIRE S/A, BLACK, 6"
31	82468	2	WIRE S/A, ORANGE, 6"
30	82467	2	WIRE S/A, GREEN, 6"
29	70759	1	HEXAGON, SOCKET, PLASTIC, BLACK
28	63105	8	SCR, 4-24 X 1/2, FLT 180, BREG, TYPE AB, BLK ZINC
27	62944	2	SCR, 8-15 X 1/2, FLT 180, BREG, TYPE AB, BLK ZINC
26	62944	2	SCR, 8-15 X 1/2, FLT 180, BREG, TYPE AB, BLK ZINC
25	56202	1	SWITCH, 4PDT, ARROW-HAFT #82636
24	46869	1	RES. 27 OHM, 20 W, 10%
23	46869	1	RES. 3 OHM, 20 W, 10%
22	46822	1	RES. 10 OHM, 10%, 20 W, POWER ROCKWOOD
21	46815	1	CAP. 20 MFD, 100V
20	42766	1	CAP. 50 MFD, 10%, MYLAR
19	42761	1	CAP. 50 MFD, 10%, MYLAR
18	42760	2	CAP. 30 MFD, 10%, MYLAR
17	42728	1	CAP. 2.0 MFD, 5%, 100V, POLYESTER FILM
16	42936	1	CAP. 10 MFD, 5%, 100V, MYLAR
15	35143	1	INDUCTOR, 1.6 MH
14	35095	1	INDUCTOR, 1.3 MH
13	35095	1	INDUCTOR, 1.3 MH
12	35034	1	INDUCTOR, 1.6 MH
11	28039	2	TAPE, FOAM, TESIMOL, 7 IN LG
10	28039-39	2	TAPE, FOAM, TESIMOL, 8 1/2 IN LG, 1/2 IN WIDE
9	27384	4	TERMINAL STRIP
8	16714-21	1	WIRE, BLACK W/WHITE STRIPE, 45 IN
7	16586-03	1	WIRE, YELLOW, 5 IN
6	16586-03	1	WIRE, BROWN, 5 IN
5	16587-10	2	WIRE, RED, 5 IN
4	16586-11	2	WIRE, BLACK, 5 IN
3	16586-08	1	WIRE, WHITE, 6 IN
2	16586-10	2	WIRE, RED, 5 IN
1	15305	2	INDUCTOR, 4.0 MA, 10%

NAME	DATE	REV.
SCHALLER	9-18-93	1
SCHALLER	6-22-00	2
F. DIGIROLOMO	11-17-93	3

ITEM	PART NO.	QTY.	DESCRIPTION
47	27238	1	TERMINAL STRIP
46	16586-26	2	WIRE, HOOKUP, YELLOW 18 GA., 12' LG.
45	46840	2	RES. 50 OHM, 50 WATT 10%
44	69190	1	BOARD, MOUNTING
43	39790	1	WASHER, LOCK, 3/164 EXT TOOTH
42	97276	1	RETD HOT MELT, HIGH TEMP.
41	97289	1	RETD RY (EV# 37289) WHITE NON-CORROSI
40	39790	2	WASHER, LOCK, 3/164 EXT TOOTH
39	532076	1	TABLE MOUNT PANEL
38	89885	4	THE CABLE, 6F-350
37	89885	1	WIRE & RECEPT S/A, 24", BLACK
36	89884	1	WIRE & RECEPT S/A, 24", RED
35	89843	1	PHONE JACK S/A
34	83012	1	WIRE & RECEPT S/A
33	82170	2	WIRE S/A, RED, 6"
32	82169	2	WIRE S/A, BLACK, 6"
31	82468	2	WIRE S/A, ORANGE, 6"
30	82467	2	WIRE S/A, GREEN, 6"
29	70759	1	HEXAGON, SOCKET, PLASTIC, BLACK
28	63105	8	SCR, 4-24 X 1/2, FLT 180, BREG, TYPE AB, BLK ZINC
27	62944	2	SCR, 8-15 X 1/2, FLT 180, BREG, TYPE AB, BLK ZINC
26	62944	2	SCR, 8-15 X 1/2, FLT 180, BREG, TYPE AB, BLK ZINC
25	56202	1	SWITCH, 4PDT, ARROW-HAFT #82636
24	46869	1	RES. 27 OHM, 20 W, 10%
23	46869	1	RES. 3 OHM, 20 W, 10%
22	46822	1	RES. 10 OHM, 10%, 20 W, POWER ROCKWOOD
21	46815	1	CAP. 20 MFD, 100V
20	42766	1	CAP. 50 MFD, 10%, MYLAR
19	42761	1	CAP. 50 MFD, 10%, MYLAR
18	42760	2	CAP. 30 MFD, 10%, MYLAR
17	42728	1	CAP. 2.0 MFD, 5%, 100V, POLYESTER FILM
16	42936	1	CAP. 10 MFD, 5%, 100V, MYLAR
15	35143	1	INDUCTOR, 1.6 MH
14	35095	1	INDUCTOR, 1.3 MH
13	35095	1	INDUCTOR, 1.3 MH
12	35034	1	INDUCTOR, 1.6 MH
11	28039	2	TAPE, FOAM, TESIMOL, 7 IN LG
10	28039-39	2	TAPE, FOAM, TESIMOL, 8 1/2 IN LG, 1/2 IN WIDE
9	27384	4	TERMINAL STRIP
8	16714-21	1	WIRE, BLACK W/WHITE STRIPE, 45 IN
7	16586-03	1	WIRE, YELLOW, 5 IN
6	16586-03	1	WIRE, BROWN, 5 IN
5	16587-10	2	WIRE, RED, 5 IN
4	16586-11	2	WIRE, BLACK, 5 IN
3	16586-08	1	WIRE, WHITE, 6 IN
2	16586-10	2	WIRE, RED, 5 IN
1	15305	2	INDUCTOR, 4.0 MA, 10%