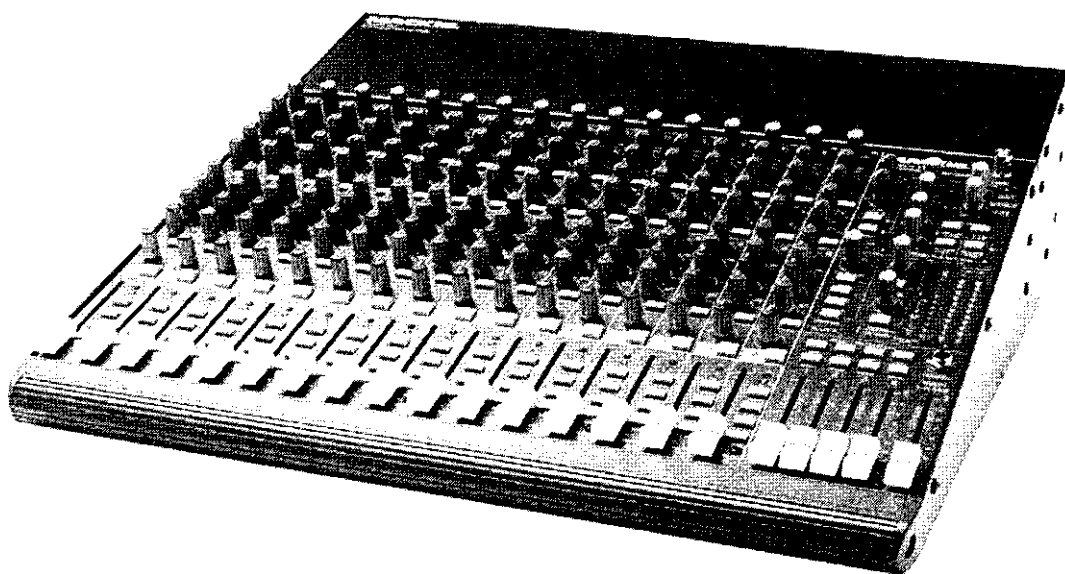


MACKIE

# 1604-VLZ™

## 16 CHANNEL MIC/LINE MIXER

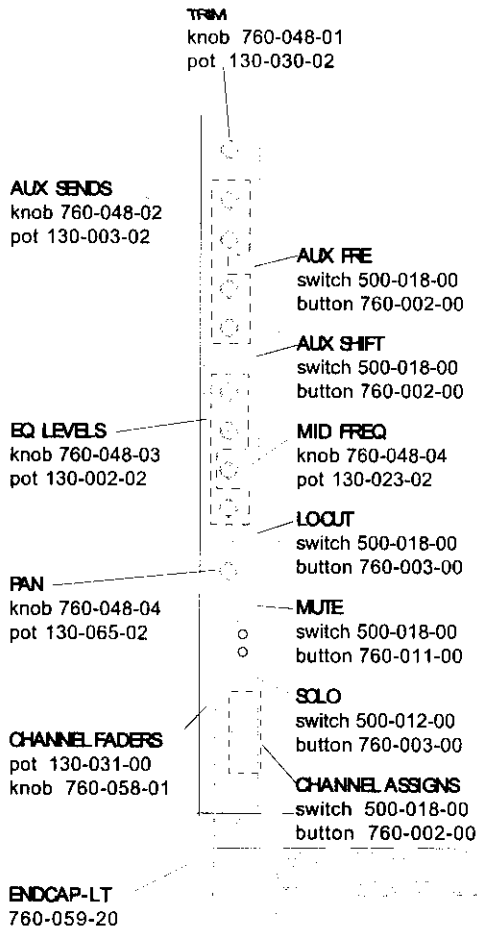


# SERVICE MANUAL

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Quick Parts	1
Block Diagram	2
Channel Schematic	3
Pod Section Schematics	4-6
Pod Section PCB Layout	7-8
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Main Section PCB Layout	15
Jumper Location and Pinout	16
Power Supply	17

MACKIE DESIGNS INC., 16220 WOOD-RED ROAD, WOODINVILLE, WA 98072, USA  
820-172-00 05/99

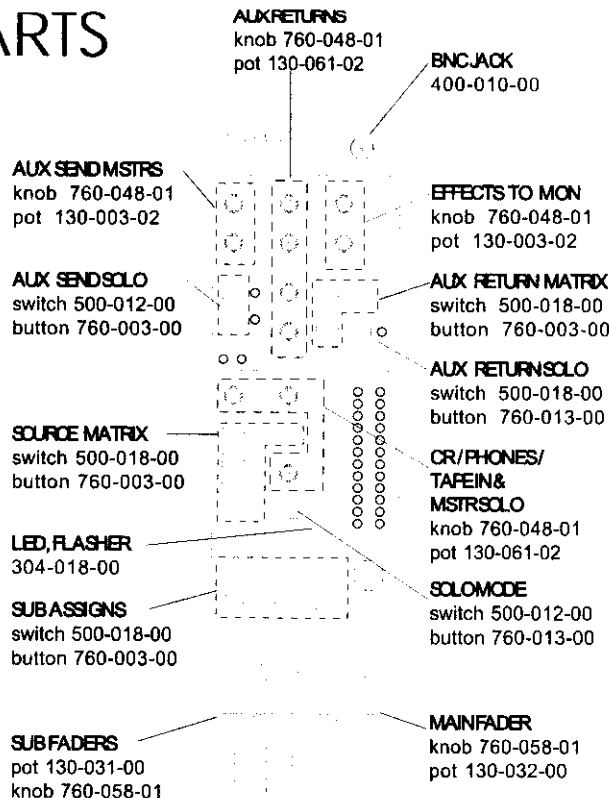
# QUICK PARTS



ALL 1/4" JACKS  
jack 400-214-00  
washer 710-002-00  
nut 705-003-00

ALL LEDS  
red 304-001-00  
yellow 304-003-00  
green 304-004-00

ARMREST  
551-021-00



ENDCAP-RT  
760-059-10

## SCREW PLACEMENT

TOP ALLEN SCREWS  
700-011-00

BOTTOM SCREWS  
701-002-00

SIDE POD SCREWS  
700-004-00

SIDE SCREWS  
700-006-00

END CAP SCREWS  
700-010-06

FLATE SCREWS  
700-010-00

XLR SCREWS  
700-005-00

STAR GROUND  
screw 700-031-01  
nut 705-001-00

CHASSIS BOTTOM  
550-173-00

CHASSIS TOP  
550-172-10

CABLE PLATE  
550-176-00

## METAL

POD BOTTOM  
550-175-00

POD TOP  
550-174-00

BUMFON  
750-001-00

## POD COMPONENTS

ALL 1/4" JACKS  
jack 400-214-00  
washer 710-002-00  
nut 705-003-00

FEMALE XLR INPUT  
400-223-00

RCA INPUT  
400-022-00

IEC RECEPTACLE  
400-009-00

PWR SWITCH  
500-013-00

PHANTOM SW  
500-016-00

MONO OUTPUT  
knob 760-007-00  
pot 130-062-02

## INTERNAL PARTS

TRANSFORMER  
100V 080-008-02  
120V 080-008-00  
230V 080-008-01

POB-POD  
055-219-00-01

POB-MAIN  
055-220-00-01

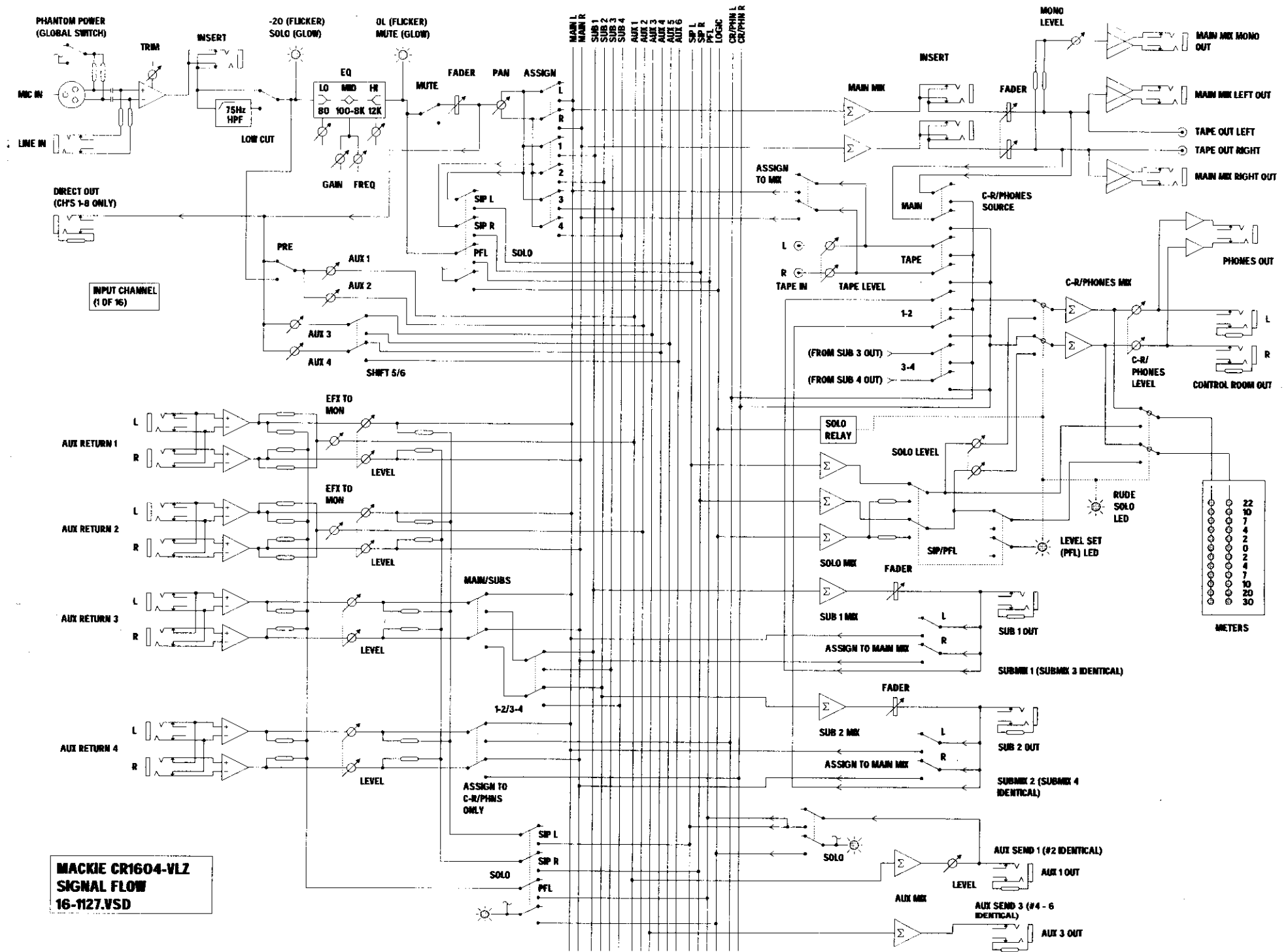
POB-PWR  
055-066-00

## MISC...

ROTO RACK EARS  
L - 550-179-00  
R - 550-180-00  
RACK EARS  
550-177-00 (X2)

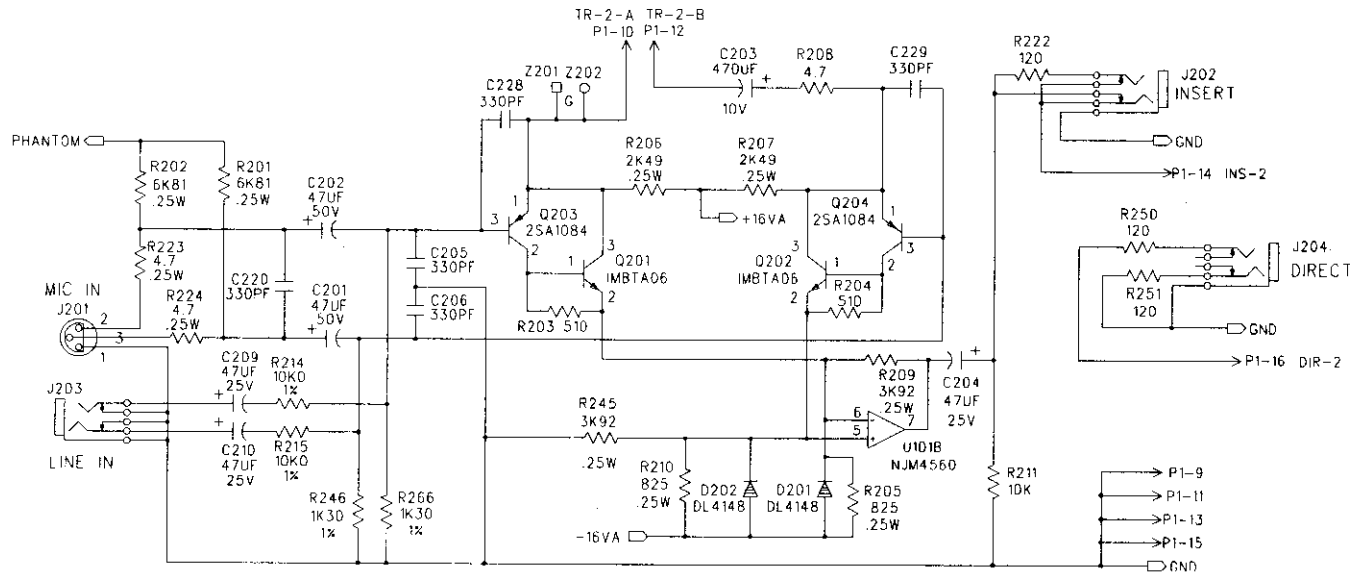
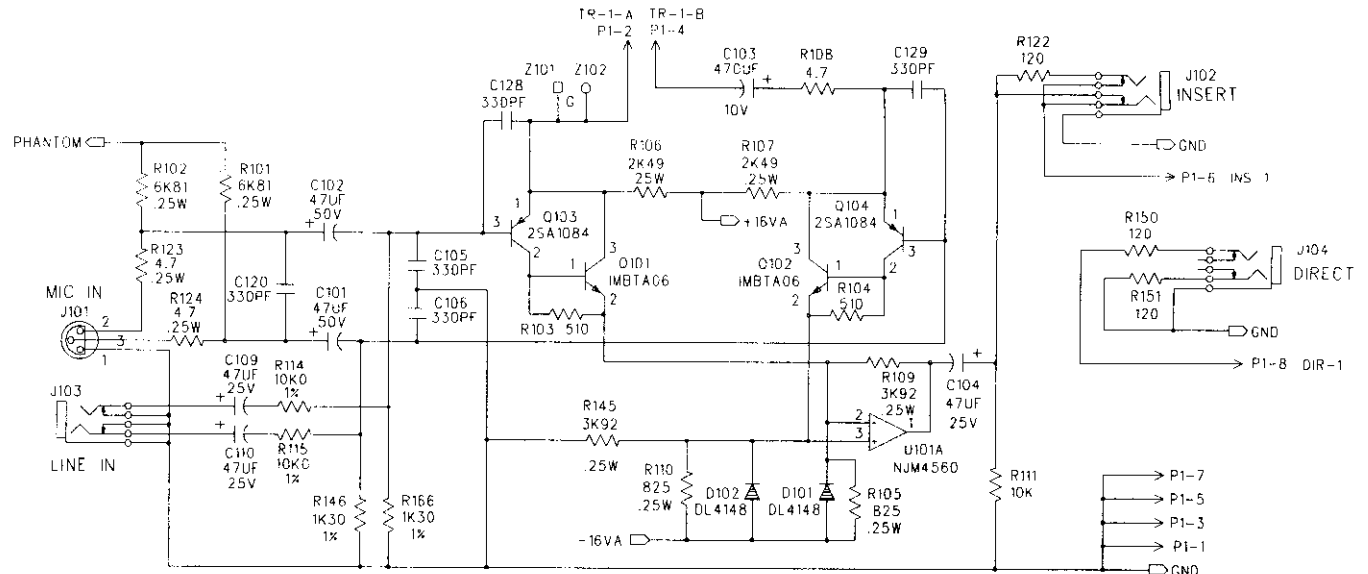
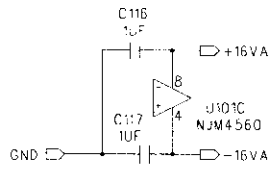
AC LINE CORD  
(120V) 640-001-00

OWNER'S MANUAL  
820-034-01



**MACKIE CR1604-VLZ  
 SIGNAL FLOW  
 16-1127.VSD**

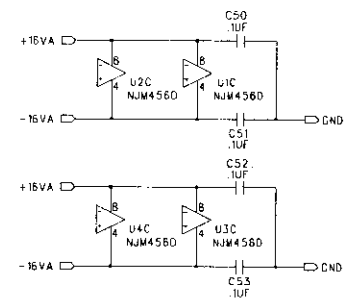
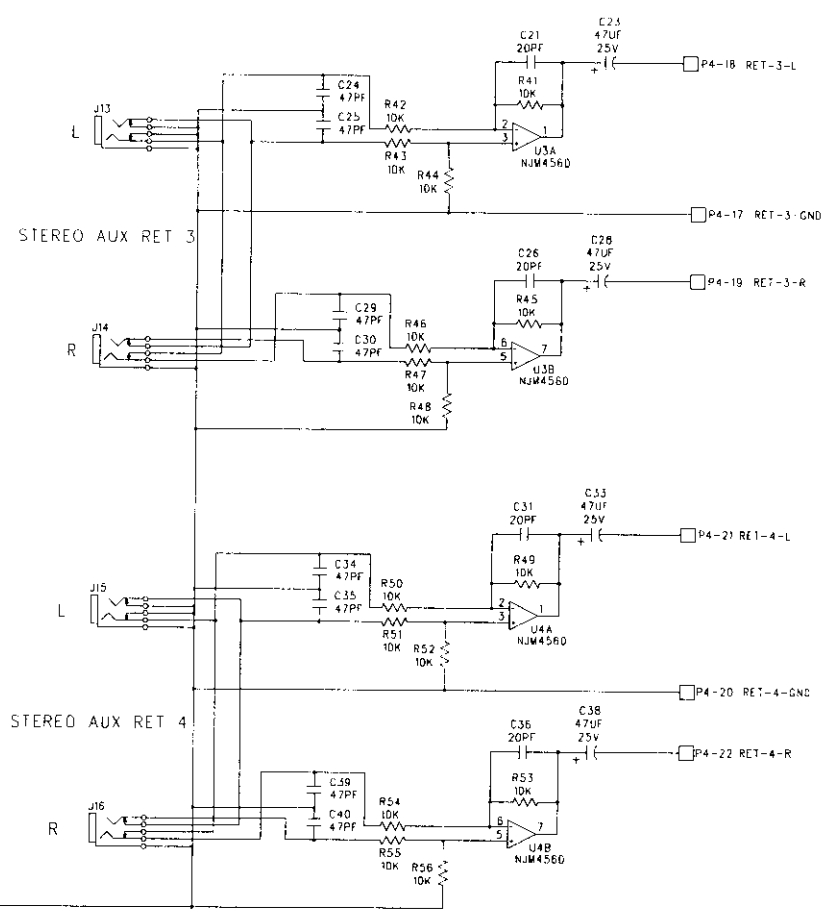
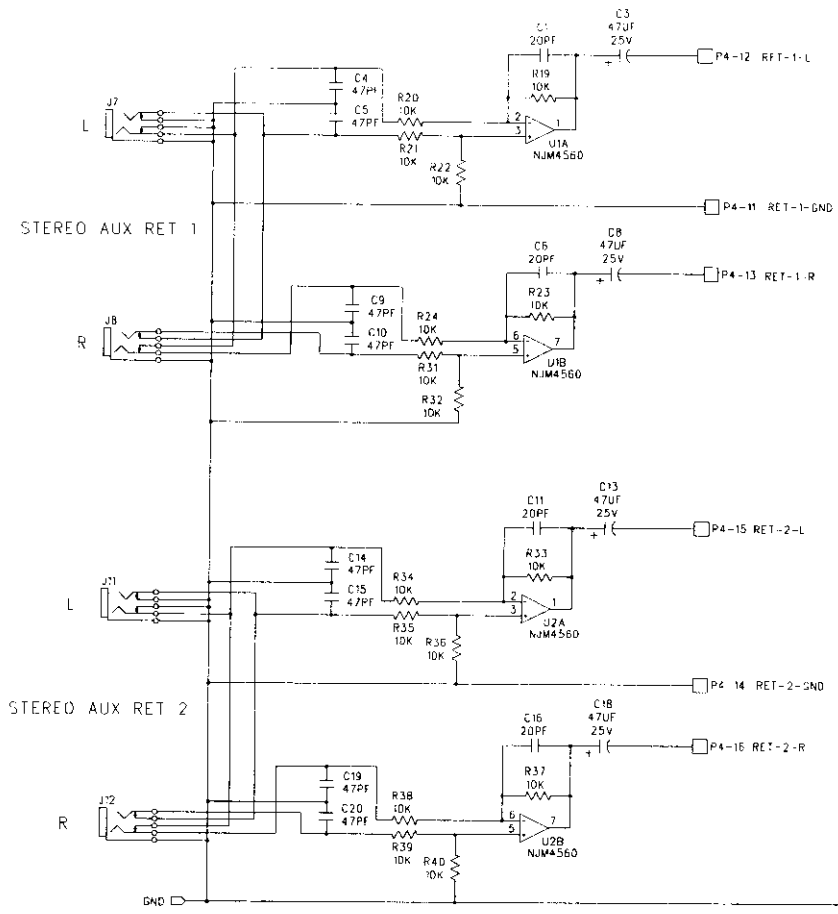


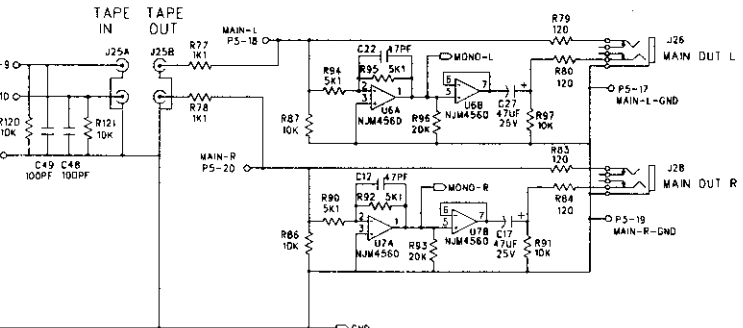
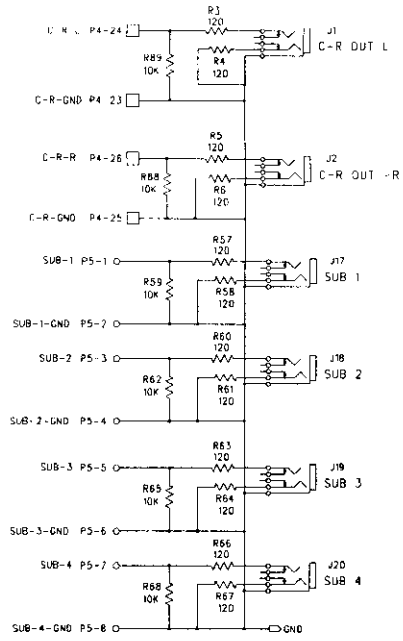
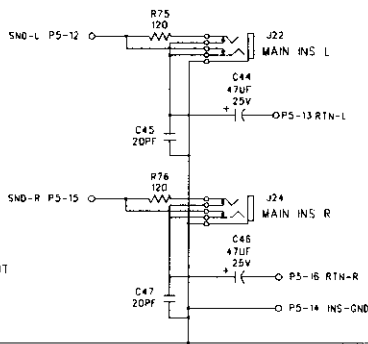
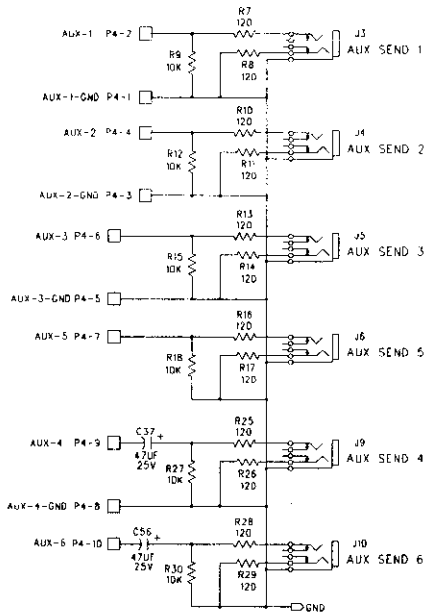
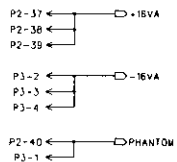
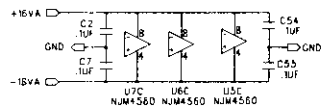
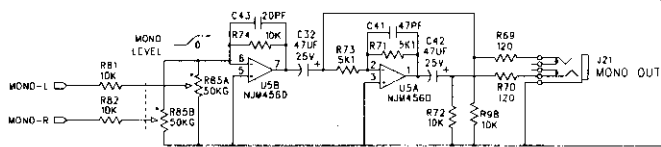
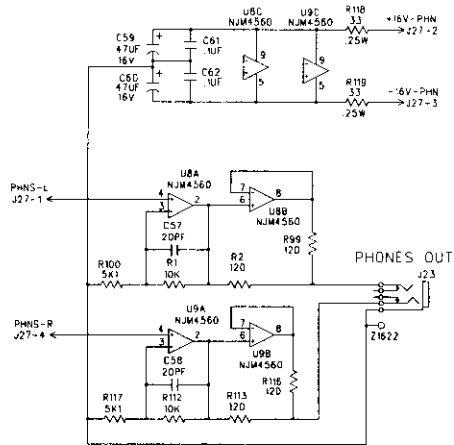


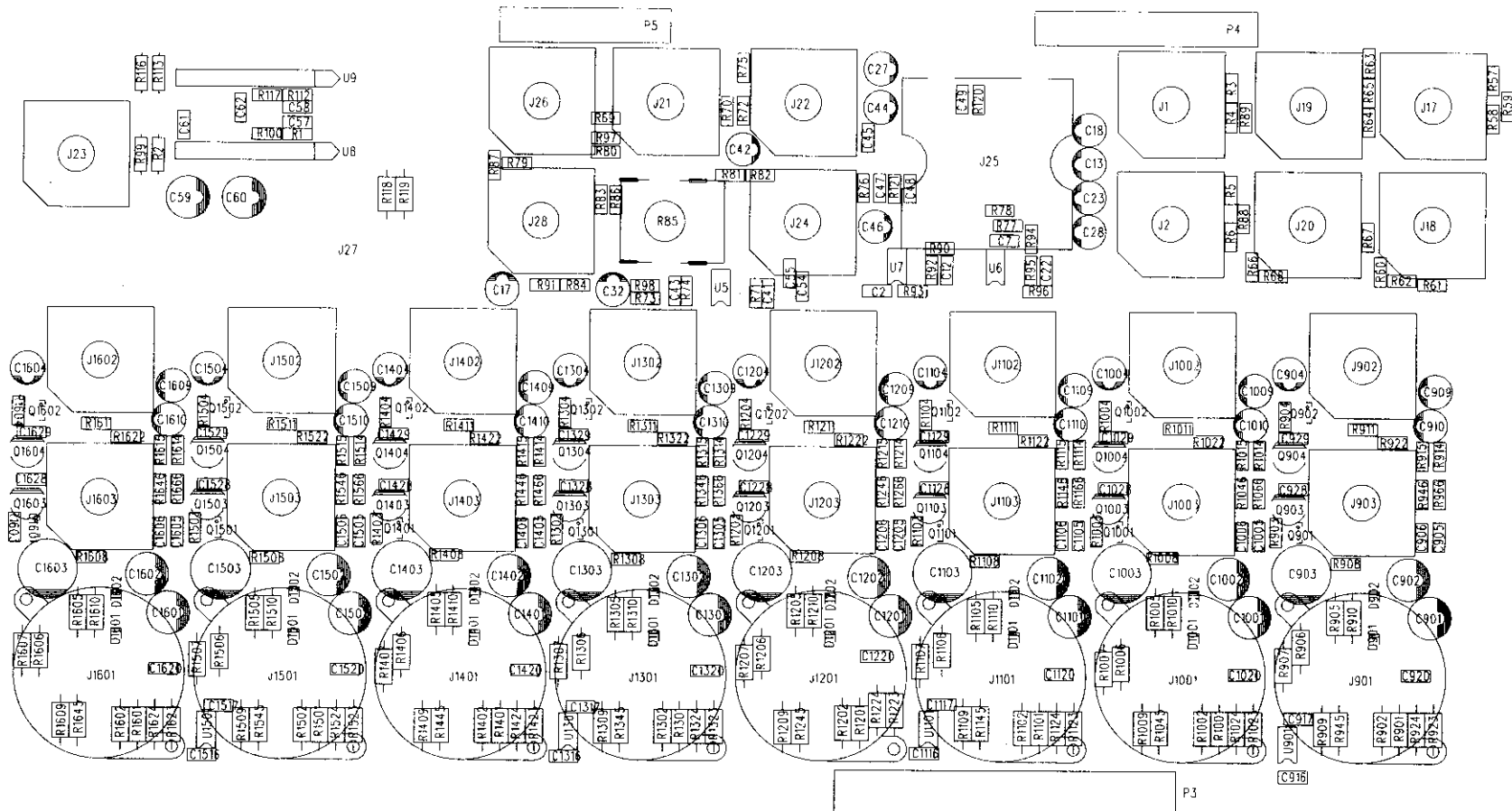
CHANNELS 1-2 SHOWN, 3-16 SIMILAR

**MACKIE.**

**CR1604-VLZ, POD SECTION SHEET 1**



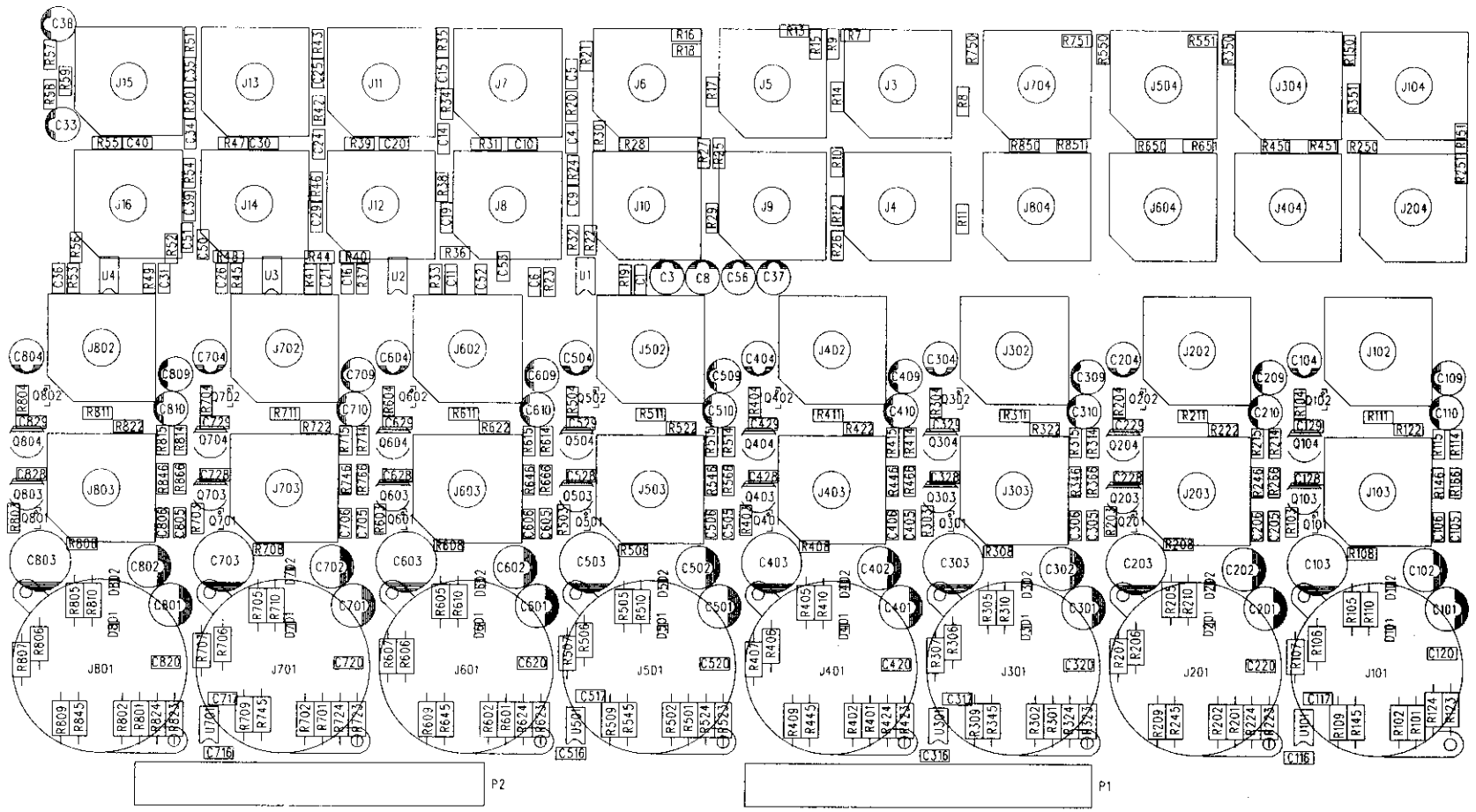




REV C

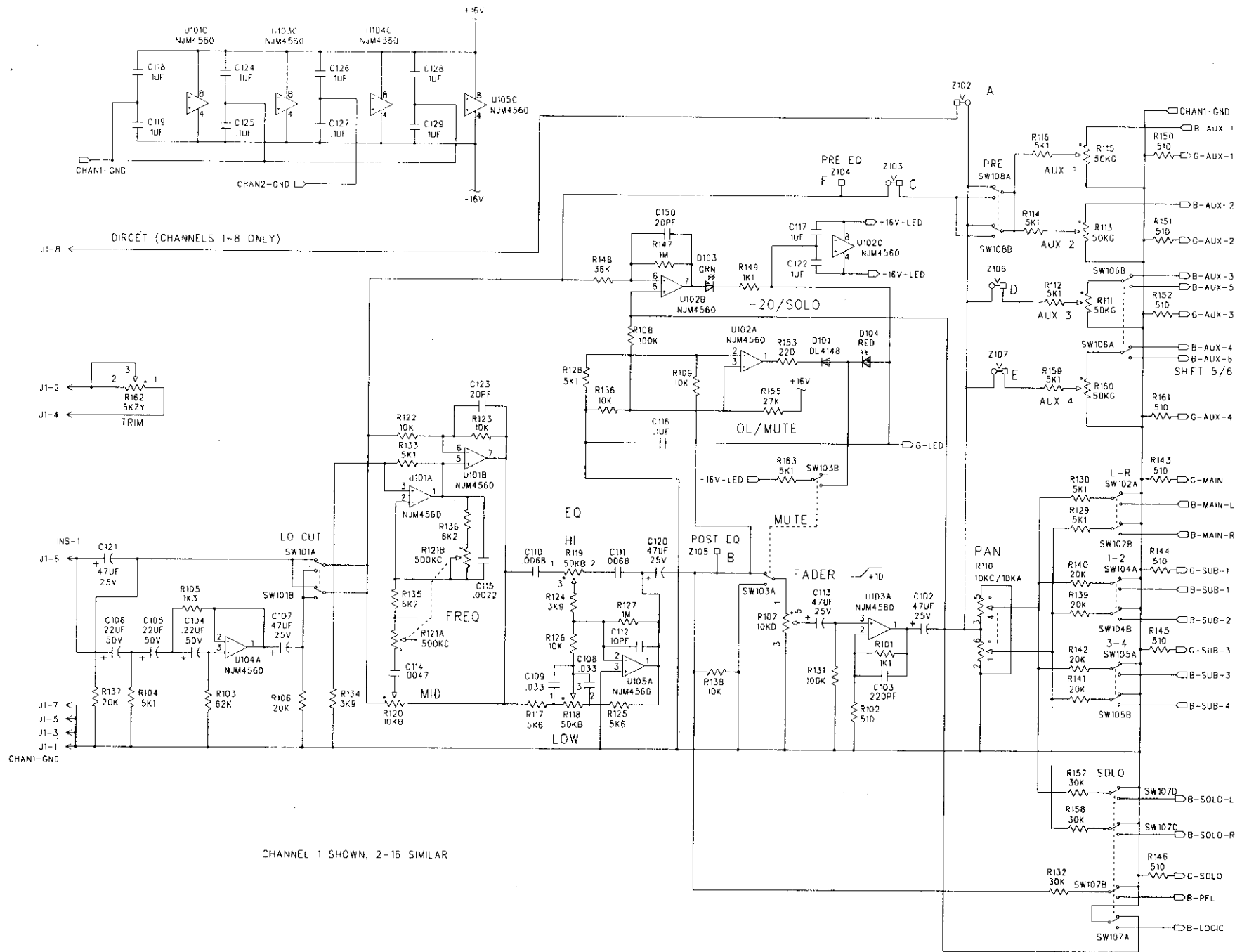
MACKIE.  
CR1604-VLZ POD PCB LAYOUT, LEFT HALF



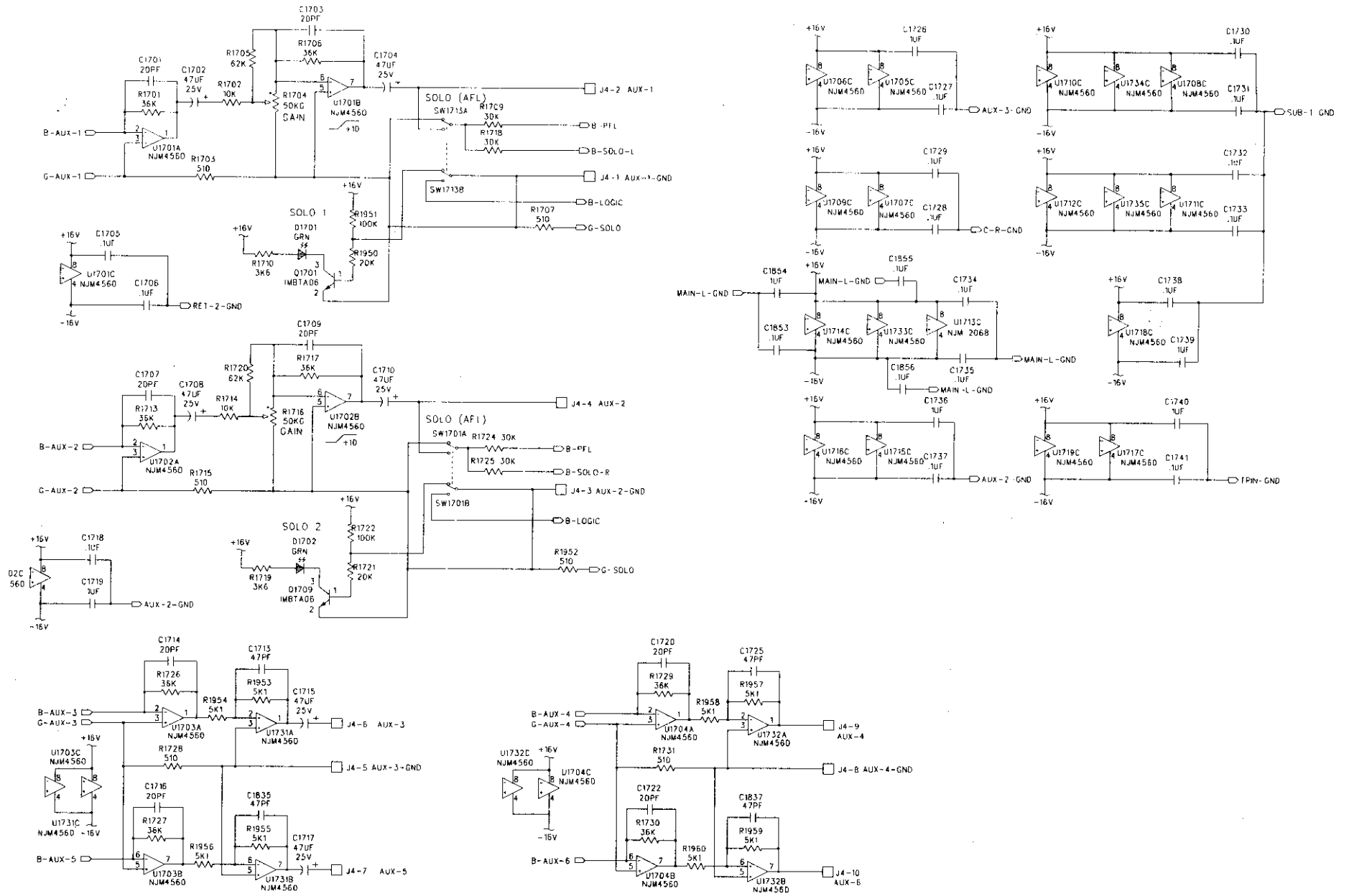


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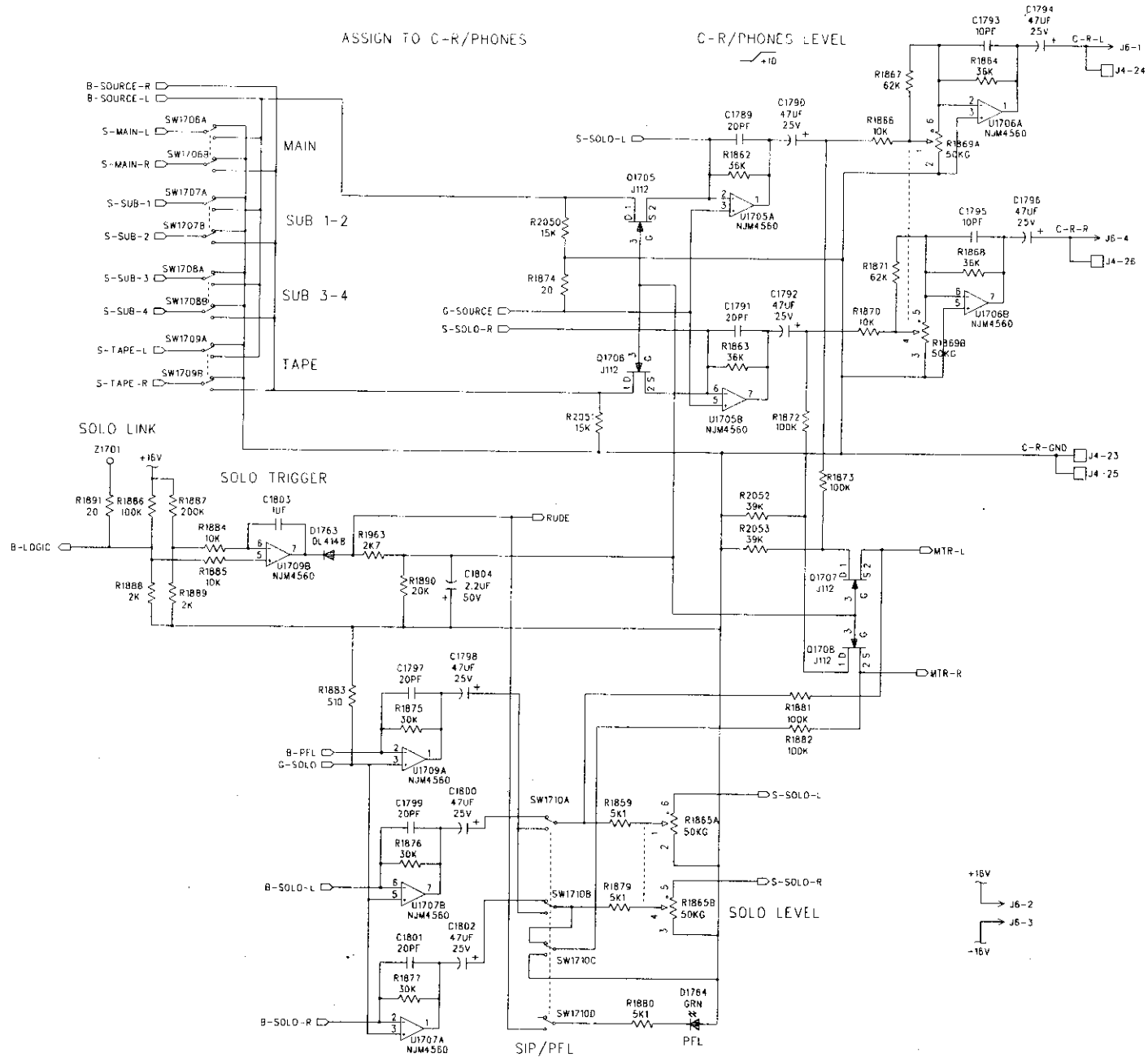
**MACKIE.**  
**CR1604-VLZ POD PCB LAYOUT, RIGHT HALF**



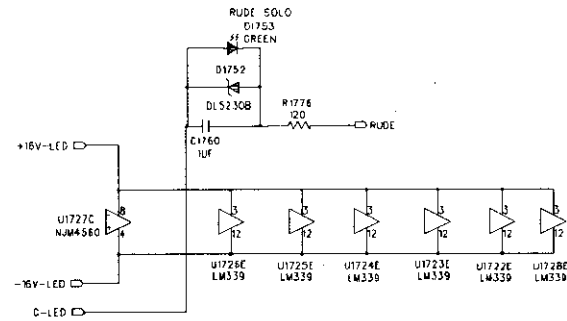
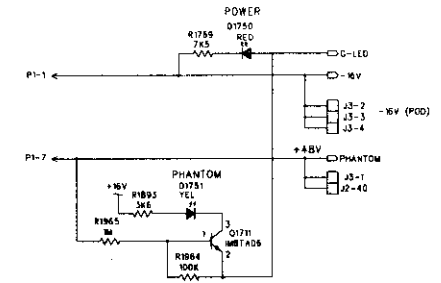
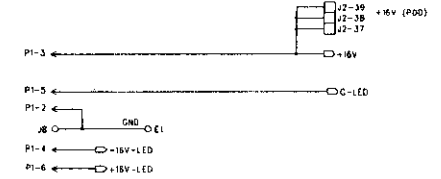
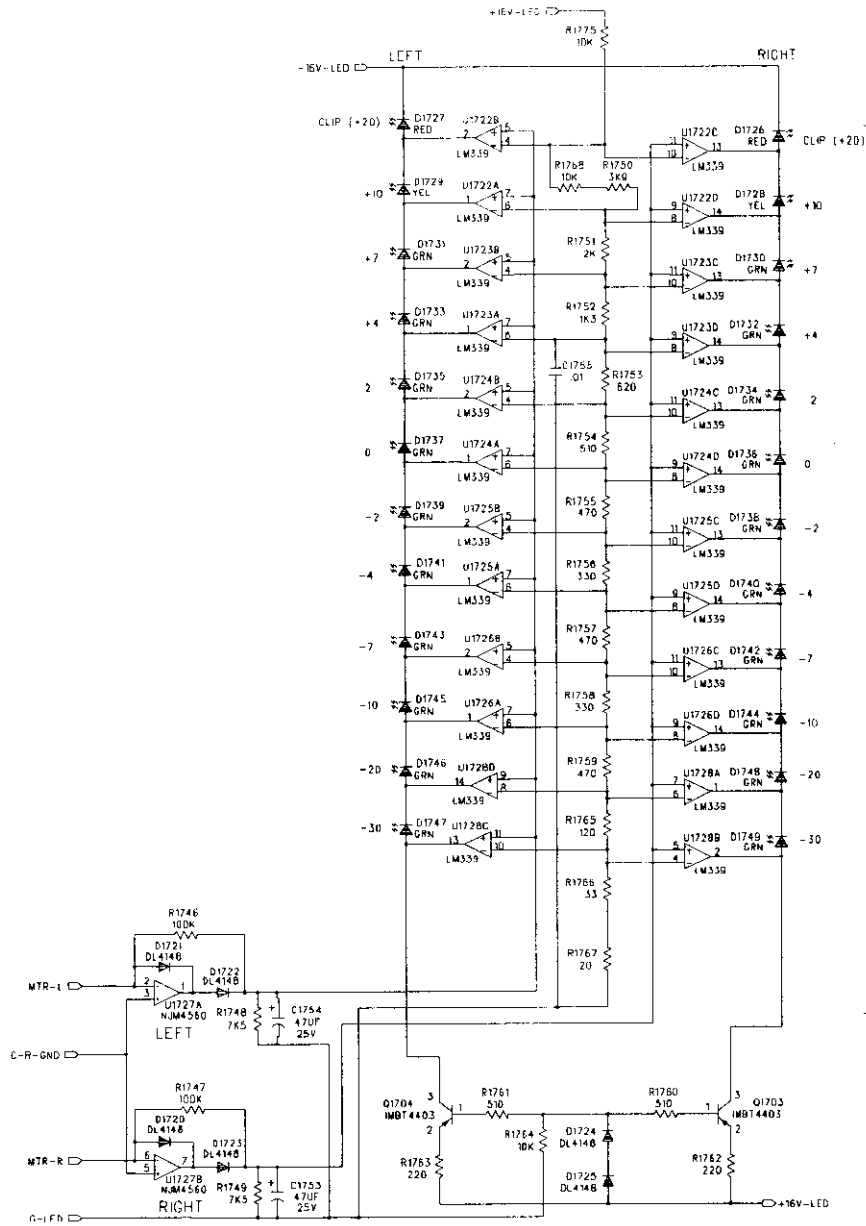






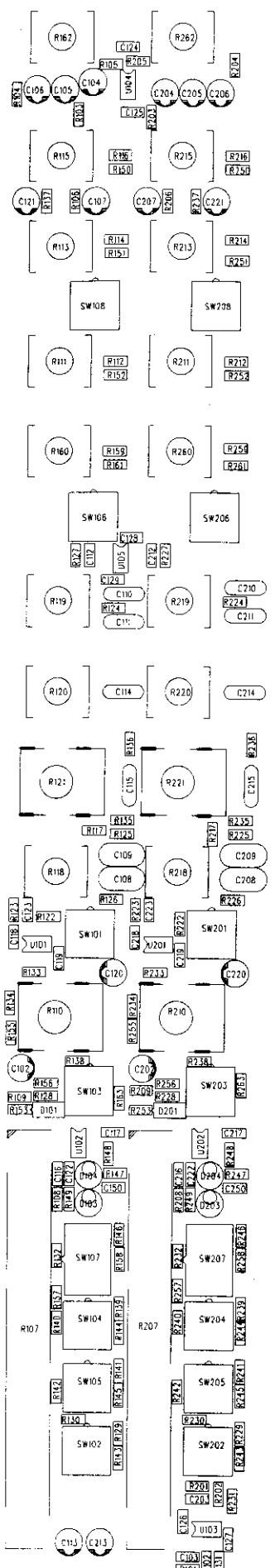


**MACKIE.**  
**CR1604-VLZ MAIN SECTION, SHEET 5**



**MACKIE**

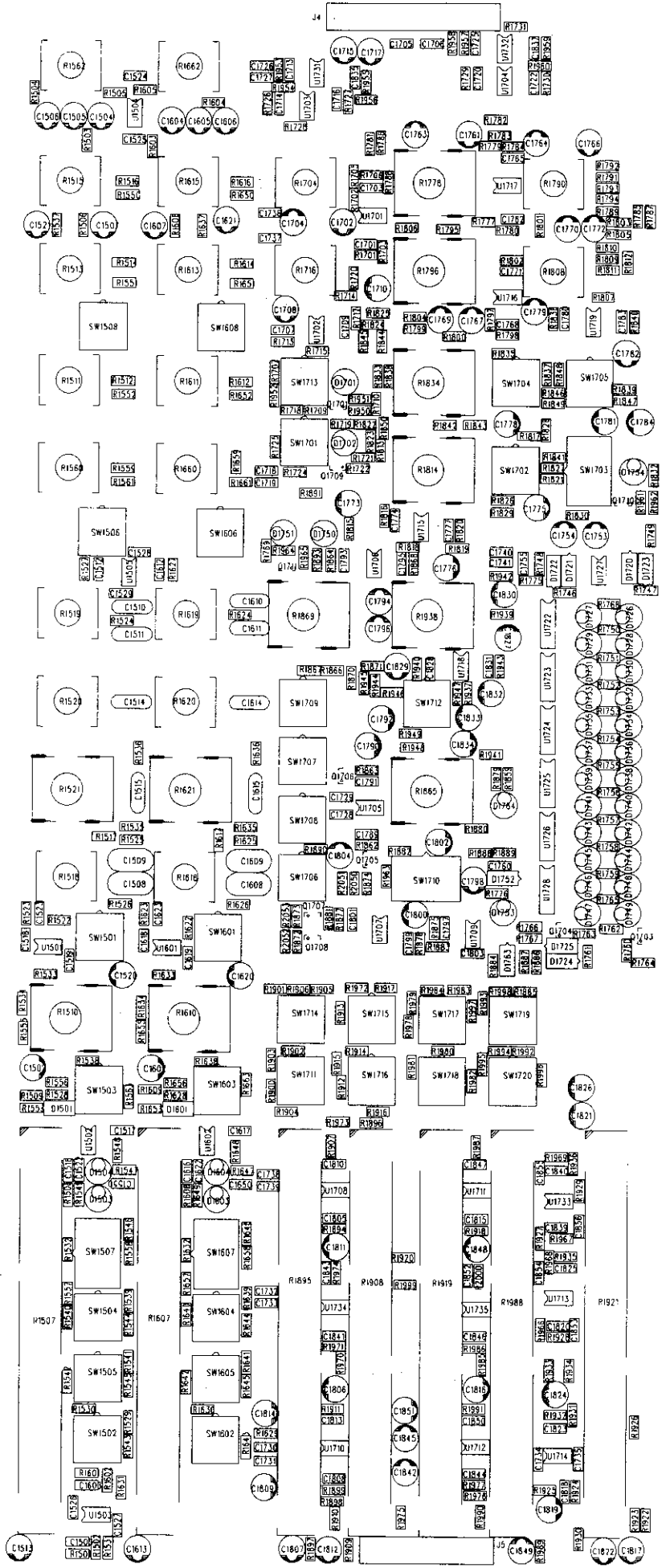
**CR1604-VLZ MAIN SECTION, SHEET 6**



MAGKIE  
CRI604-VLZ

MAIN BOARD  
PCB LAYOUT  
REV B

CHANNELS 3-14  
NOT SHOWN,  
REFER TO  
CHANNELS 1-2.





**MACKIE™**

**CR1604-VLZ  
MAIN PCB**

**JUMPER LOCATION  
AND PINOUT**

**J1**

40 PIN

MAIN CABLE PART # 040-076-00  
POD CABLE PART # 040-073-00

**J2**

40 PIN

MAIN CABLE PART # 040-076-00  
POD CABLE PART # 040-073-00

**J3**

40 PIN

MAIN CABLE PART # 040-076-00  
POD CABLE PART # 040-073-00

**P1**

POWER DISTRIBUTION  
CABLE ASSY PART # 040-078-00

**J4**

26 PIN

MAIN CABLE PART # 040-074-00  
POD CABLE PART # 040-071-00

**J5**

20 PIN

MAIN CABLE PART # 040-075-00  
POD CABLE PART # 040-072-00

J1			
CHANNEL 1 GND	1	2	CHANNEL 1 TRIM A
CHANNEL 1 GND	3	4	CHANNEL 1 TRIM B
CHANNEL 1 GND	5	6	CHANNEL 1 IN
CHANNEL 1 GND	7	8	CHANNEL 1 DI OUT
CHANNEL 2 GND	9	10	CHANNEL 2 TRIM A
CHANNEL 2 GND	11	12	CHANNEL 2 TRIM B
CHANNEL 2 GND	13	14	CHANNEL 2 IN
CHANNEL 2 GND	15	16	CHANNEL 2 DI OUT
CHANNEL 3 GND	17	18	CHANNEL 3 TRIM A
CHANNEL 3 GND	19	20	CHANNEL 3 TRIM B
CHANNEL 3 GND	21	22	CHANNEL 3 IN
CHANNEL 3 GND	23	24	CHANNEL 3 DI OUT
CHANNEL 4 GND	25	26	CHANNEL 4 TRIM A
CHANNEL 4 GND	27	28	CHANNEL 4 TRIM B
CHANNEL 4 GND	29	30	CHANNEL 4 IN
CHANNEL 4 GND	31	32	CHANNEL 4 DI OUT
CHANNEL 5 GND	33	34	CHANNEL 5 TRIM A
CHANNEL 5 GND	35	36	CHANNEL 5 TRIM B
CHANNEL 5 GND	37	38	CHANNEL 5 IN
CHANNEL 5 GND	39	40	CHANNEL 5 DI OUT

J2			
CHANNEL 6 GND	1	2	CHANNEL 6 TRIM A
CHANNEL 6 GND	3	4	CHANNEL 6 TRIM B
CHANNEL 6 GND	5	6	CHANNEL 6 IN
CHANNEL 6 GND	7	8	CHANNEL 6 DI OUT
CHANNEL 7 GND	9	10	CHANNEL 7 TRIM A
CHANNEL 7 GND	11	12	CHANNEL 7 TRIM B
CHANNEL 7 GND	13	14	CHANNEL 7 IN
CHANNEL 7 GND	15	16	CHANNEL 7 DI OUT
CHANNEL 8 GND	17	18	CHANNEL 8 TRIM A
CHANNEL 8 GND	19	20	CHANNEL 8 TRIM B
CHANNEL 8 GND	21	22	CHANNEL 8 IN
CHANNEL 8 GND	23	24	CHANNEL 8 DI OUT
CHANNEL 9 GND	25	26	CHANNEL 9 TRIM A
CHANNEL 9 GND	27	28	CHANNEL 9 TRIM B
CHANNEL 9 GND	29	30	CHANNEL 9 IN
CHANNEL 10 GND	31	32	CHANNEL 10 TRIM A
CHANNEL 10 GND	33	34	CHANNEL 10 TRIM B
CHANNEL 10 GND	35	36	CHANNEL 10 IN
	37	38	+16 V
	39	40	+16 V
			+48V PHANTOM PWR

J5			
SUB 1 OUT	1	2	SUB 1 GND
SUB 2 OUT	3	4	SUB 2 OUT
SUB 3 OUT	5	6	SUB 3 GND
SUB 4 OUT	7	8	SUB 4 GND
TAPE IN LEFT	9	10	TAPE IN RIGHT
TAPE IN GND	11	12	LEFT MAIN INS SEND
LEFT MAIN INS RETURN	13	14	INSERT GND
RIGHT MAIN INS RTN	15	16	RIGHT MAIN INS SEND
MAIN L GND	17	18	MAIN L TO POD
MAIN R GND	19	20	MAIN R TO POD

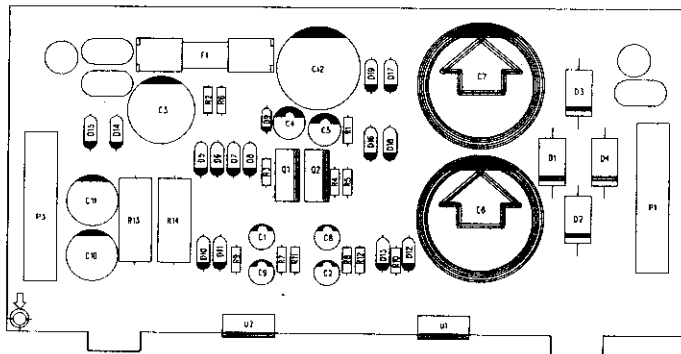
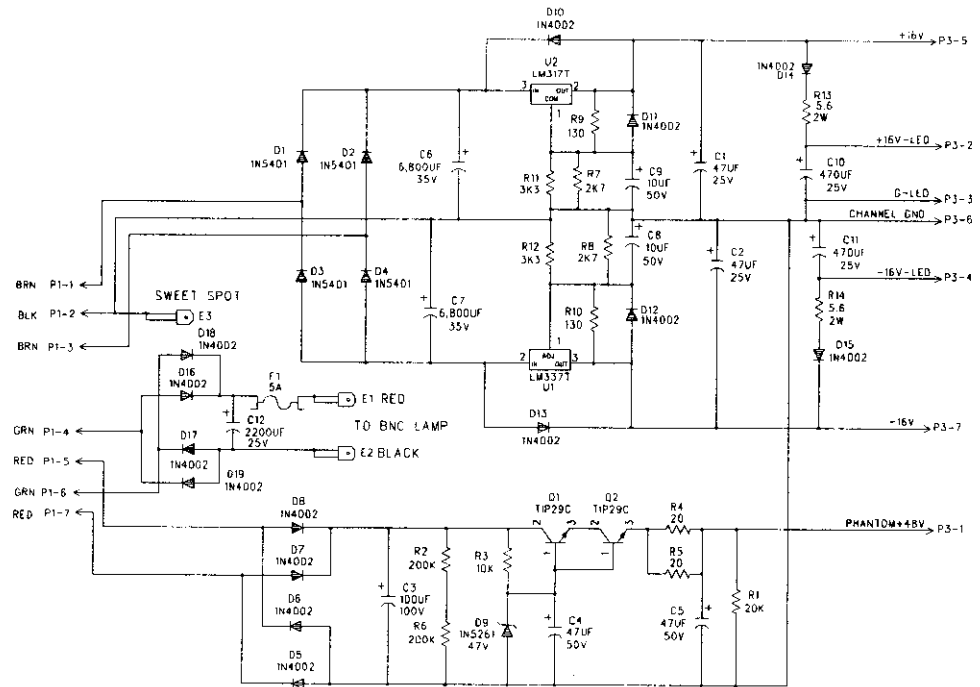
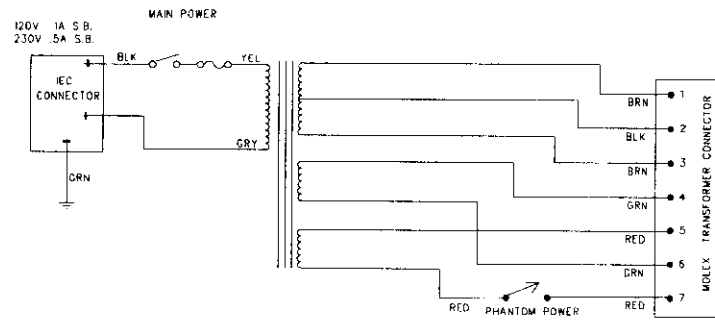
**P1**

7	+48V PHANTOM
6	+16V LED
5	GND LED
4	-16V LED
3	+16V
2	GND
1	-16V

**J4**

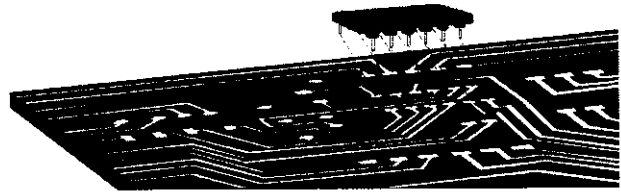
AUX 1 SEND GND	1	2	AUX 1 SEND
AUX 2 SEND GND	3	4	AUX 2 SEND
AUX 3/5 SEND GND	5	6	AUX 3 SEND
AUX 5 SEND	7	8	AUX 4/6 SEND GND
AUX 4 SEND	9	10	AUX 6 SEND
AUX RETURN 1 GND	11	12	AUX RETURN 1 LEFT
AUX RETURN 1 RIGHT	13	14	AUX RETURN 2 GND
AUX RETURN 2 LEFT	15	16	AUX RETURN 2 RIGHT
AUX RETURN 3 GND	17	18	AUX RETURN 3 LEFT
AUX RETURN 3 RIGHT	19	20	AUX RETURN 4 GND
AUX RETURN 4 LEFT	21	22	AUX RETURN 4 RIGHT
CONTROL ROOM GND	23	24	CONTROL ROOM LEFT
CONTROL ROOM GND	25	26	CONTROL ROOM RIGHT

J3			
+48V PHANTOM PWR	1	2	-16V
	3	4	-16V
CHANNEL 11 GND	5	6	CHANNEL 11 TRIM A
CHANNEL 11 GND	7	8	CHANNEL 11 TRIM B
CHANNEL 11 GND	9	10	CHANNEL 11 IN
CHANNEL 12 GND	11	12	CHANNEL 12 TRIM A
CHANNEL 12 GND	13	14	CHANNEL 12 TRIM B
CHANNEL 12 GND	15	16	CHANNEL 12 IN
CHANNEL 13 GND	17	18	CHANNEL 13 TRIM A
CHANNEL 13 GND	19	20	CHANNEL 13 TRIM B
CHANNEL 13 GND	21	22	CHANNEL 13 IN
CHANNEL 14 GND	23	24	CHANNEL 14 TRIM A
CHANNEL 14 GND	25	26	CHANNEL 14 TRIM B
CHANNEL 14 GND	27	28	CHANNEL 14 IN
CHANNEL 15 GND	29	30	CHANNEL 15 TRIM A
CHANNEL 15 GND	31	32	CHANNEL 15 TRIM B
CHANNEL 15 GND	33	34	CHANNEL 15 IN
CHANNEL 16 GND	35	36	CHANNEL 16 TRIM A
CHANNEL 16 GND	37	38	CHANNEL 16 TRIM B
CHANNEL 16 GND	39	40	CHANNEL 16 IN



**MACKIE.**  
CR1604-VLZ  
POWER SUPPLY

# MACKIE®



## THE MACKIE FIXER • MACKIE DESIGNS SERVICE NEWS

### 1604-VLZ Auxiliary modifications

In addition to the modifications shown in the 1604-VLZ owner's manual, there are two rather lovely and optional mods for the signal routing of Aux 3/4 and 5/6.

#### **UL Warning**

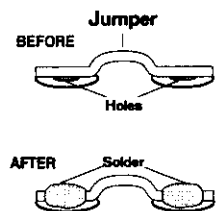
**CAUTION!** These modification instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than changing the fuse unless you are qualified to do so. Refer all servicing and modifying to qualified personnel.

#### **Mackie Disclaimer**

Any modification of any Mackie Designs product must be performed by a competent electronic technician. Mackie Designs accepts no responsibility for any damages or injuries caused by any modification, regardless of the source of the modification instructions or the qualifications of the technician performing them. In the case of such damages, Mackie Designs may declare warranty privileges void. **BE CAREFUL!**

#### **About Jumpers**

We recommend solid (non-stranded) insulated wire, 26–28 gauge (wire-wrapping variety). When installing jumpers, do not run their ends through holes in the circuit board. Rather, solder them flat against the desired pad (the flat silver area, possibly with a hole in the middle). Make sure the ends of these flat wires do not extend beyond the pad.



#### **Tools required**

Sharp razor (X-acto) knife, soldering iron, solder, Phillips screwdriver.

#### **Getting ready**

The following must be performed before starting the actual mods.

1. Remove all cords, including the power cable, from the 1604-VLZ.
2. Place the mixer upside-down on a dry, non-marring surface.
3. If you have converted your mixer to the rack-mount position or have installed a RotoPod, undo those changes and temporarily configure the mixer in the original desktop mode. You do not have to install the pod, just get it out of the way of the bottom cover.
4. Remove the screws that attach the bottom cover. Keep track of what screws go where. Remove the bottom cover and have at the mods shown on sheet 2.
5. When you have finished the mods, put it all back together and retest all functions for correct operation, making especially sure that all modified channels are working correctly.

To make Aux 3/5 and Aux4/6  
Pre-EQ and Pre-Fader

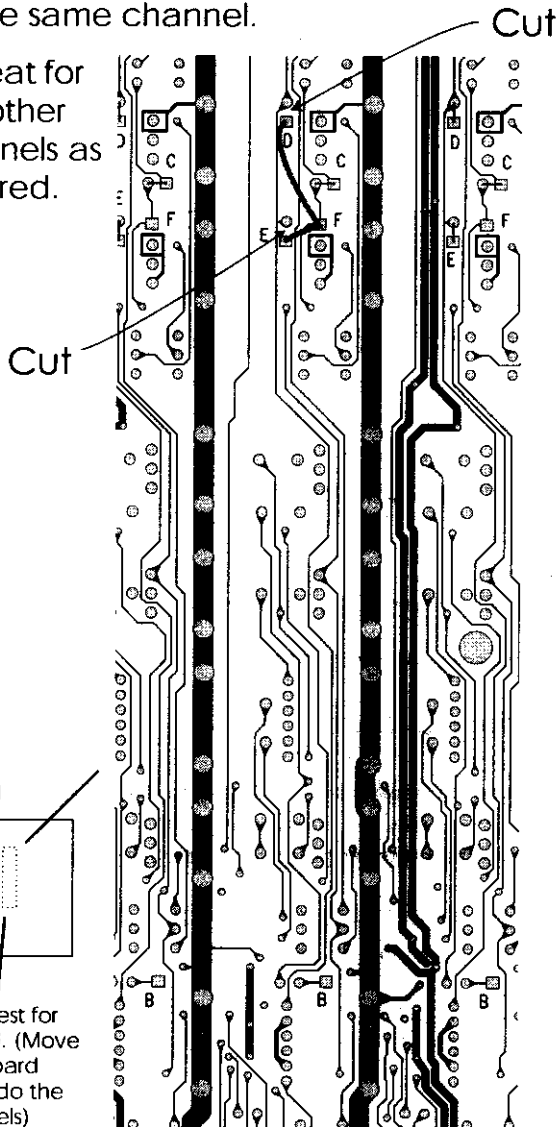
**Aux 3/5**

1. Cut the trace between the round and square pads at point **D** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **D** to the square pad at **F** on the same channel.
3. Repeat for other channels as required.

**Aux 4/6**

1. Cut the trace between the round and square pads at point **E** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **E** to the square pad at **F** on the same channel.

3. Repeat for any other channels as required.



To make Aux 3/5 and Aux4/6  
Post-EQ and Pre-Fader

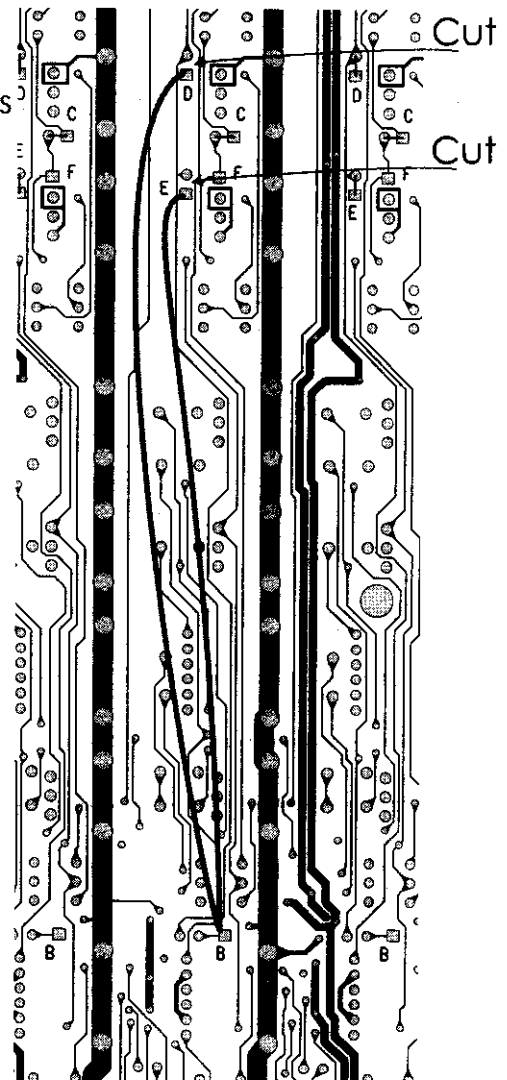
**Aux 3/5**

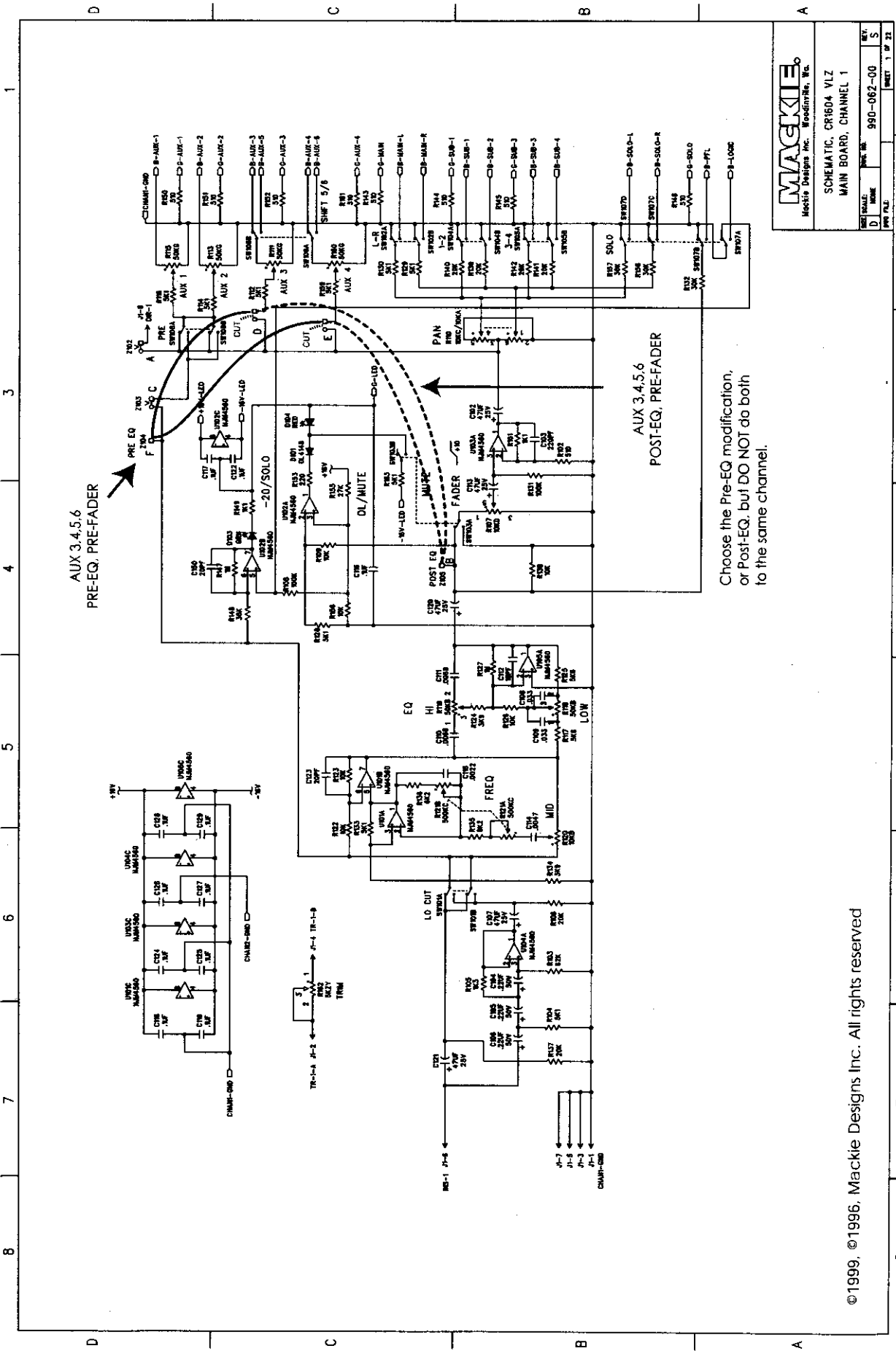
1. Cut the trace between the round and square pads at point **D** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **D** to the square pad at **B** on the same channel.
3. Repeat for other channels as required.

**Aux 4/6**

1. Cut the trace between the round and square pads at point **E** on the channel to be modified.
2. Solder an insulated jumper wire from the square pad at **E** to the square pad at **B** on the same channel.

3. Repeat for any other channels as required.





**MACKIE**  
Mackie Designs Inc. Woodinville, Wa.

SCHEMATIC, CR1604 VLZ  
MAIN BOARD, CHANNEL 1

REV. 1 11 93  
D 990-082-00 S  
REV. 1 11 93

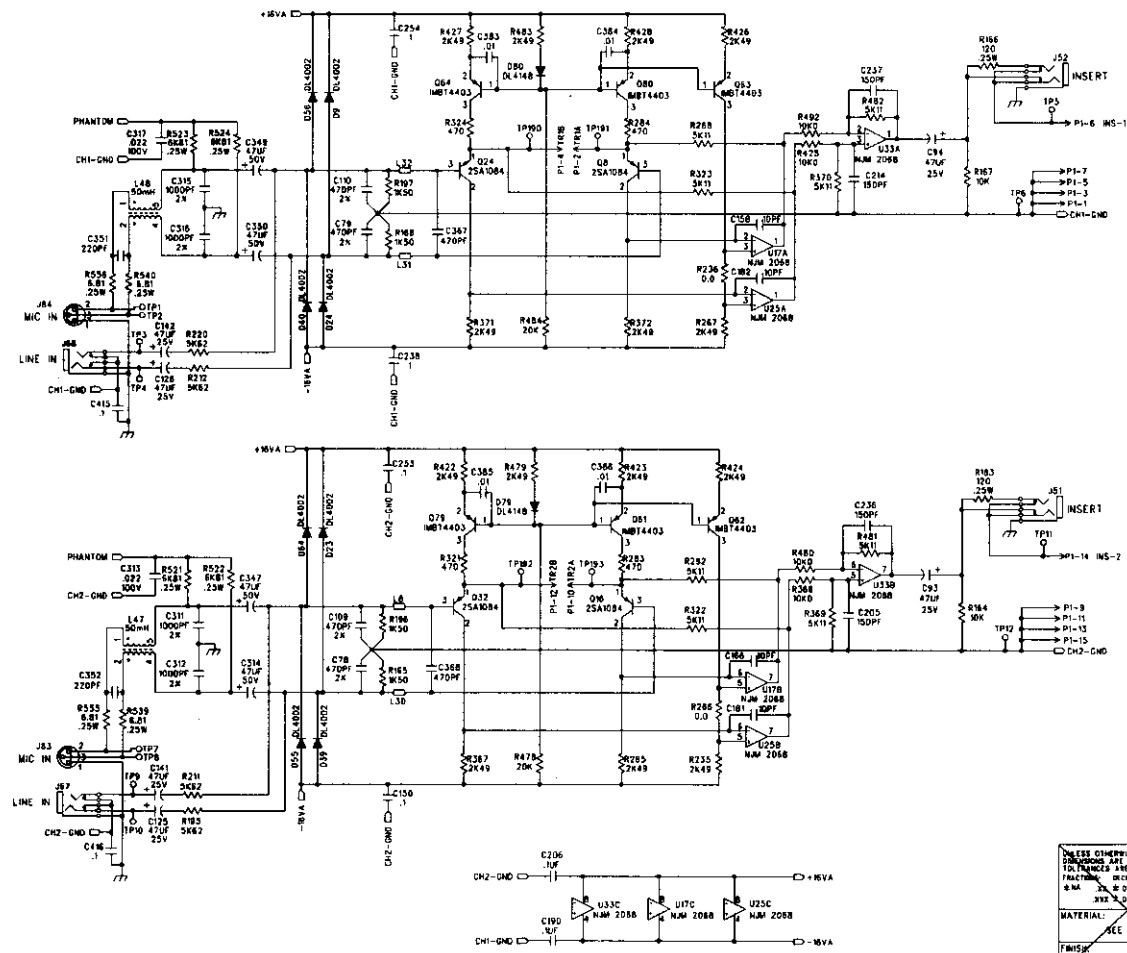
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**MACKIE DESIGNS CR-1604 VLZ PRO**

**REV 12-3-1998**

REV. NO.	990-219-00	REV. BY	1	DATE	7-3-99
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REV.	ECO	DESCRIPTION	REV. BY	APP. BY	DATE
B		2185 ADD LABEL TO B.O.M.	KR		7-3-99
		2186 MOVE CHOKES			

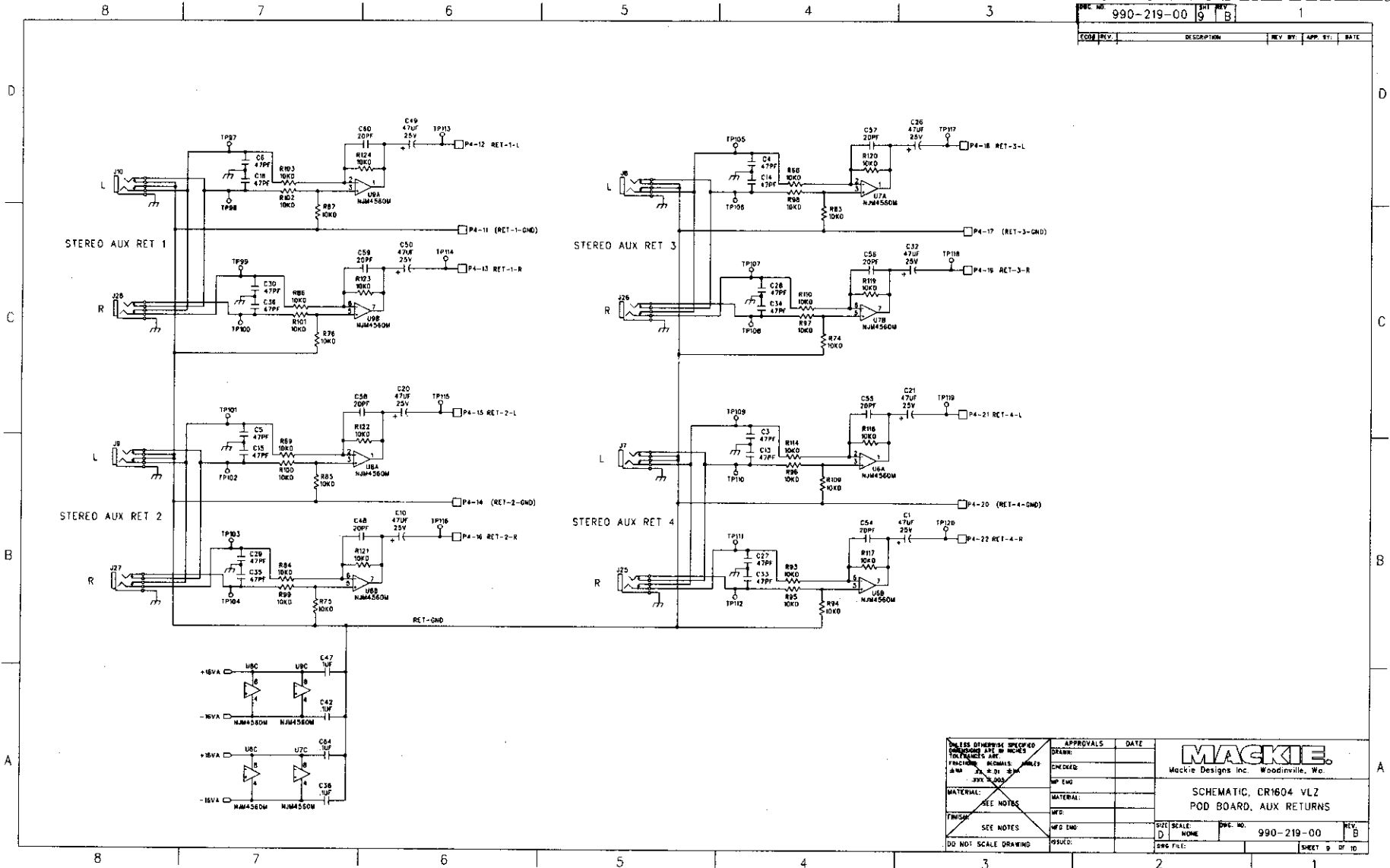


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS MILLIS: .004 .001 .005 XXX .004	APPROVALS	DATE
DRAWN	KR	4-21-88
CHECKED		
DESIGNED		
DATE		
UFG ENG:	EW	12-2-88
MATERIAL:		
UFG:		
UFG ENG:		
ISSUED	LEIGH	12-3-88
DO NOT SCALE DRAWING		

<b>MACKIE</b> Mackie Designs Inc. Woodinville, Wa.	
SCHEMATIC, CR1604 VLZ POD, CH 1/2	
REV. NO.	990-219-00
REV. BY	KR
DATE	7-3-99
SHEET	1 OF 10

990-219-00 9 B

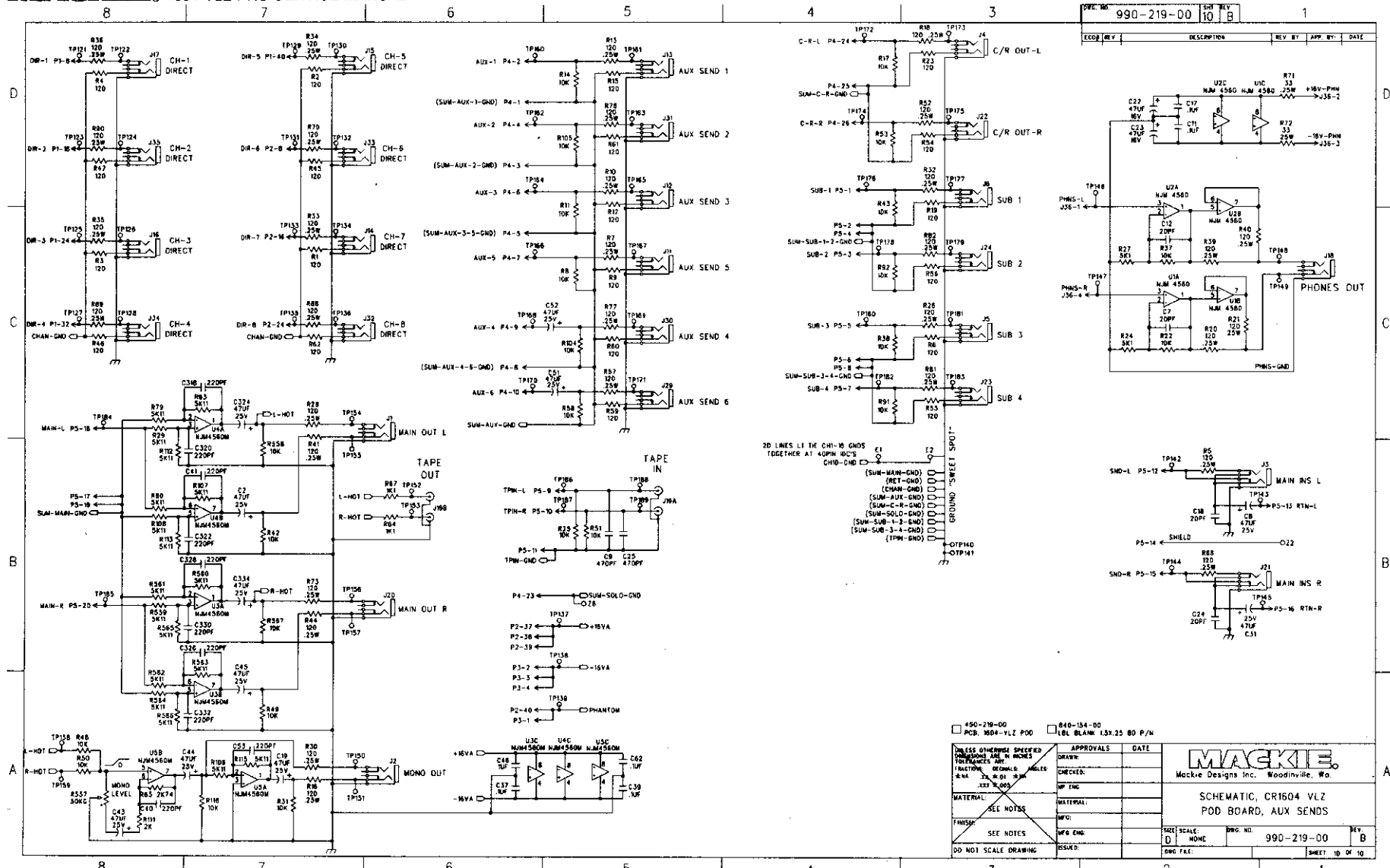
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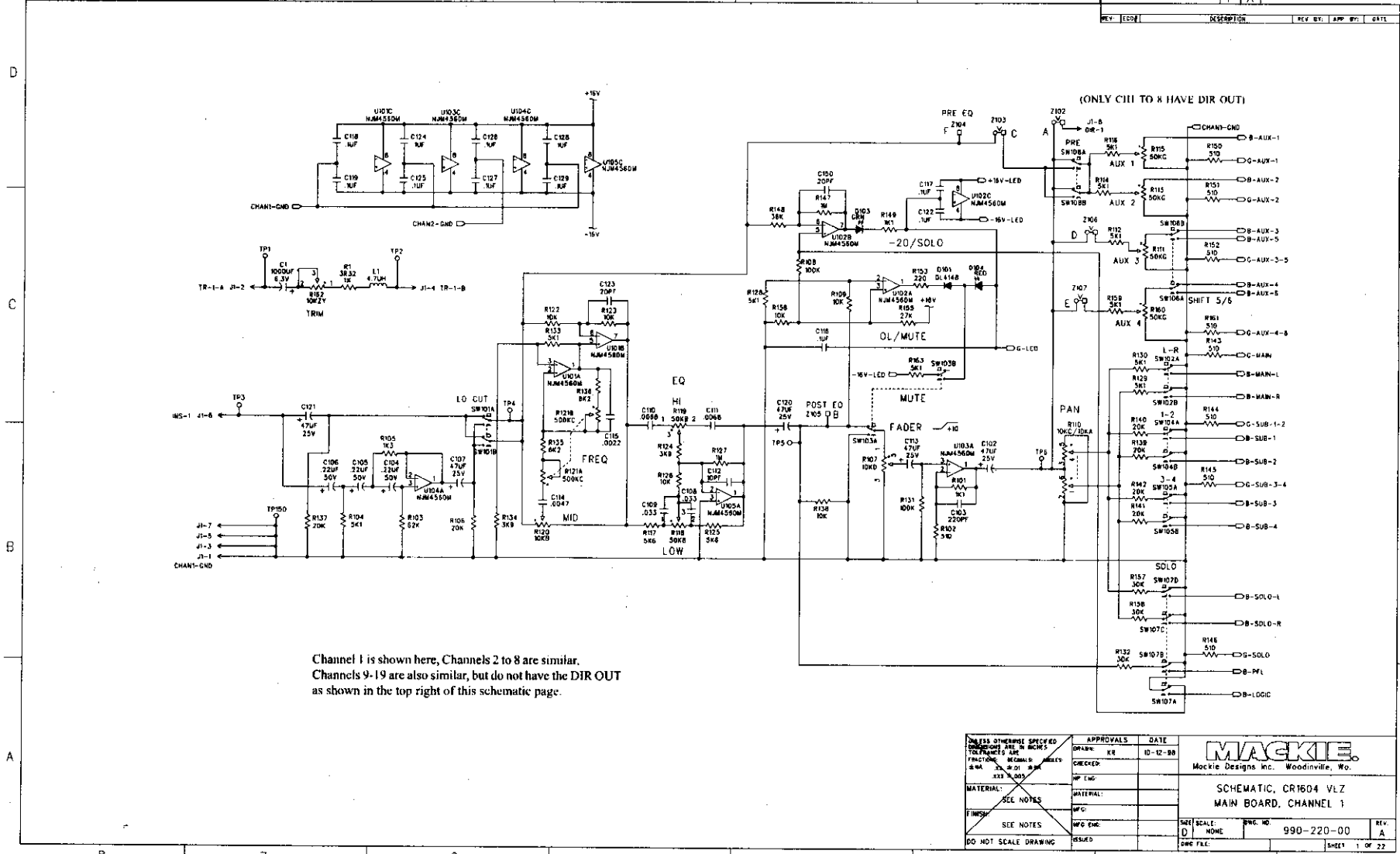
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	DRAWN	
	CHECKED	
	MP ENG	
MATERIAL		
FINISH		
SEE NOTES	MP ENG	
DO NOT SCALE DRAWING	ISSUED	

<b>MACKIE</b> Mackie Designs Inc. Woodville, Wc	
SCHEMATIC, CR1604 VLZ POD BOARD, AUX RETURNS	
SIZE: D	SCALE: NONE
DWG. NO.: 990-219-00	REV. B
ISSUED FILE:	SHEET 9 OF 10





219-3 POD BOARD 219 REV B



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS FRACTIONS ARE DECIMALS	APPROVALS	DATE
MATERIAL: SEE NOTES	DRAWN: KR	10-12-90
FINISH: SEE NOTES	CHECKED:	
DO NOT SCALE DRAWING	MFG ENG:	
	ISSUED:	

SCALE: NONE	DWG NO. 990-220-00	REV. A
SHEET 1	SHEET 1 OF 22	

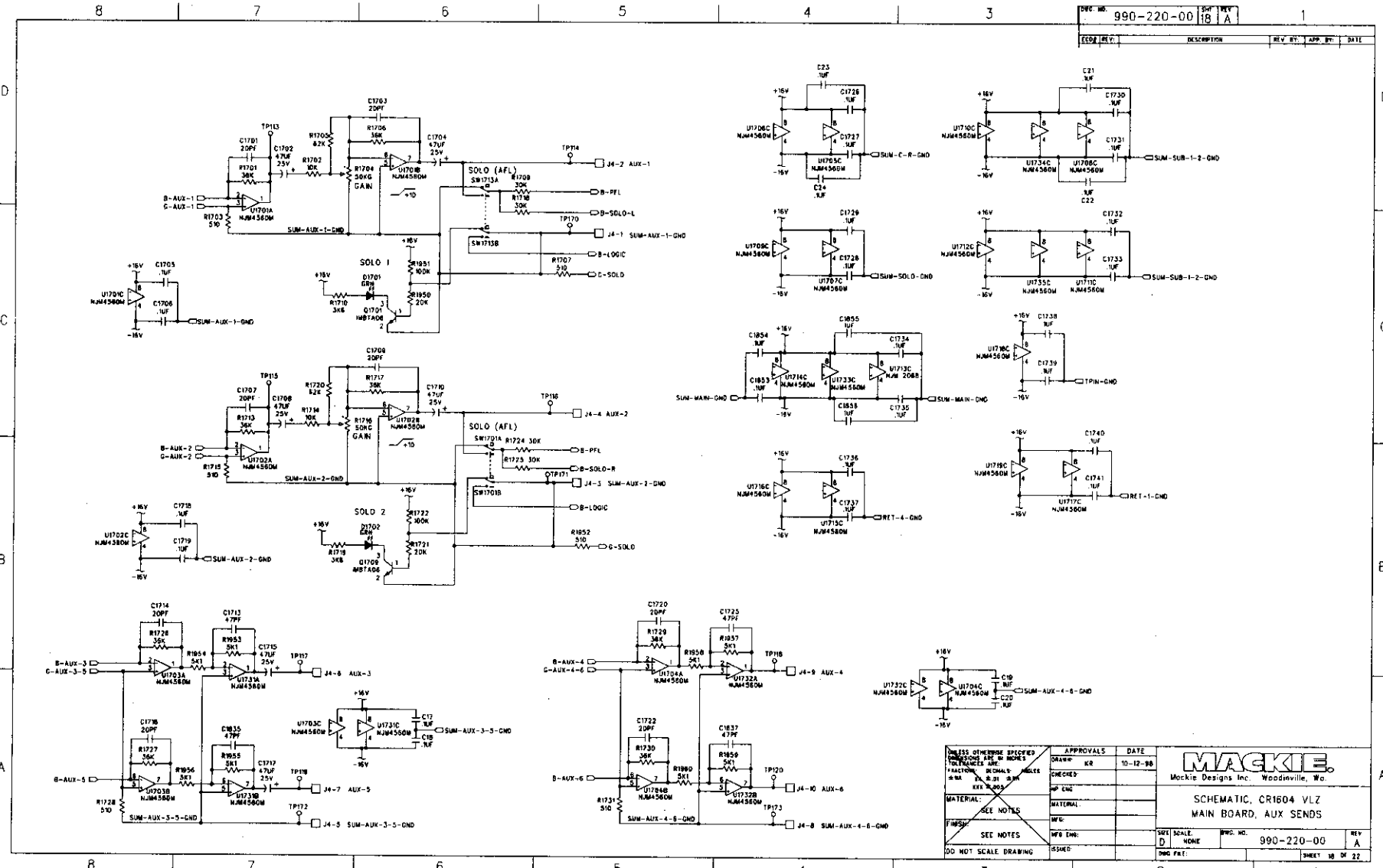
**MACKIE**  
Mackie Designs Inc., Woodville, Wo.

SCHEMATIC, CR1604 VLZ  
MAIN BOARD, CHANNEL 1

**220-1** MAIN BOARD 220 REV A



MACKIE 1604 VLZ PRO SERVICE MANUAL



DWG. NO.	990-220-00	REV	18	REV	A
DATE					
REV.					
APP.					
DATE					

220-3 MAIN BOARD 220 REV A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES FRACTIONS DECIMALS DIM. SHALL BE TO THE CENTER UNLESS OTHERWISE SPECIFIED MATERIAL: FINISH: SEE NOTES DO NOT SCALE DRAWING	APPROVALS	DATE	<b>MACKIE</b> Mackie Designs Inc. Woodville, W.V. SCHEMATIC, CR1604 VLZ MAIN BOARD, AUX SENDS
	DRAWN: KR	10-12-98	
	CHECKED:		
	DATE:		
	REV		
	SCALE: NONE	DWG. NO. 990-220-00	REV A
	ISSUED:		SHEET 18 OF 22

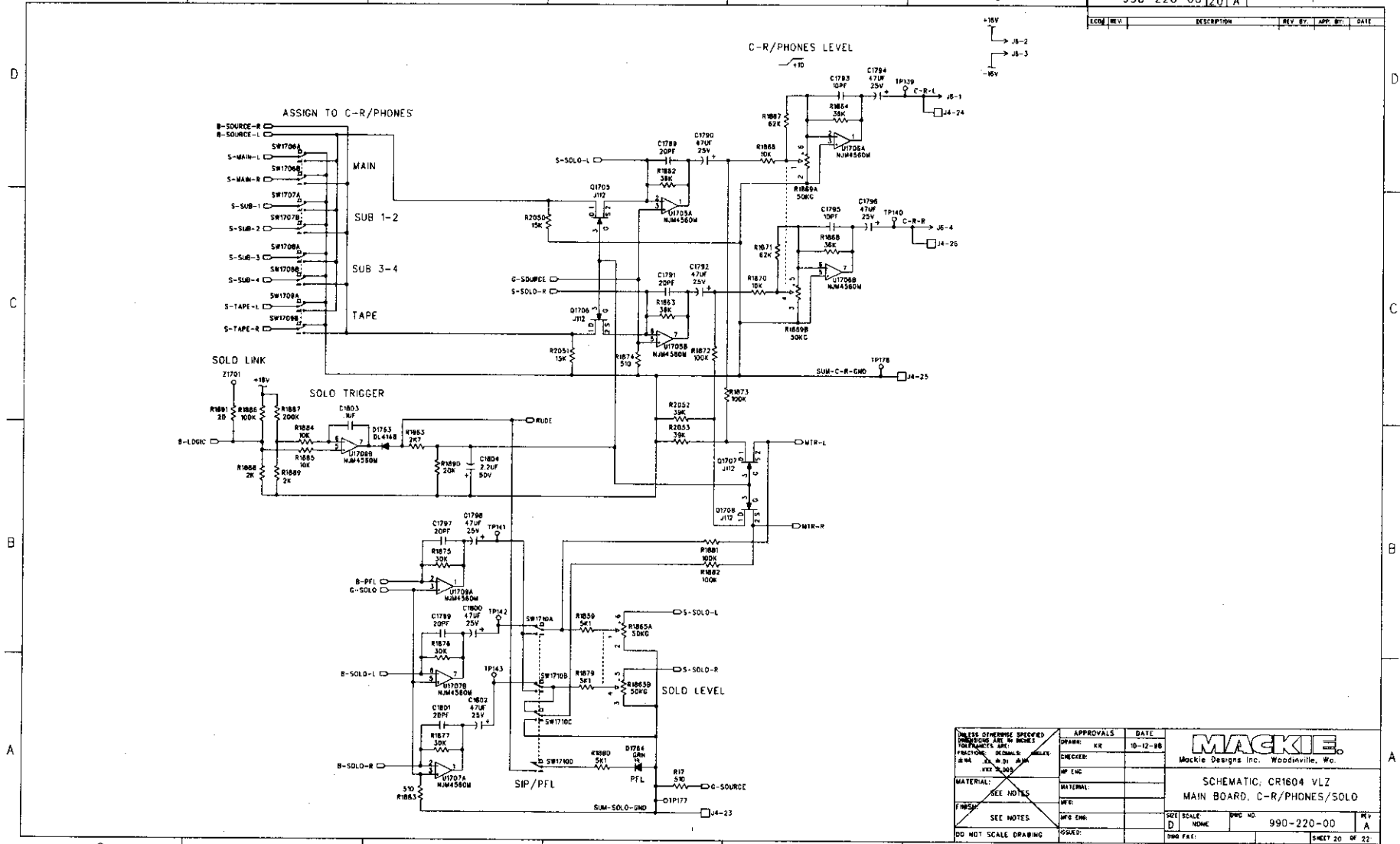


# MACKIE 1604 VLZ PRO SERVICE MANUAL

8 7 6 5 4 3 2 1

990-220-00 SHI REV 20 A

FORM NO. 1000-1000-0000

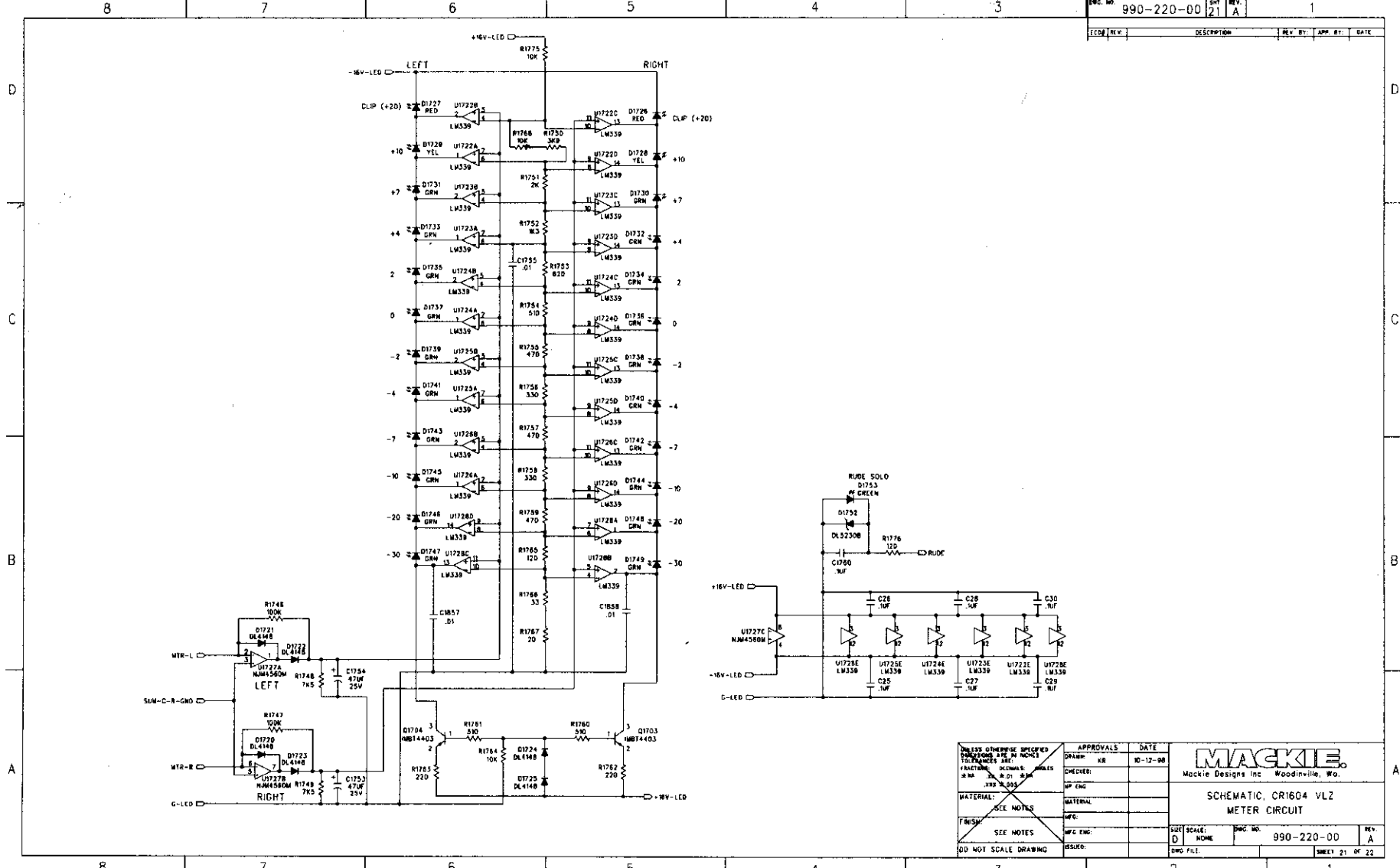


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONS DECIMALS 32ND 1/8 1/16 3/32 1/4 3/8 1/2 5/8 3/4 7/8 1 MATERIAL: SEE NOTES FINISH: SEE NOTES DO NOT SCALE DRAWING	APPROVALS	DATE	<b>MACKIE</b> Mackie Designs Inc. Woodville, Wv. SCHEMATIC: CR1604 VLZ MAIN BOARD, C-R/PHONES/SOLO
	DRAWN: KR	10-12-98	
	CHECKED:		
	MATERIAL:		
	ISSUED:		SIZE: D SCALE: NONE DWG NO: 990-220-00 SHEET 20 OF 22

220-5 MAIN BOARD 220 REV A

990-220-00 21 A

REV.	DESCRIPTION	REV. BY	APP. BY	DATE



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:	APPROVALS	DATE
FRACTIONS DECIMALS	DRAWN: KR	10-17-98
ANGLES	CHECKED:	
2X, 3X, 4X, 5X	APP. ENG:	
MATERIAL:	MATERIAL:	
SEE NOTES	DATE:	
SEE NOTES	MFG. ENG.:	
DID NOT SCALE DRAWING	INSURER:	

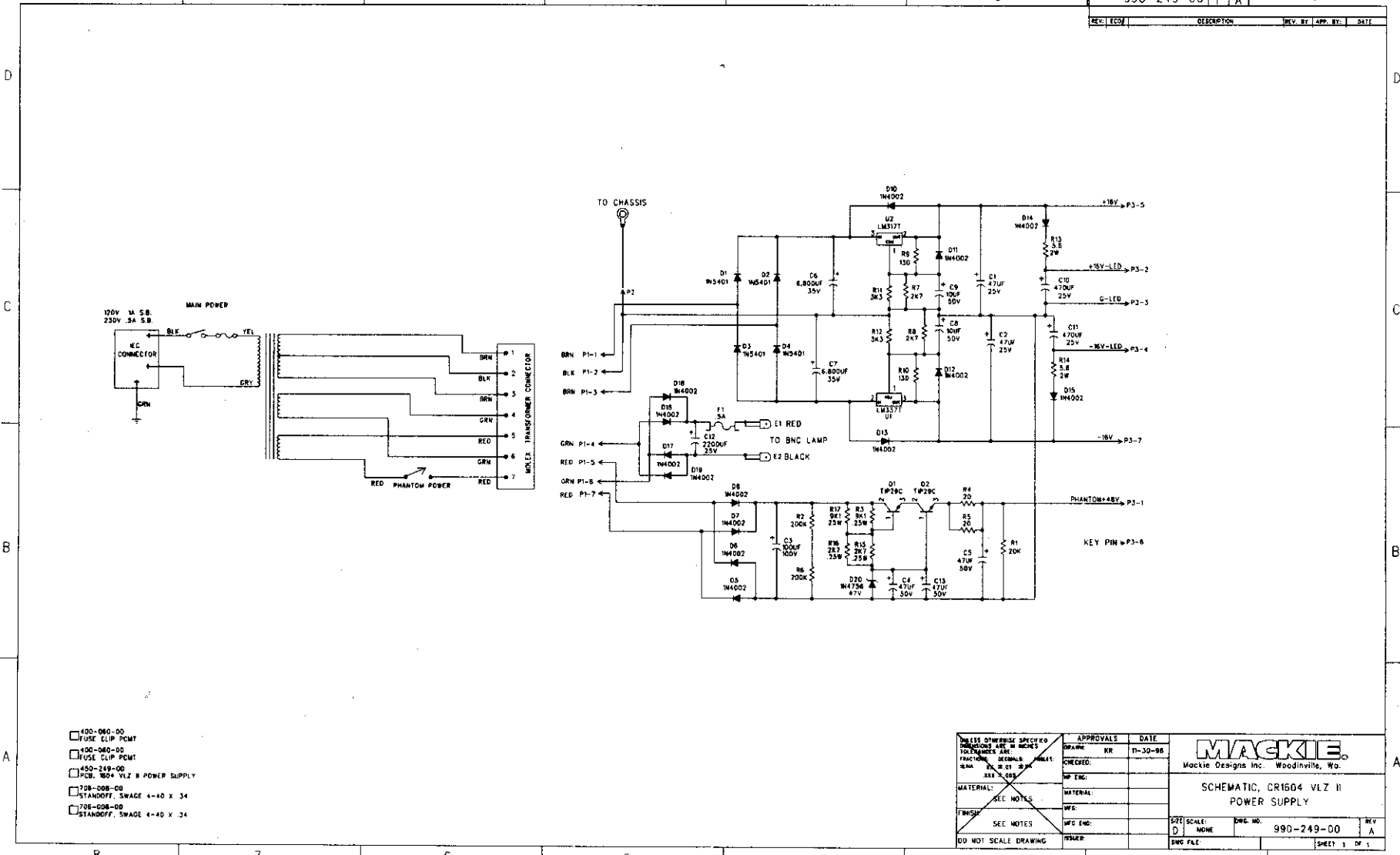
<b>MACKIE</b> Mackie Designs Inc. Woodville, Mo.	
SCHEMATIC, CR1604 VLZ METER CIRCUIT	
SIZE: D	SCALE: NONE
DWG. NO.: 990-220-00	REV. A
DWG. FILE:	SHEET 21 OF 22





REV NO	990-249-00	REV	1	DATE	
REV	ECV	DESCRIPTION		REV BY	APP BY

8 7 6 5 4 3 2 1



- 400-080-00 FUSE CLIP PCMT
- 400-080-00 FUSE CLIP PCMT
- 450-249-00 PCB, 1604 VLZ II POWER SUPPLY
- 700-008-00 STANDOFF, SWAGE 4-40 X .34
- 700-008-00 STANDOFF, SWAGE 4-40 X .34

LIST OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVALS	DATE
FRACTION DECIMAL	DRAWN KR	11-30-98
MM 1/32 1/16 1/8 3/16 1/4 3/8 1/2 5/8 3/4 7/8 1 1 1/4 1 1/2 1 3/4 2 2 1/4 2 1/2 3 3 1/4 3 1/2 4 4 1/4 4 1/2 5 5 1/4 5 1/2 6 6 1/4 6 1/2 7 7 1/4 7 1/2 8 8 1/4 8 1/2 9 9 1/4 9 1/2 10	CHECKED:	
	MP ENG:	
	MATERIAL:	
	WF:	
	MFG ENG:	
	INSP:	
SEE NOTES		
DO NOT SCALE DRAWING		

<b>MACKIE</b> Mackie Designs Inc. Woodville, Wv.	
SCHEMATIC, CR1604 VLZ II POWER SUPPLY	
SIZE	SCALE
D	NONE
DWG NO.	REV
990-249-00	A
SHEET	OF
1	1