

# ALESIS HD24 (RL) Service Manual

P/N: 8-31-0092-B

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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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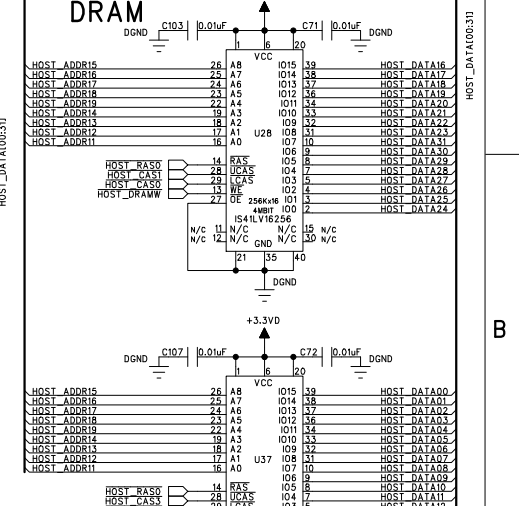
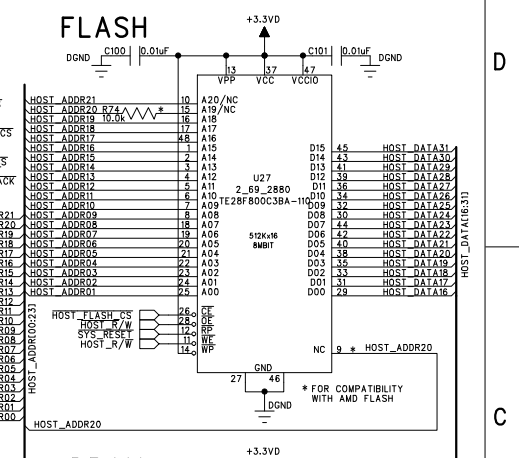
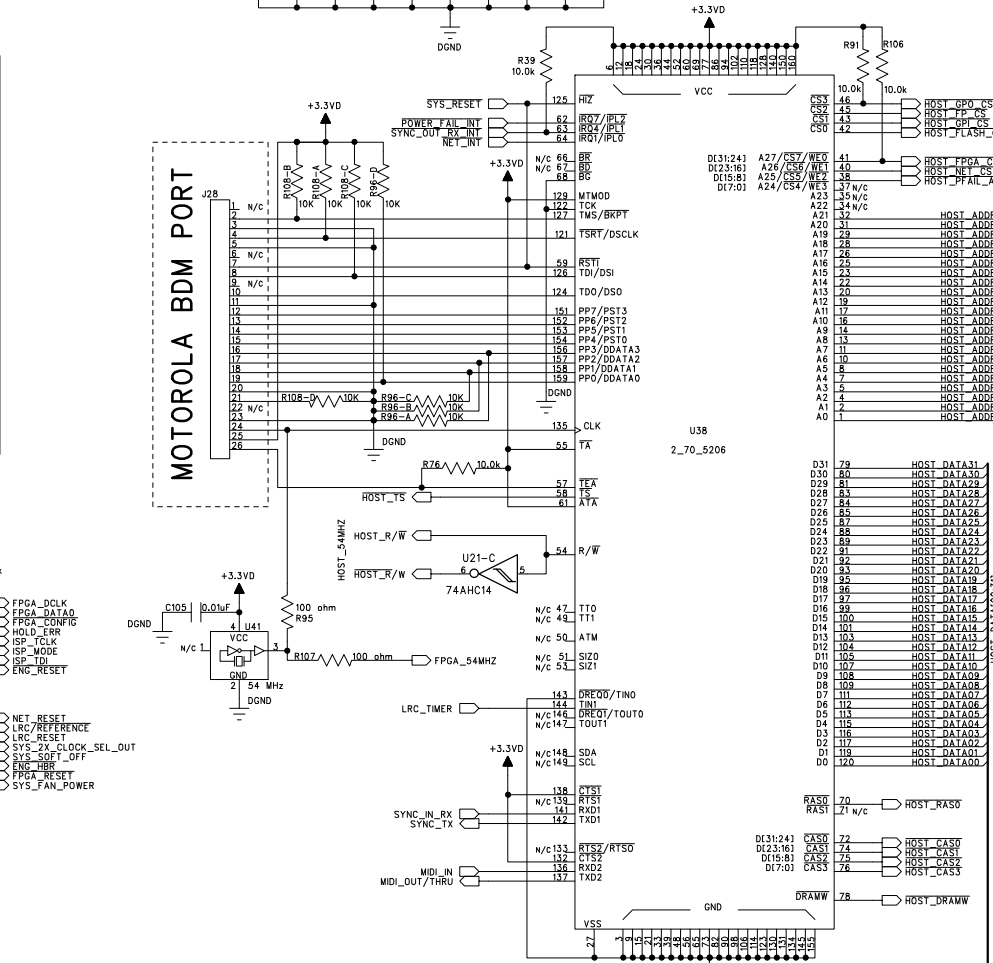
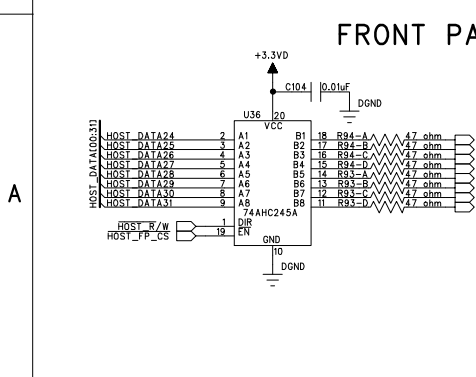
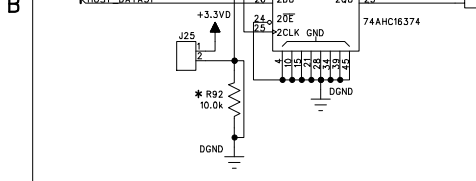
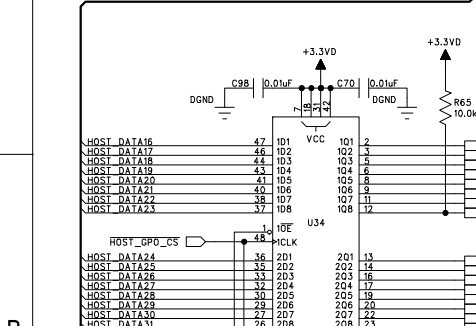
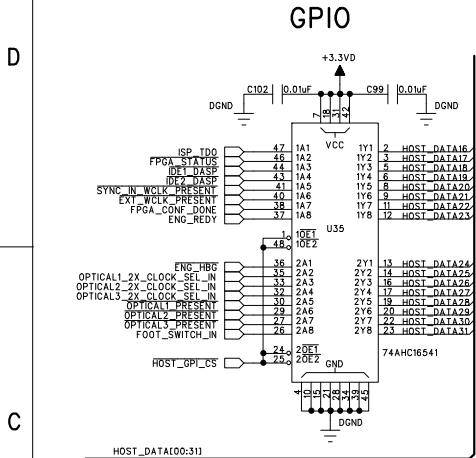
**Hot Keys for the ADAT HD24  
Software Version 1.00**

<b>Hot Key Combination</b>	<b>Action</b>	<b>Description</b>
Record + Play	Restore Defaults	Try this first to fix minor crashes and software errors. Resets system variables such as Canned Locate Names and IP Address, etc. to their default values.
Track 16 + Track 24	Jump to MIDI OS loader	Force the ADAT HD24 Boot Software to load OS code via MIDI. In the case where the software on the flash is valid yet not compatible with the hardware, this will force the HD24 to load new software using the MIDI.
Track 9 + Track 20	Reconfigure Hardware	This will force the PLD firmware to be reloaded. In the case, where a PLD part is replaced, its firmware can be loaded through this method.
Track 1 + Track 8	Production Tests	Automated self-diagnostics mode.
Track 1 + Track 7	Diagnostics Tests	Manual self-diagnostics mode.

# HD24 MAIN PCB

## Rev D

REVISION RECORD			
LTR	ECCO NO:	APPROVED:	DATE:



**\* STUFFING OPTIONS**

J25, R92: Install for development only. Cut trace under R92 before installing. Short jumper to release Host control of Engine reset, ISP JTAG and FPGA programming port.

MOTOROLA BDM PORT: Install for development only.

**ALESIS**

**RL MAIN PCB HOST PROCESSOR**

COMPANY: ALESIS

TITLE: RL MAIN PCB HOST PROCESSOR

PART NUMBER: 9-40-0231-D

ASSY NUMBER: 9-79-0231-D

FILENAME: RLMND01A.SCH

SCALE: 1:1

SHEET: 1 of 5

REV: D

SIZE: C

DRAWN: SCHMANSKI/MEYER

DATED: 08/31/2001

RELEASED: DATED:

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REVISION RECORD			
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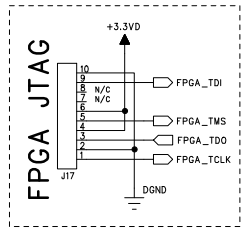
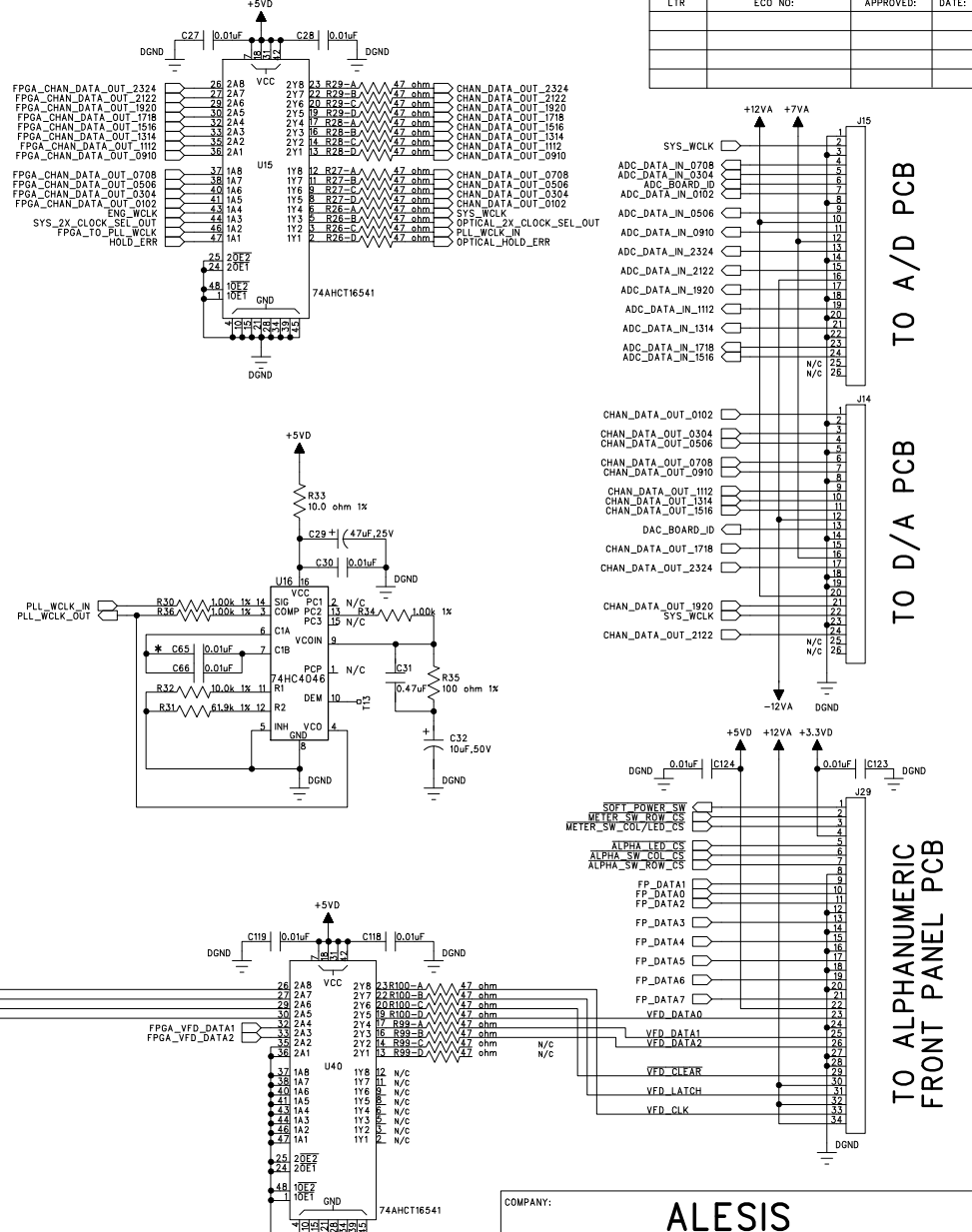
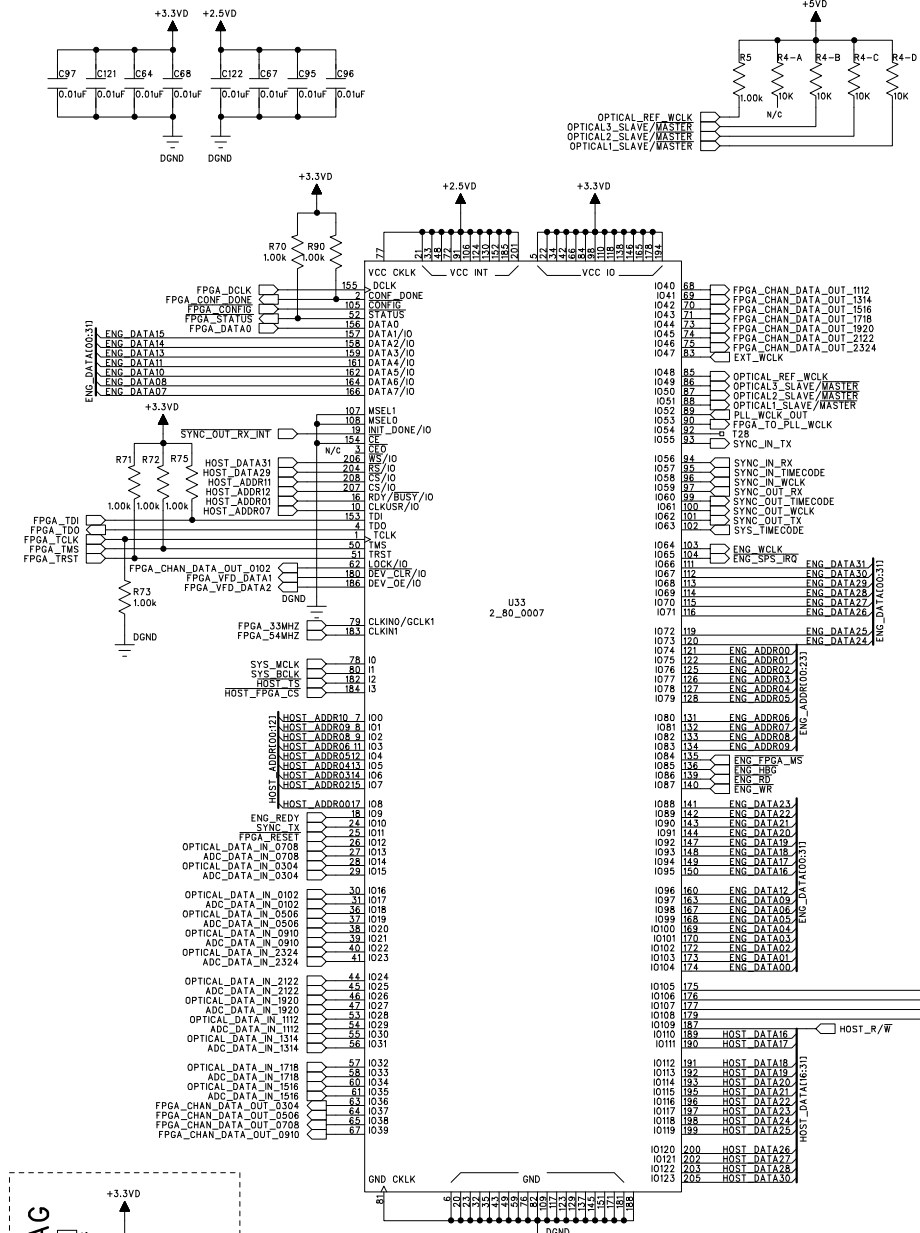
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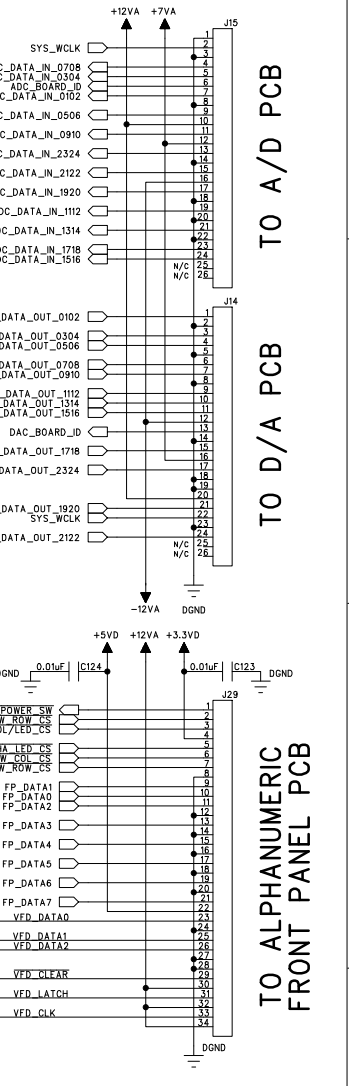
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\* STUFFING OPTIONS:  
 FPGA JTAC: Install components for development only.  
 C65: Do not install. Alternate component option for C66.



COMPANY: **ALESIS**

TITLE: **RL MAIN PCB  
FPGA**

PART NUMBER: **9-40-0231-D**      REV: C

ASSY NUMBER: **9-79-0231-D**

FILENAME: **RLMND01A.SCH**      SIZE: C

RELEASED:      DATED:      SCALE:      SHEET: 2 of 5

DRAWN: **SCHMANSKI/MEYER**      DATED: **08/31/2001**

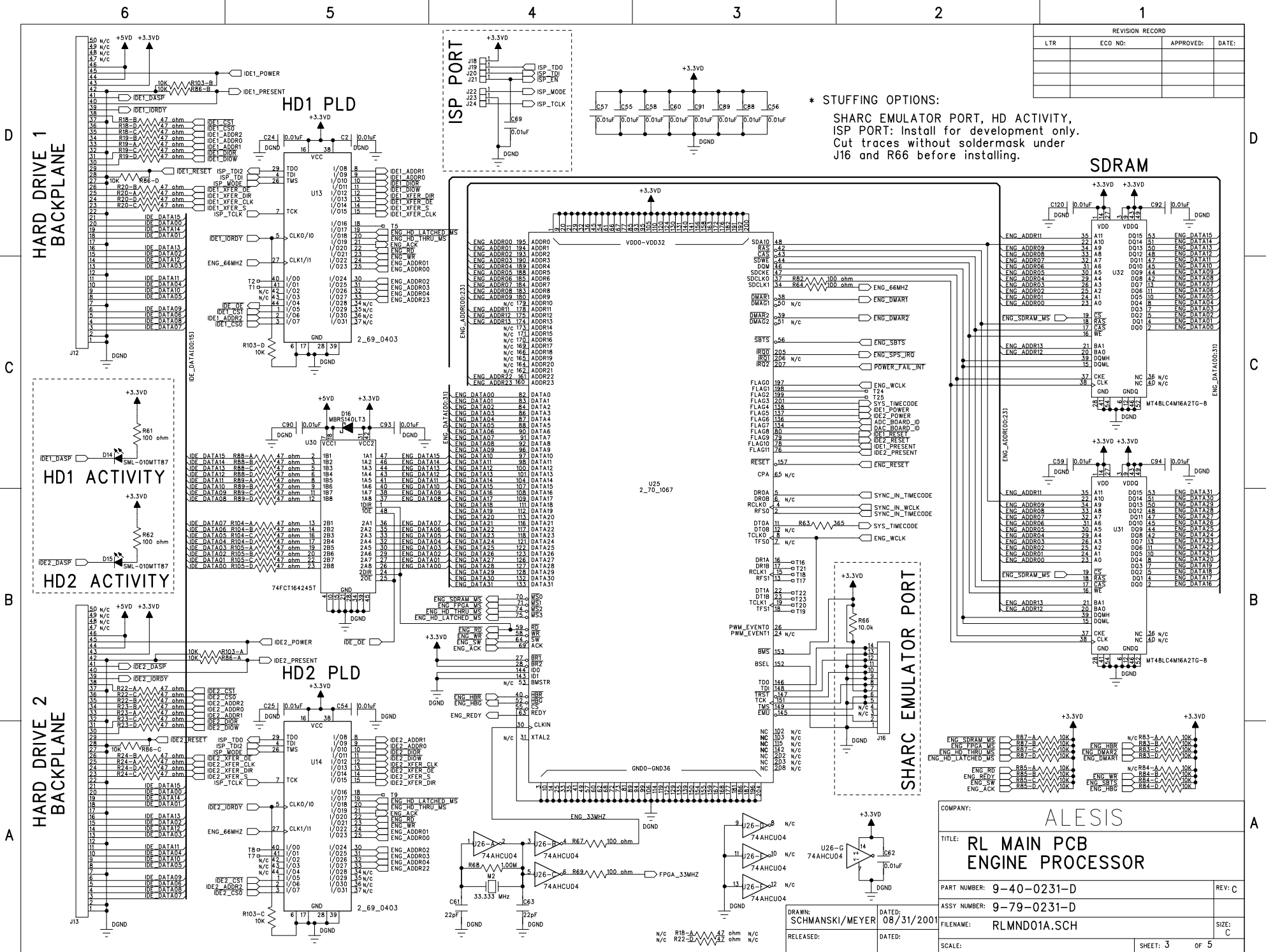
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TO A/D PCB

TO D/A PCB

TO ALPHANUMERIC FRONT PANEL PCB

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



\* STUFFING OPTIONS:  
 SHARC EMULATOR PORT, HD ACTIVITY,  
 ISP PORT: Install for development only.  
 Cut traces and R66 without soldermask under  
 J16 and R66 before installing.

COMPANY: **ALESIS**

TITLE: **RL MAIN PCB ENGINE PROCESSOR**

PART NUMBER: **9-40-0231-D** REV: C

ASSY NUMBER: **9-79-0231-D**

FILENAME: **RLMND01A.SCH** SIZE: C

DRAWN: **SCHMANSKI/MEYER** DATED: **08/31/2001**

RELEASED: DATED:

SCALE: SHEET: 3 OF 5

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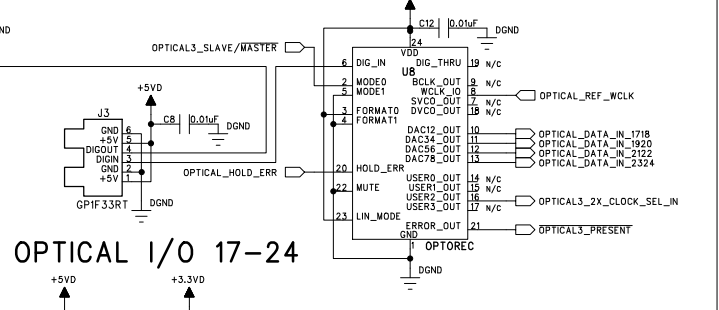
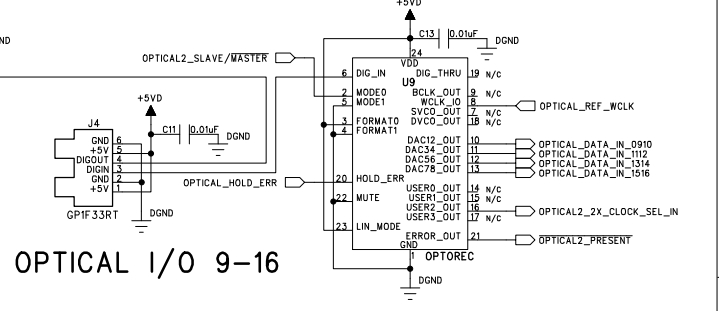
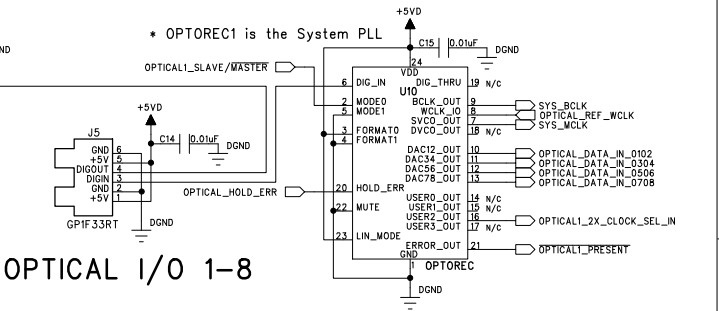
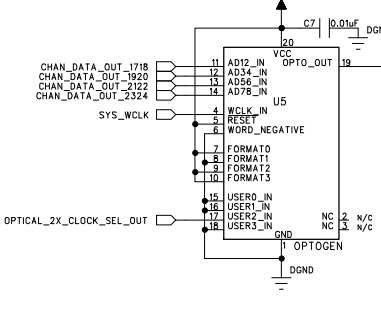
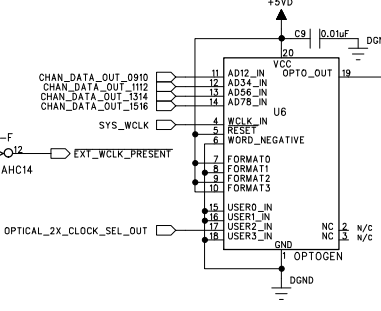
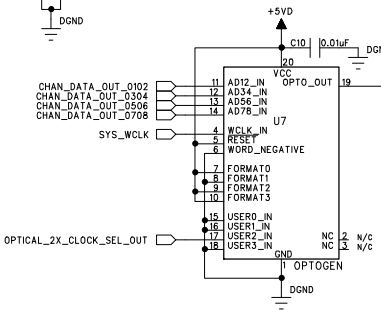
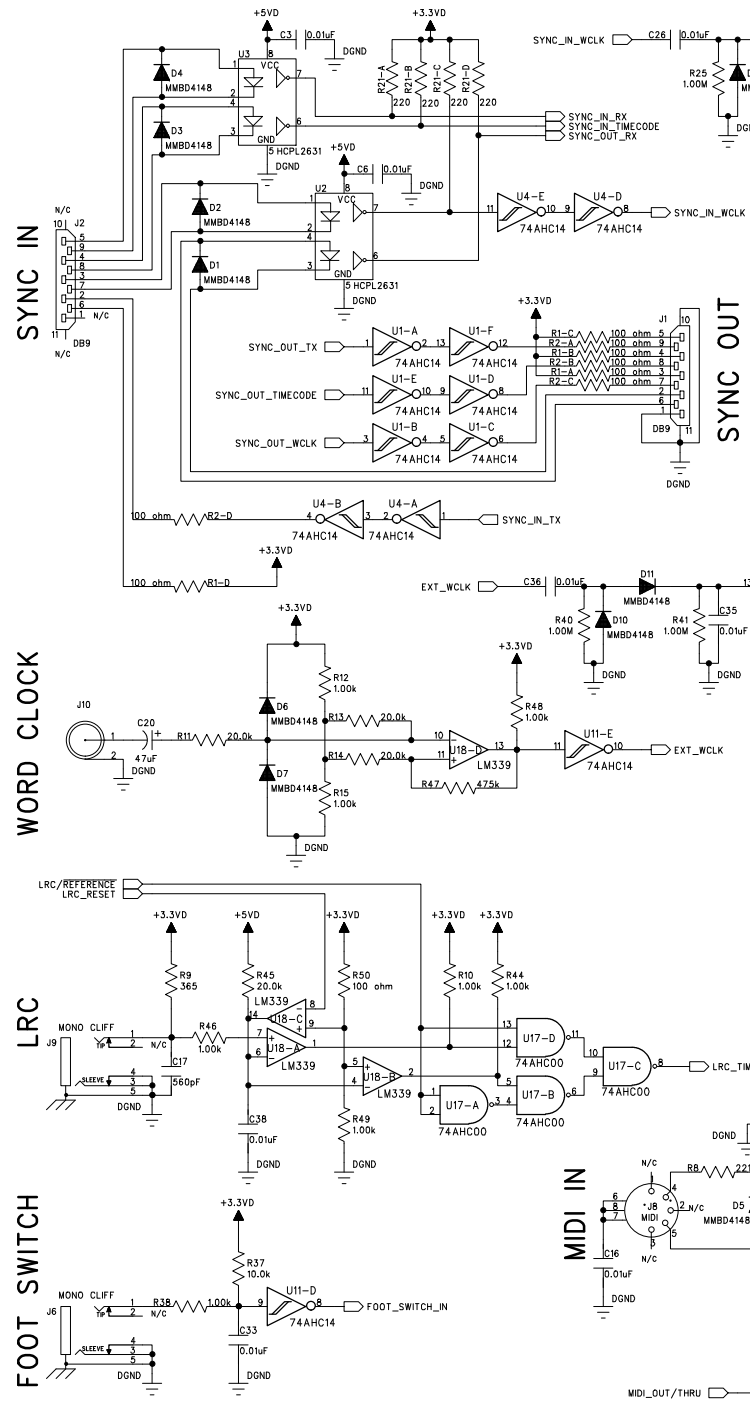
SYNC IN

SYNC OUT

WORD CLOCK

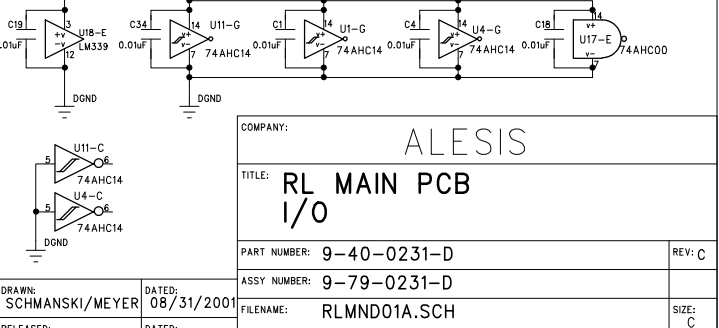
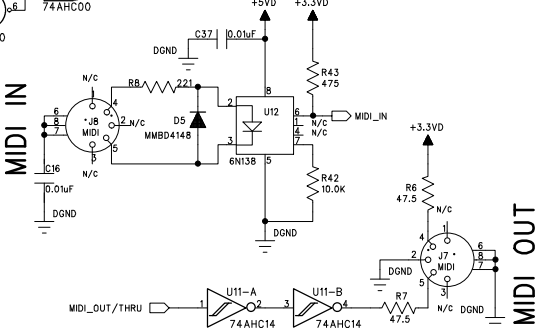
LRC

FOOT SWITCH



MIDI IN

MIDI OUT



COMPANY:		ALESIS	
TITLE:		RL MAIN PCB I/O	
PART NUMBER:	9-40-0231-D	REV:	C
ASSY NUMBER:	9-79-0231-D	SCALE:	
FILENAME:	RLMND01A.SCH	SHEET:	4 OF 5
DRAWN:	SCHMANSKI/MEYER	DATED:	08/31/2001
RELEASED:		DATED:	



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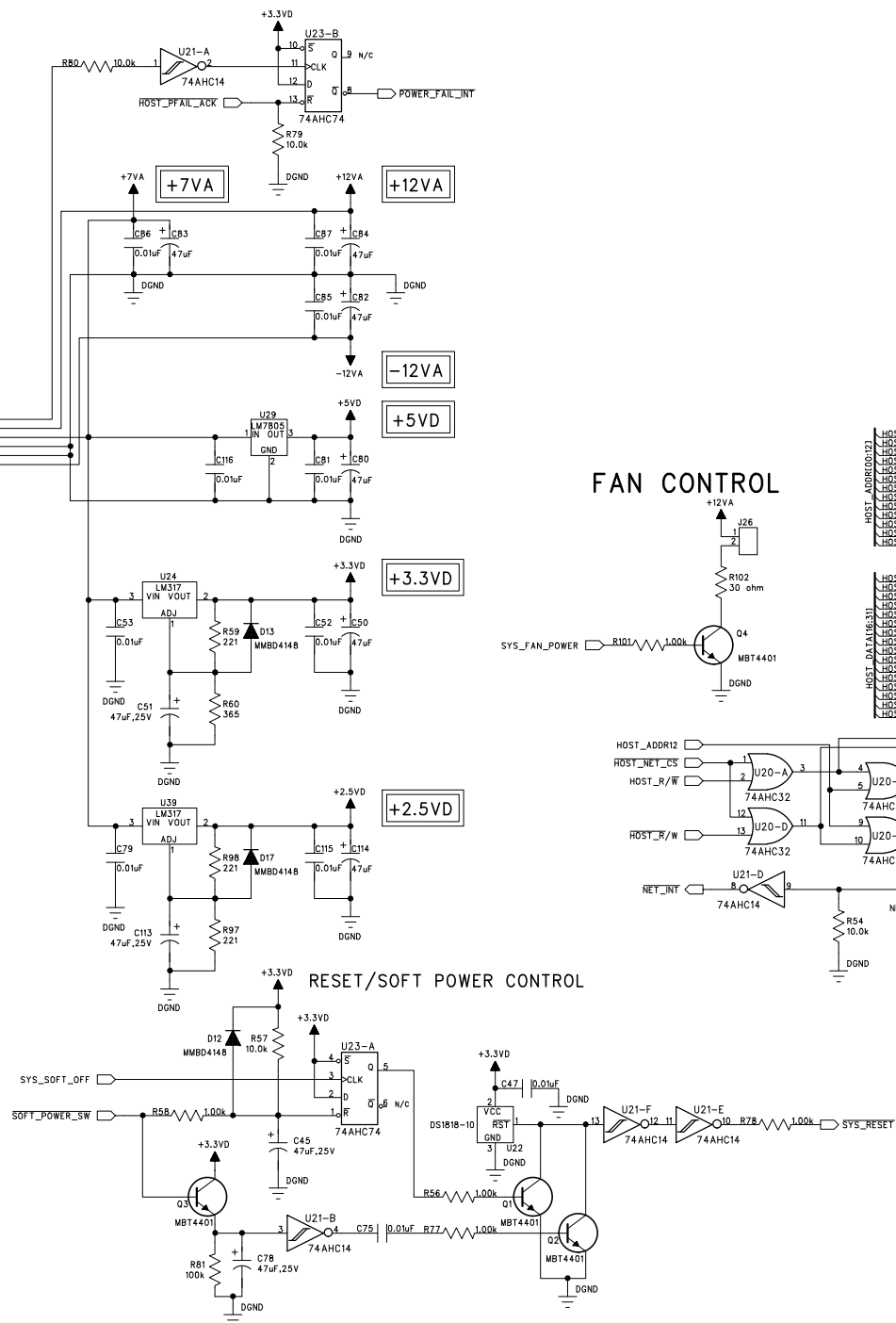
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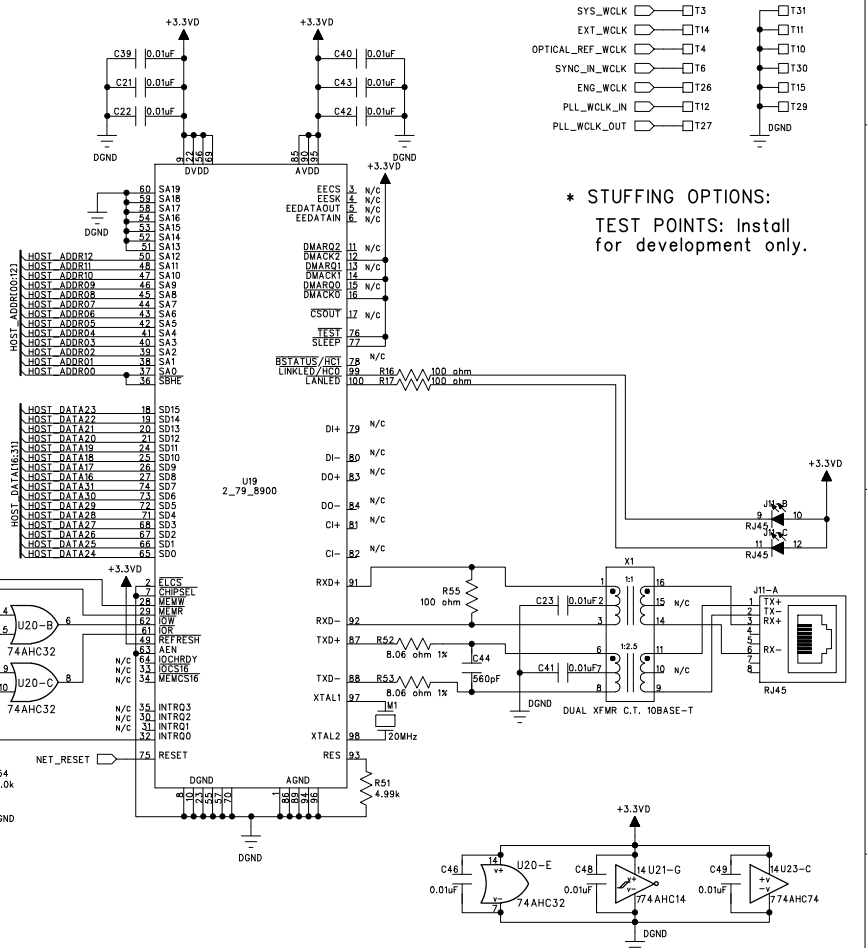
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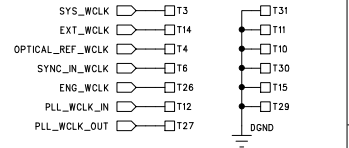
TO POWER SUPPLY



### ETHERNET



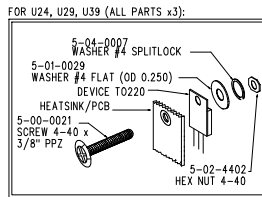
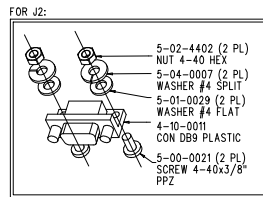
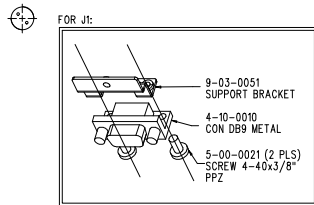
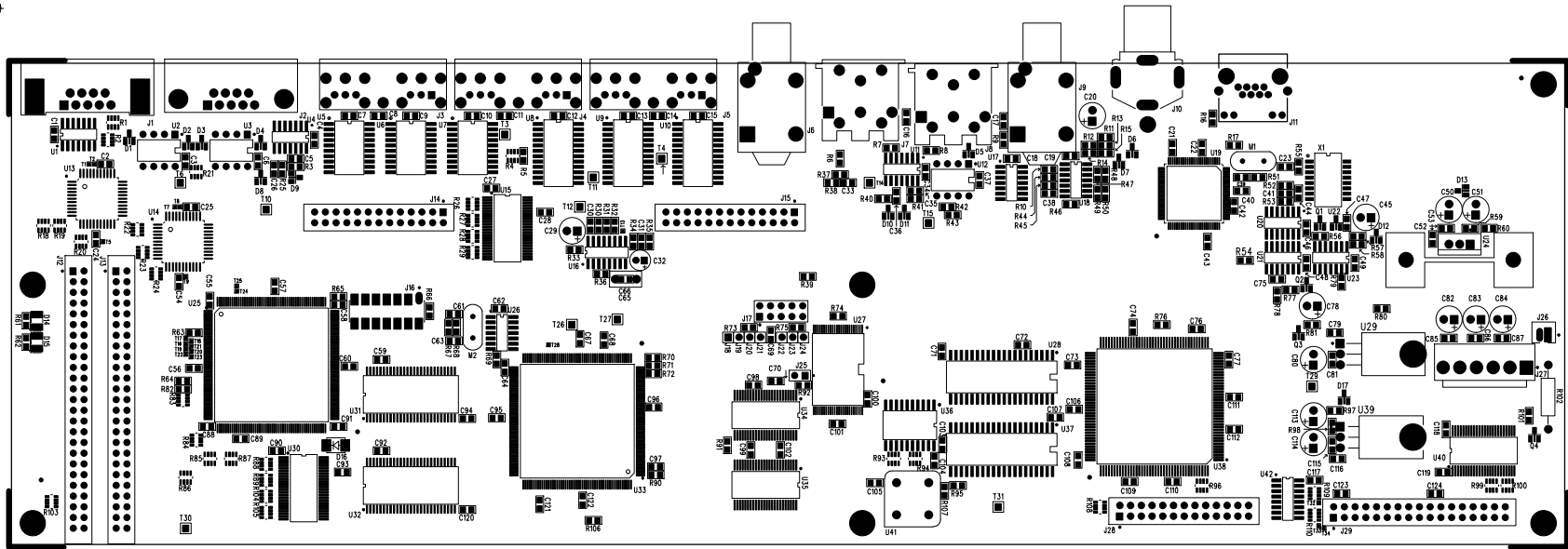
### TEST POINTS\*



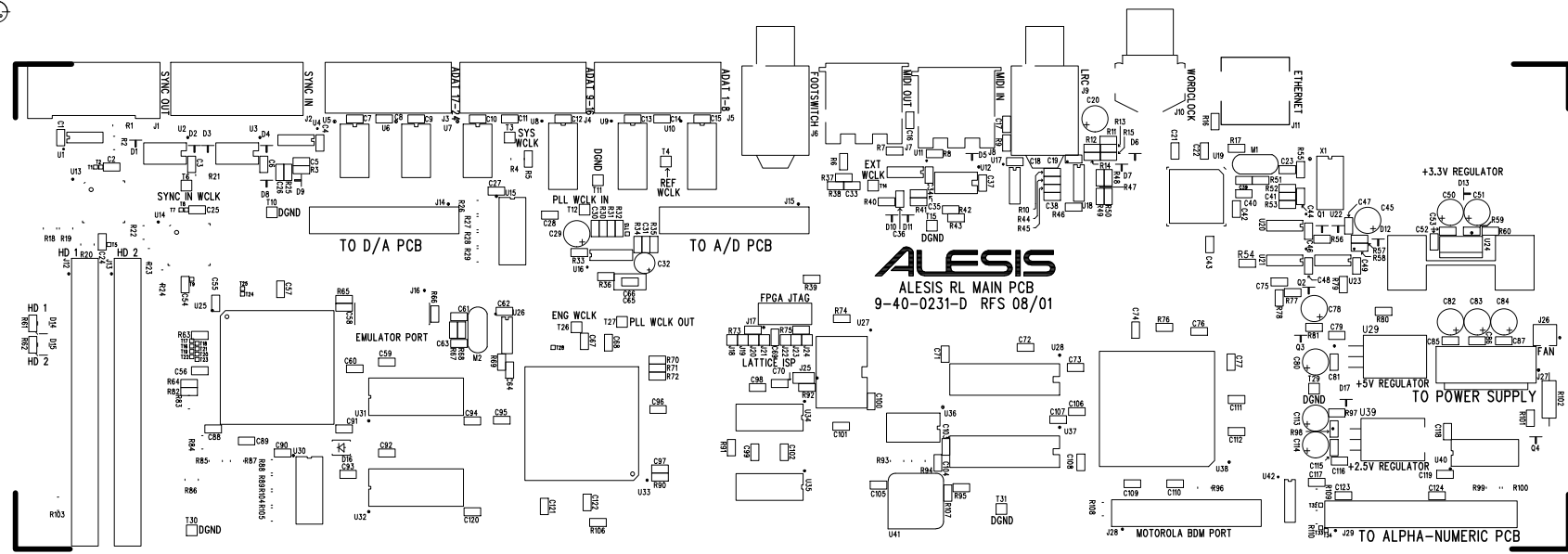
\* STUFFING OPTIONS:  
TEST POINTS: Install for development only.

COMPANY:	ALESIS		
TITLE:	RL MAIN PCB POWER / ETHERNET		
PART NUMBER:	9-40-0231-D	REV:	C
ASSY NUMBER:	9-79-0231-D	FILENAME:	RLMND01A.SCH
DRAWN:	SCHMANSKI/MEYER	DATED:	08/31/2001
RELEASED:		DATED:	
SCALE:		SHEET:	5 of 5

# ALESIS 9-79-0231-D "TOP ASSEMBLY DRAWING"

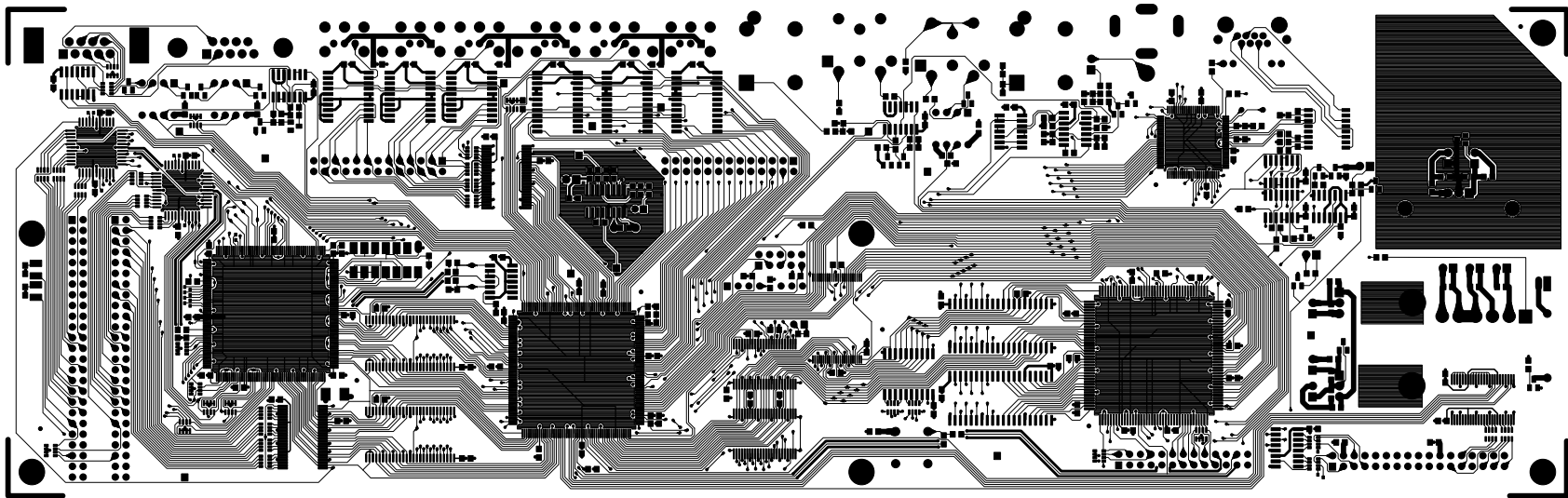


**DO NOT INSTALL:**  
 C65: 1-20-0103  
 C69: 1-56-0103  
 D14, D15: 3-20-0002  
 J16: 4-20-1400  
 J17: 4-15-0010  
 J18, J19, J20, J21, J22,  
 J23, J24: 4-98-0001  
 J25: 4-15-0002  
 J28: 4-14-2601  
 R61, R62: 0-16-1000  
 R66, R92: 0-16-1002  
 T3, T4, T6, T10, T11,  
 T14, T15, T26, T29,  
 T30, T31: 4-98-0001



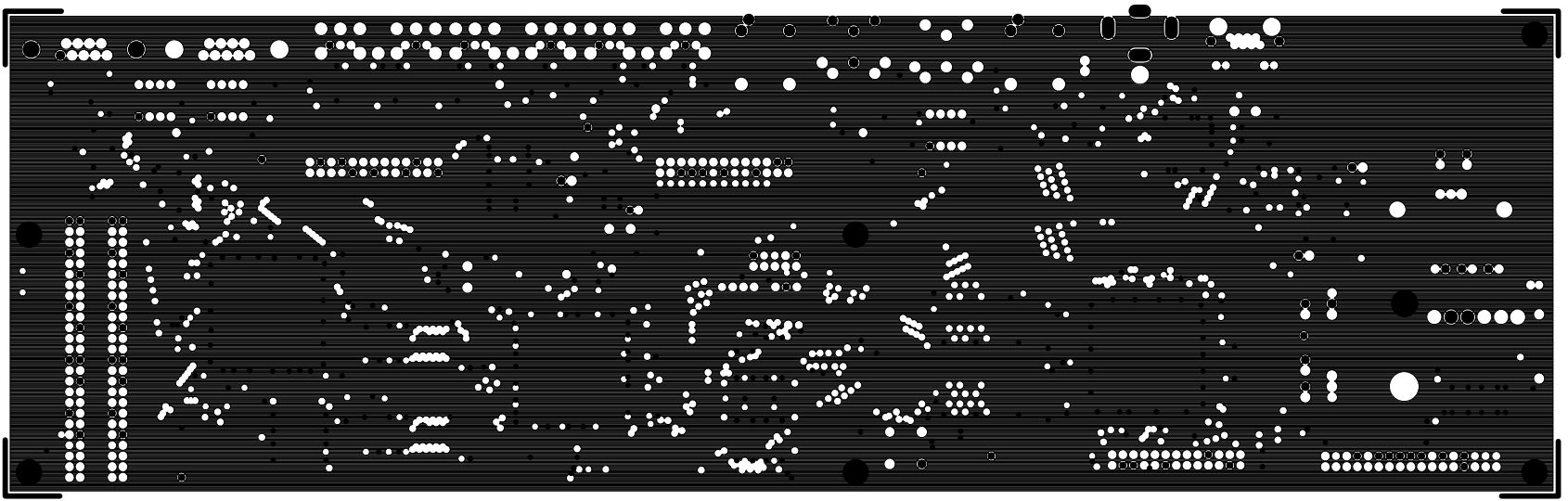
ALESIS 9-40-0231-D "TOPSILK"



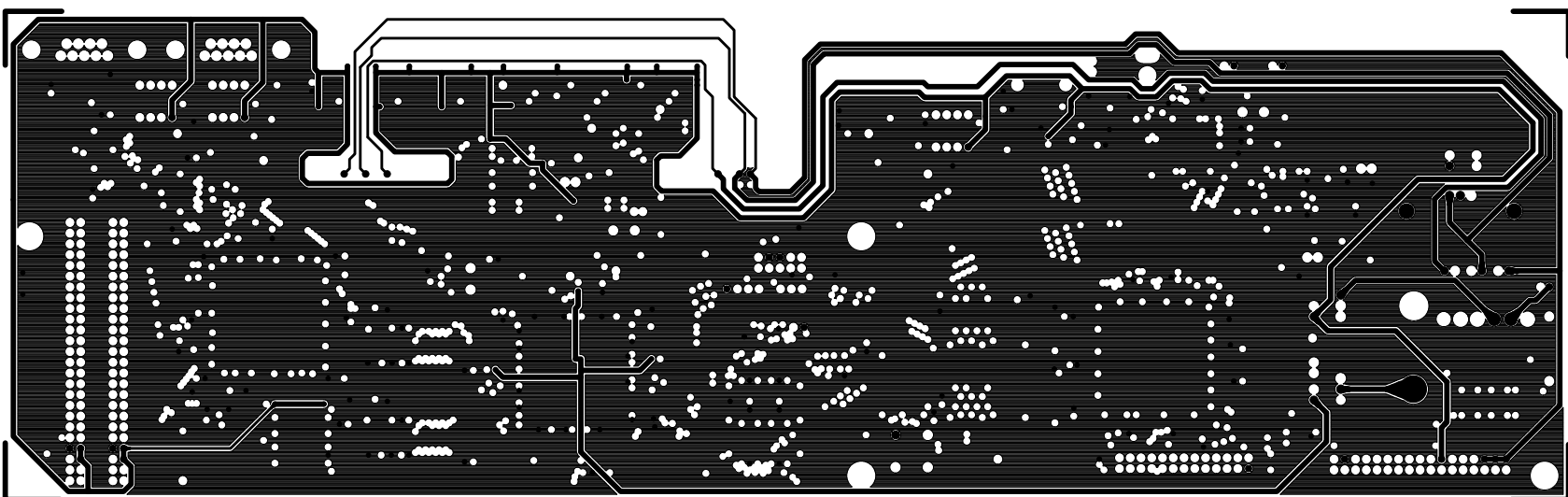


ALESIS 9-40-0231-D "TOPTRACE"



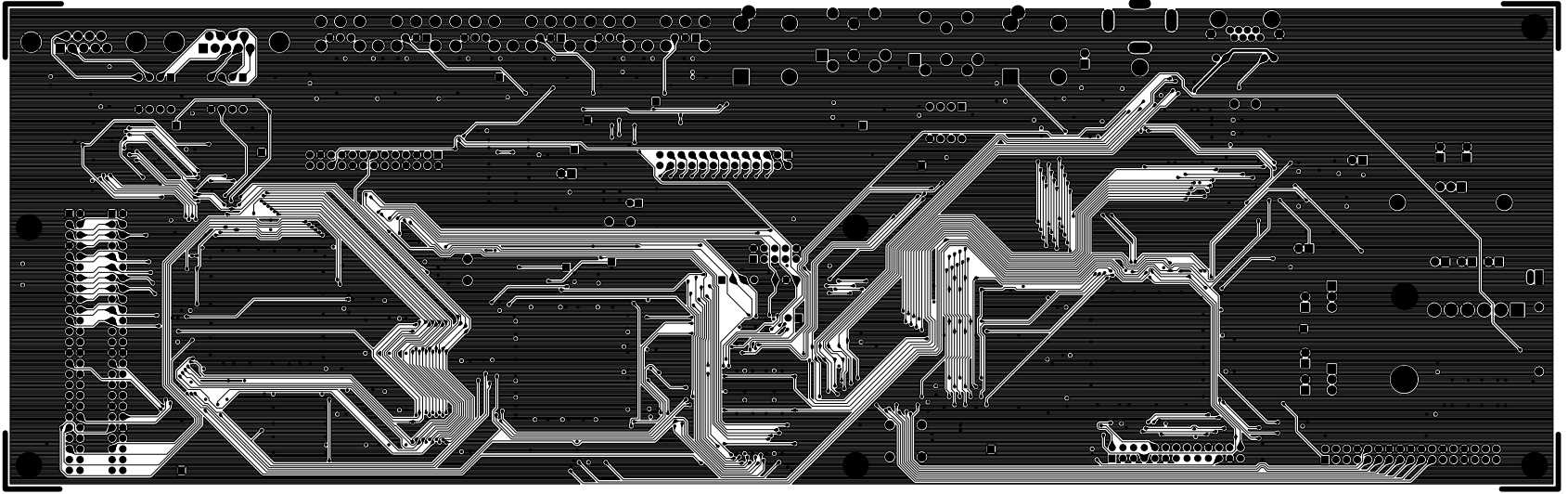


ALESIS 9-40-0231-D "GNDPLANE LAYER 2"



ALESIS 9-40-0231-D "PWRPLANE LAYER 3"





"ALESI2 3-40-031-D" BOTTRACE"

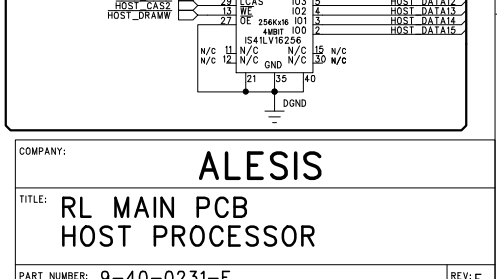
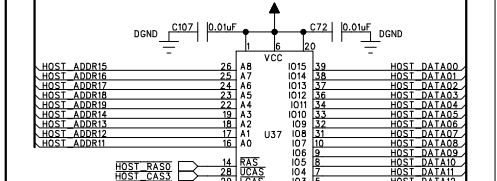
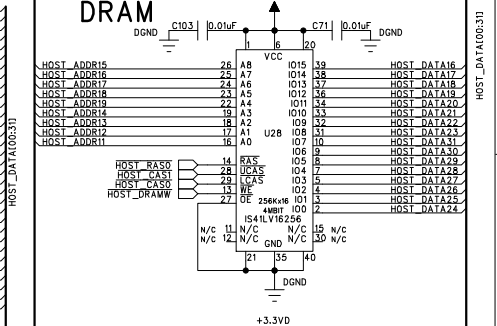
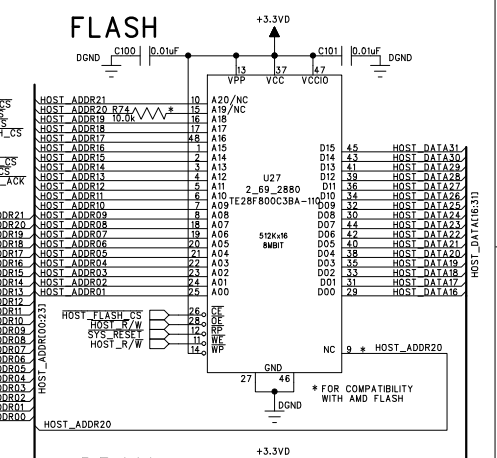
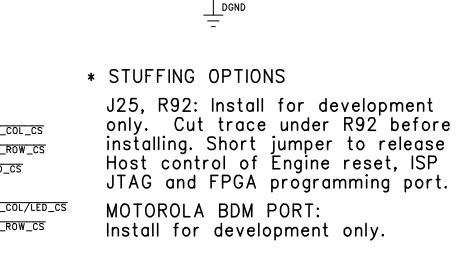
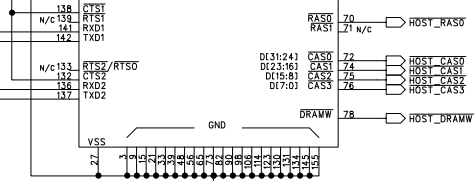
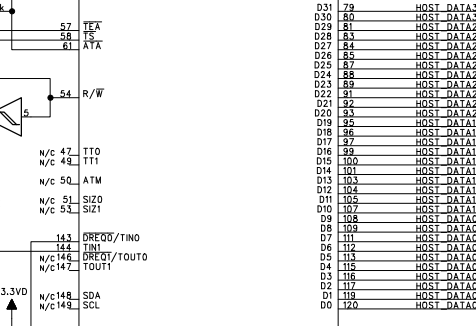
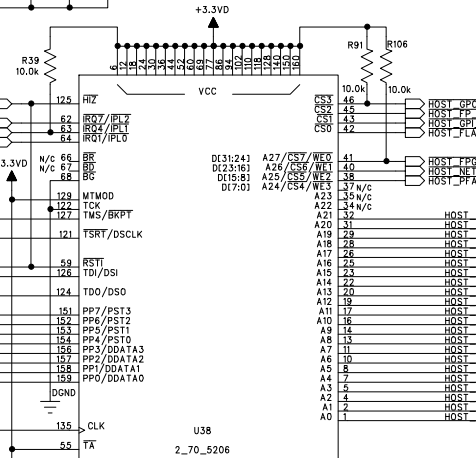
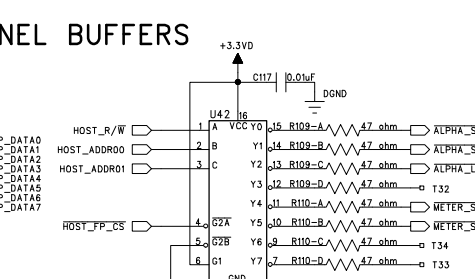
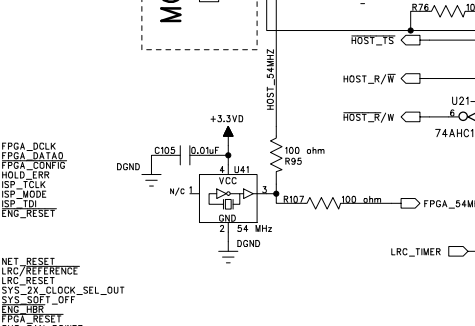
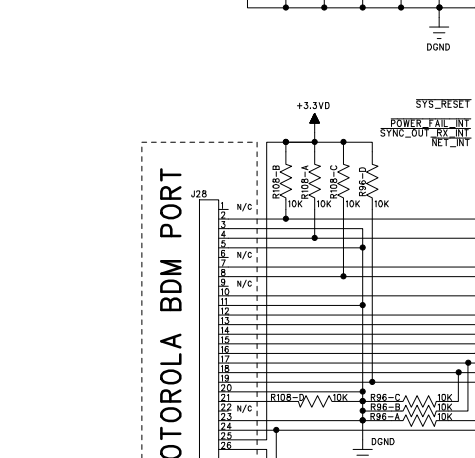
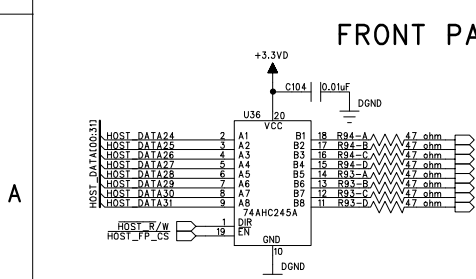
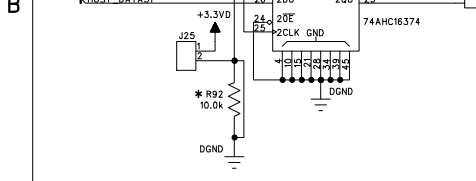
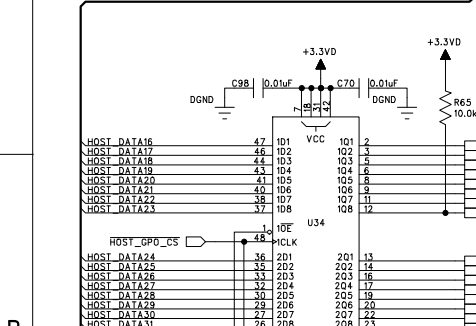
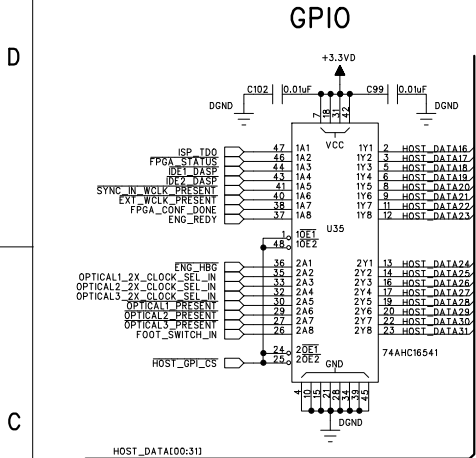


# HD24 MAIN PCB

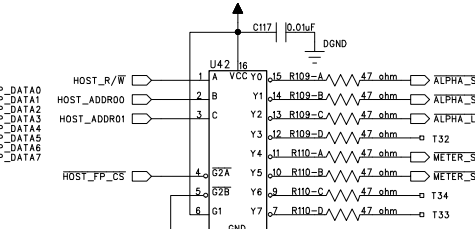
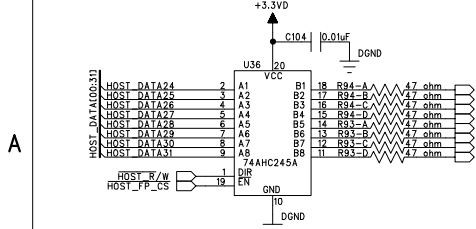
## Rev F



REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



### FRONT PANEL BUFFERS



**\* STUFFING OPTIONS**

J25, R92: Install for development only. Cut trace under R92 before installing. Short jumper to release Host control of Engine reset, ISP JTAG and FPGA programming port.

MOTOROLA BDM PORT: Install for development only.

**ALESIS**

TITLE: **RL MAIN PCB HOST PROCESSOR**

COMPANY: \_\_\_\_\_

PART NUMBER: **9-40-0231-F** REV: F

ASSY NUMBER: **9-79-0231-F**

FILENAME: **RLMNF00A.SCH** SIZE: C

SCALE: \_\_\_\_\_ SHEET: 1 of 5

DRAWN: SCHMANSKI/MEYER	DATED: 10/01/2001
RELEASED:	DATED:

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REVISION RECORD			
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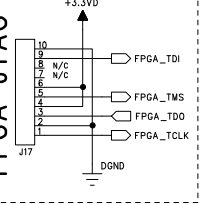
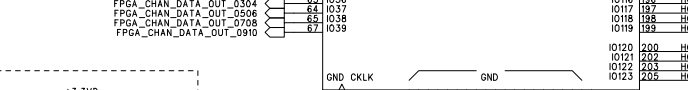
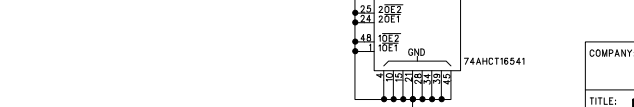
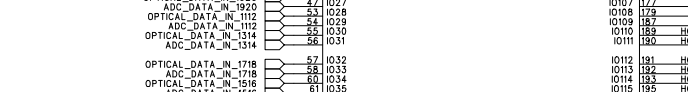
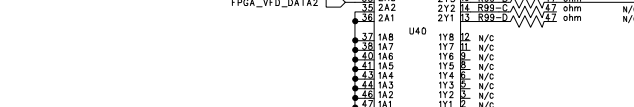
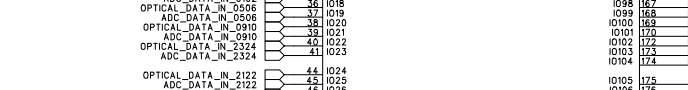
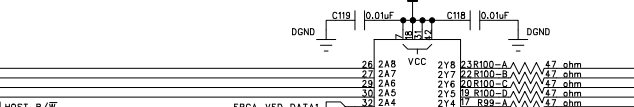
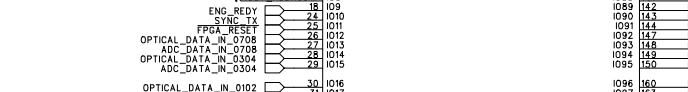
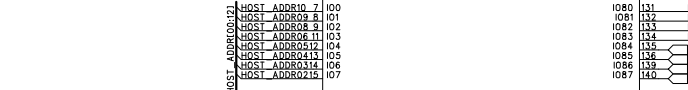
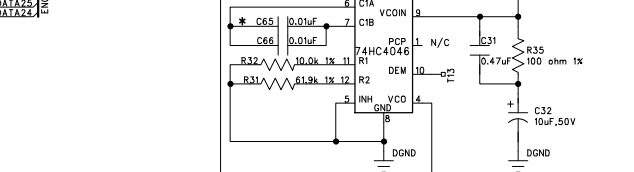
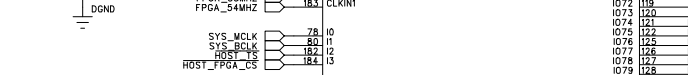
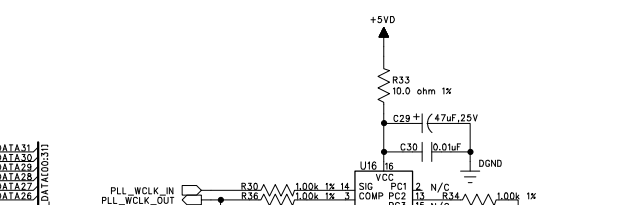
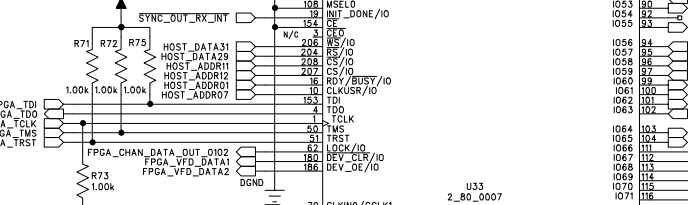
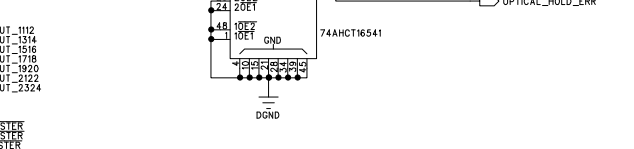
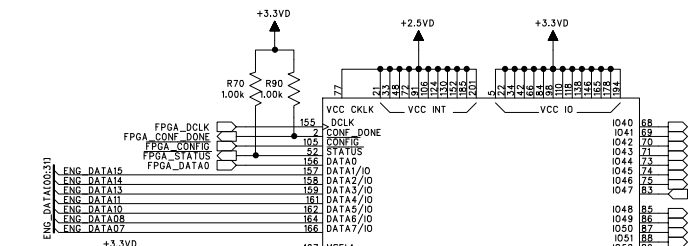
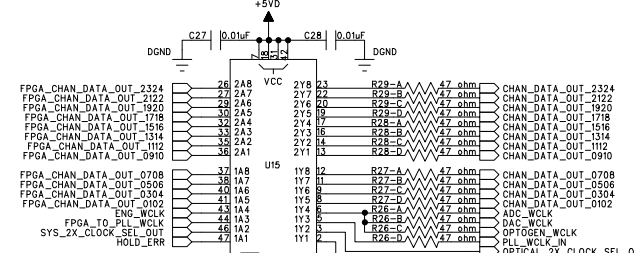
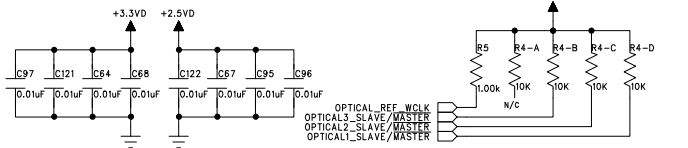
C

B

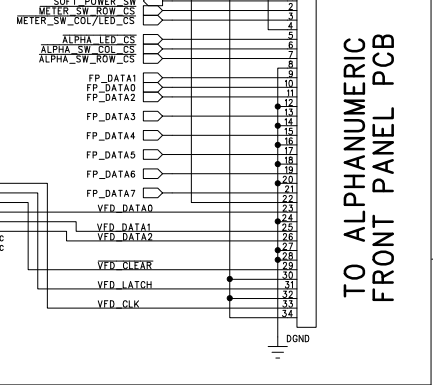
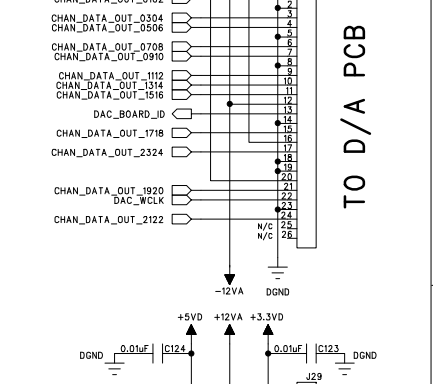
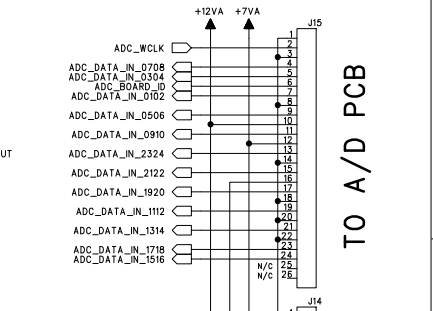
B

A

A



\* STUFFING OPTIONS:  
 FPGA JTAG: Install components for development only.  
 C65: Do not install. Alternate component option for C66.



COMPANY: **ALESIS**

TITLE: **RL MAIN PCB  
FPGA**

PART NUMBER: **9-40-0231-F**      REV: F

ASSY NUMBER: **9-79-0231-F**

FILENAME: **RLMNF00A.SCH**      SIZE: C

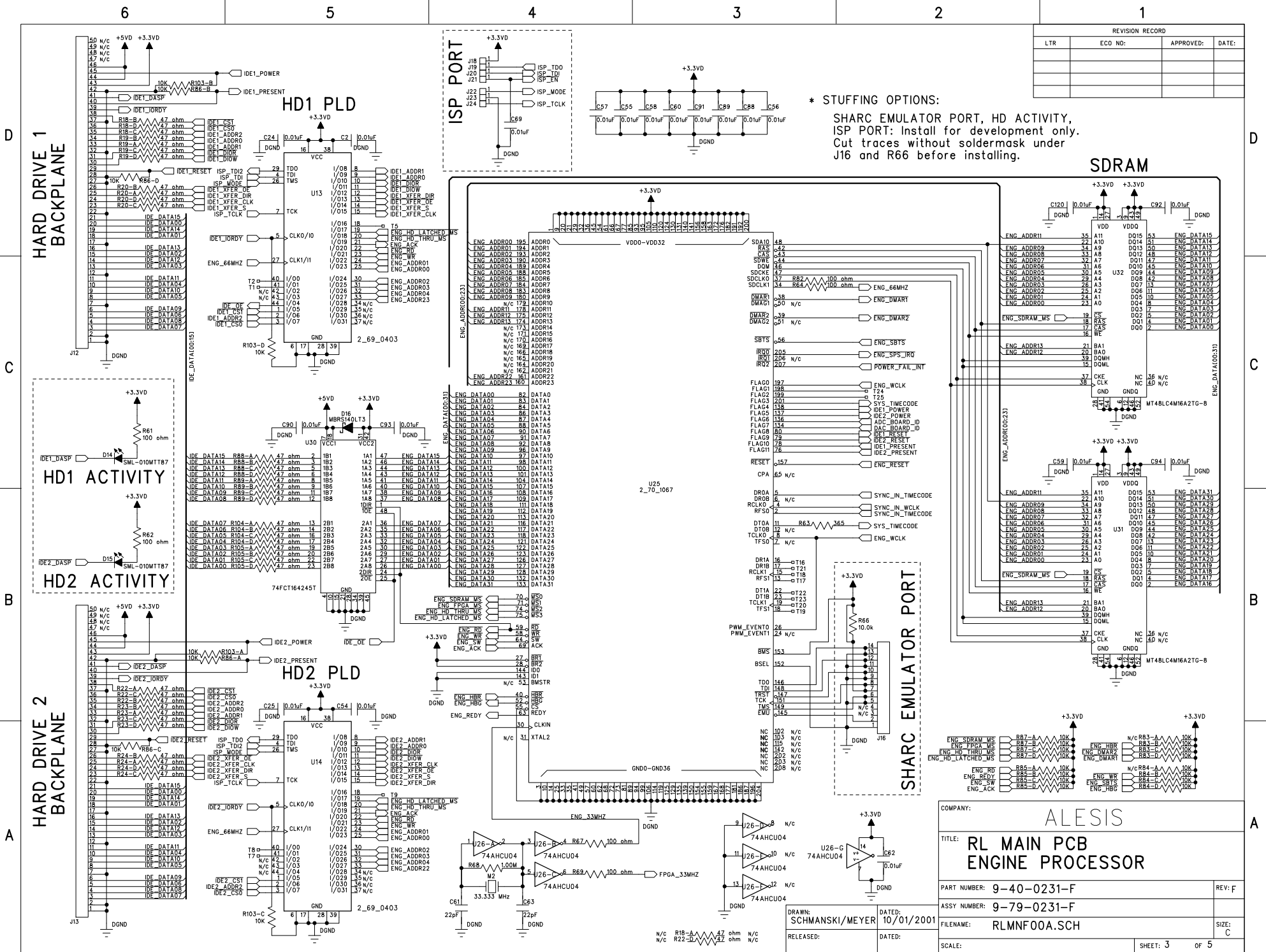
SCALE:      SHEET: 2 of 5

TO A/D PCB

TO D/A PCB

TO ALPHANUMERIC FRONT PANEL PCB

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



\* STUFFING OPTIONS:  
 SHARC EMULATOR PORT, HD ACTIVITY,  
 ISP PORT: Install for development only.  
 Cut traces without soldermask under  
 J16 and R66 before installing.

COMPANY:		ALEXIS	
TITLE: RL MAIN PCB ENGINE PROCESSOR			
PART NUMBER: 9-40-0231-F		REV: F	
ASSY NUMBER: 9-79-0231-F		DRAWN: SCHMANSKI/MEYER	
FILENAME: RLMNFO0A.SCH		DATED: 10/01/2001	
SCALE:		RELEASED:	
SHEET: 3		OF 5	

6

5

4

3

2

1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

D

D

C

C

B

B

A

A

SYNC IN

SYNC OUT

WORD CLOCK

LRC

FOOT SWITCH

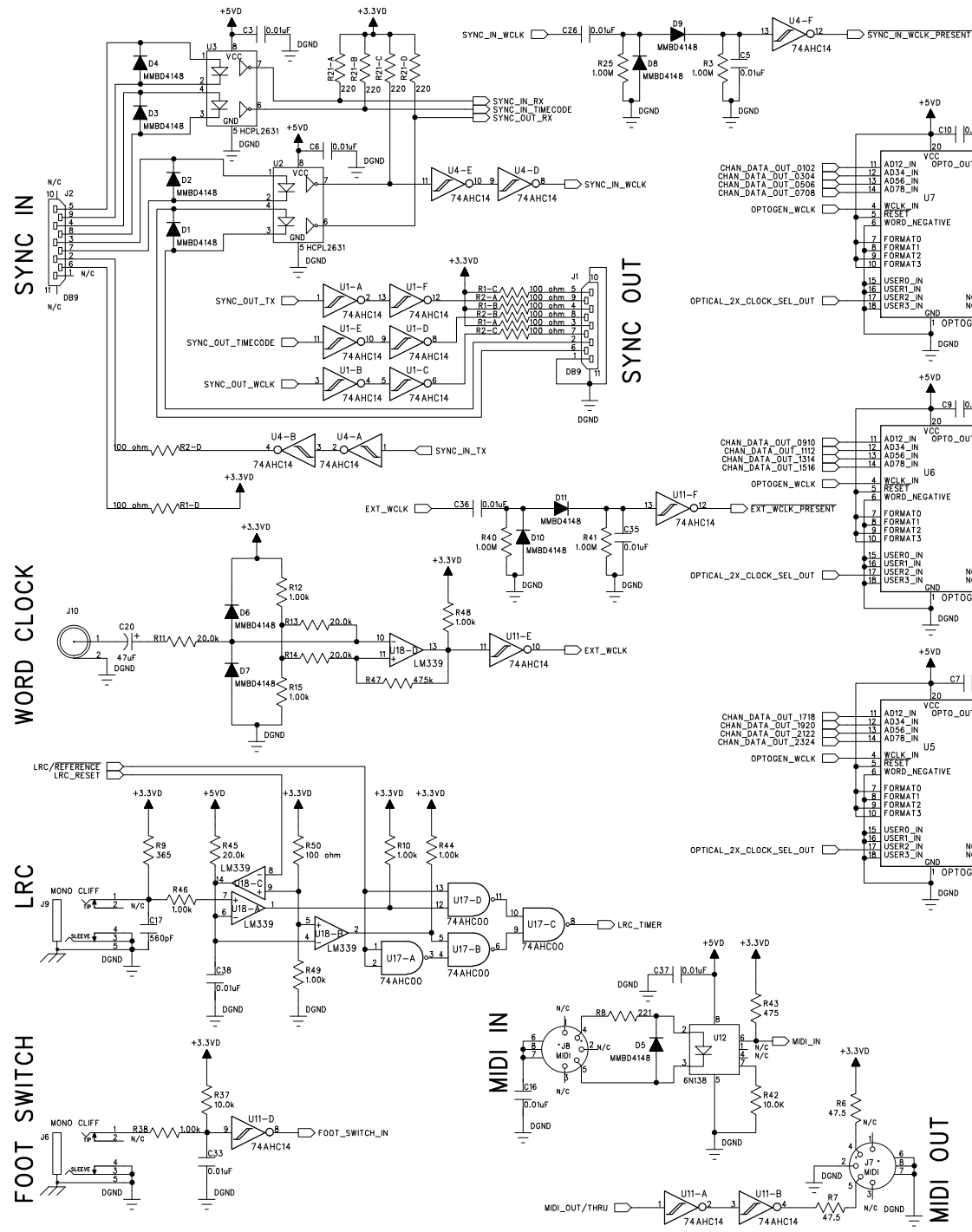
MIDI IN

MIDI OUT

OPTICAL I/O 1-8

OPTICAL I/O 9-16

OPTICAL I/O 17-24



COMPANY: **ALESIS**

TITLE: **RL MAIN PCB I/O**

PART NUMBER: **9-40-0231-F**      REV: F

ASSY NUMBER: **9-79-0231-F**

FILENAME: **RLMNF00A.SCH**      SIZE: C

DRAWN: **SCHMANSKI/MEYER**      DATED: **10/01/2001**

RELEASED:      DATED:      SCALE:      SHEET: 4 OF 5

6

5

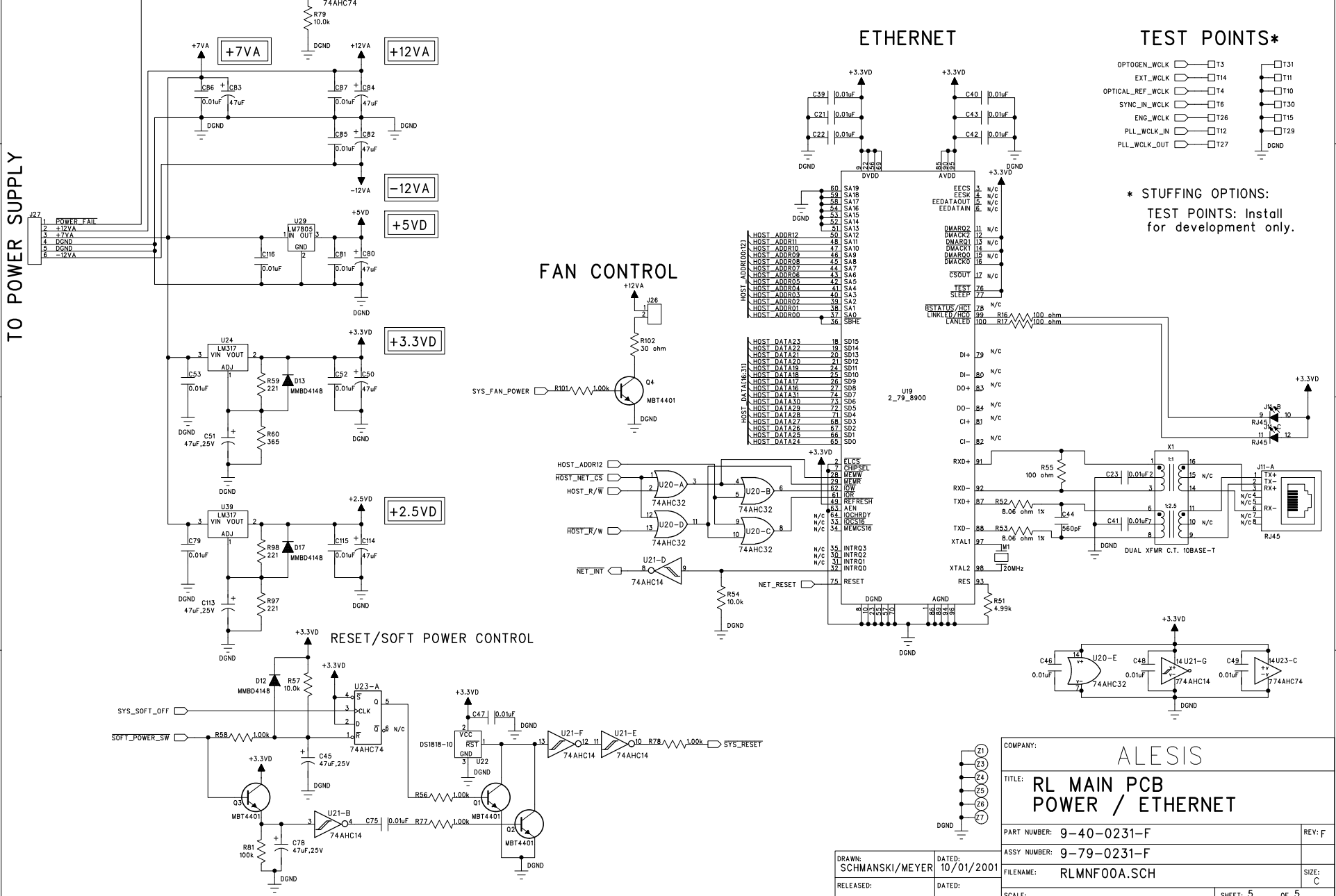
4

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2

1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



COMPANY:		ALESIS	
TITLE:		RL MAIN PCB POWER / ETHERNET	
PART NUMBER:	9-40-0231-F	REV:	F
ASSY NUMBER:	9-79-0231-F	FILENAME:	RLMNF00A.SCH
DRAWN:	SCHMANSKI/MEYER	DATED:	10/01/2001
RELEASED:		DATED:	
SCALE:		SHEET:	5 OF 5

D

C

B

A

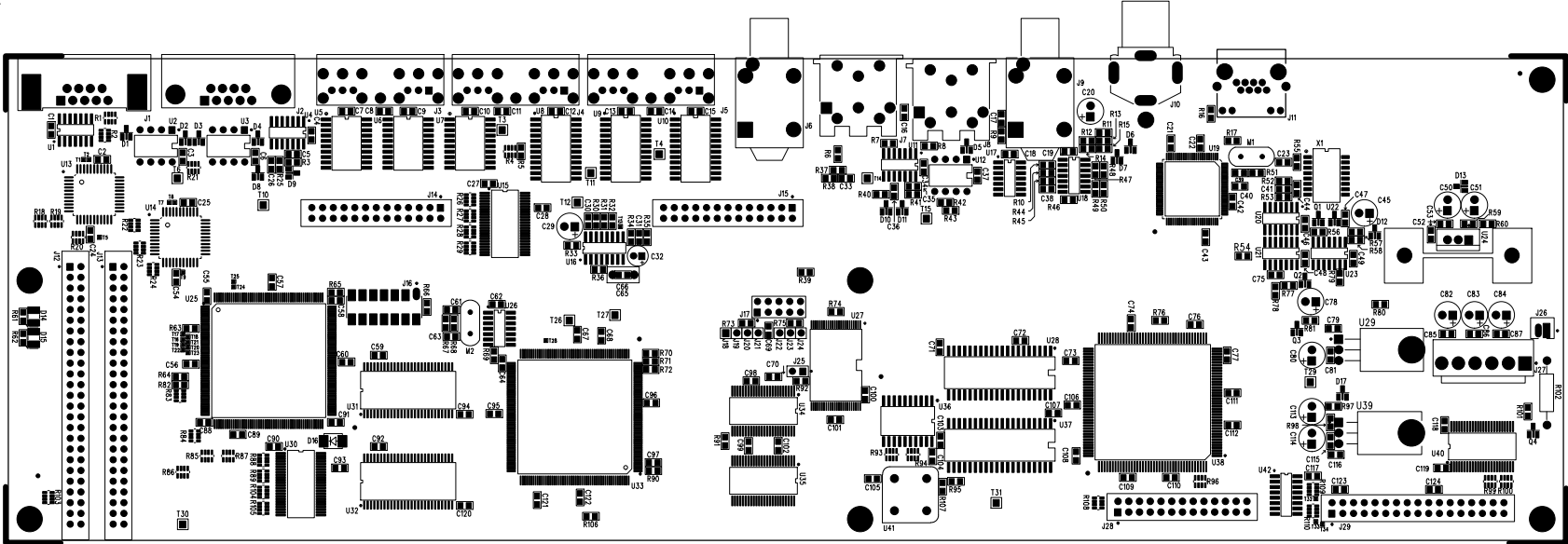
D

C

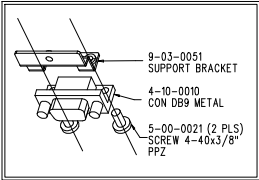
B

A

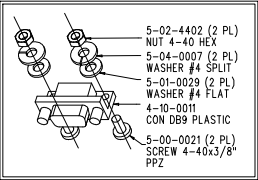
# ALESIS 9-79-0231-F "TOP ASSEMBLY DRAWING"



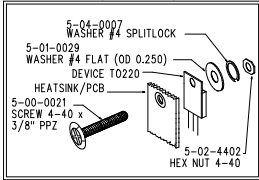
FOR J1:



FOR J2:



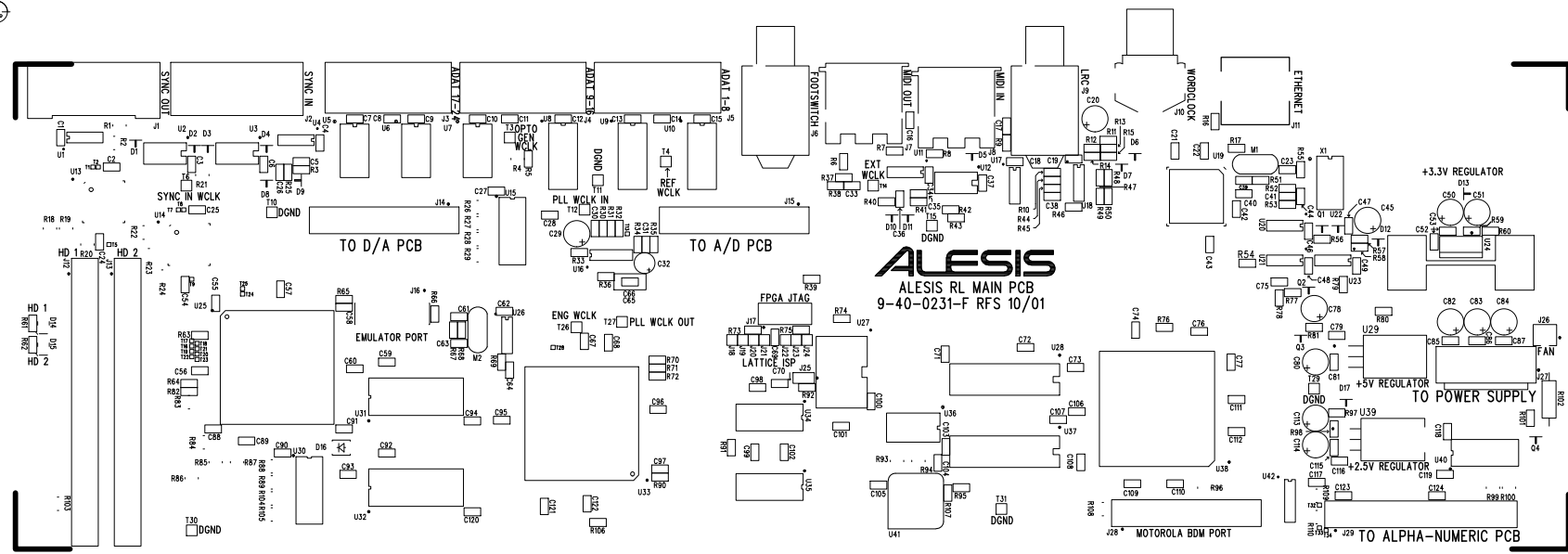
FOR U24, U29, U39 (ALL PARTS x3):



DO NOT INSTALL:

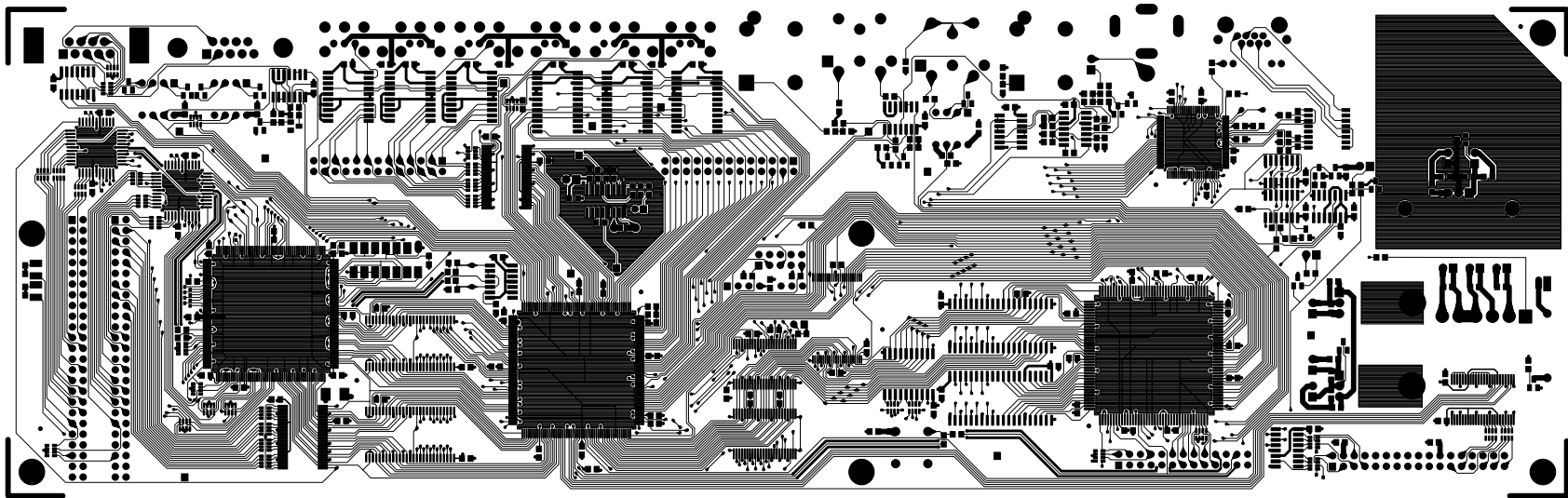
- C65: 1-20-0103
- C69: 1-56-0103
- D14, D15: 3-20-0002
- J16: 4-20-1400
- J17: 4-15-0010
- J18, J19, J20, J21, J22,
- J23, J24: 4-98-0001
- J25: 4-15-0002
- J28: 4-14-2601
- R61, R62: 0-16-1000
- R66, R92: 0-16-1002
- T3, T4, T6, T10, T11,
- T14, T15, T26, T29,
- T30, T31: 4-98-0001





ALESIS 9-40-0231-F "TOPSILK"

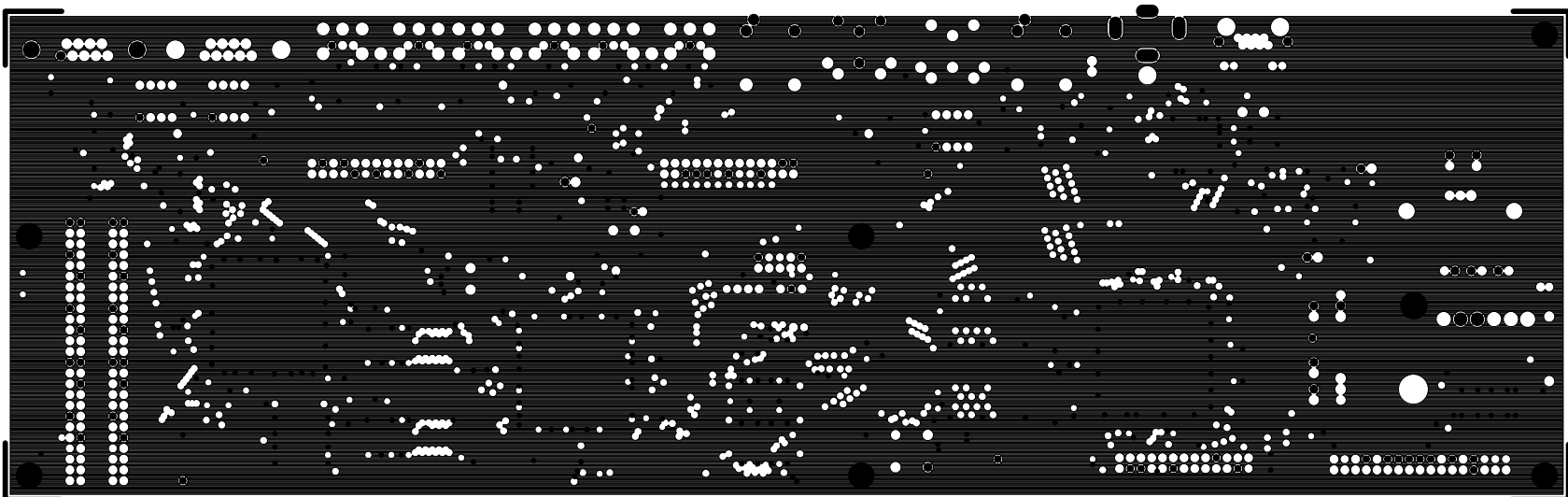




ALESIS 9-40-0231-F "TOPTRACE"

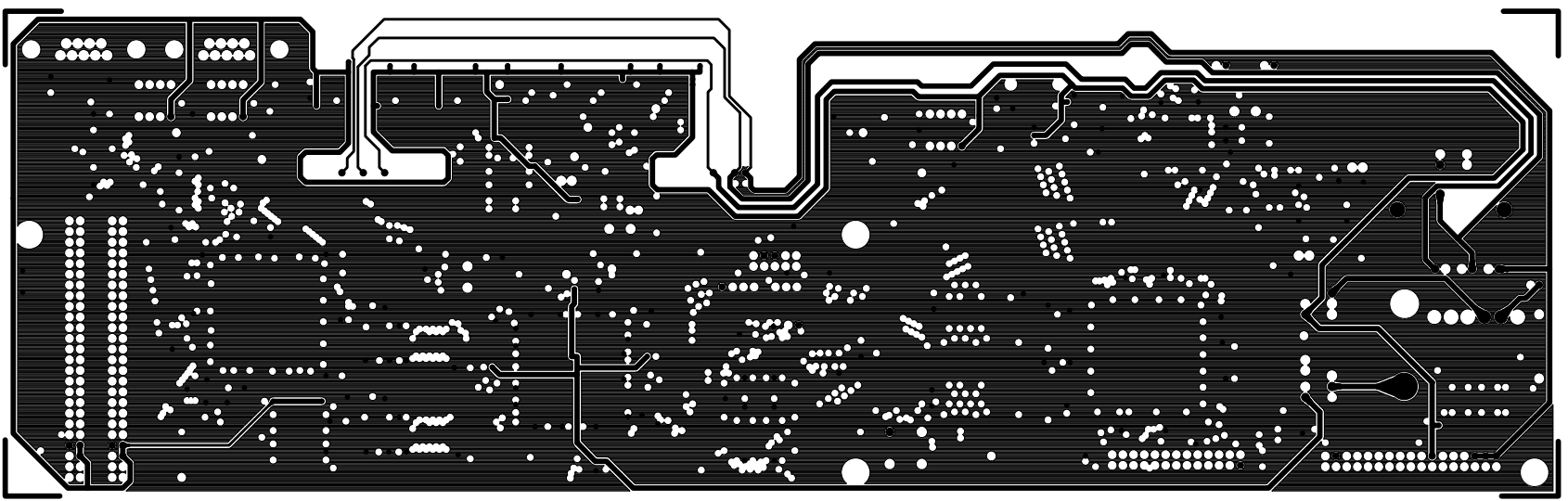






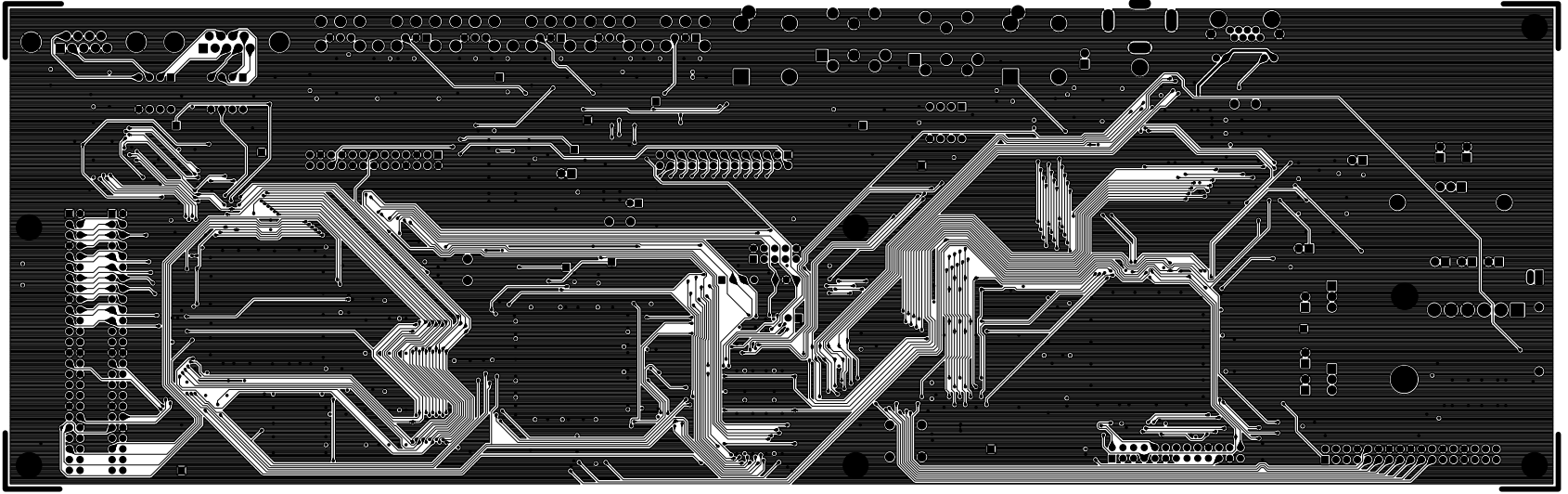
ALESIS 9-40-0231-F "GNDPLANE LAYER 2"





ALESIS 9-40-0231-F "PWRPLANE LAYER 3"





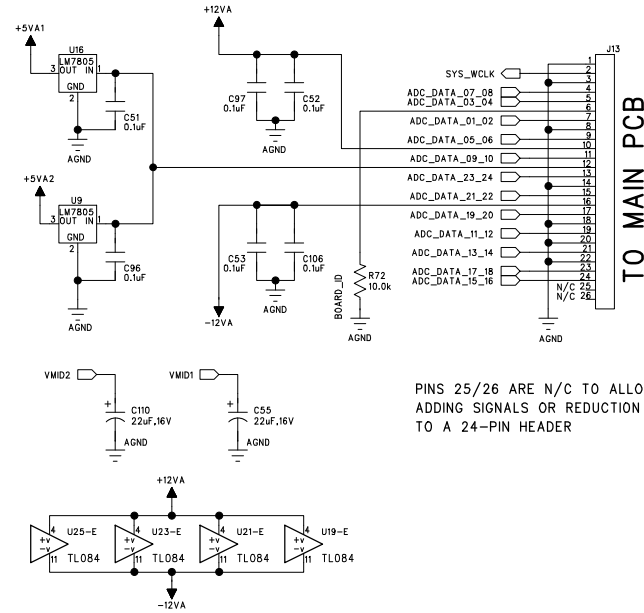
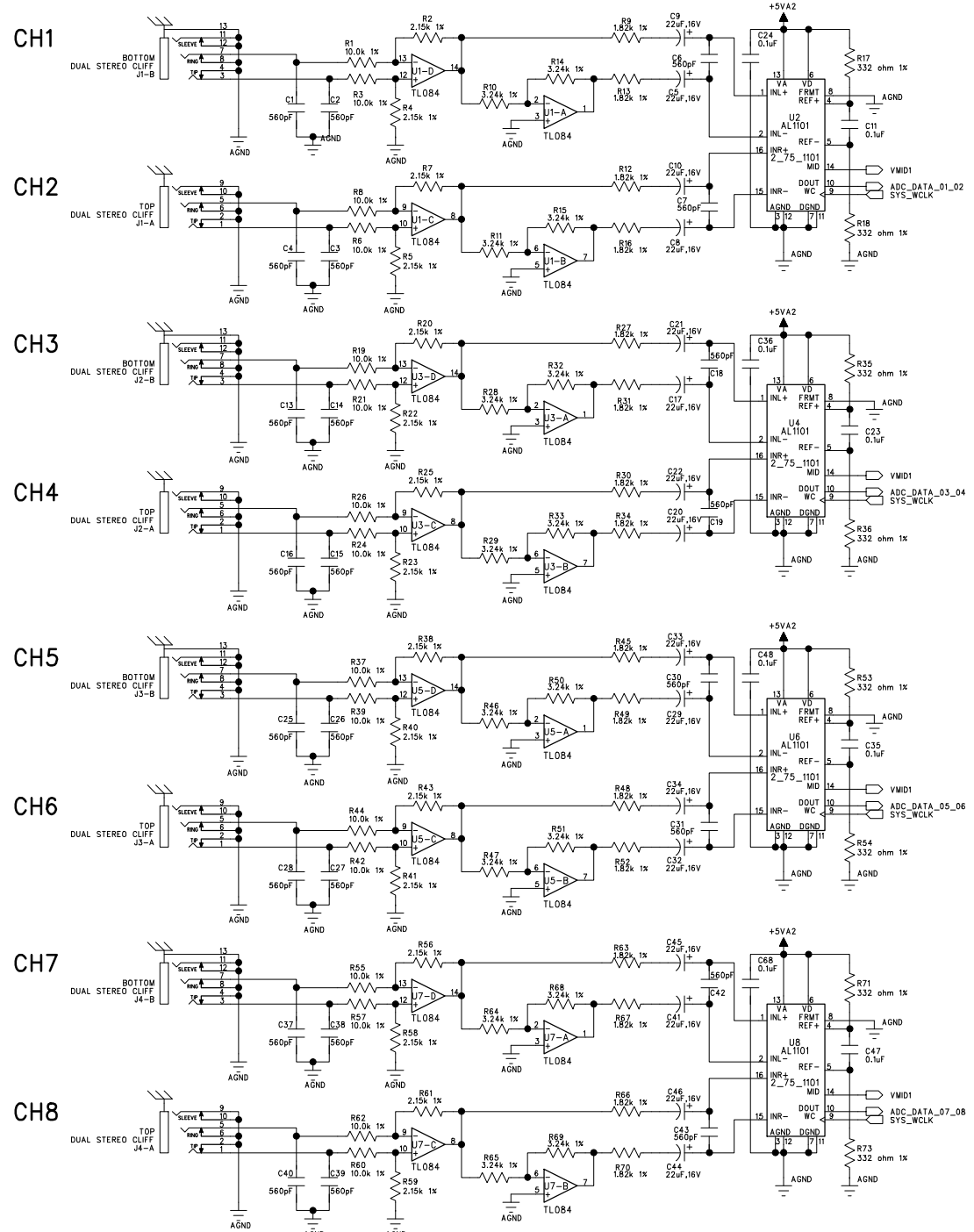
"BOTTRACE"-031F-4-0-212 ALES12



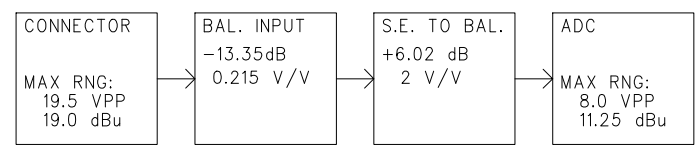
# HD24 A/D PCB

## Rev A

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



GAIN STAGE DIAGRAM



COMPANY: ALESIS	
TITLE: RL A/D Board	
PART NUMBER: 9-40-0232-A	REV:
ASSY NUMBER: 9-79-0232-A	
FILENAME: RLADA01A.SCH	SIZE: C
SCALE:	SHEET: 1 OF 3

DRAWN: JH/BG/PM/ATM	DATED: 01/08/01
RELEASED:	DATED:

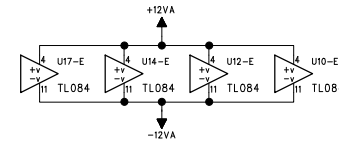
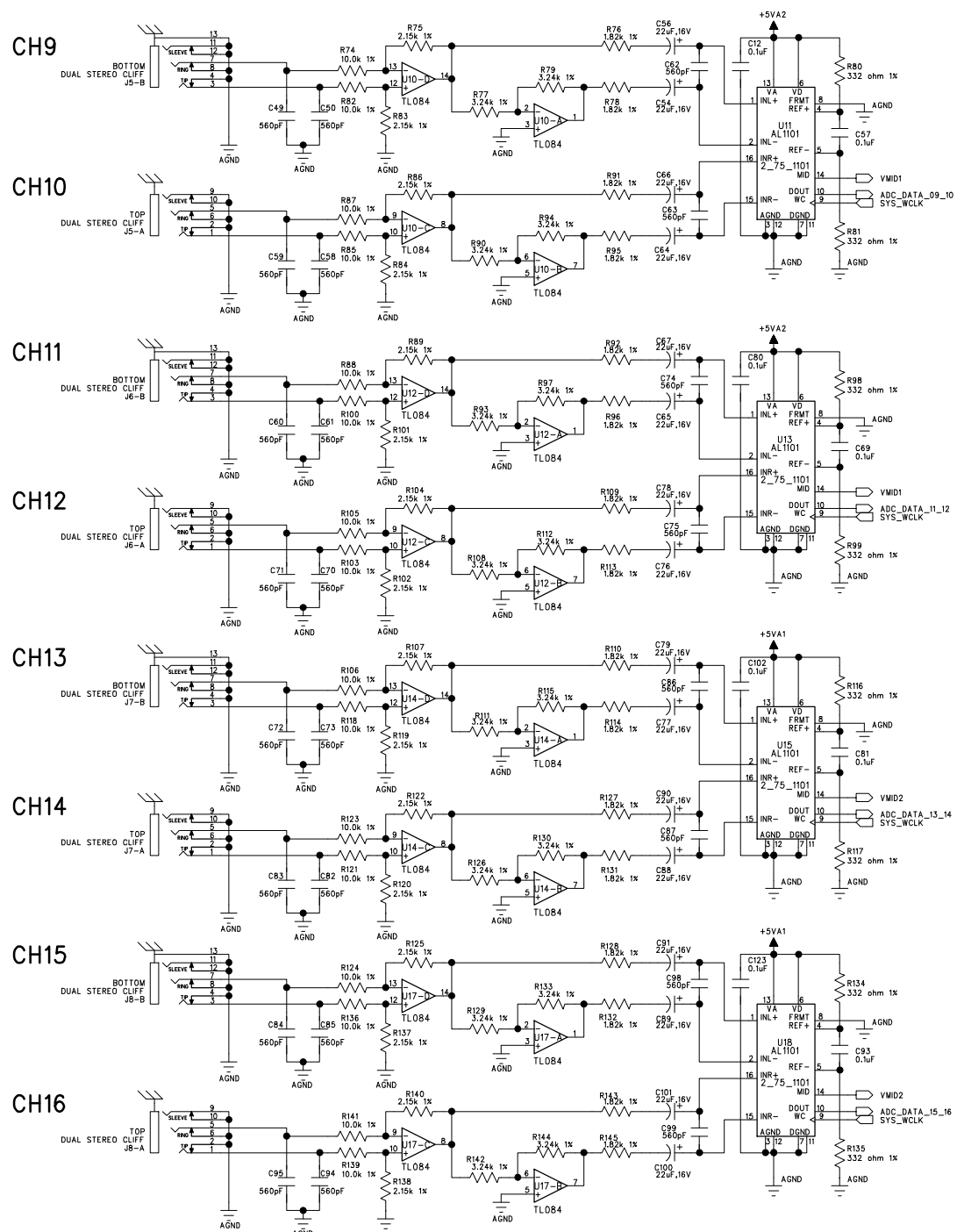
6  
5  
4  
3  
2  
1  
D  
C  
B  
A

D  
C  
B  
A

TO MAIN PCB

PINS 25/26 ARE N/C TO ALLOW ADDING SIGNALS OR REDUCTION TO A 24-PIN HEADER

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

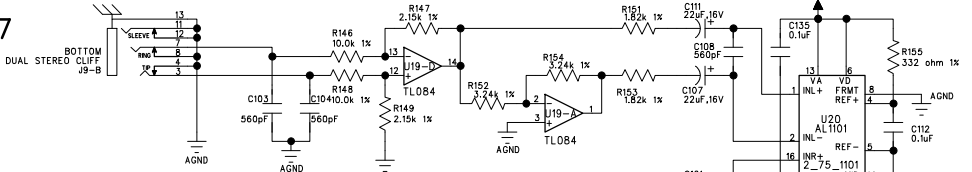


COMPANY: ALESIS	
TITLE: RL A/D Board	
PART NUMBER: 9-40-0232-A	REV:
ASSY NUMBER: 9-79-0232-A	
FILENAME: RLADA01A.SCH	SIZE: C
SCALE:	SHEET: 2 OF 3

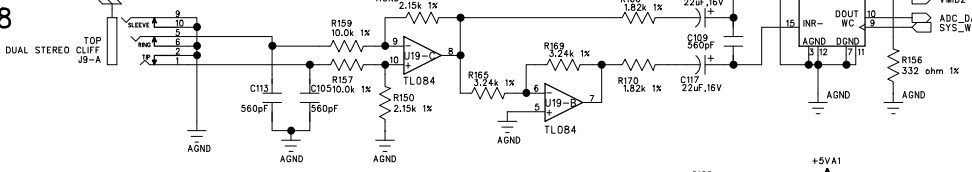
DRAWN: JH/BG/PM/ATM	DATED: 01/08/01
RELEASED:	

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

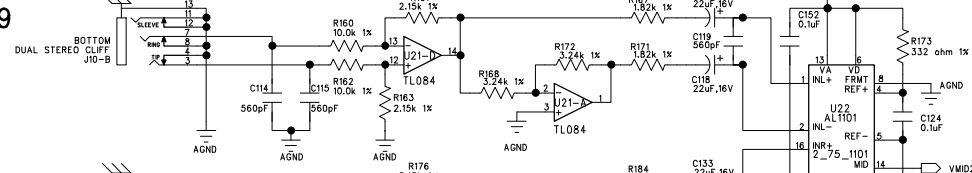
CH17



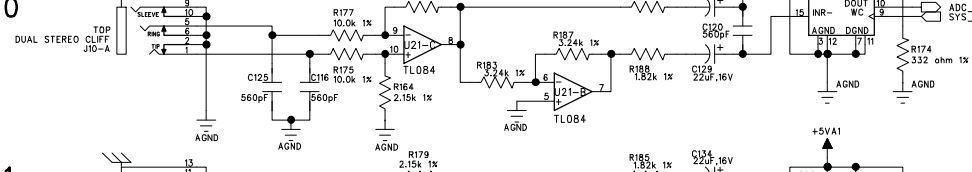
CH18



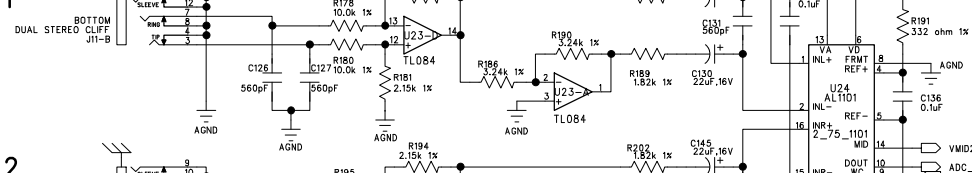
CH19



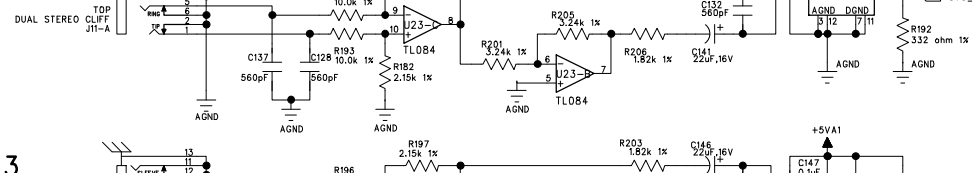
CH20



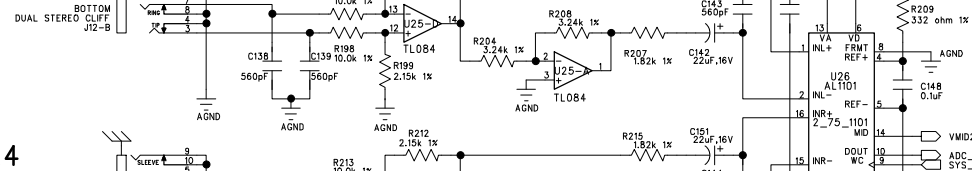
CH21



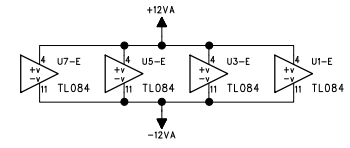
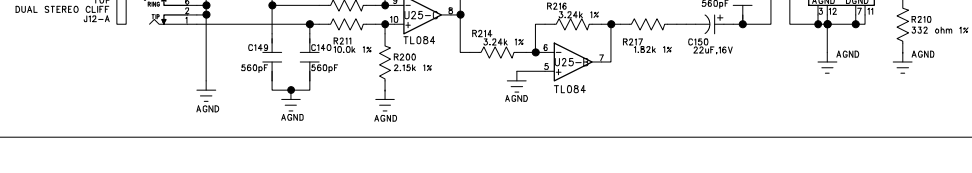
CH22



CH23



CH24



COMPANY: ALESIS	
TITLE: RL A/D Board	
PART NUMBER: 9-40-0232-A	REV:
ASSY NUMBER: 9-79-0232-A	
FILENAME: RLADA01A.SCH	SIZE: C
SCALE:	SHEET: 3 OF 3

DRAWN: JH/BG/PM/ATM	DATED: 01/08/01
RELEASED:	

6

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1

D

C

B

A

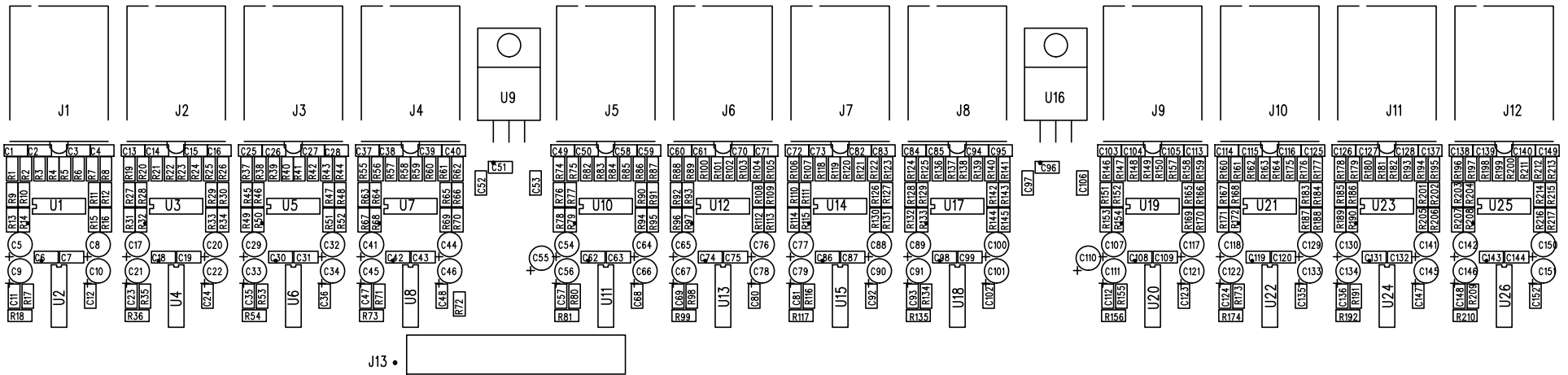
D

C

B

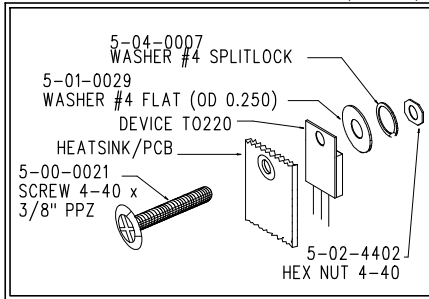
A

# ALESIS 9-79-0232-A TOPASSY

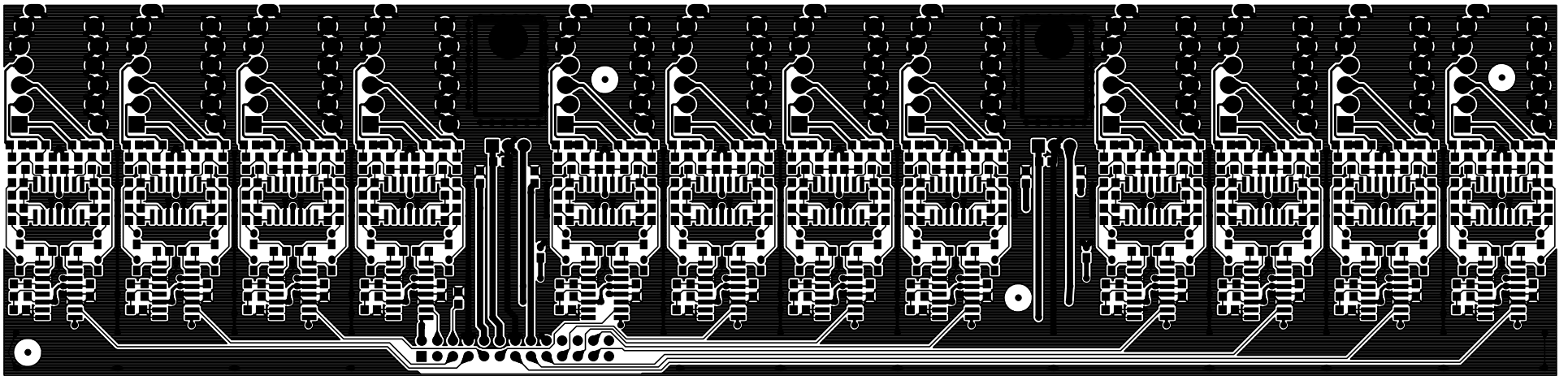


J13 •

## MOUNTING INSTRUCTIONS FOR U9 AND U16 (TO-220)

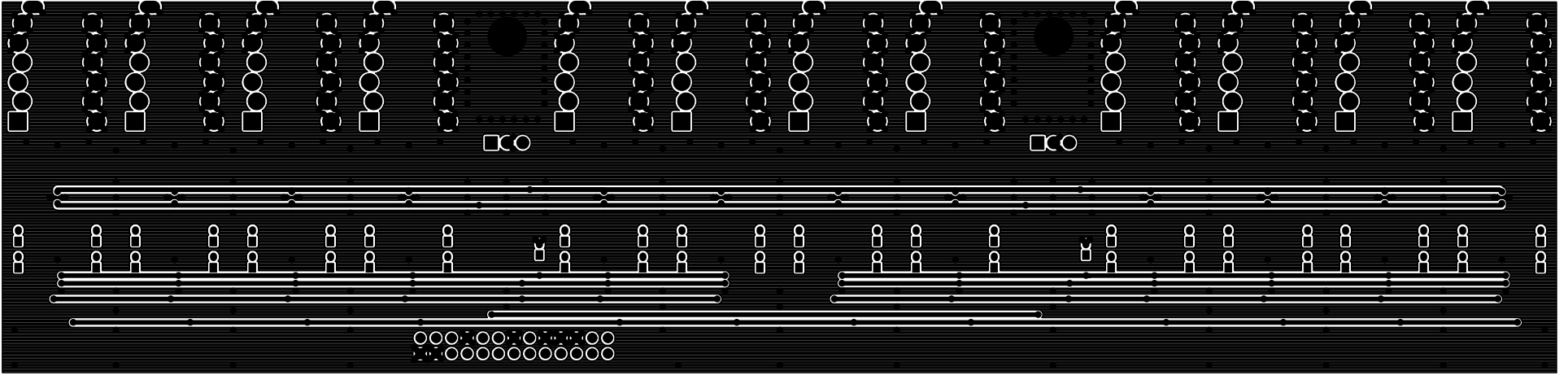


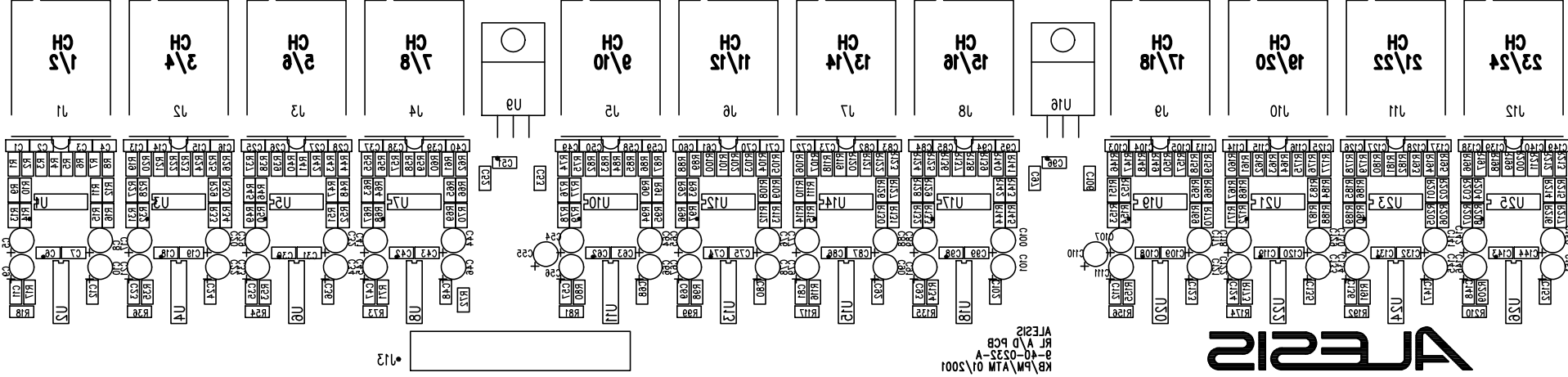




ALESIS 9-40-0232-A TOPTRACE

AL2S12 3-4-0-0535-A BOLTRACE





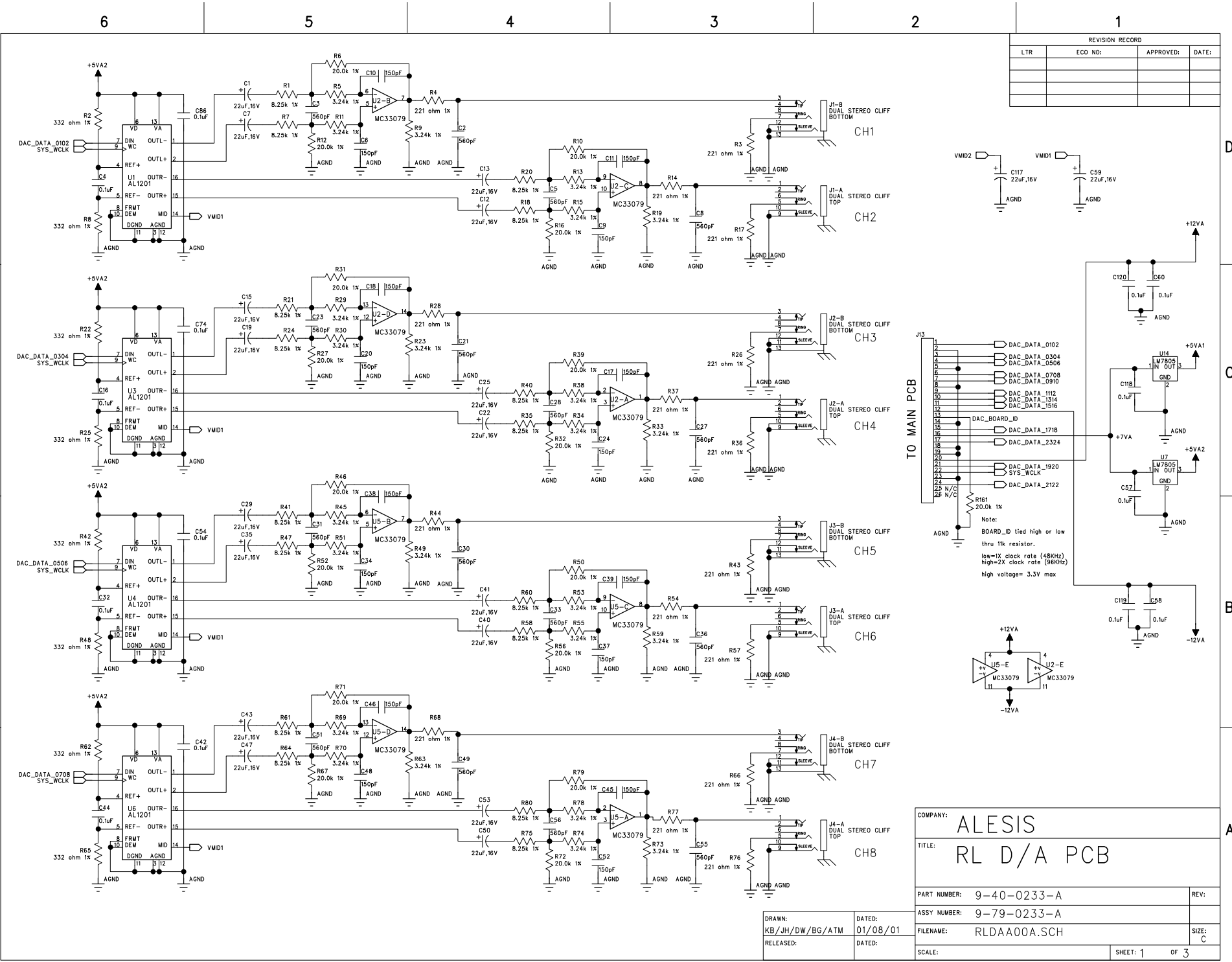
ALE212 8-40-0535-A BOTSILK



# HD24 D/A PCB

## Rev A

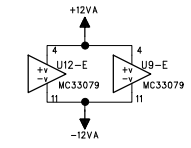
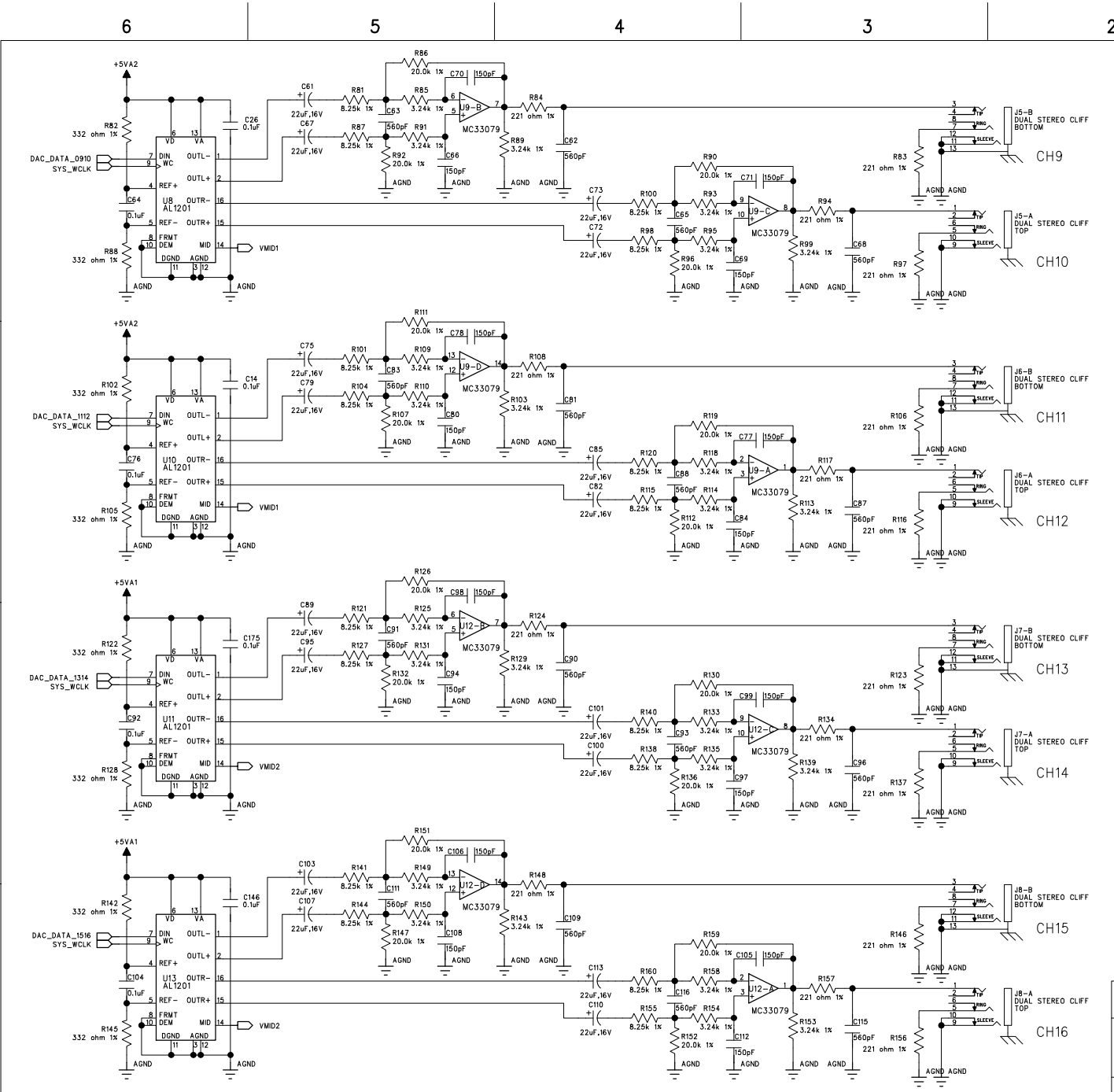
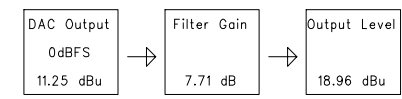
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



COMPANY: ALESIS	
TITLE: RL D/A PCB	
PART NUMBER: 9-40-0233-A	REV:
ASSY NUMBER: 9-79-0233-A	
FILENAME: RLDAA00A.SCH	SIZE: C
SCALE:	SHEET: 1 OF 3

DRAWN: KB/JH/DW/BG/ATM	DATED: 01/08/01
RELEASED:	DATED:

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



COMPANY: ALESIS	
TITLE: RL D/A PCB	
PART NUMBER: 9-40-0233-A	REV:
ASSY NUMBER: 9-79-0233-A	
FILENAME: RLDAA00A.SCH	SIZE: C
SCALE:	SHEET: 2 OF 3

DRAWN: KB/JH/DW/BG/ATM  
 RELEASED:   
 DATED: 01/08/01  
 DATED:

D

C

B

A

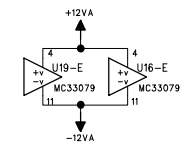
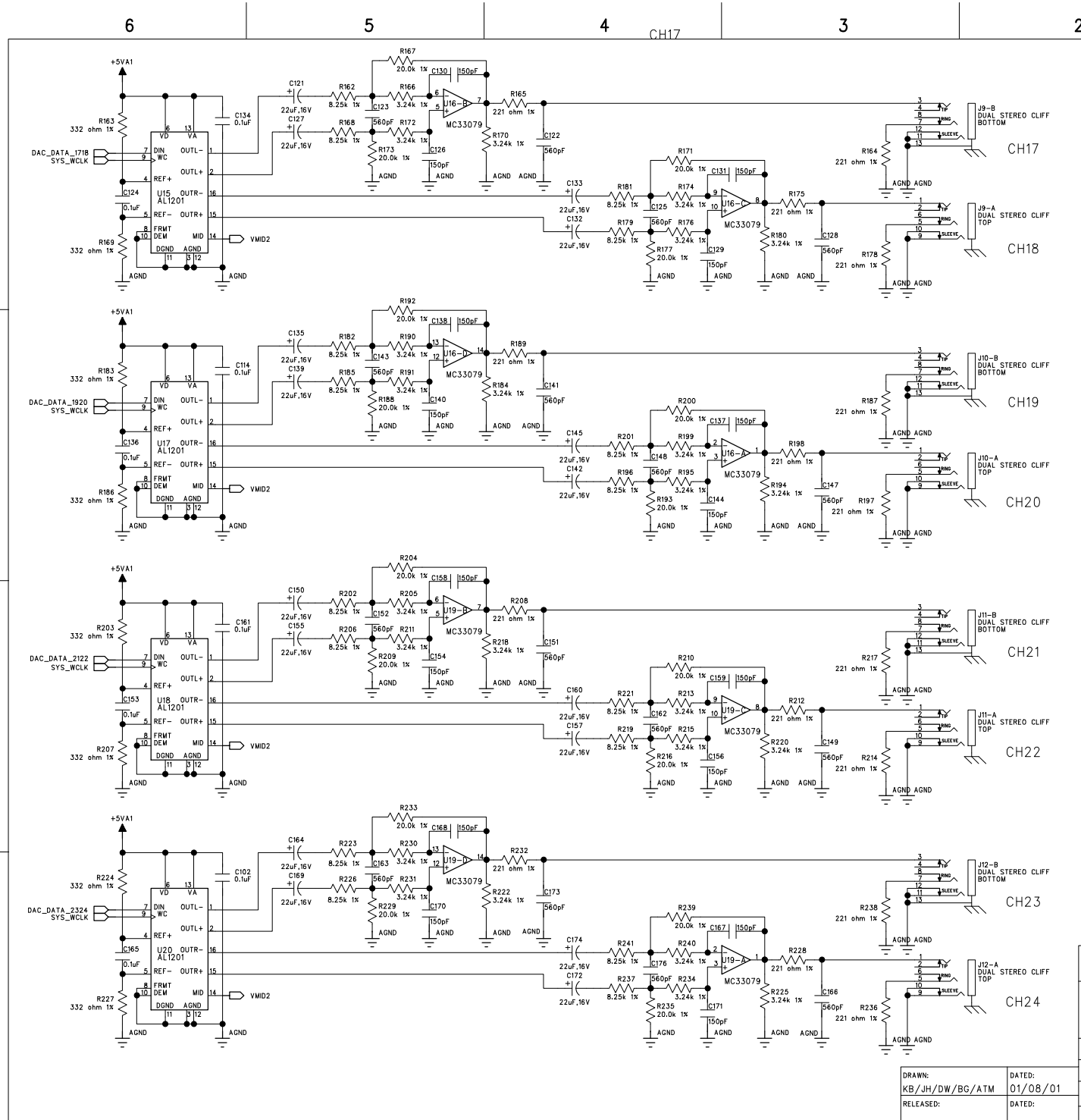
D

C

B

A

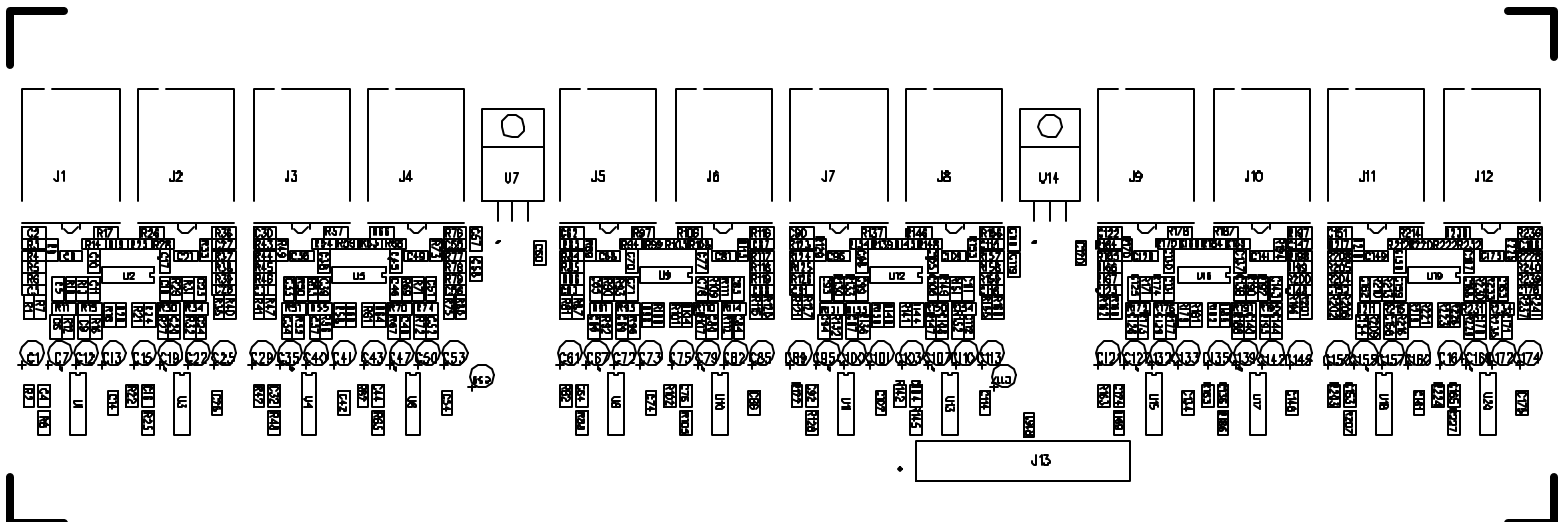
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



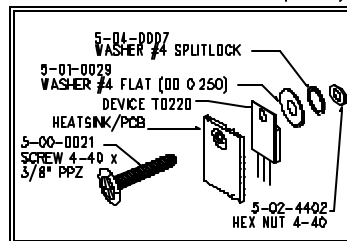
COMPANY: ALESIS	
TITLE: RL D/A PCB	
PART NUMBER: 9-40-0233-A	REV:
ASSY NUMBER: 9-79-0233-A	
FILENAME: RLDAA00A.SCH	SIZE: C
SCALE:	SHEET: 3 OF 3

DRAWN: KB/JH/DW/BG/ATM	DATED: 01/08/01
RELEASED:	

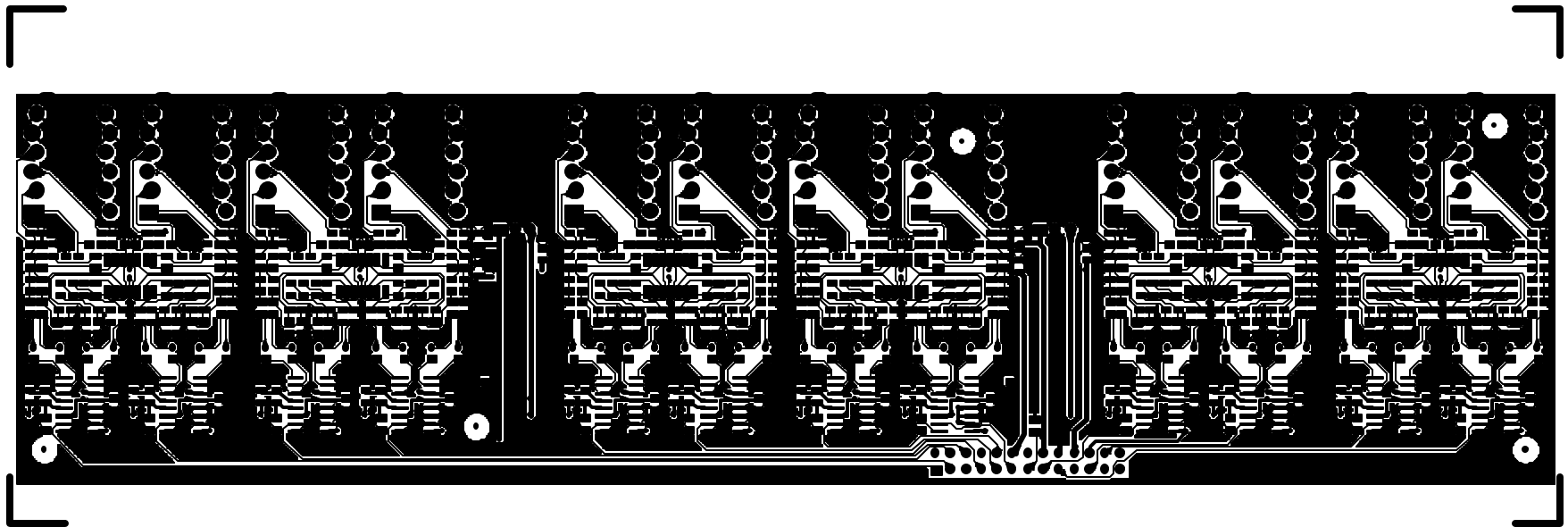
# ALESIS 9-40-0233-A ASSEMBLY DRAWING



## MOUNTING INSTRUCTIONS FOR U7 AND U14 (TO-220)

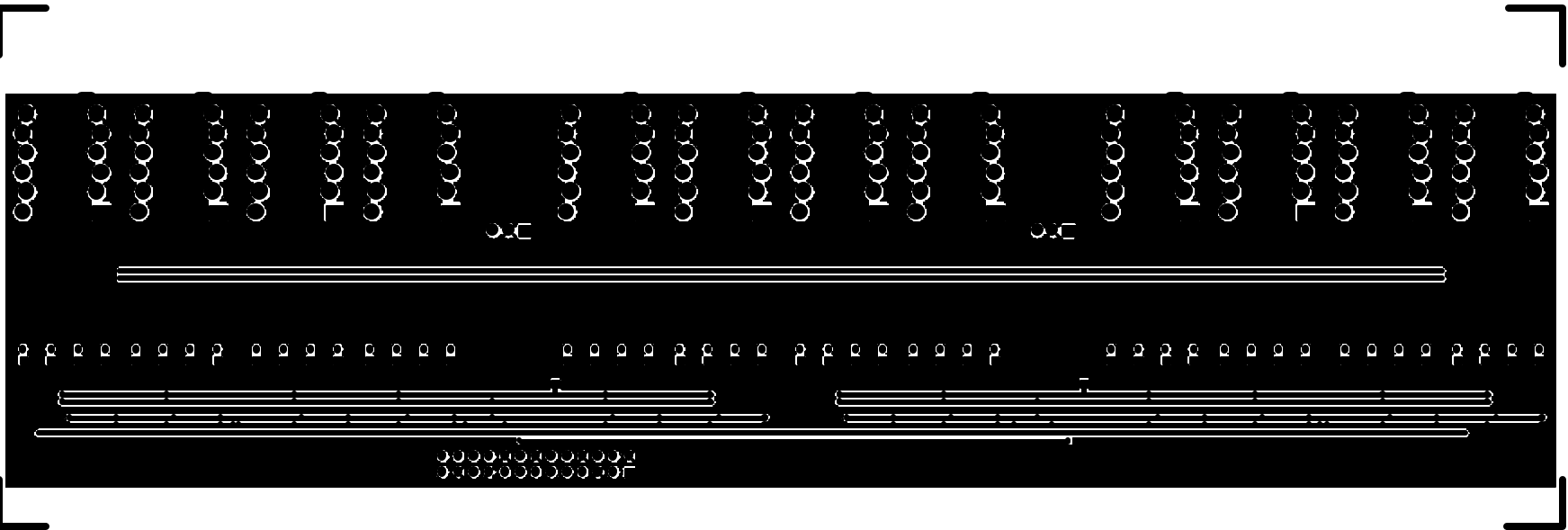




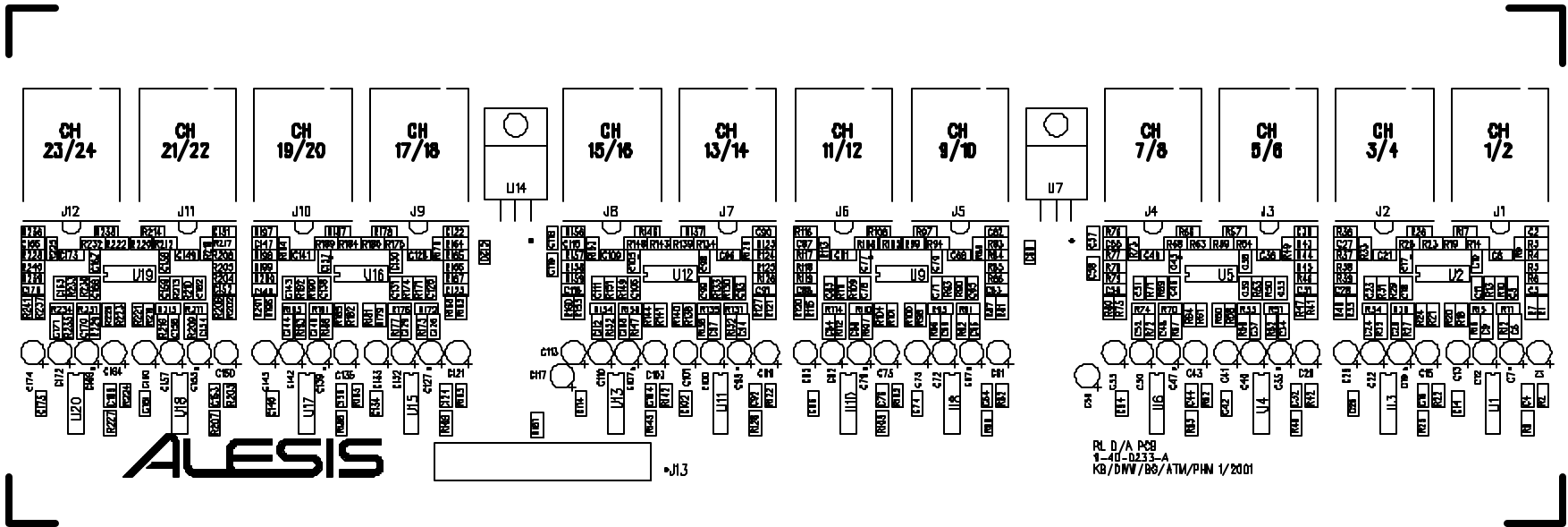


ALESIS 9-40-D233-A TOPTRAGE





ALESIS 9-40-0233-A BDTTRACE



**ALESIS**

PL D/A PCB  
 9-40-0233-A  
 KB/DNV/B8/ATM/PHN 1/2001

ALESIS 9-40-0233-A BDTSLK

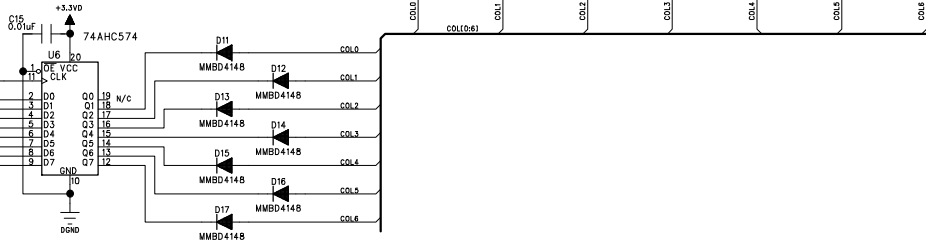
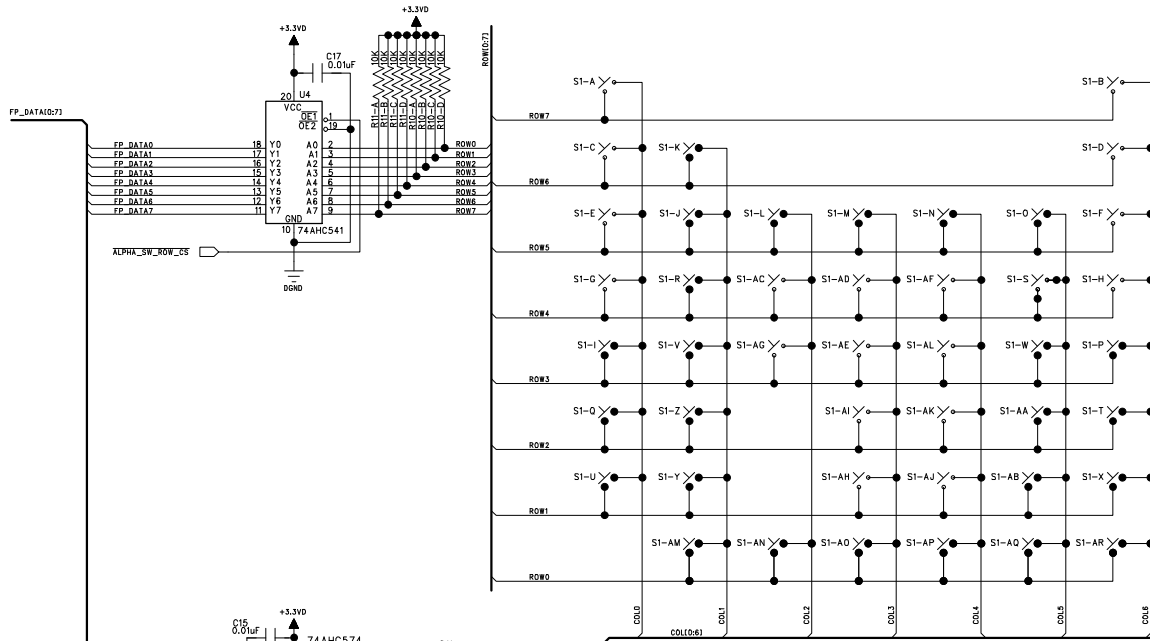


# HD24 Alpha PCB

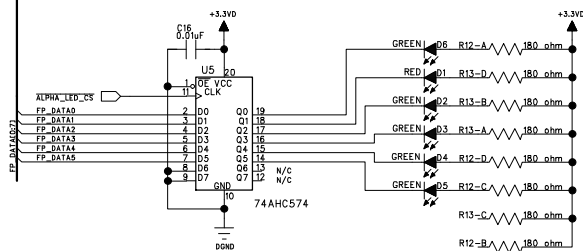
## Rev A

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

### SWITCH MATRIX



### TRANSPORT KEY LEDS



### BUTTON MAP

	COL0	COL1	COL2	COL3	COL4	COL5	COL6
ROW0			S1-AM LOCATE	S1-AN REWIND	S1-AO FAST FORWARD	S1-AP STOP	S1-AR PLAY
ROW1	S1-U PASTE	S1-Y LOC 0		S1-AH LOC 2	S1-AJ LOC 4	S1-AB REH	S1-X AUTO RECORD
ROW2	S1-Q CUT	S1-Z SET LOCATE		S1-AI LOC 3	S1-AK LOC 5	S1-AA AUTO PLAY	S1-T MIDI
ROW3	S1-I EDIT START	S1-V UNDO	S1-AG LOC 1	S1-AE DOWN/NO	S1-AL LOC 6	S1-W AUTO RETURN	S1-P UTILITY
ROW4	S1-G ALL INPUT	S1-R COPY	S1-AC LEFT	S1-AD UP/YES	S1-AF RIGHT	S1-S TRACK SLIP	S1-H NAME
ROW5	S1-E AUTO INPUT	S1-J EDIT END	S1-L CLOCK SOURCE	S1-M SAMPLE RATE	S1-N LOCATE SELECT	S1-O PITCH	S1-F DELETE SONG
ROW6	S1-C PEAK CLEAR	S1-K INPUT SELECT					S1-D NEW SONG
ROW7	S1-A PEAK MODE						S1-B SELECT SONG

COMPANY: ALESIS CORPORATION

TITLE: RL FA ALPHA-NUM FRNT PNL SWITCHES/LEDS

PART NUMBER: 9-40-0235-A

ASSY NUMBER: 9-79-0235

FILENAME: RLFAA01A.SCH

DRAWN: PHM  
RELEASED:

DATE: 1/8/01  
DATED:

REV: A

SCALE: SHEET: 1 of 2

6

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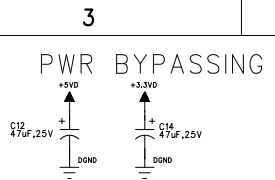
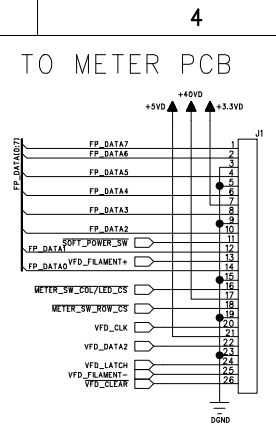
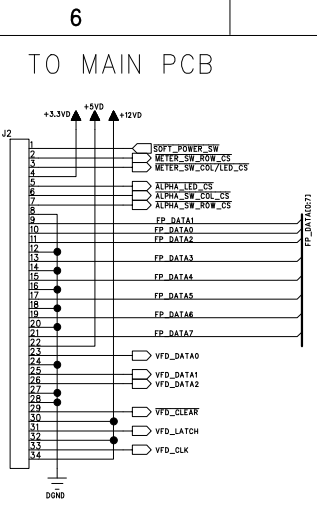
D

C

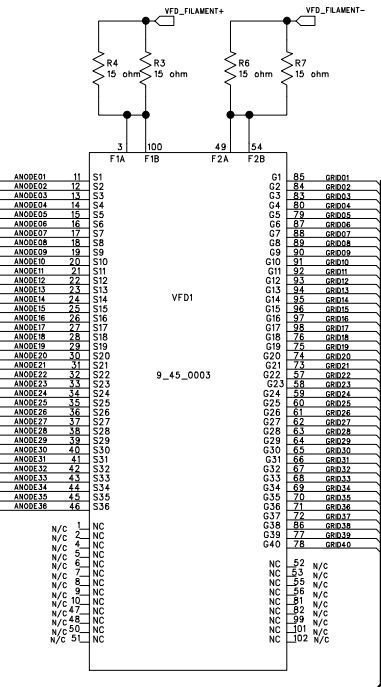
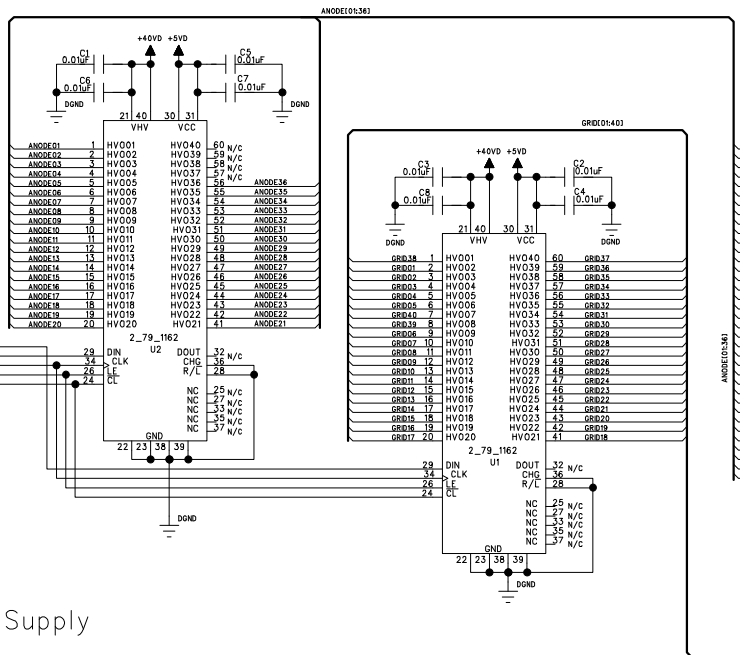
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A

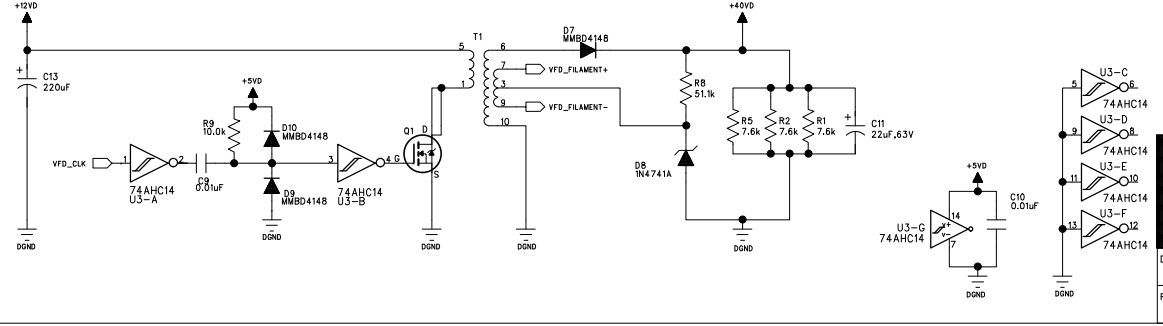
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



VFD and DRIVERS



AC and High Voltage Supply



COMPANY: **ALESIS CORPORATION**

TITLE: **RL FA FNT PNL ALPHA NUM VFD/CONNECTORS**

PART NUMBER: **9-40-0235-A**      REV: **A**

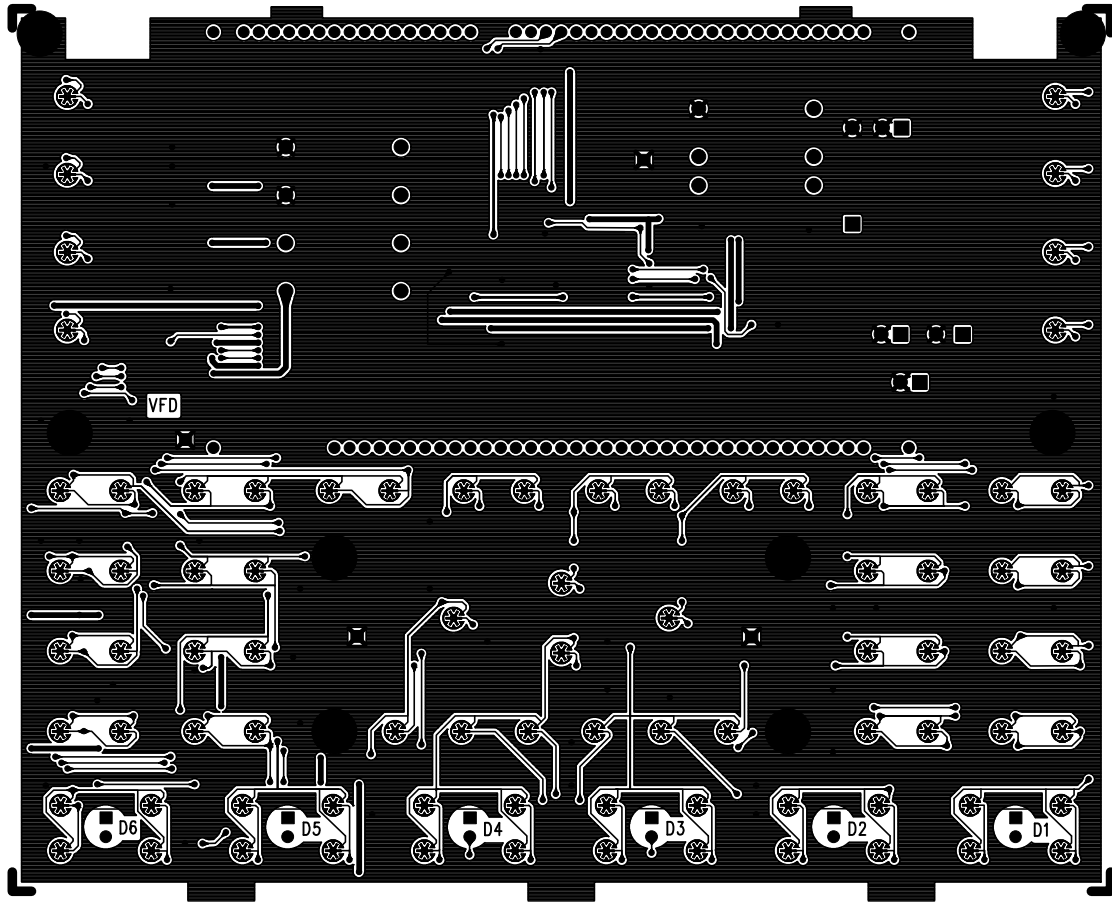
ASSY NUMBER: **9-79-0235**

FILENAME: **RLFAA01ASCH**      SIZE: **C**

SCALE:      SHEET: **2** OF **2**

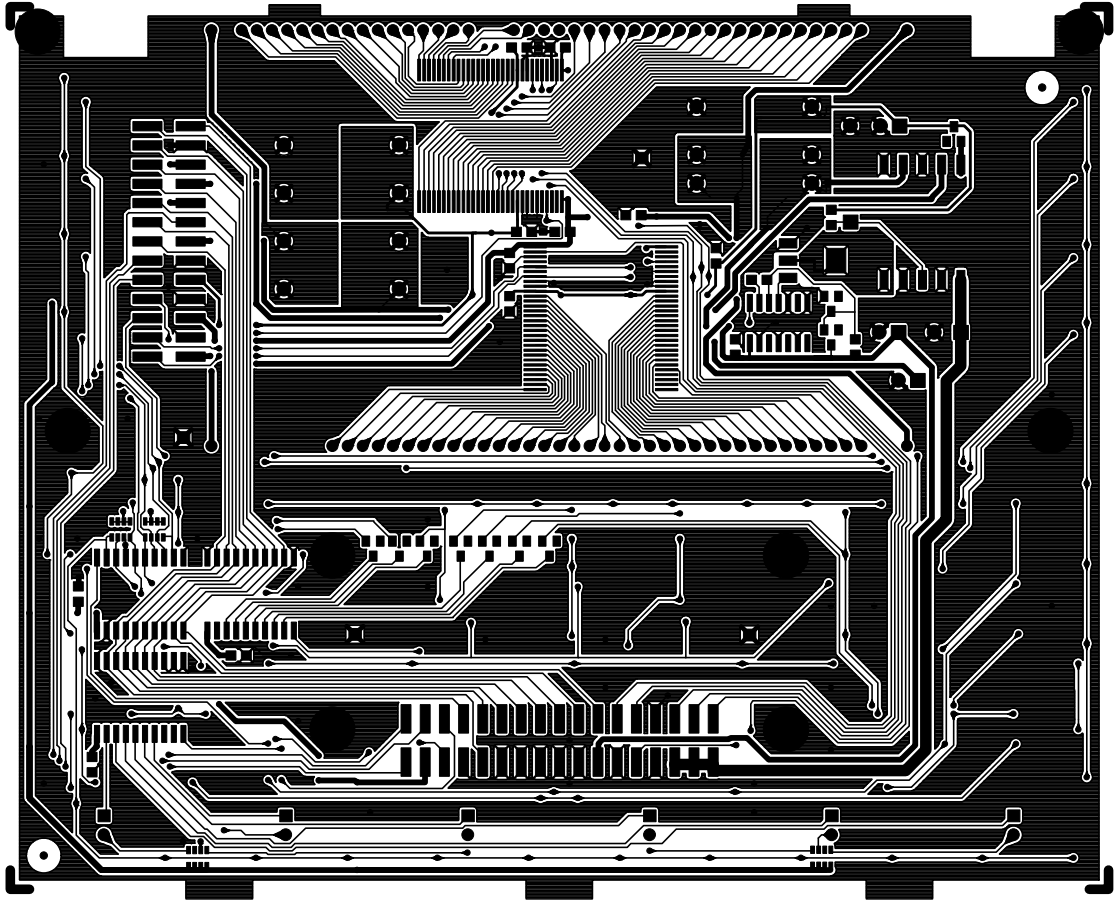
DRAWN: **PHM**      DATE: **1/8/01**

RELEASED:      DATED:



ALESIS 0235-A "TOPTRACE"

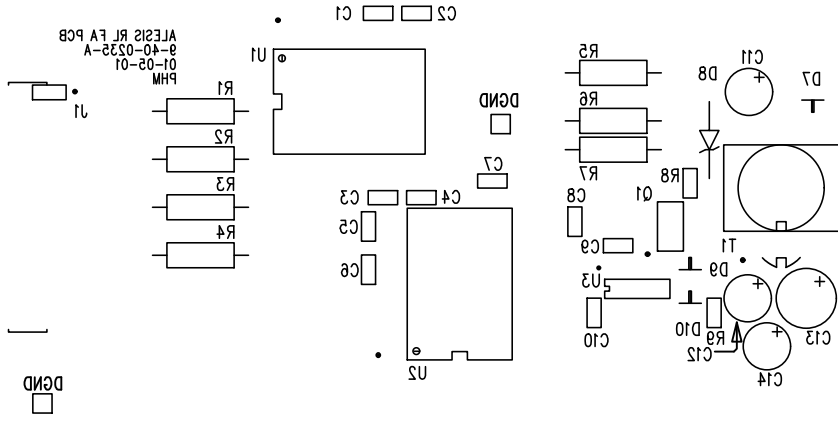




"ALESI2 0232-A" BOTTRACE"



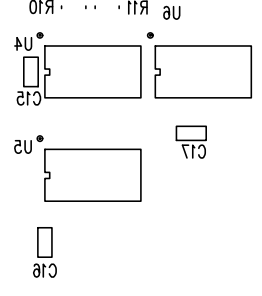




ALESIS RF FA PCB  
 8-40-0335-A  
 01-03-01  
 PHM

ALESIS

D12 D16 D18 D14 D13 D15 D11



R13 · · ·

R13 · · ·

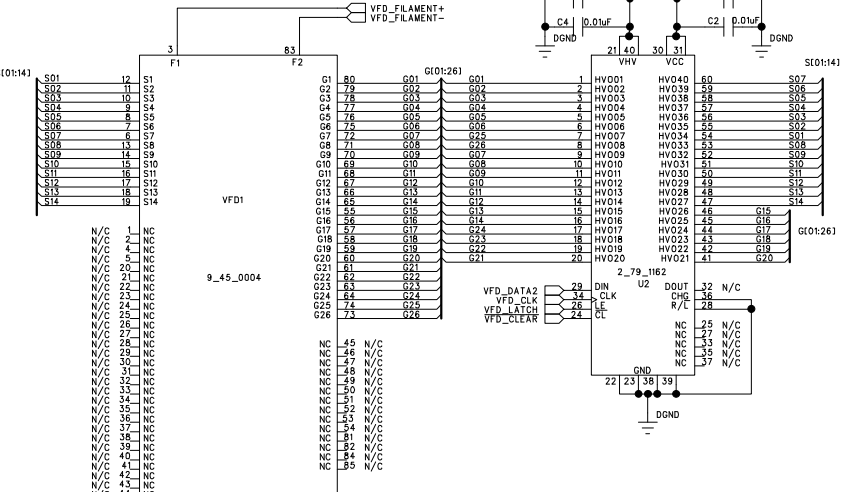
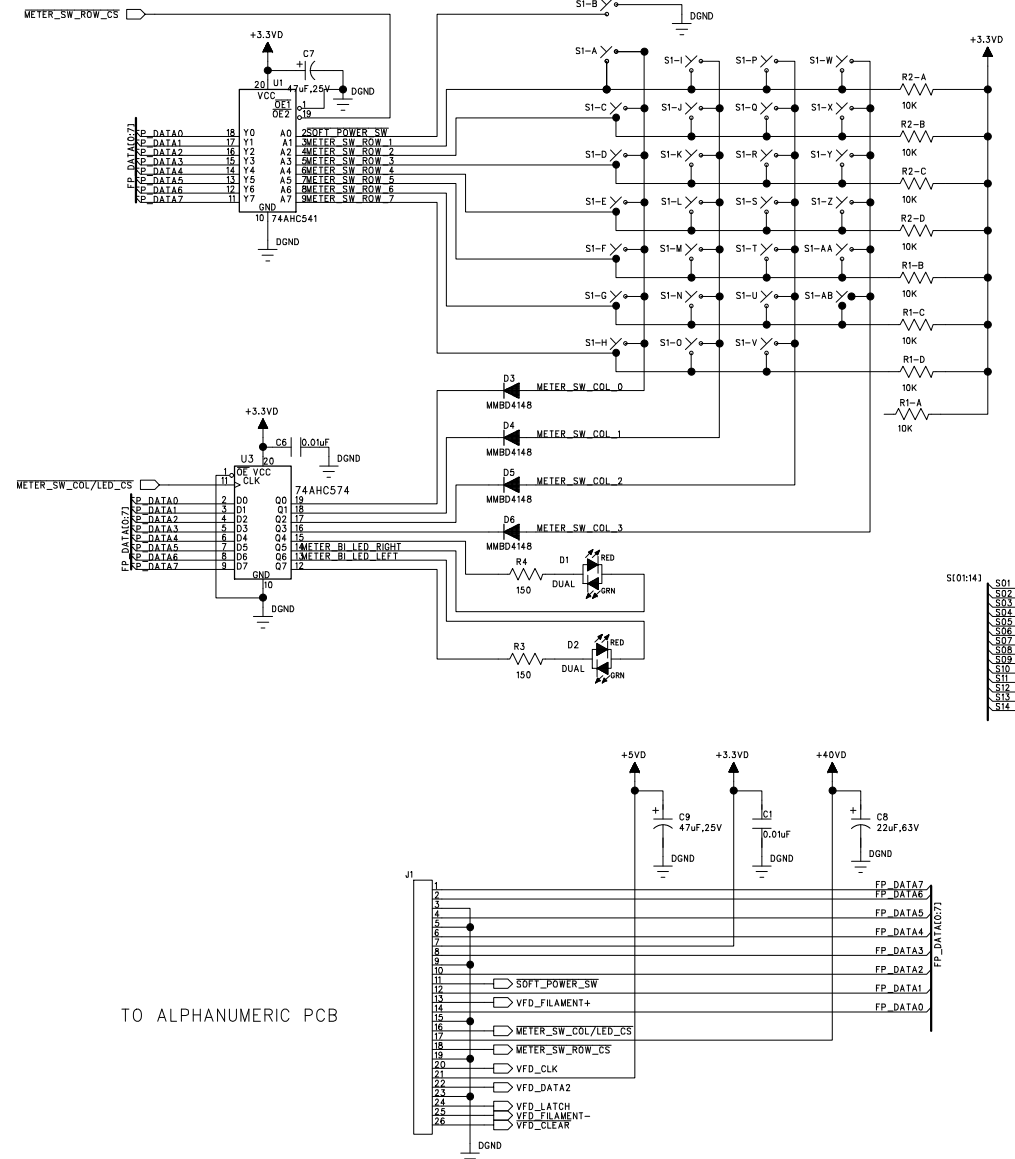
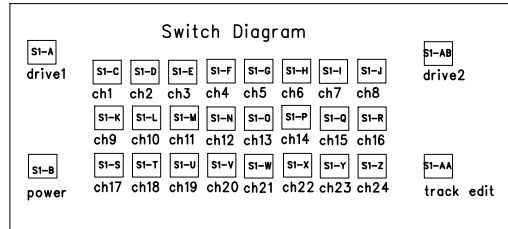
ALESIS 0535-A "BOTSIK"



# HD24 Meter PCB

## Rev A

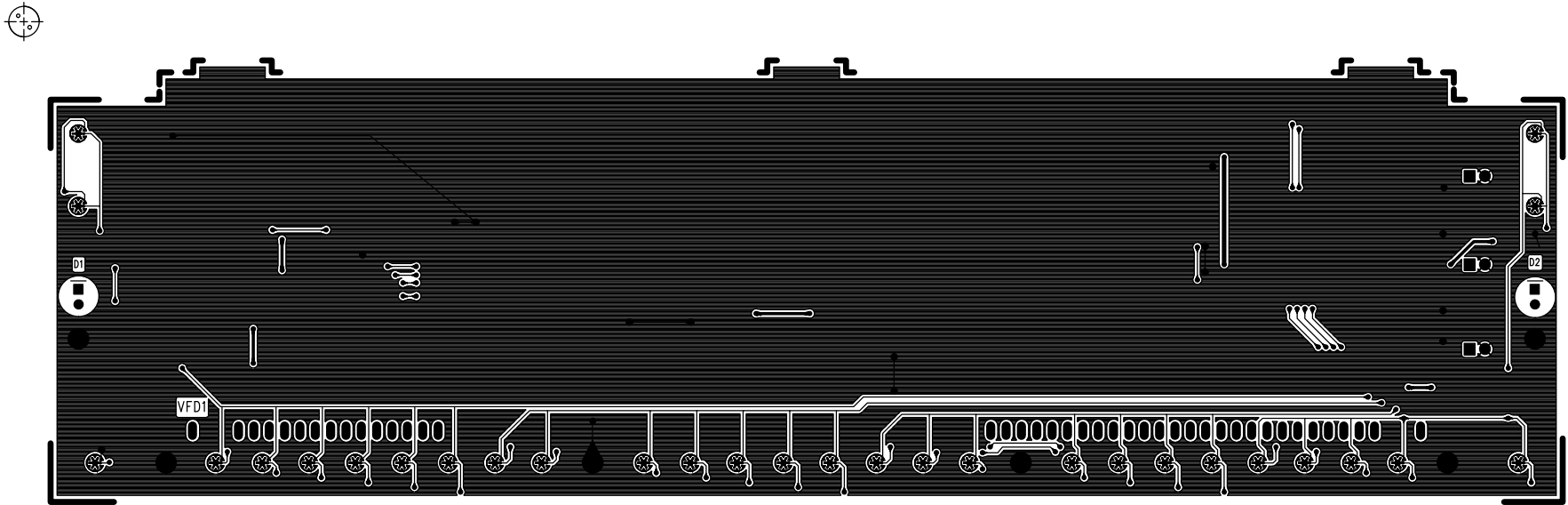
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



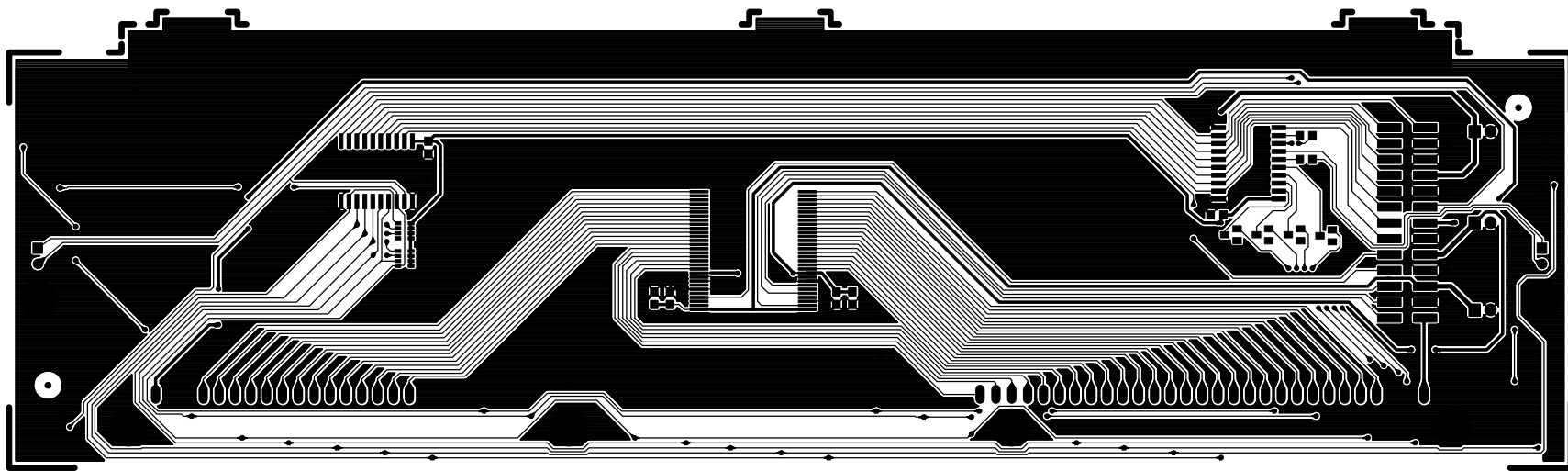
TO ALPHANUMERIC PCB

COMPANY: ALESIS	
TITLE: RL METER PCB	
PART NUMBER: 9-40-0236-A	REV: A
ASSY NUMBER: 9-79-0236	
FILENAME: RLFMA01A.SCH	SIZE: C
SCALE:	SHEET: OF

DRAWN: DW/BG/PM  
 DATED: 1/8/01  
 RELEASED:



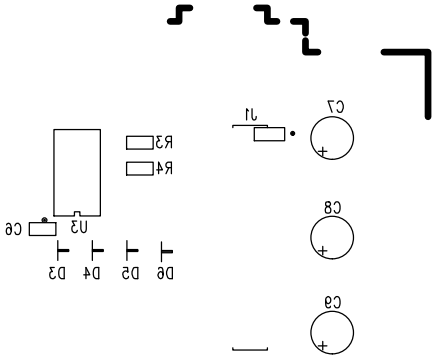
ALESIS 9-40-0236-A "TOPTRACE"



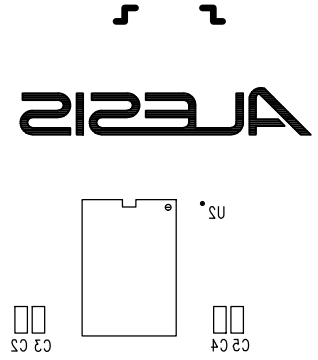
AL2312 2-40-0538-A "BOTTOM TRACE"



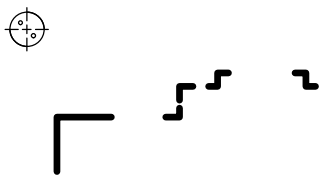
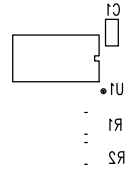
AL512 9-40-0538-A "BOTSIK"



DW\BGP.M  
01-02-01  
9-40-0538-A  
RL METER PCB  
AL512 CORP.



AL512



# HD24 HD I/F PCB

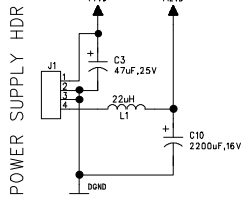
## Rev A

REVISION RECORD			
LTR	ECO NO.	APPROVED:	DATE:

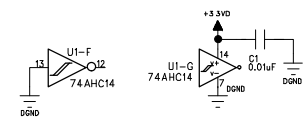
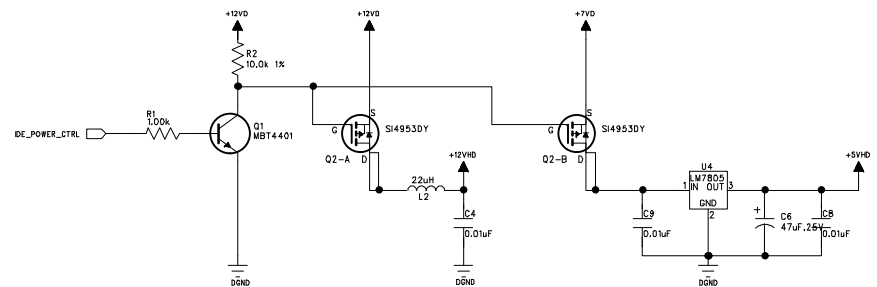
MAIN PCB HDR

CADDY CENTRONIC

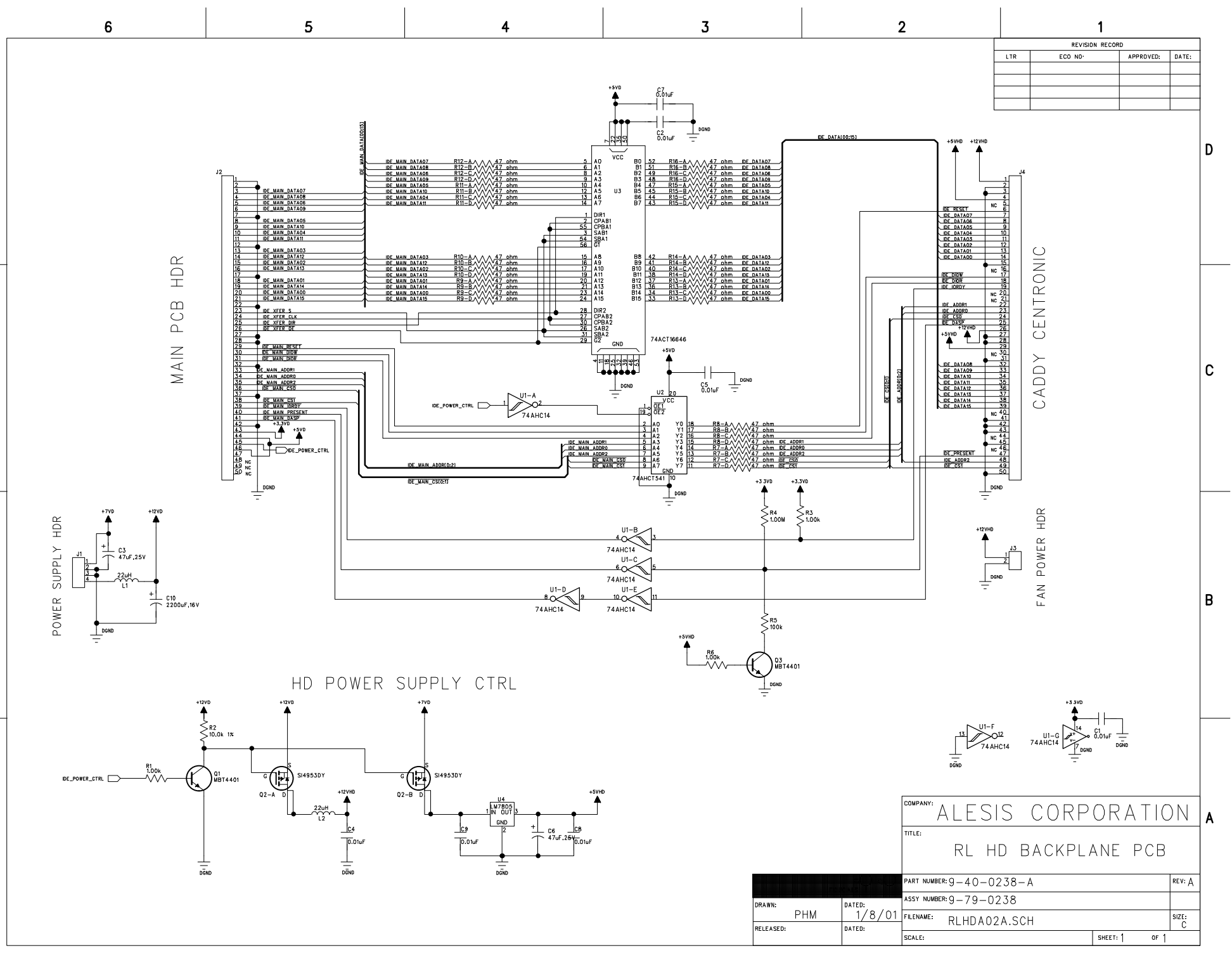
FAN POWER HDR



HD POWER SUPPLY CTRL

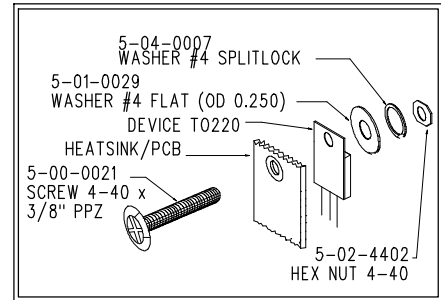
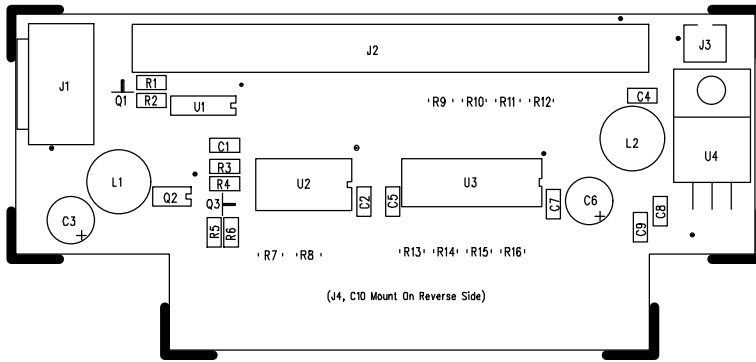


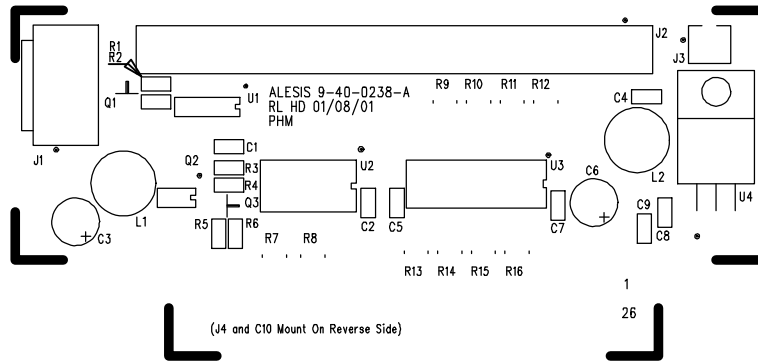
COMPANY: ALESIS CORPORATION		REV: A	
TITLE: RL HD BACKPLANE PCB		PART NUMBER: 9-40-0238-A	
DRAWN: PHM		ASSY NUMBER: 9-79-0238	
RELEASED:		FILENAME: RLHDA02A.SCH	
DATED: 1/8/01		SCALE:	
DATED:		SHEET: 1 OF 1	





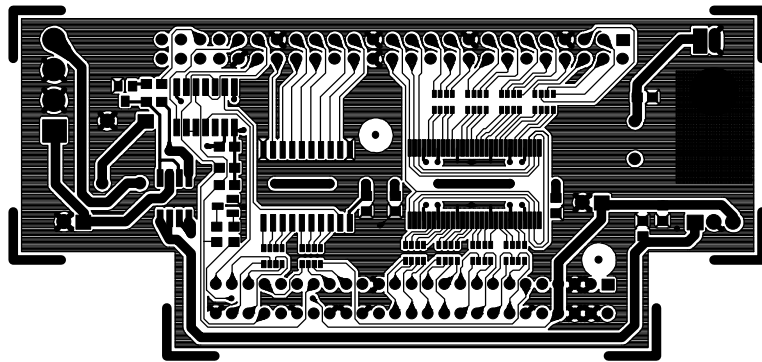
# ALESIS 9-79-0238-A TOPASSY





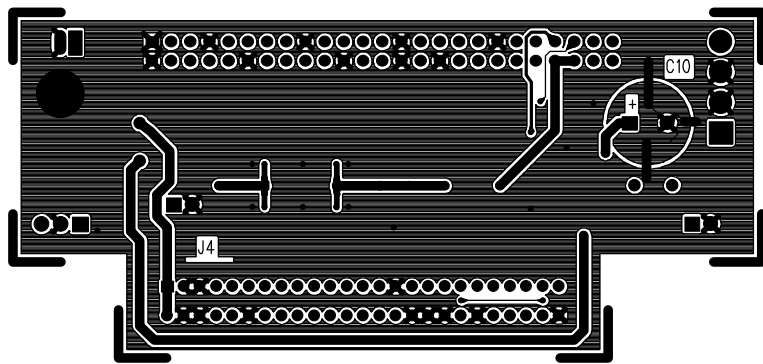
ALESIS 9-40-0238-A TOPSILK





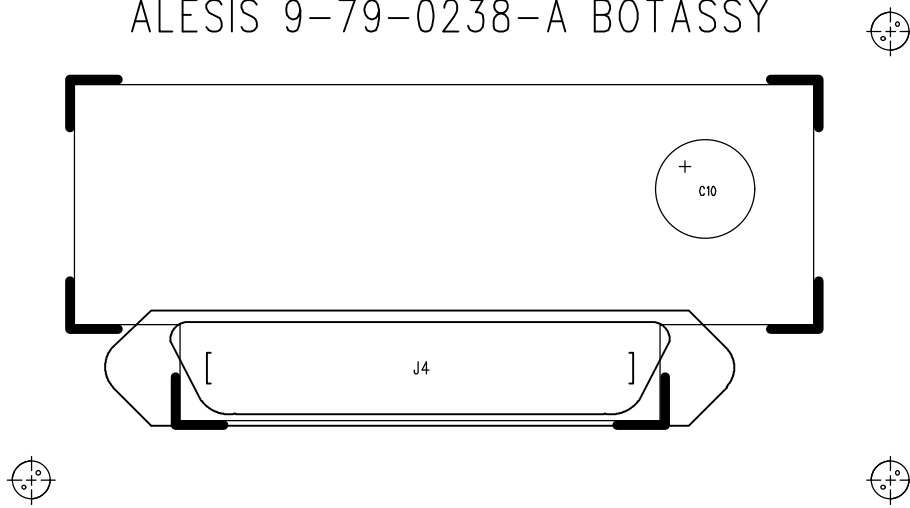
ALESIS 9-40-0238-A TOPTRACE





ALESIS 9-40-0238-A BOTTRACE

ALESIS 9-79-0238-A BOTASSY



# HD24 HD I/F PCB

## Rev B

6

5

4

3

2

1

REVISION RECORD			
LTR	ECC NO:	APPROVED:	DATE:

D

D

C

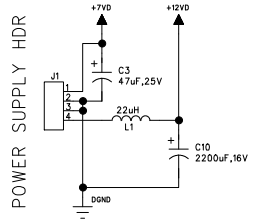
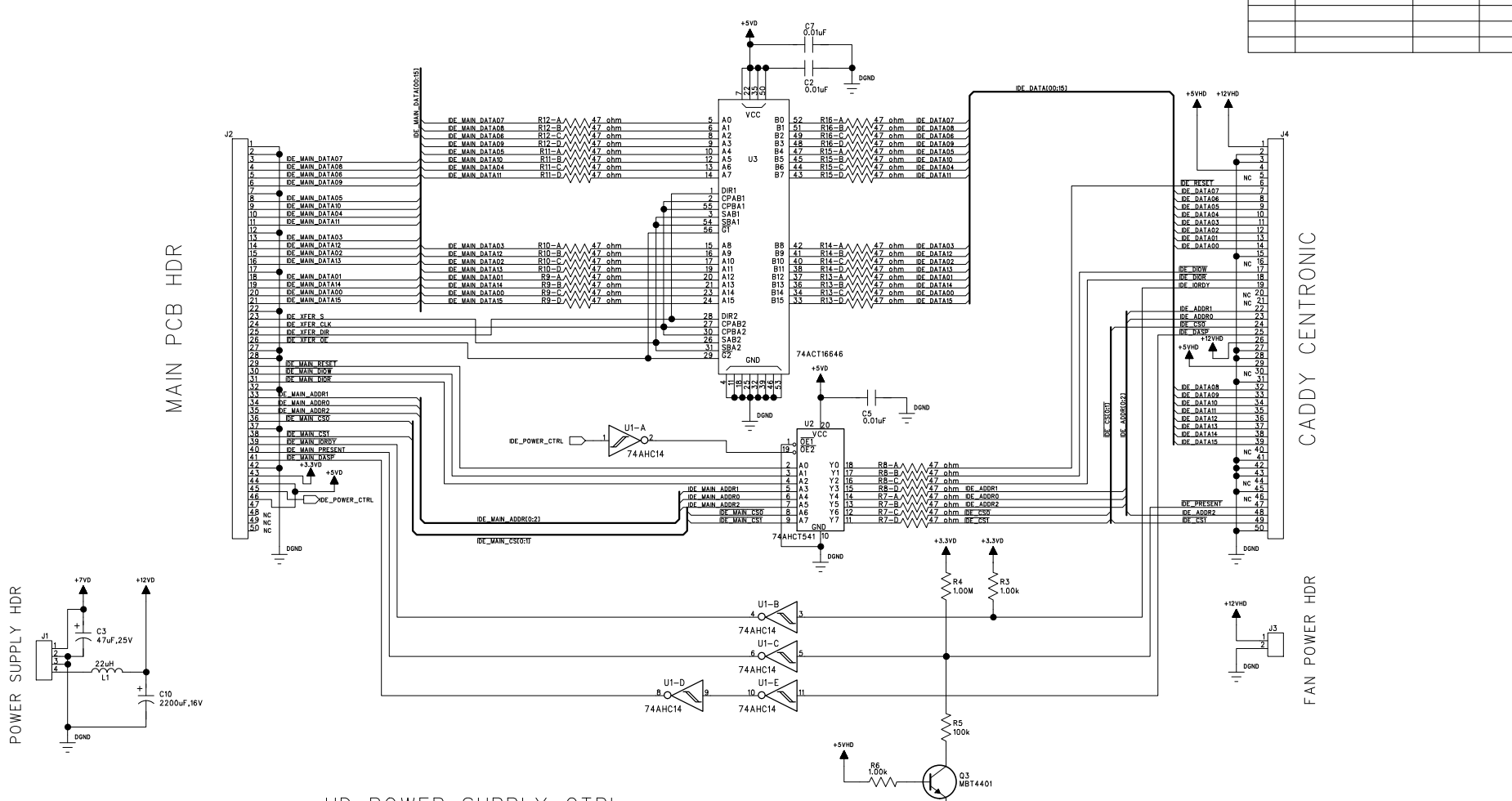
C

B

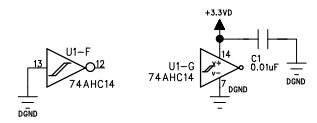
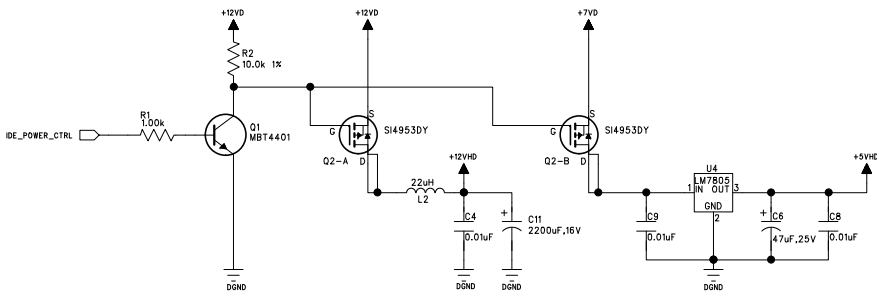
B

A

A



HD POWER SUPPLY CTRL



COMPANY: ALESIS CORPORATION	
TITLE: RL HD BACKPLANE PCB	
PART NUMBER: 9-40-0238-B	REV: B
ASSY NUMBER: 9-79-0238	
FILENAME: RLHDB00A.SCH	SIZE: C
SCALE:	SHEET: 1 OF 1

DRAWN: PHM/RFS	DATED: 11/02/2001
RELEASED:	DATED:

6

5

4

3

2

1

CENTRONICS

IDE STANDARD

IDE POWER CONN

1 +12VHD -POWER CONN  
 2 GND -POWER CONN  
 3 GND -POWER CONN  
 4 +5VHD -POWER CONN  
 5 N/C  
 6 RESET  
 7 IDE\_DATA7  
 8 IDE\_DATA6  
 9 IDE\_DATA5  
 10 IDE\_DATA4  
 11 IDE\_DATA3  
 12 IDE\_DATA2  
 13 IDE\_DATA1  
 14 IDE\_DATA0  
 15 GND  
 16 DMARQ  
 17 IOWR  
 18 IORD  
 19 IORDY  
 20 DMACK  
 21 IRQ  
 22 A1  
 23 A0  
 24 CS0  
 25 DASP  
 26 +12VHD -POWER CONN  
 27 GND -POWER CONN  
 28 GND -POWER CONN  
 29 +5VHD -POWER CONN  
 30 N/C  
 31 GND  
 32 IDE\_DATA8  
 33 IDE\_DATA9  
 34 IDE\_DATA10  
 35 IDE\_DATA11  
 36 IDE\_DATA12  
 37 IDE\_DATA13  
 38 IDE\_DATA14  
 39 IDE\_DATA15  
 40 (keypin)  
 41 GND  
 42 GND  
 43 GND  
 44 CSEL  
 45 GND  
 46 Reserved  
 47 PDIAG  
 48 A2  
 49 CS1  
 50 GND

1 RESET  
 2 GND  
 3 IDE\_DATA7  
 4 IDE\_DATA8  
 5 IDE\_DATA6  
 6 IDE\_DATA9  
 7 IDE\_DATA5  
 8 IDE\_DATA10  
 9 IDE\_DATA4  
 10 IDE\_DATA11  
 11 IDE\_DATA3  
 12 IDE\_DATA12  
 13 IDE\_DATA2  
 14 IDE\_DATA13  
 15 IDE\_DATA1  
 16 IDE\_DATA14  
 17 IDE\_DATA0  
 18 IDE\_DATA15  
 19 GND  
 20 (keypin)  
 21 DMARQ  
 22 GND  
 23 IOWR  
 24 GND  
 25 IORD  
 26 GND  
 27 IORDY  
 28 CSEL  
 29 DMACK  
 30 GND  
 31 IRQ  
 32 Reserved  
 33 A1  
 34 PDIAG  
 35 A0  
 36 A2  
 37 CS0  
 38 CS1  
 39 DASP  
 40 GND

1 +12VHD -POWER CONN  
 2 GND -POWER CONN  
 3 GND -POWER CONN  
 4 +5VHD -POWER CONN

\* POWER CONN indicates  
 thick traces intended  
 to carry high currents

All signals are connected  
 EXCEPT N/C pins

GND connections are  
 shorted together in  
 the CADDY

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

D

D

C

C

B

B

A

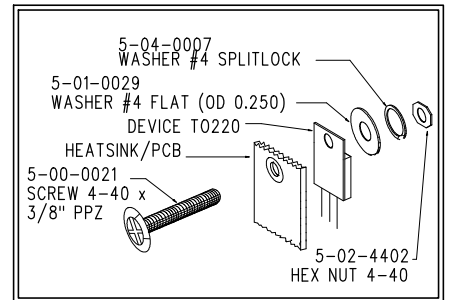
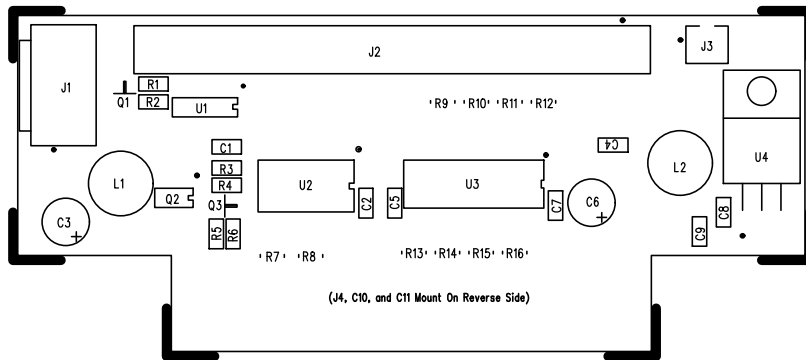
A

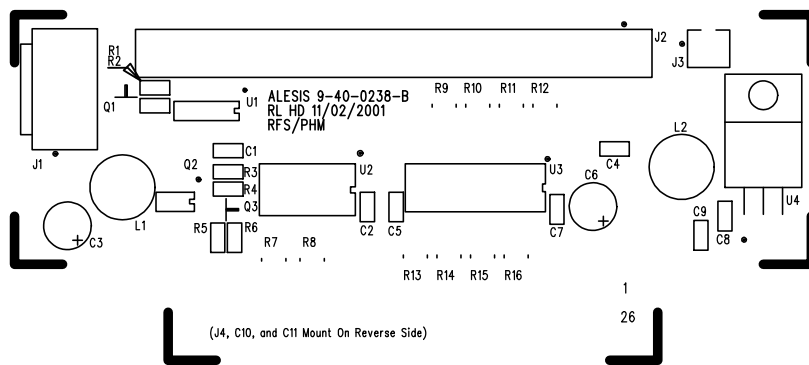
COMPANY:		ALEXIS	
TITLE:		RL CADDY CONNECTIONS	
PART NUMBER:	REV:	ASSY NUMBER:	
DRAWN: PHM	DATED: 1/8/01	FILENAME: RLHDA02A.SCH	SIZE: C
RELEASED:	DATED:	SCALE:	SHEET: OF

DRAWN: PHM	DATED: 1/8/01
RELEASED:	DATED:



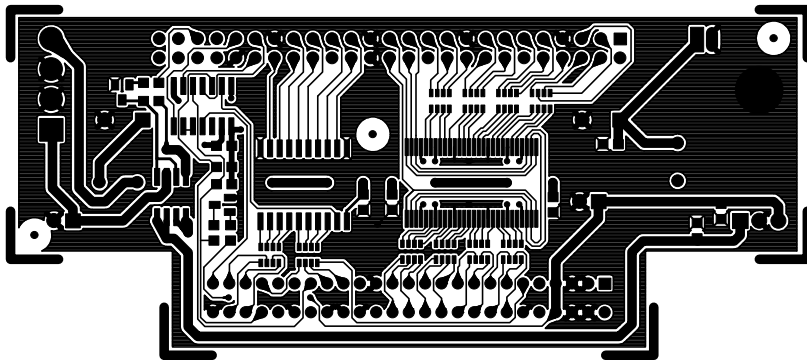
# ALESIS 9-79-0238-B TOPASSY





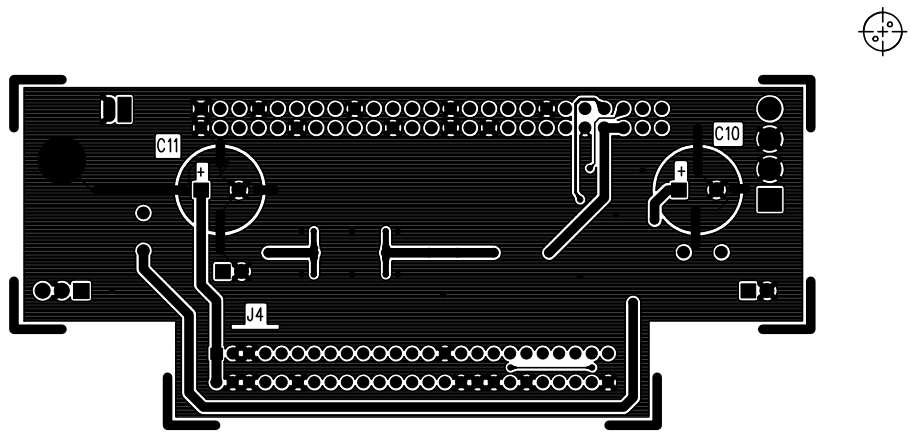
ALESIS 9-40-0238-B TOPSILK





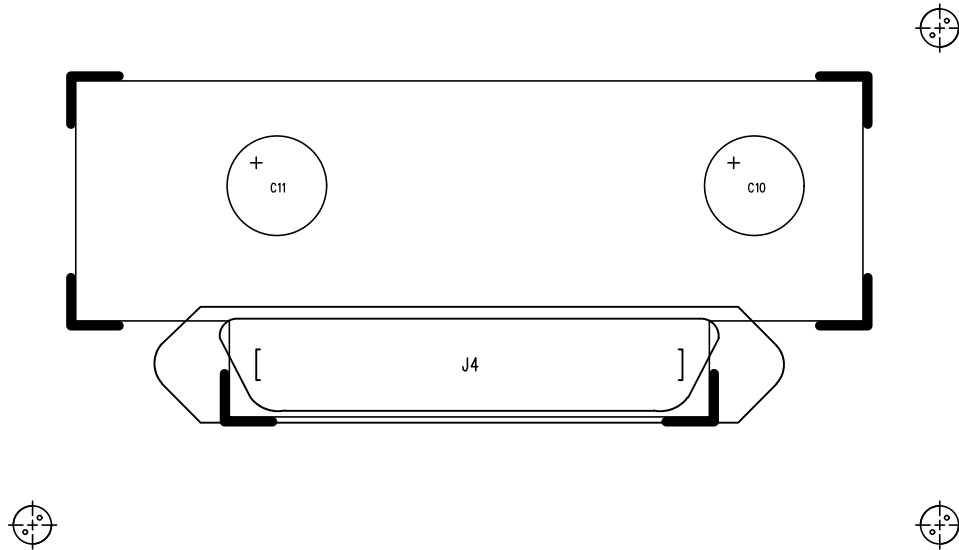
ALESIS 9-40-0238-B TOPTRACE





ALESIS 9-40-0238-B BOTTRACE

ALESIS 9-79-0238-B BOTASSY



# HD24 ECN History

# ALESIS

## ENGINEERING CHANGE NOTICE



ECN #: B27401      PRODUCT(S): RL  
 DATE: 10/1/2001      ASSEMBLY(S): 9-79-0231

### CHANGE TO BE MADE

Was:  
 9-40-0231-C PCB MAIN RL - REV C

Is:  
 9-40-0231-F PCB MAIN RL - REV F

### REASON FOR CHANGE:

Improved manufacturability, incorporates ECNs for improved clocking and improved synchronization.

### SPECIAL INSTRUCTIONS:

Number of pages attached:

### MATERIAL DISPOSITION: "X" all that apply...

	USE AS IS	REWORK	SCRAP
ON ORDER	X		
WIP	X		
STOCK	X		
RETURNS	X		

PROJECT ENGINEER:

Robert F. Khomandi  
 MANF. ENGINEER: / DIRECTOR'S INITS. mm

BOM UPDATED:

UPDATED BY: 5/16/02  
 WORK ORDER UPDATED:    /   /     
 COORDINATOR: \_\_\_\_\_

# ALESIS

## ENGINEERING CHANGE NOTICE



ECN #: B24101 PRODUCT(S): RL  
 DATE: 8/29/2001 ASSEMBLY(S): 9-79-0231-C

### CHANGE TO BE MADE

See Attached Sheet.

### REASON FOR CHANGE:

HD24 with Rev C Main PCBs would not properly synchronize as a slave in an ADAT SYNC chain.

### SPECIAL INSTRUCTIONS:

Number of pages attached: 1

This ECN was applied to all units produced with a Rev C Main PCB before they shipped, therefore, there should never be any units returned that would require this mod.

### MATERIAL DISPOSITION: "X" all that apply...

	USE AS IS	REWORK	SCRAP
ON ORDER		X	
WIP		X	
STOCK		X	
RETURNS	N/A See Special Instructions		

PROJECT ENGINEER: Robert Schmanski *Robert Schmanski*  
 MANF. ENGINEER: / DIRECTOR'S INITS. *[Signature]*

BOM UPDATED:    /   /     
 UPDATED BY: \_\_\_\_\_  
 WORK ORDER UPDATED:    /   /     
 COORDINATOR: \_\_\_\_\_



# Sync In Wordclock Modification for RL Main PCB Rev. C

(August 29, 2001)

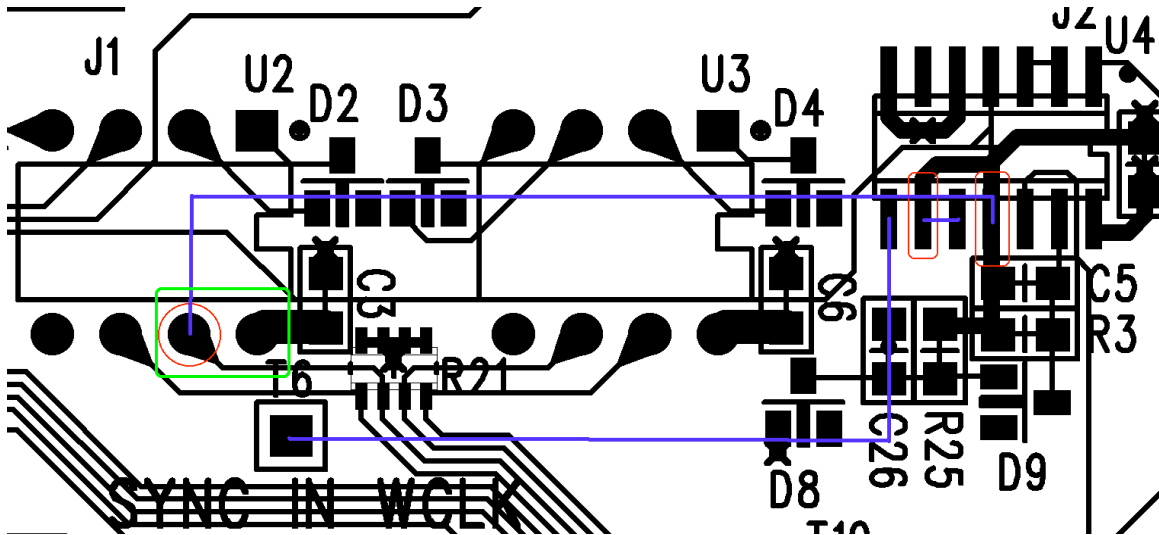


Fig. 1: Circuit Modification Diagram

## Steps:

1. Cut U2 pin 7 (red circle) as close to PCB as possible. Bend pin approximately straight out.
2. Lift U4 pins 9 & 11 (red rectangles) from the PCB. Be careful to lift pins straight to keep from breaking them off.
3. Connect 220 Ohm resistor between pins 7 and 8 of U2 (green rectangle).
4. Short pins 9 and 10 of U4 with solder blob or wire wrap wire (blue line).
5. Connect U2 pin 7 to U4 pin 11 with wire wrap wire (blue line).
6. Connect U4 pin 8 to T6 (SYNC IN WCLK) with wire wrap wire (blue line).
7. Secure wires to PCB with hot melt glue or silicone adhesive.

# ALESIS

ENGINEERING CHANGE NOTICE



ECN #: B26101      PRODUCT(S): RL  
 DATE: 9/18/2001      ASSEMBLY(S): 9-79-0231-C, 9-79-0231-D, 9-79-0231-E

## CHANGE TO BE MADE

See attached sheet.

### REASON FOR CHANGE:

2% failure rate in ADAT optical output.

### SPECIAL INSTRUCTIONS:

Number of pages attached: 1

See attached sheet. DO NOT REWORK UNITS THAT HAVE BEEN THROUGH FINAL QC AND ARE PACKAGED FOR SHIPMENT.

### MATERIAL DISPOSITION: "X" all that apply...

	USE AS IS	REWORK	SCRAP
ON ORDER		X	
WIP		X	
STOCK	<u>SEE SPECIAL INSTR.</u>	X	
RETURNS		X	

PROJECT ENGINEER:

*Robert F. Smith*  
 MANF. ENGINEER: / DIRECTOR'S INITS. *WMM*

BOM UPDATED:   /  /  

UPDATED BY: \_\_\_\_\_  
 WORK ORDER UPDATED:   /  /    
 COORDINATOR: \_\_\_\_\_

System Wordclock Modification for RL Main PCB Rev. C  
(September 19, 2001)

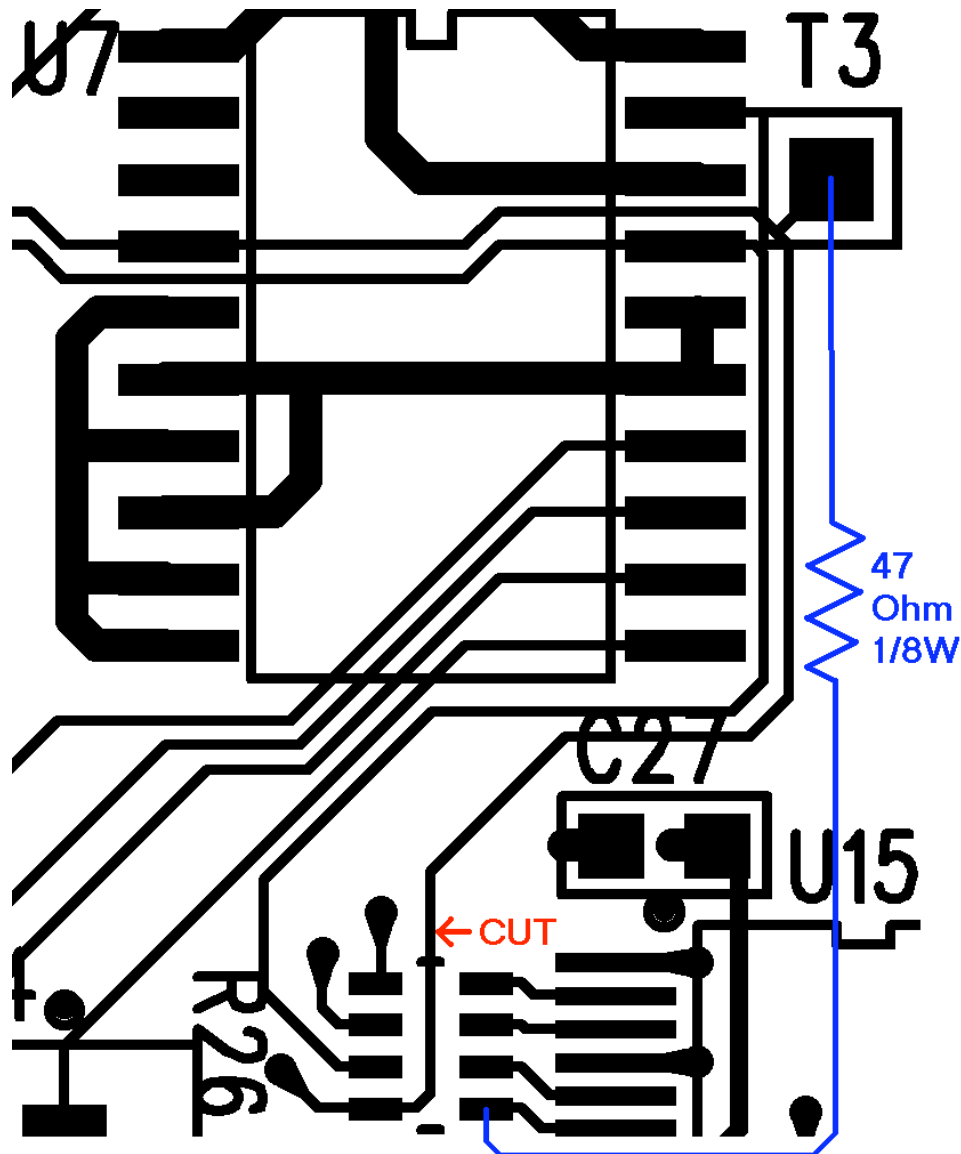


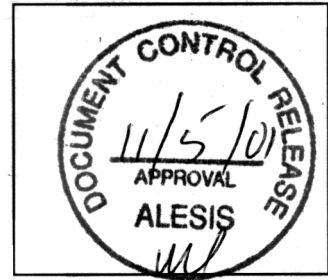
Fig. 1: Circuit Modification Diagram

Steps:

1. Cut Trace from R26 to T3 as close to R26 as possible (at red arrow).
2. Connect 47 Ohm 1/8 Watt resistor between T3 and the lower right pad of R26 (blue line w/ resistor symbol).

# ALESIS

## ENGINEERING CHANGE NOTICE



ECN #: B29804      PRODUCT(S): RI  
 DATE: 9/19/2001      ASSEMBLY(S): 9-79-0238-A

### CHANGE TO BE MADE

Add  
 1-08-0228    QTY 1      CAP 2200uF ELEC 16V 5x13.2x24mm      C11  
 9-34-0026    QTY 1      FOAM EVA STRIPS 25 x 12 x 0.5mm X5

(see instructions next page)

### REASON FOR CHANGE:

A hard drive was found that could not be powered by the HD Backplane. The high surge current of the ExcelStor Hard Drive caused the voltage to dip severly. Adding a 2200uF cap across the +12V HD solved it.

### SPECIAL INSTRUCTIONS:

Number of pages attached: **1**

### MATERIAL DISPOSITION: "X" all that apply...

	USE AS IS	REWORK	SCRAP
ON ORDER		X	
WIP		X	
STOCK		X	
RETURNS		X	

**PROJECT ENGINEER:**  
Alan Mever      *Alan Mever*      11/5/2001

**MANF. ENGINEER: / DIRECTOR'S INITS.**  
Will McGee      *W McGee*

**BOM UPDATED:** \_\_\_\_\_  
**UPDATED BY:** \_\_\_\_\_  
**WORK ORDER UPDATED:** \_\_\_/\_\_\_/\_\_\_  
**COORDINATOR:** \_\_\_\_\_

# Alesis RL (HD24) HD Backplane ECN

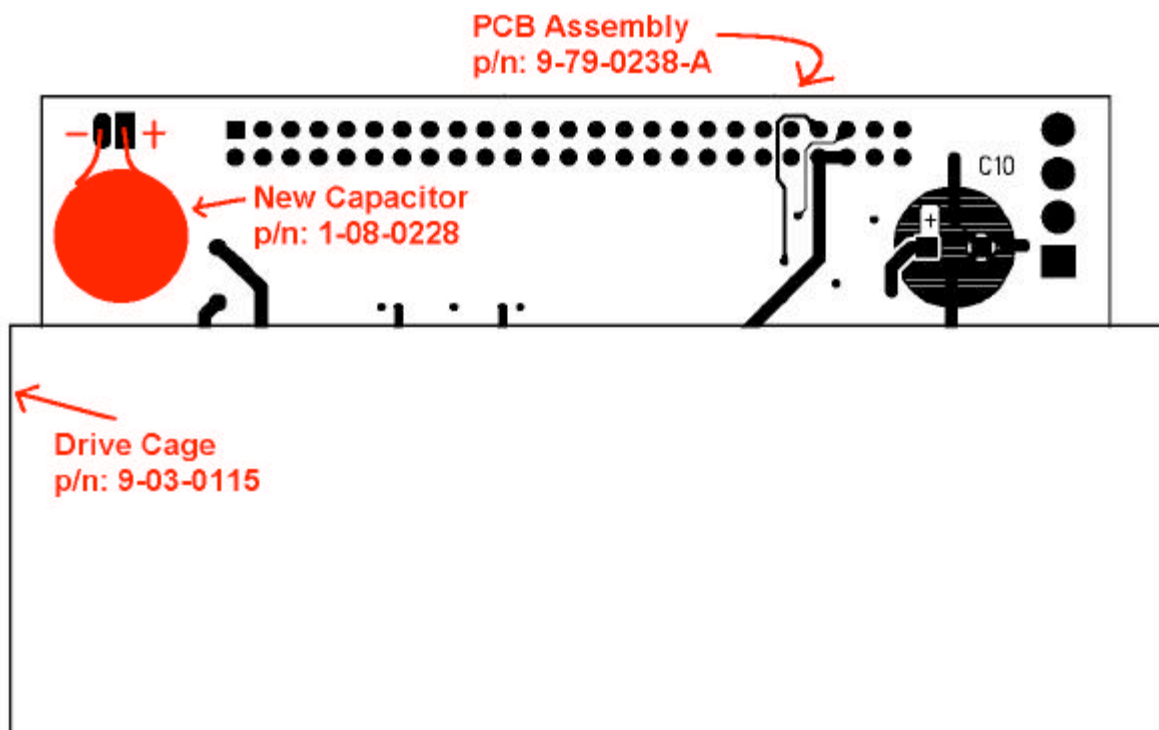
9-79-0238

11/05/2001

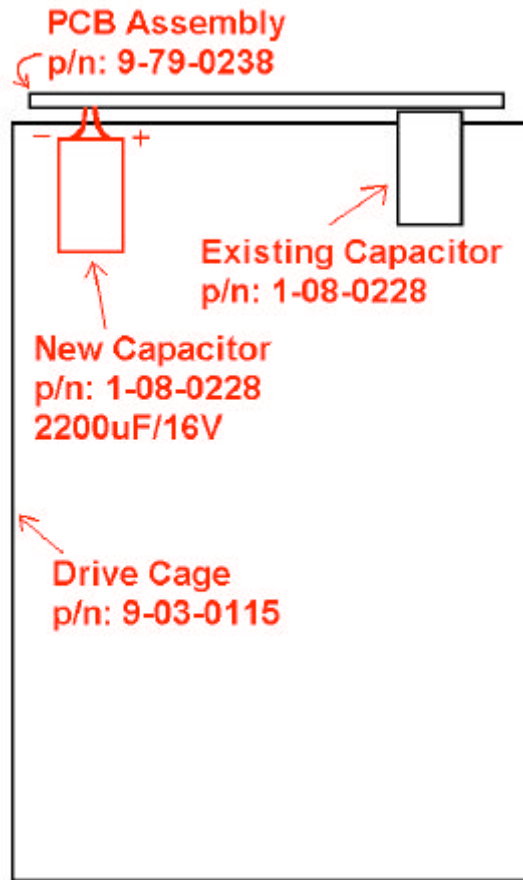
## Section 1 – PCB Modification

1. Apply the Foam Strip (9-34-0026) to the Capacitor (1-08-0228)
2. Form the leads of the Capacitor (1-08-0228) as shown in the diagrams below.
3. Solder the Capacitor (1-08-0228) to the HD Backplane PCB (9-79-0238) as shown.

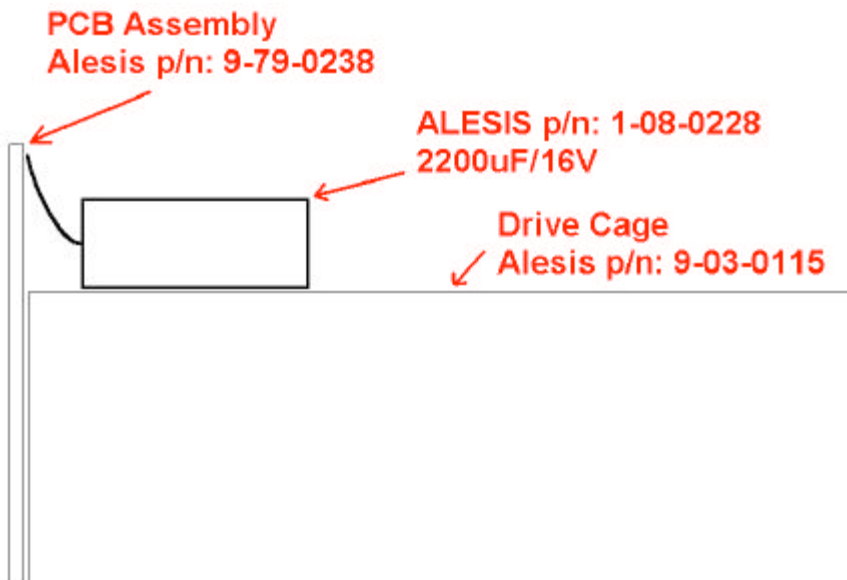
DIAGRAM OF ASSEMBLY P/N: 9-96-0080  
FRONT VIEW



# TOP VIEW



# SIDE VIEW





# HD24 BOM



Alesis ADAT HD-24 (RL)  
BOM

05-16-02

Parent	Part.Number	Description	Quantity	Ref.Designator
	RL-UL	RECORDER MULTI-TRACK ADAT-HD24 RL - UL	1	
RL-UL	7-41-0005	CABLE POWER UL/CSA SJT	1	
RL-UL	7-51-1219-B	SHEET "WELCOME TO ALESIS FAMILY" 5 x 8"	1	
RL-UL	RL	RECORDER MULTI-TRACK ADAT-HD24 RL	1	
RL	4-18-0023-A	CABLE DIL RIBBON 26-PIN F/F (MAIN-A/D) RL	1	MAIN-A/D
RL	4-18-0024-A	CABLE DIL RIBBON 34-PIN F/F (MAIN-ALPHA) RL	1	MAIN-ALPHA
RL	4-18-0026-B	CABLE DIL RIBBON 50-PIN F/F (MAIN-HD1) RL	1	MAIN-HD1
RL	4-18-0027-B	CABLE DIL RIBBON 50-PIN F/F (MAIN-HD2) RL	1	MAIN-HD2
RL	4-70-2600-A	CABLE RIBBON DIL 26-PIN 2.54mm 80mm F-F A6	2	(1)MAIN TO D/A (1)ALPHA TO METER
RL	4-74-0030-A	CABLE DC-POWER HARNESS RL	1	
RL	5-00-0107	SCREW #10 x 1/2" PPB SMA	2	IEC CONNECTOR TO CHASSIS
RL	5-00-0411	SCREW M4 x 8mm PFZ	6	(4)RACK EAR TO SUBPANEL (2)RACK EAR TO CHASSIS
RL	5-00-0511	SCREW M5 x 10mm PPB PLASTITE	4	(4)FAN TO CHASSIS
RL	5-00-1308	SCREW M3 x 8mm PPB PLASTITE	3	REAR PANEL OPTICAL CONNECTORS
RL	5-00-3505	SCREW M3.5 X 5mm PPZ	17	(6)MAIN PCB TO BOTTOM (8)CAGE TO BOTTOM (3)SIDE TO PSU
RL	5-00-3508	SCREW M3.5 x 8 PPB	20	(10)TOP COVER (4)SUB PANEL (5)EXTRUSION (1)DB-9 BRACKET
RL	5-00-3509	SCREW M3.5 x 8mm PFZ	2	EXTRUSION TO SUBPANEL
RL	5-01-0026	WASHER SPLITLOCK #6 ZINC-PLATED STEEL .250"X.148"X.031" MEDIUM	8	(4)HD CAGE TO SUBPANEL (4)HD CAGE FAN
RL	5-02-6327	NUT HEX M3.5 ZINC	8	(4)HD CAGE TO SUBPANEL (4)HD CAGE FAN
RL	7-10-0109	FAN 80x80x25mm 12VDC 2500RPM 30CFM	1	
RL	7-10-0114	ASSY OEM HARD DISK DRIVE IDE 20GB	1	
RL	7-24-0014	FOAM INSERT ACCESSORY-BOX BOTTOM RL	1	INSTALL WITH 7-80-0286
RL	7-24-0015	FOAM INSERT ACCESSORY-BOX MIDDLE RL	1	INSTALL WITH 7-80-0286
RL	7-24-0016	FOAM INSERT ACCESSORY-BOX TOP RL	1	INSTALL WITH 7-80-0286
RL	7-24-0017	FOAM INSERT CADDY-BOX MIDDLE RL	2	INSTALL WITH 7-80-0295
RL	7-24-0018	FOAM INSERT CADDY-BOX TOP/BOTTOM RL	4	INSTALL WITH 7-80-0295
RL	7-50-0151	STICKER BARCODE S/N RL	1	
RL	7-51-0096	MANUAL REFERENCE RL	1	
RL	7-52-0001-C	STICKER UL/FCC/C-TICK LOGOS & WARNINGS - REV C	1	
RL	7-53-0090	LABEL SYMBOL GND-TERM	1	
RL	7-53-0100	STICKER SYMBOL CAUTION (WHITE-ON-BLACK)	1	
RL	7-53-0163	STICKER ETHERNET ADDRESS RL	1	
RL	7-53-0168	STICKER YAHORNG FACTORY ID "T M C"	1	Place on rear or bottom of unit with the appropriate letter circled.
RL	7-80-0284	BOX SHIPPING RL	1	
RL	7-80-0285	BOX GIFT RL	1	
RL	7-80-0286	BOX ACCESSORIES RL	1	
RL	7-80-0295	BOX ACCESSORY CADDY RL	2	
RL	7-81-0174	ENDCAP FOAM LEFT/RIGHT RL	2	

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RL	7-91-1002	GEL SILICA 5G PACKET	1	
RL	7-93-4513	WRAP FOAM SHEET 45" x 13.5"	1	
RL	7-94-2029	POLYBAG 20" x 29" - 4 MIL	1	
RL	9-01-0044-A	EXTRUSION FRONT-PANEL RL - REV A	1	
RL	9-02-0008-A	RACK-EAR EXTRUSION RL - REV A	2	
RL	9-03-0112-B	CHASSIS RL - REV B	1	
RL	9-03-0113-A	COVER RL - REV A	1	
RL	9-03-0114-A	SUBPANEL RL - REV A	1	
RL	9-13-0015-B	OVERLAY REAR PANEL RL - REV B	1	
RL	9-15-0282-A	CADDY HARD-DISK RL	2	
RL	9-23-1024	FEET RUBBER	4	
RL	9-96-0075-B	ASSY CABLE AC POWER SUPPLY RL	1	
RL	9-79-0231	ASSY PCB MAIN RL	1	
9-79-0231	0-00-0470	RES 47 OHM 1/8W 5%	1	Between T3 and the lower right pad of R26
9-79-0231	0-05-0300	RES 30 OHM 1/2W 5%	1	R102
9-79-0231	0-16-1000	RES 100 OHM 1/10W 1% 0805	11	R16-17 R35 R50 R55 R64 R67 R69 R82 R95 R107
9-79-0231	0-16-1001	RES 1.00K OHM 1/10W 1% 0805	23	R5 R10 R12 R15 R30 R34 R36 R38 R44 R46 R48-49 R56 R58 R70-73 R75 R77-78 R90 R101
9-79-0231	0-16-1002	RES 10.0K OHM 1/10W 1% 0805	13	R32 R37 R39 R42 R54 R57 R65 R74 R76 R79-80 R91 R106
9-79-0231	0-16-1003	RES 100K OHM 1/10W 1% 0805	1	R81
9-79-0231	0-16-1004	RES 1.00M OHM 1/10W 1% 0805	5	R3 R25 R40-41 R68
9-79-0231	0-16-1009	RES 10.0 OHM 1/10W 1% 0805	1	R33
9-79-0231	0-16-2002	RES 20.0K OHM 1/10W 1% 0805	4	R11 R13-14 R45
9-79-0231	0-16-2210	RES 221 OHM 1/10W 1% 0805	4	R8 R59 R97-98
9-79-0231	0-16-3650	RES 365 OHM 1/10W 1% 0805	3	R9 R60 R63
9-79-0231	0-16-4750	RES 475 OHM 1/10W 1% 0805	1	R43
9-79-0231	0-16-4753	RES 475K OHM 1/10W 1% 0805	1	R47
9-79-0231	0-16-4759	RES 47.5 OHM 1/10W 1% 0805	2	R6-7
9-79-0231	0-16-4991	RES 4.99K OHM 1/10W 1% 0805	1	R51
9-79-0231	0-16-6192	RES 61.9K OHM 1/10W 1% 0805	1	R31
9-79-0231	0-16-8068	RES 8.06 OHM 1/10W 1% 0805	2	R52-53
9-79-0231	0-17-0101	RES CHIP ARRAY 4 X 100 OHM 1/16W 5% ISOLATED C-C=0.8mm	2	R1-2
9-79-0231	0-17-0103	RES CHIP ARRAY 4 X 10K OHM 1/16W 5% ISOLATED c-c=0.8mm	9	R4 R83-87 R96 R103 R108
9-79-0231	0-17-0221	RES CHIP ARRAY 4 X 220 OHM 1/16W 5% ISOLATED c-c=0.8mm	1	R21
9-79-0231	0-17-0470	RES CHIP ARRAY 4 X 47 OHM 1/16W 5% ISOLATED c-c=0.8mm	20	R18-20 R22-24 R26-29 R88-89 R93-94 R99-100 R104-105 R109-110
9-79-0231	1-08-0476	CAP 47uF ELEC 25V 2.5x6.3x7mm	12	C20 C29 C45 C50-51 C78 C80 C82-84 C113-114
9-79-0231	1-10-1102	CAP 10uF ELEC 50V 2x5x7mm	1	C32
9-79-0231	1-20-0103	CAP 0.01uF FILM 5% 100V	1	C65

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9-79-0231	1-55-0561	CAP 560pF NPO 0805	2	C17 C44
9-79-0231	1-56-0103	CAP 0.01uF X7R 0805	104	C1-16 C18-19 C21-28 C30 C33-43 C46-49 C52-60 C62 C64 C67-77 C79 C81 C85-112 C115-124
9-79-0231	1-56-0220	CAP 22pF NPO 0805 5% 50V	2	C61 C63
9-79-0231	1-56-0474	CAP 0.47uF X7R 0805 16V	1	C31
9-79-0231	2-11-1317	REG ADJ-VOLTAGE LM317 POS 1.2-37V TO-220	2	U24 U39
9-79-0231	2-11-7805	REG VOLTAGE LM7805C +5V TO-220	1	U29
9-79-0231	2-24-0138	IC OPTO-ISOLATOR 6N138	1	U12
9-79-0231	2-24-2631	IC OPTO-ISOLATOR DUAL HCPL-2631	2	U2-3
9-79-0231	2-27-0051	ASIC OPTO-REC AL1402 24-PIN	3	U8-10
9-79-0231	2-27-0056	ASIC OPTOGEN AL1401A 24-BIT SOP-20	3	U5-7
9-79-0231	2-50-4149	DIODE SIGNAL 1N4148 100V 200mA SOT-23	14	D1-13 D17
9-79-0231	2-51-0140	DIODE POWER SCHOTTKY MBRS140LT3 40V 1A	1	D16
9-79-0231	2-51-4401	TRANS NPN 2N4401 40V 1A SOT-23	4	Q1-4
9-79-0231	2-62-0000	IC 74AHC00 QUAD 2-IN POS NAND SOP-14	1	U17
9-79-0231	2-62-0014	IC 74AHC14 HEX SCHMITT-TRIGGER INVERTERS SOP-14	4	U1 U4 U11 U21
9-79-0231	2-62-0032	IC 74AHC32 QUAD 2-IN POS OR SOP-14	1	U20
9-79-0231	2-62-0074	IC 74AHC74 DUAL POS-EDGE D FF W/CLR & PRESET SOP-14	1	U23
9-79-0231	2-62-0138	IC 74AHC138 3-8 DECODER/DEMUX SOP-16	1	U42
9-79-0231	2-62-0245	IC 74AHC245 OCTAL BUS TRANSCEIVERS W/TRI-STATE OUTS SOP-20	1	U36
9-79-0231	2-62-1004	IC 74AHCU04 HEX INVERTER UNBUFFERED SOP-14	1	U26
9-79-0231	2-62-6541	IC 74AHCT16541 16-BIT BUFFER/DRIVER W/TRI OUTS SOP-48	2	U15 U40
9-79-0231	2-62-8374	IC 74AHC16374 16-BIT D-FF W/TRI OUTS SSOP-48	1	U34
9-79-0231	2-62-8541	IC 74AHC16541 16-BIT BUFFER/DRIVER W/TRI OUTS SSOP-48	1	U35
9-79-0231	2-64-4046	IC 74HC4046 PHASE LOCKED LOOP SOP-16	1	U16
9-79-0231	2-66-4816	IC DRAM 1Mb x 16 x 4 BANK 6nS 3.3V TSOP-54	2	U31-32
9-79-0231	2-66-6256	IC DRAM 256K x 16 35nS EDO 3.3V SOJ-40	2	U28 U37
9-79-0231	2-69-0403	IC PROG LOGIC ISP MACH M4A3-32/32-7 TQFP-44 (BLANK)	2	U13-14
9-79-0231	2-70-1067	IC MICROCOMPUTER DSP ADSP-21065L (REV 0.3) 66MHz PQFP-208	1	U25
9-79-0231	2-70-5206	IC MPU MCF5206E 54MHz QFP-160	1	U38
9-79-0231	2-72-0339	IC LM339 ANALOG COMP SOP-14	1	U18
9-79-0231	2-79-1818	IC CONTROLLER RESET W/OVERRIDE DS1818-10TR +3.3V SOT-23	1	U22
9-79-0231	2-79-8900	IC CONTROLLER ETHERNET 10 BASE-T TQFP-100	1	U19
9-79-0231	2-80-0007	IC FPGA EP1K30QC208-2 PQFP-208	1	U33
9-79-0231	2-81-1642	IC 74FCT164245T 3.3V to 5V TRANSCEIVER 16-BIT SSOP-48	1	U30

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9-79-0231	4-00-0002	JACK DIN 5-PIN MIDI PCB MOUNT 180ø W/SHIELD	2	J7-8
9-79-0231	4-02-0006	JACK 1/4" MONO 5-PIN FEM MINI W/GRND LUG STRAIGHT	2	J6 J9
9-79-0231	4-04-0003	CON BNC (WAKA)	1	J10
9-79-0231	4-10-0010	CON DB-9 9-PIN FEMALE 90ø METAL-FACE W/STANDOFFS	1	J1
9-79-0231	4-10-0011	CON DB-9 9-PIN FEMALE 90ø PLASTIC-FACE W/STANDOFFS	1	J2
9-79-0231	4-10-0019	CON RJ45 ETHERNET CAT5 SHIELDED W/LEDS	1	J11
9-79-0231	4-11-0001	CON FIBER-OPTIC 2-CHAN TRANS/RECEIVER	3	J3-5
9-79-0231	4-14-0035	HEADER DIL 34-PIN 0.1"	1	J29
9-79-0231	4-14-0050	HEADER DIL 50-PIN 0.1"	2	J12-13
9-79-0231	4-14-2601	HEADER DIL 26-PIN 0.1" MALE	3	J14-15 J28
9-79-0231	4-15-0600	HEADER SIL 6-PIN 3.96mm MALE EXT-LOCKING	1	J27
9-79-0231	4-15-1002	HEADER SIL 2-PIN 2mm SHRD	1	J26
9-79-0231	5-00-0021	SCREW 4-40 x 3/8" PPZ	7	INSTALL WITH U24 U29 U39 J1 J2
9-79-0231	5-01-0029	WASHER FLAT #4 ZINC 0.25"OD	5	INSTALL WITH U24 U29 U39 J2
9-79-0231	5-02-4402	NUT HEX 4-40	5	INSTALL WITH U24 U29 U39 J2
9-79-0231	5-04-0007	WASHER #4 SPLITLOCK	5	INSTALL WITH U24 U29 U39 J2
9-79-0231	5-04-0045	SPACER CRYSTAL 5x11.25x1mm (TQ-06 PIN-GOOD)	2	INSTALL WITH M1, M2
9-79-0231	7-01-0005	CRYSTAL 20 MHz KDS	1	M1
9-79-0231	7-01-0034	CRYSTAL 33.333 MHz PARALLEL 18pF HC-49U	1	M2
9-79-0231	7-01-0035	OSCILLATOR 54 MHz 3.3V DIP-8	1	U41
9-79-0231	7-40-0039	TRANSFORMER DUAL ISOLATION CENTER-TAPPED TOROIDAL 1:1 1:2.5	1	X1
9-79-0231	9-03-0051-A	BRACKET DB9-CONNECTOR RL - REV A	1	INSTALL WITH J1
9-79-0231	9-03-1132	HEATSINK	1	INSTALL WITH U24
9-79-0231	9-40-0231-F	PCB MAIN RL - REV F	1	
9-79-0231	9-61-0040	IC FIRMWARE FLASH V1.03 C/S:3492 01/28/02 RL	1	U27
RL	9-79-0232	ASSY PCB A/D RL	1	
9-79-0232	0-16-1002	RES 10.0K OHM 1/10W 1% 0805	49	R1 R3 R6 R8 R19 R21 R24 R26 R37 R39 R42 R44 R55 R57 R60 R62 R72 R74 R82 R85 R87-88 R100 R103 R105-106 R118 R121 R123-124 R136 R139 R141 R146 R148 R157 R159-160 R162 R175 R177-178 R180 R193 R195-196 R198 R211 R213
9-79-0232	0-16-1821	RES 1.82K OHM 1/10W 1% 0805	48	R9 R12-13 R16 R27 R30-31 R34 R45 R48-49 R52 R63 R66-67 R70 R76 R78 R91-92 R95-96 R109-110 R113-114 R127-128 R131-132 R143 R145 R151 R153 R166-167 R170-171 R184-185 R188-189 R202-203 R206-207 R215 R217
9-79-0232	0-16-2151	RES 2.15K OHM 1/10W 1% 0805	48	R2 R4-5 R7 R20 R22-23 R25 R38 R40-41 R43 R56 R58-59 R61 R75 R83-84 R86 R89 R101-102 R104 R107 R119-120 R122 R125 R137-138 R140 R147 R149-150 R158 R161 R163-164 R176 R179 R181-182 R194 R197 R199-200 R212

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9-79-0232	0-16-3241	RES 3.24K OHM 1/10W 1% 0805	48	R10-11 R14-15 R28-29 R32-33 R46-47 R50-51 R64-65 R68-69 R77 R79 R90 R93-94 R97 R108 R111-112 R115 R126 R129-130 R133 R142 R144 R152 R154 R165 R168-169 R172 R183 R186-187 R190 R201 R204-205 R208 R214 R216
9-79-0232	0-16-3320	RES 332 OHM 1/10W 1% 0805	24	R17-18 R35-36 R53-54 R71 R73 R80-81 R98-99 R116-117 R134-135 R155-156 R173-174 R191-192 R209-210
9-79-0232	1-08-0222	CAP 22uF ELEC 16V 20% 1.5x4x7mm	50	C5 C8-10 C17 C20-22 C29 C32-34 C41 C44-46 C54-56 C64-67 C76-79 C88-91 C100-101 C107 C110-111 C117-118 C121-122 C129-130 C133- 134 C141-142 C145-146 C150-151
9-79-0232	1-55-0561	CAP 560pF NPO 0805	72	C1-4 C6-7 C13-16 C18-19 C25-28 C30-31 C37-40 C42-43 C49-50 C58- 63 C70-75 C82-87 C94-95 C98-99 C103-105 C108-109 C113-116 C119- 120 C125-128 C131-132 C137-140 C143-144 C149
9-79-0232	1-56-0104	CAP 0.1uF X7R 0805 10% 50V	30	C11-12 C23-24 C35-36 C47-48 C51-53 C57 C68-69 C80-81 C92-93 C96-97 C102 C106 C112 C123-124 C135-136 C147-148 C152
9-79-0232	2-11-7805	REG VOLTAGE LM7805C +5V TO-220	2	U9 U16
9-79-0232	2-71-0084	IC TL084 QUAD OPAMP SOP-14	12	U1 U3 U5 U7 U10 U12 U14 U17 U19 U21 U23 U25
9-79-0232	2-75-1101	IC CONVERTER A/D 24-BIT AL1101 SOP-16	12	U2 U4 U6 U8 U11 U13 U15 U18 U20 U22 U24 U26
9-79-0232	4-02-0902	JACK 1/4" STEREO DUAL STACKED 180° W/GRND LUG	12	J1-12
9-79-0232	4-14-2601	HEADER DIL 26-PIN 0.1" MALE	1	J13
9-79-0232	5-00-0021	SCREW 4-40 x 3/8" PPZ	2	INSTALL WITH U9 U18
9-79-0232	5-01-0029	WASHER FLAT #4 ZINC 0.25"OD	2	INSTALL WITH U9 U18
9-79-0232	5-02-4402	NUT HEX 4-40	2	INSTALL WITH U9 U18
9-79-0232	5-04-0007	WASHER #4 SPLITLOCK	2	INSTALL WITH U9 U18
9-79-0232	9-40-0232-A	PCB A/D RL - REV A	1	
RL	9-79-0233	ASSY PCB D/A RL	1	
9-79-0233	0-16-2002	RES 20.0K OHM 1/10W 1% 0805	49	R6 R10 R12 R16 R27 R31-32 R39 R46 R50 R52 R56 R67 R71-72 R79 R86 R90 R92 R96 R107 R111-112 R119 R126 R130 R132 R136 R147 R151-152 R159 R161 R167 R171 R173 R177 R188 R192-193 R200 R204 R209-210 R216 R229 R233 R235 R239
9-79-0233	0-16-2210	RES 221 OHM 1/10W 1% 0805	48	R3-4 R14 R17 R26 R28 R36-37 R43-44 R54 R57 R66 R68 R76-77 R83- 84 R94 R97 R106 R108 R116-117 R123-124 R134 R137 R146 R148 R156-157 R164-165 R175 R178 R187 R189 R197-198 R208 R212 R214 R217 R228 R232 R236 R238
9-79-0233	0-16-3241	RES 3.24K OHM 1/10W 1% 0805	72	R5 R9 R11 R13 R15 R19 R23 R29-30 R33-34 R38 R45 R49 R51 R53 R55 R59 R63 R69-70 R73-74 R78 R85 R89 R91 R93 R95 R99 R103 R109-110 R113-114 R118 R125 R129 R131 R133 R135 R139 R143 R149-150 R153-154 R158 R166 R170 R172 R174 R176 R180 R184 R190-191 R194-195 R199 R205 R211 R213 R215 R218 R220 R222 R225 R230-231 R234 R240
9-79-0233	0-16-3320	RES 332 OHM 1/10W 1% 0805	24	R2 R8 R22 R25 R42 R48 R62 R65 R82 R88 R102 R105 R122 R128 R142 R145 R163 R169 R183 R186 R203 R207 R224 R227

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9-79-0233	0-16-8251	RES 8.25K OHM 1/10W 1% 0805	48	R1 R7 R18 R20-21 R24 R35 R40-41 R47 R58 R60-61 R64 R75 R80-81 R87 R98 R100-101 R104 R115 R120-121 R127 R138 R140-141 R144 R155 R160 R162 R168 R179 R181-182 R185 R196 R201-202 R206 R219 R221 R223 R226 R237 R241
9-79-0233	1-08-0222	CAP 22uF ELEC 16V 20% 1.5x4x7mm	50	C1 C7 C12-13 C15 C19 C22 C25 C29 C35 C40-41 C43 C47 C50 C53 C59 C61 C67 C72-73 C75 C79 C82 C85 C89 C95 C100-101 C103 C107 C110 C113 C117 C121 C127 C132-133 C135 C139 C142 C145 C150 C155 C157 C160 C164 C169 C172 C174
9-79-0233	1-55-0561	CAP 560pF NPO 0805	48	C2-3 C5 C8 C21 C23 C27-28 C30-31 C33 C36 C49 C51 C55-56 C62- 63 C65 C68 C81 C83 C87-88 C90-91 C93 C96 C109 C111 C115-116 C122-123 C125 C128 C141 C143 C147-149 C151-152 C162-163 C166 C173 C176
9-79-0233	1-56-0104	CAP 0.1uF X7R 0805 10% 50V	30	C4 C14 C16 C26 C32 C42 C44 C54 C57-58 C60 C64 C74 C76 C86 C92 C102 C104 C114 C118-120 C124 C134 C136 C146 C153 C161 C165 C175
9-79-0233	1-56-0151	CAP 150pF NPO 0805	48	C6 C9-11 C17-18 C20 C24 C34 C37-39 C45-46 C48 C52 C66 C69-71 C77-78 C80 C84 C94 C97-99 C105-106 C108 C112 C126 C129-131 C137-138 C140 C144 C154 C156 C158-159 C167-168 C170-171
9-79-0233	2-11-7805	REG VOLTAGE LM7805C +5V TO-220	2	U7 U14
9-79-0233	2-71-3079	IC MC33079 QUAD-OP-AMP SOP-14	6	U2 U5 U9 U12 U16 U19
9-79-0233	2-75-1201	IC CONVERTER D/A 24-BIT AL1201 SOP-16	12	U1 U3-4 U6 U8 U10-11 U13 U15 U17-18 U20
9-79-0233	4-02-0902	JACK 1/4" STEREO DUAL STACKED 180° W/GRND LUG	12	J1-12
9-79-0233	4-14-2601	HEADER DIL 26-PIN 0.1" MALE	1	J13
9-79-0233	5-00-0021	SCREW 4-40 x 3/8" PPZ	2	INSTALL WITH U7 U14
9-79-0233	5-01-0029	WASHER FLAT #4 ZINC 0.25"OD	2	INSTALL WITH U7 U14
9-79-0233	5-02-4402	NUT HEX 4-40	2	INSTALL WITH U7 U14
9-79-0233	5-04-0007	WASHER #4 SPLITLOCK	2	INSTALL WITH U7 U14
9-79-0233	9-40-0233-A	PCB D/A RL - REV A	1	
RL	9-79-BD01	ASSY PCB POWER SUPPLY RL	1	
9-79-BD01	0-00-0689	RES 6.8 OHM 1/8W 5%	1	R3
9-79-BD01	0-01-1000	RES 100 OHM 1/8W 1%	1	R9
9-79-BD01	0-01-1002	RES 10.0K OHM 1/8W 1%	3	R8 R13-14
9-79-BD01	0-01-1003	RES 100K OHM 1/8 1%	1	R10
9-79-BD01	0-01-1022	RES 10.2K OHM 1/8W 1%	1	R6
9-79-BD01	0-01-1503	RES 150K OHM 1/8W 1%	2	R1-2
9-79-BD01	0-01-2000	RES 200 OHM 1/8W 1%	2	R4 R16
9-79-BD01	0-01-2491	RES 2.49K OHM 1/8W 1%	1	R7
9-79-BD01	0-01-3652	RES 36.5K OHM 1/8W 1%	1	R11
9-79-BD01	0-05-0362	RES 3.6K OHM 1/2W 5%	1	R12
9-79-BD01	0-05-2513	RES 51K OHM 2W 5%	1	R5
9-79-BD01	0-05-2621	RES 620 OHM 2W 5%	1	R15

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9-79-BD01	0-22-0100	THERMISTOR 10 OHM 2A NTC	1	RT1
9-79-BD01	1-02-0103	CAP 0.01uF CERDISC Y5P 10% 50V 5.12x9x3mm	2	C15 C19
9-79-BD01	1-02-0104	CAP 0.1uF CERDISC 10% .30"DIA.	2	C8 C11
9-79-BD01	1-02-5103	CAP 0.01uF CERDISC 20% 500V 5x5x2mm	1	C7
9-79-BD01	1-02-9470	CAP 47pF CERDISC 20% 1kV 6.4x7.5x3mm	1	C20
9-79-BD01	1-08-0474	CAP 47uF ELEC 16V 2x5x11mm	1	C5
9-79-BD01	1-13-0103	CAP 100uF ELEC 400V 10x26x26mm	2	C6 C10
9-79-BD01	1-14-0100	CAP 0.1uF X2-CAP +/-20% 250VAC 15x18x8.5x14.5mm	2	C3-4
9-79-BD01	1-15-2102	CAP 1000pF Y-CAP 250VAC 5x6.5x4.5mm	3	C1-2 C9
9-79-BD01	1-16-0333	CAP 330uF ELEC LOW-ESR 25V 105øC 3.5x8x15mm	2	C12 C18
9-79-BD01	1-16-1224	CAP 2200uF ELEC LOW-ESR 16V 105øC 5x12.5x25mm	4	C13-14 C16-17
9-79-BD01	2-00-4148	DIODE SIGNAL 1N4148 75V 200mA	1	D3
9-79-BD01	2-01-0666	DIODE POWER SCHOTTKY 45V 10A TO-220	1	D5
9-79-BD01	2-01-2220	DIODE POWER ULTRA-FAST MUR820 200V 8A TO-220	2	D4 D6
9-79-BD01	2-02-0600	DIODE POWER ULTRAFAST MUR160 600V 1A	1	D2
9-79-BD01	2-02-5237	DIODE ZENER 1N5237B 8.2V 1/2W DO-35	1	D8
9-79-BD01	2-02-5338	DIODE ZENER 1N5338B 5.1V 5W 17-02	1	D9
9-79-BD01	2-03-0105	RECTIFIER BRIDGE DB105 600V 1A	1	D1
9-79-BD01	2-03-4401	TRANS NPN GEN-PURPOSE-AMP 2N4401 40V 1A TO-92	1	Q1
9-79-BD01	2-03-4403	TRANS PNP 2N4403 40V 600mA TO-92	1	Q2
9-79-BD01	2-05-0227	TRANS OFF-LINE PWM SWITCH 150W TO-223	1	U1
9-79-BD01	2-11-0431	REG ADJ-SHUNT TL431 2.5V-36V 100mA 2% TO-92	1	U3
9-79-BD01	2-24-8104	IC OPTO-ISOLATOR TCDT1124 6-PIN	1	U2
9-79-BD01	2-99-0021	DIODE BAV21 SOD-27	1	D7
9-79-BD01	4-09-0010	CON PWR IEC 10A 250V PCB-MOUNT W/TOP GND LUG	1	J1
9-79-BD01	4-15-0200	HEADER SIL 2-PIN 3.96mm MALE EXT-LOCKING	1	J2
9-79-BD01	4-15-0600	HEADER SIL 6-PIN 3.96mm MALE EXT-LOCKING	1	J3
9-79-BD01	5-00-0021	SCREW 4-40 x 3/8" PPZ	6	INSTALL IEC D4-6 U1
9-79-BD01	5-00-3505	SCREW M3.5 X 5mm PPZ	3	INSTALL PCB MOUNTING
9-79-BD01	5-01-0029	WASHER FLAT #4 ZINC 0.25"OD	6	INSTALL IEC D4-6 U1
9-79-BD01	5-01-0032	WASHER LOCK EXT-TOOTH #6 0.151Dx0.32ODx0.016" ZINC-PLATED-STEEL	3	INSTALL PCB MOUNTING
9-79-BD01	5-01-0035	WASHER #4 SHOULDER NYLON .140 OD X .116 ID X .090 L	3	INSTALL WITH D4-6
9-79-BD01	5-02-4402	NUT HEX 4-40	6	INSTALL IEC D4-6 U1
9-79-BD01	5-03-0030-A	STANDOFF HEX M3.5 X 40mm F-F BRASS	3	INSTALL PCB MOUNTING
9-79-BD01	5-04-0007	WASHER #4 SPLITLOCK	6	INSTALL IEC D4-6 U1
9-79-BD01	5-05-1001	CLIP FUSE HOLDER 5 x 12mm	2	F1
9-79-BD01	7-04-0023	FUSE 2A 250V 5X20mm F UL-LISTED	1	INSTALL W/F1
9-79-BD01	7-07-0023	INSULATOR POLY-PAD 400 TO-220	3	INSTALL WITH D4-6
9-79-BD01	7-07-0040-A	INSULATOR POWER SUPPLY FORMEX 152.5 x 76.25mm RH	1	INSTALL WITH IEC

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9-79-BD01	7-07-0044	INSULATOR TUBING FRS 18AWG x 7/8" STANDARD WALL	2	INSTALL WITH R5
9-79-BD01	7-13-0033-A	HEATSINK TIN-PLATED 1x0.5x1.18" TO-220 - REV A	1	INSTALL WITH U1
9-79-BD01	7-30-0012	CHOKE ROD OUTPUT 10uH 6A 1"-HIGH	4	L2-5
9-79-BD01	7-30-0022	CHOKE COMMON MODE 22mH 0.50A	1	L1
9-79-BD01	7-40-0041	TRANSFORMER FLYBACK ER28L HORIZ-MNT 12-PIN BD01	1	T1
9-79-BD01	9-03-0020	HEATSINK 66.5x25.0x25.0	1	HS1
9-79-BD01	9-40-BD01-C	PCB POWER SUPPLY RL - REV C	1	
RL	9-96-0074	ASSY LRC RL	1	
9-96-0074	4-19-1311	CABLE LRC	1	
9-96-0074	5-00-0104	SCREW M2.6 x 8 PPB TAPPING	2	
9-96-0074	7-51-0508	BAG POLY 5 x 8"	1	
9-96-0074	9-15-0283	CASE TOP LRC RL	1	
9-96-0074	9-15-0284	CASE BOTTOM LRC RL	1	
9-96-0074	9-23-1009	STRIP FEET 10x130	2	
9-96-0074	9-23-1065	KEYPAD LRC	1	
9-96-0074	9-79-1051	ASSY PCB LRC 2D/4D	1	
9-79-1051	0-01-1000	RES 100 OHM 1/8W 1%	4	R11, R12, R13, R14
9-79-1051	0-01-5110	RES 511 OHM 1/8W 1%	1	R10
9-79-1051	0-01-5119	RES 51.1 OHM 1/8W 1%	7	R1, R3, R4, R5, R6, R7, R8
9-79-1051	0-01-6819	RES 68.1 OHM 1/8W 1%	1	R9
9-79-1051	0-01-7509	RES 75.0 OHM 1/8W 1%	1	R2
9-79-1051	6-02-0011	SWITCH TACT	13	
9-79-1051	9-40-1051	PCB MAIN LRC	1	
RL	9-96-0078	ASSY ALPHA-DISPLAY-MODULE RL	1	
9-96-0078	5-00-1308	SCREW M3 x 8mm PPB PLASTITE	8	PCB TO BEZEL
9-96-0078	7-12-0045-A	ADHESIVE DIE-CUT ALPHA-LENS RL	1	
9-96-0078	9-10-0052-B	BEZEL FRONT-PANEL ALPHANUMERIC-DISPLAY RL - REV B	1	
9-96-0078	9-15-0260-A	CAP SWITCH LOCATE RL - REV A	1	
9-96-0078	9-15-0261-A	CAP SWITCH REWIND RL - REV A	1	
9-96-0078	9-15-0262-B	LENS DISPLAY ALPHANUMERIC RL	1	
9-96-0078	9-15-0263-A	CAP SWITCH STOP RL - REV A	1	
9-96-0078	9-15-0264-A	CAP SWITCH PLAY RL - REV A	1	
9-96-0078	9-15-0265-A	CAP SWITCH RECORD RL - REV A	1	
9-96-0078	9-15-0285-A	CAP SWITCH FAST FWD RL - REV A	1	
9-96-0078	9-30-0018-B	KEYPAD RUBBER ALPHANUMERIC RL - REV B	1	
9-96-0078	9-79-0235	ASSY PCB ALPHANUMERIC RL	1	



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9-79-0235	0-05-0150	RES 15 OHM 1/2W 5%	4	R3-4 R6-7
9-79-0235	0-05-0752	RES 7.5K OHM 1/2W 5%	3	R1-2 R5
9-79-0235	0-16-1002	RES 10.0K OHM 1/10W 1% 0805	1	R9
9-79-0235	0-16-5112	RES 51.1k OHM 1/10W 1% 0805	1	R8
9-79-0235	0-17-0103	RES CHIP ARRAY 4 X 10K OHM 1/16W 5% ISOLATED c-c=0.8mm	2	R10-11
9-79-0235	0-17-0181	RES CHIP ARRAY 4 x 180 OHM 1/16W 5% ISOLATED c-c=0.8mm SMD	2	R12-13
9-79-0235	1-08-0476	CAP 47uF ELEC 25V 2.5x6.3x7mm	2	C12 C14
9-79-0235	1-09-0221	CAP 220uF ELEC 25V 3.5x8x12.5mm	1	C13
9-79-0235	1-16-0222	CAP 22uF ELEC LOW-ESR 20% 63V 105øC 2.5X6.3X11mm	1	C11
9-79-0235	1-56-0103	CAP 0.01uF X7R 0805	13	C1-10 C15-17
9-79-0235	2-02-4741	DIODE ZENER 1N4741A 11V 1W DO-41	1	D8
9-79-0235	2-50-4149	DIODE SIGNAL 1N4148 100V 200mA SOT-23	10	D7 D9-17
9-79-0235	2-56-0014	TRANS MED-POWER N-CHAN EN-FET NDT014L SOT-223	1	Q1
9-79-0235	2-62-0014	IC 74AHC14 HEX SCHMITT-TRIGGER INVERTERS SOP-14	1	U3
9-79-0235	2-62-0541	IC 74AHC541 OCTAL BUFFERS/DRIVERS W/TRI-STATE OUTS SOP-20	1	U4
9-79-0235	2-62-0574	IC 74AHC574 OCTAL D FF W/TRI-STATE OUTS SOP-20	2	U5-6
9-79-0235	2-79-1162	IC DRIVER DISPLAY VAC-FLR MSC1162A ANDODE/GRID SSOP-60	2	U1-2
9-79-0235	3-02-0012	LED GREEN HLMP-1540 T1	5	D2-6
9-79-0235	3-02-0014	LED RED HLMP-1340 T1	1	D1
9-79-0235	4-20-2600	HEADER DIL 26-PIN 0.1" MALE SMD	1	J1
9-79-0235	4-20-3400	HEADER DIL 34-PIN 0.1" MALE SMD	1	J2
9-79-0235	7-40-0023	TRANSFORMER SINGLE DC-DC CONVERTER RL	1	T1
9-79-0235	9-23-1167-B	SPACER VFD ALPHANUMERIC RL - REV B	1	
9-79-0235	9-40-0235-A	PCB ALPHANUMERIC RL - REV A	1	
9-79-0235	9-45-0003	DISPLAY VFD ALPHANUMERIC RL	1	VFD1
RL	9-96-0079	ASSY METER-DISPLAY-MODULE RL	1	
9-96-0079	5-00-1308	SCREW M3 x 8mm PPB PLASTITE	6	PCB TO BEZEL
9-96-0079	7-12-0044-A	ADHESIVE DIE-CUT METER-LENS RL	1	
9-96-0079	7-13-0014	TUBING HEATSHRINK 5mm DIA x 15mm	1	COVER METER VFD TUBE
9-96-0079	9-06-0022-B	SPRING HARD DRIVE BAY DOOR RL	2	
9-96-0079	9-10-0053-B	BEZEL FRONT-PANEL METER RL - REV B	1	
9-96-0079	9-15-0259-B	DOOR HARD-DISK-BAY RL - REV B	2	
9-96-0079	9-15-0266-B	LENS METER RL	1	
9-96-0079	9-30-0019-B	KEYPAD RUBBER METER RL - REV B	1	
9-96-0079	9-34-0044-B	FOAM GASKET METER-VFD RL - REV B	1	
9-96-0079	9-79-0236	ASSY PCB METER RL	1	
9-79-0236	0-16-1500	RES 150 OHM 1/10W 1% 0805	2	R3-4

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9-79-0236	0-17-0103	RES CHIP ARRAY 4 X 10K OHM 1/16W 5% ISOLATED c-c=0.8mm	2	R1-2
9-79-0236	1-08-0476	CAP 47uF ELEC 25V 2.5x6.3x7mm	2	C7 C9
9-79-0236	1-16-0222	CAP 22uF ELEC LOW-ESR 20% 63V 105øC 2.5X6.3X11mm	1	C8
9-79-0236	1-56-0103	CAP 0.01uF X7R 0805	6	C1-6
9-79-0236	2-50-4149	DIODE SIGNAL 1N4148 100V 200mA SOT-23	4	D3-6
9-79-0236	2-62-0541	IC 74AHC541 OCTAL BUFFERS/DRIVERS W/TRI-STATE OUTS SOP-20	1	U1
9-79-0236	2-62-0574	IC 74AHC574 OCTAL D FF W/TRI-STATE OUTS SOP-20	1	U3
9-79-0236	2-79-1162	IC DRIVER DISPLAY VAC-FLR MSC1162A ANDODE/GRID SSOP-60	1	U2
9-79-0236	3-03-0001	LED TRI-STATE	2	D1-2
9-79-0236	4-20-2600	HEADER DIL 26-PIN 0.1" MALE SMD	1	J1
9-79-0236	9-23-1166-B	SPACER VFD METER RL - REV A	1	INSTALL BETWEEN VFD1 AND PCB
9-79-0236	9-40-0236-A	PCB METER RL - REV A	1	
9-79-0236	9-45-0004	DISPLAY VFD LEVEL METER RL	1	VFD1
RL	9-96-0080	ASSY DRIVE-CAGE RL	2	
9-96-0080	5-02-6328	NUT KEP M3 STEEL/ZINC	2	CAGE TO CENTRONICS
9-96-0080	9-03-0115-A	DRIVE CAGE RL - REV A	1	
9-96-0080	9-34-0026	FOAM EVA STRIPS 25 x 12 x 0.5mm X5	1	PLACE ON DRIVE CAGE UNDER CAPACITOR
9-96-0080	9-79-0238	ASSY PCB HD INTERFACE RL	1	
9-79-0238	0-16-1001	RES 1.00K OHM 1/10W 1% 0805	3	R1 R3 R6
9-79-0238	0-16-1002	RES 10.0K OHM 1/10W 1% 0805	1	R2
9-79-0238	0-16-1003	RES 100K OHM 1/10W 1% 0805	1	R5
9-79-0238	0-16-1004	RES 1.00M OHM 1/10W 1% 0805	1	R4
9-79-0238	0-17-0470	RES CHIP ARRAY 4 X 47 OHM 1/16W 5% ISOLATED c-c=0.8mm	10	R7-16
9-79-0238	1-08-0228	CAP 2200uF ELEC 16V 5x13.2x24mm	2	C10 C11
9-79-0238	1-08-0476	CAP 47uF ELEC 25V 2.5x6.3x7mm	2	C3 C6
9-79-0238	1-56-0103	CAP 0.01uF X7R 0805	7	C1-2 C4-5 C7-9
9-79-0238	2-11-7805	REG VOLTAGE LM7805C +5V TO-220	1	U4
9-79-0238	2-51-4401	TRANS NPN 2N4401 40V 1A SOT-23	2	Q1 Q3
9-79-0238	2-56-4953	TRANS POWER P-CHAN EN-MOSFET SOIC-8	1	Q2
9-79-0238	2-62-0014	IC 74AHC14 HEX SCHMITT-TRIGGER INVERTERS SOP-14	1	U1
9-79-0238	2-63-0541	IC 74AHC541 OCTAL BUFFER/DRIVER W/TRI-STATE SOIC-20	1	U2
9-79-0238	2-64-1646	IC 74ACT16646 16-B BUS TRANSCEIVER/REGISTER W/TRI OUTS SSOP-56	1	U3
9-79-0238	4-14-0050	HEADER DIL 50-PIN 0.1"	1	J2
9-79-0238	4-14-5000	HEADER DIL 50-PIN CENTRONICS MALE	1	J4
9-79-0238	4-15-0204	HEADER SIL 4-PIN 3.96mm MALE EXT-LOCKING	1	J1

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9-79-0238	4-15-1002	HEADER SIL 2-PIN 2mm SHRD	1	J3
9-79-0238	5-00-0021	SCREW 4-40 x 3/8" PPZ	1	INSTALL WITH U4
9-79-0238	5-01-0029	WASHER FLAT #4 ZINC 0.25"OD	1	INSTALL WITH U4
9-79-0238	5-02-4402	NUT HEX 4-40	1	INSTALL WITH U4
9-79-0238	5-04-0007	WASHER #4 SPLITLOCK	1	INSTALL WITH U4
9-79-0238	7-20-0065	INDUCTOR 22uH 1.29A 5x8.5x11.5mm 20%	2	L1-2
9-79-0238	9-34-0026	FOAM EVA STRIPS 25 x 12 x 0.5mm X5	1	
9-79-0238	9-40-0238-A	PCB HD INTERFACE RL - REV A	1	