Service Dept.
6033 De Soto Ave.
Woodland Hills, CA 91367
P. 818-575-3600
F. 818-676-1585
E. service@line6.com

WARNING!!!

Dangerous and lethal potentials are present in this product!!

Before proceeding any further, the service center is warned that caution must be used when troubleshooting, repairing and testing the circuits in this unit. High voltage AC line-connected potentials are present in the circuits used in this unit.

All work performed on this unit must be done with an isolation transformer connected between the power circuit's input and the AC line in order to prevent electric shock, especially when connecting test equipment to the circuit. Extreme caution must be used when working on this product!!!

HOST MCU SECTION

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

REFERENCE ECOs FOR CHANGES. PCB RELEASED AS REV D.

COLDFIRE

U27
MCF5206

FLASH

U26
28F160

SRAM

U29
CY7C1021
IC SRAM 64K X 16
64K X 16 and 128K X 16 footprints and some manufacturers 256K X 16

COLDFIRE BDM INTERFACE

H1
Configured As 13 X 2
Header H1 is not installed in production assy.

R173 Is NOT INSTALLED
R173 0 OHM

ISP/VM DOWNLOAD CABLE

HB
8 pin inline header
Header H8 is not installed in production assy.

U28
M4A3-64/32

PCB REVISION IDENTIFIER
REV ID = 0H (0H - 7H)
R125 4.75K → BDM_DDATA0
R130 4.75K → BDM_DDATA1
R131 4.75K → BDM_DDATA2
Update this identifier to indicate gross changes that affect system addressing, etc...

Coldfire Boot On RESET:
IRQ7=1: 15 wait states
IRQ4=1 & IRQ=1: Boot from 16 BIT Port

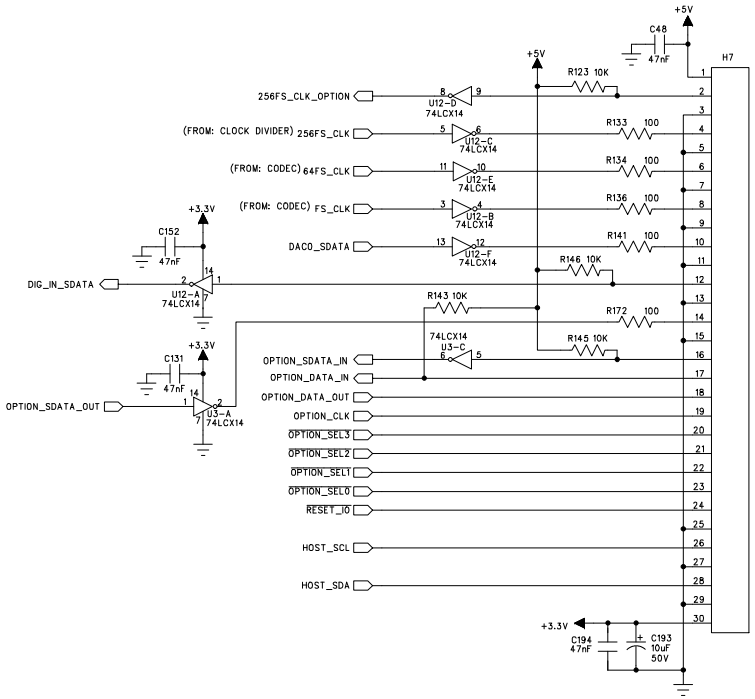
Jumper to disable Host to DSP reset

COMPANY:	LINE 6
TITLE:	AX3_MAIN HOST MCU SECTION
PROGRAM:	PADS POWER LOGIC V3.5.1
REV:	D
FILENAME:	G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/ /Hardware/Schematic/Main/REV D/AX3 MAIN REV D.sch
SCALE: 1:1	SIZE: C
PART NUMBER:	35-00-0094
SHEET:	1 OF 8

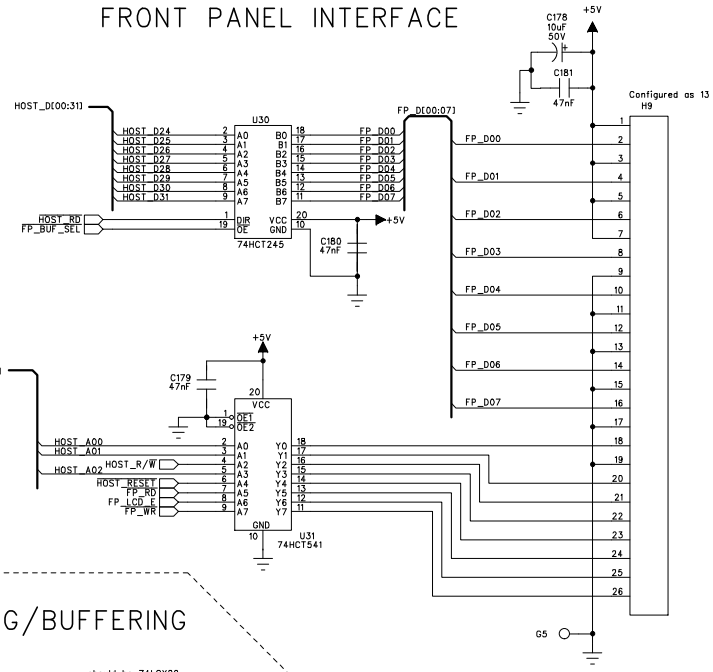
DRAWN: D. Molnar / DB	DATED: 10/24/01
CHECKED:	DATED:

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

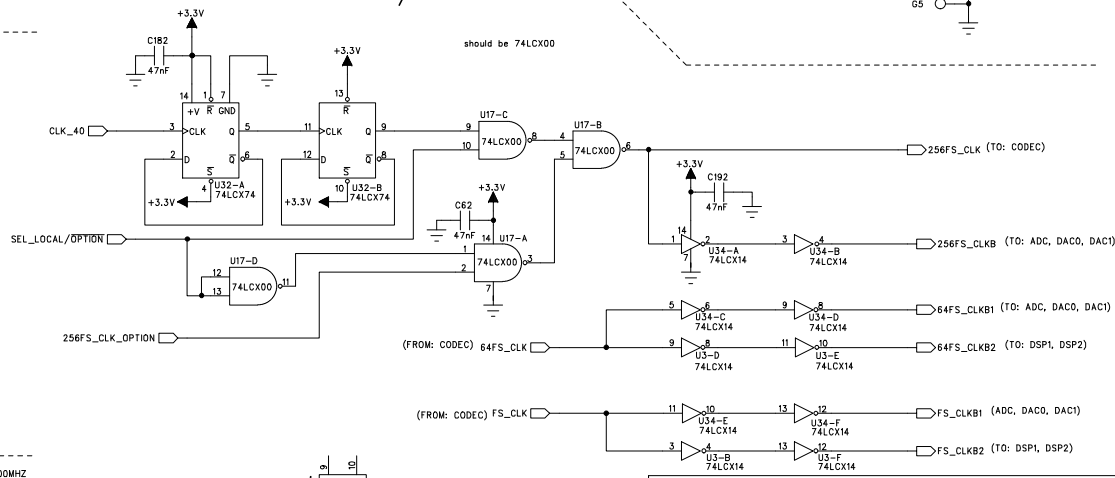
AX3 OPTION CARDS INTERFACE (DIGITAL AUDIO, USB, ETC...)



FRONT PANEL INTERFACE

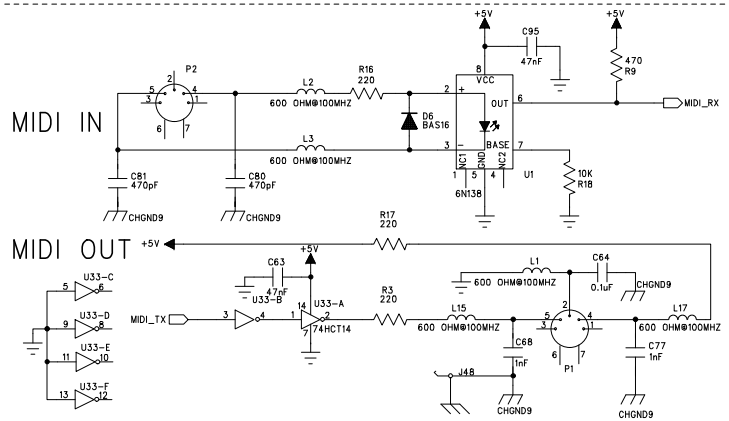


AUDIO CLOCKING/BUFFERING

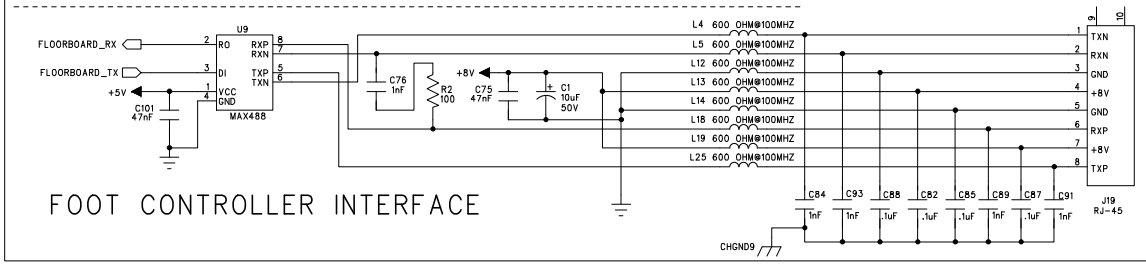


MIDI IN

MIDI OUT



FOOT CONTROLLER INTERFACE



DRAWN: D. Molnar	DATED: 6/5/01	
CHECKED:	DATED:	

COMPANY: LINE 6

TITLE: AX3 MAIN PCB INTERFACE/CLOCKING

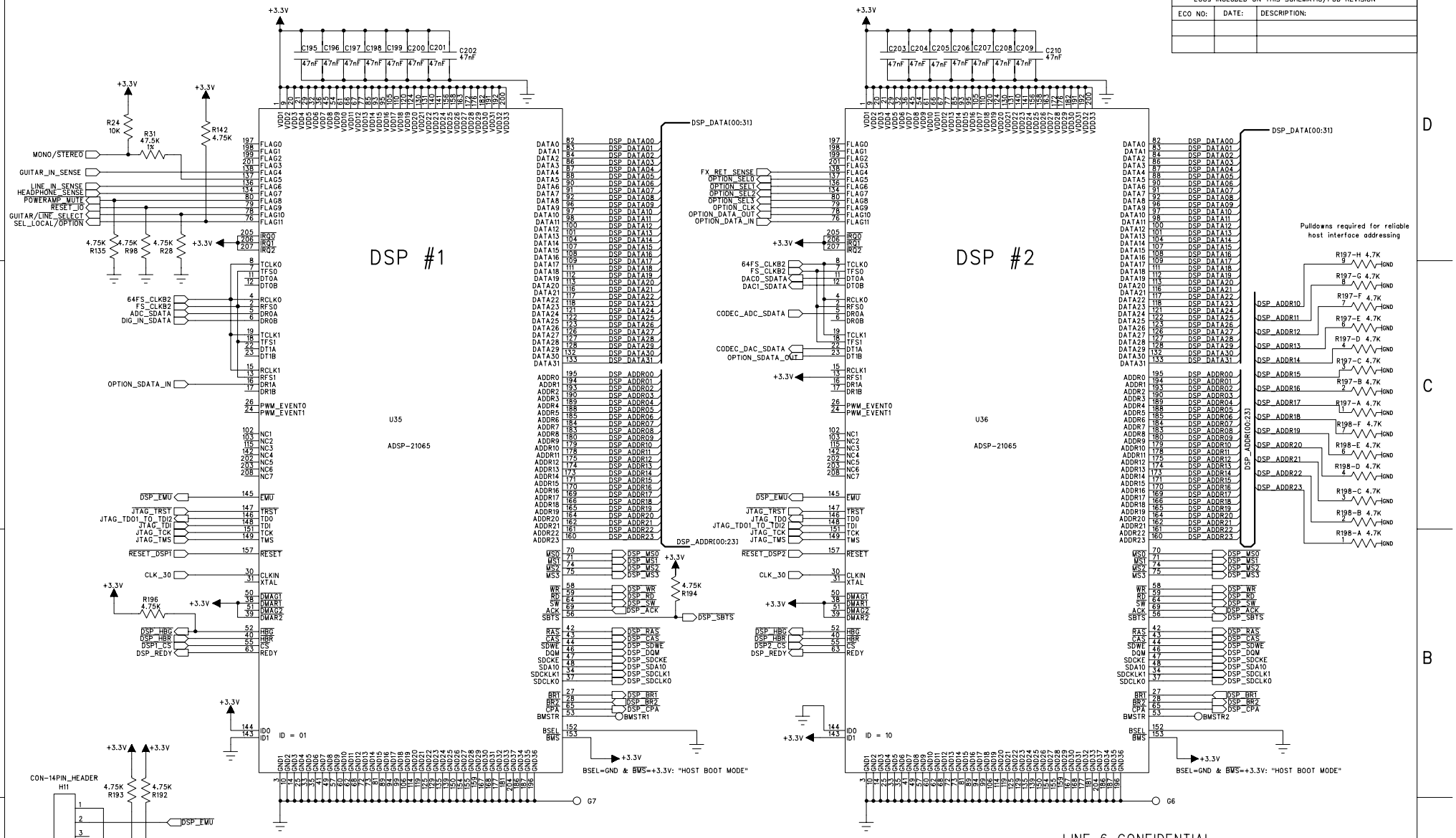
PROGRAM: PADS POWER LOGIC V3.5.1

REV: D

FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/ /Hardware/Schematic/Main/REV D/AX3 MAIN REV D.sch

SCALE: 1:1 | SIZE: C | PART NUMBER: 35-00-0094 | SHEET: 2 OF 8

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

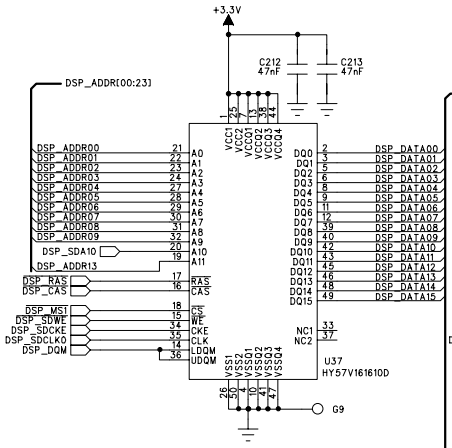


COMPANY:	LINE 6
TITLE:	AX3 MAIN PCB DSP
PROGRAM:	PADS POWER LOGIC V3.5.1
REV:	D
FILENAME:	G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/ /Hardware/Schematic/Main/REV D/AX3 MAIN REV D.sch
DRAWN:	D. Molnar
DATED:	6/5/01
CHECKED:	
DATED:	
SCALE:	1:1
SIZE:	C
PART NUMBER:	35-00-0094
SHEET:	3 OF 8

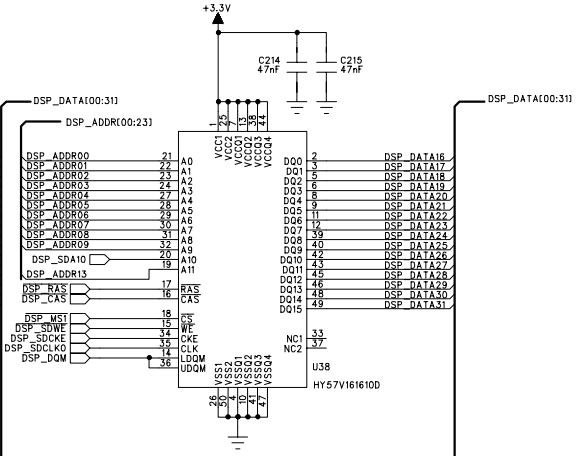
ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

DSP MEMORY

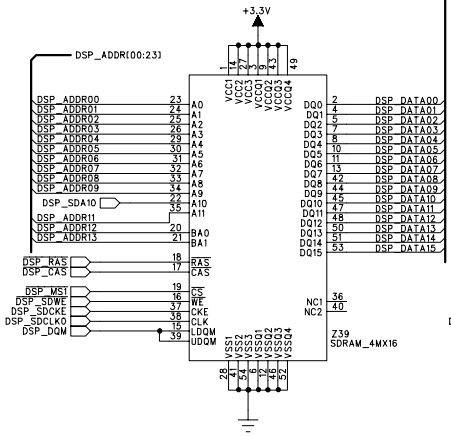
SDRAM LOWER 1M X 16



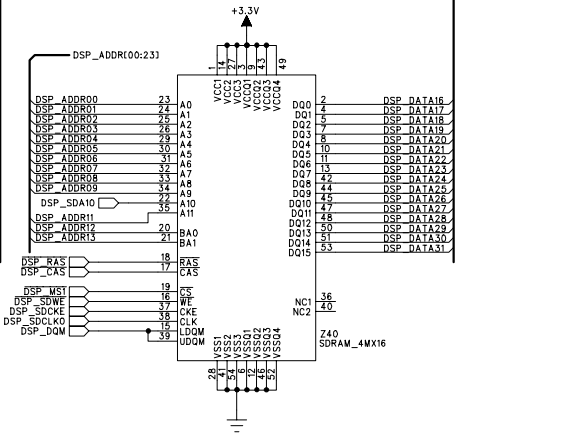
SDRAM UPPER 1M X 16



SDRAM LOWER 4M X 16

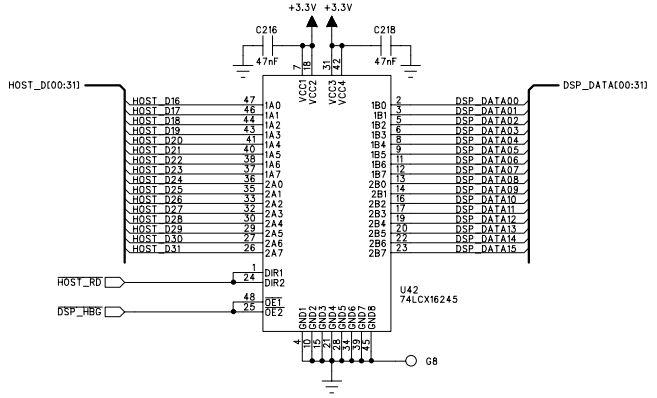


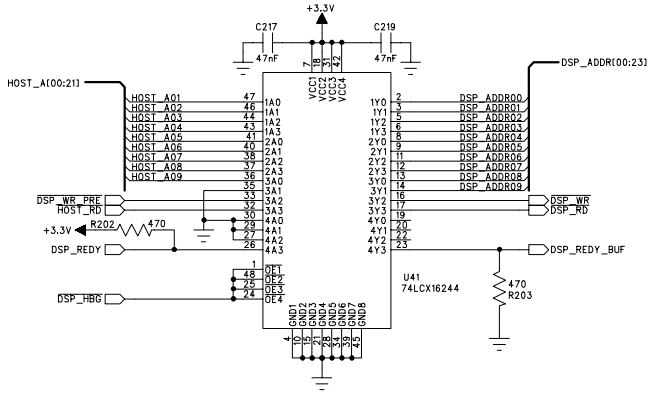
SDRAM UPPER 4M X 16



NOTE: The PCB layout is configured to install Either the 1M X 16 or the 4M X 16 parts but not both!

DSP HOST INTERFACE



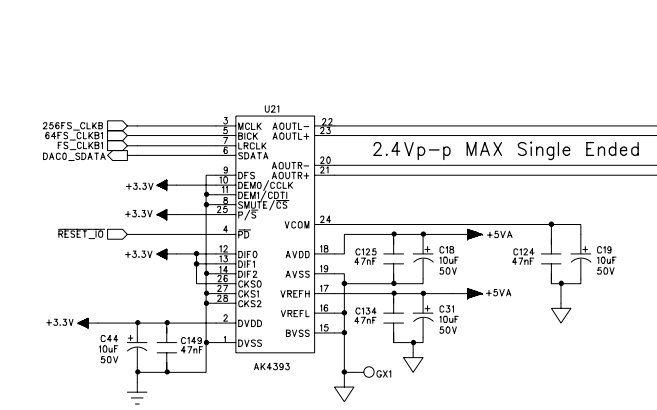


LINE 6 CONFIDENTIAL

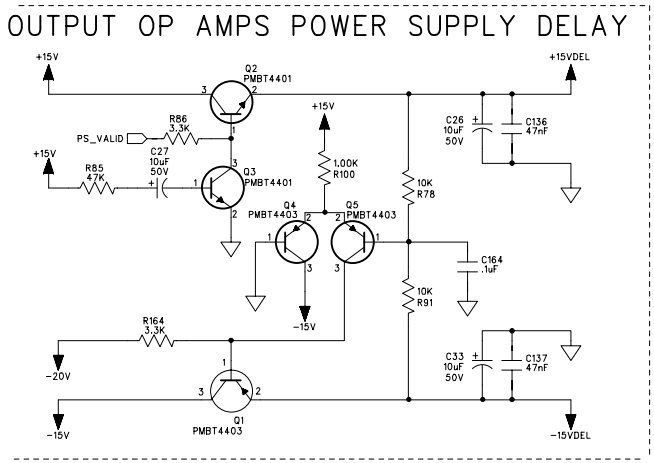
DRAWN: D. Molnar	DATED: 6/5/01	COMPANY: LINE 6	
CHECKED:	DATED:	TITLE: AX3 MAIN PCB DSP PERIPHERALS	
		PROGRAM: PADS POWER LOGIC V3.5.1	REV: D
		FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/ /Hardware/Schematic/Main/REV D/AX3 MAIN REV D.sch	
		SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0094	SHEET: 4 OF 8

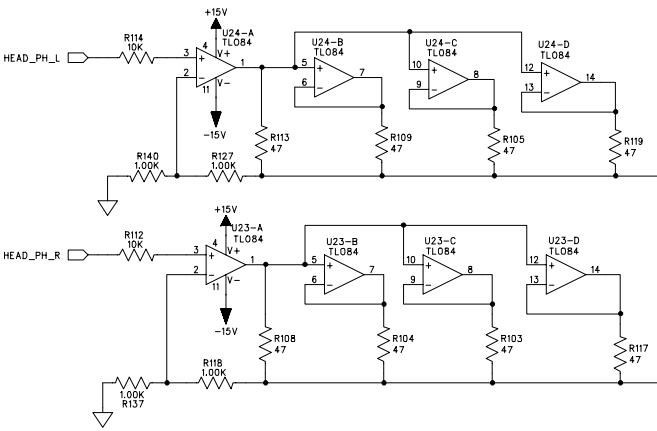
DIRECT / WET OUTPUTS

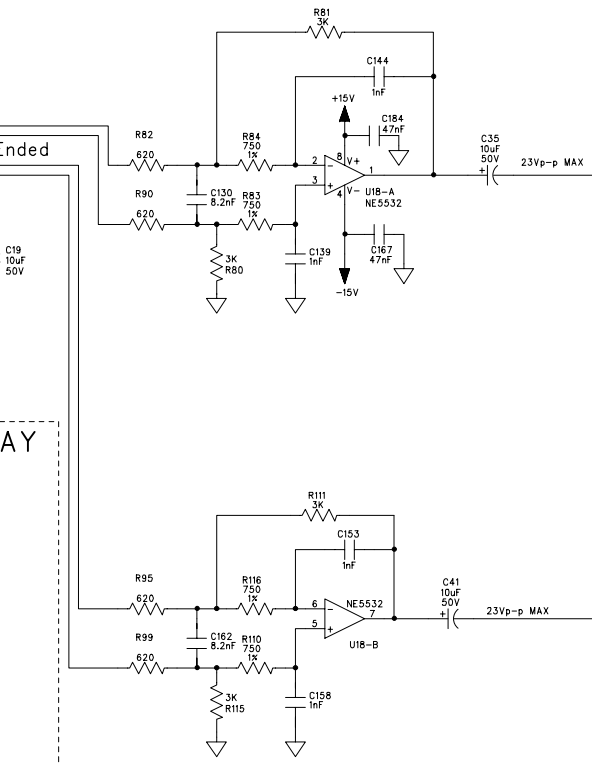
ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

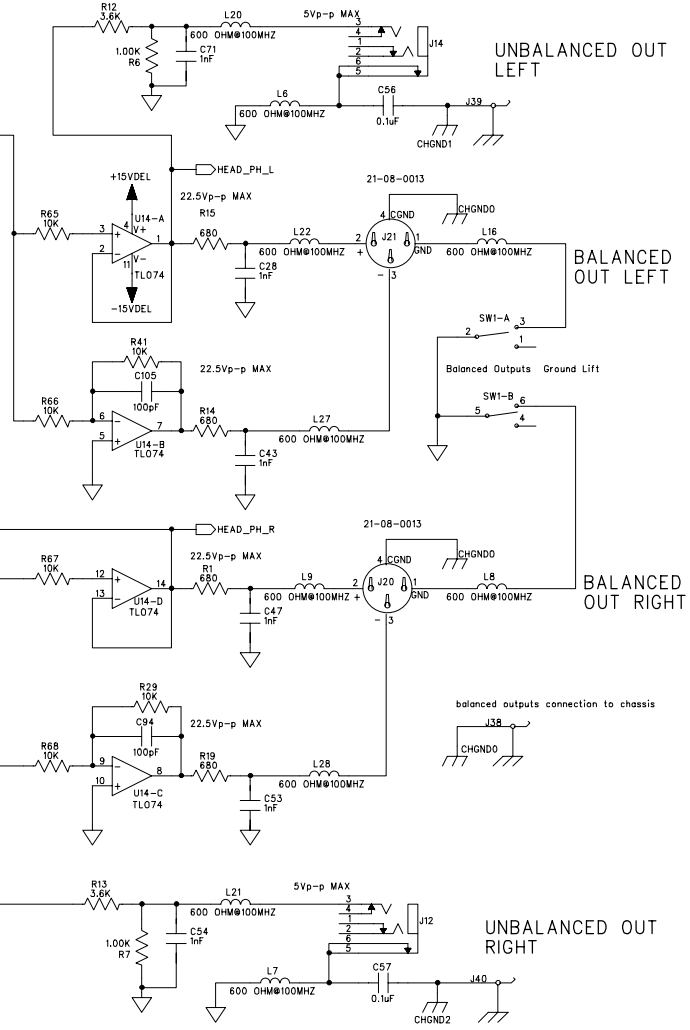


2.4Vp-p MAX Single Ended



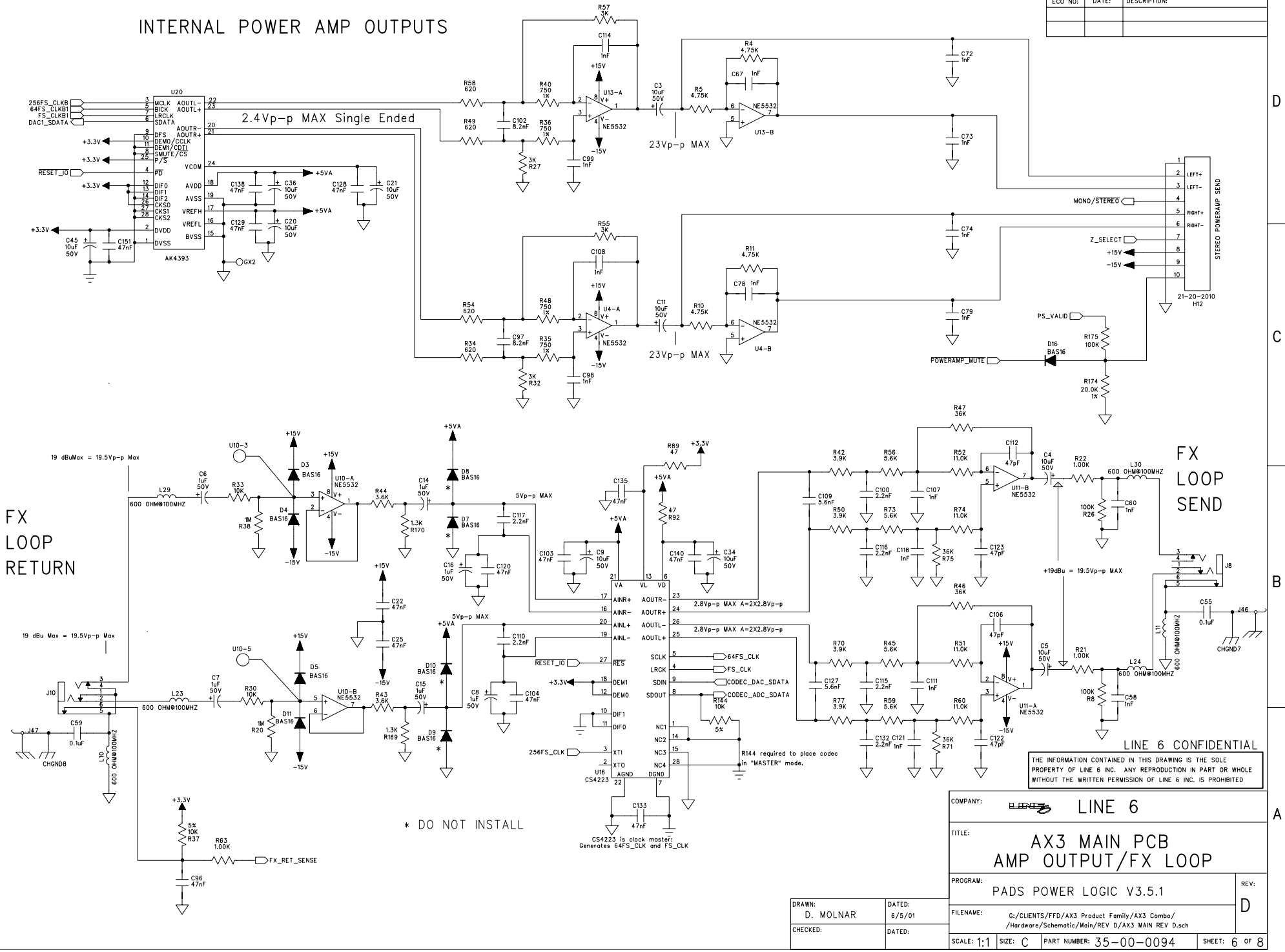




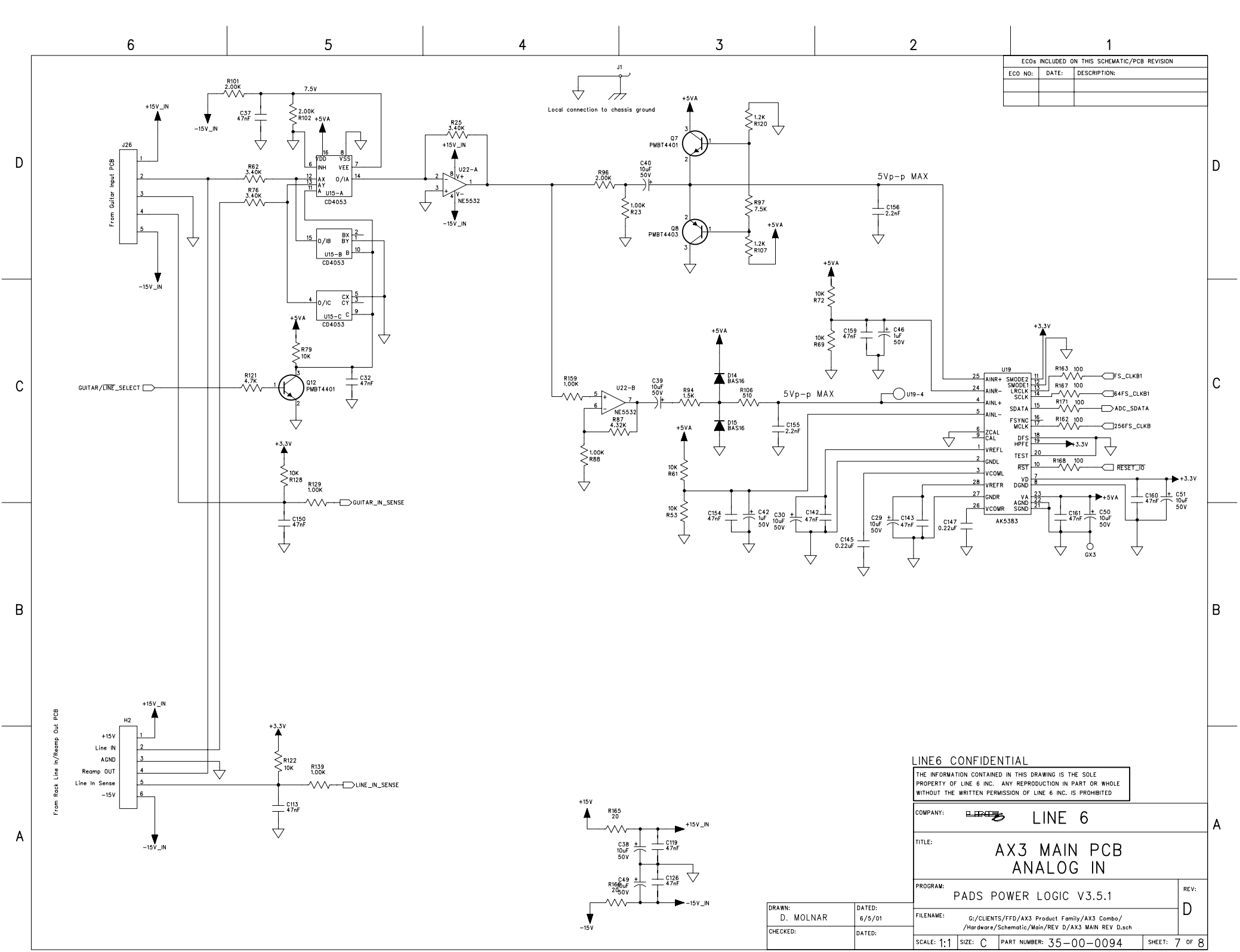


DRAWN: D. Molnar	DATED: 6/5/01		
CHECKED:	DATED:		
COMPANY: LINE 6			
TITLE: AX3 MAIN PCB DIRECT OUT/HEADPHONES			
PROGRAM: PADS POWER LOGIC V3.5.1			REV: D
FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/ /Hardware/Schematic/Main/REV D/AX3 MAIN REV D.sch			
SCALE: 1:1	SIZE: C	PART NUMBER: 35-00-0094	SHEET: 5 OF 8

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



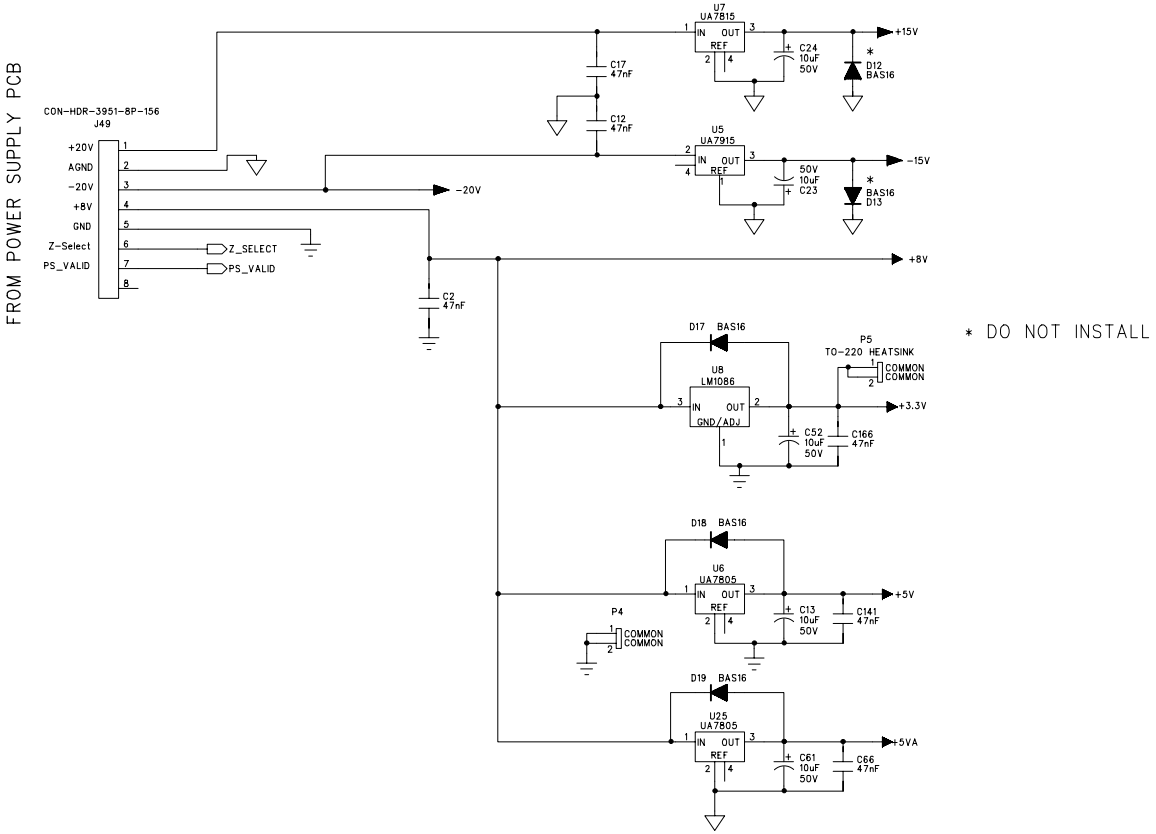
DRAWN: D. MOLNAR	DATED: 6/5/01	COMPANY: LINE 6	
CHECKED:	DATED:	TITLE: AX3 MAIN PCB AMP OUTPUT/FX LOOP	
		PROGRAM: PADS POWER LOGIC V3.5.1	REV: D
		FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/ /Hardware/Schematic/Main/REV D/AX3 MAIN REV D.sch	
		SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0094	SHEET: 6 OF 8



AX3 MAIN REV D.sch-7 - Tue Nov 27 14:13:00 2001

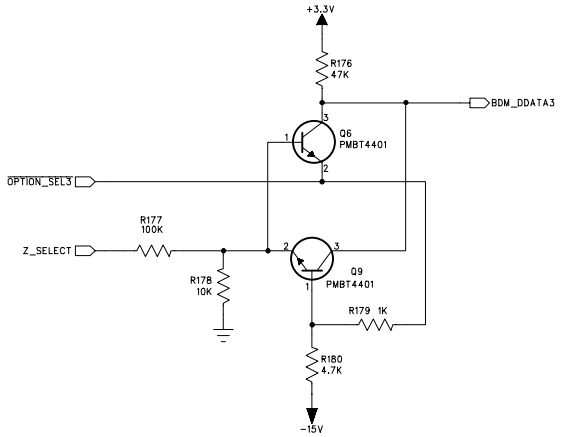
ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

POWER ENTRY

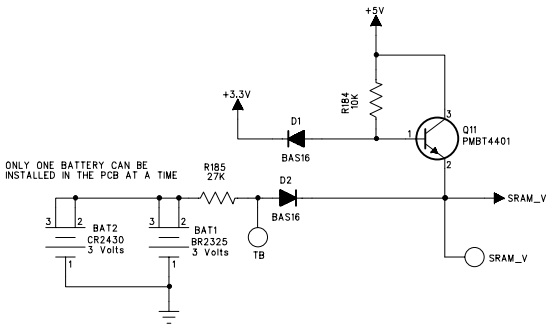


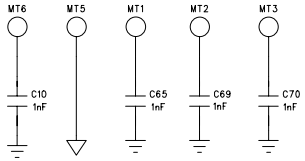
* DO NOT INSTALL

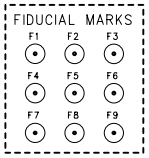
Z-SELECT DETECTION CIRCUITRY



BATTERY FOR NON VOLATILE SRAM







DRAWN: D. MOLNAR / DB	DATED: 10/24/01	COMPANY: LINE 6	
CHECKED:	DATED:	TITLE: AX3 MAIN PCB POWER	
		PROGRAM: PADS POWER LOGIC V3.5.1	REV: D
		FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/ /Hardware/Schematic/Main/REV D/AX3 MAIN REV D.sch	
		SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0094	SHEET: 8 OF 8

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

*Vetta Combo and Head use the same PCB

The schematic reflects the different components inserted for each respective assembly

P3 21-20-1566: +HIGH, +LOW, AGND, -LOW, -HIGH

P1 21-20-2010: R166 1.0; +AUDIO_L, -AUDIO_L, STEREO, +AUDIO_R, -AUDIO_R, Z_SELECT, +15V, -15V, MUTE

P4 21-20-0204: STEREO, +15V, Z_SELECT, +15V

P2 21-20-1564: OUTPUT_R, AGND, OUTPUT_L, AGND

MH1 MH2 MH3 X1 X2 X3

+LOW — T10 — J13 — +RAIL — T8; C38 47uF 100V

+LOW — D34 BAS16 — R139 27K 1% — Q20 PMBT4403 — Q34 2N5551; D6 12V; R12 150 1%; +BIAS_HIGH_L — T5; C25 100uF 16V; OUTPUT_L

D4 BAS16 — R17 27K 1% — Q17 PMBT4403 — Q38 2N5551; D17 12V; R5 150 1%; +BIAS_HIGH_R — T6; C22 100uF 16V; OUTPUT_R

-LOW — C40 47uF 100V — T12 — J14

BAS16 D15; R18 150 1%; -15V

R93 27K 1% — Q33 PMBT4403 — Q23 2N5551; AGND; D7 12V; R16 150 1%; +BIAS_LOW — T14; C18 100uF 16V; -RAIL — T13

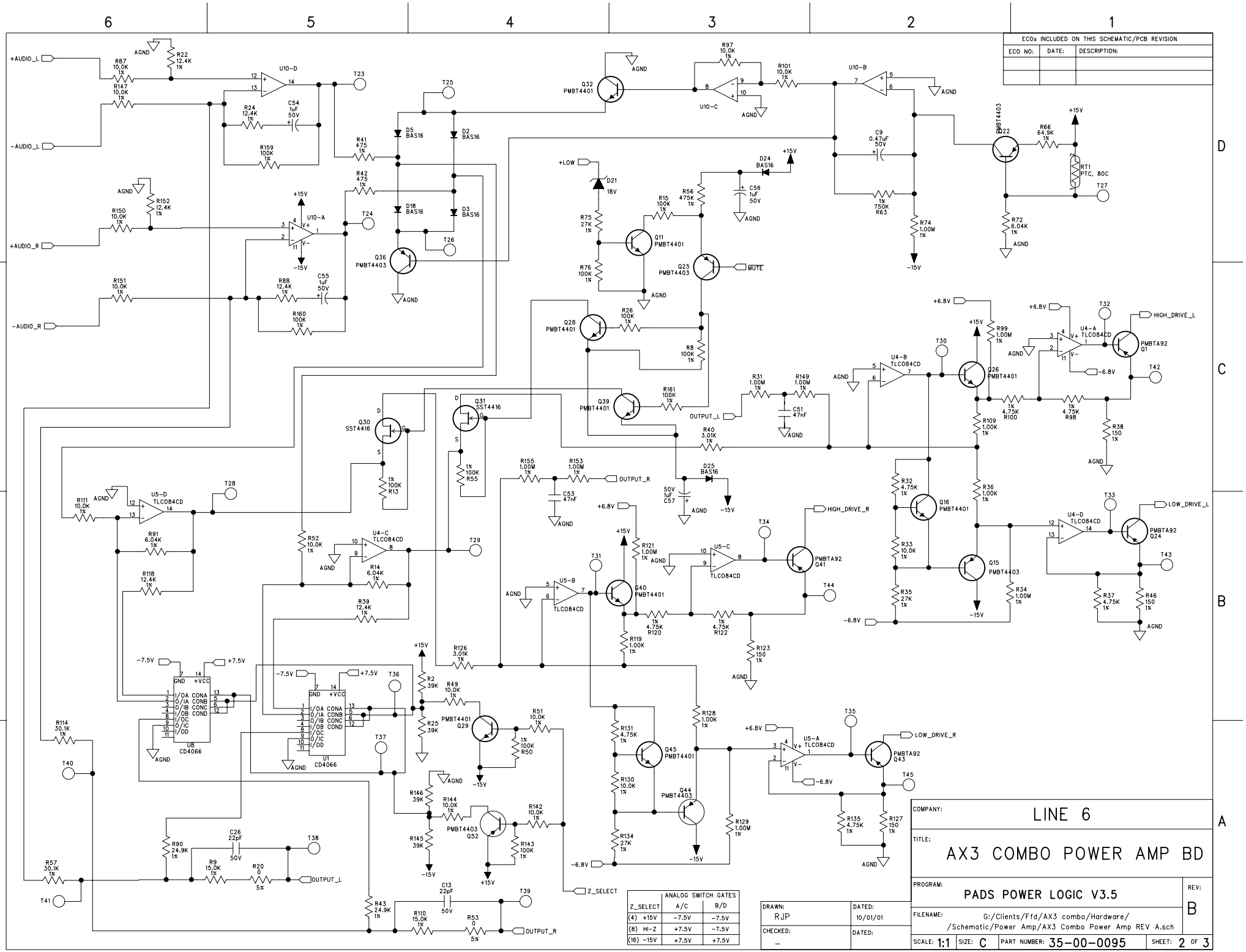
C1 100uF 16V; D10 3.9V; R70 0; J2 0; -BIAS_LOW — T15

+15V; C52 47nF; R124 4.75K 1%; +7.5V — T1; Q18 PMBT4401 — T3; +6.8V; R132 4.75K 1%; C17 47nF; C28 47nF; C8 220uF 50V

AGND; R133 4.75K 1%; C21 47nF; C33 47nF; -6.8V — T4; -7.5V — T2; Q19 PMBT4403; R125 4.75K 1%; C34 47nF; -15V

-HIGH — T11 — J1; R156 330

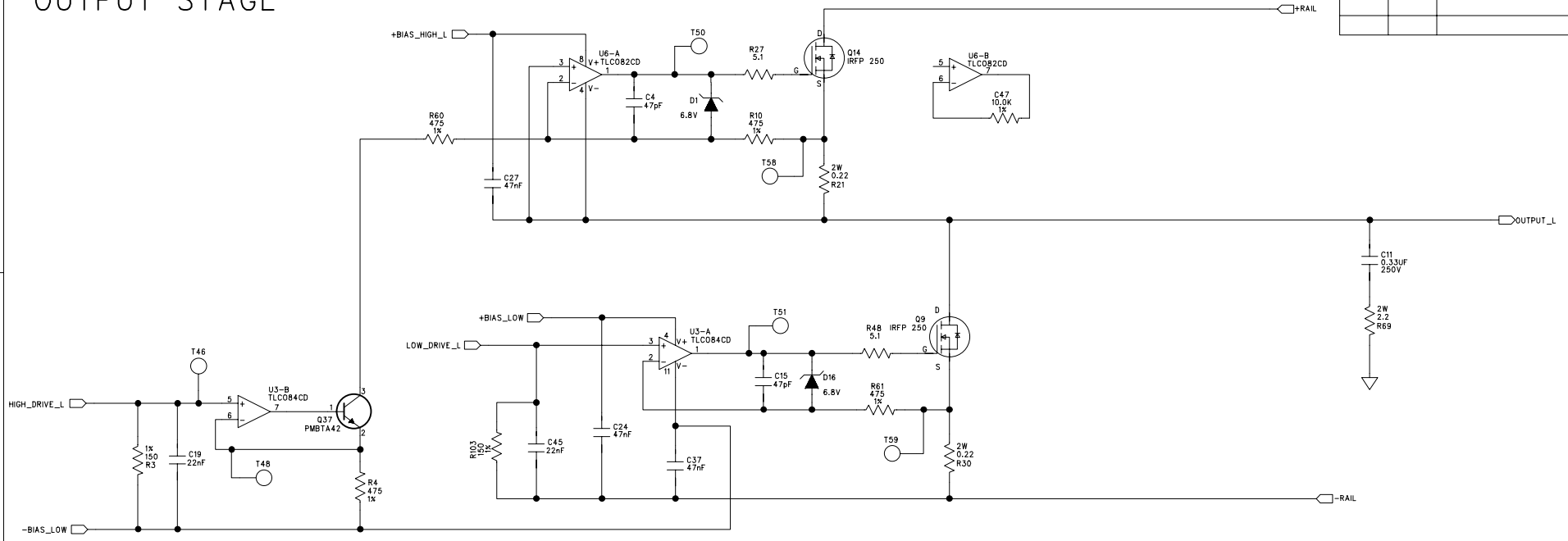
DRAWN: RJP	DATED: 10/01/01	COMPANY: LINE 6	
CHECKED: _	DATED:	TITLE: AX3 COMBO POWER AMP BD	
		PROGRAM: PADS POWER LOGIC V3.0	REV: B
		FILENAME: G:/Clients/Ffd/AX3 combo/Hardware/ /Schematic/Power Amp/AX3 Combo Power Amp REV A.sch	
		SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0095	SHEET: 1 OF 3

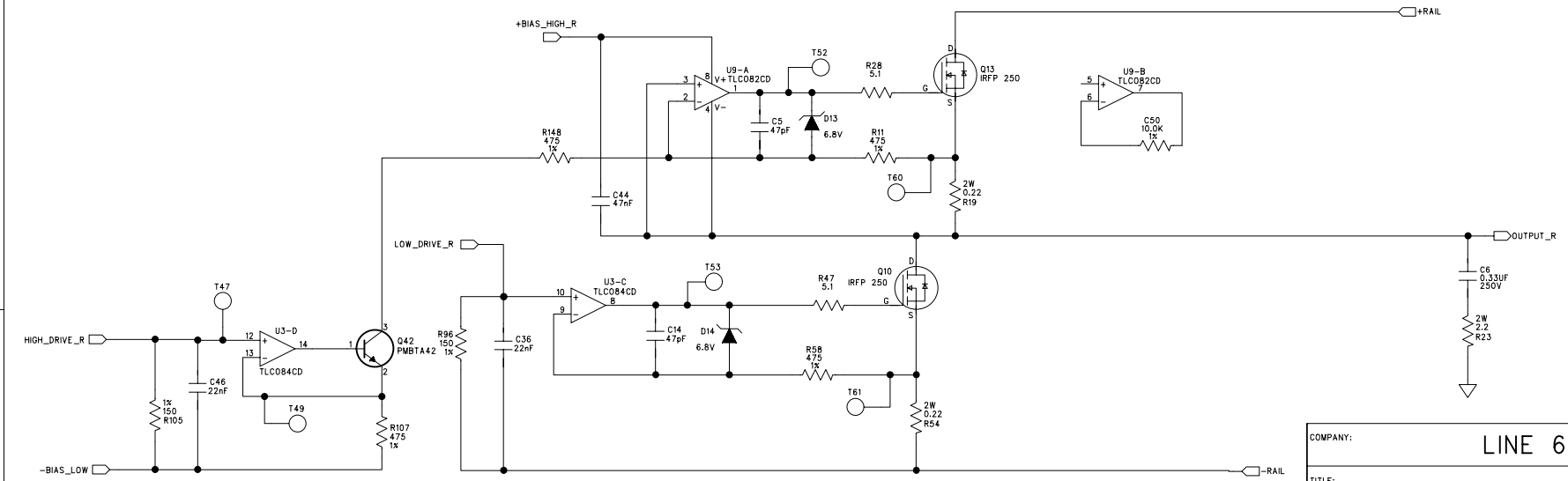


AX3 (Combo) Power Amp Rev. B.sch-2 - Wed Nov 28 11:00:11 2001

OUTPUT STAGE

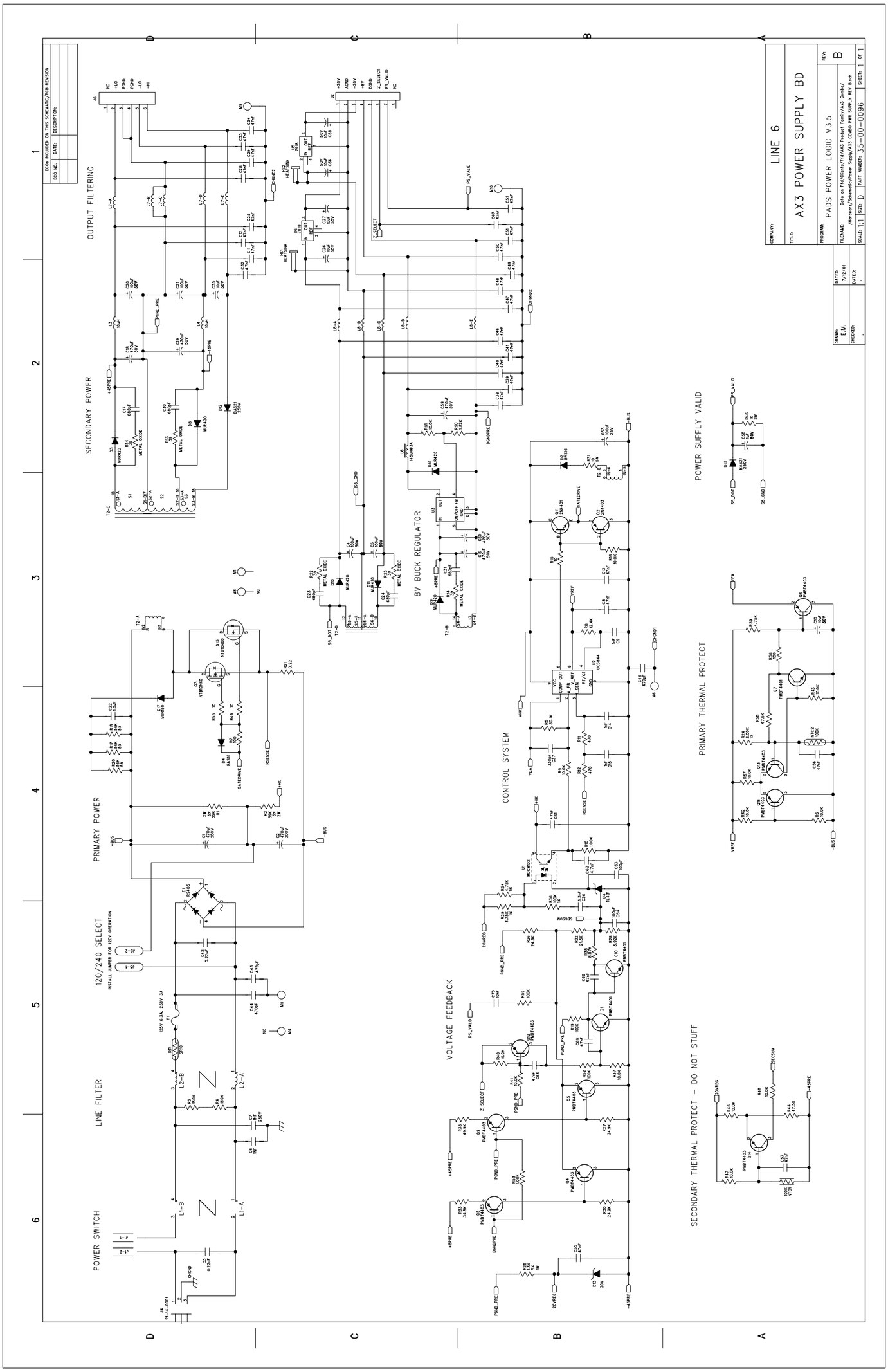
ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:





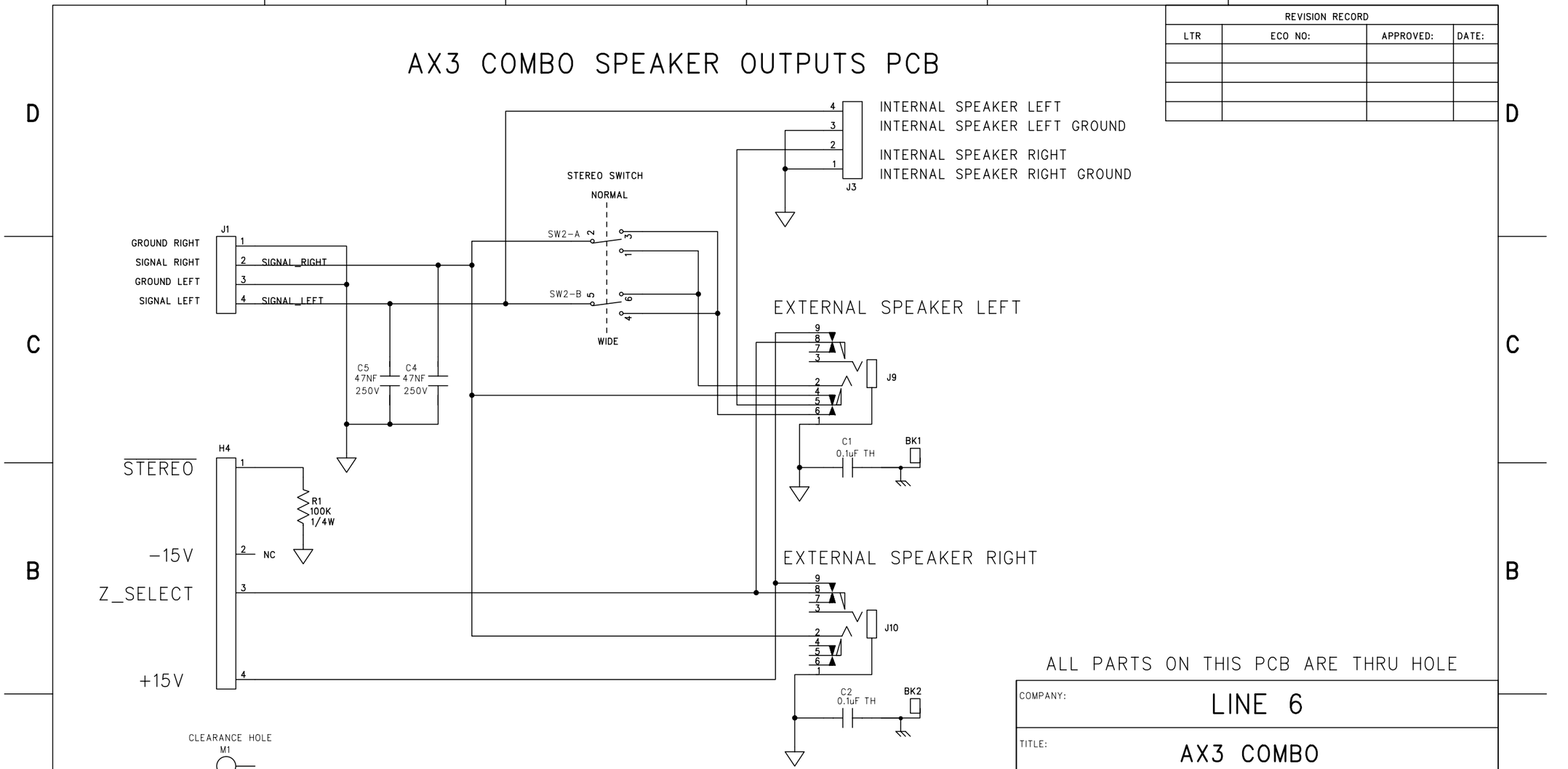
DRAWN: RJP	DATED: 10/01/01	COMPANY: LINE 6	
CHECKED: _	DATED:	TITLE: AX3 COMBO POWER AMP BD	
		PROGRAM: PADS POWER LOGIC V3.0	REV: B
		FILENAME: G:/Clients/Ffd/AX3 combo/Hardware/ /Schematic/Power Amp/AX3 Combo Power Amp REV A.sch	
		SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0095	SHEET: 3 OF 3

AX3 (Combo) Power Amp Rev. B.sch-3 - Wed Nov 28 11:00:10 2001


ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION
ECO NO. | DATE | DESCRIPTION
COMPANY: LINE 6
TITLE: AX3 POWER SUPPLY BD
PROGRAM: PADS POWER LOGIC V3.5
REV: B
FILENAME: Data on FTG/Clients/FTG/AX3 Product Family/AX3 Combo/Hardware/Schematic/Power Supply/AX3 COMBO PWR SUPPLY REV B.sch
DRAWN: E.M. DATED: 7/12/01
CHECKED: DATED:
SCALE: 1:1 SIZE: D PART NUMBER: 35-00-0096 SHEET: 1 OF 1
OUTPUT FILTERING
SECONDARY POWER
8V BUCK REGULATOR
CONTROL SYSTEM
POWER SUPPLY VALID
PRIMARY THERMAL PROTECT
SECONDARY THERMAL PROTECT – DO NOT STUFF
PRIMARY POWER
120/240 SELECT
INSTALL JUMPER FOR 120V OPERATION
LINE FILTER
POWER SWITCH
VOLTAGE FEEDBACK

AX3 COMBO SPEAKER OUTPUTS PCB

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:



ALL PARTS ON THIS PCB ARE THRU HOLE

DRAWN: dblackmore	DATED: 10.22.01		
CHECKED: Initials	DATED: Date		

COMPANY: LINE 6

TITLE: AX3 COMBO SPEAKER OUTPUTS PCB

PROGRAM: PADS POWER LOGIC V3.5

REV: B

FILENAME: G:/Clients/Ffd/AX3 Product Family/Ax3 Combo/Hardware/ /Schematic/OUTPUT SPKR/REV B/AX3_COMBO_SPKR OUT REV B.sch

SCALE: 1:1 SIZE: B PART NUMBER: 35-00-0105 SHEET: 1 OF 1

INTERFACE TO DIGITAL PCB

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

REV A SAME AS REV X3
REV B INCORPORATES ECO 0127002 PLUS ALSO
CHANGES TO 0805 PACKAGES FROM 1206 db 10/24/01

Note: This +5VA is not the same as the +5VA on the main PCB. It is only to power the pots and A/D converter on this board

GRAPHIC LCD INTERFACE

Locate the LM50CIM3 directly under the center of the graphic LCD module.

Pin 3 should connect directlt to the ground plane

NOTE: Header H9 is for graphics LCD backlight The wire points BACKLIGHT+ and BACKLIGHT- are optional if H9 is not installed.

CHARACTER LCD INTERFACE

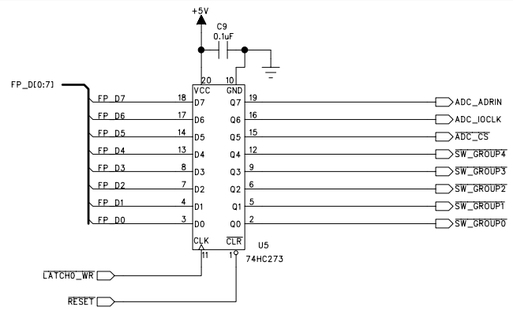
Note: The -5V here is borrowed from the graphic LCD contrast port.

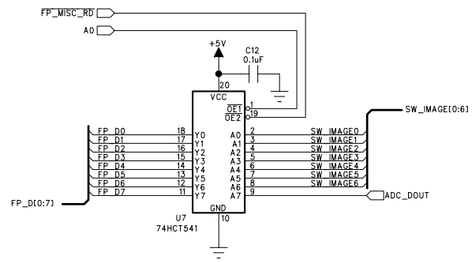
PCB MOUNTING HOLES: M16 M10 M11 M15 M13 M14 M18 M20

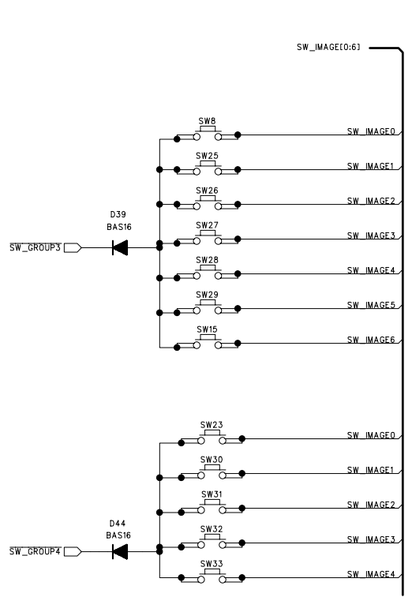
FIDUCIAL MARKS: F1 F2 F3 F6 F5 F4

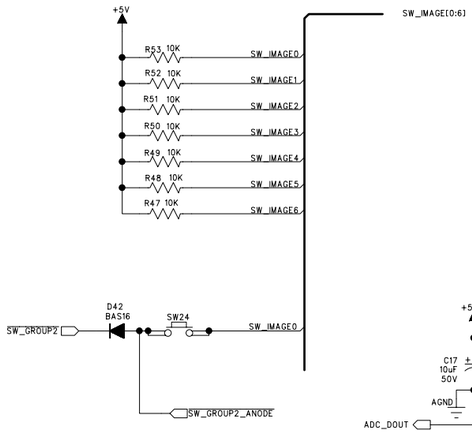
DRAWN: D. MOLNAR / DB	DATED: 10/24/01	COMPANY: LINE 6	
CHECKED:	DATED:	TITLE: AX3 COMBO/HEAD U.I. LEFT HALF	
		PROGRAM: PADS POWER LOGIC V3.0	REV: B
		FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/Hardware/ /Schematic/UI_BOARD/REV B/AX3 COMBO UI LEFT REV B.sch	
SCALE: 1:1	SIZE: C	PART NUMBER: 35-00-0106	SHEET: 1 OF 3

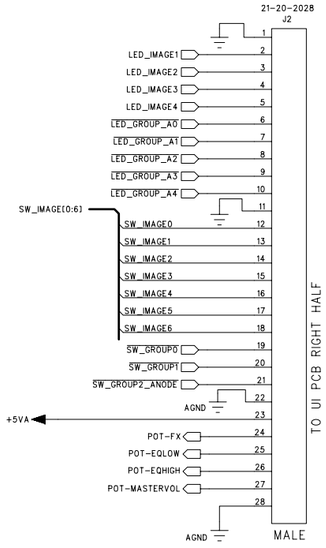
ECOs INCLUDED ON THIS SCHEMATIC/PCB REVISION		
ECO NO:	DATE:	DESCRIPTION:

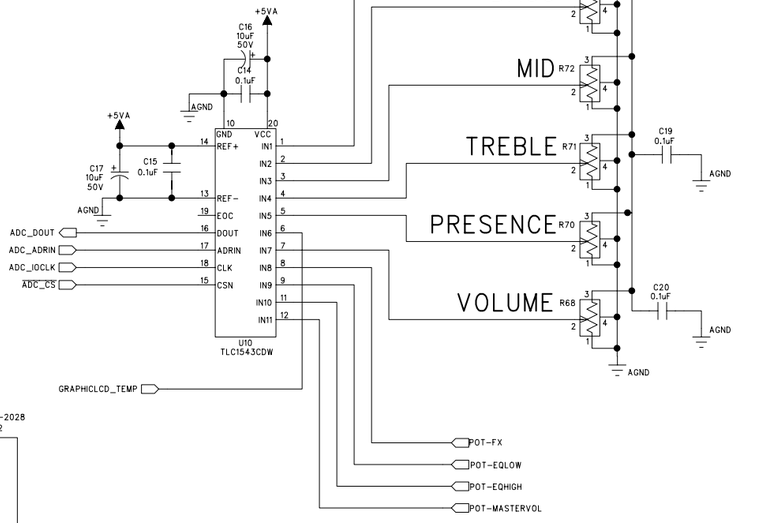












DRAWN: D. MOLNAR / DB	DATED: 10/24/01	COMPANY: LINE 6	
CHECKED:	DATED:	TITLE: AX3 COMBO/HEAD U.I. LEFT HALF	
		PROGRAM: PADS POWER LOGIC V3.0	REV: b
		FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/Hardware/ /Schematic/UI_BOARD/REV B/AX3 COMBO UI LEFT REV B.sch	
		SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0106	SHEET: 2 OF 3

AX3 COMBO UI Left Rev B.sch-3 - Thu Oct 25 07:47:54 2001

FRONT PANEL LEDS

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

FP_D[0:7]
LATCH1_WR
LATCH2_WR
LATCH3_WR
RESET
ENC_GROUP
U4 74HC273
U3 74HC273
U9 TPIC6273
C8 0.1uF
C7 0.1uF
C13 0.1uF
+5V
SEG_A
SEG_B
SEG_C
SEG_D
SEG_E
SEG_F
SEG_G
H2
H4
LED_GROUP_B2
LED_GROUP_B1
LED_GROUP_B0
LED_GROUP_A0
LED_GROUP_A1
LED_GROUP_A2
LED_GROUP_A3
LED_GROUP_A4
LED_IMAGE7
LED_IMAGE6
LED_IMAGE5
LED_IMAGE4
LED_IMAGE3
LED_IMAGE2
LED_IMAGE1
LED_IMAGE0
TP1-1
TP1-2
HARD LED RESET TOGGLE SWITCH

DRAWN: D. MOLNAR / DB	DATED: 10/24/01	COMPANY: LINE 6	
CHECKED:	DATED:	TITLE: AX3 COMBO/HEAD U.I. LEFT HALF	
		PROGRAM: PADS POWER LOGIC V3.0	REV: B
		FILENAME: G:/CLIENTS/FFD/AX3 Product Family/AX3 Combo/Hardware/ /Schematic/UI_BOARD/REV B/AX3 COMBO UI LEFT REV B.sch	
		SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0106	SHEET: 3 OF 3

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

Mounting holes for UI PCB right half

M1 M21 M20 M17 M16 M15 M19

C28 0.1uF

C27 0.1uF

AGND

FIDUCIAL MARKS

F1 F2 F3

21-20-1028

J1

TO UI PCB LEFT HALF

1 LED_IMAGE1
2 LED_IMAGE2
3 LED_IMAGE3
4 LED_IMAGE4
5 LED_GROUP_A0
6 LED_GROUP_A1
7 LED_GROUP_A2
8 LED_GROUP_A3
9 LED_GROUP_A4
10
11
12 SW_IMAGE0
13 SW_IMAGE1
14 SW_IMAGE2
15 SW_IMAGE3
16 SW_IMAGE4
17 SW_IMAGE5
18 SW_IMAGE6
19 SW_GROUP0
20 SW_GROUP1
21 SW_GROUP2_ANODE
22 AGND
23 +5VA
24 POT-FX
25 POT-EQLOW
26 POT-EQHIGH
27 POT-MASTERVOL
28 AGND

SW_IMAGE[0:6]

FEMALE

C29 0.1uF AGND

LED_IMAGE4 LED_IMAGE3 LED_IMAGE2 LED_IMAGE1

D1 D2 D3 D4 D5 ORANGE
D17 D10 D11 D18 D19 ORANGE
D7 D6 D15 D23 D14 ORANGE
D22 D21 D13 D12 D20 ORANGE

LED_GROUP_A0 LED_GROUP_A1 LED_GROUP_A2 LED_GROUP_A3 LED_GROUP_A4

SW_IMAGE[0:6]

SW_GROUP0 D40 BAS16

SW1 SW_IMAGE0
SW2 SW_IMAGE1
SW3 SW_IMAGE2
SW4 SW_IMAGE3
SW5 SW_IMAGE4
SW6 SW_IMAGE5
SW7 SW_IMAGE6

SW_IMAGE[0:6]

SW_GROUP1 D41 BAS16

SW9 SW_IMAGE0
SW10 SW_IMAGE1
SW11 SW_IMAGE2
SW12 SW_IMAGE3
SW13 SW_IMAGE4
SW14 SW_IMAGE5
SW22 SW_IMAGE6

KP3
AX3_UI_KEYPAD_3

SW_IMAGE[0:6]

SW_GROUP2_ANODE

SW21 SW_IMAGE1
SW20 SW_IMAGE2
SW19 SW_IMAGE3
SW18 SW_IMAGE4
SW17 SW_IMAGE5
SW16 SW_IMAGE6

+5VA

FX POT-FX R67 C21 0.1uF AGND

EQ-LOW POT-EQLOW R66

EQ-HIGH POT-EQHIGH R65

MASTER VOL POT-MASTERVOL R64 C22 0.1uF AGND

DRAWN: D. Molnar	DATED: 05/21/2001
CHECKED:	DATED:

COMPANY: LINE 6

TITLE: AX3 COMBO/HEAD U.I. RIGHT HALF

PROGRAM: PADS POWER LOGIC V3.5.1

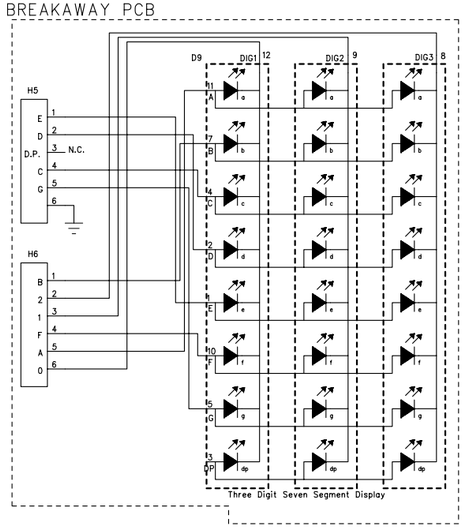
REV: A

FILENAME: G:/CLIENTS/FFD/AX3 Product Family/Ax3 Combo/Hardware/Schematic/UI_BOARD/REV A/AX3_COMBO_UI_RIGHT REV_A.sch

SCALE: 1:1 SIZE: C PART NUMBER: 35-00-0107 SHEET: 1 OF 2

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

BREAKAWAY PCB

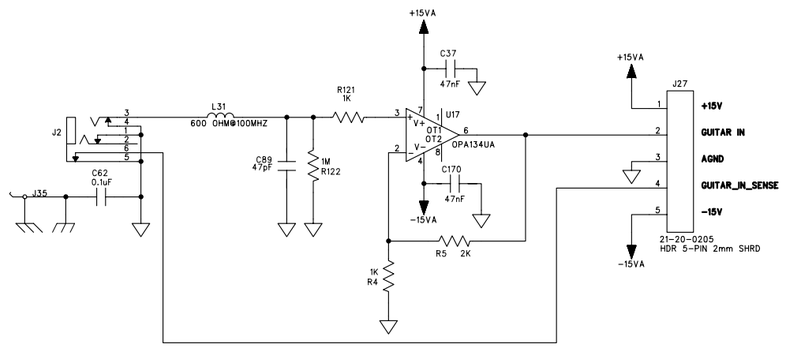


DRAWN: D. Molnar	DATED: 5/21/2001
CHECKED:	DATED:

COMPANY:	LINE 6
TITLE:	AX3 COMBO/HEAD U.I. RIGHT HALF
PROGRAM:	PADS POWER LOGIC V3.5.1
REV:	A
FILENAME:	G:/CLIENTS/FFD/AX3 Product Family/Ax3 Combo/Hardware/ /Schematic/UI_BOARD/REV A/AX3_COMBO_UI_RIGHT REV_A.sch
SCALE: 1:1	SIZE: C
PART NUMBER:	35-00-0107
SHEET:	2 OF 2

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

GUITAR INPUT PCB

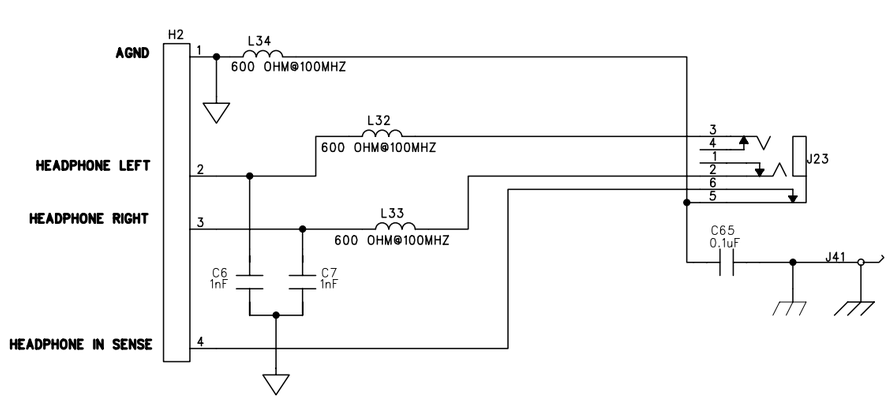


DRAWN: D. Molnar	DATED: 5/22/01
CHECKED: Initials	DATED: Date

COMPANY:	LINE 6
TITLE:	AX3 GUITAR INPUT PCB
PROGRAM:	PADS POWER LOGIC V3.5
REV:	A
FILENAME:	G:/Clients/Ffd/AX3 Product Family/Ax3 Combo/Hardware/ /Schematic/GUITAR IN/REV A/AX3_GUITAR IN_REV_A.SCH
SCALE: 1:1	SIZE: C
PART NUMBER:	35-00-0099
SHEET:	1 OF 1

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

HEADPHONE OUTPUT PCB



COMPANY:	LINE 6
TITLE:	AX3 HEADPHONE OUTPUT BD
PROGRAM:	PADS POWER LOGIC V3.0
REV:	A
FILENAME:	G:/Clients/Ffd/AX3 Product Family/Ax3 Combo/Hardware/ Schematic/Headphone/Rev A/AX3_Headphone Rev A.sch
SCALE: 1:1 SIZE: B	PART NUMBER: 35-00-0103
SHEET: 1 OF 1	

DRAWN: D Molnar	DATED: 5/22/01
CHECKED: .	DATED: .

LINE 6
Vetta Combo Parts List

Item: 99 VETTA Combo 120V US

Level	Part Number	Component-Description	Qty-Per-Parent
99 VETTA US		AMP Vetta Combo 120V US	
1	11-10-0003	FERRITE CYLINDRICAL 26mm OD x 13mm IDx 29mm LENGTH	2.000000
1	11-20-1212	SPEAKER 12" CELESTION Vetta	2.000000
1	21-30-0009-1	CABLE DIL 10 PIN .100 PITCH PCB Position:H12-P1 8.0 in	1.000000
1	21-30-0026	CABLE DIL RBN 26 PIN 8.0 PCBPosition:H9-H12	1.000000
1	21-34-0006	CABLE SIL 1.95 PCB Position: J5	1.000000
1	21-34-0007-1	CABLE SIL 4 PIN 7.0 IN LG PCB Position: P4-H4	1.000000
1	21-34-0008-1	CABLE SIL 4 PIN .156 IN PITCH PCB Position: P2-J1 6.0 IN LG	1.000000
1	21-34-0009	CABLE SIL 2 PIN 4.71 PCB Position: J1-switch	1.000000
1	21-34-0014-1	CABLE SIL 8 PINS .156 IN PITCH PCB Position: LB-J49 5.0 IN LG	1.000000
1	21-34-0015	CABLE SIL 5 PIN .079 IN PITCH PCB Position: J26-Guitar 5.4 IN LG	1.000000
1	21-34-0019	CABLE SIL 4 PIN .079 IN PITCH PCB Position: H3-H2 20 IN LG	1.000000
1	21-34-0020	CABLE SIL 4 PINS .156 IN PITCH PCB Position: J3-Speakers 27.0 IN LG	1.000000
1	21-34-0021-1	CABLE SIL 6 PIN .156 IN PITCH PCB Position: J6-P2 4.0 IN	1.000000
1	21-37-1160	CABLE PWR UL/CSA SJT 18awg Blk EL-302 w/GND PLUG EL701 Sock	1.000000
1	24-06-0001	SWITCH ROCKER 9.2mm 3 pins FAST ACTING	1.000000
1	30-00-0006	SCR BTNHD 6-32 x.375 BLK OXIDE	5.000000

1	30-00-0023	SCREW 10-12 OVAL HD PHILLIPS x 1 in.	2.000000
1	30-00-0015	SCREW 10-24 x1.0in TRUSS HD BLK OXIDE	8.000000
1	30-00-0018	SCREW 6-32 SLFTPG x.75 FLH PHILLIPS	4.000000
1	30-00-0019	SCREW 6-18 x.75 FLH PH WOOD	1.000000
1	30-00-0020	SCREW 10-32 x1.75 OVAL HD PHILLIPS NICKEL	6.000000
1	30-00-0375	SCR 6-32 x .375 LG PHILLIPS PN H STL BLK OXIDE	6.000000
1	30-00-0607	SCR 6-32 x 7/16 LG PHILLIPS PN H STL ZINC (W/ LK WASH)	28.000000
1	30-00-4250	SCR sheet metal pan head slf tap. w/blk oxide 4 x.250"	4.000000
1	30-00-8375	SCR sheet metal pan head Slf tap. w/blk oxide 8 x.375"	2.000000
1	30-00-9124	SCR, 10-32 x 1 1/2 LG, OVAL CT SK, PHH, STL, Nickel	6.000000
		Ref: Replaced by 30-00-0020	
	Obsolete Date: 092401		
1	30-03-0110	WASHER, FINISHING, NO. 10, NIC KEL PLATED	4.000000
1	30-03-0610	Washer, #6 internal lock	1.000000
1	30-06-0623	NUT 6-32 W/CAPTV-STAR-WASHER	1.000000
1	30-15-0004	SPACER .13THKx.63OD NYLON MUDGE 5610-82-.125	2.000000
1	30-24-0003	CABLE TIE Panduit 3 7/8" clear Panduit PLT1M-M	1.000000
1	30-24-0850	CABLE TIE, 11.5 IN. LG, NYLON (XMFR) PANDUIT PLT3S ONLY	2.000000
1	30-27-0025	KNOB SM ENCDR STU MOD .55Dx.57 H IMP ABS MICROTEX	5.000000
1	30-27-0027	KNOB LGE ENCDR STU MOD .80Dx.60 H IMP ABS MICROTEX	2.000000

LINE 6
Vetta Combo Parts List

1	30-27-0031	BEZEL LEFT 1.5x5.8x.28 H IMP ABS BLK	1.000000
1	30-27-0032	LENS BEZEL MAIN 4.3x2.2 LEXAN SMOKED	1.000000
1	30-27-0033	LENS BEZEL LEFT 4.3x1.2 LEXAN SMOKED	1.000000
1	30-27-0034	BEZEL MAIN Vetta 4.6x.28 H IMP ABS BLK	1.000000
1	30-27-0042	GROM ENCDR Vetta .50DIAx.04 NYLON WHT/SM	7.000000
1	30-45-2000	KNOB PLASTIC	10.000000
1	30-51-0040	EXP SLOT COV 7.7x2.2 20 GA STL BLK PWD COAT	1.000000
1	30-51-0041	EDGE TRTMT 27.3x.535 20 GA STL EG	1.000000
1	30-51-0042	COV Vetta COMBO 27.3x6.5 20 GA STL EG	1.000000
1	30-51-0074	Handle BRKT top 11x 3.7	1.00000
1	30-57-0580	HANDLE/STRAP HEAVY DUTY BLACK	1.000000
1	30-60-0002	LOGO LINE 6 FLAT BLACK 7.8x1.9 OVAL	1.000000
1	30-63-0001	FOAM SILICONE 1.50 x 7.25	2.000000
1	30-51-0075	HDL BRKT Front 11.0x3.0 AL ALY	1.000000
1	30-63-0010	INSULATION, VOLARAPOLYOLEFIN FOAM, 26.5 x 1/4 x 1/16	4.000000
1	30-75-0010	PEDAL SWITCH RUBBER PAD	1.000000
1	30-75-9600	Grommet, Rubber Mcmaster Carr #9600k19	1.000000
1	40-00-0000	CHART PATCH Vetta	1.000000
1	40-00-0001	USERS MANUAL Vetta	1.000000

LINE 6
Vetta Combo Parts List

1	40-10-0006B	FOAM CORNER PE-LAM 1.5pcf SP212 BOTTOM	4.000000
1	40-10-0006T	FOAM CORNER PE-LAM 1.5pcf	4.000000
1	40-10-0008	Carton, Shipping, Inner, Vetta	1.000000
1	40-10-0009	Carton, Shipping, Outer, Vetta	1.000000
1	40-20-0010	Plastic Bag,43"x38"x.004,clear	1.000000
1	40-20-0011	BAG PLASTIC 10 x 16 2 mil	1.000000
1	40-25-0000	Label, Speaker	2.000000
1	40-25-0015	Label, Grounding	1.000000
1	40-25-0020	Label, Quality Inspection	1.000000
1	40-25-0101	Label, Bar Code Serial Number 2-PNL LTX 16 1125502	1.000000
1	40-25-0150	Sticker, Vetta Disclaimer	1.000000
1	40-25-0255	Sticker, Corner Grill-cloth Vetta-Combo	1.000000
1	50-00-0039	ASSY KEYCAPS AMP SEL	1.000000
1	50-00-0042	ASSY KEYCAPS CHAN SEL	1.000000
1	50-00-0043	ASSY KEYCAPS EDIT SEL	1.000000
1	50-00-0074	ASSY ARTWORK OVERLAY Vetta	1.000000
1	50-00-0075	ASSY ARTWORK, CHASSIS Vetta	1.000000
1	50-00-0094	PCBA MAIN Vetta	1.000000

LINE 6
Vetta Combo Parts List

2	01-00-0000	RES 0R 5% 0805	1.000000
		Ref: R161	
2	01-00-0101	RES 100R 5% 0805	11.000000
		Ref: R2,r133-134,r136,r141,r162-163,r167-168,r171-172	
2	01-00-0103	RES 10K 5% 0805	29.000000
		Ref: R18,R29-30,R33,R37,R41,R53,R61,R65-69,R72,R78-79,R91,R93, R112,R114,R122-123,R128,R143-146,R178,R184	
2	01-00-0104	RES 100K 5% 0805	4.000000
		Ref: R8,R26,R175,R177	
2	01-00-0105	RES 1M 5% 0805	2.000000
		Ref: R20,R38	
2	01-00-0122	RES 1.2K 5% 0805	2.000000
		Ref: R107,R120	
2	01-00-0132	RES 1.3K 5% 0805	2.000000
		Ref: R169-170	
2	01-00-0150	RES 15R 5% 0805	2.000000
		Ref: R126,R138	
2	01-00-0152	RES 1.5K 5% 0805	1.000000
		Ref: R94	
2	01-00-0200	RES 20R 5% 0805	2.000000
		Ref: R165-166	
2	01-00-0221	RES 220R 5% 0805	3.000000
		Ref: R3,R16-17	
2	01-00-0273	RES 27K 5% 0805	1.000000
		Ref: R185	
2	01-00-0302	RES 3K 5% 0805	8.000000
		Ref: R27,R32,R55,R57,R80-81,R111,R115	
2	01-00-0332	RES 3.3K 5% 0805	2.000000
		Ref: R86,R164	

2	01-00-0362	RES 3.6K 5% 0805	2.000000
		Ref: R43-44	
2	01-00-0363	RES 36K 5% 0805	4.000000
		Ref: R46-47,R71,R75	
2	01-00-0392	RES 3.9K 5% 0805	4.000000
		Ref: R42,R50,R70,R77	
2	01-00-0431	RES 430R 5% 0805	1.000000
		Ref: R158	
2	01-00-0470	RES 47R 5% 0805	10.000000
		Ref: R89,R92,R103-105,R108-109,R113,R117,R119	
2	01-00-0471	RES 470R 5% 0805	3.000000
		Ref: R9,R202-203	
2	01-00-0472	RES 4.7K 5% 0805	2.000000
		Ref: R121, R180	
2	01-00-0473	RES 47K 5% 0805	2.000000
		Ref: R85,R176	
2	01-00-0511	RES 510R 5% 0805	1.000000
		Ref: R106	
2	01-00-0562	RES 5.6K 5% 0805	4.000000
		Ref: R45,R56,R59,R73	
2	01-00-0621	RES 620R 5% 0805	8.000000
		Ref: R34,R49,R54,R58,R82,R90,R95,R99	
2	01-00-0681	RES 680R 5% 0805	4.000000
		Ref: R1,R45-15,R19	
2	01-04-0362	RES 3.6K 5% 1206	2.000000
		Ref: R12-13	
2	01-04-0752	RES 7.5K 5% 1206	1.000000
		Ref: R97	
2	01-24-1001	RES 1.00K 1% 0805	18.000000
		Ref: R6-7,R21-23,R63-64,R88,R100,R118,R127,R129,R137,R139-140,R159-160,R179	

2	01-24-1102	RES 11.0K 1% 0805	4.000000
		Ref: R51-52,R60,R74	
2	01-24-2001	RES 2.00K 1% 0805	3.000000
		Ref: R96,R101-102	
2	01-24-2002	RES 20.0K 1% 0805	1.000000
		Ref: R174	
2	01-24-3401	RES 3.40K 1% 0805	3.000000
		Ref: R62,R76,R25	
2	01-24-4321	RES 4.32K 1% 0805	1.000000
		Ref: R87	
2	01-24-4751	RES 4.75K 1% 0805	27.000000
		Ref: R4-5,R10-11,R28,R39,R98,R124-125,R130-131,R135,R142,R147-155 R192-196	
2	01-60-0472	RES NETWORK 4.7K 1/8W 5% SM	4.000000
	EXB-A10P472J or 745X101472J		
		Ref: R156-157,R197-198	
2	03-18-0105	CAP ELEC 1uF 50V 20% RADIAL	8.000000
	5/11/5		
		Ref: C6-8,C14-16,C42,C46	
2	03-18-0106	CAP ELEC 10uF 50V 20% RADIAL	35.000000
	5/11/5		
		Ref: C1,C3-5,C9,C11,C13,C18-21,C23-24,C26-27,C29-31,C33-36, C38-41,C44-45,C49-52,C61,C178,C193	
2	03-46-0104	CAP X7R 0.1uF 50V 20% 1206	4.000000
		Ref: C55-57,C59	
2	03-50-0101	CAP NPO 100pF 50V 10% 0805	2.000000
	Mfg p/n# 0805C101K5GAC		
		Ref: c94,c105	
2	03-50-0102	CAP NPO 1nF 50V 5% 0805	32.000000
		Ref: c28,c43,c47,c53-54,c58,c60,c65,c67-74,c76-79,c98-99,c107-108 c111,c114,c118,c121,c139,c144,c153,c158	

2	03-50-0103	CAP NPO 10nF 50V 20% 0805	1.000000
		Ref: C176	
2	03-50-0222	CAP NPO 2.2nF 50V 20% 0805	8.000000
		Ref: C100,C110,C115-117,C132,C155-156	
2	03-50-0470	CAP NPO 47pF 50v 20% 0805	4.000000
		Ref: C106,C112,C122-123	
2	03-50-0562	CAP NPO 5.6nF 50V 20% 0805	2.000000
		Ref: C109,C127	
2	03-50-0822	CAP NPO 8.2nF 50V 20% 0805	4.000000
		Ref: C97,C102,C130,C162	
2	03-52-0102	CAP X7R 1nF 50V 20% 0805	4.000000
		Ref: C84,C89,C91,C93	
2	03-52-0104	CAP X7R 0.1uF 50V 20% 0805	6.000000
		Ref: C64,C82,C85,C87-88,C164	
2	03-52-0224	CAP X7R 0.22uf 25V 20% 0805	2.000000
		Ref: C145,C147	
2	03-52-0473	CAP X7R 47nF 50V 20% 0805	88.000000
		Ref: 2,12,17,22,25,32,37,48,62,63,66,75,83,86,90,92,95,101,103, 119,120,124-126,128,129,131,133-138,140-143,146,148,149,151, 152,154,159-161,166-169,171-175,179-182,184,192,194-219	
2	03-52-1471	CAP X7R 470pF 100V 20% 0805	2.000000
		Ref: C80-81	
2	06-34-0016	DIODE SWITCHING 75V 200mA 6nS SOT-23 SM BAS16LT1	10.000000
		Ref: D1-6,D11,D14-16	
2	09-10-4401	TRANS NPN SMALL-SIGNAL MBT4401 SOT-23 SM	8.000000
		Ref: Q2-3,Q6-7,Q9-12	

2	09-10-4403	TRANS PNP SMALL-SIGNAL MBT4403	4.000000
	SOT-23 SM		
		Ref: Q1,Q4-5,Q8	
2	11-00-3000	CRYSTAL 30.000MHZ DIP8 TH	1.000000
	EH13HS		
		Ref: Y3	
2	11-00-4000	CRYSTAL 40.00MHZ DIP8 TH	1.000000
	EH13HS		
		Ref: Y1	
2	11-10-0601	FERRITE BEAD 600R @100MHZ 1206	29.000000
		Ref: L1-25,L27-30	
2	11-40-2430	BATTERY 3V LITHIUM COSMOS	1.000000
	CR2430 3P-TH		
		Ref: BAT2	
2	12-02-1086	IC REG 3.3V Nat Semi	1.000000
	LM1086CT-3.3 3.3V T0-220 TH		
		Ref: U8	
2	12-02-7805	IC REG +5v 1.5 Amp TH	2.000000
		Ref: U6,U25	
2	12-02-7815	IC REG +15V 1AMP TH	1.000000
		Ref: U7	
2	12-02-7915	IC REG -15V 1AMP TH	1.000000
	7915		
		Ref: U5	
2	12-54-0074	IC OP-AMP TL074 SM	1.000000
		Ref: U14,U39 U39 removed per ECO 0129807	
2	12-54-0084	IC OP AMP Quad TL084CD SM	2.000000
	mfg p/n# TL084CD		
		Ref: U23-24	
2	12-54-4393	IC DAC 96KHZ SM AK4393VF	2.000000
		Ref: U20-21	
2	12-54-5538	IC OP-AMP DUAL LO NOISE	6.000000
	NE5532AD8 SM SO-8		
		Ref: U4,U10-11,U13,U18,U22	
2	12-62-4053	IC SWITCH-ANALOG TRIPLE 2-CHAN	1.000000
	TSSOP-16 SM CD4053BPW		
		Ref: U15	

2	12-64-4223	IC CONVERTER CODEC 24--BIT CS4223 SM	1.000000
		Ref: U16	
2	12-64-5383	IC ADC 24 Bit, 96KHz SM 28 SOP mfg p/n# AK5383	1.000000
		Ref: U19	
2	15-40-6138	IC OPTO-ISOLATOR 6N138 DIP-8 TH	1.000000
		Ref: U1	
2	15-64-0014	IC 74HCT14 HEX INVERTER 6 SM	1.000000
		Ref: U33	
2	15-64-0245	IC 74HCT245 OCTAL BUF LINE DRIVER 3-S 8 SM	1.000000
		Ref: U30	
2	15-64-0541	IC 74HCT 541 OCTAL BUF/DRIVER 3-S 8 SM	1.000000
		Ref: U31	
2	15-65-0000	IC 74LCX00 LOW VOLTAGE CMOS QUAD NOR SM	1.000000
		Ref: U17	
2	15-65-0014	IC 74LCX14 LOW VOLTAGE CMOS INV HEX SCHMITT TRIGGER SM	3.000000
		Ref: U3,U12,U34	
2	15-65-0074	IC 74LCX74M LOW VOLT CMOS DUAL D-FLIP FLOP SM	1.000000
		Ref: U32	
2	15-65-0244	IC 74LCX16244MTD LOW VOLT CMOS OCTAL BUS BUFFER 3-S SM	1.000000
		Ref: U41	
2	15-65-0245	IC 74LCX16245MEA LOW VOLT CMOS OCTAL BUS TRANSCEIVER SM	1.000000
		Ref: U42	
2	15-67-0488	IC RS-485/422 TRANSCEIVER MAXIM MAX488ECSA SO-8 SM	1.000000
		Ref: U9	
2	15-70-1610	IC DRAM 1M X 16 SDRAM HY57V161610DTC-7 SM	2.000000
		Ref: U37-38	
2	15-72-1021	IC SRAM 64K X 16 CY7C1021V33-15ZC SM	1.000000
		Ref: U29	
2	15-78-1016	IC MEMORY FLASH 1Meg X 16 70nS TE28F160C3BA90 TSOP48 SM Ref:U26	1.000000

2	15-84-5206	IC MPU COLDFIRE MCU MCF5206EFT QFP160 SM	1.000000
		Ref: U27	
2	15-86-1065	IC DSP SHARC ADSP-21065LKS-240 MQFP208 SM	2.000000
		Ref: U35-36	
2	15-92-1817	IC RESET 3.3V 5% ACTIVE-HI SM SOT-23 DS1817R-5/T&R	1.000000
		Ref: U2	
2	15-96-3232	IC PLD 32 CELL/32I/O LATTICE M4A3-32/32-10VC TQFP44 SM	1.000000
		Ref: U28	
2	21-00-6616	JACK 1/4" TRS 6-PIN PCB MT HORIZ TH	4.000000
		Ref: J8,J10,J12,J14	
2	21-04-5075	JACK DIN 5-PIN FEMALE MIDI PCB-MNT RT-ANG LN 05075	2.000000
		Ref: P1-2	
2	21-08-0013	JACK XLR MALE PCB MNT RT ANG TH NEUTRIK-NC3MAH	2.000000
		Ref: J20-21	
2	21-16-0045	JACK RJ-45 8-PIN FEMALE PCB-MNT RT-ANG	1.000000
		Ref: J19	
2	21-20-0030	HDR PCB MT DIL 30-PIN 2x15x .100 MALE SHRD VERT MT TH	1.000000
		Ref: H7	
2	21-20-0204	HDR PCB MT SIL 4-PIN x 2mm FEMALE SHRD VERT MT TH	1.000000
		Ref: H3	
2	21-20-0205	HDR PCB MT SIL 5-PIN x 2mm FEMALE SHRD VERT MT TH	1.000000
		Ref: J26	
2	21-20-0206	HDR PCB MT SIL 6-PIN x 2mm FEMALE SHRD VERT MT TH	1.000000
		Ref: H2	
2	21-20-1010	HDR PCB MT DIL 10-PIN 2x5x.100 MALE SHRD VERT MT TH	1.000000
		Ref: H12	
2	21-20-1302	HDR PCB MT DIL 26-PIN 2X13-100 VERT MT TH	1.000000
		Ref: H9	

2	21-20-1568	HDR PCB MT SIL 8-PIN X .156 MALE VERT-MNT FRIC-LOCK	1.000000
		Ref: J49	
2	21-34-1116	Cable, Earthing green with yellow strip	1.000000
2	24-09-0222	SWITCH SLIDE DPDT SK-22H03	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
2	30-06-0006	NUT, .300 HEX, NO.4, STL, ZINC (FOR AC RCPT AND +5 V)	2.000000
2	30-18-3030	CLIP GND PCB .30x.30x.07	7.000000
		Ref: J1,J38-40,J46-48	
2	30-51-0029	HTSK (Vetta MAIN BD) AL BLK ANDZ Aavid 590102B03600	1.000000
		Ref: P4	
2	30-51-0057	HEAT SINK, BLACK ANODIZED AL, WAKEFIELD #287-1A	1.000000
		Ref: P5	
1	50-00-0096	PCBA POWER SUPPLY COMBO	1.000000
2	01-00-0100	RES 10R 5% 0805	4.000000
		Ref: r15,R31,R49,R55	
2	01-00-0101	RES 100R 5% 0805	2.000000
		Ref: R7,R56	
2	01-00-0471	RES 470R 5% 0805	2.000000
		Ref: R11-12	
2	01-12-0154	RES CARBON FILM 150K 1/4W 5% TH	2.000000
		Ref: R3-4	
2	01-20-0102	RES METAL OXIDE 1K 2W 5% TH S/B 01-22-0102	1.000000
		Ref: R46	
2	01-20-0132	RES METAL OXIDE 1.3K 1W 5% TH S/B 01-21-0132	1.000000
		Ref: R25	

2	01-20-0390	RES METAL OXIDE 39R 2W 5% TH		5.000000
	S/B 01-22-0390			
		Ref: R13-14,R22-23,R34		
2	01-20-0393	RES METAL OXIDE 39K 2W 5% TH		2.000000
	S/B 01-22-0393			
		Ref: R1-2		
2	01-20-0563	RES METAL OXIDE 56K 2W 5% TH		3.000000
	S/B 01-22-0563			
		Ref: R17-18,R20		
2	01-20-0R18	RES METAL OXIDE 0.18R 2W 5% TH		1.000000
	S/B 01-22-0R18			
		Ref: r21		
2	01-24-1001	RES 1.00K 1% 0805		2.000000
		Ref: R10,R53		
2	01-24-1002	RES 10.0K 1% 0805		10.000000
		Ref: R6,R9,R16,R37,R40-43,R51,R57		
2	01-24-1003	RES 100K 1% 0805		4.000000
		Ref: R19,R36,R52,R59		
2	01-24-1242	RES 12.4K 1% 0805		1.000000
		Ref: R8		
2	01-24-1821	RES 1.82K 1% 0805		1.000000
		Ref: R50		
2	01-24-2001	RES 2.00K 1% 0805		1.000000
		Ref: R24		
2	01-24-2152	RES 21.5K 1% 0805		1.000000
		Ref: R32		
2	01-24-2492	RES 24.9K 1% 0805		3.000000
		Ref: R26-27,R30		
2	01-24-3012	RES 30.1K 1% 0805		1.000000
		Ref: R5		
2	01-24-3482	RES 34.8K 1% 0805		1.000000
		Ref: R33		
2	01-24-3921	RES 3.92K 1% 0805	Ref: R28	1.000000

2	01-24-4751	RES 4.75K 1% 0805	3.000000
		Ref: R29,R39,R54	
2	01-24-4752	RES 47.5K 1% 0805	1.000000
		Ref: R58	
2	01-24-4992	RES 49.9K 1% 0805	1.000000
		Ref: R35	
2	01-24-8871	RES 8.87K 1% 0805	1.000000
		Ref: R38	
2	01-70-0001	THERMISTOR NTC 100K@25C 0603 SM	1.000000
		Ref: NTC2	
2	01-70-1032	THERMISTOR 10R 4A TH	1.000000
		Ref: RT1	
2	03-00-1681	CAP CER DISC 680pF 1000V 10% TH Ref: C17,C23-24,C30-31	5.000000
2	03-10-0228	CAP ELEC 2200uF 10V 20% <---> Ref: C59	1.000000
	03-14-0107	CAP ELEC 100uF 25V 20% RADIAL 6.3/11.2/5	1.000000
		Ref: C53	
2	03-18-0106	CAP ELEC 10uF 50V 20% RADIAL 5/11/5	6.000000
		Ref: C10,C26-27,C35,C66,C68	
2	03-18-0107	CAP ELEC 100uF 50V 20% 105C LowZ 0.2R RADIAL 8/20/5	4.000000
		Ref: C4-5,C20-21	
2	03-18-0477	CAP ELEC 470uF 50V 20% 105C LowZ 0.05R RADIAL12.5/25/5	5.000000
		Ref: C16,C18-19,C60	
2	03-18-5105	CAP ELEC 1UF 50V 20% 105C LowZ 11R RADIAL 5/11/5	1.000000
		Ref: c58	
2	03-22-1477	CAP ELEC 470uF 200V 20% SNAP-IN RADIAL 25/25/10	2.000000
		Ref: C1-2	
2	03-36-0105	CAP 1uF 250VDC 10% ESTR TH Ref: C22	1.000000

2	03-41-0224	CAP X-CAP 0.22uF 275VAC 20% POLYPROYPYLENE 18/9.5/17.5/15	2.000000
		Ref: C3,C42	
2	03-42-0471	CAP Y-CAP 470pF 250VAC CER DISC 7/7/7.5	3.000000
		Ref: C43-45	
2	03-50-0101	CAP NPO 100pF 50V 10% 0805 Mfg p/n# 0805C101K5GAC	2.000000
		Ref: C54,C63	
2	03-50-0102	CAP NPO 1nF 50V 5% 0805	3.000000
		Ref: C9,C14-15	
2	03-50-0331	CAP NPO 330pF 50v 5% 0805	1.000000
		Ref: C37	
2	03-50-0332	CAP NPO 3.3nF 50V 5% 0805	1.000000
		Ref: C36	
2	03-50-1472	CAP NPO 4.7nF 50V 5% 0805	1.000000
		Ref: C62	
2	03-52-0473	CAP X7R 47nF 50V 20% 0805	28.000000
		Ref: C8,C11-13,C25,C28-29,C32-34,C38-41,C46-52,C55-56,C61,C64-65, C67,C69	
2	03-52-1103	CAP X7R 10nF 100V 10% 0805	1.000000
		Ref: C70	
2	03-75-0102	CAP Y-CAP 1nF 250VAC 20%	2.000000
		Ref: C6-7	
2	06-08-0020	DIODE ZENER 20V 5% 1W DO-41 TH 1N4747A	1.000000
		Ref: D13	
2	06-12-0160	DIODE ULTRA FAST 600V 1A 50nS 59-04 PLASTIC TH MUR160	1.000000
		Ref: D17	
2	06-16-0405	DIODE BRIDGE 600V 4A 4-PIN SIL RS-4L TH RS405L	1.000000
		Ref: D1	
2	06-24-0420	DIODE ULTRAFAST 4A 200V 267-03 TH MUR420 Ref: D3,D8-11,D16	6.000000

2	06-34-0016	DIODE SWITCHING 75V 200mA 6nS SOT-23 SM BAS16LT1		2.000000
		Ref: D2,D4		
2	06-34-0021	DIODE SWITCHING 250V 200mA 50nS SOT-23 SM BAS21LT1		2.000000
		Ref: D12,D15		
2	09-00-4401	TRANS NPN SMALL-SIGNAL 2N4401 TH		1.000000
		Ref: Q11		
2	09-00-4403	TRANS PNP SMALL-SIGNAL 2N4403 TH		1.000000
		Ref: Q2		
2	09-10-4401	TRANS NPN SMALL-SIGNAL MBT4401 SOT-23 SM		3.000000
		Ref: Q1,Q7,Q10		
2	09-10-4403	TRANS PNP SMALL-SIGNAL MBT4403 SOT-23 SM		8.000000
		Ref: Q4-6,Q8-9,Q12-13,Q16		
2	09-61-1060	TRANS POWER MOSFET N-CHANL ON-SEMI NTB10N60		2.000000
		Ref: Q3,Q15		
2	10-11-3501	INDUCTOR COMMON-MODE CUSTOM ICE LF-35040-0044		2.000000
		Ref: L1-2		
2	11-10-0010	INDUCTOR ROD CHOKE 10uH VERT MNT TH ICE C03-00100-06-00		2.000000
		Ref: L3-4		
2	11-10-0145	INDUCTOR PWR CHOKE 145uH VERT MNT TH ICE I01--0145-01-00		1.000000
		Ref: L6		
2	11-10-0528	BEAD 5 LINE FERRITE 342R STEWARD 29F0528-0T0 TH		2.000000
		Ref: L7-8		
2	11-30-4220	XFMR FLYBACK ICA-0708		1.000000
		Ref: T2		
2	12-00-0431	IC REG ADJ PREC SHUNT <36V T.I. TL431CLP (ACLP) TH		1.000000
		Ref: U4		
2	12-02-7818	IC REG +18V 1 AMP TH TO-220		1.000000
		Ref: U6		
2	12-02-7918	IC REG -18V 1 AMP TH TO-220	Ref: U5	1.000000

2	12-70-2576	IC REG SWITCHER STEP-DOWN ADJ LM2576 TO-263 SM	1.000000
		Ref: U3	
2	15-40-8102	IC OPTO-ISOLATOR MOC8102 DIP6-400 TH	1.000000
		Ref: U1	
2	15-68-3844	IC CONTROLLER PWM SO-8 UC3844D8	1.000000
		Ref: U2	
2	21-14-0001	JACK AC 3-PIN MALE PCB-MNT RT-ANG GND SS-7B-1	1.000000
		Ref: J4	
2	21-20-1566	HDR PCB MT SIL 6-PIN X .156 MALE VERT-MNT FRIC-LOCK	1.000000
		Ref: J6	
2	21-20-2075	HDR PCB MT SIL 2-PIN X 7.5mm MALE VERT MT FRIC-LOCK TH	2.000000
		Ref: J1,J5	
2	21-34-1116	Cable, Earthing green with yellow strip	1.000000
2	21-48-9521	CLIP FUSE HOLDER p/n 19521	2.000000
		Ref: F1	
2	24-19-6325	FUSE 6.3 AMP 250V 5X20mm DOM F	1.000000
		Ref: F1	
2	30-00-0607	SCR 6-32 x 7/16 LG PHILLIPS PN H STL ZINC (W/ LK WASH)	4.000000
2	30-06-0006	NUT, .300 HEX, NO.4, STL, ZINC (FOR AC RCPT AND +5 V)	4.000000
2	30-15-0008	INSULATOR SLEEVE NYLON .047I.D. 0.24"x0.125"	1.000000
		Ref: D17	
2	30-51-0057	HEAT SINK, BLACK ANODIZED AL, WAKEFIELD #287-1A	2.000000
		Ref: HS1-2	
1	50-00-0099	PCBA INPUT GUITAR	1.000000

2	01-00-0102	RES 1K 5% 0805	2.000000
		Ref: r4,R121	
2	01-00-0105	RES 1M 5% 0805	1.000000
		Ref: R122	
2	01-00-0202	RES 2K 5% 0805	1.000000
		Ref: r5	
2	03-46-0104	CAP X7R 0.1uF 50V 20% 1206	1.000000
		Ref: C62	
2	03-50-0470	CAP NPO 47pF 50v 20% 0805	1.000000
		Ref: C89	
2	03-52-0473	CAP X7R 47nF 50V 20% 0805	2.000000
		Ref: C37,C170	
2	11-10-0601	FERRITE BEAD 600R @100MHZ 1206	1.000000
		Ref: L31	
2	12-54-0134	IC OP AMP - OPA134UA SM SO-8	1.000000
		Ref: U17	
2	21-00-6617	JACK 1/4" TRS 6-PIN PCB MT HORIZ TH W/CHROME HRDWARE	1.000000
		Ref: J2	
2	21-20-0205	HDR PCB MT SIL 5-PIN x 2mm FEMALE SHRD VERT MT TH	1.000000
		Ref: J27	
2	30-18-3030	CLIP GND PCB .30x.30x.07	1.000000
		Ref: J35	
1	50-00-0103	PCBA HEADPHONE	1.000000
2	03-46-0104	CAP X7R 0.1uF 50V 20% 1206	1.000000
		Ref: C65	
2	03-50-0102	CAP NPO 1nF 50V 5% 0805	2.000000
		Ref: c6-7	

2	11-10-0601	FERRITE BEAD 600R @100MHZ 1206	3.000000
		Ref: L32-34	
2	21-00-6617	JACK 1/4" TRS 6-PIN PCB MT HORIZ TH W/CHROME HRDWARE	1.000000
		Ref: J23	
2	21-20-0204	HDR PCB MT SIL 4-PIN x 2mm FEMALE SHRD VERT MT TH	1.000000
		Ref: H2	
2	30-18-3030	CLIP GND PCB .30x.30x.07	1.000000
		Ref: J41	
1	50-00-0105	PCBA OUTPUT SPEAKER COMBO Vetta	1.000000
2	03-00-0104	CAP CER DISC 100nF 50V 20% TH (0.1uF)	2.000000
		Ref: c1-2	
2	21-00-0688	JACK 1/4" TRS 9 PIN PCB MT HORIZ TH	2.000000
		Ref: j9-10	
2	21-20-0204	HDR PCB MT SIL 4-PIN x 2mm FEMALE SHRD VERT MT TH	1.000000
		Ref: H4	
2	21-20-1564	HDR PCB MT SIL 4-PIN X .156 MALE VERT-MNT FRIC-LOCK	2.000000
		Ref: J1,J3	
2	24-09-0202	SWITCH SLIDE DPDT RA PCB MT 6A@125V NKK MS22BSG30	1.000000
		Ref: SW2	
2	30-18-3030	CLIP GND PCB .30x.30x.07	2.000000
		Ref: J38,J40	
1	50-00-0106	PCBA INTERFACE USER LEFT	1.000000
2	01-00-0102	RES 1K 5% 0805	15.000000
		Ref: R6,R8-11,R16,R28,R31,R36,R39,R41,R43,R45,R55,R61	
2	01-00-0103	RES 10K 5% 0805	23.000000
		Ref: R32-35,R47-53,R56-59,R62-63,R79-84	

2	01-00-0152	RES 1.5K 5% 0805	1.000000
		Ref: R4	
2	01-00-0472	RES 4.7K 5% 0805	9.000000
		Ref: R13-14,R20-26	
2	01-00-0752	RES 7.5K 5% 0805	1.000000
		Ref: R3	
2	01-04-0111	RES 110R 5% 1206	7.000000
		Ref: R17-19,R29-30,R37-38	
2	01-04-0390	RES 39R 5% 1206	8.000000
		Ref: R5,R7,R15,R40,R42,R44,R54,R60	
2	01-04-05R6	RES 5.6R 5% 1206	1.000000
		Ref: R12	
2	01-24-3401	RES 3.40K 1% 0805	1.000000
		Ref: R2	
2	01-24-4321	RES 4.32K 1% 0805	1.000000
		Ref: R1	
2	01-48-0103	POT SINGLE 10K MONO LINEAR 25 mm D-SHAFT	6.000000
		Ref: R68,R70-74	
2	01-16-03R9	RES CARBON FILM 3.9R 1/2W 5% TH	1.000000
		Ref: R46	
2	03-18-0106	CAP ELEC 10uF 50V 20% RADIAL 5/11/5	6.000000
		Ref: C1-2,C16-17,C23-24	
2	03-46-0104	CAP X7R 0.1uF 50V 20% 1206	14.000000
		Ref: C5-15,C18-20	
2	03-52-0103	CAP X7R 10nF 50V 20% 0805	2.000000
		Ref: C3-4	
2	03-52-0104	CAP X7R 0.1uF 50V 20% 0805	2.000000
		Ref: C25-26	

2	03-52-0473	CAP X7R 47nF 50V 20% 0805	1.000000
		Ref: C21	
2	06-34-0016	DIODE SWITCHING 75V 200mA 6nS SOT-23 SM BAS16LT1	15.000000
		Ref: D39,D42-55	
2	09-10-4401	TRANS NPN SMALL-SIGNAL MBT4401 SOT-23 SM	7.000000
		Ref: Q1,Q4-5,Q7-10	
2	09-10-4403	TRANS PNP SMALL-SIGNAL MBT4403 SOT-23 SM	9.000000
		Ref: Q2-3,Q6,Q11-16	
2	12-64-1543	IC ADC 10 BIT 11 CHANNEL SMT TI TLC1543CDW	1.000000
		Ref: U10	
2	12-72-0050	IC PRECISION TEMPERATURE SENSOR SOT-23 SM LM50CIM3	1.000000
		Ref: U11	
2	15-62-0002	IC 74HC02 QUAD 2-INPUT NOR SO-14 SM	1.000000
		Ref: U2	
2	15-62-0074	IC 74HC74 FLIP-FLOP DUAL D-TYPE 2-IN SO-14 SM	1.000000
		Ref: U1	
2	15-62-0138	IC 74HC138 DECODER/DEMUX 3-8 LINE SO-16 SM	1.000000
		Ref: U8	
2	15-62-0273	IC 74HC273 FLIP-FLOP D-TYPE 8-BIT SO-20 SM	3.000000
		Ref: U3-5	
2	15-64-0541	IC 74HCT 541 OCTAL BUF/DRIVER 3-S 8 SM	2.000000
		Ref: U6-7	
2	18-21-0002	LED ORANGE 3mmX2mm SM Kingbrite APK3020SEC	17.000000
		Ref: D8,D16,D24-38	
2	21-20-0016	HDR PCB MT DIL 16-PIN 2X8X.100 BOTTOM ENTRY SM	1.000000
		Ref: H13	
2	21-20-1203	HDR PCB MT SIL 3 PINx .100 FEMALE BOTTOM ENTRY VERT MT	1.000000
		Ref: H1	
2	21-20-1216	HDR PCB MT SIL 16 PIN x .100 FEMALE BOTTOM ENTRY VERT MT Ref: H3	1.000000

2	21-20-1302	HDR PCB MT DIL 26-PIN 2X13-100 VERT MT TH	1.000000
		Ref: h12	
2	21-20-2006	HDR PCB MT SIL 6-PIN 1x6x.100 MALE VRT-MNT TH	2.000000
		Ref: H2,H4	
2	21-20-2028	HDR PCB MT DIL 28-PIN 2x14x100 MALE RT ANG TH	1.000000
		Ref: J2	
2	24-12-0120	ENCODER 24-STEP ALPHA RE120-40-XXF TH	5.000000
		Ref: E8,E10-13	
2	24-12-1120	ENCODER 12-STEP ALPHA RE120-40-20F-12P TH	2.000000
		Ref: E9,E14	
2	30-12-0001	STANDOFF .343 (.710 LG) PLASTIC	4.000000
2	30-12-0002	STANDOFF .470 LG PLASTIC	4.000000
2	30-15-0044	TAPE, 7" x .5",TEFLON AND FOAM MFG PN# UHMW-7" x 5"	1.000000
2	30-27-0003	BTN FR CHAN SEL UI PNL 1.058x5.484 BLK ABS NA/	1.000000
2	30-27-0004	BUT FR AMP BTN UI PNL 1.058x1.615 BLK ABS N/A	1.000000
2	30-65-0002	TAPE POLYESTER w/RBR ADHESIVE 6mil 19mm X 10mm	1.000000
2	30-75-0010	PEDAL SWITCH RUBBER PAD	1.000000
2	50-00-0007	ASSY BUTTON PAD AMP SELECT X0	1.000000
2	50-00-0008	ASSY BUTTON PAD CHANNEL SELECT X0	1.000000
2	50-00-0114	PCBA DISPLAY LCD 192x48 GRAPHIC Vetta	1.000000
3	18-30-0003	DISPLAY LCD - 192 X 48 GRAPHIC	1.000000

3	21-20-2001	HDR PCB MT SIL 2-PIN X .100 MALE VRT-MNT TH	1.000000
3	21-20-2003	HDR PCB MT SIL 3-PIN x .100 MALE VERT-MT TH	1.000000
		Ref: J4	
3	21-20-2216	HDR PCB MT DIL 16 PIN 2x8x.100 MALE VERT MT TH	1.000000
		Ref: J1	
3	30-63-1111	FOAM, 1/8" THK, 1/2" SQ, ADH O NE SD, 3M NO. 4508	4.000000
2	50-00-0115	PCBA DISPLAY LCD 1x16 CHARACTER Vetta	1.000000
3	18-30-0002	DISPLAY LCD - 1 X 16 CHARACTER	1.000000
3	21-20-2016	HDR PCB MT SIL 16 PIN 1x16x100 MALE VERT MT TH	1.000000
1	50-00-0107	PCBA INTERFACE USER RIGHT	1.000000
2	01-48-0103	POT SINGLE 10K MONO LINEAR 25 mm D-SHAFT	1.000000
		Ref: R64	
2	01-48-8103	POT SINGLE 10K LINEAR CENTER DETENT 25mm D-SHFT	3.000000
		Ref: R65-67	
2	03-52-0104	CAP X7R 0.1uF 50V 20% 0805	5.000000
		Ref: C21-22,C27-29	
2	06-34-0016	DIODE SWITCHING 75V 200mA 6nS SOT-23 SM BAS16LT1	2.000000
		Ref: D40-41	
2	18-12-0001	LED 3-DIGIT 7-SEG YEL w/DP Ledtech LM3633-11-11BWRN TH	1.000000
		Ref: D9	
2	18-21-0002	LED ORANGE 3mmX2mm SM Kingbrite APK3020SEC	20.000000
		Ref: D1-7,D10-15,D17-23	
2	21-20-1028	HDR PCB MT DIL 28 PIN 2x14x100 FEMALE RT ANGLE TH	1.000000
		Ref: J1	
2	30-27-0001	FR ISLN EDIT SEL AX3 5.483x1.807 BLK ABS N/A	1.000000

1.000000

2	50-00-0009	ASSY BUTTON PAD EDIT SELECT X0	1.000000
1	50-00-0150	CABINET COMBO Vetta	1.000000
2	30-00-0621	SCR WD 6-18 x 1 1/4 LG PHILLIP S RND HD STL BLK OXIDE	7.000000
2	30-00-6839	FEET SCREW FOR AMP WOOD BOX #10-12X7/8 PHIL PN	4.000000
2	30-00-9812	SCR NO.8 x 3/4 LG PHH TRUSS NICKEL	12.000000
2	30-06-1024	NUT 10-24 X 5/16 Tee Plain steel, Tape/reel package	8.000000
2	30-30-0001	COR PROTECTOR NCH STL PWD COAT MATTE SIL	2.000000
2	30-30-0002	CORNER PROTECTOR STEEL PWD COAT MATTE SIL	6.000000
2	30-36-0002	COVER VINYL BLK TAURUS 23 OZ.	1.090000
2	30-39-0002	CLOTH SPEAKER GRILL	1.000000
2	30-75-0008	RUBBER FOOT RUBBER 1.50 in DIA x .75 in HT BLACK	4.000000
1	50-00-9095	Vetta Power amp PCBA assembly	1.000000
2	30-00-0010	SCREW 8-32 x.562 SCH CAP SCR	4.000000
2	30-03-0002	WASHER .293 x.174x .040 STEEL	4.000000
2	30-06-0007	NUT .344 HEX 8-32 STEEL ZINC	4.000000
2	30-51-0059-1	HEAT SINK 4.0 IN LG AL ALY	1.000000
2	30-51-0073	CLAMP, TO - 220 HTSK 1.3x.45x.35 CR STEEL 1018	4.000000
2	30-63-4001	THERMAL PAD TO-247 BERGQUIST BERG-400AC-7-102	4.000000

2	30-63-5050	GAP-PAD VO-SOFT .125"THK x .50 " x .50"	1.000000
2	50-00-0095	PCBA AMP 2X50 WATT COMBO	1.000000
3	01-00-0000	RES 0R 5% 0805	5.000000
		Ref: J2,R20,R53,R70,R166	
3	01-00-0273	RES 27K 5% 0805	6.000000
		Ref: R17,R35,R75,R93,R134,R139	
3	01-00-0331	RES 330R 5% 0805	1.000000
		Ref: R156	
3	01-00-0393	RES 39K 5% 0805	4.000000
		Ref: R2,R25,R145-146	
3	01-00-05R1	RES 5.1R 5% 0805	4.000000
		Ref: R27-28,R47-48	
3	01-12-0000	RES CARBON FILM 0R 1/4W 5% TH	3.000000
		Ref: J1,J13-14	
3	01-20-02R2	RES METAL OXIDE 2.2R 2W 5% TH S/B 01-22-02R2	2.000000
		Ref: R23,r69	
3	01-20-0R22	RES METAL OXIDE 0.22R 2W 5% TH S/B 01-22-0R22	4.000000
		Ref: R19,R21,R30,R54	
3	01-24-1001	RES 1.00K 1% 0805	4.000000
		Ref: R36.R109,R119,R128	
3	01-24-1002	RES 10.0K 1% 0805	17.000000
		Ref: R33,R49,R51-52,R87,R97,R101,R111,R130,R142,R144,R147 R150-151,R165,C47,C50	
3	01-24-1003	RES 100K 1% 0805	11.000000
		Ref: R8,R13,R15,R26,R50,R55,R76,R143,R159-161	
3	01-24-1004	RES 1.00M 1% 0805	9.000000
		Ref: R31,R34,R74,R99,R121,R129,R149,R153,R155,	
3	01-24-1242	RES 12.4K 1% 0805 Ref: R22,R24,R39,R88,R118,R152	6.000000

3	01-24-1500	RES 150R 1% 0805	12.000000
		Ref: R3,R5,R12,R16,R18,R38,R46,R96,R103,R105,R123,R127	
3	01-24-1502	RES 15.0K 1% 0805	2.000000
		Ref: R9,R110	
3	01-24-2492	RES 24.9K 1% 0805	2.000000
		Ref: R43,R90	
3	01-24-3012	RES 30.1K 1% 0805	2.000000
		Ref: R57,R114	
3	01-24-4750	RES 475R 1% 0805	10.000000
		Ref: R4,R10-11,R41-42,R58,R60-61,R107,R148	
3	01-24-4751	RES 4.75K 1% 0805	12.000000
		Ref: R32,R37,R98,R100,R120,R122,R124-125,R131-133,R135	
3	01-24-4752	RES 47.5K 1% 0805	1.000000
		Ref: R162	
3	01-24-4753	RES 475K 1% 0805	1.000000
3	01-24-6041	RES 6.04K 1% 0805	3.000000
		Ref: R14,R72,R91	
3	01-32-01R1 TH	RES CARBON FILM 1.1R 1/8W 1%	.000000
		Ref: Pin 1 of 21-30-0009	
Obsolete Date: 101001			
3	01-70-0080 100/300/200	THERMISTOR 80C PTC TH	1.000000
		Ref: RT1	
3	03-12-0107 6.3/11/5	CAP ELEC 100uF 16V 20% RADIAL	4.000000
		Ref: C1,C18,C22,C25	
3	03-18-0105 5/11/5	CAP ELEC 1uF 50V 20% RADIAL	4.000000
3	03-18-0227 RADIAL 10/12.5/5	CAP ELEC 220uF 50V 20% Ref:C8	1.000000

3	03-18-0474	CAP ELEC 0.47uF 50V 20% RADIAL		1.000000
	5/11/5			
		Ref: C9		
3	03-22-0476	CAP ELEC 47uF 100V 20% RADIAL		2.000000
	10/15/5			
		Ref: C38,C40		
3	03-24-0334	CAP 0.33uF 250V 5% FILM-POLY		2.000000
		Ref: C6,C11		
3	03-52-0220	CAP X7R 22pF 50V 20% 0805		2.000000
		Ref: C13,C26		
3	03-52-0223	CAP X7R 22nF 50V 20% 0805		4.000000
	16/7/10			
		Ref: C19,C36,C45-46		
3	03-52-0470	CAP X7R 47pF 50V 20% 0805		4.000000
		Ref: C4-5,C14-15		
3	03-52-0473	CAP X7R 47nF 50V 20% 0805		12.000000
		Ref: C17,C21,C24,C27-28,C33-34,C37,C44,C51-53		
3	06-28-8412	DIODE ZENER 12V 5% 350mW		3.000000
	SOT-23 SM BZX84C12			
		Ref: D6-7,D17		
3	06-28-8418	DIODE ZENER 18V 5% 350mW		1.000000
	SOT-23 SM BZX84C18			
		Ref: D21		
3	06-28-8439	DIODE ZENER 3.9V 5% 350mW		1.000000
	SOT-23 SM BZX84C3V9			
		Ref: D10		
3	06-28-8468	DIODE ZENER 6.8V 5% 350mW		4.000000
	SOT-23 SM BZX84C6V8			
		Ref: D1,D13-14,D16		
3	06-34-0016	DIODE SWITCHING 75V 200mA		9.000000
	6nS SOT-23 SM BAS16LT1			
		Ref: D2-5,D15,D18,D24-25,D34		
3	09-00-5551	TRANS NPN SMALL-SIGNAL 2N5551		3.000000
	TH			
		Ref: Q23,Q34,Q38		
3	09-10-0042	TRANS NPN POWER 300V 200mA		2.000000
	SOT-23 SM MMBTA42			
		Ref: Q37,Q42		
3	09-10-0092	TRANS SMALL-SIGNAL PMBTA92 SOT-23 SMD	Ref: Q1,Q2,Q41,Q43	4.000000

3	09-10-4401	TRANS NPN SMALL-SIGNAL MBT4401 SOT-23 SM	10.000000
		Ref: Q11,Q16,Q18,Q26,Q28-29,Q32,Q39-40,Q45	
3	09-10-4403	TRANS PNP SMALL-SIGNAL MBT4403 SOT-23 SM	10.000000
		Ref: Q15,Q17,Q19-20,Q22,Q25,Q33,Q36,Q44,Q52	
3	09-10-4416	TRANS SMALL-SIGNAL SST4416 N-CHANNEL J-FET	2.000000
		Ref: Q30-31	
3	12-54-0084	IC OP AMP Quad TL084CD SM mfg p/n# TL084CD	1.000000
		Ref: U10	
3	12-54-1082	IC OP-AMP DUAL TLC082CD SINGLE-SUPPLY SM	2.000000
		Ref: U6,U9	
3	12-54-1084	IC OP-AMP QUAD TLC084CD SINGLE-SUPPLY SM	3.000000
		Ref: U3-5	
3	12-62-4066	IC SWITCH QUAD BI 14-PIN SM TI CD4066BM	2.000000
		Ref: U1,U8	
3	21-20-0204	HDR PCB MT SIL 4-PIN x 2mm FEMALE SHRD VERT MT TH	1.000000
		Ref: P4	
3	21-20-1564	HDR PCB MT SIL 4-PIN X .156 MALE VERT-MNT FRIC-LOCK	1.000000
		Ref: P2	
3	21-20-1566	HDR PCB MT SIL 6-PIN X .156 MALE VERT-MNT FRIC-LOCK	1.000000
		Ref: P3	
3	21-20-2010	HDR PCB MT DIL 10-PIN 2x5x100 MALE SHRD VERT SEE 21-20-1010	1.000000
		Ref: P1	

- The * sign next to a control signal name indicates that this control is active low

The Vetta Combo electronic circuitry is distributed across 8 PCBs:

- Vetta Power supply PCB
- Vetta Main PCB
- Vetta Power amplifier PCB
- Vetta U.I. (User Interface) Left PCB
- Vetta U.I. Right PCB
- Vetta Guitar Input PCB
- Vetta Headphone Output PCB
- Vetta Speaker Output PCB

Power supply system:

On the Power Supply PCB:

The main components of the power supply system are located on the power supply PCB. This is a switch mode power supply. Directly connected to the AC input is the line filter. The line filter limits the noise that the power supply injects into the AC line. L1 and L2 are common mode inductors, which work with "Y-caps" C6, 7, 43, 44, 45 to filter common mode noise. Common mode noise is on both the line and neutral. A Y-cap is connected from line or neutral to the chassis. The chassis should be connected to earth ground. There are two X-caps - C3, 43 which are connected from line to neutral and they filter differential noise. **Service note:** Both X and Y caps go through special testing from the safety agencies and should only be replaced with approved parts.

The fuse F1 provides protection in case of a failure in the primary circuit. **Service note:** It is very unlikely that this fuse will blow without a catastrophic failure. Never replace the fuse and apply power before repairing any failed components.

The negative temperature coefficient (NTC) thermistor RT1 limits inrush current when the unit is cold.

D1, C1, and C2 comprise a full-wave, or voltage doubler rectifier circuit. If a jumper is installed across J5, the unit is in voltage doubler mode and the nominal AC input range will be 100 to 120VAC. If no jumper is present the range is 200 to 240VAC. When the jumper is set properly for the available AC, the DC voltage across C1, C2 is a roughly constant 350VDC. **Service note:** If no jumper is installed (240VAC mode), and the unit is operated at 120VAC, it will function but it will not be able to output full power. If the opposite condition is present (jumper in 240VAC) the unit will get damaged (350V across 200V caps). Obviously, great care should be taken to avoid this condition.

The power converter is a flyback topology (The correct term for the magnetic element in a flyback converter is a coupled inductor but it is commonly referred to as a flyback transformer.

An inductor can store energy while an ideal transformer transfers energy but does not store it. We won't buck tradition so we'll call it a flyback transformer).

The basic operation is to apply the input voltage across T2-A by turning on Q3, 15. Energy is stored in T2 and all of the secondary diodes are reverse biased. When Q3, 15 turn off, the stored energy is transferred to the outputs. As the voltage fly's back, the secondary diodes are forward biased. Voltage clamp D17, C22, R17, 18, 20 limits the voltage across Q3, 15 by providing a path for primary current flow while the energy is being transferred from primary to secondary. The secondary voltages will track each other quite well as long as a nominal load is applied: **Service note:** This supply is not designed to be operated with no load, and this condition may over stressed the output caps. Constructing a test fixture with the following resistors will allow test bench operation: 390Ω 10W from J6.2 – J6.3; 390Ω 10W from J6.4 – J6.5; 10Ω 2W from J6.5 – J6.6; 330Ω 2W from J2.1 – J2.2; 330Ω 2W from J2.3 – J2.2; 10Ω 10W from J2.4 – J2.5

A buck regulator consisting of IC U3 Inductor L6 and Capacitor C59 regulates the voltage generated by winding T2_B. This generates an 8V regulated output. Also, the voltages generated by the T2_D winding are stepped down to ±18 V by the linear regulators U8 and U9.

The Voltage Feedback circuit monitors secondary voltages (+8Pre, +45Pre, -45Pre and PS_Valid). The PS_VALID signal is AC coupled into the feedback and does not play a part in determining the DC output voltages. Transistors Q1, 4, 5, 8, 9, 10, 12 comprise a circuit that does level shifting, voting and output voltage switching. The regulation scheme looks at +8Pre, +45Pre, and -45Pre and decides which is at, or below, their nominal regulation point and regulates this output. The other outputs are ignored and allowed to exceed their regulation points.

This circuit controls the duty cycle of the primary switching through the opto-isolator U1 and shunt regulator U4 on the secondary side. On the primary side, controller IC U2 (U2 is itself supplied by the T2_E secondary winding) drives the gates of the main MOSFETs through buffer transistors Q2, 11. This provides the voltage regulation feed back loop. A thermal protection circuits monitors the temperature of the primary components through the thermistor NTC2, and shut down the controller IC U2 if necessary.

The sequence of events at application of power is as follows: C1, 2 are charged and current flows through R1, 2. The PWM chip U2 is in a low power mode and the main MOSFETs are not being switched. When the voltage at +HK (house keeping) reaches about 17V, the PWM chip starts running and the main MOSFETs start switching. The current supplied by R, 1 is not sufficient to allow continued operation so the voltage at +HK drops. If the secondary voltages ramp up properly, then winding T2-E will power +HK before it drops to the lower cut off point of about 10V. If there is a short on the output or one of several other failures, the PWM will shutoff at +HK=10V and +HK will start to charge again. This charge and discharge cycle will continue at a rate of several Hz. **Service note: Do not attempt to monitor primary voltages with an oscilloscope. The safest method is to use an isolation transformer. Removing the 'scope ground connection or "floating" the scope is potentially lethal for the technician or others that may come in contact with the 'scope.**

In addition the Z_SELECT signal controls the voltage feedback circuit and allows to select one of two sets for DC output values:

	On connector J6 to the Power Amp			On connector J2 to the Main PCB			
	+ LO	- LO	–HI	+20V	-20V	PS_Valid	+8V
If Z_SELECT is set at +15V	+32	-32	-36	+18	-18	+20	+8
If Z_SELECT is set at 0V (or floating)	+45	-45	-50	+18	-18	+30	+8

This feature is used to adjust the voltage rail of the power amps (+LO and – LO) in function of the speaker impedance that they currently drive. For 8 Ohm load the Z-select line will be left floating and the supply will provide ±45 Volts. For 4 Ohm load the Z-select line will be pulled to 15V and the supply will provide only ±32 Volts. This will result in the same maximum audio power on each load setup.

The PS_VALID validate the other supplies. A high level indicates that all the supplies are within a valid range. This line will also go low before any of the supply start to drop significantly.

Note that the ground references for the voltages on J6 (to power amp) and J2 (to main PCB) are not connected together on the supply. The same is true of the AGND and DGND signal on J2. They will be connector together only through the Main PCB and Power Amp PCB.

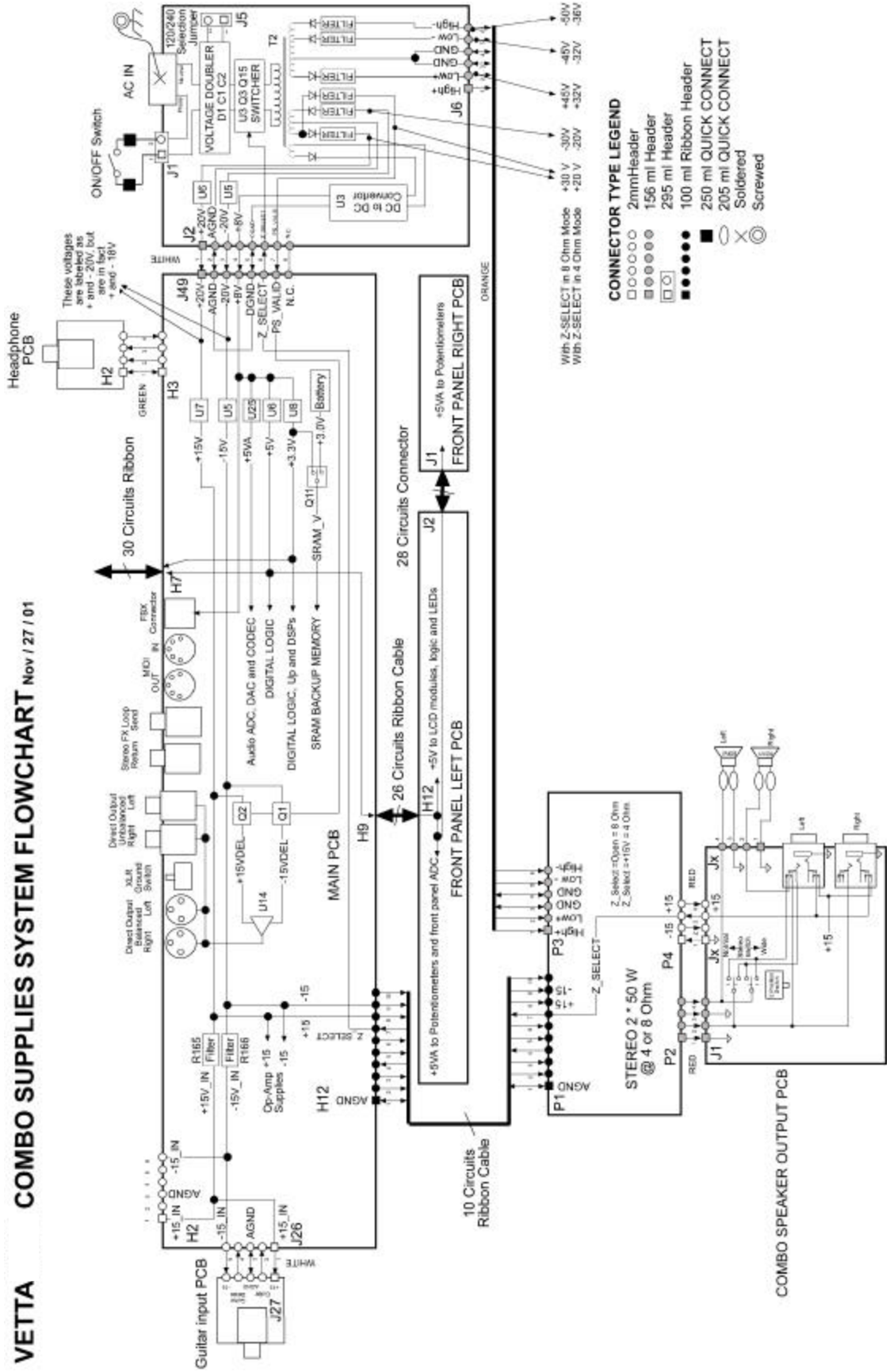
On the Main PCB:
The ±18V (labeled ±20V on the connector J49) are further stepped down and regulated ±15V by the linear regulators U7 and U8. These ±15V supplies directly drive a number of Op amps on the main board and on the power amp PCB. The ±15V are both further filtered by an RC network (R165 and R166) to create the ±15V_IN supplies, which are used by the op amps of the guitar input circuitry. This extra filtering removed any possibility of supply induced audio feedback between the audio output and input stages. Finally, the ±15V are also delayed and slowly ramped up over a two seconds period after the main power is turned on (detected by the state of PS_VALID) by the circuitry around Q2 and Q1. The resulting ±15VDEL supplies are used by the op amp U14 which drives the Direct output connectors. This setup limits the audio thump, which would otherwise appear on the direct outputs when the main power is turned ON or OFF.

The +8V is stepped down and regulated to +5VA (A= Analog) by U25, +5V by U6 and +3.3V by U8.
The +5VA is used only for the Audio converters U19, U20, U18, and U16.
The +5V supplies the logic on the Main PCB and the U.I. PCBs.
The 3.3V supplies the logic on the main PCB including the microprocessor (Coldfire) U27 and the two Sharc DSPs U35 and U36.

The +8V also directly supplies the FBX (Foot Controller Option) where it will be regulated down to 5V.

While the main power is turned ON, the 3.3V supply the SRAM U29. When the main power is OFF the SRAM supply is maintained (to avoid memory lost) by the battery BAT2 voltage. The battery voltage should be above 2.7V. If it drops below the battery should be replaced. The current draw on the battery, while the main power is OFF, should be less than 3.7 micro amps. This will correspond to a maximum voltage of 100mV across R185. With this maximum current, and a fresh battery, the battery life should be a minimum of six years.

On the U.I. PCBs:
After arriving on the U.I. Left PCB, the +5V and its ground (GND) are separated into two local signal pairs +5V/ GND and +5VA/AGND. The separation between these pairs is only achieved through the U.I. PCB layout. The +5VA/AGND drives the 10 potentiometers and the front panel ADC U10. The +5V/ GND drives all other circuits on the front panel PCBs. This setup improves the potentiometer jitters immunity.


VETTA COMBO SUPPLIES SYSTEM FLOWCHART Nov / 27 / 01
CONNECTOR TYPE LEGEND
2mmHeader
156 mil Header
295 mil Header
100 mil Ribbon Header
250 mil QUICK CONNECT
205 mil QUICK CONNECT
Soldered
Screwed
AC IN
ON/OFF Switch
VOLTAGE DOUBLER D1 C1 C2
U3 Q3 Q15 SWITCHER
DC to DC Converter
Headphone PCB
These voltages are labeled as + and - 20V, but are in fact + and - 18V
30 Circuits Ribbon
28 Circuits Connector
26 Circuits Ribbon Cable
10 Circuits Ribbon Cable
MAIN PCB
FRONT PANEL LEFT PCB
FRONT PANEL RIGHT PCB
+5VA to Potentiometers
+5V to LCD modules, logic and LEDs
+6VA to Potentiometers and front panel ADC
Audio ADC, DAC and CODEC
DIGITAL LOGIC
DIGITAL LOGIC, Up and DSPs
SRAM BACKUP MEMORY
Stereo FX Loop Send
Stereo FX Loop Return
MIDI IN
MIDI OUT
FBX Connector
Direct Output Unbalanced Right
Direct Output Unbalanced Left
Direct Output Balanced Right
Direct Output Balanced Left
XLR Ground Switch
Op-Amp Supplies
STEREO 2 * 50 W @ 4 or 8 Ohm
Z_Select =Open = 8 Ohm
Z_Select =+10V = 4 Ohm
Guitar input PCB
COMBO SPEAKER OUTPUT PCB
With Z-SELECT in 8 Ohm Mode
With Z-SELECT in 4 Ohm Mode

Audio system:

On the Main PCB:

There are four independent audio circuits on the main PCB. The only audio connection between them is through the DSP signal path.

Guitar input (Page 7 of 8 of Main PCB schematics):

The guitar input is first buffered and amplified on the Guitar Input PCB before it reaches the Main PCB at connector J26 (15Vpp @ 5Vpp at the guitar jack). An analog switch made of U15 and U22 allows for selecting the input signal either from J26, or from an optional I/O PCB connected to the main PCB at connector H2. This option board is currently not available, and until then this switch will not be used and is permanently switched to the J26 input (= The Guitar/Line_Select control signal should be at 3.3V). After the switch, the signal is spliced into two branches. R96 and R23 divide by 3 the upper branch to +/-2.5 VPP (@ 5Vpp at guitar input). C40 allows this signal to be DC biased at +2.5V by the ADC input. Q7 and Q8 clip the signal to a maximum range of 0/5V. The signal then enters the right channel of the ADC U19. In the lower branch, U22-B adds a gain of 5.3 to the signal. C39 allows this signal to be DC biased at +2.5V by the ADC input. D14 and D15 limit the maximum signal swing to a -0.6V /+5.6V range before entering the left channel of ADC U19. The net result is that the ADC left channel is feed by a signal 16 times larger than the one on the right channel. Once these signals are converted and moved into the DSP#1, the DSP code will monitor the amplitude of the signals and use the one of the two versions most appropriate for the current input level. This scheme allows for significantly improving the signal noise and low-level distortion performance of the ADC.

Direct output (Page 5 of 8 of Main PCB schematics):

The direct output audio circuit supplies the audio signals to the Direct ¼"jacks and XLR Outputs. The digital signal from DSP#2 feeds DAC U21. The left and right differential outputs of the DAC are amplified and Low Pass filtered (FC = 31KHz) by U18_A and B. U18 outputs directly feed the headphone amplifier made of U24 and U23. They also feed a differential buffer made of U14 which drives the XLR balanced outputs, and, through a divider made of R12/R6 R13/R7, the ¼" unbalanced outputs. Notice that U14 is supplied by ±15VDEL supplies (see Main PCB power supply operation for the justification).

Power Amp output (Page 6 of 8 of Main PCB schematics):

The power amp output audio circuit supplies the audio signals to the power amp differential inputs. The digital signal from DSP#2 feeds DAC U20. The left and right differential outputs of the DAC are amplified and Low Pass filtered (FC = 31KHz) by U13_A and U4_A. Their outputs directly feed the left and right positive inputs of the power amp through connector H12. (U39 shown on schematic version C was removed and bypassed by an ECO prior to FCS). U13_B and U4_B invert the signal and feed the left and right negative inputs of the power amp.

Effect loop (Page 6 of 8 of Main PCB schematics):

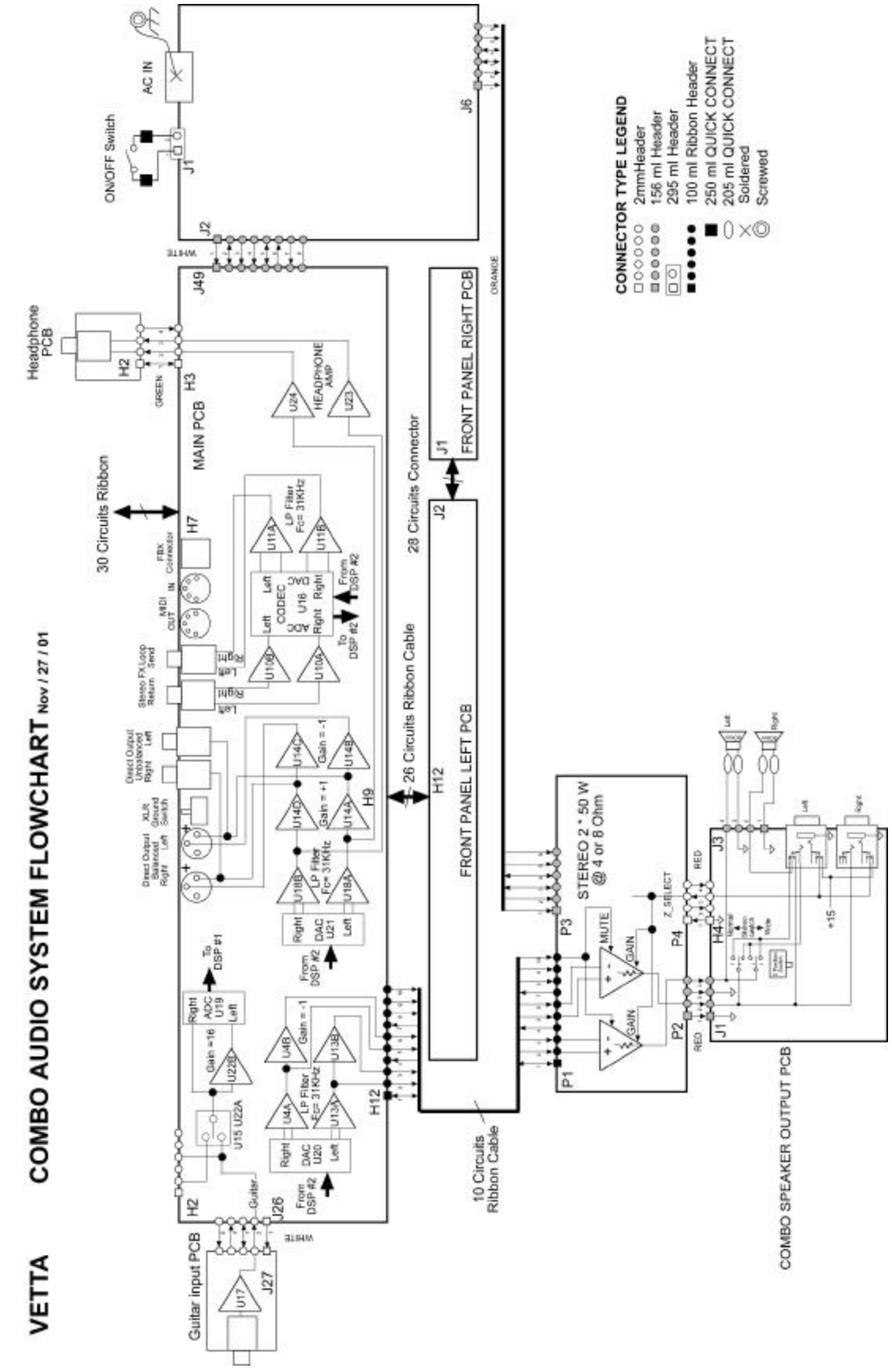
The effect loop audio circuit provides a path to bring the analog FX Return signals into the DSP#2 and to bring DSP#2 digital audio output to the analog FX Send.
FX Return:

Diodes D3/D4 and D5/D11 protect the op amp U10 from overdriving and electrostatic discharges. R44/R170 and R43/R169 attenuate the FX Return signal from the maximum specified 20Vpp to 5Vpp. R44 and R43 also protect the input of the CODEC ADC in case the voltage would exceed +/-2.5V. C14 and C15 allow the signal to be DC biased at +2.5V by the ADC input. D8/D7 and D10/D9 are not installed on the PCB. The ADC output of CODEC U16 feed DSP#2.

FX Send:
The differential outputs of CODEC U16 DAC are amplified and low pass filtered (31KHz) by U11_A and B. U11 outputs feed the FX Loop ¼" jack (20Vpp max)

On the Power Amp PCB:
The differential inputs at connector P1 feeds the two power amps. Notice that the gain of the power amp is conditioned by the status of the Z-Select line. This allows for setting the maximum power amp output swing, and power, in function of the current load impedance (4 or 8 Ohm). Notice also that the power amp can be muted by the POWERAMP_MUTE* signal (0V = muted, above 3V = un-muted)

On the Speaker Output PCB:
The function of SPLIT switch on the Speaker Output PCB is described in the VETTA User Manual. The wiring of the ¼" jack J9 is such that if no jack is plugged into it, the split switch SW2 default to the Split OFF position. This was designed so that if no external speaker is plugged in the LEFT speaker output jack the split switch will have no effect on the speaker signals routing.


VETTA COMBO AUDIO SYSTEM FLOWCHART Nov / 27 / 01
CONNECTOR TYPE LEGEND
2mmHeader
156 ml Header
295 ml Header
100 ml Ribbon Header
250 ml QUICK CONNECT
205 ml QUICK CONNECT
Soldered
Screwed
AC IN
ON/OFF Switch
J1
J6
J2
WHITE
ORANGE
J49
H3
MAIN PCB
Headphone PCB
H2
GREEN
HEADPHONE AMP
U24
U23
30 Circuits Ribbon
H7
FBX Connector
MIDI IN
MIDI OUT
Stereo FX Loop Send
Stereo FX Loop Return
Direct Output Unbalanced Right
Direct Output Unbalanced Left
XLR Ground Switch
Direct Output Balanced Right
Direct Output Balanced Left
CODEC U16
LP Filter Fc= 31KHz
U11A
U11B
U10B
U10A
From DSP #2
To DSP #2
U14C
U14B
U14D
U14A
Gain = -1
Gain = +1
H9
26 Circuits Ribbon Cable
28 Circuits Connector
J1
FRONT PANEL RIGHT PCB
J2
FRONT PANEL LEFT PCB
H12
U18B
U18A
DAC U21
To DSP #1
From DSP #2
ADC U19
Gain =16
U22B
U15 U22A
U4B
U13B
U4A
U13A
DAC U20
Guitar
J26
J27
U17
Guitar input PCB
10 Circuits Ribbon Cable
P3
P4
P2
P1
STEREO 2 * 50 W @ 4 or 8 Ohm
MUTE
GAIN
Z SELECT
RED
J3
H4
J1
+15
COMBO SPEAKER OUTPUT PCB

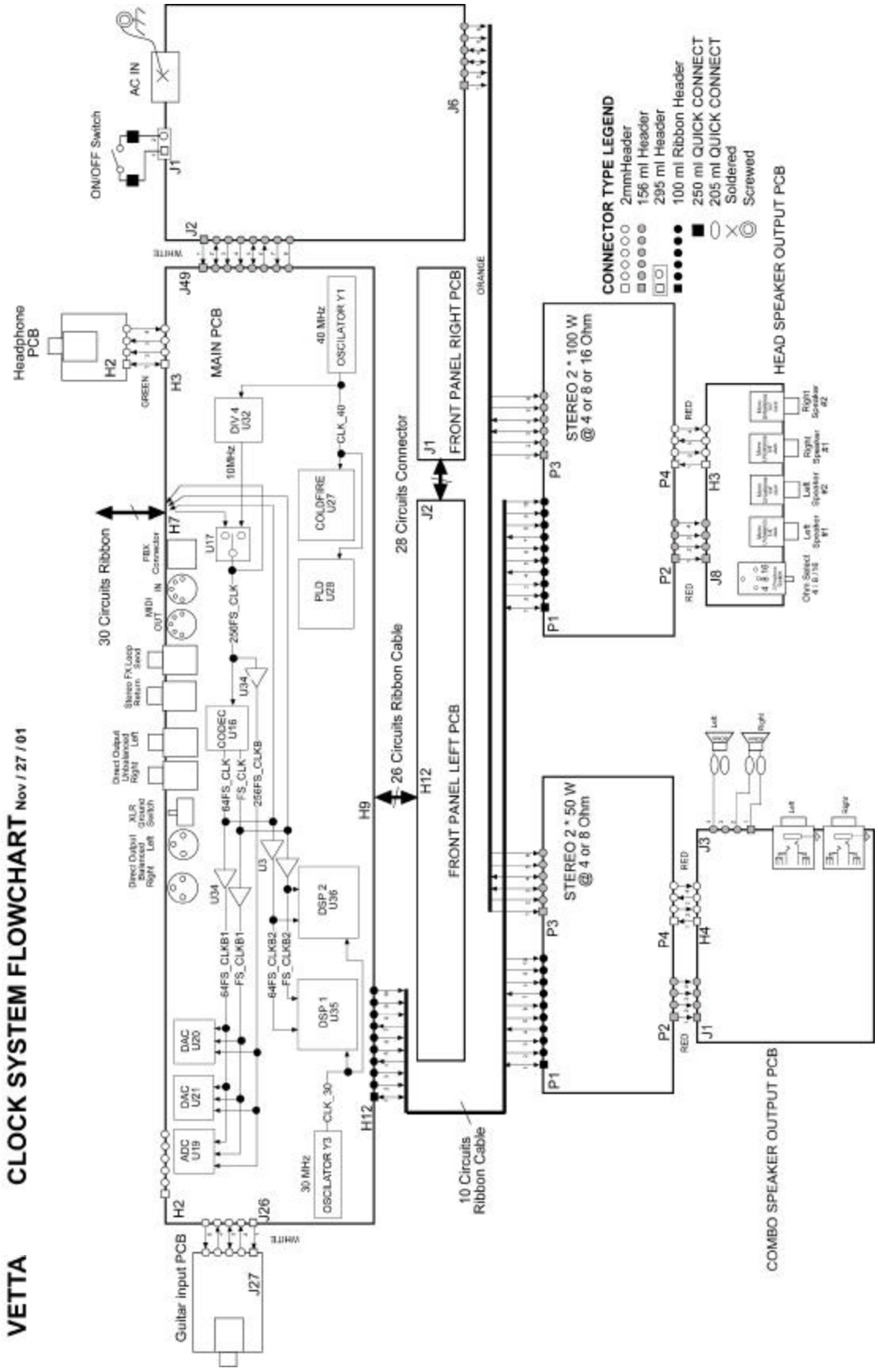
Clock system:

Except when the digital I/O option board is used (currently not available), all the clocks are contained within the Main PCB.

There are two master clocks: CLK_30 (30MHz) and CLK_40 (40MHz).

The crystal oscillator Y3 generates the CLK_30 clock. Its only purpose is to set the execution speed of the two Sharc DSP U35 and U36.

The crystal oscillator Y1 generates the CLK_40 clock. It has a number of distinct functions:
1). It sets the execution speed of the microprocessor U27 and drives all its peripheral access timing through the PLD U28.
2) It provides the run rate for the MIDI and FBX interface (internally generated in U27).
3) After being divider by four by the flip-flop U32 it becomes the 256FS_CLK (10MHz) which is the master clock for the audio sample rate. U17 implements a two-way switch, which allows for using an alternate clock generated on a future digital I/O option card. This card is not currently available and the switch should always be set to the U32 divider branch (= the SEL_LOCAL/OPTION* control signal should remain high). The 256FS_CLK drives the CODEC U16, which generates the FS-CLK (256FS_CLK/256= 39.0625KHz) and the 64FS_CLK (FS_CLK * 64 = 2.5MHz) signals. After buffering by U34 the 256FS_CLKB, 64FS_CLKB1, and FS_CLKB1 clocks drive the guitar input ADC U19 and the direct and power amp output ADC U21 and U20. Also, after buffering by U3, the 64FS_CLKB2, and FS_CLKB2 drive the DSP #1 and #2 to synchronize the DSP processing with the converters sample rate.

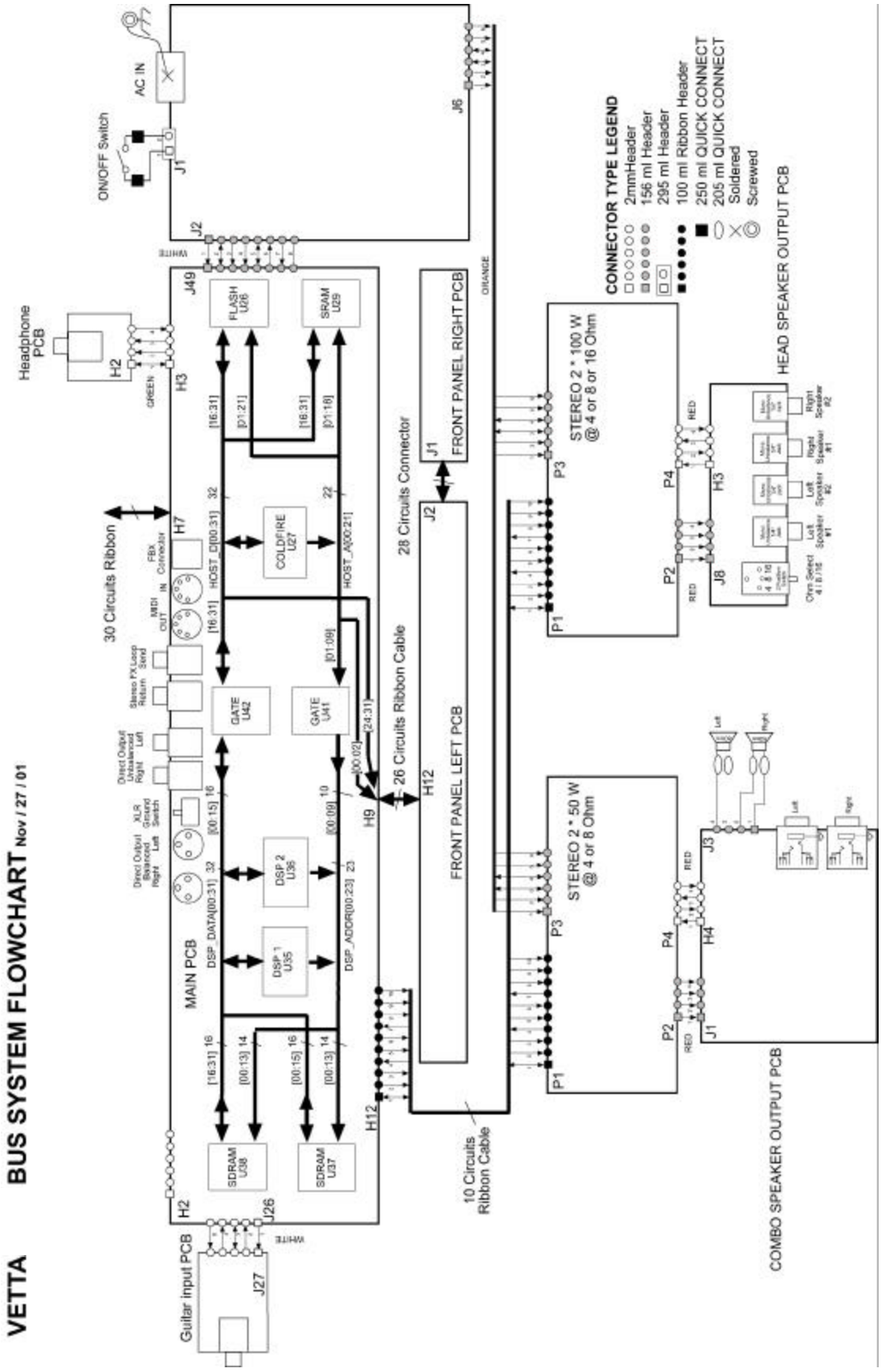

VETTA
CLOCK SYSTEM FLOWCHART Nov / 27 / 01
Headphone PCB
H2
GREEN
H3
MAIN PCB
J49
WHITE
J2
ON/OFF Switch
AC IN
J1
J6
ORANGE
40 MHz
OSCILLATOR Y1
DIV 4 U32
10MHz
CLK_40
COLDFIRE U27
PLD U28
U17
256FS_CLK
U34
CODEC U16
64FS_CLK
FS_CLK
256FS_CLKB
U3
DSP 2 U36
DSP 1 U35
64FS_CLKB1
FS_CLKB1
64FS_CLKB2
FS_CLKB2
CLK_30
30 MHz
OSCILATOR Y3
DAC U20
DAC U21
ADC U19
H7
30 Circuits Ribbon
FBX Connector
MIDI OUT IN
Stereo FX Loop Send Return
Direct Output Unbalanced Right Left
Direct Output XLR Ground Switch Balanced Right Left
H9
26 Circuits Ribbon Cable
H12
FRONT PANEL LEFT PCB
J2
28 Circuits Connector
J1
FRONT PANEL RIGHT PCB
10 Circuits Ribbon Cable
Guitar input PCB
J27
WHITE
J26
H2
STEREO 2 * 100 W @ 4 or 8 or 16 Ohm
STEREO 2 * 50 W @ 4 or 8 Ohm
P1
P2
P3
P4
RED
H3
H4
J8
J3
J1
HEAD SPEAKER OUTPUT PCB
COMBO SPEAKER OUTPUT PCB
Ohm Select 4 8 16
Left Speaker #1
Left Speaker #2
Right Speaker #1
Right Speaker #2
Left
Right
CONNECTOR TYPE LEGEND
2mmHeader
156 ml Header
295 ml Header
100 ml Ribbon Header
250 ml QUICK CONNECT
205 ml QUICK CONNECT
Soldered
Screwed

Bus system:

DSP #1 U35 and #2 U36 share a common 32 bit wide data bus named DSP_DATA[00:31] and a 24 bit wide address bus named DSP_ADDR[00:23]. These buses allow for communication between the DSPs and with the SDRAM. The SDRAM can be configured either with two 1Meg. by 16 ICs (U37 and U38) or two 4 Meg. by 16 ICs (U39 and U40). The current Main board is stuffed with U37 and U38 (1Meg.) (U39 and U40 are not installed on the PCB). Since each SDRAM IC is only 16 bit data wide they each carry only half of the DSP data bus. U37 and U38 are accessed together as a single 1 Meg by 32 bit wide SDRAM with U37 carrying the 16 less significant bits and U38 carrying the 16 most significant bits. These two busses also permit communication between the DSPs and the microprocessor U27. The address bus lower 10 bits [00:09] can be driven by the microprocessor through the tri-state gate U41. The lower 16 bit of the data bus [00:15] can be bidirectionaly connected to the microprocessor address bus through the bidirectional buffer U42. This interface permits to move the DSP code from the microprocessor flash memory U26 into the DSP memory upon power on initialization. It also permits to send new parameters to the DSP when a new patch is recalled or a U.I. control is changed. This interface must be working for the DSP to run valid code after power on.

On the microprocessor side, the 32-bit data bus is called HOST_D[00:31], and the 24-bit address bus is HOST_A[00:21] (bit 22 and 23 are not used). Through these buses the microprocessor can access the FLASH memory U26 that holds the microprocessor and DSP code. The data to the FLASH is bidirectional allowing the microprocessor to transfer new code from MIDI to the FLASH thus allowing reprogramming the VETTA software operations from the outside. These buses also connect to the SRAM U29, which is permanently supplied by a battery, and hold the user defined data setups.

Finally, to allow bidirectional communication with the U.I. PCB, bit 24 to 32 of the data bus are bidirectionaly buffered by U30 to the U.I. bus FB_D[00:07]. U31 buffers the 3 less significant bits of the address bus.


VETTA
BUS SYSTEM FLOWCHART Nov / 27 / 01
Headphone PCB
ON/OFF Switch
AC IN
J1
J2
J6
J49
FLASH U26
SRAM U29
H2
H3
H7
30 Circuits Ribbon
FBX Connector
COLDFIRE U27
MIDI IN
MIDI OUT
Stereo FX Loop Send
Stereo FX Loop Return
GATE U42
GATE U41
Direct Output Unbalanced Left
Direct Output Unbalanced Right
XLR Ground Switch
Direct Output Balanced Left
Direct Output Balanced Right
MAIN PCB
DSP 2 U36
DSP 1 U35
DSP_DATA[00:31]
DSP_ADDR[00:23]
SDRAM U38
SDRAM U37
H9
H12
26 Circuits Ribbon Cable
28 Circuits Connector
FRONT PANEL LEFT PCB
FRONT PANEL RIGHT PCB
10 Circuits Ribbon Cable
Guitar input PCB
J27
J26
H2
WHITE
GREEN
ORANGE
CONNECTOR TYPE LEGEND
2mmHeader
156 ml Header
295 ml Header
100 ml Ribbon Header
250 ml QUICK CONNECT
205 ml QUICK CONNECT
Soldered
Screwed
STEREO 2 * 100 W @ 4 or 8 or 16 Ohm
STEREO 2 * 50 W @ 4 or 8 Ohm
P1
P2
P3
P4
J8
H3
H4
J3
RED
HEAD SPEAKER OUTPUT PCB
COMBO SPEAKER OUTPUT PCB
Ohm Select 4 8 16
Left Speaker #1
Left Speaker #2
Right Speaker #1
Right Speaker #2
Left
Right

I/O system:

The following Input and Output (I/O) signals control the VETTA operations

GUITAR_IN_SENSE

This input signal is generated on the Guitar Input PCB and read on the Main PCB by an I/O pin of DSP #1. It is high when a jack is plugged in the guitar input and low otherwise.
When this signal is read low (= no jack plugged in), the DSP mutes the audio signal path in order to keep the noise on the audio outputs at a minimum

On the Option Board (not available yet):

LINE_IN_SENSE (USED ONLY WITH OPTION BOARD PRESENT)

This input signal is generated on the option board (when present) and read on the Main PCB by an I/O pin It is high when a jack is plugged in the Line input of the option board and low otherwise. As with the GUITAR INPUT, muting is applied to the DSP if the LINE input is selected and no jack is present (=Low).

Option card ID reading (USED ONLY WITH OPTION BOARD PRESENT)

If an option card is installed, the firmware can read from it an eight-bit serial ID code unique to that type of card. If no card is installed the ID read will be 0FFh
The IDs currently assigned are:

000h	=	Digital OUT only card
001h	=	Digital IN and OUT card
…		Unused
0FFh	=	No card

Hardware version reading

The three lines BDM_DDATA0 = bit 0, BDM_DDATA1 = bit 1, and BDM_DDATA2 = bit 2 can be read at anytime by the microprocessor U27 to determine what hardware revision of the Main PCB hardware is being used. The code read is determined by the set up of the three resistors R125, R130, and R131 that can be installed to be either pull down or pull up.
This allows for future version of the firmware to automatically adapt to older Main PCB hardware version. The first board version released in the market had code 0 (= all three resistors are wired to be pull down). If necessary, following version code will increment by 1. Seven hardware IDs from 0 to 06h are allowed. The hardware differences of relevance to the firmware between the Main PCB versions will be documented in ECOs. Code 07h is reserved for test mode.

Test mode reading

When, while during the firmware initialization, the three lines BDM_DDATA0 = bit 0, BDM_DDATA1 = bit 1, and BDM_DDATA2 = bit 2 are read all high (07h) by the microprocessor U27, it signals that the MAIN BOARD is being tested (likely on a bed of nail fixture), and that the test firmware should be executed instead of the regular firmware. Those three lines can be forced high by the tester's bed of nail by forcing the right side of R125, R130, and R131 to 5 volts.

Z-SELECT status reading (CURRENTLY UNUSED)

The status of the Z_SELECT signal can be read by the microprocessor U27 through the circuit made of Q6 and Q9 (page 8 of 8 of the Main PCB). The reading is done in two paths.

- First the BDN-DDATA3 line is read while the Option_Sel_3* line is held **low**. This first reading brings bit 0 of the Z_Select status.
- The BDN-DDATA3 line is read again while the Option_Sel_3* line is held **high**. This second reading brings bit 1 of the Z_Select status.
- The status of the Z_Select is then determined as follows

	Bit 0	Bit 1	
4 Ohm (+15V)	0	1	
8 Ohm (open)	1	1	
16 Ohm (-15V)	1	0	(used only on VETTA Head)

GUITAR/LINE*_SELECT (USED ONLY WITH OPTION BOARD PRESENT)

This output control line, generated by an I/O pin of DSP #1, controls the analog switch made of U15 and U22 (page 7 of 8 in Main PCB) and selects which one of the GUITAR or LINE jack (on the option board) is active. A high level (3.3V) selects the GUITAR jack and a low level selects the LINE jack. Due to the possible presence of different DC offset level on each input an audio click could appears on the output when this signal is switched. To avoid this the following switching sequence is used:

1) Ramp the amplitude of the DSP audio path to 0 over approximately 20ms second
2) Switch the GUITAR/LINE_SELECT Line.
3) Ramp the amplitude of the DSP audio path back to its original level over approximately 20ms second

NOTES:

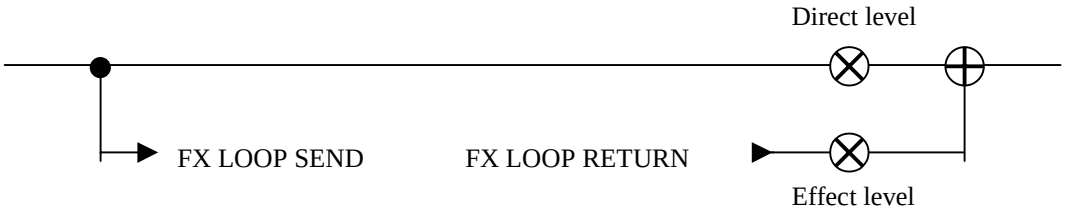
- On all three VETTA versions the LINE INPUT is available only if a DIG I/O card is installed. Therefore if a DIG I/O card is not installed the GUITAR / LINE selection page is not available on the menu.

RESET-IO*

This output line, generated by an I/O pin of DSP #1, resets the main ADC, both DACs, the effect loop CODEC, and the option card (when present). It is pulsed low for a few microseconds as soon as the firmware starts to run.

FX_RET_SENSE

This input signal, generated by effect return ¼" jack J10 (page 6 of 8 of the Main PCB), is read by an I/O pin of the DSP #1. It is high when a jack is plugged in the FX LOOP RETURN jack and low otherwise. When no jack is sensed on this input (= low), the DSP Direct Level on the diagram below is set a 1 and the Effect Level at zero.



POWERAMP_MUTE *
This output signal is generated by an I/O pin of DSP #1. When low it mutes the power amps. It is kept low from the start up of the firmware until all DSP code is downloaded and running, all memory is cleared, and the +/- 15DEL (delayed +/- 15 V supplies) are up. This last item takes about 2 seconds from the time the AC power is turned ON. The POWERAMP_MUTE* signal is combined with the PS_VALID signal (see power supply PCB) by D16, R175 and R174 (page 6 of 8 of the Main PCB). This arrangement helps muting the power amp as soon as the power supply starts to fall, and therefore limits the amount of audio thump when the power is turned OFF.

MONO/STEREO*
This input signal is generated on the Speaker Output PCB, and is read by an I/O pin of DSP #1. Since the VETTA Combo always runs in stereo, it is grounded and will always read low. This signal will be used in the VETTA Head.

When the unit is running in VETTA COMBO mode (as determined by a flag stored in the flash memory) the MONO/STEREO* input is ignored and the unit defaults to stereo.

Z_SELECT
The Z_Select line is an analog signal generated on the Speaker Output PCB. Its level indicates the current setting of the Power Amp output impedance. Its analog voltage level versus speaker's impedance setting is a as follows:
4 Ohm = +15V
8 Ohm = 0V (or open)
16 Ohm = -15V (Used only on VETTA Head)

The status of the Z_SELECT line affects two parameters in the VETTA
1) It changes the gain of the power amp (see Audio System)
2) It changes the rail voltages of the power amp (see Power Supply System)

HEADPHONE_SENSE
This input signal is generated on the Headphone Output PCB, and is read by an I/O pin of DSP #1. It is high when a jack is connected to the headphone output jack and low otherwise. When a jack is connected into the Headphone Output (presumably a headphone), the DSP signal going to the power amp DAC (U20) is muted.

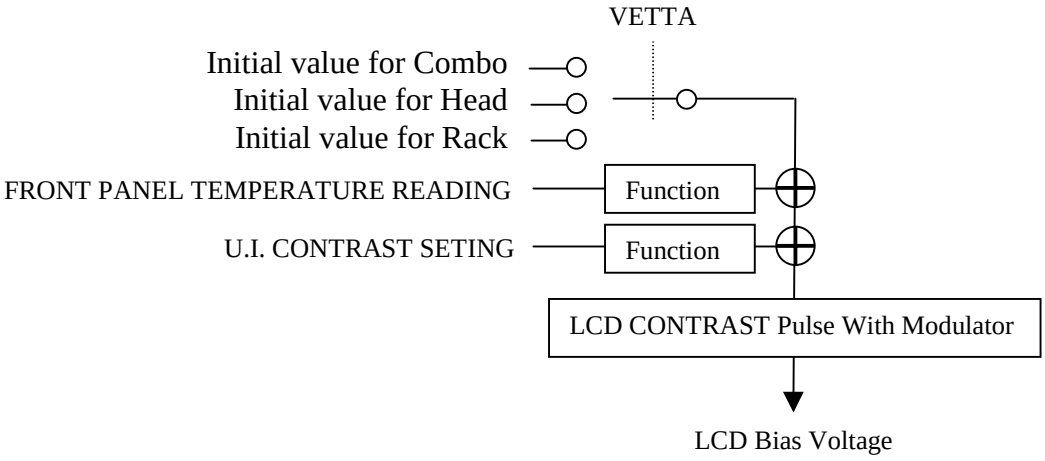
When the unit is running in VETTA HEAD mode (as determined by a flag stored in the flash memory) the status of this line is ignored and the mode default to "no headphone plugged in" (= do not turn off the power amp).

LCD Temperature compensation:
Because a fair amount of heat is generated in the Vetta chassis, and because the contrast of the U.I. LCDs is significantly affected by this heat, the VETTA implement a compensation scheme to automatically adjust the LCD contrast setting in function of the chassis internal temperature. To this effect, the temperature under the large graphic LCD is sensed on the U.I. Left PCB by U11 (page 1 of 3 of U.I. left half). This IC generates a DC voltage proportional to the sensed

temperature (GRAPHICLCD_TEMP line). This voltage is digitized by the U.I. ADC U10 (page 2 of 3) and read by the main PCB microprocessor. The microprocessor code uses this temperature reading, plus two other parameters, to determine the required LCD contrast through the following process:
1) According to the VETTA version an initial value is selected which optimize the viewing angle as follows:
- Bottom for VETTA Combo
- Front for VETTA Rack (not available)
- Top for VETTA Head

2) The front panel temperature reading is scaled by a function and added to this initial value. This automatically corrects for the LCD contrast change with temperature.
3) The U.I. user adjustable LCD contrast setting is scaled by a function and added

The scaling functions, initial values and contrast values are different for the graphic and alphanumeric LCD, but the temperature reading is common to both.
The following diagram represents the firmware flowchart for one of the LCD



The result of this computation is used to control the duty cycle of two100Hz pulse generators implemented by the main PCB microprocessor U27 and the two U.I. PCB flip-flops U1-4 and U1-B. Each of these flip-flops output is then rectified by Q18, R4 and C24 for the graphic LCD and R1, R3 and C23 for the character LCD. This produces two negative voltages proportional to the generator's duty cycle. These voltages are then sent to the LCDs contrast adjustment pin.

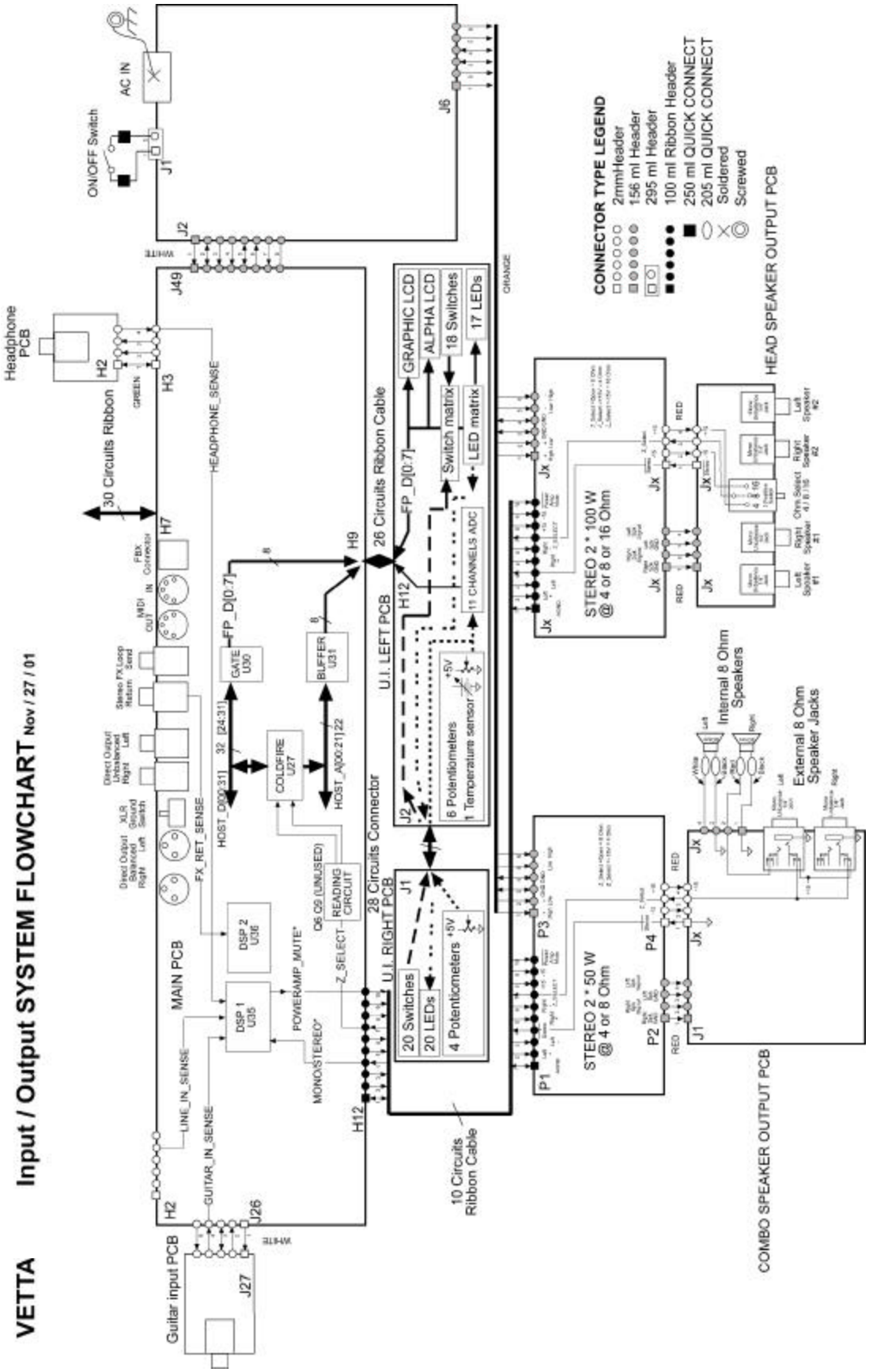
While the Vetta is in test mode (power the unit with the REVERB switch depressed), the software does not perform the temperature compensation algorithm. For this reason, when the Vetta is running in test mode, and the unit had had a chance to significantly warm up, the contrast of the LCD will be significantly off.

U.I. potentiometers:
The 10 U.I. potentiometers (6 on the left side, and 4 on the right side) provide a voltage from 0 to 5V. These voltages are digitized by the U.I. ADC U10. The resulting serial stream is read by the Main PCB microprocessor U27.

U.I. LEDs:
All of the U.I. LEDs (except the LCD's backlight LEDs) are multiplexed in a 15 row by 5-column matrix. The rows of the matrix are driven by U4, U3 and the associated 16 buffer transistors. The columns of the matrix are directly driven by U9. The multiplexing cycle is about 10ms long. The matrix driver circuit resides on the Left U.I. PCB (page 3 of 3 of left U.I. PCB).

U.I. Switches and encoders:
All of the U.I. switches are read in a 5 by 7 matrix. One side of the matrix is driven by U5, and the other by U7 (page 2 of 3 of left U.I. PCB). The encoders, except E8 (program select), are read in a 12 by 2 matrix driven by U6 and U4. E8 is read directly by U6. Notice that the encoders are 24 positions except for E9 (amp select) and E14 (Page).

U.I. LCDs:
Both LCD modules are written to and read from through the U.I. PCB parallel bus FP_D[0:7]. Their electronic is supplied with the +5V. Their backlight LED are also supplied from the 5V through current limiting resitors, R46 for the graphic LCD and R12 for the Character LCD.

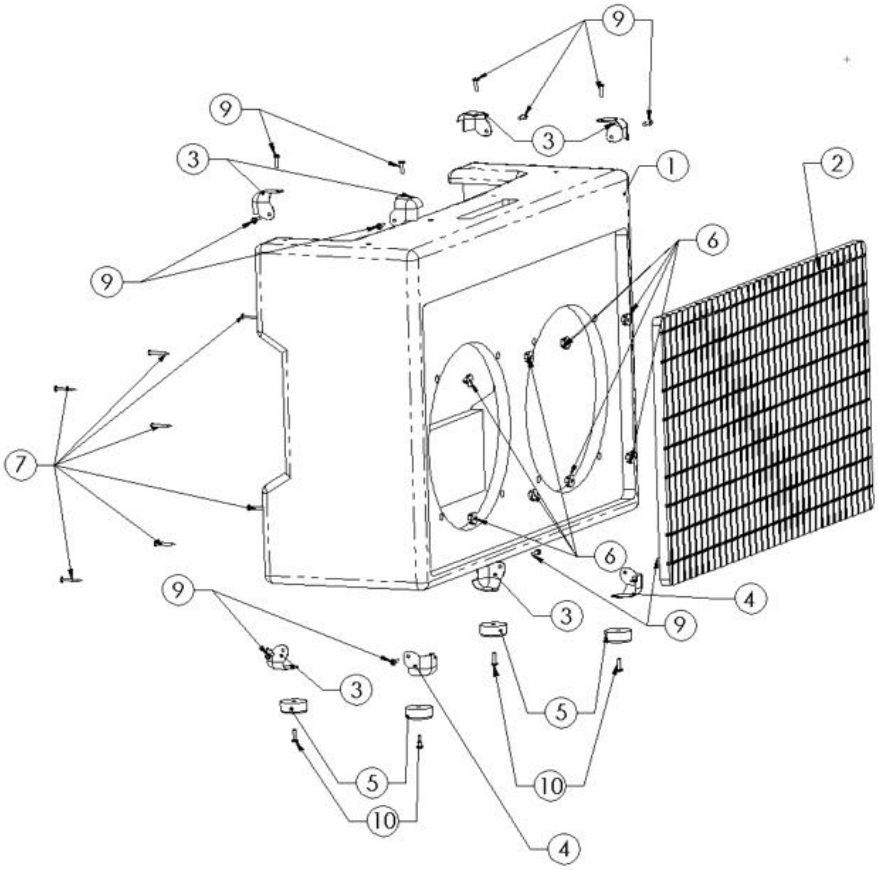

VETTA
Input / Output SYSTEM FLOWCHART Nov / 27 / 01
Headphone PCB
ON/OFF Switch
AC IN
30 Circuits Ribbon
26 Circuits Ribbon Cable
28 Circuits Connector
10 Circuits Ribbon Cable
MAIN PCB
U.I. LEFT PCB
U.I. RIGHT PCB
Guitar input PCB
COMBO SPEAKER OUTPUT PCB
HEAD SPEAKER OUTPUT PCB
GRAPHIC LCD
ALPHA LCD
18 Switches
17 LEDs
Switch matrix
LED matrix
11 CHANNELS ADC
6 Potentiometers
1 Temperature sensor
20 Switches
20 LEDs
4 Potentiometers
DSP 1 U35
DSP 2 U36
GATE U30
BUFFER U31
COLDFIRE U27
READING CIRCUIT
STEREO 2 * 100 W @ 4 or 8 or 16 Ohm
STEREO 2 * 50 W @ 4 or 8 Ohm
Internal 8 Ohm Speakers
External 8 Ohm Speaker Jacks
CONNECTOR TYPE LEGEND
2mmHeader
156 mil Header
295 mil Header
100 mil Ribbon Header
250 mil QUICK CONNECT
205 mil QUICK CONNECT
Soldered
Screwed

Service Dept.
6033 De Soto Ave.
Woodland Hills, CA 91367
P. 818-575-3600
F. 818-676-1585
E. service@line6.com

Flowcharts for the various systems in Vetta can be found in the “Theory of Operation” section of this service manual. They are in PDF form.

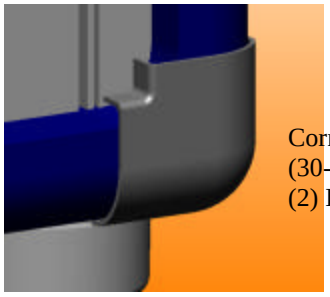
Microsoft Word versions of the same flowcharts can be found in the “Word Forms” folder that shows up when you first call up this service manual. The Word versions of the flowcharts read and print more clearly than the PDF versions.

Vetta Exploded Parts Views and Assembly Instructions

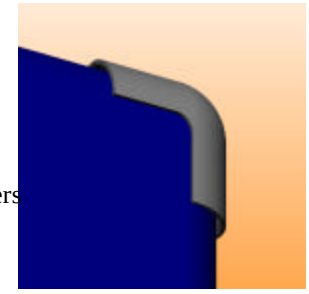


ITEM	QTY	LINE6 PART NO	REV	DESCRIPTION
1	1	50-00-0150	C	CABINET, Vetta COMBO
2	1	N/A	N/A	GRILL, SPEAKER
3	6	30-30-0001	N/A	CORNER PROTECTOR STEEL PWD COAT MATTE SIL
4	2	30-30-0002	N/A	CORNER, POWDER COAT
5	4	30-75-0008	N/A	FOOT, RUBBER, 1.48 x .75 in
6	8	30-06-1024	N/A	NUT, TEE, 10-24 x 5/16
7	7	30-00-0621	N/A	SCREW, WOOD, #6-18 x 1.25
9	12	30-00-9812	N/A	SCREW, #6-TRUSS HEAD PH, NI
10	4	30-00-9812	N/A	SCREW, WOOD, #10-12 x .875

There are two types of corner guards used on the cabinet. The lower front corner guards have an inner corner that mates with the area around the speaker grill. The upper corners and lower rear corners do not have this feature. The (4) rubber feet (30-75-0008) are each held in place by a #10 wood screw (30-00-6839). They are seated on the corner guards (30-30-0001) and (30-30-0002), attached through the bottom mounting holes. This is shown is the graphic below.



Corner, Grill Detail
(30-30-0001)
(2) Lower Front Corners
-



Corner
(30-30-0002)
(6) Remaining Corners

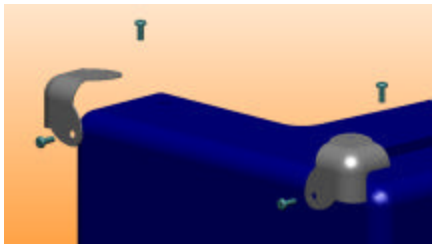
Seat the mating surfaces of the corner guards such that they are flush with sides of the cabinet. Secure them to the cabinet wall before placing the rubber feet. Use a #8 self-tapping wood screw (30-00-0812).

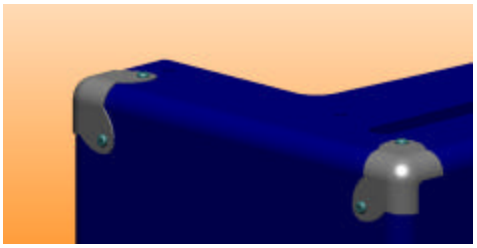
When the outside screws of the lower corners are fixed, place and secure the rubber feet.

These screws should have a torque rating of 6-8 in-lbs. Do not over tighten.

a) Attach the Upper Corners

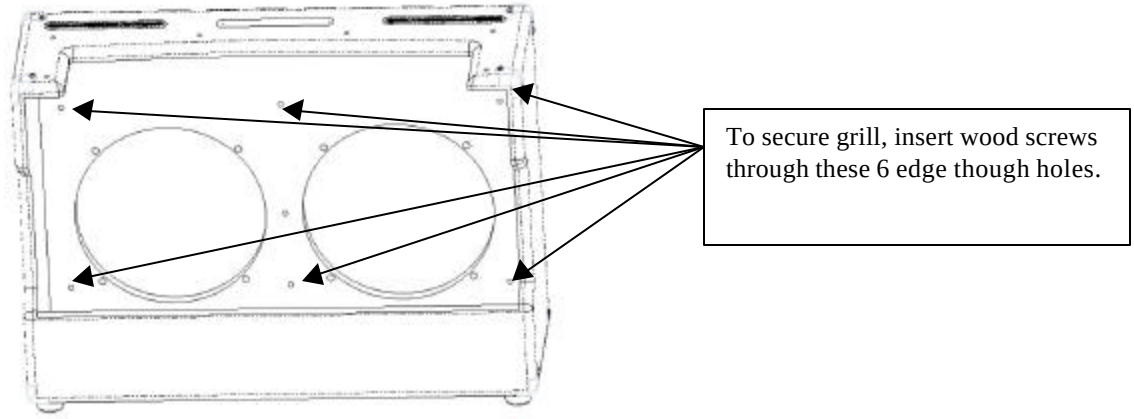
The top corners guards must next be added to the cabinet. The upper corners each attach with (2) #8 self-tapping wood screws.

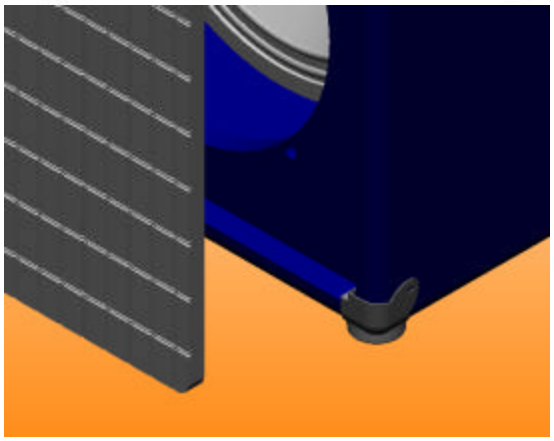


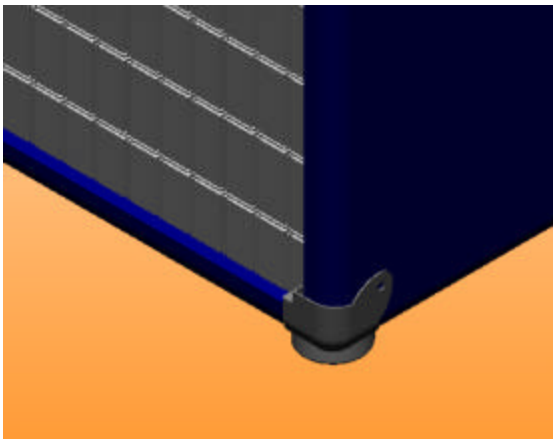


These screws should have a torque rating of 6 in-lbs. Do not over tighten.

If the speaker grill has not already been secured, it should be placed at this time. Hold the grill in the recess in the front of the cabinet. Secure the grill using 6 #8 wood screws. Pass the screws though predrilled holes in the backside of the cabinet (see figure below).

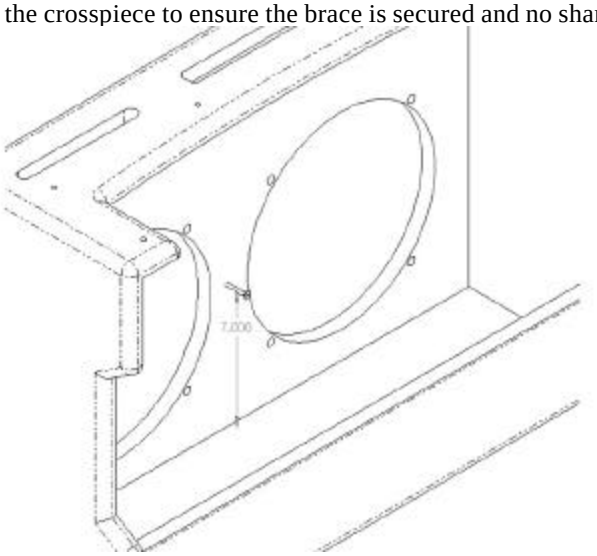




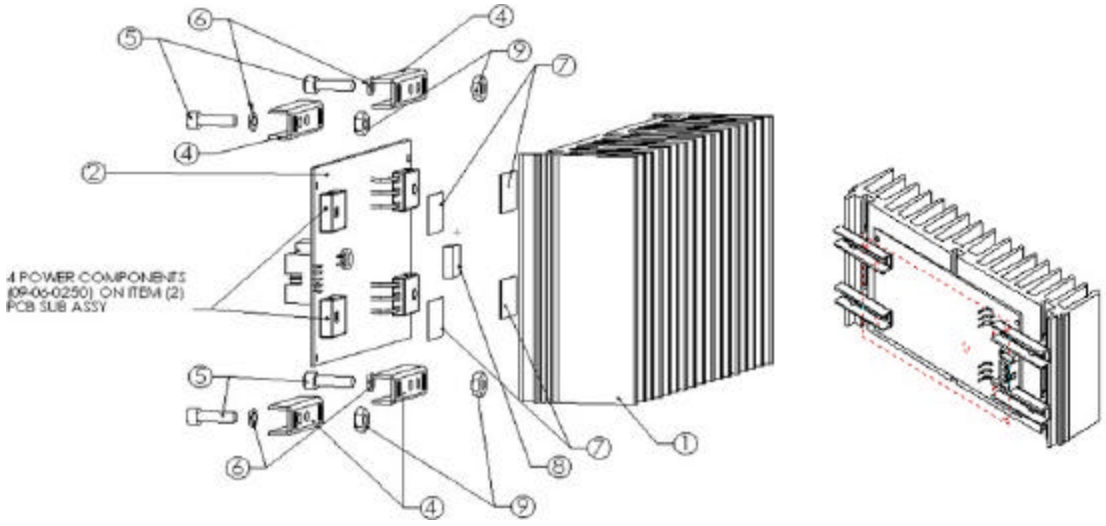


b) Secure speaker grill with wood screw

After the grill is mounted onto the cabinet, secure the cross piece of the grill frame to the cabinet using a #8 wood screw (30-00-0014). The wood screw will be applied to the inside of the cabinet front at a position between the circular speaker openings approximately 7 inches from the cabinet base. After installation, through the grill fabric tug gently on the crosspiece to ensure the brace is secured and no sharp points project through the grill cloth.

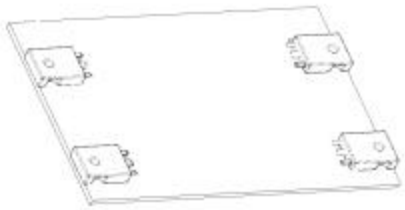


Power Amp Assembly

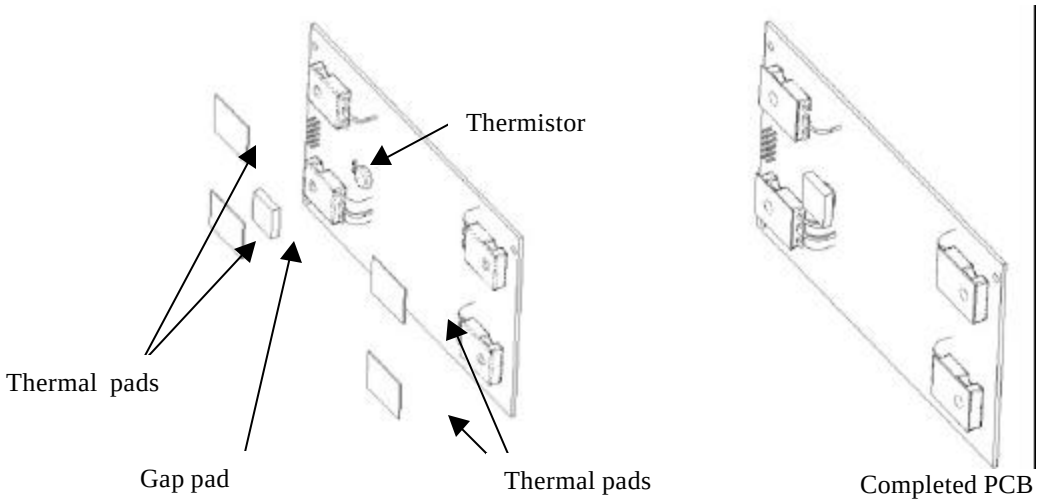


ITEM	QTY	LINE6 PART NO	DESCRIPTION
1	1	30-51-0059	HEAT SINK
2	1	50-00-0095	PCB ASSY, AMP 2x50 WATT COMBO Vetta
4	4	30-51-0073	CLAMP, DEVICE,
5	4	30-00-0010	SOCKET HEAD CAP SCREW
6	4	30-03-0002	WASHER, LOCK, #8
7	4	30-63-4001	THERMAL PAD
8	1	30-63-5050	GAP PAD
9	4	30-06-0007	NUT, HEX #8-32, STEEL

Install Power Components (09-06-0250) on bottom side of PCB. Orient the component so that the terminal edge points towards the center of the board, while the opposite face points out toward the edge of the PCB. When properly installed the edge of the Power Component should meet the edge of the PCB. Insure that the components are lying flush against PCB (see figure below).
Install thermistor on bottom side of PCB. Solder down with minimum lead length then bend down toward the center of the PCB. Apply the thermal pads flat against the power components. Apply the gad pad over

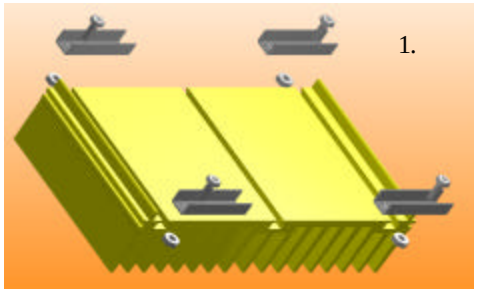


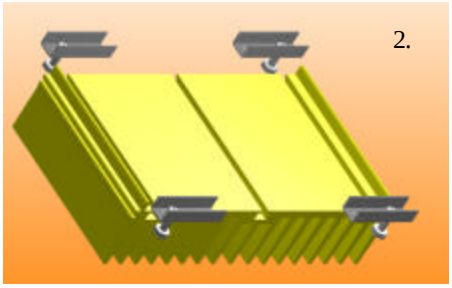
the thermistor, completely covering the device (see figure below).



a) Pre-assemble the Device Clamps

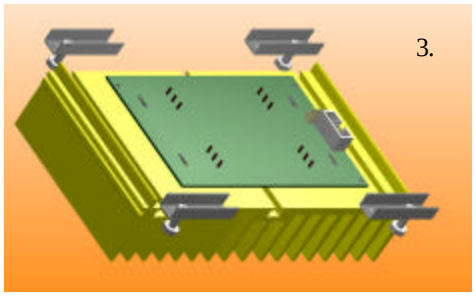
Custom clamps hold the PCB/heat sink assembly together. The first step in assembling the heat sink is to assemble these. They each consist of an 8-32 x .532 socket head cap screw (30-00-0010), a #8 split lock washer (30-03-0002), a #8-32 nut (30-06-0007), and the clamping bar (30-51-0073). Put a lock washer onto the cap screw. Then assemble such that the screw is through the clamping bar and partially threaded into the nut. This will make it easier to slide them into the T-groove after the PCB has been placed.

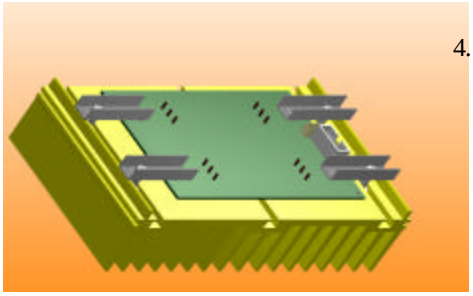




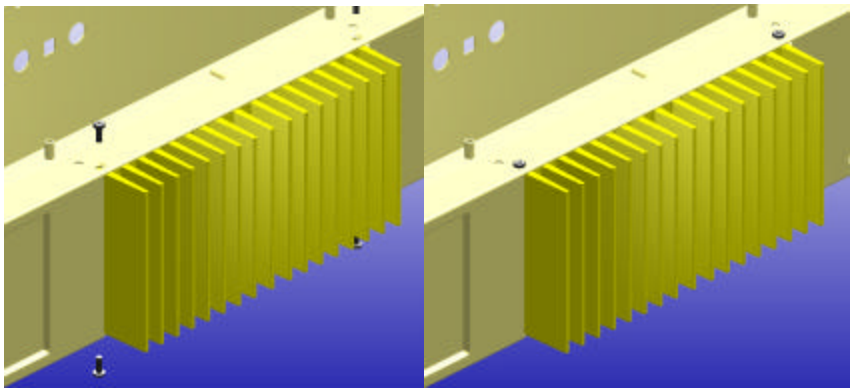
b) Attach the Power Amp PCB to the Heat Sink

The Power Amp PCB can now be placed and attached. Center the PCB on the heat sink as shown, slide the clamps into position, and tighten them down. All clamps should be loosely assembled before any of the hold down screws is tightened. Check to make sure that the gap pad has remained in position over the thermistor. Tighten clamp screws to 12 in-lbs torque.

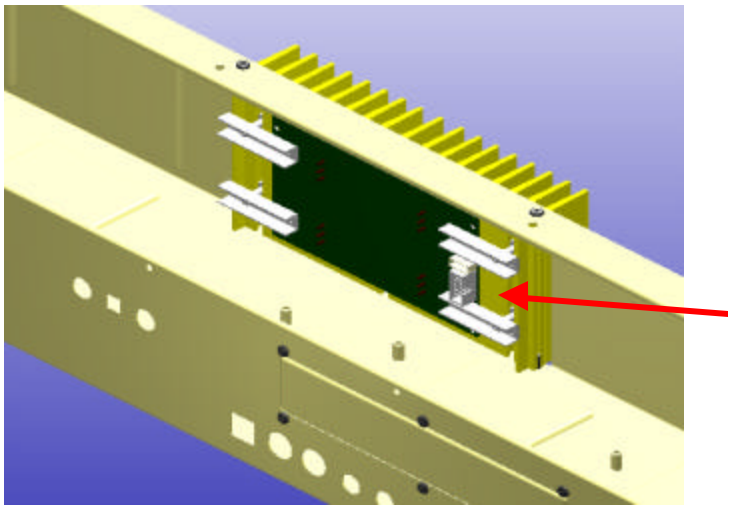




Insert the heat sink sub-assembly #50-00-9095(see previous section of the manual) into the chassis (30-51-0043). **NOTE: THE POWER AMP ASSEMBLY NEEDS TO BE ORIENTED CORRECTLY WHEN INSTALLING. NOTE THE POSITION OF THE 10-PIN HEADER ON THE PCB IN THE FIGURE BELOW FOR CORRECT ORIENTATION.** If the unit is installed in the opposite orientation, the ribbon cables will not work. The assembly is held in place by four self-tapping #6 screws (30-00-0018). The head of the screws will fit into dimpled cavities on the chassis, but will not screw in completely flush with the top surface.



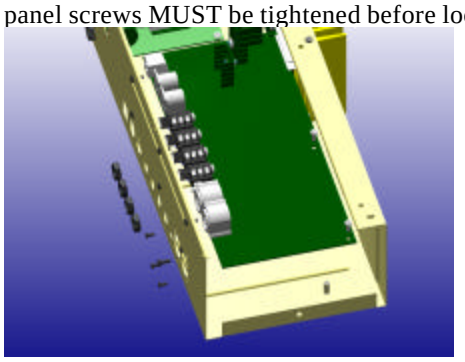
Views showing both front and backside of installed assembly.



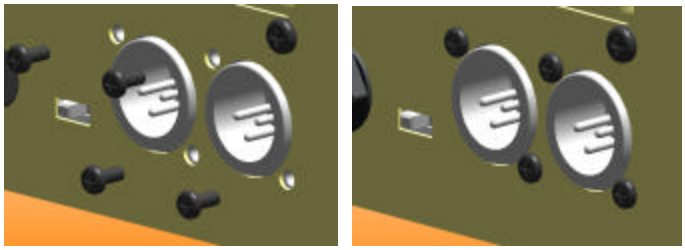
NOTE ORIENTATION OF CORRECTLY INSTALLED POWER AMP ASSEMBLY:
The 10-pin ribbon connector is to the right when the chassis is viewed from the connector side.

Place the PCB on the PEMs in the chassis and slide the jacks through the appropriate cutouts as shown. The jack faces should be flush with the back of the chassis. The PCB is held in place by hardware both on the inside and the outside of the chassis. Make sure the RJ45 jack on the board projects though to the back panel

Begin by placing and partially tightening the (9) #6-32 x .375 lg. pan head phillips screws w/ captive star lock washers (30-00-0607) that attach through the PCB. Tighten these screws only partially. The back-panel screws MUST be tightened before locking these screws down.



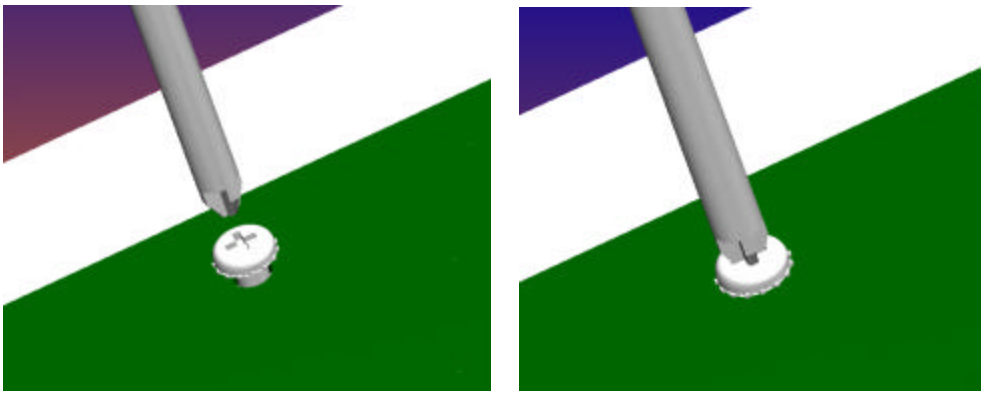
Note: In spite of the warning, a screwdriver may be used to help insert the screws and partially tighten them, but they must not be fully tightened until after the back panel screws are placed and tightened. The "No Screwdrivers" graphic is simply to highlight this. The reasons for this are detailed in the note at the end of this section.



(4) #4 tapping screws (30-00-4250) hold the XLR jacks to the back panel. Flush the jacks with the back panel, insert the screws, and tighten to 4 in-lbs.

(4) Plastic jack nuts should be placed next. Flush the jacks with the back panel, insert the nuts, and tighten to 4 in-lbs.

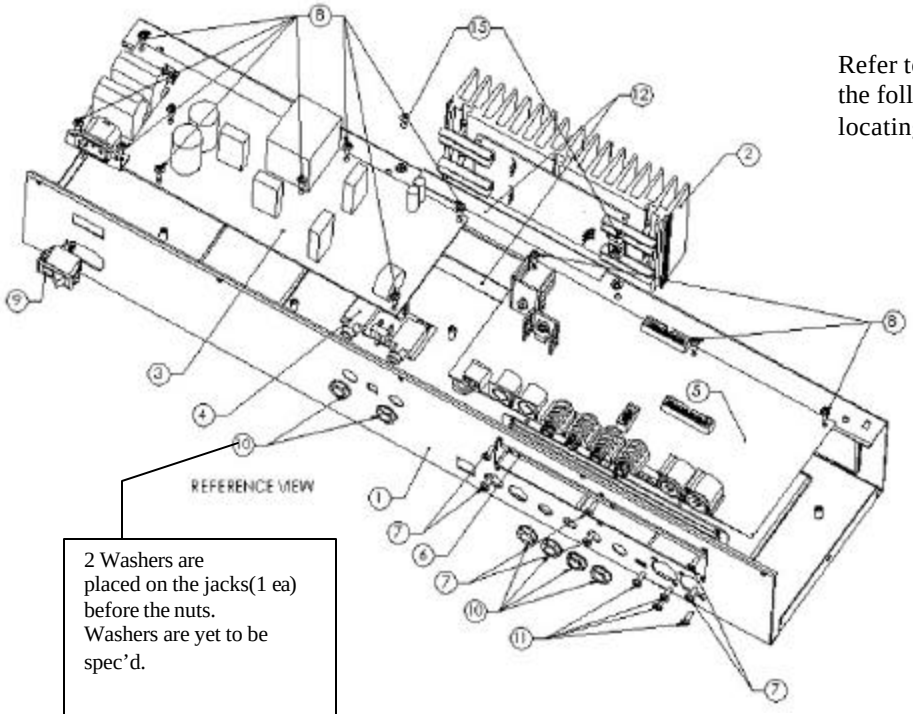
The PCB Screws must now be tightened the rest of the way. They should be tightened to a torque of 6 in-lbs.



Note: These screws must be left loose until this step for 3 main reasons: (1) It is the easiest way to get all of the screws to line up. (2) It will help prevent cracking in the solder joints on the jacks and (3) it will ensure grounding points will make electrical contact with the chassis.

FYI: If the PCB screws are tightened prior to inserting and tightening the back panel screws, the fixed board may not align properly, creating high shear stress on the jack pins. Conversely, if the PCB screws have not been placed and finger tightened to rough locate the board prior to the back panel screws, there is a possibility of misalignment with the PEMS. Forcing this misalignment back into alignment while the back panel screws are tight will have the same effect of heightening shear stress on the jack pins and may crack the solder joints.

The Chassis Assembly



Refer to this graphic throughout the following section for aid in locating the parts discussed.

2 Washers are placed on the jacks(1 ea) before the nuts. Washers are yet to be spec'd.

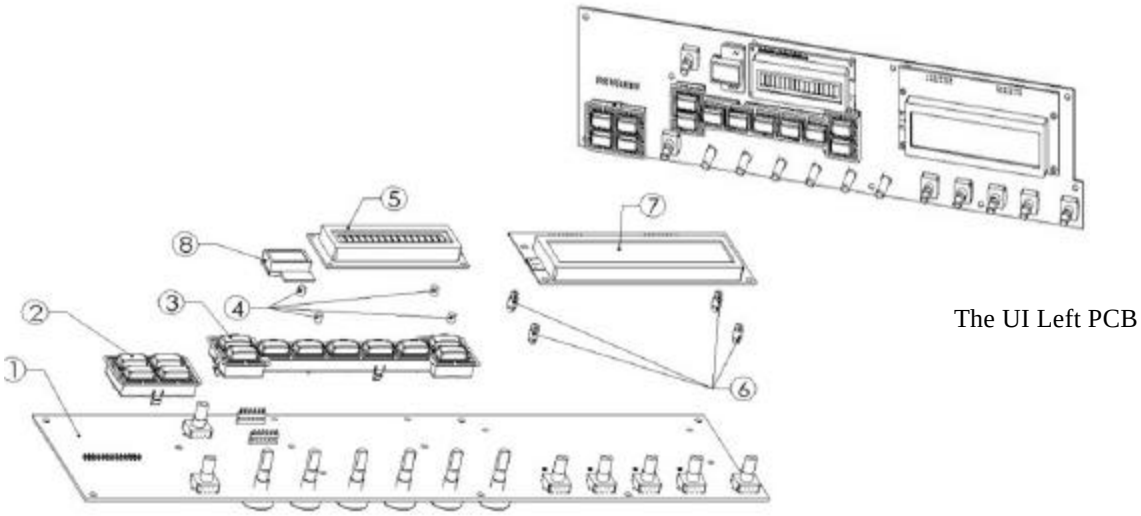
ITEM	QTY	LINE6 PART NO	DESCRIPTION
1	1	30-51-0043	CHASSIS
2	1	N/A (SEE SECTION 2)	ASSY, POWER AMP
3	1	50-00-0096	PCB ASSY, POWER SUPPLY COMBO Vetta
4	1	50-00-0105	PCB ASSY, OUTPUT SPEAKER
5	1	50-00-0094	PCB ASSY, MAIN, Vetta
6	1	30-51-0040	COVER PLATE, DIG I/O PANEL
7	6	30-00-0375	PAN HEAD PHILLIPS SCREW
8	12	30-00-0607	PAN HEAD PHILLIPS SCREW
9	1	24-06-0001	ROCKER SWITCH
10	6	N/A [INCL ASSY]	NUT, JACK
11	4	30-00-4250	SCREW, #4 x .250, PAN HD, SH METAL, BL OXIDE
12	2	30-63-0001	PAD, FOAM, SILICONE
14	1	30-75-9600	GROMMET, RUBBER
15	4	30-00-0018	SCREW, #6-32 x 3/4, SELF TAPP, FLAT HD, PHIL

After completing the sub-assembly, inspect it to ensure that everything is correctly placed. Check that:

- **The power amp assembly is secure in the chassis. Inspect the foam about the power amp to see that it has not rolled or become loose during the insertion process.**
- **Check that the power amp assembly is mounted in the correct orientation.**
- **Check that the all PCB standoff holes have been secured (12 screws total).**
- **Check that the power switch is snapped flush into the chassis in the correct orientation.**
- **Check that all screws and nuts securing the output jack have been installed and are secure (4 screws, 4 plastic nuts and 2 metal nuts used).**
- **Check that the RJ45 jack protrudes through the square hole in the chassis and is flush with the back face of the chassis.**

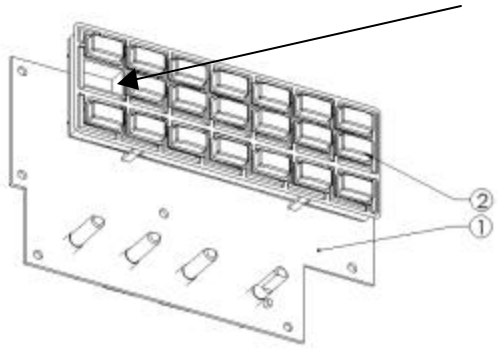
The User Interface (UI) PCBs

Before the user interface PCBs can be attached to the chassis cover, it is first necessary to assemble the button arrays and LCDs.



The UI Left PCB

ITEM	QTY	LINE6 PART NO	DESCRIPTION
1	1	50-00-0106	PCB ASSY, USER INTERFACE, LEFT
2	1	50-00-0006	ASSEMBLY, AMP SELECT
3	1	50-00-0038	ASSEMBLY, CHANNEL SELECT
4	4	30-12-0001	RICHCO P/N DLCBST-3-01
5	1	50-00-0114	PCB ASSY, DISPLAY, 192 x 48
6	4	30-12-0002	RICHCO P/N LMSP-3-01
7	1	50-00-0115	PCB ASSY, DISPLAY, 1 X 16
8	1	N/A (BREAK AWAY, 50-00-0107)	PCB ASSY, LED

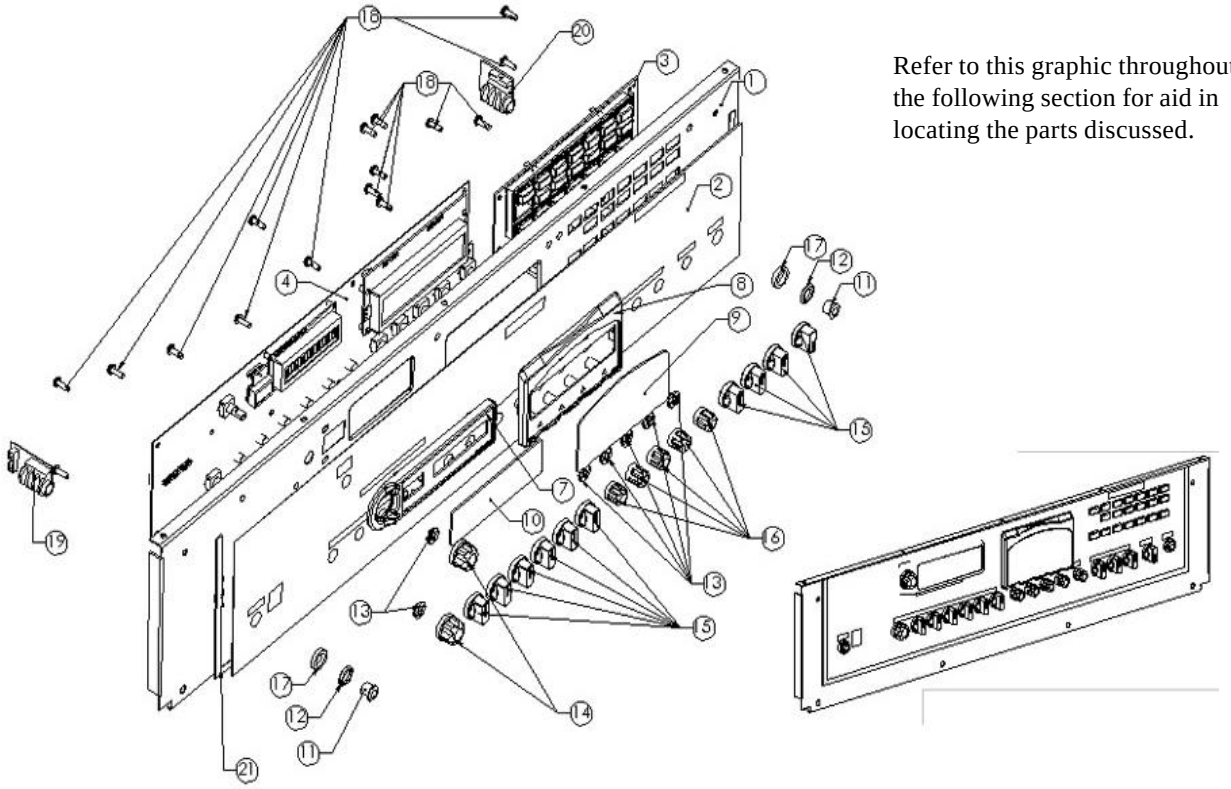


The UI Right PCB.

Refer to this graphic throughout the following section for aid in locating the parts discussed.

ITEM	QTY	LINE6 PART NO	DESCRIPTION
1	1	50-00-0107	PCB ASSY, INTERFACE, USER RIGHT
2	1	50-00-0031	ASSY, FINAL, EDIT SEL

The Chassis Cover Assembly

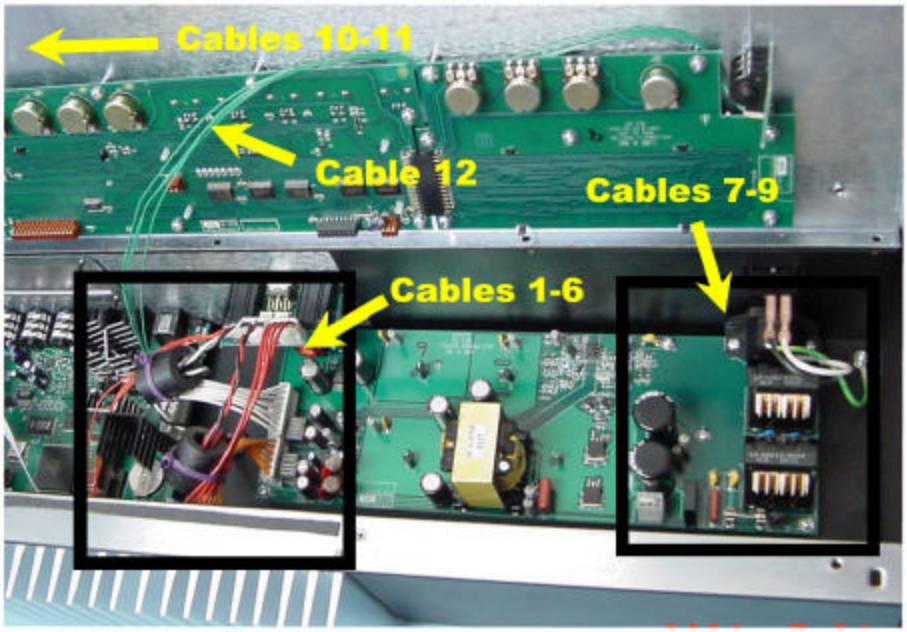


Refer to this graphic throughout the following section for aid in locating the parts discussed.

ITEM	QTY	LINE6 PART NO	DESCRIPTION
1	1	30-51-0042	CHASSIS COVER
2	1	30-42-0011	OVERLAY, COVER
3	1	N/A (SEE PREVIOUS SECTIONS)	PCB ASSY WITH KEYPAD ASSY
4	1	N/A (SEE PREVIOUS SECTION)	PCB ASSY WITH SUB ASSY
7	1	30-27-0031	BEZEL, LEFT
8	1	30-27-0034	BEZEL, MAIN
9	1	30-27-0032	LENS, LARGE BEZEL
10	1	30-27-0033	LENS, BEZEL, LEFT
11	2	N/A [INCL ASSY]	NUT, FINISHING - 1/4 JACK
12	2	N/A [INCL ASSY]	WASHER, 1/4" JACK
13	7	30-27-0042	SHOULDER WASHER, ENCODER
14	2	30-27-0027	KNOB, ENCODER LG.
15	10	30-45-2000	KNOB, POT LG.
16	5	30-27-0025	KNOB, SMALL POT
17	2	30-15-0004	WASHER, SPACER
18	16	30-00-0607	PAN HEAD PHILLIPS SCREW
19	1	50-00-0099	PCB ASSY, GUITAR INPUT
20	1	50-00-0103	PCB ASSY, HEADPHONES
21	4 FT	30-63-0001	FOAM STRIPPING

Cable Assemblies

a) Connect the Cable Assemblies



The adjacent picture should help in locating the cables discussed throughout this section.

There are annotated graphics corresponding to each of the four indicated areas.

Refer to the table below for an index of each cable.

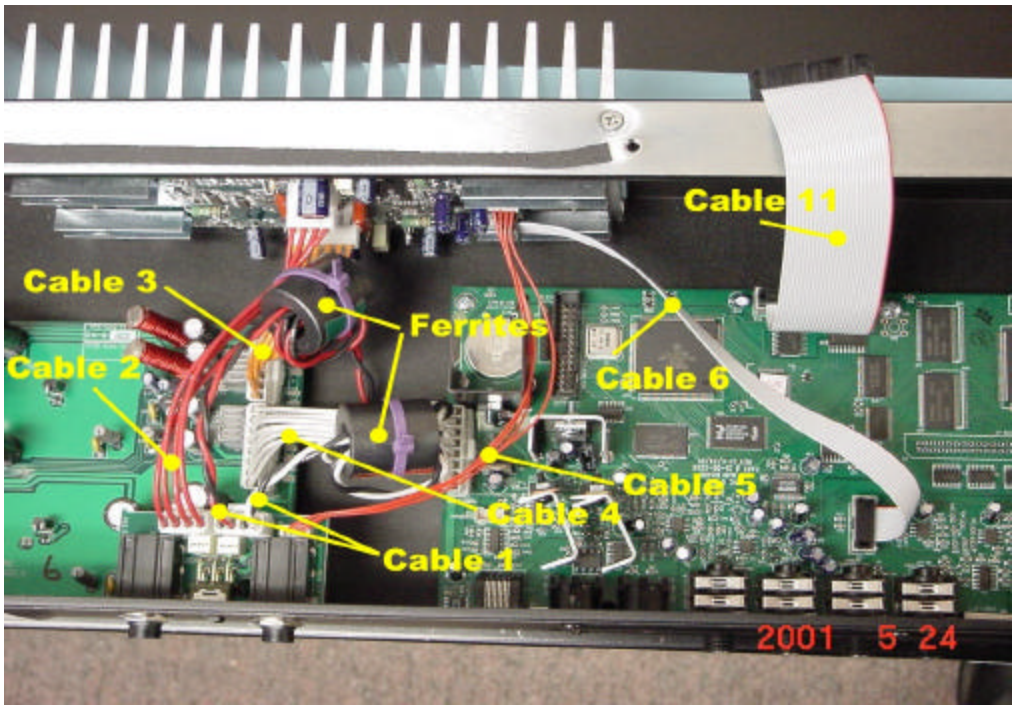
Due to the very repetitive nature of this section, it will be very short on text. Keep the following things in mind while connecting the cable assemblies:

- Connect all cable assemblies securely.
- Connectors should be fully engaged with Header shrouds.
- There are (4) headers that will not have cables connected to them. These are shown in the graphics below. (2) are related to the digital expansion option and (2) are related to programming connectors. All other headers should have cables connected to them.

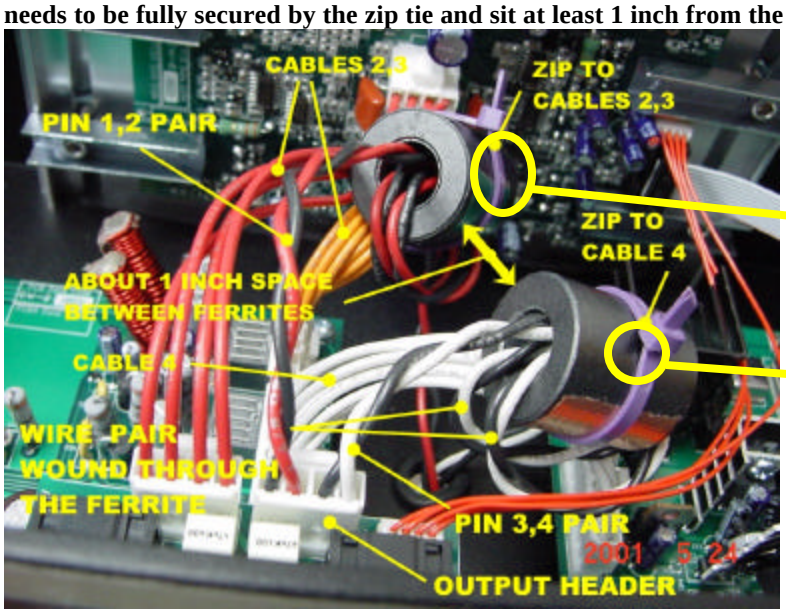
Vetta CABLE TABLE

No.	Line6PartNo	Description	PCB Position*	No. of Pins	Wire color
1	21-34-0020	Output (j3) – speakers	J3 - speakers	4	variable
2	21-34-0008-1	Pwr amp(p2) – output (j1)	P2 – J1	4	Red
3	21-34-0021-1	Pwr supply (j6) – pwr amp	J6 - P2	6	Orange
4	21-34-0014-1	Pwr supply – main board	LB – J49	8	White
5	21-34-0007-1	Pwr amp – output	P4 – H4	4	Red
6	21-30-0009	Main – pwr amp	H12-P1	10	Grey
7	21-34-0009	Main power switch	J1-Switch	2	Black/white
8	21-34-1116	Earthing	AC -Ground	1	Green
9	21-34-0006	Voltage jumper	J5	2	White
10	21-34-0015	Guitar input	J26-Guitar	5	White
11	21-30-0026	User interface Rt – main	H9-H12	26	Grey
12	21-34-0019	Headphones	H3-H2	4	Green
-	40-25-0015	Label, grounding	-	-	Green with yellow stripe

*** Refers to lettered position on PCBs.**

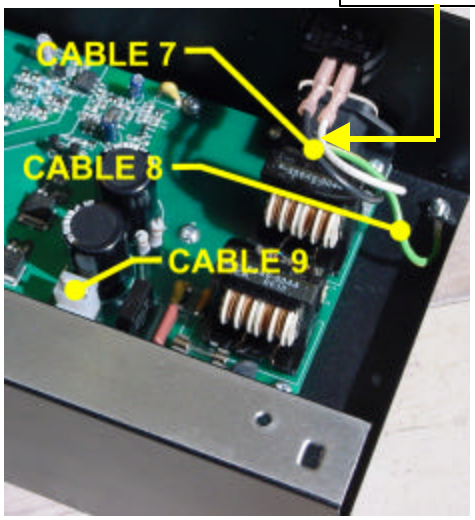


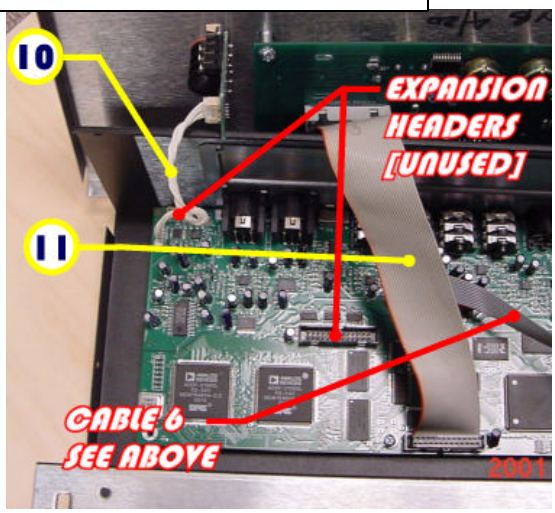
Note on Cable 1: Speaker Cables. Wind the wires from pin 1 and pin 2 to form one pair, and wires from pin 3 and pin 4 to form a second pair (see figure above). Then each cable pair needs to be wrapped through a ferrite (11-10-0003, see figure below). Coil the cable twice through the ferrite, leaving about 3 inches of length between the 4-pin connector and the ferrite, then feed the rest of the output cable through the output hole at the base of the chassis. Secure the ferrite wound wire pairs to adjacent cables as described in the figure below. Wire pair 3,4 is secured to the Cable 4 (shown above), wire pair 1,2 is secured about both cables 2 and cable 3. Pull the zip tie(30-24-0850) to firmly secure the ferrite/wire assembly. **The ferrite needs to be fully secured by the zip tie and sit at least 1 inch from the second ferrite**.



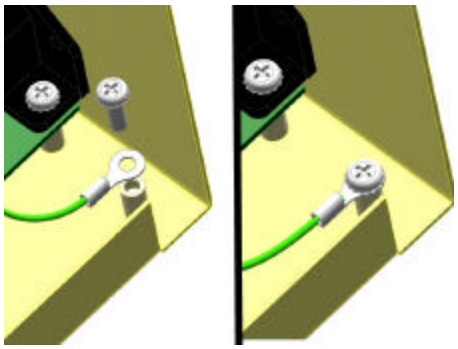
Stabilize zip ties (30-24-0850)onto both ferrites using silicone glue applied at these points. Get good contact between zip tie/ferrite and cable

Add zip tie #30-24-0003 at this point.



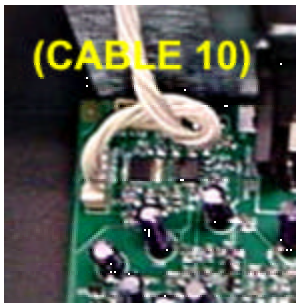


Note on Cable 7: Power Supply Connectors. Be sure to connect the black wire to the negative terminal of the switch and the white wire to the positive terminal. Add zip tie #30-24-0003 where shown above.



Note on Cable 8: Ensure that the cable has been securely attached to the nub on the back of the AC receptacle, place the ground cable over the PEM standoff in the sub-chassis, and firmly tighten the #6 captive star machine screw (30-00-0607)

Attach grounding label (40-25-0015) to chassis surface here.



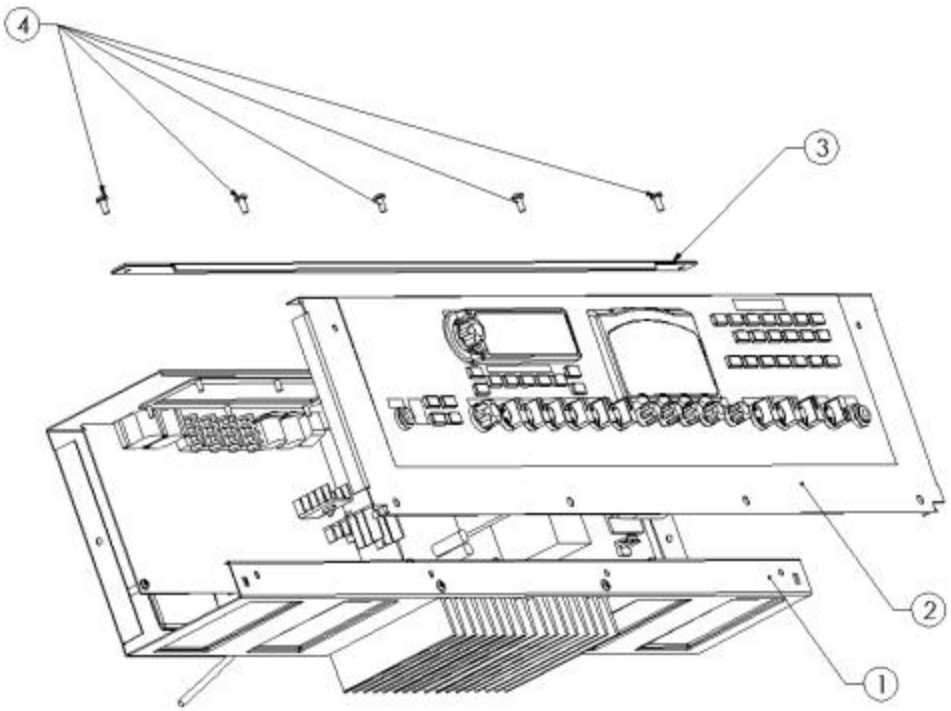
Note on Cable10: Twist this cable before connecting as shown in the figure here.

b) Set the voltage jumpers

The correct voltage jumper configuration is as follows:

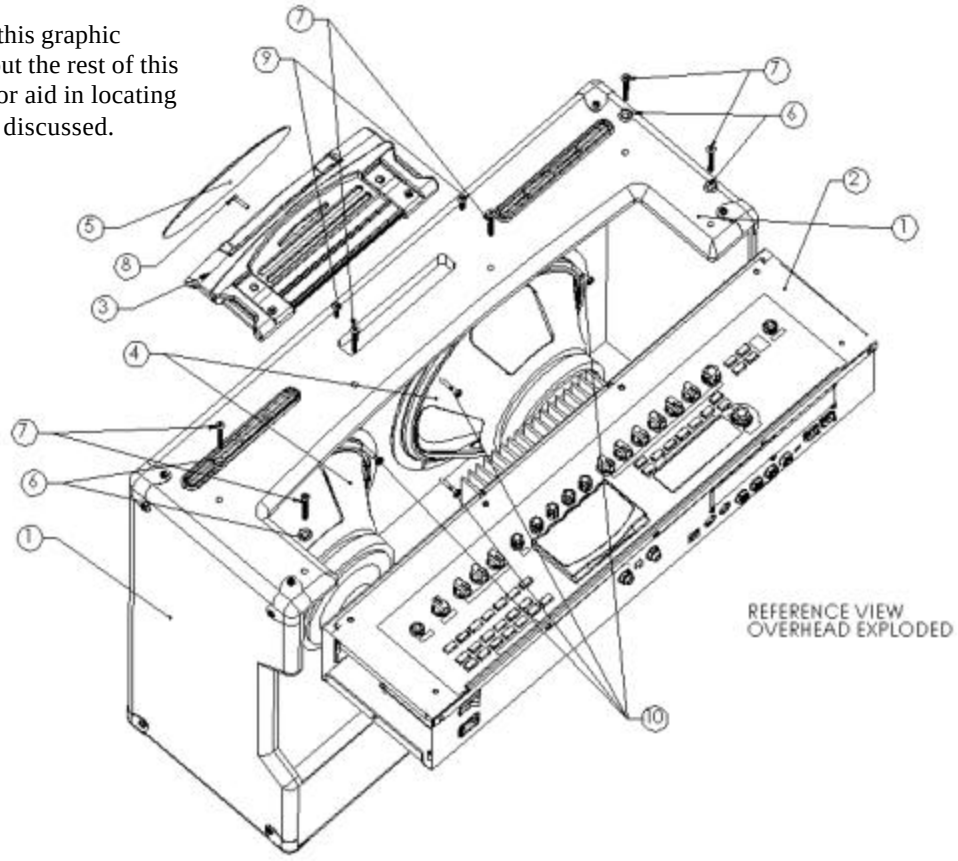
Voltage:	Jumper	Fuse:
100 – 120	On (in the assembly)	6 amp (24-19-6325)
220-240	Off (removed from assembly)	3.15 amp (24-19-3152)

Refer to this graphic throughout this section for aid in locating the parts discussed.



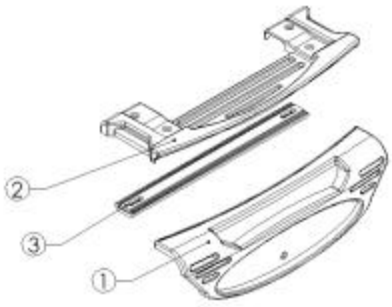
ITEM	QTY	LINE6 PART NO	DESCRIPTION
1	1	N/A (SEE EARLIER SECTION)	CHASSIS ASSY
2	1	N/A (SEE EARLIER SECTION)	CHASSIS COVER ASSY
3	1	30-51-0041	EDGE TRIM
4	5	30-00-0006	BUTTON HEAD SOCKET CAP

Refer to this graphic throughout the rest of this section for aid in locating the parts discussed.



ITEM	QTY	LINE6 PART NO	DESCRIPTION
1	1	N/A (SEE EARLIER SECTION)	CABINET ASSY
2	1	N/A (SEE EARLIER SECTION)	CHASSIS/COVER ASSY
3	1	N/A (SEE EARLIER SECTION)	HANDLE BRACKET ASSY
4	2	11-20-1212	SPEAKERS, CELESTION 100
5	1	30-60-0002	LOGO, OVAL HANDLE BRCKT
6	4	30-03-0110	WASHER, FINISHING, #10
7	6	30-00-0020	SCREW, OVAL HEAD PHILLIPS, 10-32 1.75,NICKEL
8	1	30-00-0019	#6 FLAT HEAD PHILIPS SCREW
9	2	30-00-0008	SCREW, OVAL HEAD PHILLIPS, 10-12, .75
10	8	30-00-0015	TRUSS HEAD PHILLIPS SCREW

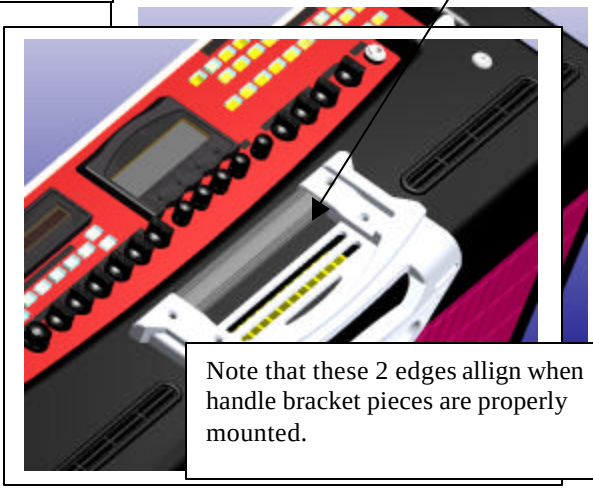
c) Assemble the Handle Bracket



The handle bracket is essentially a collection of (3) separate pieces ; the top, the front, and the handle strap. These pieces do not lock directly together, but are secured to the chassis with screws.

ITEM	QTY	LINE6 PART NO	REV	DESCRIPTION
1	1	30-51-0075	B	BRACKET, HANDLE, FRONT
2	1	30-51-0074	B	BRACKET, HANDLE, TOP
3	1	30-57-0580	X0	HANDLE STRAP

Note orientation of handle strap with groves on top



Note that these 2 edges allign when handle bracket pieces are properly mounted.

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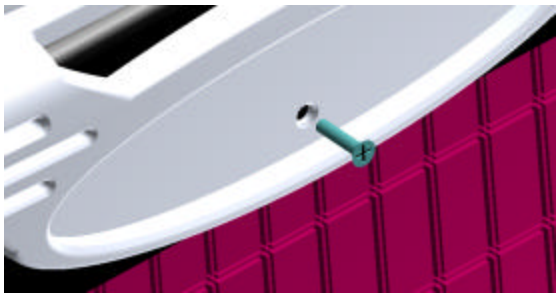
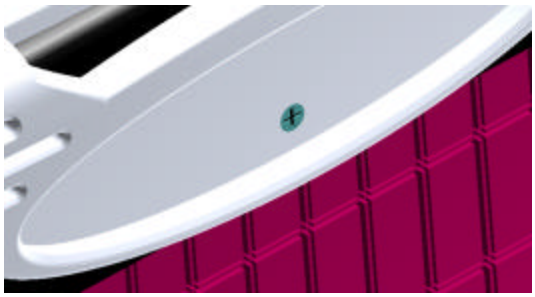
The handle strap will neatly fit into recesses in the back of the top bracket. Place the top bracket over the handle strap. Mate the groove in the top bracket with the ridge on the front bracket. Make sure that there is no gap or misalignment between these pieces. When the assembly is properly situated on the chassis, fasten it down with the remaining (2) oval head screws (30-00-0008) from the previous step. These screws will thread though the cabinet and into the chassis, securing the entire assembly together.

These screws should be tightened to 8 in-lbs.

d) Attach the Logo Screw

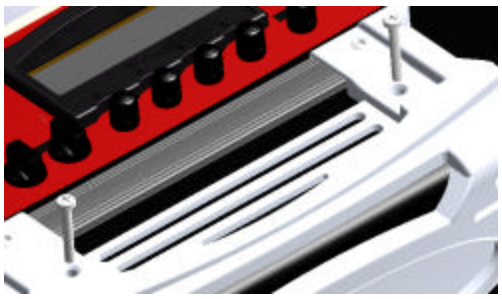
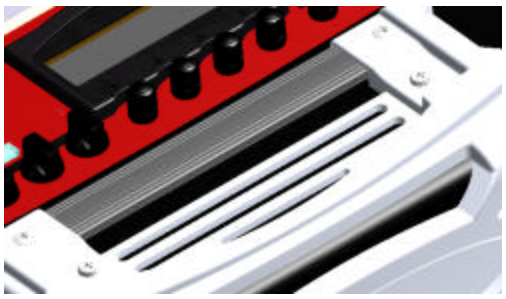
After the handle bracket assembly is secured to the product, fix the front plate with the self-tapping #6 flat head screw (30-00-0019). Ensure that the assembly's front panel and the top panel are properly mated and aligned before tightening this screw.

These screws should be tightened to 6 in-lbs.

e) Attach the Bracket Tightening Screws

The last (2) screws added to the handle bracket go through the top bracket. They are (2) #10 x .75" self-tapping oval head wood screws (30-00-0008).

These screws should be tightened to 8 in-lbs.

Engineering

Vetta and FBX Service Hints

If the PS_VALID line is inadvertently short-circuited, D15 on the power supply will almost certainly fail. This will keep the audio from appearing on the Direct Outputs, and possibly on the speaker outputs.

If the main FETs (Q3 & Q15) on the power supply are shorted, a series of components will most likely fail. Replace R21, R7, R55, R49, R12, R11, R15, D4, Q3, Q15, Q11, Q2, and U2.

If unit locks up intermittently and or settings aren't remembered after power cycle, check SRAM battery to ensure voltage isn't significantly below 3V. Replace the battery if it is below 2.7V and check the SRAM current consumption by measuring less than 100mV across R185.

If 7 segment numeric display behaves erratically, check to ensure proper insulation between pins and chassis on header connecting numeric display PCB to U.I. PCB.

If displays show garbled information or none at all, check to ensure proper seating of ribbon cable from main board to U.I. board. Note: obvious but common.

Be extremely cautious when removing knobs for the three global controls. The shafts on these pots will pull out easily. The suggested method is to hold the shaft of the pot from the inside of the chassis with pliers while pulling the knob off. If the shaft breaks, the pot CAN be replaced without removing the entire U.I. board. The method is to first cut the pins of the pot, remove it and then de-solder and remove the pins remaining in the board.

If the power supply must be removed from the unit, it is not necessary to remove the speaker output PCB. There is a hole in this board, which allows for accessing the power amp screw below. A magnetic screwdriver is handy to put the screw back in.

Be very careful while working on the power supply PCB. The PCB section between the AC receptacle and the transformer has high voltages.

Notice that the power connectors have a lever, which must be pressed to unplug them. Also while pulling or pushing on these connector, try to support the PCB with the other hand to avoid excessive stress.

Both power connectors on the speaker output board are 4 pin wide. The PCB screening shows which one plug where.

If the DC bias voltage at the input pin 25, 24, 4, or 5 of the guitar input ADC U19 is significantly off from its nominal value of 2.5V (less than 1.8V or more than 3.2V), the part is probably bad. The same is true for Pin 22,23, 20 or 21 of the DAC U20 and U21, and for pin 17,16,20,19,23,24,26, or 25 of the CODEC U16.

When troubleshooting the amp PCB by itself, you can power just the +/-15V rails and check almost the entire audio path. Once that is checked then bring up the main rails and check to see if the proper bias rails are all correct. This process allows for easier troubleshooting before applying the high voltage rails.

If the software locks up when changing amp models, either the battery is not working or dead, or the Model Defaults are bad. Model Defaults are loaded via MIDI SysEx from the Save pages, and can be loaded from a working amp or from a MIDI SysEx computer program.

Vetta Self Test Procedure

These tests should be used to confirm a customer complaint or as a final test at the completion of a repair. Failure of any of these tests may indicate a problem within that section's underlying circuit and not just a failure of the surface component. In these cases, further troubleshooting in the failing circuit should be performed.

1. Hold down **Reverb** Button while powering the unit up.
   Small LCD will display "**1 SRAM Test**"
   Large right LCD will display 4 lines of text:
   "**Press TREMOLO to decrement test" (**press to step down through different tests.)
   "**Press "GATE" to increment test** (press to step up through different tests)
   "**Press COMPRESS to execute test"** (press to start an individual test)
   "Press REVERB to exit" (press to exit an individual test)
   Press **COMP** to start 1st test. When first test is complete, the right display will read out either pass or fail. Press **GATE** to advance to test #2.

2.**Switch test #2**
   Press **COMP** to start test
   Press each of the 33 buttons, the large right LCD should display **DOWN** when each button is pressed and **UP** when the button is released.
   Press both the **Preset** and **User** buttons to exit Test 2.
   Press the **Gate** button once to advance to Test #3.

3.**LED Test #3**
   Press the **COMP** button to start test.
   All 33 button LEDs should light
   All segments on the small LED board ("888") should light
   All 4 small LEDs below the large right LCD should light
   Each individual LED should light sequentially.
   Press **GATE** once to advance to Test #4.

4.**Character LCD Test #4**
   Press **COMP** button to start test

All 16 blocks on the small left LCD should fill.
Press **GATE** once to advance to Test #5.

5. **Graphic LCD Test #5**

Press **COMP** button to start test.
The large right LCD should fill and then clear.
A vertical line will run from right to left on the right LCD.
Then a horizontal line will run from bottom to top.
Press **GATE** to advance to test #6

6.**Encoder Test #6**

Press the **COMP** button to start test
Rotate all 7 black encoder knobs. The large right LCD should display changing numbers as each of the encoders is turned.
Press **REVERB** to exit test.
Press **GATE** button to advance to test #7.

7. **POTS test #7**

Press the **COMP** button to start test.
Rotate all 10 silver pots. The large right LCD should display 000 when pot is fully to the left and 127 when fully to the right.
Press **REVERB** to exit test.
Press **GATE** to advance to test #8

8. **MIDI Test**

A midi cable must be connected from the Midi In port to the Midi Out port for this test.
After midi cable is in, press **COMP** to begin Midi Test.
Large right LCD will display test results (pass or fail/error)
Press **REVERB** to exit test.
Press **GATE** to advance to test #9

9. **FB Test**

This test requires a special RJ45 loopback connector. If you do not have this connector, simply press **GATE** to advance to next test.
With the loopback connector connected, hit the **COMP** to begin test.
Large right LCD will display test results (Pass or fail/error)
Press **REVERB** to exit test.
Press **GATE** to advance to next test.

10. & 11. Currently these are empty tests. Press **GATE** to advance past these tests.

12.**InitDefaults?**

This is not an actual test routine but is used for resetting amp model and effects parameter defaults back to what was originally loaded in via flash. This is useful if a user has customized one or more of his or her amp models or effects and decides he or she wants to go back to the defaults loaded during the last flash update. Please note: this does not affect the presets, just the amp and effect default settings.
Press **COMP** to execute the initialization or **GATE** to skip ahead.

13.**UploadCode?**

Again not a test but a way to off-load the current operating system from the Vetta to a Midi data filer, computer or another Vetta via Midi. Press **COMP** to begin uploading or **GATE** to skip ahead.

14.**Upload Factory?**

This will off-load the factory presets loaded in the Vetta to a Midi data filer, computer or another Vetta via Midi.
Press **COMP** to begin uploading the current factory presets or **GATE** to skip ahead.

15.**Rcv Factory?**

This will prepare Vetta to receive a Midi SysEx data dump of a factory preset bank from a Midi data filer, computer or other Vetta. Press **COMP** to prepare the Vetta to receive a factory preset midi dump or **GATE** to skip ahead. **NOTE:** After **COMPRESS** is pressed, the Vetta will erase it's factory and user presets as well as the internal back up memory before it will receive the new file.

16.**Burn in LEDs?**

This will turn on all LED's until the **REVERB** button is pressed to exit. To begin LED burn-in, press **COMPRESS**.

If you press **COMP,** the Vetta will call Test #1 (SRAM) back up. To exit test mode, press **REVERB.**

Vetta Software Upgrade Procedure

The Vetta's software is upgraded via a Midi SysEx data dump to the Vetta's Flash memory; there is no replaceable EPROM. To perform an upgrade to Vetta, you will need either a Midi data filer or a computer with Midi SysEx software as well as the new software code and a standard Midi cable (or joystick-to-midi cable). New code can also be imported from another Vetta.

Connect the midi cable from the Midi out port of your transmitting device to the Vetta's MIDI In port (If your computer has a soundcard that utilizes the joystick port for midi operations, you will need a Midi-to-joystick cable.) After the midi connections are made and the unit from which you are transmitting the software is ready with the proper code, follow the instructions below.

(**Note: To find the current software version in the Vetta,** press **System Setup** and turn the PAGE knob clockwise to the last page. The right display should read "V e t t a Version 1.0x", denoting the current software version.)

1. Turn Vetta's power button on while holding down **COMP.** The right LCD will display "Software Update…Press **EDIT** to continue. Press **TAP** to cancel"

2.Press **EDIT** to enter software update mode or **TAP** to exit update mode.

3.The right LCD will say "WARNING!! This cannot be undone! Are you sure? Press **SAVE** to continue. Press **TAP** to Cancel". Press **Save** to proceed. The amp will now erase the current operating system software from its memory. **Please note**: if you exit the procedure now and try to use the amp, it will light up but the amp will not function as there is no operating software.

4. After the amp has cleared out the old software, the right display will read "Ready for Software Download". Tell your Midi Data filer, Computer Midi SysEx software or 2nd Vetta to send the new Vetta Operating system software. (To send the software out of the 2nd Vetta, you must go into the self test mode. To do this, power up the 2nd Vetta while holding down it's

REVERB button. Proceed to TEST #13, "Upload Code". Press **COMP** to begin sending the software).

5. After amp has received the new software, the right display will read "Software download complete. Press **SAVE** to run new software"

6. Press **SAVE** and the Vetta will go into play mode.

7. If program load is slow switching from channel to channel, you will need to reset the program memory. Press **SAVE** and scroll to page 10, "RESET FACTORY". Press **SAVE** while on this page to reset the Factory Bank. The right LCD will read "…restoring FACTORY bank…". When this process is complete, scroll to page 11, "RESET USER" and press **SAVE** once again. The right LCD will now read "…restoring USER bank…". Press TAP when the process is complete.

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Vetta's presets (Factory and User) can be reset from the internal back up memory within the amp. To do this, hit the Save button and scroll to the appropriate reset page (Factory or User from back up memory).

You can also install new Factory or User banks via Midi Data dump. To do this, hit the Save button and scroll to the appropriate receive page ("Receive MIDI Factory Bank?" or "Receive MIDI USER Bank?")
It is also possible to receive a Factory bank (Rcv Factory?) from within the test mode. See Self test #16. Please note, when importing a Factory bank in this way, the Factory bank will expand into the User bank as well.

To re-install or upgrade the operating system, please see the section titled "Software Install/Upgrade/Version".