

ALESIS

Studio 32 (X4)

Service Manual

P/N: 8-31-0063-A

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Preface

This document is intended to assist the service technician in the operation, maintenance and repair of the Alesis device. Together with the User Reference Manual, this document provides a complete description of the functionality and serviceability of the Device. Any comments or suggestions you may have pertaining to the document are welcome and encouraged.

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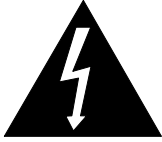
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Warnings

TO REDUCE THE RISK OF ELECTRIC SHOCK OR FIRE, DO NOT EXPOSE THIS PRODUCT TO WATER OR MOISTURE.



The arrowhead symbol on a lightning flash inside a triangle is intended to alert the user to the presence of un-insulated "dangerous voltage" within the enclosed product which may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point inside a triangle is intended to alert the user to the presence of important operating, maintenance and servicing instructions in the literature which accompanies the product.

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Safety Suggestions

Carefully read the applicable items of the operating instructions and these safety suggestions before using this product. Use extra care to follow the warnings written on the product itself and in the operating instructions. Keep the operating instructions and safety suggestions for reference in the future.

1. Power Source. The product should only be connected to a power supply which is described either in the operating instructions or in markings on the product.
2. Power Cord Protection. AC power supply cords should be placed such that no one is likely to step on the cords and such that nothing will be placed on or against them.
3. Periods of Non-use. If the product is not used for any significant period of time, the product's AC power supply cord should be unplugged from the AC outlet.
4. Foreign Objects and Liquids. Take care not to allow liquids to spill or objects to fall into any openings of the product.
5. Water or Moisture. The product should not be used near any water or in moisture.
6. Heat. Do not place the product near heat sources such as stoves, heat registers, radiators or other heat producing equipment.
7. Ventilation. When installing the product, make sure that the product has adequate ventilation. Improperly ventilating the product may cause overheating, which may damage the product.
8. Mounting. The product should only be used with a rack which the manufacturer recommends. The combination of the product and rack should be moved carefully. Quick movements, excessive force or uneven surfaces may overturn the combination which may damage the product and rack combination.
9. Cleaning. The product should only be cleaned as the manufacturer recommends.
10. Service. The user should only attempt the limited service or upkeep specifically described in the operating instructions for the user. For any other service required, the product should be taken to an authorized service center as described in the operating instructions.
11. Damage to the Product. Qualified service personnel should service the unit in certain situations including without limitation when:
 - a. Liquid has spilled or objects have fallen into the product,
 - b. The product is exposed to water or excessive moisture,
 - c. The AC power supply plug or cord is damaged,
 - d. The product shows an inappropriate change in performance or does not operate normally, or
 - e. The enclosure of the product has been damaged.

A Quick Note Regarding Short/Loaded D.C. Power Supply Lines in the Studio 32

The STUDIO 32 main P.C.B. is quite densely packed. This inhibits the implementation of standard troubleshooting techniques. Described herein is a time efficient technique for locating D.C. shorted capacitors.

Operational symptoms may include:

- No power up.

- All L.E.D.'s are dim or pulsing, but +48 v phantom will operate correctly if enabled.

Solution:

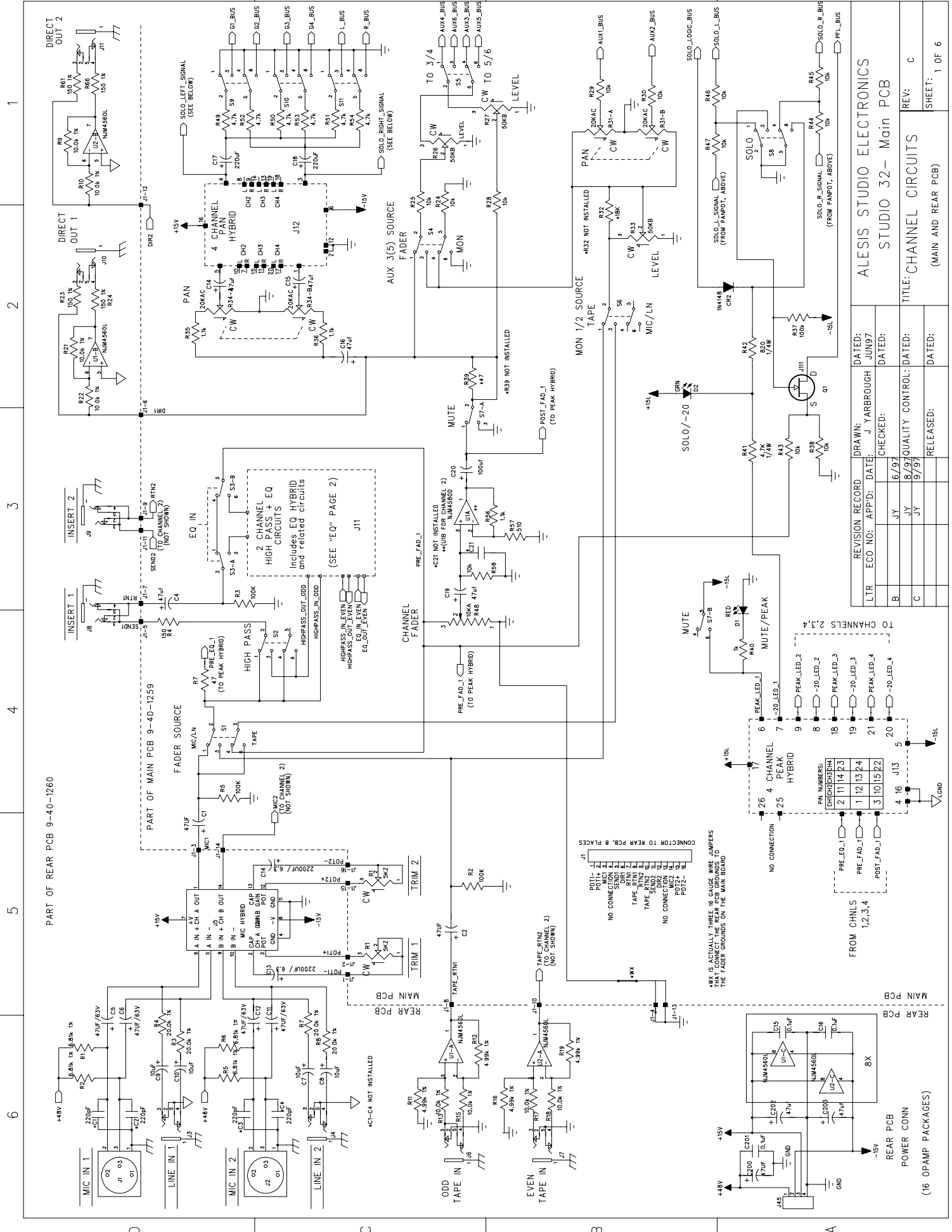
- Remove D.C. power cables the main P.C.B. and the rear panel P.C.B.

- Apply a high current (5A) low voltage (less than 25V) to the shorted supply line. This will usually cause the capacitor to fuse open.

- The mixer should function normally, but a full Q.C. test must be performed to rule out latent damage.

ALESIS Studio 32 (X4)

SCHEMATIC AND PCB FILES



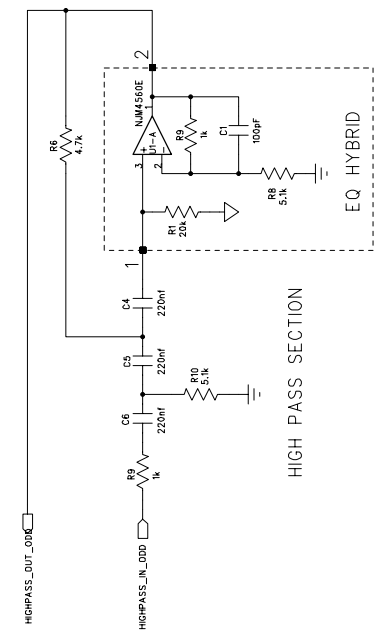
ALISIS STUDIO ELECTRONICS
STUDIO 32— Main PCB
TITLE: CHANNEL CIRCUITS
(MAIN AND REAR PCB)

REVISION RECORD	DATE:	DRAWN:	DATE:
LTR	ECO NO:	APPID:	JUN97
B	JY	CHECKED:	8/6/97
C	JY	QUALITY CONTROL:	9/9/97
		RELEASED:	

REAR PCB	REAR TO B	MAIN TO B
POWER CONN		
(16 OPAMP PACKAGES)		

REV: C
SHEET: 1 OF 6

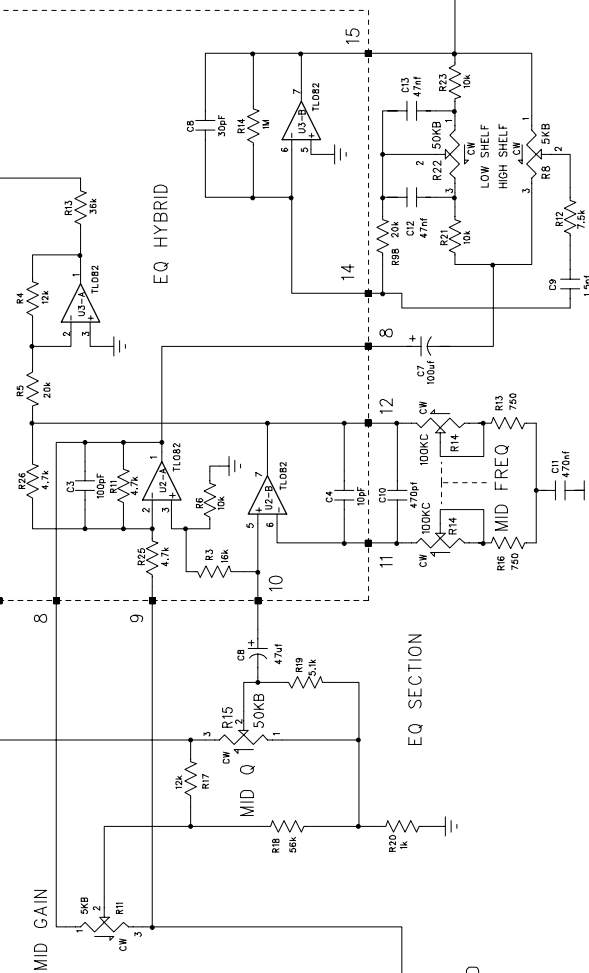
6 5 4 3 2 1



HIGH PASS SECTION

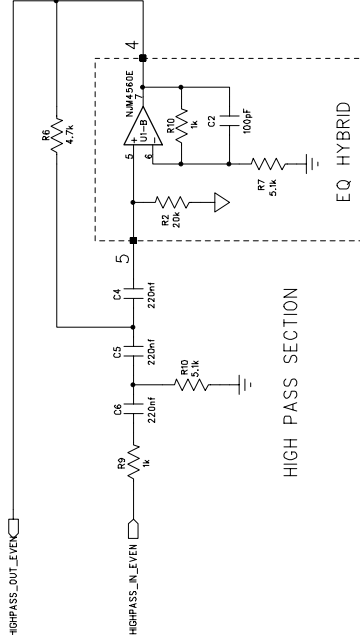
EQ HYBRID

ALL HYBRID CONNECTIONS PART OF J11
PARTS WITHIN DOTTED LINES ARE PART OF EQ HYBRID
ALL OTHER PARTS ARE PART OF MAIN BOARD



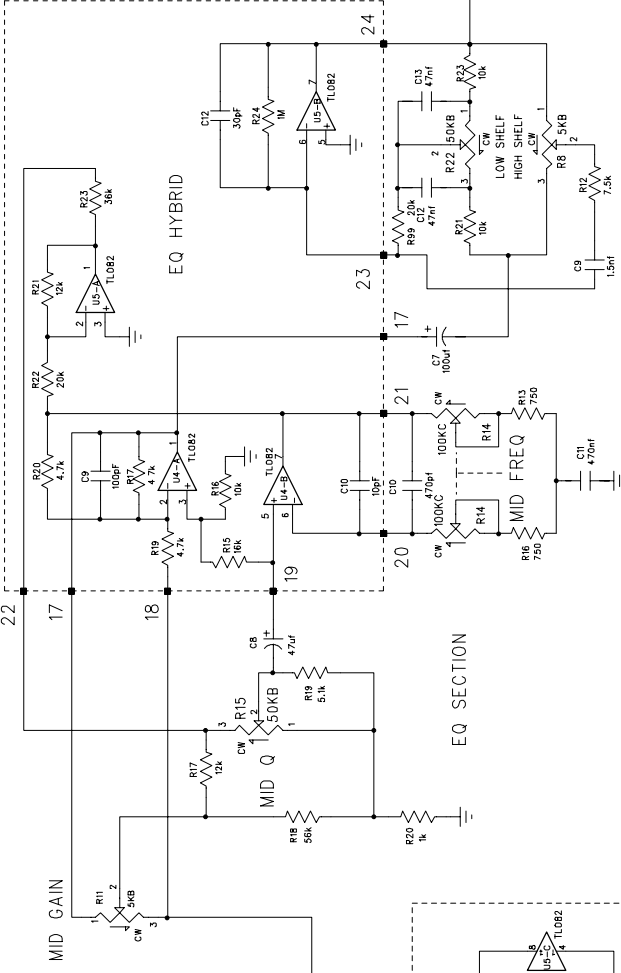
EQ SECTION

EQ HYBRID



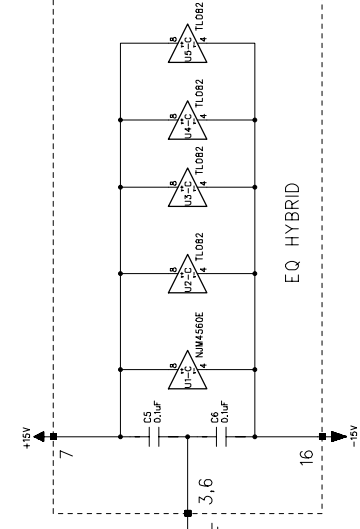
HIGH PASS SECTION

EQ HYBRID



EQ SECTION

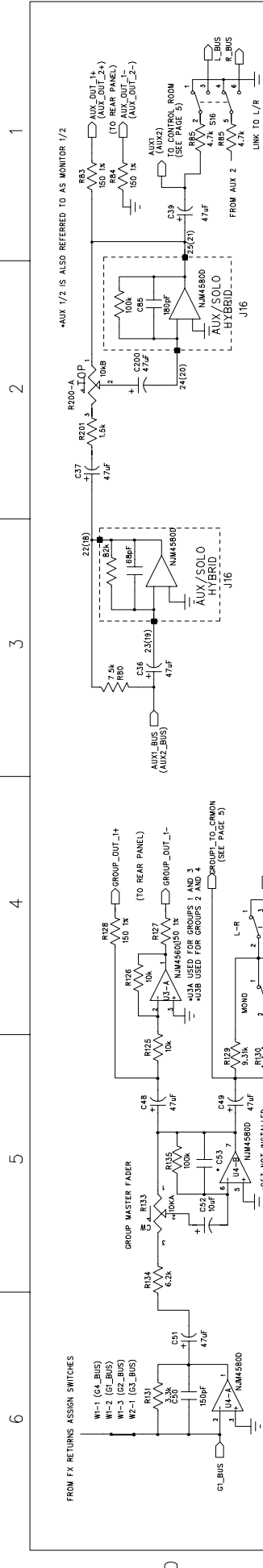
EQ HYBRID



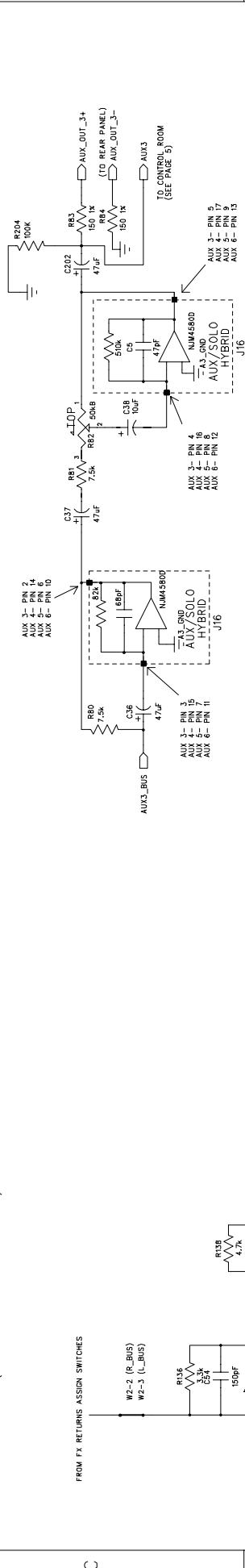
EQ HYBRID

REVISION RECORD		DRAWN: J YARBRO		DATE: JUN 97	
LTR	ECO NO.	APPROVED:	DATE:	CHECKED:	DATE:
B		JY	6/97		
C		JY	8/97		
		QUALITY CONTROL:		RELEASED:	

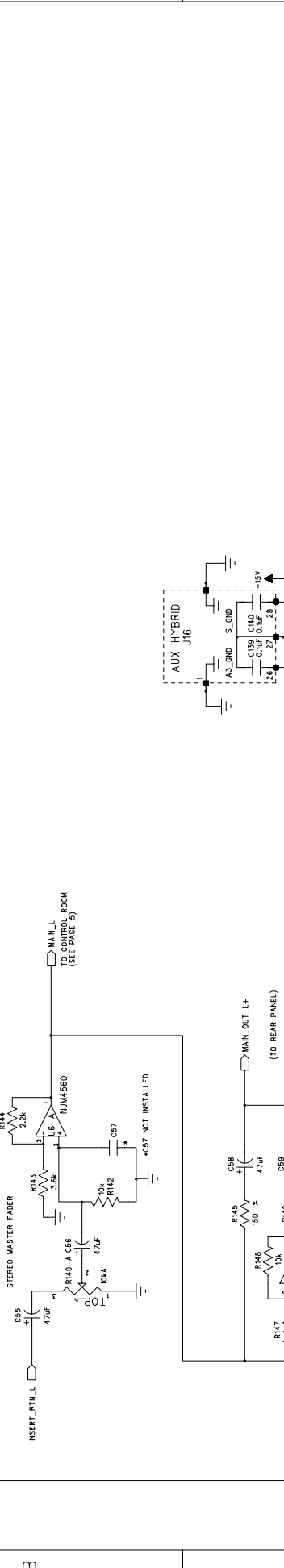
TITLE: ALESIS STUDIO ELECTRONICS					
STUDIO 32-Main PCB					
DRAWING NO: EQ Circuits				REV: C	
SCALE:					
SHEET-PAGE 2 OF 6					



GROUP CIRCUITS
(1 OF 4 SHOWN)



AUX 1/2 (MONITOR 1/2) CIRCUITS
(1 OF 2 SHOWN)



1

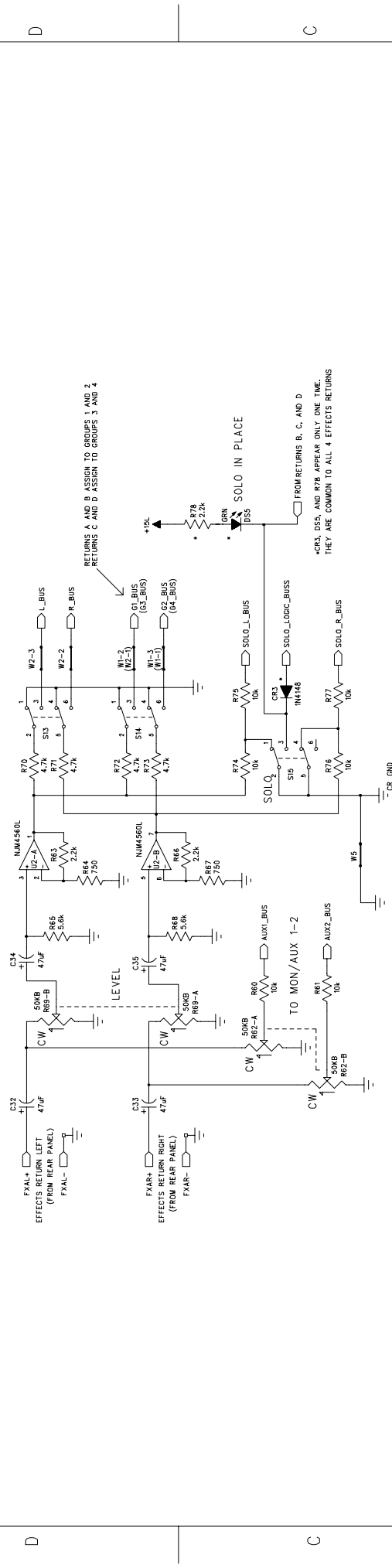
2

3

4

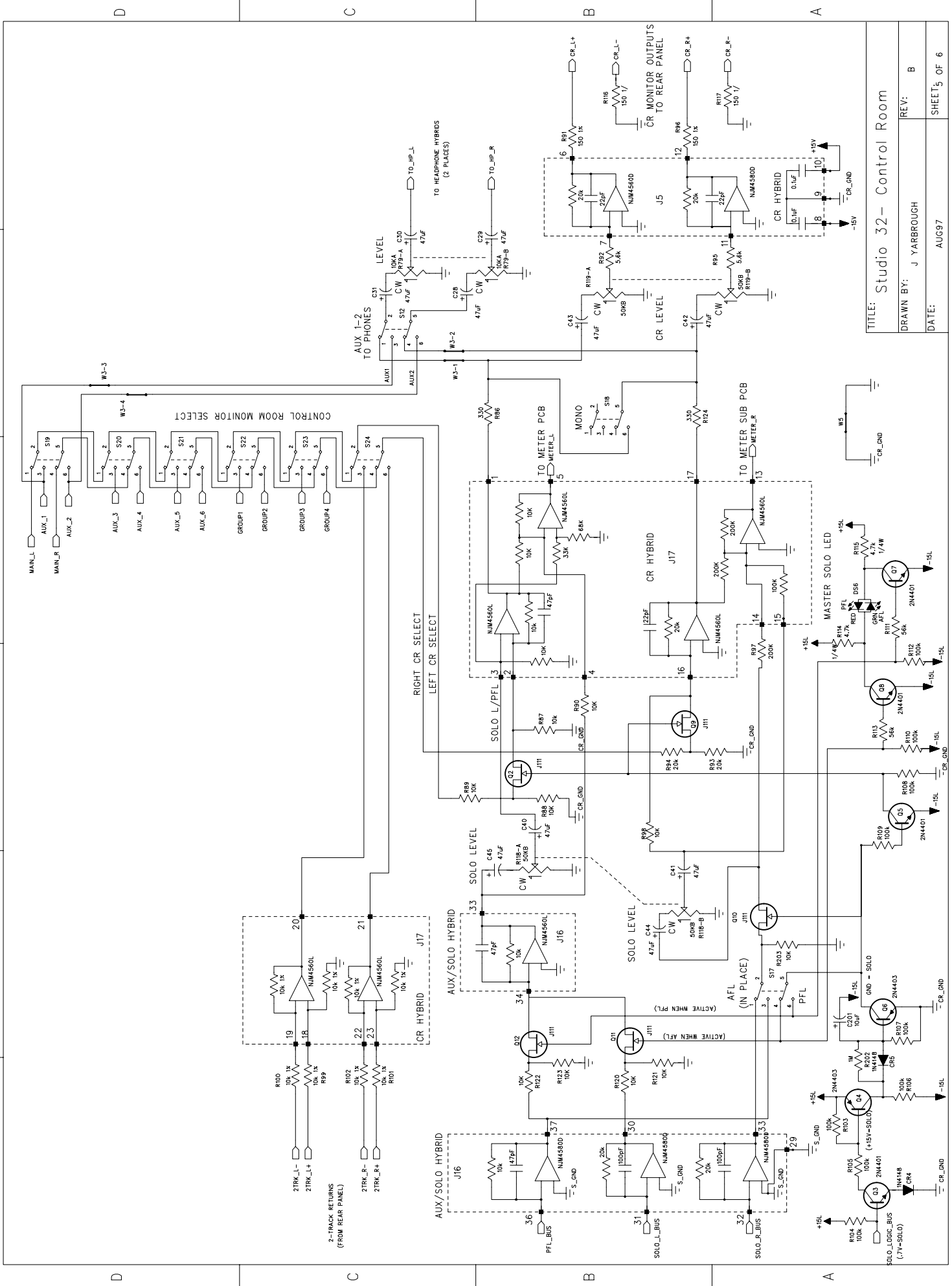
5

6

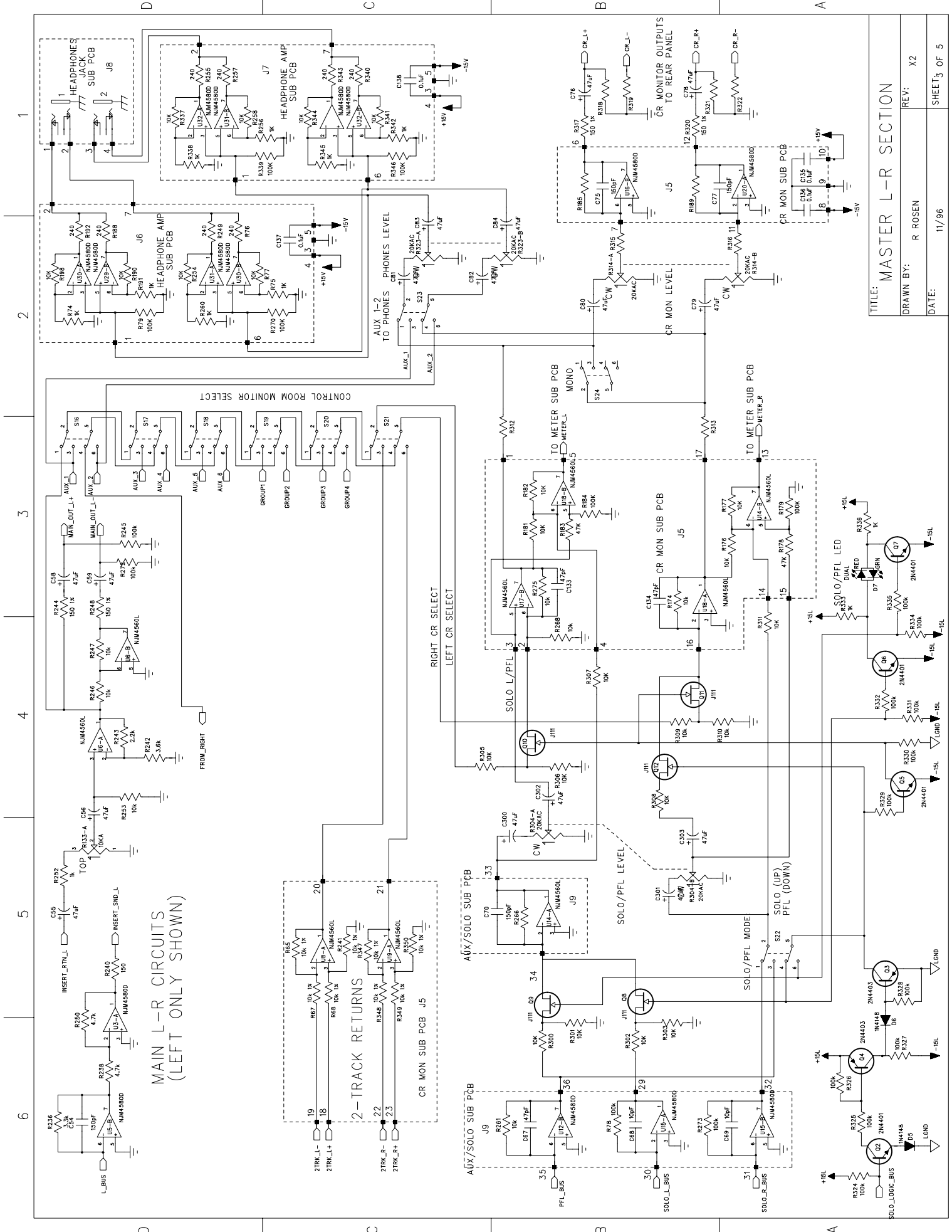


EFFECTS RETURNS (1 OF 4 SHOWN)

TITLE:	Alesis Studio 32
DRAWN BY:	J. YARBROUGH
DATE:	AUG97
REV:	B
SHEET:	4 OF 6



TITLE: Studio 32- Control Room
 DRAWN BY: J YARBROUGH
 DATE: AUG 97
 REV: B
 SHEET 5 OF 6



MAIN L-R CIRCUITS
(LEFT ONLY SHOWN)

2-TRACK RETURNS

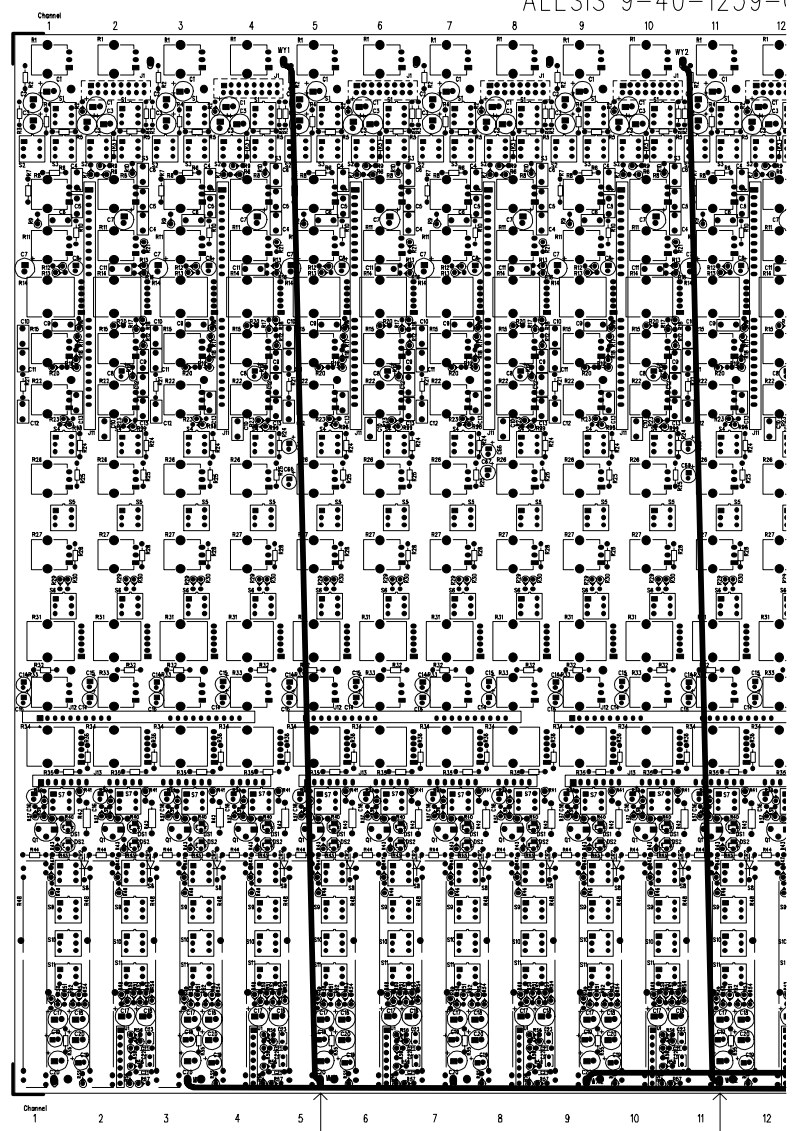
TITLE: MASTER L-R SECTION

DRAWN BY: R ROSEN

REV: X2

DATE: 11/96

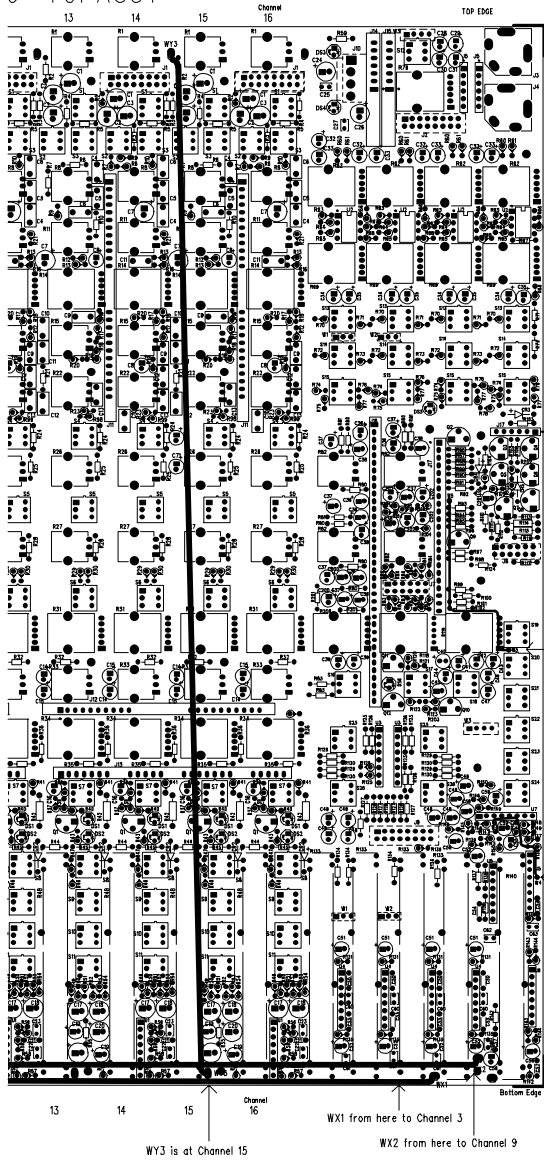
SHEET 3 OF 5



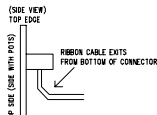
WY1 is at Channel 5

WY2 is at Channel 11

C "TOPASSY"

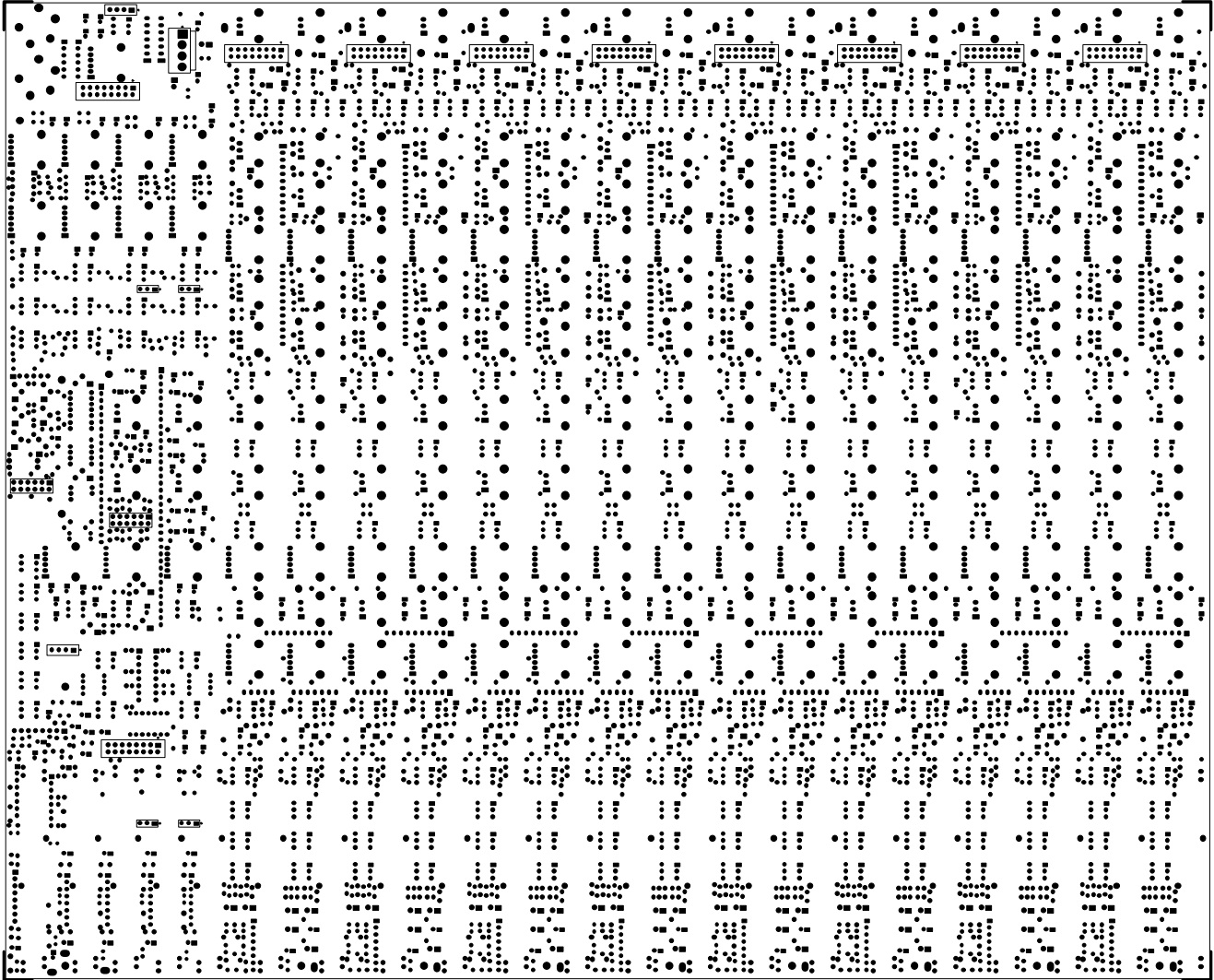


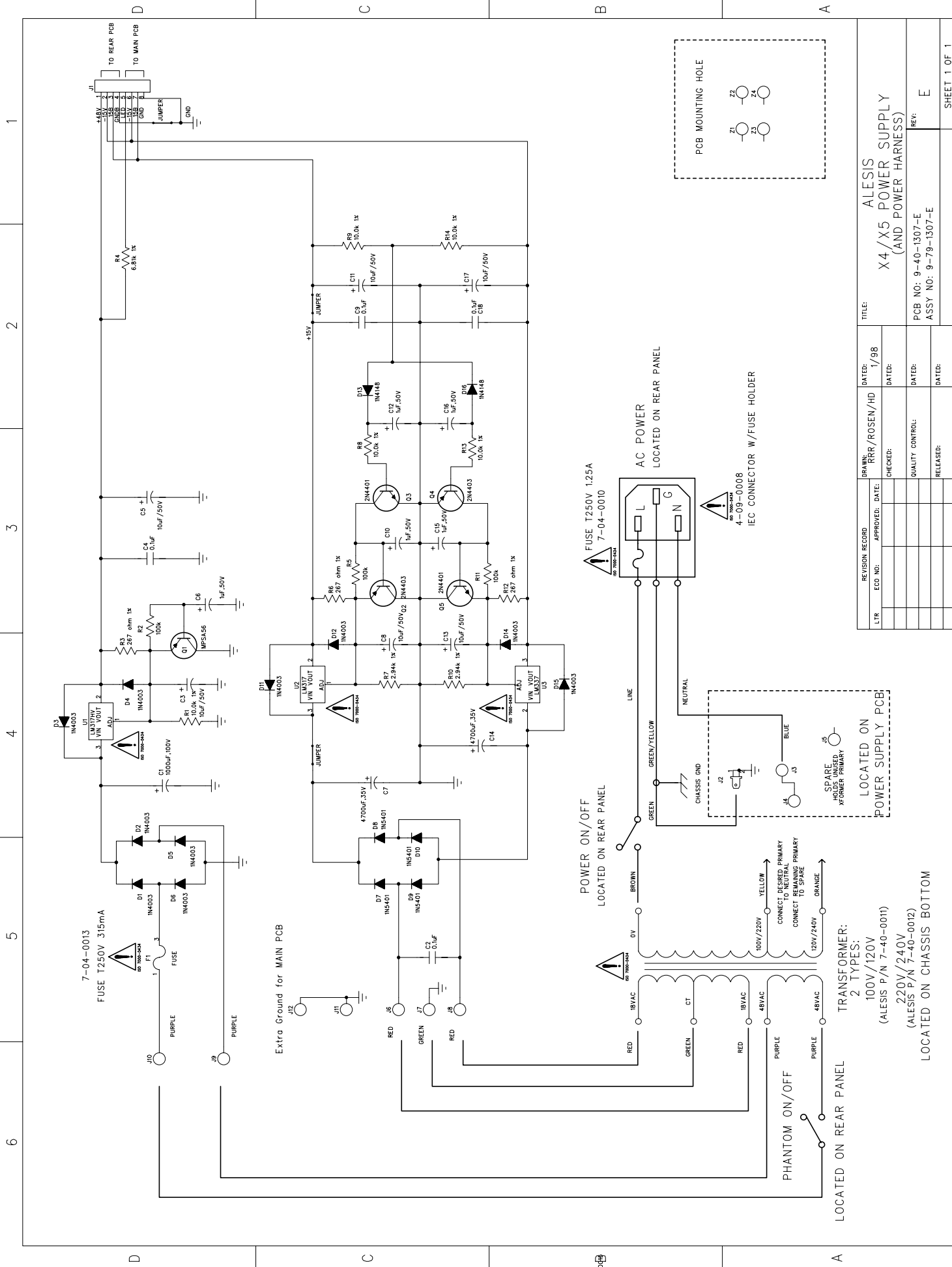
- 9-79-3259 ASSEMBLY NOTES:
1. Front panel PCM studs are NOT indicated on channels 3, 7, 11 and 15. The spacer mounting holes for these channels are not used.
 2. Transformer Q3-Q8 should be mounted with their bodies as close to the PCB as possible to prevent interference with the LED Meter PCB mounting.
 3. All LEDs are mounted with the flat side of the package facing the top edge of the PCB. Use plastic standoffs 2-14-024 for all LED mounting.
 4. Please note hybrid card locations:
 - A) 9-79-3259 Top Hybrid-215 (4 Places)
 - B) 9-79-0783 Peak Hybrid-215 (4 Places)
 - C) 9-79-3255 Inexpensive Hybrid-215 and 215
 - D) 9-79-3255 EQ Hybrid-211 (8 Places)
 - E) 9-79-3252 EQ Hybrid-211
 - F) 9-79-3259 Aux Hybrid-218
 5. These gages are mounted on the BACK SIDE of the PCB:
 - G) 10, 22, 27, 38, 39, 40, 81-83, 811-15, 811-12
 6. These components are not installed:
 - C21 (4 Places)
 - C22 (4 Places)
 - C23 (2 Places)
 - R32 (8 Places)
 - R33 (8 Places)
 7. Orientation of ribbon JL J2, J7-18:



8. Note location of W5 and W4. (See below). Both are installed on the top side of the board.
9. Note locations of W1, W2, W3, W4 and W5.
 - These jumpers are installed on the BACK SIDE of the board.
 - Note that the silkscreen labels for these jumpers are missing from the Rev B board.
 - Use a drop of hot glue one or two pieces on each jumper to hold the wire close to the board.
 - These jumpers must be connected at the location of channel numbers.
10. Note the following component changes since Rev A:
 - The location of Q10 has changed.
 - R203, R204 (4 Places), and C202 (4 Places) have been added.
 - R123 and (1 of 4) R8 have changed from horizontal mount to vertical mount.

ALESIS 9-40-1259-C "BOTASSY"





TITLE:		ALESIS X4/X5 POWER SUPPLY (AND POWER HARNESS)	
DRWING:	RRR/ROSEN/HD	DATE:	1/98
ECO NO.:		CHECKER:	
APPROVED:		DATE:	
REVISION RECORD:		QUALITY CONTROL:	
LTR:		RELEASED:	
		PCB NO:	9-40-1307-E
		ASSY NO:	9-79-1307-E
		REV:	E
		DATE:	
		DATE:	

LOCATED ON CHASSIS BOTTOM

TRANSFORMER:
2 TYPES:
100V/120V
(ALESIS P/N 7-40-0011)
220V/240V
(ALESIS P/N 7-40-0012)

PHANTOM ON/OFF
LOCATED ON REAR PANEL

CONNECT DESIRED PRIMARY TO SPARE
CONNECT REMAINING PRIMARY TO SPARE

SPARE HOLDS UNUSED XFORMER PRIMARY

GREEN/YELLOW
NEUTRAL
LINE

AC POWER
LOCATED ON REAR PANEL

FUSE T250V 1.25A
7-04-0010
IEC CONNECTOR W/FUSE HOLDER
4-09-0008

POWER ON/OFF
LOCATED ON REAR PANEL

Extra Ground for MAIN PCB

LOCATED ON CHASSIS BOTTOM

LOCATED ON REAR PANEL

LOCATED ON CHASSIS BOTTOM

LOCATED ON REAR PANEL

LOCATED ON CHASSIS BOTTOM

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LOCATED ON REAR PANEL

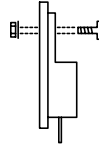
LOCATED ON CHASSIS BOTTOM

LOCATED ON REAR PANEL

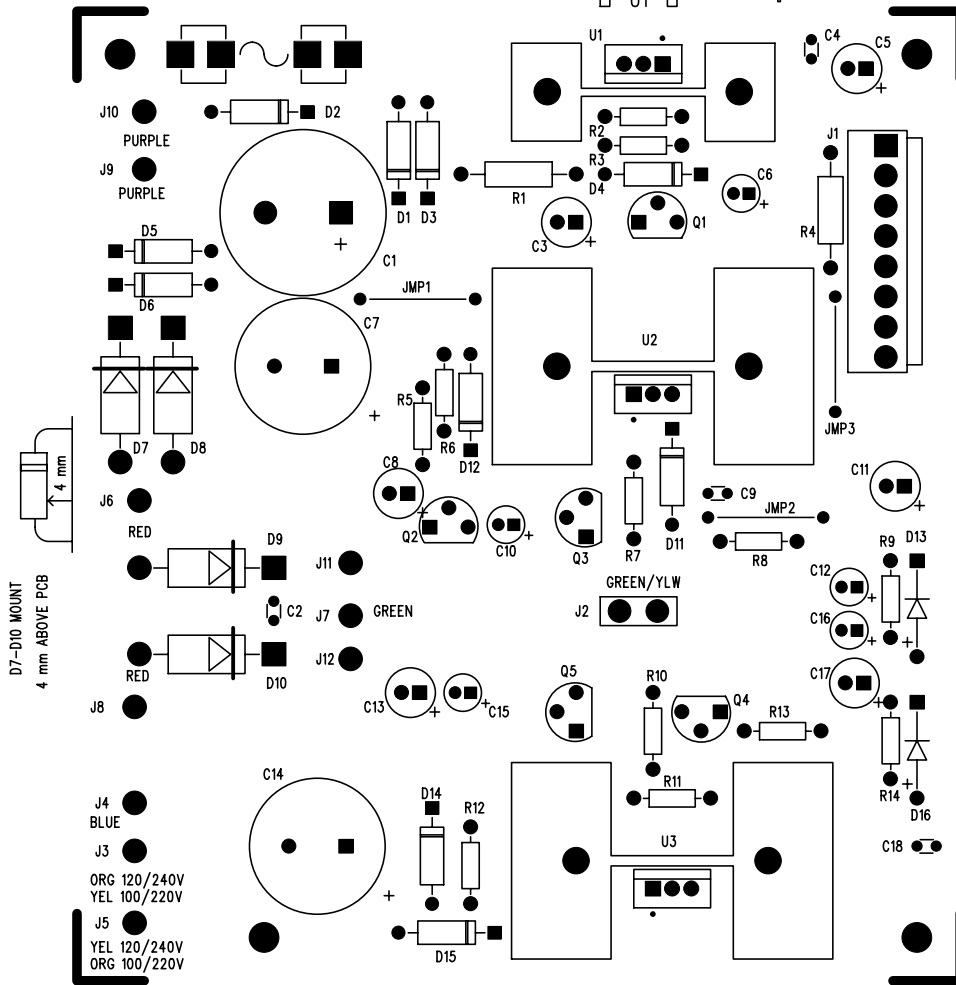
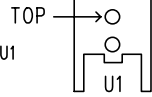
LOCATED ON CHASSIS BOTTOM

ALESIS 9-40-1307-E "ASSEMBLY DWG"



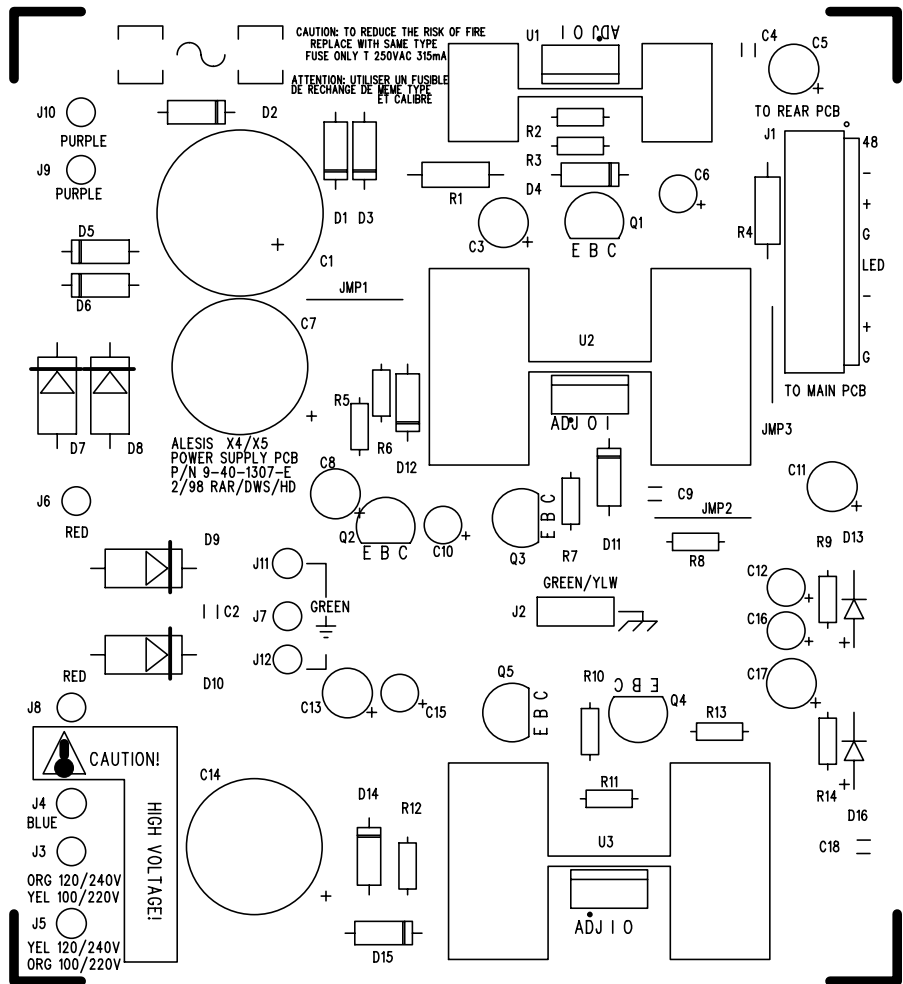
SCREW ATTACHES AS SHOWN 

IF TWO HOLES ON HEATSINK:
FASTEN REGULATOR TO TOP HOLE ON HEATSINK FOR U1



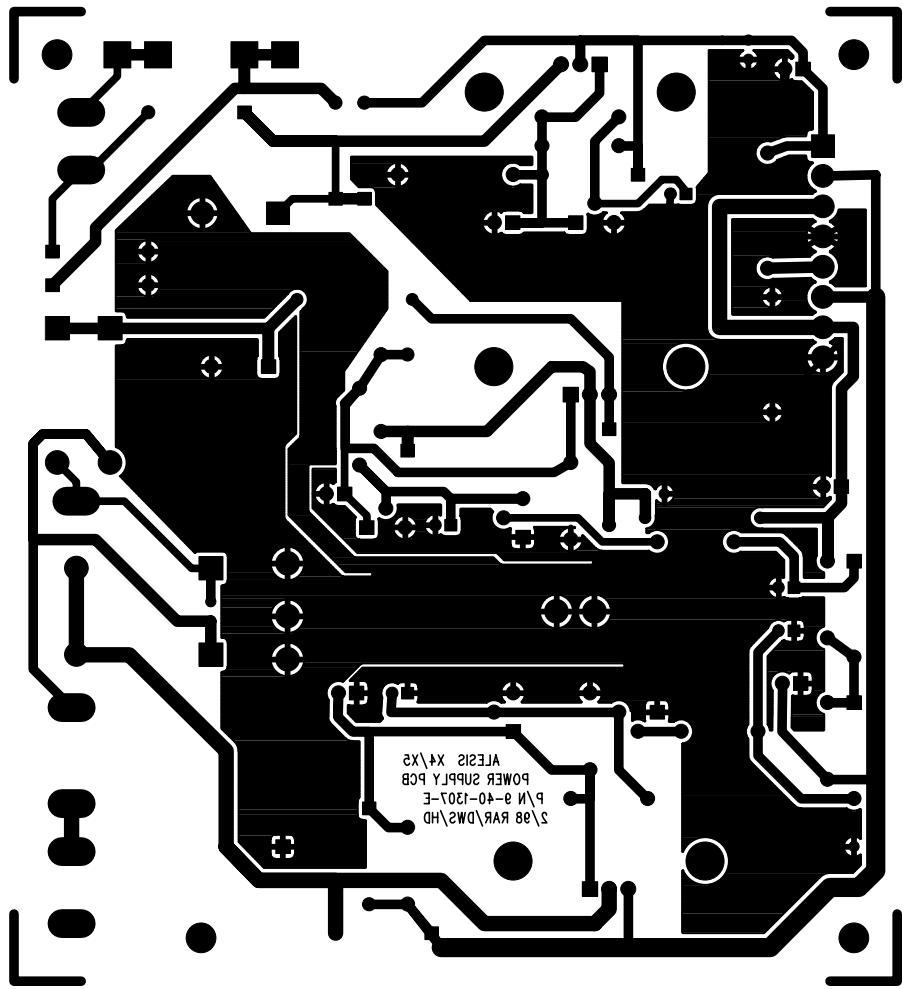
USE HEATSINK COMPOUND ON ALL 3 HEATSINKS
DO NOT USE INSULATORS ON HEATSINKS





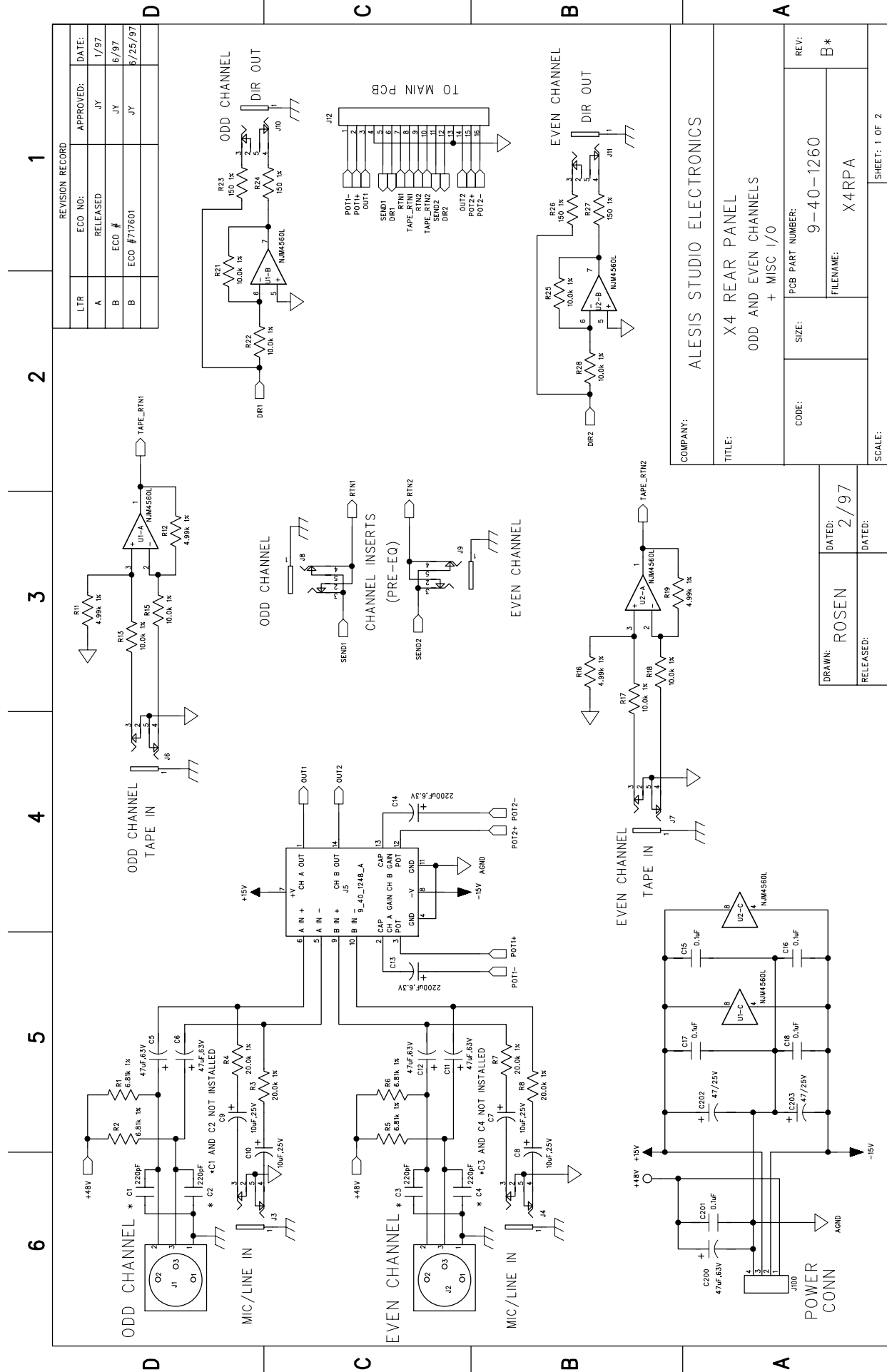
ALESIS 9-40-1307-E "TOP SILK"





ALLESIS 9-40-1307-E "BOTTRACE"

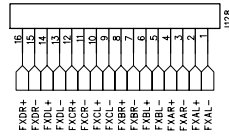
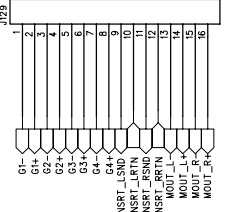
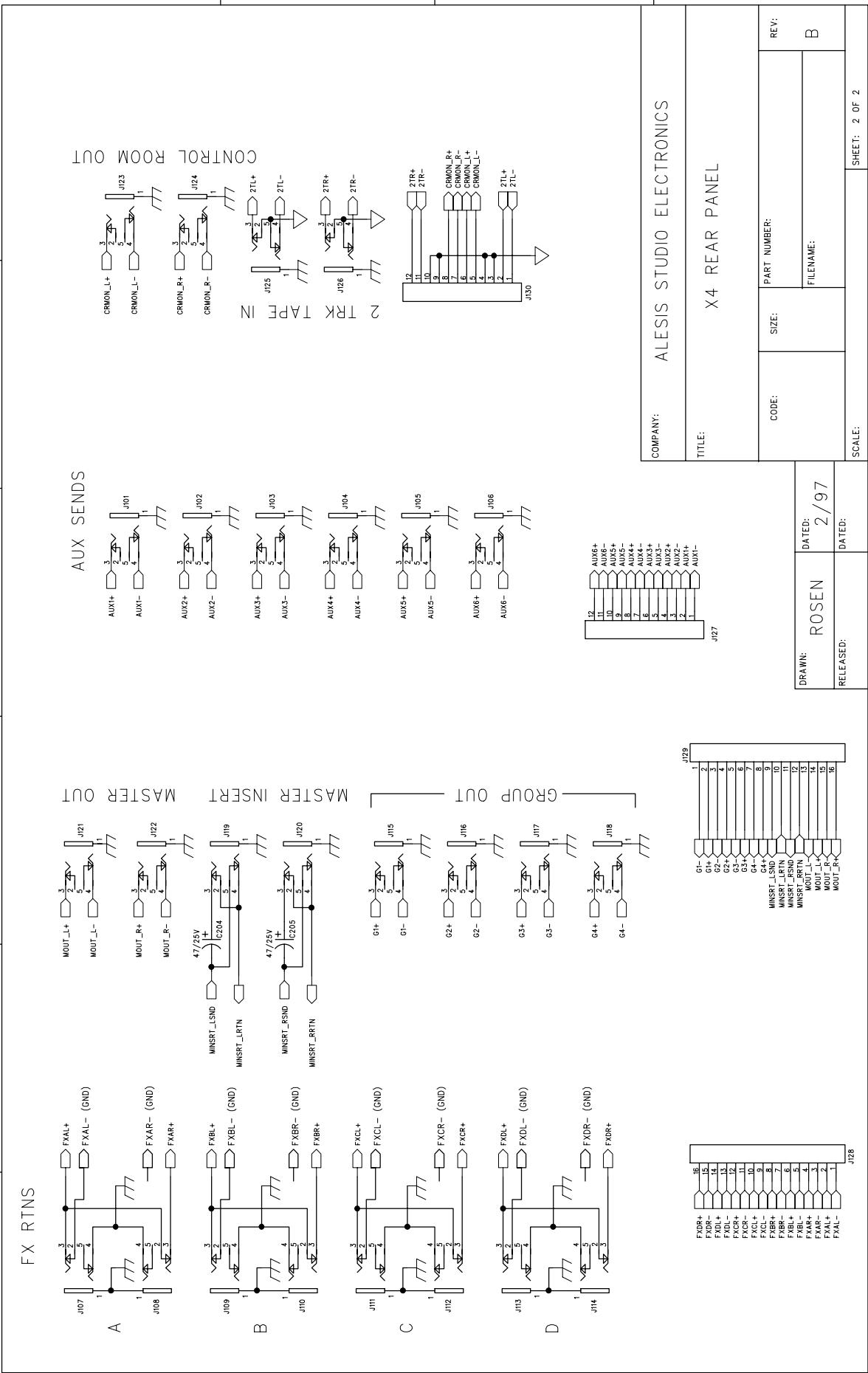




REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:
A	RELEASED	JY	1/97
B	ECO #	JY	6/97
B	ECO #717601	JY	8/25/97

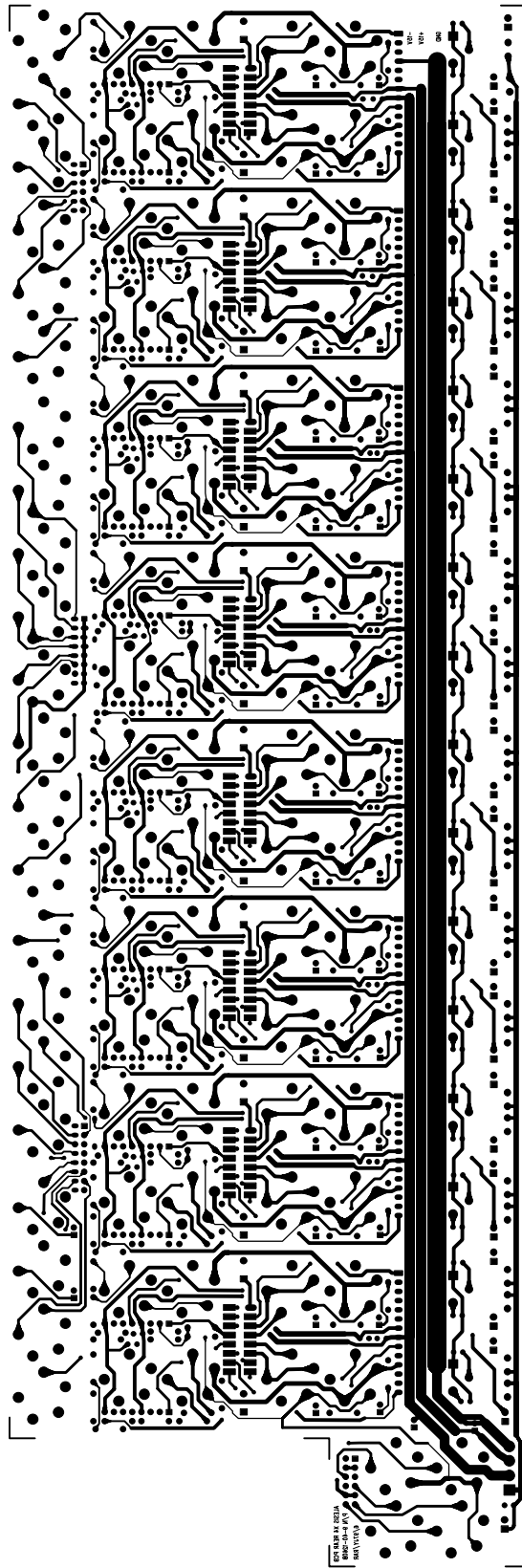
COMPANY:		ALESIS STUDIO ELECTRONICS	
TITLE:		X4 REAR PANEL ODD AND EVEN CHANNELS + MISC I/O	
CODE:	SIZE:	PCB PART NUMBER:	REV:
		9-40-1260	B*
RELEASED:		FILENAME:	
		X4RPA	
DRAWN: ROSEN		SCALE:	
RELEASED:		SHEET: 1 OF 2	
DATED: 2/97			
RELEASED:			

6 5 4 3 2 1



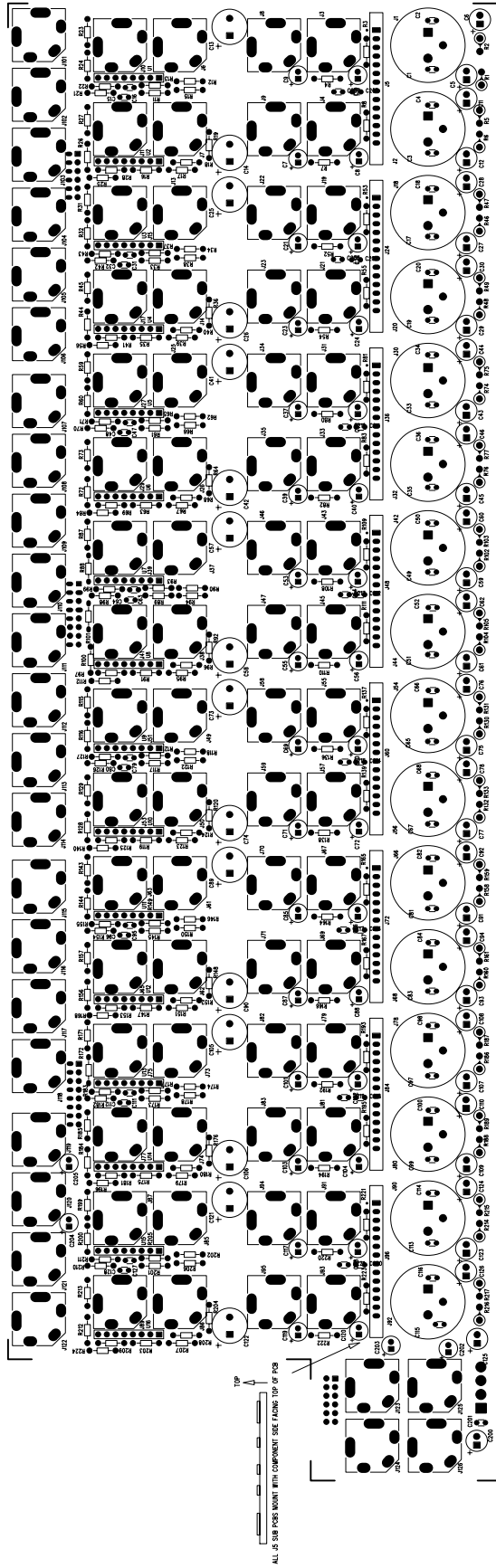
COMPANY: ALESIS STUDIO ELECTRONICS	
TITLE: X4 REAR PANEL	
CODE:	PART NUMBER:
SIZE:	FILENAME:
DATE: 2/97	REV: B
RELEASED:	SCALE: 2 OF 2

DRAWN: ROSEN	DATED: 2/97
RELEASED:	DATED:



"VTE212 8-40-1580-B", BOLLION, JAVCE.

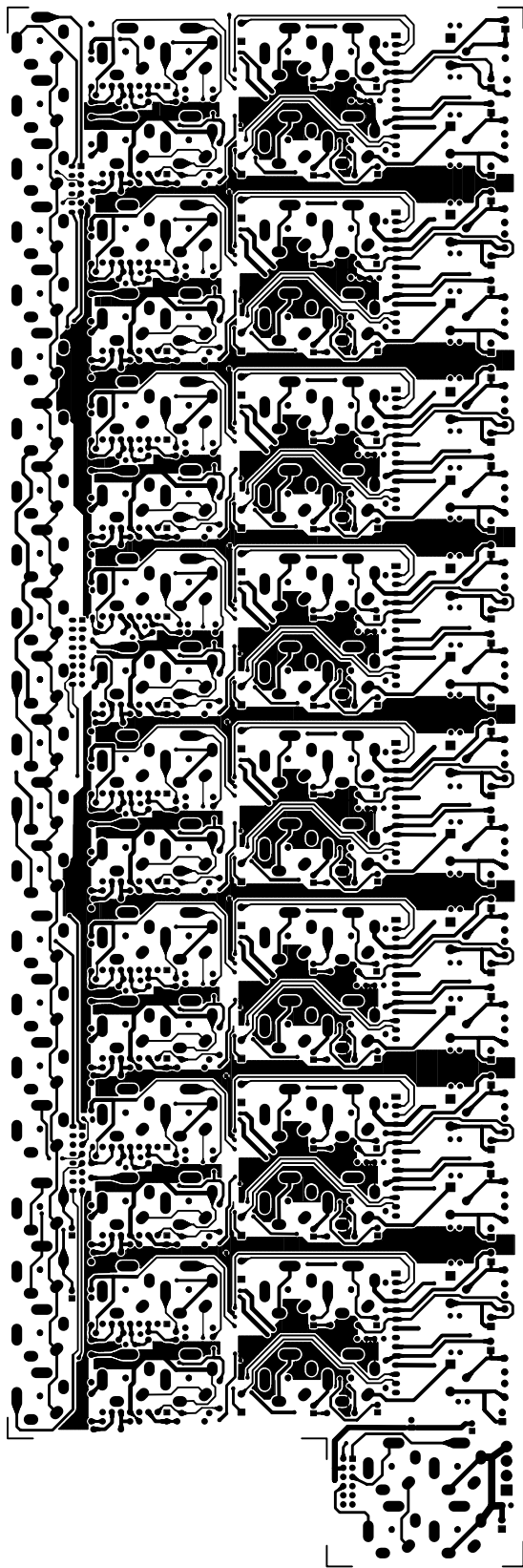




- ASSEMBLY NOTES:
- 1). Wave solder component-side components only.
 - 2). All top-side connectors must be fixtured during wave solder to assure proper alignment to chassis.
 - 3). Hand solder all solder-side connectors.
 - 4). Use pure-deionized water if subjecting PCB to wash process.
 - 5). Headers J12 and J127-J130 are hand-soldered to solder-side of PCB.
 - 6). C1, C2, C3, and C4 are not installed.

ALESIS 9-40-1260-B "ASSY DRAWING"





ALESIS 9-40-1260-B "TOP TRACE"



ALESIS

Studio 32 (X4)

BOM

Part.Number	Description	Qty Per	Ref.Designator	ECN
X4-UL	MIXER 16-CHANNEL RACK/TABLE-TOP STUDIO 32 X4 - UL	1		
7-04-0010	FUSE 1.25A 250V 5x20mm T	1		
7-40-0011	TRANSFORMER TORROID POWER 100/120V X4	1		
7-41-0005	CABLE POWER UL/CSA SJT	1		
7-51-0000-A	CARD WARRANTY DOMESTIC-ONLY - REV A	1		
7-51-1217	SHEET SERVICE-CENTER-CONTACTS 8.5 x 11"	1		
7-51-1219	SHEET "WELCOME TO ALESIS FAMILY" 5 x 8"	1		
7-53-0001	STICKER BUMPER ALESIS	1		
7-53-0018	STICKER QC W/ MFR DATE (UL APPROVED)	1		
7-53-0106	STICKER RATINGS/FUSE/UL/120V X4	1		
X4-AS	MIXER 16-CHANNEL RACK/TABLE-TOP STUDIO 32 X4 - AS	1		
7-04-0011	FUSE 630mA 250V 5x20mm T TIME-LAG	1		
7-40-0012	TRANSFORMER TORROID POWER 220/240V X4	1		
7-41-0003	CABLE POWER AS	1		
7-53-0111	STICKER RATINGS/FUSE/220V-COUNTRIES X4	1		
X4-EU	MIXER 16-CHANNEL RACK/TABLE-TOP STUDIO 32 X4 - EU	1		
7-04-0011	FUSE 630mA 250V 5x20mm T TIME-LAG	1		
7-53-0107	STICKER RATINGS/FUSE/CE/230V X4	1		
7-40-0012	TRANSFORMER TORROID POWER 220/240V X4	1		
7-41-0002	CABLE POWER EU	1		
7-53-0107	STICKER RATINGS/FUSE/CE/230V X4	1		
X4-UK	MIXER 16-CHANNEL RACK/TABLE-TOP STUDIO 32 X4 - UK	1		
7-04-0011	FUSE 630mA 250V 5x20mm T TIME-LAG	1		
7-40-0012	TRANSFORMER TORROID POWER 220/240V X4	1		
7-41-0004	CABLE POWER UK	1		
7-51-0030	TAG POWER-UP HANGING - REV A	1		
7-53-0107	STICKER RATINGS/FUSE/CE/230V X4	1		
X4	MIXER 16-CHANNEL RACK/TABLE-TOP STUDIO 32 X4	1		
4-09-0008	CON PWR IEC (SNAP IN) W/FUSE HOLDER	1		
4-19-0108	CABLE SIL 8-PIN-TO-4-PIN (2X) 4mm 620mm X4	1	GREEN wire to Pin4, connects to a ground opening by R140	
4-19-0201	CABLE 1-PIN 18AWG BLUE 510mm 300V F-B SPADE-TINNED	1	IEC TO J4	
4-19-0301	CABLE 1-PIN 18AWG BROWN 75mm 300V F-B SPADE-TINNED	1	IEC TO POWER SWITCH	
4-19-0401	CABLE 1-PIN 18AWG PURPLE 425mm 300V F-F SPADE-SPADE	1	PHANTOM-SWITCH TO J10	719602
4-19-1318	WIRE 1-PIN 120mm GREEN TINNED STRIPPED	1	IEC TO CHASSIS GND	
4-50-0032	WIRE 18AWG 425mm GREEN W/YELLOW STRANDED RING-TO-TINNED	1	POWER-PCB TO CHASSIS-GND	
4-51-4500	WIRE JUMPER 15AWG 450mm 300V STRANDED	1	PIN of R200 on the main PCB, to J2 on the P/S PCB	
5-00-0027	SCREW M3 x 5mm PPZ	4	POWER-SUPPLY PCB MOUNTING	
5-00-0048	SCREW M3 x 6MM PHIL-SLOT TRUSS BLK	24	BOTTOM-PANEL TO TOP-PANEL	
5-00-0126	SCREW 2.6 x 5mm PPB MACHINE	22	LED-PCB TO MAIN PCB STANDOFFS, MAIN PCB STANDOFFS TO F/P	
5-00-0130	SCREW 6-32 x 1/2" PPB 1WAY	1	CHASSIS GND	

5-00-0308	SCREW M3 x 8mm PPB SELFTAP	32	XLR MOUNTING
5-00-0508	SCREW M5 x 8mm PPB	10	(6) BAGGED (4) FEET
5-00-1006	SCREW M3 x 10mm PPB THREADFORM	2	(2) HANDREST
5-02-6320	NUT KEP 6-32	1	CHASSIS-GND
5-02-6326	NUT KEP M6 ZINC	1	TRANSFORMER
5-02-6327	NUT HEX M3.5 ZINC	4	
5-04-0043	WASHER M3.5ID WIDE 10mmOD STEEL ZINC	4	
5-04-0044	WASHER M6 NYLON SHOULDER	1	
5-10-1005	LOCK CABLE TWIST	2	
5-10-1012	RIBBON BINDING 80mmLG.	13	
6-02-0035	SWITCH ROCKER SPST 250VAC 6A 9.5x21mm	1	
6-02-0036	SWITCH ROCKER SPST 250VAC 6A 15x21mm	1	
7-13-0014	TUBING HEATSHRINK 5mm DIA x 15mm	3	JACK AC INPUT W/FUSE-HOLDER
7-50-0073	STICKER BARCODE S/N X4	1	
7-51-1197	MANUAL REFERENCE X4	1	
7-51-1248	BROCHURE CLOTHING/ACCESSORIES	1	
7-53-0090	LABEL SYMBOL GND-TERM	1	
7-81-0125	ENDCAP FOAM LEFT X4	1	
7-81-0126	ENDCAP FOAM RIGHT P/S-SIDE X4	1	
7-81-0128	BOX SHIPPING X4	1	
7-81-0137	BOX GIFT TOP X4	1	
7-81-0138	BOX GIFT BOTTOM X4	1	
7-90-0203	POLYBAG 2x3 - 2 MIL	1	FOR RACK EAR SCREWS
7-91-1002	GEL SILICA 5G PACKET	2	
7-94-0411	POLYBAG 4 x 11 - 4 MIL	1	FOR POWER CABLE
7-94-0418	POLYBAG 4 x 18 - 4 MIL	2	RACK EARS
7-94-0912	POLYBAG 9 x 12 - 4 MIL	1	FOR LITERATURE
7-94-2427	POLYBAG 24 x 27 - 4 MIL	1	FOR UNIT
9-02-1010	RACK EAR 1.60 SECC X4	2	
9-03-0014	COVER TRANSFORMER SHIELD X4	1	
9-03-1189	CHASSIS TOP MAIN X4 - REV G	1	
9-03-1190-A	CHASSIS BOTTOM MAIN X4 - REV A	1	
9-03-1270	HAND-REST ALUMINUM X4	1	
9-03-1289	SHIELD TRANSFORMER TOP X4	1	
9-03-1290	BASE TRANSFORMER BOTTOM X4	1	
9-07-0001	SHIELD TRANSFORMER SHIELD #3 X4	1	
9-07-0008	SHIELD 42ø RADIUS .36mm THICK X5	1	
9-15-0076	FOOT ROUND LARGE	4	
9-15-1228	KNOB BODY ABS W/OUT CAP X3	192	
9-15-1231	CAP SWITCH ABS MT11000-TEXTURE X3	26	MASTER SELECTION SWITCHES
9-15-1301	CAP KNOB LIGHT GREEN X3/X4	32	CHANNEL Q AND FREQ. CONTROLS FOR MID.EQ
9-15-1302	CAP KNOB BLUE X3/X4	36	(32) CHANNEL AUX-3 AND AUX-4, (4) ALL PANS [2/CHANNEL]
9-15-1303	CAP KNOB BLACK X3/X4	32	ALL PANS [2/CHANNEL]
9-15-1304	CAP KNOB PURPLE X3/X4/X5	21	(16) CHANNEL AUX 1/2 LEVEL, (1) MASTER AUX 1/2 LEVEL, (4) AUX RETURN TO AUX 1/2 LEVELS
9-15-1327	CAP FADER X4	21	
9-15-1328	LINE CAP FADER BLACK X4	16	CHANNELS
9-15-1329	LINE CAP FADER WHITE X4	4	GROUPS
9-15-1330	LINE CAP FADER RED X4	1	STEREO MASTER
9-15-1331	CAP SWITCH SMALL X4	160	
9-15-1332	CAP SWITCH LARGE X4	16	MUTE SWITCHES
9-15-1333	CAP KNOB DARK GREEN X3/X4	48	HI/LOW/MID CHANNEL GAIN CONTROLS
9-15-1338	CAP KNOB GREY X3/X4	23	(16) CHANNEL TRIMS, (1) HEADPHONE, (1) SOLO, (1) CONTROL ROOM, (4) AUX RETURN LEVEL
9-15-1339	ENDCAP HAND-REST LEFT X4	1	
9-15-1340	ENDCAP HAND-REST RIGHT X4	1	

9-23-1077	STRIP GREASE 438.30mm X4	1	
9-79-0184-C	ASSY PCB METER	1	
9-79-1259-C	ASSY PCB MAIN X4	1	
0-00-0103	RES 10K OHM 1/8W 5%	101	(8)R21, (16)R24, (16)R25, (16)R28, (16)R44, (16)R45, (1)R87, (1)R88, (1)R89, (1)R90, (1)R98, (3)R125, (3)R126, (1)R142A, (1)R147A
0-00-0104	RES 100K OHM 1/8W 5%	54	(8)R2, (16)R3, (16)R5, (8)R55, (1)R103, (1)R104, (1)R105, (1)R106, (1)R110, (1)R112
0-00-0112	RES 1.1K OHM 1/8W 5%	31	(16)R35, (15)R36
0-00-0151	RES 150 OHM 1/8W 5%	16	R4
0-00-0152	RES 1.5K OHM 1/8W 5%	2	R201
0-00-0203	RES 20K OHM 1/8W 5%	2	R93, R94
0-00-0204	RES 200K OHM 1/8W 5%	1	R97
0-00-0222	RES 2.2K OHM 1/8W 5%	1	R59
0-00-0331	RES 330 OHM 1/8W 5%	2	R86, R124
0-00-0332	RES 3.3K OHM 1/8W 5%	1	R136A
0-00-0470	RES 47 OHM 1/8W 5%	8	R7A
0-00-0472	RES 4.7K OHM 1/8W 5%	14	(8)R6A, (1)R71, (1)R73, (2)R85, (1)R137A, (1)R138A
0-00-0512	RES 5.1K OHM 1/8W 5%	8	R10A
0-00-0562	RES 5.6K OHM 1/8W 5%	2	(1)R92, (1)R95
0-00-0563	RES 56K OHM 1/8W 5%	2	R111, R113
0-00-0622	RES 6.2K OHM 1/8W 5%	4	(4)R134
0-00-0751	RES 750 OHM 1/8W 5%	1	(1)R67
0-00-0752	RES 7.5K OHM 1/8W 5%	9	(6)R80, (3)R81
0-01-1002	RES 10.0K OHM 1/8W 1%	4	R99-102
0-01-1500	RES 150 OHM 1/8W 1%	12	(1)R91, (1)R96, (1)R116, (1)R117, (4)R127, (4)R128
0-01-9311	RES 9.31K OHM 1/8W 1%	8	(4)R129, (4)R130
0-03-0432	RES 4.3K OHM 1/4W 5%	2	R114, R115
0-03-0821	RES 820 OHM 1/4W 5%	16	(16)R42
0-09-0001	POT 5KY SINGLE	16	R1-16
0-09-0007	POT 5KB SINGLE C-DET	32	(16)R8, (16)R11

0-09-0008	POT 10KA DUAL	1	R79	
0-09-0013	POT 50KB SINGLE	68	(16)R15, (16)R26, (16)R27, (16)R33, (4)R82	
0-09-0014	POT 50KB DUAL	10	(4)R62, (4)R69, (1)R118, (1)R119	
0-09-0016	POT 10KB DUAL	1	R200	
0-09-0050	POT 50KB SINGLE C-DET	16	(16)R22	
0-09-0210	POT 10KA MONO SLIDE 60mm 15mmSHFT	20	(16)R48, (4)R133	
0-09-1013	POT 10KA STEREO SLIDE 60mm-LG. 15mm-SHFT	1	R140	
0-09-1100	POT 100KC DUAL	16	R14	
0-09-1203	POT 20KA&C DUAL C-DET	32	(16)R31, (16)R34	
0-90-0102	RES 1K OHM 1/8W 5% CFR-VM	32	(16)R9, (16)R20	
0-90-0103	RES 10K OHM 1/8W 5% CFR-VM	171	(8)R21, (16)R23, (16)R29, (16)R30, (16)R38, (16)R43, (16)R46, (16)R47, (16)R58, (4)R60, (4)R61, (4)R74, (4)R75, (4)R76, (4)R77, R120-123, R125, R126, R142, R147, (2)R148, (1)R203	
0-90-0104	RES 100K OHM 1/8W 5% CFR-VM	47	(8)R2, (16)R37, (8)R55, (1)R107, (1)R108, (1)R109, (4)R135, (2)R146, (2)R150, (4)R204	
0-90-0105	RES 1M OHM 1/8W 5% CFR-VM	1	R202	
0-90-0112	RES 1.1K OHM 1/8W 5% CFR-VM	17	(1)R36 (16)R56	
0-90-0123	RES 12K OHM 1/8W 5% CFR-VM	16	(16)R17	
0-90-0151	RES 150 OHM 1/8W 5% CFR-VM	2	(2)R139	
0-90-0203	RES 20K OHM 1/8W 5% CFR-VM	16	(8)R98, (8)R99	
0-90-0222	RES 2.2K OHM 1/8W 5% CFR-VM	11	(4)R63, (4)R66, (1)R78, (2)R144	
0-90-0332	RES 3.3K OHM 1/8W 5% CFR-VM	5	(4)R131, (1)R136B	
0-90-0362	RES 3.6K OHM 1/8W 5% CFR-VM	2	(2)R143	
0-90-0470	RES 47 OHM 1/8W 5% CFR-VM	8	(8)R7B	
0-90-0472	RES 4.7K OHM 1/8W 5% CFR-VM	120	(8)R6B, (16)R49, (16)R50, (16)R51, (16)R52, (16)R53, (16)R54, (4)R70, (3)R71, (4)R72, (3)R73, (1)R137A, (1)R138A	
0-90-0511	RES 510 OHM 1/8W 5% CFR-VM	16	(16)R57	
0-90-0512	RES 5.1K OHM 1/8W 5% CFR-VM	24	(8)R10B, (16)R19	
0-90-0562	RES 5.6K OHM 1/8W 5% CFR-VM	8	(4)R65, (4)R68	
0-90-0563	RES 56K OHM 1/8W 5% CFR-VM	16	(16)R18	
0-90-0751	RES 750 OHM 1/8W 5% CFR-VM	39	(16)R13, (16)R16, (4)R64, (3)R67	

0-90-0752	RES 7.5K OHM 1/8W 5% CFR-VM	17	(1)R81, (16)R12
0-91-1500	RES 150 OHM 1/8W 1% CFR-VM	16	(6)R83, (6)R84, (2)R145, (2)R149
0-93-0102	RES 1K OHM 1/4W 5% CFR-VM	16	R40
0-93-0472	RES 4.7K OHM 1/4W 5% CFR-VM	16	R41(16)
1-08-0100	CAP 100uF ELEC 20% 16V 2.5x6.3x11.2mm	80	(16)C1, (16)C2, (16)C3, (16)C7, (16)C20
1-08-0223	CAP 220uF ELEC 16V 3.5x8x12.5mm	32	(16)C17, (16)C18
1-09-0100	CAP 10uF ELEC 25V 2x5x11mm	8	(4)C38, (4)C52
1-09-0101	CAP 100uF ELEC 25V 2.5x6.3x11.2mm	2	C24, C26
1-09-0476	CAP 47uF ELEC 25V 2x5x11mm	156	(16)C8, (16)C14, (16)C15, (16)C16, (16)C19, (4)C32, (4)C33, (4)C34, (4)C35, (4)C48, (4)C49, (4)C51, (6)C36, (6)C37, (1)C28, (1)C29, (1)C30, (1)C31, (2)C55, (2)C56, (2)C39, (1)C40, (1)C41, (1)C42, (1)C43, (1)C44, (1)C45, (1)C46, (1)C47, (2)C58, (2)C59, (1)C64, (1)C65, (1)C66, (1)C67, (1)C68, (1)C69, (1)C70, (1)C71, (2)C200, (4)C202
1-09-1100	CAP 10uF ELEC 20% 25V 1.5x4x7mm	1	C201
1-20-0152	CAP 1500pF FILM 5%	16	(16)C9
1-20-0224	CAP 0.22uF FILM 5% 50V	48	(16)C4, (16)C5, (16)C6
1-20-0471	CAP 470pF FILM 5% 50V	16	C10
1-20-0473	CAP 0.047uF FILM 5% 100V	32	(16)C12, (16)C13
1-20-0474	CAP 0.47uF FILM 5% 63V	16	C11
1-21-0151	CAP 150pF MONO 10% 50V	6	(4)C50, (2)C54
1-23-0104	CAP 0.1uF Z5U 10% 100V 0.1" 2.0x4.0x5.0mm	28	(8)C22, (8)C23, (1)C25, (1)C27, (4)C60, (4)C61, (1)C62, (1)C63
2-00-4148	DIODE SIGNAL 1N4148 75V 200mA	19	(16)CR2, (1)CR3, (1)CR4, (1)CR5
2-03-4401	TRANS NPN GEN-PURPOSE-AMP 2N4401 40V 1A TO-92	4	Q3, Q5, Q7, Q8
2-03-4403	TRANS PNP 2N4403 40V 600mA TO-92	2	Q4, Q6
2-05-0111	TRANS N-CHAN FET J111 35V 50mA TO-92	21	(16)Q1, (1)Q2, (1)Q9, (1)Q10, (1)Q11, (1)Q12
2-21-4560	IC NJM4560L DUAL OP-AMP 8-SIP	4	(2)U3, (1)U6, (1)U7
2-21-4580	IC NJM4580D DUAL OP-AMP DIP-8	4	U2
2-21-4581	IC NJM4580L DUAL OP-AMP 8-SIP	14	(8)U1, (4)U4, (2)U5
3-00-0001	LED GREEN DIFFUSED ROUND T1(3mm)	17	(16)DS2, (1)DS5
3-01-0001	LED YELLOW ROUND T1(3mm)	1	DS4

3-02-0001	LED RED DIFFUSED ROUND T1(3mm)	17	(16)DS1, (1)DS3	
3-03-0001	LED TRI-STATE	1	DS6	
4-02-1000	JACK 1/4" STEREO VERTICAL MOUNT	2	J3, J4 (HEADPHONE JACKS)	
4-15-0204	HEADER SIL 4-PIN 3.96mm MALE EXT-LOCKING	1		
4-19-0006	CABLE 6-PIN 0.1" FILM 50mm LG. SPC	1	J5 (MAIN PCB TO HEADPHONE PCB)	
4-19-0303	INTERCONNECT SIL 3-PIN 0.1" 215mm SPC	2	W1-W2	
4-19-0404	INTERCONNECT SIL 4-PIN 0.1" 240mm SPC	1	W3	
4-51-0016	WIRE JUMPER 16AWG 345mm 300V STRANDED	4	WY1-WY3, WX1	719602
4-51-0024	WIRE JUMPER 24AWG 40mm 300V SOLID	1	W4	719602
4-51-0116	WIRE JUMPER 16AWG 270mm 300V STRANDED	1	WX2	719602
4-51-0124	WIRE JUMPER 25AWG 75mm 300V SOLID	1	W5	719602
4-51-0165	WIRE JUMPER 22AWG 175mm	1	R62 GND PIN to R118 GND PIN	
4-70-0016	CABLE RIBBON DIL 16-PIN 2.54mm 95mm M-F	2	J2, J9 (FX AND GROUPS TO REAR)	
4-70-0112	CABLE RIBBON DIL 12-PIN 2.54mm 600mm M-F	1	J7 (AUX TO REAR)	
4-70-1200	CABLE RIBBON 12-PIN 0.1" 200mm FDIL-MDIL	1	J8 (CR TO REAR)	
4-70-1612	CABLE RIBBON DIL 16-PIN 145mm X4	8	FP-TO-REAR PNL	
5-00-0126	SCREW 2.6 x 5mm PPB MACHINE	22	FOR STANDOFFS	
5-03-0021	STANDOFF M2.6 x 14mm F-F BRASS X3/X4	20	PCB MOUNTING	
5-03-1232	STANDOFF M2.6 x 8.5mm F-F METER-PCB X3	2	LED MOUNTING TO MAIN PCB	
5-04-0034	STANDOFF PLASTIC 11.5mm-LNGTH	36	FOR ALL LEDS	
6-02-0026	SWITCH DPDT PUSH-LATCH 30VDC 0.3A VERT-MNT	202	(16)S1, (16)S2, (16)S3, (16)S4, (16)S5, (16)S6, (16)S7, (16)S8, (16)S9, (16)S10, (16)S11, (1)S12, (4)S13, (4)S14, (4)S15, (1)S16, (1)S17, (1)S18, (1)S19, (1)S20, (1)S21, (1)S22, (1)S23, (1)S24, (2)S25, (2)S26,	
9-40-1259-C	PCB MAIN X4 - REV C	1		
9-79-0185-C	ASSY PCB HEADPHONE	2		
9-79-1315-C	ASSY PCB PAN HYBRID	4		
9-79-1319-C	ASSY PCB AUX HYBRID X4	1		
9-79-1320-C	ASSY PCB CR HYBRID X4	1		

9-79-0183-C	ASSY PCB PEAK HYBRID	4	
0-15-0103	RES 10K OHM 1/10W 5% 0805	1	R15
0-15-0122	RES 1.2K OHM 1/10W 5% 0805	4	R3-4, R9-10
0-15-0151	RES 150 OHM 1/10W 5% 0805	1	R13
0-15-0274	RES 270K OHM 1/10W 5% 0805	8	R1-2, R5-8, R11-12
0-15-0822	RES 8.2K OHM 1/10W 5% 0805	1	R14
1-03-0474	CAP 0.47uF TANT-A SMD 10% 35V	4	C1-2, C5-6
1-57-0104	CAP 0.1uF Z5U 0805	2	C3-4
2-50-4148	DIODE SIGNAL LS4148 MELF	12	D1-12
2-72-1339	IC NJM339E QUAD COMP SMD SOP-14	2	U1-2
4-28-0001	PIN HYBRID 1-PIN (FROM ROLL)	24	2 SETS x 5 PINS, 2 SETS x 7 PINS
9-40-0183-A	PCB PEAK HYBRID X4 - REV A	1	
9-79-1255-C	ASSY PCB EQ HYBRID	8	
0-15-0102	RES 1K OHM 1/10W 5% 0805	2	R9-10
0-15-0103	RES 10K OHM 1/10W 5% 0805	2	R6, R16
0-15-0105	RES 1M OHM 1/10W 5% 0805	2	R14, R24
0-15-0123	RES 12K OHM 1/10W 5% 0805	2	R4, R21
0-15-0163	RES 16K OHM 1/10W 5% 0805	2	R3, R15
0-15-0203	RES 20K OHM 1/10W 5% 0805	4	R1-2, R5, R22
0-15-0363	RES 36K OHM 1/10W 5% 0805	2	R13, R23
0-15-0472	RES 4.7K OHM 1/10W 5% 0805	6	R11, R17, R19-20, R25-26
0-15-0512	RES 5.1K OHM 1/10W 5% 0805	2	R7-8
1-55-0030	CAP 30pF NPO 0805	2	C8, C12
1-56-0100	CAP 10pF NPO 0805 5% 100V	2	C4, C10
1-56-0101	CAP 100pF NPO 0805 5% 50V	4	C1-3, C9
1-57-0104	CAP 0.1uF Z5U 0805	2	C5-6

2-71-0082	IC TL082 DUAL OPAMP SOP-8	4	
2-71-4560	IC NJM4560E DUAL OP-AMP SOP-8	1	U1
4-28-0001	PIN HYBRID 1-PIN (FROM ROLL)	24	2 SETS x 12 PINS
9-40-1255-A	PCB EQ HYBRID X4 - REV A	1	
9-79-1260-C	ASSY PCB REAR X4	1	
0-01-1002	RES 10.0K OHM 1/8W 1%	64	(8)R13, (8)R15, (8)R17, (8)R18, (8)R21, (8)R22, (8)R25, (8)R28
0-01-1500	RES 150 OHM 1/8W 1%	32	(8)R23, (8)R24, (8)R26, (8)R27
0-01-2002	RES 20.0K OHM 1/8W 1%	32	(8)R3, (8)R4, (8)R7, (8)R8
0-01-4991	RES 4.99K OHM 1/8W 1%	32	(8)R11, (8)R12, (8)R16, (8)R19
0-96-6811	RES 6.81K OHM 1/2W 1% CFR-VM	32	(8)R1, (8)R2, (8)R5, (8)R6
1-07-0224	CAP 2200uF ELEC 20% 6.3V 5x10.2x20mm	16	(8)C13, (8)C14
1-09-0100	CAP 10uF ELEC 25V 2x5x11mm	32	(8)C7, (8)C8, (8)C9, (8)C10
1-09-0476	CAP 47uF ELEC 25V 2x5x11mm	4	(1)C202, (1)C203, (1)C204, (1)C205
1-12-0472	CAP 47uF ELEC 20% 63V 2.5x6.3x11mm	33	(8)C5, (8)C6, (8)C11, (8)C12, (1)C200
1-23-0104	CAP 0.1uF Z5U 10% 100V 0.1" 2.0x4.0x5.0mm	33	(8)C15, (8)C16, (8)C17, (8)C18, (1)C201
2-21-4560	IC NJM4560L DUAL OP-AMP 8-SIP	16	(8)U1, (8)U2
4-02-1000	JACK 1/4" STEREO VERTICAL MOUNT	90	(8)J3, (8)J4, (8)J6, (8)J7, (8)J8, (8)J9, (8)J10, (8)J11, (1)J101, (1)J102, (1)J103, (1)J104, (1)J105, (1)J106, (1)J107, (1)J108, (1)J109, (1)J110, (1)J111, (1)J112, (1)J113, (1)J114, (1)J115, (1)J116, (1)J117, (1)J118, (1)J119, (1)J120, (1)J121, (1)J122, (1)J123, (1)J124, (1)J125, (1)J126
4-05-0010	JACK XLR 3-PIN FEM PCB-MNT 180ø	16	(8)J1, (8)J2
4-14-0012	HEADER DIL 12-PIN 0.1"	2	J127, J130
4-14-0016	HEADER DIL 16-PIN 0.1"	2	J128, J129
4-15-0204	HEADER SIL 4-PIN 3.96mm MALE EXT-LOCKING	1	J100
4-20-0016	HEADER DIL 16-PIN 0.1" SMD	8	J12
9-40-1260-B	PCB REAR X4 - REV B	1	
9-79-0171-C	ASSY PCB MIC/LINE MODULE	8	J5
0-15-0102	RES 1K OHM 1/10W 5% 0805	4	R20-21, R27, R30
0-15-0152	RES 1.5K OHM 1/10W 5% 0805	2	R9, R11

0-15-0222	RES 2.2K OHM 1/10W 5% 0805	2	R4, R10
0-15-0629	RES 6.2 OHM 1/10W 5% 0805	2	R22, R28
0-15-0681	RES 680 OHM 1/10W 5% 0805	4	R7-8, R12-13
0-16-3011	RES 3.01K OHM 1/10W 1% 0805	4	R5-6, R14, R17
0-16-3321	RES 3.32K OHM 1/10W 1% 0805	4	R23-26
0-16-7501	RES 7.50K OHM 1/10W 1% 0805	8	R1-3, R15-16, R18-19, R29
1-55-0221	CAP 220pF NPO 0805 5% 100V	4	C1-4
2-51-4403	TRANS PNP 2N4403 40V 800mA SOT-23	8	Q1-8
2-71-4560	IC NJM4560E DUAL OP-AMP SOP-8	2	MIC/LIN U1-2
4-28-0001	PIN HYBRID 1-PIN (FROM ROLL)	14	1 SET x 14 PINS
9-40-0171-A	PCB MIC/LINE MODULE X3 - REV A	1	
9-79-1307-C	ASSY PCB POWER SUPPLY X4	1	
0-03-0104	RES 100K OHM 1/4W 5%	3	R2, R5, R11
0-04-1002	RES 10.0K OHM 1/4W 1%	5	R1, R8-9, R13-14
0-04-2670	RES 267 OHM 1/4W 1%	3	R3, R6, R12
0-04-2941	RES 2.94K OHM 1/4W 1%	2	R7, R10
0-21-6811	RES 6.81K OHM 1/2W 1%	1	R4
1-10-0474	CAP 4700uF ELEC 20% 35V 7.5x18x40mm	2	C7, C14
1-11-0100	CAP 10uF ELEC 50V 2x5x11mm	6	C3, C5, C8, C11, C13, C17
1-11-0105	CAP 1.0uF ELEC 50V 2x5x11mm	5	C6, C10, C12, C15-16
1-13-0104	CAP 1000uF ELEC 20% 100V 7.5x18x40mm	1	C1
1-23-0104	CAP 0.1uF Z5U 10% 100V 0.1" 2.0x4.0x5.0mm	4	C2, C4, C9, C18
2-00-4148	DIODE SIGNAL 1N4148 75V 200mA	2	D13, D16
2-01-4003	DIODE POWER 1N4003 200V 1A	10	D1-6, D11-12, D14-15
2-01-5401	DIODE POWER 1N5401 100V 3A	4	D7-10
2-03-0056	TRANS PNP SMALL-SIGNAL MP5A56RLRA 80V 500mA	1	Q1
2-03-4401	TRANS NPN GEN-PURPOSE-AMP 2N4401 40V 1A TO-92	2	Q3, Q5

2-03-4403	TRANS PNP 2N4403 40V 600mA TO-92	2	Q2, Q4	
2-11-1317	REG ADJ-VOLTAGE LM317 POS 1.2-37V TO-220	1	U2	
2-11-1337	REG ADJ-VOLTAGE LM337 NEG 1.2-37V TO-220	1	U2	
2-11-3317	REG VOLTAGE LM317HV POS 1.2-57V TO-220	1	U1	
4-08-0006	CON SPADE 1-PIN 0.25" PLATED-ALUMINUM PCB-MNT	9	J2-10	
4-15-0016	HEADER SIL 8-PIN 3.96mm MALE EXT-LOCKING	1	J1	
4-50-0600	WIRE JUMPER 22AWG 0.6" INSULATED	3	JMP1-3	
5-00-0090	SCREW 4-40 x 1/4" PPZ	3	FOR HEATSINK	
5-02-4400	NUT KEP 4-40 ZINC	3	FOR HEATSINK	
5-05-1001	CLIP FUSE HOLDER 5 x 12mm	2		
7-04-0013	FUSE 315mA 250V 5x20mm T	1		
9-03-1132	HEATSINK	1		
9-03-1272	HEATSINK THERMALLOY 6299B X4	2		
9-40-1307-D	PCB POWER SUPPLY X4 - REV D	1	PCB	