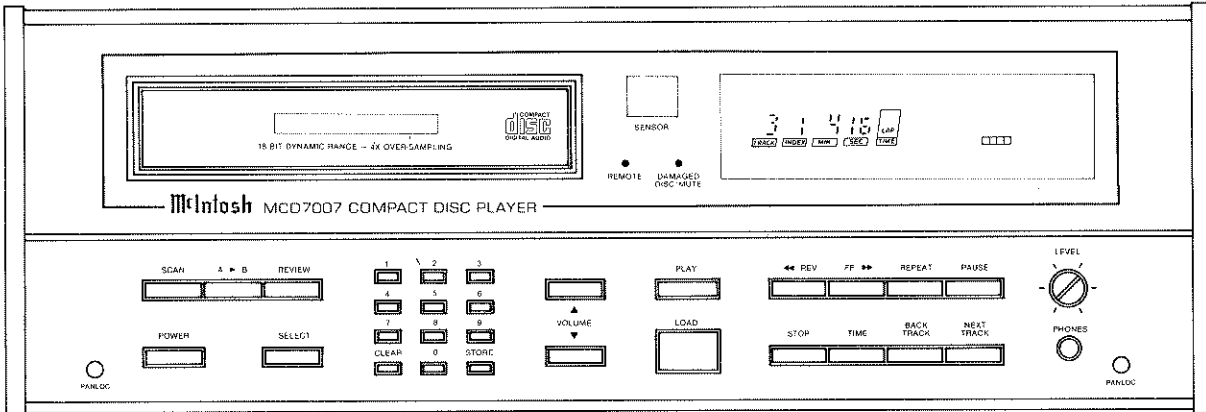


MCD 7007

COMPACT DISC PLAYER



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Performance Specifications

TYPICAL AUDIO PERFORMANCE

NUMBER OF CHANNELS

2, left and right

FREQUENCY RESPONSE

20-20,000Hz, +0, -0.3dB

DYNAMIC RANGE

96dB (114dB EIA)

SIGNAL-TO-NOISE RATIO

107dB (A)

CHANNEL SEPARATION

102dB (at 1000Hz)

TOTAL HARMONIC DISTORTION

0.0012% (at 1000Hz)

WOW AND FLUTTER

Quartz crystal precision

SAMPLING RATE

176.4kHz

D/A CONVERSION

Quadruple oversampling (176.4kHz) with digital filter and two 16 bit D/A converters

ERROR CORRECTION SYSTEM

Cross Interleave Reed Solomon Code (CIRC)

AUDIO OUTPUT LEVEL

2.5V

IMPEDANCE HEADPHONES

8-1000 ohms

DIGITAL OUTPUT

Output for digital signal processing

OPTICAL READOUT SYSTEM

LASER

Semiconductor AlGaAs

WAVE LENGTH

780nm

SIGNAL FORMAT

SAMPLING FREQUENCY

44.1kHz

QUANTIZATION

16 bit linear/channel

DISC

SCANNING VELOCITY

1.2 to 1.4 m/s

ROTATION SPEED

500-200 rpm

PLAYING TIME (maximum)

74 minutes (stereo)

GENERAL INFORMATION

POWER SUPPLY

120V, 50/60Hz, 30 watts

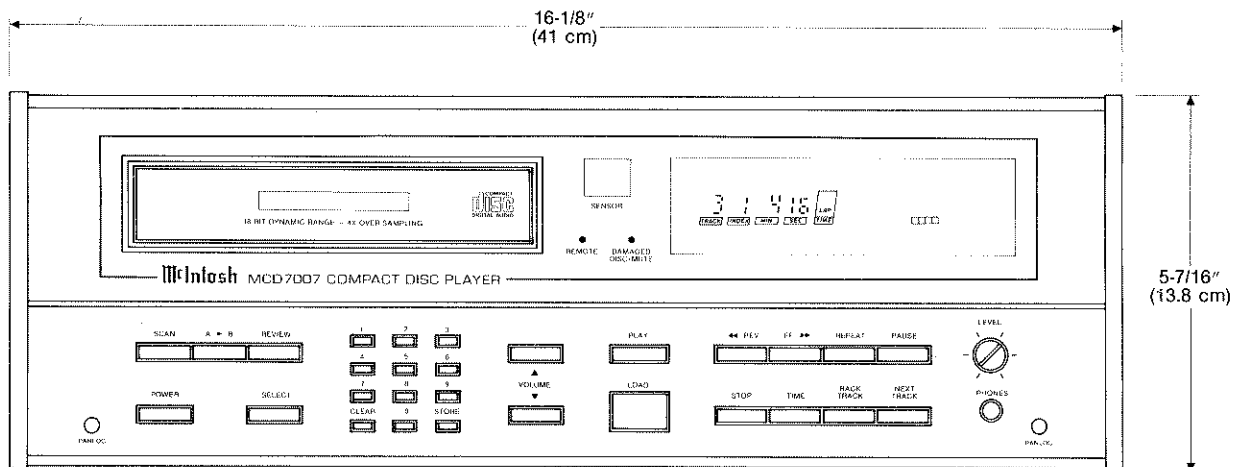
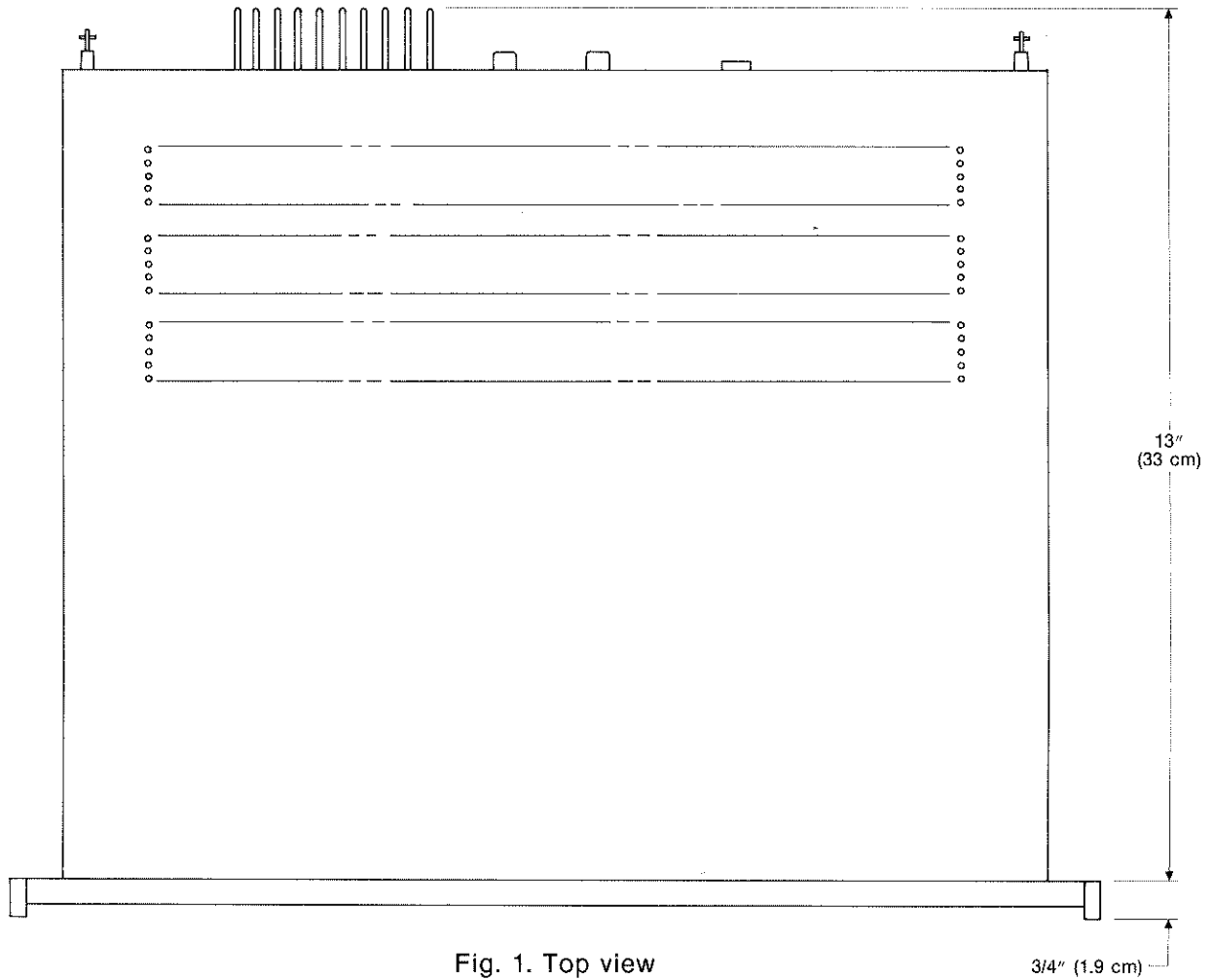
WEIGHT

18 pounds (8.2 kg) net, 30 pounds (13.6 kg) in shipping carton.

Notes

1. Unless otherwise noted, all voltages indicated on the following schematics are measured under the following conditions:
 - a. AC input at 120 volts, 50/60Hz.
 - b. All voltages are $\pm 10\%$ with respect to ground. A high impedance (10 megohm) voltmeter must be used.
2. Unless otherwise specified:
 - a. Resistor values are in ohms.
 - b. Capacitor values smaller than 1 are microfarads (μF), and capacitor values greater than 1 are in picofarads (pF).
 - c. Inductor values are in microhenries (μH).

Mechanical Views



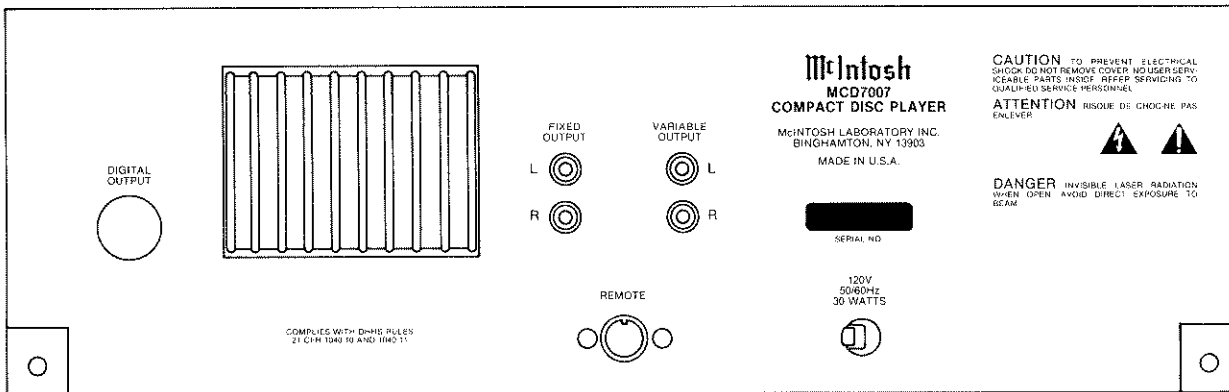


Fig. 3 Rear view

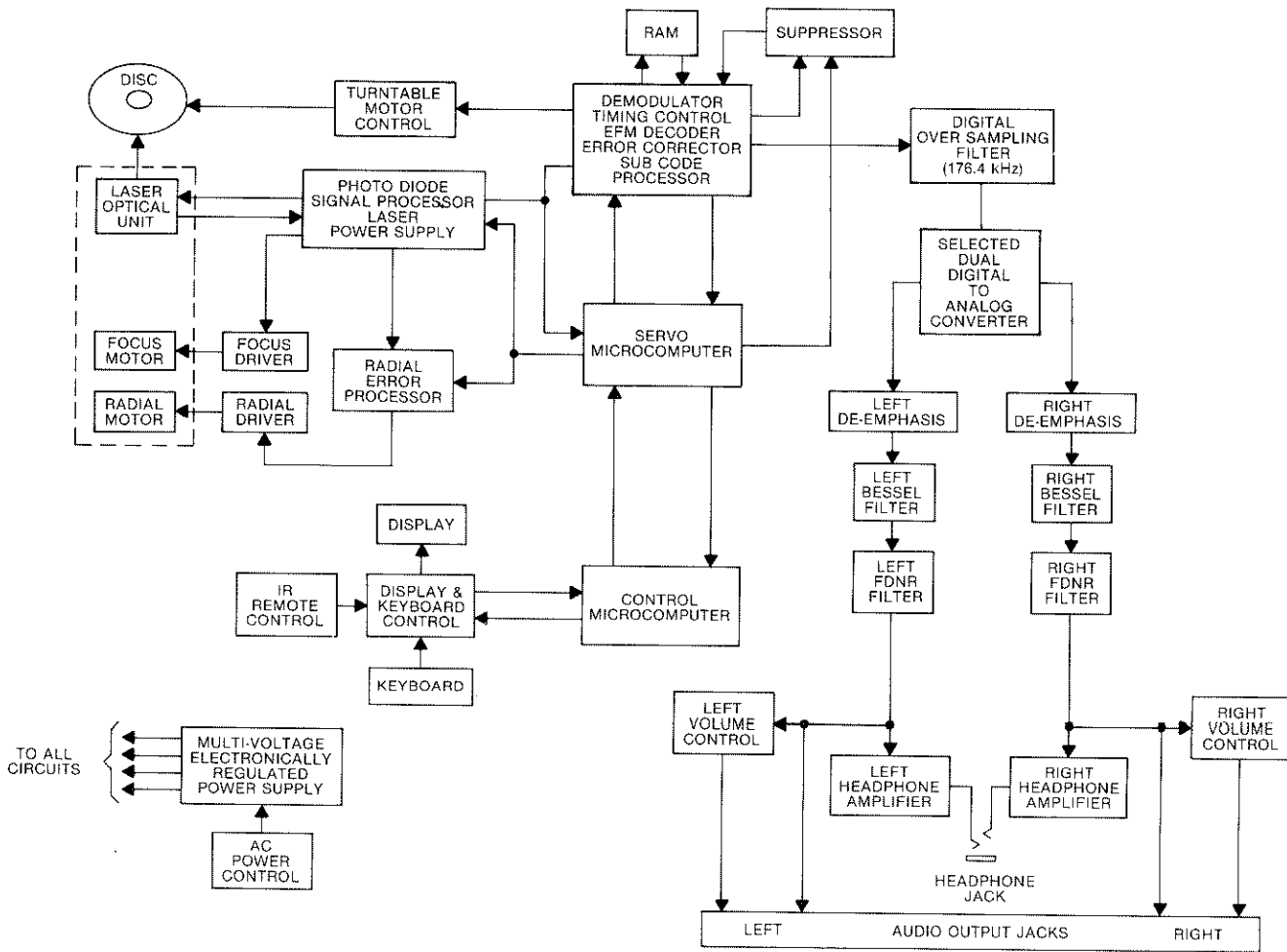
FRONT PANEL and TRIM PARTS LIST

Part No.	Description
046938	Front Panel Glass
018372	Front Panel, Bottom Extrusion
018378	Front Panel, Top Extrusion
018232	Front Panel, End Cap
046856	Front Panel, Drawer Front
046910	Remote Control
310036	Level Knob
017340	Pushbutton, Power (Red)
017341	Pushbutton, Function (Black)
017343	Pushbutton, Load (Black)
017389	Pushbutton, Keypad (Black)

INSTALLATION HARDWARE PARTS LIST

Part No.	Description
039671	Mounting Template
043401	Mounting Strips
046451	Hardware Package
003508	Panloc Shelf, Right
003509	Panloc Shelf, Left
114090	Panloc Receptacle Only
100163	Player Mechanism Shipping Screw, #4 x 1-7/8 (4.76cm)

Block Diagram



Section Locations

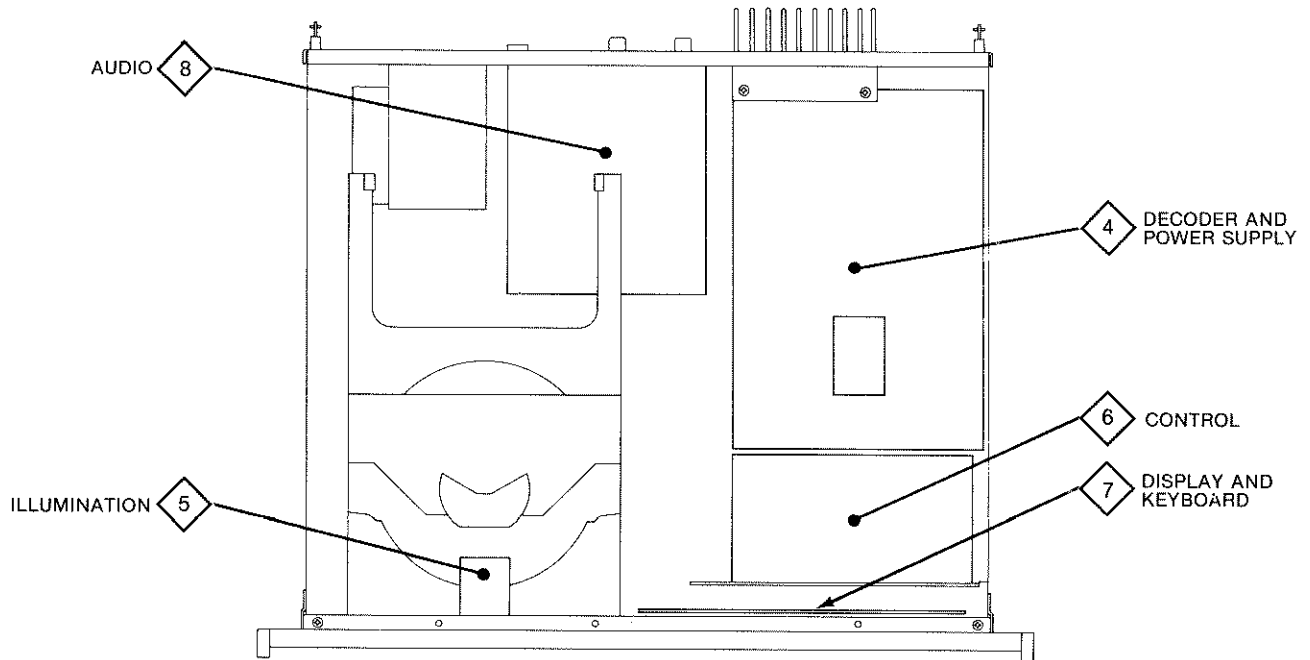


Fig. 4. Top view with cover removed

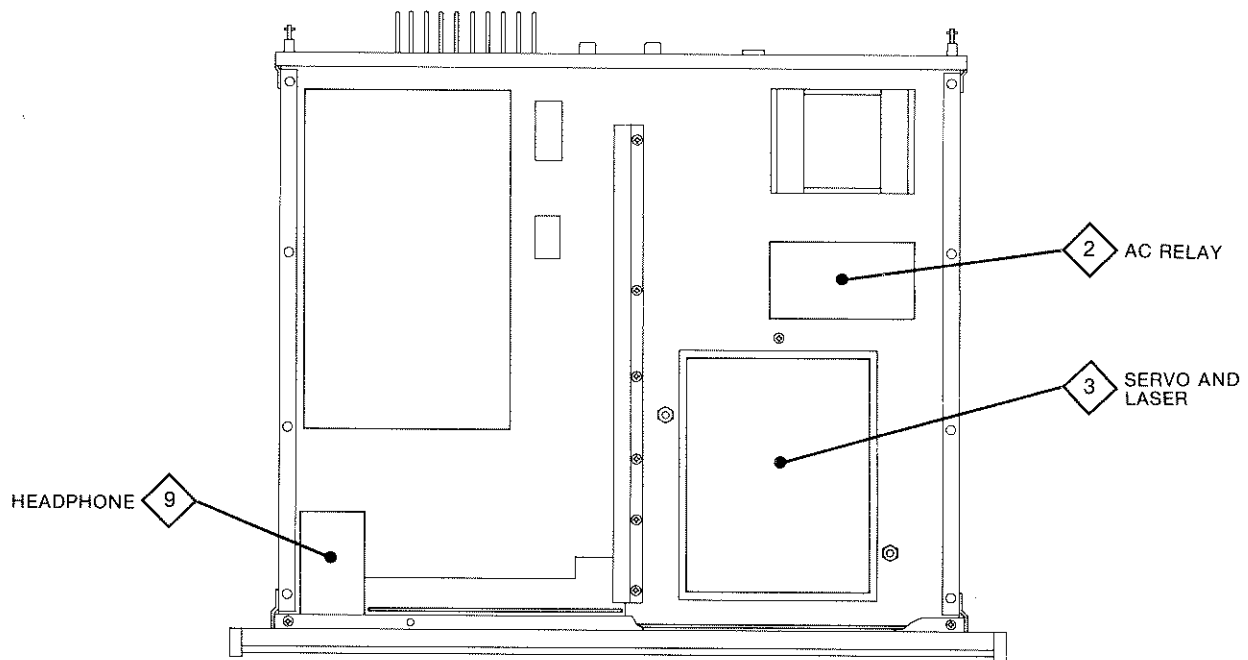


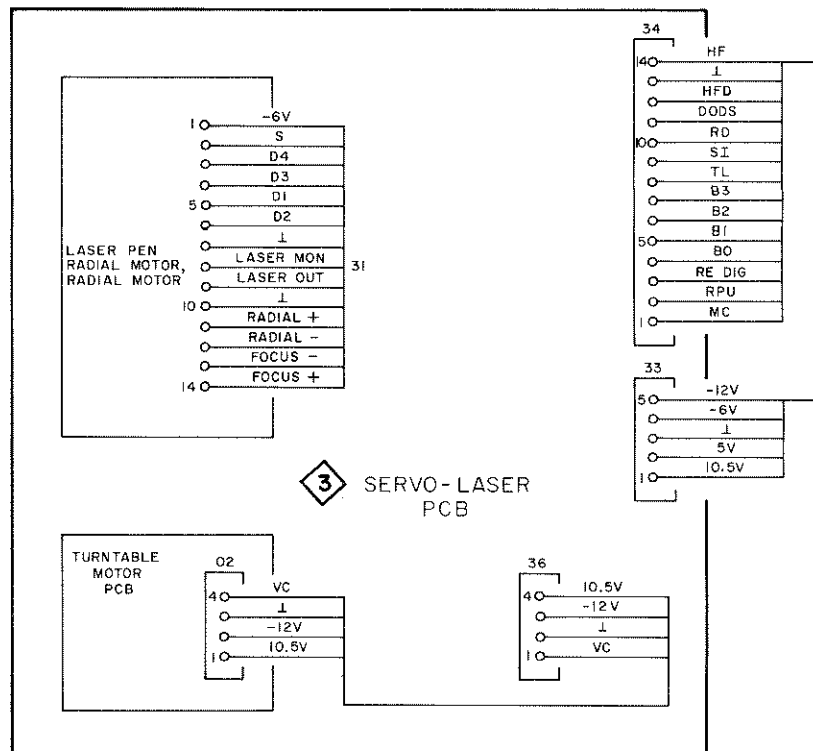
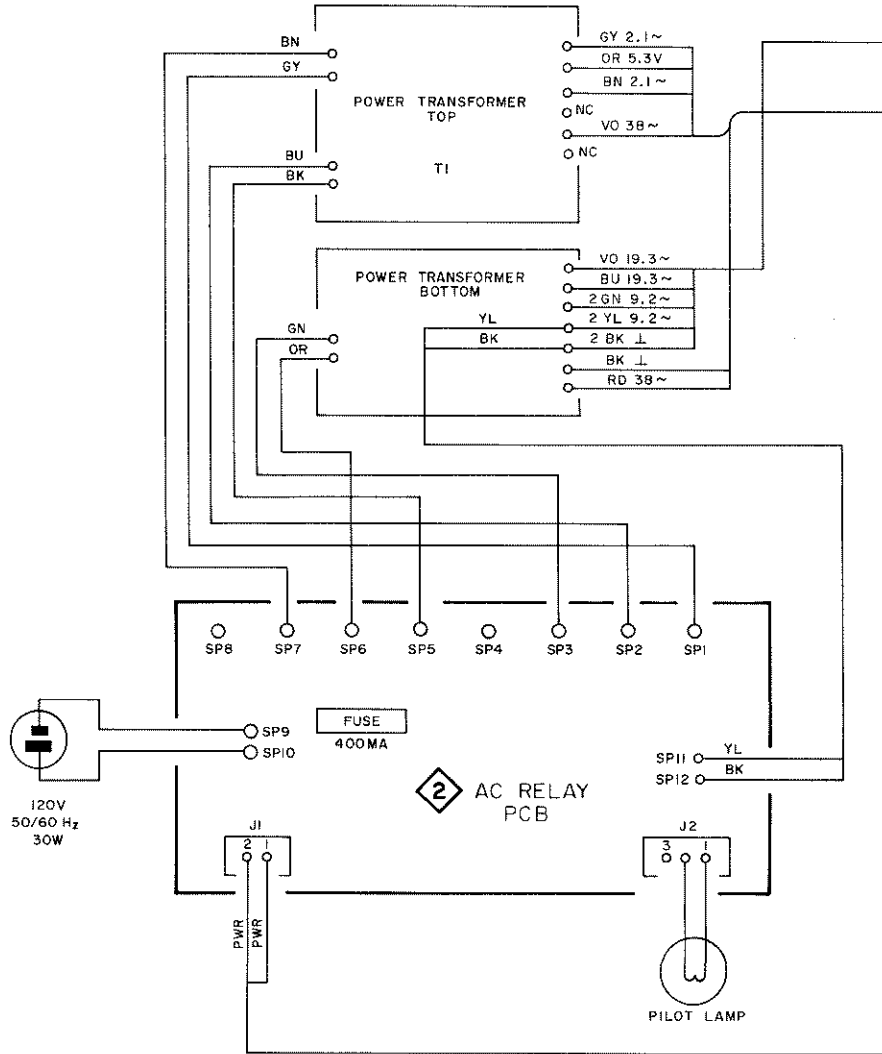
Fig. 5. Bottom view with cover removed

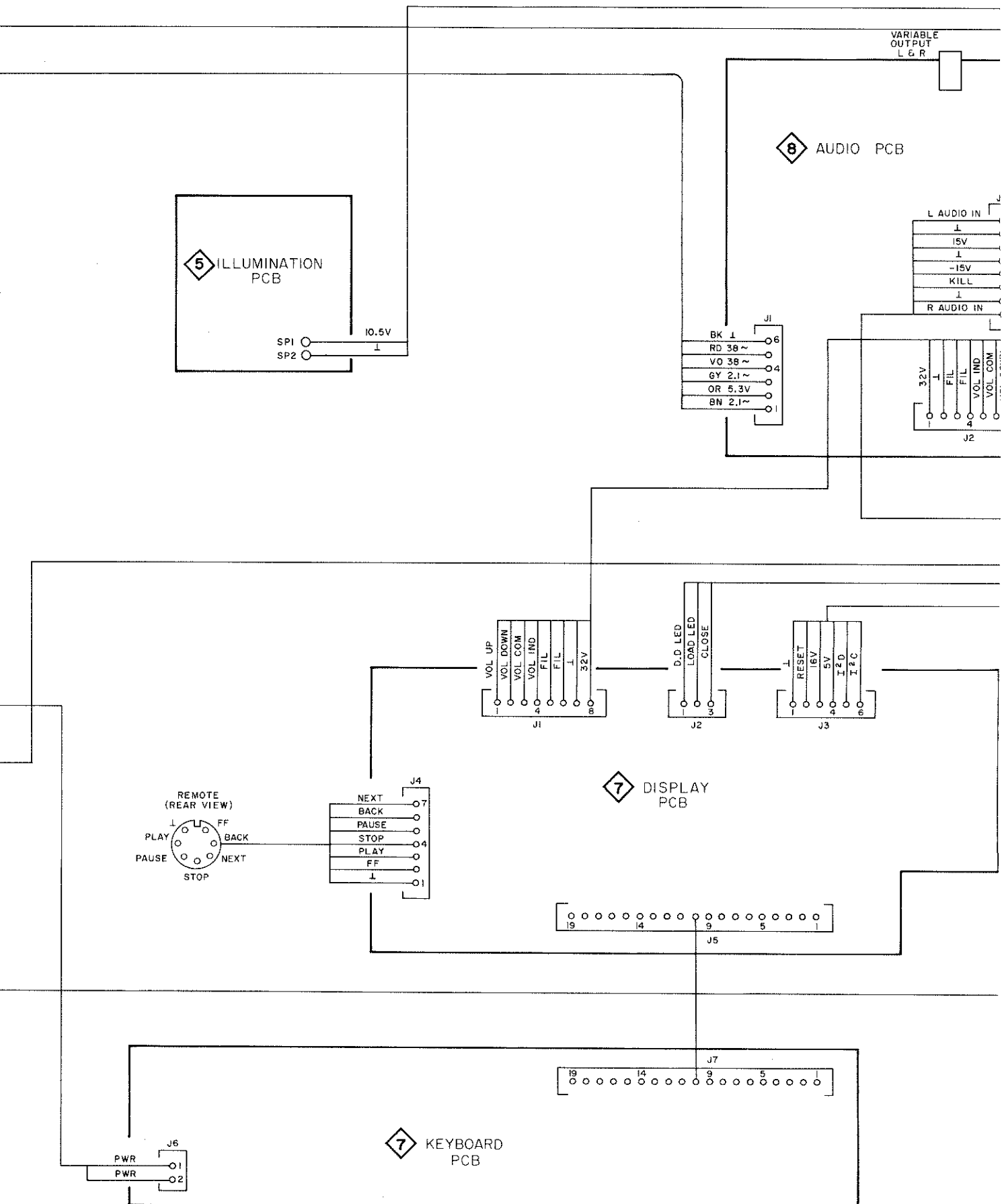
Interconnection Diagram

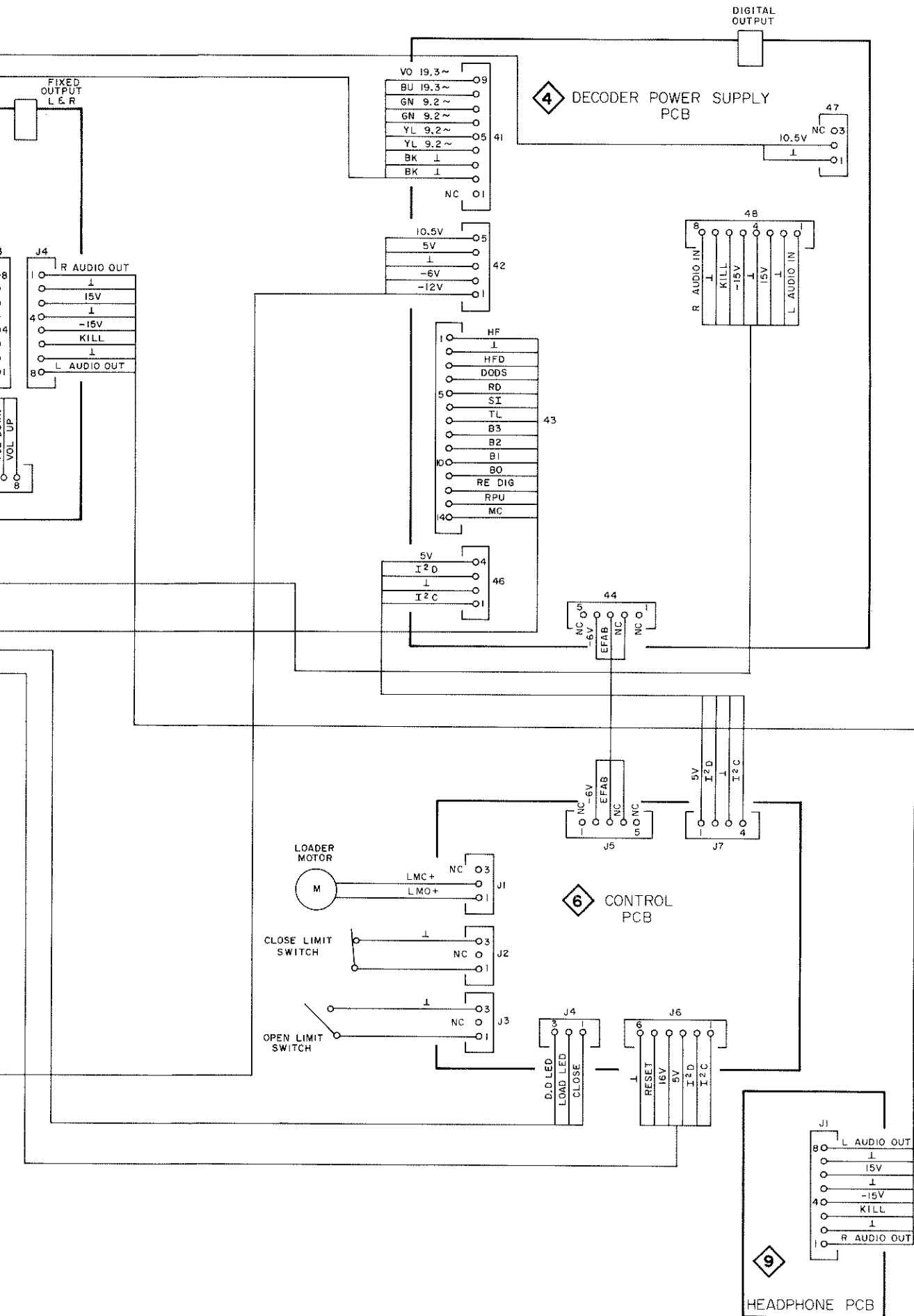
1

INTERCONNECTION PARTS LIST

Symbol No.	Part No.	Description
LIGHTING DEVICES		
DS1	058069	INC, 6.3V 8610
TRANSFORMERS		
T1	320014	Power

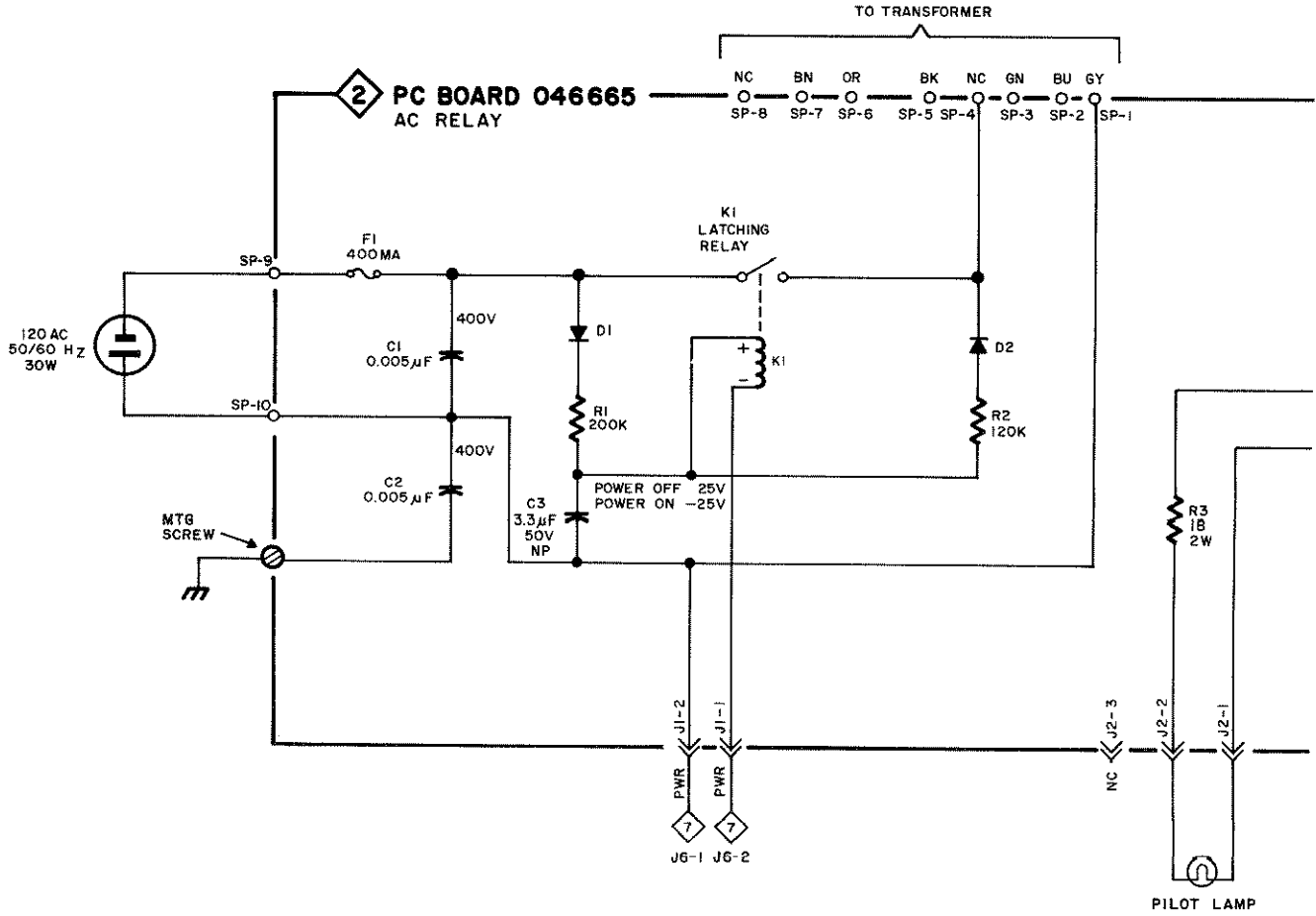




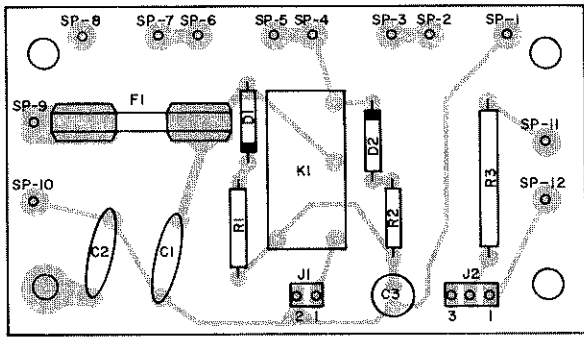


2

AC Relay



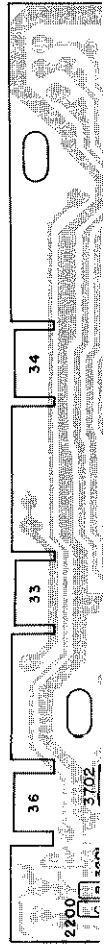
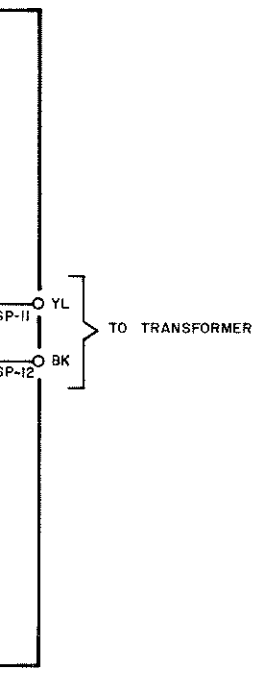
CIRCUIT SII

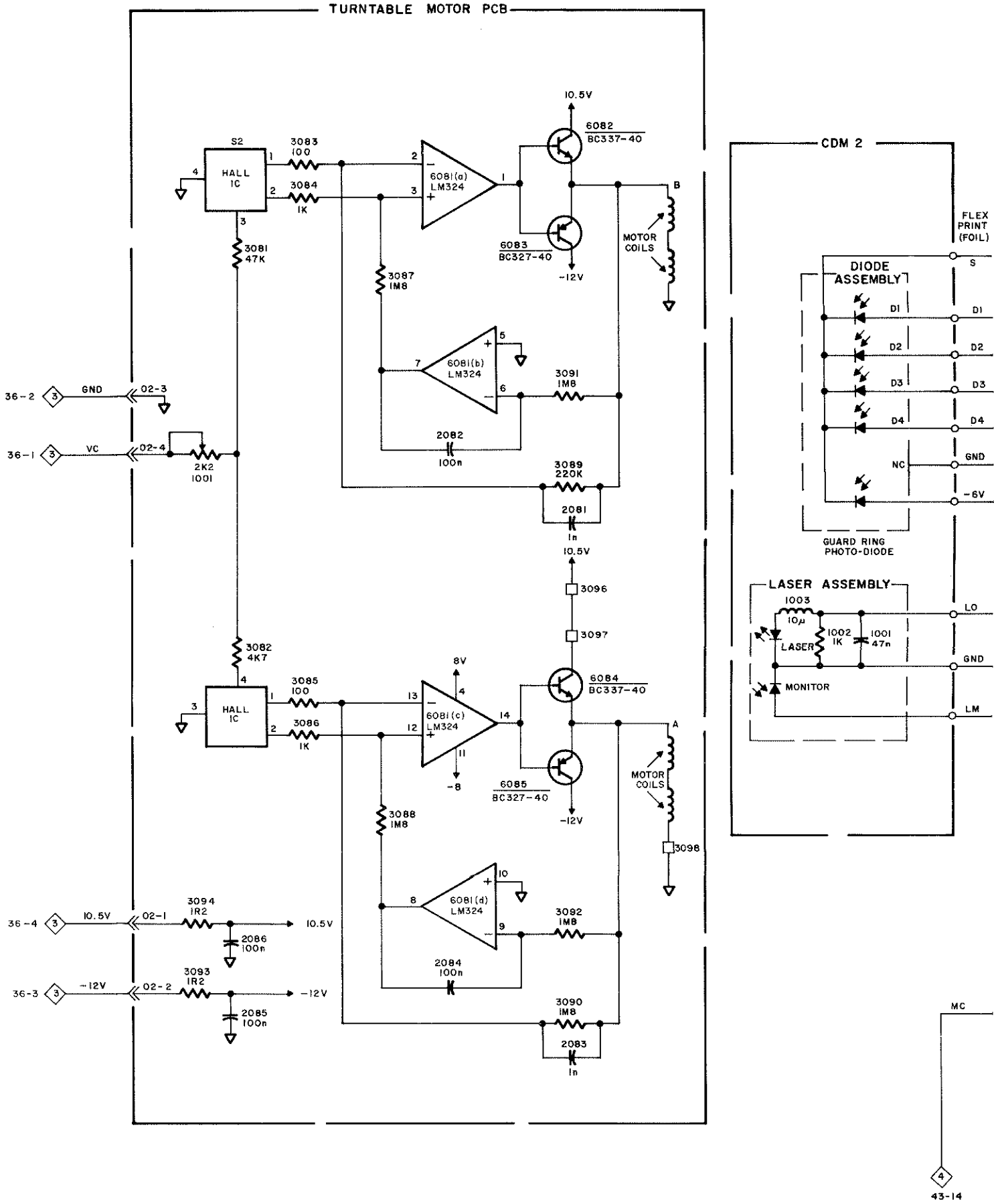


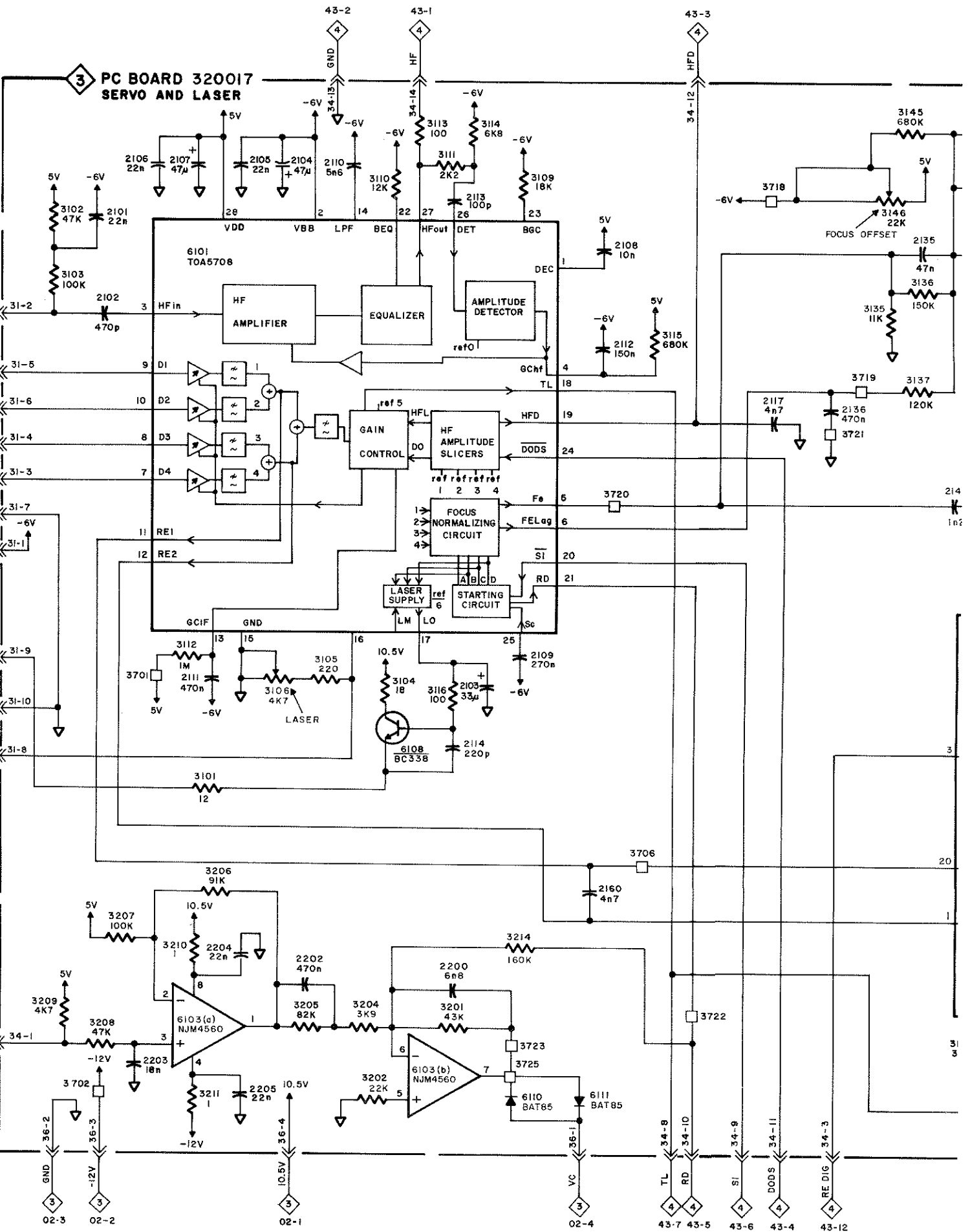
AC RELAY PCB 046665

**AC RELAY
PARTS LIST**

Symbol No.	Part No.	Description
CAPACITORS		
C1,C2	061276	CD, .0047uF, 400V, UL/CSA
DIODES		
D1,D2	070131	RECT, 400V, 1A, IN4004
FUSES		
F1	089049	Fuse, SB, 0.4A, 250V
RELAYS		
K1	087045	12VDC, Latching

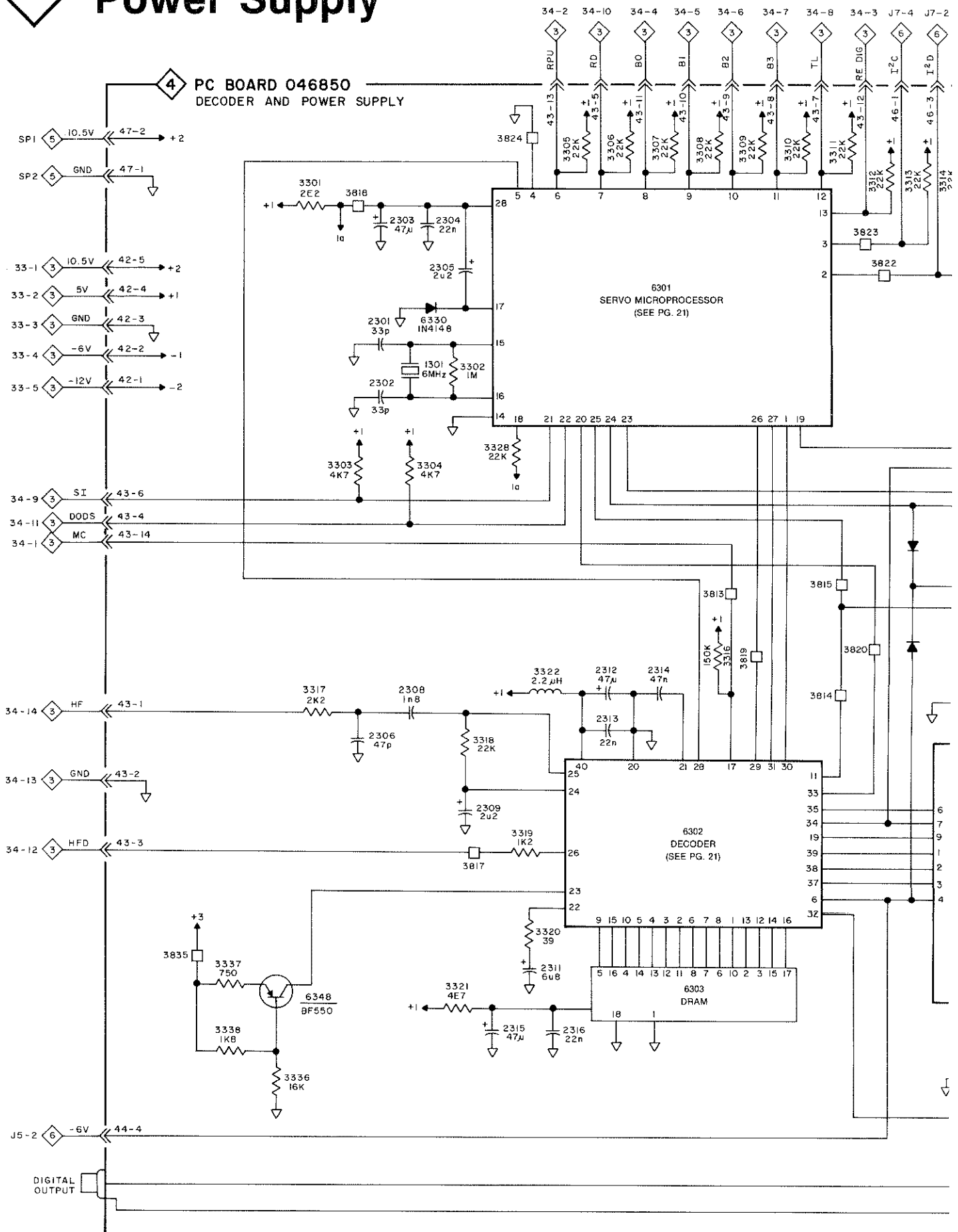






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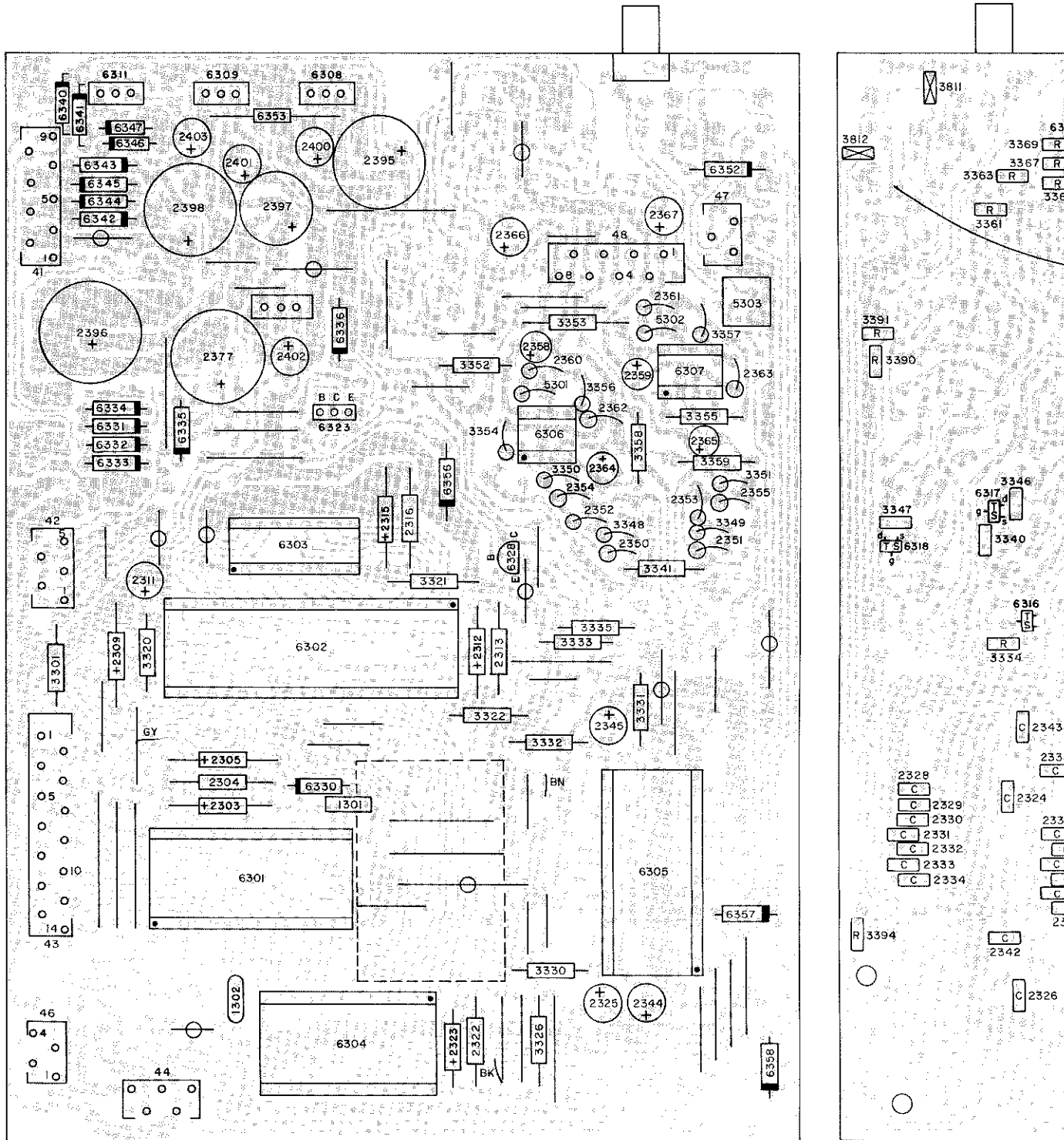
Decoder and Power Supply



Decoder and Power Supply



COMPONENT SIDE



DECODER AND POWER SUPPLY PCB 046662

CIRCUIT SIDE (WITH SURFACE-MOUNT COMPONENTS)

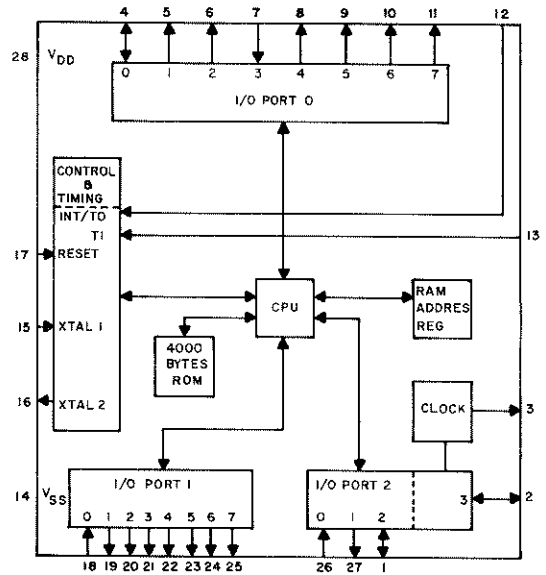
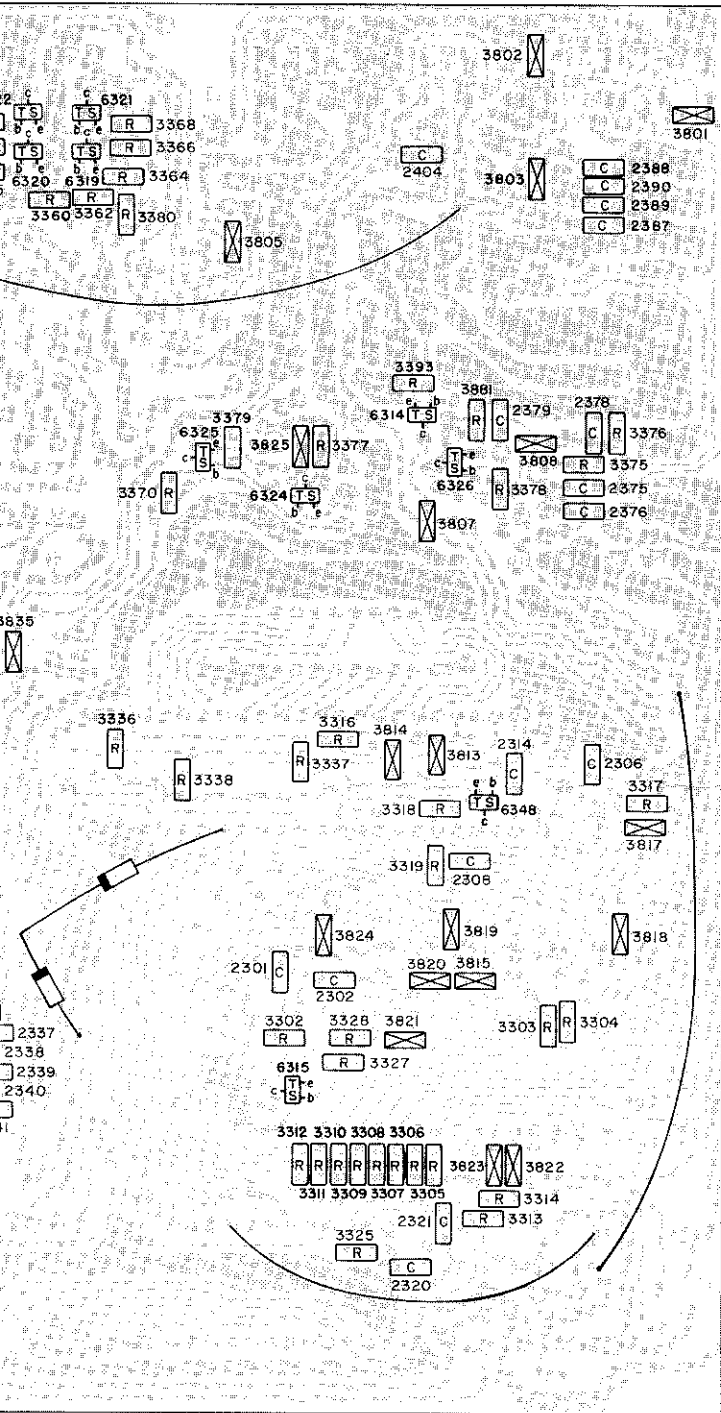


Fig. 6. Block diagram of Servo Microprocessor 6301.

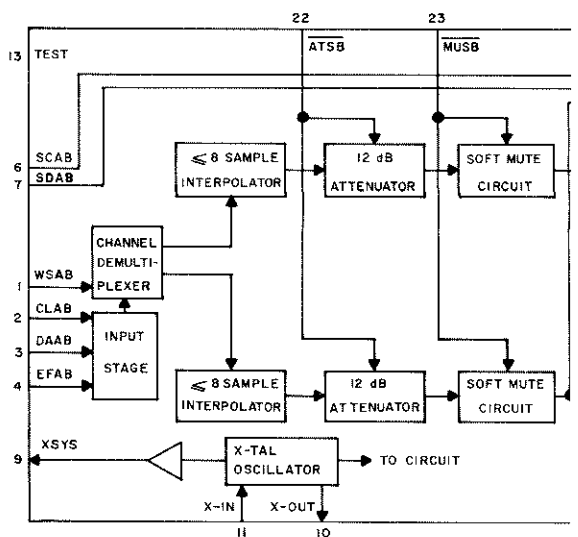


Fig. 8. Block diagram of Digital Filter

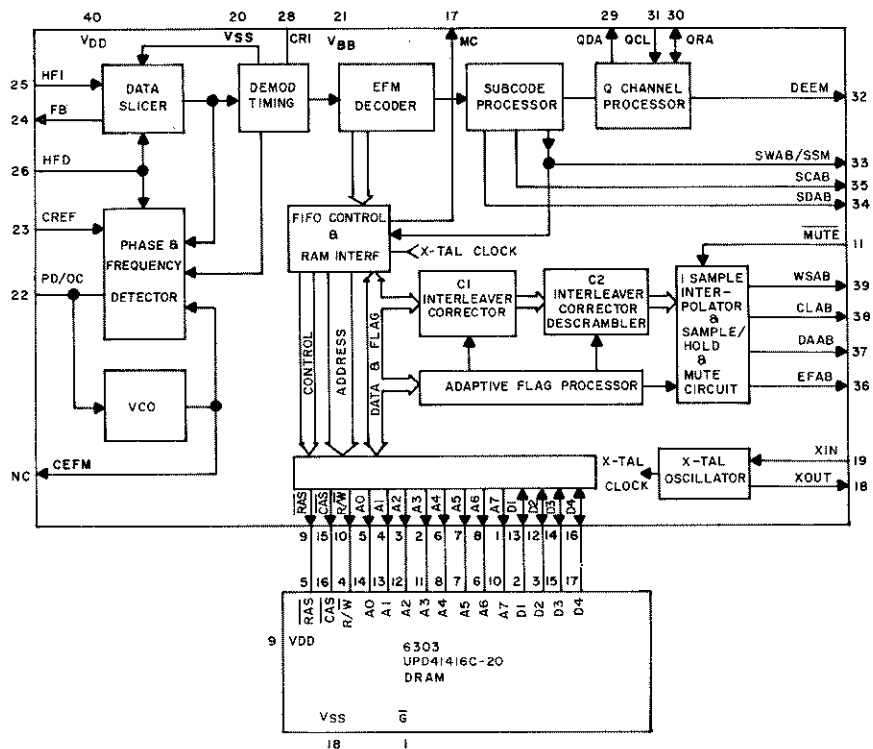
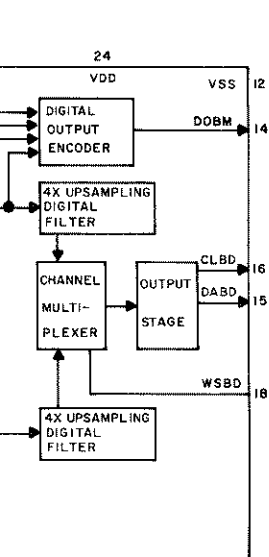


Fig. 7. Block diagram of Decoder 6302.



er 6304.

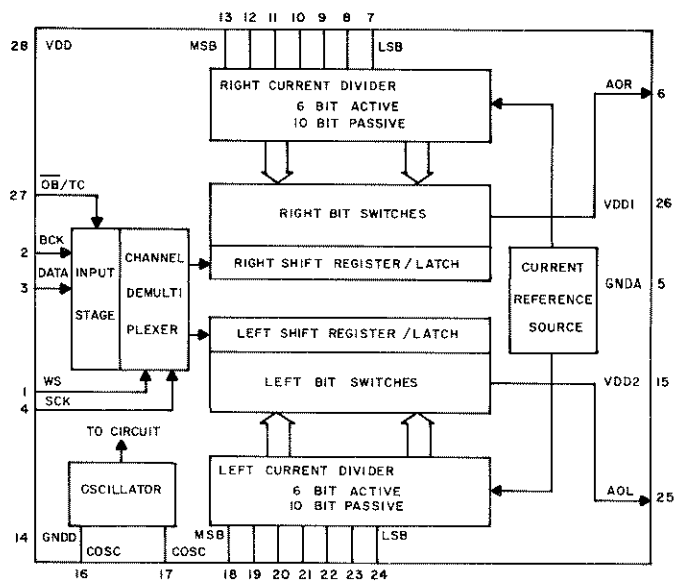
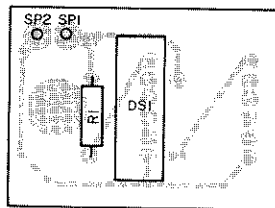
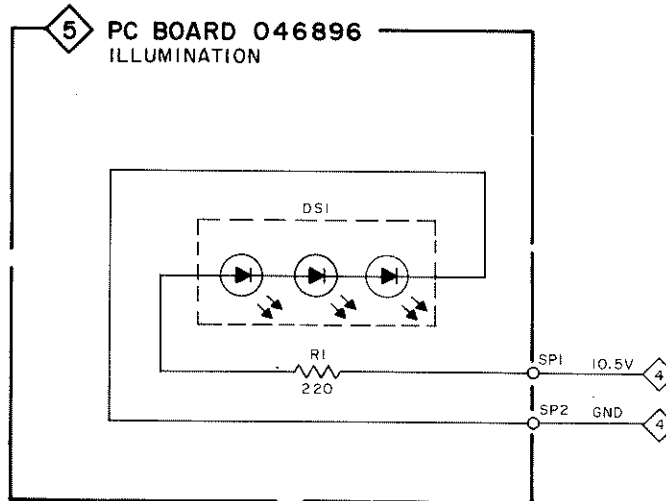


Fig. 9. Block diagram of Dual Dac 6305.

5

ILLUMINATION



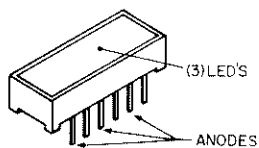
ILLUMINATION PCB 046896

ILLUMINATION PARTS LIST

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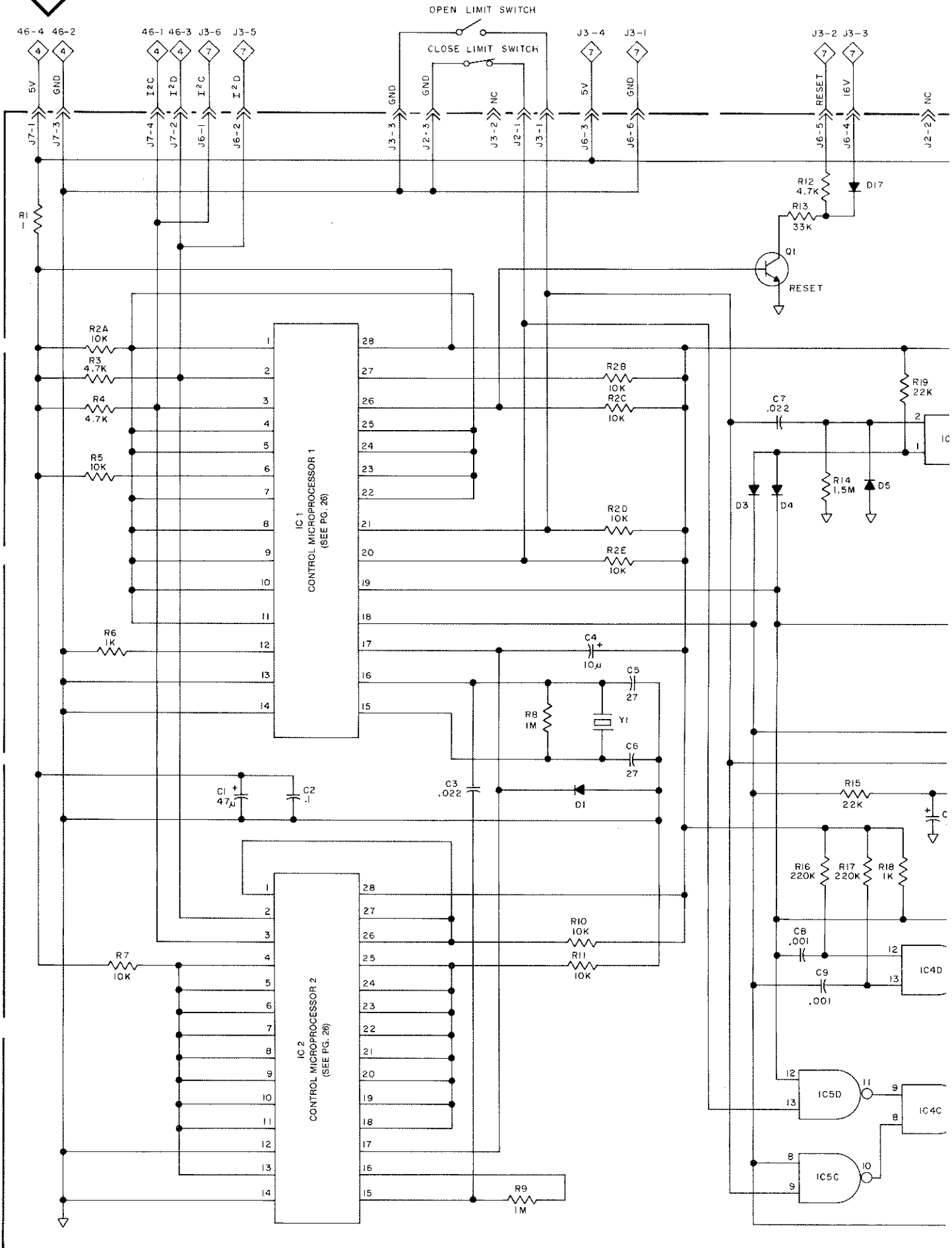
LIGHTING DEVICES

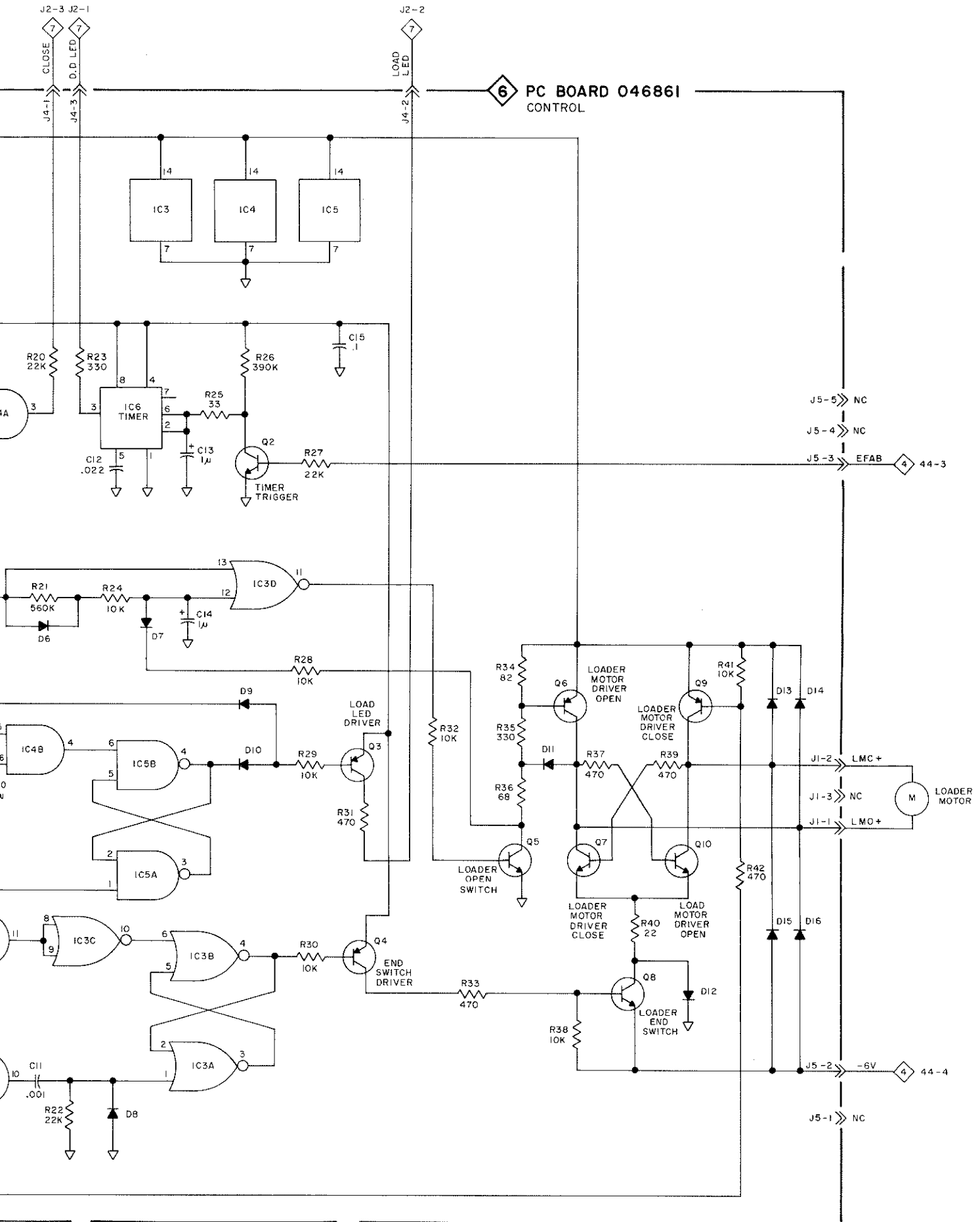
DS1	058102	LED, GREEN, BAR
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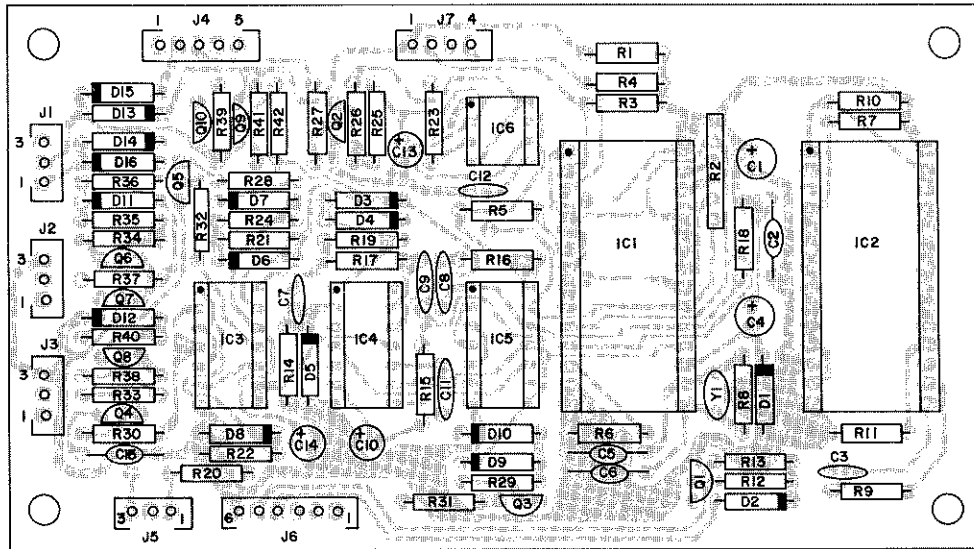


DS1

6 Control







CONTROL PCB 046861

CONTROL PARTS LIST

Symbol No.	Part No.	Description
------------	----------	-------------

DIODES

D1-D11	070047	SIG, 75V, 150mA, 1N4148
D12	070131	RECT, 400V, 1A, 1N4004
D13-D16	070047	SIG, 75V, 150mA, 1N4148

INTEGRATED CIRCUITS

IC1	310041	Microprocessor, MAB8461P, W079
IC2	310042	Microprocessor, MAB8421P, F050
IC3	133064	CMOS, Quad 2-input NOR Gate, MC14001B
IC4	133076	CMOS, Quad 2-input AND Gate, MC140811B
IC5	133063	CMOS, Quad 2-input NAND Gate MC14081B
IC6	133141	TIMER, NE555N

TRANSISTORS

Q1	132235	NPN, 2SC2240-BL
Q2	132223	NPN, MPS4124
Q3,Q4	132224	PNP, MPS4126
Q5	132223	NPN, MPS4124
Q6	132172	PNP, MPSA55
Q7,Q8	132171	NPN, MPSA05
Q9	132172	PNP, MPSA55
Q10	132171	NPN, MPSA05

CRYSTAL

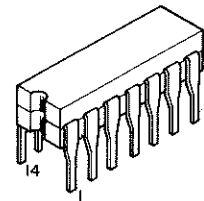
Y1	310043	Ceramic Resonator, 6MHz
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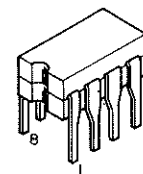
Q2-Q10



Q1



IC3-IC5



IC6

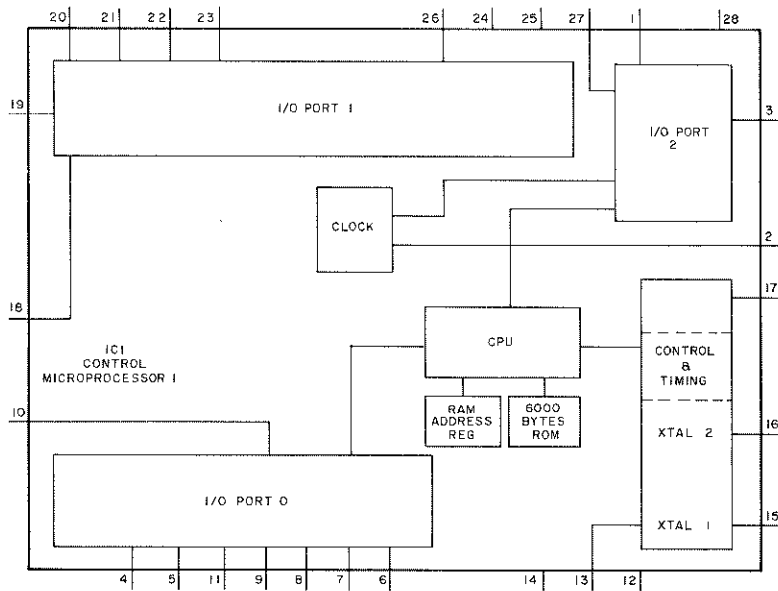


Fig. 10. Block diagram of Control Microprocessor 1.

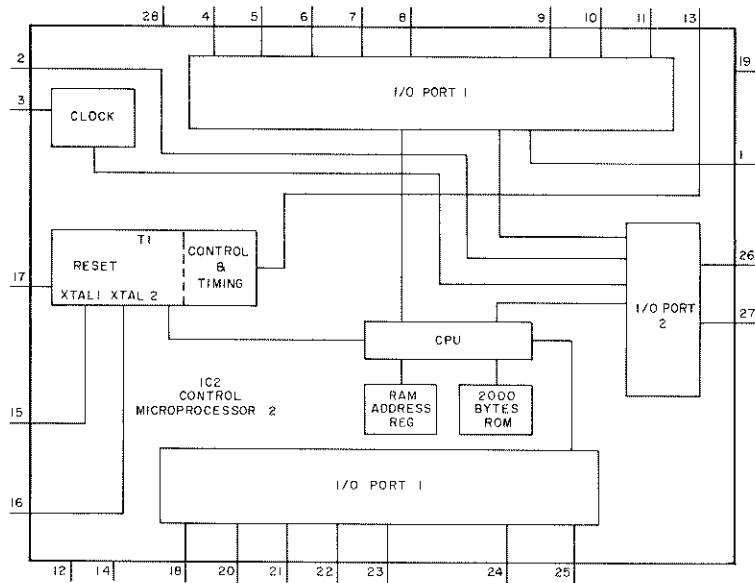
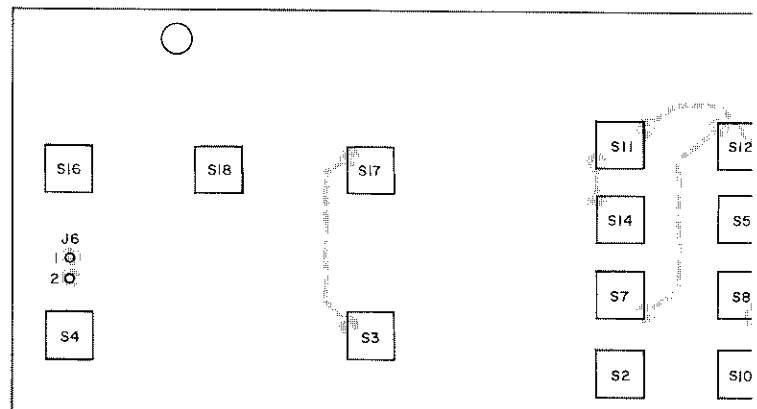


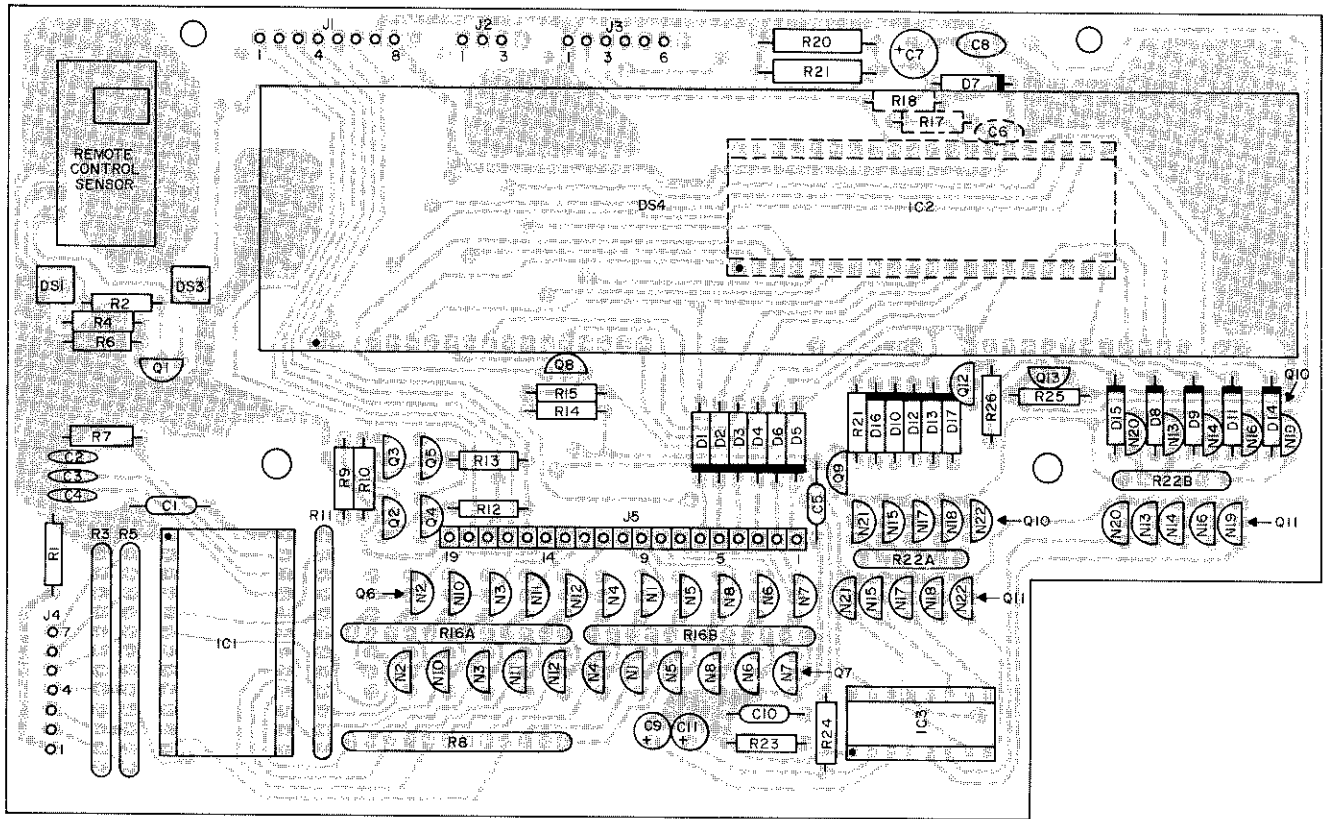
Fig. 11. Block diagram of Control Microprocessor 2.



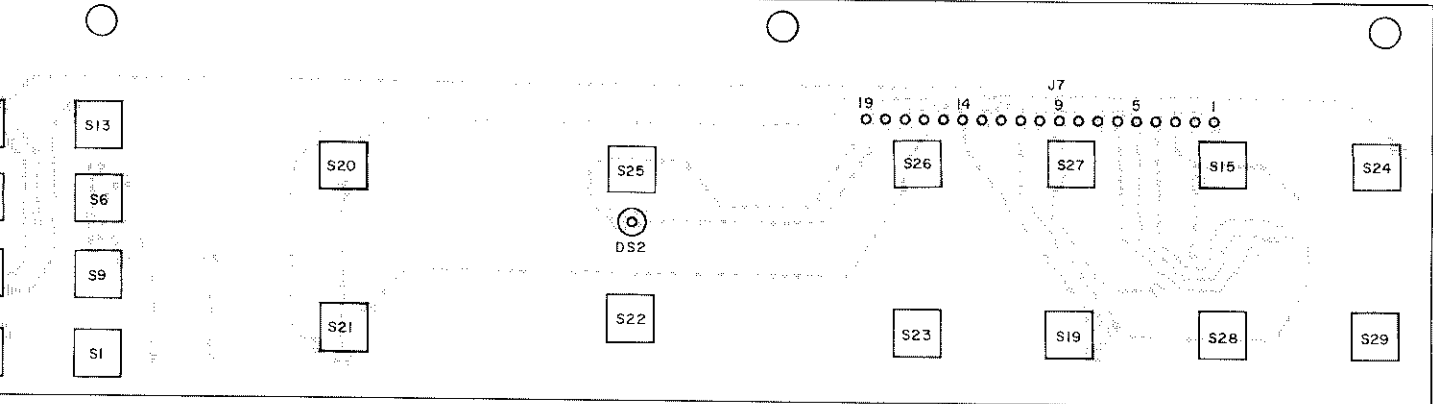
DISPLAY AND KEYBOARD PARTS LIST

Symbol No.	Part No.	Description
DIODES		
D1-D6	070047	SIG, 150mA, 1N4148
D7	070061	ZN, 15V, 10%, 1W
D8-D17	070047	SIG, 75V, 150mA, 1N4148
LIGHTING DEVICES		
DS1	058109	LED, Red, SPR5551SQR
DS2	058077	LED, Green, SLP244B
DS3	058109	LED, Red, SPR5551SQR
DS4	310044	Fluorescent Display
INTEGRATED CIRCUITS		
IC1	133133	CMOS, Remote Control Receiver, TC9150P
IC2	310046	Display Driver, TMS3763BNL
IC3	133118	Level Display Driver, LB1411
TRANSISTORS		
N1-N22, Q1	132236	PNP, 2SA970-BL
N1-N22, Q2	132235	NPN, 2SC2240-BL
Q1-Q3	132224	PNP, MPS4126
Q4, Q5	132223	NPN, MPS4124
Q6	132236	PNP, 2SA970-BL
Q7	132235	NPN, 2SC2240-BL
SWITCHES		
S1-S29	150051	TACT, Momentary
MISCELLANEOUS		
	121002	Sensor, IR





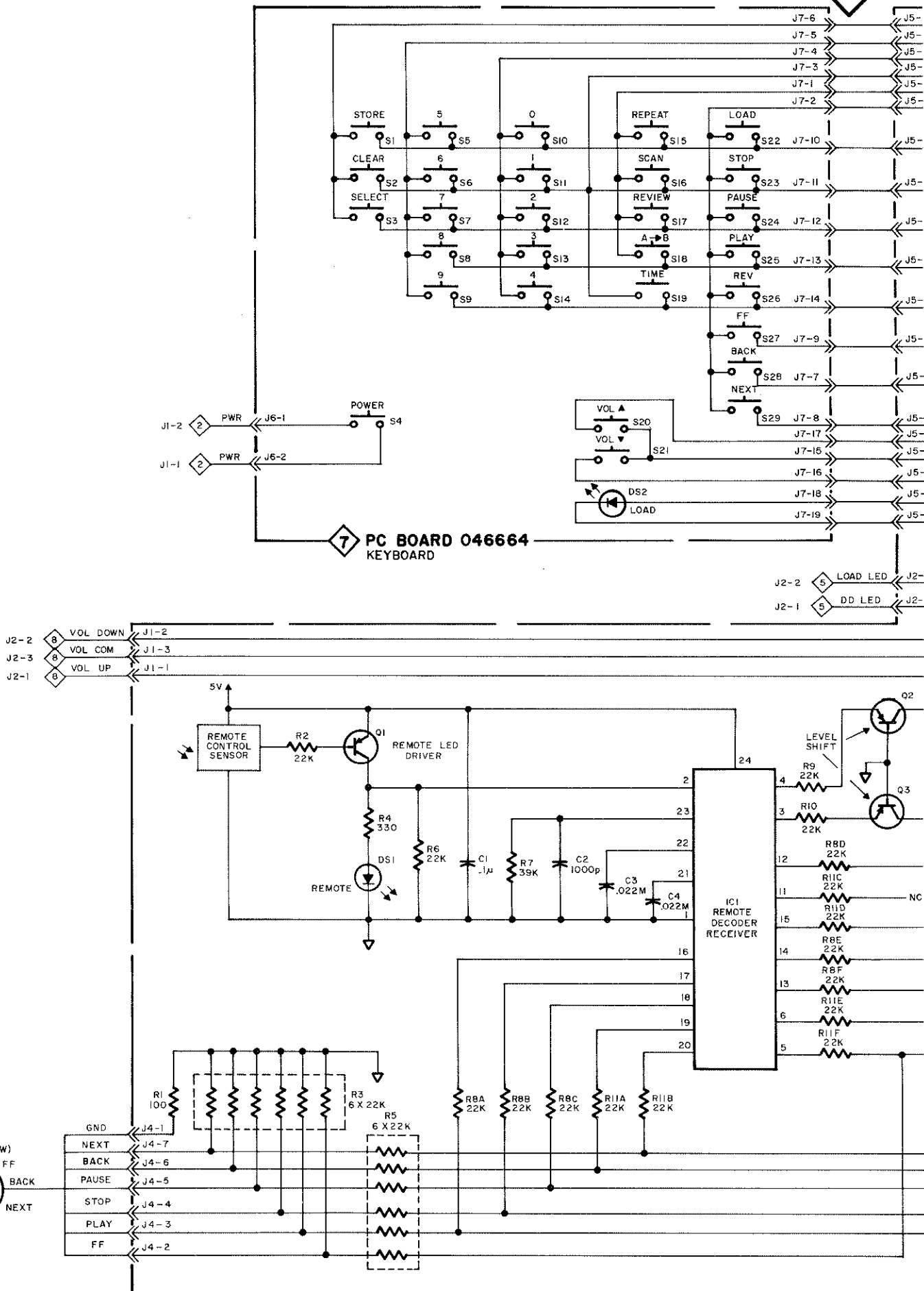
DISPLAY PCB 046849

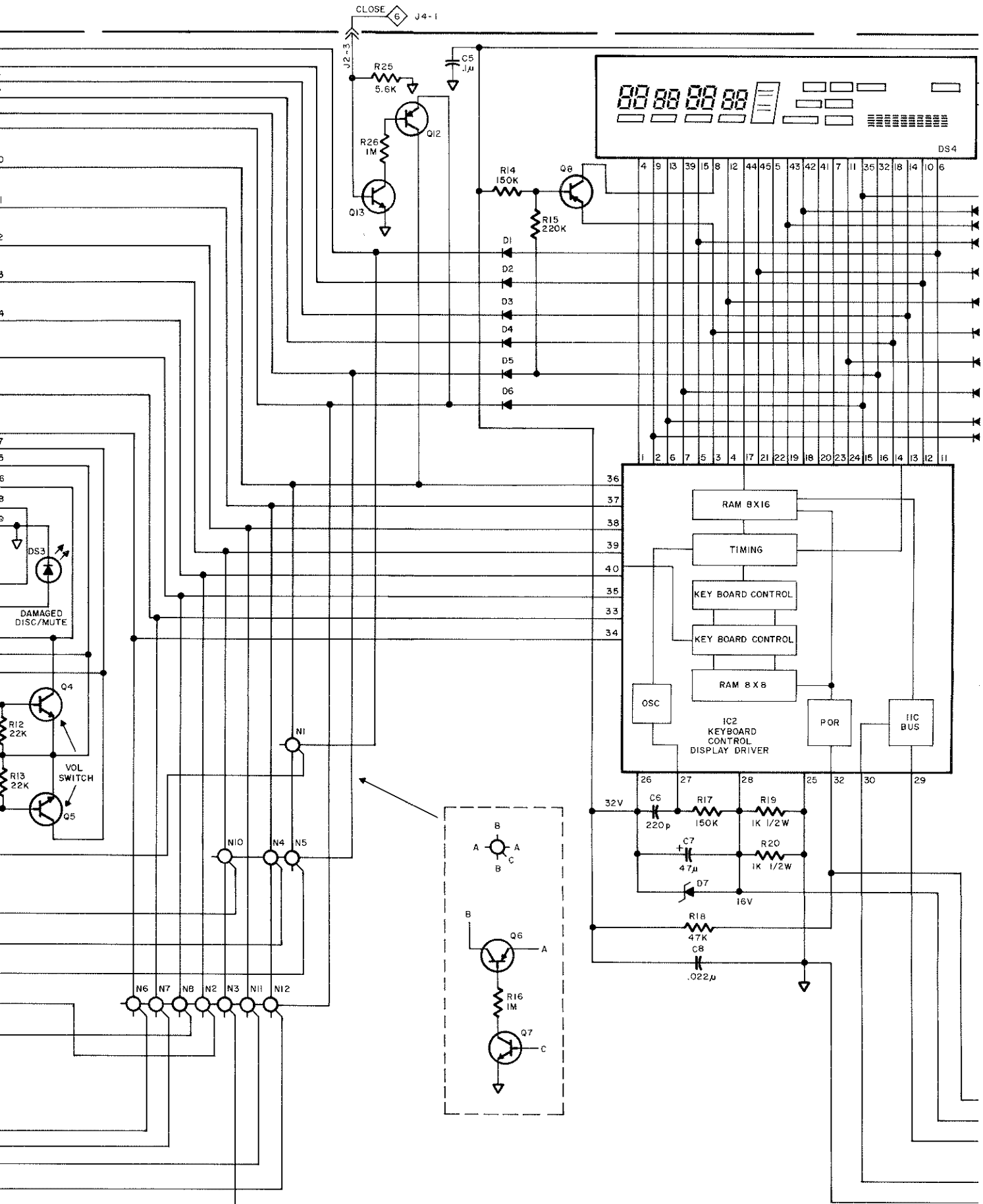


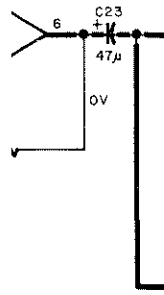
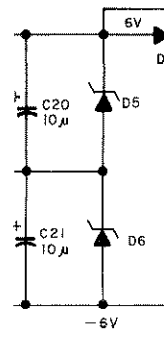
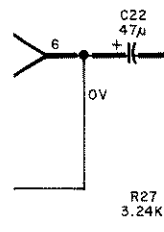
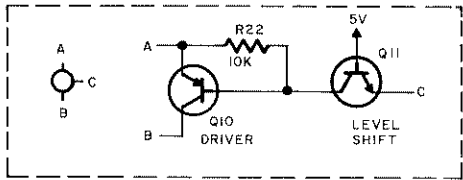
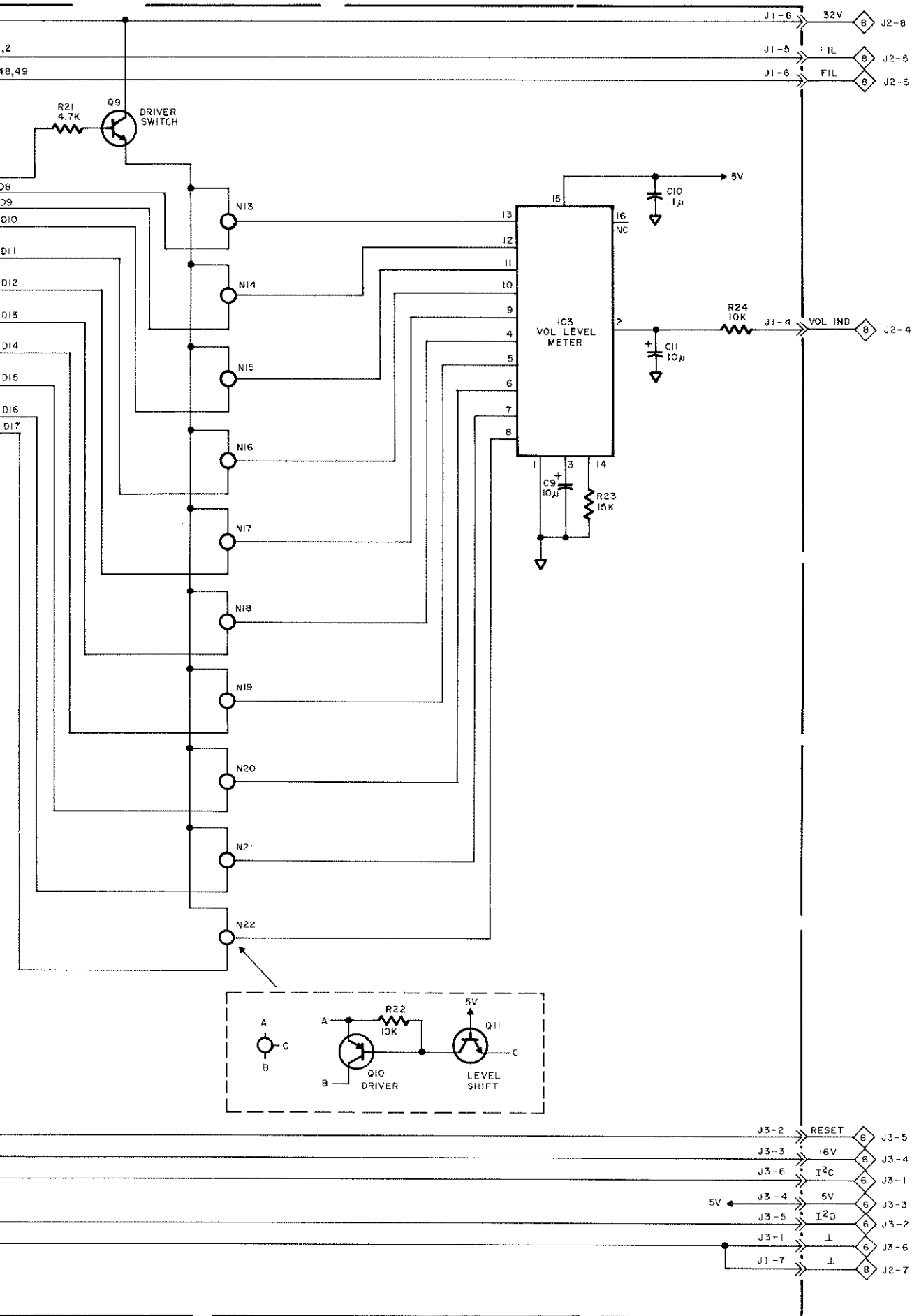
KEYBOARD PCB 046664

Display and Keyboard

7

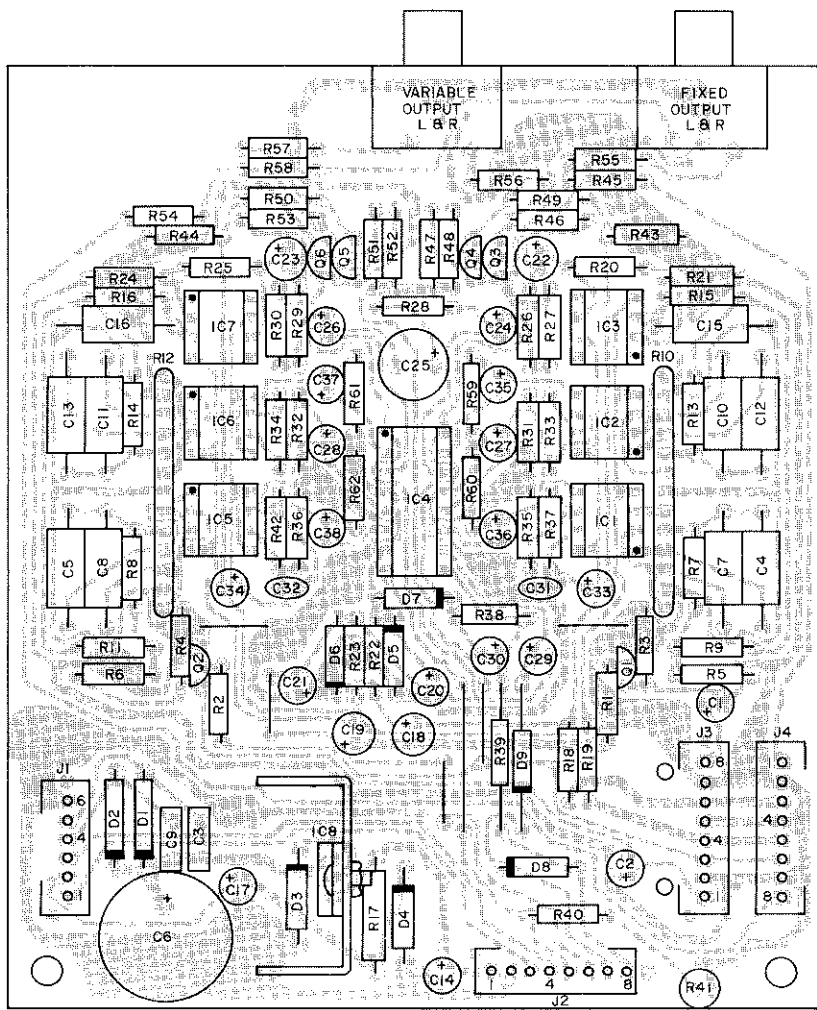






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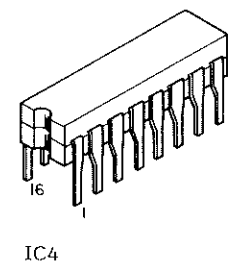
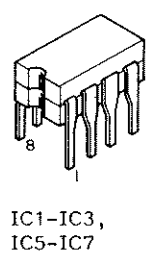
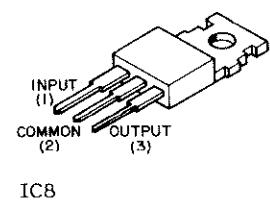
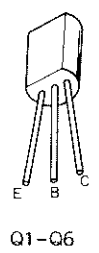
Audio



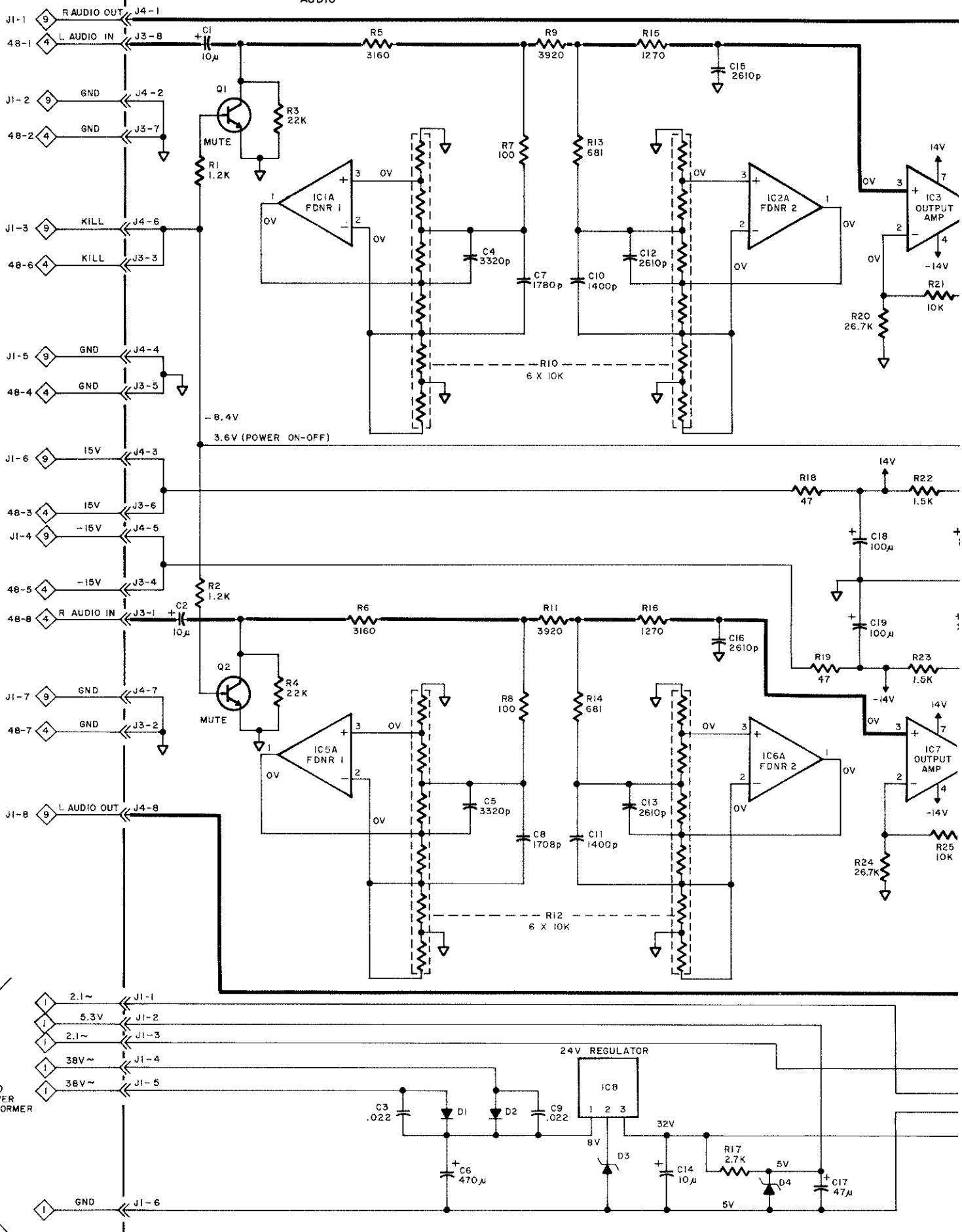
AUDIO PCB 046846

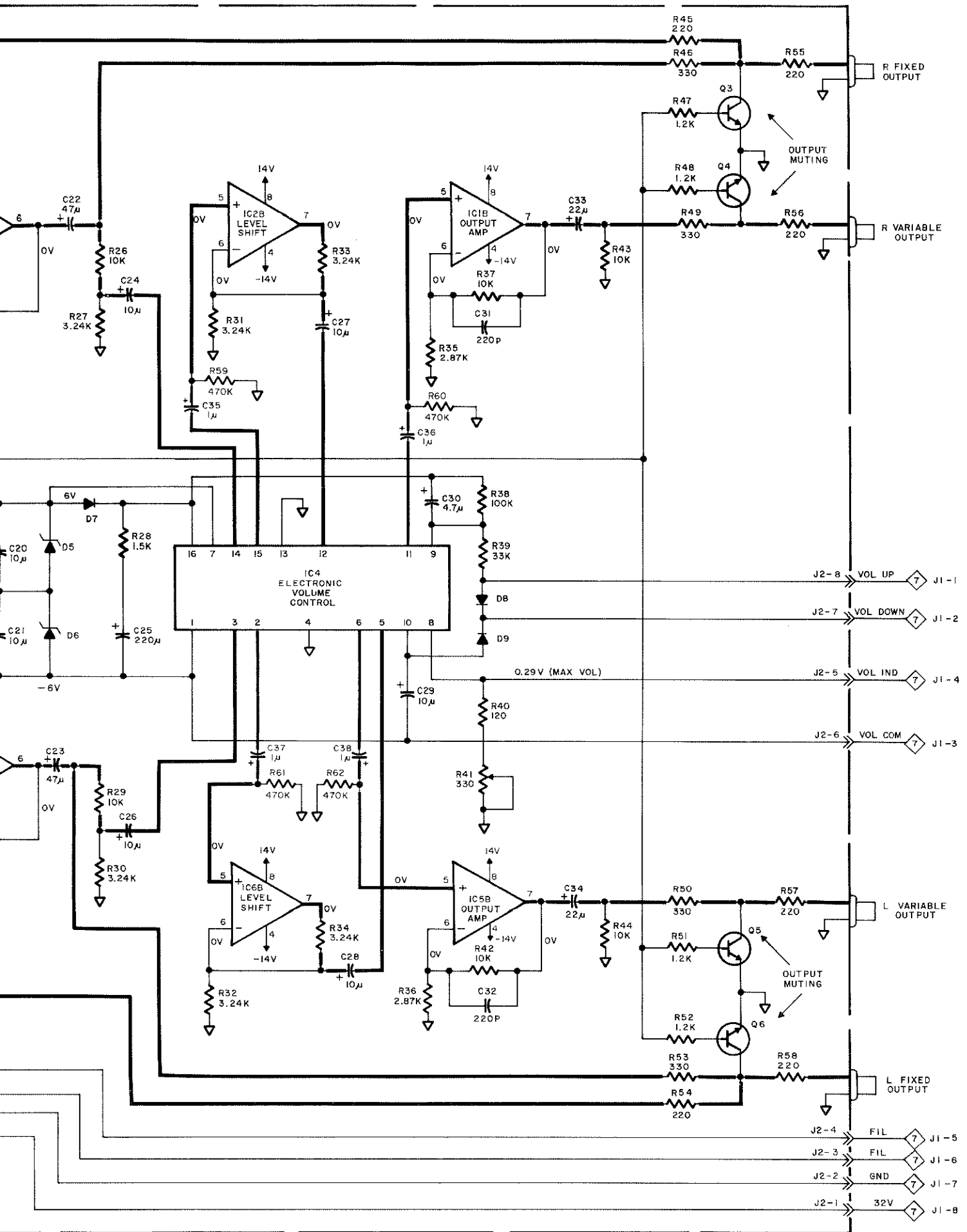
AUDIO PARTS LIST

Symbol No.	Part No.	Description
DIODES		
D1,D2	070131	RECT, 400V, 1A, 1N4004
D3	070130	ZN, 8.2V, 5%, 500mW, 1N5237B
D4	070132	ZN, 5V, 5%, 500mW, 1N5231B
D5,D6	070058	ZN, 6.2V, 5%, 500mW, 1N5234B
D7-D9	070047	SIG, 75V, 150mA, 1N4148
INTEGRATED CIRCUITS		
IC1,IC2	133094	Dual Operational Amp NE5532N
IC3	133066	Operational Amp, NE5534N
IC4	133132	CMOS, Volume Control, TC9153P
IC5,IC6	133094	Dual Operational Amp, NE5532N
IC7	133066	Operational Amp, NE5534N
IC8	133140	+24V Regulator, MC78M24CT
JACKS		
	117350	Jack, FIXED & Variable Output
TRANSISTORS		
Q1-Q6	132223	NPN, MPS4124



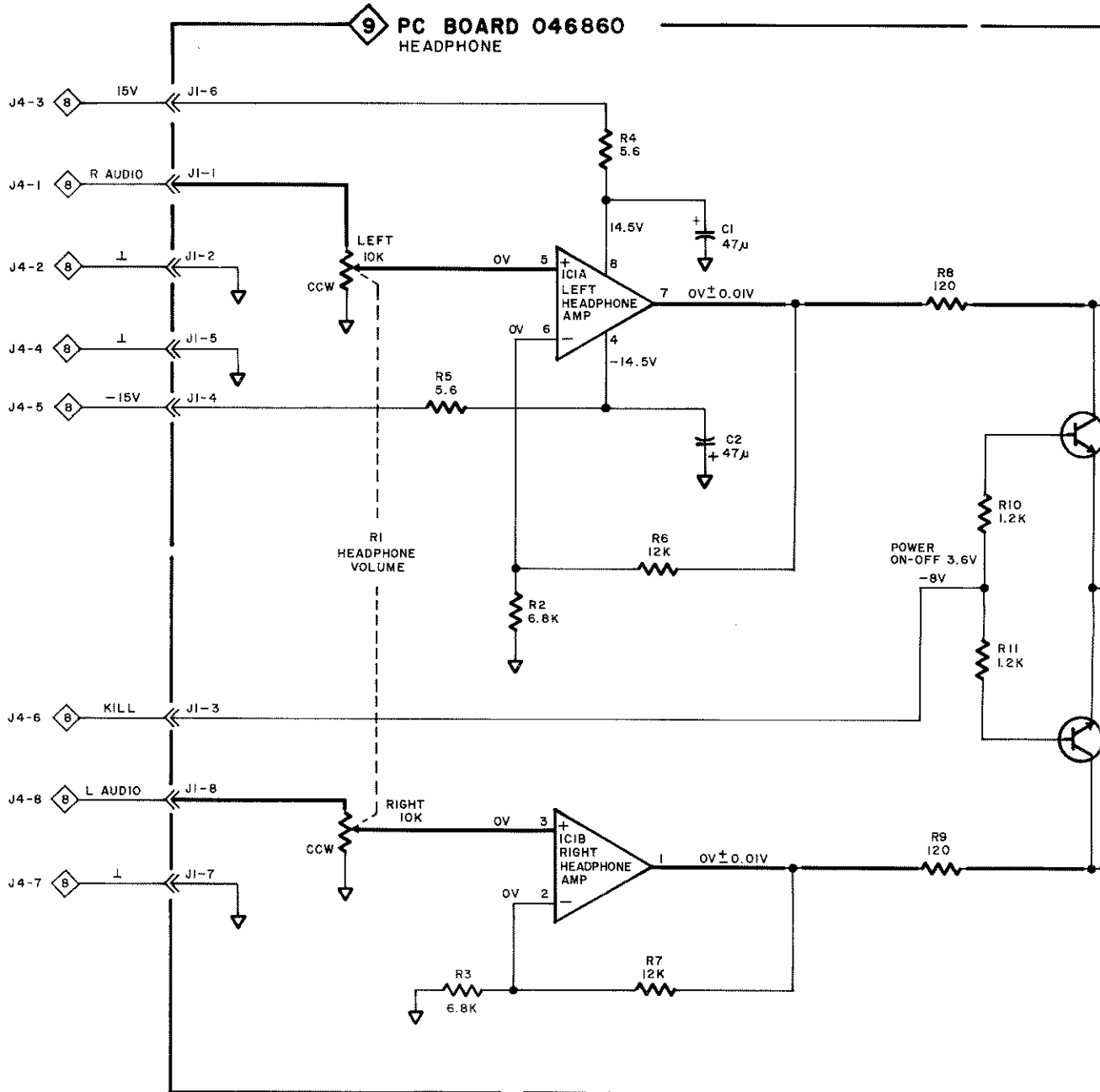
8 PC BOARD 046846
AUDIO

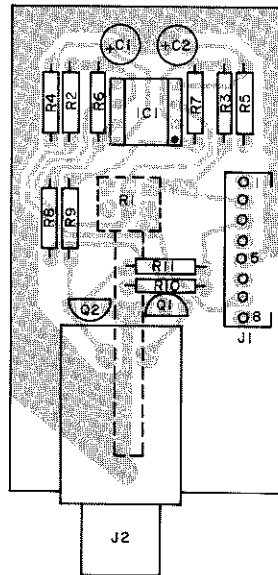
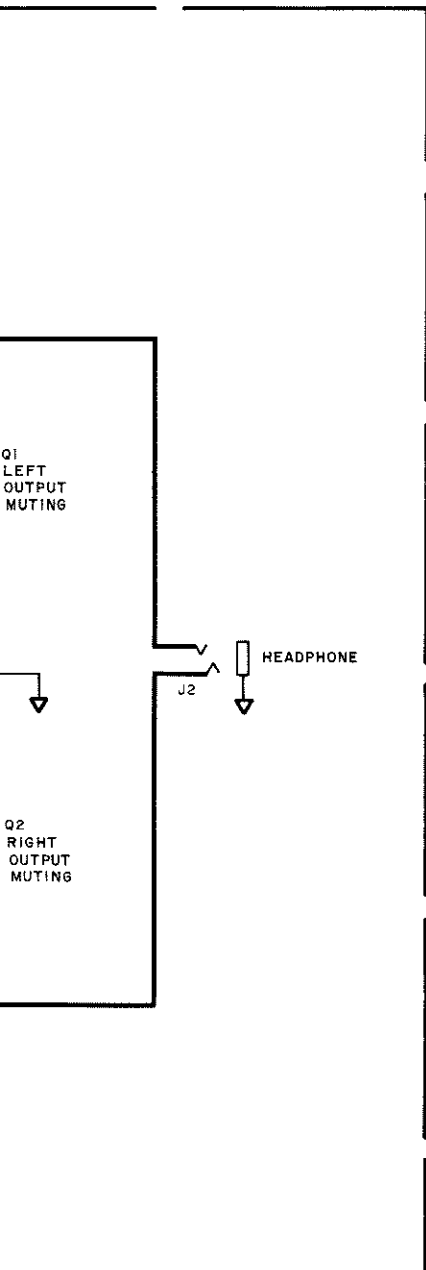




Headphone

9





HEADPHONE PCB 046860

**HEADPHONE
PARTS LIST**

Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	310016	Dual Operational Amp, NJM4556D
JACKS		
J2	117340	Headphone Jack
TRANSISTORS		
Q1, Q2	132223	NPN, MPS4124

Service Tests and Adjustments

A. CONTROL PERFORMANCE TEST

ACTION	NORMAL RESPONSE
1. Press POWER	<ul style="list-style-type: none">• TRACK, INDEX, LAP and VOLUME indicators light in display• DD/M (DAMAGED DISC/MUTE) lights
2. Press LOAD and load DISC 5A	<ul style="list-style-type: none">• Load light operates on open and close• TRACK 24, MIN 59 and SEC 42 light in display
3. Press PLAY	<ul style="list-style-type: none">• Track 1, INDEX 1, MIN 0, SEC 00 and TIME light in display• Timer starts counting• DD/M light goes off
4. Press and hold REV	<ul style="list-style-type: none">• Timer starts counting downward• DD/M light lights• ERROR block lights when timer reaches 0
5. Press and hold FF	<ul style="list-style-type: none">• Timer starts counting upward• DD/M light lights
6. Press REPEAT	<ul style="list-style-type: none">• REPEAT block lights
Press REPEAT again to resume	
7. Press PAUSE	<ul style="list-style-type: none">• PAUSE block lights• Timer stops counting• Audio mutes
Press PAUSE again to resume	
8. Press NEXT TRACK	<ul style="list-style-type: none">• Next higher track number lights• Timer starts count from 0
9. Press BACK TRACK	<ul style="list-style-type: none">• Next lower track number lights• Timer starts count from 0
10. Press TIME two times	<ul style="list-style-type: none">• Timer displays time two different ways: LAP (elapsed)-Time from start of track REM (remaining)—Total remaining time on disc
11. Press STOP	<ul style="list-style-type: none">• TRACK 24, MIN 59 and SEC 42 light in display• DD/M lights

- | | |
|-----------------|--|
| 12. Press SCAN | <ul style="list-style-type: none"> • SCAN lights • Plays first 10 seconds of each track
(Continues for all tracks) |
| 13. Press PLAY | <ul style="list-style-type: none"> • SCAN goes off, plays entire track |
| 14. Press A-B | <ul style="list-style-type: none"> • PROGRAM lights, A-B flashes |
| Press A-B again | <ul style="list-style-type: none"> • A-B stops flashing, plays and repeats a portion
of the disc |
| 15. Press CLEAR | <ul style="list-style-type: none"> • PROGRAM and A-B go off, plays entire track |
| 16. Press STOP | <ul style="list-style-type: none"> • TRACK 24, MIN 59, and SEC 42 light in display |
| 17. Press 5 | <ul style="list-style-type: none"> • TRACK flashes, 5 lights |
| Press SELECT | <ul style="list-style-type: none"> • INDEX flashes |
| Press SELECT | <ul style="list-style-type: none"> • MIN flashes |
| Press 1 | <ul style="list-style-type: none"> • 1 lights |
| Press SELECT | <ul style="list-style-type: none"> • SEC flashes |
| Press 0 | <ul style="list-style-type: none"> • 00 lights |
| Press STORE | <ul style="list-style-type: none"> • MIN flashes |
| Press 2 | <ul style="list-style-type: none"> • 2 lights |
| Press SELECT | <ul style="list-style-type: none"> • SEC flashes |
| Press 0 | <ul style="list-style-type: none"> • 00 lights |
| Press STORE | <ul style="list-style-type: none"> • TRACK 1, MIN 1, SEC 00 and PROGRAM light |
| Press REVIEW | <ul style="list-style-type: none"> • TRACK 5, MIN 1, SEC 00 and the REVIEW
block light, then the MIN 2 and SEC 00 light |
| 18. Press PLAY | <ul style="list-style-type: none"> • TRACK 1, MIN 1, SEC 00 and PROGRAM light • REVIEW goes off |
| 19. Press STOP | <ul style="list-style-type: none"> • Starts playing at TRACK 5, MIN 1 and SEC 00 • Stops playing at TRACK 5, MIN 2 and SEC 00 • TRACK 1, MIN 1, SEC 00 and DD/M light |
| 19. Press STOP | <ul style="list-style-type: none"> • TRACK 24, MIN 59, SEC 42, and DD/M light |

B. ERROR CORRECTION TEST

1. Load TEST DISC 5A and play the first 40 seconds of track 9, then play first 40 seconds of track 17. Both tracks should play without music interruption and the DD/M lamp should not flash.

C. PERFORMANCE TEST

1. Load TEST DISC 3, connect Distortion Analyzer to L fixed output, and play the first 15 seconds of track 2. Output level should be 2.7 to 2.9 volts, frequency 997Hz, and total harmonic distortion less than .003%. If necessary, use A-B feature when measuring distortion as 997Hz tone lasts only 15 seconds.
2. Press PAUSE; the noise level should be less than -97dB.
3. Play track 2 from 15 seconds to 65 seconds which is a sweep from 20Hz to 20kHz. The output should remain constant ± 0.5 dB.
4. Repeat steps 1-3 for the L variable output with the VOLUME set at maximum.
5. Repeat steps 1-3 for the R fixed output.
6. Repeat step 4 for the R variable output.
7. The headphone output, headphone LEVEL control operation, and VOLUME control operation can be checked using test signals on TEST DISC 3.

D. SERVICE ADJUSTMENTS — Perform the following only if necessary.

1. POWER SUPPLY VOLTAGE TEST. Refer to figures 12 and 13 for voltages and the measurement locations.
2. LASER SUPPLY ADJUSTMENT. Refer to figure 14 for the measurement and adjustment location.
 - a. Play track 1 on TEST DISC 5
 - b. The voltage between TP1 and TP2 should be $50\text{mV} \pm 5\text{mV}$; adjust R3106 LASER if necessary.
3. FOCUS OFFSET ADJUSTMENT. Refer to figure 14 for the measurement and adjustment location.
 - a. Play track 1 on TEST DISC 5
 - b. The voltage between TP3 and TP4 should be $400\text{mV} \pm 40\text{mV}$; adjust R3146 FOCUS OFFSET if necessary.
NOTE: The CD player must be upright in the normal position while making this adjustment.
4. VOLUME INDICATOR ADJUSTMENT. Press and hold the VOLUME UP until the volume is at maximum. Adjust R41, Section 8 so the volume indicator displays all 10 segments.

E. CALLING THE SERVICE LOOPS. The service loops in the CD player allow examining the CD player in defined conditions.

1. To call the service loops, load TEST DISC 5. Press PLAY, STOP and FF buttons simultaneously and hold, then turn on POWER button.

2. SERVICE LOOP "0". In this loop the laser arm moves outward. The arm can be moved inward and outward by pressing the REV or the FF buttons. In this loop the laser does not emit light.

Press NEXT TRACK button

3. SERVICE LOOP "1". In this loop the laser emits light and the laser unit starts to search for a focus point. (Focusing unit moves up and down). If the focus point is found, the display indicates "1". As in loop "0", the arm can be moved inward and outward using REV or FF.

If the focus point is not found, the display will continue to indicate "0". This loop should be used for Focus Adjustment.

Press NEXT TRACK button

4. SERVICE LOOP "2". The display should indicate "2", the motor starts to run, and the laser arm stays inward. (The radial control is OFF).

Press NEXT TRACK button

5. SERVICE LOOP "3". The display should indicate "3". In this loop the radial servo system is switched on and the music will be reproduced after about 1 minute. The arm can be moved by pressing the REV or FF button.

To exit service loops, turn off the POWER button.

The test discs used in these service tests and adjustments are available from:

NAP Consumer Electronics
Product Services
P.O. Box 555
Old Andrew Jackson Highway
Jefferson City, Tennessee 37760

<u>DISC</u>	<u>PART NUMBER</u>
Disc 5A	4822 397 30096
Disc 3	4822 397 30085

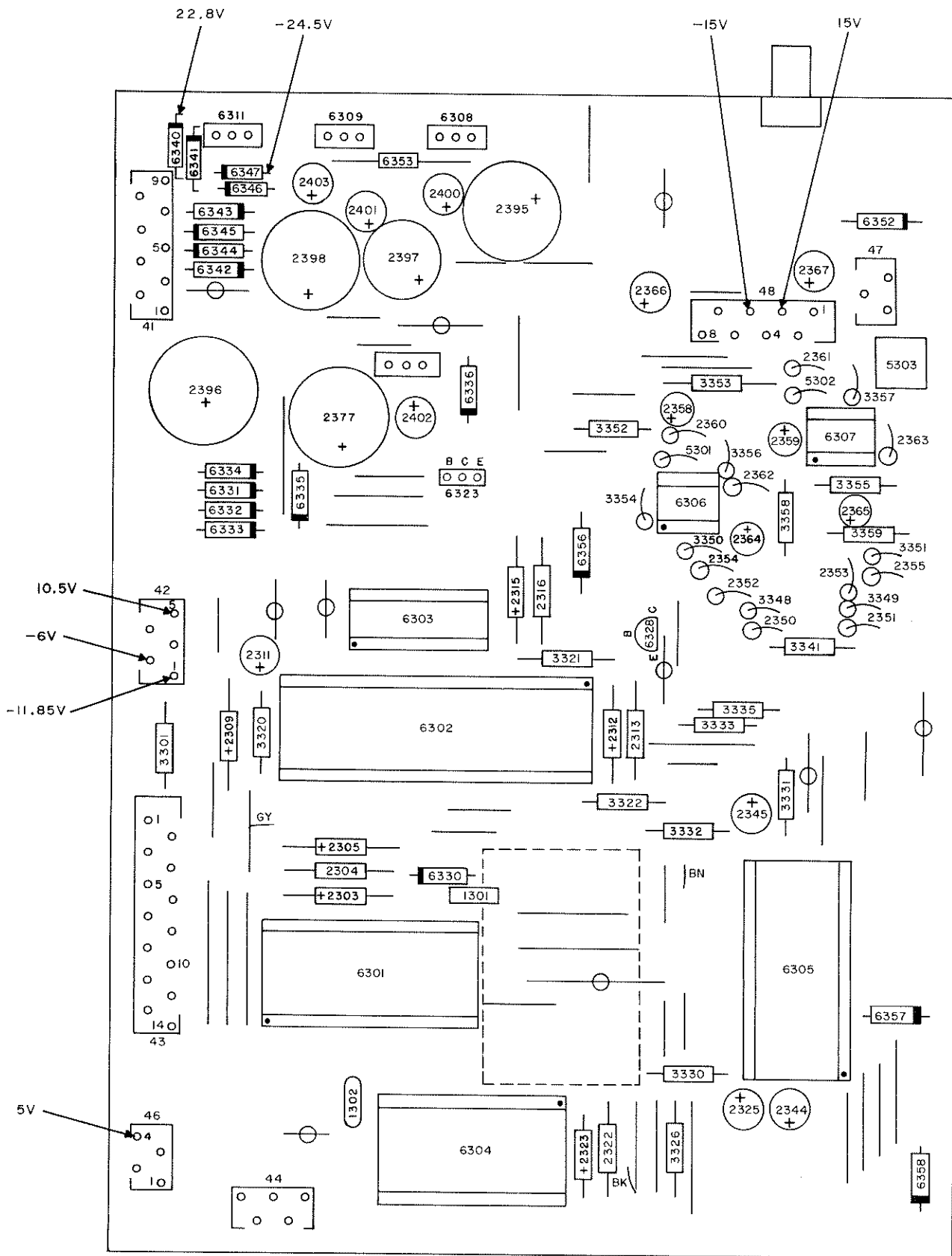


Fig. 12. Decoder and Power Supply PC board measurement locations.

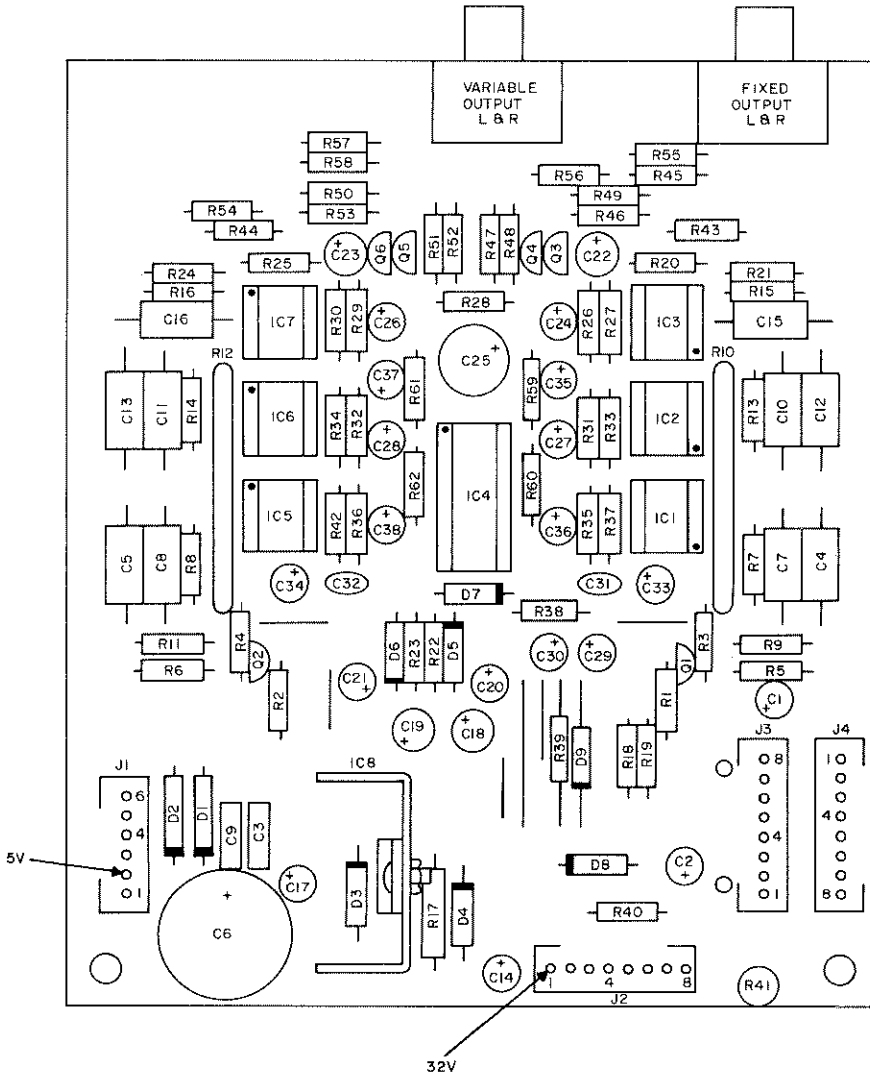


Fig. 13. Audio PC board Measurement locations.

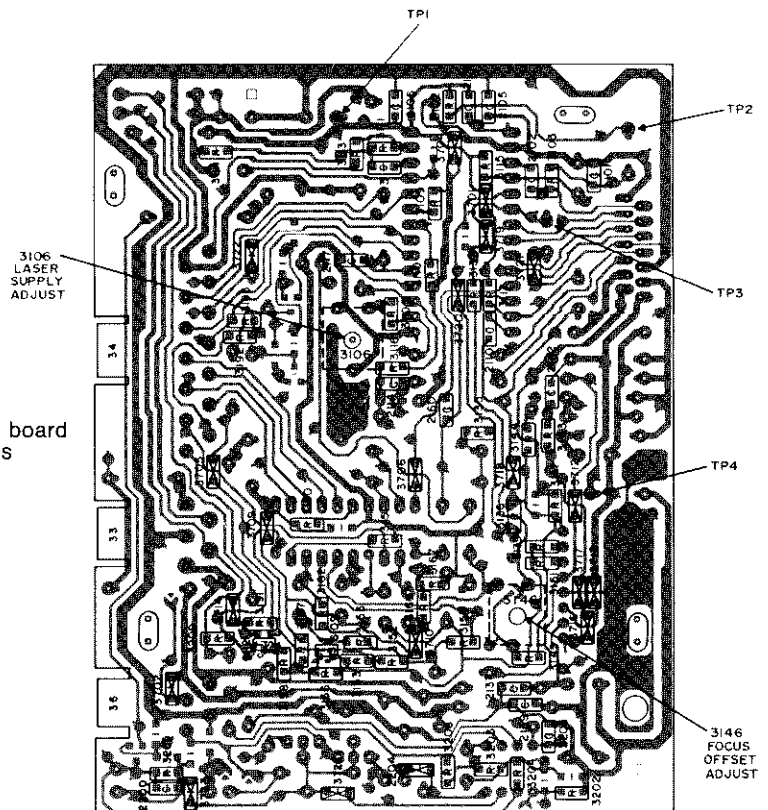
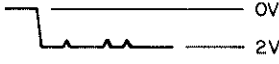
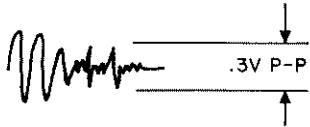
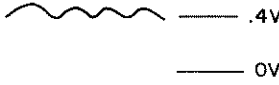
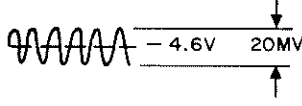
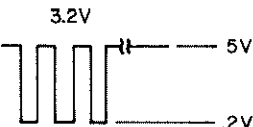

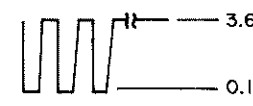
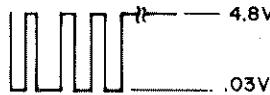
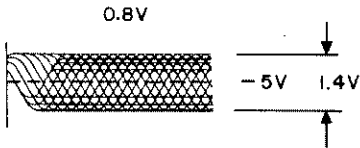


Fig. 14. Servo and Laser PC board adjustment locations


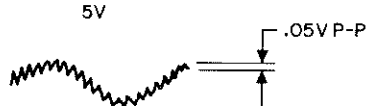
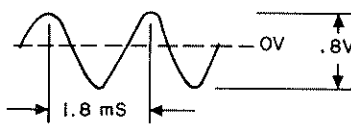
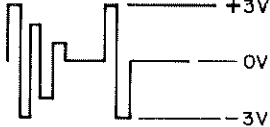
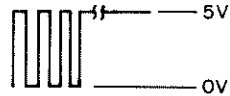
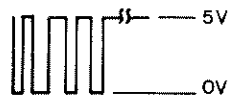
Servo and Laser Waveforms

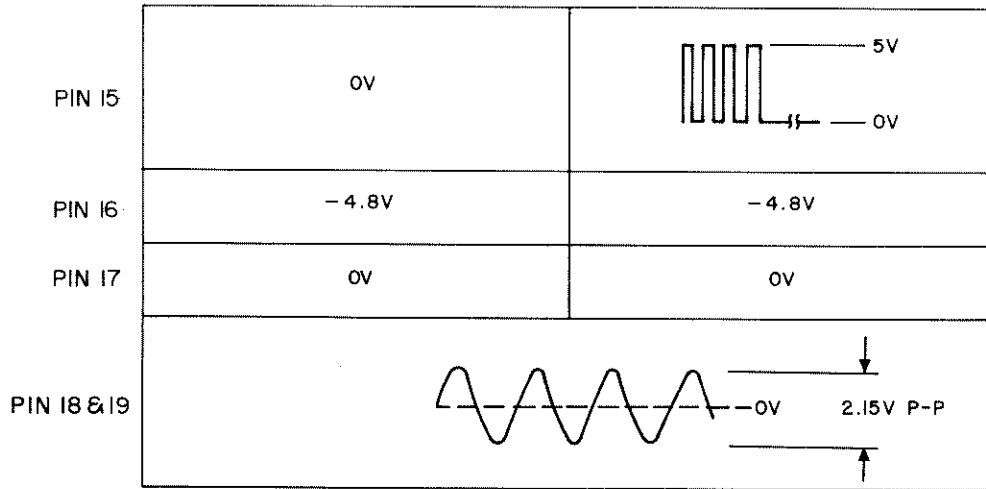
IC6101 TDA5708

	STOP	PLAY
PIN 1	3.7V	3.7V
PIN 2	5.9V	5.9V
PIN 3	4.4V	4.4V
PIN 4	0V	
PIN 5	0V	
PIN 6	0V	
PIN 7,8 9&10	-4.6V	
PIN 11&12	0V	-4.6V
PIN 13	4V	-1.5V
PIN 14	0V	-3.4V
PIN 15	0V	0V
PIN 16	0V	0.2V
PIN 17	0.4V	
PIN 18	5V	
PIN 19	.08V	
PIN 20	5V	-.025V
PIN 21	.12V	5V
PIN 22	-4.6V	-4.6V

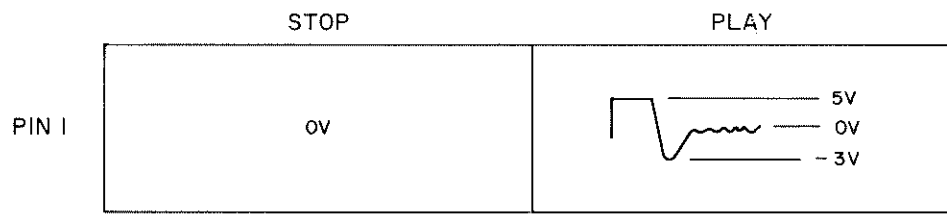
PIN 23	-4.6V	-4.6V
PIN 24	.03V	
PIN 25	-5.2V	
PIN 26	-5V	
PIN 28	5V	5V

IC6102 TDA5709

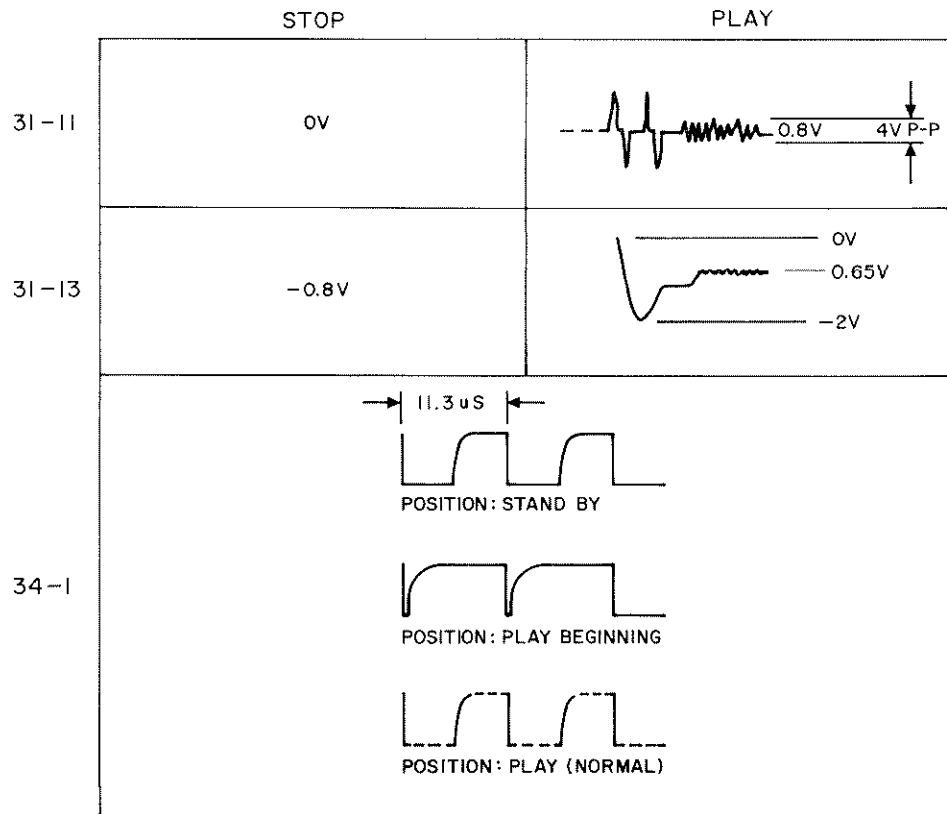
	STOP	PLAY
PIN 2	-2.8V	-3.6V
PIN 3	0.15V	
PIN 4	0V	0.24V
PIN 5	-0.85V	-1V
PIN 6	5V	
PIN 7	0V	
PIN 8&9	0V	
PIN 10	-.35V	
PIN 11	-6V	-6V
PIN 12	0V	
PIN 13&14	5V	

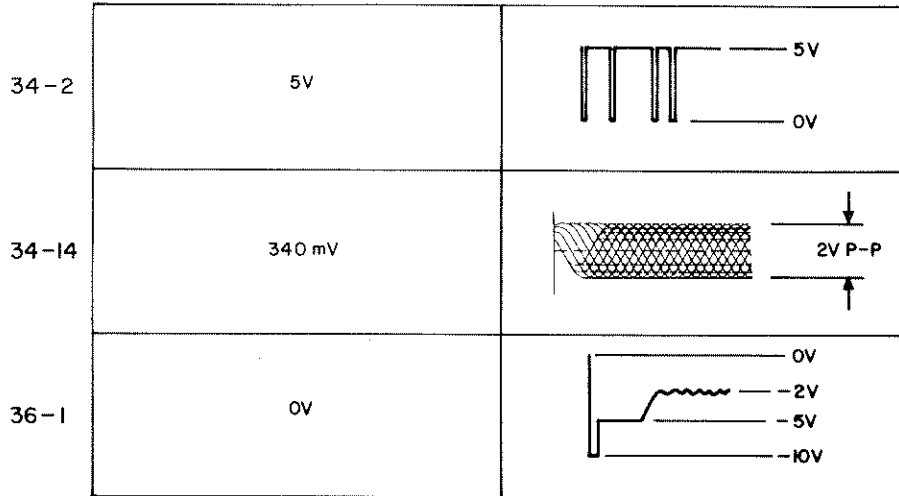


IC6103 NJM4560



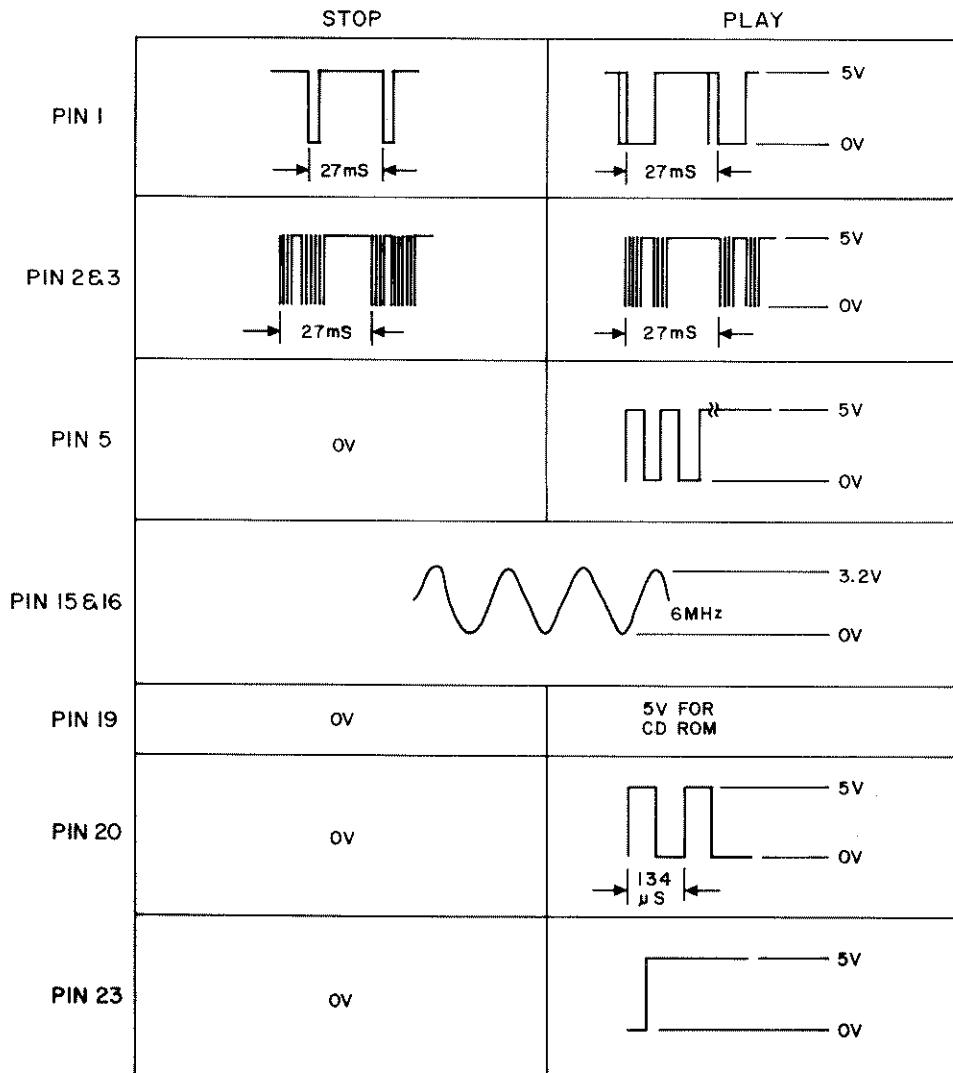
Connectors

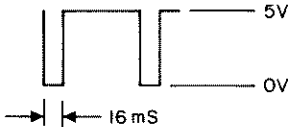
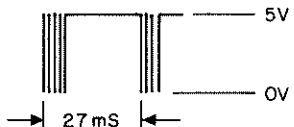





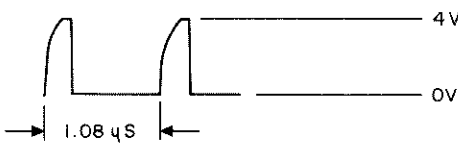
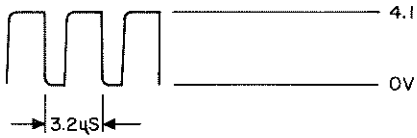
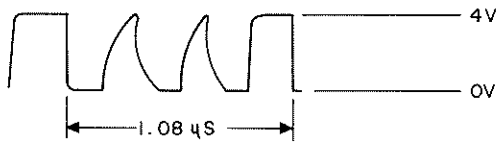
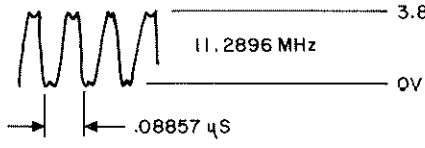
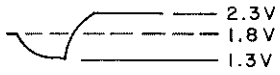
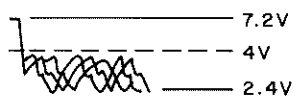
Decoder and Power Supply Waveforms

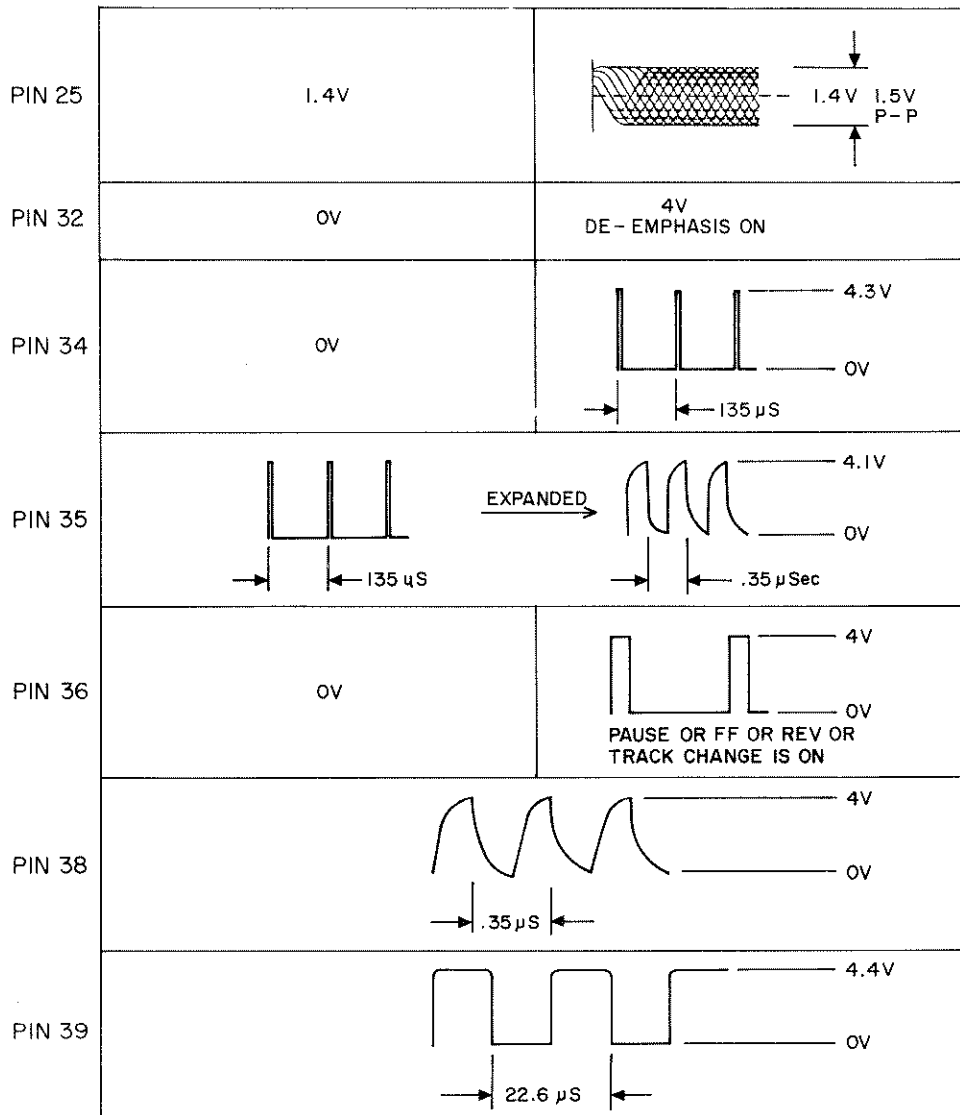
IC6301 MAB8441P T082



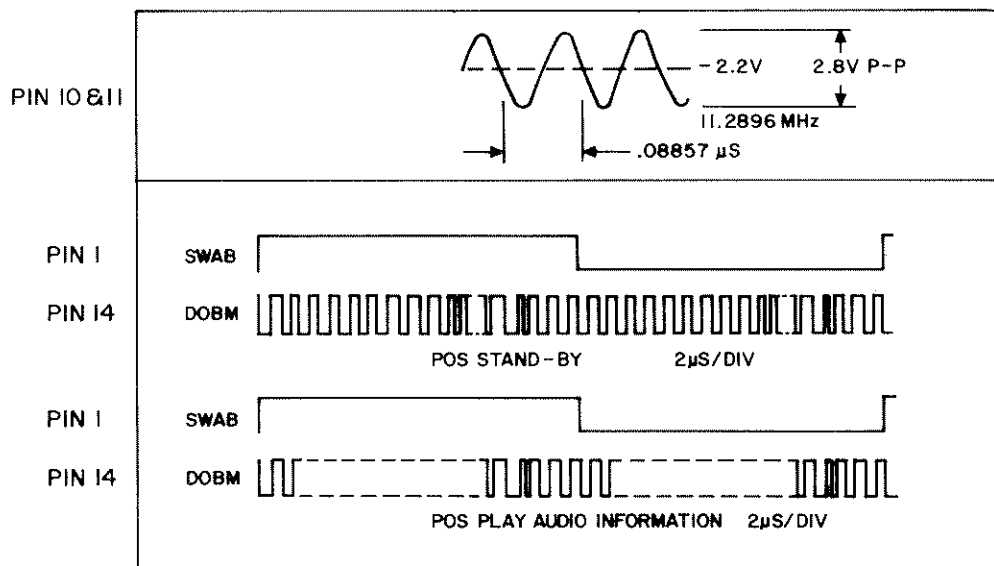
PIN 24	4.2V	0V ON FF OR REV
PIN 25	5V	
PIN 26	5V	
PIN 27	5V	

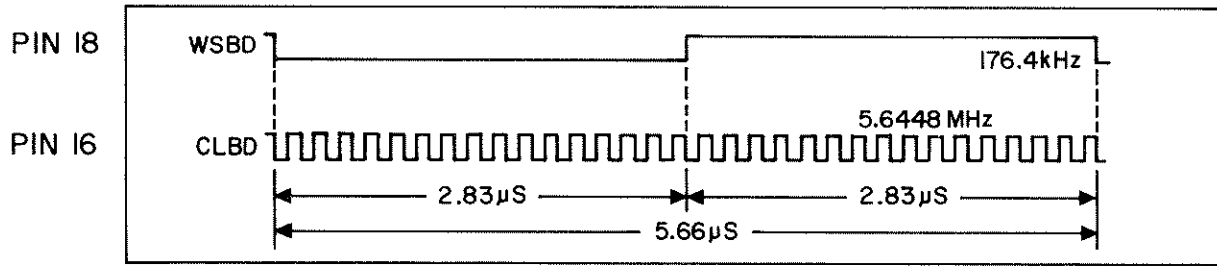
IC6302 SAA7210P

	STOP	PLAY
PIN 9		
PIN 10		
PIN 15		
PIN 19		
PIN 21	- 2V	- 2V
PIN 22	1.8V	
PIN 23	7.2V	
PIN 24	1.35V	1.5V

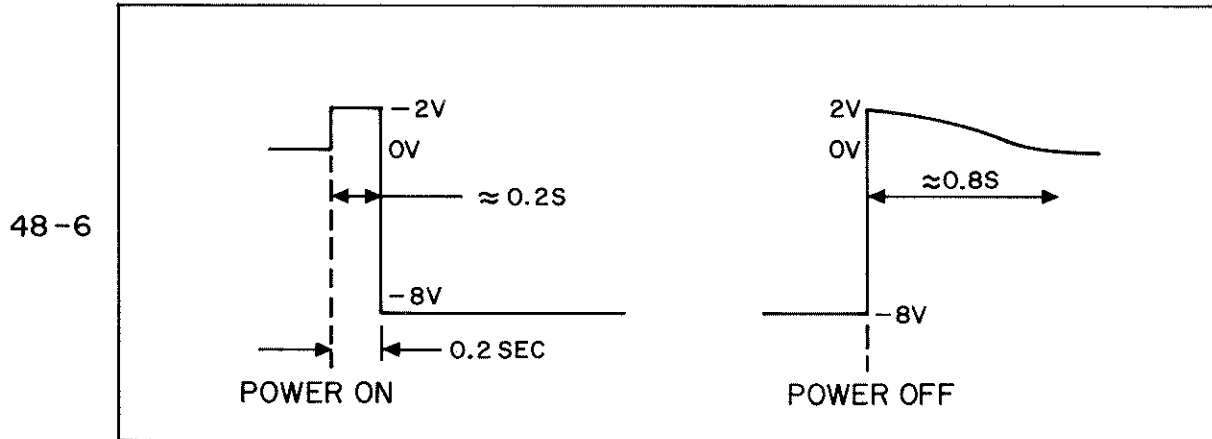


IC6304 SAA7220P





Connectors



Repacking Instructions

In the event it is necessary to repack the unit for shipment, the unit must be packed exactly as shown below. The shelf brackets do not have to be included in the carton for the unit to be packed properly, but their position in the carton is indicated.

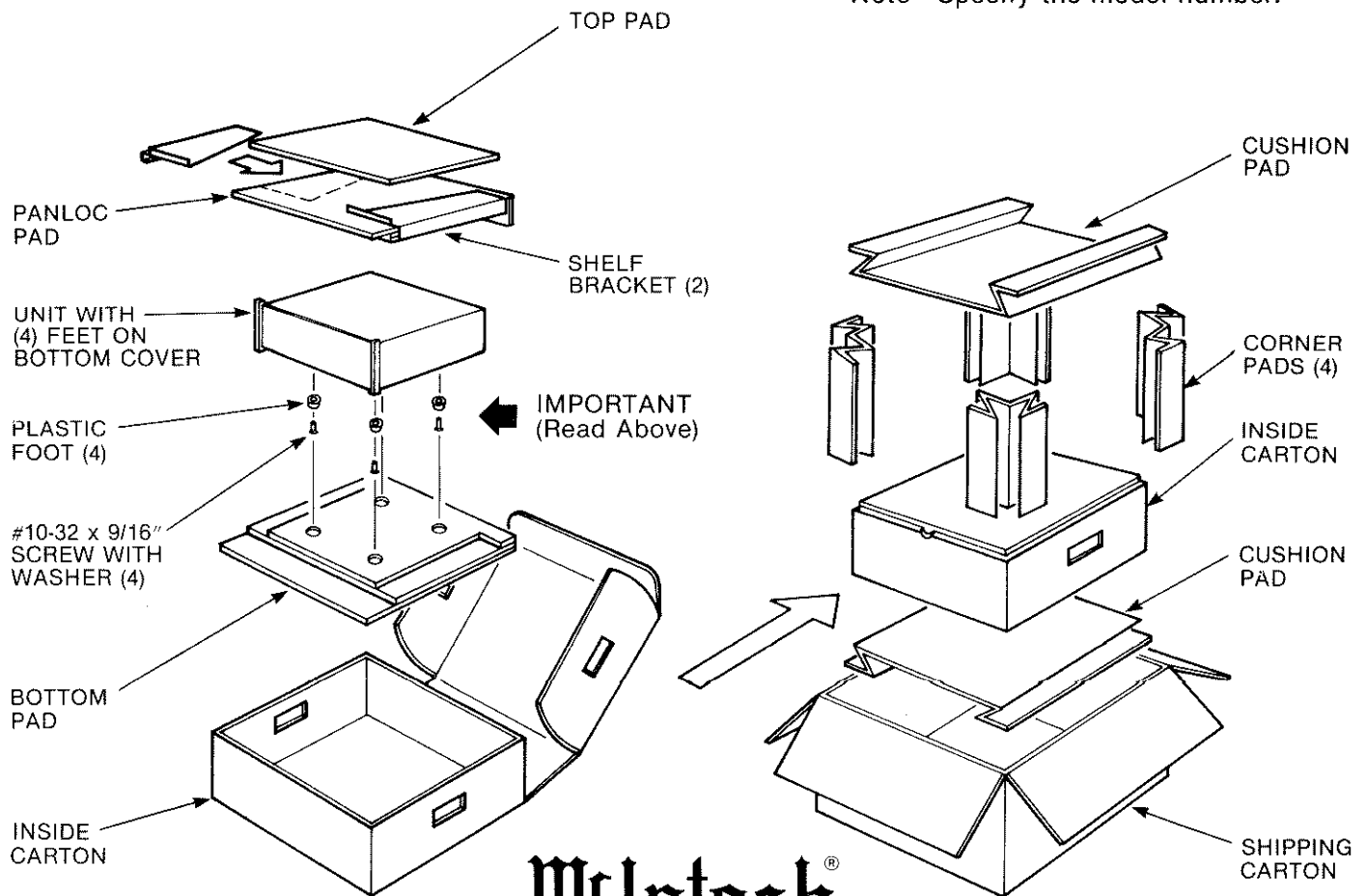
IMPORTANT - The four plastic feet must be attached to the bottom of the unit so they will locate in the four holes of the bottom pad. Failure to do this will result in shipping damage. In addition, two transit screws that lock the player mechanism to protect it during transportation must be reinstalled. The proper holes are identified on the bottom cover.

If a shipping carton or any of the interior parts is needed, please call or write the Customer Service Department of McIntosh Laboratory. Order parts from the accompanying list by part number.

Use the original shipping carton and interior parts only if they are all in good serviceable condition.

Qty	Part No.	Description
2	100163	Transit screw for MCD 7007, #4-40 x 1-7/8" with washer
1	033466	Shipping carton only
2	033332	Cushion pad
4	033333	Corner pad
1	033118	Inside carton only
1	033331	Top pad
1	033330	Panloc pad
1	(Note below)	Bottom pad
4	017156	Plastic foot
4	100160	#10-32 x 9/16 Machine screw (earlier units used a 101089 #8 x 5/8 Sheet-metal screw)
4	104080	#10 Flat washer
1	(Note below)	Shipping carton complete with all the above parts

Note - Specify the model number.



McIntosh®

MCD 7007 COMPACT DISC PLAYER

The continuous improvement of its products is the policy of McIntosh Laboratory Incorporated, who reserve the right to improve design without notice. Because of the constant upgrading of McIntosh products' circuitry and components, the Company cannot insure, and does not warrant, the accuracy of the within schematic material, which is intended for information only.

McIntosh Laboratory Inc. 2 Chambers Street Binghamton, NY 13903-2699

Part No. 039668

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