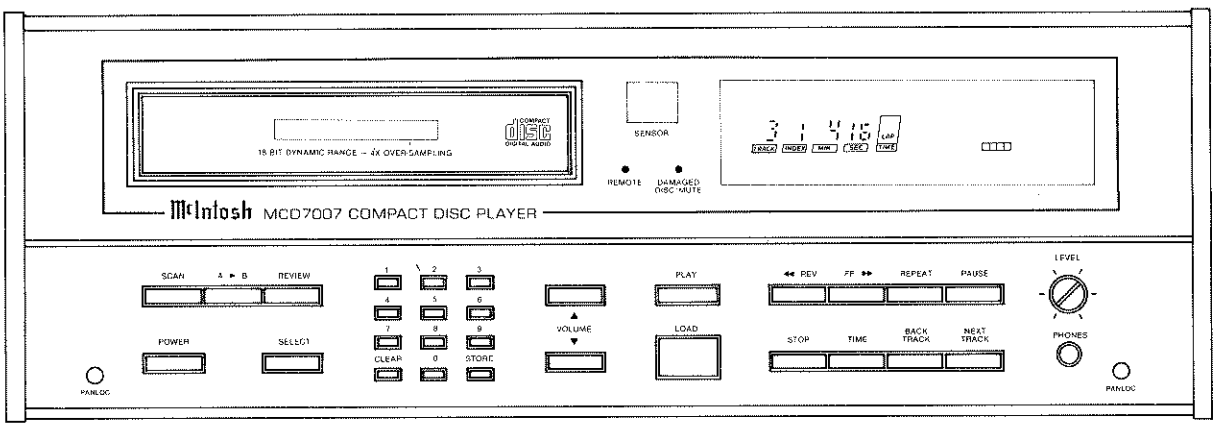
MCD 7007

COMPACT DISC PLAYER



CONTENTS

McIntosh® Service Manual

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 ±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 then 1 are microfarads (uF), and capacitor values greater than 1 are in picofarads (pF).
   c. Inductor values are in microhenries (uH).

Mechanical Views

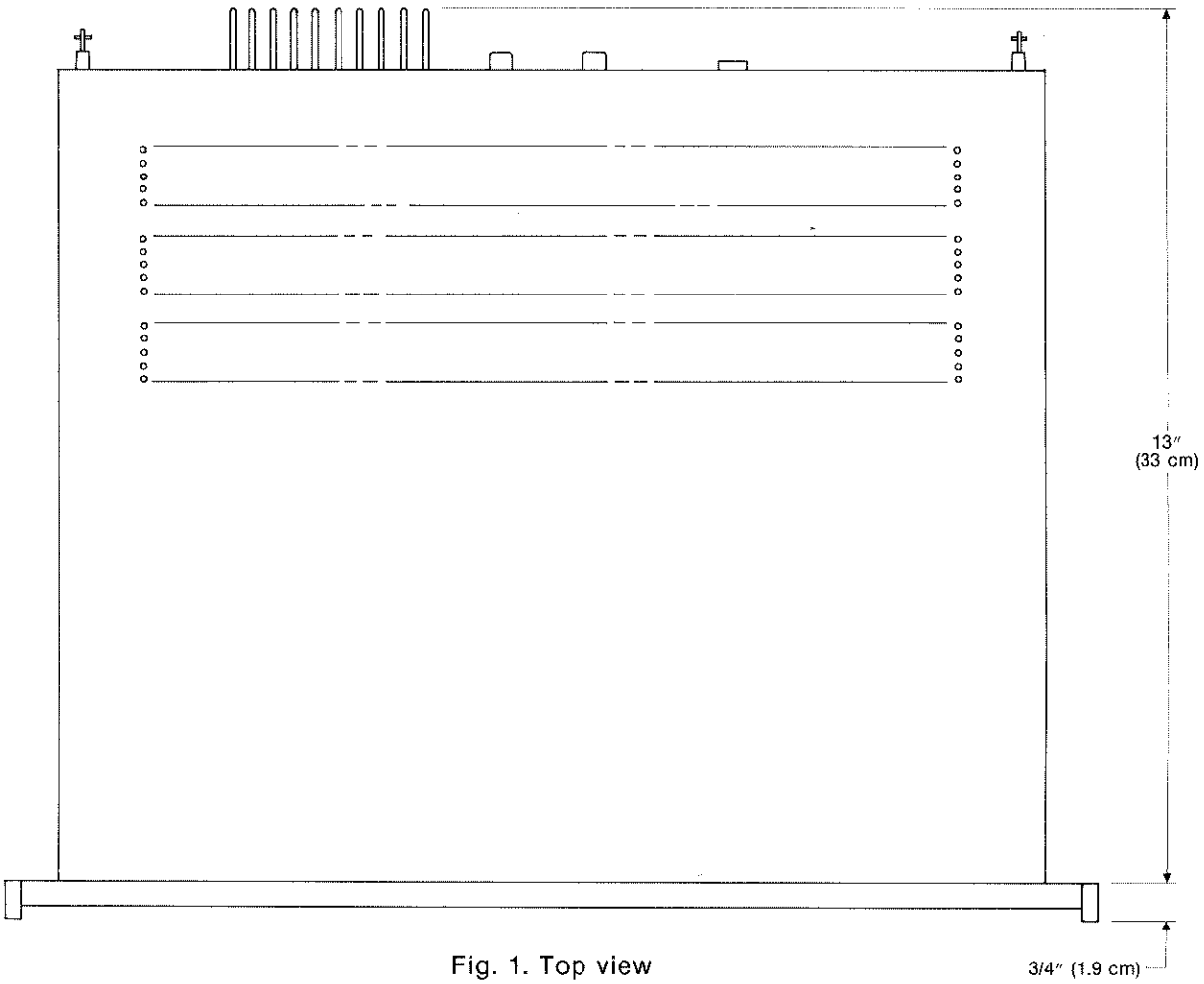


Fig. 1. Top view

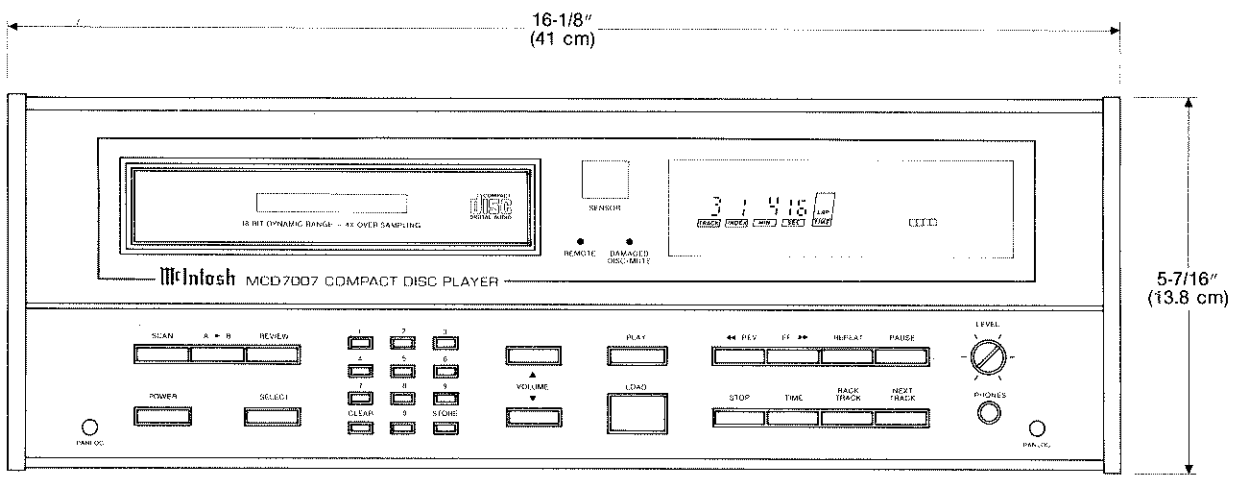


Fig. 2. Front view

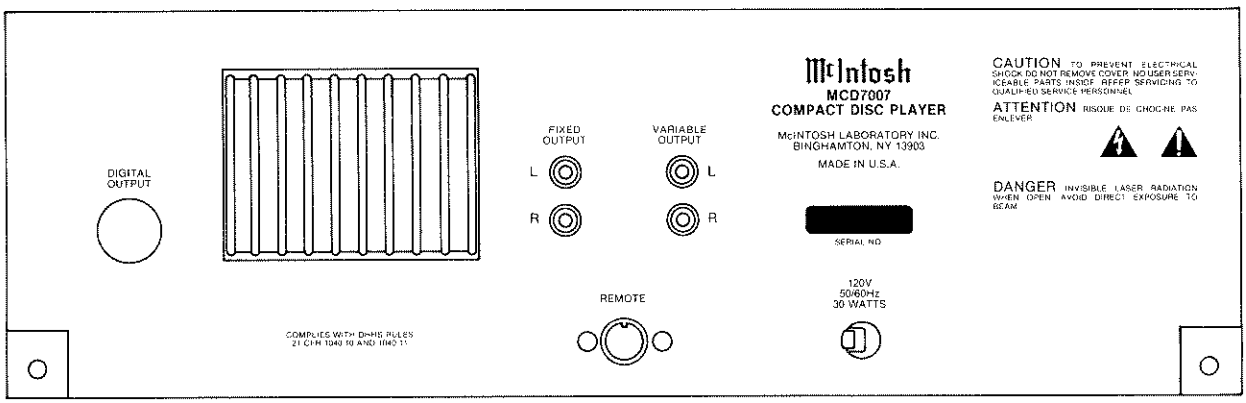


Fig. 3 Rear view

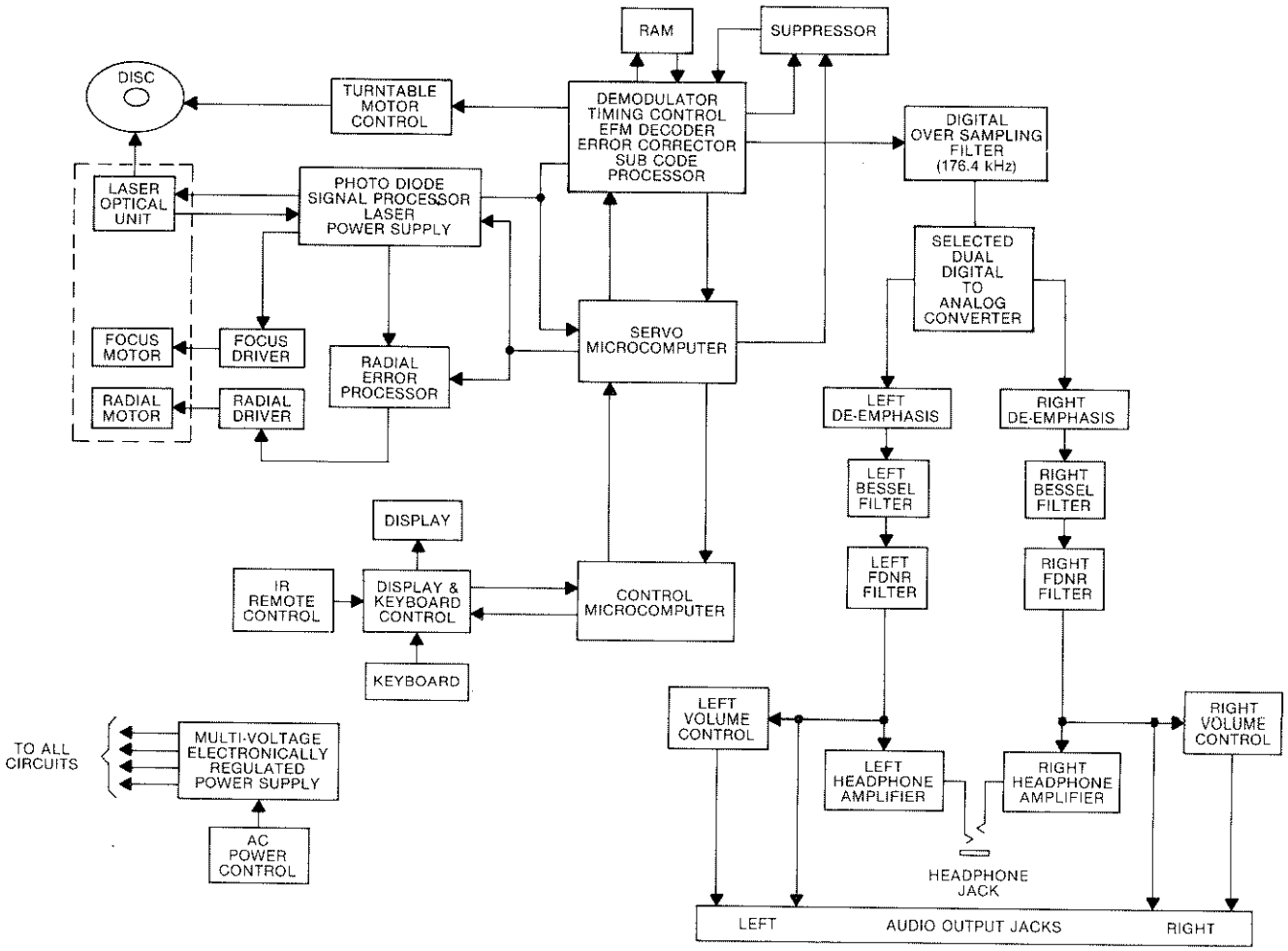
FRONT PANEL and TRIM PARTS LIST

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

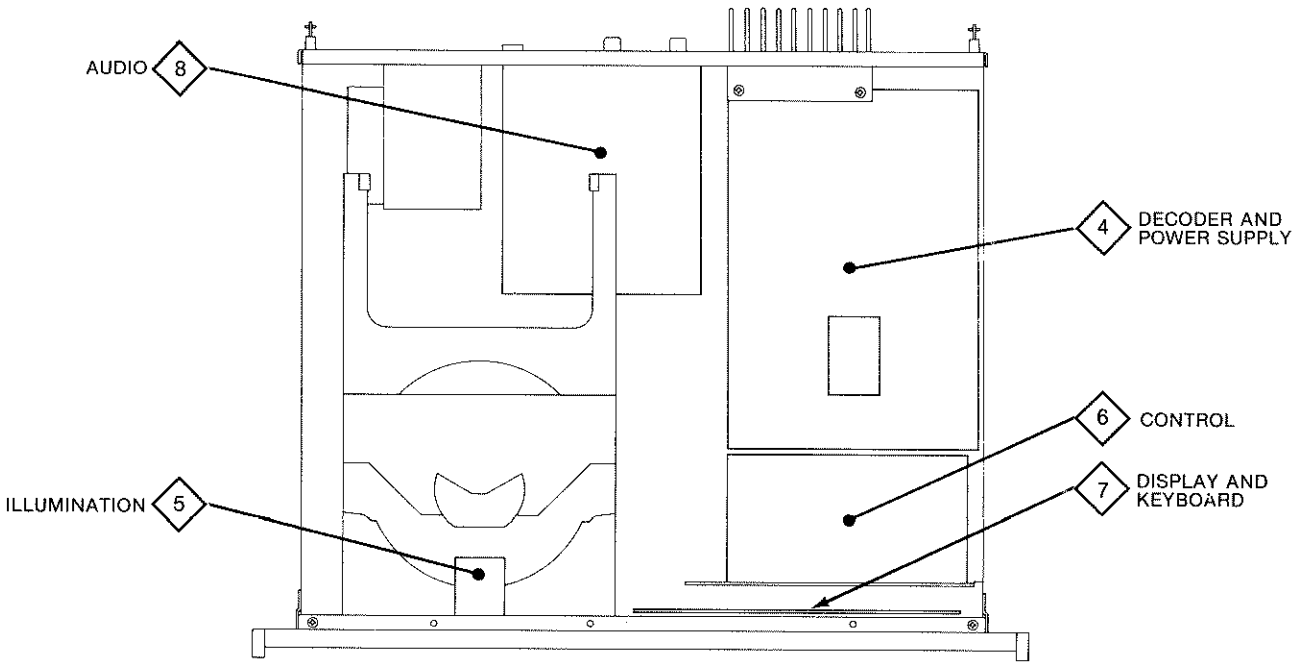


Fig. 4. Top view with cover removed

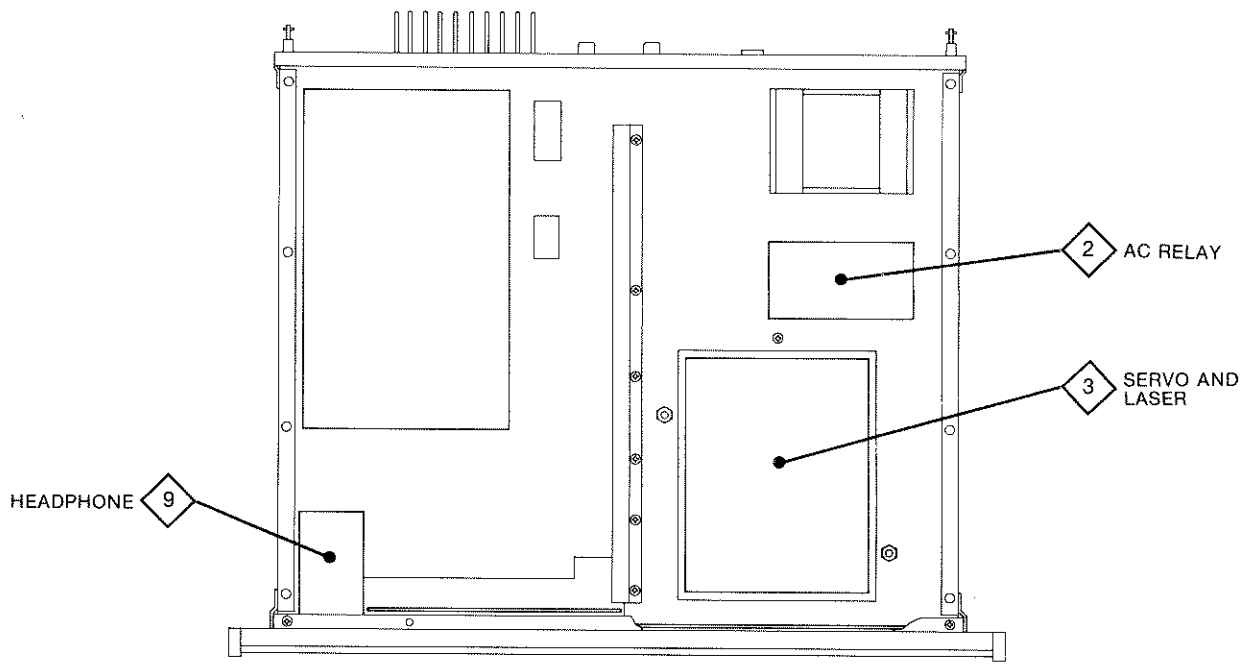
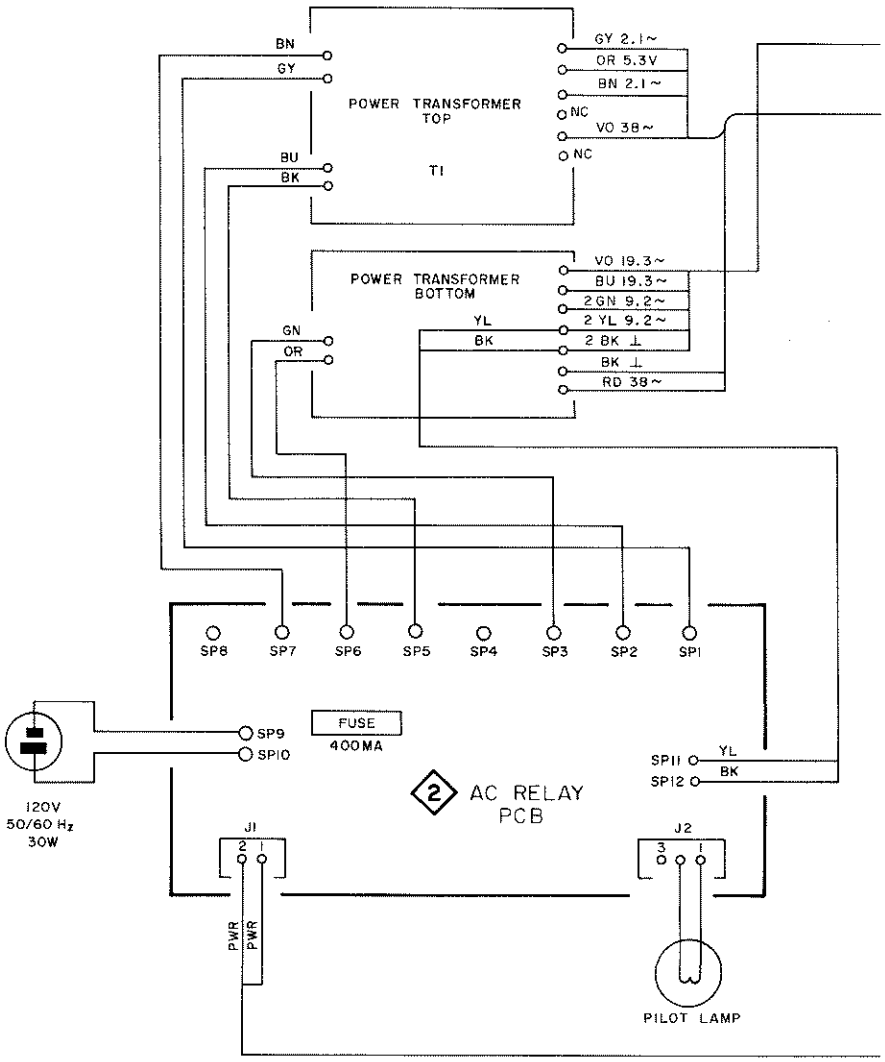


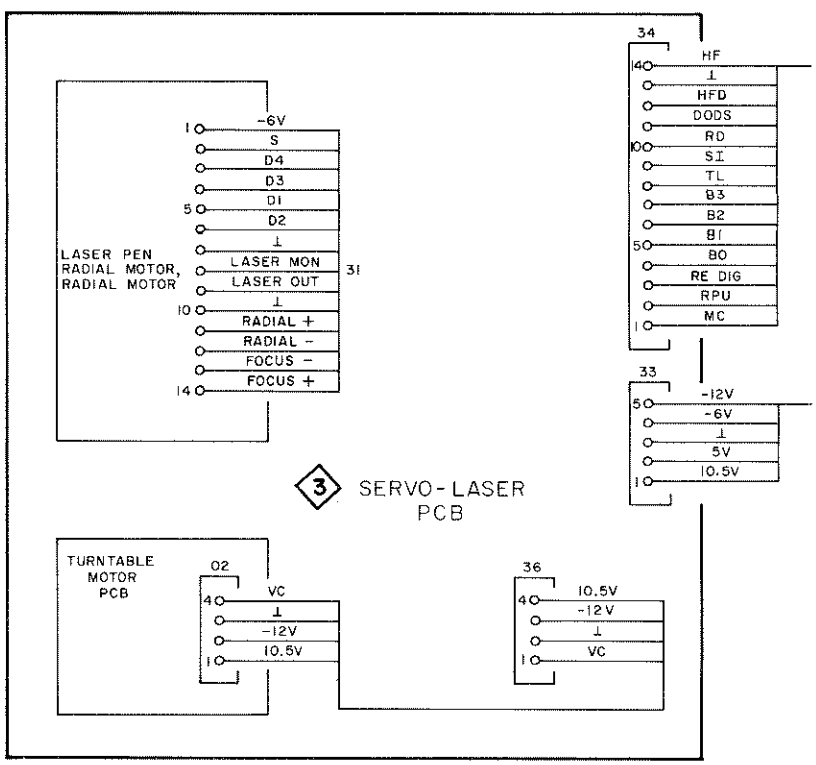
Fig. 5. Bottom view with cover removed

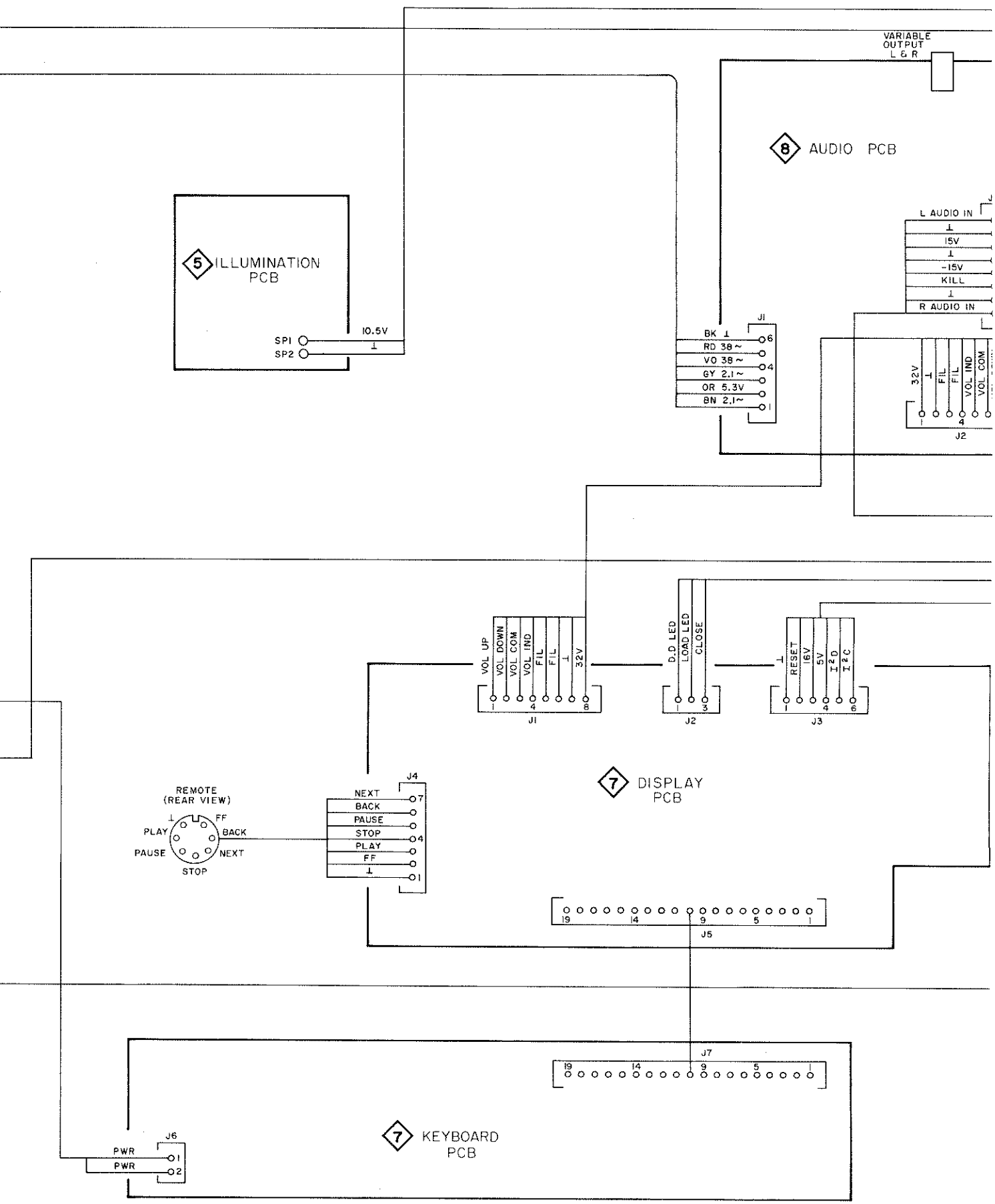
Interconnection Diagram 1

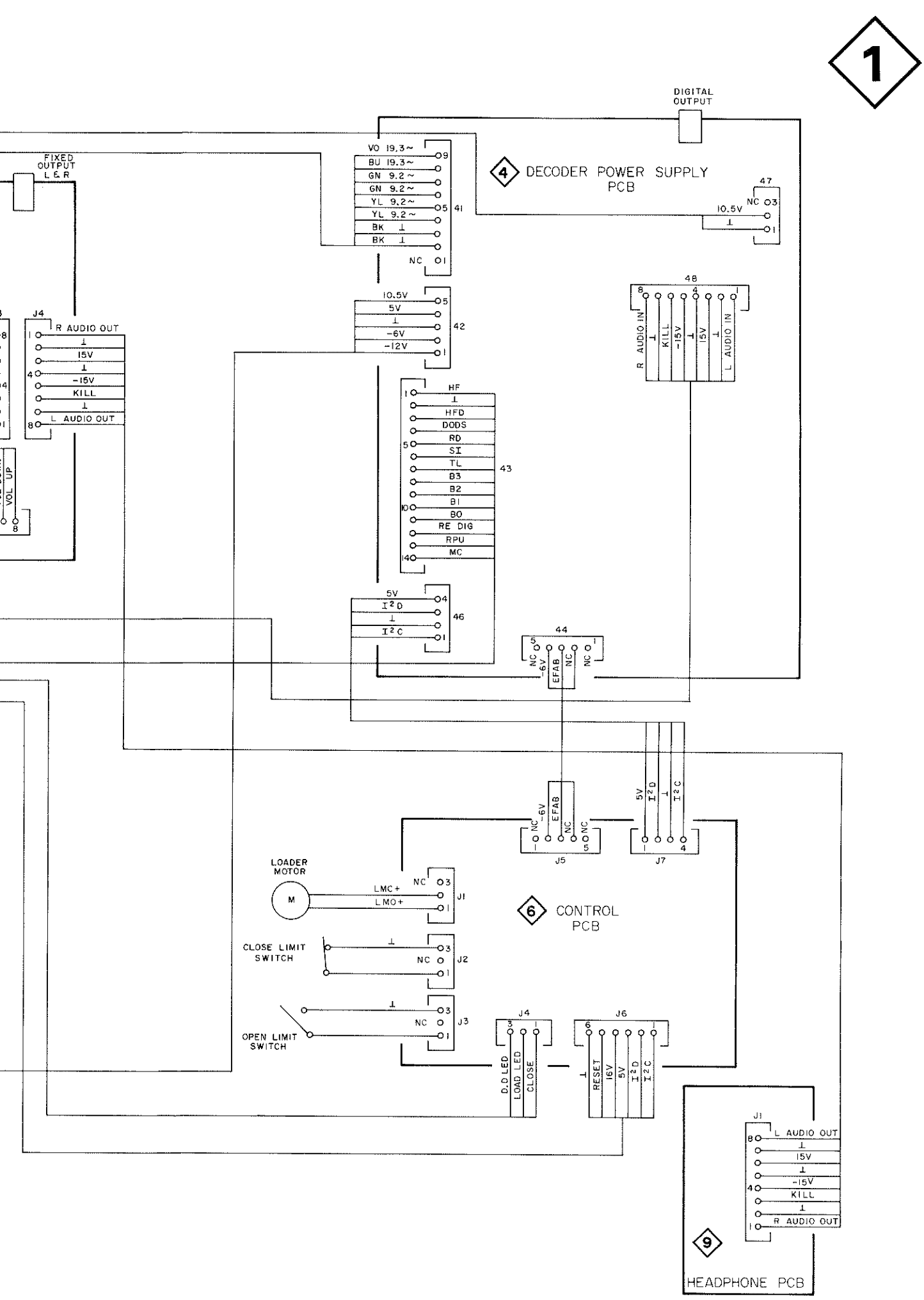


INTERCONNECTION PARTS LIST

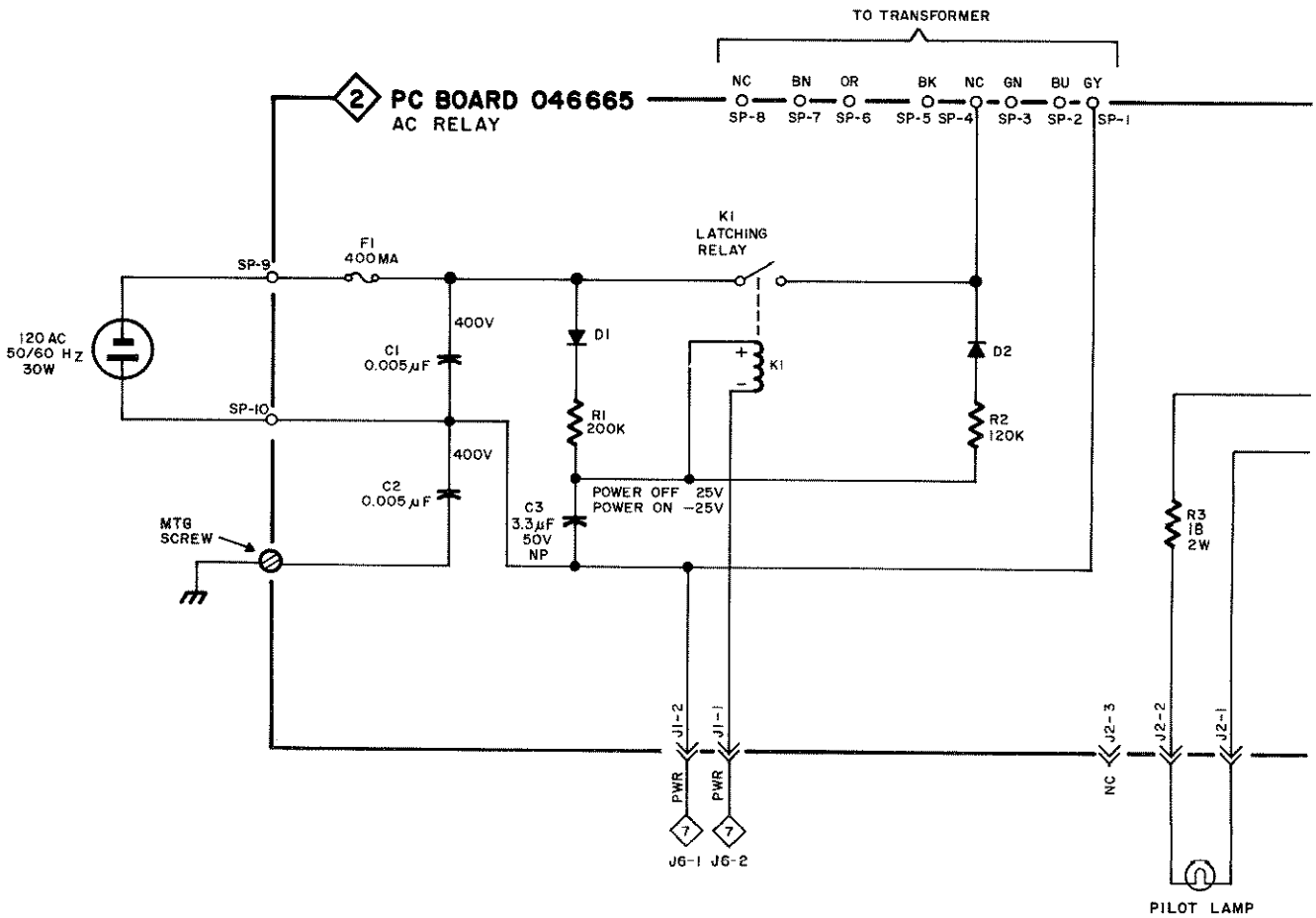
Symbol No.	Part No.	Description
LIGHTING DEVICES		
DS1	058069	INC, 6.3V 8610
TRANSFORMERS		
T1	320014	Power



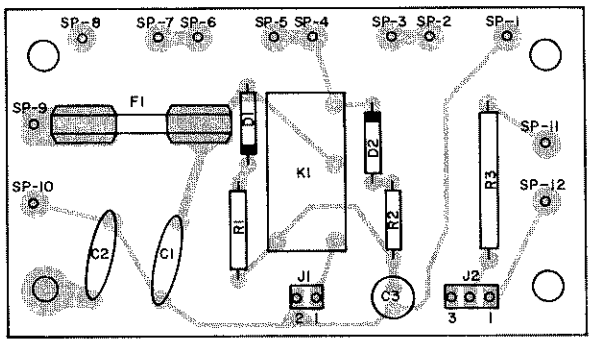

VARIABLE OUTPUT L & R
8 AUDIO PCB
5 ILLUMINATION PCB
SP1
SP2
10.5V
J1
BK ⊥ 6
RD 38~
VO 38~ 4
GY 2.1~
OR 5.3V
BN 2.1~ 1
L AUDIO IN
⊥
15V
⊥
-15V
KILL
⊥
R AUDIO IN
32V
⊥
FIL
FIL
VOL IND
VOL COM
J2
VOL UP
VOL DOWN
VOL COM
VOL IND
FIL
FIL
⊥
32V
J1
D.D LED
LOAD LED
CLOSE
J2
⊥
RESET
16V
5V
I²D
I²C
J3
REMOTE (REAR VIEW)
⊥
FF
PLAY
BACK
PAUSE
NEXT
STOP
J4
NEXT 7
BACK
PAUSE
STOP 4
PLAY
FF
⊥ 1
7 DISPLAY PCB
19 14 9 5 1
J5
J7
19 14 9 5 1
7 KEYBOARD PCB
J6
PWR 1
PWR 2


1
DIGITAL OUTPUT
FIXED OUTPUT L & R
4 DECODER POWER SUPPLY PCB
VO 19.3~
BU 19.3~
GN 9.2~
GN 9.2~
YL 9.2~
YL 9.2~
BK ⊥
BK ⊥
NC
41
47
NC
10.5V
⊥
48
R AUDIO IN
⊥
KILL
-15V
⊥
15V
⊥
L AUDIO IN
10.5V
5V
⊥
-6V
-12V
42
J4
R AUDIO OUT
⊥
15V
⊥
-15V
KILL
⊥
L AUDIO OUT
VOL UP
HF
⊥
HFD
DODS
RD
SI
TL
B3
B2
B1
BO
RE DIG
RPU
MC
43
5V
I²D
⊥
I²C
46
44
NC
-6V
EFAB
NC
NC
J5
5V
I²D
⊥
I²C
J7
LOADER MOTOR
M
LMC+
LMO+
NC
J1
6 CONTROL PCB
CLOSE LIMIT SWITCH
⊥
NC
J2
OPEN LIMIT SWITCH
⊥
NC
J3
J4
D.D LED
LOAD LED
CLOSE
J6
⊥
RESET
16V
5V
I²D
I²C
J1
L AUDIO OUT
⊥
15V
⊥
-15V
KILL
⊥
R AUDIO OUT
9 HEADPHONE PCB

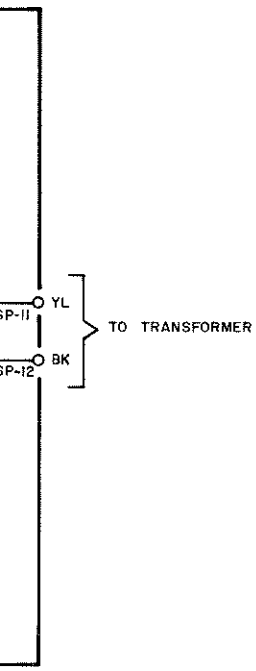
2 AC Relay


TO TRANSFORMER
NC BN OR BK NC GN BU GY
SP-8 SP-7 SP-6 SP-5 SP-4 SP-3 SP-2 SP-1
2 PC BOARD 046665
AC RELAY
K1 LATCHING RELAY
F1 400MA
SP-9
SP-10
120 AC 50/60 HZ 30W
C1 0.005μF
400V
C2 0.005μF
400V
C3 3.3μF 50V NP
D1
D2
R1 200K
R2 120K
K1
POWER OFF 25V
POWER ON −25V
MTG SCREW
R3 18 2W
J1-2
J1-1
PWR
PWR
7
7
J6-1 J6-2
J2-3
J2-2
J2-1
NC
PILOT LAMP

CIRCUIT SII



AC RELAY PCB 046665

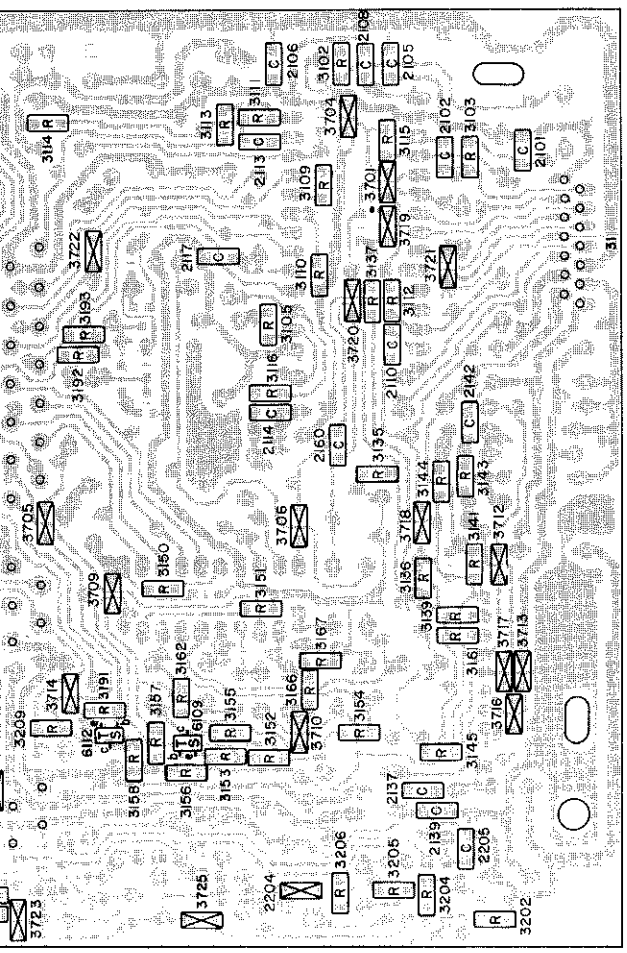


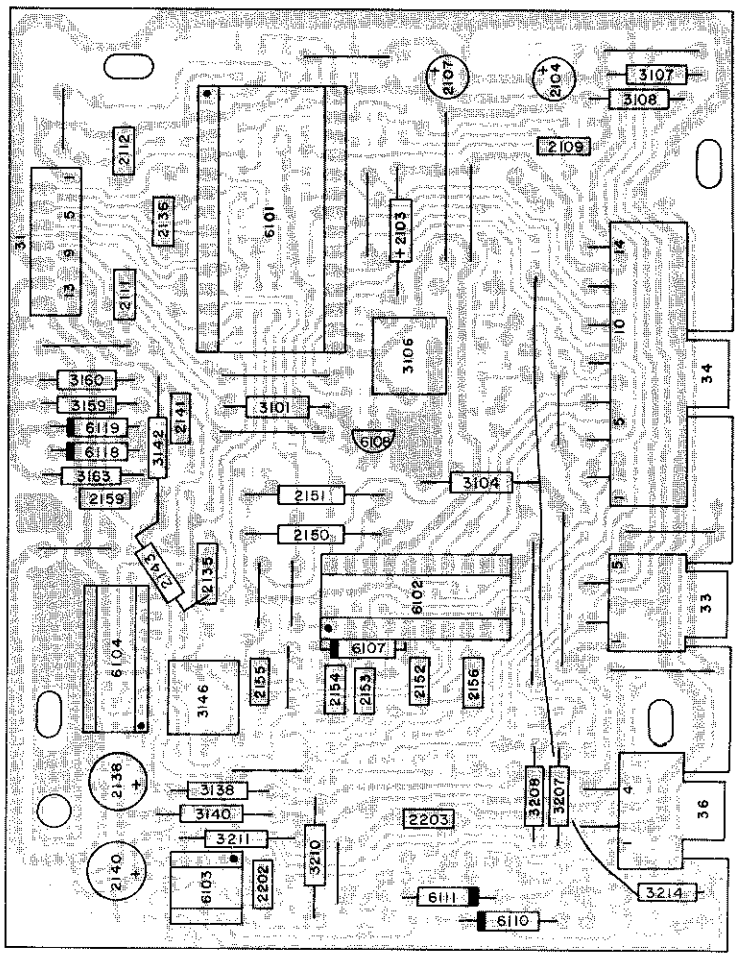
AC RELAY PARTS LIST

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

E (WITH SURFACE-MOUNT COMPONENTS)

COMPONENT SIDE

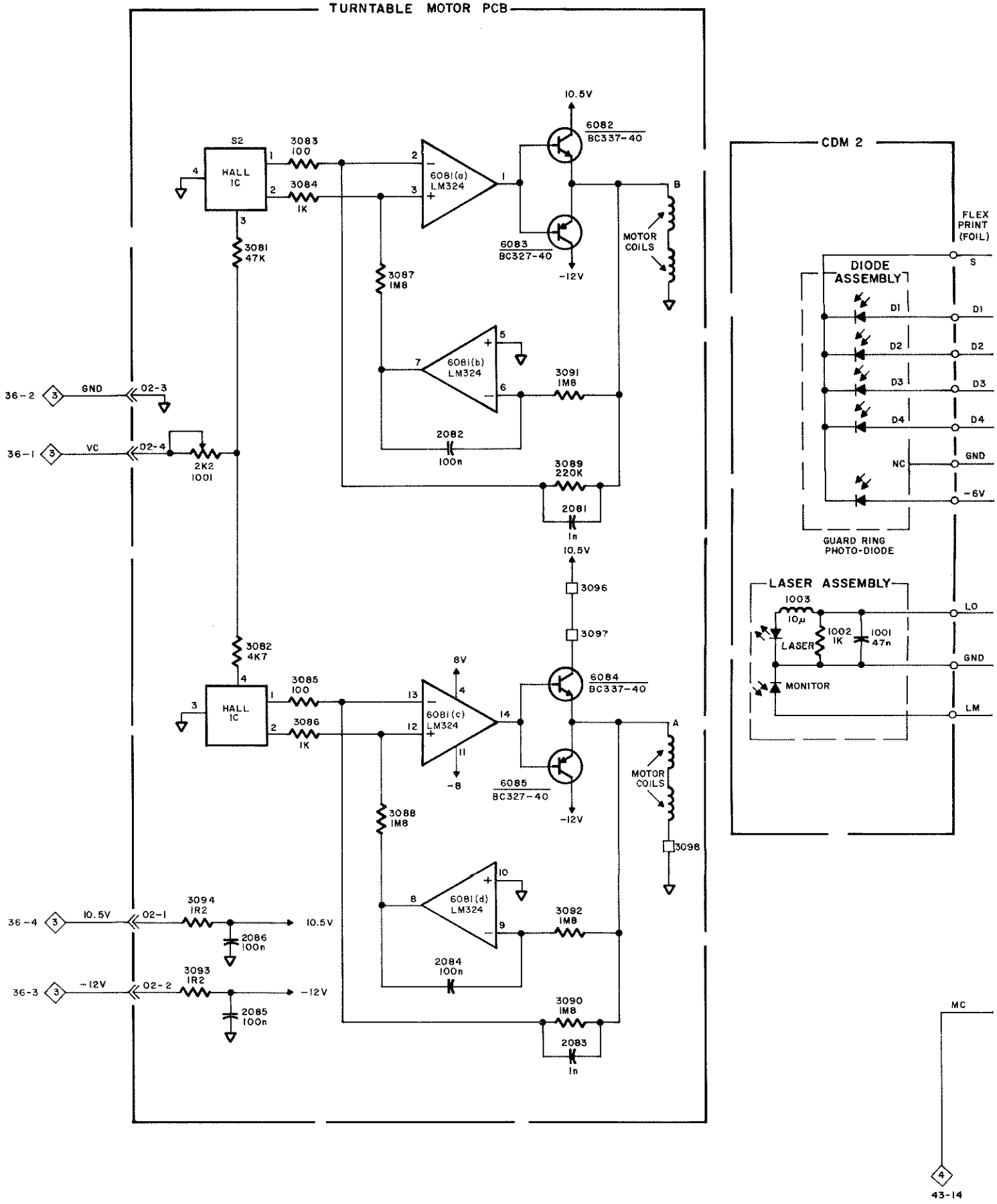


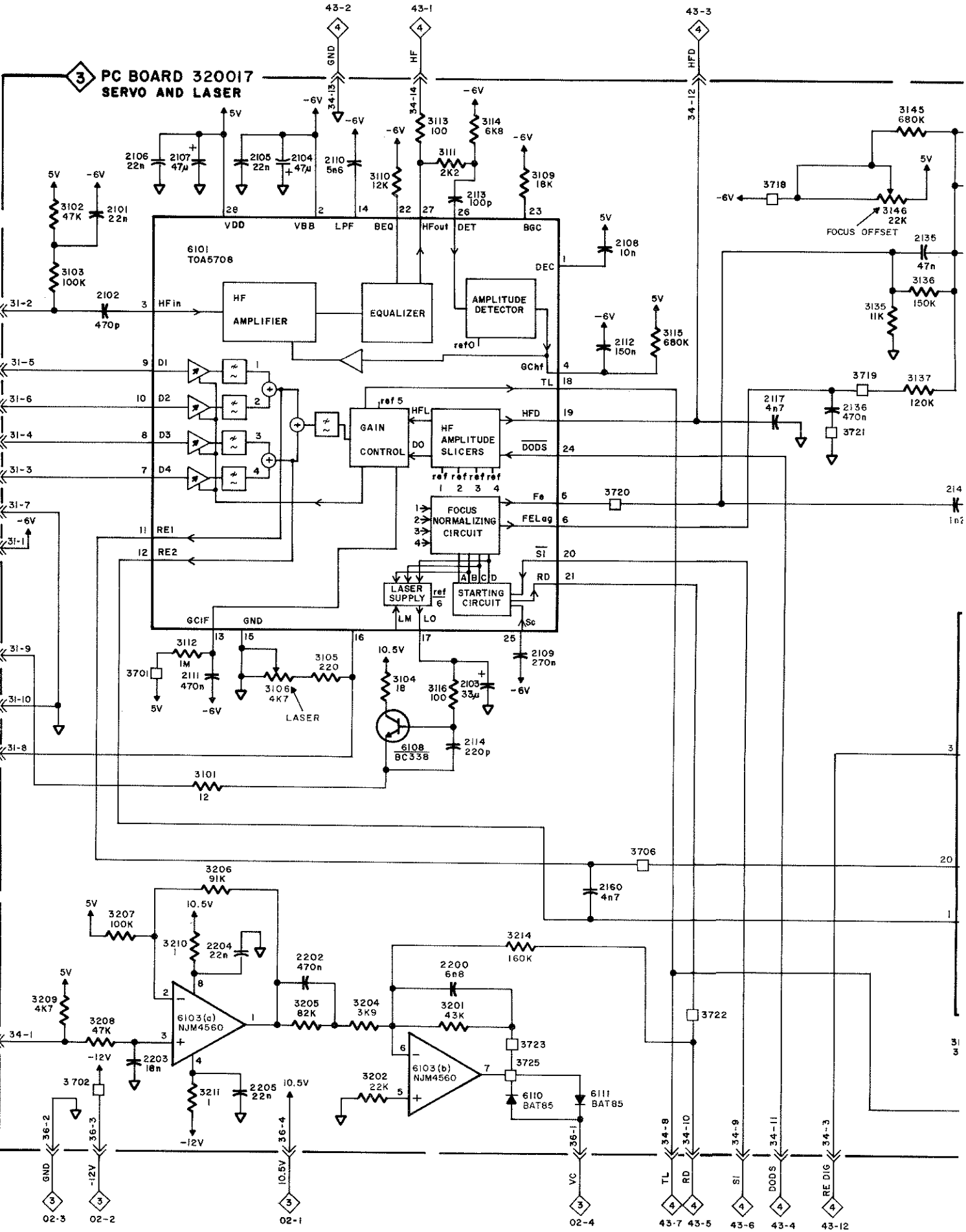


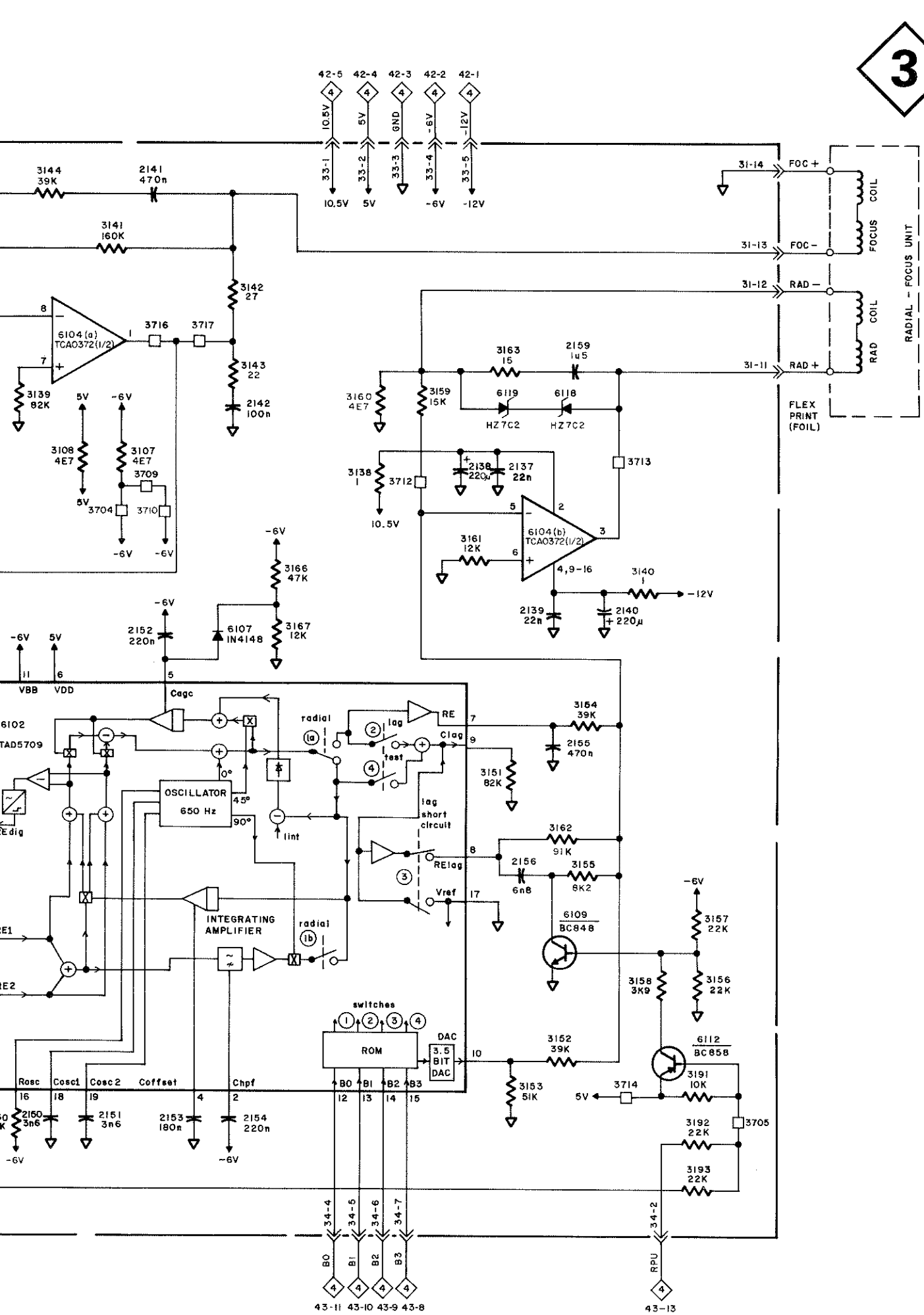
SERVO AND LASER PCB 320013

SERVO AND LASER PARTS LIST

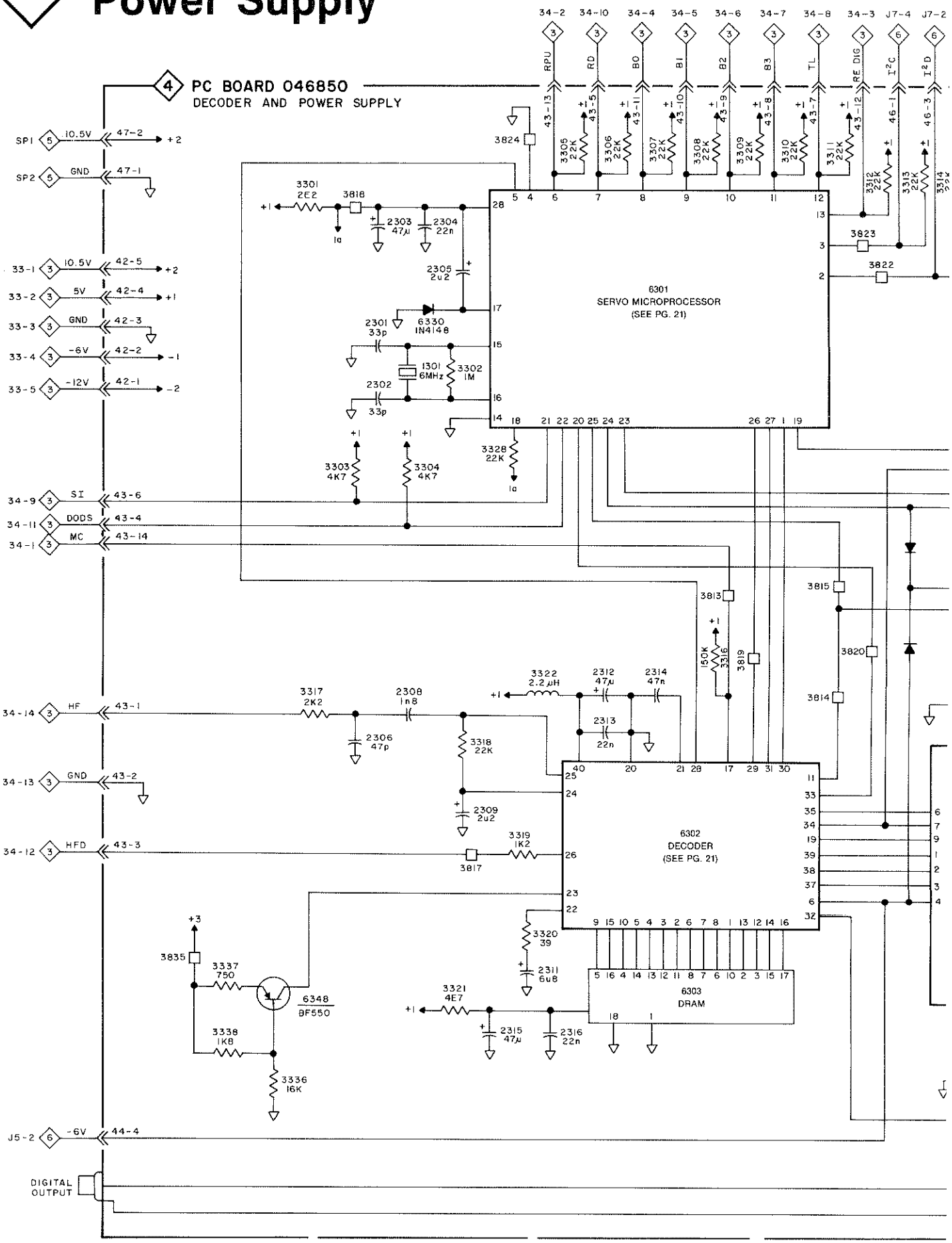
Symbol No.	Part No.
INTEGRATED CURCUITS	
6101	TOA5708
6102	TAD5709
6103	NJM4560
6104	TCA0372

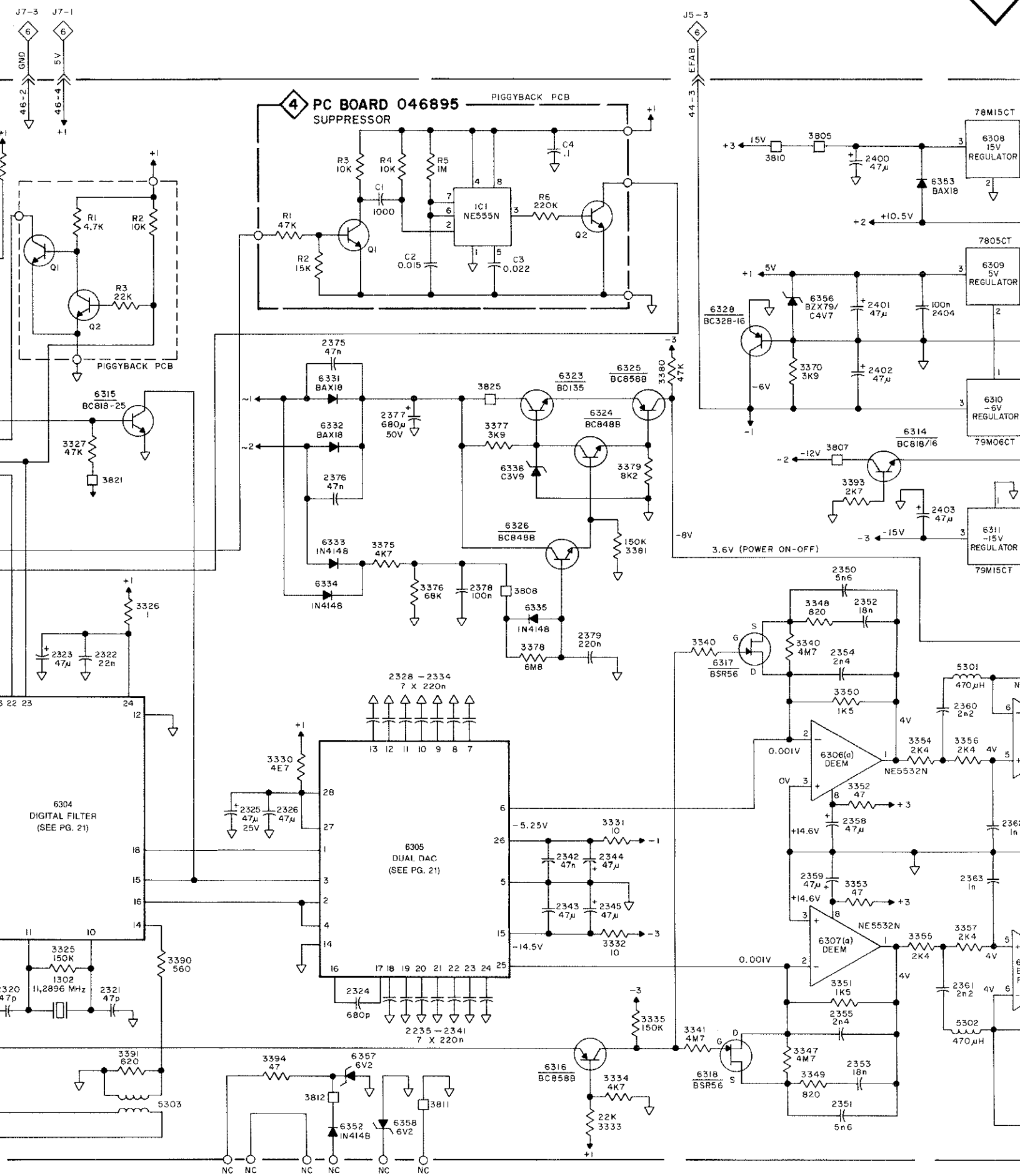

TURNTABLE MOTOR PCB
CDM 2
10.5V
6082 BC337-40
S2
HALL IC
3083 100
3084 1K
6081(a) LM324
3081 47K
3087 1M8
6083 BC327-40
-12V
MOTOR COILS
B
FLEX PRINT (FOIL)
DIODE ASSEMBLY
S
D1
D2
D3
D4
NC
GND
-6V
GUARD RING PHOTO-DIODE
LASER ASSEMBLY
1003 10µ
LASER
1002 1K
1001 47n
MONITOR
LO
GND
LM
36-2 GND 02-3
36-1 VC 02-4
2K2 1001
6081(b) LM324
3091 1M8
2082 100n
3089 220K
2081 1n
10.5V
3096
3097
3082 4K7
8V
3085 100
3086 1K
HALL IC
6081(c) LM324
6084 BC337-40
6085 BC327-40
-8
-12V
A
MOTOR COILS
3098
3088 1M8
6081(d) LM324
3092 1M8
2084 100n
3090 1M8
2083 1n
36-4 10.5V 02-1
3094 1R2
2086 100n
10.5V
36-3 -12V 02-2
3093 1R2
2085 100n
-12V
MC
4
43-14

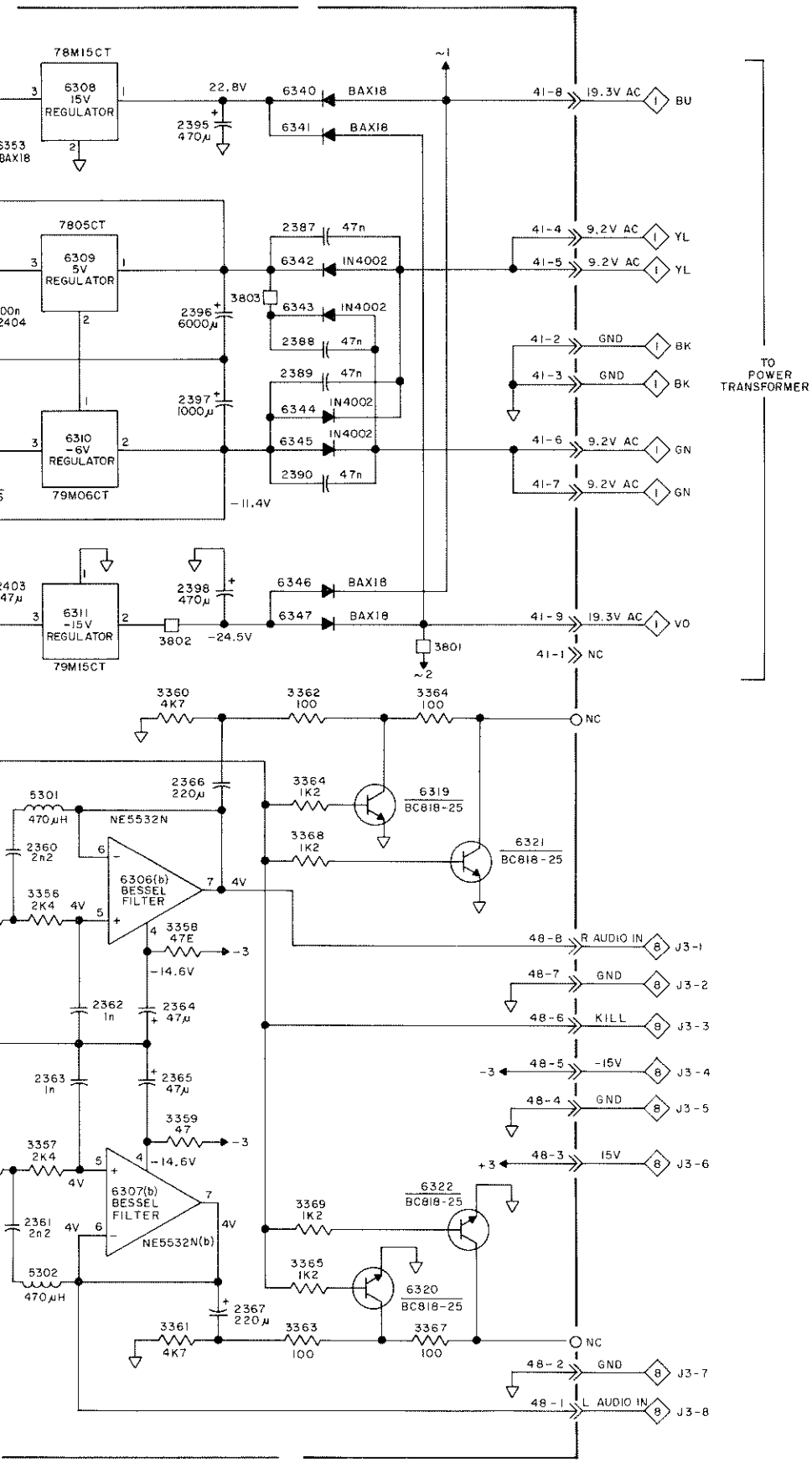

3 PC BOARD 320017
SERVO AND LASER
6101
TOA5708
VDD
VBB
LPF
BEQ
HFout
DET
BGC
HFin
HF AMPLIFIER
EQUALIZER
AMPLITUDE DETECTOR
DEC
refO
GCHf
TL
GAIN CONTROL
HFL
DO
HF AMPLITUDE SLICERS
HFD
DODS
ref 1 2 3 4
FOCUS NORMALIZING CIRCUIT
Fe
FELag
SI
RD
LASER SUPPLY
STARTING CIRCUIT
LM
LO
Sc
GCIF
GND
RE1
RE2
D1
D2
D3
D4
FOCUS OFFSET
LASER
6108
BC338
6103(a)
NJM4560
6103(b)
NJM4560
6110
BAT85
6111
BAT85
43-2
43-1
43-3
34-1
36-2
36-3
36-4
36-1
34-8
34-10
34-9
34-11
34-3
02-3
02-2
02-1
02-4
43-7
43-5
43-6
43-4
43-12

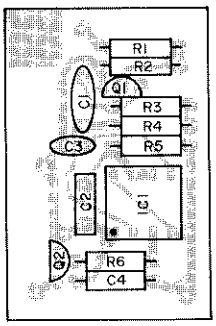

3
4
42-5 42-4 42-3 42-2 42-1
10.5V 5V GND -6V -12V
33-1 33-2 33-3 33-4 33-5
10.5V 5V -6V -12V
3144 39K
2141 470n
3141 160K
3142 27
3143 22
2142 100n
6104(a) TCA0372(1/2)
3716 3717
3139 82K
3108 4E7
3107 4E7
3709
3704 3710
3160 4E7
3159 15K
3163 15
2159 1u5
6119 6118
HZ7C2 HZ7C2
3138 1
3712
2138 220µ
2137 22n
3713
10.5V
6104(b) TCA0372(1/2)
3161 12K
4,9-16
3140 1
-12V
2139 22n
2140 220µ
3166 47K
3167 12K
2152 220n
6107 IN4148
31-14 FOC+
31-13 FOC-
31-12 RAD-
31-11 RAD+
FOCUS COIL
RAD COIL
RADIAL - FOCUS UNIT
FLEX PRINT (FOIL)
VBB VDD
Cagc
6102 TAD5709
radial
lag
test
RE
Clag
3154 39K
2155 470n
3151 82K
OSCILLATOR 650 Hz
0°
45°
90°
lint
lag short circuit
RElag
Vref
3162 91K
2156 6n8
3155 8K2
INTEGRATING AMPLIFIER
radial
6109 BC848
3157 22K
3158 3K9
3156 22K
switches
ROM
DAC 3.5 BIT DAC
3152 39K
6112 BC858
3191 10K
3153 5K6
3714
3192 22K
3705
3193 22K
Rosc Cosc1 Cosc2 Coffset Chpf
2150 3n6
2151 3n6
2153 180n
2154 220n
B0 B1 B2 B3
34-4 34-5 34-6 34-7
34-2
RPU
43-11 43-10 43-9 43-8
43-13
78M15CT
6308 15V REGULATOR
6353 BAX18
7805CT
6309 5V REGULATOR
100n 2404
6310 -6V REGULATOR
79M06CT
2403 47µ
6311 -15V REGULATOR
79M15CT
5301 470µH
2360 2n2
3356 2K4 4V
2363 in
3357 2K4 4V
2361 2n2 4V
5302 470µH

4 Decoder and Power Supply

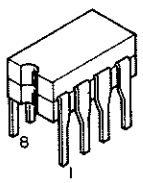



4 PC BOARD 046895
SUPPRESSOR
PIGGYBACK PCB
IC1 NE555N
6304 DIGITAL FILTER (SEE PG. 21)
6305 DUAL DAC (SEE PG. 21)
6306(a) DEEM
6307(a) DEEM
NE5532N
78M15CT
79M06CT
79M15CT
7805CT
6308 15V REGULATOR
6309 5V REGULATOR
6310 -6V REGULATOR
6311 -15V REGULATOR
3.6V (POWER ON-OFF)
11,2896 MHz
J7-3
J7-1
J5-3
GND
5V
EFAB





SUPPRESSOR PCB 046895



IC1

IQ, Q2

SUPPRESSOR PARTS LIST

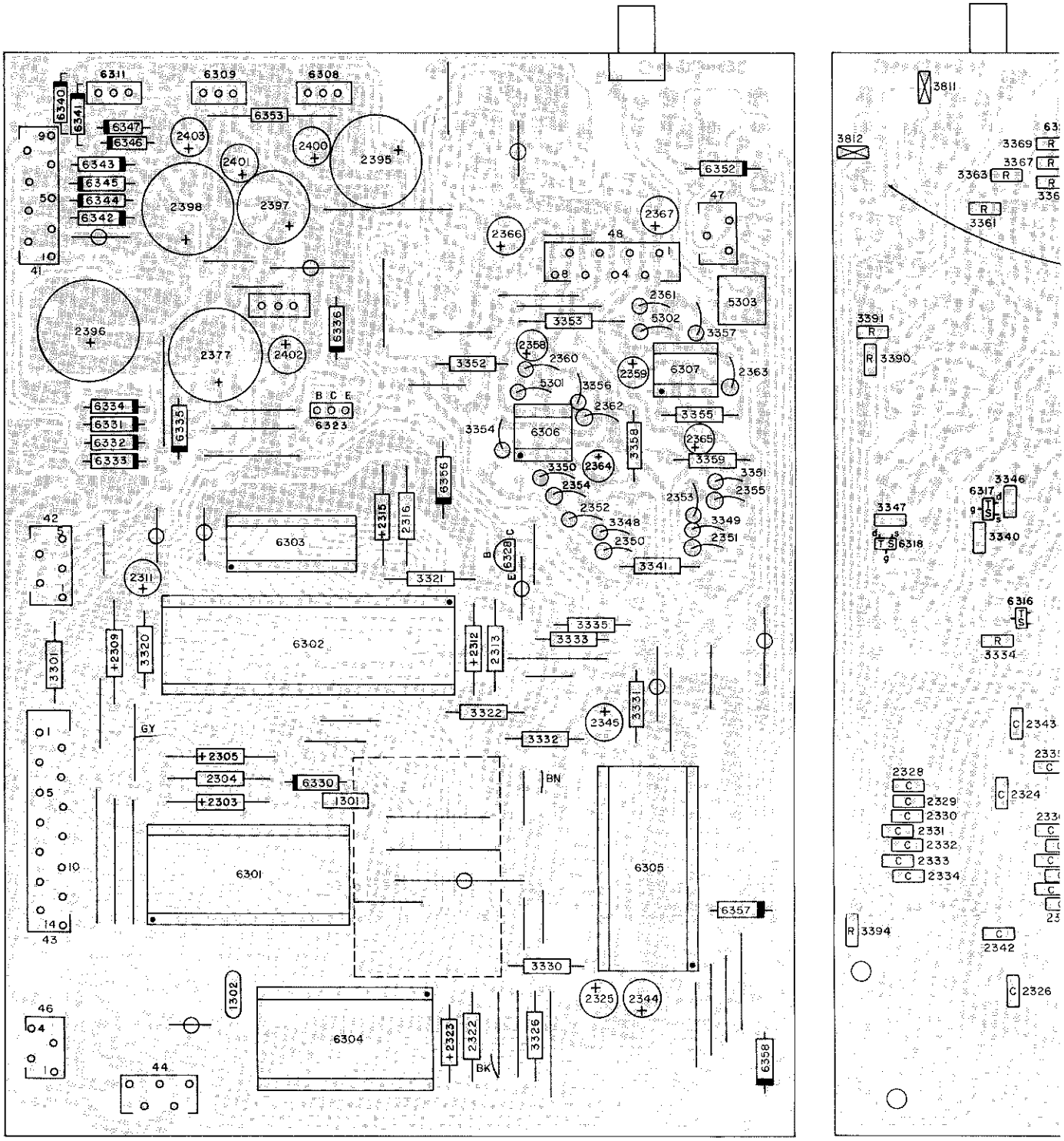
Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	133141	TIMER, NE555N
TRANSISTORS		
Q1,Q2	132223	NPN, MPS4124

DECODER AND POWER SUPPLY PARTS LIST

Symbol No.	Part No.
INTEGRATED CIRCUITS	
6301	MAB8441P T082
6302	SAA7210P
6303	MPD41416C-15
6304	SAA7220P/B
6305	TDA1541A
6306,6307	NE5532N
6308	78M15CT
6309	7805CT
6310	79M06CT
6311	79M15CT

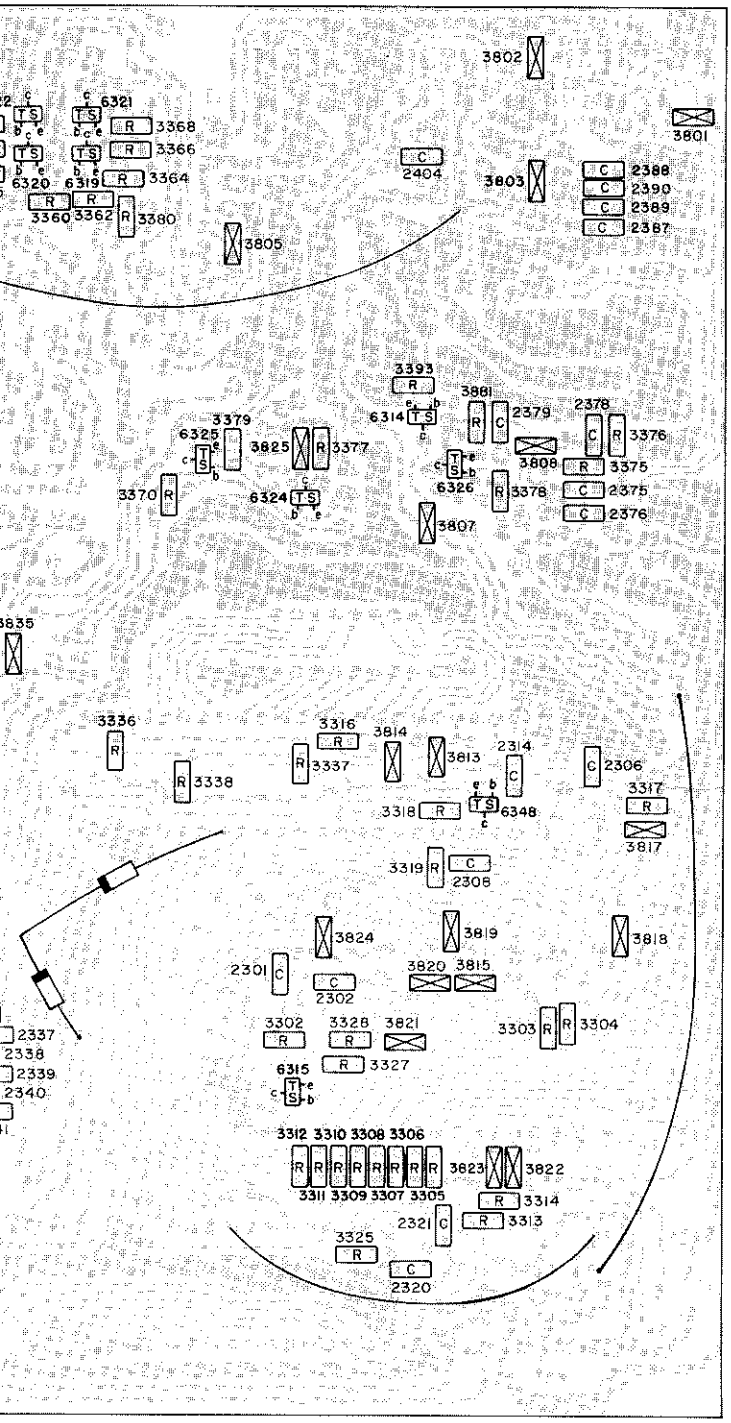
Decoder and Power Supply

COMPONENT SIDE



DECODER AND POWER SUPPLY PCB 046662

CIRCUIT SIDE (WITH SURFACE-MOUNT COMPONENTS)



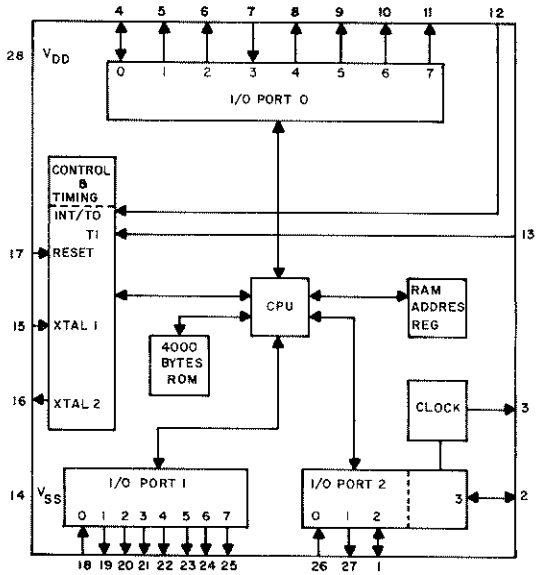


Fig. 6. Block diagram of Servo Microprocessor 6301.

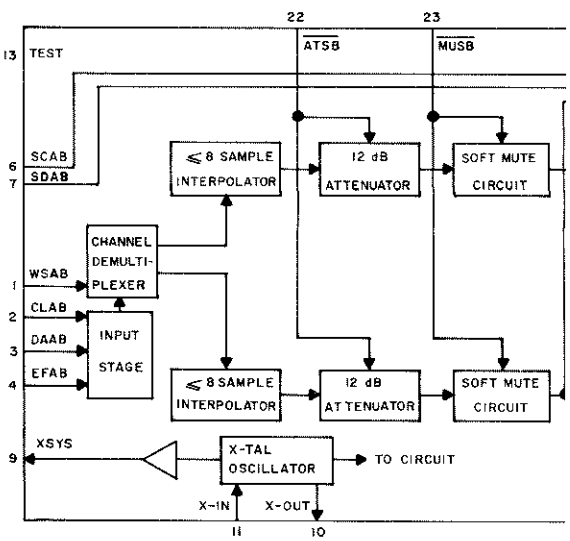


Fig. 8. Block diagram of Digital Fil

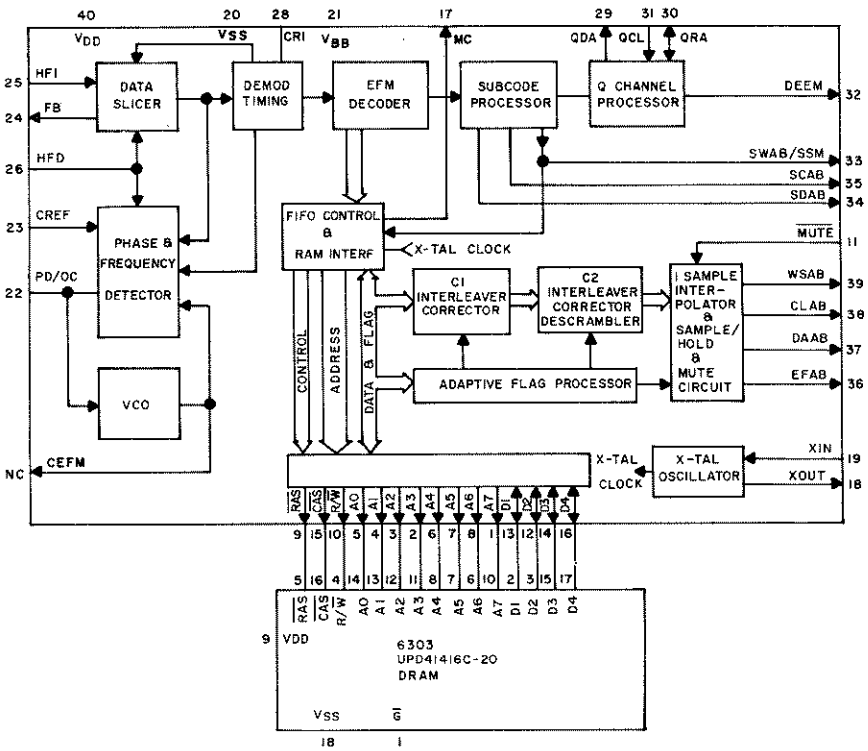
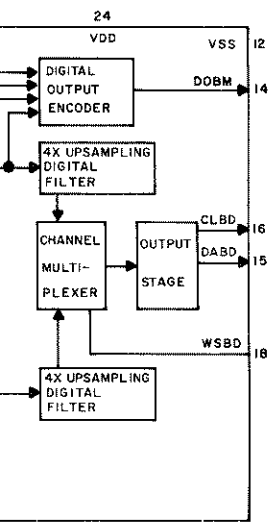


Fig. 7. Block diagram of Decoder 6302.



er 6304.

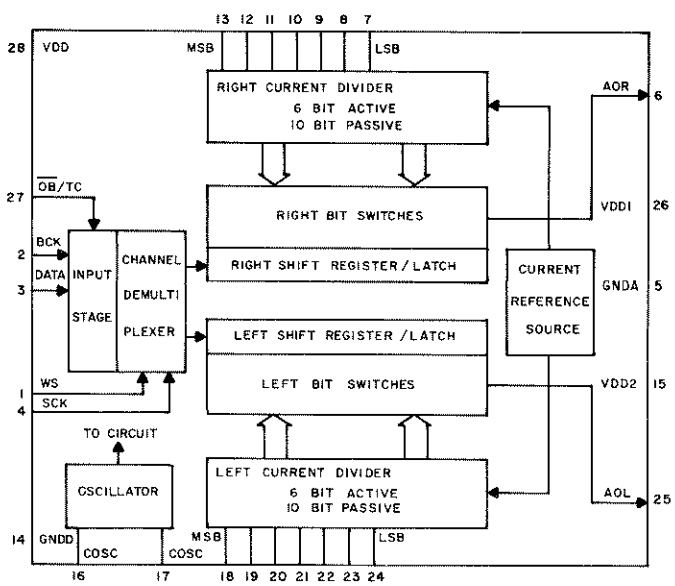
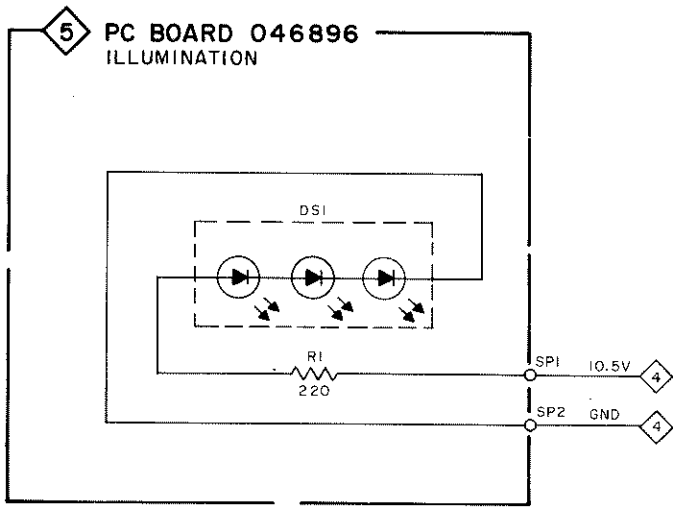
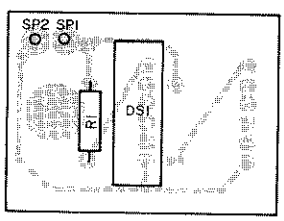


Fig. 9. Block diagram of Dual Dac 6305.

5 Illumination

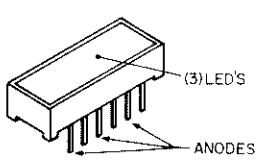




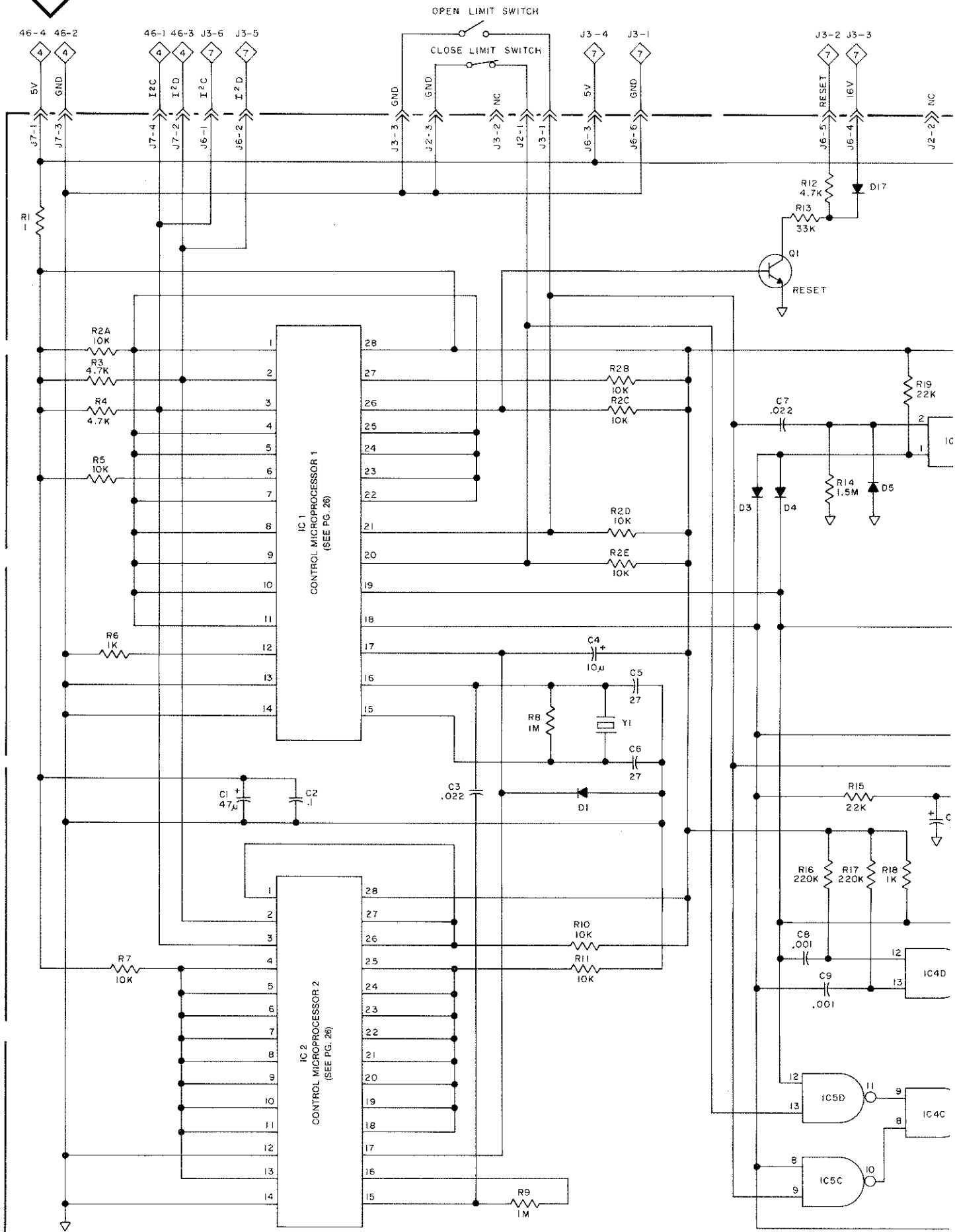
ILLUMINATION PCB 046896

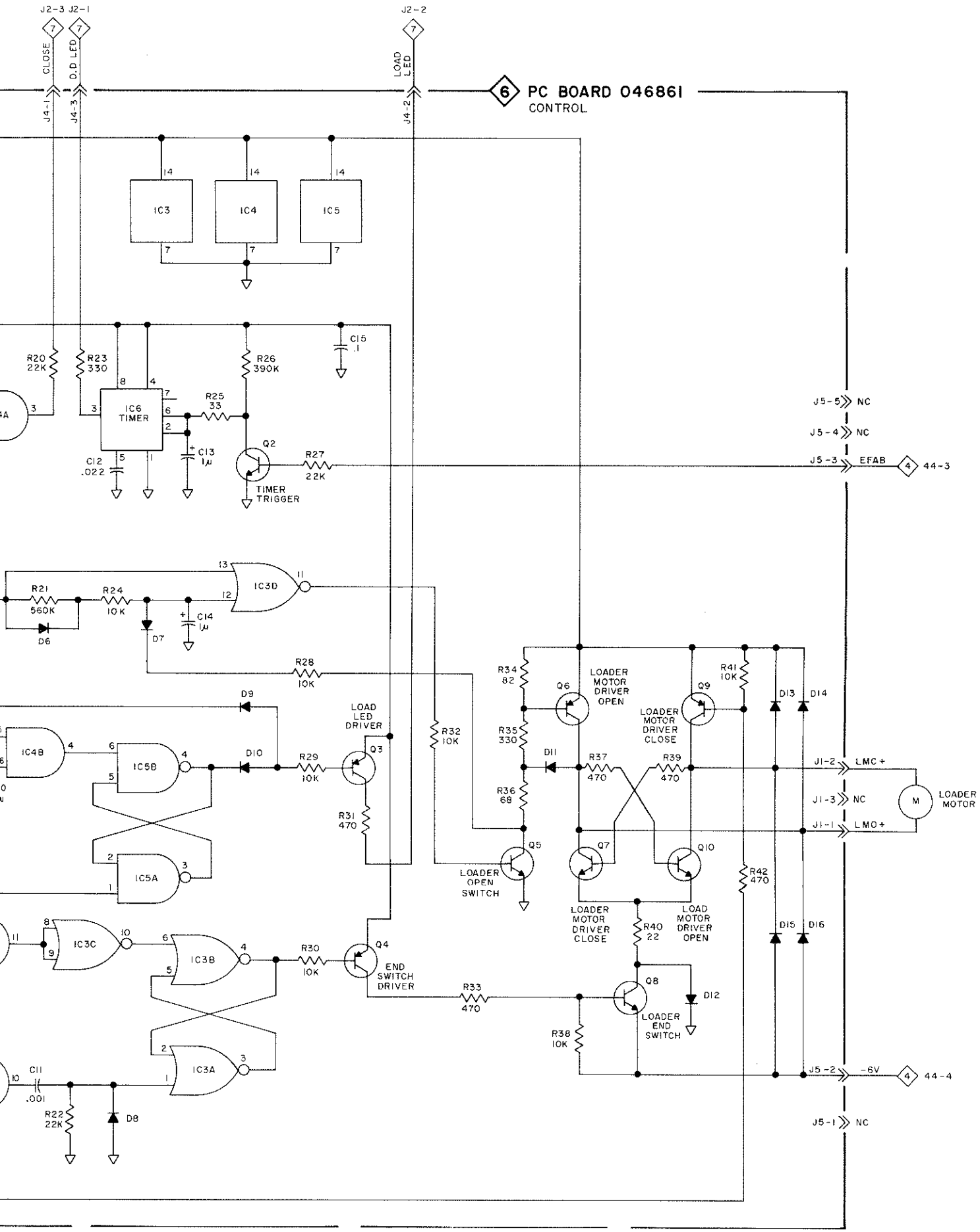
ILLUMINATION PARTS LIST

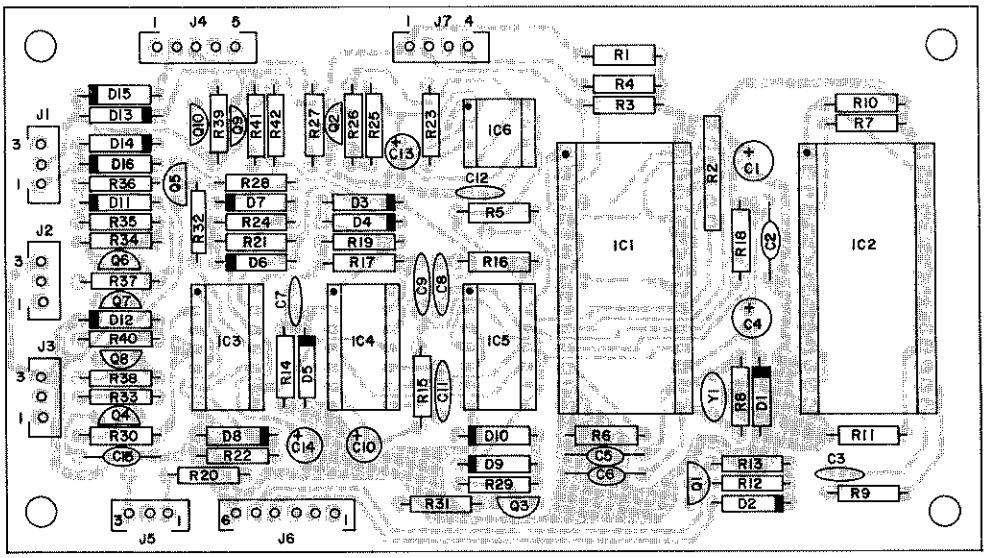
Symbol No.	Part No.	Description
LIGHTING DEVICES		
DS1	058102	LED, GREEN, BAR



DS1


OPEN LIMIT SWITCH
CLOSE LIMIT SWITCH
46-4 46-2 46-1 46-3 J3-6 J3-5 J3-4 J3-1 J3-2 J3-3
5V GND I2C I2D I2C I2D GND GND NC 5V GND RESET 16V NC
J7-1 J7-3 J7-4 J7-2 J6-1 J6-2 J3-3 J2-3 J3-2 J2-1 J3-1 J6-3 J6-6 J6-5 J6-4 J2-2
R1
R12 4.7K
R13 33K
D17
Q1
RESET
R2A 10K
R3 4.7K
R4 4.7K
R5 10K
R6 1K
R7 10K
IC 1
CONTROL MICROPROCESSOR 1
(SEE PG. 26)
IC 2
CONTROL MICROPROCESSOR 2
(SEE PG. 26)
R2B 10K
R2C 10K
R2D 10K
R2E 10K
R10 10K
R11 10K
C1 47µ
C2 .1
C3 .022
C4 10µ
C5 27
C6 27
R8 1M
Y1
D1
R9 1M
C7 .022
R14 1.5M
D3
D4
D5
R19 22K
R15 22K
R16 220K
R17 220K
R18 1K
C8 .001
C9 .001
IC4D
IC5D
IC4C
IC5C

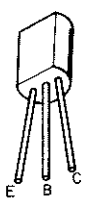

J2-3
J2-1
J2-2
7
CLOSE
D.D LED
LOAD LED
J4-1
J4-3
J4-2
6 PC BOARD 046861
CONTROL
IC3
IC4
IC5
14
7
R20 22K
R23 330
R26 390K
C15 .1
IC6 TIMER
R25 33
C12 .022
C13 1μ
Q2
R27 22K
TIMER TRIGGER
J5-5 NC
J5-4 NC
J5-3 EFAB
4 44-3
R21 560K
R24 10K
IC3D
C14 1μ
D6
D7
R28 10K
D9
IC4B
IC5B
D10
R29 10K
Q3
LOAD LED DRIVER
R31 470
IC5A
R32 10K
R34 82
Q6
LOADER MOTOR DRIVER OPEN
R35 330
D11
R36 68
Q5
LOADER OPEN SWITCH
R37 470
R39 470
Q9
LOADER MOTOR DRIVER CLOSE
R41 10K
D13
D14
J1-2 LMC+
J1-3 NC
J1-1 LMO+
M
LOADER MOTOR
Q7
Q10
R42 470
LOADER MOTOR DRIVER CLOSE
R40 22
LOAD MOTOR DRIVER OPEN
D15
D16
IC3C
IC3B
R30 10K
Q4
END SWITCH DRIVER
R33 470
Q8
D12
LOADER END SWITCH
R38 10K
C11 .001
IC3A
R22 22K
D8
J5-2 -6V
4 44-4
J5-1 NC



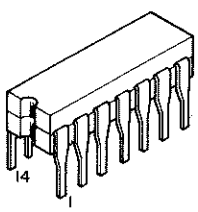
CONTROL PCB 046861

CONTROL
PARTS LIST

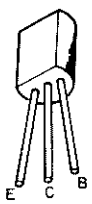
Symbol No.	Part No.	Description
DIODES		
D1-D11	070047	SIG, 75V, 150mA, 1N4148
D12	070131	RECT, 400V, 1A, 1N4004
D13-D16	070047	SIG, 75V, 150mA, 1N4148
INTEGRATED CIRCUITS		
IC1	310041	Microprocessor, MAB8461P, W079
IC2	310042	Microprocessor, MAB8421P, F050
IC3	133064	CMOS, Quad 2-input NOR Gate, MC14001B
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



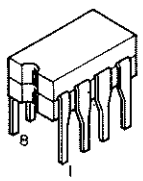
Q2-Q10



IC3-IC5



Q1



IC6

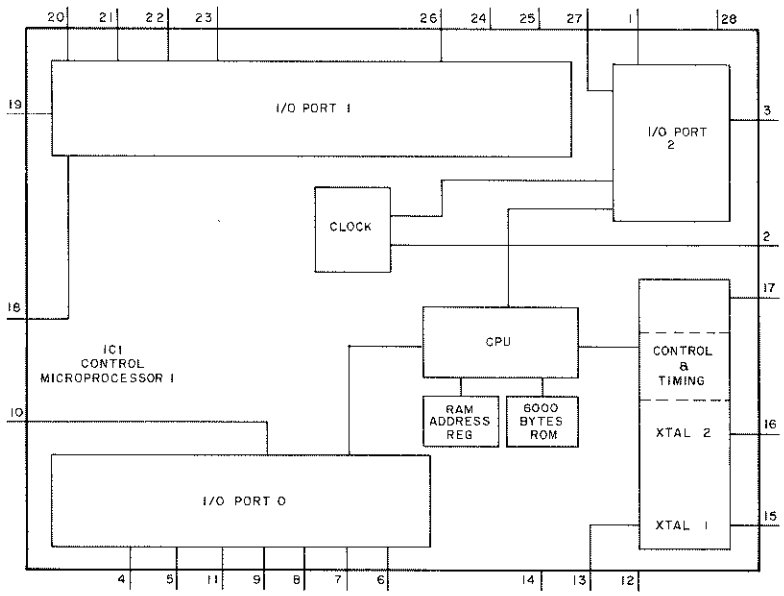


Fig. 10. Block diagram of Control Microprocessor 1.

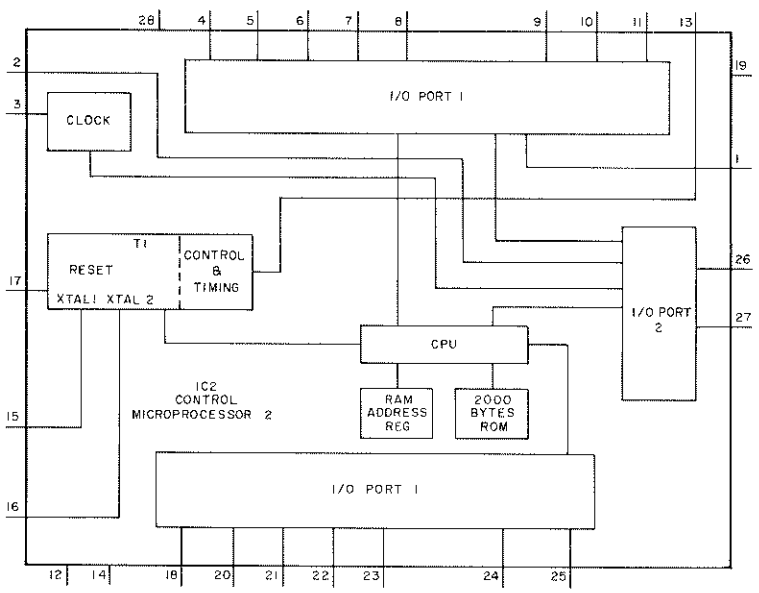
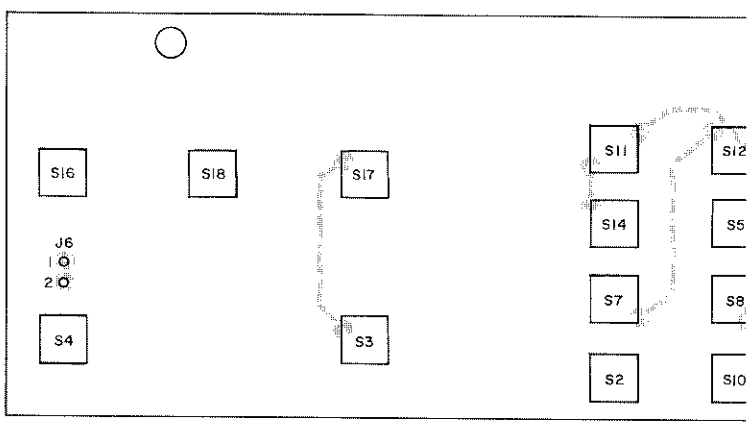


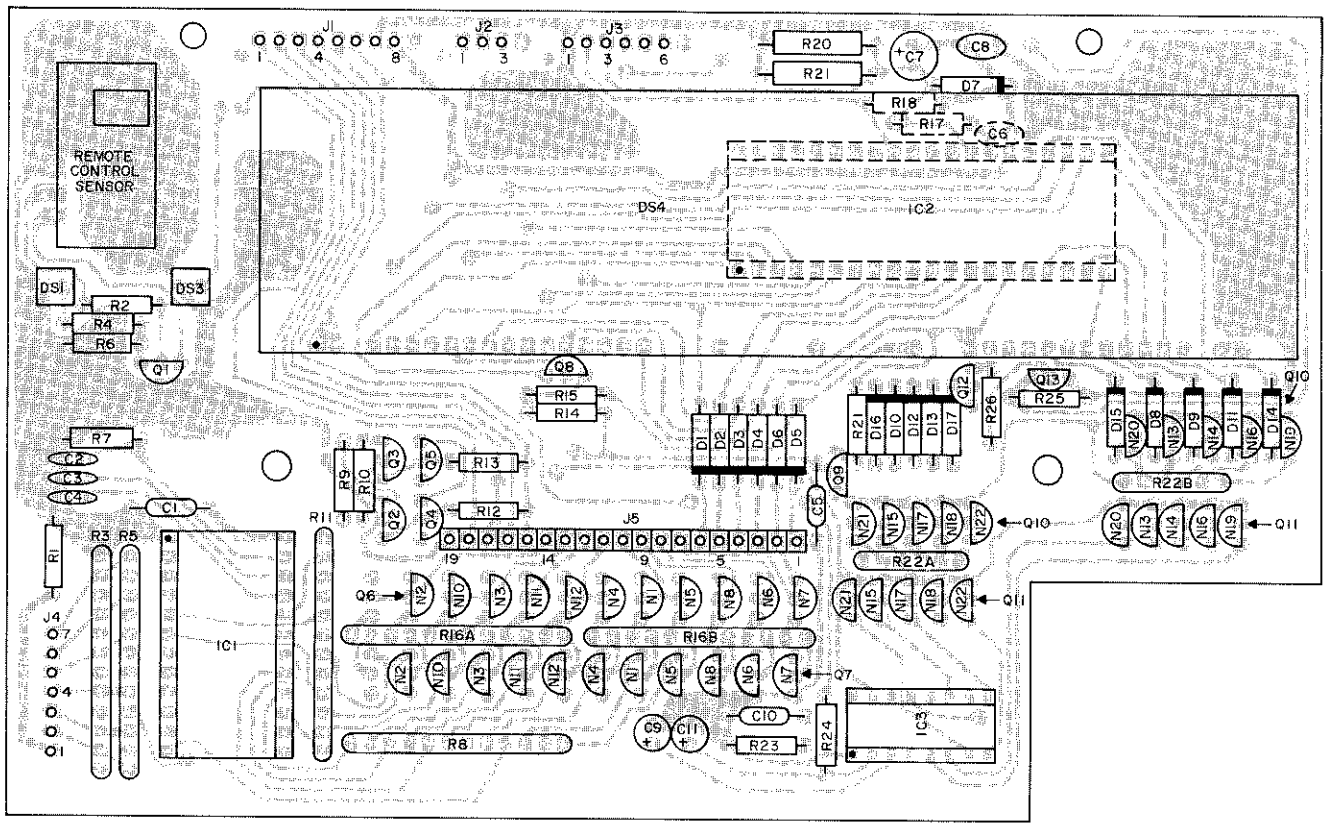
Fig. 11. Block diagram of Control Microprocessor 2.

7

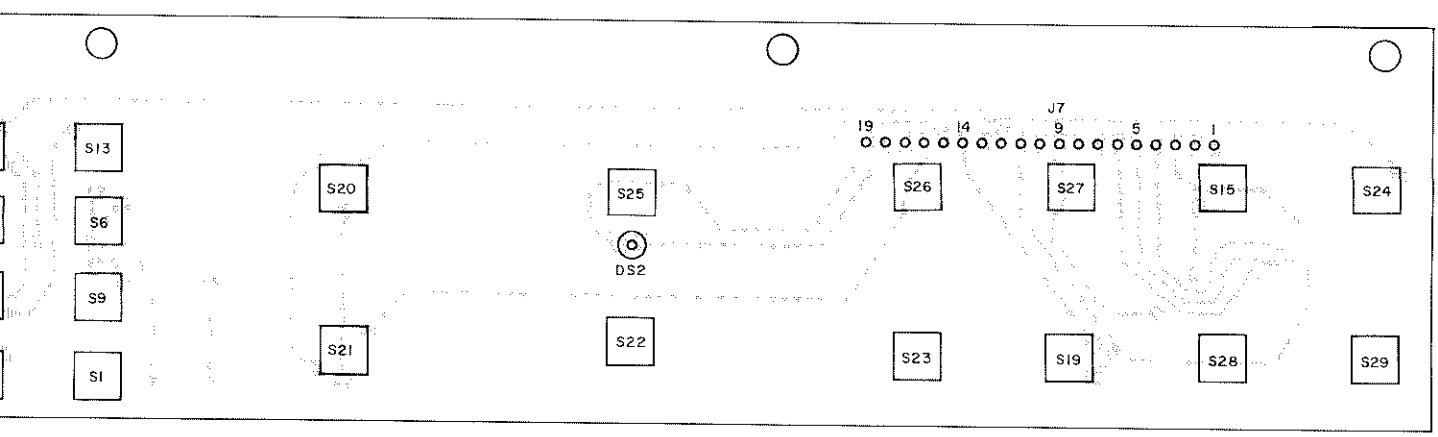
DISPLAY AND KEYBOARD PARTS LIST

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



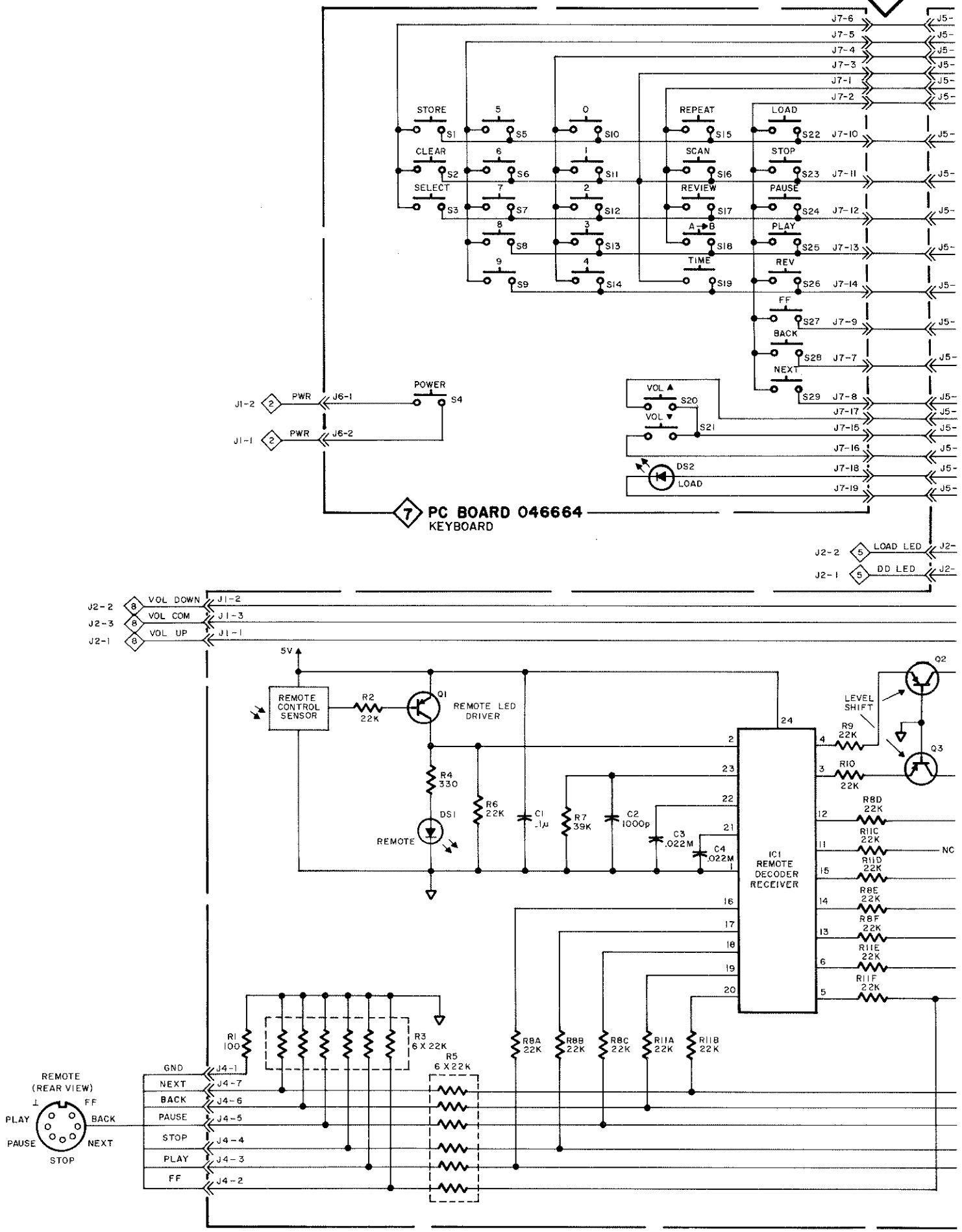


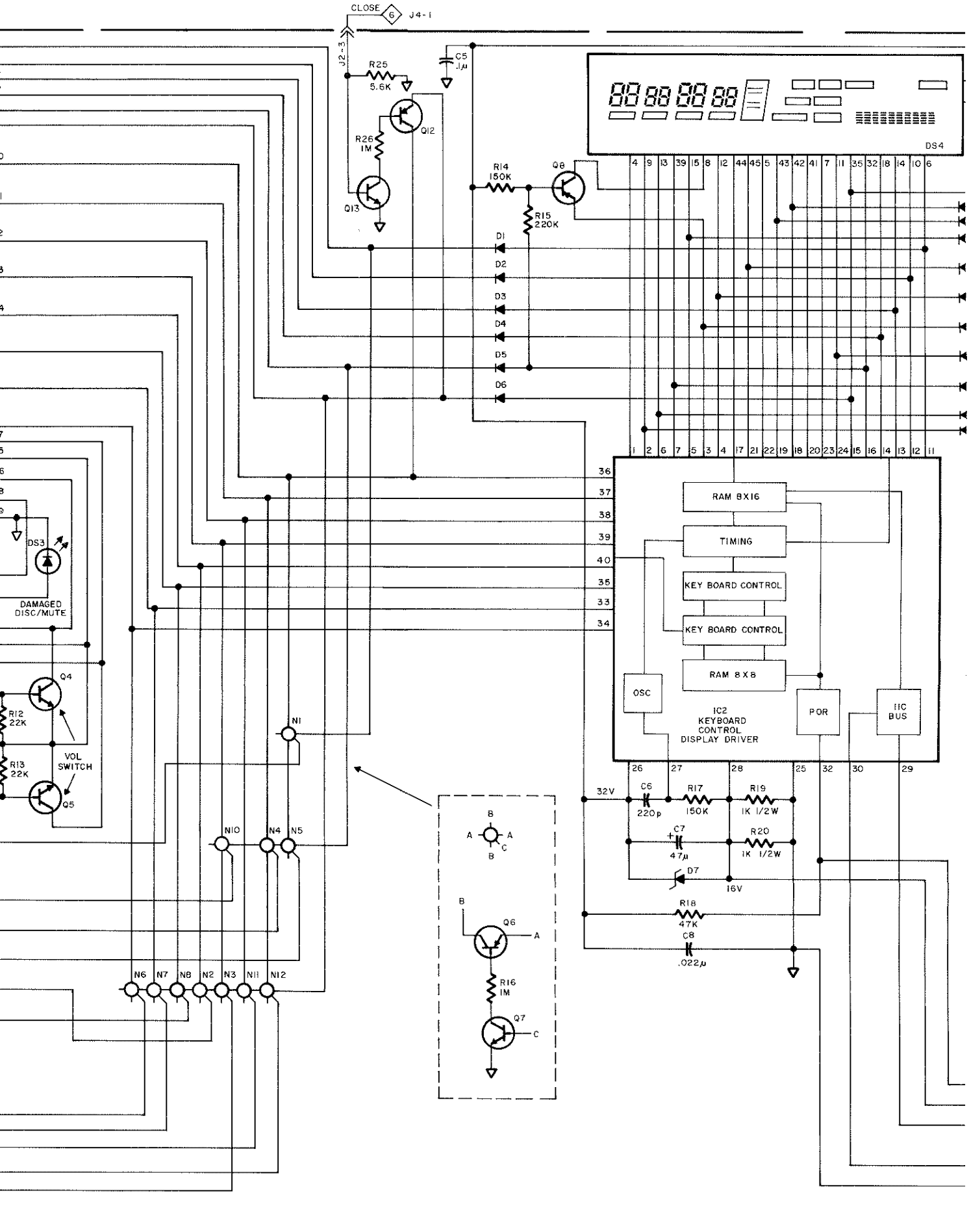
DISPLAY PCB 046849

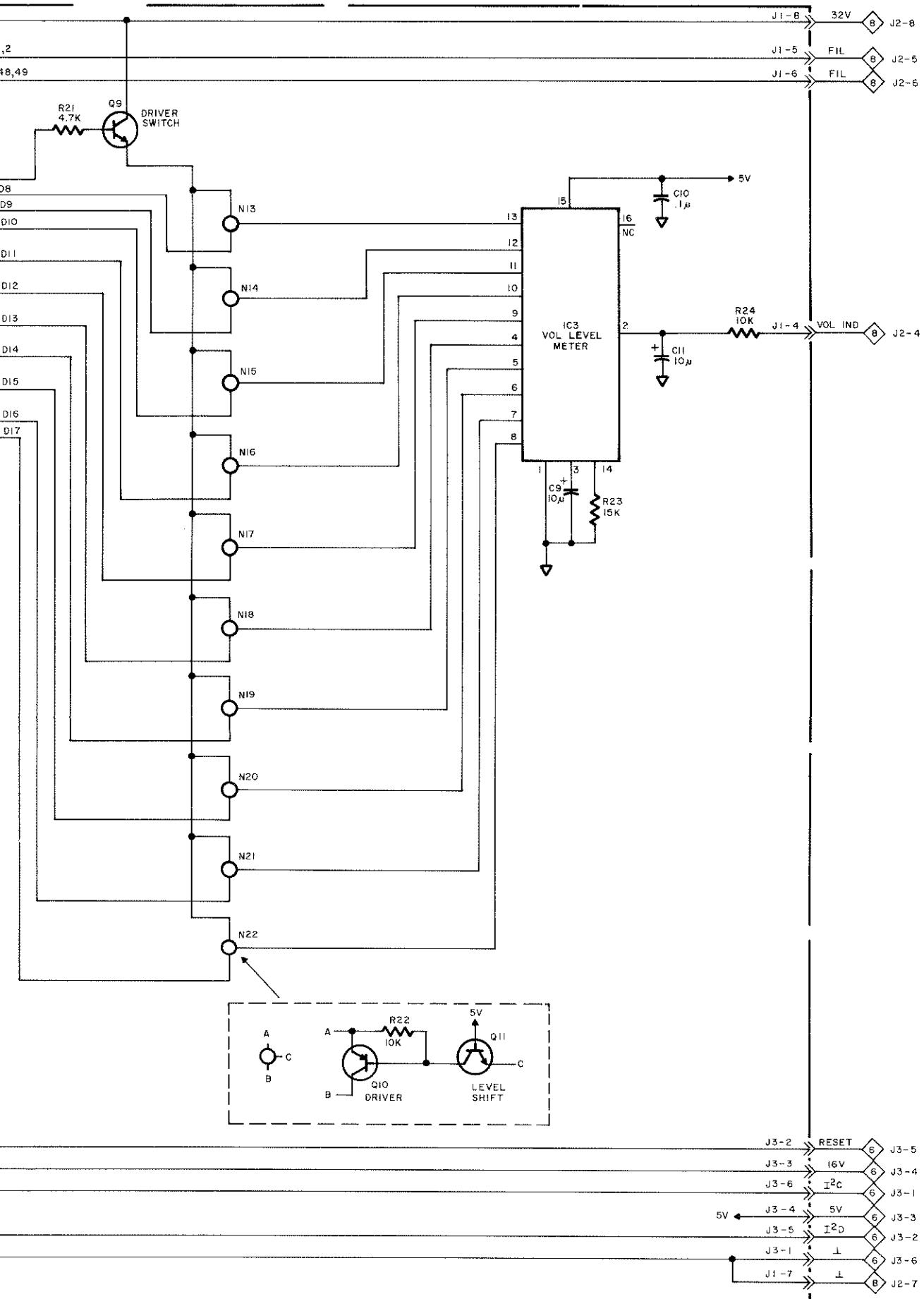


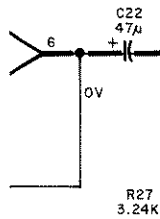
KEYBOARD PCB 046664

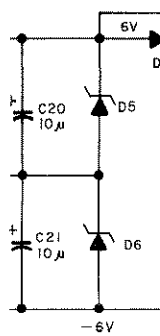
Display and Keyboard 7

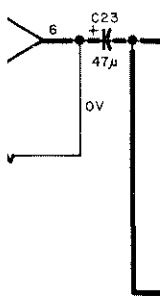



CLOSE 6 J4-1
J2-3
R25
5.6K
C5
.1µ
Q12
R26
1M
Q13
R14
150K
Q8
R15
220K
D1
D2
D3
D4
D5
D6
DS4
RAM 8X16
TIMING
KEY BOARD CONTROL
KEY BOARD CONTROL
RAM 8X8
OSC
IC2
KEYBOARD
CONTROL
DISPLAY DRIVER
POR
IIC
BUS
32V
C6
220p
R17
150K
R19
1K 1/2W
C7
47µ
R20
1K 1/2W
D7
16V
R18
47K
C8
.022µ
DS3
DAMAGED
DISC/MUTE
Q4
R12
22K
R13
22K
VOL
SWITCH
Q5
N1
N10
N4
N5
N6
N7
N8
N2
N3
N11
N12
Q6
R16
1M
Q7

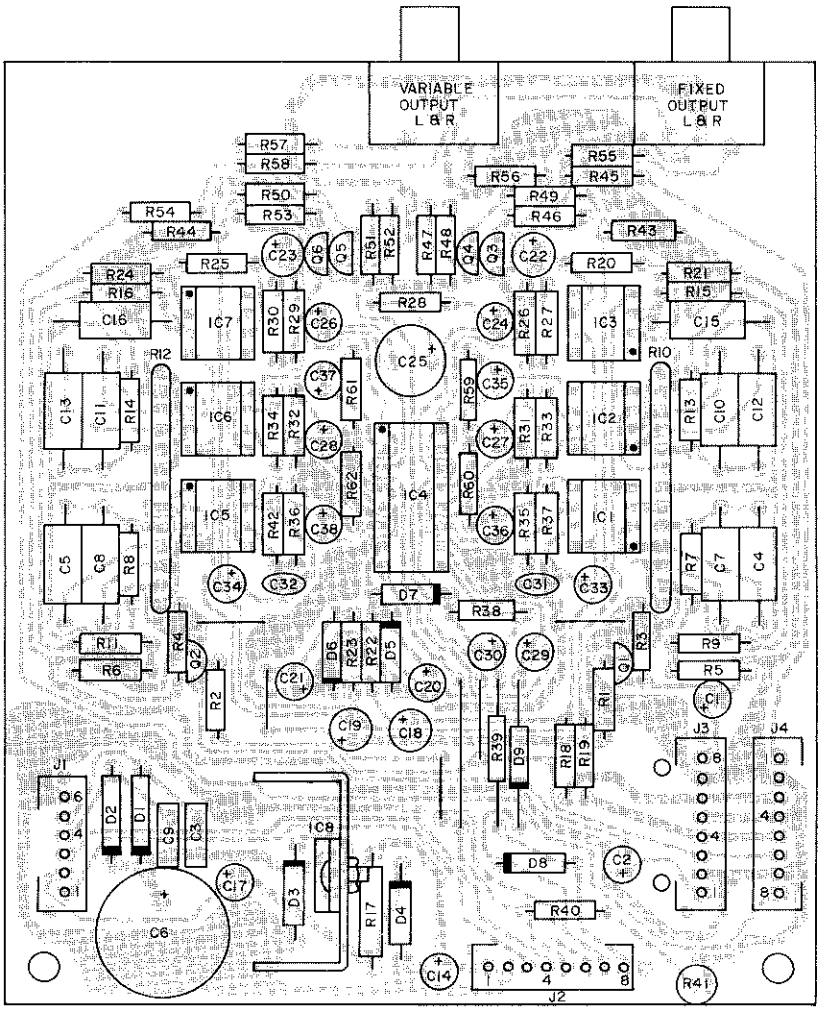

J1-8
32V
J2-8
J1-5
FIL
J2-5
J1-6
FIL
J2-6
R21
4.7K
Q9
DRIVER
SWITCH
N13
N14
N15
N16
N17
N18
N19
N20
N21
N22
IC3
VOL LEVEL
METER
5V
C10
.1μ
C11
10μ
C9
10μ
R23
15K
R24
10K
J1-4
VOL IND
J2-4
R22
10K
Q10
DRIVER
Q11
LEVEL
SHIFT
J3-2
RESET
J3-5
J3-3
16V
J3-4
J3-6
I2C
J3-1
J3-4
5V
J3-3
J3-5
I2D
J3-2
J3-1
J3-6
J1-7
J2-7


C22
47μ
6
0V
R27
3.24K

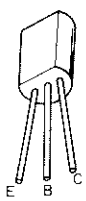

6V
C20
10μ
D5
C21
10μ
D6
-6V


6
C23
47μ
0V

8 Audio



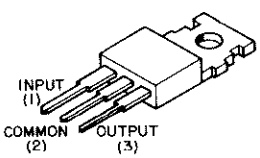
AUDIO PCB 046846



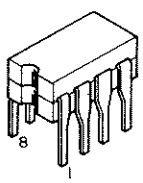
Q1-Q6

AUDIO
PARTS LIST

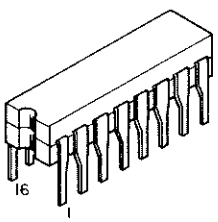
Symbol No.	Part No.	Description
DIODES		
D1,D2	070131	RECT, 400V, 1A, 1N4004
D3	070130	ZN, 8.2V, 5%, 500mW, 1N5237B
D4	070132	ZN, 5V, 5%, 500mW, 1N5231B
D5,D6	070058	ZN, 6.2V, 5%, 500mW, 1N5234B
D7-D9	070047	SIG, 75V, 150mA, 1N4148
INTEGRATED CIRCUITS		
IC1,IC2	133094	Dual Operational Amp NE5532N
IC3	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



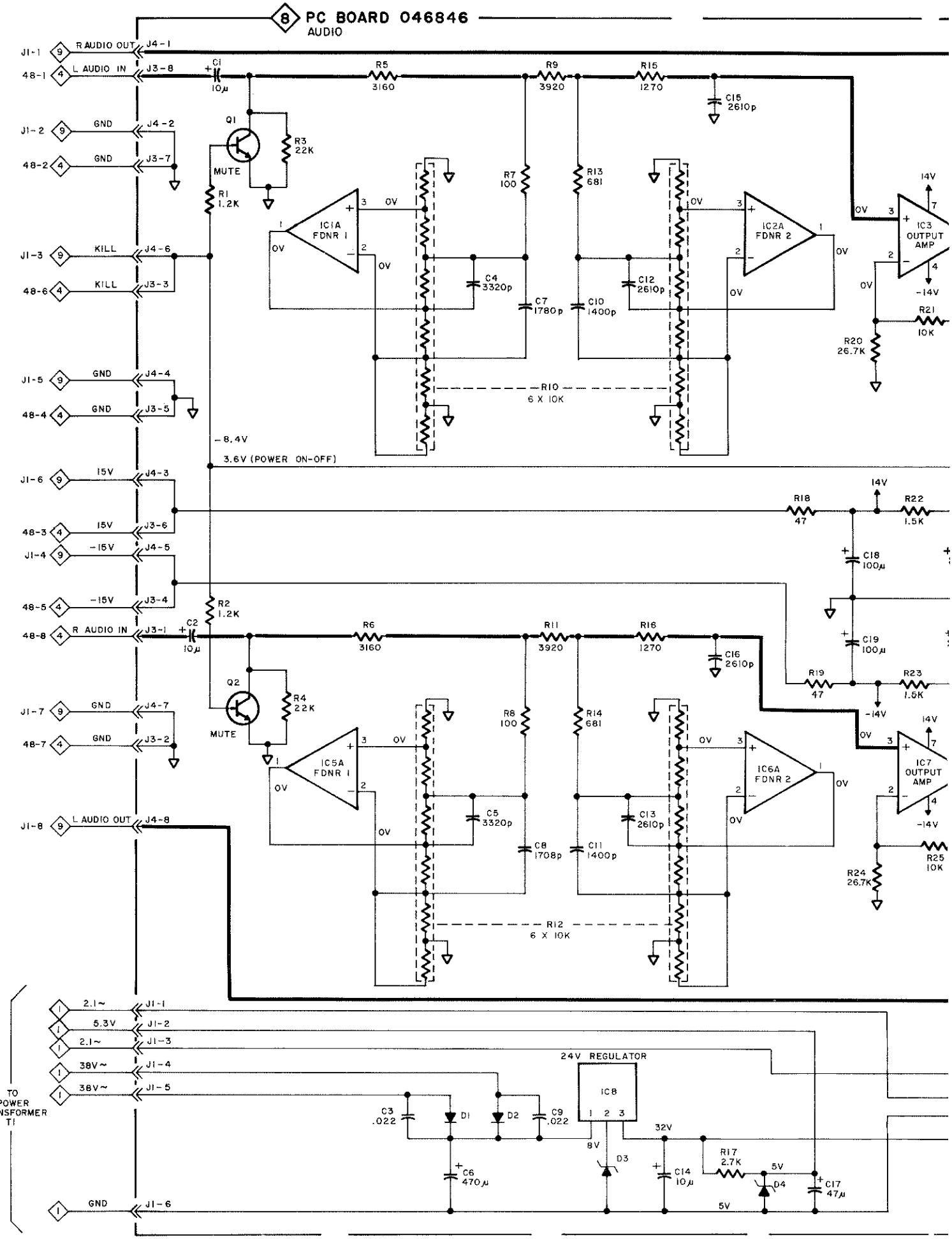
IC8

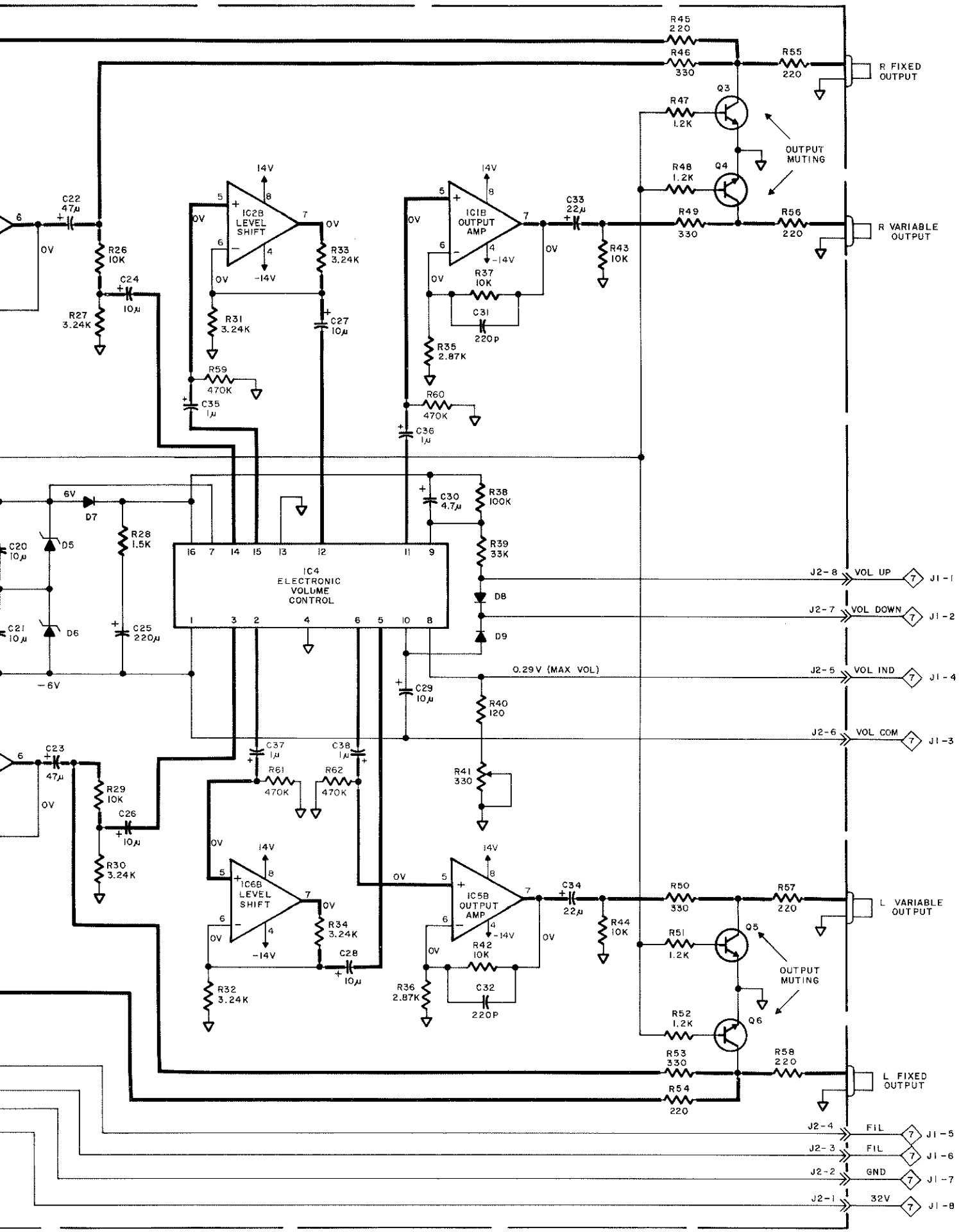


IC1-IC3,
IC5-IC7

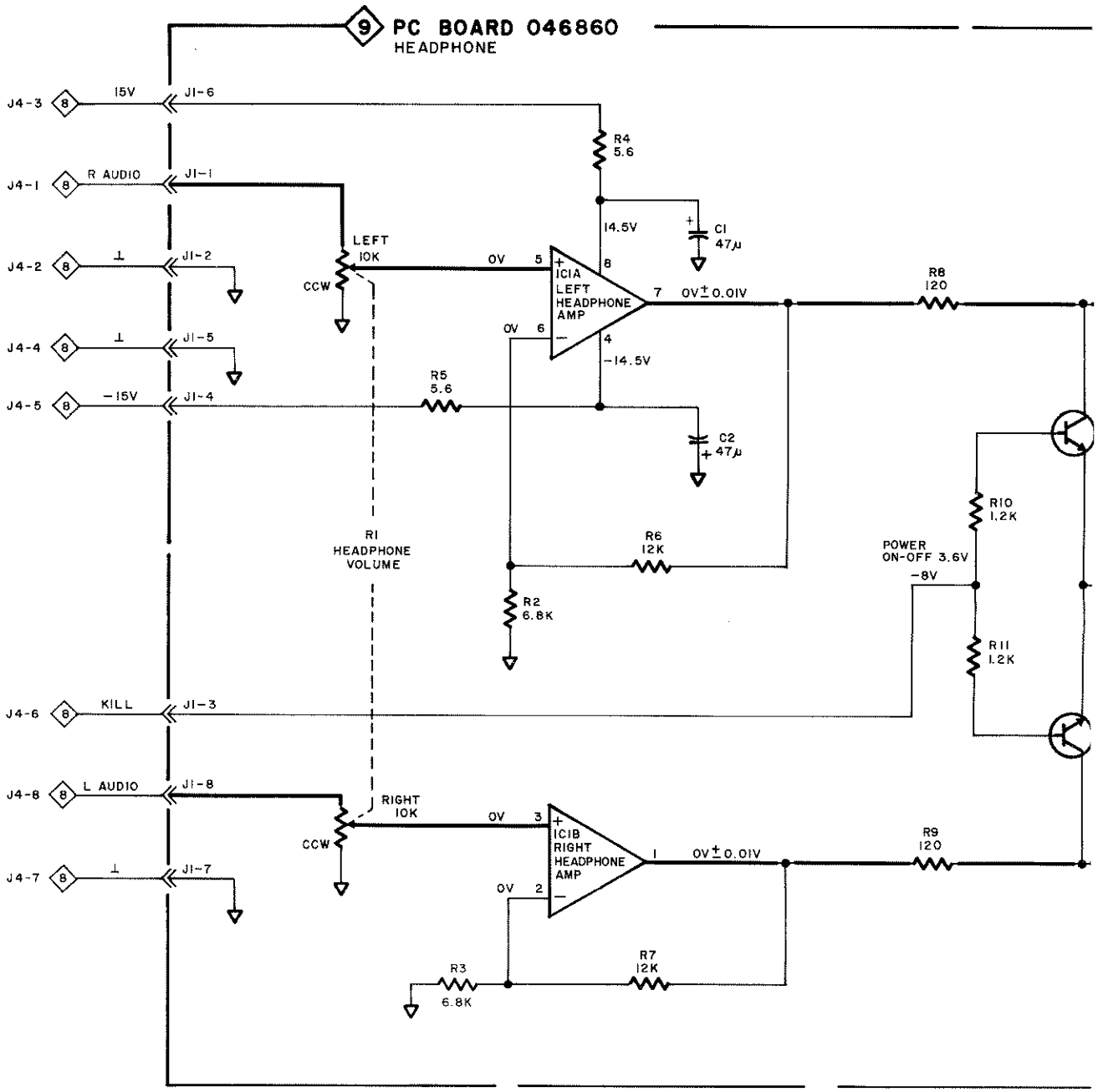


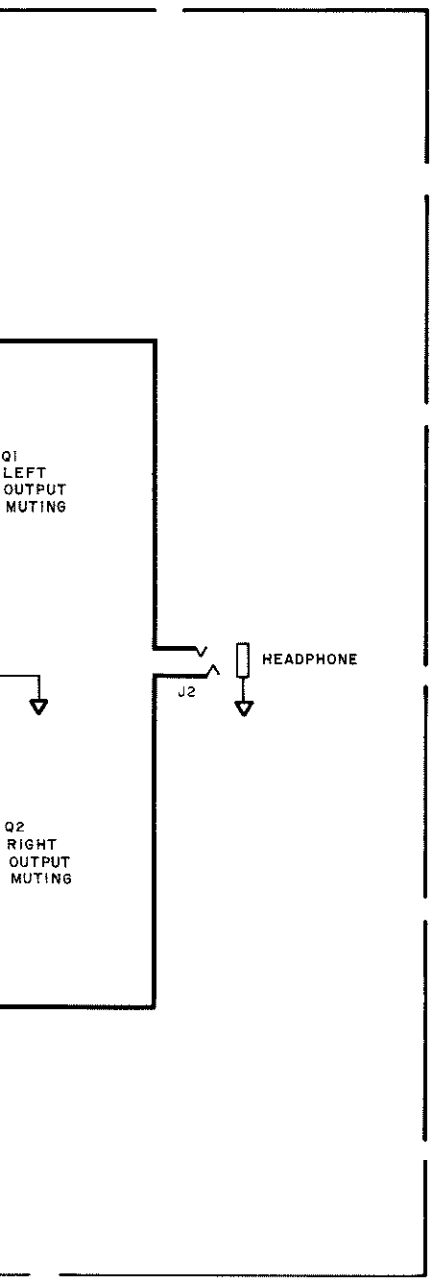
IC4

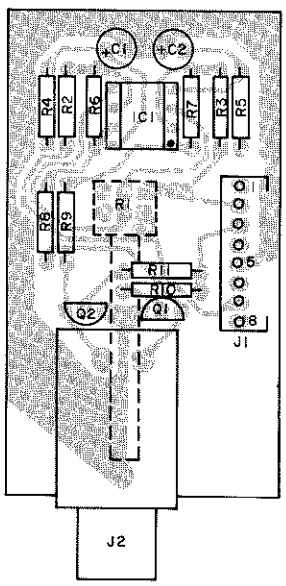

8 PC BOARD 046846
AUDIO
J1-1
R AUDIO OUT
J4-1
48-1
L AUDIO IN
J3-8
C1
10µ
R5
3160
R9
3920
R15
1270
C15
2610p
J1-2
GND
J4-2
48-2
GND
J3-7
Q1
MUTE
R3
22K
R1
1.2K
J1-3
KILL
J4-6
48-6
KILL
J3-3
IC1A
FDNR 1
IC2A
FDNR 2
R7
100
R13
681
C4
3320p
C7
1780p
C10
1400p
C12
2610p
R10
6 X 10K
IC3
OUTPUT
AMP
14V
-14V
R21
10K
R20
26.7K
J1-5
GND
J4-4
48-4
GND
J3-5
-8.4V
3.6V (POWER ON-OFF)
J1-6
15V
J4-3
48-3
15V
J3-6
J1-4
-15V
J4-5
48-5
-15V
J3-4
R18
47
R22
1.5K
C18
100µ
C19
100µ
R19
47
R23
1.5K
R2
1.2K
48-8
R AUDIO IN
J3-1
C2
10µ
R6
3160
R11
3920
R16
1270
C16
2610p
Q2
MUTE
R4
22K
J1-7
GND
J4-7
48-7
GND
J3-2
IC5A
FDNR 1
IC6A
FDNR 2
R8
100
R14
681
C5
3320p
C8
1708p
C11
1400p
C13
2610p
R12
6 X 10K
IC7
OUTPUT
AMP
R25
10K
R24
26.7K
J1-8
L AUDIO OUT
J4-8
TO
POWER
NSFORMER
T1
2.1~
J1-1
5.3V
J1-2
2.1~
J1-3
38V~
J1-4
38V~
J1-5
24V REGULATOR
IC8
C3
.022
D1
D2
C9
.022
C6
470µ
8V
D3
32V
C14
10µ
R17
2.7K
5V
D4
C17
47µ
5V
GND
J1-6


R45 220
R46 330
R55 220
R FIXED OUTPUT
Q3
R47 1.2K
OUTPUT MUTING
R48 1.2K
Q4
R49 330
R56 220
R VARIABLE OUTPUT
14V
IC2B LEVEL SHIFT
IC1B OUTPUT AMP
C33 22µ
R43 10K
C22 47µ
R26 10K
C24 10µ
R27 3.24K
R33 3.24K
C27 10µ
R31 3.24K
R37 10K
C31 220p
R35 2.87K
R59 470K
C35 1µ
R60 470K
C36 1µ
C30 4.7µ
R38 100K
R39 33K
6V
D7
R28 1.5K
C20 10µ
D5
C21 10µ
D6
C25 220µ
−6V
IC4 ELECTRONIC VOLUME CONTROL
D8
D9
0.29V (MAX VOL)
C29 10µ
R40 120
R41 330
J2-8 VOL UP J1-1
J2-7 VOL DOWN J1-2
J2-5 VOL IND J1-4
J2-6 VOL COM J1-3
C23 47µ
R29 10K
C26 10µ
R30 3.24K
C37 1µ
C38 1µ
R61 470K
R62 470K
IC6B LEVEL SHIFT
IC5B OUTPUT AMP
C34 22µ
R44 10K
R50 330
R57 220
L VARIABLE OUTPUT
R51 1.2K
Q5
OUTPUT MUTING
R52 1.2K
Q6
R53 330
R58 220
L FIXED OUTPUT
R54 220
R34 3.24K
C28 10µ
R32 3.24K
R42 10K
C32 220P
R36 2.87K
J2-4 FIL J1-5
J2-3 FIL J1-6
J2-2 GND J1-7
J2-1 32V J1-8

Headphone 9


9 PC BOARD 046860
HEADPHONE
J4-3
15V
J1-6
J4-1
R AUDIO
J1-1
J4-2
J1-2
J4-4
J1-5
J4-5
-15V
J1-4
J4-6
KILL
J1-3
J4-8
L AUDIO
J1-8
J4-7
J1-7
R4
5.6
14.5V
C1
47μ
LEFT
10K
CCW
0V
5
ICIA
LEFT
HEADPHONE
AMP
8
7
0V±0.01V
R8
120
0V
6
4
-14.5V
R5
5.6
C2
47μ
R1
HEADPHONE
VOLUME
R6
12K
R2
6.8K
R10
1.2K
POWER
ON-OFF 3.6V
-8V
R11
1.2K
RIGHT
10K
CCW
0V
3
ICIB
RIGHT
HEADPHONE
AMP
1
0V±0.01V
R9
120
0V
2
R3
6.8K
R7
12K





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	• TRACK, INDEX, LAP and VOLUME indicators light in display • DD/M (DAMAGED DISC/MUTE) lights
2. Press LOAD and load DISC 5A	• Load light operates on open and close • TRACK 24, MIN 59 and SEC 42 light in display
3. Press PLAY	• 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	• Timer starts counting downward • DD/M light lights • ERROR block lights when timer reaches 0
5. Press and hold FF	• Timer starts counting upward • DD/M light lights
6. Press REPEAT	• REPEAT block lights
Press REPEAT again to resume	
7. Press PAUSE	• PAUSE block lights • Timer stops counting • Audio mutes
Press PAUSE again to resume	
8. Press NEXT TRACK	• Next higher track number lights • Timer starts count from 0
9. Press BACK TRACK	• Next lower track number lights • Timer starts count from 0
10. Press TIME two times	• Timer displays time two different ways: LAP (elapsed)-Time from start of track REM (remaining)—Total remaining time on disc
11. Press STOP	• TRACK 24, MIN 59 and SEC 42 light in display • DD/M lights

12. Press SCAN	• SCAN lights • Plays first 10 seconds of each track (Continues for all tracks)
13. Press PLAY	• SCAN goes off, plays entire track
14. Press A-B	• PROGRAM lights, A-B flashes
Press A-B again	• A-B stops flashing, plays and repeats a portion of the disc
15. Press CLEAR	• PROGRAM and A-B go off, plays entire track
16. Press STOP	• TRACK 24, MIN 59, and SEC 42 light in display
17. Press 5	• TRACK flashes, 5 lights
Press SELECT	• INDEX flashes
Press SELECT	• MIN flashes
Press 1	• 1 lights
Press SELECT	• SEC flashes
Press 0	• 00 lights
Press STORE	• MIN flashes
Press 2	• 2 lights
Press SELECT	• SEC flashes
Press 0	• 00 lights
Press STORE	• TRACK 1, MIN 1, SEC 00 and PROGRAM light
Press REVIEW	• TRACK 5, MIN 1, SEC 00 and the REVIEW block light, then the MIN 2 and SEC 00 light • TRACK 1, MIN 1, SEC 00 and PROGRAM light • REVIEW goes off
18. Press PLAY	• 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	• 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 ± 0.5dB.

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 50mV ± 5mV; 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 400mV ± 40mV; adjust R3146 FOCUS OFFSET if necessary.
      NOTE: The CD player must be upright in the normal postion 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

DISC	PART NUMBER
Disc 5A	4822 397 30096
Disc 3	4822 397 30085

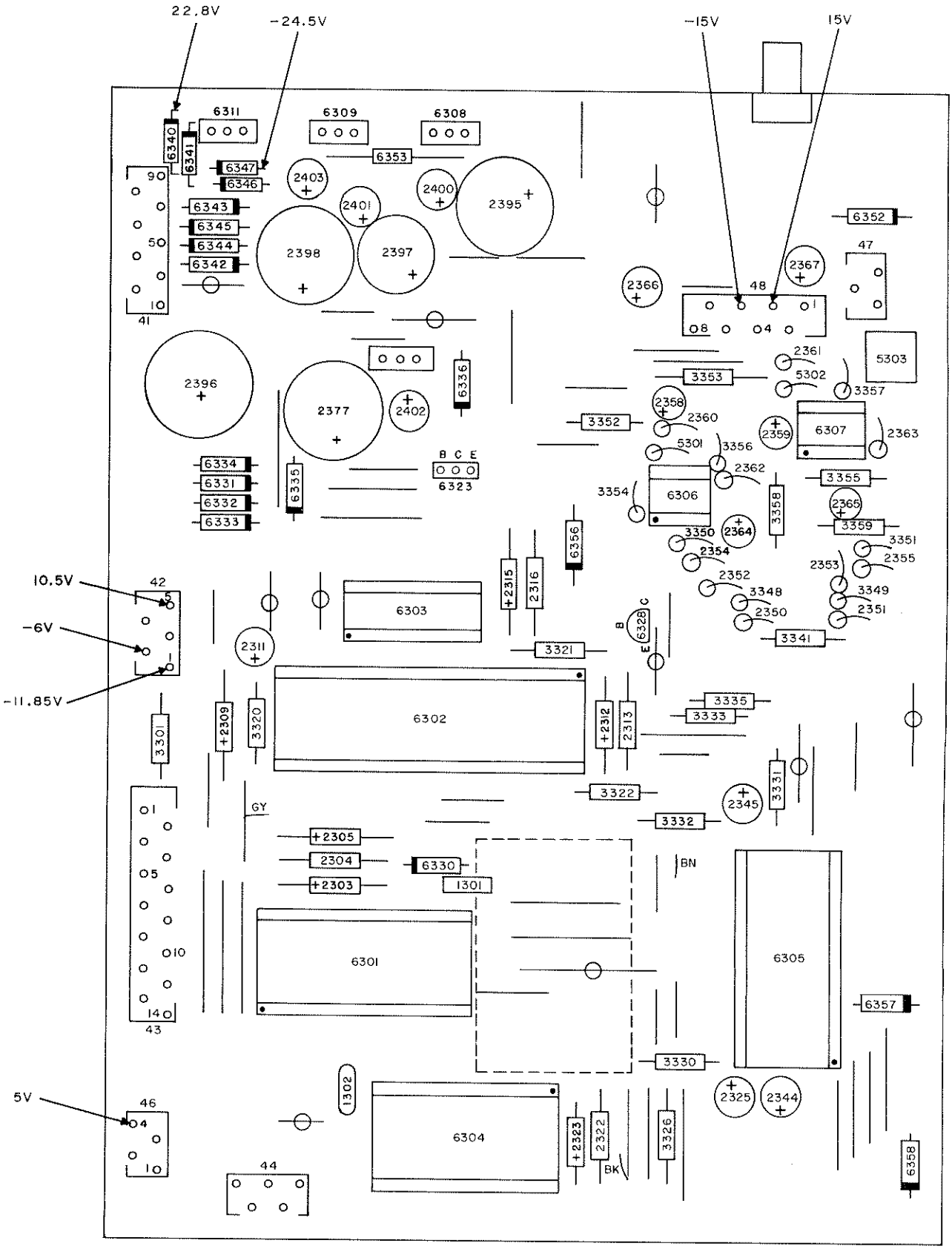


Fig. 12. Decoder and Power Supply PC board measurement locations.

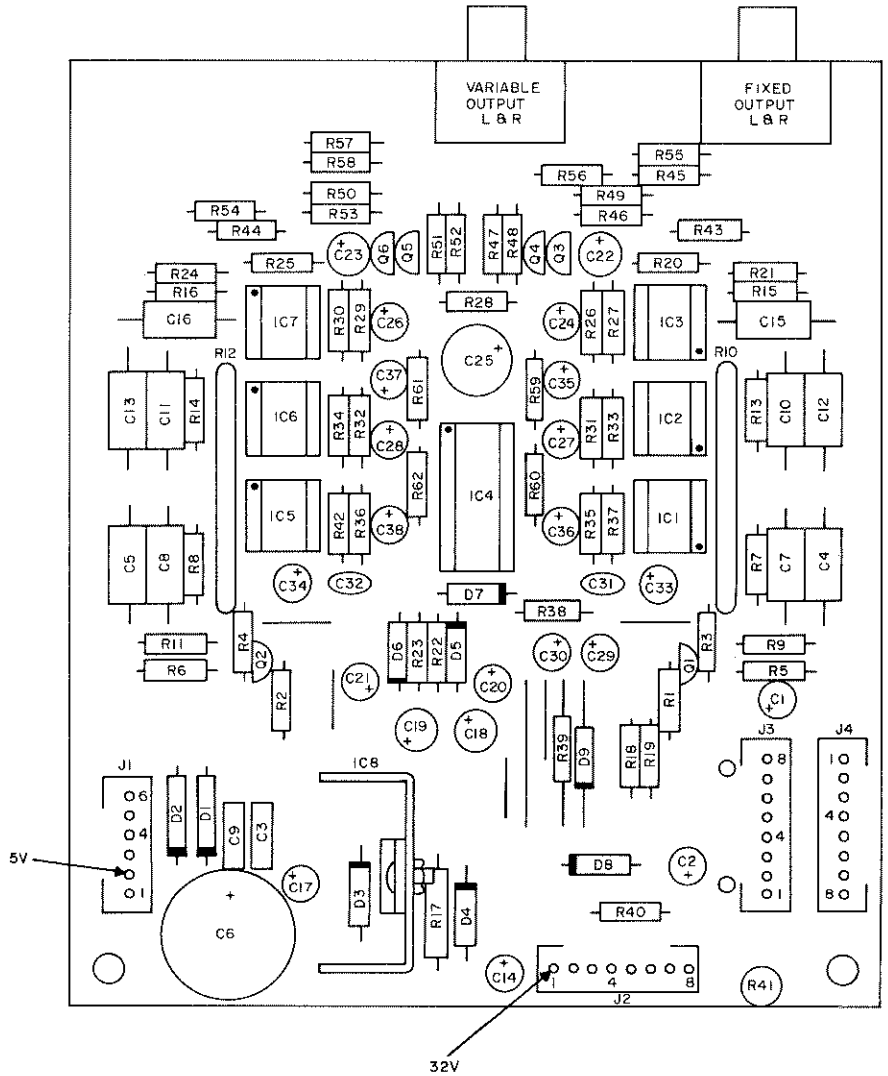


Fig. 13. Audio PC board Measurement locations.

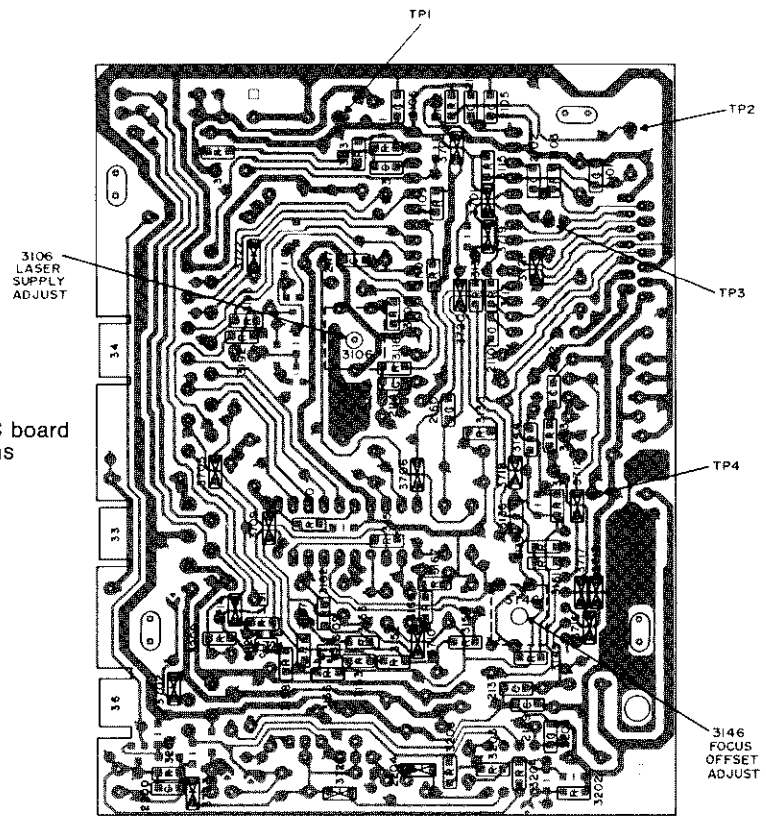
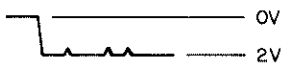
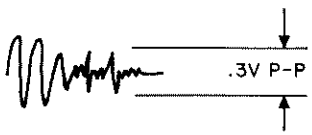
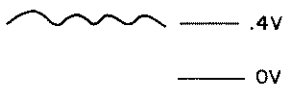
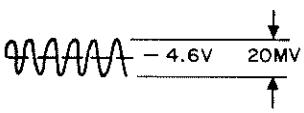
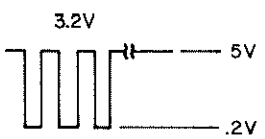
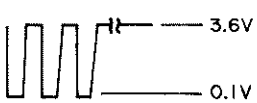
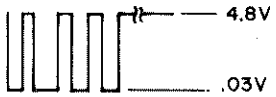
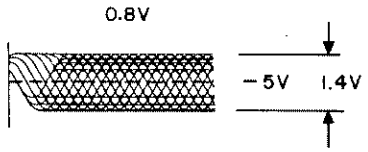


Fig. 14. Servo and Laser PC board adjustment locations

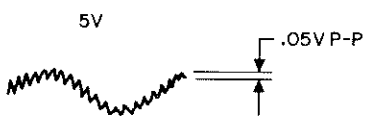
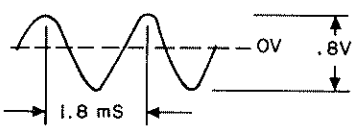
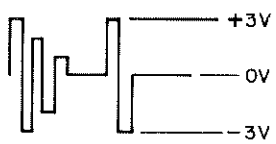
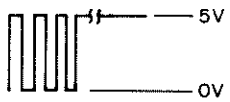
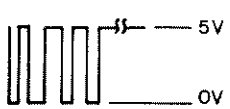
Servo and Laser Waveforms

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	

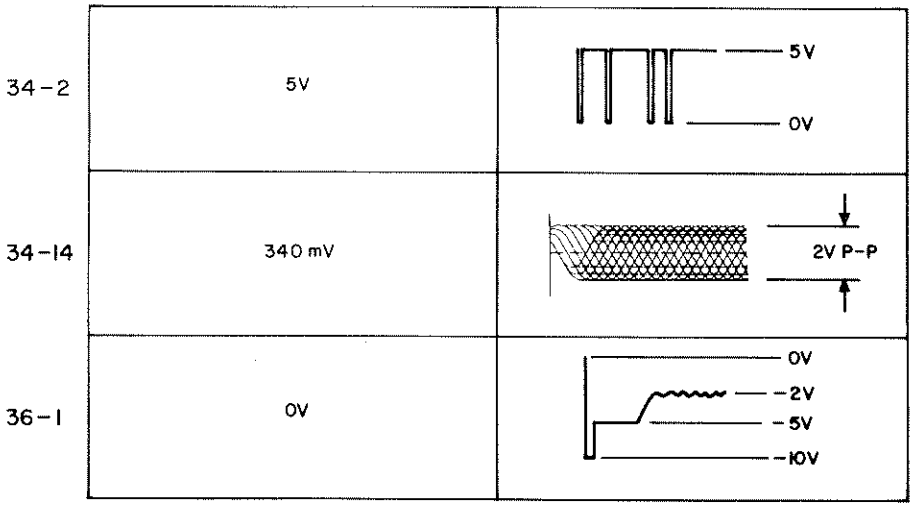
PIN 15	0V	5V / 0V
PIN 16	−4.8V	−4.8V
PIN 17	0V	0V
PIN 18&19	0V	2.15V P-P

IC6103 NJM4560

	STOP	PLAY
PIN 1	0V	5V / 0V / −3V

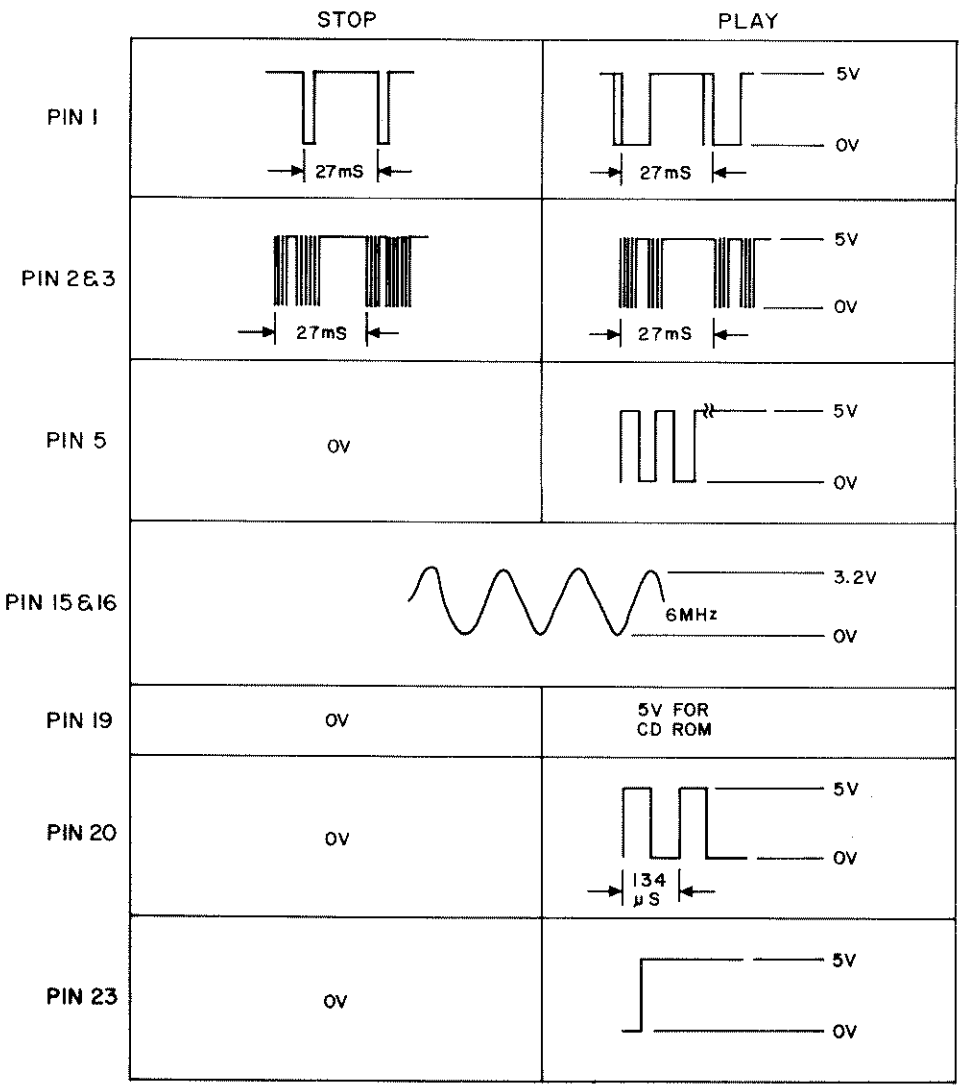
Connectors

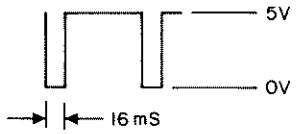
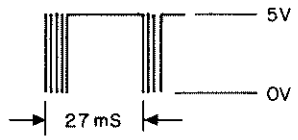
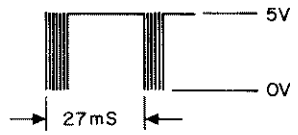
	STOP	PLAY
31−11	0V	0.8V, 4V P-P
31−13	−0.8V	0V / 0.65V / −2V
34−1	11.3uS POSITION: STAND BY POSITION: PLAY BEGINNING POSITION: PLAY (NORMAL)	



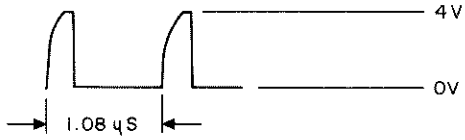
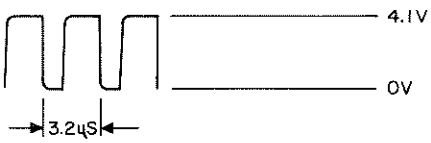
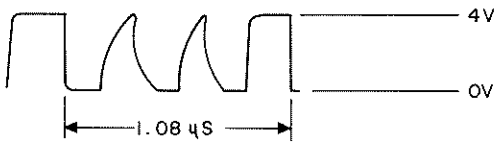
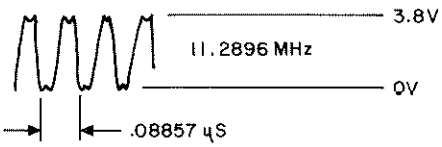
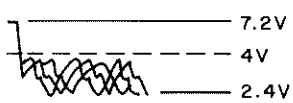
Decoder and Power Supply Waveforms

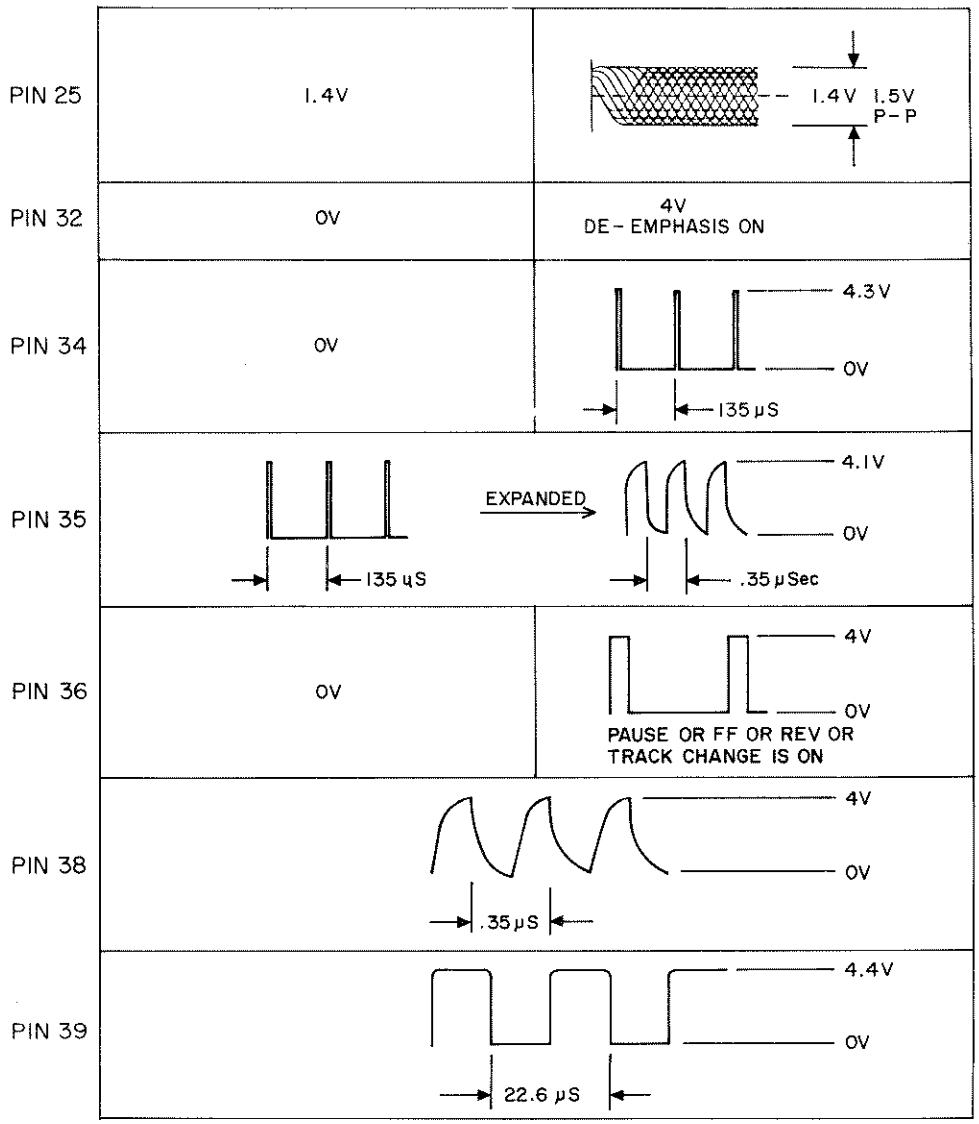
IC6301 MAB8441P T082



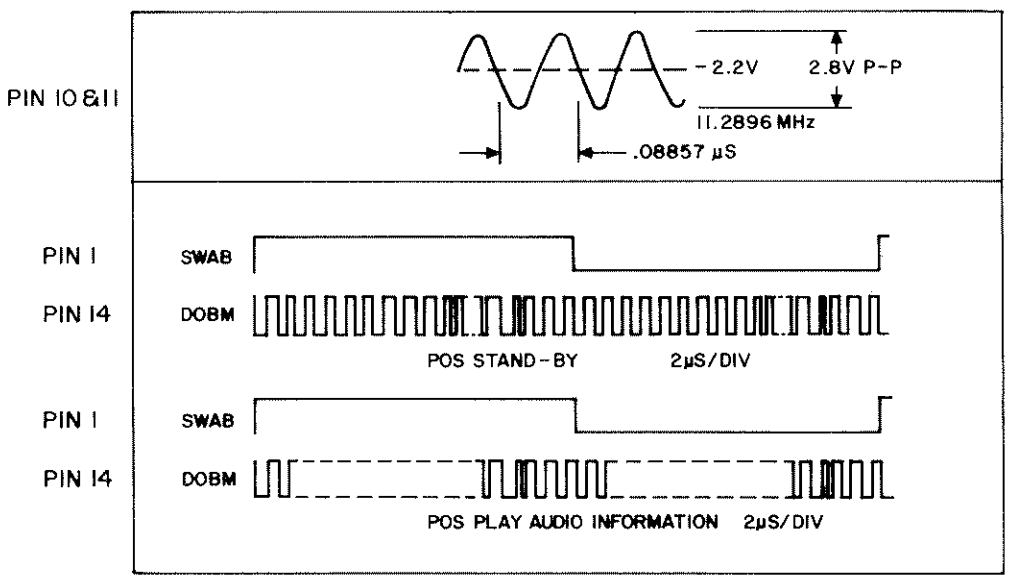
PIN 24	4.2V	0V ON FF OR REV
PIN 25	5V	
PIN 26	5V	
PIN 27	5V	

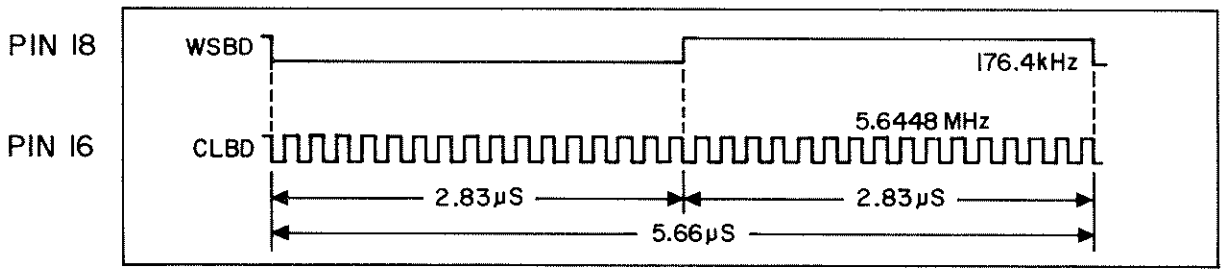
IC6302 SAA7210P

	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

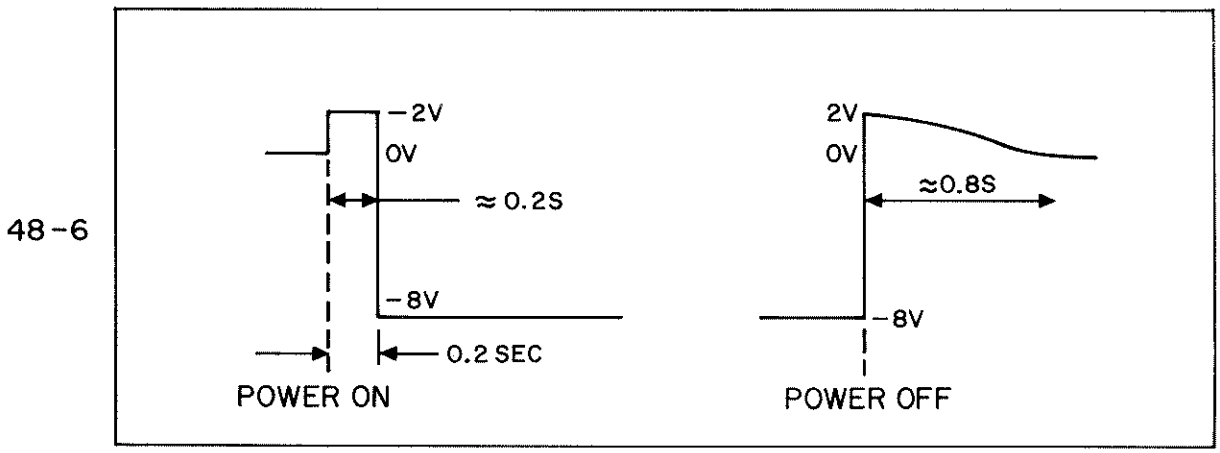


IC6304 SAA7220P




PIN 18
WSBD
176.4kHz
PIN 16
CLBD
5.6448 MHz
2.83μS
2.83μS
5.66μS

Connectors


48-6
-2V
0V
≈0.2S
-8V
0.2 SEC
POWER ON
2V
0V
≈0.8S
-8V
POWER OFF

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.

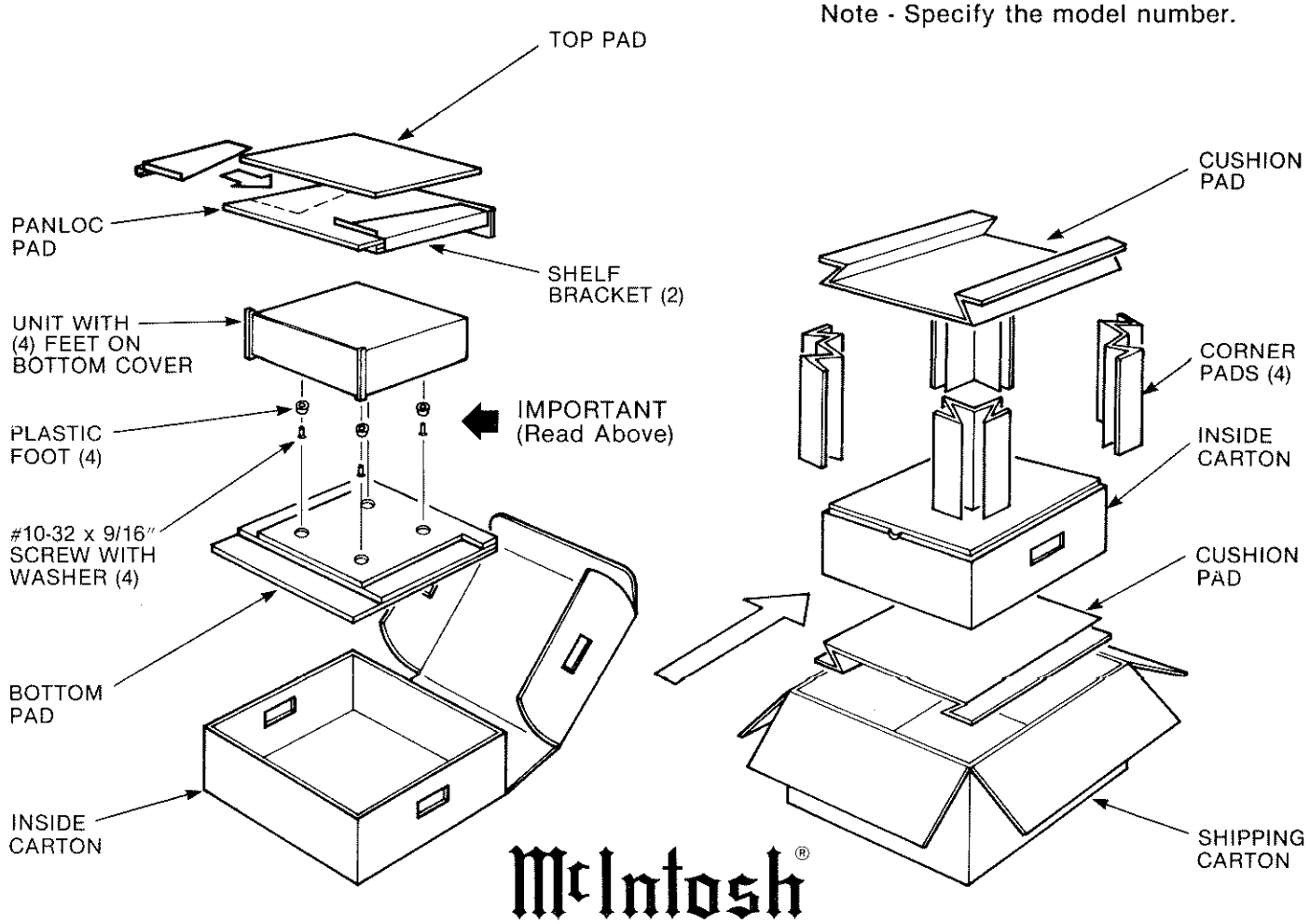
IMPORTANT - The four plastic feet must be attached to the bottom of the unit so they will locate in the four holes of the bottom pad. Failure to do this will result in shipping damage. In addition, two transit screws that lock the player mechanism to protect it during transportation must be reinstalled.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

MCD7007 COMPACT DISC PLAYER

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

Part No. 039668 Printed in U.S.A. 607-723-3512

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