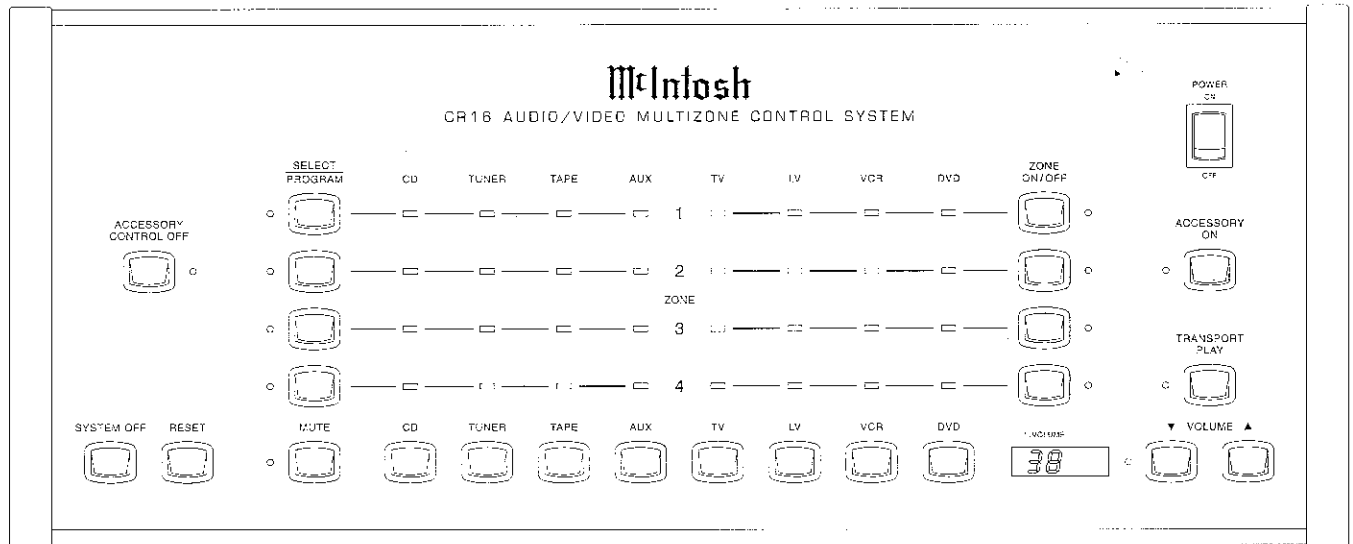


# CR16

## AUDIO/VIDEO MULTIZONE CONTROL SYSTEM



### CONTENTS

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**McIntosh®**  
SERVICE MANUAL

# PERFORMANCE SPECIFICATIONS

**Frequency Response**

+0, -0.5dB from 20Hz to 20,000Hz

**Total Harmonic Distortion**

0.01% maximum from 20Hz to 20,000Hz, all channels at rated output

**Signal To Noise Ratio (A Weighted)**

90dB below rated output

**Rated Output Voltage**

1.25V

**Maximum Output Voltage**

6V from 20Hz to 20,000Hz

**Sensitivity**

All inputs, 0.25V for 1.25V rated output

**Input Impedance**

22k ohms

**Maximum Input Signal**

8V

**Voltage Gain**

Input to Variable Outputs 14dB

Input to Fixed (Balanced) Outputs 0dB

**Tone Controls**

Bass and Treble 12dB boost or cut (Level controls at center detent)

**Power Requirements**

120 Volts, 50/60Hz at 35 watts


**Dimensions**

17-1/2 inches (44.5cm) Wide, 7-1/16 inches (17.9cm) High, 14-1/2 inches (36.8cm) Deep

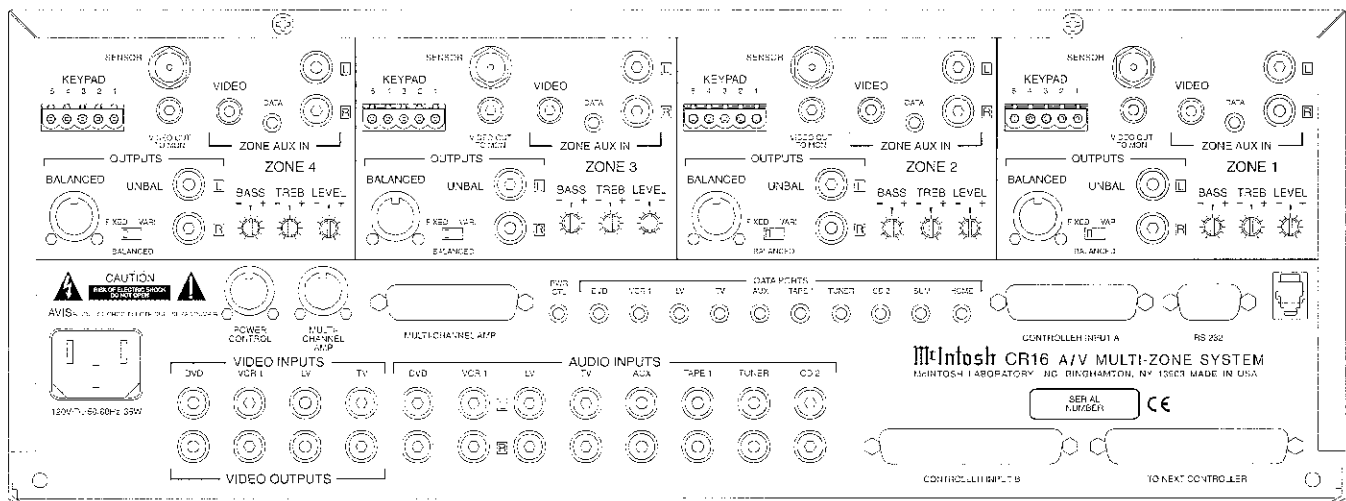
**Weight**

27.2 pounds (12.2 kg) net, 39.5 pounds (18 kg) in shipping carton

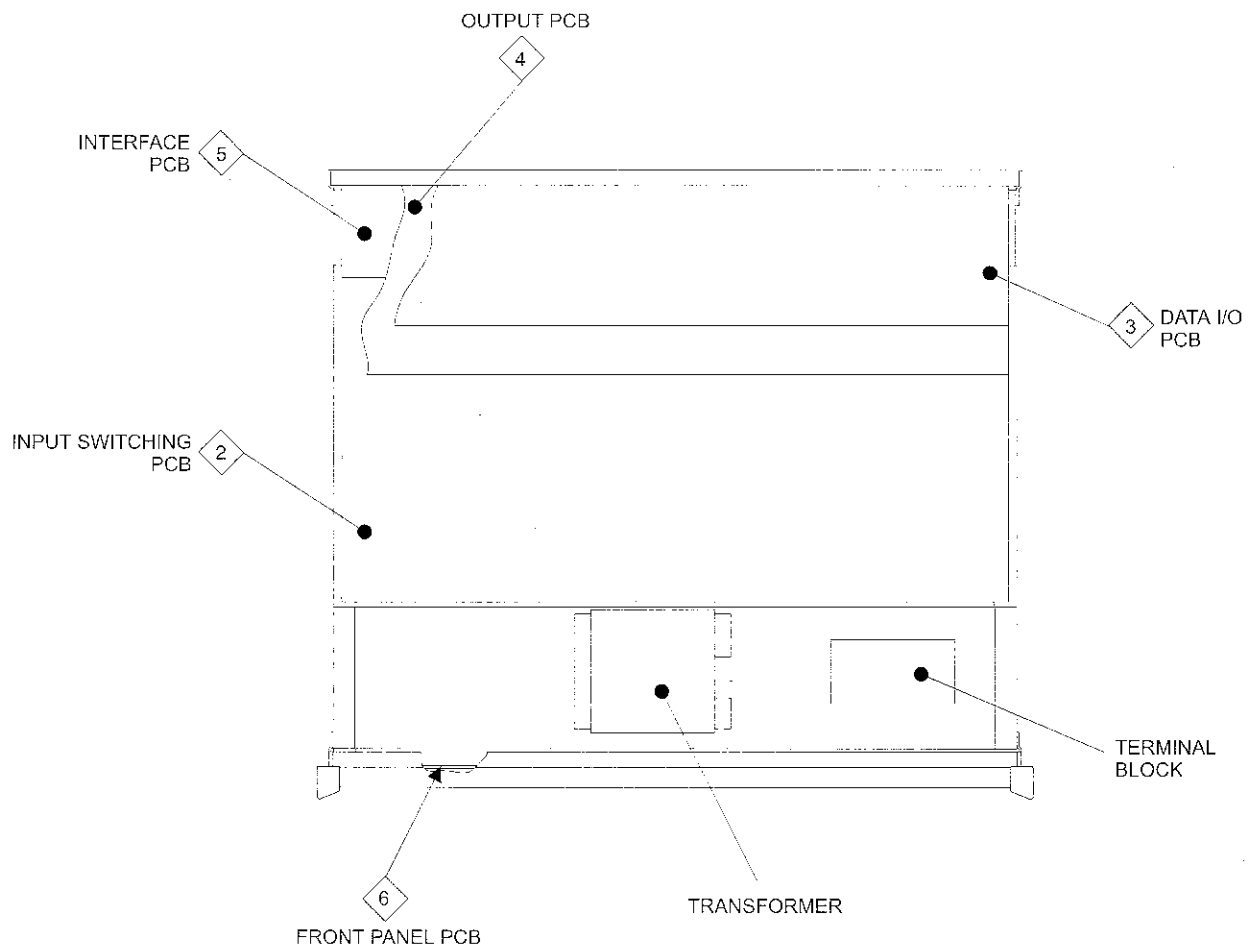
## NOTES

1. The heavy notes on the schematic denote the primary signal path.
2. Unless otherwise noted, all voltages indicated on the 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 megaohm) voltmeter must be used.
3. Unless otherwise specified:
  - a. Resistor values are in ohms.
  - b. Capacitor values are microfarads (uF).
  - c. Inductor values are in microhenries (uH).
4. On PC board drawings, Square pad indicates:
  - a. Polarized Capacitors - Positive
  - b. Diodes - Cathode
  - c. Others - Pin 1
5. **WARNING**  Parts marked with the symbol have critical characteristics. Use only replacement parts recommended by the manufacturer.
6. Use McIntosh Remote Control Model HRL042 with the CR16.

# REAR PANEL

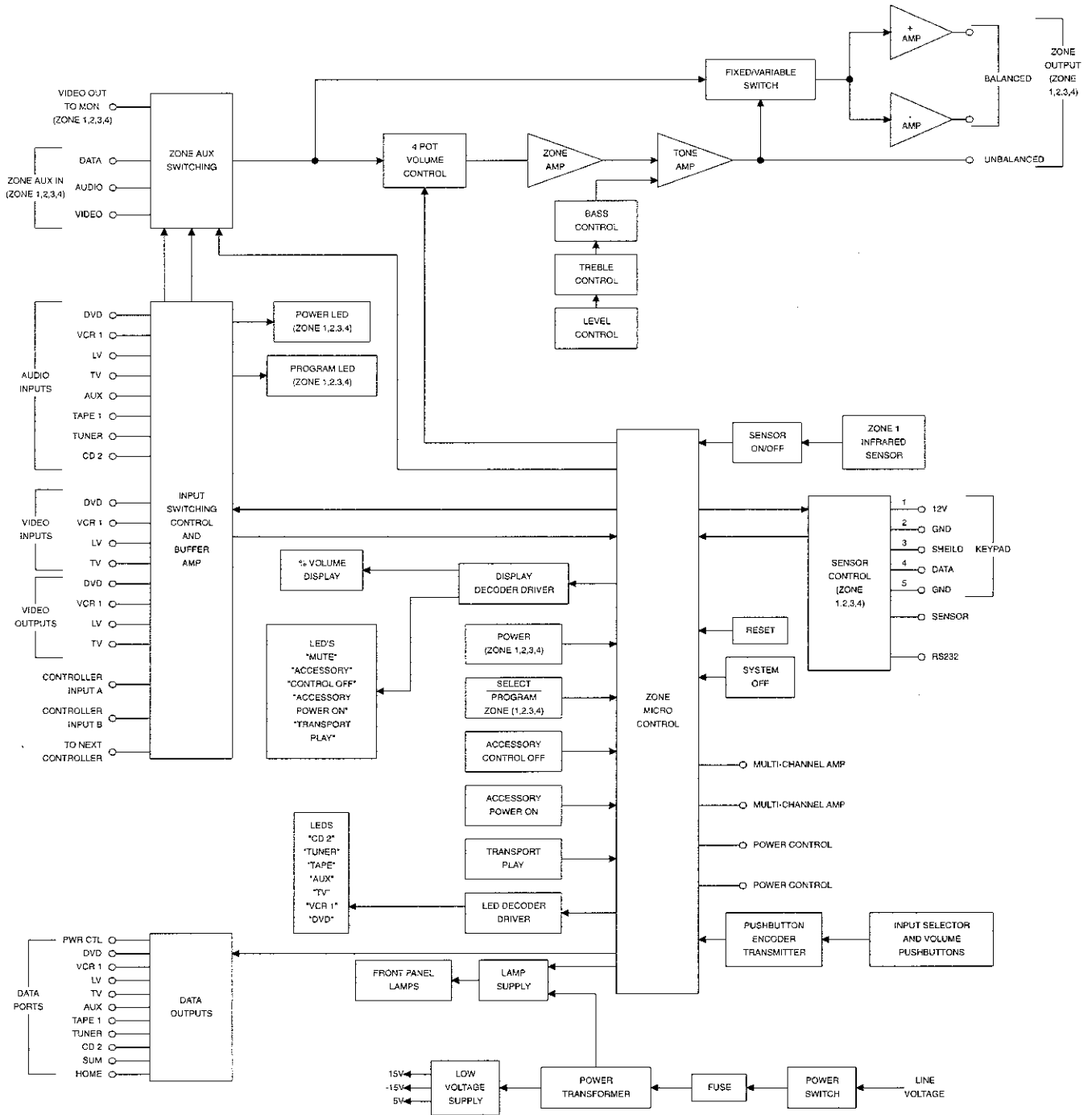


## SECTION LOCATION

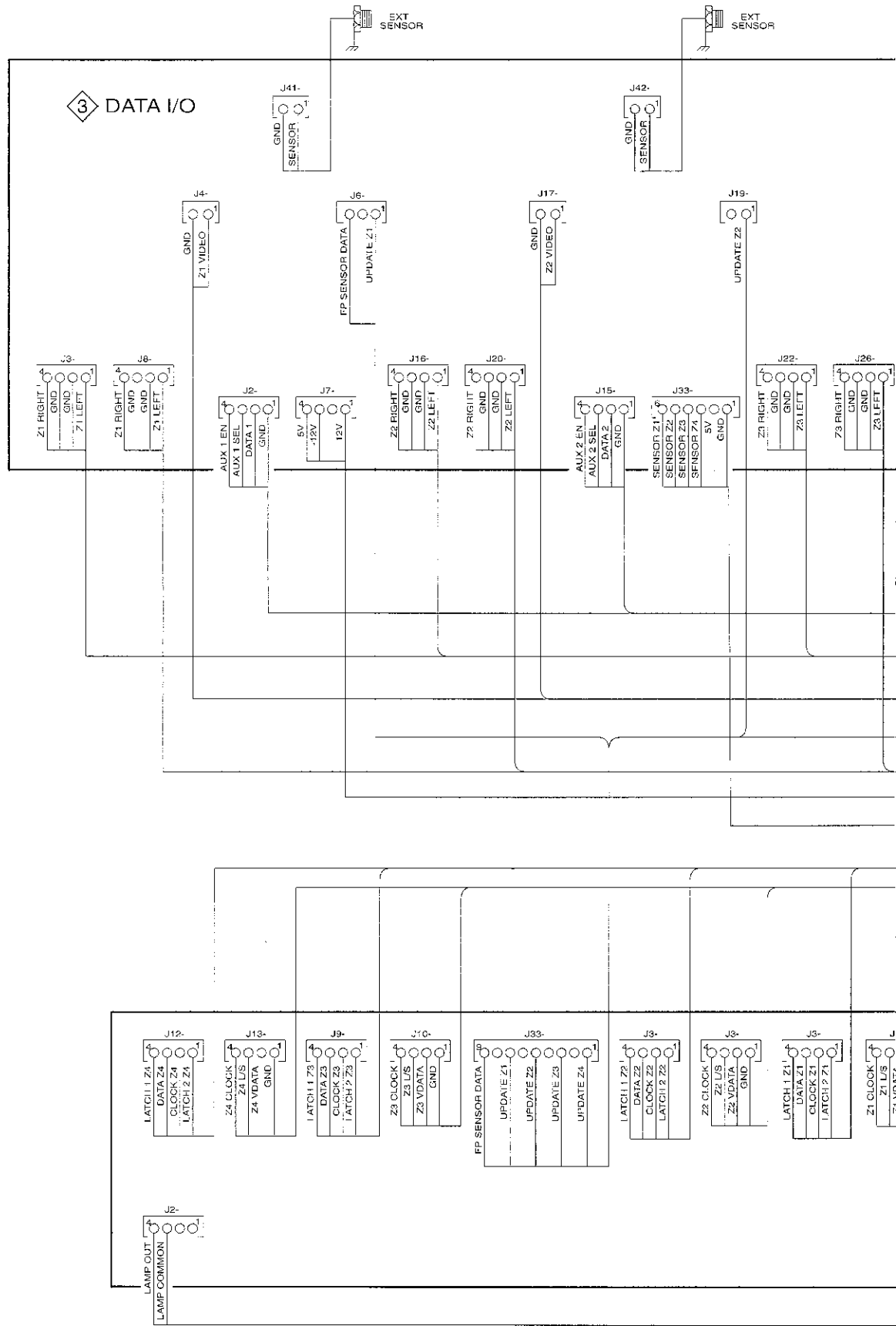


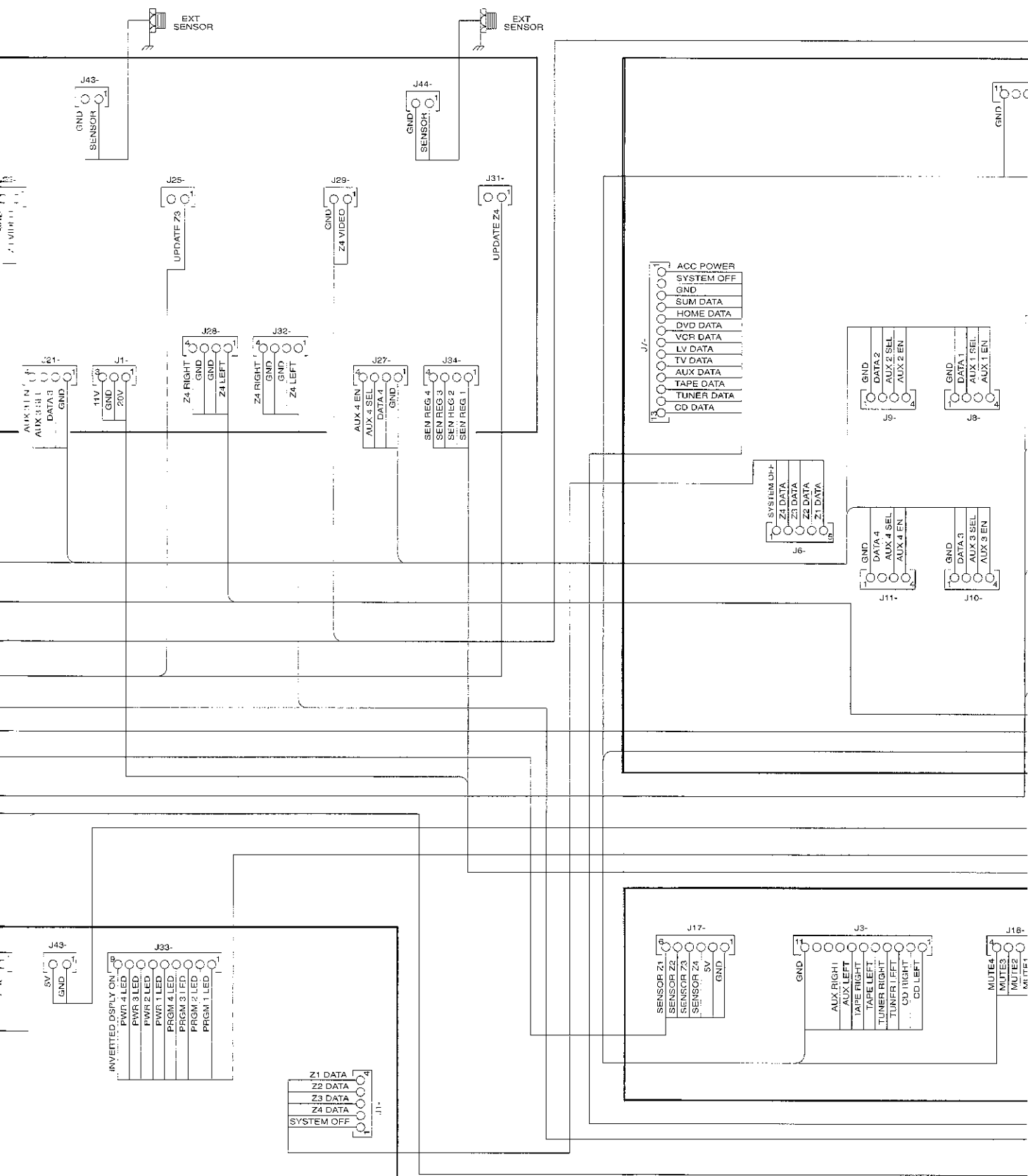
TOP VIEW WITH COVER REMOVED

# BLOCK DIAGRAM

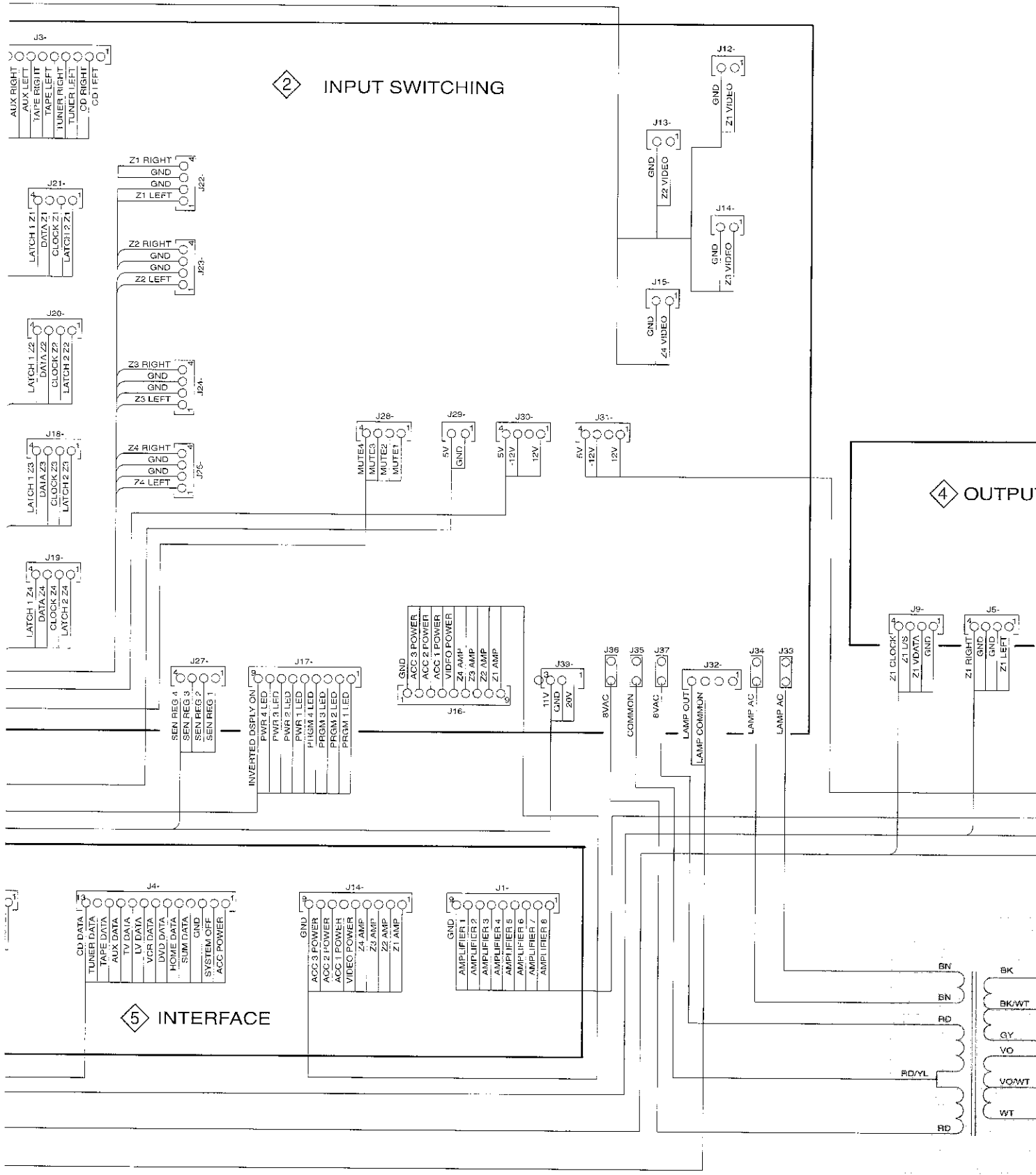


# INTERCONNECT



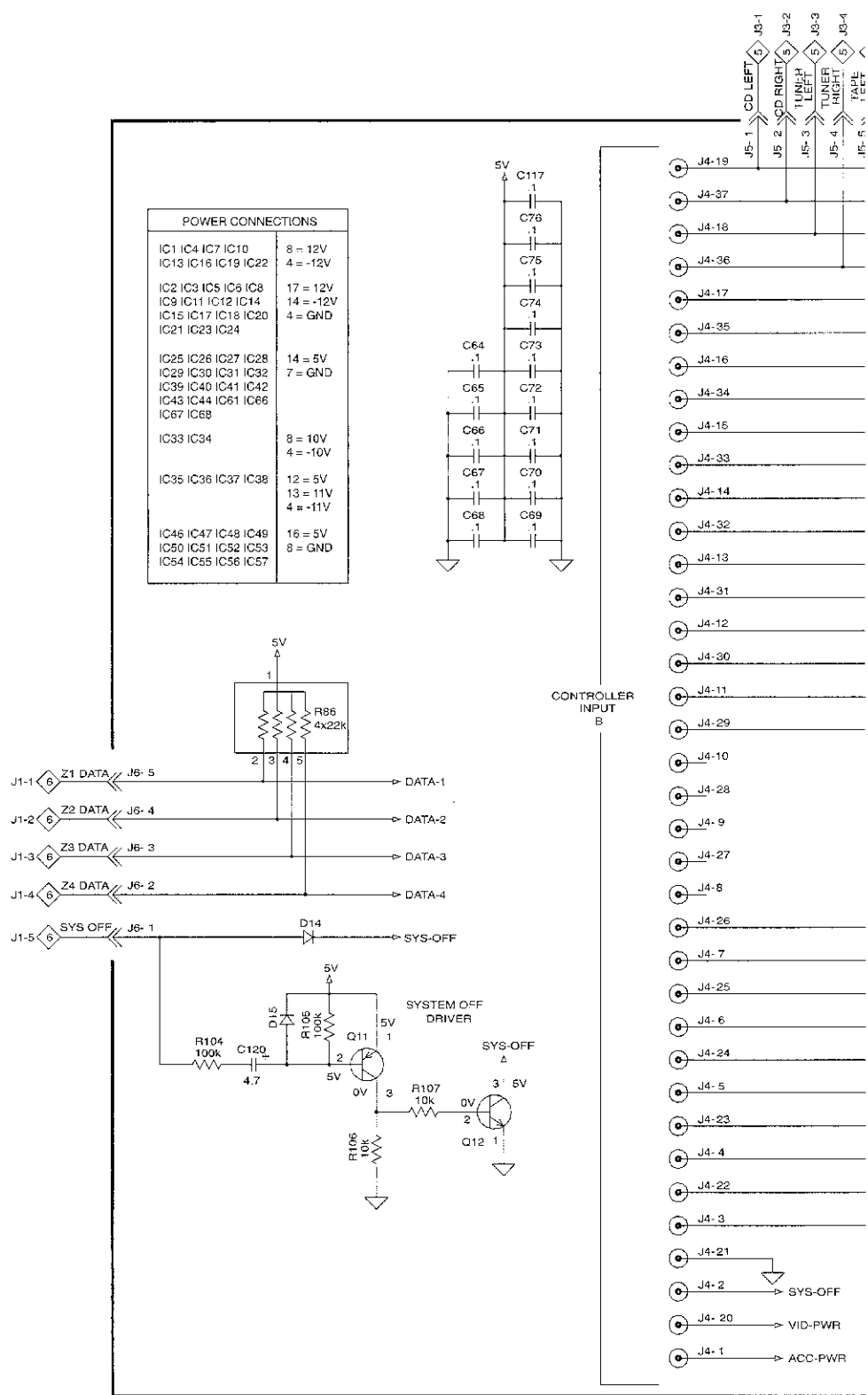


## 2 INPUT SWITCHING

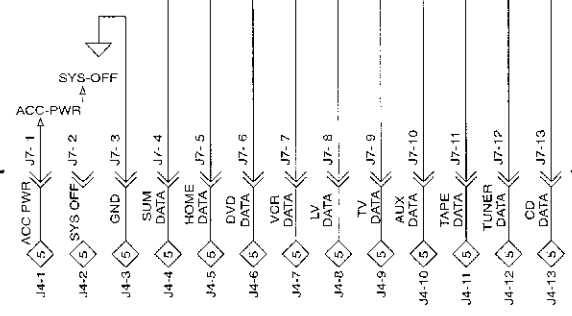
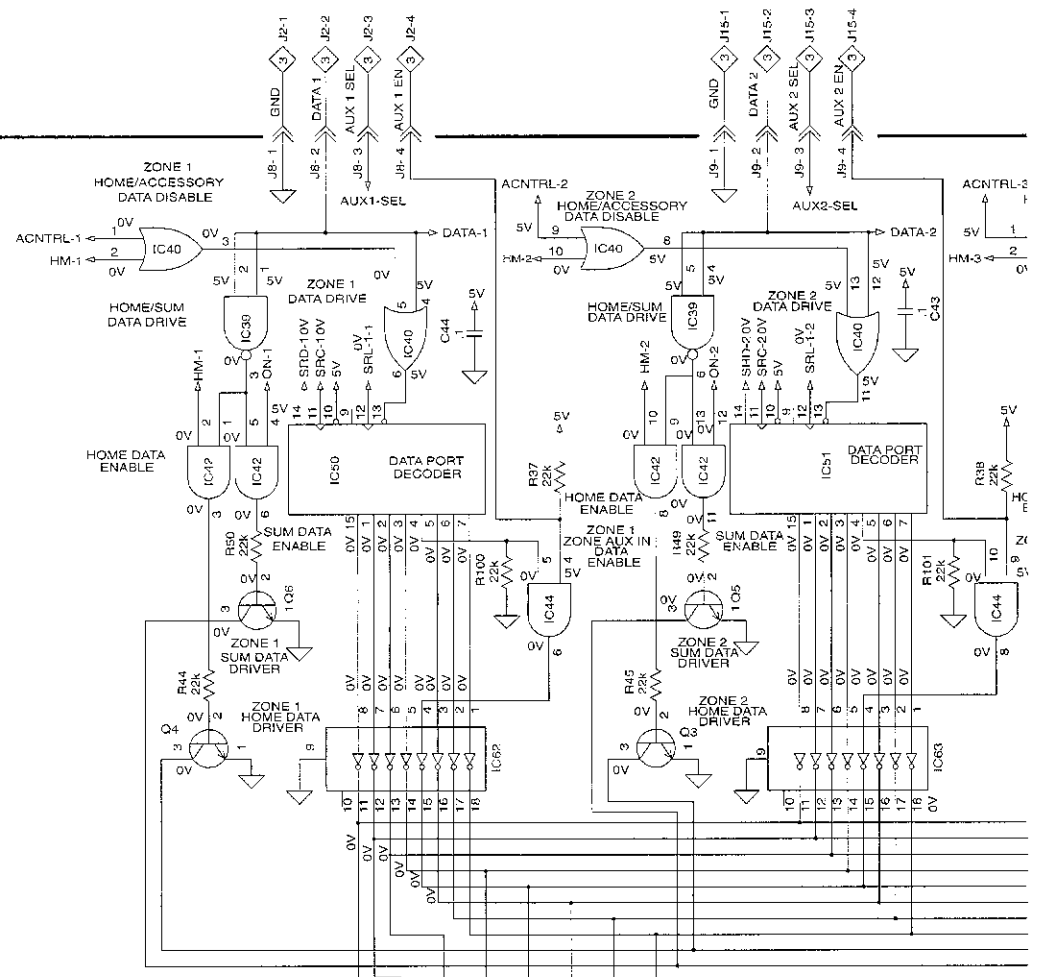
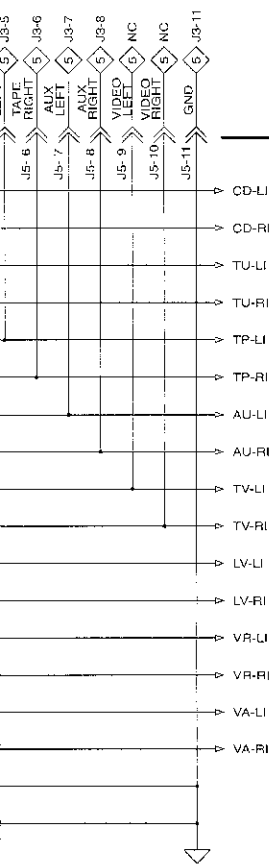


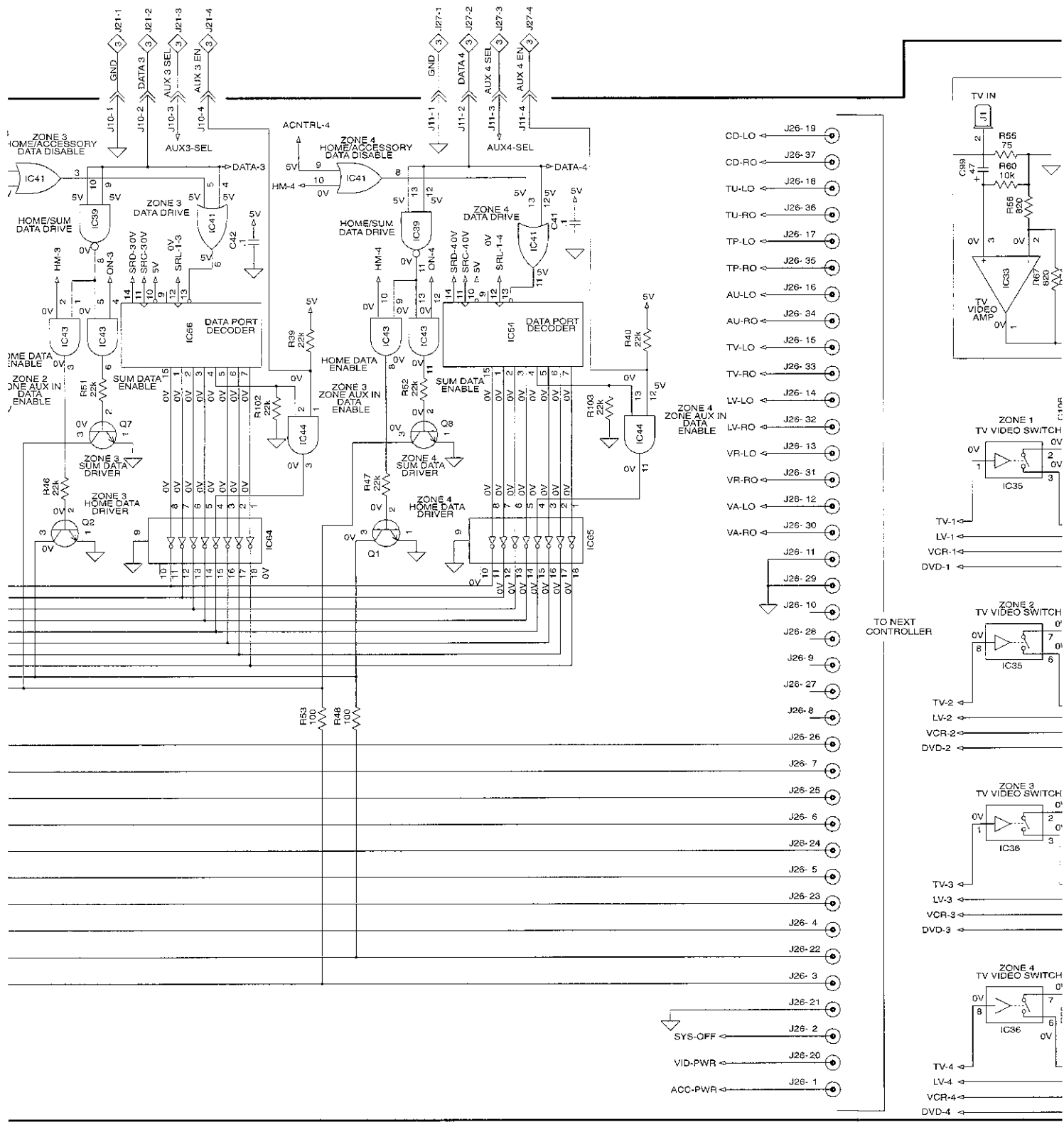
# 2

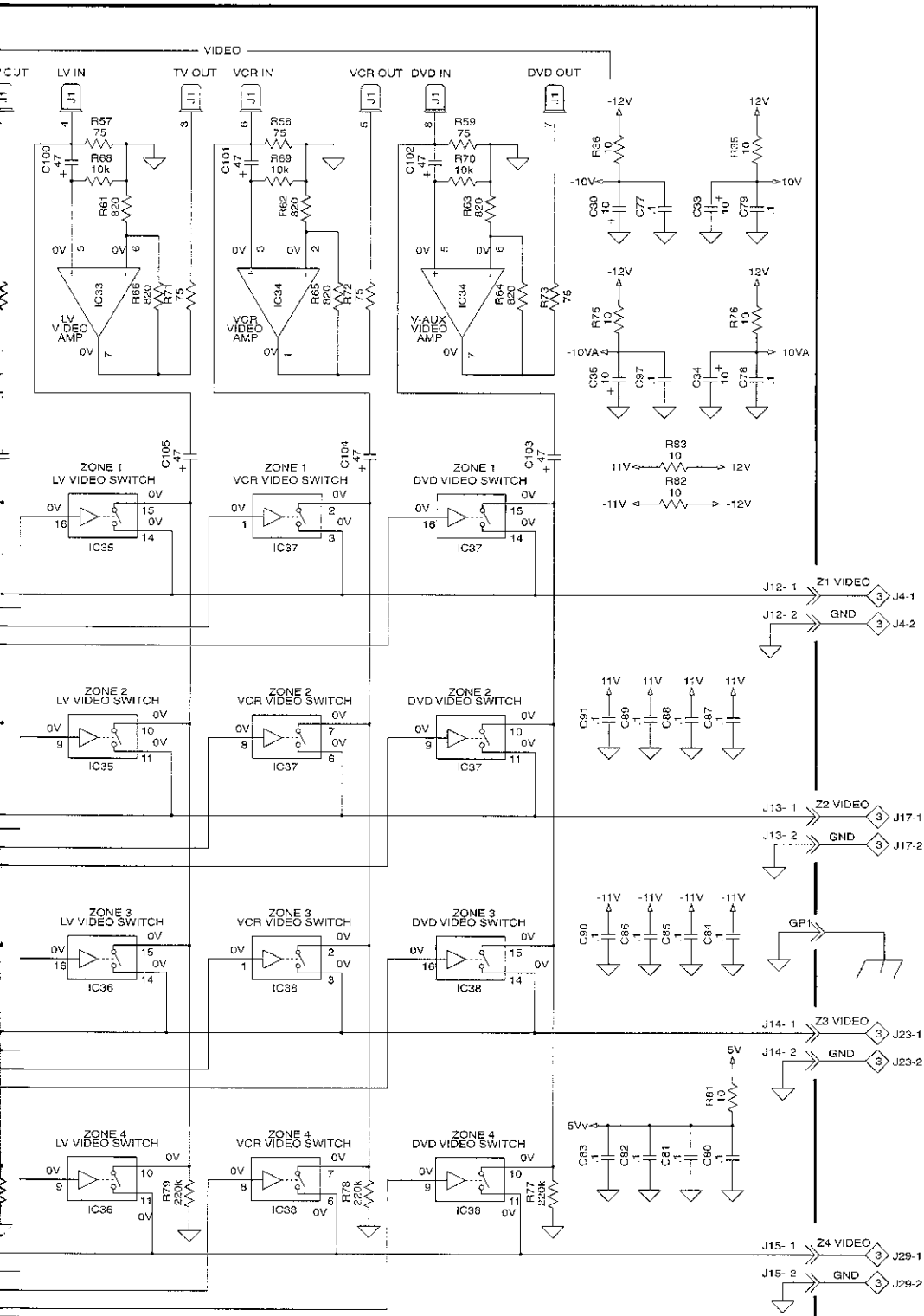
# INPUT SWITCHING 049451 1 OF 3





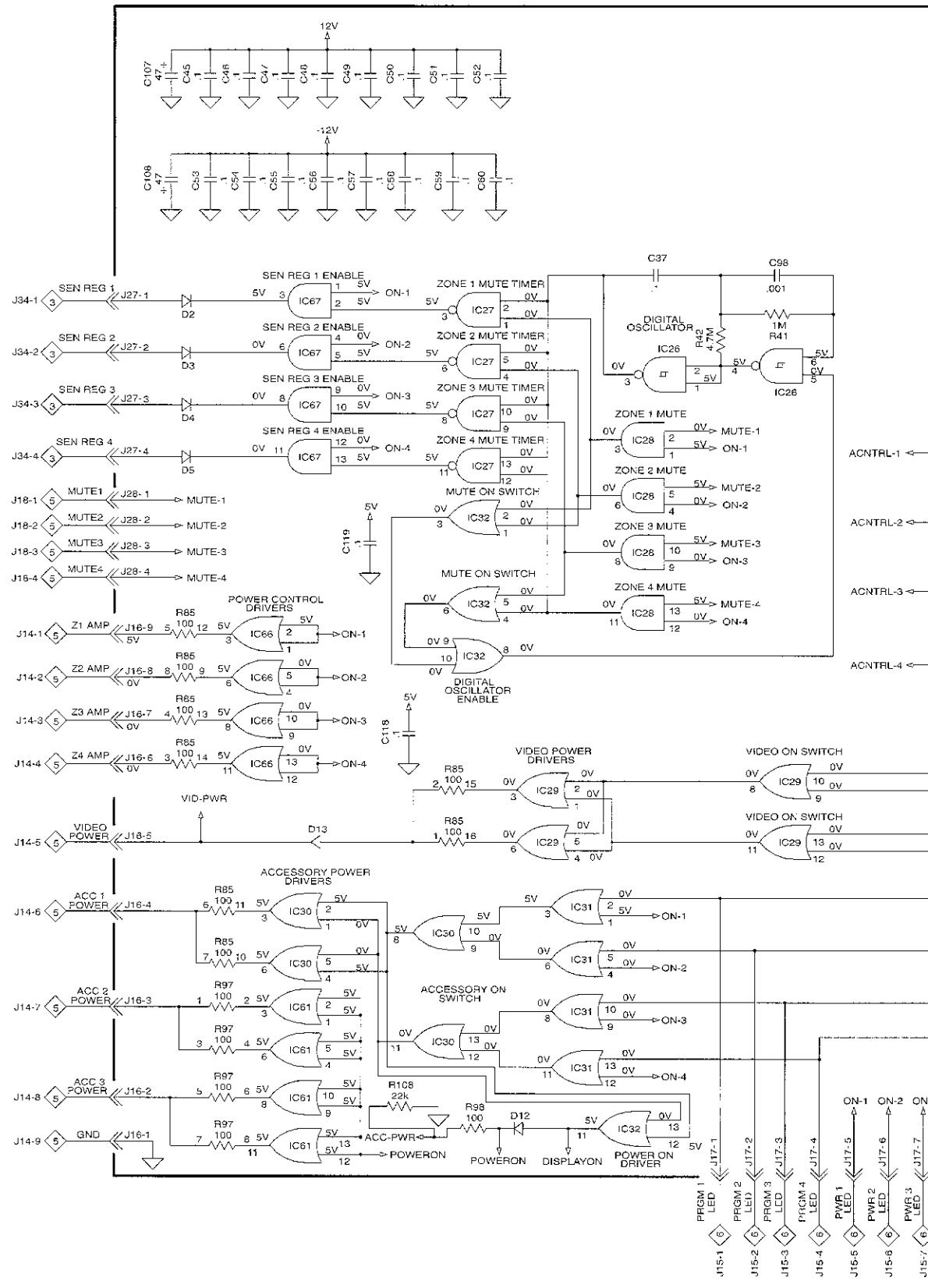


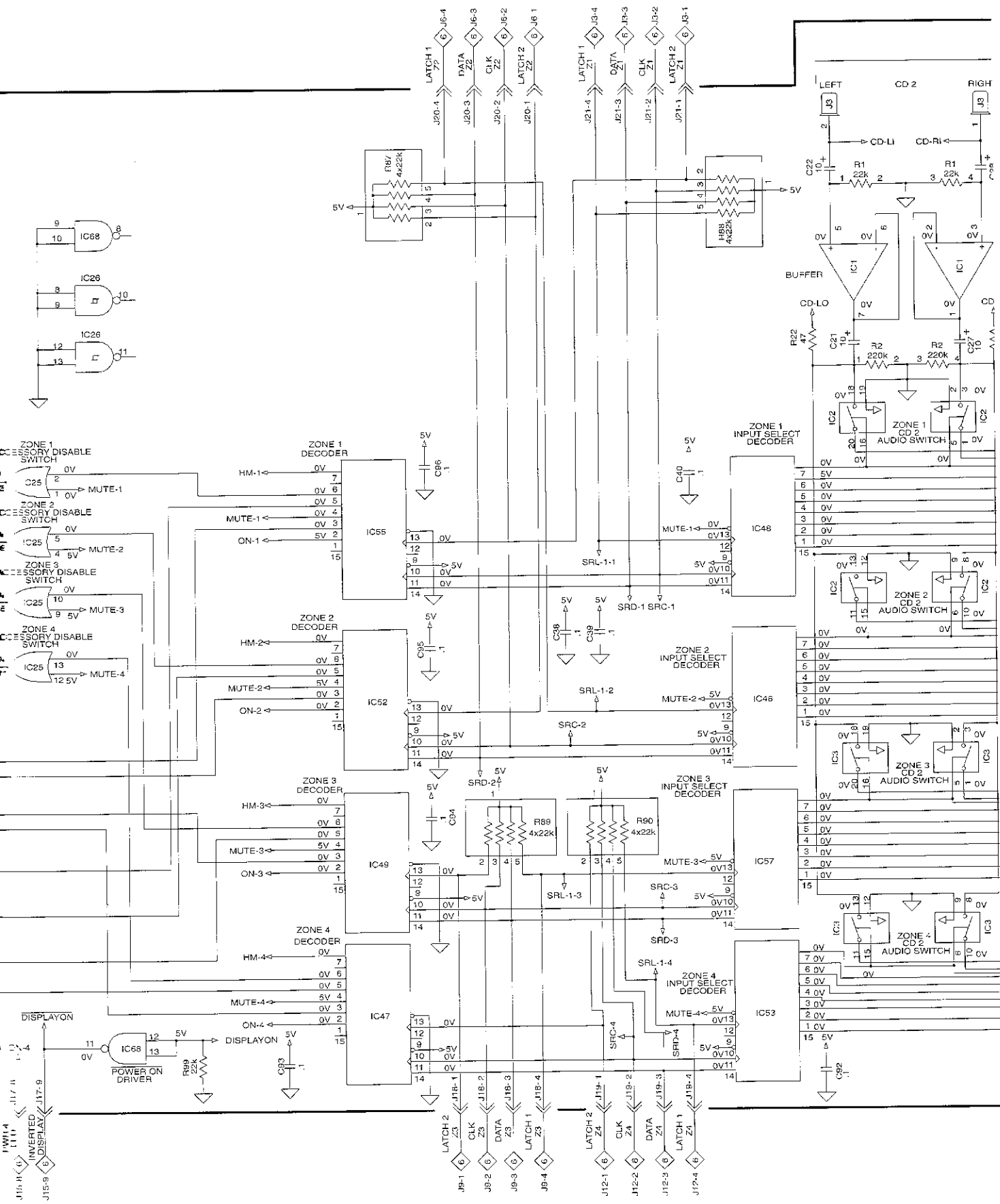




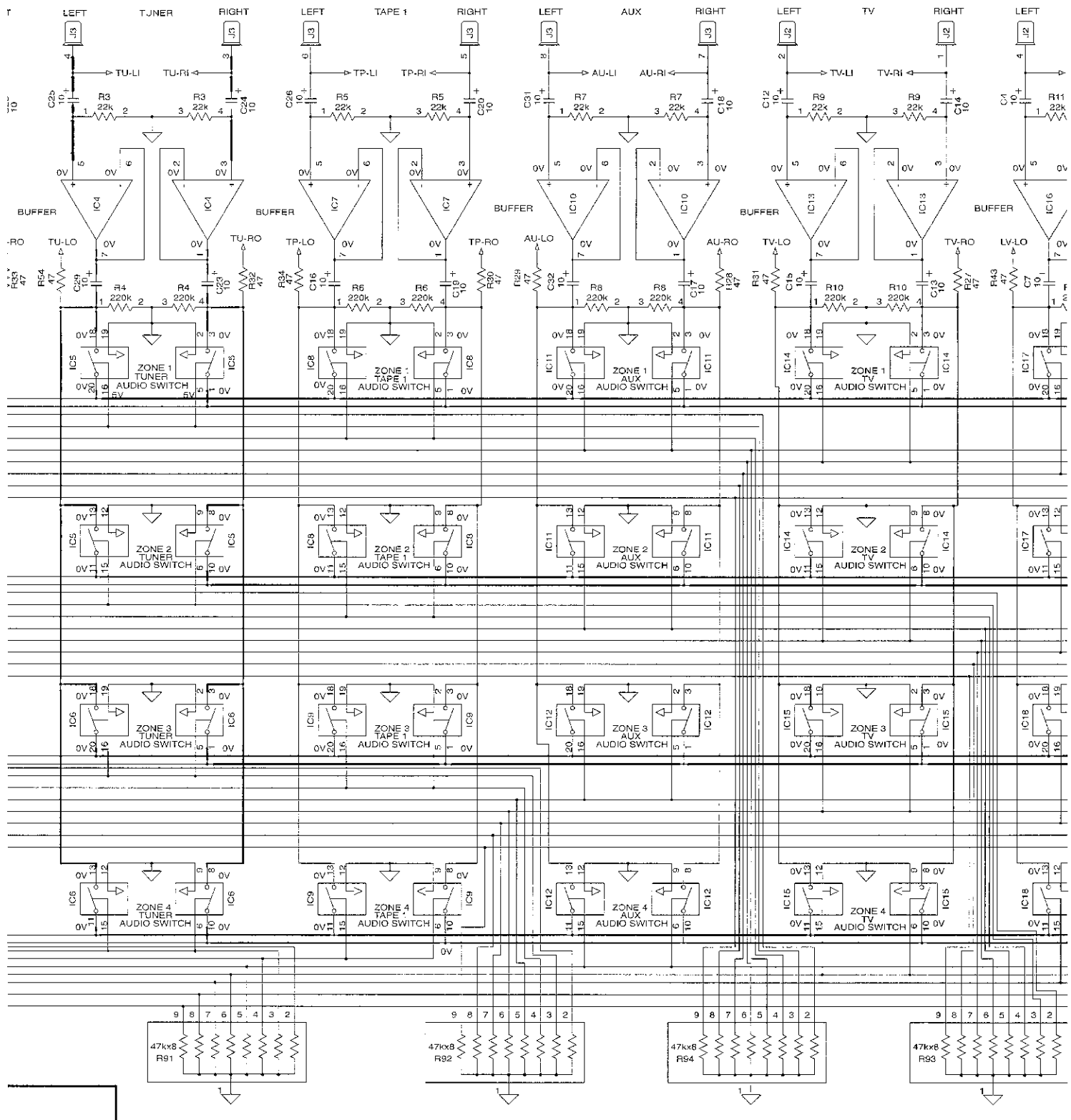
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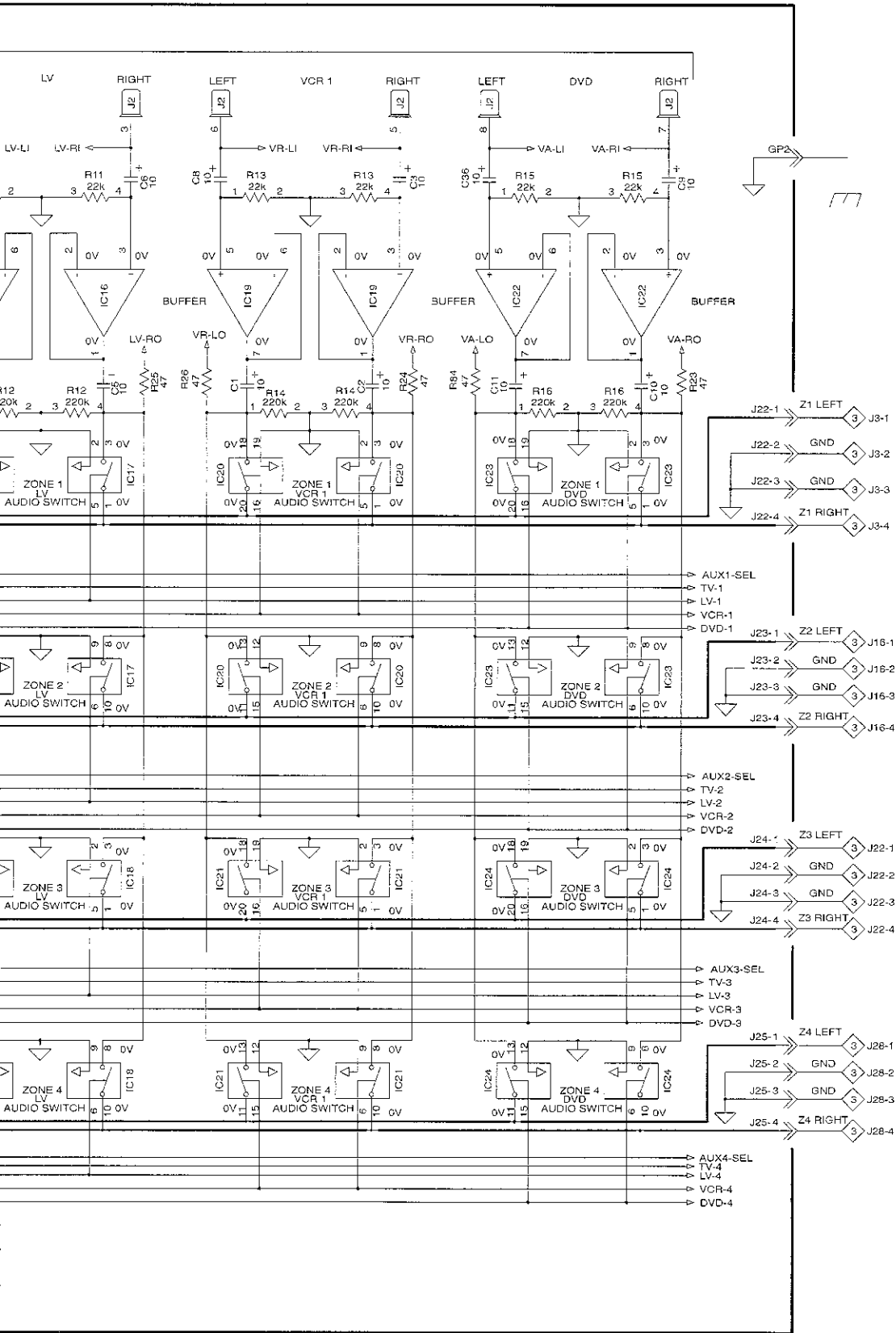
INPUT SWITCHING 049451 2 OF 3





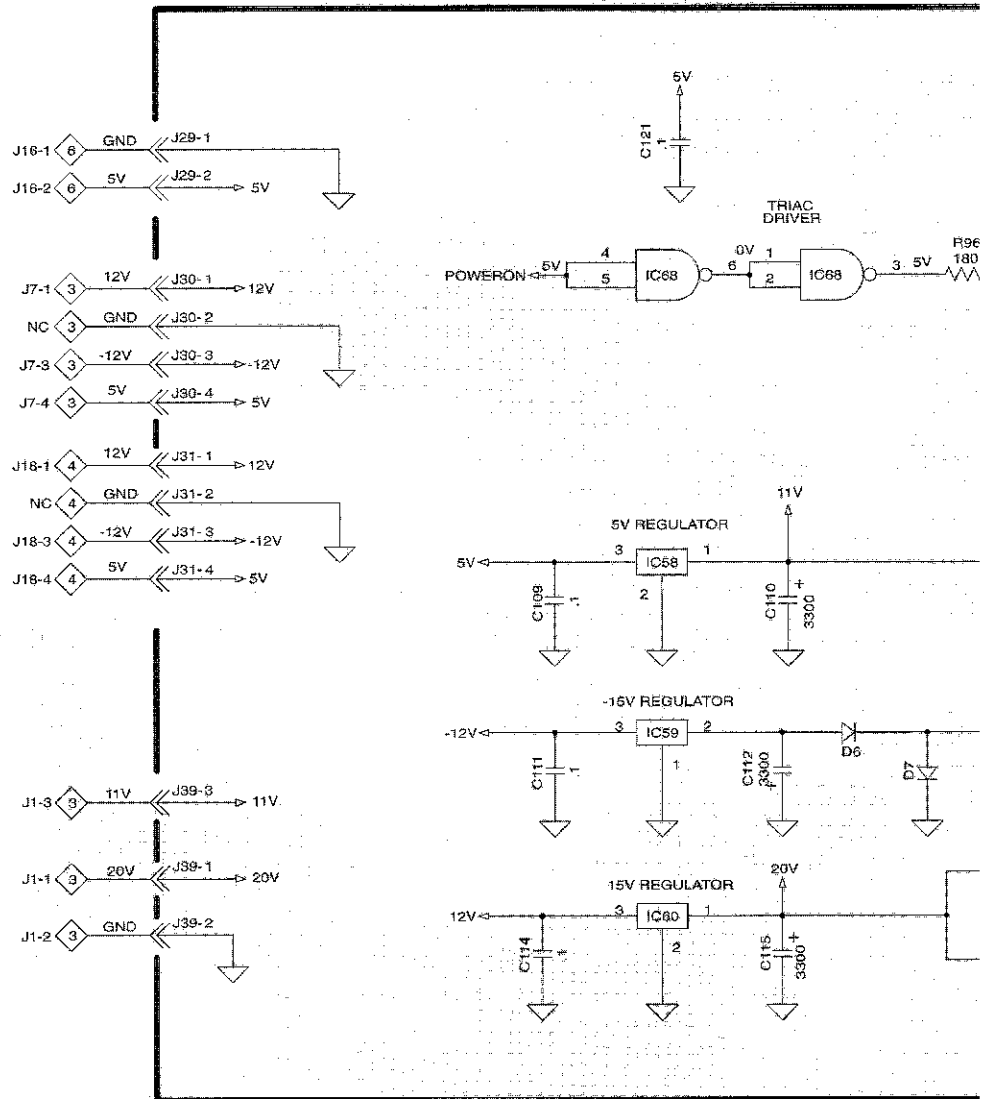
AUDIO INPUTS



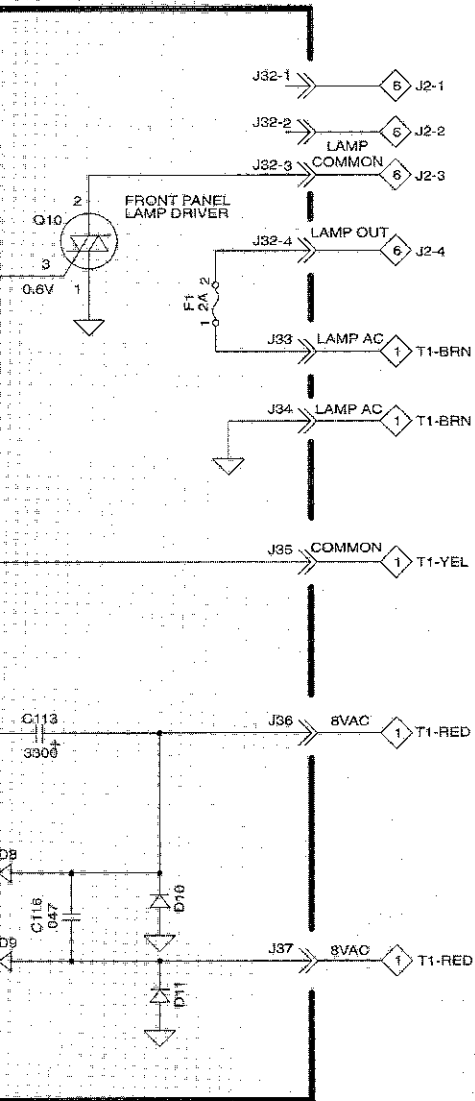



# 2

# INPUT SWITCHING 049451 3 OF 3

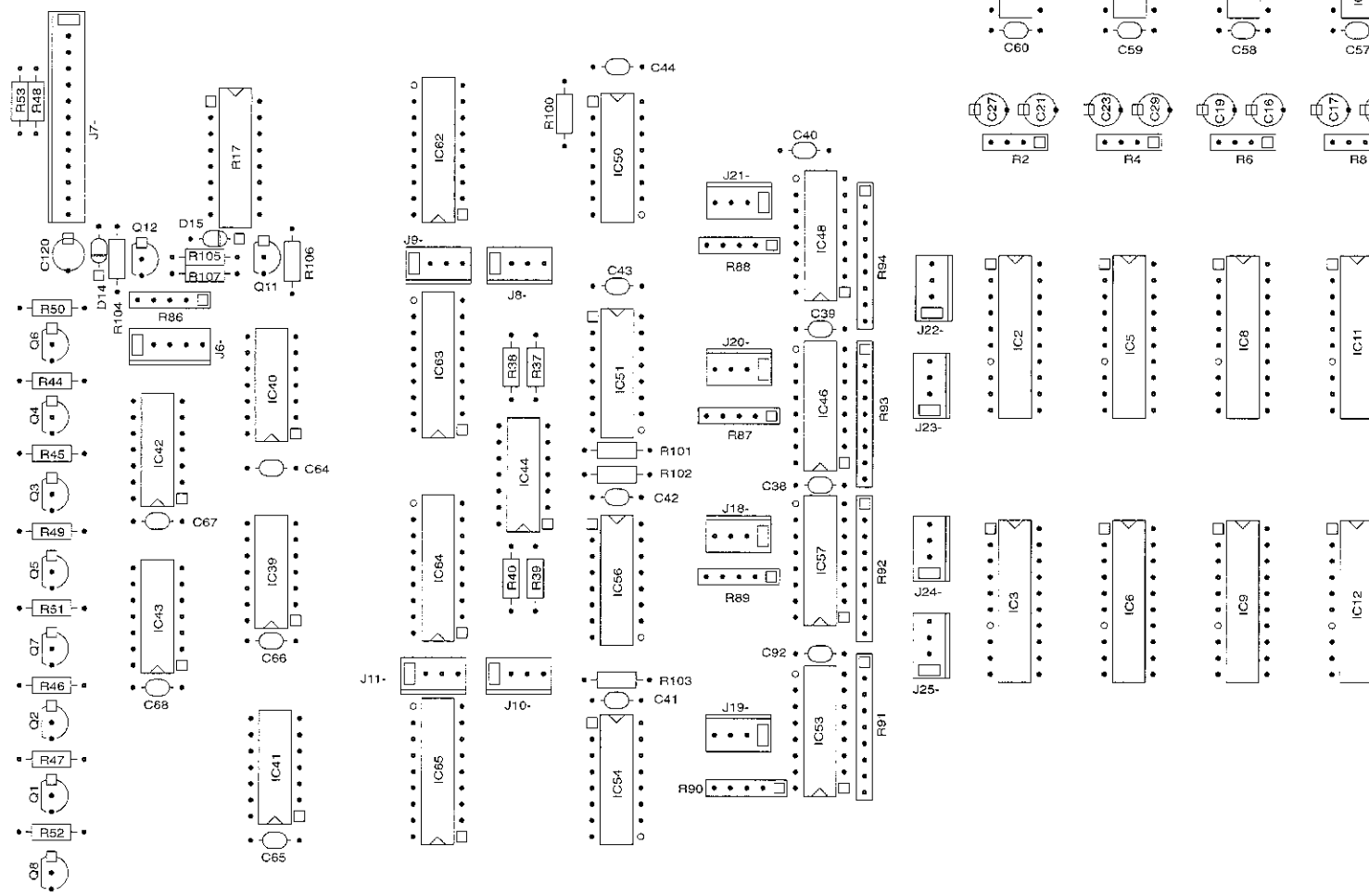
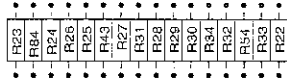
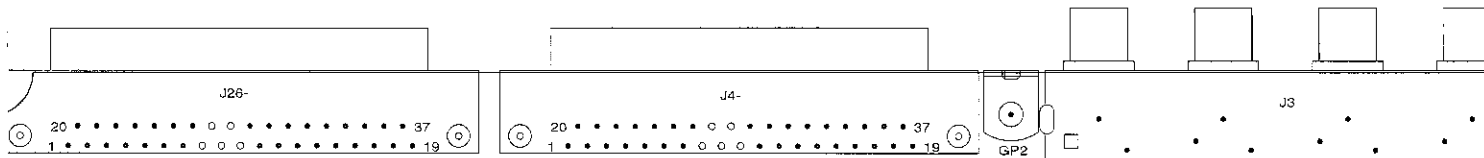






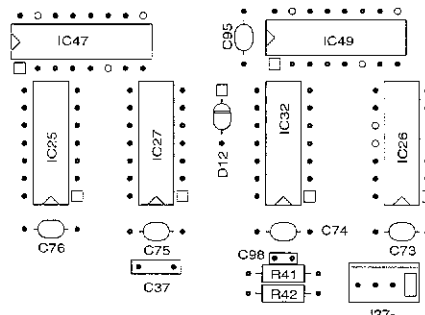
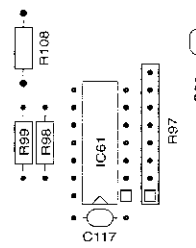
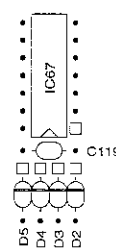
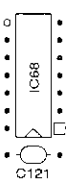
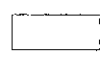
 **WARNING** Parts located in the shaded area have critical characteristics. Use only replacement parts recommended by the manufacturer.



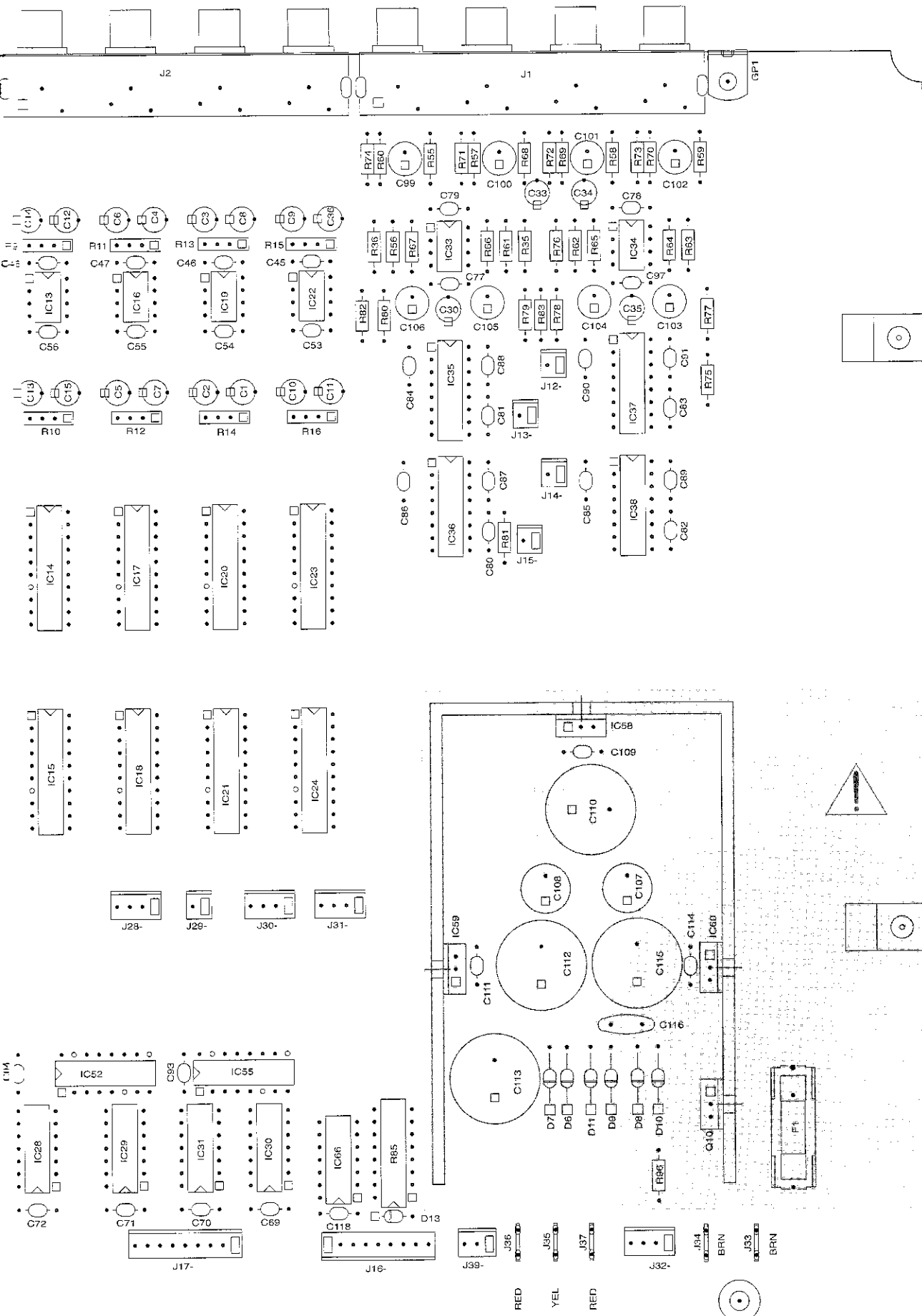


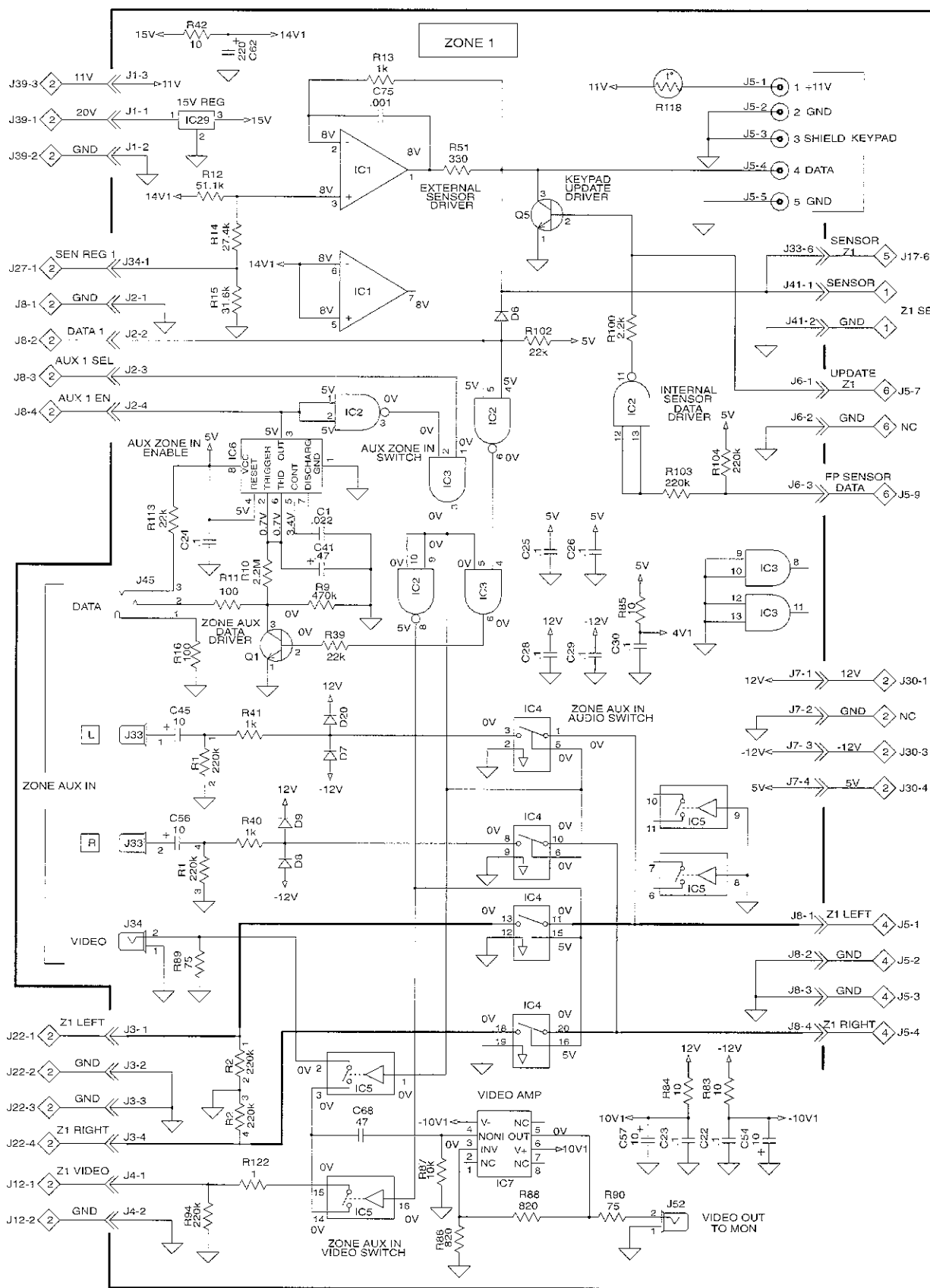
J11-

J10-



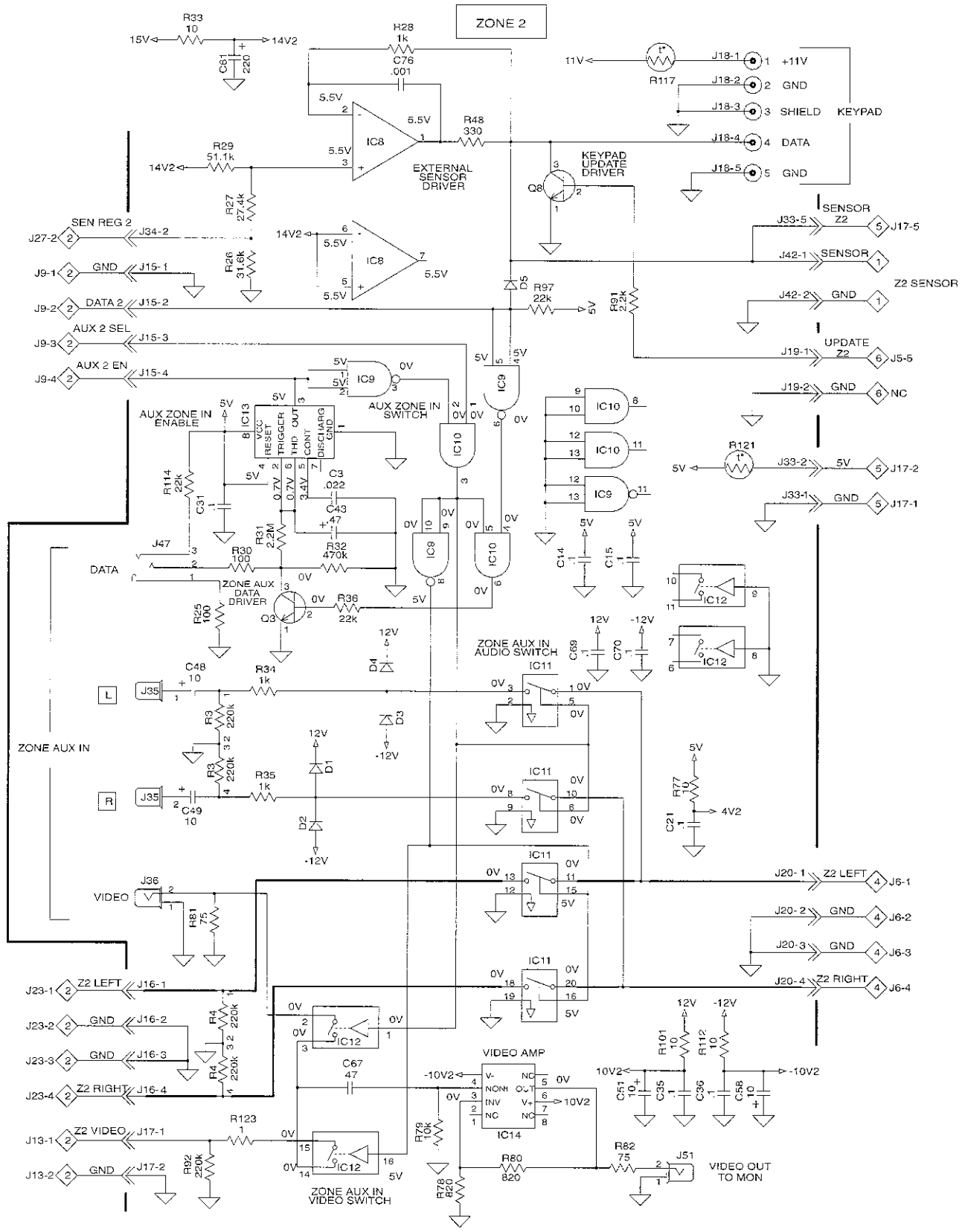
J27-

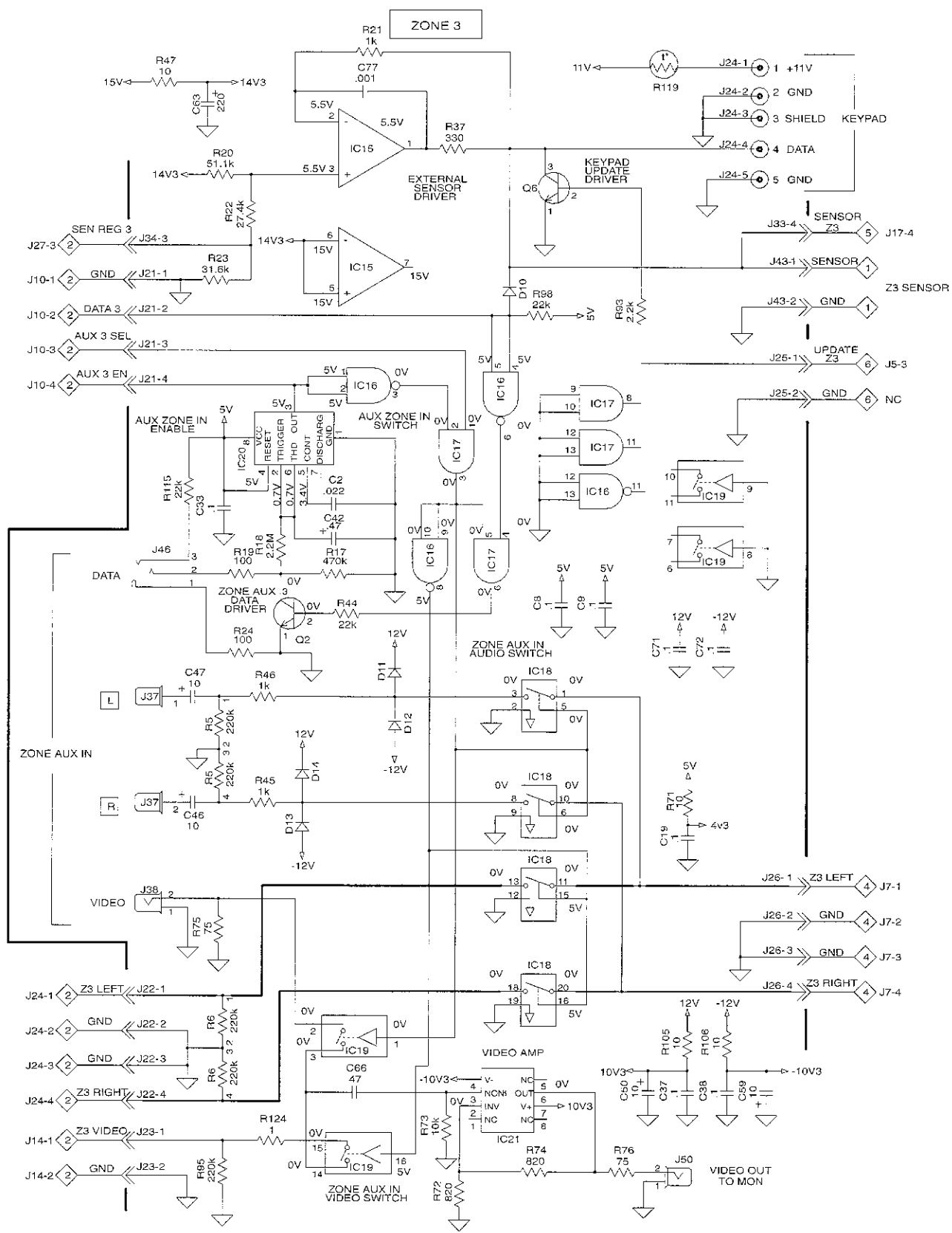


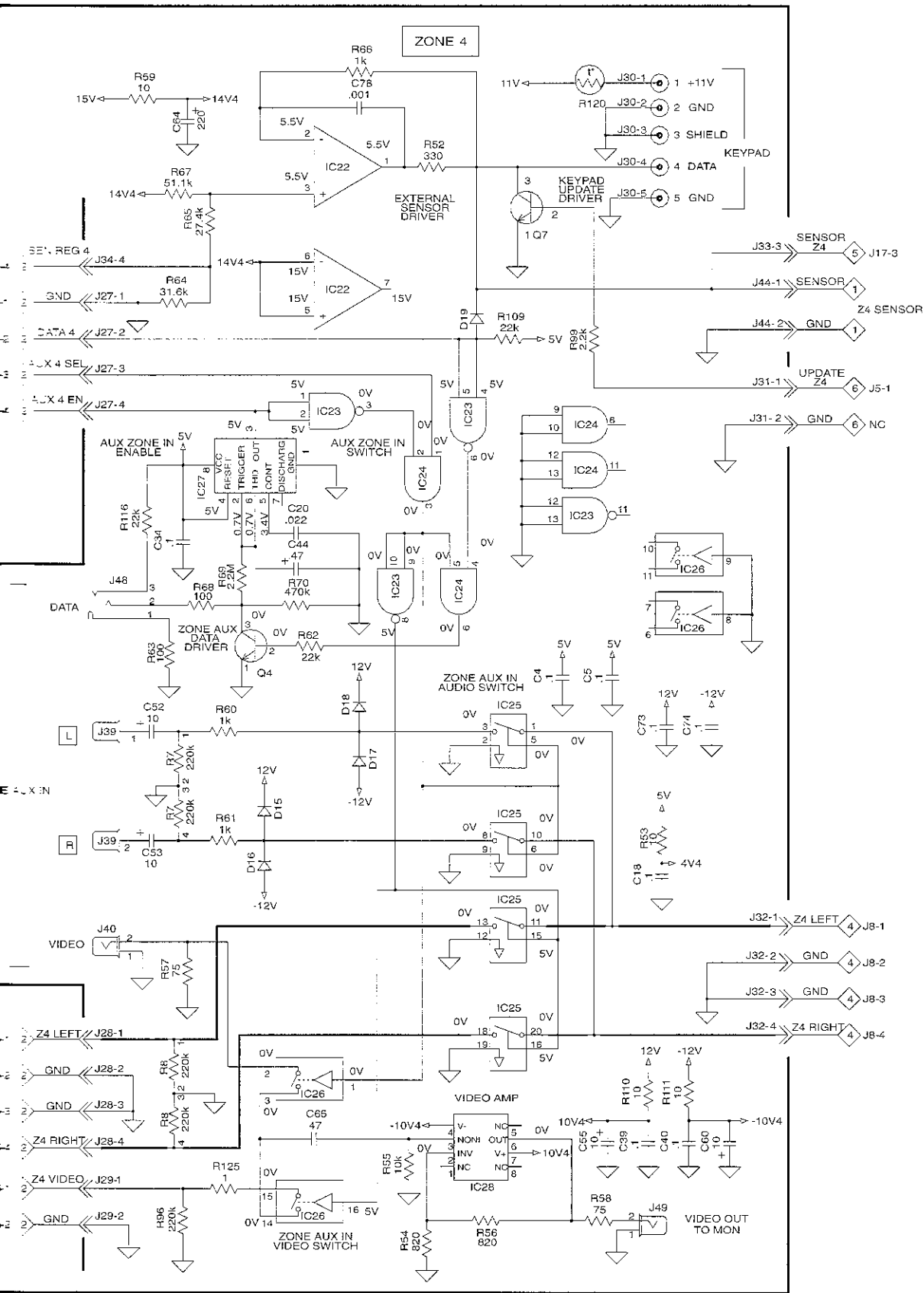


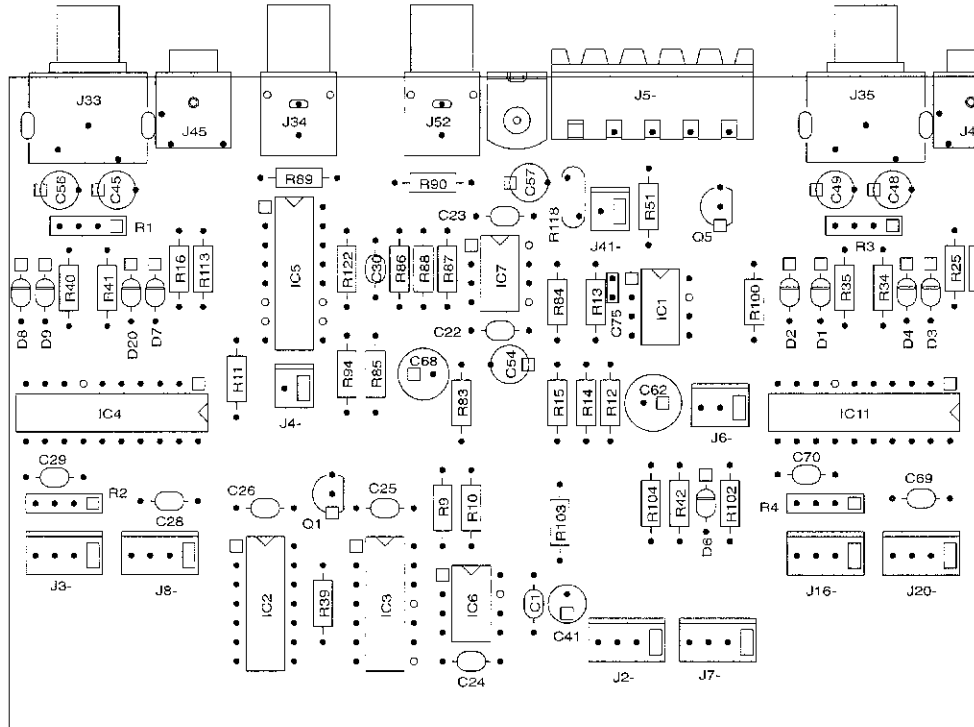
POWER CONNECTIONS	
IC1 IC8 IC15 IC22	8 4
IC2 IC3 IC9 IC10 IC16 IC17 IC23 IC24	1 7
IC4 IC11 IC18 IC25	1 4
IC5 IC12 IC19 IC26	1 4

TIONS  
 = 14V  
 = -12V  
 = 5V  
 = GND  
 = 10V  
 = -10V  
 = 4V

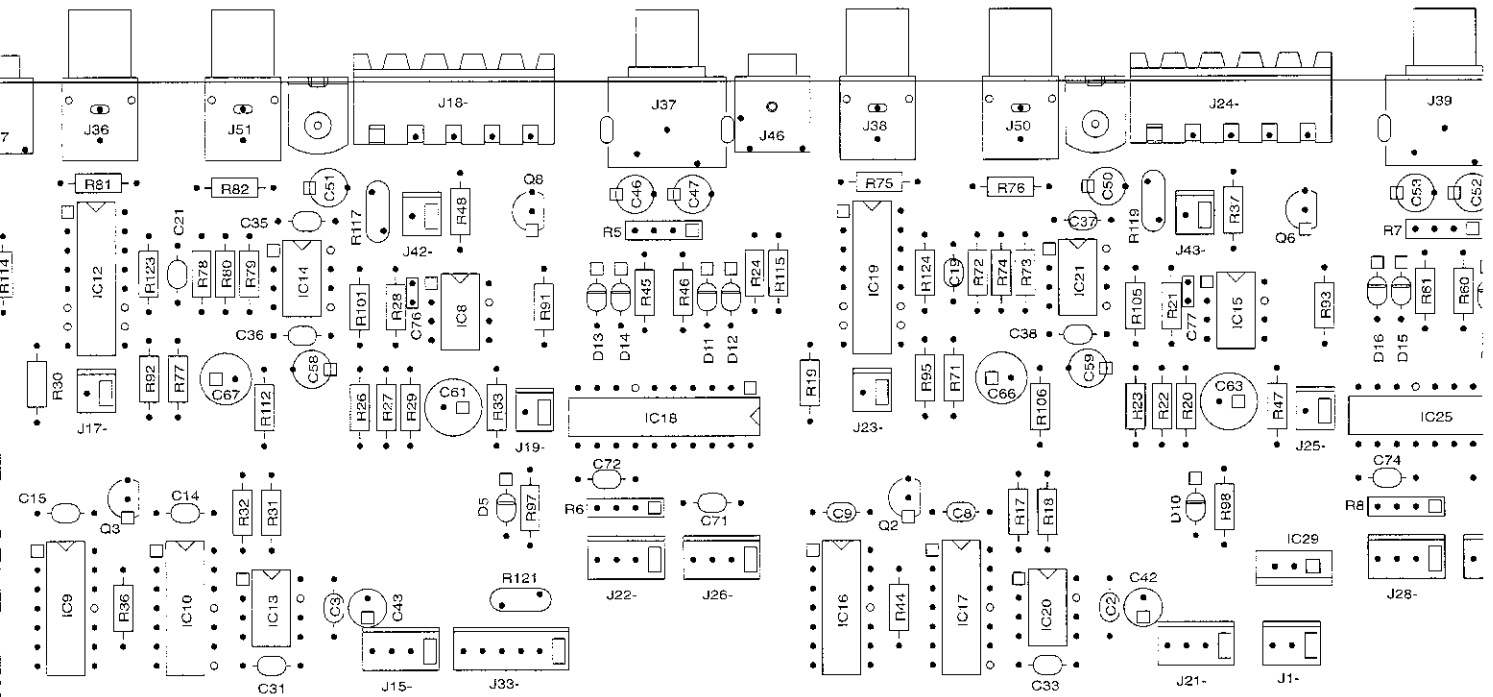


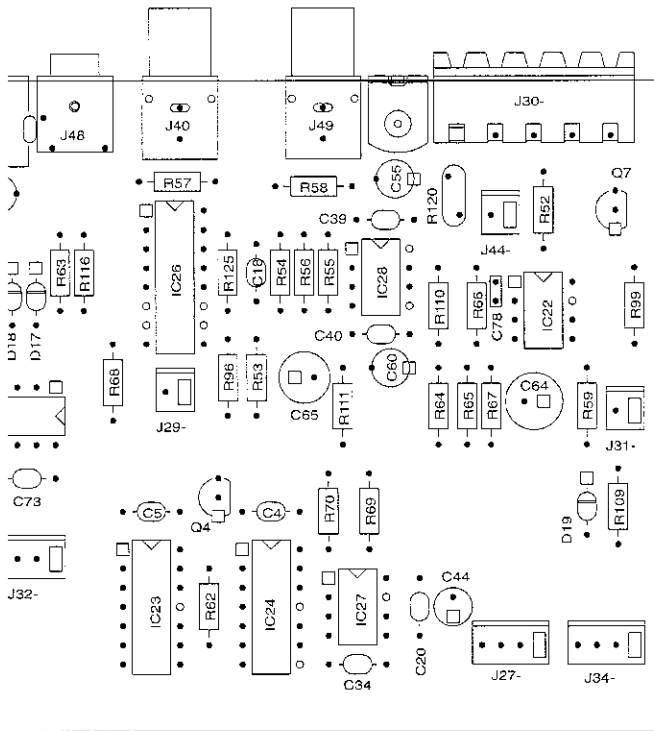






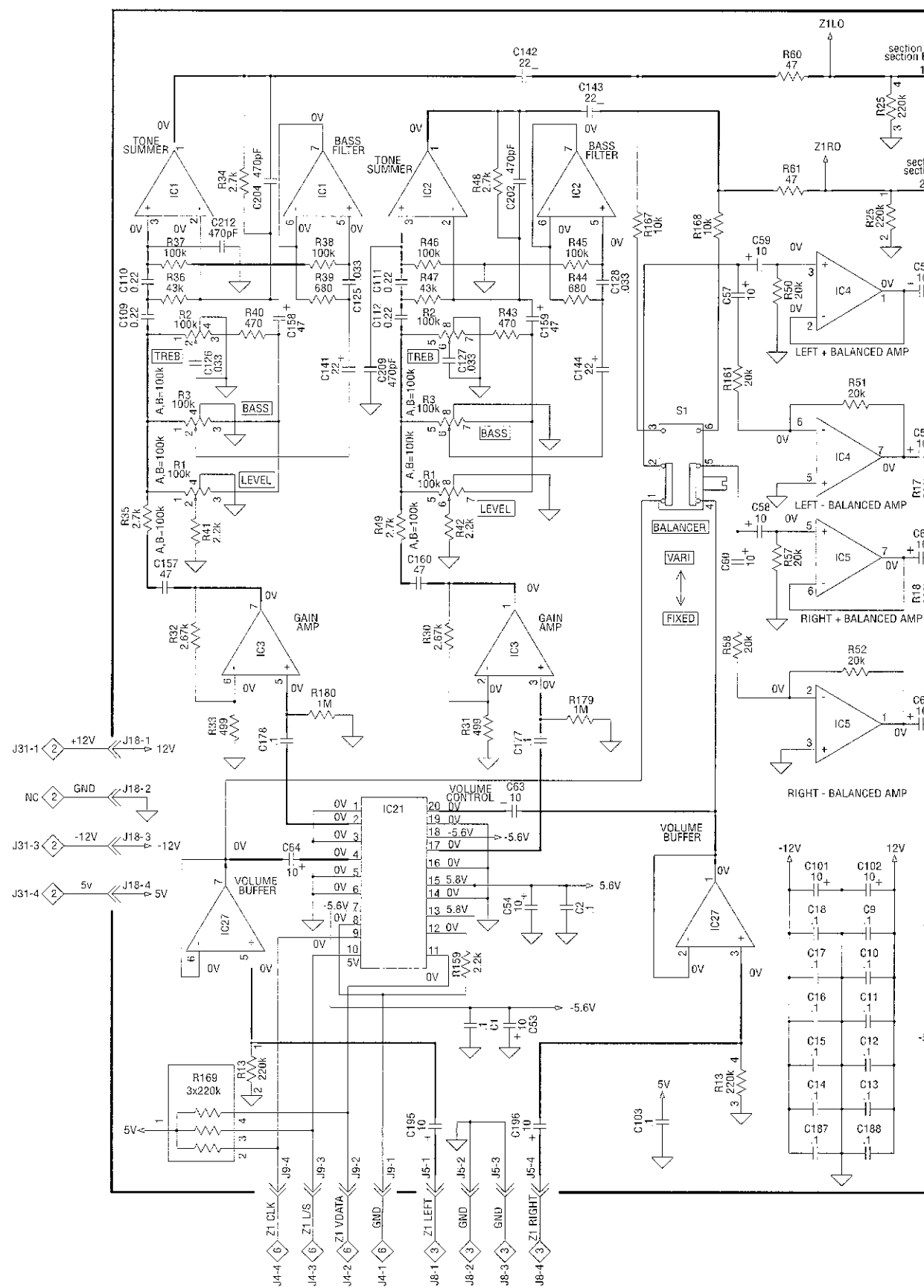


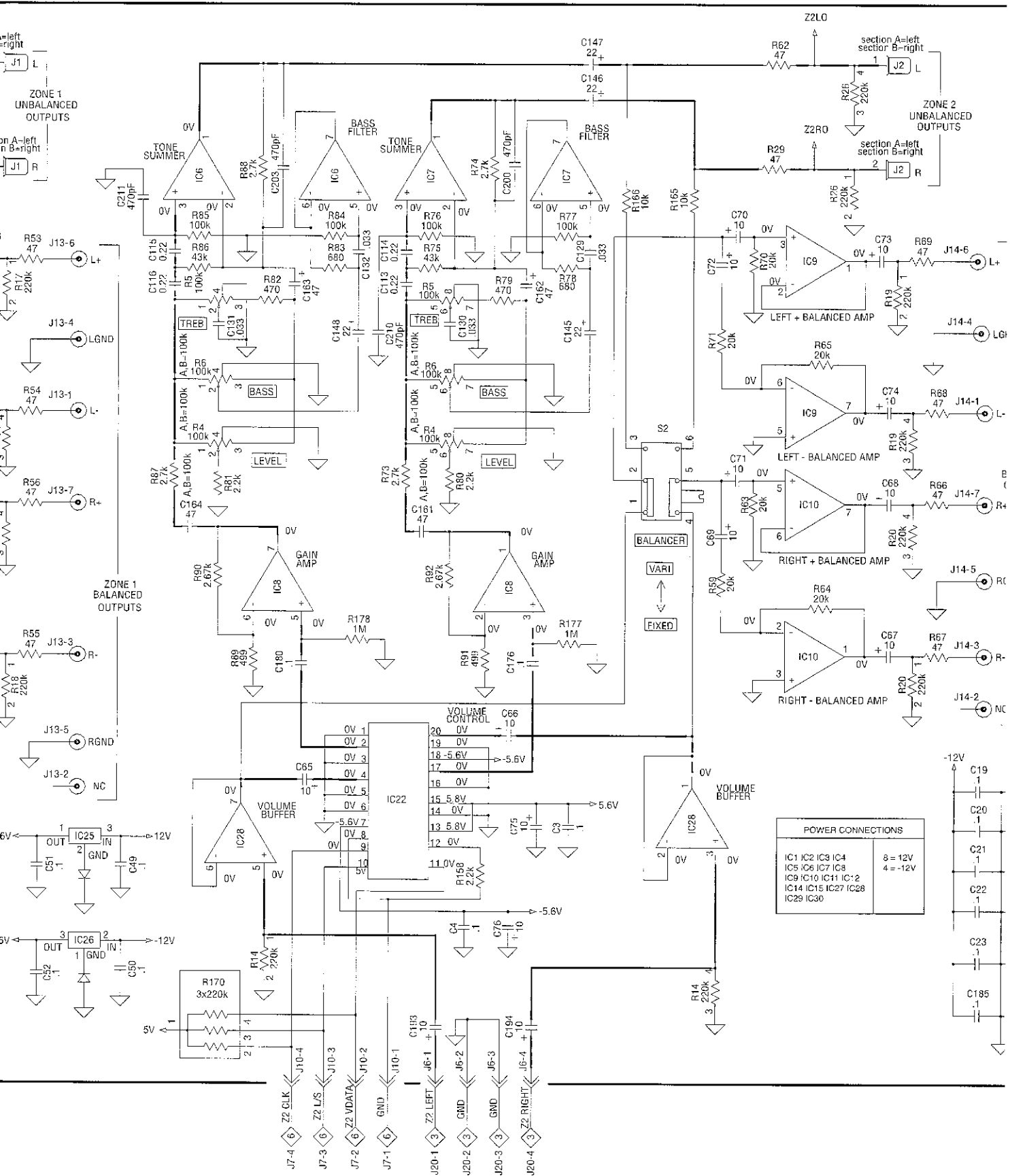


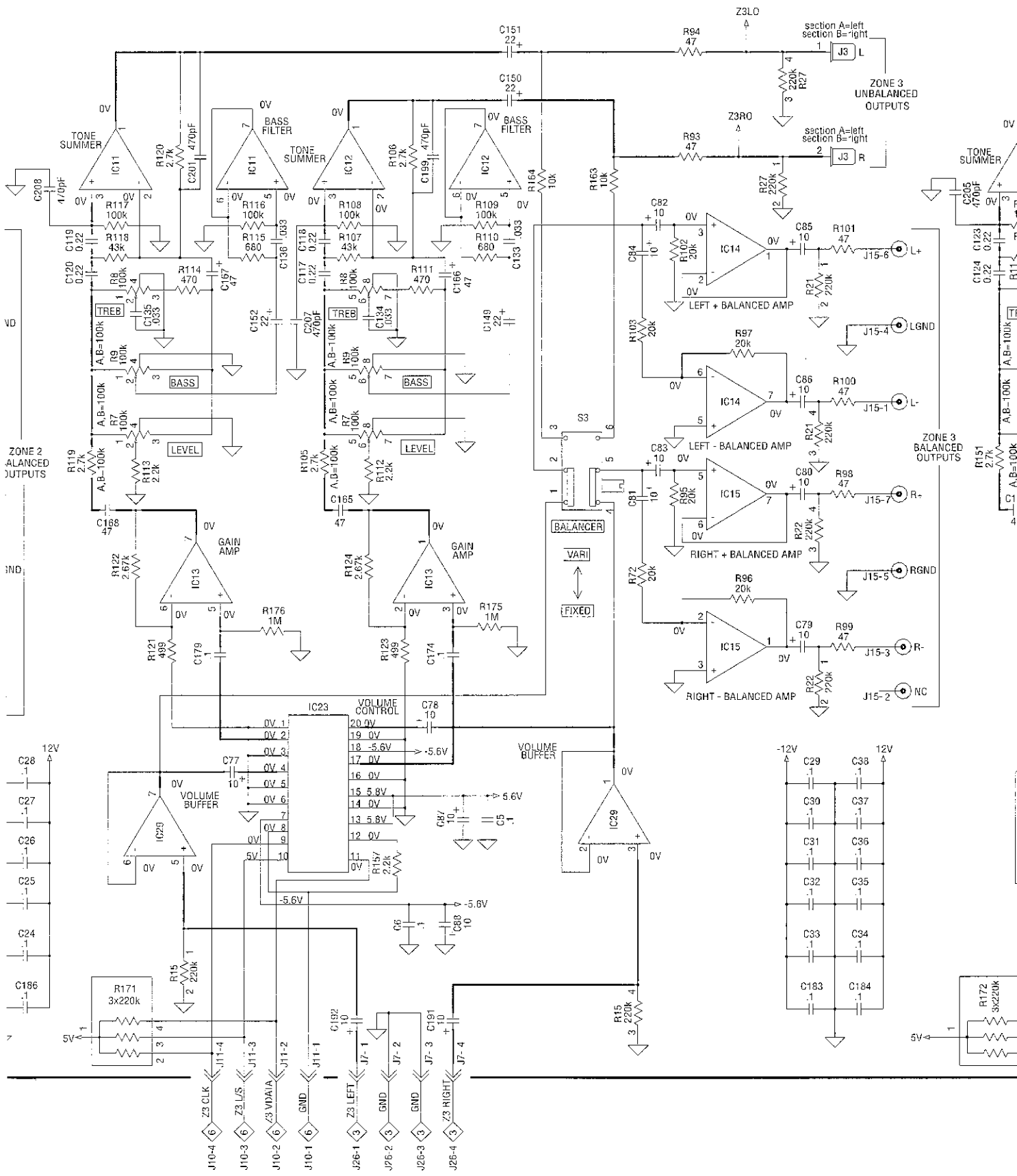


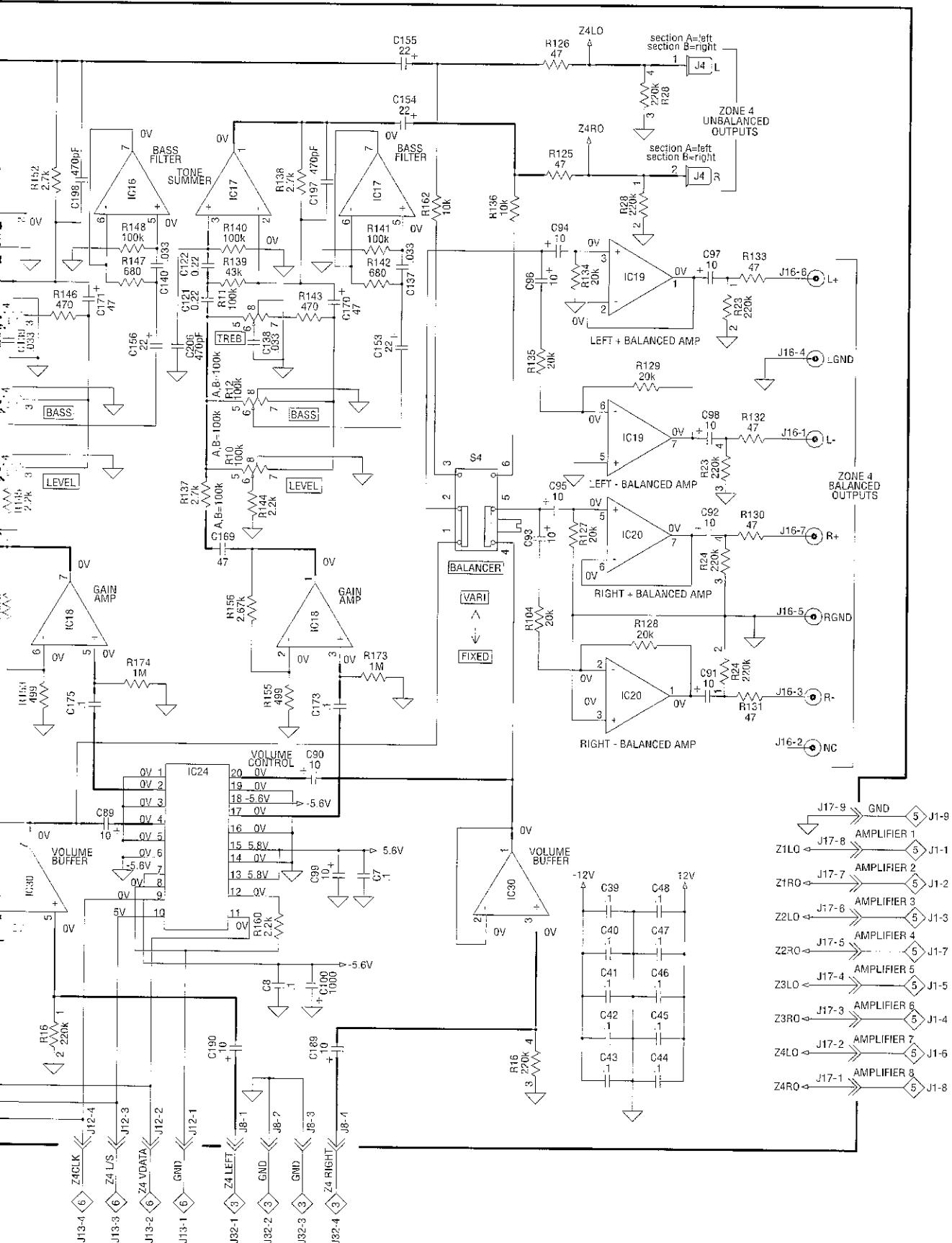


# OUTPUT 049453



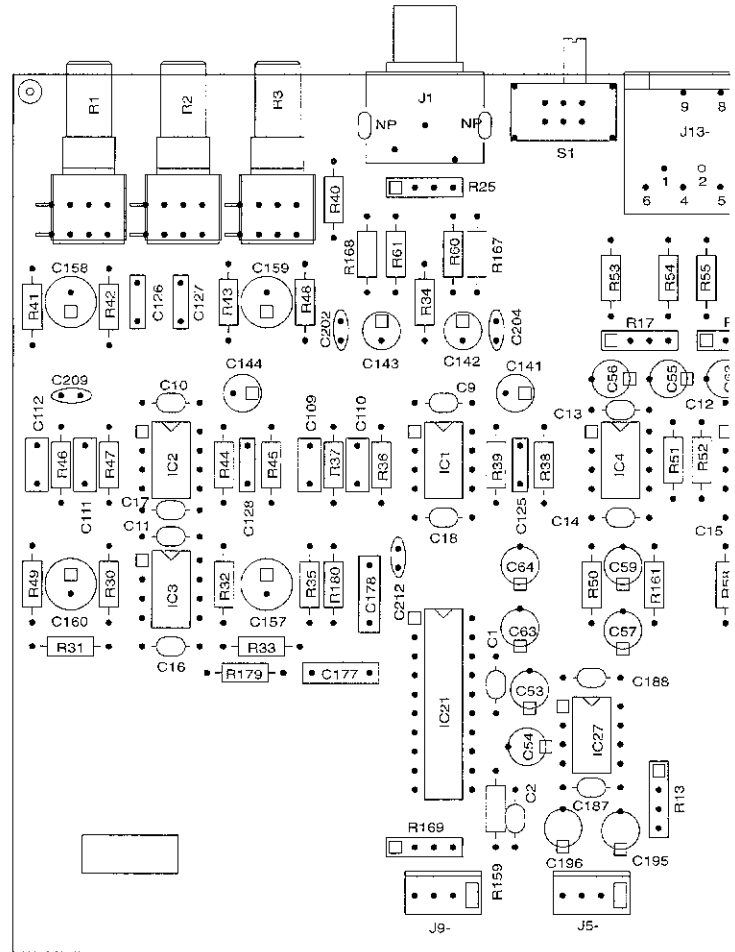




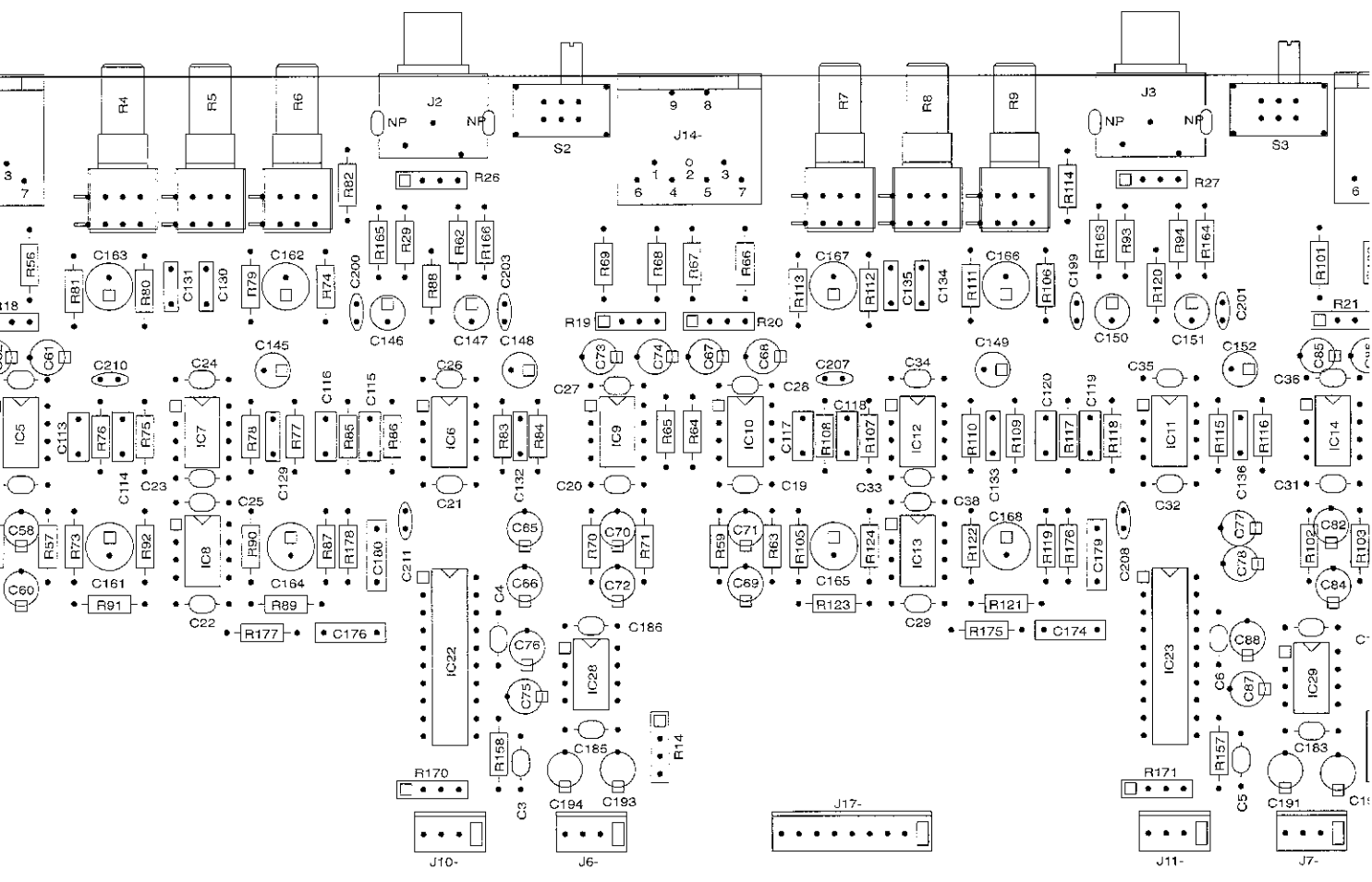


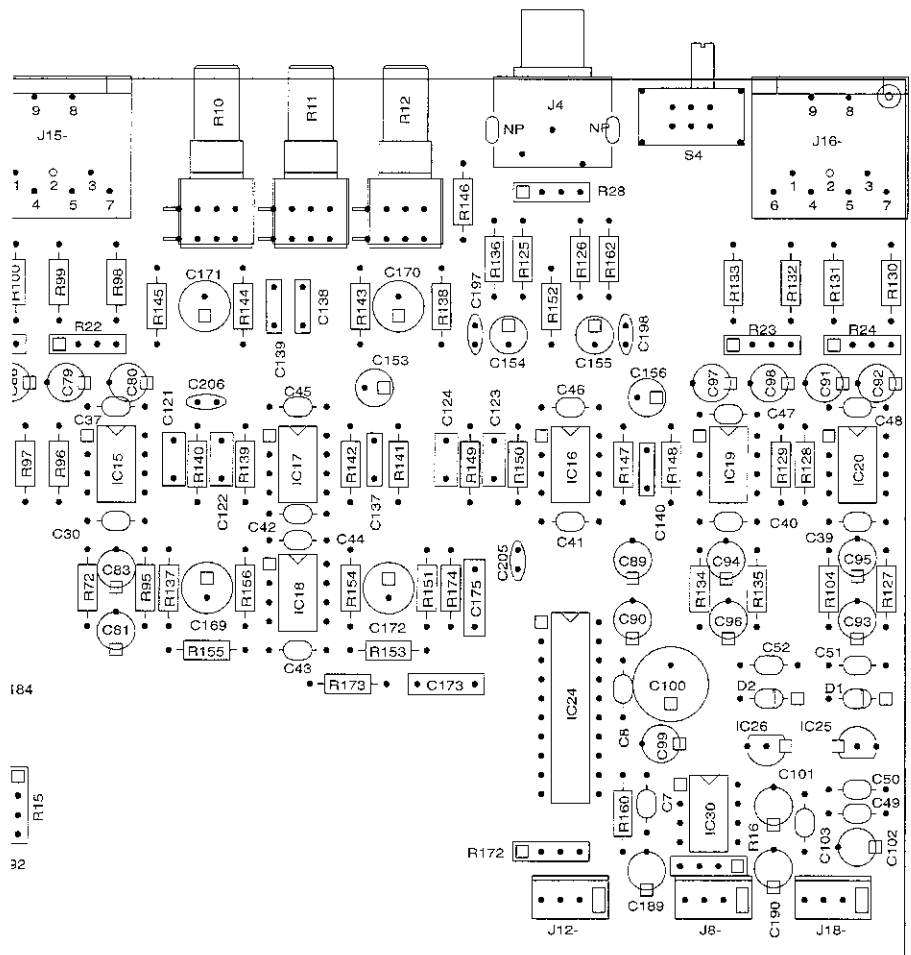
4

DATA I/O 049452





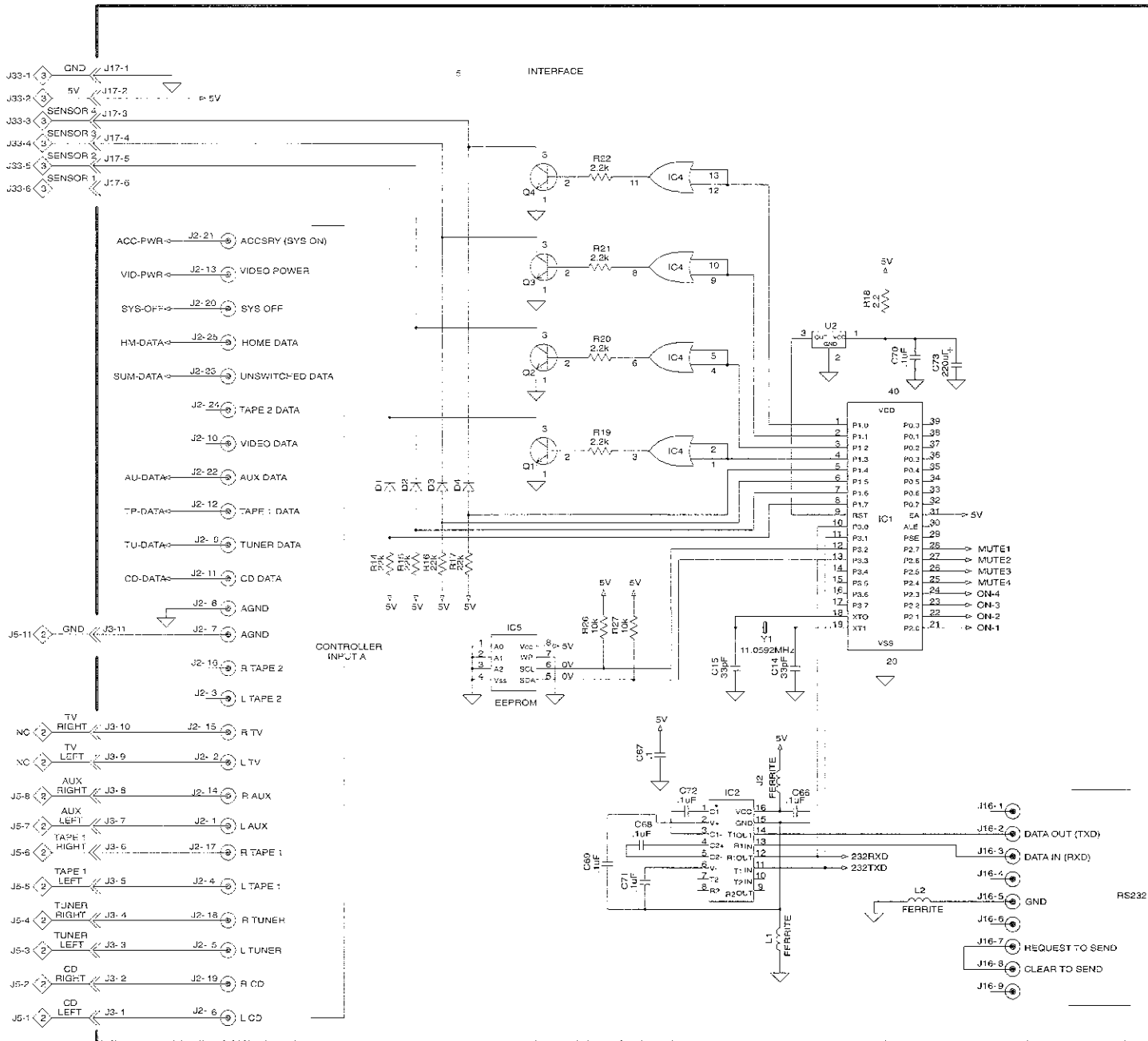


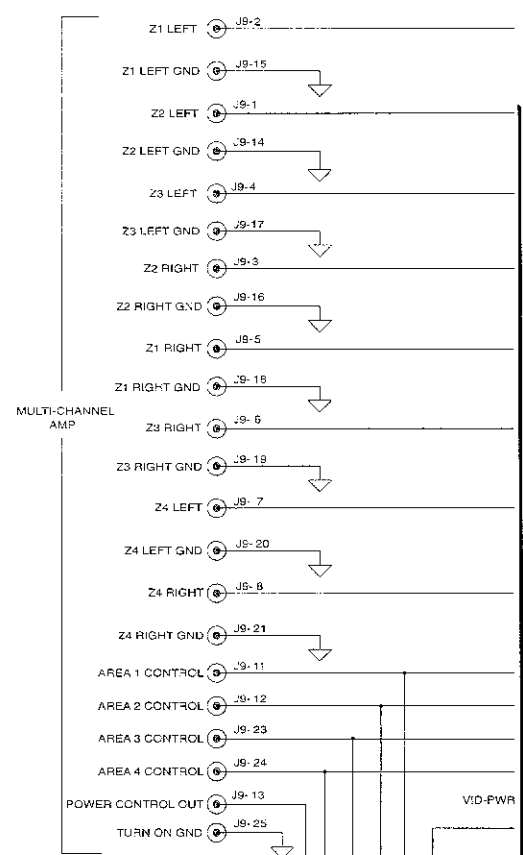
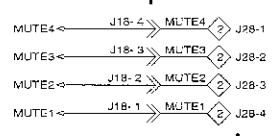
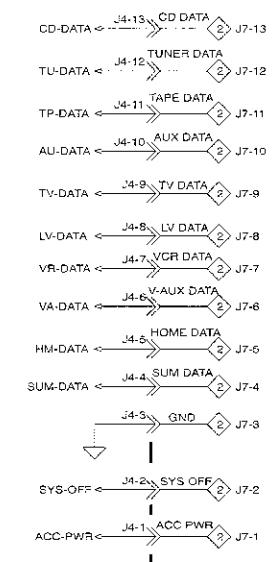
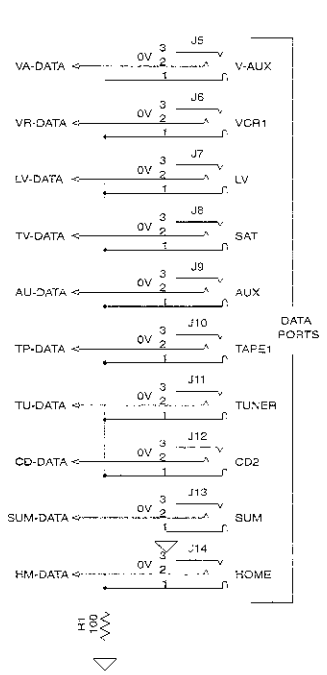




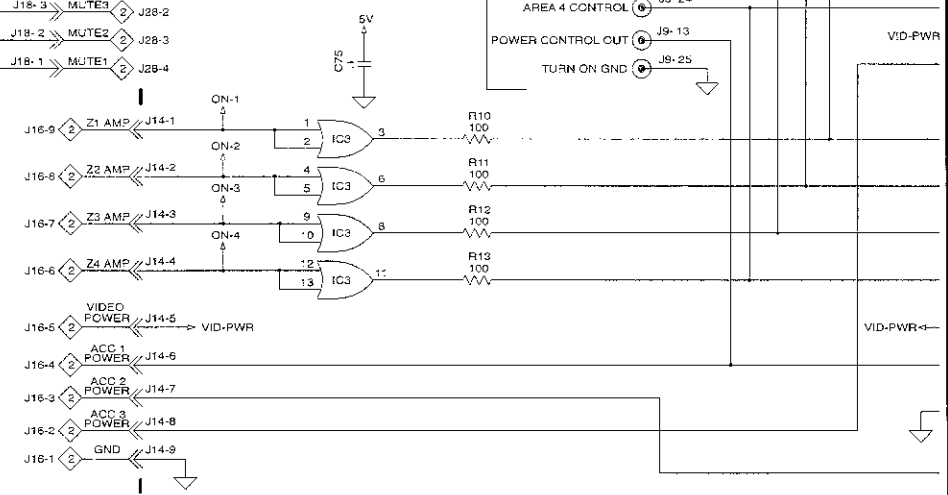
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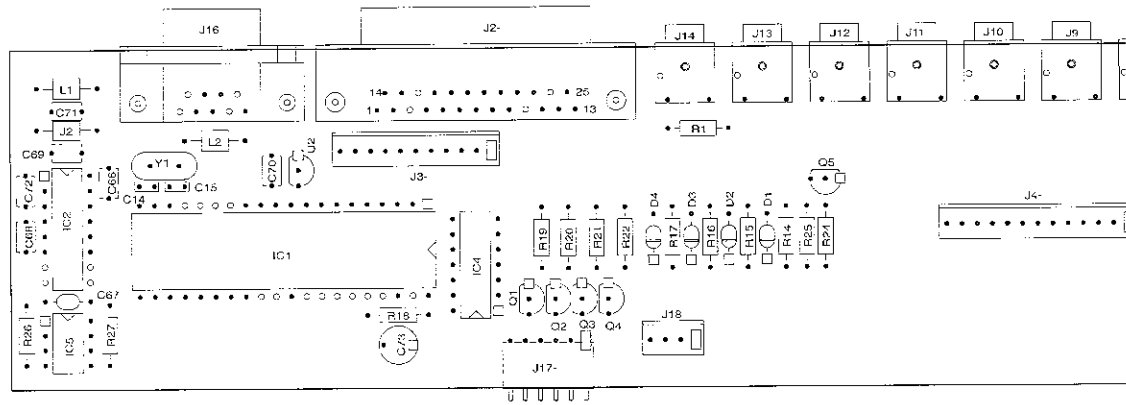
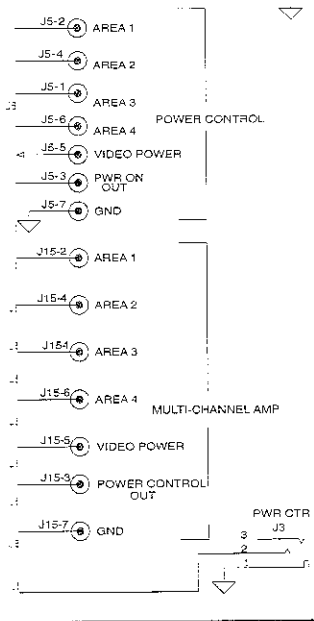
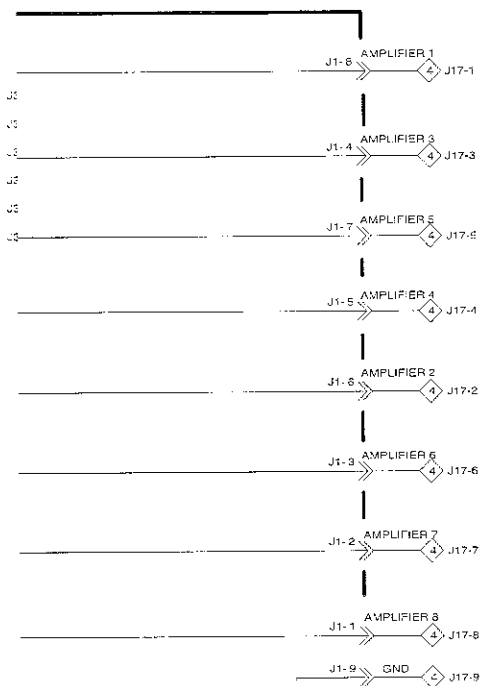
INTERFACE 049450

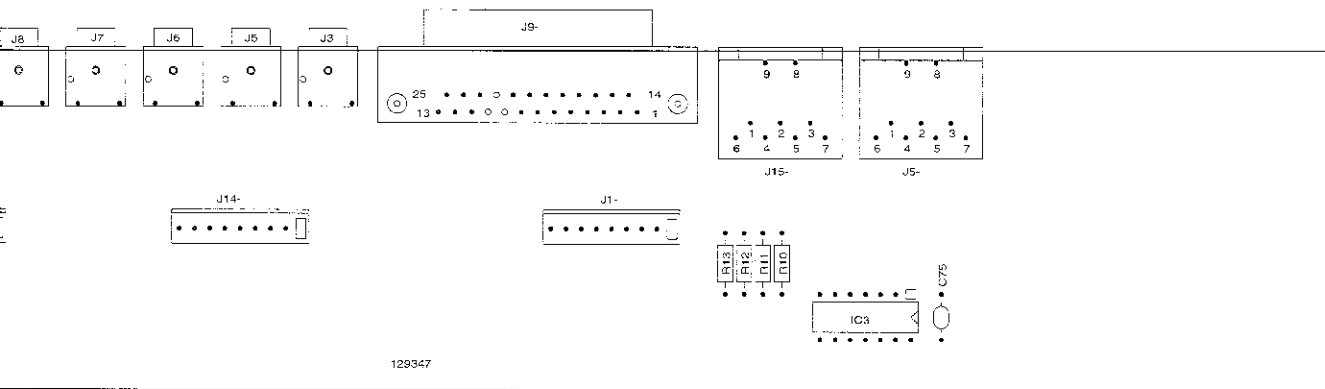




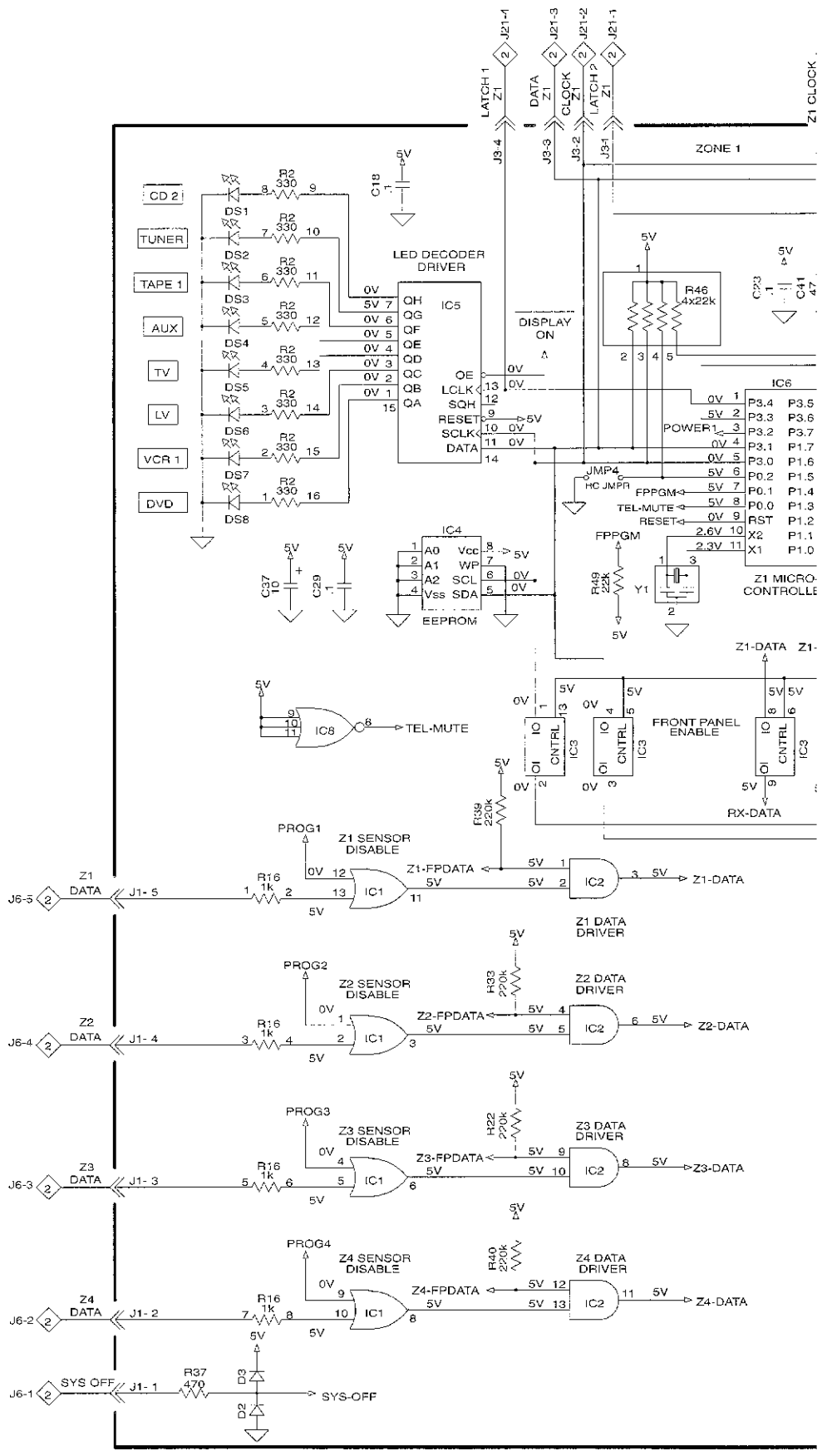
POWER CONNECTIONS	
IC3 IC4	14 = 5V
	7 = GND



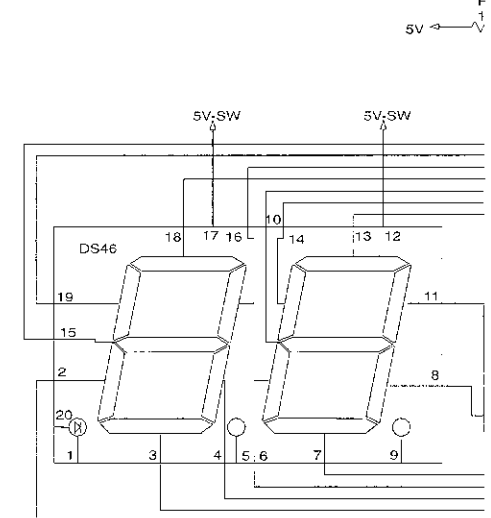
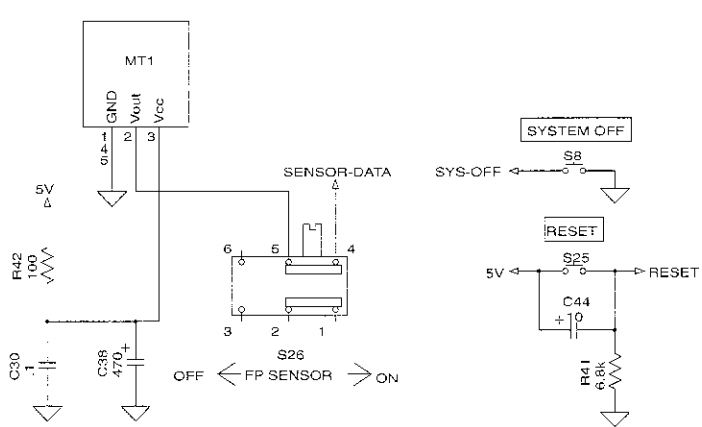
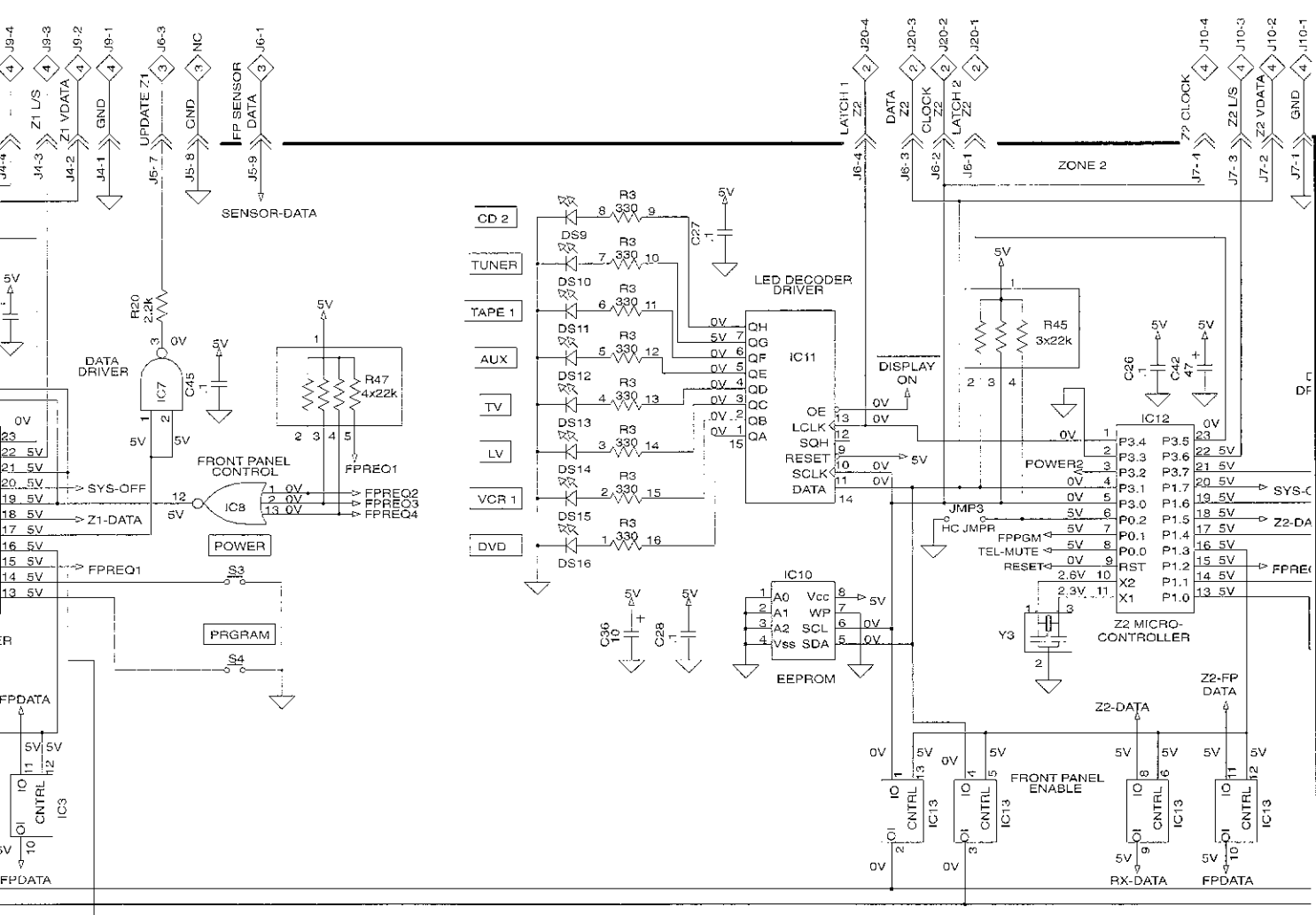


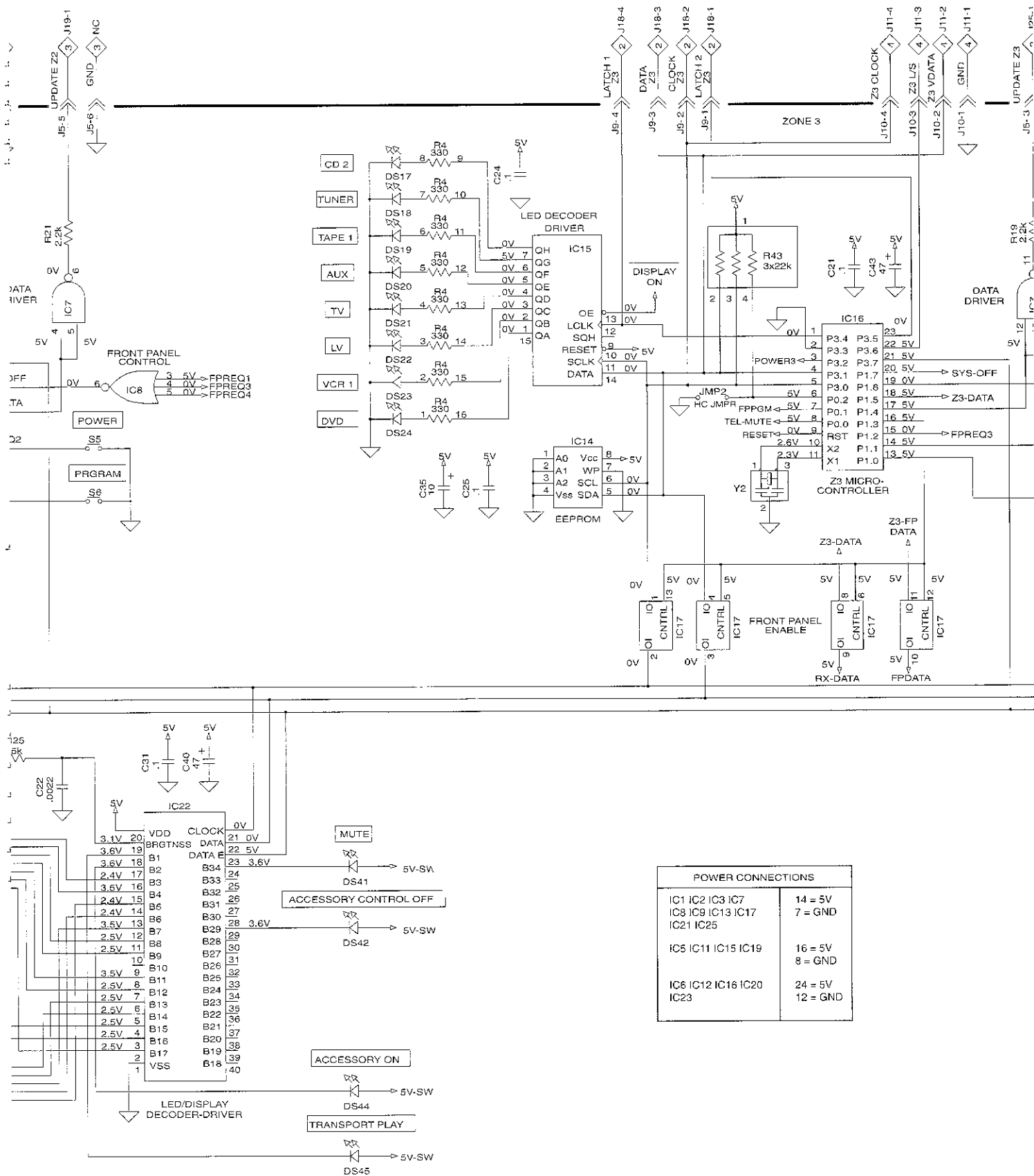


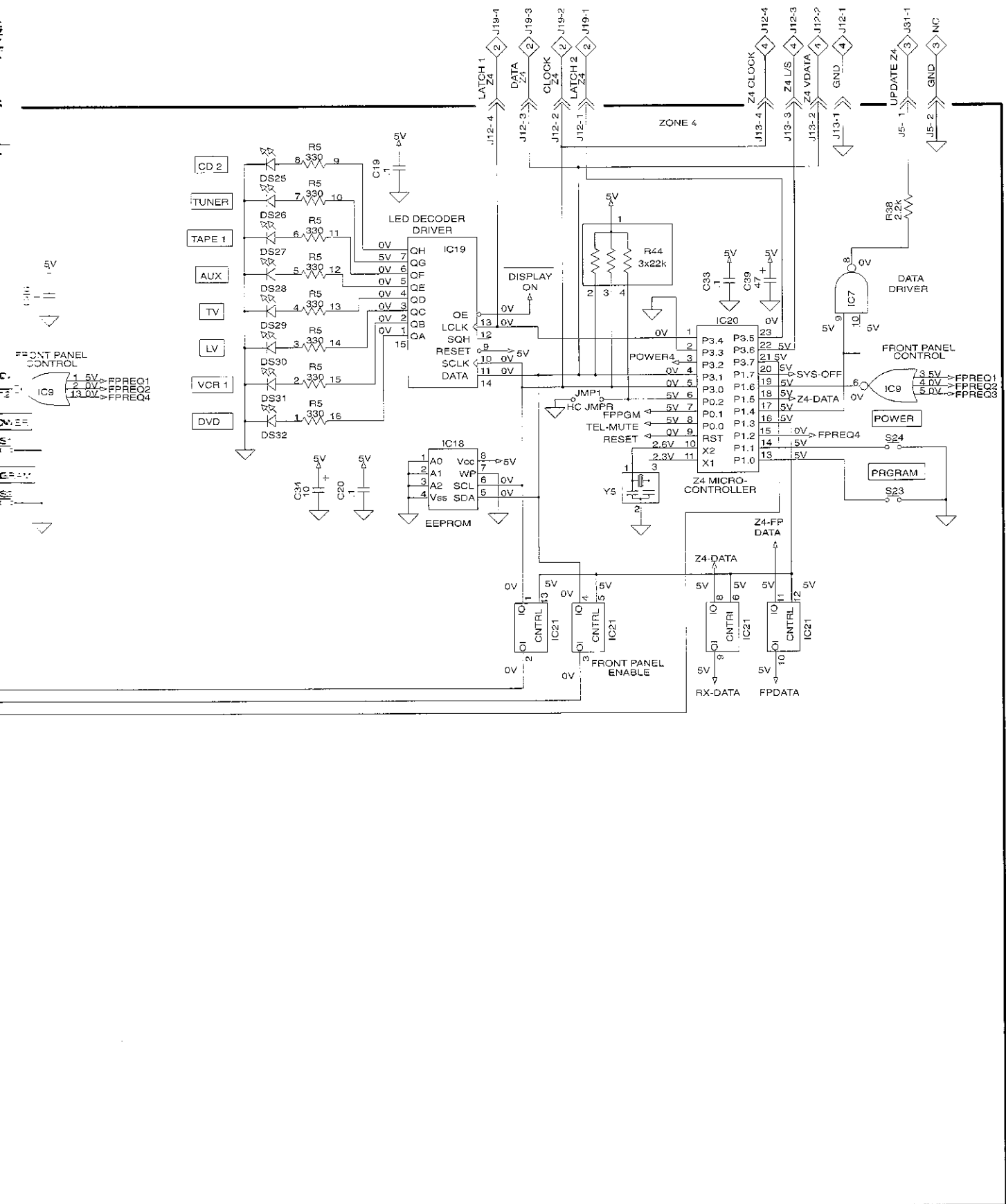
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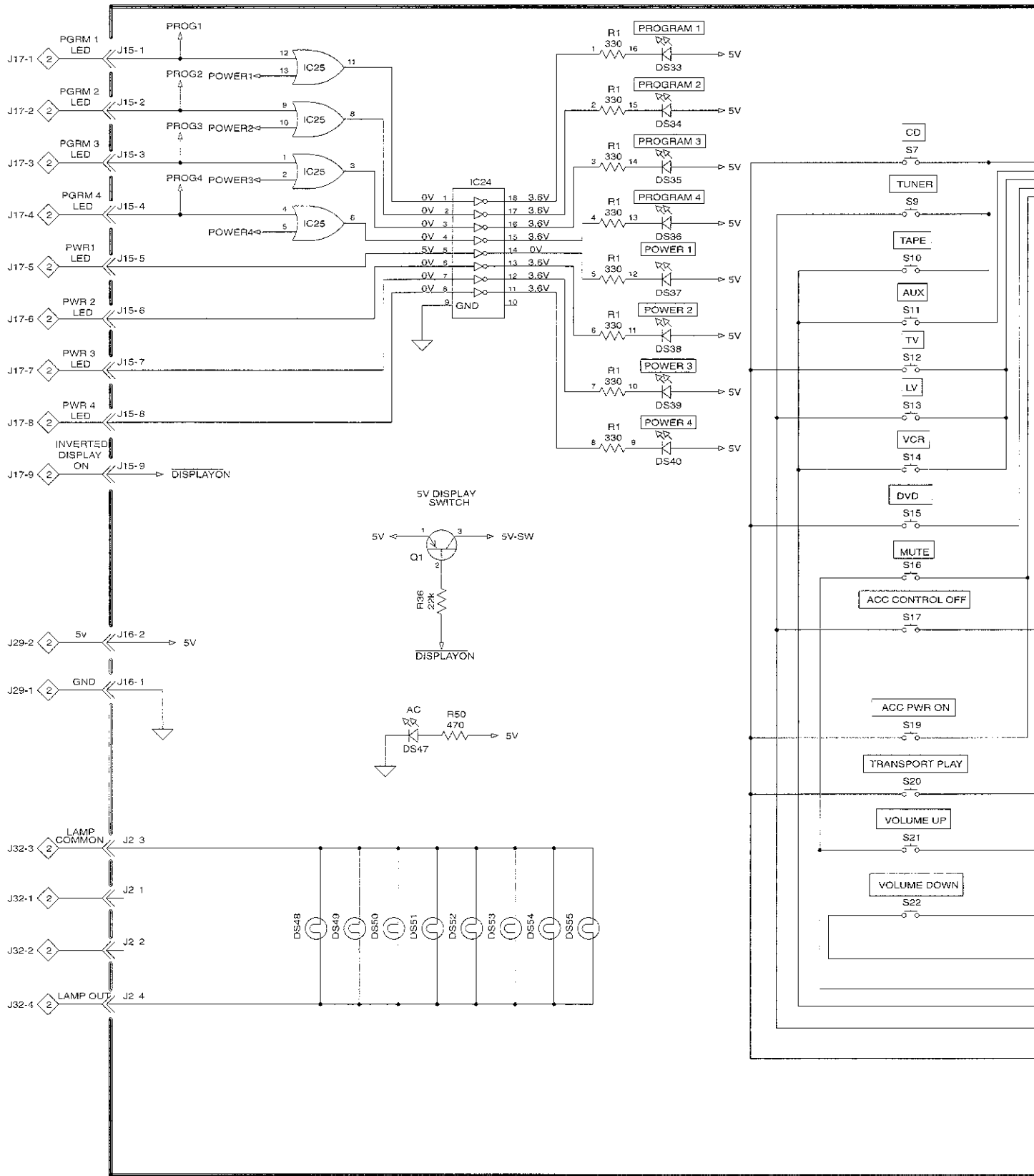


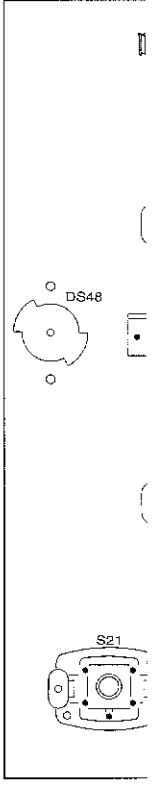
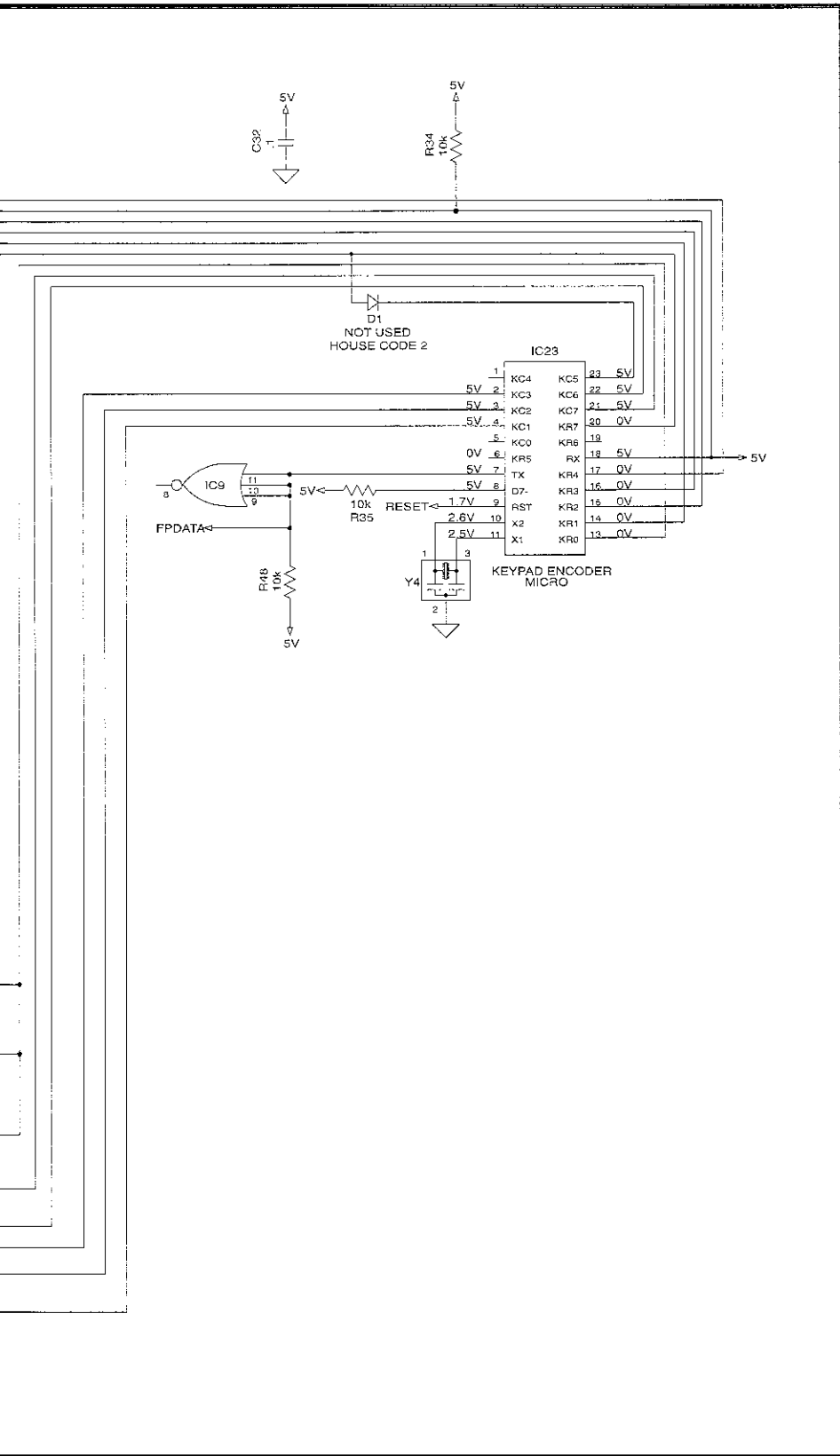




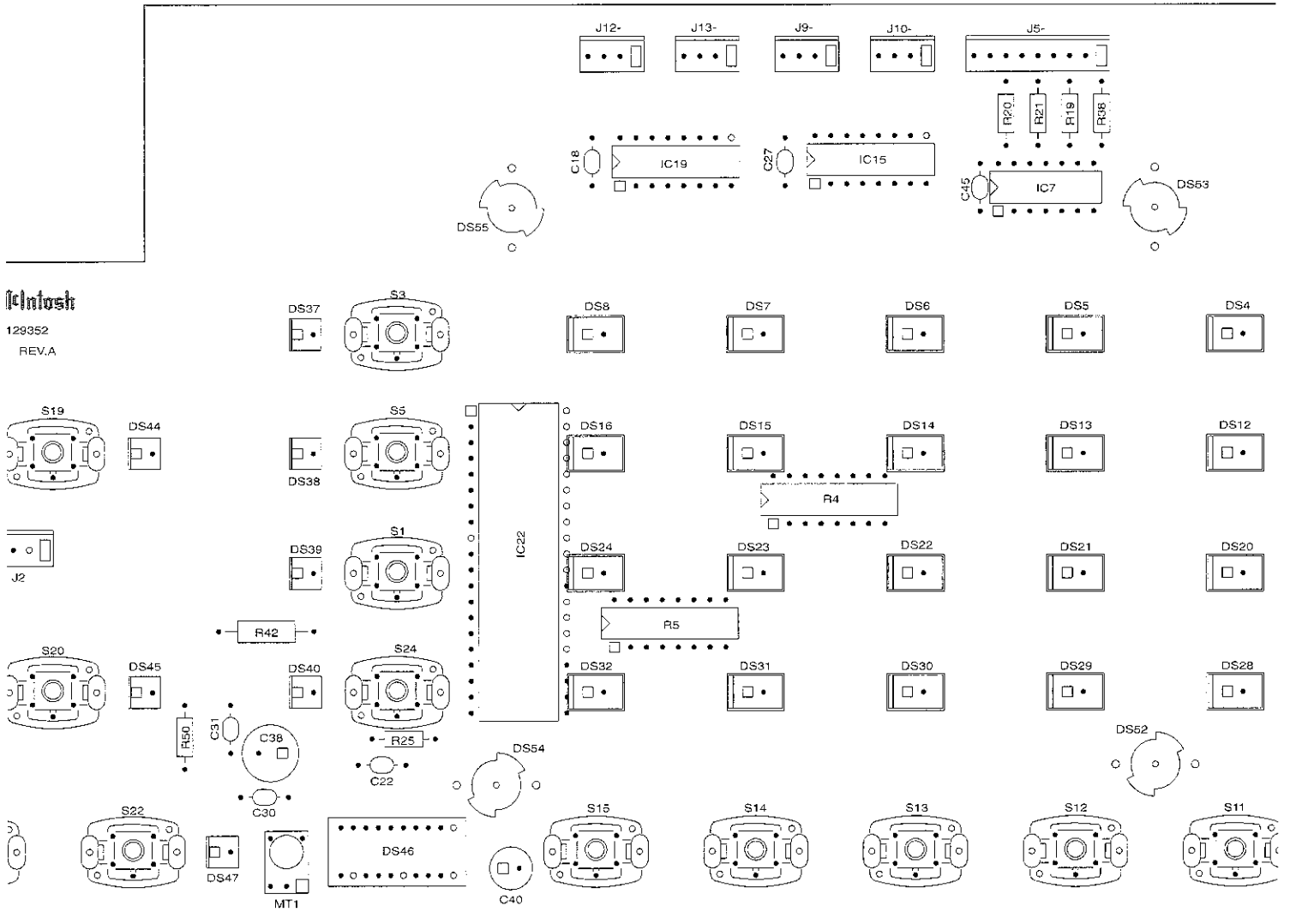
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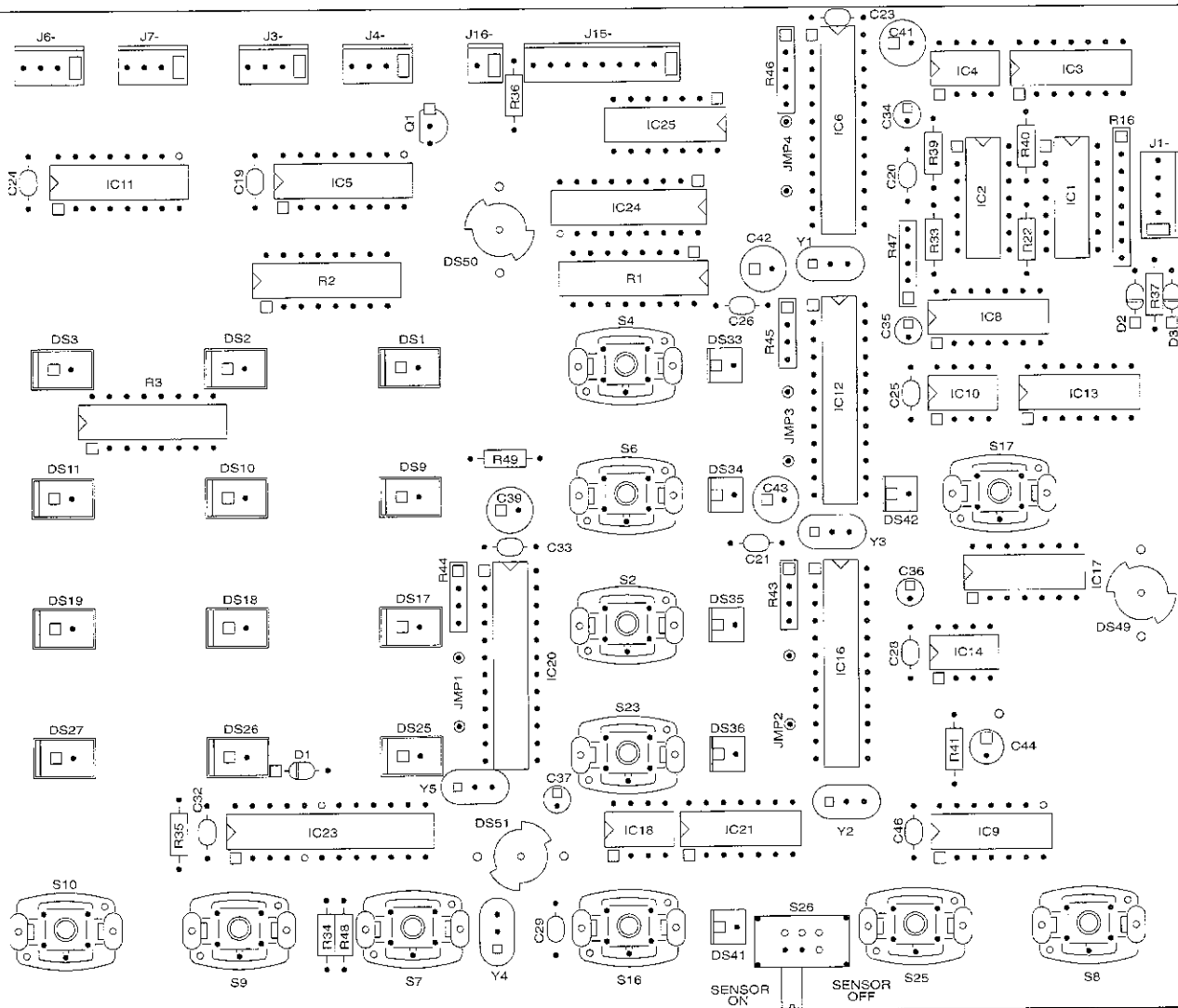
FRONT PANEL 049460 2 OF 2





**Intosh**  
129352  
REV.A





# PARTS LIST

## REF. NO

## DESCRIPTION

## PART NO

### 049451 INPUT SWITCHING PCB

C1 C2 C3 C4 C5 C6 C7 C8 C9  
 C10 C11 C12 C13 C14 C15 C16  
 C17 C18 C19 C20 C21 C22 C23  
 C24 C25 C26 C27 C28 C29 C30  
 C31 C32 C33 C34 C35 C36  
 C37  
 C38 C39 C40 C41 C42 C43 C44  
 C45 C46 C47 C48 C49 C50 C51  
 C52 C53 C54 C55 C56 C57 C58  
 C59 C60 C64 C65 C66 C67 C68  
 C69 C70 C71 C72 C73 C74 C75  
 C76 C77 C78 C79 C80 C81 C82  
 C83 C84 C85 C86 C87 C88 C89  
 C90 C91 C92 C93 C94 C95 C96  
 C97 C109 C111 C114 C117 C118  
 C98  
 C99 C100 C101 C102 C103  
 C104 C105 C106  
 C107 C108  
 C110 C112 C113 C115  
 C119 C121  
 C120  
 C161  
 D2 D3 D4 D5 D12 D13 D14 D15  
 D6 D7 D8 D9 D10 D11  
 F1  
 F1  
 GP1 GP2  
 IC1 IC4 IC7 IC10 IC13 IC16  
 IC2 IC3 IC5 IC6 IC8 IC9 IC11  
 IC12 IC14 IC15 IC17 IC18 IC20  
 IC19 IC22  
 IC21 IC23 IC24  
 IC25 IC29 IC30 IC31 IC32 IC40  
 IC26  
 IC27 IC39 IC68  
 IC28 IC42 IC43 IC44 IC67  
 IC33 IC34  
 IC35 IC36 IC37 IC38  
 IC41 IC61 IC66  
 IC46 IC47 IC48 IC49 IC50 IC51  
 IC52 IC53 IC54 IC55 IC56 IC57  
 IC58  
 IC59  
 IC60  
 IC62 IC63 IC64 IC65  
 J1  
 J2 J3  
 J4- J26-  
 J5-  
 J6-  
 J7-  
 J8- J9- J10- J11-J18- J19- J20-  
 J12- J13- J14- J15- J29- J32-  
 J16- J17-  
 J21- J22- J23- J24- J25- J27- J28-

CAP ELECT 10UF 50V 06644500  
 CAP ELECT 10UF 50V 6644500  
 CAP ELECT 10UF 50V 06644500  
 CAP ELECT 10UF 50V 06644500  
 CAP ELECT 10UF 50V 06644500  
 CAP M POLY .1UF 5% 63VDC 06432500  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MONO CAP.1UF, 50V, Z5U 06126800  
 MON CER 0.001MF 100V NPO 06126200  
 CAP ELECT 47UF 50V 06621500  
 CAP ELECT 47UF 50V 06621500  
 CAP ELECT 47MF 100V 20% 06627800  
 CAP ELECT 3300UF 35V 06636000  
 MONO CAP.1UF, 50V, Z5U 06126800  
 CAP ELECT 4.7UF 10% 35V 06628900  
 CER CAP.047MF, +80-20%, 50V 06116100  
 DIODE SILICON 07004700  
 DIODE RECTIFIER 07013100  
 FUSE 2A SLO-BLO 5X20 08908900  
 FUSE HLDR 5X20MM PCB MNT 17815900  
 CARD MOUNTING BRACKET 00361100  
 DUAL OPERATIONAL AMP 13326000  
 SSM2404P QUAD AUDIO SW 13320900  
 SSM2404P QUAD AUDIO SW 13320900  
 DUAL OPERATIONAL AMP 13326000  
 SSM2404P QUAD AUDIO SW 13320900  
 2 INPUT X 4 13316700  
 QUAD NAND SCHMITT 13320700  
 74HC00N NAND 2 INPUT X 4 13316100  
 IC AND 2 INPUT X 4 13317500  
 IC 100MA I FEEDBACK AMP 13328600  
 QUAD SPST SWITCH 13330000  
 2 INPUT X 4 13316700  
 IC SHFT REG SER-PAR 13318600  
 IC SHFT REG SER-PAR 13318600  
 IC +5V REGULATOR 13310800  
 MC7912CT -12V REG 13313800  
 IC REGULATOR +12 VOLT 13311900  
 LB1720 8 LN DRIVER ARRAY 13318000  
 PHONO JACK 8 POS YEL, GLD 11765600  
 PHONO JACK 8P, GLD PLATED 11745500  
 D SUBMINI CONN 37PIN 11755000  
 11-POS. MALE CONN. 11727900  
 MALE CONN 5-PIN 0.1 PST ASSY 11721600  
 13-POS. CONNECTOR 11729800  
 4-PIN CONNECTOR 11721500  
 2-PIN MALE CONNECTOR 11721300  
 FRICTION LK CONN 9POS MALE 11724400  
 4-PIN CONNECTOR 11721500

J30- J31-  
 J33 J34 J35  
 J39-  
 Q1 Q2 Q3 Q  
 Q10  
 Q11  
 R1 R3 R5 R  
 R2 R4 R6 R  
 R17 R85  
 R22 R23 R2  
 R30 R31 R3  
 R35 R36 R7  
 R37 R38 R3  
 R41  
 R42  
 R48 R53 R9  
 R49 R50 R5  
 R55 R57 R5  
 R56 R61 R6  
 R60 R68 R6  
 R77 R78 R7  
 R86 R87 R8  
 R91 R92 R9  
 R96  
 R97  
 R102 R103 I  
 R104 R105

### 049452 DAT

C1 C2 C3 C  
 C4 C5 C8 C  
 C22 C23 C2  
 C31 C33 C3  
 C40 C69 C7  
 C41 C42 C4  
 C45 C46 C4  
 C53 C54 C5  
 C61 C62 C6  
 C65 C66 C6  
 C75 C76 C7  
 D1 D2 D3 D  
 D12 D13 D1  
 IC1 IC8 IC15  
 IC2 IC9 IC16  
 IC3 IC10 IC1  
 IC4 IC11 IC1  
 IC5 IC12 IC1  
 IC6 IC13 IC2  
 IC7 IC14 IC2  
 IC29  
 J1- J6-  
 J2- J3- J7- J  
 J4- J17- J19  
 J5- J18- J24  
 J21- J22- J2  
 J33-  
 J33 J35 J37  
 J34 J36 J38  
 J41- J42- J4  
 J45 J46 J47  
 Q1 Q2 Q3 Q  
 R1 R2 R3 R  
 R9 R17 R32  
 R10 R18 R3



J30- J31-  
 J33 J34 J35 J36 J37  
 J39-  
 Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q12  
 Q10  
 Q11  
 R1 R3 R5 R7 R9 R11 R13 R15  
 R2 R4 R6 R8 R10 R12 R14 R16  
 R17 R85  
 R22 R23 R24 R25 R26 R27 R28 R29  
 R30 R31 R32 R33 R34 R43 R54 R84  
 R35 R36 R75 R76 R81 R82 R83  
 R37 R38 R39 R40 R44 R45 R46 R47  
 R41  
 R42  
 R48 R53 R98  
 R49 R50 R51 R52 R99 R100 R101  
 R55 R57 R58 R59 R71 R72 R73 R74  
 R56 R61 R62 R63 R64 R65 R66 R67  
 R60 R68 R69 R70 R106 R107  
 R77 R78 R79 R80  
 R86 R87 R88 R89 R90  
 R91 R92 R93 R94  
 R96  
 R97  
 R102 R103 R108  
 R104 R105

**049452 DATA I/O PCB**

C1 C2 C3 C20  
 C4 C5 C8 C9 C14 C15 C18 C19 C21  
 C22 C23 C24 C25 C26 C28 C29 C30  
 C31 C33 C34 C35 C36 C37 C38 C39  
 C40 C69 C70 C71 C72 C73 C74  
 C41 C42 C43 C44  
 C45 C46 C47 C48 C49 C50 C51 C52  
 C53 C54 C55 C56 C57 C58 C59 C60  
 C61 C62 C63 C64  
 C65 C66 C67 C68  
 C75 C76 C77 C78  
 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11  
 D12 D13 D14 D15 D16 D17 D18 D19 D20  
 IC1 IC8 IC15 IC22  
 IC2 IC9 IC16 IC23  
 IC3 IC10 IC17 IC24  
 IC4 IC11 IC18 IC25  
 IC5 IC12 IC19 IC26  
 IC6 IC13 IC20 IC27  
 IC7 IC14 IC21 IC28  
 IC29  
 J1- J6-  
 J2- J3- J7- J8- J15- J16- J20-  
 J4- J17- J19- J23- J25- J29- J31-  
 J5- J18- J24- J30  
 J21- J22- J26- J27- J28- J32- J34-  
 J33-  
 J33 J35 J37 J39  
 J34 J36 J38 J40 J49 J50 J51 J52  
 J41- J42- J43- J44-  
 J45 J46 J47 J48  
 Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8  
 R1 R2 R3 R4 R5 R6 R7 R8  
 R9 R17 R32 R70  
 R10 R18 R31 R69

4-PIN CONNECTOR 11721500  
 1/4IN FASTON BLADE 11734200  
 MLE CONN 3-POS MTS100 NRML 11721400  
 TRANSISTOR NPN 2K/REEL 13222300  
 TRIXC, HA, 100V, 2N6070A 13101800  
 TRANSISTOR PNP 13222400  
 RES NETWRK ISOLATED 2X22K 14436600  
 RES NETWRK 2X220K ISO 14426200  
 RES NETWORK 8X100 ISO 14427500  
 RES CF 47 5% 1/4W 14115200  
 RES CF 47 5% 1/4W 14115200  
 RES CF 10 5% 1/4W 14113600  
 RES CF 22K 5% 1/4W 14108000  
 RES CF 1.0M 5% 1/4W 14112000  
 RES CF 4.7M 5% 1/4W 14112800  
 RES CF 100 5% 1/4W 14102500  
 RES CF 22K 5% 1/4W 14108000  
 RES CF 75 5% 1/4W 14115700  
 RES CF 820 5% 1/4W 14104700  
 RES CF 10K 5% 1/4W 14107200  
 RES CF 220K 5% 1/4W 14110400  
 RES NETWORK 4 X 22K BUS 14423400  
 RES NETWORK 9 X 47K BUS 14425000  
 RES CF 180 5% 1/4W 14103100  
 RES NETWORK 4 X 100 ISO 14425900  
 RES CF 22K 5% 1/4W 14108000  
 RES CF 100K 5% 1/4W 14109600

CAP, MC, 022MF, 50V, +80-20% 06128100  
 MONO CAP.1UF, 50V,Z5U 06126800  
 MONO CAP.1UF, 50V,Z5U 06126800  
 MONO CAP.1UF, 50V,Z5U 06126800  
 MONO CAP.1UF, 50V,Z5U 06126800  
 CAP ELECT 0.47UF 50V 20% 06624400  
 CAP ELECT 10UF 50V 06644500  
 CAP ELECT 10UF 50V 06644500  
 CAP ELECT 220UF 16V SH CAN 06633000  
 CAP ELECT 47UF 10V BP 06637800  
 MON CER 0.001MF 100V NPO 06126200  
 DIODE SILICON 07004700  
 DIODE SILICON 07004700  
 IC OPERATIONAL AMPLIFIER 13318900  
 74HC00N NAND 2 INPUT X 4 13316100  
 IC AND 2 INPUT X 4 13317500  
 SSM2404P QUAD AUDIO SW 13320900  
 QUAD SPST SWITCH 13330000  
 TIMER 13314100  
 IC 100MA VIDEO OP AMP 13328900  
 IC REGULATOR 15V 13315400  
 ML CONN 3-POS MTS100 NRML 11721400  
 4-PIN CONNECTOR 11721500  
 2-PIN MALE CONNECTOR 11721300  
 HEADER 5 POS RIGHT ANGLE 11767100  
 4-PIN CONNECTOR 11721500  
 ML CONN 6-POS FRICTION LK 11721800  
 PJ261G PHON JACK, GOLD 11743600  
 PH JACK YEL GOLD FLASHED 11757200  
 2-PIN MALE CONNECTOR 11721300  
 MINI JACK 11749400  
 TRANSISTOR NPN 2K/REEL 13222300  
 RES NETWORK 2X220K ISO 14426200  
 RES CF 470K 5% 1/4W 14111200  
 RES CF 2.2M 5% 1/4W 14112400

R11 R16 R19 R24 R25 R30 R63 R68  
 R12 R20 R29 R67  
 R13 R21 R28 R34 R35 R40 R41 R45  
 R14 R22 R27 R65  
 R15 R23 R26 R64  
 R33 R42 R47 R53 R59 R71 R77 R83  
 R36 R39 R44 R62 R97 R98 R102  
 R37 R48 R51 R52  
 R46 R60 R61 R66  
 R54 R56 R72 R74 R78 R80 R86 R88  
 R55 R73 R79 R87  
 R57 R58 R75 R76 R81 R82 R89 R90  
 R85 R101 R105 R106 R110 R111 R112  
 R91 R93 R99 R100  
 R92 R94 R95 R96 R103 R104  
 R109 R113 R114 R115 R116  
 R117 R118 R119 R120 R121  
 R122 R123 R124 R125

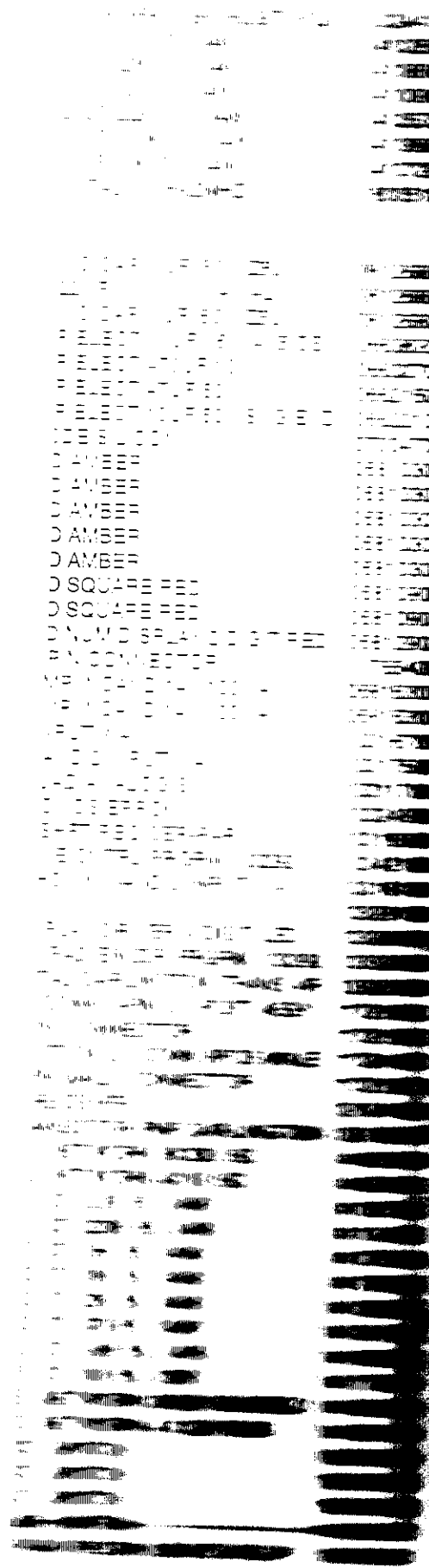
**049453 OUTPUT PCB**

C1 C2 C3 C4 C5 C6 C7 C8 C9 C10  
 C11 C12 C13 C14 C15 C16 C17 C18  
 C19 C20 C21 C22 C23 C24 C25 C26  
 C27 C28 C29 C30 C31 C32 C33 C34  
 C35 C36 C37 C38 C39 C40 C41 C42  
 C43 C44 C45 C46 C47 C48 C49 C50  
 C51 C52 C103 C183 C184 C185 C186  
 C53 C54 C55 C56 C57 C58 C59 C60  
 C61 C62 C63 C64 C65 C66 C67 C68  
 C69 C70 C71 C72 C73 C74 C75 C76  
 C77 C78 C79 C80 C81 C82 C83 C84  
 C85 C86 C87 C88 C89 C90 C91 C92  
 C93 C94 C95 C96 C97 C98 C99 C101  
 C100  
 C102 C189 C190 C191 C192 C193  
 C109 C110 C111 C112 C113 C114  
 C115 C116 C117 C118 C119 C120  
 C121 C122 C123 C124  
 C125 C126 C127 C128 C129 C130  
 C131 C132 C133 C134 C135 C136  
 C137 C137 C138 C140  
 C141 C142 C143 C144 C145 C146  
 C147 C148 C149 C150 C151 C152  
 C153 C154 C155 C156  
 C157 C160 C161 C164 C165 C168  
 C158 C159 C162 C163 C166 C167  
 C169 C172  
 C170 C171  
 C173 C174 C175 C176 C177 C178  
 C179 C180  
 C187 C188  
 C194 C195 C196  
 C197 C198 C199 C200 C201 C202  
 C203 C204 C205 C206 C207 C208  
 C209 C210 C211 C212  
 D1 D2  
 IC1 IC2 IC3 IC4 IC5 IC6 IC7 IC8  
 IC9 IC10 IC11 IC12 IC13 IC14 IC15  
 IC16 IC17 IC18 IC19 IC20 IC27  
 IC21 IC22 IC23 IC24  
 IC25  
 IC26  
 IC28 IC29 IC30  
 J1 J2 J3 J4

R11 R16 R19 R24 R25 R30 R63 R68	RES CF 100 5% 1/4W	14102500
R12 R20 R29 R67	RES MF 51.1K 1% 1/4W	14415500
R13 R21 R28 R34 R35 R40 R41 R45	RES CF 1.0K 5% 1/4W	14104900
R14 R22 R27 R65	RES MF 27.4K 1% 1/4W	14414100
R15 R23 R26 R64	RES MF 31.6K 1% 1/4W	14414800
R33 R42 R47 R53 R59 R71 R77 R83 R84	RES CF 10 5% 1/4W	14113600
R36 R39 R44 R62 R97 R98 R102	RES CF 22K 5% 1/4W	14108000
R37 R48 R51 R52	RES CF 330 5% 1/4W	14103700
R46 R60 R61 R66	RES CF 1.0K 5% 1/4W	14104900
R54 R56 R72 R74 R78 R80 R86 R88	RES CF 820 5% 1/4W	14104700
R55 R73 R79 R87	RES CF 10K 5% 1/4W	14107200
R57 R58 R75 R76 R81 R82 R89 R90	RES CF 75 5% 1/4W	14115700
R85 R101 R105 R106 R110 R111 R112	RES CF 10 5% 1/4W	14113600
R91 R93 R99 R100	RES CF 2.2K 5% 1/4W	14105700
R92 R94 R95 R96 R103 R104	RES CF 220K 5% 1/4W	14110400
R109 R113 R114 R115 R116	RES CF 22K 5% 1/4W	14108000
R117 R118 R119 R120 R121	RES POLYSWITCH RXE030	14424000
R122 R123 R124 R125	RES CF 1.0 5% 1/4W	14100100

**049453 OUTPUT PCB**

C1 C2 C3 C4 C5 C6 C7 C8 C9 C10	MONO CAP .1UF, 50V, Z5U	06126800
C11 C12 C13 C14 C15 C16 C17 C18	MONO CAP .1UF, 50V, Z5U	06126800
C19 C20 C21 C22 C23 C24 C25 C26	MONO CAP .1UF, 50V, Z5U	06126800
C27 C28 C29 C30 C31 C32 C33 C34	MONO CAP .1UF, 50V, Z5U	06126800
C35 C36 C37 C38 C39 C40 C41 C42	MONO CAP .1UF, 50V, Z5U	06126800
C43 C44 C45 C46 C47 C48 C49 C50	MONO CAP .1UF, 50V, Z5U	06126800
C51 C52 C103 C183 C184 C185 C186	MONO CAP .1UF, 50V, Z5U	06126800
C53 C54 C55 C56 C57 C58 C59 C60	MONO CAP .1UF, 50V, Z5U	06126800
C61 C62 C63 C64 C65 C66 C67 C68	CAP ELECT 10UF 50V	06644500
C69 C70 C71 C72 C73 C74 C75 C76	CAP ELECT 10UF 50V	06644500
C77 C78 C79 C80 C81 C82 C83 C84	CAP ELECT 10UF 50V	06644500
C85 C86 C87 C88 C89 C90 C91 C92	CAP ELECT 10UF 50V	06644500
C93 C94 C95 C96 C97 C98 C99 C101	CAP ELECT 10UF 50V	06644500
C100	CAP ELECT 1000UF 10V 10X12.5	06639200
C102 C189 C190 C191 C192 C193	CAP ELECT 10UF 50V	06644500
C109 C110 C111 C112 C113 C114	CAP M POLY .22UF 5% 63VDC	06432900
C115 C116 C117 C118 C119 C120	CAP M POLY .22UF 5% 63VDC	06432900
C121 C122 C123 C124	CAP M POLY .22UF 5% 63VDC	06432900
C125 C126 C127 C128 C129 C130	CAP M POLY .033UF 5% 63VDC	06431800
C131 C132 C133 C134 C135 C136	CAP M POLY .033UF 5% 63VDC	06431800
C137 C137 C138 C140	CAP M POLY .033UF 5% 63VDC	06431800
C141 C142 C143 C144 C145 C146	CAP ELECT 22UF 50V 20%	06624000
C147 C148 C149 C150 C151 C152	CAP ELECT 22UF 50V 20%	06624000
C153 C154 C155 C156	CAP ELECT 22UF 50V 20%	06624000
C157 C160 C161 C164 C165 C168	CAP ELECT 47UF 10V BP	06637800
C158 C159 C162 C163 C166 C167	CAP ELECT 47UF 50V	06621500
C169 C172	CAP ELECT 47UF 10V BP	06637800
C170 C171	CAP ELECT 47UF 50V	06621500
C173 C174 C175 C176 C177 C178	CAP M POLY .1UF 10% 100VDC	06425400
C179 C180	CAP M POLY .1UF 10% 100VDC	06425400
C187 C188	MONO CAP .1UF, 50V, Z5U	06126800
C194 C195 C196	CAP ELECT 10UF 50V	06644500
C197 C198 C199 C200 C201 C202	DISC CAP 470PF 10% 25F 50V	06120900
C203 C204 C205 C206 C207 C208	DISC CAP 470PF 10% 25F 50V	06120900
C209 C210 C211 C212	DISC CAP 470PF 10% 25F 50V	06120900
D1 D2	DIODE SILICON	07004700
IC1 IC2 IC3 IC4 IC5 IC6 IC7 IC8	DUAL OPERATIONAL AMP	13326000
IC9 IC10 IC11 IC12 IC13 IC14 IC15	DUAL OPERATIONAL AMP	13326000
IC16 IC17 IC18 IC19 IC20 IC27	DUAL OPERATIONAL AMP	13326000
IC21 IC22 IC23 IC24	IC 2CHANNEL AUDIO ATTNTR	13328100
IC25	IC REG +5 VOLT	13309300
IC26	IC REG -5V TO92 100MA	13326900
IC28 IC29 IC30	DUAL OPERATIONAL AMP	13326000
J1 J2 J3 J4	PJ261G PHON JACK, GOLD	11743600



J5- J6- J7- J8- J9- J10- J11- J12- J18-  
 J13- J14- J15- J16-  
 J17-  
 R1 R2 R3 R4 R5 R6 R7 R8 R9 R10  
 R11 R12  
 R13 R14 R15 R16 R17 R18 R19  
 R20 R21 R22 R23 R24 R25 R26  
 R27 R28  
 R29 R53 R54 R55 R56 R60 R61 R62  
 R30 R32 R90 R92 R122 R124 R154  
 R31 R33 R89 R91 R121 R123 R153  
 R34 R35 R48 R49 R73 R74 R87 R88  
 R36 R47 R75 R86 R107 R118 R139  
 R37 R38 R45 R46 R76 R77 R84 R85  
 R39 R44 R78 R83 R110 R115 R142  
 R40 R43 R79 R82 R111 R114 R143  
 R41 R42 R80 R81 R112 R113 R144  
 R50 R51 R52 R57 R58 R59 R63 R64  
 R65 R70 R71 R72 R95 R96 R97 R102  
 R66 R67 R68 R69 R93 R94 R98 R99  
 R100 R101 R125 R126 R130 R131  
 R103 R104 R127 R128 R129 R134  
 R105 R106 R119 R120 R137 R138  
 R108 R109 R116 R117 R140 R141  
 R132 R133  
 R135 R161  
 R136 R162 R163 R164 R165 R166  
 R145 R157 R158 R159 R160  
 R146  
 R147  
 R148 R149  
 R150  
 R151 R152  
 R155  
 R156  
 R167 R168  
 R169 R170 R171 R172  
 R173 R174 R175 R176 R177 R178  
 R179 R180  
 S1 S2 S3 S4

4-PIN CONNECTOR 11721500  
 DIN CONN 7-PIN 11738300  
 FRICTION LK CONN 9POS MALE 11724400  
 POT DUAL WITH TAP 13448000  
 POT DUAL WITH TAP 13448000  
 RES NETWORK 2X220K ISO 14426200  
 RES NETWORK 2X220K ISO 14426200  
 RES NETWORK 2X220K ISO 14426200  
 RES CF 47 5% 1/4W 14115200  
 RES MF 2.67K 1% 1/4W 14412100  
 RES MF 499 1% 1/4W 14408700  
 RES CF 2.7K 5% 1/4W 14105900  
 RES CF 43K 5% 1/4W 14108700  
 RES CF 100K 5% 1/4W 14109600  
 RES CF 680 5% 1/4W 14104500  
 RES CF 470 5% 1/4W 14104100  
 RES CF 2.2K 5% 1/4W 14105700  
 RES MF 20K 1% 1/4W 14410400  
 RES MF 20K 1% 1/4W 14410400  
 RES CF 47 5% 1/4W 14115200  
 RES CF 47 5% 1/4W 14115200  
 RES MF 20K 1% 1/4W 14410400  
 RES CF 2.7K 5% 1/4W 14105900  
 RES CF 100K 5% 1/4W 14109600  
 RES CF 47 5% 1/4W 14115200  
 RES MF 20K 1% 1/4W 14410400  
 RES MF 10K 1% 1/4W 14405300  
 RES CF 2.2K 5% 1/4W 14105700  
 RES CF 470 5% 1/4W 14104100  
 RES CF 680 5% 1/4W 14104500  
 RES CF 100K 5% 1/4W 14109600  
 RES CF 43K 5% 1/4W 14108700  
 RES CF 2.7K 5% 1/4W 14105900  
 RES MF 499 1% 1/4W 14408700  
 RES MF 2.67K 1% 1/4W 14412100  
 RES MF 10K 1% 1/4W 14405300  
 RESNET 3 X 220K OHM BUS 14432300  
 RES CF 1.0M 5% 1/4W 14112000  
 RES CF 1.0M 5% 1/4W 14112000  
 SLIDE SWITCH 14805900

Q6  
 R1 F  
 R14 F  
 R18  
 R19 F  
 R24  
 R25 F  
 Y1

**04946**

C18 C  
 C22  
 C28 C  
 C34 C  
 C38  
 C39 C  
 C44  
 D2 D3  
 DS1 D  
 DS9 D  
 DS16 D  
 DS23 D  
 DS30 D  
 DS33 D  
 DS39 D  
 DS46  
 DS46  
 DS48 D  
 DS54 D  
 IC1 IC2  
 IC2  
 IC3 IC1  
 IC4 IC1  
 IC5 IC1  
 IC6 IC1  
 IC7  
 IC8 IC  
 IC22  
 IC23  
 IC24  
 J1-  
 J2 J3-  
 J5- J15  
 J16-  
 MT1  
 Q1  
 R1 R2  
 R16  
 R19 R2  
 R22 R3  
 R25  
 R34 R3  
 R36 R-  
 R37 R5  
 R41  
 R42  
 R43 R-  
 R46 R-  
 S1 S2  
 S11 S1  
 S20 S2  
 S26  
 Y1 Y2

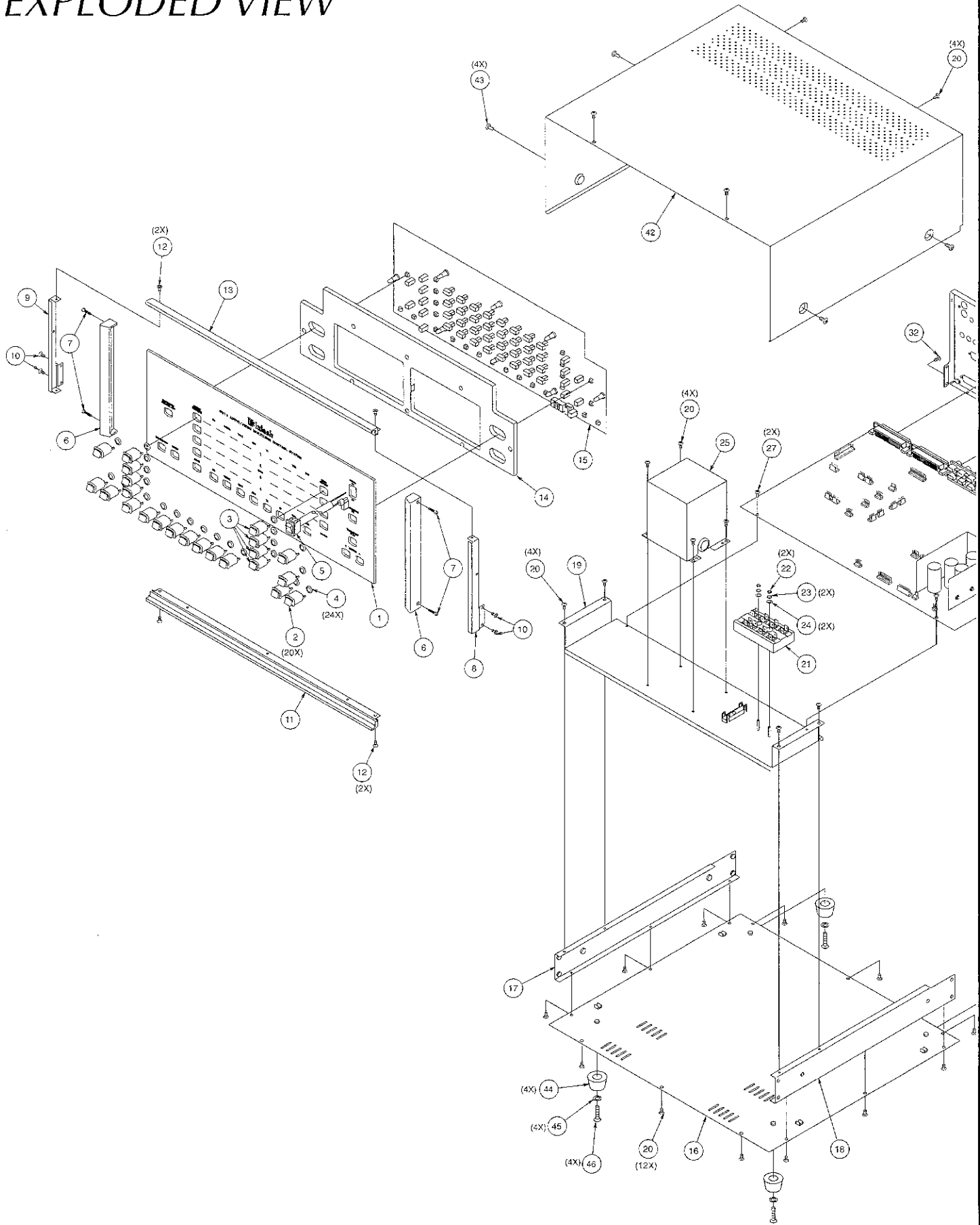
**049450 INTERFACE PCB**

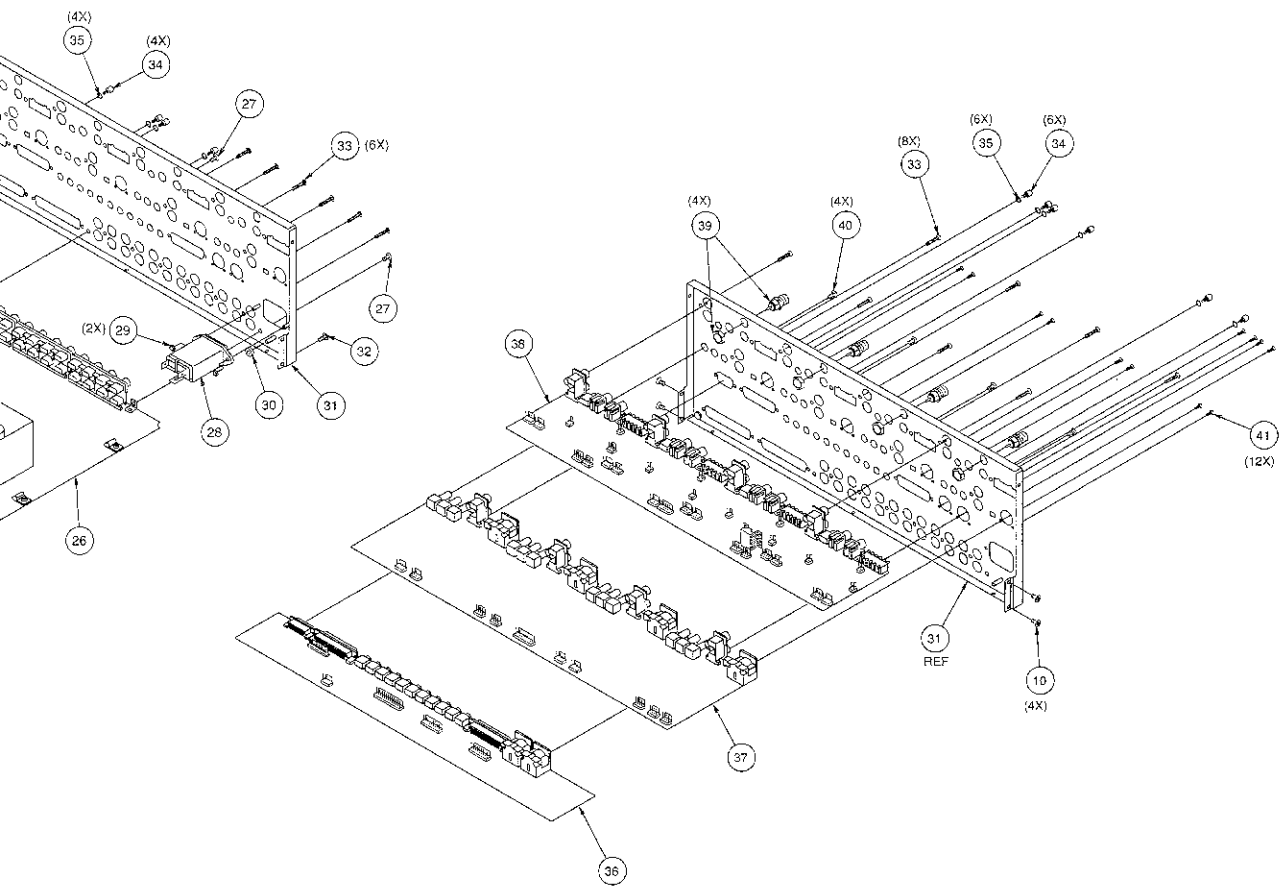
C14 C15  
 C66 C68 C69 C70 C71 C72  
 C67 C75  
 C73  
 D1 D2 D3 D4  
 IC1  
 IC2  
 IC3 IC4  
 IC5  
 J1- J14-  
 2-  
 J3-  
 J3 J5 J6 J7 J8 J9 J10 J11 J12 J13 J14  
 J4-  
 J5- J15-  
 J9-  
 J16  
 J17-  
 J18  
 L1 J2 L2  
 Q1 Q2 Q3 Q4  
 Q5

MONO CAP 33PF 06128500  
 M CAP .1UF 50V 5% Z50 T&R 06130500  
 MONO CAP .1UF, 50V, Z5U 06126800  
 CAP ELECT 220UF 25V 06650700  
 DIODE SILICON 07004700  
 CR16 RS232 PRGRMMD MICRO 13342200  
 IC RS232 LINE DRIVER 13338000  
 2 INPUT X 4 13316700  
 IC CMOS EPROM 13324900  
 FRICTION LK CONN 9POS MALE 11724400  
 D CONN 25-PIN 11750100  
 11-POS. MALE CONN. 11727900  
 MINI JACK 11749400  
 13-POS. CONNECTOR 11729800  
 DIN CONN 7-PIN 11738300  
 25 PIN MALE 11751700  
 D-SUBCONNECTOR 9-PIN 11750700  
 MALE CONN 6-POS FRCTN LK 11722300  
 4-PIN CONNECTOR 11721500  
 LEADED FERRITE BEADS 07601900  
 TRANSISTOR NPN 2K/REEL 13222300  
 TRANSISTOR NPN DAR 13209000

11721500	Q6	IC MICROPCSSR RESET POS	13324100
11738300	R1 R10 R11 R12 R13	RES CF 100 5% 1/4W	14102500
11724400	R14 R15 R16 R17	RES CF 22K 5% 1/4W	14108000
13448000	R18	RES CF 2.2 5% 1/4W	14100900
13448000	R19 R20 R21 R22	RES CF 2.2K 5% 1/4W	14105700
14426200	R24	RES CF 100K 5% 1/4W	14109600
14426200	R25 R26 R27	RES CF 10K 5% 1/4W	14107200
14115200	Y1	CRYSTAL 11.0592MHZ	18005100
14412100	<b>049460 FRONT PANEL PCB</b>		
14408700	C18 C19 C20 C21 C23 C24 C25 C26 C27	MONO CAP .1UF, 50V, Z5U	06126800
14105900	C22	.0022MF 10% 100V AXIAL	06126600
14108700	C28 C29 C30 C31 C32 C33 C45 C46	MONO CAP .1UF, 50V, Z5U	06126800
14109600	C34 C35 C36 C37	CAP ELECT 10UF 16V (4X5 CS)	06638200
14104500	C38	CAP ELECT 470UF 10V	06632700
14104100	C39 C40 C41 C42 C43	CAP ELECT 47UF 50V	06621500
14105700	C44	CAP ELECT 10UF 50V SNG END	06622100
14410400	D2 D3	DIODE SILICON	07004700
14410400	DS1 DS2 DS3 DS4 DS5 DS6 DS7 DS8	LED AMBER	05813300
14115200	DS9 DS10 DS11 DS12 DS13 DS14 DS15	LED AMBER	05813300
14115200	DS16 DS17 DS18 DS19 DS20 DS21 DS22	LED AMBER	05813300
14410400	DS23 DS24 DS25 DS26 DS27 DS28 DS29	LED AMBER	05813300
14105900	DS30 DS31 DS32	LED AMBER	05813300
14109600	DS33 DS34 DS35 DS36 DS37 DS38	LED SQUARE RED	05810900
14115200	DS39 DS40 DS41 DS42 DS44 DS45 DS47	LED SQUARE RED	05810900
14410400	DS46	LED NUM DISPLAY 2 DIGIT RED	05812900
14405300	DS46	10 PIN CONNECTOR	11765400
14105700	DS48 DS49 DS50 DS51 DS52 DS53	LAMP INCAND 14V 100MA	05815300
14104100	DS54 DS55	LAMP INCAND 14V 100MA	05815300
14104500	IC1 IC25	2 INPUT X 4	13316700
14109600	IC2	IC AND 2 INPUT X 4	13317500
14108700	IC3 IC13 IC17 IC21	QUAD ANALOG SW	13311700
14105900	IC4 IC10 IC14 IC18	IC CMOS EPROM	13324900
14408700	IC5 IC11 IC15 IC19	IC SHFT REG SER-PAR	13318600
14412100	IC6 IC12 IC16 IC20	ZONE CNTRL PRGRM 133292	13342100
14405300	IC7	74HC00N NAND 2 INPUT X 4	13316100
14432300	IC8 IC9	IC	13329100
14112000	IC22	DISPLAY DRIVER 4 DIGIT LED	13326800
14112000	IC23	KEYPAD ENCDR PRGRM 133292	13332900
14805900	IC24	OCTAL DARLINGTON TRANS AR	13325800
	J1-	ML CONN 5-PIN 0.1 POST ASSY	11721600
	J2 J3- J4- J6- J7- J9- J10- J12- J13-	4-PIN CONNECTOR	11721500
06128500	J5- J15-	FRICTION LK CONN 9POS MALE	11724400
06130500	J16-	2-PIN MALE CONNECTOR	11721300
06126800	MT1	IR RECEIVER	12104100
06650700	Q1	TRANSISTOR PNP DARLINGTON	13218200
07004700	R1 R2 R3 R4 R5	RES NETWORK 8X330 ISO	14426300
13342200	R16	RES NETWORK 4X1K ISO	14427600
13338000	R19 R20 R21 R38	RES CF 2.2K 5% 1/4W	14105700
13316700	R22 R33 R39 R40	RES CF 220K 5% 1/4W	14110400
13324900	R25	RES CF 15K 5% 1/4W	14107600
11724400	R34 R35 R48	RES CF 10K 5% 1/4W	14107200
11750100	R36 R49	RES CF 22K 5% 1/4W	14108000
11727900	R37 R50	RES CF 470 5% 1/4W	14104100
11749400	R41	RES CF 6.8K 5% 1/4W	14106800
11729800	R42	RES CF 100 5% 1/2W	14117000
11738300	R43 R44 R45	RES NETWORK 3X22K BUSSED	14425200
11751700	R46 R47	RES NETWORK 4 X 22K BUS	14423400
11750700	S1 S2 S3 S4 S5 S6 S7 S8 S9 S10	TACT SWITCH	15005800
11722300	S11 S12 S13 S14 S15 S16 S17 S19	TACT SWITCH	15005800
11721500	S20 S21 S22 S23 S24 S25	TACT SWITCH	15005800
07601900	S26	SLIDE SWITCH	14805900
13222300	Y1 Y2 Y3 Y4 Y5	CERAM RESON 6.0MHZ W/CAP	18003900
13209000			

# EXPLODED VIEW





# EXPLODED VIEW PARTS LIST

Ref. No.	Part No.	Description
1	016428	FRONT PANEL GLASS
2	017517	PUSHBUTTON ASSY BLK
3	017531	PUSHBUTTON ASSY RED
4	078033	O-RING
5	171061	POWER SWITCH
6	018650	END CAP
7	101042	TS 4-40 X 1/2 SLOT FILLISTER
8	004124	EXTRUSION BRACKET RIGHT
9	004125	EXTRUSION BRACKET LEFT
10	101172	TCS 6-32 X 1/4 PHIL FLAT U/C
11	018446	BOTTOM EXTRUSION
12	100147	MS 6-32 X 3/16 PHIL FLAT U/C
13	018411	TOP EXTRUSION
14	017701	PLEXIGLAS
15	049460	FRONT PANEL PCB ASSY
16	005147	BOTTOM COVER
17	004778	LEFT SIDE PANEL
18	004779	RIGHT SIDE PANEL
19	004758	CHASSIS TRAY
20	101054	TS 6-32 X 1/4 PH PAN TAPTITE BLK
21	074091	AC TERMINAL BLOCK
22	102022	MN 4-40 X 3/16 X 1/16
23	104004	LK WASHER 5 X .255 INT STAR
24	104001	FLAT STEEL WASHER 4 X 9/32 X .025
25	049511	TRANSFORMER ASSY
26	049451	INPUT PCB ASSY
27	101160	6-32 X 1/4 PHIL PAN TAPTITE
28	117638	AC RECEPTACLE WITH LINE FILTER
29	102001	KEP NUT 4-40 CADMIUM PLATE
30	102020	MACH NUT: 6-32 SELF-LOCK
31	005112	REAR PANEL
32	100109	6-32 X 5/16 PHIL PAN ZINC
33	101114	SM 4-40 X 1/2 PHIL PAN TYPE A
34	112015	STANDOFF
35	104142	LOCKWASHER 2.5mm INT STAR
36	049450	INTERFACE PCB ASSY
37	049453	OUTPUT PCB ASSY
38	049452	DATA I/O PCB ASSY
39	117369	COAX RECEPTACLE GOLD TYPE F
40	100157	MS 6-32 X 1/4 PHIL PAN ZINC
41	101161	TS 2-32 X 1/4 PHIL PAN TAPTITE
42	004209	TOP COVER
43	100056	8-32 X 3/8 PHIL PAN ZINC
44	017218	PLASTIC FEET-BLACK
45	104080	FLAT WASHER #10 CLEAR ZINC
46	100159	MS 10-32 X 3/4 PH PAN BLK ZINC

# NOTES



# REPACKING INSTRUCTION

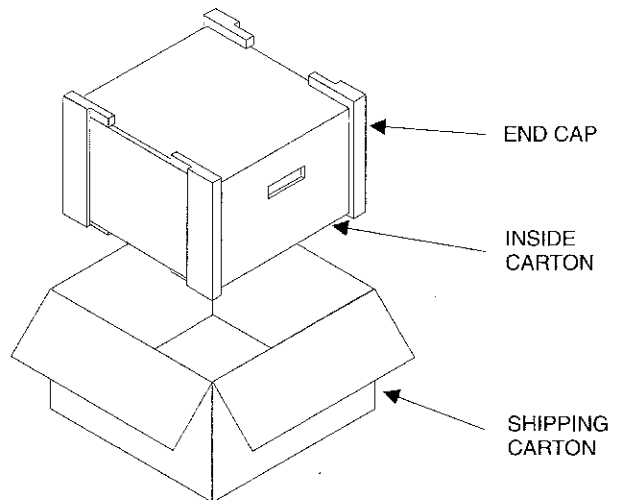
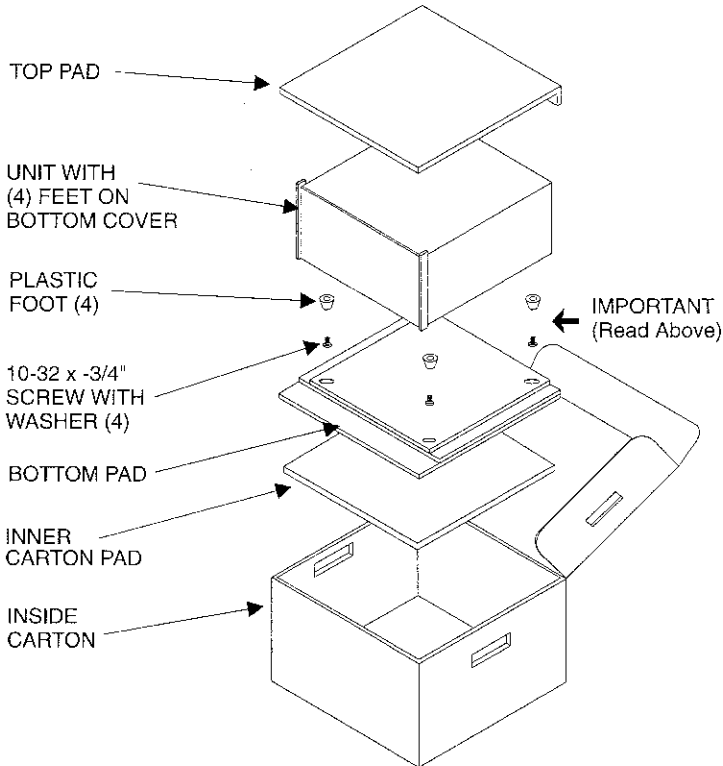
In the event it is necessary to repack the unit for shipment, the unit must be packed exactly as shown below.

**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.

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 in good serviceable condition.

Qty.	Part No.	Description
1	033762	Shipping carton only
4	033887	End cap
1	033620	Inside carton only
1	033726	Top pad
1	033729	Bottom pad
1	033622	Inner carton pad
4	017218	Plastic foot
4	100159	#10-32 x 3/4" screw
4	104080	#10 Flat washer
1	047920	Shipping carton complete with all the above parts



# CR16

## **AUDIO/VIDEO MULTIZONE CONTROL SYSTEM**

### SERVICE MANUAL

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.

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