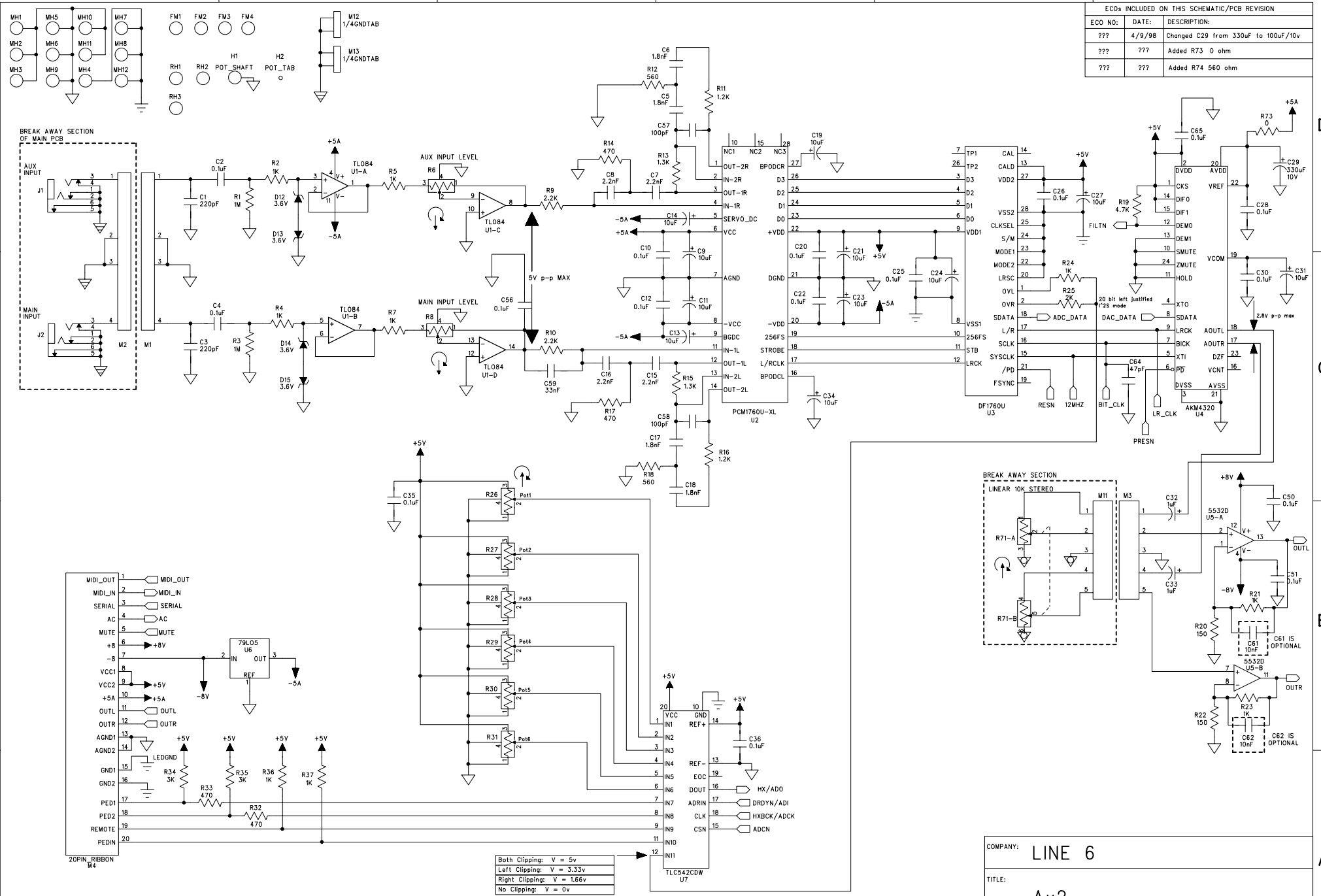
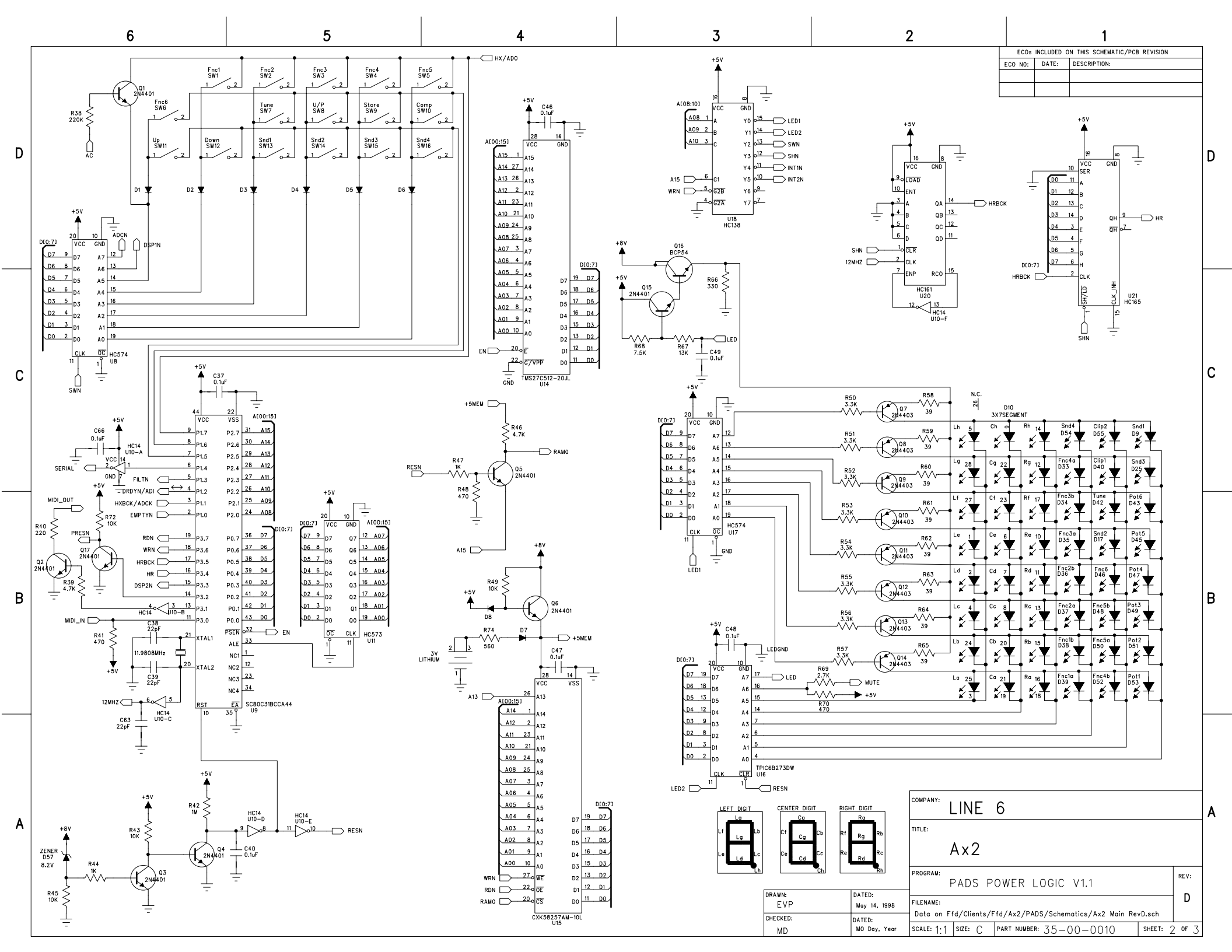
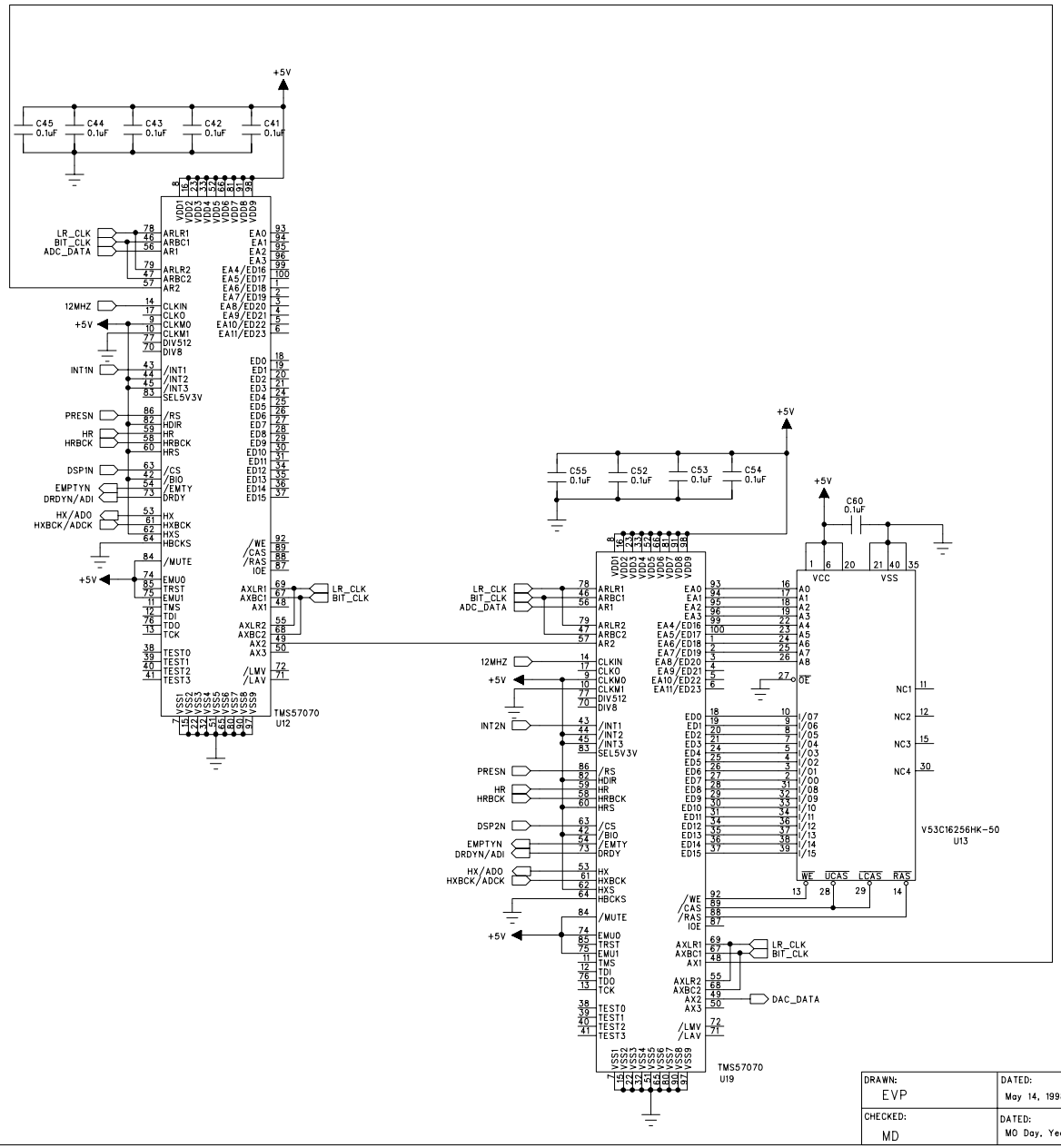
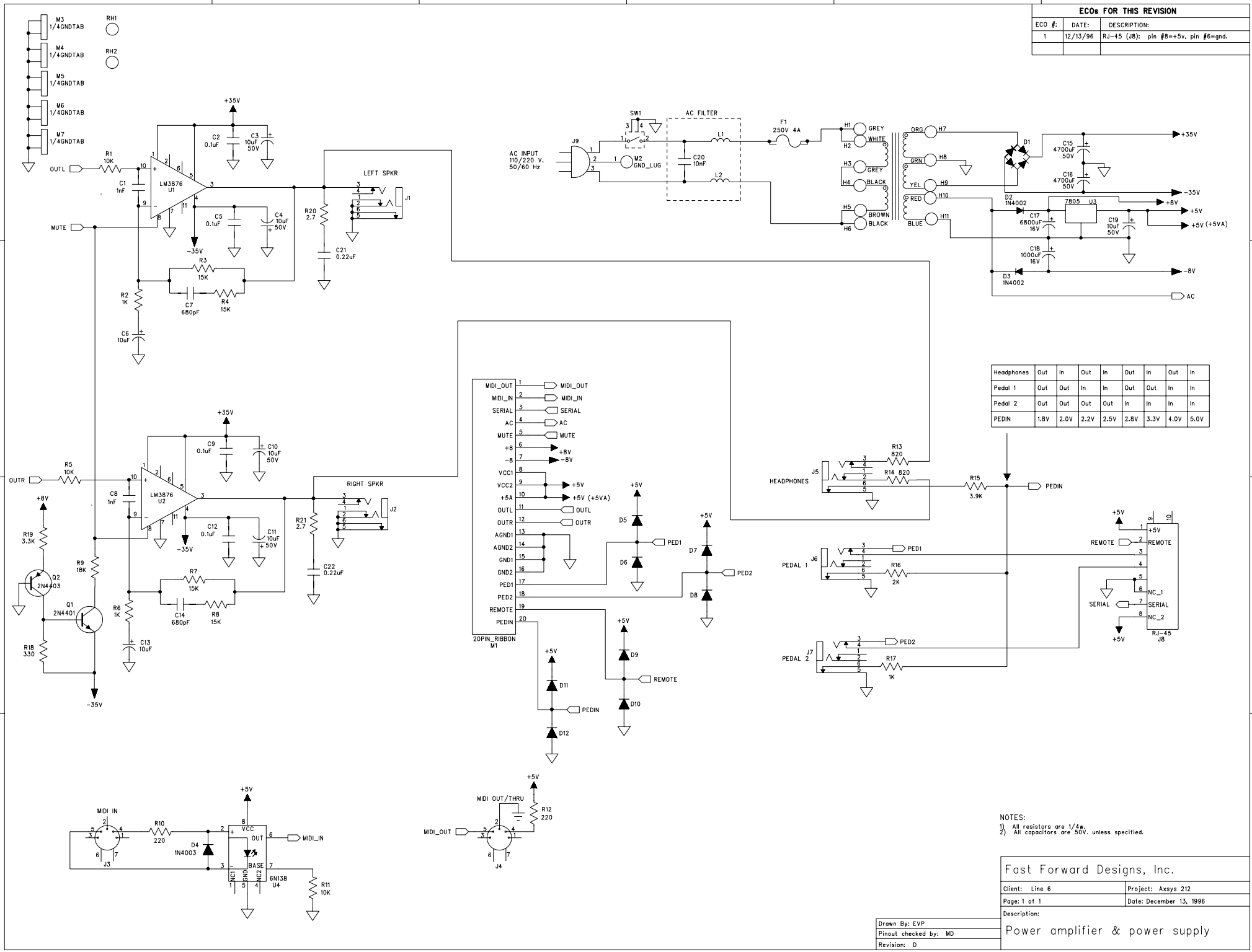

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION
ECO NO: | DATE: | DESCRIPTION:
??? | 4/9/98 | Changed C29 from 330uF to 100uF/10v
??? | ??? | Added R73 0 ohm
??? | ??? | Added R74 560 ohm
BREAK AWAY SECTION OF MAIN PCB
AUX INPUT
MAIN INPUT
AUX INPUT LEVEL
MAIN INPUT LEVEL
5V p-p MAX
TLO84 U1-A
TLO84 U1-B
TLO84 U1-C
TLO84 U1-D
PCM1760U-XL U2
DF1760U U3
AKM4320 U4
5532D U5-A
5532D U5-B
TLC542CDW U7
79L05 U6
20PIN_RIBBON M4
BREAK AWAY SECTION LINEAR 10K STEREO
20 bit left justified I²2S mode
2.8V p-p max
C61 IS OPTIONAL
C62 IS OPTIONAL
Both Clipping: V = 5v
Left Clipping: V = 3.33v
Right Clipping: V = 1.66v
No Clipping: V = 0v
COMPANY: LINE 6
TITLE: Ax2
PROGRAM: PADS POWER LOGIC V1.1
REV: D
FILENAME: Data on Ffd/Clients/Ffd/Ax2/PADS/Schematics/Ax2 Main RevD.sch
DRAWN: EVP
DATED: May 14, 1998
CHECKED: MD
DATED: MO Day, Year
SCALE: 1:1
SIZE: C
PART NUMBER: 35-00-0010
SHEET: 1 OF 3

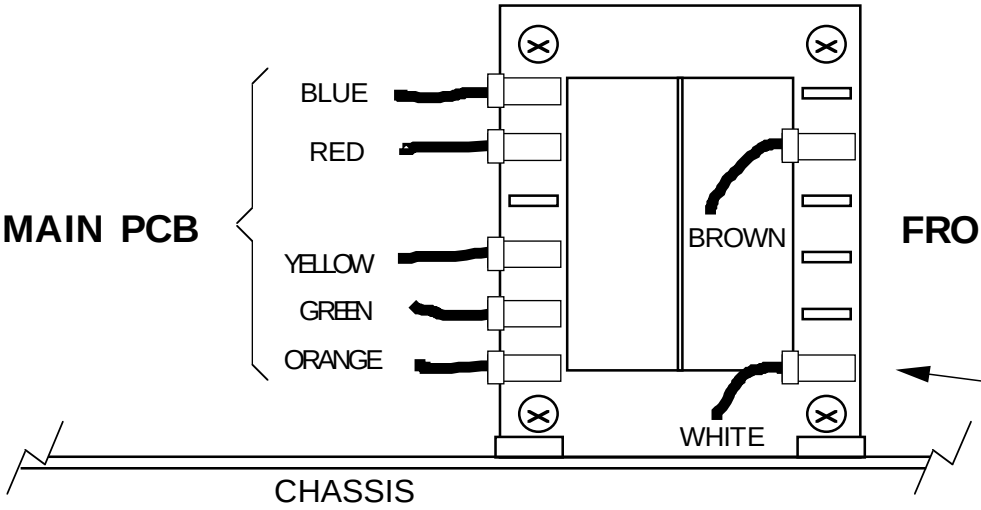

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION
ECO NO: DATE: DESCRIPTION:
HX/ADO
Fnc1 SW1
Fnc2 SW2
Fnc3 SW3
Fnc4 SW4
Fnc5 SW5
Fnc6 SW6
Tune SW7
U/P SW8
Store SW9
Comp SW10
Up SW11
Down SW12
Snd1 SW13
Snd2 SW14
Snd3 SW15
Snd4 SW16
Q1 2N4401
R38 220K
AC
D1
D2
D3
D4
D5
D6
+5V
C46 0.1uF
A[00:15]
D[0:7]
TMS27C512-20JL U14
A[08:10]
U18 HC138
LED1
LED2
SWN
INT1N
INT2N
HC161 U20
HC14 U10-F
LOAD
ENT
ENP
SHN
12MHZ
HRBCK
HR
HC165 U21
SER
SH/LD
CLK_INH
C37 0.1uF
HC574 U8
ADCN
DSP1N
C66 0.1uF
HC14 U10-A
SERIAL
FILTN
DRDYN/ADI
HXBCK/ADCK
EMPTYN
RDN
WRN
HRBCK
HR
DSP2N
PRESN
MIDI_OUT
MIDI_IN
R72 10K
R40 220
R39 4.7K
Q2 2N4401
Q17 2N4401
R41 470
C38 22pF
C39 22pF
11.9808MHz
C63 22pF
HC14 U10-C
HC14 U10-B
SC80C31BCCA44 U9
PSEN
EN
ALE
XTAL1
XTAL2
RST
EA
HC573 U11
R46 4.7K
R47 1K
R48 470
Q5 2N4401
RAM0
RESN
A15
R49 10K
Q6 2N4401
D8
R74 560
D7
+5MEM
3V LITHIUM
C47 0.1uF
CXK58257AM-10L U15
WRN
RDN
RAM0
Q16 BCP54
Q15 2N4401
R66 330
R68 7.5K
R67 13K
C49 0.1uF
LED
HC574 U17
R50 3.3K
R51 3.3K
R52 3.3K
R53 3.3K
R54 3.3K
R55 3.3K
R56 3.3K
R57 3.3K
Q7 2N4403
Q8 2N4403
Q9 2N4403
Q10 2N4403
Q11 2N4403
Q12 2N4403
Q13 2N4403
Q14 2N4403
R58 39
R59 39
R60 39
R61 39
R62 39
R63 39
R64 39
R65 39
N.C.
D10 3X7SEGMENT
Lh Ch Rh Snd4 D54 Clip2 D55 Snd1 D9
Lg Cg Rg Fnc4a D33 Clip1 D40 Snd3 D25
Lf Cf Rf Fnc3b D34 Tune D42 Pot6 D43
Le Ce Re Fnc3a D35 Snd2 D17 Pot5 D45
Ld Cd Rd Fnc2b D36 Fnc6 D46 Pot4 D47
Lc Cc Rc Fnc2a D37 Fnc5b D48 Pot3 D49
Lb Cb Rb Fnc1b D38 Fnc5a D50 Pot2 D51
La Ca Ra Fnc1a D39 Fnc4b D52 Pot1 D53
C48 0.1uF
LEDGND
R69 2.7K
MUTE
R70 470
TPIC6B273DW U16
LEFT DIGIT
CENTER DIGIT
RIGHT DIGIT
R42 1M
R43 10K
R44 1K
R45 10K
ZENER D57 8.2V
Q3 2N4401
Q4 2N4401
C40 0.1uF
HC14 U10-D
HC14 U10-E
COMPANY: LINE 6
TITLE: Ax2
PROGRAM: PADS POWER LOGIC V1.1
REV: D
FILENAME: Data on Ffd/Clients/Ffd/Ax2/PADS/Schematics/Ax2 Main RevD.sch
DRAWN: EVP
DATED: May 14, 1998
CHECKED: MD
DATED: MO Day, Year
SCALE: 1:1
SIZE: C
PART NUMBER: 35-00-0010
SHEET: 2 OF 3

ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:



COMPANY: LINE 6			
TITLE: Ax2			
PROGRAM: PADS POWER LOGIC V1.1			REV: D
FILENAME: Data on Ffd/Clients/Ffd/Ax2/PADS/Schematics/Ax2 Main RevD.sch			
DRAWN: EVP	DATED: May 14, 1998		
CHECKED: MD	DATED: MO Day, Year		
SCALE: 1:1	SIZE: C	PART NUMBER: 35-00-0010	SHEET: 3 OF 3

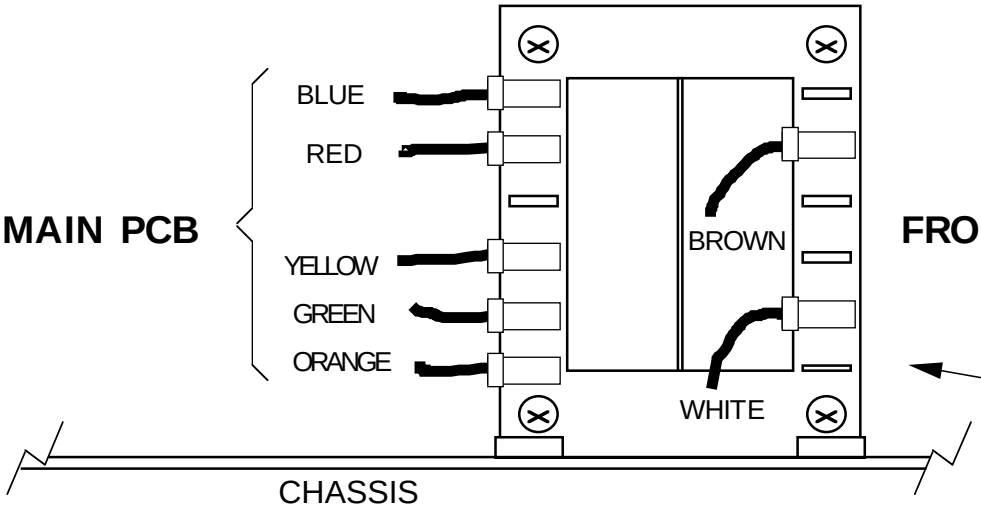

ECOs FOR THIS REVISION
ECO #: | DATE: | DESCRIPTION:
1 | 12/13/96 | RJ-45 (J8): pin #8=+5v, pin #6=gnd.
M3 1/4GNDTAB
M4 1/4GNDTAB
M5 1/4GNDTAB
M6 1/4GNDTAB
M7 1/4GNDTAB
RH1
RH2
+35V
OUTL
R1 10K
C1 1nF
C2 0.1uF
C3 10uF 50V
LM3876 U1
C4 10uF 50V
C5 0.1uF
-35V
MUTE
R2 1K
R3 15K
R4 15K
C6 10uF
C7 680pF
R20 2.7
C21 0.22uF
LEFT SPKR
J1
OUTR
R5 10K
C8 1nF
C9 0.1uF
C10 10uF 50V
LM3876 U2
C11 10uF 50V
C12 0.1uF
R6 1K
R7 15K
R8 15K
C13 10uF
C14 680pF
R21 2.7
C22 0.22uF
RIGHT SPKR
J2
+8V
R19 3.3K
R9 18K
Q2 2N4403
Q1 2N4401
R18 330
AC INPUT 110/220 V. 50/60 Hz
J9
SW1
M2 GND_LUG
AC FILTER
C20 10nF
L1
L2
F1 250V 4A
H1 GREY
H2 WHITE
H3 GREY
H4 BLACK
H5 BROWN
H6 BLACK
ORG H7
GRN H8
YEL H9
RED H10
BLUE H11
D1
D2 1N4002
D3 1N4002
C15 4700uF 50V
C16 4700uF 50V
C17 6800uF 16V
C18 1000uF 16V
7805 U3
C19 10uF 50V
+35V
-35V
+8V
+5V
+5V (+5VA)
-8V
AC
MIDI_OUT
MIDI_IN
SERIAL
AC
MUTE
+8
-8
VCC1
VCC2
+5A
OUTL
OUTR
AGND1
AGND2
GND1
GND2
PED1
PED2
REMOTE
PEDIN
20PIN_RIBBON M1
D5
D6
D7
D8
D9
D10
D11
D12
HEADPHONES
J5
R13 820
R14 820
R15 3.9K
PEDIN
PEDAL 1
J6
R16 2K
PEDAL 2
J7
R17 1K
RJ-45 J8
NC_1
NC_2
MIDI IN
J3
R10 220
D4 1N4003
VCC
OUT
BASE
GND
NC1
NC2
6N138 U4
R11 10K
MIDI OUT/THRU
J4
R12 220
Headphones | Out | In | Out | In | Out | In | Out | In
Pedal 1 | Out | Out | In | In | Out | Out | In | In
Pedal 2 | Out | Out | Out | Out | In | In | In | In
PEDIN | 1.8V | 2.0V | 2.2V | 2.5V | 2.8V | 3.3V | 4.0V | 5.0V
NOTES:
1) All resistors are 1/4w.
2) All capacitors are 50V. unless specified.
Fast Forward Designs, Inc.
Client: Line 6
Project: Axsys 212
Page: 1 of 1
Date: December 13, 1996
Description:
Power amplifier & power supply
Drawn By: EVP
Pinout checked by: MD
Revision: D



TO MAIN PCB

FROM AC BOARD

FOR 120 V WITH **SUHIL** TRANSFORMER
PART # 4-49-8607 *before wiring, Click here*



TO MAIN PCB

FROM AC BOARD

FOR 100 V WITH **SUHIL** TRANSFORMER
PART # 4-49-8607

Note orientation of connector

FAST FORWARD DESIGNS/ LINE 6

5/30/01

Document created with MacDraw Pro
File location: MAC: DATA\FFD STUFF \ GA \Flextone \Flextone Production Notes \ Flextone II Part assembly

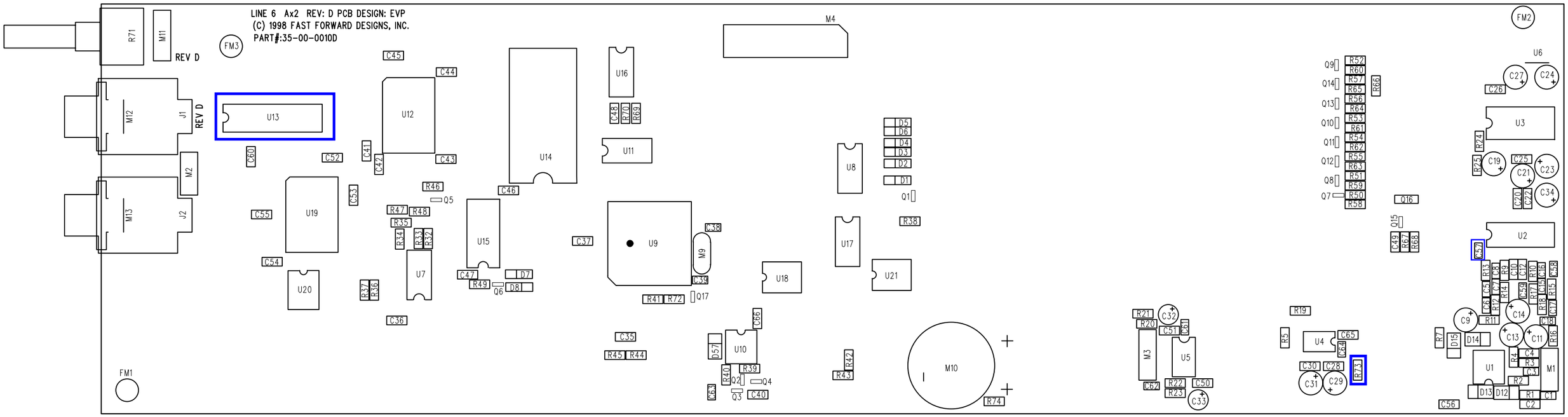
SHEET 1 of 1 AX2 Transformer wiring

AX2 Transformer Secondary Wiring Voltages

As a precaution to ensure proper transformer wiring, this page explains what voltages the secondary wires need to see. Before wiring up a new transformer, you may want to measure the voltages on the secondary taps for verification.

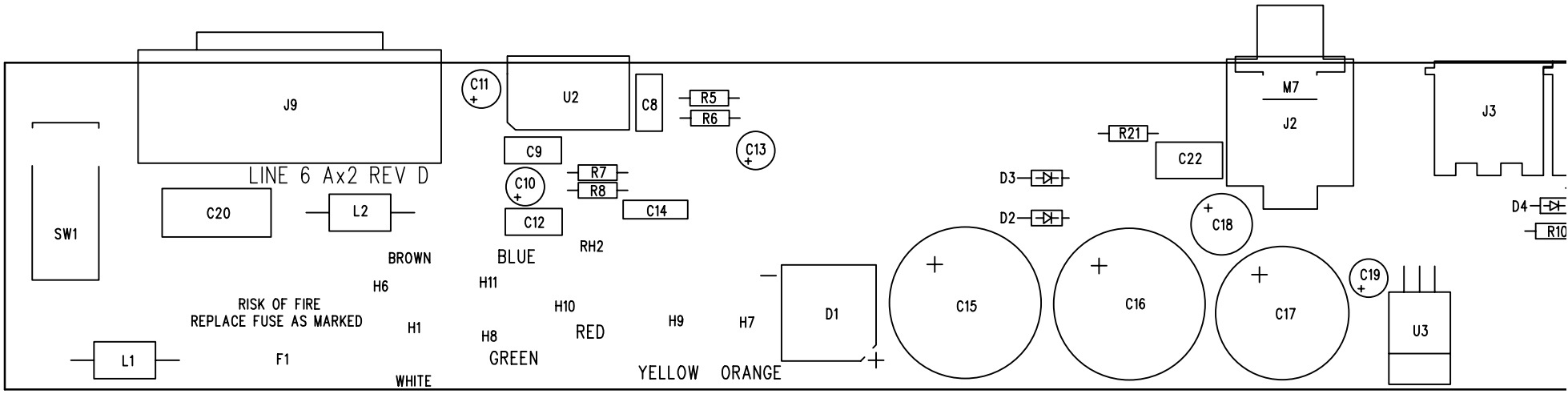
The blue and red wires on the AX2 rear board need to see about 9.75 VAC between them.

The yellow and orange wires on the AX2 rear board should have about 59 VAC across them. The green wire is the center tap between the yellow and orange, so yellow-to-green should have about 29.5 VAC and orange-to-green should have about 29.5 VAC.

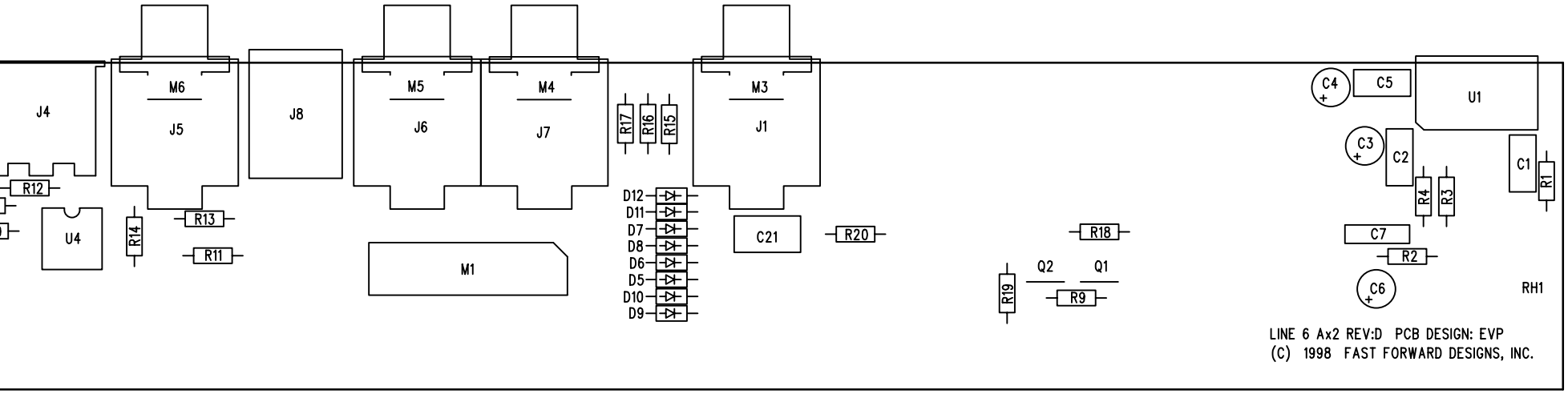


AX2 MAIN BOARD REV:D ASSEMBLY

AX2 REAR BOARD



REV:D ASSEMBLY



LINE 6

AX2 Parts List

Items: 99 AX2 120V

Level	Seq	Component-Item	Component-Description	Qty-Per-Parent
Parent Item: 99 AX2 120V AX2 AMP 120V				
1		11-20-1200	Speaker 12" 8R	2.000000
1		11-30-8607	TRANS. 11/120 V	1.000000
1		21-37-1160	CABLE,PWR UL/CSA,SJT,18awg,Blk EL-302 grnded plug,EL701 Sockt	1.000000
1		21-34-0010	Cable 1/4" male phone to quick connect	2.000000
1		24-21-0001	SWITCH cap for 24-24-0010 PB0850000RED	1.000000
1		24-30-0002	SWITCH Matrix Rubber Keyboard AX2	1.000000
1		30-00-9358	SCR, NO.3, 1/2LG, OVAL CTSK PH H, BLK (SUBST FOR 30-00-0358	2.000000
1		30-00-0607	SCR 6-32 x 7/16 LG PHILLIPS PN H STL ZINC (W/ LK WASH)	19.000000
1		30-00-0820	SCR 8-32 x 1 1/4 LG OVAL CTSK PHH BLK OXIDE (S PNL)screws for-mounting-chassis-to-sides-of-cabinet	4.000000
1		30-00-1008	SCR, 10-24 x 1/2 LG, PHILLIPS PNH, ZINC	4.000000
1		30-00-1016	SCR, 10-24 x 1 LG, PHILLIPS PN H, STL, BLACK	8.000000
1		30-00-1124	SCR, 10-32 x 1 1/2 LG, OVAL CT SK, PHH, STL, BLK screws-for-mounting-chassis-to-top-of-cabinet	2.000000
1		30-00-1632	SCR, 6-32 x 3/8 LG, PHILLIPS P H, STL, BLK	1.000000
1		30-03-0008	WASHER, FINISHING, NO.10, CTSK , BLACK washers-for-side-mount-chassis-screws-p/n-30-00-0820	4.000000
1		30-03-0010	WASHER, FINISHING, NO.10, ZINC (XMFR)	4.000000
1		30-03-0011	WASHER, FINISHING, NO. 10, CTS K, BLK OXIDE washers-for-top-chassis-mount-screws-p/r-30-00-1124	2.000000

1	30-03-0610	Washer, #6 internal lock	2.000000
1	30-06-0006	NUT, .300 HEX, NO.4, STL, ZINC (FOR AC RCPT AND +5 V)	2.000000
1	30-06-0024	NUT .370 HEX 10-24 STL ZINC W/ NYLON INSERT	4.000000
1	30-06-3232	Threaded Hex Nut for 1/4" 6 pin stereo phone jack	7.000000
1	30-21-0012	PLATE XMFR 92MM x 93.5 MM CRS (AXSYS 212)	1.000000
1	30-24-0003	CABLE TIE Panduit 3 7/8" clear Panduit PLT1M-M	2.000000
1	30-40-2825	TRANSFORMER GASKET, FLEXTONE	1.000000
1	30-42-0012	Overlay, AX2	1.000000
1	30-45-2000	KNOB PLASTIC	9.000000
1	30-51-0010	BOTTOM, METAL, AX2	1.000000
1	30-51-0212	CHASSIS, TOP, AL (AX2)	1.000000
1	30-51-6013	HEATSINK 4x3.75x1" AL	2.000000
1	30-57-0580	HANDLE/STRAP Heavy Duty, Black	1.000000
1	30-57-0581	END CAPS, BLACK, TEXTURED FINI SH	2.000000
1	30-60-2000	LOGO LINE 6	1.000000
1	30-63-0010	INSULATION, VOLARAPOLYOLEFIN F OAM, 26.5 x 1/4 x 1/16	2.000000
1	40-00-0050	Manual, User's, AX2	1.000000
1	40-00-0051	Chart, Patch, AX2	1.000000

2	40-10-0043L	FLEXTONE TOP LEFT FOAM BLOCK	1.000000
2	40-10-0043R	FLEXTONE TOP RIGHT FOAM BLOCK	1.000000
2	40-10-0043B	Foam Block,Bottom-Flextone	2.000000
1	40-10-0051	Carton, AX2, Outer	1.000000
1	40-10-0052	Carton, AX2, Inner	1.000000
1	40-20-0010	Plastic Bag,43"x38"x.004,clear	1.000000
1	40-20-0011	Plastic Bag, 10 x 16, 2 mil	1.000000
1	40-25-0100	Label, Bar Code Serial Number 4 panel label - LTX 16 1125503	1.000000
1	40-25-0475	Label, speaker	2.000000
1	40-30-0020	Label,Gloss Duropoly 613 Silver 0.1W x 0.5L 2 across	2.000000
1	50-00-0017	PCBA, AX2 MAIN	1.000000
2	01-04-0000	RES 0R 1/4W 5% 1206 SM	1.000000
2	01-04-0102	RES 1K 1/8W 5% 1206 SM	11.000000
2	01-04-0103	Ref: R2, R4, R5, R7, R21, R23, R24, R36, R37, R44, R47 RES 10K 1/8W 5% 1206 SM	4.000000
2	01-04-0105	Ref: R43, R45, R49, R72 RES 1M 1/8W 5% 1206 SM	3.000000
2	01-04-0122	Ref: R1, R3, R42 RES 1.2K 1/8W 5% 1206 SM	2.000000
2	01-04-0132	Ref: R11, R16 RES 1.3K 1/8W 5% 1206 SM	2.000000

		Ref: R13, R15	
2	01-04-0133	RES 13K 1/8W 5% 1206 SM	1.000000
		Ref: R67	
2	01-04-0151	RES 150R 1/8W 5% 1206 SM	2.000000
		Ref: R20, R22	
2	01-04-0202	RES 2K 1/8W 5% 1206 SM	1.000000
		Ref: R25	
2	01-04-0221	RES 220R 1/8W 5% 1206 SM	1.000000
		Ref: R40	
2	01-04-0222	RES 2.2K 1/8W 5% 1206 SM	2.000000
		Ref: R9, R10	
2	01-04-0224	RES 220K 1/8W 5% 1206 SM	1.000000
		Ref: R38	
2	01-04-0272	RES 2.7K 1/8W 5% 1206 SM	1.000000
		Ref: R69	
2	01-04-0302	RES 3K 1/8W 5% 1206 SM	2.000000
		Ref: R34, R35	
2	01-04-0331	RES 330R 1/8W 5% 1206 SM	1.000000
		Ref: R66	
2	01-04-0332	RES 3.3K 1/8W 5% 1206 SM	8.000000
		Ref: R50 - R57	
2	01-04-0390	RES 39R 1/8W 5% 1206 SM	8.000000
		Ref: R58 - R65	
2	01-04-0471	RES 470R 1/8W 5% 1206 SM	7.000000
		Ref: R32, R33, R14, R17, R41, R48, R70	
2	01-04-0472	RES 4.7K 1/8W 5% 1206 SM	3.000000
		Ref: R19, R39, R46	
2	01-04-0561	RES 560R 1/8W 5% 1206 SM	3.000000
		Ref: R12, R18, R74	
2	01-04-0752	RES 7.5K 1/8W 5% 1206 SM	1.000000

		Ref: R68	
2	01-48-0103 mm	POT 10K MONO LINEAR D-SHAFT-25	8.000000
		Ref: R6, R8, R26 - R31	
2	01-48-3103	POT 10KB SINGLE 16MM STEREO	1.000000
		Ref: R71	
2	03-10-0331	CAP 330uF 10V 20% RAD ELEC TH	1.000000
		Ref: C29	
2	03-18-0105	CAP 1uF 50V 20% RAD ELEC TH	2.000000
		Ref: C32, C33	
2	03-18-0106	CAP 10uF 50V 20% RAD ELEC TH	11.000000
		Ref: C9, C11, C13, C14, C19, C21, C23, C24, C27, C31, C34	
2	03-46-0104 X7R	CAP 0.1uF 50V 20% 1206 SM	32.000000
2	03-52-0101 X7R 08055A101KATMA	CAP 100 pF 50V 20% 0805 SM	1.000000
2	03-52-0182 X7R	CAP 1.8nF 50V 20% 0805 SM	4.000000
		Ref: C5, C6, C17, C18	
2	03-52-0220 X7R	CAP 22pF 50V 20% 0805 SM	3.000000
		Ref: C38, C39, C63	
2	03-52-0221 X7R	CAP 220pF 50V 20% 0805 SM	2.000000
		Ref: C1, C3	
2	03-52-0222 X7R	CAP 2.2nF 50V 20% 0805 SM	4.000000
		Ref: C7, C8, C15, C16	
2	03-52-0333 X7R	CAP 33nF 50V 20% 0805 SM	1.000000
		Ref: C59	
2	03-52-0470 X7R	CAP 47pF 50V 20% 0805 SM	1.000000
		Ref: C64	
2	06-20-4148 SM	DIODE SMALL-SIGNAL 4148 DL-35	8.000000
		Ref: D1 - D8	
2	06-28-0360	DIODE ZENER 3.6V DL-35 SM	4.000000

		Ref: D12 - D15		
2	06-28-0620	DIODE ZENER 6.2V SM		1.000000
		Ref: D57		
2	09-10-4401 SM	TRANS NPN SMALL-SIGNAL 2N4401		8.000000
		Ref: Q1- Q6, Q15, Q17		
2	09-10-4403 SM	TRANS PNP SMALL-SIGNAL 2N4403		8.000000
		Ref: Q7 - Q14		
2	09-13-0054 BCP54 SM	TRANS NPN MID-POWER BIPOLAR		1.000000
		Ref: Q16		
2	11-00-1198 HC-49/u holder	Crystal Osc 11.98080MHz		1.000000
		Ref: M9		
2	11-40-0030	BATTERY LITHIUM 3V BR2325-1HG		1.000000
		Ref: M10		
2	12-00-7905	IC REG -5V 100mA TH		1.000000
		Ref: U6		
2	12-54-0084 mfg p/n# TL084CD	IC OP AMP Quad TL084CD SM		1.000000
		Ref: U1		
2	12-54-5532	IC OP-AMP DUAL NE5532D SM		1.000000
		Ref: U5		
2	12-64-0542 SM	IC CONVERTER A/D 8-BIT TLC542		1.000000
		Ref: U7		
2	12-64-1760 PCM1760U-X	IC ADC part 1 of Stereo 20 bit		1.000000
		Ref: U2		
2	12-64-1761 20 Bit DF1760U	IC ADC Filter part 2 Stereo		1.000000
		Ref: U3		
2	12-68-4320 SM	IC CONVERTER D/A 20-BIT AK4320		1.000000
		Ref: U4		
2	15-62-0014 1-IN SM	IC 74HC14 INVERTER-HEX SIN		1.000000

		Ref: U10	
2	15-62-0138	IC 74HC138 INVERTING-DECODER 3-8 LINE SM	1.000000
		Ref: U18	
2	15-62-0161	IC 74HC161 COUNTER BINARY 4-BIT SM	1.000000
		Ref: U20	
2	15-62-0165	IC 74HC165 SHIFT-REGISTER PARLL-IN/SERIAL-OUT SM	1.000000
		Ref: U21	
2	15-62-0573	IC 74HC573 BUFFER INVERTING 8-BIT SM	1.000000
		Ref: U11	
2	15-62-0574	IC 74HC574 FLIP-FLOP D-TYPE 8-BIT SM	2.000000
		Ref: U8, U17	
2	15-66-0273	IC OCTAL-LATCH D-TYPE TRANS TPIC6B273 SM	1.000000
		Ref: U16	
2	15-70-6256	DRAM FLEXTONE ISSI P/N IS4IC16257-35K	1.000000
2	15-72-0256	IC SRAM 32K X 8 CY62256LL-70SNC 0024 623249	1.000000
		Ref: U15	
2	15-84-8031	IC MPU 80C31 SM	1.000000
		Ref: U9	
2	15-86-7070	IC DSP TMS57070FFT SM	2.000000
		Ref: U12, U19	
2	18-00-0314	RED LED TH SLX-LX3054ID	24.000000
		Ref: D9, D17, D25, D33-40, D42-43, D45-55	
2	18-10-0003	7 segment RED, 3 digit led LDT-C514RI	1.000000
		Ref: D10	
2	21-00-4420	JACK 1/4" EARTHING-WASHER JB0661-K01-3	2.000000
		Ref: M12, M13	
2	21-00-6616	JACK 1/4" STEREO FEMALE PCB-MN 6-PIN FLUSH	2.000000
		Ref: J1, J2	
2	21-20-0204	HDR SIL 4-PIN 2mm SHRD	2.000000

		Ref: M1, M2	
2	21-20-0205	HDR 5-PIN 2mm SHRD	2.000000
		Ref: M3, M11	
2	21-23-1002	CON 10 X 2 Male Rcpt 100mI spa cing	1.000000
		Ref: M4	
2	21-34-0012	CAB SIL 4-PIN 2mm 45mm F-F	1.000000
		Ref: M1-M2	
2	21-34-0013	Cable master volume assy	1.000000
		Ref: M3-M11	
2	21-42-0028	SOCKET 28 pin TH	1.000000
		Ref: U14	
2	30-03-1218	WASHER, LOCK, INT T, NO.6	1.000000
		Ref: R71	
2	30-15-0420	SPCR LED .078 H x .135 O.D. PL ASTIC (ELM 4-2MM)	24.000000
		Ref: D9, D17, D25, D33-40, D42-43, D45-55	
2	45-00-0011	EPROM, Programmed, AX2	1.000000
		Ref: U14	
1	50-00-0018	PCBA, AX2 REAR	1.000000
2	01-12-0027	RES 2.7R 1/4W 5% DIP TH	2.000000
		Ref: R20, R21	
2	01-12-0102	RES 1K 1/4W 5% DIP TH	3.000000
		Ref: R2, R6, R17	
2	01-12-0103	RES 10K 1/4W 5% DIP TH	3.000000

		Ref: R1, R5, R11	
2	01-12-0153	RES 15K 1/4W 5% DIP TH	4.000000
		Ref: R3, R4, R7, R8	
2	01-12-0183	RES 18K 1/4W 5% DIP TH	1.000000
		Ref: R9	
2	01-12-0202	RES 2.0K 1/4W 5% DIP TH	1.000000
		Ref: R16	
2	01-12-0221	RES 220R 1/4W 5% DIP TH	2.000000
		Ref: R10, R12	
2	01-12-0331	RES 330R 1/4W 5% DIP TH	1.000000
		Ref: R18	
2	01-12-0332	RES 3.3K 1/4W 5% DIP TH	1.000000
		Ref: 19	
2	01-12-0392	RES 3.9K 1/4W 5% DIP TH	1.000000
		Ref: R15	
2	01-16-0821	RES 820R 1/2W 5% DIP TH	2.000000
		Ref: R13, R14	
2	03-00-0102	CAP 1nF 50V 20% CER DISC TH	2.000000
		Ref: C1, C8	
2	03-00-0680	CAP 68pF 50V 20% CER DISC TH	2.000000
		Ref: C7, C14	
2	03-01-0103	CAP 10nF 250V 20% CER DISC TH	1.000000
		Ref: C20	
2	03-12-0102	CAP 1000uF 16V 20% RAD ELEC TH	1.000000
		Ref: C18	
2	03-12-0688	CAP 6800uF 16V 20% RAD ELEC TH	1.000000
		Ref: C17	
2	03-18-0106	CAP 10uF 50V 20% RAD ELEC TH	7.000000

			Ref: C3, C4, C6, C10, C11, C13, C19	
2	03-18-0478	CAP 4700uF 50V 20% RAD ELEC TH		2.000000
			Ref: C15, C16	
2	03-36-0224	CAP 0.22uF 50V 20% ESTR TH		2.000000
			Ref: C21, C22	
2	03-36-0104	CAP 0.1uF 50V 20% ESTR TH		4.000000
			Ref: C2, C5, C9, C12	
2	06-00-4148	DIODE SMALL-SIGNAL 1N4148 4.0n S 100V TH		9.000000
			Ref: D4-D12	
2	06-04-4002	DIODE POWER 1N4002 TH		2.000000
			Ref: D2, D3	
2	06-16-6200	DIODE BRIDGE-RECTIFIER TH VISH AY-PB64		1.000000
			Ref: D1	
2	09-00-4401	TRANS NPN SMALL-SIGNAL 2N4401 TH		1.000000
			Ref: Q1	
2	09-00-4403	TRANS PNP SMALL-SIGNAL 2N4403 TH		1.000000
			Ref: Q2	
2	11-10-2020	Wide band choke 1-5 turns		2.000000
			Ref: L1, L2	
2	12-02-7805	IC REG +5v 1.5 Amp TH		1.000000
			Ref: U3	
2	12-30-3886	IC POWER-AMP 50W LM3886TF TH		2.000000
			Ref: u1, u2	
2	15-40-6138	IC OPTO-ISOLATOR 6N138 TH		1.000000
			Ref: u4	
2	21-00-4420	JACK 1/4" EARTHING-WASHER JB0661-K01-3		5.000000
			Ref: M3 - M7	
2	21-00-6616	JACK 1/4" STEREO FEMALE PCB-MN 6-PIN FLUSH		5.000000
			Ref: J1-J2, J5-J7	
2	21-04-5075	JACK DIN 5-PIN FEMALE MIDI		2.000000

		PCB-MNT RT-ANG LN 05075	
		Ref: J3, J4	
2	21-14-0001	JACL AC 3-PIN MALE PCB-MNT RT-ANG GND SS-7B-1	1.000000
		Ref: J9	
2	21-16-0045	JACK RJ-45 8-PIN FEMALE PCB-MNT RT-ANG	1.000000
		Ref: J8	
2	21-30-0020	Cable Assy, Ribbon 20 Pin	1.000000
3	21-26-0020	RIBBON CABLE,BARE,20 PIN	1.000000
3	21-23-0020	CONNECTOR,RIBBON CABLE,20PIN, Female	1.000000
3	21-23-0021	Connector, ribbon cable, 20 pin, male	1.000000
2	21-34-1501	Cable Assy-Brown,Cusom Per Dwg AX2 Transformer	1.000000
		Ref: H6	
2	21-34-1502	Cable Assy-Red,Custom per Dwg. AX2 Transformer	1.000000
		Ref: H10	
2	21-34-1503	Cable Assy-Orange,CustomPerDwg AX2 Transformer	1.000000
		Ref: H7	
2	21-34-1504	Cable Assy-Yellow,CustomPerDwg AX2 Transformer	1.000000
		Ref: H9	
2	21-34-1505	Cable Assy-Green,CustomPerDwg AX2 Transformer	1.000000
		Ref: H8	
2	21-34-1506	Cable Assy-Blue,Custom Per Dwg AX2 Transformer	1.000000
2	21-34-1509	Cable Assy-White,Custom PerDwg AX2 Transformer	1.000000
		Ref: H1	
2	21-34-1806	Cable Assy, Earthing	1.000000
		Ref: M2	
2	24-19-4025	FUSE 4A 125v	1.000000

		Littlefuse# H239 004 or equiv.	
		Ref: ECO# 22204.	
2	24-24-0010	SWITCH RF power	1.000000
		Ref: SW1	
2	30-00-0607	SCR 6-32 x 7/16 LG PHILLIPS PN H STL ZINC (W/ LK WASH)	3.000000
		Ref: J9, U3	
2	30-06-0006	NUT, .300 HEX, NO.4, STL, ZINC (FOR AC RCPT AND +5 V)	2.000000
2	30-12-2210	STDF .250 HEX 6-32 F/F .500 LG AL (KEYSTONE P/N 2210)	1.000000
		Ref: U3	
2	21-48-9521	FUSE HOLDER CLIP p/n 19521	2.000000
1	50-00-0050	AX2 WOOD BOX ASSEMBLY	1.000000
2	30-00-0621	SCR WD 6-18 x 1 1/4 LG PHILLIP S RND HD STL BLK OXIDE	3.000000
2	30-00-0812	SCR NO.8 x 3/4 LG PHH TRUSS BL K OXIDE W/WAX (CORNER)	16.000000
2	30-00-6839	FEET SCREW FOR AMP WOOD BOX #10-12X7/8 PHIL PN	4.000000
2	30-06-1024	NUT 10-24 X 5/16 Tee Plain steel, Tape/reel package	8.000000
2	30-27-0010	AXSYS 212 PLASTIC EXTRUSION	1.000000
2	30-30-1520	CORNER PROTECTOR, METAL, BLK, NOTCHED, TWO LEGS	6.000000
2	30-30-1530	Corner, black, black, two legs and cut out	2.000000
2	30-36-0001	FABRIC VINYL BLACK-BRONCO ASC03 54"-Wide	.926000
2	30-39-0001	FAB Grille Black #BY4584-22 50 Yard Rolls	.480000
2	30-48-1686	FEET, 1.48 INCH O.D., RBR, BLK	4.000000

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Procedure for reinitialization of AX2 (Hard reset)

Power unit up while holding down the “User/Preset” and “Save” buttons. Hold for 3 seconds and then release. Factory presets will be re-installed.

Procedure for identifying firmware version of AX2

While amp is on, hold down the top (“Aux/Midi”) and bottom (“Main”) function buttons simultaneously. The software version will be displayed in the LED display.

Accessing the test routines

Press and hold the Save button while turning power on until the display reads "SrA" to access the internal test routines. Different tests can be selected by using the BANK UP or BANK DOWN buttons. The selected test is started by pressing the TUNER button. The display will then usually show "Err" (error) or "PAS" (pass) to indicate the test status. The nine tests are:

#	Display	Name	Description	Result Display
1.	SrA	SRAM test	Tests SRAM (U15)	Err or PAS
2.	EPr	EPROM test	Tests EPROM (U14)	Err or PAS
3.	LEd	LED test	Lights all LEDs	no result; visual inspection
4.	bAt	Battery test	Tests SRAM retention	Err or PAS
5.	bUt	Button test	Tests buttons & pots	Displays button or pot name
6.	PEd	Pedal test	[only at factory]	Err
7.	AC	AC timer test	Tests AC freq counter	Err or PAS
8.	idi	MIDI test	Tests MIDI in & out	Err or PAS
9.	Aud	Audio test	Passes audio with delay	Err or blank
10.	AdA	A/D/A path test	Tests audio THD, etc.	Err or PAS (version 1.05)

Power off then on to exit the test routines.

Descriptions of Test Routines

SrA The SRAM test performs read and write cycles to all memory locations of the SRAM. If the data read back is different than what was written, the display will show Err. If this occurs, check all signals connected to U15.

EPr The EPROM test calculates the checksum of the EPROM and compares it with the checksum stored in the EPROM. If it does not match, the display will show Err. If this occurs, it usually indicates that there is some erroneous data in the EPROM (or a missing checksum), and the EPROM should be replaced (U14). It could also be caused by a problem on an upper address line connected to the EPROM. However, in general, major problems with the EPROM or the address and data lines are likely to prevent any of the test routines to be entered in the first place.

LEd The LED test can be used to check that all LEDs are functioning properly. First, all LEDs will turn on at the same time. Then, the software will cycle each LED on and off one at a time. When the six LEDs next to the edit potentiometers are cycled, they will be lit at half brightness. NOTE: When entering this test, holding TUNER will cause all of the LEDs to stay on until the button is released.

bAt The battery test actually is testing the SRAM's contents, which can be an indicator as to the battery status. It checks to see if a specific set of SRAM locations contain specific data. This data is loaded in once at the factory, and it is assumed that if the data remains unchanged in the field, the battery is working properly. If an error occurs, it will be necessary to check the battery, the SRAM, and the reset circuitry. Once an error has occurred, it will continue to reoccur until the specific data is written back to the SRAM. This can be performed from within this test routine by pressing and holding

the SOUND D button and the USER/PRESET button. The display will show "---" to indicate that the SRAM has been initialized.

bUt The button test can be used to check that each button and edit potentiometer is working properly. Pressing each button will cause the name of that button to be displayed. The display will show as follows:

Button	Display
no button	"---"
User/Preset	"U-P"
Sound Bank Up	"UP "
Sound Bank Down	"Dn "
Sound A	" A "
Sound B	" b "
Sound C	" C "
Sound D	" d "
Tuner	"tnr"
Compare	"CPr"
Store Sound	"Str"
Function 1	"Fn1"
Function 2	"Fn2"
Function 3	"Fn3"
Function 4	"Fn4"
Function 5	"Fn5"
Function 6	"Fn6"

The function buttons are the small black buttons to the left of the edit matrix. The top button is 1 and bottom button is 6. When any of the six edit potentiometers are turned, the display should read "P1" through "P6", depending on which pot was turned. This test can be exited by pressing the function 5 and function 6 buttons at the same time. This is indicated by the LEDs next to each of these switches being lit.

PEd The sixth test is performed on a test fixture at the factory to verify that the pedal inputs are working. Without the test fixture, this test will always result in an "Err". For this reason, this test should always be skipped. The pedal inputs can be easily tested by performing a functional test to see that the wah and volume functions are being controlled by the pedals. If the pedal inputs do not work, try checking that the voltages reach the ADC (U7), and that the switch in each jack is working properly. This switch lets the micro know that something is plugged in, and is sensed by checking the ADC voltage at U7 pin 11 and comparing it to the table shown in the Power PCB schematic.

AC The AC verifies that the micro can properly determine the current AC line frequency. It expects to find 50Hz or 60Hz, and will display an "Err" if the results are different. If this occurs, check the Power PCB signal labeled AC, as well as R38 and Q1 on the Processor board.

idi The MIDI requires that a MIDI cable be connected from the MIDI output back to the MIDI input. Without this cable, this test will always fail. If the test fails with the cable, check the connection first, then check U4 on the Power board, and then check for the serial interface signals at the microcontroller U9 pins 11 and 13 and follow the signal path through to the MIDI connectors.

AUd The Audio takes the Guitar input and passes it unmodified to the left speaker, and takes the Aux input and passes it unmodified to the right speaker. It also adds a 1 second

delayed signal to each of these signals in order to verify that the audio DRAM (U13) is functioning properly. The audio passes through both DSPs, so this test checks their functionality as well. The display should be blank during this test. If the display reads "rd1 or "rd2" followed by "Err", this means that an error occurred when the micro tried to read data from either DSP. If the error was "rd1", then the problem was between the micro (U9) and the DSP U19. If the error was "rd2", then the problem was between the micro and DSP U12.

AdA The speaker outputs must be connected to the aux and guitar inputs. The left speaker output should be connected to the guitar input, and the right speaker output should be connected to the aux input. **Since the speaker outputs are too high a level for the inputs, a pad must be used. Each speaker output should pass through a 30K resistor, followed by a 1K resistor to ground prior to connecting to the input. ** The Guitar and Aux input level knobs should be set to 5 (pointing straight up), and the Master volume knob should be at 0 (off). When this test is first entered, the display will read "OFF", to inform you that the Master volume should be off. Press the Tuner button. The software will output a 1KHz sine wave on both outputs, and verify that no signal is coming in (since the Master is off). During this test, a dot will appear to indicate the test is running (display reads "OFF."). If signal is received, the display will show "Err", followed by one of the following:

n L	Noise present on left input
n r	Noise present on right input
nLr	Noise present on left and right inputs
A L	1K Hz Audio tone present at left input
A r	1K Hz Audio tone present at right input
ALr	1K Hz Audio tone present at left and right inputs

If there are no errors, the display will momentarily show "PAS", followed by "HLF". This stands for "half", and indicates that the Master volume should now be turned up half way, or 5 (pointing straight up). Pressing Tuner again will initiate the next tests, and cause a dot to be displayed again. The software will then check the level, frequency response, and distortion of both inputs and outputs. It performs this test by outputting a sine wave at 40Hz, 1KHz, and then 10KHz, and measuring the absolute input level, the relative input level, and the level of signal at frequencies other than the tone being generated. If there is an error, the display will show "Err", followed by one of the following alternating messages:

Ldt	XX	Left distortion too high by XX dB.
rdt	XX	Right distortion too high by XX dB.
L40	±XX	Left amplitude error at 40Hz of ±XX dB.
L 1	±XX	Left amplitude error at 1KHz of ±XX dB.
L10	±XX	Left amplitude error at 10KHz of ±XX dB.
L A	±XX	Left amplitude error of ±XX dB.
r40	±XX	Right amplitude error at 40Hz of ±XX dB.
r 1	±XX	Right amplitude error at 1KHz of ±XX dB.
r10	±XX	Right amplitude error at 10KHz of ±XX dB.
r A	±XX	Right amplitude error of ±XX dB.
L-r		Left signal crosstalk into the right input.
r-L		Right signal crosstalk into the left input.

The relative amplitude of the three tones are used to determine the frequency response. If any one tone is more than 1dB from the relative volume of the other tones, it will be displayed as an error. If all three tones are more than 1dB apart from each other, the one that is the furthest away from the other two will be displayed. If the amplitude of all

three tones are within 1dB of each other, the average is taken and compared with an absolute level that is expected when all knobs are at 5. If this absolute amplitude has an error of ±2dB or more, the display will show the error amount. When measuring the level of each tone, the software will also measure the level after passing the signal through a steep notch filter set to the same frequency as the tone. If the level after the filter is greater than a predetermined level, the display will show the number of dB above this level that the distortion exists. If when performing the tests on the left input, signal is received in the right, or vice versa, the display will show this as a crosstalk error.
If there are no errors, the display will momentarily show "PAS", followed by "FUL". This indicates that the Master volume should now be turned up all the way to 10. Pressing Tuner again will initiate the next tests, and display a dot. The software will again check the level, frequency response, and distortion of both inputs and outputs, and will display "PAS" or any of the above mentioned error displays. The tests are identical, except that the software's output level is dropped 6dB to accommodate for the increase in Master volume level. If an error occurs only during the half way up test and not the full test, or vice versa, the Master stereo pot or its connections should be considered the likely source of the problem.

Troubleshooting

For technicians familiar with component level troubleshooting and surface mount components, the test routines, the circuit descriptions and the schematic diagrams should be useful tools in focusing in on the problem. If the problem cannot be specifically located, an attempt should be made to identify which board is the source of the problem. At that point, a board swap would be the most likely solution.

AX2 TROUBLE SHOOTING GUIDE:

This section will discuss some of the problems that may cause a test to fail. Each section will include part information such as reference number, part type, and geographical location on board.

TEST #1: **SRAM Test**: (display shows "SrA") Checks functionality of SRAM.

Part Info:
U15: SRAM, located below EPROM (28-pin thru-hole IC).

1.) Short between address/data lines
2.) Bad connection caused by cut trace or bad feedthru on address/data line.
3.) +5v or digital ground not connected.

TEST #2: **EPROM Test**: (display shows "Epr") Checks functionality of EPROM.

Part Info:
U14: EPROM, 28-pin thru-hole IC.

1.) Short between address/data lines.
2.) Bad connection caused by cut trace or bad feedthru on address/data line.
3.) +5v or digital ground not connected.

TEST #3: **LED Test**: (display shows "Led") Checks functionality of each LED and each segment of triple 7-segment display.

Part Info:
D10: triple 7-segment display, top side of board.
ALL red LEDs on top side of board.
M4: 20-pin ribbon cable connector, top center of board.
U9: 8031 microcontroller, next to crystal.
U16: TPIC6B273DW, left of M4.
U17: HC574, center of board.

1.) Entire COLUMN (vertical row) doesn't light up. Check connection between cathode side (round pad) of each LED and U17. Refer to schematic pg. 2.

2.) Entire ROW (horizontal row) doesn't light up. Check for a bad connection on anode side (square pad) of LED. Refer to schematic pg. 2.

3.) More than one LED lights up at the same time during individual LED light up test. Check for short between LED pads and ground plane.

TEST #4: **BATTERY Test**: (display shows "bAt") Checks battery. However, an error for this test could be caused by something other than the battery.

Part Info:
M10: 3v lithium battery, lower center of board, looks like a silver disc.

1.) Measure voltage on battery. Should be 3 volts.

TEST #5: **BUTTON & POTENTIOMETER Test**: (display shows "bUt") Checks functionality of buttons and potentiometers.

Part Info:
SW1-16: Carbon coated button pads on top side of board.
R26-31: Potentiometers
U7: HC574, left side of board above potentiometer R29.
U8: HC574, center of board below ribbon cable connector.
U9: 8031, square IC with pins on all 4 sides next to crystal.
U18: HC138, lower center of board to the right of crystal.

BUTTONS:
1.) Entire ROW (horizontal row) doesn't work. Check connection from lower button pad to corresponding port pin (7,8,9) on U9.

2.) Entire COLUMN (vertical row) doesn't work. Check connection from upper button pad to anode side of corresponding diode. Check connection from cathode side of diode to U8.

3.) Single button doesn't work. Bad connection due to cut trace or bad feedthru.

4.) Check for short between button pads and analog ground plane.

5.) Check connection between U8 pin#11 & U18 pin#13.

6.) Check address lines between U9 and U18.

POTENTIOMETERS:
1.) Single potentiometer doesn't work. Check connection from wiper pin #2 and U7.

No Pots Work:
2.) Check for connection between U7 pin #16 & U9 pin #9.

3.) Check for connection between U7 pin #17 & U9 pin #4.

4.) Check for connection between U7 pin #18 & U9 pin #3.

5.) Check for connection between U7 pin #15 & U8 pin #12.

TEST #6: **PEDAL Test**: (display shows "Ped") Checks connections between M4, U7 and resistors (R34-37).

Part Info:
M4: 20-pin ribbon cable connector, top center of board.
R34-37: resistors, located around U7
U7: HC574, left side of board above potentiometer R29.

1.) "P17" ,"Err" - Check that R34 is 3K ohms, check all other connections related to M4 pin#17 & U7 pin #7.

2.) “P18” ,”Err” - Check that R35 is 3K ohms, check all other connections related to M4 pin#18 & U7 pin #8.

3.) “P19” ,”Err” - Check that R36 is 1K ohms, check all other connections related to M4 pin#19 & U7 pin #9.

4.) “P20” ,”Err” - Check that R37 is 1K ohms, check all other connections related to M4 pin#20 & U7 pin #11.

TEST #7: **AC Test**: (display shows “AC “) Checks for 60Hz AC voltage
Part Info:
M4: 20-pin ribbon cable connector (M4), top center of board.
Q1: transistor, near center of board by mounting hole.
R38: 220K resistor below Q1.
U8: HC574, center of board below ribbon cable connector.
U9: 8031, square IC with pins on all 4 sides next to crystal.

1.) Check all connections between parts listed above.

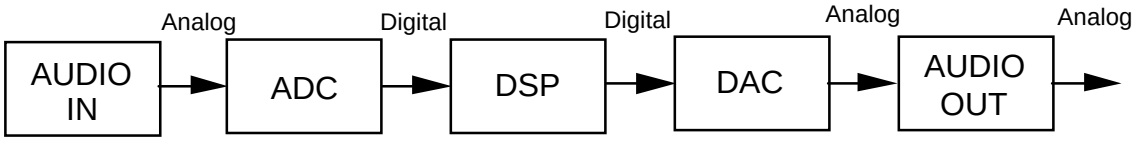
TEST #8: **MIDI Test**: (display shows “idi”) Checks MIDI circuitry and connections to M4 20-pin ribbon cable.

Part Info:
Q2: transistor, between pots R26,27.
R39,40: 4.7K,220 resistors, near Q2.
R41: 470 resistor, below U9.
M4: 20-pin ribbon cable pin #1,2, top center of board.
U9: 8031, square IC with pins on all 4 sides next to crystal.
U10: HC14, between pots R26,27 pin #3,4.

1.) Check all connections between parts listed above.

TEST #9: **AUDIO/DRAM/8031 READ Test**: (display shows “Aud”) Checks that audio signal passes from both inputs to both outputs. Checks the DRAM for functionality. Checks that 8031 microcontroller is writing to both DSP chips (U12,19) It is impossible

to list all the potential problems for this test. It is best to find the area where the problem is and go from there. Below is a basic flow chart of how the audio passes from the input of the board to the output.



Part Info:
J1,J2: 1/4" jacks on break-away board.
M1: 4-pin header, lower right corner of board.
M2: 4-pin header, near J1,J2 on break-away board.
M3: 5-pin header, 2 inches right of silver disc battery.
M11: 5-pin header, by R71 stereo pot on break-away board.
U1: TLO84 quad op-amp, lower right hand corner of board.
U2: PCM1760,ADC filter, right edge of board.
U3: DF1760, ADC, above U2.
U4: AKM4320, DAC, between pots R6,R8.
U5: 5532, dual op-amp, next to M3.
U9: 8031, square IC with pins on all 4 sides next to crystal.
U12,19: TMS57070, DSP, left side of board near break-away board.
U13: uPD421165G5-7JF, DRAM, near break-away board by U19.

Analog Input: Check for audio at these points.

AUX Input:
1.) 1/4" jack J1 pin #1 and 4-pin header M2 pin #1.
2.) U1 pin #3,1,8. Make sure volume (R6) is up.
3.) U2 pin #1,3 (it is normal for signal to look "fuzzy" here.)

MAIN Input:
1.) 1/4" jack J2 pin #1 and 4-pin header M2 pin #4.
2.) U1 pin #5,7,14. Make sure volume (R8) is up.
3.) U2 pin #12,14 (it is normal for signal to look "fuzzy" here.)

ADC: At this point the audio has been converted to digital so you must check for a digital signal.
1.) U3 pin #18.

2.) Check for clock signals at U3 pins #15-17.

DSP:
1.) Check for ADC signal at U12,19 pin #56.
2.) Check for digital signal at U19 pin #57.
3.) Check for DAC signal at U19 pin #49.
4.) Check for clock signals at U12,19 pin #14,55,67,68,69

DAC: Audio is converted from digital back to analog.
1.) Check for DAC signal (digital signal) at U4 pin #8
1.) Check for analog audio signal at U4 pin #17,18.
2.) Check U4 pin #19 for reference voltage 2.5v dc.
If the reference voltage is incorrect, replace U4.
3.) Check clock signals at U4 pin #5,7,9.

AUDIO OUT: Check for analog audio signal at these points.
LEFT:1.) M3 pin #1,2. Make sure volume (R71 on break-away board) is up.
2.) U5 pin #2,13.

RIGHT:1.) M3 pin #4,5. Make sure volume (R71 on break-away board) is up.
2.) U5 pin #7,11.

DRAM: 1.) Check +5v and ground connections on U13.
2.) Check all connections between U13 and U19.

8031 READ:1.) Check all connections between U19 and U9 for “rd1”, “Err” message.
2.) Check all connections between U12 and U9 for “rd2”, “Err” message.

MISC PROBLEMS:

SEVEN SEGMENT & LEDs DON’T LIGHT UP
1.) Check for shorts between +5v and ground.
2.) Check that reset on U9 pin #10 is low (0v).

3.) Check for 6.2v across D57 zener diode.
4.) Check address/data line connections.
5.) Check for +5v on U9-17