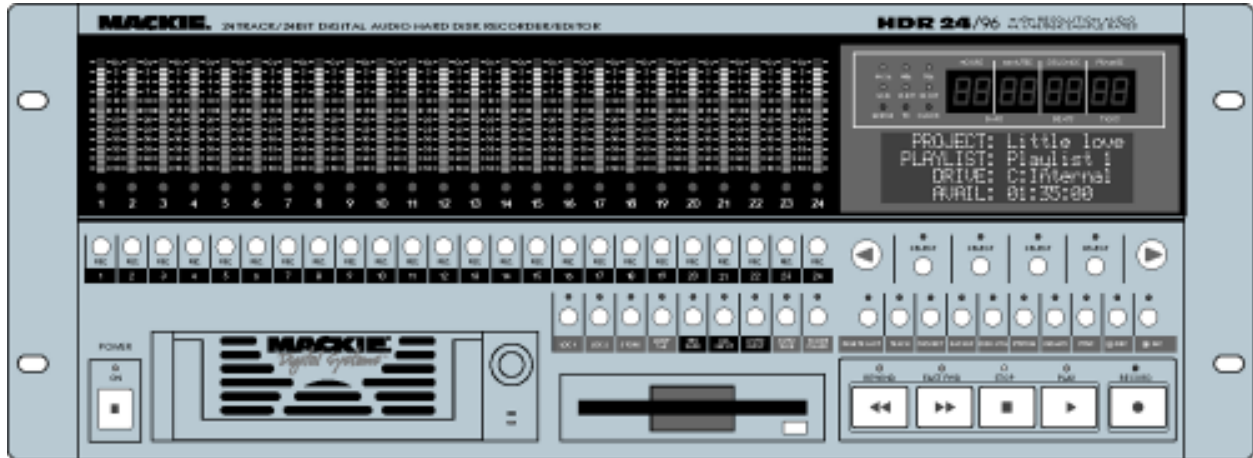


MACKIE®

HDR 24/96

Hard Disk Recorder



SERVICE MANUAL

	<p>SERVICE ON THIS EQUIPMENT IS TO BE PERFORMED BY EXPERIENCED REPAIR TECHNICIANS ONLY <i>CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE</i></p>	
---	---	---

	<p>CAUTION AVIS</p> <p>RISK OF ELECTRIC SHOCK DO NOT OPEN <i>RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR</i></p>	
---	---	---

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE THE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED PERSONNEL

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR EVITER LES RISQUES DE CHOC ELECTRIQUE, NE PAS ENLEVER LE COUVERCLE. AUCUN ENTRETIEN DE PIECES INTERIEURES PAR L'USAGER. CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE.

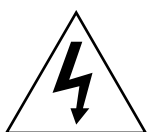
AVIS: POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, N'EXPOSEZ PAS CET ARTICLE A LA PLUIE OU A L'HUMIDITE.

POUR PREVENIR LES CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UN PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS LAISSER AUCUNE PARTIE A DECOUVERT.

This apparatus does not exceed the Class A/Class B (whichever is applicable) limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

ATTENTION :Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de class A/de class B (selon le cas) prescrites dans le règlement sur le brouillage radioélectrique édicté par les ministere des communications du Canada.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio energy and, if not installed properly and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Le symbole éclair avec point de flèche à l'intérieur d'un triangle équilatéral est utilisé pour alerter l'utilisateur de la présence à l'intérieur du coffret de "voltage dangereux" non isolé d'ampleur suffisante pour constituer un risque d'électrocution.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est employé pour alerter les utilisateurs de la présence d'instructions importantes pour le fonctionnement et l'entretien (service) dans le livret d'instruction accompagnant l'appareil.



WARNING
 Service on the HDR 24/96 must only be undertaken by experienced service technicians.



! SMD !

The HDR 24/96 makes extensive use of surface mount components. Servicing technicians should have the tools, experience and patience to perform surface mount rework.

! ESD !

The HDR 24/96 contains components that may be damaged by electrostatic discharge. All standard ESD precautions must be taken when servicing.



Warning!: Before applying power to the HDR24/96, make sure that the Voltage Selector switch next to the AC inlet jack on the rear panel is set to the line voltage used in your region. Powering-on the HDR24/96 with the Voltage Selector switch set incorrectly will cause an electrical and fire hazard that may result in irreparable damage to the unit.

Additional Safety Information

The following notice concerns the lithium battery located on the motherboard inside the HDR 24/96 chassis.



CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.



ATTENTION: IL Y A DANGER D'EXPLOSION S'IL Y A REMPLACEMENT INCORRECT DE LA BATTERIE, REMPLACER UNIQUEMENT AVEC UNE BATTERIE DU MEME TYPE OU D'UN TYPE ÉQUIVALENT RECOMMANDÉ PAR LE CONSTRUCTEUR. METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS DU FABRICANT.

CONTENTS

Safety	2, 3
Introduction	5
Ribbon Cables	6
Connectors.....	8
Acuma board notes	20
Small Remote Self-Test	21
BIOS Settings	22
Motherboard layout	25
Quick Parts	26
Parts.....	A-1
Assembly Instructions	B-1
Exploded Views.....	C-1
Wiring Diagram	WD-1
Schematics and PCB layouts	
I/O Cards	119-1
Front Panel	178-1
Backplane	179-1
Brain	180-1
Remote I/O	268-1
Small Remote	291-1
Poststamp	359-1
Acuma	367-1



Introduction

This manual contains service information for the HDR 24/96 Hard Disk Recorder. To service the HDR 24/96, technicians should be familiar with op-amp based and discrete analog circuitry, digital troubleshooting, microprocessors, digital audio, DSP, ESD, ESP, and the operation/application of Hard Disk Recorders. Presentation of this manual does not constitute endorsement of qualifications by Mackie Designs.

This manual is available in Adobe® Portable Document Format (PDF), as part of Mackie Designs' Digital Service CD-ROM (part# 820-163-00). This is available to all Service centers authorized to repair the HDR 24/96. Also included on the CD-ROM are the schematics, PCB layouts, parts lists, assembly drawings, and the owner's manual.

It is essential that you become familiar with the owner's manual as it will be a great help for you to verify customers complaints, and to check for correct operation.

SERVICE TECHNICAL ASSISTANCE

Mackie Designs, Service Technical Assistance, is available 8AM - 5PM PST, Monday through Friday for Authorized Mackie Service Centers, at 1-800-258-6883. Feel free to call with any questions and speak with a carefully-calibrated technician. If one is not available, leave a detailed message and a qualified Mackoid will return your call asap.

DISCLAIMER

The information contained in this manual is proprietary to Mackie Designs, Inc. The entire manual is protected under copyright and may not be reproduced by any means without express written permission from Mackie Designs Inc.

GETTING STARTED

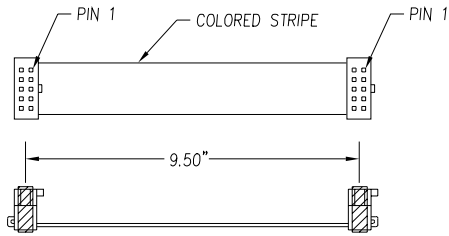
Think of the HDR 24/96 as a standard PC with extra Mackie boards inside. Standard PC troubleshooting techniques and commercially available diagnostic DOS software can be applied to repair the HDR 24/96.

A preliminary inspection will often reveal a simple problem, such as a bad connection somewhere, perhaps a loose cable, a bad switch or control, bad EEPROM or the CPU's CMOS settings may need to be reset. Check out the service bulletins, there is one which explains how to replace the EEPROM.

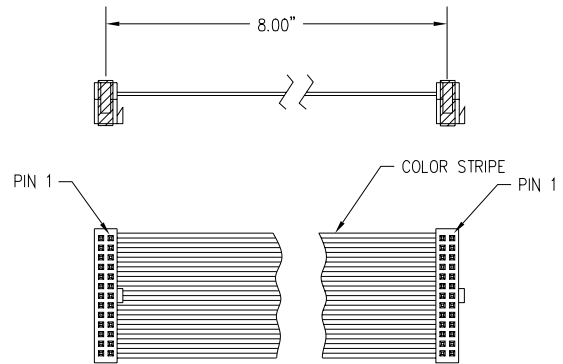
Our technical support team are available to discuss any problems and offer solutions.

Ribbon Cables

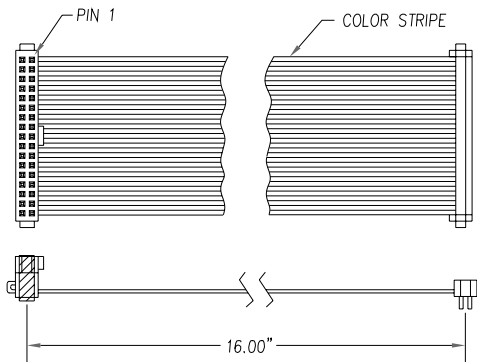
Part#	Description	Rev	Qty
040-383-00	RIB 28GA 10C 14.0 PLZD	A	1
040-384-00	RIB 28GA 26C 4IN PLZD	B	1
040-385-00	RIB 28G TRANS 34C 18.5IN	B	1
040-386-00	RIB 28G 26C .100 14.50IN	B	1
040-387-00	RIB 28GA 14C 16.0 PLZD	A	1
040-390-00	RIB 28GA 10C 7.00 PLZD	B	2
040-393-00	CBL ASY 22G 4C/6P 9.0IN	A	1
040-438-00	RIB 28GA 16P .100 15.50IN	A	1
040-489-00	DIS 18GA 4C 4.5IN PWR/MOL	A	1
040-496-00	DIS 18GA 4C 14IN PWR EX	A	1
040-497-00	DIS 22G 1007 2C/12P	A	1



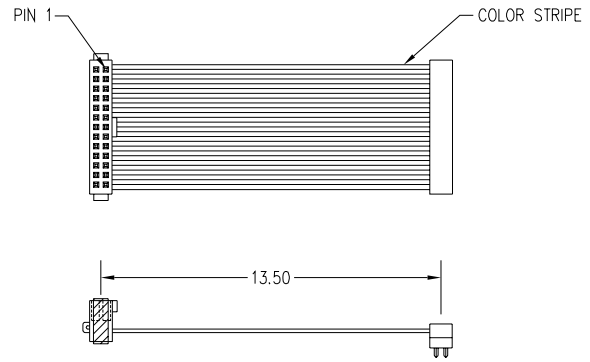
RIBBON CABLE ASSY PLZD
28GA 10C .100, 9.50"
REV. 040-383-00 A



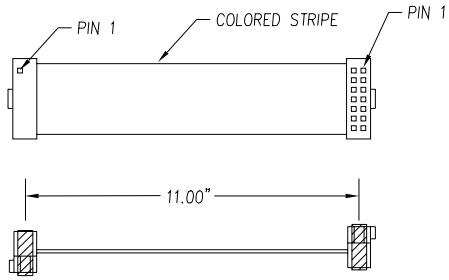
RIBBON CABLE ASSY
28GA 26C 8" PLZD
REV. 040-384-00 A



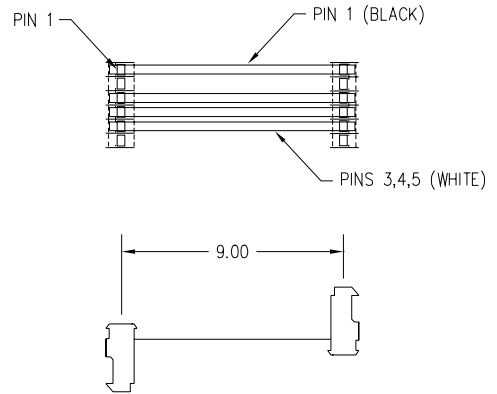
RIBBON CABLE ASSY TRANS
28GA 34C .100 16.00IN
REV. 040-385-00 A



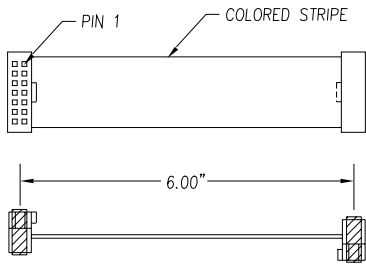
RIB CBL ASSY TRANS/PLZD
28GA 26C .100 13.50"
REV. 040-386-00 A



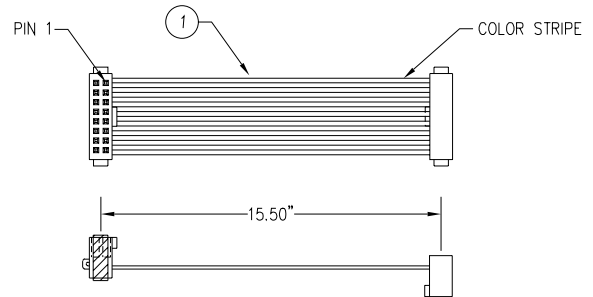
RIBBON CABLE ASSY PLZD
28GA 14C .100 11.00"
REV.
040-387-00 A



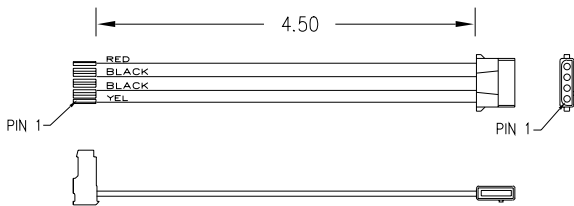
DISCRETE CABLE ASSY
22AWG 4C/6P .100 9.00"
REV.
040-393-00 A



RIBBON CABLE ASSY PLZD
28GA 10C .100 6.0"
REV.
040-390-00 A



RIB CBL ASSY PLZD
28PIN 16P .100" 15.50"
040-438-00



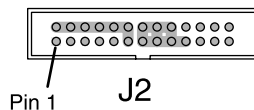
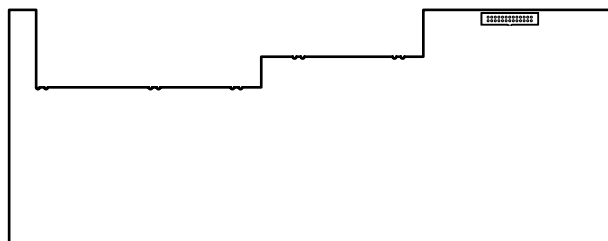
DIS 18GA 4C 5IN
PWR / IDC
REV.
040-489-00 A

Connectors

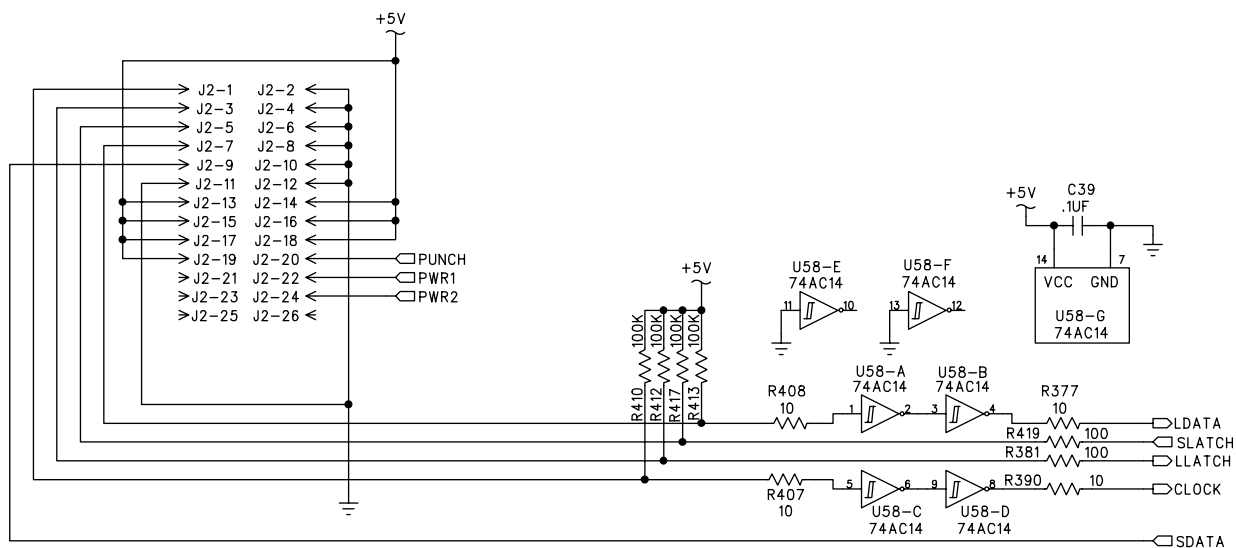
This table shows each connector and the boards they connect to. The following pages show each connector in detail, including the labeling and designation on each pin of the connectors.

J #	Pins	From	To	Description	Cable	Page
J2	26	Front Panel	J2 Brain board	Clock, Latch, Data		9
J2	4	Backplane	J2 Post Stamp	DC Power	040-489-00	10
J1	10	Backplane	J1 Brain board	Mute, Reset, IO TX, IO RX	040-383-00	10
J3	34	Backplane	J3 Acuma board	CLK, DT data transmit	040-385-00	10
J4	26	Backplane	J4 Acuma board	DR data receive	040-386-00	10
J18	62	Backplane	Card Connector	various		11
J19	62	Backplane	Card Connector	various		11
J20	62	Backplane	Card Connector	various		11
J9	4	Brain board	Power Supply	DC Power		12
J5	14	Brain board	J5 Remote I/O board	COM1, COM2, Punch	040-387-00	12
J7	16	Brain board	VFD	Display data	040-438-00	12
J3	2	Brain board	Motherboard	Flasher, +5V		12
J2	26	Brain board	J2 Front Panel board	Clock, latch, data	040-384-00	13
J8	2	Brain board	VFD Display			13
J1	10	Brain board	J1 Backplane	Mute, Reset, IO RX, IO TX	040-383-00	13
J2	4	Remote I/O	Power Supply	DC Power		14
J9	10	Remote I/O	Serial 2 Mother board	COM2	040-390-00	14
J10	10	Remote I/O	Serial 1 Mother board	COM1	040-390-00	14
J5	14	Remote I/O	J5 Brain board	COM1, COM2, Punch	040-387-00	15
J4	3	Remote I/O	1/4" TRS jack	Punch		15
J3	9	Remote I/O	Mouse	Mouse data		15
J6	6	Remote I/O	Motherbrd Mouseport	Mouse data	040-393-00	15
J1	12	Remote I/O	Small Remote	Remote data		15
J1	4	Post Stamp	Power Supply	DC Power		16
J2	4	Post Stamp	J2 Backplane	DC Power		16
J3	34	Acuma board	J3 Backplane	Mackie Bus Output	040-385-00	17
J4	26	Acuma board	J4 Backplane	Mackie Bus Input	040-386-00	17
J5	6	Acuma board	SMPTE 1/4" Jack	SMPTE		18
J2	2	Acuma board	CLK IN BNC Jack	CLK IN		18
J1	2	Acuma board	CLK OUT BNC Jack	CLK OUT		18
PCI	124	Acuma board	PCI Connector	PCI data		19

Front Panel Connector



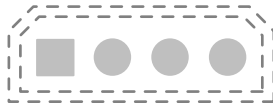
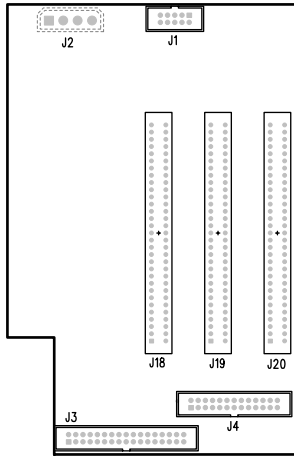
This connects to J2 of the Brain board, see page 13



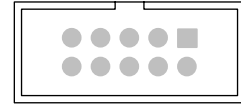
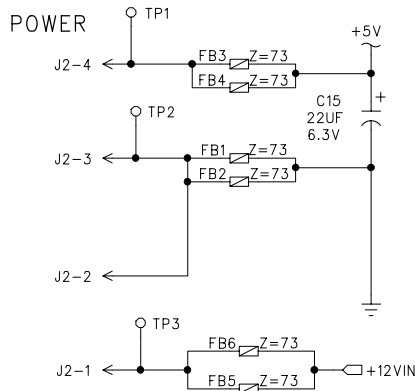
BackPlane Connectors

Power from J2 of poststamp board, see page 16

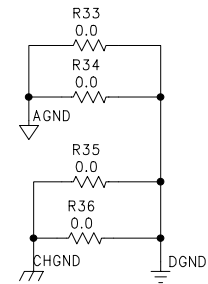
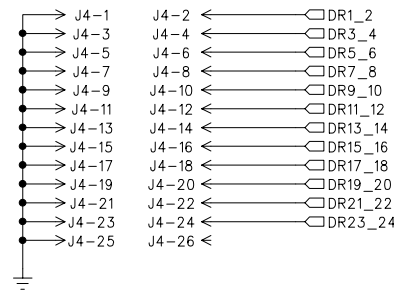
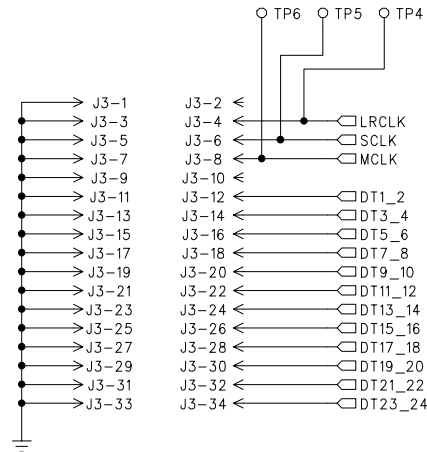
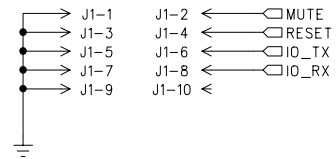
This connects to J1 of the Brain board, see page 13



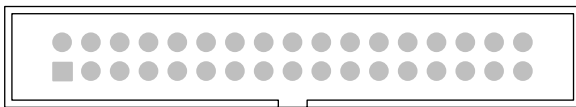
J2



J1



J3

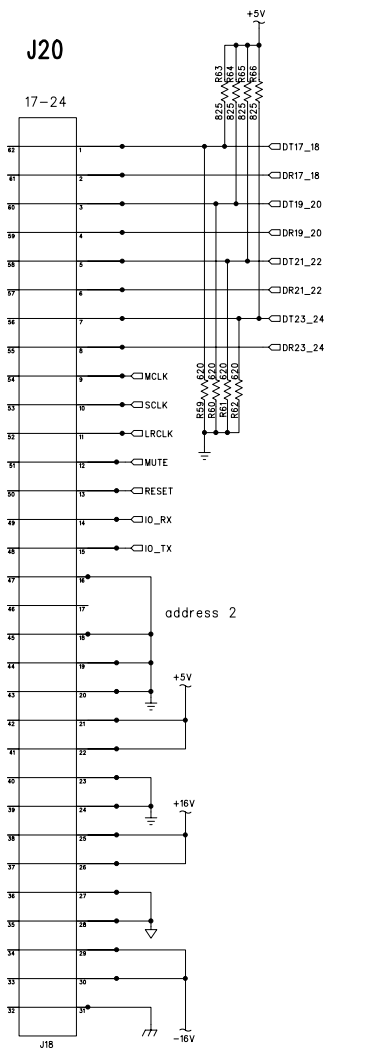
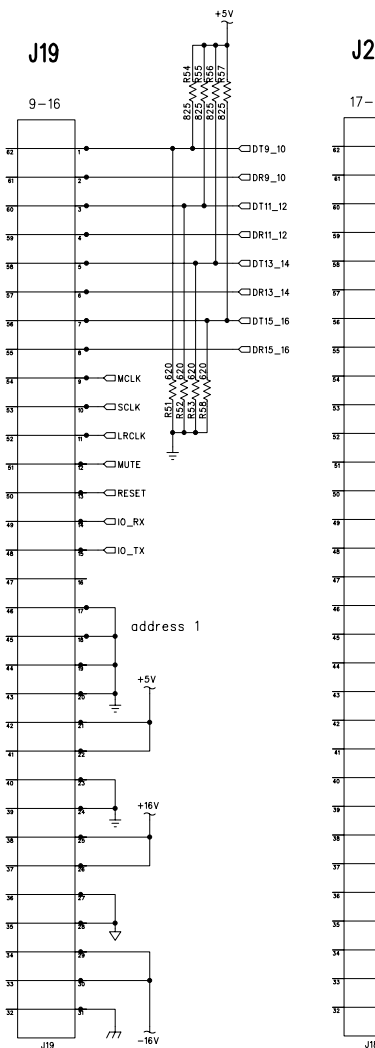
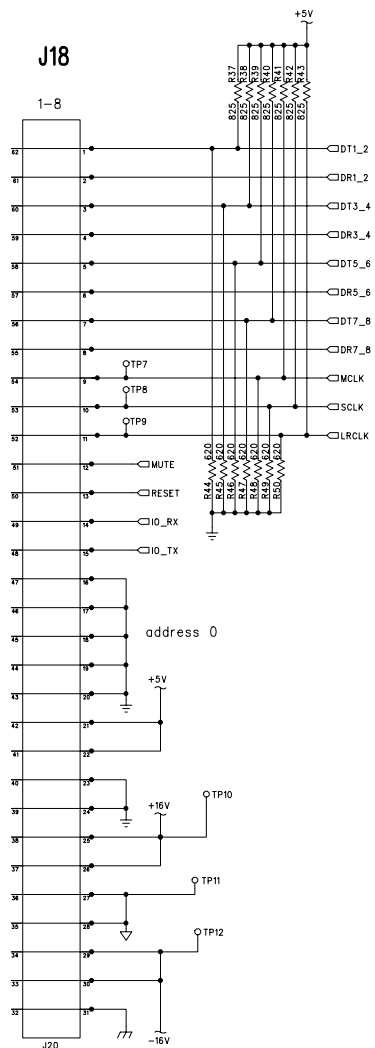
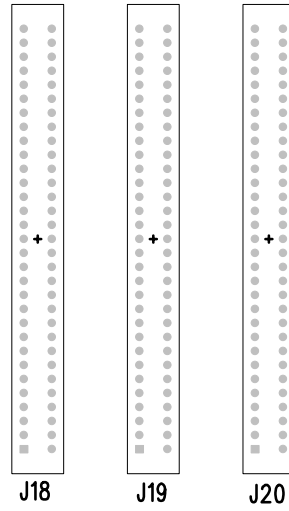
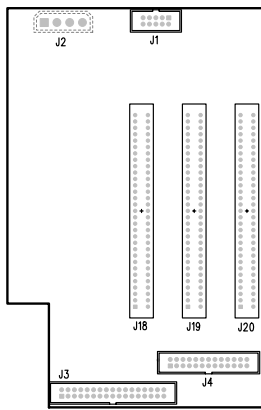


This connects to J3 of the Acuma board, see page 17

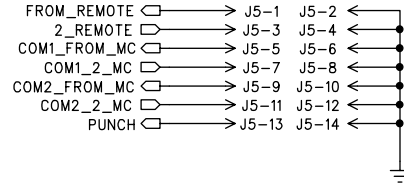
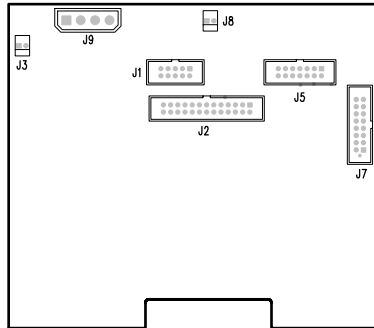
J4

This connects to J4 of the Acuma board, see page 17

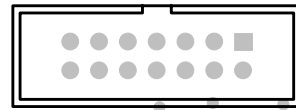
BackPlane Connectors



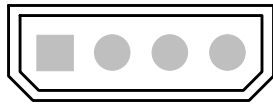
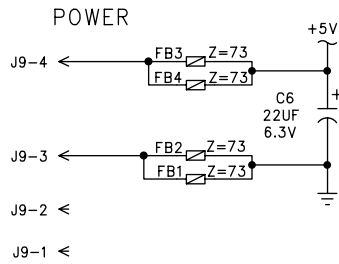
Brain Board Connectors



This connects to J5 of the remote board, see page 15

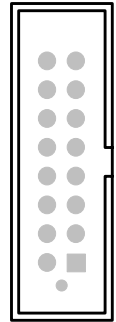


J5



J9

This connects to power supply

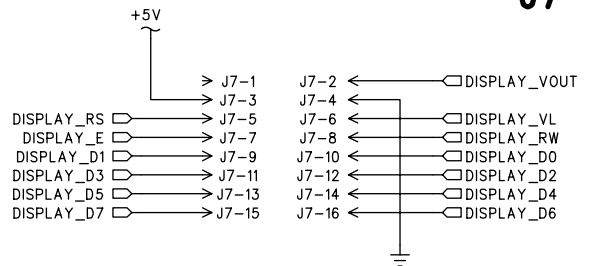
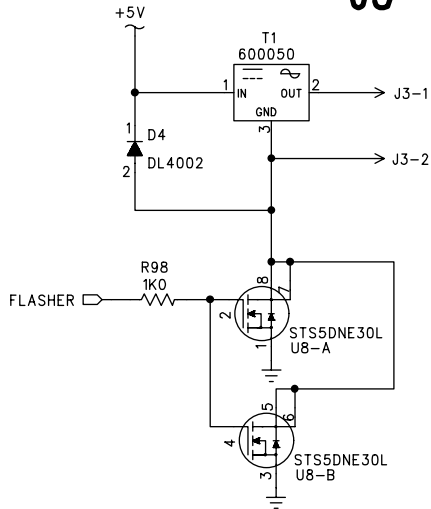


J7

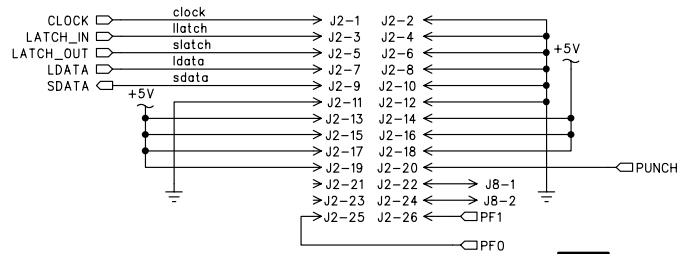
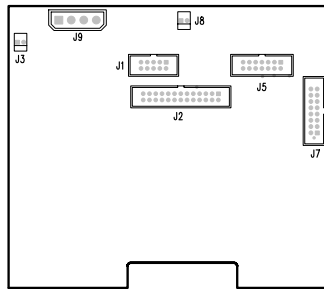
This connects to the VFD



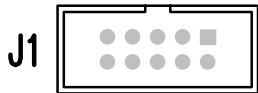
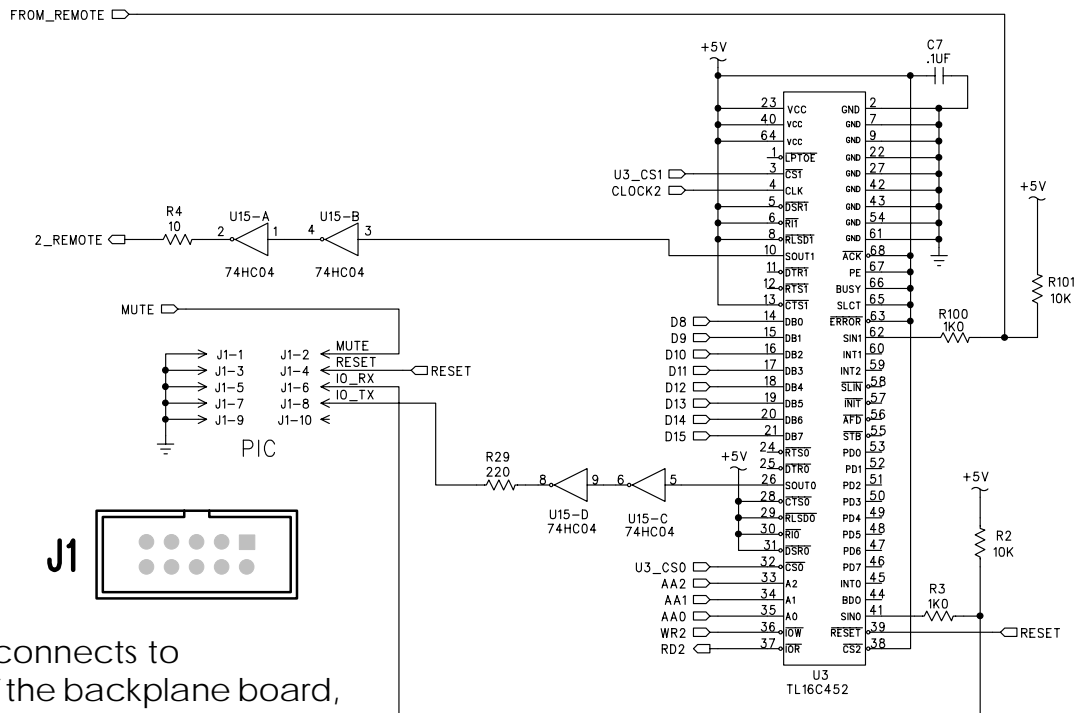
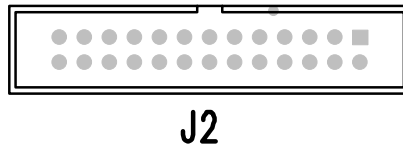
J3



Brain Board Connectors

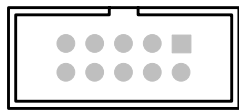
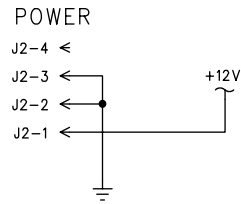
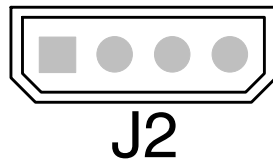
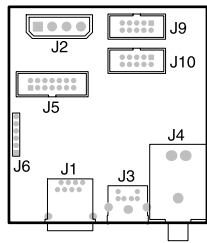


This connects to J2 of the front panel board, see page 9



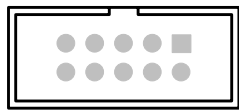
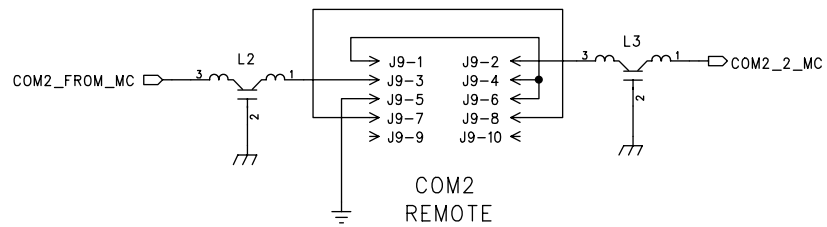
This connects to J1 of the backplane board, see page 10

Remote Board Connectors



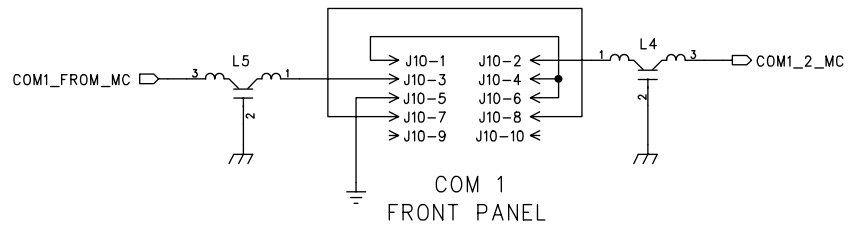
J9

This connects to
Serial 2 of the
motherboard

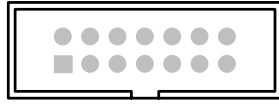
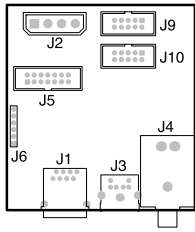


J10

This connects to
Serial 1 of the
motherboard

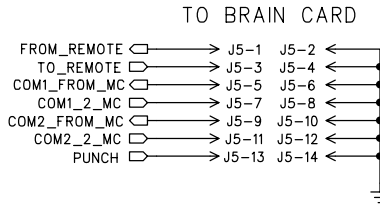


Remote Board Connectors

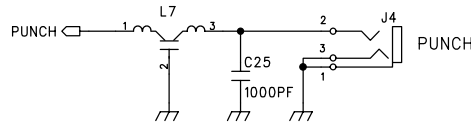
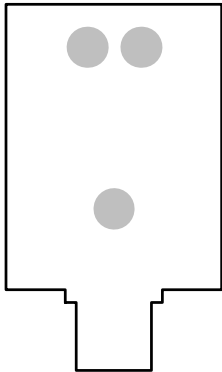


J5

J5 connects to J5 of the brain board, see page 12



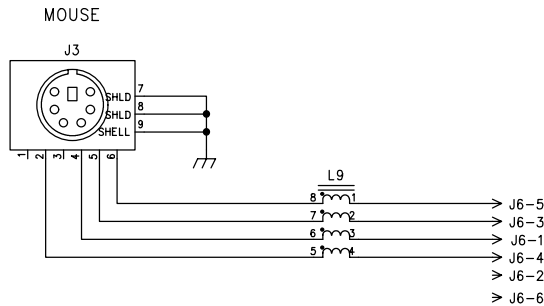
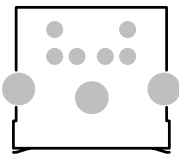
J4



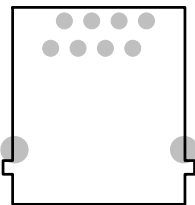
J6

J6 connects to the Mouseport of the motherboard

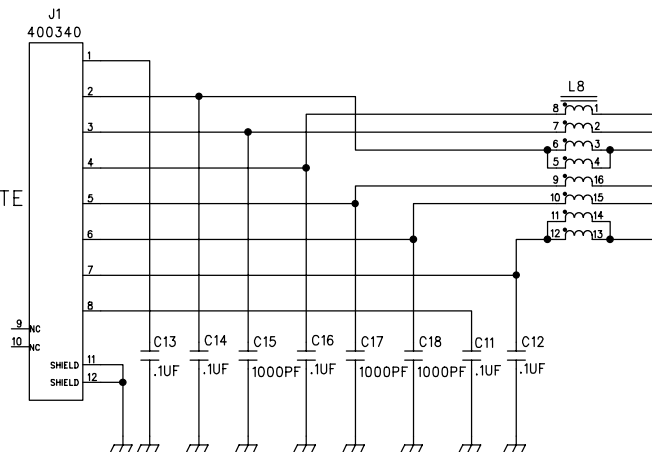
J3



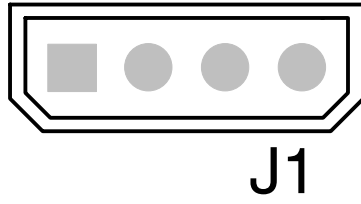
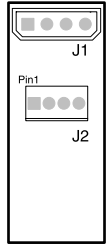
J1



RJ 45 TO REMOTE



Post Stamp Board Connectors

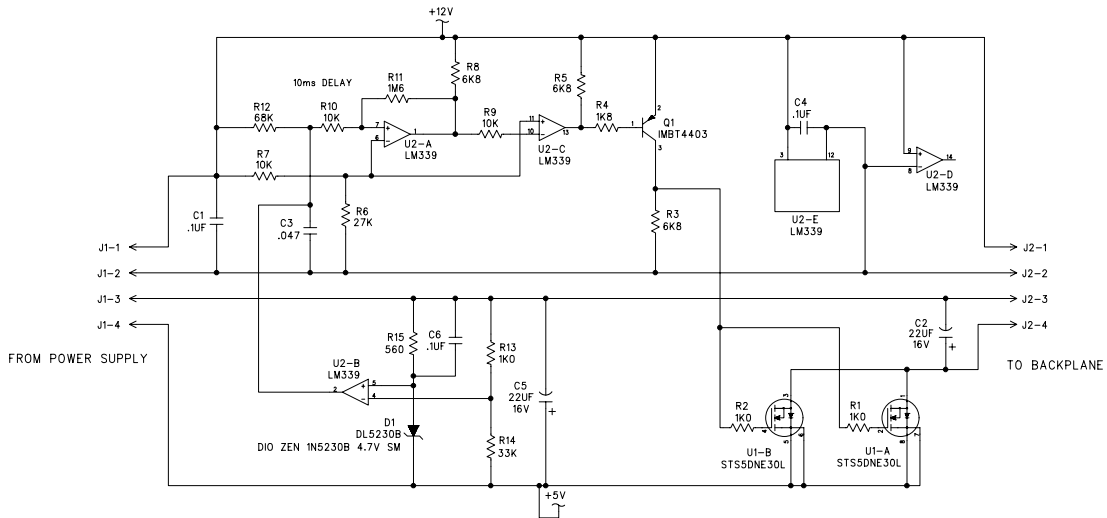


This connects to power supply

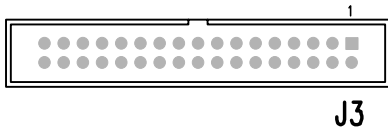
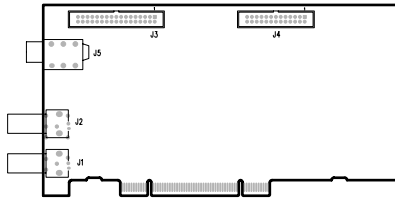
Pin1



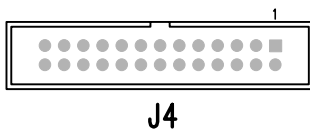
This connects to J2 of the backplane board, see page 10



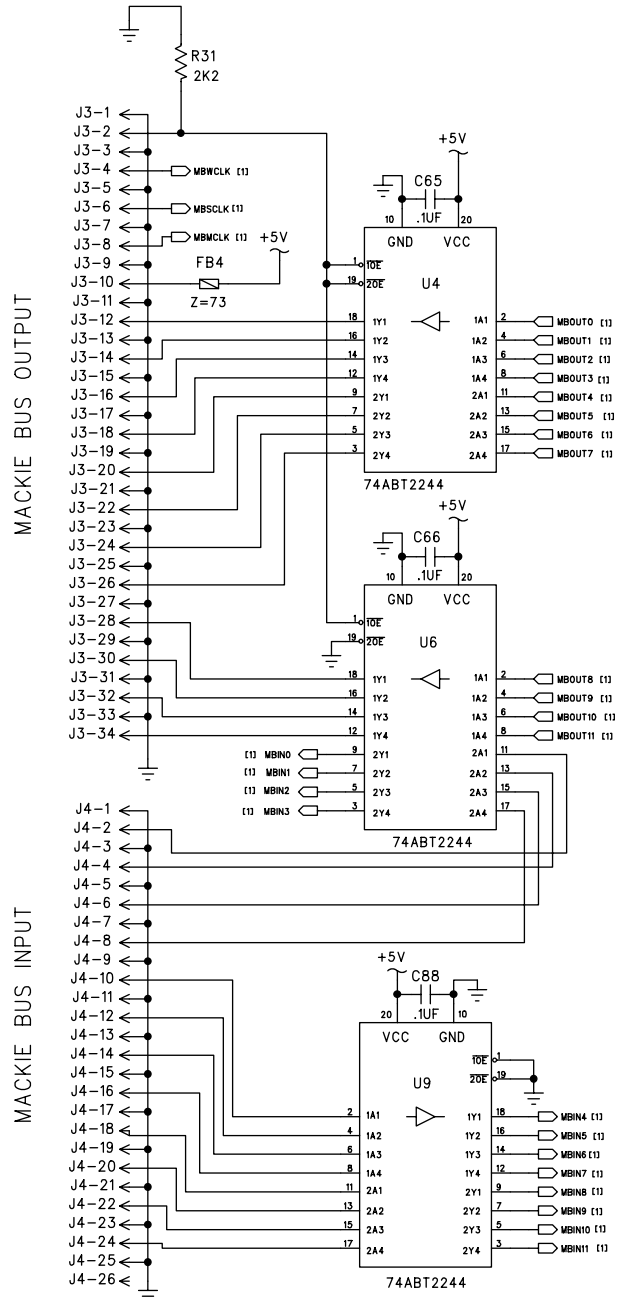
Acuma Board Connectors



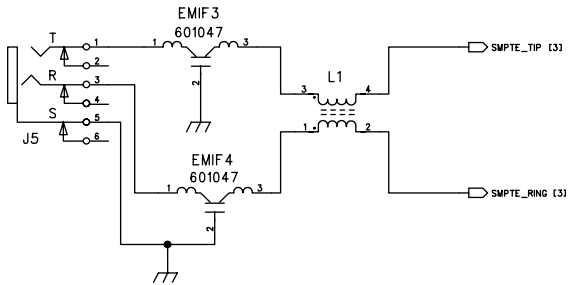
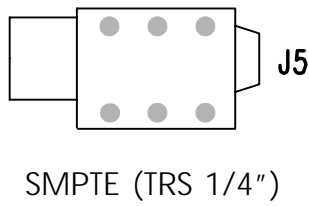
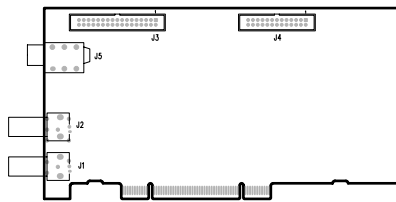
This connects to J3 of the Backplane, see page 10



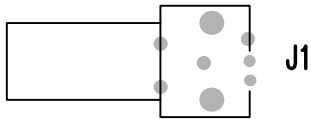
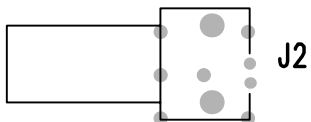
This connects to J4 of the Motherboard, see page 10



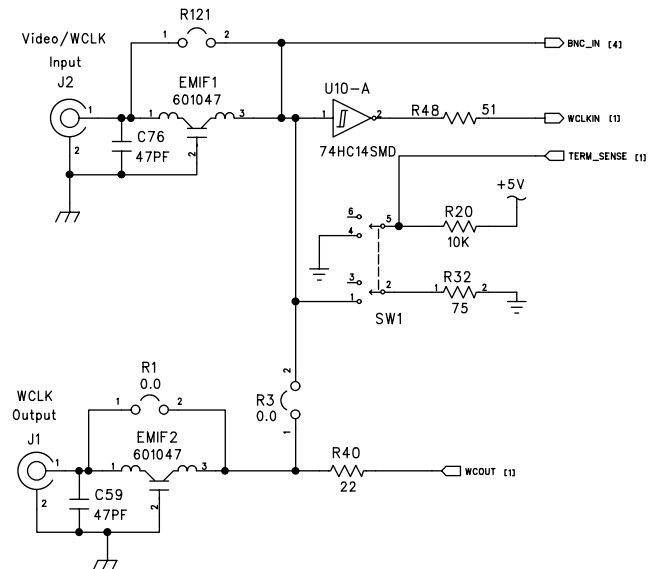
Acuma Board Connectors



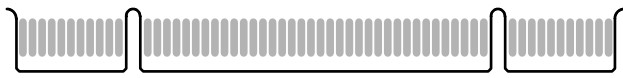
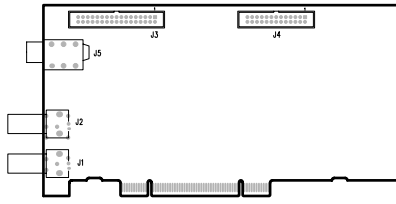
CLK IN (BNC)



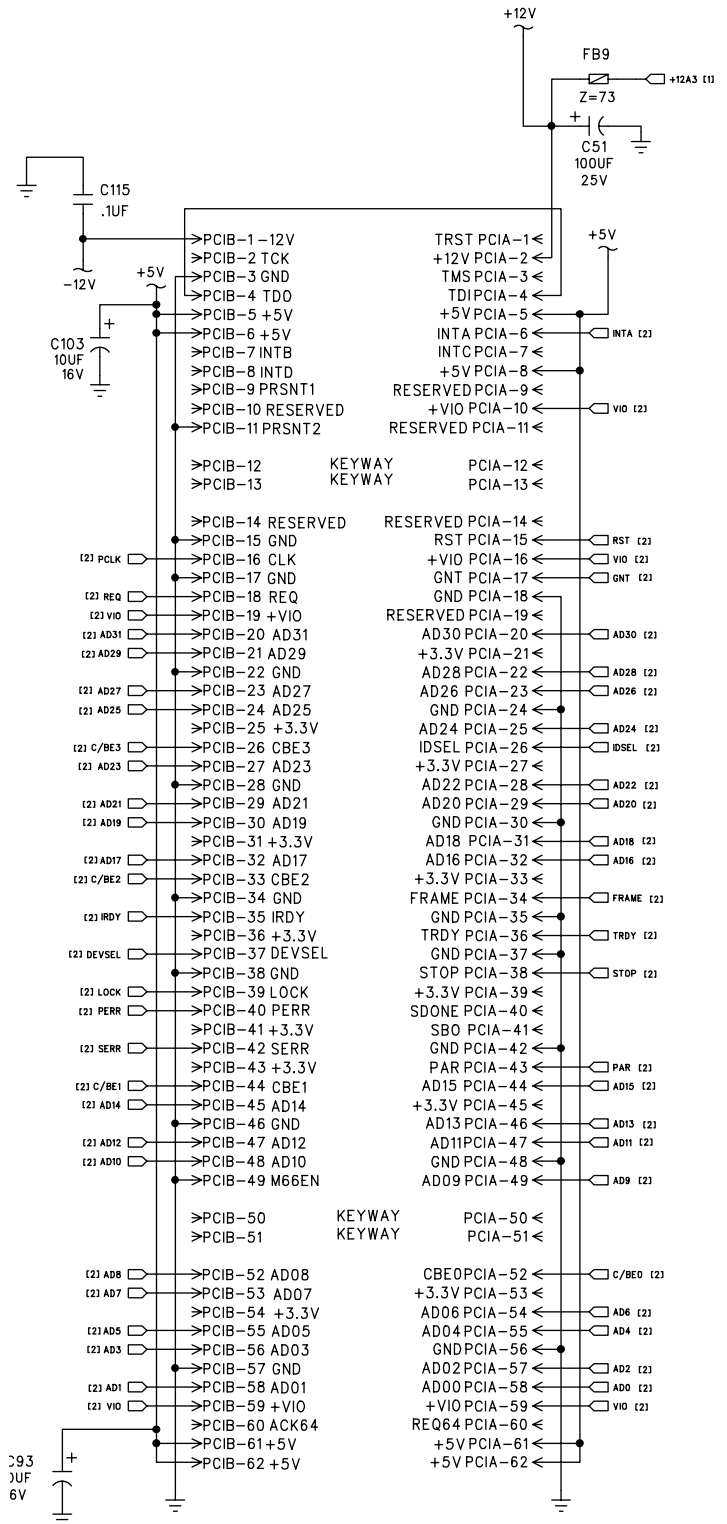
CLK OUT (BNC)



Acuma Board Connectors

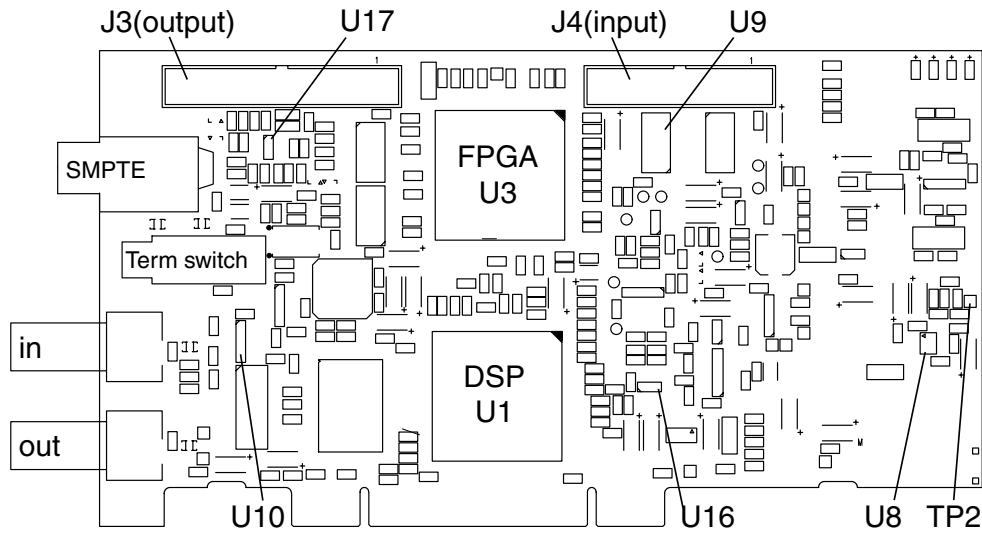


PCI connector



Acuma Board notes

The Acuma board is used to transfer audio from the converter card cage to the PC via the PCI bus. It is also where the SMPTE and Word Clock connection comes into the PC. Physically, it is a card which fits into the PCI bus of the PC, and connects via 2 ribbon cables to the card cage. It has jacks which extend out the back of the unit for WCLK in (BNC), WCLK out (BNC), and SMPTE (1/4"). There is also a pushbutton for selecting termination impedance.



All the audio data comes over the ribbon cables from the card cages to the Acuma card. This data is in digital format. If channels are dead, the ribbon cable connectors are a good place to start looking since they are readily accessible. For instance, for HDR input channels, look at the signals on J4. If you see activity on here, then the problem is on the Acuma card (check U9). If no activity is visible, the problem is within the card cage - possibly a bad I/O card. For output channels, look on J3. These signals 'flow' the other way, so if no activity is visible, the problem is on the Acuma card.

A failure in the SMPTE transmit or sync capability could be related to a bad component or faulty joint in the SMPTE circuit. A small amount of analog circuitry (around U17) is used to buffer incoming signals or generate outgoing signals, and then these are converted to digital signals (U16) and fed into the FPGA (U3). Tracing from the FPGA to the jacks might help to spot a problem.

The card contains a PLL for generating WCLK. If WCLK out capabilities are defective, this circuit could be the culprit. Chip U8 is the 'guts' of this. The FPGA (U3) generates signals (FIN_A and FIN_B) which are smoothed out by the PLL, visible at TP2. This circuit is extremely sensitive, and bad performance may be caused by a poor joint or 'worn out' passive component around U8.

WCLK sync capability is fairly simple. Incoming signals are buffered (U10) and then fed to the FPGA (U3). Again, tracing from the FPGA back to the jack is a good way to start.

A lot of the "complicated stuff" is handled within the DSP (U1) or FPGA (U3). If either of these components fail, rework is not possible and the card will need replacement.

Small Remote Self-Test

There is a self-test for the small remote which will help you verify that it is working correctly. Follow the steps below to enter the self-test mode:

1. Connect the small remote to the back of the HDR24/96.
2. Put a floppy in the HDR to keep it from booting up (so it will provide power for the small remote without resetting it).
3. On the small remote, hold down Rec Arm 1+2 while powering up the HDR24/96.
4. All leds should light, the firmware version will be displayed on the 7-segment displays (such as 1.03).

In this TEST MODE:

- Pressing any button will extinguish the associated LED
- The INC / DEC buttons control the 7-seg displays and VU meter
- The footswitch controls the (minutes) LED

HDR24/96 Troubleshooting Tips

The following tips come from one of our fearless Mackie service technician heroes. These tips were given of his own free will, in order to help out fellow service techs wherever they may be. We would like to state that he was not harmed, threatened, intimidated, or blackmailed very much.

If you see "No boot" or Video Error 43:

- With the power off, try reseating the Processor IC or the ROM.
- Try removing the Sync/Audio PCI card and see if the error changes. This may show if the card is bad.
- Check cables and connections, and the DC supply connections to the motherboard.
- Possible bad motherboard.

May boot, but won't load software:

- Possible bad hard drive.

External Drive not seen:

- Check cables and connections.
- Possible bad drive bay.

If you see memory extraction error:

- CMOS settings not correct.
- Possible bad hard drive.

Have seen a few bad LEDs on the front panel display

Check the EPROM version. Look at the service bulletin at the end of this manual

BIOS Settings:

Standard CMOS Setup:

Date (mm:dd:yy) : *Current Date*
 Time (hh:mm:ss) : *Current Time*

Hard Disks:	Type:	Size:	Cyls:	Head:	Precomp:	Landz:	Sector:	Mode:
PrimaryMaster	Auto	0	0	0	0	0	0	Auto
Primary Slave	None	0	0	0	0	0	0	_____
Sec Master	Auto	0	0	0	0	0	0	Auto
Sec Slave	None	0	0	0	0	0	0	_____

Drive A: 1.44M, 3.5 in.
 Drive B: None

Video: EGA/VGA
 Halt On: All, But Keyboard

Base Memory: 640K
 Extended Memory: 130048K
 Other Memory: 384K
 Total Memory: 131072K

NOTE: DO NOT use the IDE HDD AUTO DETECTION utility located in the main BIOS screen to mount IDE hard drives. Instead, set the "Type" field for the Primary Master and Secondary Master drives in the drive setup menu above to "Auto." This will cause the BIOS to automatically detect any changes in drive status each time the HDR boots up.

BIOS Features Setup:

Virus Warning : Disabled
 CPU L1 Cache : Enabled
 CPU L2 Cache : Enabled
 CPU L2 Cache ECC Checking: Enabled
 Quick Power On Self Test : Enabled
 Boot Sequence : A,C,SCSI
 Swap Floppy Drive : Disabled
 Boot Up Floppy Seek : Disabled
 Boot Up NumLock Status : On
 Typematic Rate Setting : Disabled
 Typematic Rate (Chars/Sec) : 6
 Typematic Delay (Msec) : 250
 Security Option : Setup
 PCI/VGA Palette Snoop : Disabled
 OS Select For DRAM > 64MB : Non-OS2
 HDD S.M.A.R.T. Capability : Disabled

Chipset Features Setup:

SDRAM RAS-to-CAS Delay	: 3
SDRAM RAS Precharge Time	: 3
SDRAM CAS Latency Time	: 3
SDRAM Precharge Control	: Disabled
DRAM Data Integrity Mode	: Non-ECC
System BIOS Cacheable	: Disabled
Video BIOS Cacheable	: Disabled
Video RAM Cacheable	: Disabled
8 Bit I/O Recovery Time	: 1
16 Bit I/O Recovery Time	: 1
Memory Hole At 15M-16M	: Disabled
PCI 2.1 Compliance	: Enabled
AGP Aperture Size (MB)	: 64
CPU/PCI Clock (MHz)	: Default
Spread Spectrum	: Enabled

Power Management Setup:

ACPI Function	: Disabled
Power Management	: User Define
PM Control By APM	: Yes
Video Off Method	: DPMS
Video Off After	: Suspend
MODEM Use IRQ	: NA
Standby Mode	: Disabled
Suspend Mode	: Disabled
HDD Power Down	: Disabled
PCI/VGA Act-Monitor	: Disabled
Soft-Off by PWR-BTTN	: Instant-Off
PWR Lost Resume State	: Keep Off
Resume on Ring	: Disabled
Resume on LAN	: Disabled
Resume on Alarm	: Disabled

continued....

PCI/PNP Configuration:

Resources Controlled By	: Manual
Reset Configuration Data	: Disabled
Assign IRQ for VGA	: Disabled
Assign IRQ for USB	: Disabled
PCI Slot 1 Use IRQ	: Auto
PCI Slot 2 Use IRQ	: Auto
PCI Slot 3 Use IRQ	: Auto
PCI Slot 4 Use IRQ	: Auto

Used MEM Base Address: N/A

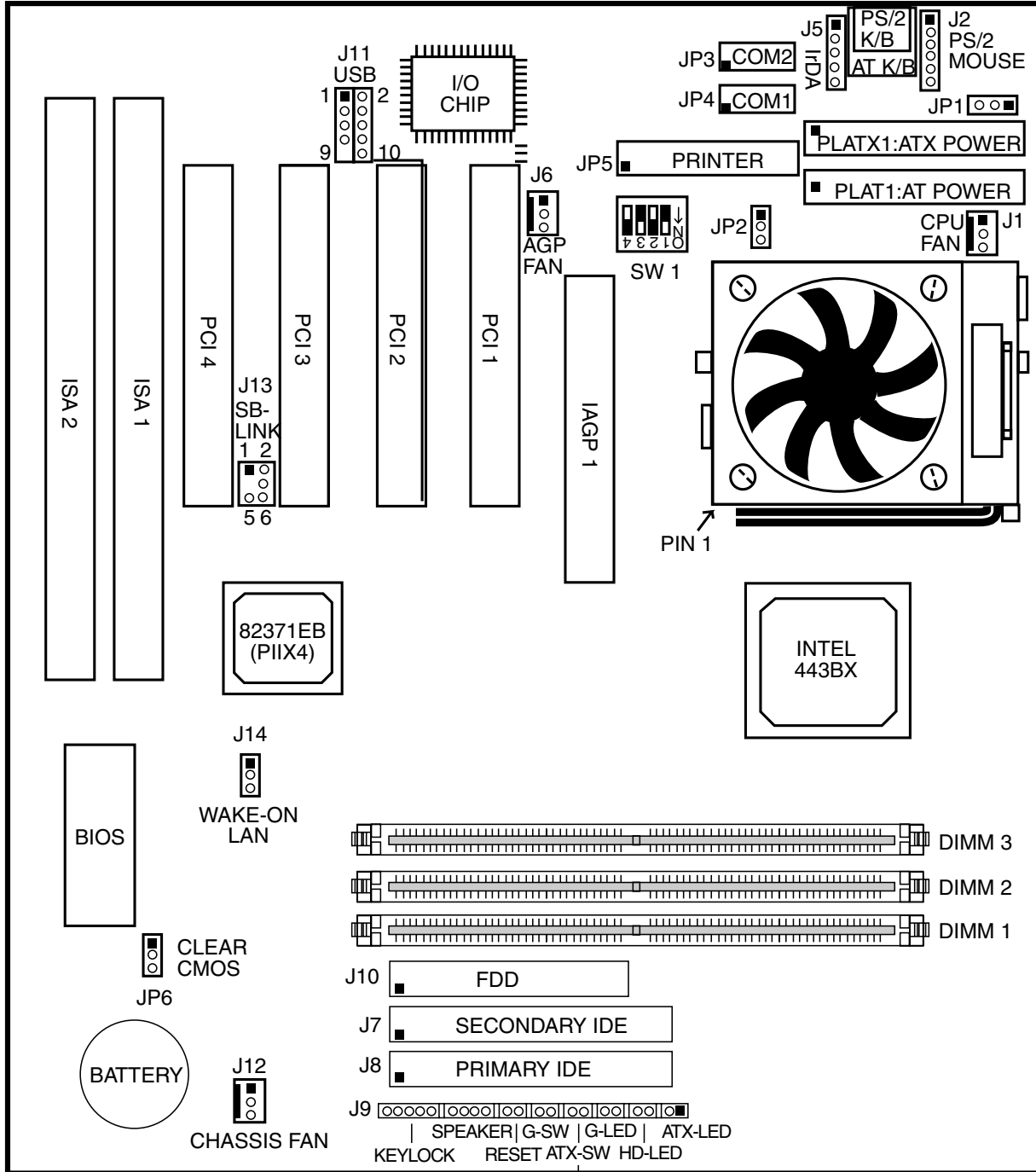
IRQ-3 Assigned to	: PCI/ISA PnP
IRQ-4 Assigned to	: PCI/ISA PnP
IRQ-5 Assigned to	: PCI/ISA PnP
IRQ-7 Assigned to	: PCI/ISA PnP
IRQ-9 Assigned to	: PCI/ISA PnP
IRQ-10 Assigned to	: Legacy ISA
IRQ-11 Assigned to	: PCI/ISA PnP
IRQ-12 Assigned to	: PCI/ISA PnP
IRQ-14 Assigned to	: PCI/ISA PnP
IRQ-15 Assigned to	: PCI/ISA PnP
DMA-0 Assigned to	: PCI/ISA PnP
DMA-1 Assigned to	: PCI/ISA PnP
DMA-3 Assigned to	: PCI/ISA PnP
DMA-5 Assigned to	: PCI/ISA PnP
DMA-6 Assigned to	: PCI/ISA PnP
DMA-7 Assigned to	: PCI/ISA PnP

Integrated Peripherals Setup:

IDE HDD Block Mode	: Enabled
IDE Primary Master PIO	: Auto
IDE Primary Slave PIO	: Auto
IDE Secondary Master PIO	: Auto
IDE Secondary Slave PIO	: Auto
IDE Primary Master UDMA	: Auto
IDE Primary Slave UDMA	: Auto
IDE Secondary Master UDMA	: Auto
IDE Secondary Slave UDMA	: Auto
On-Chip Primary PCI IDE	: Enabled
On-Chip Secondary PCI IDE	: Enabled
USB Keyboard Support	: Disabled
Init Display First	: AGP
KBC Input Clock	: 8 MHz
Onboard FDC Controller	: Enabled
Onboard Serial Port 1	: 3F8/IRQ4
Onboard Serial Port 2	: 2F8/IRQ3
UART2 Mode Select	: Normal
Onboard Parallel Port	: Disabled*
Keyboard/Mouse Power On	: Disabled

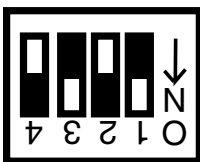
***NOTE:** Be sure that the Onboard Parallel Port is *Disabled* in this setup.

Motherboard layout



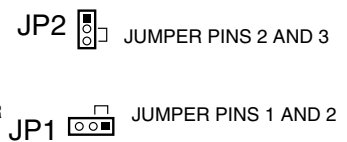
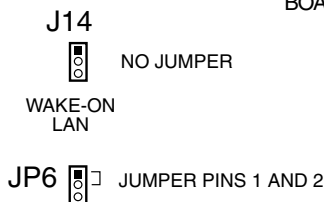
■ SQUARE PIN = PIN 1

TO J8 OF BRAIN BOARD

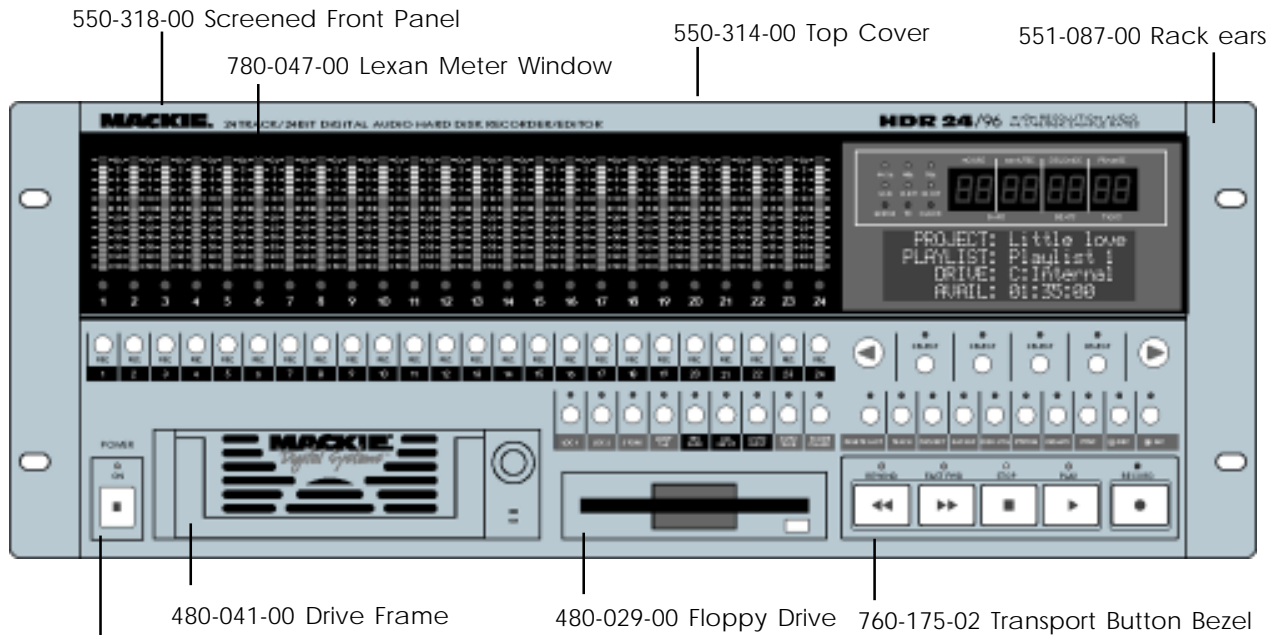


SW 1

SET SW1:
1=OFF
2=ON
3=OFF
4=ON

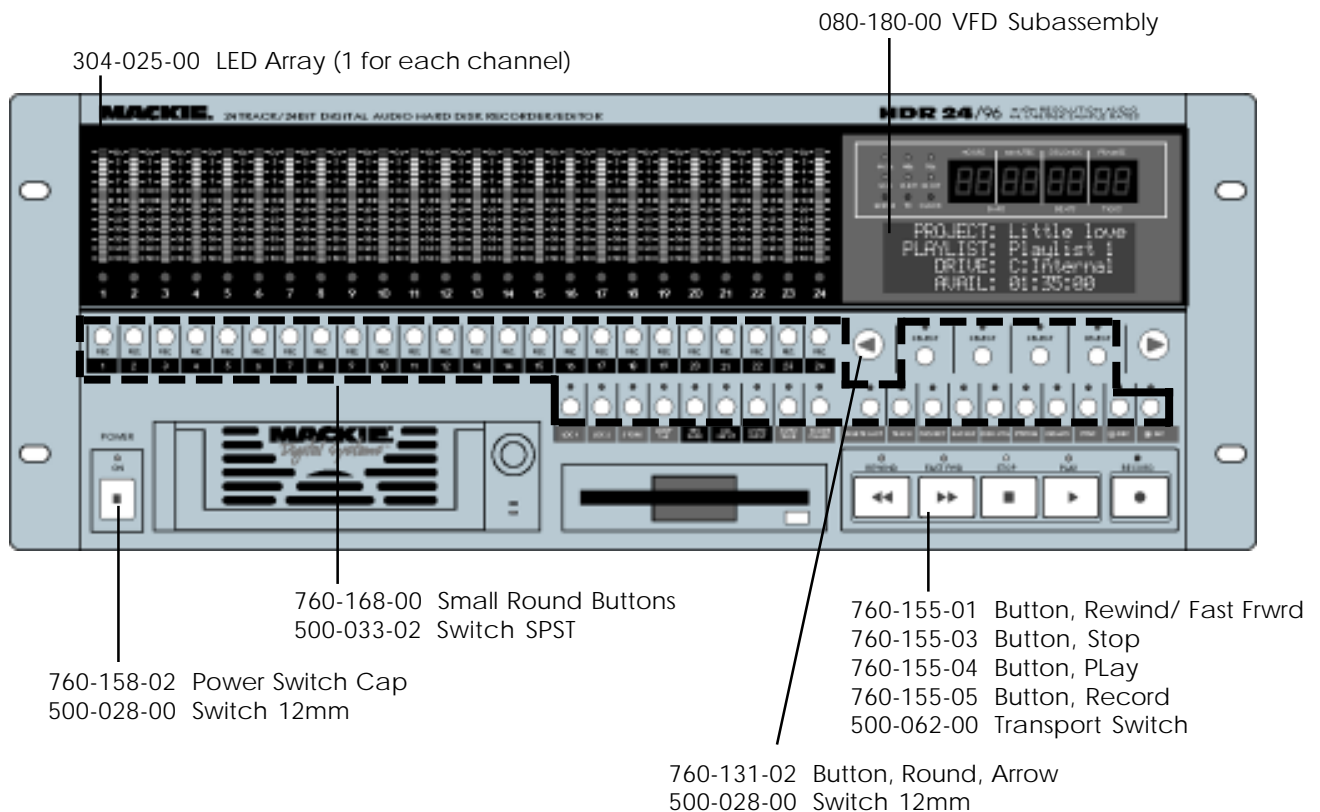


Quick Parts



760-159-01 Power Switch Bezel

- 750-001-0 Bump Feet
- 055-178-00-01 Front Panel PCB assembly
- 640-001-00 LineCord 120VAC

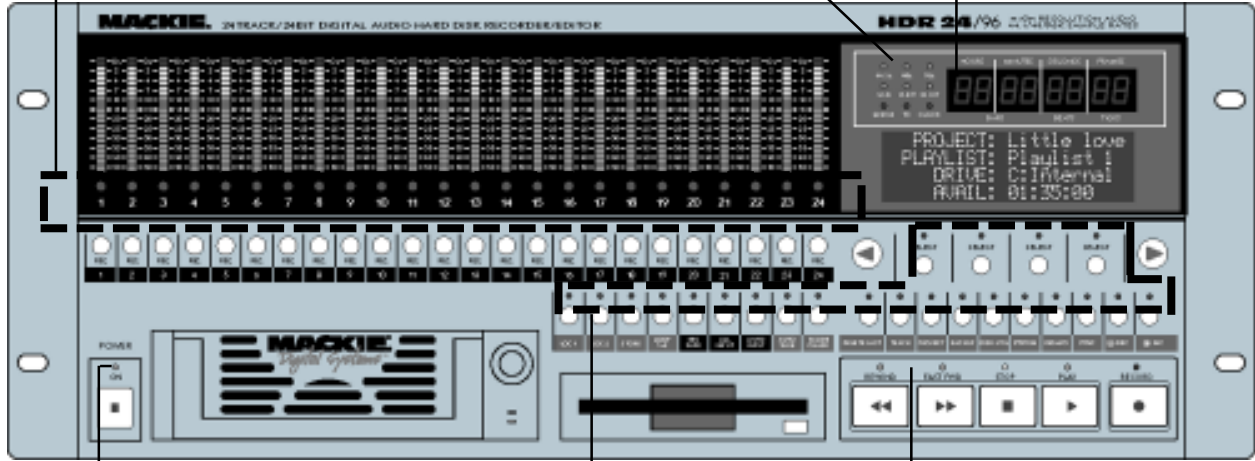


HDR 24/96 SERVICE MANUAL **MACKIE.**

304-081-02 LED Red, Error, TC, Clock
 304-082-02 LED Green, 6-Bit, 24-Bit, 44.1K, 48K, 96K, VARI

304-081-02 LED RED Channel LEDs (x24)

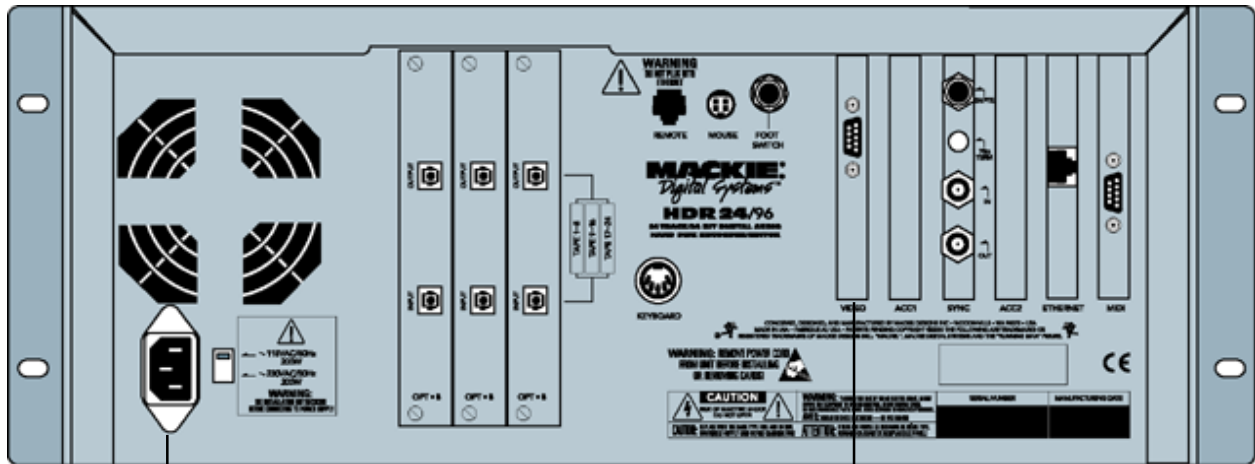
304-035-00 7 Segment Display



304-001-00 LED Red, Power

304-093-02 LED Red, Tower

304-001-00 LED Red, Record
 304-003-00 LED Yellow, FF, Stop, RW
 304-004-00 LED Green, Play



080-247-00 SA POWER SUPPLY

480-045-00 VIDEO CARD
 480-046-00 ETHERNET CARD
 480-053-00 MIDI CARD
 055-367-00-01 ACUMA CARD

- 055-178-00-01 PCB ASSY FRONT PANEL
- 055-179-00-01 PCB ASSY BACKPLANE
- 055-180-00-01 PCB ASSY BRAIN
- 055-268-00-01 PCB ASSY RMT I/O
- 055-359-00-01 PCB ASSY HDR179 POSTSTAMP
- 480-039-00 MOTHERBOARD CB50-BX
- 329-088-03 MICROPROC CELERON 433MHZ
- 480-043-00 OEM FAN MICROPROC
- 480-062-00 SDRAM 128MB 2MX8 DIMM MOD

HDR 24/96 PARTS LIST

Parts Numbering guide

040- Cables
 055- Finished PCB Assy
 100- Pots and resistors
 200- Capacitors
 300- Semiconductors
 400- Jacks/Connectors
 500- Switches
 510- Fuses
 550- Chassis Metalwork
 600- Transformers
 601- Inductors
 610- Wires and Cables
 640- AC line cords
 700- Hardware
 760- Knobs/Plastic
 770- Fans
 790- Misc./Packing
 800- Printed Material
 860- EPROM

<u>PART#</u>	<u>DESCRIPTION</u>	<u>PAGES</u>
090-082-00	Master Parts	A-2
055-178-00	Front Panel	A-4
055-179-00	Backplane	A-6
055-180-00	Brain	A-7
055-268-00	Remote I/O	A-8
055-359-00	Poststamp	A-9
055-367-00	Acuma	A-10
080-180-00	LCD Subassy	A-12
080-268-00	Data Cables Subassy	A-12
080-247-00	Power Supply Subassy	A-12




Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.

090-082-00 Rev A HDR 24/96 120VAC

Item	Part #	Description	Rev	Qty	Notes	
	3	040-383-00	RIB 28GA 10C 14.0 PLZD	A	1	
	4	040-384-00	RIB 28GA 26C 4IN PLZD	B	1	
	5	040-385-00	RIB 28G TRANS 34C 18.5IN	B	1	
	6	040-386-00	RIB 28G 26C .100 14.50IN	B	1	
	7	040-387-00	RIB 28GA 14C 16.0 PLZD	A	1	
	9	040-390-00	RIB 28GA 10C 7.00 PLZD	B	2	
	12	040-393-00	CBL ASY 22G 4C/6P 9.0IN	A	1	
	13	040-438-00	RIB 28GA 16P .100 15.50IN	A	1	
		040-489-00	DIS 18GA 4C 4.5IN PWR/MOL	A	1	
		040-496-00	DIS 18GA 4C 14IN PWR EX	A	1	
		040-497-00	DIS 22G 1007 2C/12P	A	1	
	14	055-178-00-01	PCB ASSY FRONT PANEL HDR	A3 A1	1	See page A4
	15	055-179-00-01	PCB ASSY BACKPLANE HDR	A A1	1	See page A6
	16	055-180-00-01	PCB ASSY BRAIN HDR	B A1	1	See page A7
	18	055-268-00-01	PCB ASSY RMT I/O HDR	A1 A1	1	See page A8
		055-359-00-01	PCB ASSY HDR179 POSTSTAMP	A A1	1	See page A9
		055-367-00-01	PCB ASSY ACUMA HDR	A7 A2	1	See page A10
	19	080-180-00	SA LCD ASSY HDR	A	1	See page A12
		080-218-03	OP SYS DISK 1 PRGMD V1-0	A A1	1	
		080-218-04	OP SYS DISK 2 PRGMD V1-0	A A1	1	
		080-246-00	SA DATA CABLES HDR	B	1	See page A12
⚠		080-247-00	SA POWER SUPPLY HDR	A	1	See page A12
⚠	20	329-088-03	MICROPROC CELERON 433MHZ	A	1	
		400-406-00	ADAPTER MIDI BRKOUT CABLE	A	1	
	22	480-024-00	BRKT BLANK PORT	A	2	
⚠	23	480-029-00	OEM FLOPPY DRV 3.5 BLACK	B	1	
⚠	24	480-039-00	OEM PCB MOTHER CB50-BX	A A1	1	
⚠	25	480-040-00	OEM HARDDRIVE 20.4G	B A1	1	
⚠	32	480-041-00	OEM DRIVE FRAME BLACK	A	1	
⚠	27	480-043-00	OEM FAN MICROPROC	A A1	1	
⚠	29	480-045-00	OEM VIDEO CARD	A A1	1	
⚠	30	480-046-00	OEM ETHERNET CARD	A A1	1	
⚠	31	480-053-00	OEM MIDI CARD WINMAN1X1	A A1	1	
⚠		480-062-00	SDRAM 128MB 2MX8 DIMM MOD	B A1	1	
	33	550-266-00	BRACKET FRONT PANEL HDR	A	1	
	34	550-309-00	CARD CAGE HDR	B	1	
	35	550-311-00	CARD RACK HDR	C	1	
	36	550-313-00	SUB CHASSIS HDR	C	1	
	37	550-314-00	PNT TOP COVER HDR	B	1	
	38	550-315-00	FAB ZINC-PLATED CHAS HDR	F	1	
	39	550-316-00	BRACKET 3.5 HDR	A	1	
	40	550-317-00	BRACKET 5.25 HDR	C	1	
	41	550-318-00	SCN FRONT PANEL HDR	C	1	
	42	550-319-00	BRACKET HARD DRIVE HDR	B	1	
	43	550-320-00	BRACKET SUB CHASSIS HDR	C	1	
	44	550-332-00	PNT BLANK COV PLATE SM D8	B	3	
	45	551-087-00	PNT EXTR RACKEAR HDR	C	2	
	50	700-028-00	SEMS 6-32X1/4 PHP BLKZC	B	60	
		700-034-00	SEMS 4-40X1/4 PHP BLKZC	A	10	
	51	700-036-02	MCH 6-32X1/4 FLT100DG CLR	A	29	
	52	700-055-00	MCH 4-24X3/8 PHP BLK HILO	A	4	
	53	700-085-03	SCR PHP M3X6 STL BLK ZC	A	8	
	54	700-086-00	TF 6-32X3/8 FL 100DG BLK	A	16	



Item	Part #	Description	Rev	Qty	Notes
	700-126-01	SCR 6-32X1/4 FL UNCUT BLK	A	3	
55	700-129-02	SCR 10-32X1/2 FLT PHP BLK	A	6	
	700-135-00	SEMS 6-32X1/4 PHP CL ZINC	A	19	
49	701-002-00	SM B 6X1/4 PHP BLKZC	A	6	
56	705-029-00	NUT HEX W/400-287-00	A	AR	
57	706-097-00	STDF HEX 6-32 .562L M/F	A	3	
57	706-097-00	STDF HEX 6-32 .562L M/F	A	2	
58	710-046-00	WASH FLAT W/400-287-00	A	AR	
57	706-097-00	STDF HEX 6-32 .562L M/F	A	2	
59	712-077-00	GASKET EMI CLP FDR 11.5IN	A	1	
60	712-078-00	GSKT EMI BKPLN SHLD 6SLOT	A	1	
61	712-079-00	GASKET EMI PERP CLIP .5IN	A	1	
62	730-001-00	THERMAL JOINT COMPOUND	A	AR	
	740-001-00	TYRAP 3-1/4L	A	7	
	740-002-00	TYRAP MOUNT .75 X .75	B	1	
	740-007-02	GROMMET STRIP LARGE	A	AR	
66	740-017-00	CARD GUIDE 4.0L SNAP-IN	A	6	
	740-023-00	FLT CBL CLMP NYL LOCK 40C	A	1	
	750-001-00	BUMPON ROUND BLK .63X.31	A	4	
68	760-130-00	DUST CVR 9S/15HD DSUB F B	A	2	
70	760-159-01	PWR SW BEZEL HDR POWER	C	1	
73	760-172-00	PLUG HARD DRIVE BAY HDR	A	1	
	760-175-02	TRSPRT BTN BEZEL HDR	B	1	
71	780-047-00	LEXAN METER HDR	A	1	
72	780-152-00	FOAM GASKET LED HDR	A	1	
	860-047-01	OP SFTWR HD V1.0 HDR	A	AR	
	640-001-00	LC IEC SJT 10A/125V 6FT	D	1	Lincord for 120 V model



Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.

055-178-00 Rev A Front Panel assembly

Part #	Description	Value	Ref Designator
140-025-00	RES TF SM .1W 5% 10 OHM	10 5%	R377 R390 R407-408
140-049-00	RES TF SM .1W 5% 100 OHM	100 5%	R381 R419
140-064-00	RES TF SM .1W 5% 430 OHM	430 5%	R1-12 R14-25 R30-41 R46-69 R74-85 R90-125 R130-153 R158-169 R176-199 R202-225 R230-241 R246-257 R262-285 R290-301 R306-329 R338 R340-350
140-068-00	RES TF SM .1W 5% 620 OHM	620 5%	R226-229 R242-245 R351 R353-355 R357-358 R372 R375 R379 R389 R391 R394 R396-399 R422 R429 R449 R455-457 R464 R468 R476
140-071-00	RES TF SM .1W 5% 820 OHM	820 5%	R362-369 R382-388 R392-393 R395 R400-406 R409 R414 R421 R423-428 R431 R433 R435-436 R438 R441-442 R444-448 R450-453 R458 R461 R463 R466 R469-470 R472 R474 R477-482
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0 5%	R13 R26-29 R42-45 R126-129 R154-157 R258-261 R286-289 R339 R352 R356 R473 R475
140-097-00	RES TF SM .1W 5% 10K OHM	10K 5%	R70-73 R86-89 R170-175 R200-201 R302-305 R330-337 R359-361 R370-371 R373-374 R376 R378 R380 R411 R415-416 R418 R420 R430 R432 R434 R437 R439-440 R443 R454 R459-460 R462 R465 R467 R471
140-123-00	RES TF SM .1W 5% 100K OHM	100K 5%	R410 R412-413 R417
212-001-00	CER .01UF 10% 50V X7R SM	.01 10%	C46
212-025-00	CAP CER .1UF 50V 10% X7R	.1UF 10%	C1-45 C47-54
301-004-00	DIO PWR DL4002 SM	DL4002	D67
△304-001-00	LED RED T-1 RED		D63 D78
△304-003-00	LED YELLOW T-1 YEL		D64-66
△304-004-00	LED GREEN T-1 GRN		D62
△304-025-00	LED ARRAY 46MM GRN\Y\RED		LED1-24
△304-035-00	DISPL 7SEG 1 DIG SUPR RED		D32-39
△304-081-02	LED RED W/.140 SPACER T/R	RED	D1-16 D24-31 D56 D59 D77
△304-082-02	LED GRN W/.140 SPACER T/R	GRN	D57-58 D60-61 D75-76
△304-093-02	LED RED TOWER W/.175 SPCR T/R	RED	D17-23 D40-55
311-001-00	XSTR NPN IMBT4401 SMT	IMBT4401	Q1
325-012-03	TTL 74HC595 SHIFT REG SM	74HC595	U1 U3 U5 U7 U9-53 U55-56 U59



HDR 24/96 SERVICE MANUAL **MACKIE.**

Part #	Description	Value	Ref Designator
325-025-03	CMOS 74HC597 SHIFT REG SM	74HC597	U2 U4 U6 U8 U54 U57 U60
325-053-03	TTL 74AC14 INV SH-TR SM	74AC14	U58
400-341-26	HDR 26P .10X2 STR LCK		J2
450-178-00	PCB, HDR24/96: FRONT PANEL		Z100
500-028-00	SW MOM SPST TACT 12MM PCM		SW48-49
500-033-02	SW TACT 6MMSQR 9.5H 260GF	SPST	SW1-47
500-062-00	SW, KEYBOARD N.O., 6425 SERIES 6425		SW50-55
⚠ 501-008-00	RELAY 2 FORM C TQ2E-5V		K1
620-002-00	CBL RIB 5C 26GA 2IN .100		J1
706-009-00	SPCR PLASTIC .385 LED		Z1
706-085-00	SPCR PVC .175 LED		Z2-11
760-131-02	BTN ARROW CURSOR		B48-49
760-155-01	BTN, TRANSPRT LG .61X.5 RWFF		B50-51
760-155-03	BTN, TRANSPRT LG .61X.5 STP		B52
760-155-04	BTN, TRANSPRT LG .61X.5 PLY		B53
760-155-05	BTN, TRANSPRT LG .61X.5 REC		B54
760-158-02	PWR SW CAP, HDR		B55
760-168-00	BTN .280 IN DIA HDR/D2B		B1-47



Components noted with this symbol shall be replaced only by the component specified.
This is required to maintain product safety.

055-179-00 Rev A Backplane assembly

Part #	Description	Value	Ref Designator
123-001-00	RES MO 3W 5% .1 OHM	.1 OHM 5%	R3
140-025-00	RES TF SM .1W 5% 10 OHM	10 5%	R32
140-049-00	RES TF SM .1W 5% 100 OHM	100 5%	R25
140-068-00	RES TF SM .1W 5% 620 OHM	620 5%	R44-53 R58-62
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0 5%	R4-5 R12 R19 R27-29
140-085-00	RES TF SM .1W 5% 3K3 OHM	3K3 5%	R9 R11 R15
140-097-00	RES TF SM .1W 5% 10K OHM	10K 5%	R7 R17 R22-23 R30
140-101-00	RES TF SM .1W 5% 15K OHM	15K 5%	R1-2 R8 R10 R16 R26
140-105-00	RES TF SM .1W 5% 22K OHM	22K 5%	R24
140-123-00	RES TF SM .1W 5% 100K OHM	100K 5%	R18 R20-21
140-126-00	RES TF SM .1W 5% 150K OHM	150K 5%	R6
140-135-00	RES TF SM .1W 5% 330K OHM	330K 5%	R13
140-147-00	RES TF SM .1W 5% 1M OHM	1M 5%	R14
145-000-00	RES TF SM .1W 0 OHM	0.0 5%	R33-36
145-281-00	RES MF SM .1W 1% 825 OHM	825 1%	R37-43 R54-57 R63-66
212-003-00	CER 100PF 5% 50V NPO SM	100PF 5%	C3
212-023-00	CER .001UF 10% 50V NPO SM	.001 10%	C4 C16
212-025-00	CAP CER .1UF 50V 10% X7R	.1UF 10%	C5 C8-11 C14
212-034-00	CER .022UF 10% 100V X7R	.022 10%	C12
220-002-02	LYT 47UF 20% 25V RAD TR	47UF 20%	C2 C6 C13
220-068-02	LYT 100UF 20% 35V 105C T/R	100UF 20%	C7
223-003-00	LYT 22UF 20% 6.3V SM	22UF 20%	C15
223-004-00	LYT 10UF 20% 16V SM	10UF 20%	C1
300-003-00	DIO SW DL4148 100V SM	DL4148 D6 D8	
301-027-00	DIO STKY BAR 3A 40V SM	SS34 D1-4	
302-003-03	DIO ZEN DL4745 16V 1W	DL4745A	D5 D7
311-001-00	XSTR NPN IMBT4401 SMT	IMBT4401	Q2-3 Q7
311-002-00	XSTR PNP MMST4403 SMT	IMBT4403	Q1 Q4
311-024-00	PWR MOSFET, N-CHANNEL	STS5DNE30	U3-4
323-002-00	LM339D QUAD COMP SM	LM339 U1-2	
400-200-00	I.S.A. EDGE CONNECTOR 2.54MM	J18-20	
400-206-00	HDR 4P .200X1 DISK DRIVE	J2	
400-341-10	HDR 10P .10X2 STR LCK	J1	
400-341-26	HDR 26P .10X2 STR LCK	J4	
400-341-34	HDR 34P .10X2 STR LCK	J3	
450-179-00	PCB, BK PLN SCSI HDR-2424	Z14	
600-039-00	XFMR	T2	
601-002-00	INDUCTOR 4.7UH AX	4.7UH L1-2	
601-010-00	FERRITE SMT POWER	Z=73 FB1-6	



055-180-00 Rev B Brain Assembly (Abe Normal)

Part #	Description	Value	Ref Designator
080-174-00	SA EPROM PRGMD PCB180-HDR		Z7
140-025-00	RES TF SM .1W 5% 10 OHM	10 5%	R4
140-042-00	RES TF SM .1W 5% 51 OHM	51 5%	R14 R18 R20-22 R24-27 R33-38 R43-44 R46-55 R57-62
140-049-00	RES TF SM .1W 5% 100 OHM	100 5%	R15 R23 R68 R74-77 R85-90 R93-97
140-057-00	RES TF SM .1W 5% 220 OHM	220 5%	R29
140-065-00	RES TF SM .1W 5% 470 OHM	470 5%	R82-83
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0 5%	R3 R98 R100
140-089-00	RES TF SM .1W 5% 4K7 OHM	4K7 5%	R56
140-097-00	RES TF SM .1W 5% 10K OHM	10K 5%	R1-2 R5-13 R16-17 R19 R28 R45 R63 R73 R79 R101-102
140-140-00	RES TF SM .1W 5% 510K OHM	510K 5%	R69
145-331-00	RES MF SM .1W 1% 2K49 OHM	2K49 1%	R71
145-380-00	RES MF SM .1W 1% 8K06 OHM	8K06 1%	R70
⚠ 159-002-00	THMS NTC 0805 15K 10% SM	15k OHMS	10% R84
⚠ 212-025-00	CAP CER .1UF 50V 10% X7R	.1UF 10%	C1-5 C7-16 C18-19 C21-22 C24-26
223-003-00	LYT 22UF 20% 6.3V SM	22UF 20%	C6
301-004-00	DIO PWR DL4002 SM	DL4002	D4
⚠ 304-064-03	LED RED SM 0805	RED	D1
⚠ 304-066-03	LED YELLOW SM 0805	YEL	D2
311-006-00	XSTR PNP IMBTA56 SMT	IMBTA56	Q1
311-024-00	XSTR MOSFET N-CH 5A 30V	STS5DNE30	U8
315-004-00	OSC J-LEAD 7.3728 MHZ SM	7.3728	X2
315-006-00	OSC J-LEAD 20 MHZ SM	20 MHZ	X1
324-004-03	232A DRIVER 5V SM	ADM232A	U1
325-010-03	TTL 74HCT574 OCT D FLP SM	74HCT574	U6 U9 U13
325-020-03	TTL 74HC04 HEX INV SM	74HC04	U15
325-037-03	74AC138 3 TO 8 DECODER	74AC138	U2 U4
329-040-03	IC SERIAL NUM DS2401	DS2401	U11
335-003-00	ADM705 SUPERVISOR CIRCUIT	ADM705	U12
335-004-00	TL16C452 ASYNC COMM	TL16C452	U3 U14
335-011-00	IC, SMD, DIGITAL SIGNAL PROCESSOR	PROPRIETARY	U7
400-028-00	HDR 2P .100X1 STR PLZD		J3 J8
400-206-00	HDR 4P .200X1 DISK DRIVE		J9
400-341-10	HDR 10P .10X2 STR LCK		J1
400-341-14	HDR 14P .10X2 STR LCK		J5
400-341-16	HDR 16P .10X2 STR LCK		J7
400-341-26	HDR 26P .10X2 STR LCK		J2
401-001-32	IC SOCKET 32PIN DIP		U5
450-180-00	PCB BRAIN HDR		Z5
⚠ 600-050-00	INVERTER DC/AC EL LCD		T1
⚠ 601-010-00	FERRITE SMT POWER	Z=73	FB1-4
706-033-11	STDF SWAGE NO.4 X .380L F		Z1-4



Components noted with this symbol shall be replaced only by the component specified.
This is required to maintain product safety.

055-268-00 Rev A Remote I/O

Part #	Description	Value	Ref Designator
122-037-00	RES MO 2W 5% 3.3 OHM	3.3 5%	R1 R4
140-049-00	RES TF SM .1W 5% 100 OHM	100 5%	R2
140-057-00	RES TF SM .1W 5% 220 OHM	220 5%	R5-6
140-066-00	RES TF SM .1W 5% 510 OHM	510 5%	R7 R9
140-070-00	RES TF SM .1W 5% 750 OHM	750 5%	R3 R8
212-003-00	CER 100PF 5% 50V NPO SM	100PF 5%	C4
212-010-00	CER .1 +80/-20 25V Z5U SM	.1UF +80/-20%	C1 C3 C8-9 C11-14 C16
212-037-00	CER 1000PF 2% 50V NPO SMT	1000PF 2%	C15 C17-18 C25
212-042-00	CER 470PF 5% 50V NPO SM	470PF 5%	C5-7 C10
220-002-02	LYT 47UF 20% 25V RAD TR	47UF 20%	C2
300-003-00	DIODE SIGNAL SMD	DL4148	D1
329-008-00	IC, OPTO-ISOLATOR	PC900	U1
400-001-00	HDR 6P .100 STR		J6
400-060-00	FUSE CLIP PCMT 5MM DIA		FC1-2
400-177-00	CONN, PS2 MOUSE		J3
400-206-00	HDR 4P .200X1 DISK DRIVE		J2
400-287-00	JACK 1/4 RTA PCMT METBUSH		J4
400-340-00	CONN MODULAR JACK W/SHLD RJ45		J1
400-341-10	HDR 10P .10X2 STR LCK		J9-10
400-341-14	HDR 14P .10X2 STR LCK		J5
450-268-00	PCB, HDR24/96; REMOTE I/O		Z100
⚠ 510-002-00	FUSE SB .5A 5X20 250V IEC	.5A	F1
601-010-00	FERRITE SMT POWER	Z=73	L1 L6
601-036-00	EMI/RFI FILTER, 4 LINE	5UH/WIND	L9
601-037-00	EMI/RFI FILTER, 8 LINE	5UH/WIND	L8
601-038-00	EMI SUPPRESSION FILTER	2200PF	L2-5 L7
712-020-00	BRKT ANG 6-32X.037THK STL		BRKT1
712-021-01	RVT CL END .125X.062-.125		RVT1-2



055-359-00 Rev A Poststamp assembly

Part #	Description	Value	Ref Designator
140-067-00	RES TF SM .1W 5% 560 OHM	560 5%	R15
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0 5%	R1-2 R13
140-079-00	RES TF SM .1W 5% 1K8 OHM	1K8 5%	R4
140-093-00	RES TF SM .1W 5% 6K8 OHM	6K8 5%	R3 R5 R8
140-097-00	RES TF SM .1W 5% 10K OHM	10K 5%	R7 R9-10
140-108-00	RES TF SM .1W 5% 27K OHM	27K 5%	R6
140-110-00	RES TF SM .1W 5% 33K OHM	33K 5%	R14
140-118-00	RES TF SM .1W 5% 68K OHM	68K 5%	R12
140-152-00	RES TF SM .1W 5% 1M6 OHM	1M6 5%	R11
212-007-00	CER .047UF 20% 50V Z5U SM	.047 20%	C3
212-010-00	CER .1 +80/-20 25V Z5U SM	.1UF +80/-20%	C1 C4 C6
⚠ 222-001-00	TANT 22UF 20% 16V SM	22UF 5%	C2 C5
⚠ 302-002-03	DIO ZEN 1N5230B 4.7V SM	DL5230B	D1
⚠ 311-002-00	XSTR PNP MMST4403 SMT	IMBT4403	Q1
⚠ 311-024-00	PWR MOSFET, N-CHANNEL	STS5DNE30	U1
⚠ 323-002-00	LM339D QUAD COMP SM	LM339	U2
400-206-00	HDR 4P .200X1 DISK DRIVE		J1
400-211-00	HDR 4P .156X1 STR LOCK		J2
450-359-00	PCB, HDR179 POSTSTAMP		Z4



Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.

055-367-00 Rev A Acuma Assembly

Part #	Description	Value	Ref Designator
140-025-00	RES TF SM .1W 5% 10 OHM	10 5%	R19 R26-27 R76 R136
140-033-00	RES TF SM .1W 5% 22 OHM	22 5%	R40
140-035-00	RES TF SM .1W 5% 27 OHM	27 5%	R23-24 R33
140-037-00	RES TF SM .1W 5% 33 OHM	33 5%	R18 R61-62 R70 R75
140-042-00	RES TF SM .1W 5% 51 OHM	51 5%	R4 R34-35 R48 R108-109 R138
140-046-00	RES TF SM .1W 5% 75 OHM	75 5%	R32
140-047-00	RES TF SM .1W 5% 82 OHM	82 5%	R29 R36-37 R44-45 R64 R66-68
140-049-00	RES TF SM .1W 5% 100 OHM	100 5%	R69
140-051-00	RES TF SM .1W 5% 120 OHM	120 5%	R63 R132-133
140-057-00	RES TF SM .1W 5% 220 OHM	220 5%	R72 R74
140-066-00	RES TF SM .1W 5% 510 OHM	510 5%	R104
140-067-00	RES TF SM .1W 5% 560 OHM	560 5%	R50-51
140-068-00	RES TF SM .1W 5% 620 OHM	620 5%	R106
140-073-00	RES TF SM .1W 5% 1K0 OHM	1K0 5%	R8 R21-22 R42-43 R52 R54-60 R71 R73 R77 R94-97 R118-120 R125-130
140-080-00	RES TF SM .1W 5% 2K0 OHM	2K 5%	R131
140-081-00	RES TF SM .1W 5% 2K2 OHM	2K2 5%	R25 R28 R31 R65 R114
140-085-00	RES TF SM .1W 5% 3K3 OHM	3K3 5%	R116
140-087-00	RES TF SM .1W 5% 3K9 OHM	3K9 5%	R139
140-089-00	RES TF SM .1W 5% 4K7 OHM	4K7 5%	R140
140-097-00	RES TF SM .1W 5% 10K OHM	10K 5%	R5-7 R9-16 R20 R80-83 R90-93
140-104-00	RES TF SM .1W 5% 20K OHM	20K 5%	R86-87 R134-135
140-131-00	RES TF SM .1W 5% 220K OHM	220K 5%	R84-85
140-143-00	RES TF SM .1W 5% 680K OHM	680K 5%	R107
140-155-00	RES TF SM .1W 5% 2M2	2M2 5%	R46-47
145-000-00	RES TF SM .1W 0 OHM	0.0 5%	R17 R78-79 R89 R113 R117
145-234-00	RES MF SM .1W 1% 267 OHM	267 1%	R39
145-289-00	RES MF SM .1W 1% 1K00 OHM	1K00 1%	R38
145-297-00	RES MF SM .1W 1% 1K21 OHM	1K21 1%	R98-101
145-306-00	RES MF SM .1W 1% 1K50 OHM	1K50 1%	R2
145-343-00	RES MF SM .1W 1% 3K32 OHM	3K32 1%	R41
145-358-00	RES MF SM .1W 1% 4K75 OHM	4K75 1%	R30
145-389-00	RES MF SM .1W 1% 10K0 OHM	10K0 1%	R102-103
145-394-00	RES MF SM .1W 1% 11K3 OHM	11K3 1%	R137
212-003-00	CER 100PF 5% 50V NPO SM	100PF 5%	C90
212-008-00	CER .22UF +80/-20% 25V SM	.22 5%	C45
212-009-00	CER 47PF 5% 50V NPO SM	47PF 5%	C5-6 C48-49 C59 C76
212-016-00	CER 1000PF 5% 50V NPO SM	1000PF 5%	C106
212-025-00	CAP CER .1UF 50V 10% X7R	.1UF 10%	C1 C7-9 C15-17 C19 C21-31 C33 C38-44 C46-47 C58 C60-73 C75 C81 C83-89 C95 C100-102 C105 C107-108 C113-115
212-029-00	CER 270PF 5% 50V NPO SM	270PF 5%	C91-92
212-030-00	CER 1UF 16V 10% X7R 1206	1UF 10%	C77-78
212-044-00	CER 390PF 10% 50V NPO SM	390PF 10%	C10
212-045-00	CER 18PF 5% 50V NPO SM	18PF 5%	C34-37
212-046-00	CER 510PF 5% 50V 0805 SM	510PF 5%	C99
222-005-00	TANT 10UF 20% 16V SM	10UF 20%	C3-4 C93 C103 C109-112



HDR 24/96 SERVICE MANUAL **MACKIE.**

Part #	Description	Value	Ref Designator
222-006-00	TANT 1UF 10% 50V 6032 SM	1UF 10%	C20 C94
222-007-00	CAP TANT 4.7UF 10% 16V SM	4.7UF 10%	C2 C82
222-007-00	TANT 4.7UF 10% 16V 3216SM	4.7UF 10%	C52 C50
222-008-00	CAP TANT 10UF 10% 16V SM	10UF 10%	C11-13 C18 C32 C53-57 C79-80
222-008-00	TANT 10UF 10% 16V 6032 SM	10UF 10%	C74 C96-98 C104
223-009-00	LYT 100UF 20% 25V SMT	100UF 20%	C51
300-011-03	DIO, SIGNAL, DUAL, BAV99	BAV99	D10-11
300-012-03	SW DIODE BAS21 SMT	BAS21	D1-4
⚠ 304-064-03	LED RED SM 0805	RED	D6-9
315-017-00	CRYSTAL 24.576MHZ LOWPF	24.576	X2
315-026-00	CRYSTAL 22.5792MHZ LOWPF	22.5792	X3
315-033-00	OSC 65MHZ 5V 8DIP CAN	M3H13FAD-	X5
320-022-03	OP AMP VIDEO LT 1252	LT1252	U20
320-023-03	OP AMP DUAL LMV922M	LMV922M	U2 U17
⚠ 321-008-03	REG LM317L ADJ SM	LM317L	Q3
⚠ 321-014-03	REGULATOR, 3.3V, LDO	LT1129CST	Q1
325-007-03	TTL 74HC14A INV SH-TR SM	74HC14 U10 U19	
325-010-03	TTL 74HCT574 OCT D FLP SM	74HCT574	U28
325-019-03	TTL 74HC00 QUAD NAND SM	74HC00 U7	
325-024-03	TTL 74HC4316 QUAD MX/DEMX	74HC4316	U21
325-068-03	IC, QUAD 74LCX/LVCOO SMT	74LVC00	U12
325-082-03	TTL 74HCT08 QUAD AND SM	74HCT08	U11
325-109-03	74ABT2244 SMT 74ABT2244	U4 U6 U9	
325-110-03	Video Sync Separator	LM1881M	U18
329-057-03	IC, PLL SMD TLC2932IP		U8
329-089-03	IC, SMD, EIA RS-485/422 TRANSCEIVER	DS75176B	U16
329-090-03	IC, CPLD, PQFP208	EPF10K30A	U3
329-091-03	SSRAM 64K X 36, LQFP100	MT58LC64K	U5
329-092-03	EEPROM, 64K AT28bV64B-20Sc		U14
335-007-00	DSP XC56301PW-80	XC56301PW	U1
400-166-00	JACK 1/4 HRZ PCMNT STEREO	UJ-611-E	J5
400-312-00	BNC PCMT RTA 75 OHM LOW P ALL METAL		J1-2
400-341-26	HDR 26P .10X2 STR LCK		J4
400-341-34	HDR 34P .10X2 STR LCK		J3
450-367-00	PCB, ACUMA: HDR		Z1
500-063-00	SW PB DPDT DPDT		SW1
550-559-00	FAB BRKT SONORUS	CB-1128-M	Z4
⚠ 601-010-00	FERRITE SMT POWER	Z=73	FB3-4 FB7 FB9 FB11
⚠ 601-018-00	COMMON MODE CHOKE DUAL		L1
⚠ 601-047-00	EMI T-FILTER 47PF 47PF		EMIF1-4
700-011-00	MCH 4-40X1/4 BTNSKT BLKOX		Z2 Z5
760-100-00	BTN BLACK 10.5x8.8mm		Z3
NOT USED			R49 R53 R123-124 R88 R105 R110-111 R115 R1 R3 R112 R121-122 R200 C14



Components noted with this symbol shall be replaced only by the component specified. This is required to maintain product safety.

080-180-00 Rev A LCD Subassembly

Part #	Description	Rev	Quantity
040-430-00	CBL ASS 22G 1007 2C 12.00	A	1
304-077-00	LCD 24X4 EL/BKLT BLUE/WHT	A	1
400-257-00	HDR 16P .100X2 STR	A	1

080-246-00 Rev B Data Cable Subassembly

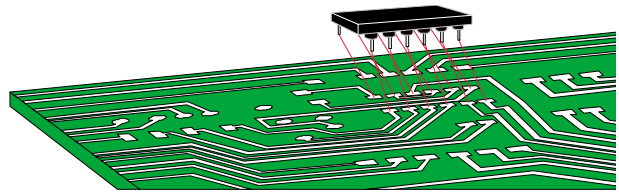
Part #	Description	Rev	Quantity
040-139-00	RIB 28GA 34C 23IN PLZD	B	1
040-392-00	RIB 28GA 40C 20IN PLZD	B	2
730-038-00	JET MELT 3M 3779-Q	A	AR

080-247-00 Rev A Power Supply Subassembly

Part #	Description	Rev	Quantity
 480-070-00	OEM PWR SUP 200W WO/SW	A	1
740-001-00	TYRAP 3-1/4L	A	1
740-002-00	TYRAP MOUNT .75 X .75	B	1
740-034-00	CBL WRAP SPIRAL PE .75"	A	AR



MACKIE®



THE MACKIE FIXER • MACKIE DESIGNS SERVICE NEWS

HDR 24/96 EPROM Replacement

Models affected:

If you are working on an HDR 24/96 hard disk recorder before serial number CD11218, please update the EPROM to Revision 1.2 or higher. Changing the EPROM may be one fix for the "system error 43" message.

Note:

If the EPROM is before Rev 1.2, the initial front panel message "loading..please wait" is all lower case letters.

If the EPROM is Rev 1.2, then the initial front panel message "Loading..Please Wait," has some upper case letters.

MACKIE DIGITAL SYSTEMS
HDR 24/96
loading, please wait

MACKIE DIGITAL SYSTEMS
HDR 24/96
Loading, Please Wait

*HDR 24/96
front panel
display just
after turn-on*

Safety Warning:



Caution! These instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing unless you are qualified to do so. Refer all service to qualified personnel.

ESD Warning:



Caution! The HDR 24/96 should be treated with respect and repaired using all standard ESD precautions.

Tools Required:

Phillips screwdriver, ESD wriststrap and workstation

Parts Required:

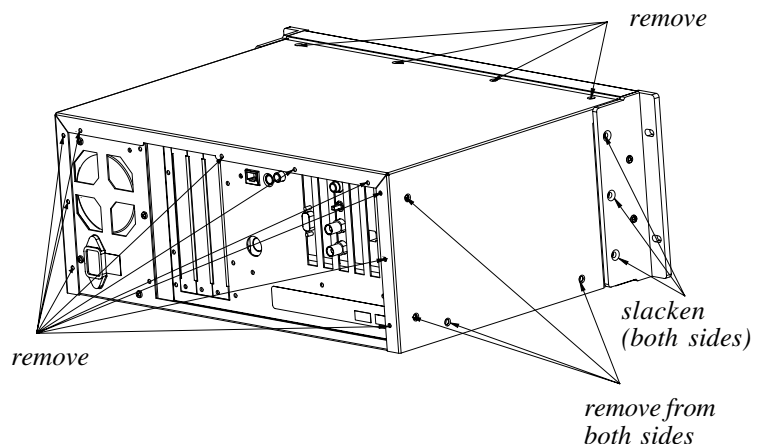
EPROM (revision 1.2 or higher) 080-174-00

Overview

The EPROM replacement is not a major job, so fear not. The EPROM is fitted to a socket on the Brain board in front of the internal hard drive.

Procedure:

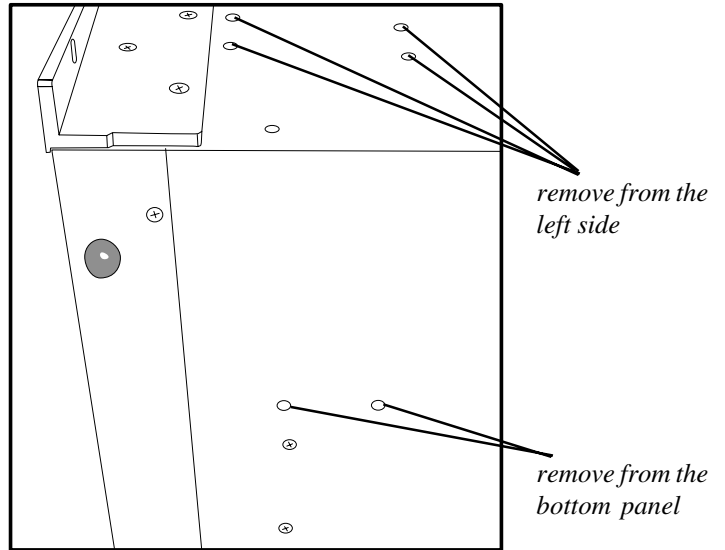
1. Turn off the power to the HDR 24/96.
2. Remove all cords (including the power cable and cables) from the HDR 24/96.
3. Place the HDR 24/96 on a soft surface.
4. Undo the three screws on each of the rack brackets, just enough to give a little slack when removing the top cover.
5. Remove the top cover by undoing the other screws shown.



Procedure continued:

6. Remove the four side screws and two bottom screws securing the internal hard drive assembly to the chassis. This gives a little bit more access to the Brain board, as the hard drive assembly can move backwards a small distance.

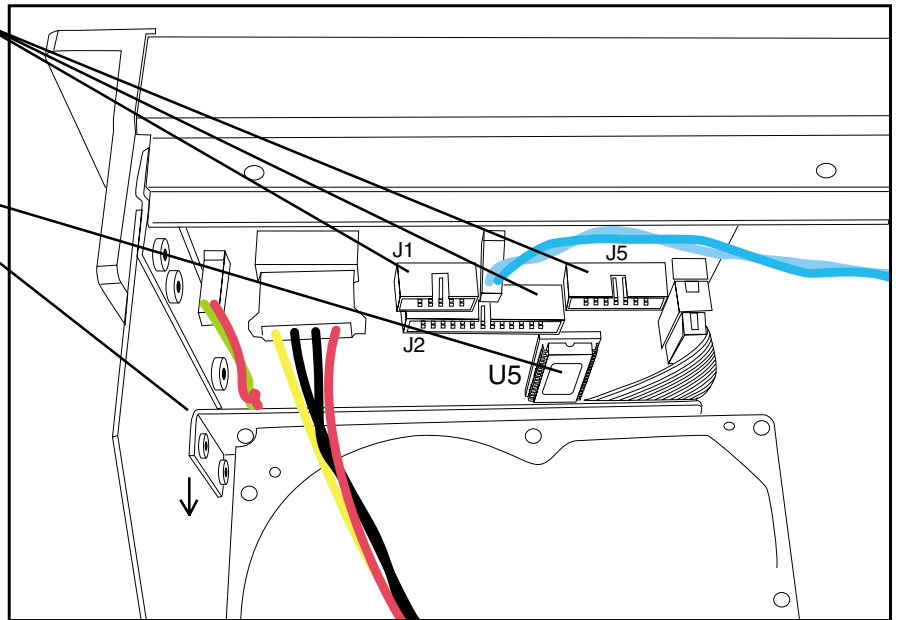
You can also remove the hard drive assembly if you prefer. Make a note of all the connections and the exact cable routing for when you put it back in.



7. Undo the connectors at J1, J5 and J2 on the Brain board. Move them out of the way so you can reach the EPROM U5.

8. Slide the hard drive assembly backwards to give you some room, and then use a small screwdriver to remove the existing EPROM from its socket.

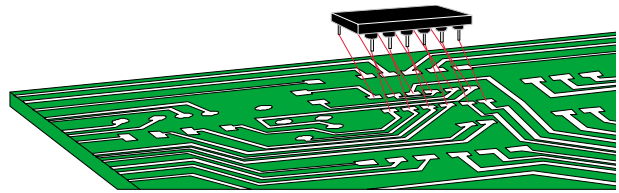
9. You should first bend the legs of the EPROM to make sure they are straight down. Then carefully and securely put in the new EPROM, making sure that each pin is in its socket. The notched end of the EPROM should point upwards.



10. Replace the six hard drive screws.
11. Replace the top cover and secure all the screws, including the rack bracket screws.
12. Perform a complete specification test before returning the HDR 24/96 to the customer.
13. The old EPROM may be saved and recycled as a unique earring, bound to break the ice at service technician parties.



MACKIE®



THE MACKIE FIXER • MACKIE DESIGNS SERVICE NEWS

HDR 24/96 Hard Disk Recorder

Bulletin: HDR 27April2001

Models affected: HDR 24/96

Add this as part of your normal repair procedures.

Symptom:

HDR 24/96 does not power up, and yet it tastes surprisingly good.

Possible Cause:

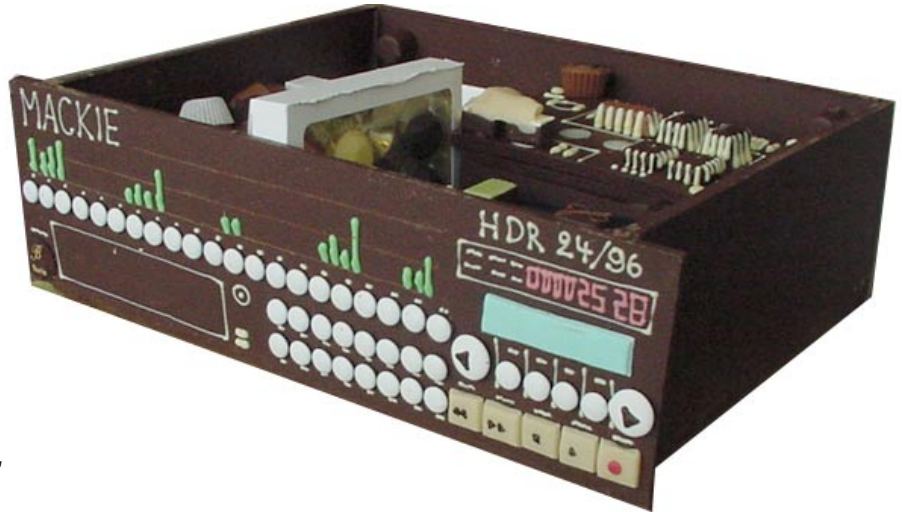
Due to a mix up in documentation, some HDR 24/96 hard disk recorders were accidentally made of chocolate.

Solution:

Replace all circuit boards, creme-filled ICs, marzipan transistors, truffle capacitors, all candy chassis work, screws and liquorice ribbon connectors.

Note:

Not all models are affected. If you receive an HDR 24/96 for repair, it is recommended that you nibble the front panel. If it tastes good and chocolaty, then follow the repair procedure outlined below. If it tastes metallic and you break a few teeth in the process, there may be another cause.



Safety Warning:



Caution! These instructions are for use by qualified personnel only. To avoid overeating, do not perform any servicing unless you are qualified to do so. Refer all service to qualified, hungry service personnel, who are specially trained to deal with chocolate, glazed donuts, pizza and other hazards.

Tools Required:

Phillips screwdriver, Torx and Allen drivers, safety glasses, knife, fork, safety bib and overalls.

Procedure:

1. Turn the power off and remove **all** external cables.
2. Place the HDR 24/96 on a soft dry surface.
3. Take off the top cover and inspect the circuit boards.
4. Using service tools (knife and fork), eat all the circuit boards one at a time, taking care to share with your service colleagues.
5. Eat all the chassiswork, ribbon connectors until the HDR 24/96 is gone.
6. Replace with a new model.
7. Perform a complete specification and taste test before returning the new unit to the customer.

