



770A ELECTRONIC CROSSOVER BIAMPLIFIER

OPERATING INSTRUCTIONS

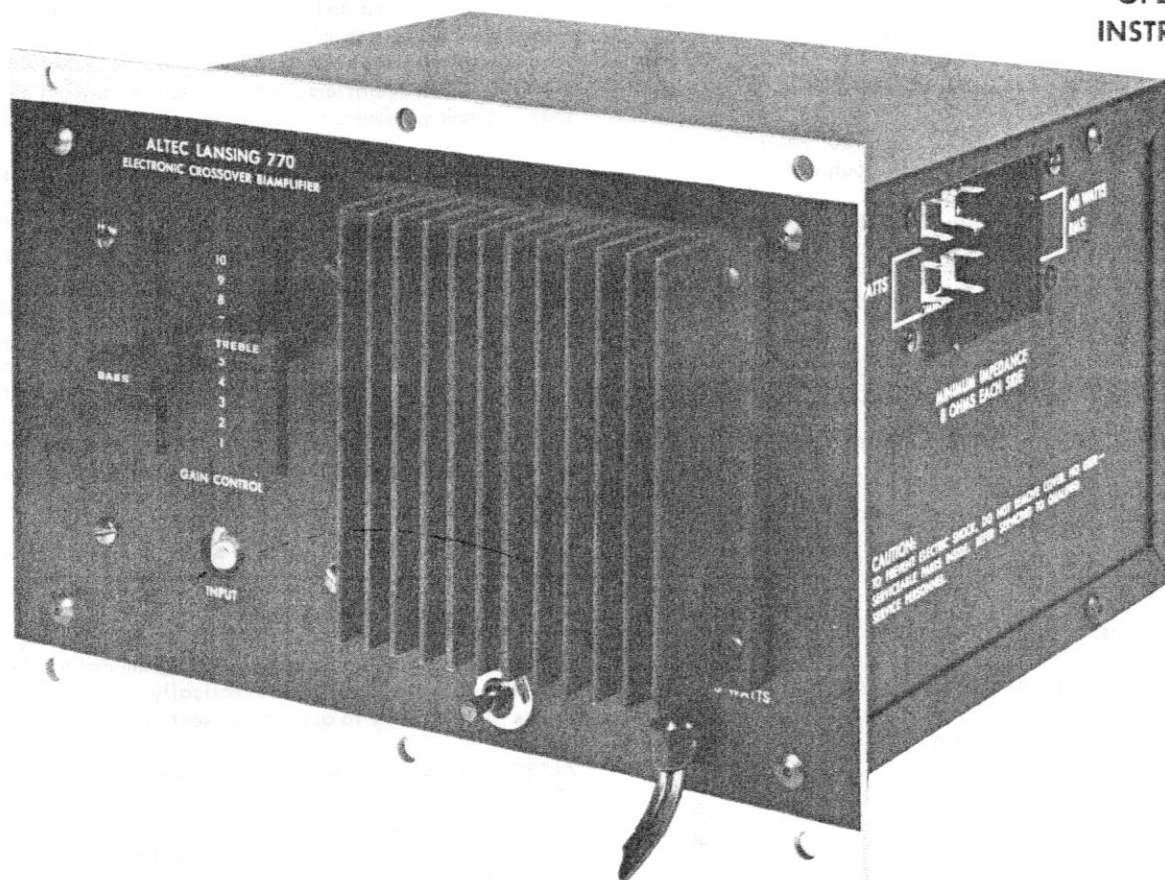


Figure 1. The ALTEC 770A Electronic Crossover Biampifier

Your new ALTEC 770A Electronic Crossover Biampifier represents a superior design in an amplifier for high fidelity music-sound systems. Compact — it may be mounted in the rear panel of your speaker enclosure. This outstanding biampifier was developed after extensive circuit evaluation and testing by ALTEC engineers to provide you with years of reliable high-quality performance.

FEATURES

- Separate amplifier for each speaker component for greater dynamic range
- Electronic crossover selectable at 500 or 800 Hz with attenuation of 12 dB/octave at frequencies beyond the crossover frequency
- High power output — totals 90W RMS — the bass amplifier output is 60W RMS and the treble amplifier output is 30W RMS
- Full advantage of amplifier damping is provided by direct coupling of the speakers to the biampifier
- Increased dynamic range provides undistorted power that may be compared to a single amplifier having a power output of 175W RMS
- Total harmonic distortion (THD) is less than 0.3% for all frequencies from 20 Hz to 20 KHz at full rated output
- IM distortion is inherently decreased to its lowest point — virtually unmeasurable by normal IHF method
- Signal Sentry™: 'on/off' switching circuit automatically turns 'on' when program material is being received and automatically turns 'off' two minutes after program ceases
- Fail-Safe protection system with active dissipation sensing circuit for protection of output transistors
- All plug-in modular solid-state circuitry
- Separate gain controls for bass and treble amplifiers
- self-contained power supply



A quality company of LTV Ling Altec, Inc.

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

1515 S. Manchester Ave., Anaheim, Calif. 92803
New York

42-02-042276-01
Litho in USA

Price \$0.42
CP-970-1K

SPECIFICATIONS

Power Output — Bass Amplifier:	60 watts RMS - 8 ohms
Treble Amplifier:	30 watts RMS - 8 ohms
THD:	Less than 0.3% at all frequencies 20 Hz to 20,000 Hz
IM Distortion:	Unmeasurable by normal IHF method
Frequency Response:	$\pm 1/2$ dB 20 Hz to 20,000 Hz (normalized composite output)
IHF Power Bandwidth:	15 Hz to 25,000 Hz (normalized composite output)
Damping Factor:	25
Hum and Noise:	80 dB below rated output (each channel)
Input Sensitivity:	0.5V RMS for rated output
Crossover Slope (Dual Section):	12 dB/octave
Control Range:	26 dB
Overall Dimensions:	6-1/2" H x 9-7/8" W x 9" D
Panel Cutout Dimensions:	5-1/2" H x 9-1/2" W
Weight:	16 pounds
Maximum Gain at Full Rated Output — Bass Amplifier:	73 dB
Treble Amplifier:	70 dB
Input Impedance:	80 kilohms
Load Impedance:	8 ohms, nominal (each channel)
Output Impedance:	Less than 10% of rated load impedance (each channel)
'Turn-On' Sensitivity Threshold:	10 mV
'Turn-Off' Hold Time:	2 minutes
Bass and Treble Level Controls:	Separate slide-type controls, continuously variable from +6 to -20 dB when referenced to a setting of '5'
Accessories:	4 speaker hookup wires and miscellaneous hardware

DESCRIPTION

The ALTEC 770A Electronic Crossover Biampifier is a solid-state amplifier designed to provide separate power amplification for speaker components in a two-way system. The common input for the 770A is provided from an external single-source preamplifier that plugs into the INPUT jack on the front panel of the 770A. The preamplifier drives the bass and treble ampli-

fiers of the 770A. The bass and treble amplifiers are separated by an electronic crossover network with the crossover frequency selectable for 500 or 800 Hz. The bass amplifier provides 60W RMS of power to the LF speaker and the treble amplifier provides 30W of power to the HF driver. With separate amplifiers for each speaker component, the full extent of amplifier damping can be achieved and an extreme power demand in the low frequencies will not affect the high-frequency reproduction. Panel-mounted slide controls provide adjustable shelving for the bass and treble amplifiers. From a nominal setting of '5', the shelving may be boosted to +6 dB or attenuated to -20 dB.

In a conventional sound system, the crossover network is placed between the output amplifier and the speakers — where the insertion loss of the network may consume more than 10% of the amplifier power output before the remaining power is distributed to the speakers. The crossover network in the ALTEC 770A is placed between the preamplifier and the output amplifiers so the full output from the amplifiers is distributed to the speakers. Transient response is improved as never before. The increased dynamic range of an ALTEC 770A biampifier sound system may therefore be compared to a conventional single amplifier system having a power output of 175W RMS! The results in sound quality from an ALTEC biampified sound system are dramatic and exciting.

A special feature of the 770A is ALTEC's exclusive Signal Sentry. This is a low-level sensing circuit that instantly energizes the amplifier when program material equal to or greater than 10 mV is applied to its input. The amplifier remains fully energized for two minutes after the program material has been removed; then it shuts off automatically, leaving the Signal Sentry circuit ready to accept the next program.

ALTEC's Active Dissipation Sensing Circuit is included in the 770A to protect the output transistors. The action of the sensing circuit is immediate and effective at all frequencies within the passband of the amplifier, limiting only that portion of the program material that would damage the transistors.

Completely self-contained, including its own dc power supply, the 770A plugs into any 120V, 50/60 Hz outlet and requires only simple connections to the LF speaker and HF driver. ALTEC's space-saving design for the 770A permits easy installation in the rear of the speaker enclosure, if desired. Figures 2 and 3 show front and right side views and Figure 4 illustrates wiring instructions.

INSTALLATION

The compact design of the ALTEC 770A allows it to be installed in the rear of a speaker enclosure. If installation is made in an existing speaker system, the passive crossover network already present in the system must be removed because the 770A contains the only crossover circuitry required. Only six steps are then necessary to complete the installation:

1. Cut a rectangular hole 5-1/2" H x 9-1/2" W in the back panel of the speaker enclosure.
2. Insert the 770A in the cutout and mark the location of the six holes for the securing hardware, then remove the 770A.
3. Drill each of the six holes to accept an 8-32 'T' nut.
4. Insert the six 'T' nuts in their respective holes from the inner side of the back panel of the speaker enclosure.

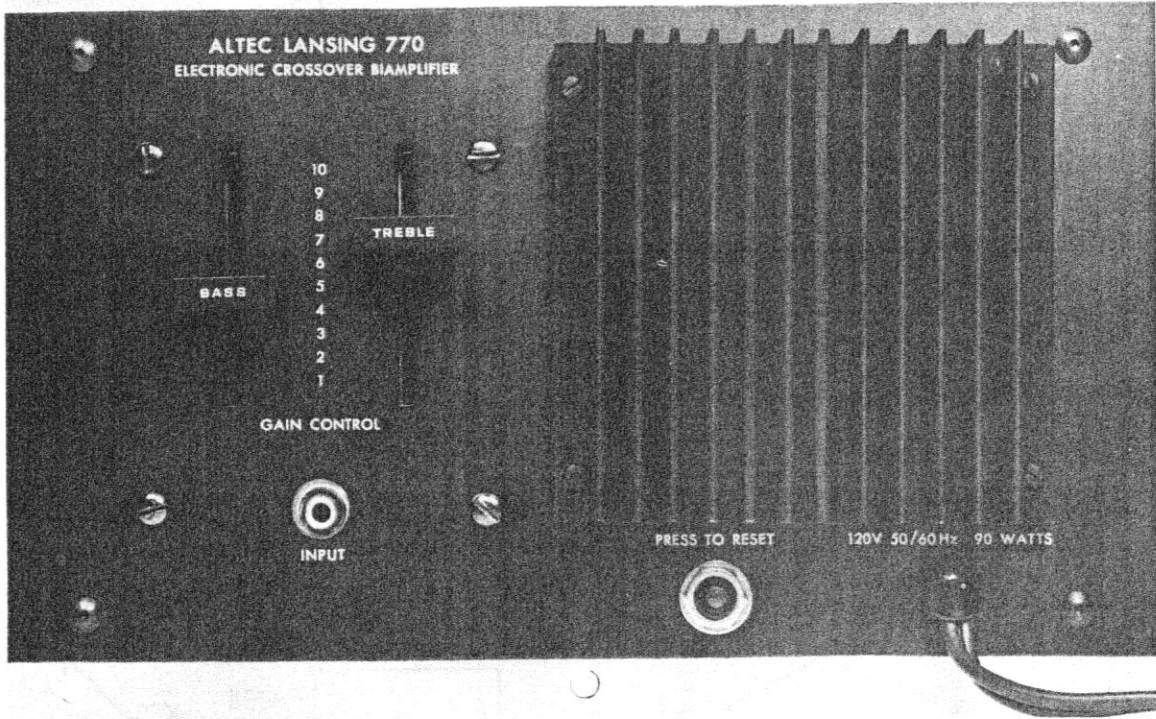


Figure 2. View of 770A Front Panel

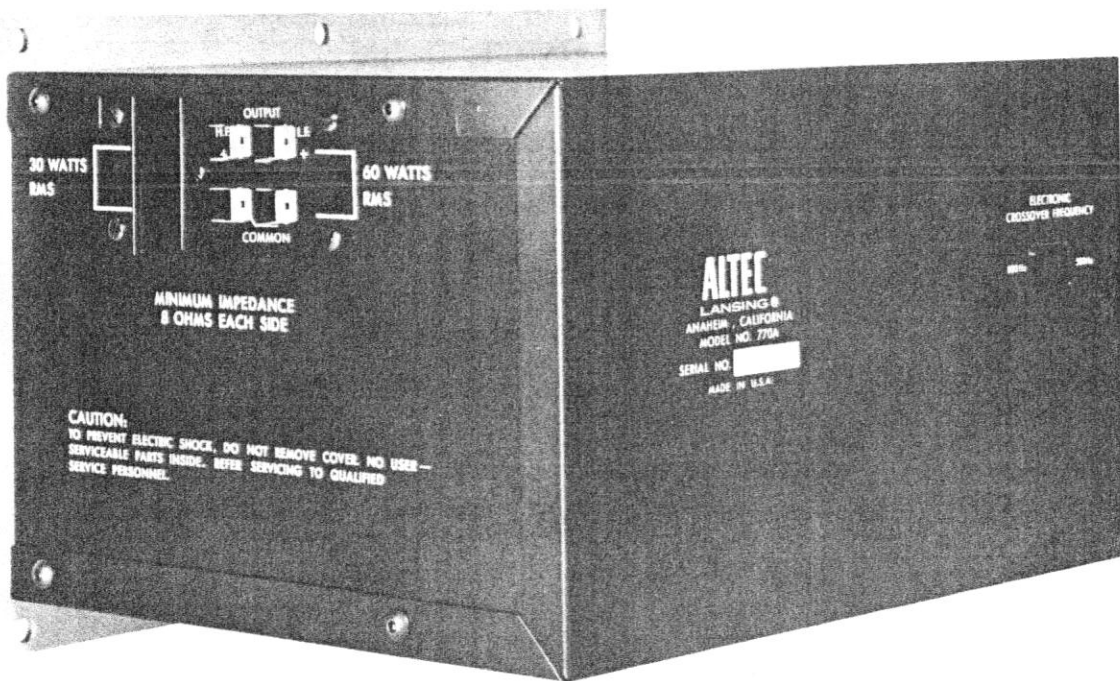


Figure 3. View of 770A Right Side and Rear Panels

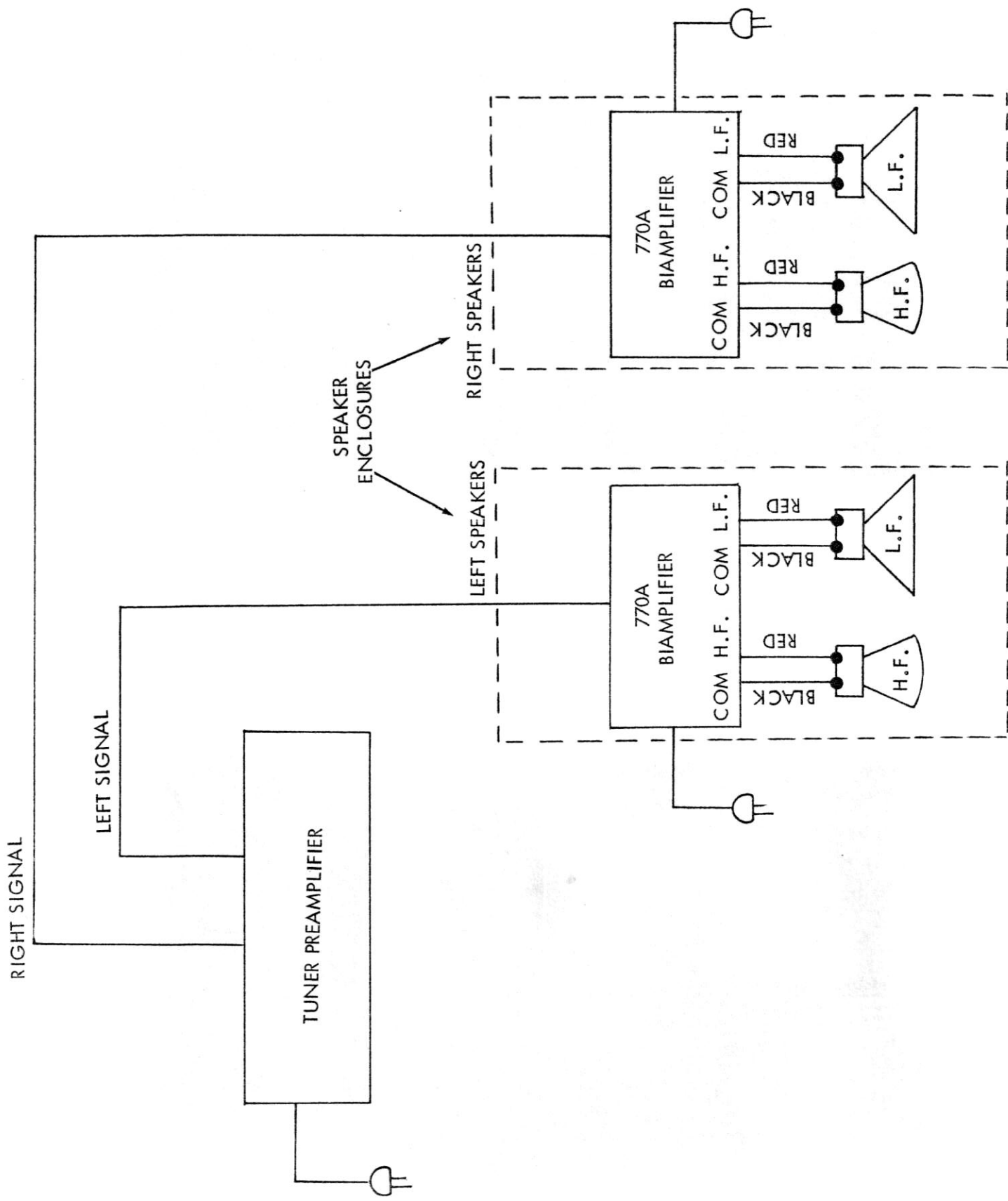


Figure 4. Speaker connection Diagram

5. Connect the speakers, as shown in Figure 4, with stranded AC line (zip or Class 11) or with the four special speaker wires provided with the 770A. When using stranded wire, be sure no loose strands are short circuiting to adjacent terminals or to the case of the 770A.

6. Install the 770A in the mounting hole and secure it to the 'T' nuts with the six 8-32 x 1-1/4" bolts supplied with the amplifier.

OPERATION

Input for the 770A is applied to the INPUT jack on the front panel of the biampifier. Interconnection with the preamplifier of the sound system should be made with shielded coaxial cable fitted with standard RCA phone plugs. Connect each channel output of the system preamplifier to the appropriate 770A in its respective speaker enclosure.

When all inputs have been provided, plug the line cord from each 770A into a 120V, 50/60 Hz outlet.

Set the BASS and TREBLE controls on the front panel of each 770A to position '5'. Select the tuner, tape or record player from the main sound system source. Adjust the BASS and TREBLE controls on each 770A to boost or shelve the signal as desired. No further adjustments are necessary.

MAINTENANCE AND SERVICE

The ALTEC 770A is designed for long, trouble-free life. Its unique 'Fail-Safe' circuitry protects it against damage from any accidental misuse. If a malfunction does occur, service should be performed by an authorized ALTEC Warranty Station. Contact your ALTEC dealer or one of the warranty stations on the enclosed list. For factory service, package the biampifier in the original carton and ship it prepaid to ALTEC Lansing, 1515 South Manchester Avenue, Anaheim, California 92803. The return shipment will be made prepaid if the defect is covered by warranty. For additional information or technical assistance, call 714-774-2900, or TWX 910-591-1142.

Schematics for the ALTEC 770A Electronic Crossover Biampifier are shown in Figures 5 through 8.

Electronic part locations for the 770A are shown in Figures 9 through 12.

PARTS LIST

Reference Designator	Ordering Number	Name and Description
<u>770A Biampifier Main Chassis Assembly (see Figure 5)</u>		
C11	15-01-100296-01	Cap., 5000 μ F, 25V
C12	15-01-107511-01	Cap., 6200 μ F, 75V
C13	15-01-100298-01	Cap., 5000 μ F, 60V
C14	15-01-109683-01	Cap., 2000 μ F, 50V
C15	15-01-100279-01	Cap., 500 μ F, 50V
CB1	51-03-109809-01	Circuit breaker, 2.2A
CR1,2	48-01-107429-01	Diode, stabistor, 3-pellet
CR3,4,5,6	48-02-107467-01	Rectifier, 1N5402
CR7	48-02-108577-01	Diode bridge rectifier
J1	21-01-109811-01	Jack, phono
J2	21-01-109803-01	Connector, 9-pin
J3,4	21-01-109806-01	Connector, 10-pin

Reference Designator	Ordering Number	Name and Description
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770A Biampifier Main Chassis Assembly (Continued)

Q1,2,3,4	48-03-109715-01	Transistor
R1,2	47-02-107434-01	Res., 0.33 Ω \pm 10%, 3W
R3,4	47-02-108238-01	Res., 0.25 Ω \pm 10%, 3W
R5,6	47-06-042269-01	Pot., 10K Ω , B taper
R7,8	47-01-102359-01	Res., 2.2K Ω \pm 10%, 1/2W
R9,10	47-01-102163-01	Res 1K Ω \pm 10%, 1/4W
T1	56-08-007458-01	Transformer
W1	69-09-042284-01	Cable assembly
W2	60-06-012934-04	Power cord w/plug
None	60-07-109621-01	Wire, 20 AWG, black PVC
None	60-07-109622-01	Wire, 20 AWG, red PVC
None	60-07-109702-01	Wire, 20 AWG, w/red PVC
None	60-07-109703-01	Wire, 20 AWG, w/black PVC
None	27-01-042243-01	Power Control Board Assembly
None	27-01-042244-01	LF Power Amplifier Board Assembly
None	27-01-042245-01	HF Power Amplifier Board Assembly

Power Control Board Assembly (27-01-042243-01) (see Figure 6)

C1,3	15-01-100191-01	Cap., 5 μ F, 25V
C2	15-01-100241-01	Cap., 50 μ F, 50V
C4	15-02-100087-01	Cap., 0.02 μ F \pm 20%, 100V
C5	15-02-107470-01	Cap., 220 pF \pm 10%, 100V
C6,9	15-06-109103-01	Cap., 0.047 μ F \pm 10%, 250V
C7,11,14	15-01-107495-01	Cap., 25 μ F \pm 10%, 25V
C8,10	15-06-109091-01	Cap., 0.012 μ F \pm 5%, 100V
C12	15-02-100082-01	Cap., 0.05 μ F +80%, -30%, 75V
C13	15-01-108236-01	Cap., 100 μ F, 35V
C15	15-01-110019-01	Cap., 5 μ F, 70V
CR1	48-01-107017-01	Diode, 1N456A, 25V, 100 mA
CR2	48-04-109618-01	Thyristor, 2-way triode
Q1,2,3,4	48-03-041627-01	Transistor
Q5	48-03-041440-01	Transistor
Q6,7	48-03-108557-01	Transistor, 2N5367
R1	47-01-100482-01	Res., 1 M Ω \pm 10%, 1/4W
R2,3	47-01-102187-01	Res., 100K Ω \pm 10%, 1/4W
R4,25	47-01-102191-01	Res., 220K Ω \pm 10%, 1/4W
R5,27,28	47-01-102175-01	Res., 10K Ω \pm 10%, 1/4W
R6	47-01-102167-01	Res., 2.2K Ω \pm 10%, 1/4W
R7	47-01-108929-01	Res., 8.2 M Ω \pm 10%, 1/4W
R8,20,22,29	47-01-102163-01	Res., 1K Ω \pm 10%, 1/4W
R9,14,19	47-01-102179-01	Res., 22K Ω \pm 10%, 1/4W
R10,15	47-01-102098-01	Res., 6.8K Ω \pm 5%, 1/4W
R11,12	47-01-102103-01	Res., 11K Ω \pm 5%, 1/4W
R13,17	47-01-102120-01	Res., 51K Ω \pm 5%, 1/4W
R16,18	47-01-102112-01	Res., 27K Ω \pm 5%, 1/4W
R21,23	47-01-102170-01	Res., 3.9K Ω \pm 10%, 1/4W
R24	47-01-100477-01	Res., 470K Ω \pm 10%, 1/4W
R26	47-01-102342-01	Res., 100 Ω \pm 10%, 1/2W
S1	51-02-109833-01	Switch, 4PST, slide

PARTS LIST (Continued)

Reference Designator	Ordering Number	Name and Description	Reference Designator	Ordering Number	Name and Description
<u>Low-Frequency Power Driver Board Assembly (27-01-042244-01)</u> (see Figure 7)			<u>High-Frequency Power Driver Board Assembly (27-01-042245-01)</u> (see Figure 8)		
C1	15-01-107452-01	Cap., 10 μ F, 50V	C1	15-06-100311-01	Cap., 0.1 μ F \pm 20%, 250V
C2,6,13	15-01-100241-01	Cap., 50 μ F, 50V	C2,4	15-01-107501-01	Cap., 25 μ F, 50V
C3,7	15-01-110771-01	Cap., 5 μ F, 50V	C3,7	15-01-110771-01	Cap., 5 μ F, 50V
C4	15-01-107500-01	Cap., 100 μ F, 50V	C5	15-06-108173-01	Cap., 0.47 μ F \pm 20%, 100V
C5,9,10	15-06-107173-01	Cap., 0.47 μ F \pm 20%, 100V	C6	15-01-100241-01	Cap., 50 μ F, 50V
C8	15-02-107454-01	Cap., 100 pF \pm 10%, 100V	C8	15-02-107454-01	Cap., 100 pF \pm 10%, 100V
C11,12	15-02-100307-01	Cap., 0.01 μ F \pm 20%, 100V	C9	15-02-100110-01	Cap., 0.1 μ F, 100V
C14	15-02-100110-01	Cap., 0.1 μ F \pm 20%, 100V	CR1,2,3	48-01-102592-01	Diode
CR1,2,3,4,5	48-01-107017-01	Diode, 1N456A, 25V, 100 mA	J1	21-01-109731-01	Jack, phono
CR6,7	48-01-102592-01	Diode	Q1,2	48-03-108557-01	Transistor, 2N5367
J1	21-01-109731-01	Jack, phono	Q3,7	48-03-107447-01	Transistor
Q1,2	48-03-110773-01	Transistor, PNP	Q4	48-03-101098-01	Transistor, 2N2712
Q3,7	48-03-107447-01	Transistor	Q5	48-03-041440-01	Transistor
Q4	48-03-041440-01	Transistor	Q6	48-03-107448-01	Transistor
Q5	48-03-101098-01	Transistor, 2N2712	R1,8	47-01-102181-01	Res., 33K Ω \pm 10%, 1/4W
Q6	48-03-107448-01	Transistor	R2,3,14,16	47-01-102175-01	Res., 10K Ω \pm 10%, 1/4W
R1,9	47-01-102178-01	Res., 18K Ω \pm 10%, 1/4W	R4	47-01-102159-01	Res., 470 Ω \pm 10%, 1/4W
R2,3	47-01-102181-01	Res., 33K Ω \pm 10%, 1/4W	R5,6,16,17	47-01-102169-01	Res., 3.3K Ω \pm 10%, 1/4W
R4	47-01-102155-01	Res., 220 Ω \pm 10%, 1/4W	R7	47-01-102163-01	Res., 1K Ω \pm 10%, 1/4W
R5,6	47-01-102169-01	Res., 3.3K Ω \pm 10%, 1/4W	R9	47-01-102183-01	Res., 47K Ω \pm 10%, 1/4W
R7,16,17,25,27	47-01-102151-01	Res., 100 Ω \pm 10%, 1/4W	R10,11	47-01-102359-01	Res., 2.2K Ω \pm 10%, 1/2W
R8	47-01-102067-01	Res., 360 Ω \pm 10%, 1/4W	R12	47-05-107504-01	Pot., 500 Ω \pm 20%, 2W
R10	47-01-102183-01	Res., 47K Ω \pm 10%, 1/4W	R13	47-01-102156-01	Res., 270 Ω \pm 10%, 1/4W
R11,12	47-01-102359-01	Res., 2.2K Ω \pm 10%, 1/4W	R18,19	47-01-102151-01	Res., 100 Ω \pm 10%, 1/4W
R13	47-05-107504-01	Pot., 500 Ω \pm 20%, 2W	R20	47-01-102330-01	Res., 10 Ω \pm 10%, 1/2W
R14	47-01-102140-01	Res., 10 Ω \pm 10%, 1/4W			
R15	47-01-102147-01	Res., 47 Ω \pm 10%, 1/4W			
R18,19,20	47-01-102171-01	Res., 4.7K Ω \pm 10%, 1/4W			
R21	47-01-102156-01	Res., 270 Ω \pm 10%, 1/4W			
R22,23	47-01-102167-01	Res., 2.2K Ω \pm 10%, 1/4W			
R24,26	47-01-102152-01	Res., 120 Ω \pm 10%, 1/4W			
R28	47-01-102180-01	Res., 27K Ω \pm 10%, 1/4W			
R29	47-01-102330-01	Res., 10 Ω \pm 10%, 1/2W			

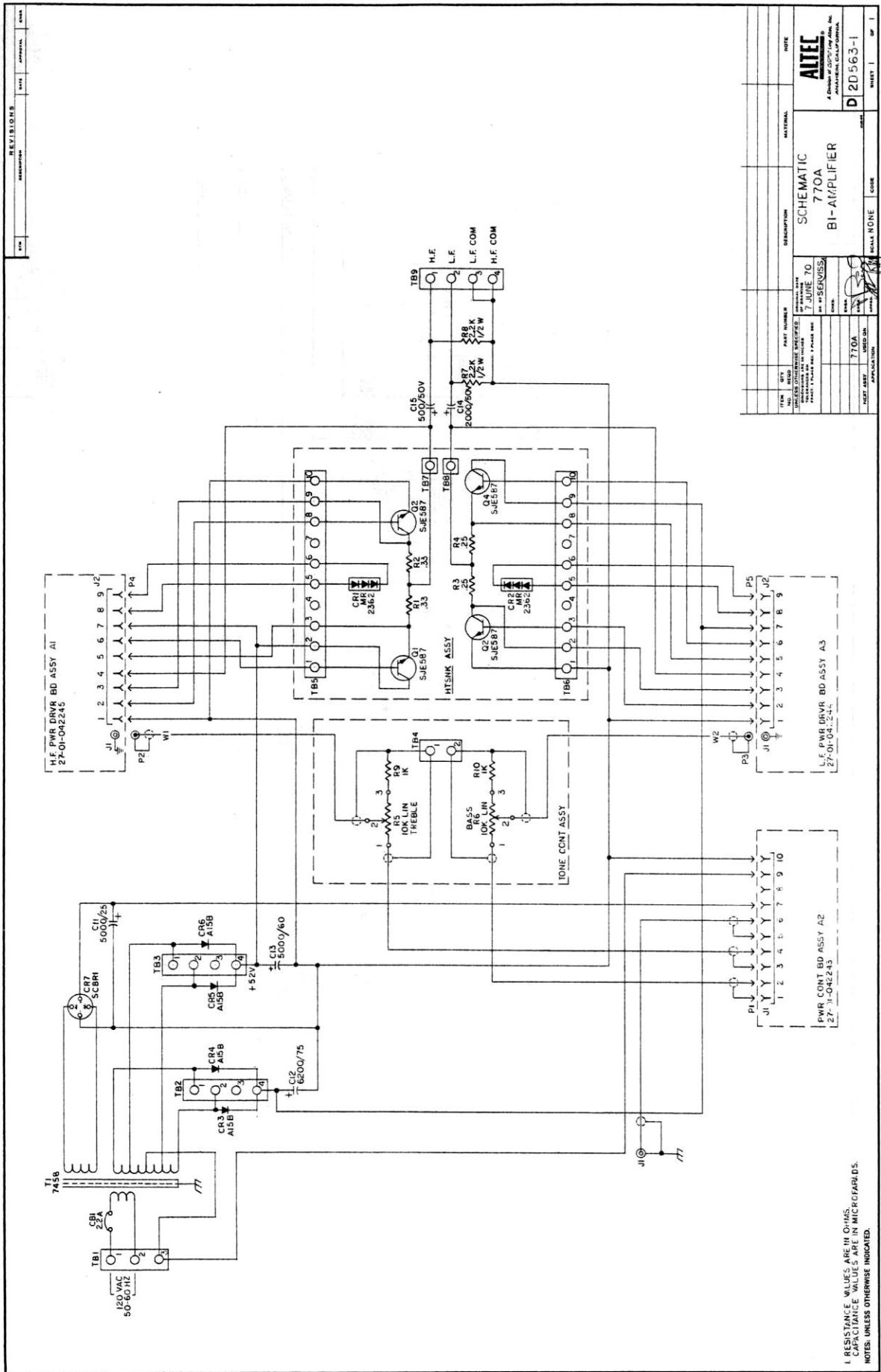
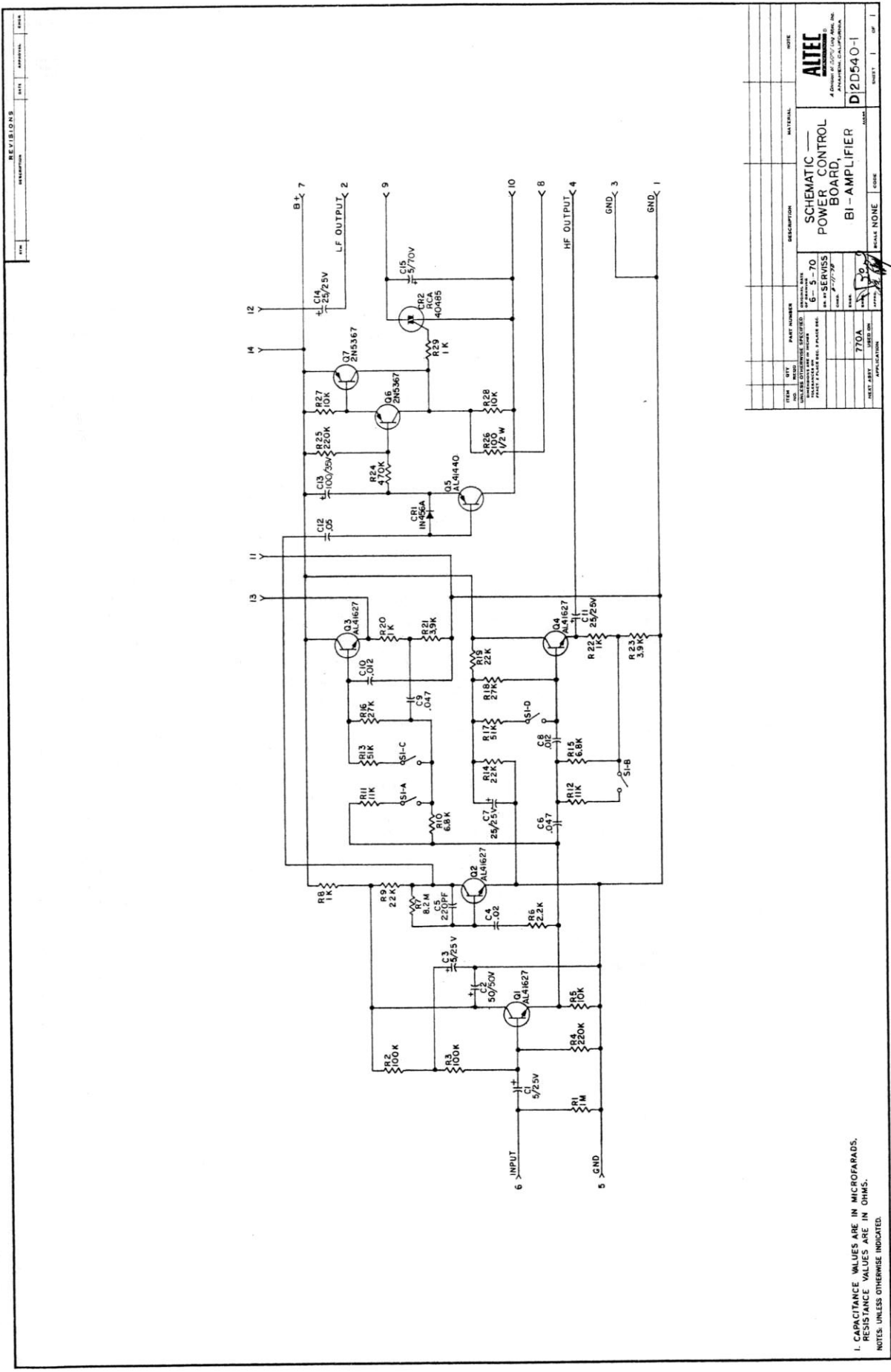


Figure 5. Schematic, 770A Bi-amplifier Main Chassis Assembly

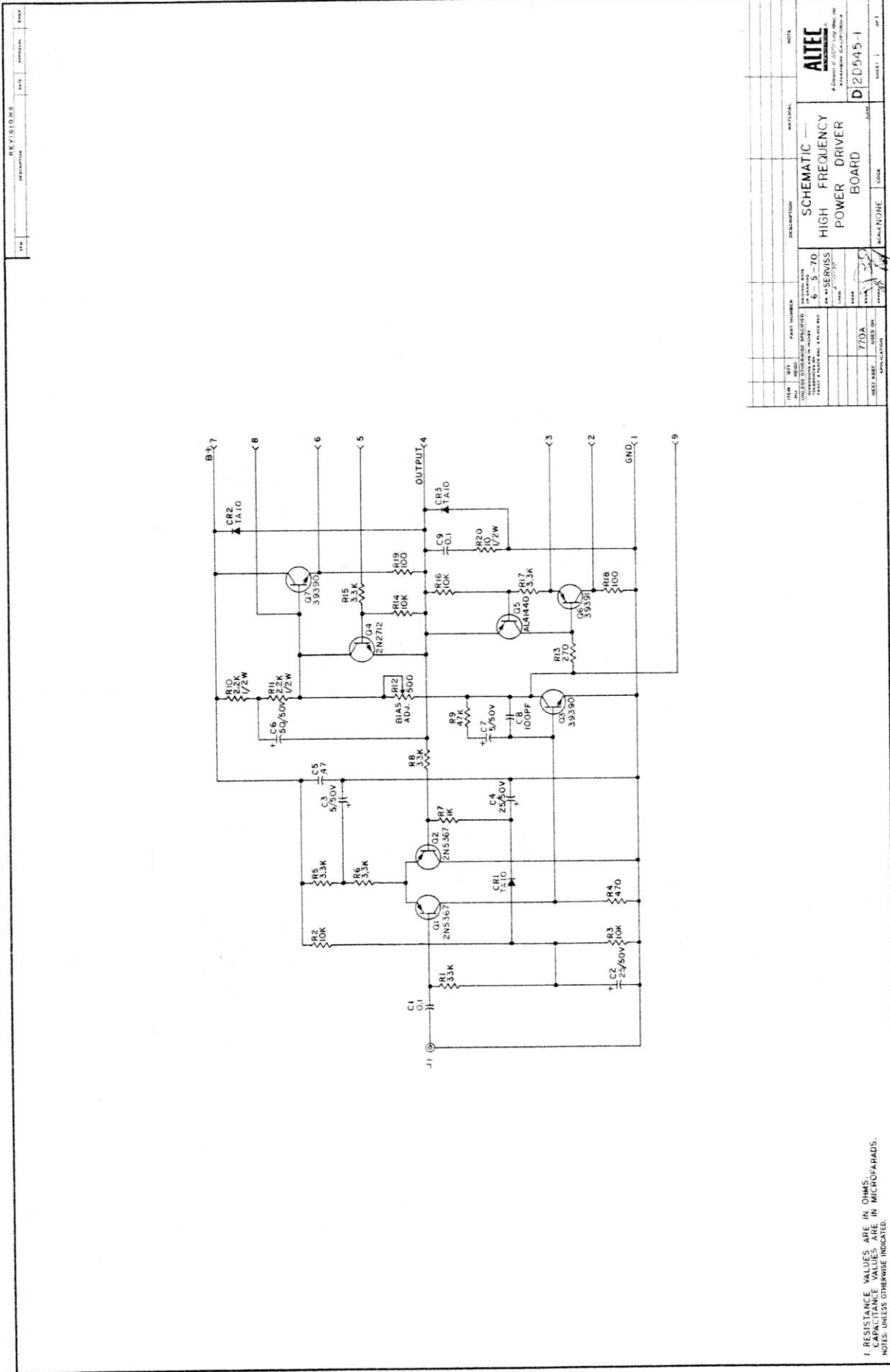


1. CAPACITANCE VALUES ARE IN MICROFARADS.
 2. RESISTANCE VALUES ARE IN OHMS.
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ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	NOTE
1	1	AL41627	TRANSISTOR		
2	1	AL41627	TRANSISTOR		
3	1	AL41627	TRANSISTOR		
4	1	AL41627	TRANSISTOR		
5	1	AL4144D	TRANSISTOR		
6	1	2N5367	TRANSISTOR		
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98	1	AL41627	TRANSISTOR		
99	1	AL41627	TRANSISTOR		
100	1	AL41627	TRANSISTOR		

Figure 6. Schematic, Power Control Board Assembly



STEP	NO.	DESCRIPTION	DATE	BY	CHECKED	APPROVED	REVISIONS

PART NUMBER	770A	DESCRIPTION	VACUUM TUBE	DATE	DRAWN
UNLESS OTHERWISE SPECIFIED	USE STANDARD	USE STANDARD	USE STANDARD	USE STANDARD	USE STANDARD
RESISTOR TOLERANCE	5%	CAPACITOR TOLERANCE	5%	WAVEFORM	
RESISTOR TOLERANCE	5%	CAPACITOR TOLERANCE	5%	WAVEFORM	

SCHEMATIC	HIGH FREQUENCY POWER DRIVER BOARD	DRAWN	DATE

ATEL ATECHNICAL CORPORATION 4200 UNIVERSITY AVENUE BERKELEY, CALIF. 94704	SHEET 1 OF 1 D120545-1
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Figure 8. Schematic, High-Frequency Power Driver Board Assembly

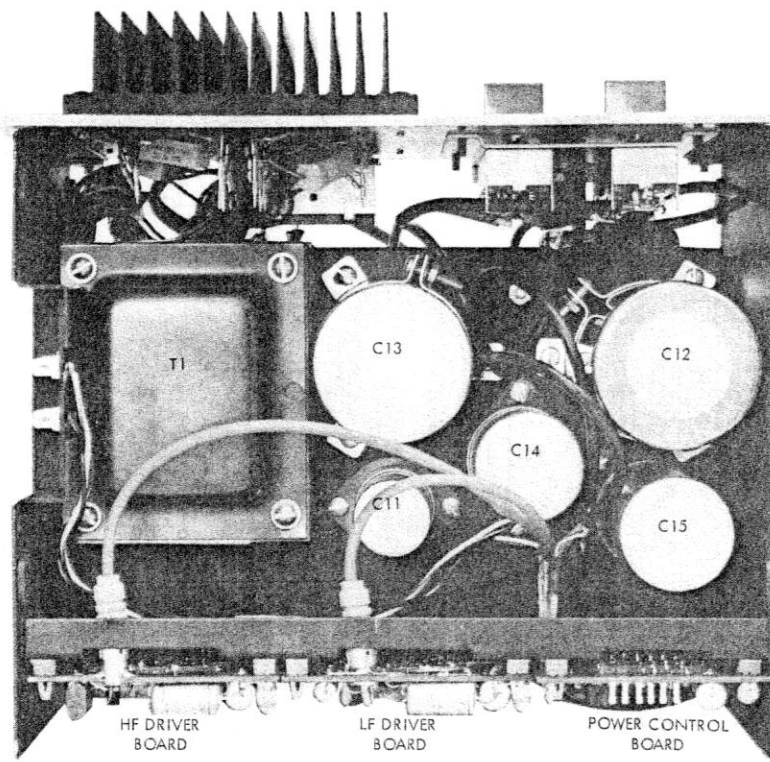


Figure 9. Top View 770A Biampifier Main Chassis Assembly

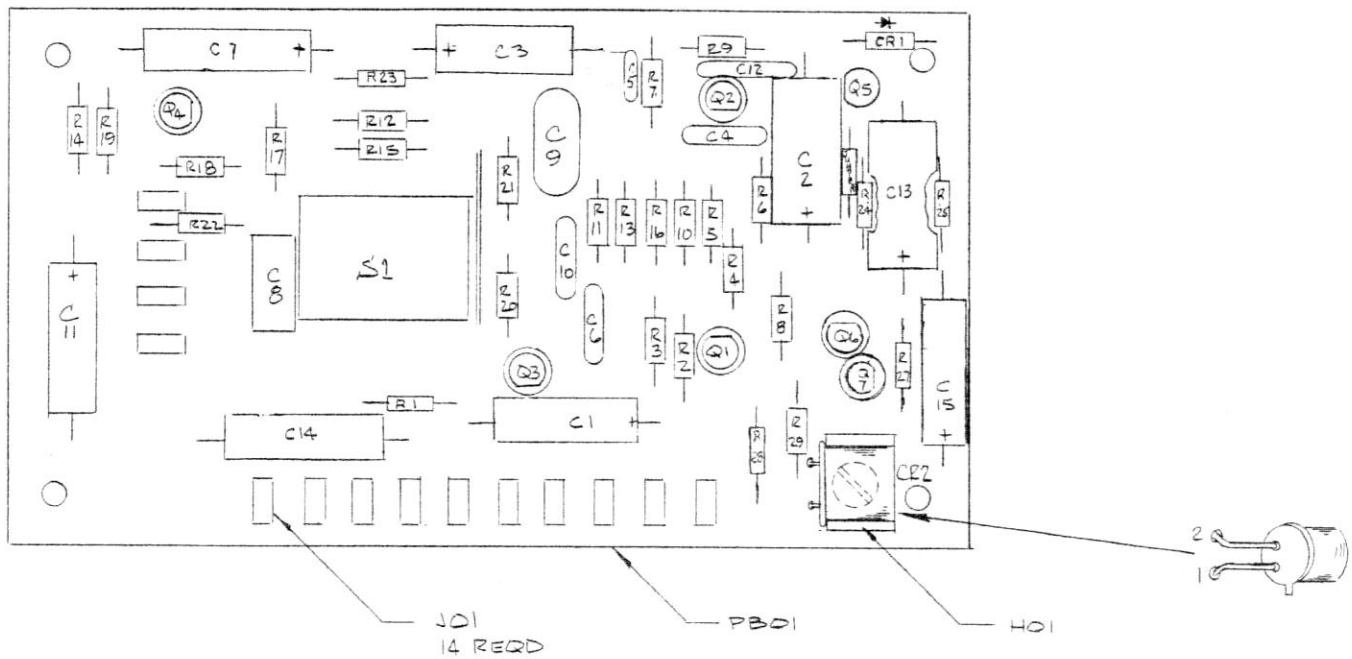


Figure 10. Electronic Part Locations, Power Control Board Assembly

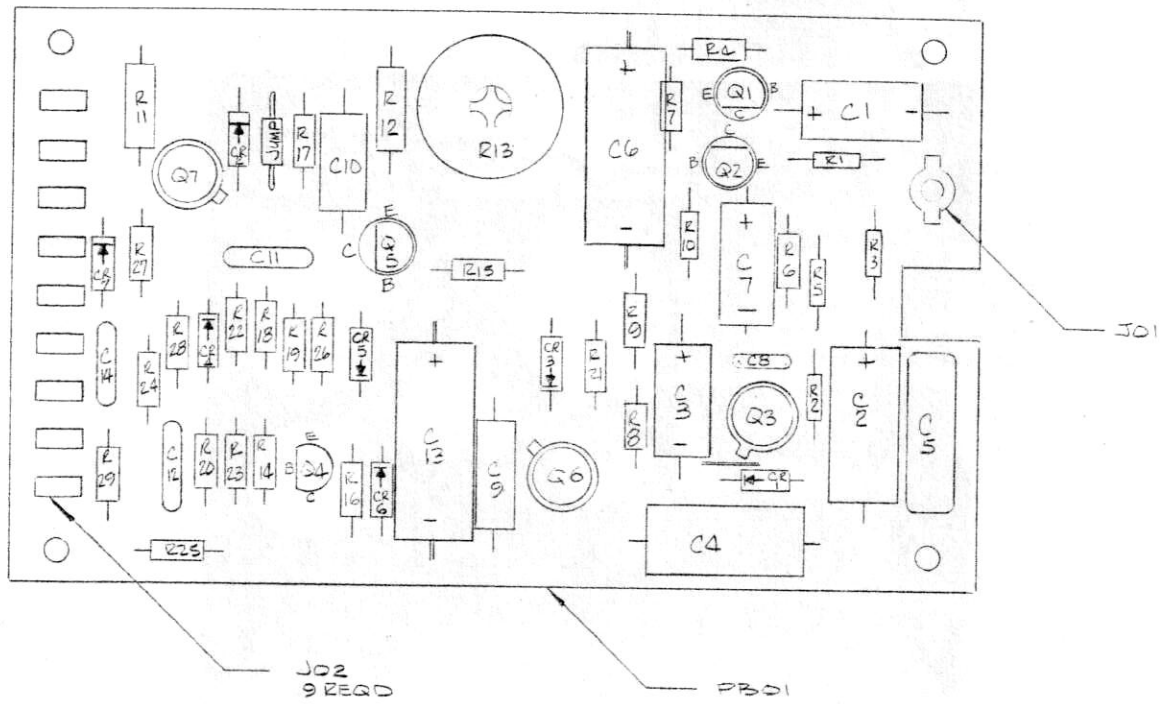


Figure 11. Electronic Part Locations, Low-Frequency Power Driver Board Assembly

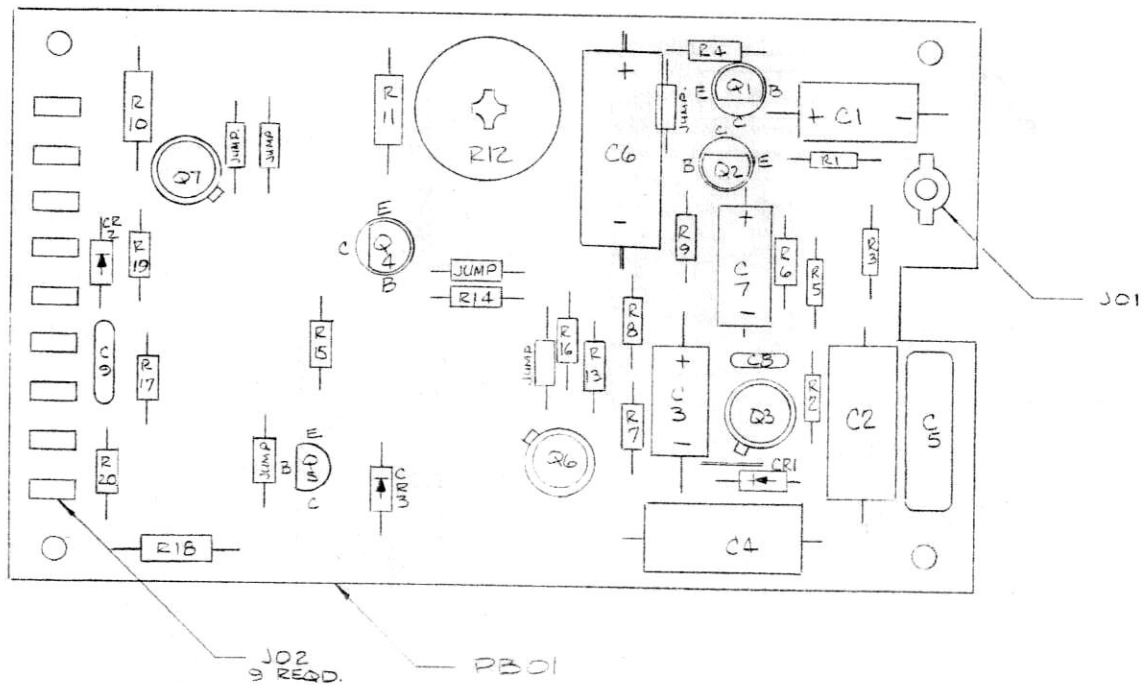


Figure 12. Electronic Part Locations, High-Frequency Power Driver Board Assembly