

DESCRIPTION

Quantum increases in the sophistication of modern sound systems have been paralleled by rapid and significant advances in the design of amplifiers intended to power these systems. The first generation of 'super amplifiers' successfully met the challenge of generating massive wattage from a single source.

As system demands continue to rise, however, output capability alone no longer represents the full measure of professional grade performance. The ALTEC LANSING Model 1270 Power Amplifier harnesses super amp brute strength to state-of-the-art computer protection circuitry. Designed to protect itself and the acoustic elements it drives, the 1270 is 800+ watts of **controlled** power in the bridged mode. It provides continuous high power demand where uninterrupted operation is requisite. Two channels may be operated independently or in bridged configuration to deliver up to 400 watts per channel at less than 0.05% THD from 20 Hz to 20 kHz.

Error Computer Each amplifier channel is provided with an error computer that compares channel input and output signals and detects any output errors. Detection of any error causes the appropriate peak/error indicator to illuminate. Output anomalies detected include excessive voltage, excessive current (load), excessive slew rate, and any other significant difference between the channel input and output signal.

Amplifier Protection The amplifier output is continuously monitored to guard against excessive current drain. An instantaneous VI limiter restricts output to 400 VA $\pm 45^\circ$ phase shift. The amplifier is additionally protected against excessive operating temperature; logic circuitry automatically overrides low-speed fan operation and locks to the high fan speed mode. If operating temperature remains excessive, the load is disconnected by a relay and the protection indicator illuminates. When temperature falls to safe operating conditions, the amplifier automatically resumes operation.

Load Protection The load is protected from transients during startup and shutdown of the amplifier. During startup, the load remains disconnected through a relay during a three-second delay period. During shutdown or loss of power, the load is instantaneously disconnected by the relay. The load is similarly protected against amplifier failure, such as dc voltage at the output.

The ALTEC Model 1270 Power Amplifier has less than 0.05% total harmonic distortion (THD) while delivering more than 200 watts per channel into 8-ohm loads, or more than 400 watts into 4-ohm loads. An optional plug-in line bridging transformer module modifies the amplifier for operation with balanced inputs.

The 1270 may be operated from a 120V or 240V, 50/60 Hz ac source. An LED indicates ac power.

SPECIFICATIONS

Type: Two-channel basic power amplifier, accommodating optional plug-in line transformer module for balanced input

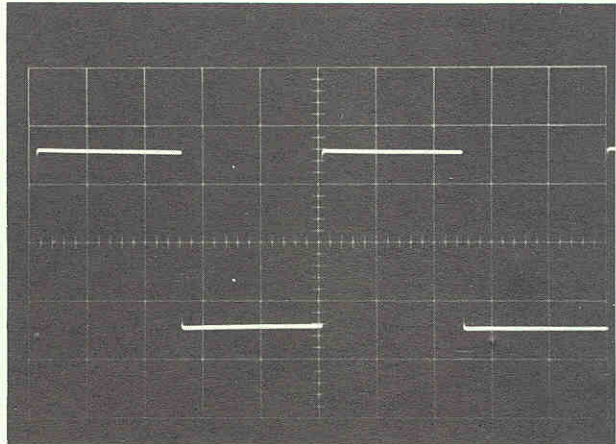
Power Gain: 52.2 dB (balanced) bridging 600-ohm line with 8-ohm load
 55.2 dB (balanced) bridging 600-ohm line with 4-ohm load
 58.2 dB (balanced) bridging 600-ohm line in bridge (mono) mode with 8-ohm load

Voltage Gain: 34.7 dB (unbalanced)

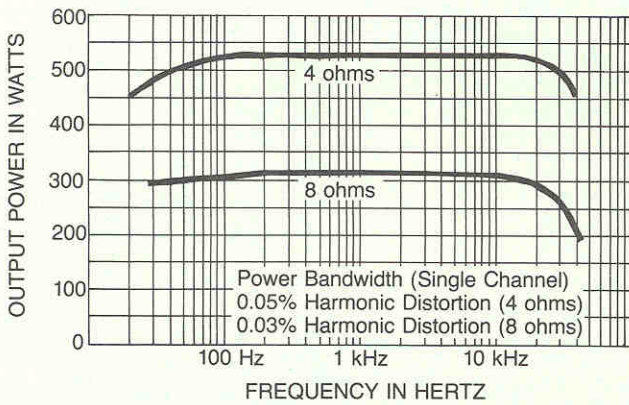
Input Sensitivity: 0.775V rms for rated output

Power Output—
 220 watts per channel into 8 ohms from 20 Hz to 20 kHz at less than 0.03% THD
 Typically greater than 250 watts per channel into 8 ohms at 1 kHz at less than 0.01% THD
 400 watts per channel into 4 ohms from 20 Hz to 20 kHz at less than 0.05% THD
 Typically greater than 450 watts per channel into 4 ohms at 1 kHz at less than 0.02% THD
 400VA per channel into 4 ohms $\pm 45^\circ$ from 20 Hz to 20 kHz at less than 0.1% THD

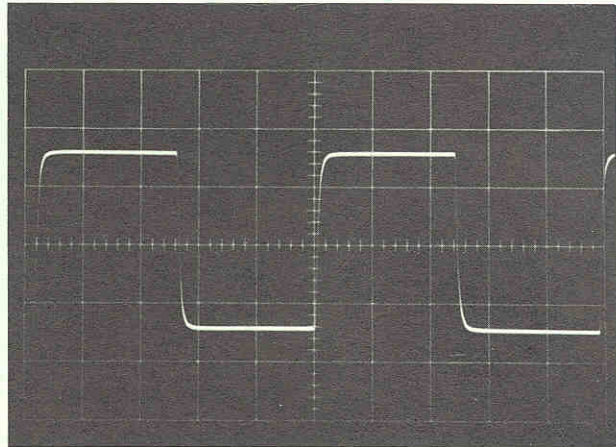
Bridge (mono) Operation: Greater than 800 watts into 8 ohms from 20 Hz to 20 kHz at less than 0.05% THD



1 kHz Square Wave Output (typical)



POWER OUTPUT vs FREQUENCY



10 kHz Square Wave Output (typical)

NOTE: All power and distortion tests are made at specified line voltage while maintaining a 1.414 crest factor.

Frequency Response (direct input): ± 0.25 dB at 1W (8 ohms) from 20 Hz to 20 kHz
 $+0$ dB, -3 dB at 1W (8 ohms) from 5 Hz to 100 kHz

Input Impedance: 15,000 ohms (nominal for all inputs)

Load Impedance: 4 ohms or greater $\pm 45^\circ$ or less
 8 ohms or greater $\pm 45^\circ$ or less in bridge (mono) mode

Output Impedance: Less than 0.1 ohm in dual mode at 1 kHz
 Less than 0.2 ohms in bridge (mono) mode at 1 kHz

Signal-to-Noise Ratio: Greater than 100 dB unweighted with 600-ohm source impedance volume at maximum

IM Distortion (single channel): Less than 0.03% from 0.01 watt to 220 watts into 8 ohms (60 Hz, 7 kHz, 4:1)
 Less than 0.05% from 0.01 watt to 400 watts into 4 ohms (60 Hz, 7 kHz, 4:1)

Channel Separation: Greater than 70 dB at 1 kHz

Slew Rate: 18 V/ μ sec

Controls: 2 stepped attenuators
 1 MODE switch (mono or dual operation)
 1 FAN SPEED (hi-low) select switch
 1 ac POWER ON-OFF switch
 1 ac power indicator (LED)
 2 peak/error indicators (LED); indicate excessive input/output differential for each channel; shows THD greater than 1% and transient errors. Response time: 1 microsecond with 25 millisecond hold for visibility.
 1 PROTECTION indicator (LED); indicates operation of load/amplifier protection system.

Connections: 2 channel input receptacles (TS phone jack type)
 4 channel output jacks (5-way binding post type)
 2 phone jack multiple receptacles (to connect additional amplifiers)
 8-foot, 3-wire, 16GA power cord with NEMA 5-15 plug

Power Requirements: 120/240V ac, 50/60 Hz 100W at zero signal 1 kW at $\frac{1}{3}$ rated output (4 ohms) with both channels driven at 1 kHz
 1500W at rated output (4 ohms) with both channels driven at 1 kHz

Amplifier Protection: Active output stage with voltage/current limiting. Temperature sensor switches to high fan speed automatically in event of excessive heat sink temperature.

Load Protection: Output relay delays turn-on of output power for 3 seconds. Provides instant turn-off of output power and removal of load during presence of dc voltage in output, or in event of excessive heat sink temperature

Operating Temperature Range: Up to $+55^\circ$ (131° F) ambient

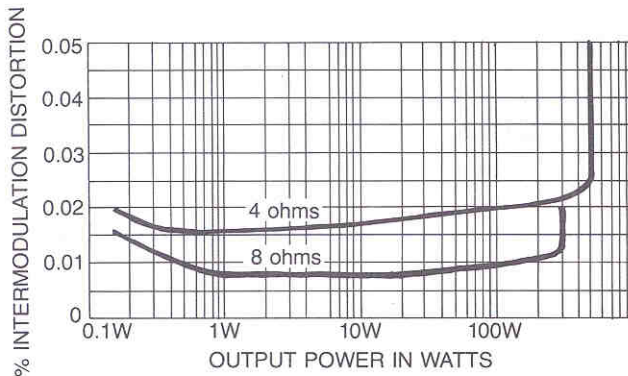
Dimensions: 5 $\frac{1}{4}$ " (13.3 cm) H
 19" (48.3 cm) W
 15" (38.1 cm) D

Weight: 51.5 pounds (23.4 kg)

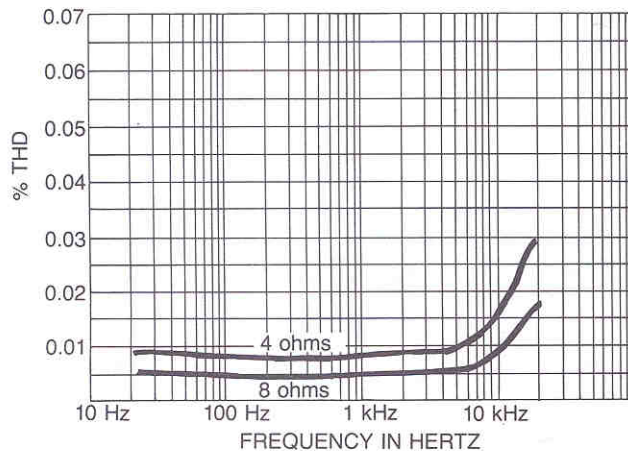
Color: Black

Enclosure: Rack mount chassis with heavy duty front handles

Accessories: Model 1270TM Dual Balanced Transformer Input Module (2-channel)



INTERMODULATION DISTORTION vs OUTPUT POWER



% THD vs FREQUENCY (AT RATED POWER)

SERVICE INSTRUCTIONS

This service information is for the use of authorized warranty stations (dealers) only. Service must be performed by an Altec Qualified Service Representative.

NOTE

REPAIR PERFORMED BY OTHER THAN AUTHORIZED WARRANTY STATIONS (DEALERS) OR OTHER QUALIFIED PERSONNEL SHALL VOID THE WARRANTY PERIOD OF THIS UNIT. TO AVOID LOSS OF WARRANTY, SEE YOUR NEAREST ALTEC AUTHORIZED DEALER OR CALL ALTEC CUSTOMER SERVICE DIRECTLY AT (714) 774-2900, OR WRITE:

**ALTEC Customer Service
1491 N. Main Street
Orange, California 92667**

For factory service, ship the 1270 prepaid to ALTEC Customer Service/Repair, 1491 N. Main Street, Orange, California 92667. For additional information or technical assistance, call (714) 774-2900 or Telex 65-5414.

Access

Remove eight screws securing top cover of chassis; raise front edge of cover and pull forward to disengage cover from chassis.

Fuse Replacement

If replacement of any fuse is required, determine and correct the cause of failure before installing another fuse. Install an identical fuse as specified by the PARTS LIST.

The primary power fuse is located on the rear of the chassis. Replace fuse by unscrewing fuse holder, replacing 10-ampere fuse and resealing fuse holder.

CAUTION

Replace fuses only with identical type and rating. See PARTS LIST. Use of different fuses voids warranty of 1270.

120 Volt, 50/60 Hz Power Connections

Equipment supplied for domestic use is provided with the power transformer primary strapped for 120 volts. Specified voltage rating is located on the chassis, adjacent to the power cord. See Figure 1. Verify that line voltage is in accordance with the specified voltage rating **before** connecting the 1270 to line power.

100V, 200V, 220V, 240V, 50/60 Hz Power Connections

Export equipment requires restrapping of the power transformer primary for voltages other than 120V, 50/60 Hz. To change primary power operating voltage of the 1270, refer to the conversion chart of Table I and proceed as follows:

1. Remove eight screws securing top cover of chassis; raise front edge of cover and pull forward to disengage cover from chassis.

CAUTION: No user-serviceable parts inside. Hazardous voltage may be encountered within the chassis. Installation and Service information within this document is for use only by ALTEC sound contractors, factory authorized warranty stations and qualified service personnel.

IMPORTANT: Il est enjoint à l'utilisateur de ne pas réparer lui-même les pièces internes de l'appareil, des courants à haute tension pouvant passer à l'intérieur du châssis. Les renseignements inclus dans ce document sont destinés uniquement à l'usage des installateurs agréés des systèmes acoustiques ALTEC, des centres de réparation sous garantie autorisés, ainsi que du personnel d'entretien qualifié.

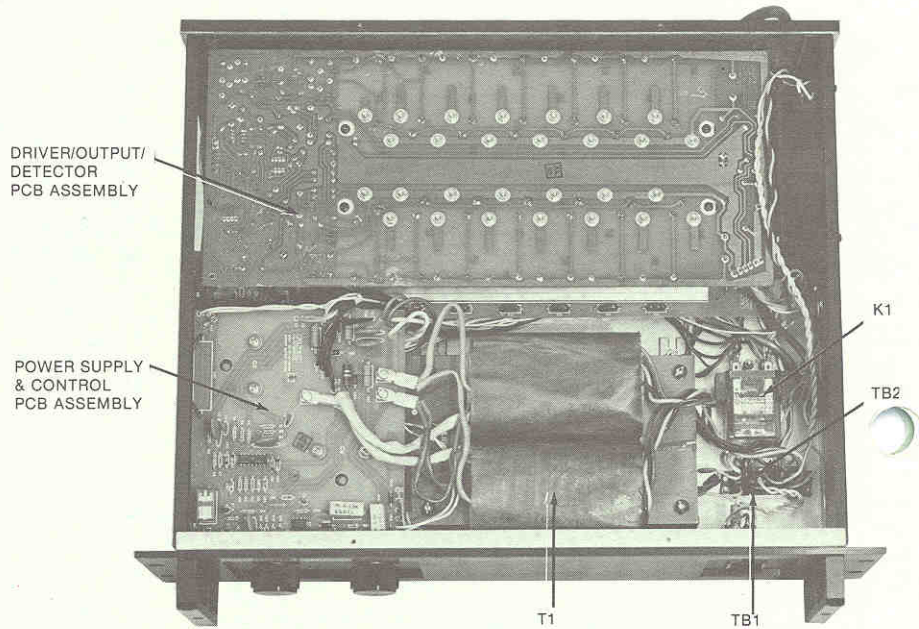


Figure 1. Internal View

Table I. Primary Power Conversion Chart for 100V, 120V, 200V, 220V, and 240V 50/60 Hz Operation

T101 LEADS	100V	120V	200V	220V	240V
black	TB2-3	TB2-3	TB2-9	TB2-6	TB2-6
white	TB1-6	TB2-9	TB1-6	TB1-6	TB1-10
brown	TB2-9	TB1-6	TB1-10	TB1-10	TB1-6
black/white	TB2-4	TB2-4	TB2-3	TB2-3	TB2-3
white/green	TB1-7	TB2-10	TB2-10	TB2-10	TB2-10
brown/white	TB2-8	TB1-7	TB2-6	TB2-7	TB2-7
fan (0V)	TB2-5	TB2-5	TB2-4	TB2-4	TB2-4
fan (120V)	TB2-7	TB1-8	TB2-7	TB2-8	TB2-8

PERMANENT AC POWER CONNECTIONS*

AC Cord (white)	TB2-2	<table style="margin: auto;"> <tr> <td colspan="10" style="text-align: center;">TB2</td> </tr> <tr> <td style="text-align: center;">1</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td><td style="text-align: center;">4</td><td style="text-align: center;">5</td><td style="text-align: center;">6</td><td style="text-align: center;">7</td><td style="text-align: center;">8</td><td style="text-align: center;">9</td><td style="text-align: center;">10</td> </tr> <tr> <td colspan="10" style="text-align: center;"> </td> </tr> <tr> <td colspan="10" style="text-align: center;">TB1</td> </tr> <tr> <td colspan="10" style="text-align: center;">FRONT OF CHASSIS</td> </tr> </table>	TB2										1	2	3	4	5	6	7	8	9	10											TB1										FRONT OF CHASSIS									
TB2																																																				
1	2	3	4	5	6	7	8	9	10																																											
TB1																																																				
FRONT OF CHASSIS																																																				
Fuse F1	TB1-2																																																			
Power Switch S1	TB1-3																																																			
Power Switch S1	TB1-5																																																			
Capacitor C2	TB1-1																																																			
Capacitor C1	TB2-1																																																			

*Do not make any wiring changes of these wire connections when altering the amplifier for a different primary operating voltage.

2. Locate terminal block TB1/TB2 within the chassis; see Figure 1.
3. Referring to Table I, disconnect leads of transformer T1 from terminal block TB1/TB2 and reconnect leads in accordance with terminal designations that correspond to the desired operating voltage. Pull each wire firmly to disengage push-on terminal connector. Press each connector firmly to snap in place.
4. Select the appropriate voltage rating label from the voltage rating label strip supplied with the 1270. Affix label over previous voltage rating designation on chassis.

5. Install top cover and secure with eight screws previously removed.

5. Set bias potentiometer R16 for an average voltage of 10 millivolts across output emitter resistors R25 through R38.

Bias Adjustment

1. With ac power OFF, remove top cover from amplifier.
2. Turn both CHANNEL controls fully counterclockwise.
3. Set bias potentiometer R16 fully clockwise (minimum). See Figure 2.
4. Turn on ac power.



Figure 2. Bias Control (R16)

PARTS LIST

MAIN CHASSIS

Reference Designator	Ordering Number	Name and Description
---	24-02-122893-01	Knob, blk/wht line
A1, 2	27-01-045418-02	Driver/Output PCB Assembly
A3	27-01-045416-02	Power Supply/Control PCB Assy
B1	35-01-122948-01	Fan, Howard
C1, 2	15-02-122768-01	Cap., 0.003 μ F \pm 20%, 1400V
C3	15-01-109010-01	Cap., 18 μ F \pm 10%, 50V
C8, 9	15-01-122367-01	Cap., 12,000 μ F, 100V
CR1, 2, 3, 4	39-01-122876-01	Lamp, LED, red

Reference Designator	Ordering Number	Name and Description
CR5	48-02-122651-01	Rect., bridge, 25A, 200V
F1	51-04-105890-01	Fuse, 10A, 3AB, 250V
K1	45-01-044782-01	Relay, 2C, 24VDC
L1, 2	56-01-044110-01	Choke, ferrite bead
R1, 2	47-06-122802-03	Pot., 15k Ω \pm 20%, 32 detent
R29	47-02-122651-01	Res., 300 Ω \pm 5%, 25W
S1	51-02-122875-02	Switch, rocker, DPST, 16A
S2, 3	51-02-122828-01	Switch, slide, SPDT
T1	56-08-007644-01	Transformer, power

POWER SUPPLY/CONTROL PCB ASSEMBLY

Reference Designator	Ordering Number	Name and Description
C1, 2, 10, 11, 12	15-02-100109-01	Cap., 0.1 μ F \pm 20%, 100V
C3, 4	15-02-100081-01	Cap., 0.05 μ F \pm 20%, 12V
C5, 6, 7	15-01-121637-01	Cap., 1.0 μ F, 35V
CR1, 2, 3, 4	48-01-100876-01	Diode, 1N270, 80V, 200 mA
CR5, 6, 7, 8, 9	48-01-122601-01	Diode, 1N4448 (selected), 10 mA, 4 nsec, 1/2W
CR10, 11	48-01-108576-02	Diode, Zener, 15V, \pm 5%, 33.5 mA, 2W
CR12, 13, 14, 15, 16	48-01-122601-01	Rect., 1N4004 (selected), 1A, 400V
K1	45-01-079459-01	Relay, 24V, DC
Q1, 2, 3	48-03-121306-02	Transistor, 2N3904 (selected), NPN, 60V, 300 MHz, 1W
Q4, 5	48-03-120159-01	Transistor, MPS-U10 (selected), NPN, 300V, 45 MHz, 10W
R1, 2	47-01-100484-01	Res., 2.7 M Ω , \pm 5%, 1/4W
R3, 4	47-01-104544-01	Res., 430k Ω , \pm 5%, 1/4W

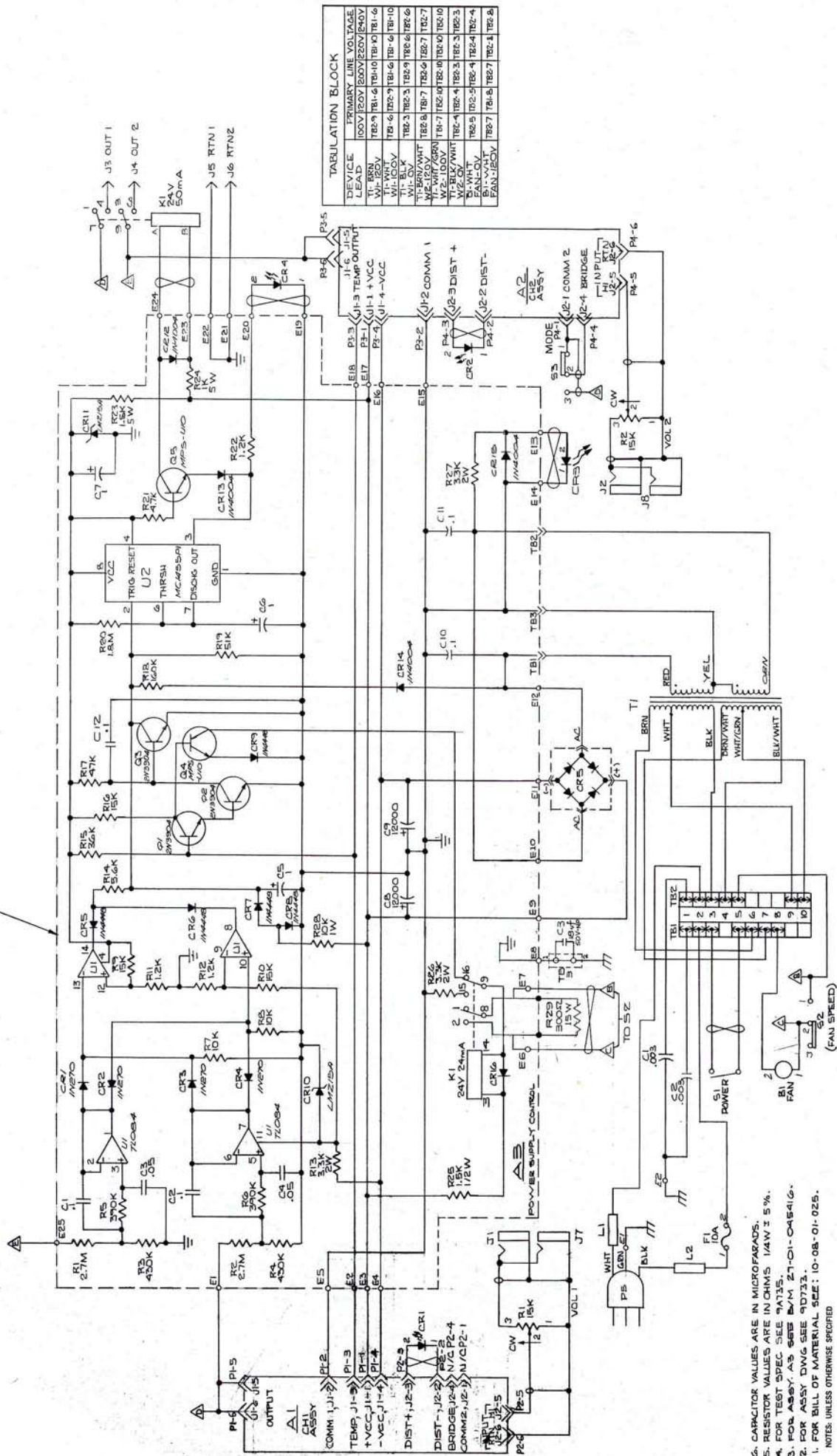
Reference Designator	Ordering Number	Name and Description
R5, 6	47-01-102886-01	Res., 390k Ω , \pm 10%, 1/4W
R7, 8	47-01-102102-01	Res., 10k Ω , \pm 5%, 1/4W
R9, 10, 16	47-01-102106-01	Res., 15k Ω , \pm 5%, 1/4W
R11, 12, 22	47-01-102080-01	Res., 1.2k Ω , \pm 5%, 1/4W
R13, 26, 27	47-01-104512-01	Res., 3.3k Ω , \pm 5%, 2W
R14	47-01-102096-01	Res., 5.6k Ω , \pm 5%, 1/4W
R15	47-01-102115-01	Res., 36k Ω , \pm 5%, 1/4W
R17	47-01-102119-01	Res., 47k Ω , \pm 5%, 1/4W
R18	47-01-102132-01	Res., 160k Ω , \pm 5%, 1/4W
R19	47-01-102120-01	Res., 51k Ω , \pm 5%, 1/4W
R20	47-01-108606-01	Res., 1.8 M Ω , \pm 5%, 1/4W
R21	47-01-102094-01	Res., 4.7k Ω , \pm 5%, 1/4W
R23	47-02-122881-01	Res., 1.5k Ω , \pm 5%, 5W
R24	47-02-122880-01	Res., 1k Ω , \pm 5%, 5W
R25	47-01-102268-01	Res., 1.5k Ω , \pm 5%, 1/2W
R28	47-01-102625-01	Res., 10k Ω , \pm 5%, 1W
U1	17-01-122131-01	Int. Ckt., TL084, Quad Op-Amp
U2	17-01-121887-01	Int. Ckt., MC1455P1, Timer

PARTS LIST (Continued)

DRIVER/OUTPUT PCB ASSEMBLY

Reference Designator	Ordering Number	Name and Description	Reference Designator	Ordering Number	Name and Description
C1, 6	15-02-100022-01	Cap., 100 pF \pm 10%, 500V	R3	47-03-121532-01	Res., 1.0k Ω \pm 1%, 1/4W
C2, 12	15-01-121637-01	Cap., 1.0 μ F, 35V	R4, 5	47-01-104512-01	Res., 3.3k Ω \pm 5%, 2W
C3	15-01-100233-01	Cap., 50 μ F, 15V	R7	47-01-102090-01	Res., 3.3k Ω \pm 5%, 1/4W
C4	15-02-108927-01	Cap., 18 pF \pm 10%, 500V	R8, 10	47-01-102072-01	Res., 560 Ω \pm 5%, 1/4W
C7, 8, 9	15-02-100109-01	Cap., 0.1 μ F \pm 20%, 100V	R9	47-01-102057-01	Res., 130 Ω \pm 5%, 1/4W
C10, 11	15-01-102595-01	Cap., 10 μ F, 100V	R11	47-01-102053-01	Res., 91 Ω \pm 5%, 1/4W
CR1, 2, 11	48-01-108576-02	Diode, Zener, LMZ15A, 15V \pm 5%, 33.5 mA, 2W	R12	47-01-102296-01	Res., 22k Ω \pm 5%, 1/2W
CR3	48-01-100881-03	Diode, STB567, 12V 2 Pellet, 0.4 W	R13	47-01-102061-01	Res., 200 Ω \pm 5%, 1/4W
CR4	48-01-122226-01	Diode, Zener, 1N748A, 3.1V \pm 5%, 1.45 mA, 0.4W	R14	47-01-102094-01	Res., 4.7k Ω \pm 5%, 1/4W
CR5, 6, 9, 10, 14, 15	48-01-122601-01	Diode, 1N4448, selected, 75V, 10 mA, 4 nsec, 0.5W	R15	47-01-102085-01	Res., 2k Ω \pm 5%, 1/4W
CR7, 8	48-02-042802-02	Rect., 3A, 400V	R16	47-06-121743-01	Pot., trim, 1k Ω \pm 20%, 1/2W
CR12, 13	48-01-107429-01	Diode, STB568, 12V, 3 Pellet, 0.4W	R17, 18, 47	47-01-102068-01	Res., 390 Ω \pm 5%, 1/4W
L1	56-01-122770-01	Choke, 2.5 mH	R19, 20	47-01-102284-01	Res., 6.8k Ω \pm 5%, 1/2W
Q1	48-03-120233-01	Transistor, MPS-A43, selected	R21, 22	47-01-102050-01	Res., 68 Ω \pm 5%, 1/4W
Q2, 4, 9	48-03-120160-01	Transistor, MPS-U60, selected	R23, 24	47-01-102070-01	Res., 470 Ω \pm 5%, 1/4W
Q3, 8	48-03-120159-01	Transistor, MPS-U10, selected	R25, 26	47-01-102218-01	Res., 12 Ω \pm 5%, 1/2W
Q5	48-03-119140-03	Transistor, 2N5308, selected	R27 thru R38	47-02-120244-01	Res., 0.5 Ω \pm 5%, 3W
Q6	48-03-121306-01	Transistor, 2N3904, selected	R39	47-02-100701-01	Res., 5 Ω \pm 10%, 5W
Q7	48-03-107102-02	Transistor, 2N3906, selected	R40	47-01-122960-01	Res., 3.9 Ω \pm 5%, 2W
Q10	48-03-122320-01	Transistor, 1E02, selected	R42, 43, 44	47-01-102102-01	Res., 10k Ω \pm 5%, 1/4W
Q11	48-03-122321-01	Transistor, 1E03, selected	R45	47-01-102093-01	Res., 4.3k Ω \pm 5%, 1/4W
Q12, 13, 14, 15, 16, 17	48-03-122318-01	Transistor, 2N3773, selected	R46	47-01-102088-01	Res., 2.7k Ω \pm 5%, 1/4W
Q18, 19, 20, 21, 22, 23	48-03-122319-01	Transistors, 2N6609, selected	R48	47-01-102111-01	Res., 24k Ω \pm 5%, 1/4W
Q24	48-03-101098-06	Transistor, 2N2712, selected	R49	47-01-102109-01	Res., 20k Ω \pm 5%, 1/4W
R1	47-01-105894-01	Res., 300k Ω \pm 5%, 1/4W	R50	47-02-100701-02	Res., 1.5k Ω \pm 5%, 3W
R2, 6	47-03-119033-01	Res., 53.6k Ω \pm 1%, 1/4W	R51	47-01-102080-01	Res., 1.2k Ω \pm 5%, 1/4W
			R52	47-01-102112-01	Res., 27k Ω \pm 5%, 1/4W
			R53	47-01-102030-01	Res., 10 Ω \pm 5%, 1/4W
			RT1	47-09-122830-01	Thermister, TS3-85
			U1	17-01-122317-01	Int. Ckt., LF356, op amp
			U2	17-01-079486-01	Int. Ckt., TL081CP, op amp
			U3	17-01-121887-01	Int. Ckt., MC1455P1, timer

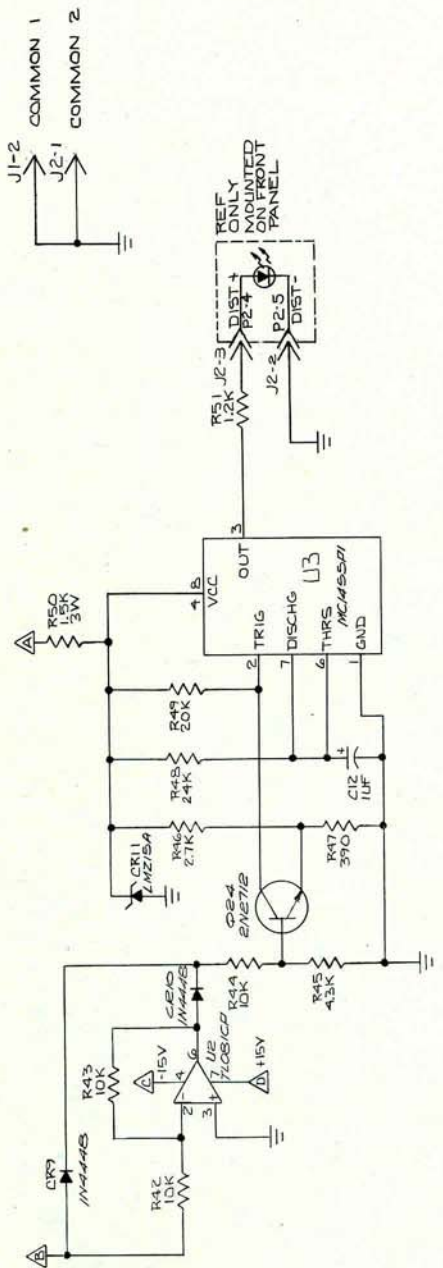
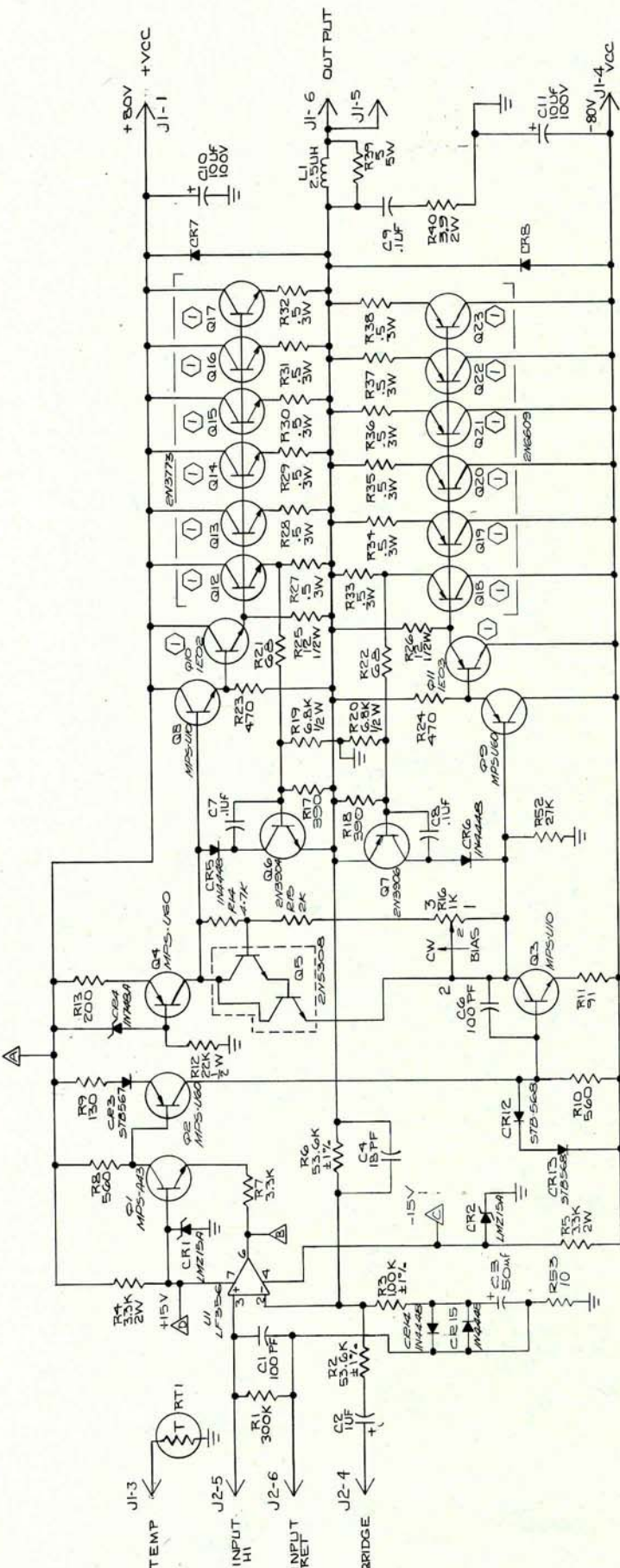
A3 POWER SUPPLY-CONTROL



DEVICE LEAD	PRIMARY LINE VOLTAGE
W1-100V	100V/120V/100V/220V/240V
W1-250V	250V
W1-275V	275V
W1-300V	300V
W1-350V	350V
W1-400V	400V
W1-450V	450V
W1-500V	500V
W1-550V	550V
W1-600V	600V
W1-650V	650V
W1-700V	700V
W1-750V	750V
W1-800V	800V
W1-850V	850V
W1-900V	900V
W1-950V	950V
W1-1000V	1000V

1. FOR ASSY DWG/6 SEE 9D733.
 2. FOR BILL OF MATERIAL SEE 9D733.
 3. FOR ASSY A3 SEE B/M 27-01-045416.
 4. FOR TEST SPEC SEE 9A135.
 5. RESISTOR VALUES ARE IN OHMS 1/4W ± 5%.
- NOTES: UNLESS OTHERWISE SPECIFIED

Figure 3. Schematic (9D732-03), Power Supply/Control



DESIGNATIONS DELETED
 C5 C13 R41

5. SEE TEST SPEC IOA 157.
 4. SEE ASSEMBLY DWG. # 10736.
 3. SEE SEPARATE BILL OF MATERIALIAL: 27-DI 045418.
 2. RESISTOR VALUES ARE IN OHMS, 1/4W ± 5%.
 1. PARTS ARE MOUNTED IN THE MAIN HIFATJUNK.
- NOTES: UNLESS OTHERWISE SPECIFIED

Figure 4. Schematic (9D737-03), Driver/Output/Detector Assembly