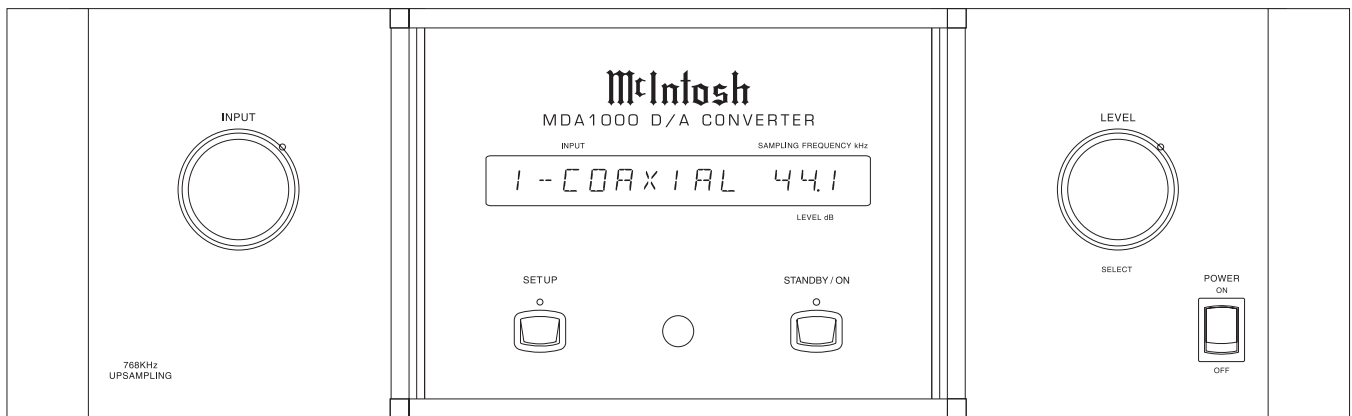




# MDA1000

## D/A CONVERTER



### CONTENTS

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# SERVICE MANUAL

# PERFORMANCE SPECIFICATIONS

## Analog Audio Specifications

### Frequency Response

+/-0.5dB from 4Hz to 45,000Hz

(Sampling Frequency – 96kHz and 88.2kHz)

+/-0.3dB from 4Hz to 22,000Hz

(Sampling Frequency – 48kHz)

+/-0.3dB from 4Hz to 20,000Hz

(Sampling Frequency – 44.1kHz)

+/-0.3dB from 4Hz to 15,000Hz

(Sampling Frequency – 32kHz)

### Total Harmonic Distortion

0.002% at 1,000Hz

### Signal To Noise Ratio

Better than 110dB (A Weighted)

### Dynamic Range

Better than 100dB (1,000Hz)

### Rated Output Voltage

2V Unbalanced Outputs (Bypass On Mode)

6V Unbalance Outputs (Bypass Off Mode)

2V Balanced Outputs (Bypass On Mode)

6V Balanced Outputs (Bypass Off Mode)

## Digital Audio Specifications

### Digital Audio Format

IEC958, S/PDIF

### Coaxial Inputs (1, 2 and 3)

0.5V p-p @ 75ohms

### Optical Inputs (4, 5 and 6)

-15 ~ -20dBm

### XRL Input (7)

5V p-p @ 110ohms

### Sampling Frequencies

96kHz, 48kHz, 44.1kHz and 32kHz

## General Specifications

### Power Requirements

100 Volts 50/60Hz, 20 watts

110 Volts 50/60Hz, 20 watts

120 Volts 50/60Hz, 20 watts

220 Volts 50/60Hz, 20 watts

230 Volts 50/60Hz, 20 watts

240 Volts 50/60Hz, 20 watts

*Note: Refer to the rear panel of the MDA1000 for the correct voltage.*

### Overall Dimensions

Width is 17-1/2 inches (44.45cm), Height is 6 inches


(15.24cm) including feet, Depth is 16-1/8 inches

(40.96cm) including Front Panel and Knobs

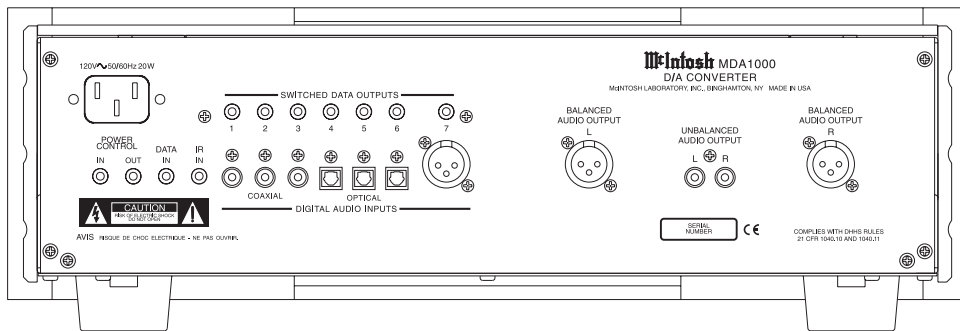
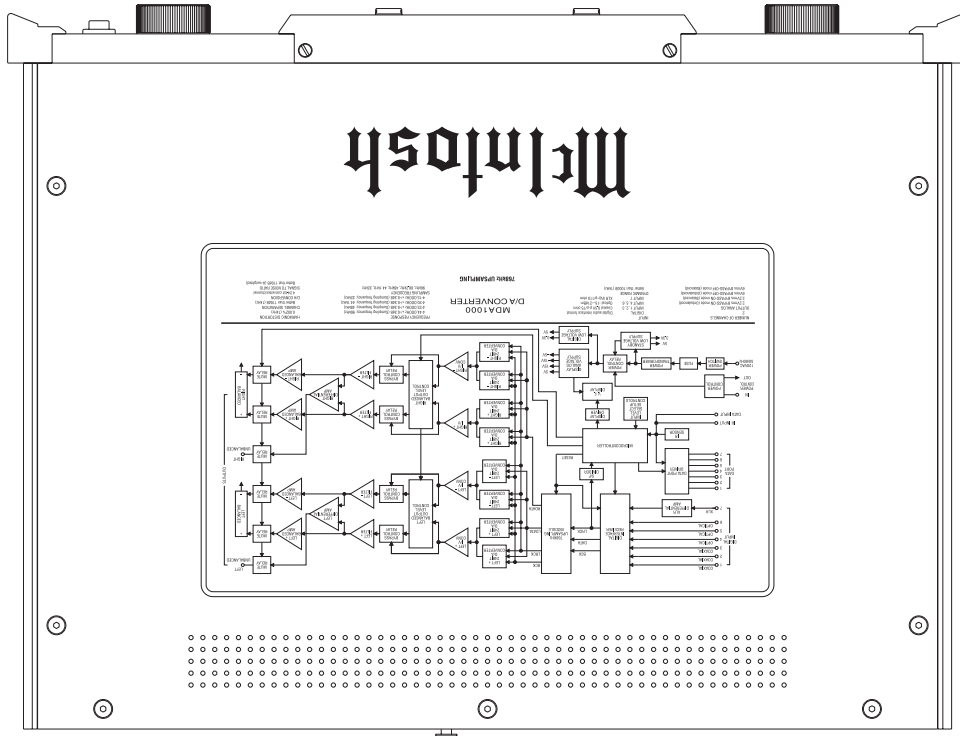
### Weight

24 pounds (10.89kg) net, 38 pounds (17.24kg) in shipping carton

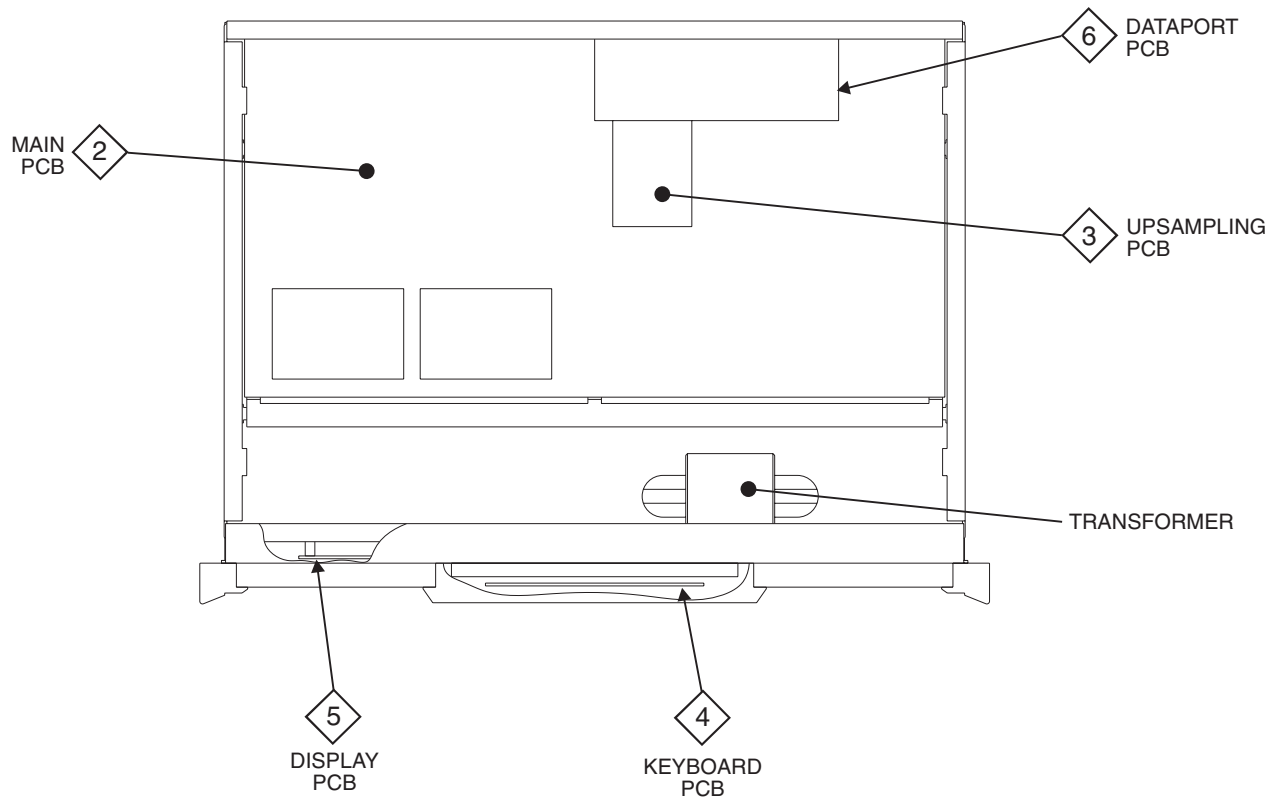
# NOTES

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.

# TOP AND REAR PANEL

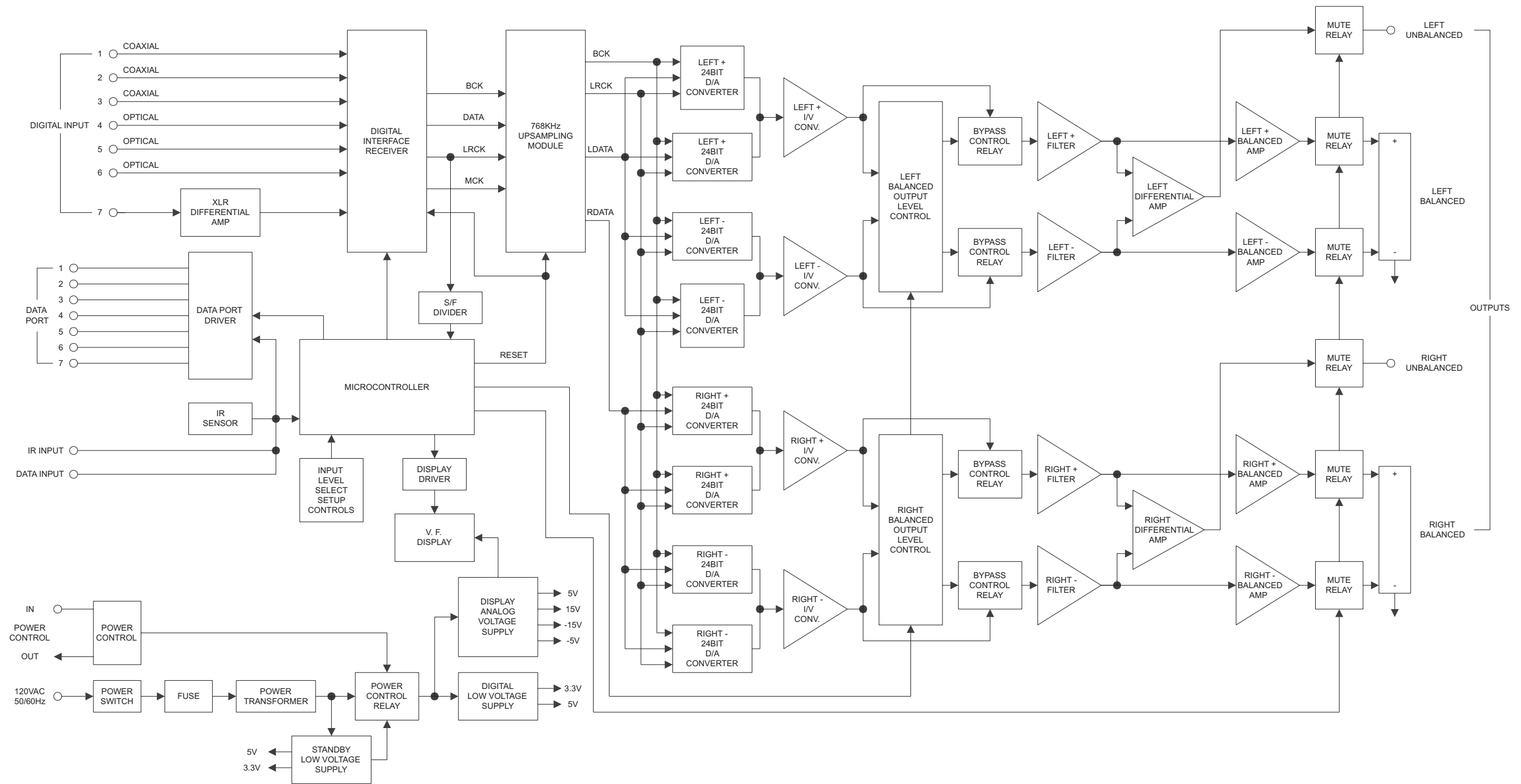


# SECTION LOCATIONS

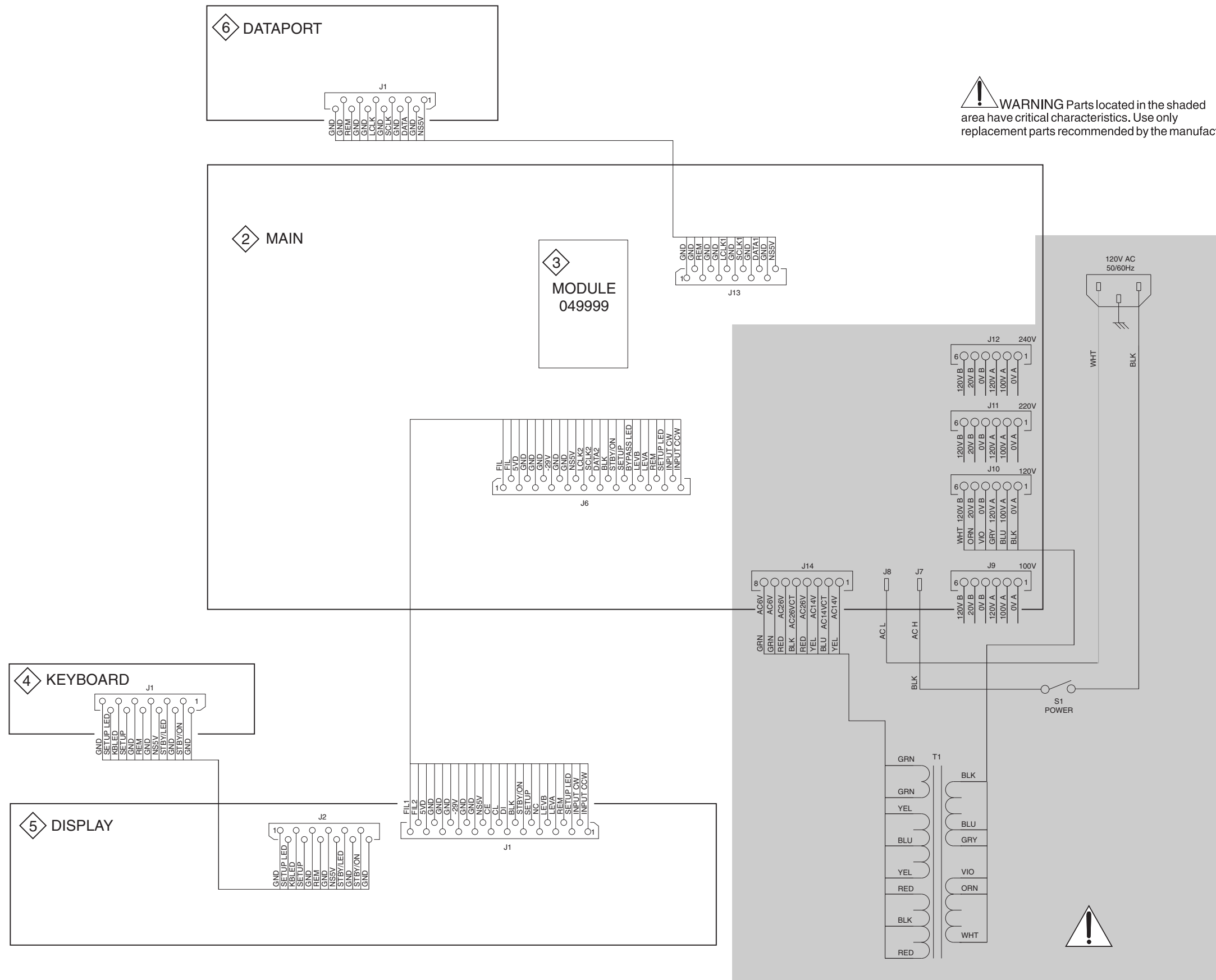


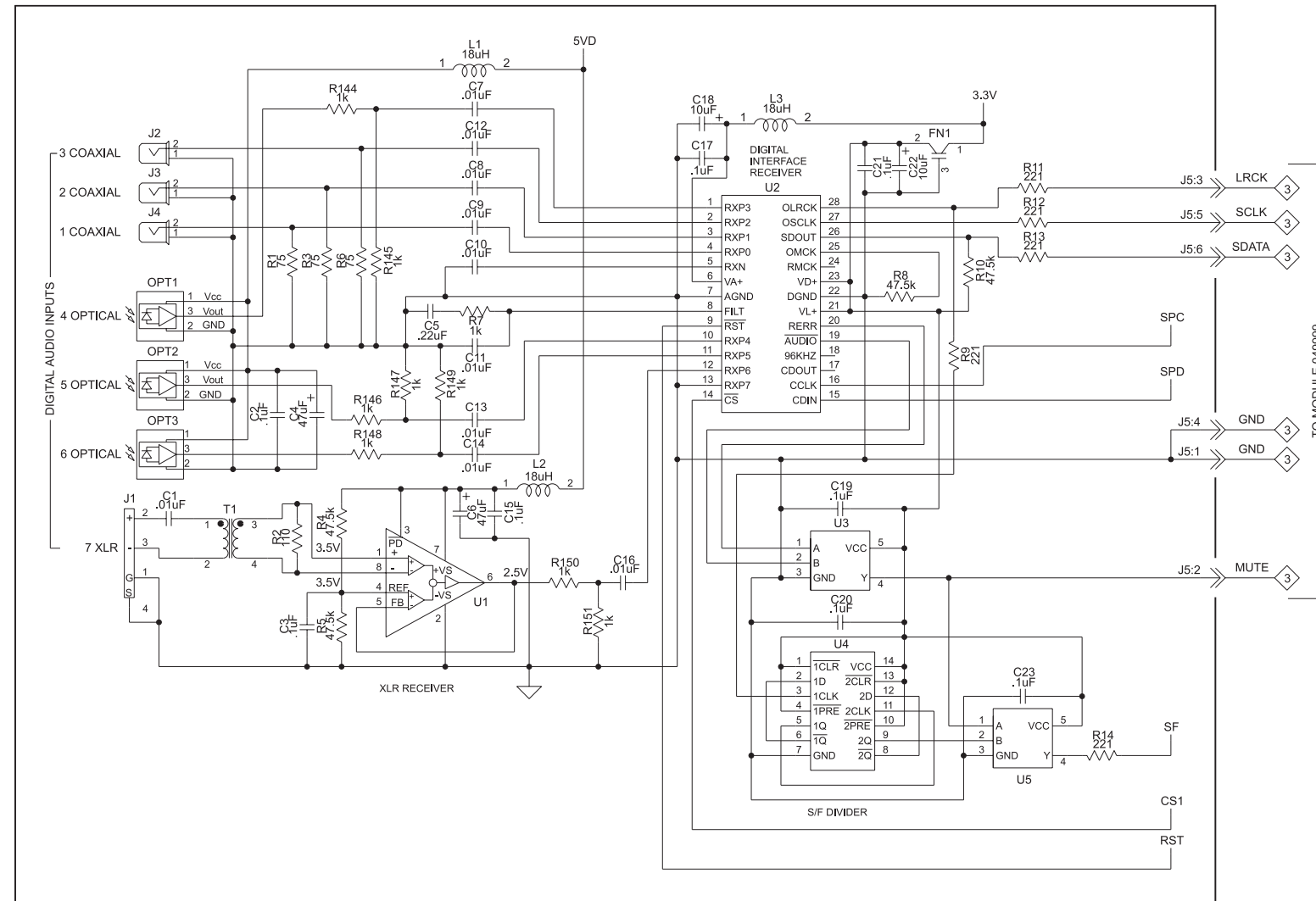
TOP VIEW WITH COVER REMOVED

# BLOCK DIAGRAM

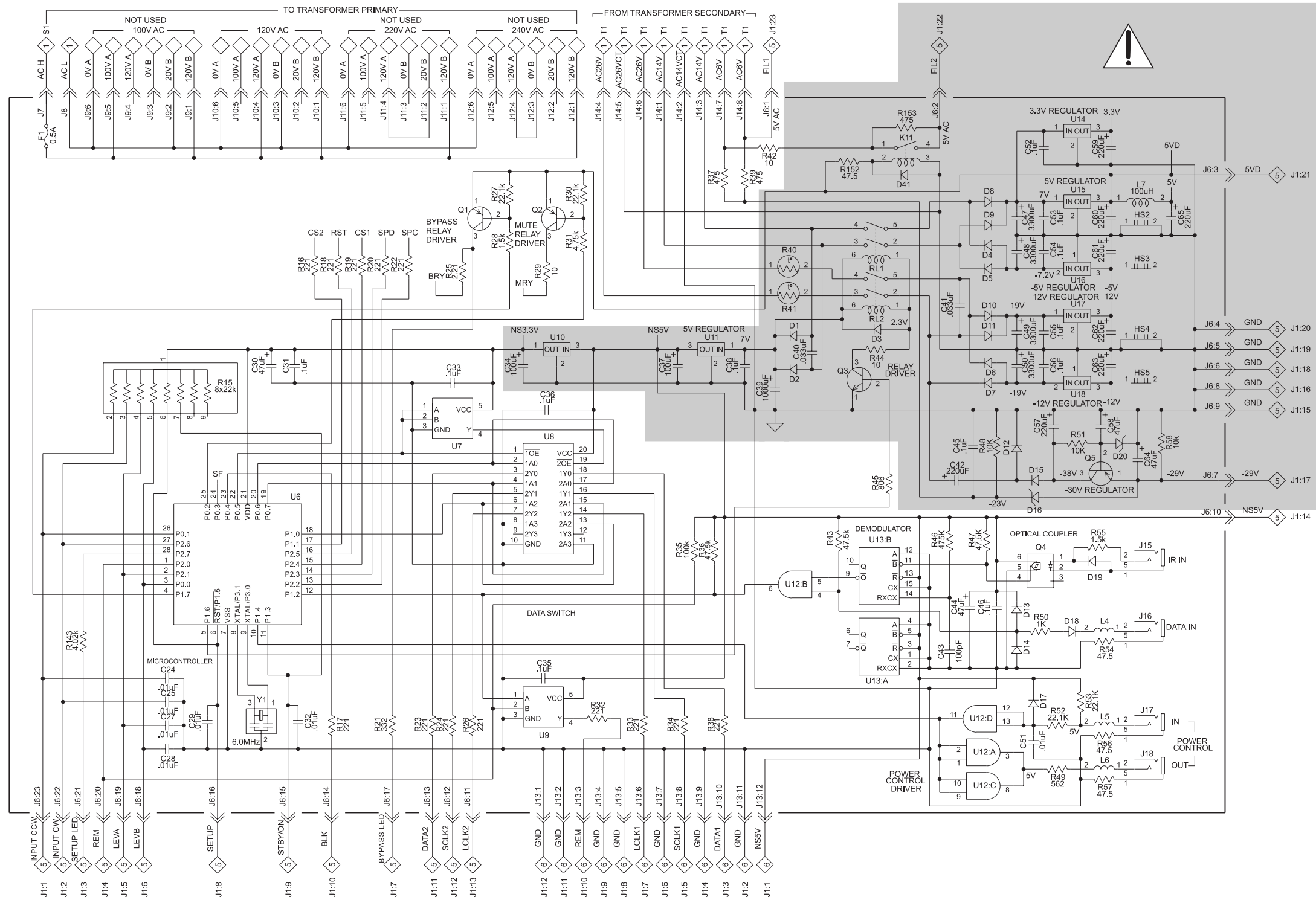


# 1 INTERCONNECT

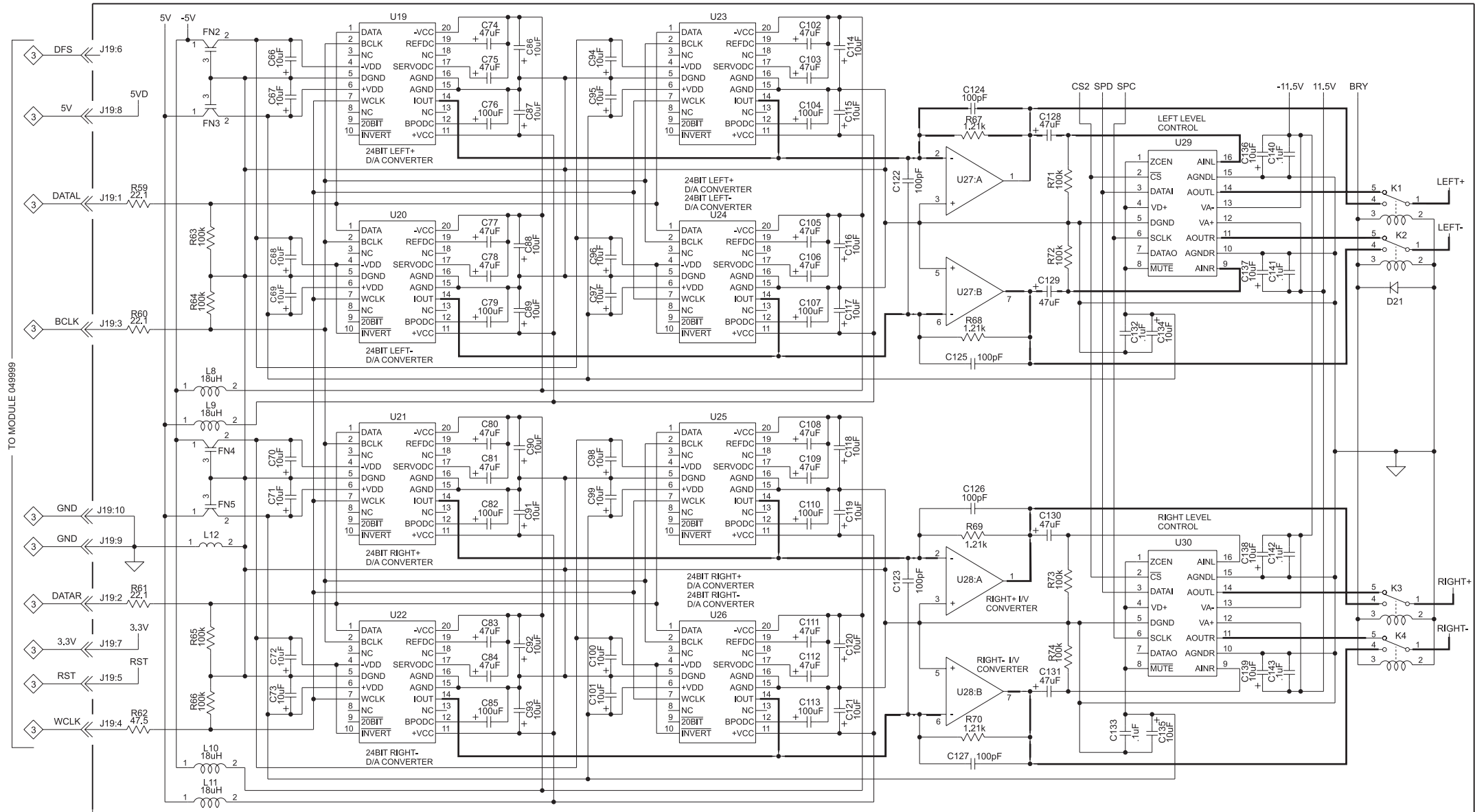


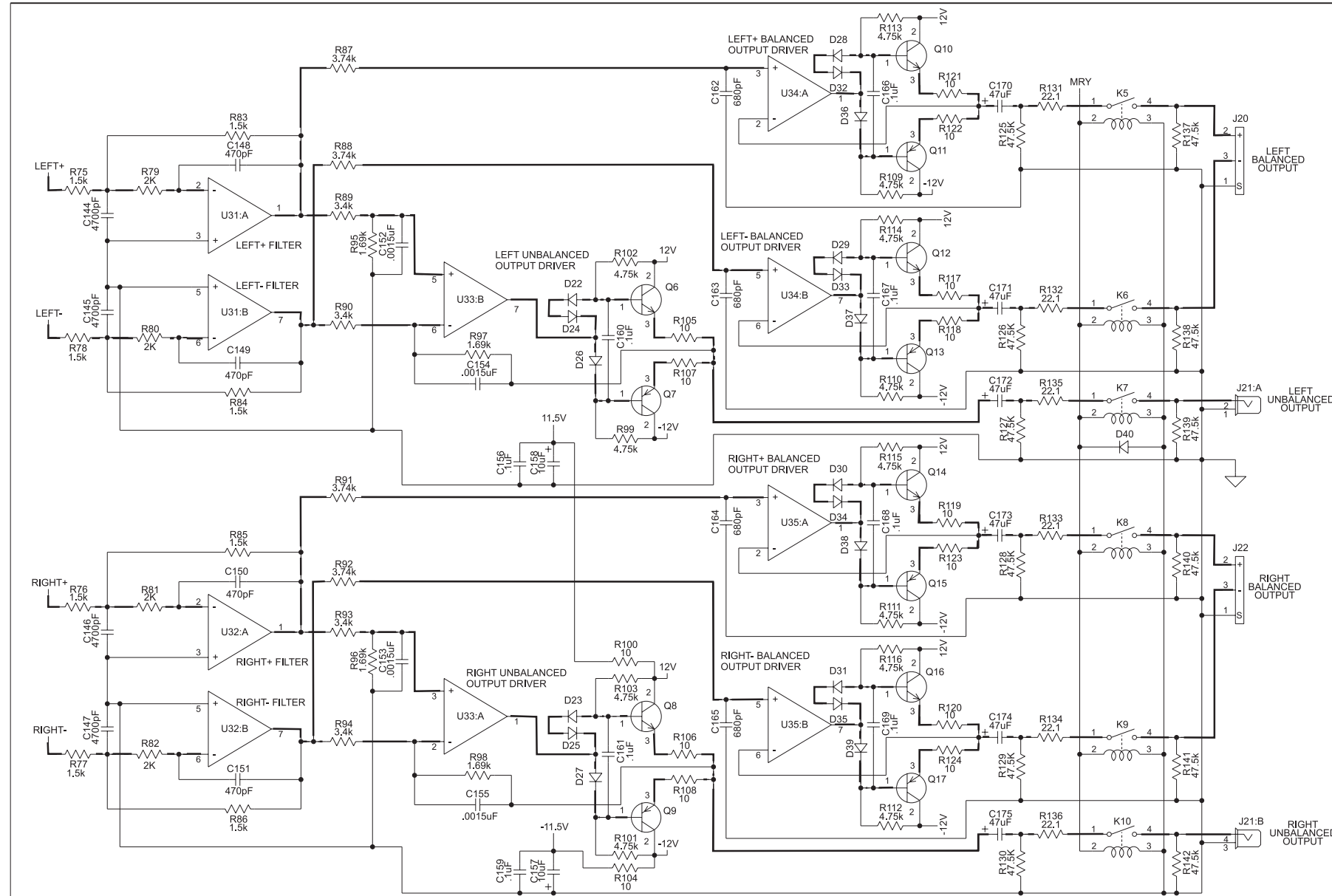


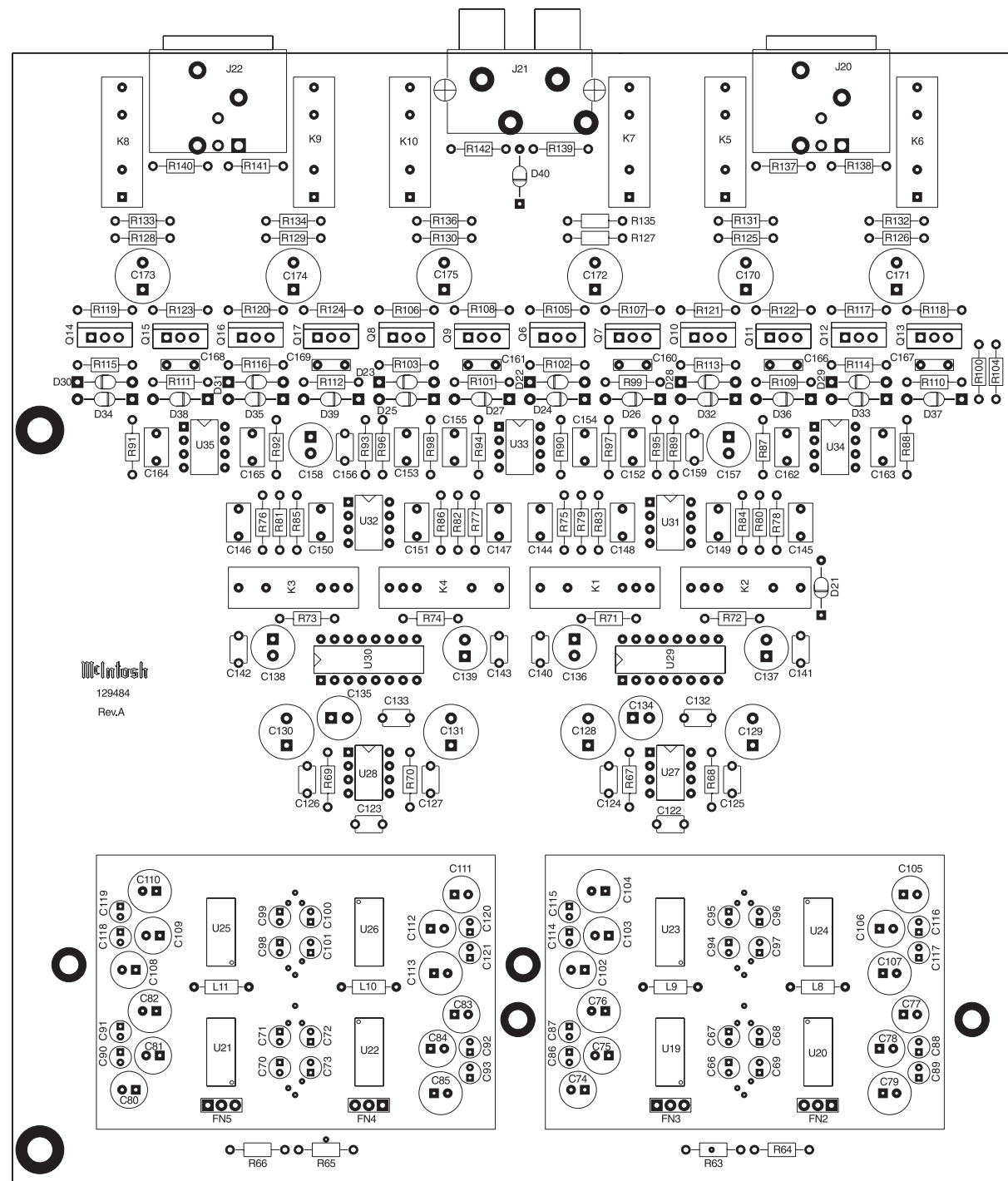
WARNING Parts located in the shaded area have critical characteristics. Use only replacement parts recommended by the manufacturer.



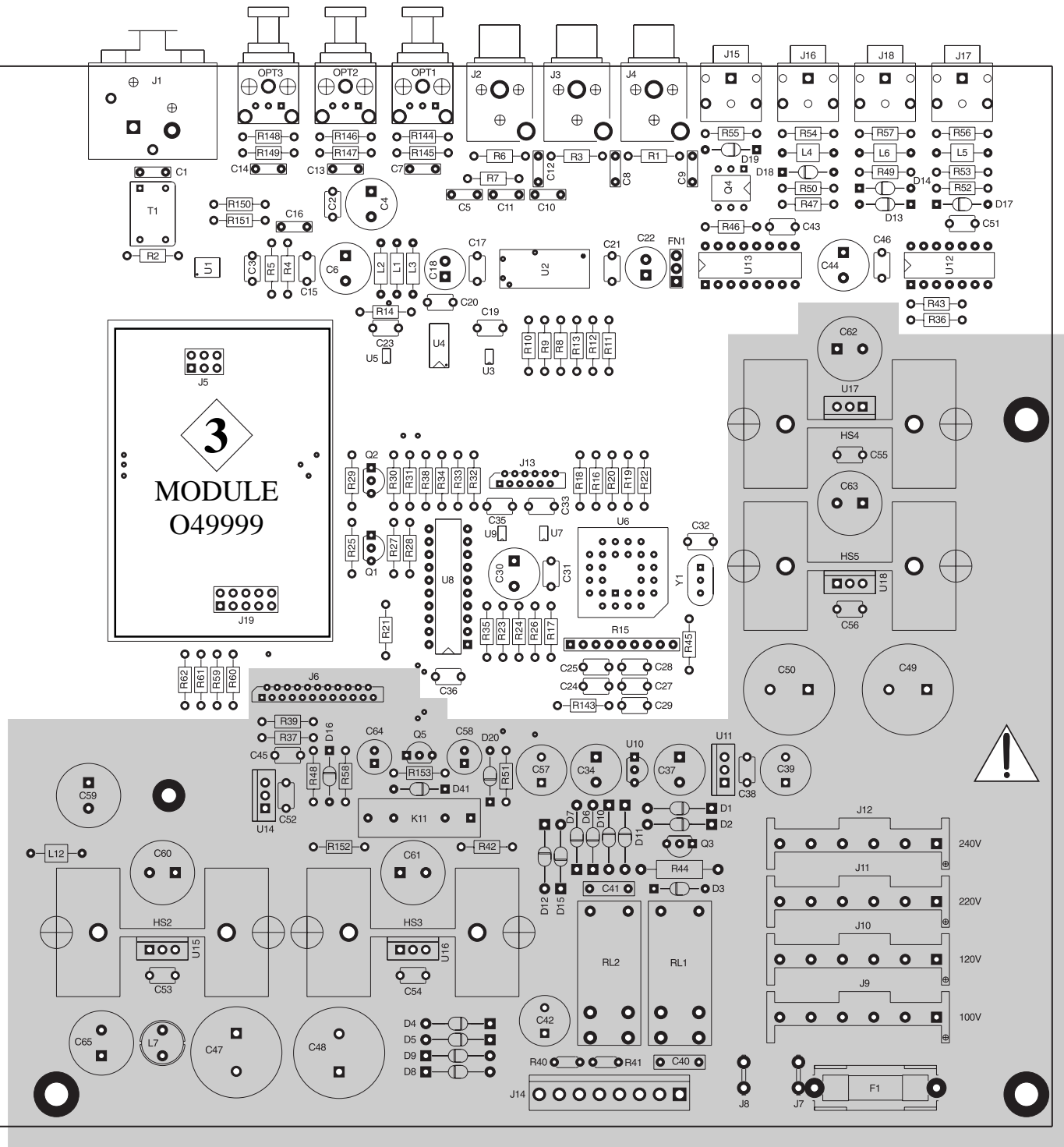






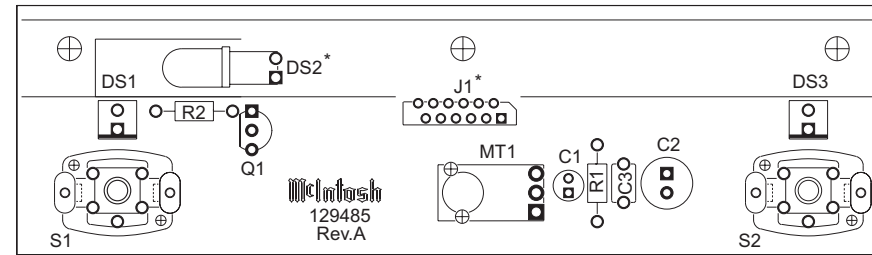
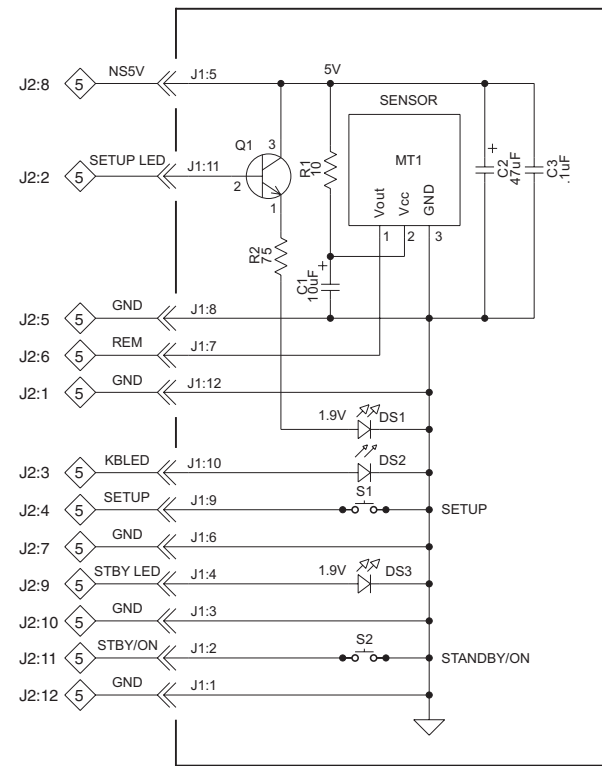


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 Rev.A



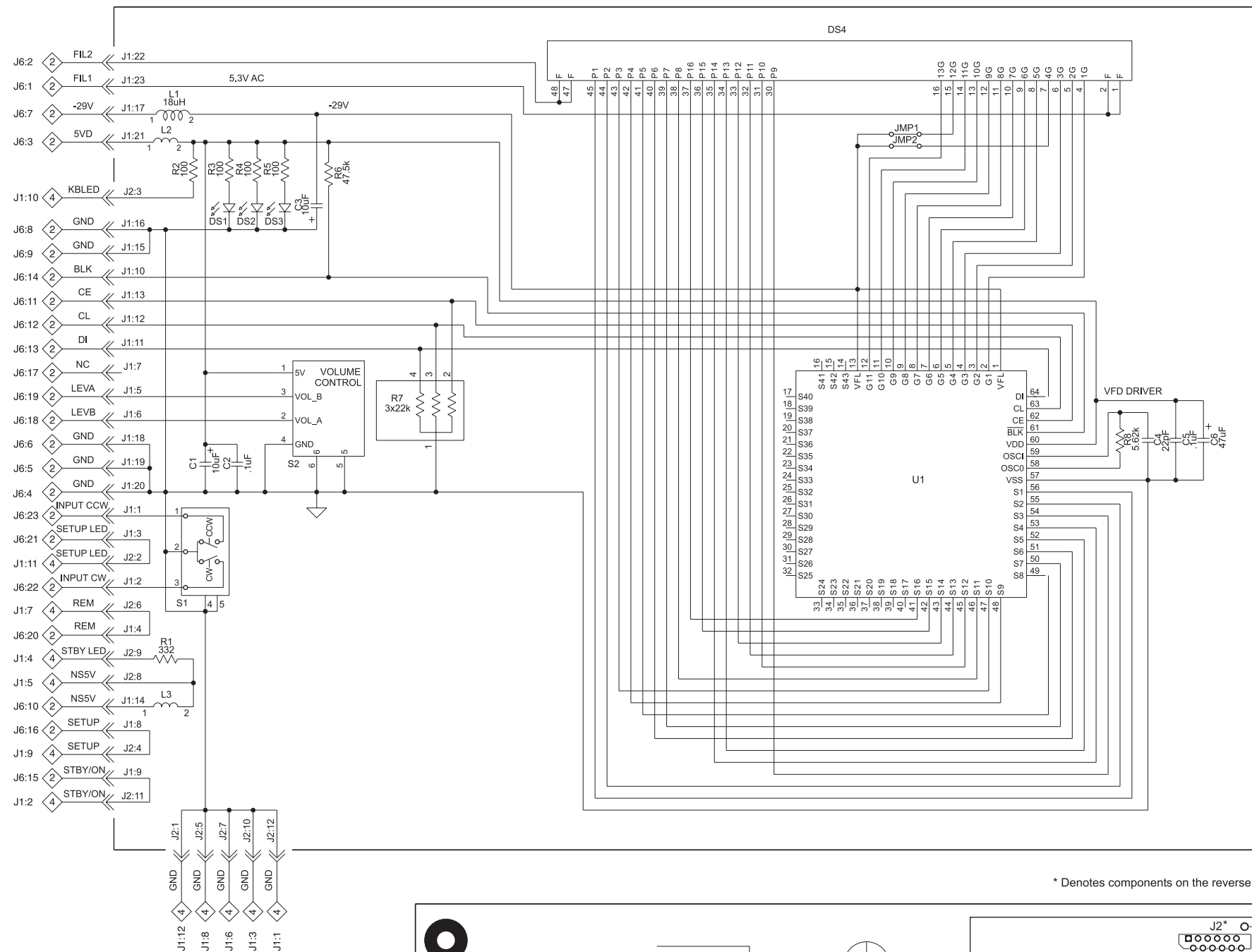
**WARNING** Parts located in the shaded area have critical characteristics. Use only replacement parts recommended by the manufacturer.

# 4 KEYBOARD 049990

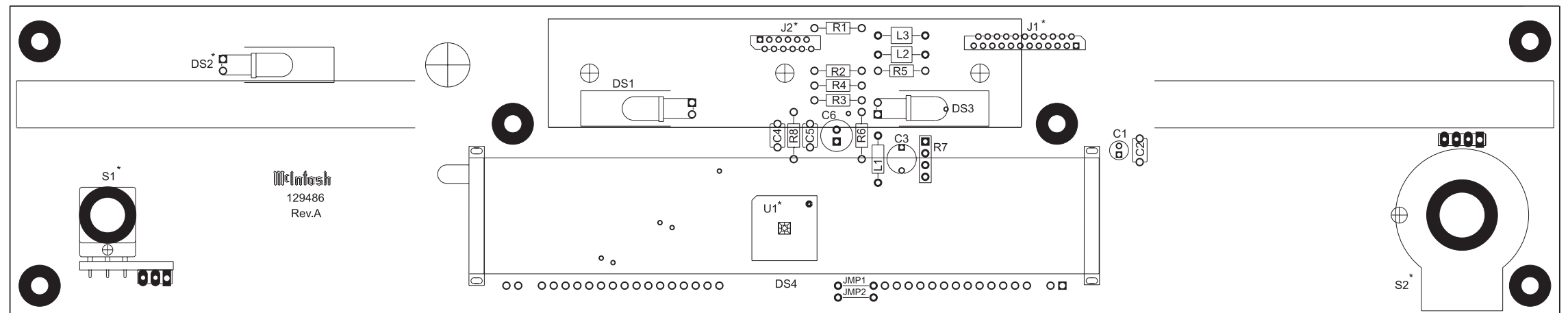


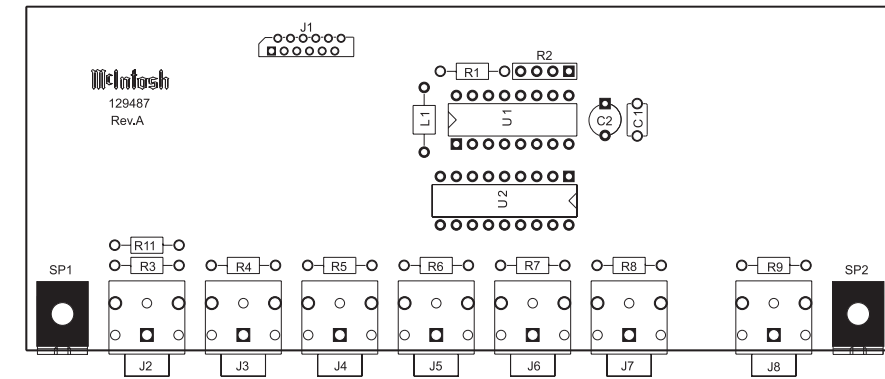
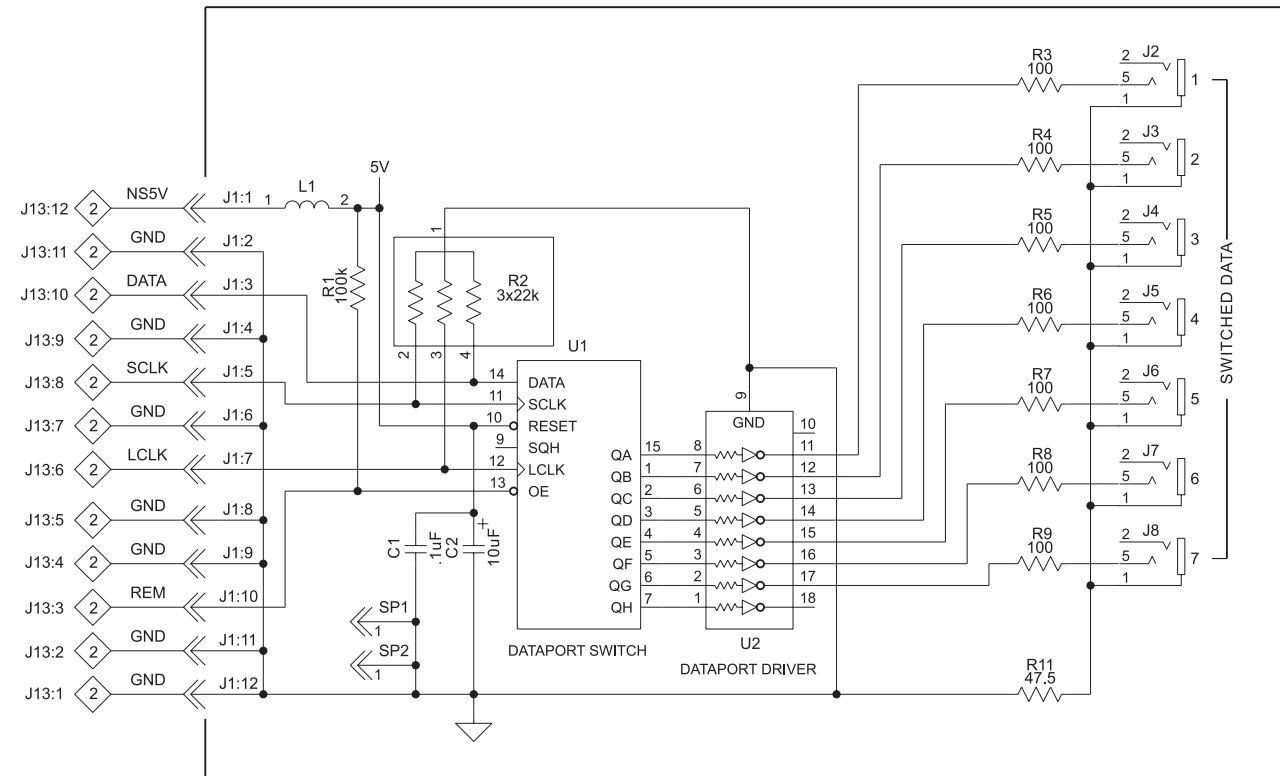
\* Denotes components on the reverse or backside of the Pc Bd

**5** DISPLAY 049989



\* Denotes components on the reverse or backside of the PCB





# MDA1000

## PARTS LIST

Ref. No.	Description	Part No.	Ref. No.	Description	Part No.	Ref. No.	Description	Part No.
<b>① MAIN PCB 049988</b>			C60	CAP ELECT 220UF 25V AUDIO	066414	C124	CAP MONO 100PF 100V 10% NPO	061300
C1	CAP MPF 0.01UF 5% 63VDC	064312	C61	CAP ELECT 220UF 25V AUDIO	066414	C125	CAP MONO 100PF 100V 10% NPO	061300
C2	CAP MONO .1uF 50V 20% Z5U	061305	C62	CAP ELECT 220UF 25V AUDIO	066414	C126	CAP MONO 100PF 100V 10% NPO	061300
C3	CAP MONO .1uF 50V 20% Z5U	061305	C63	CAP ELECT 220UF 25V AUDIO	066414	C127	CAP MONO 100PF 100V 10% NPO	061300
C4	CAP ELECT 47UF 25V	066413	C64	CAP ELECT 47UF 50V	066215	C128	CAP ELECT 47UF 25V	066413
C5	CAP MPF 0.022UF 5% 63VDC	064316	C65	CAP ELECT 220UF 25V AUDIO	066414	C129	CAP ELECT 47UF 25V	066413
C6	CAP ELECT 47UF 25V	066413	C66	CAP ELECT 10UF 16V 4X5 CASE	066382	C130	CAP ELECT 47UF 25V	066413
C7	CAP MPF 0.01UF 5% 63VDC	064312	C67	CAP ELECT 10UF 16V 4X5 CASE	066382	C131	CAP ELECT 47UF 25V	066413
C8	CAP MPF 0.01UF 5% 63VDC	064312	C68	CAP ELECT 10UF 16V 4X5 CASE	066382	C132	CAP MONO .1uF 50V 20% Z5U	061305
C9	CAP MPF 0.01UF 5% 63VDC	064312	C69	CAP ELECT 10UF 16V 4X5 CASE	066382	C133	CAP MONO .1uF 50V 20% Z5U	061305
C10	CAP MPF 0.01UF 5% 63VDC	064312	C70	CAP ELECT 10UF 16V 4X5 CASE	066382	C134	CAP ELECT 10UF 100VDC	066411
C11	CAP PF 0.001UF 5% 63VDC	064300	C71	CAP ELECT 10UF 16V 4X5 CASE	066382	C135	CAP ELECT 10UF 100VDC	066411
C12	CAP MPF 0.01UF 5% 63VDC	064312	C72	CAP ELECT 10UF 16V 4X5 CASE	066382	C136	CAP ELECT 10UF 100VDC	066411
C13	CAP MPF 0.01UF 5% 63VDC	064312	C73	CAP ELECT 10UF 16V 4X5 CASE	066382	C137	CAP ELECT 10UF 100VDC	066411
C14	CAP MPF 0.01UF 5% 63VDC	064312	C74	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C138	CAP ELECT 10UF 100VDC	066411
C15	CAP MONO .1uF 50V 20% Z5U	061305	C75	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C139	CAP ELECT 10UF 100VDC	066411
C16	CAP MPF 0.01UF 5% 63VDC	064312	C76	CAP ELECT 100UF 16V 5MM	066539	C140	CAP MONO .1uF 50V 20% Z5U	061305
C17	CAP MONO .1uF 50V 20% Z5U	061305	C77	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C141	CAP MONO .1uF 50V 20% Z5U	061305
C18	CAP ELECT 10UF 100VDC	066411	C78	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C142	CAP MONO .1uF 50V 20% Z5U	061305
C19	CAP MONO .1uF 50V 20% Z5U	061305	C79	CAP ELECT 100UF 16V 5MM	066539	C143	CAP MONO .1uF 50V 20% Z5U	061305
C20	CAP MONO .1uF 50V 20% Z5U	061305	C80	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C144	CAP POLYPROP 4700PF 2.5% 63VDC	064390
C21	CAP MONO .1uF 50V 20% Z5U	061305	C81	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C145	CAP POLYPROP 4700PF 2.5% 63VDC	064390
C22	CAP ELECT 10UF 100VDC	066411	C82	CAP ELECT 100UF 16V 5MM	066539	C146	CAP POLYPROP 4700PF 2.5% 63VDC	064390
C23	CAP MONO .1uF 50V 20% Z5U	061305	C83	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C147	CAP POLYPROP 4700PF 2.5% 63VDC	064390
C24	CAP MONO .01UF 50V 20% X7R	061304	C84	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C148	CAP POLYPROP 470PF 5% 100VDC	064370
C25	CAP MONO .01UF 50V 20% X7R	061304	C85	CAP ELECT 100UF 16V 5MM	066539	C149	CAP POLYPROP 470PF 5% 100VDC	064370
C27	CAP MONO .01UF 50V 20% X7R	061304	C86	CAP ELECT 10UF 16V 4X5 CASE	066382	C150	CAP POLYPROP 470PF 5% 100VDC	064370
C28	CAP MONO .01UF 50V 20% X7R	061304	C87	CAP ELECT 10UF 16V 4X5 CASE	066382	C151	CAP POLYPROP 470PF 5% 100VDC	064370
C29	CAP MONO .01UF 50V 20% X7R	061304	C88	CAP ELECT 10UF 16V 4X5 CASE	066382	C152	CAP POLYPROP .0015UF 5% 100VDC	064369
C30	CAP ELECT 47UF 25V	066413	C89	CAP ELECT 10UF 16V 4X5 CASE	066382	C153	CAP POLYPROP .0015UF 5% 100VDC	064369
C31	CAP MONO .1uF 50V 20% Z5U	061305	C90	CAP ELECT 10UF 16V 4X5 CASE	066382	C154	CAP POLYPROP .0015UF 5% 100VDC	064369
C32	CAP MONO .01UF 50V 20% X7R	061304	C91	CAP ELECT 10UF 16V 4X5 CASE	066382	C155	CAP POLYPROP .0015UF 5% 100VDC	064369
C33	CAP MONO .1uF 50V 20% Z5U	061305	C92	CAP ELECT 10UF 16V 4X5 CASE	066382	C156	CAP MONO .1uF 50V 20% Z5U	061305
C34	CAP ELECT 100UF 25V	066412	C93	CAP ELECT 10UF 16V 4X5 CASE	066382	C157	CAP ELECT 10UF 100VDC	066411
C35	CAP MONO .1uF 50V 20% Z5U	061305	C94	CAP ELECT 10UF 16V 4X5 CASE	066382	C158	CAP ELECT 10UF 100VDC	066411
C36	CAP MONO .1uF 50V 20% Z5U	061305	C95	CAP ELECT 10UF 16V 4X5 CASE	066382	C159	CAP MONO .1uF 50V 20% Z5U	061305
C37	CAP ELECT 100UF 25V	066412	C96	CAP ELECT 10UF 16V 4X5 CASE	066382	C160	CAP MPF 0.1UF 5% 63VDC	064325
C38	CAP MONO .1uF 50V 20% Z5U	061305	C97	CAP ELECT 10UF 16V 4X5 CASE	066382	C161	CAP MPF 0.1UF 5% 63VDC	064325
C39	CAP ELECT 1000UF 25V	066513	C98	CAP ELECT 10UF 16V 4X5 CASE	066382	C162	CAP POLYPROP 680PF 2.5% 100VDC	064389
C40	CAP MPF 0.033UF 100V 10%	064427	C99	CAP ELECT 10UF 16V 4X5 CASE	066382	C163	CAP POLYPROP 680PF 2.5% 100VDC	064389
C41	CAP MPF 0.033UF 100V 10%	064427	C100	CAP ELECT 10UF 16V 4X5 CASE	066382	C164	CAP POLYPROP 680PF 2.5% 100VDC	064389
C42	CAP ELECT 220UF 50V 20%	066254	C101	CAP ELECT 10UF 16V 4X5 CASE	066382	C165	CAP POLYPROP 680PF 2.5% 100VDC	064389
C43	CAP MONO 100PF 100V 10% NPO	061300	C102	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C166	CAP MPF 0.1UF 5% 63VDC	064325
C44	CAP ELECT 47UF 25V	066413	C103	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C167	CAP MPF 0.1UF 5% 63VDC	064325
C45	CAP MONO .1uF 50V 20% Z5U	061305	C104	CAP ELECT 100UF 16V 5MM	066539	C168	CAP MPF 0.1UF 5% 63VDC	064325
C46	CAP MONO .1uF 50V 20% Z5U	061305	C105	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C169	CAP MPF 0.1UF 5% 63VDC	064325
C47	CAP ELECT 3300UF 35V	066509	C106	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C170	CAP ELECT 47UF 25V	066413
C48	CAP ELECT 3300UF 35V	066509	C107	CAP ELECT 100UF 16V 5MM	066539	C171	CAP ELECT 47UF 25V	066413
C49	CAP ELECT 3300UF 35V	066509	C108	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C172	CAP ELECT 47UF 25V	066413
C50	CAP ELECT 3300UF 35V	066509	C109	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C173	CAP ELECT 47UF 25V	066413
C51	CAP MONO .01UF 50V 20% X7R	061304	C110	CAP ELECT 100UF 16V 5MM	066539	C174	CAP ELECT 47UF 25V	066413
C52	CAP MONO .1uF 50V 20% Z5U	061305	C111	CAP ELECT 47UF 16V 6.3X5 CASE	066380	C175	CAP ELECT 47UF 25V	066413
C53	CAP MONO .1uF 50V 20% Z5U	061305	C112	CAP ELECT 47UF 16V 6.3X5 CASE	066380	D1	DIODE RECTIFIER	070131
C54	CAP MONO .1uF 50V 20% Z5U	061305	C113	CAP ELECT 100UF 16V 5MM	066539	D2	DIODE RECTIFIER	070131
C55	CAP MONO .1uF 50V 20% Z5U	061305	C114	CAP ELECT 10UF 16V 4X5 CASE	066382	D3	DIODE SILICON	070047
C56	CAP MONO .1uF 50V 20% Z5U	061305	C115	CAP ELECT 10UF 16V 4X5 CASE	066382	D4	DIODE RECTIFIER	070131
C57	CAP ELECT 220UF 50V 20%	066254	C116	CAP ELECT 10UF 16V 4X5 CASE	066382	D5	DIODE RECTIFIER	070131
C58	CAP ELECT 47UF 50V	066215	C117	CAP ELECT 10UF 16V 4X5 CASE	066382	D6	DIODE RECTIFIER	070131
C59	CAP ELECT 220UF 25V AUDIO	066414	C118	CAP ELECT 10UF 16V 4X5 CASE	066382	D7	DIODE RECTIFIER	070131
			C119	CAP ELECT 10UF 16V 4X5 CASE	066382	D8	DIODE RECTIFIER	070131
			C120	CAP ELECT 10UF 16V 4X5 CASE	066382	D9	DIODE RECTIFIER	070131
			C121	CAP ELECT 10UF 16V 4X5 CASE	066382	D10	DIODE RECTIFIER	070131
			C122	CAP MONO 100PF 100V 10% NPO	061300	D11	DIODE RECTIFIER	070131
			C123	CAP MONO 100PF 100V 10% NPO	061300	D12	DIODE RECTIFIER	070131

# PARTS LIST con't

D13	DIODE SILICON	070047
D14	DIODE SILICON	070047
D15	DIODE RECTIFIER	070131
D16	DIODE ZENER 6.2V 5% 500MW	070085
D17	DIODE SILICON	070047
D18	DIODE SILICON	070047
D19	DIODE SILICON	070047
D20	DIODE ZENER 30V 1/2W 5%	070161
D21	DIODE SILICON	070047
D22	DIODE FAST RECOVER	070156
D23	DIODE FAST RECOVER	070156
D24	DIODE FAST RECOVER	070156
D25	DIODE FAST RECOVER	070156
D26	DIODE FAST RECOVER	070156
D27	DIODE FAST RECOVER	070156
D28	DIODE FAST RECOVER	070156
D29	DIODE FAST RECOVER	070156
D30	DIODE FAST RECOVER	070156
D31	DIODE FAST RECOVER	070156
D32	DIODE FAST RECOVER	070156
D33	DIODE FAST RECOVER	070156
D34	DIODE FAST RECOVER	070156
D35	DIODE FAST RECOVER	070156
D36	DIODE FAST RECOVER	070156
D37	DIODE FAST RECOVER	070156
D38	DIODE FAST RECOVER	070156
D39	DIODE FAST RECOVER	070156
D40	DIODE SILICON	070047
D41	DIODE SILICON	070047
F1	0.5A 5x20 fuse IEC	089092
FN1	FILTER EMI	180057
FN2	FILTER EMI	180057
FN3	FILTER EMI	180057
FN4	FILTER EMI	180057
FN5	FILTER EMI	180057
HS2	HEATSINK TO-220	080017
HS3	HEATSINK TO-220	080017
HS4	HEATSINK TO-220	080017
HS5	HEATSINK TO-220	080017
J1	XLR FEMALE HORIZ PCB WITH LATCH	117814
J2	JACK RCA ORANGE WITH GOLD	117798
J3	JACK RCA ORANGE WITH GOLD	117798
J4	JACK RCA ORANGE WITH GOLD	117798
J5	6 PIN HEADER	117828
J6	CONN 23 PIN FFC	117715
J7	BLADE FASTON W/FEET	117708
J8	BLADE FASTON W/FEET	117708
J9	CONN PCB MOUNT POWER RED	117719
J10	CONN PCB MOUNT POWER RED	117719
J11	CONN PCB MOUNT POWER RED	117719
J12	CONN PCB MOUNT POWER RED	117719
J13	CONN 12 PIN FFC	117720
J14	HEADER 8 PIN MTA-156	117717
J15	JACK HEADPHONE STEREO 1/8IN	117759
J16	JACK HEADPHONE STEREO 1/8IN	117759
J17	JACK HEADPHONE STEREO 1/8IN	117759
J18	JACK HEADPHONE STEREO 1/8IN	117759
J19	10 PIN HEADER	117829
J20	RECEPTACLE XLR MALE	117686
J21	JACK PHONO DUAL WHT/RED	117692

J22	RECEPTACLE XLR MALE	117686
K1	RELAY REED FORM 1C 5V 125 OHM	087056
K2	RELAY REED FORM 1C 5V 125 OHM	087056
K3	RELAY REED FORM 1C 5V 125 OHM	087056
K4	RELAY REED FORM 1C 5V 125 OHM	087056
K5	RELAY REED FORM 1A 5V 500 OHMS	087050
K6	RELAY REED FORM 1A 5V 500 OHMS	087050
K7	RELAY REED FORM 1A 5V 500 OHMS	087050
K8	RELAY REED FORM 1A 5V 500 OHMS	087050
K9	RELAY REED FORM 1A 5V 500 OHMS	087050
K10	RELAY REED FORM 1A 5V 500 OHMS	087050
K11	RELAY REED FORM 1A 5V 500 OHMS	087050
L1	CHOKE 18uH 5%-10%	122224
L2	CHOKE 18uH 5%-10%	122224
L3	CHOKE 18uH 5%-10%	122224
L4	BEADS FERRITE LEADED	076019
L5	BEADS FERRITE LEADED	076019
L6	BEADS FERRITE LEADED	076019
L7	CHOKE 100UH	122312
L8	CHOKE 18uH 5%-10%	122224
L9	CHOKE 18uH 5%-10%	122224
L10	CHOKE 18uH 5%-10%	122224
L11	CHOKE 18uH 5%-10%	122224
L12	BEADS FERRITE LEADED	076019
OPT1	Fiber Optic Receiver	058156
OPT2	Fiber Optic Receiver	058156
OPT3	Fiber Optic Receiver	058156
Q1	TRANSISTOR PNP SILICON	132172
Q2	TRANSISTOR PNP	132224
Q3	TRANSISTOR NPN SILICON	132171
Q4	COUPLER OPTICAL SCHMITT OUTPUT	131023
Q5	TRANSISTOR PNP SILICON	132172
Q6	TRANSISTOR NPN	132268
Q7	TRANSISTOR PNP	132267
Q8	TRANSISTOR NPN	132268
Q9	TRANSISTOR PNP	132267
Q10	TRANSISTOR NPN	132268
Q11	TRANSISTOR PNP	132267
Q12	TRANSISTOR NPN	132268
Q13	TRANSISTOR PNP	132267
Q14	TRANSISTOR NPN	132268
Q15	TRANSISTOR PNP	132267
Q16	TRANSISTOR NPN	132268
Q17	TRANSISTOR PNP	132267
R1	RES MF 75 OHM 1% 1/4W	144444
R2	RES MF 110 OHM 1% 1/4W	144489
R3	RES MF 75 OHM 1% 1/4W	144444
R4	RES MF 47.5K 1% 1/4W	144108
R5	RES MF 47.5K 1% 1/4W	144108
R6	RES MF 75 OHM 1% 1/4W	144444
R7	RES MF 2.87K 1% 1/4W	144142
R8	RES MF 47.5K 1% 1/4W	144108
R9	RES MF 221 OHM 1% 1/4W	144172
R10	RES MF 47.5K 1% 1/4W	144108
R11	RES MF 221 OHM 1% 1/4W	144172
R12	RES MF 221 OHM 1% 1/4W	144172
R13	RES MF 221 OHM 1% 1/4W	144172
R14	RES MF 221 OHM 1% 1/4W	144172
R15	RES NETWORK 9X-1-223	144238
R16	RES MF 221 OHM 1% 1/4W	144172
R17	RES MF 221 OHM 1% 1/4W	144172
R18	RES MF 221 OHM 1% 1/4W	144172
R19	RES MF 221 OHM 1% 1/4W	144172
R20	RES MF 221 OHM 1% 1/4W	144172

R21	RES MF 332 OHM 1% 1/4W	144446
R22	RES MF 221 OHM 1% 1/4W	144172
R23	RES MF 221 OHM 1% 1/4W	144172
R24	RES MF 221 OHM 1% 1/4W	144172
R25	RES MF 2.21 OHM 1/4W 1%	144378
R26	RES MF 221 OHM 1% 1/4W	144172
R27	RES MF 22.1K 1% 1/4W	144187
R28	RES MF 1.5K 1% 1/4W	144128
R29	RES MF 10 OHM 1% 1/4W	144157
R30	RES MF 22.1K 1% 1/4W	144187
R31	RES MF 4.75K 1% 1/4W	144097
R32	RES MF 221 OHM 1% 1/4W	144172
R33	RES MF 221 OHM 1% 1/4W	144172
R34	RES MF 221 OHM 1% 1/4W	144172
R35	RES MF 100K 1% 1/4W	144113
R36	RES MF 47.5K 1% 1/4W	144108
R37	RES MF 475 OHM 1% 1/4W	144086
R38	RES MF 221 OHM 1% 1/4W	144172
R39	RES MF 475 OHM 1% 1/4W	144086
R40	PTC RESETTABLE FUSE	144488
R41	PTC RESETTABLE FUSE	144488
R42	RES FP 10 OHM 5% 1/4W	137025
R43	RES MF 47.5K 1% 1/4W	144108
R44	RES CF 10 OHM 5% 1/2W	141165
R45	RES MF 806 OHM 1% 1/4W	144089
R46	RES MF 475K 1% 1/4W	144364
R47	RES MF 47.5K 1% 1/4W	144108
R48	RES MF 10K 1% 1/4W	144053
R49	RES MF 562 OHM 1% 1/4W	144408
R50	RES MF 1K 1% 1/4W	144090
R51	RES MF 10K 1% 1/4W	144053
R52	RES MF 22.1K 1% 1/4W	144187
R53	RES MF 22.1K 1% 1/4W	144187
R54	RES MF 47.5 OHM 1% 1/4W	144442
R55	RES MF 1.5K 1% 1/4W	144128
R56	RES MF 47.5 OHM 1% 1/4W	144442
R57	RES MF 47.5 OHM 1% 1/4W	144442
R58	RES MF 10K 1% 1/4W	144053
R59	RES MF 22.1 OHM 1% 1/4W	144160
R60	RES MF 22.1 OHM 1% 1/4W	144160
R61	RES MF 22.1 OHM 1% 1/4W	144160
R62	RES MF 47.5 OHM 1% 1/4W	144442
R63	RES MF 100K 1% 1/4W	144113
R64	RES MF 100K 1% 1/4W	144113
R65	RES MF 100K 1% 1/4W	144113
R66	RES MF 100K 1% 1/4W	144113
R67	RES MF 1.21K 1% 1/4W	144191
R68	RES MF 1.21K 1% 1/4W	144191
R69	RES MF 1.21K 1% 1/4W	144191
R70	RES MF 1.21K 1% 1/4W	144191
R71	RES MF 100K 1% 1/4W	144113
R72	RES MF 100K 1% 1/4W	144113
R73	RES MF 100K 1% 1/4W	144113
R74	RES MF 100K 1% 1/4W	144113
R75	RES MF 1.5K 1% 1/4W	144128
R76	RES MF 1.5K 1% 1/4W	144128
R77	RES MF 1.5K 1% 1/4W	144128
R78	RES MF 1.5K 1% 1/4W	144128
R79	RES MF 2K 1% 1/4W	144094
R80	RES MF 2K 1% 1/4W	144094
R81	RES MF 2K 1% 1/4W	144094
R82	RES MF 2K 1% 1/4W	144094
R83	RES MF 1.5K 1% 1/4W	144128
R84	RES MF 1.5K 1% 1/4W	144128



PARTS LIST con't

R85	RES MF 1.5K 1% 1/4W	144128
R86	RES MF 1.5K 1% 1/4W	144128
R87	RES MF 3.74K 1% 1/4W	144384
R88	RES MF 3.74K 1% 1/4W	144384
R89	RES MF 3.4K 1% 1/4W	144383
R90	RES MF 3.4K 1% 1/4W	144383
R91	RES MF 3.74K 1% 1/4W	144384
R92	RES MF 3.74K 1% 1/4W	144384
R93	RES MF 3.4K 1% 1/4W	144383
R94	RES MF 3.4K 1% 1/4W	144383
R95	RES MF 1.69K 1% 1/4W	144382
R96	RES MF 1.69K 1% 1/4W	144382
R97	RES MF 1.69K 1% 1/4W	144382
R98	RES MF 1.69K 1% 1/4W	144382
R99	RES MF 4.75K 1% 1/4W	144097
R100	RES MF 10 OHM 1% 1/4W	144157
R101	RES MF 4.75K 1% 1/4W	144097
R102	RES MF 4.75K 1% 1/4W	144097
R103	RES MF 4.75K 1% 1/4W	144097
R104	RES MF 10 OHM 1% 1/4W	144157
R105	RES MF 10 OHM 1% 1/4W	144157
R106	RES MF 10 OHM 1% 1/4W	144157
R107	RES MF 10 OHM 1% 1/4W	144157
R108	RES MF 10 OHM 1% 1/4W	144157
R109	RES MF 4.75K 1% 1/4W	144097
R110	RES MF 4.75K 1% 1/4W	144097
R111	RES MF 4.75K 1% 1/4W	144097
R112	RES MF 4.75K 1% 1/4W	144097
R113	RES MF 4.75K 1% 1/4W	144097
R114	RES MF 4.75K 1% 1/4W	144097
R115	RES MF 4.75K 1% 1/4W	144097
R116	RES MF 4.75K 1% 1/4W	144097
R117	RES MF 10 OHM 1% 1/4W	144157
R118	RES MF 10 OHM 1% 1/4W	144157
R119	RES MF 10 OHM 1% 1/4W	144157
R120	RES MF 10 OHM 1% 1/4W	144157
R121	RES MF 10 OHM 1% 1/4W	144157
R122	RES MF 10 OHM 1% 1/4W	144157
R123	RES MF 10 OHM 1% 1/4W	144157
R124	RES MF 10 OHM 1% 1/4W	144157
R125	RES MF 47.5K 1% 1/4W	144108
R126	RES MF 47.5K 1% 1/4W	144108
R127	RES MF 47.5K 1% 1/4W	144108
R128	RES MF 47.5K 1% 1/4W	144108
R129	RES MF 47.5K 1% 1/4W	144108
R130	RES MF 47.5K 1% 1/4W	144108
R131	RES MF 22.1 OHM 1% 1/4W	144160
R132	RES MF 22.1 OHM 1% 1/4W	144160
R133	RES MF 22.1 OHM 1% 1/4W	144160
R134	RES MF 22.1 OHM 1% 1/4W	144160
R135	RES MF 22.1 OHM 1% 1/4W	144160
R136	RES MF 22.1 OHM 1% 1/4W	144160
R137	RES MF 47.5K 1% 1/4W	144108
R138	RES MF 47.5K 1% 1/4W	144108
R139	RES MF 47.5K 1% 1/4W	144108
R140	RES MF 47.5K 1% 1/4W	144108
R141	RES MF 47.5K 1% 1/4W	144108
R142	RES MF 47.5K 1% 1/4W	144108
R143	RES MF 4.02K 1% 1/4W	144096
R144	RES MF 1K 1% 1/4W	144090

R145	RES MF 1K 1% 1/4W	144090
R146	RES MF 1K 1% 1/4W	144090
R147	RES MF 1K 1% 1/4W	144090
R148	RES MF 1K 1% 1/4W	144090
R149	RES MF 1K 1% 1/4W	144090
R150	RES MF 1K 1% 1/4W	144090
R151	RES MF 1K 1% 1/4W	144090
R152	RES MF 47.5 OHM 1% 1/4W	144442
R153	RES MF 475 OHM 1% 1/4W	144086
RL1	RELAY 5V DPST	087074
RL2	RELAY 5V DPST	087074
T1	TRANSFORMER DIGITAL INTERFACE	159285
U1	DIFFERENTIAL RECEIVER	133485
U2	DIGITAL INTERFACE RECEIVER	133483
U3	SINGLE 2-INPUT NOR GATE	133500
U4	DUAL D-FLIP-FLOP	133499
U5	SINGLE 2-INPUT AND GATE	133502
U6	PROGRAMMED VERSION OF 133495	133496
U7	SINGLE 2-INPUT NAND GATE	133501
U8	OCTAL BUFFER WITH 3 STATE	133503
U9	SINGLE 2-INPUT AND GATE	133502
U10	REGULATOR 3.3V LOW DROP	133464
U11	IC REGULATOR 5V 1.5A LOW DROP	133365
U12	IC AND 2 INPUT X 4	133175
U13	IC MONOSTB MULTIVIB X 2	133182
U14	IC REGULATOR 3.3V LOW DROPOUT	133393
U15	IC REGULATOR 5V 1.5A LOW DROP	133365
U16	-5V LOW DROPOUT REGULATOR	133493
U17	IC REGULATOR 12V	133156
U18	IC REGULATOR -12V	133155
U19	IC D/A CONVERTER 24 BIT	133392
U20	IC D/A CONVERTER 24 BIT	133392
U21	IC D/A CONVERTER 24 BIT	133392
U22	IC D/A CONVERTER 24 BIT	133392
U23	IC D/A CONVERTER 24 BIT	133392
U24	IC D/A CONVERTER 24 BIT	133392
U25	IC D/A CONVERTER 24 BIT	133392
U26	IC D/A CONVERTER 24 BIT	133392
U27	IC OP AMP DUAL FET INPUT	133432
U28	IC OP AMP DUAL FET INPUT	133432
U29	STEREO VOLUME CONTROL	133505
U30	STEREO VOLUME CONTROL	133505
U31	IC DUAL OPERATIONAL AMPLIFIER	133260
U32	IC DUAL OPERATIONAL AMPLIFIER	133260
U33	IC DUAL OPERATIONAL AMPLIFIER	133260
U34	IC DUAL OPERATIONAL AMPLIFIER	133260
U35	IC DUAL OPERATIONAL AMPLIFIER	133260
Y1	RESONATOR CERAMIC 6.0MHZ W/CAP	180039

3 UPSAMPLING MODULE 049999

4 KEYBOARD PCB 049990

C1	CAP ELECT 10UF 16V 4X5 CASE	066382
C2	CAP ELECT 47UF 16V 6.3X5 CASE	066380
C3	CAP MONO .1uF 50V 20% Z5U	061305
DS1	LED SQUARE RED	058109
DS2	LED GREEN 5MM HI-INT VF[V] 3.5	058165
DS3	LED SQUARE RED	058109
J1	CONN 12 PIN FFC	117720
MT1	SENSOR IR 38KHZ	121046
Q1	TRANSISTOR NPN	132223
R1	RES MF 10 OHM 1% 1/4W	144157

R2	RES MF 75 OHM 1% 1/4W	144444
S1	SWITCH PB TACT	150058
S2	SWITCH PB TACT	150058

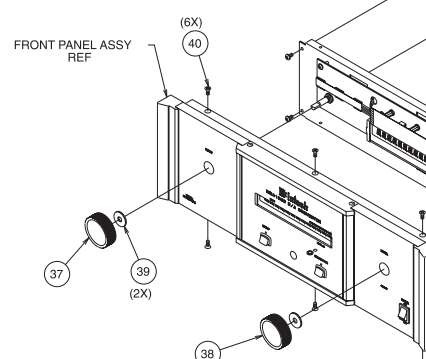
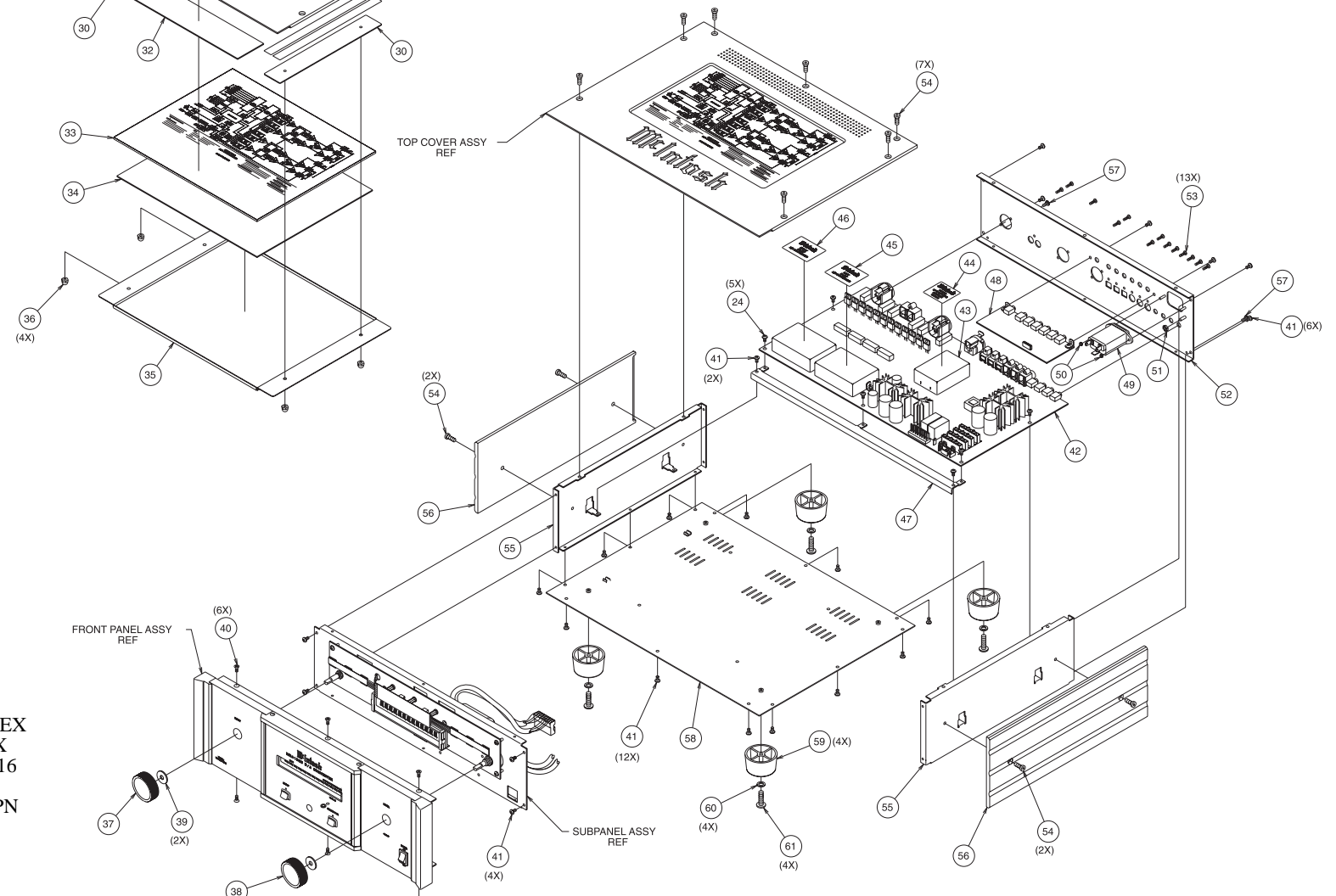
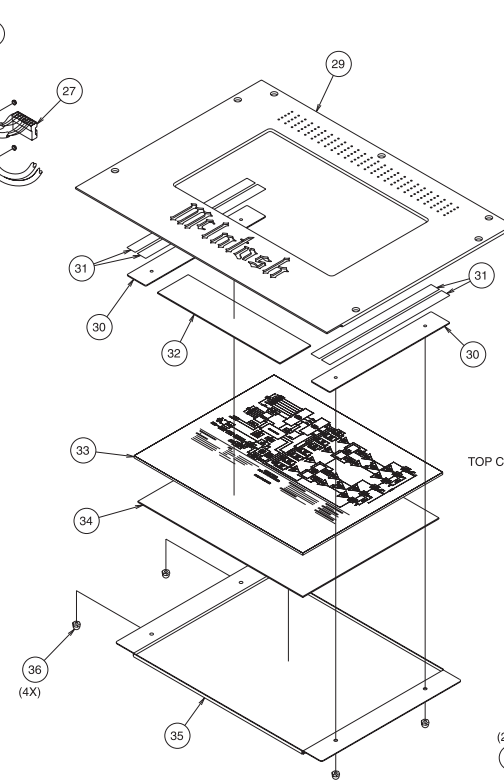
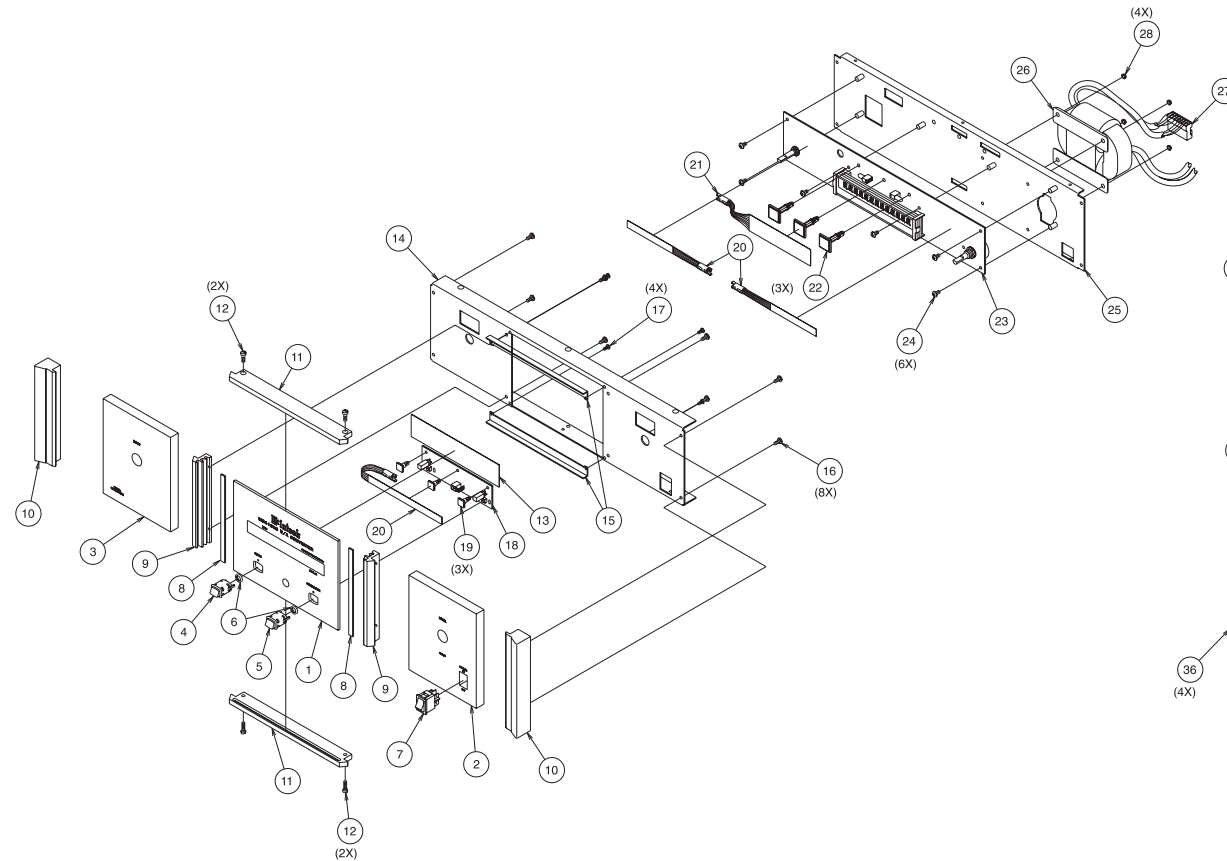
5 DISPLAY PCB 049989

C1	CAP ELECT 10UF 16V 4X5 CASE	066382
C2	CAP MONO .1uF 50V 20% Z5U	061305
C3	CAP ELECT 10UF 50V LOW ESR	066437
C4	CAP MONO 22PF 200V 10% NPO	061298
C5	CAP MONO .1uF 50V 20% Z5U	061305
C6	CAP ELECT 47UF 16V 6.3X5 CASE	066380
DS1	LED GREEN 5MM HI-INT VF[V] 3.5	058165
DS2	LED GREEN 5MM HI-INT VF[V] 3.5	058165
DS3	LED GREEN 5MM HI-INT VF[V] 3.5	058165
DS4	16 Digits VF display	058169
J1	CONN 23 PIN FFC	117715
J2	CONN 12 PIN FFC	117720
L1	CHOKe 18uH 5%-10%	122224
L2	BEADS FERRITE LEADED	076019
L3	BEADS FERRITE LEADED	076019
R1	RES MF 332 OHM 1% 1/4W	144446
R2	RES MF 100 OHM 1% 1/4W	144196
R3	RES MF 100 OHM 1% 1/4W	144196
R4	RES MF 100 OHM 1% 1/4W	144196
R5	RES MF 100 OHM 1% 1/4W	144196
R6	RES MF 47.5K 1% 1/4W	144108
R7	RES NETWORK 3X22K BUSSED	144252
R8	RES MF 5.62K OHM 1% 1/4W	144447
S1	16 ENCODER	129294
S2	ENCODER OPTICAL ROTARY	146246
U1	VFD DRIVER	133442

6 DATAPORT PCB 049991

C1	CAP MONO .1uF 50V 20% Z5U	061305
C2	CAP ELECT 10UF 50V	066445
J1	CONN 12 PIN FFC	117720
J2	JACK HEADPHONE STEREO 1/8IN	117759
J3	JACK HEADPHONE STEREO 1/8IN	117759
J4	JACK HEADPHONE STEREO 1/8IN	117759
J5	JACK HEADPHONE STEREO 1/8IN	117759
J6	JACK HEADPHONE STEREO 1/8IN	117759
J7	JACK HEADPHONE STEREO 1/8IN	117759
J8	JACK HEADPHONE STEREO 1/8IN	117759
L1	BEADS FERRITE LEADED	076019
R1	RES MF 100K 1% 1/4W	144113
R2	RES NETWORK 3X22K BUSSED	144252
R3	RES MF 100 OHM 1% 1/4W	144196
R4	RES MF 100 OHM 1% 1/4W	144196
R5	RES MF 100 OHM 1% 1/4W	144196
R6	RES MF 100 OHM 1% 1/4W	144196
R7	RES MF 100 OHM 1% 1/4W	144196
R8	RES MF 100 OHM 1% 1/4W	144196
R9	RES MF 100 OHM 1% 1/4W	144196
R11	RES MF 47.5 OHM 1% 1/4W	144442
SP1	BRACKET PCB CARD MOUNTING	003611
SP2	BRACKET PCB CARD MOUNTING	003611
U1	IC SHFT REG SER-PAR	133186
U2	LB1720 DRIVER ARRAY	133180

# EXPLODED VIEW and PARTS LIST



Ref No.	Part No.	Description
1	016499	CENTER GLASS PANEL
2	016500	RIGHT GLASS PANEL
3	016498	LEFT GLASS PANEL
4	017517	PUSHBUTTON ASSY BLK
5	017531	PUSHBUTTON ASSY RED
6	078033	O-RING
7	148073	SWITCH DPDT ROCKER
8	094016	TAPE VINYL FOAM 1/16 X 1/4
9	018722	EXTRUSION CENTER 5"
10	018721	END CAP 5"
11	018715	TOP/BOTTOM END CAP
12	100342	SCREW 6-32 X 3/8 FILLISTER HD
13	092440	DISPLAY FILTER
14	005358	PLATE BACK
15	005360	GAP PLATE
16	100276	SCREW MACH SEMS 6-32 X 5/16 PH PN
17	101074	SCREW TAPPING 4-40 X 1/4 PH PN
18	049990	ASSY KEYBOARD PCB
19	017933	CIRCUIT BOARD SUPPORT
20	017907	TITLE/PUSHBUTTON BACKLIGHT
21	017901	LOGO/PUSHBUTTON BACKLIGHT
22	017934	CIRCUIT BOARD SUPPORT
23	049989	ASSY DISPLAY PCB
24	101222	SCREW TT SEMS 6-32 X 1/4 PH PN
25	005359	SUBPANEL
26	159343	TRANSFORMER R-CORE POWER
27	117800	MTA CONN 8 PIN .156
28	102003	NUT MACH 6-32 W/LOCK
29	018723	TOP PANEL
30	005364	TOP STRIP
31	094192	TAPE DOUBLE SIDED 1/2"
32	005396	GOLD STRIP
33	016501	GLASS TOP COVER
34	094442	FOAM PAD
35	005365	TRAY
36	102064	NUT CAP 6-32
37	049619	ASSY KNOB 40 METRIC W/O INDEX
38	050000	ASSY KNOB 40 AMER W/O INDEX
39	104017	BLK FELT WASHER 3/4 X 1/4 X 1/16
40	101232	SCREW 6-32 X 1/4 PHIL FLAT
41	101196	SCREW TAP SEMS 6-32 X 1/4 PH PN
42	049988	ASSY MAIN PCB
43	049999	ASSY UPSAMPLING PCB
44	126960	DECAL UPSAMPLING
45	126961	DECAL D/A CONVERTER LEFT
46	126962	DECAL D/A CONVERTER RIGHT
47	005366	PCB BRACE
48	049991	ASSY DATAPORT PCB
49	117755	RECEPTACLE INPUT & LINE FILTER
50	102001	NUT KEP 4-40 CADMIUM PLATE
51	102002	NUT MACH 6-32 SELF-LOCK
52	005357	REAR PANEL
53	101197	SCREW HI-LO 6-32 X 1/4 PH PN
54	100356	SCREW 10-32 X 1/2 LOW SHCS
55	005361	SIDE PANEL
56	018724	SIDE PANEL
57	101109	SCREW 6-32 X 5/16 PH PN BLK
58	005363	BOTTOM COVER
59	017937	FOOT
60	104083	WASHER #10 PLATED 104062
61	100159	SCREW MACH 10-32 X 3/4 PH PN BLK

# REPACKING INSTRUCTIONS

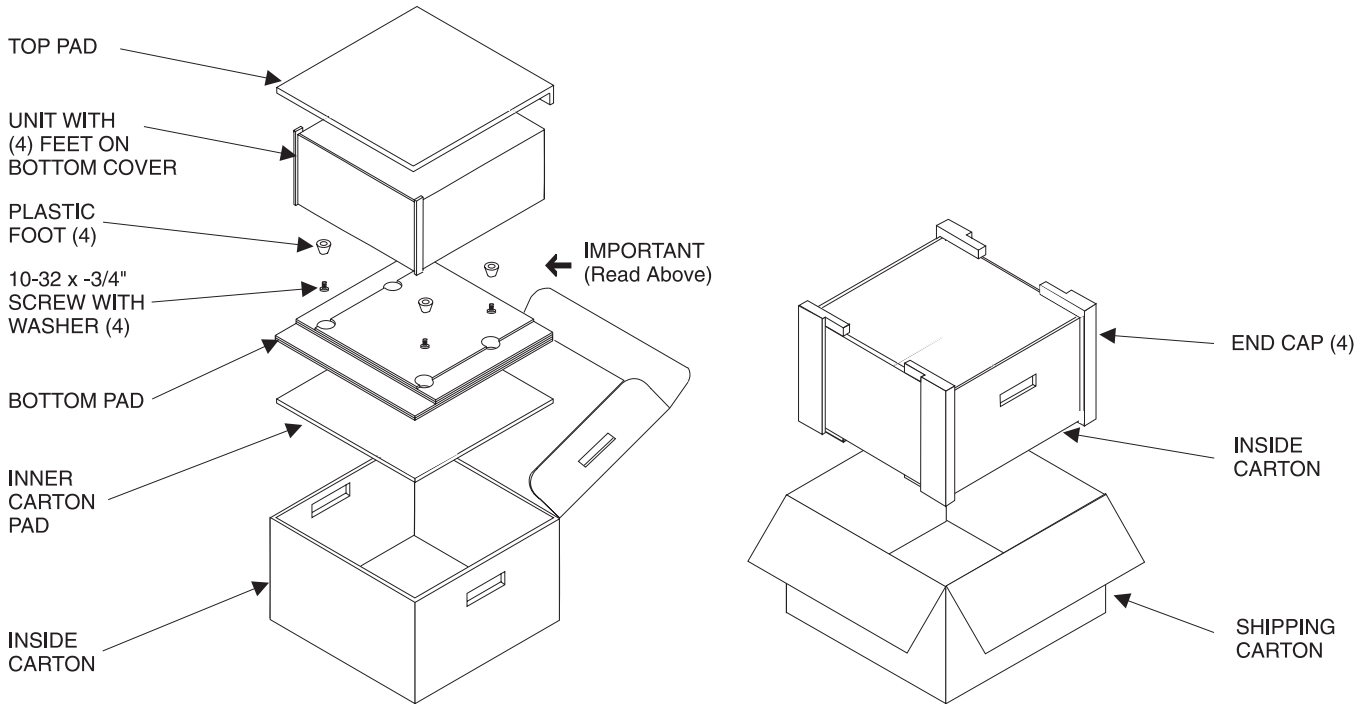
In the event it is necessary to repack the unit for shipment, the unit must be packed exactly as shown below.

*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	034075	Shipping carton only
4	033837	Foam end cap
1	034076	Inside carton only
1	033726	Top pad
1	034255	Bottom pad
1	034077	Inner carton pad
4	017937	Plastic foot
4	100159	#10-32 x 3/4" Machine screw
4	104083	#10 x 7/16" Flat washer
1	049270	Shipping carton complete with all the above parts.



# MDA 1000

## D/A CONVERTER

### 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.