

COLUMBUS

MAIN LOGIC BOARD SCHEMATIC

CURRENT REVISION HISTORY

Schematic: "columbus_evt2v12.sch" Modified By: Ken, Brian, Harold, and Doug

EVT2
DELETED MFM AND SERIAL CONNECTOR
IN FACT, CHANGED ALL CONNECTORS TO MATCH NEW ENCLOSURE SCHEME
UPDATED EMI CHANGES ALL AROUND (ETHERNET, USB, AUDIO)
UPDATE PCB PROBLEMS (ATI POWER, USB FERRITES, ETHERNET JITTER, AUDIO PROBLEMS)
UPDATE PART NUMBERS AND CLEANED UP SCHEMATIC IN GENERAL

Components which need Apple PN:

Components which need Apple PN and to be sent to ECS Library:

Components which need to be sent to ECS Library:

SCHEMATIC AND PCB VERSIONS

Schematic:	"columbus_evt2v12.sch"
PC Board:	AP3024-03
Build:	3/98
Date:	March 19, 1998

Brian Girvin, 4-1447
Ken Gudan, 4-6191
Harold Sontag, 4-6503

GLOBAL NETS

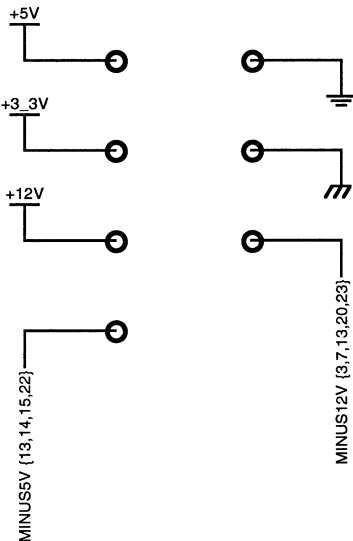
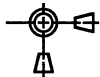


TABLE OF CONTENTS

	Page	Description
Contents	1.	Table of Contents and Current Revision History
CPU	2.	Processor and Memory Module Connector
	3.	Power Connector and Voltage Regulator
In/Out	4.	Paddington I/O Controller ASIC
	5.	10/100BaseTX Ethernet Interface, Transceiver and Port
	6.	Cuda Controller and ADB Port
	7.	Serial Modem and IrDA Ports
	8.	GCR FLOPPY CONNECTOR
	9.	IDE/ATAPI Connectors, and NVRAM
	10.	USB Controller and Port
	11.	USB Power and Soft Power On
Clocks	12.	System, Audio, and PCI Clocks
Audio	13.	Burgundy Audio ASIC
	14.	Audio Input Connectors
	15.	Headphone Output Connectors
	16.	Other Audio Outputs
Graphics	17.	ATI Graphics Controller ASIC
	18.	Graphics Memory and SO-DIMM Connector
	19.	RGB Output and Video Connector
Mezzanine	20.	Mezzanine Connector and PCI Termination
Other	21.	Pullup and Pulldown Resistors
	22.	Test Points
	23.	More Test Points
	24.	HSL Information & Mounting Holes
	25.	Previous Revision History
	26.	Reference Designator Locations

DIMENSIONS ARE EXPRESSED
IN MILLIMETERS
X.X*
X.XX*
X.XXX*
ANGLES*
DO NOT SCALE DRAWINGS



THIRD ANGLE PROJECTION

METRIC

DRAFTER	DESIGN CK
ENG APPD	MFG APPD
QA APPD	DESIGNER
RELEASE	SCALE

MATERIAL/FINISH
NOTED AS
APPLICABLE

SIZE

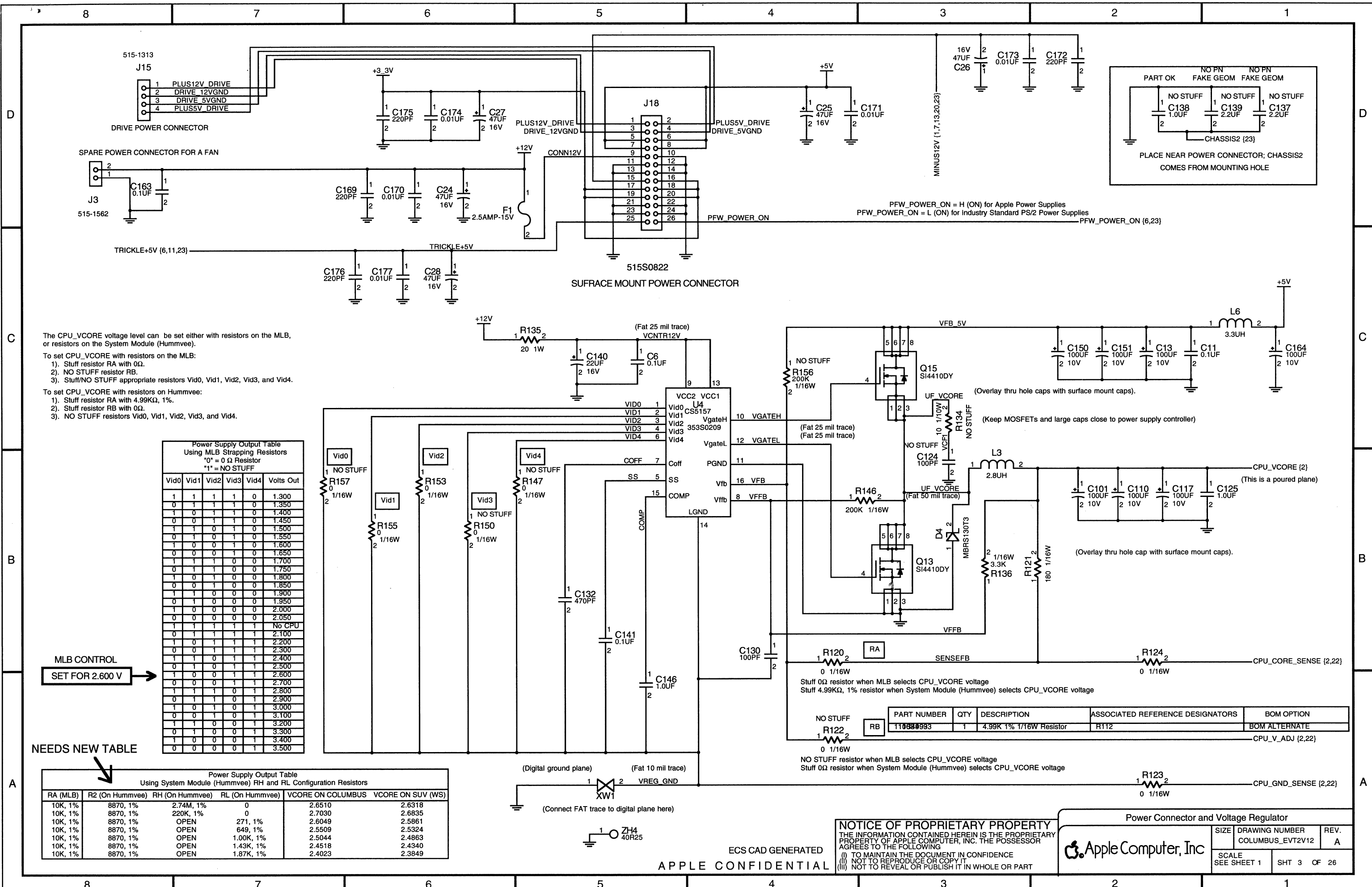
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TITLE
COLUMBUS_EVT2V12

DRAWING NUMBER 051-xxxx REV.
SHT 1 OF 26

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The CPU_VCORE voltage level can be set either with resistors on the MLB, or resistors on the System Module (Hummvee).

To set CPU_VCORE with resistors on the MLB:

- 1). Stuff resistor RA with 0Ω.
- 2). NO STUFF resistor RB.
- 3). Stuff/NO STUFF appropriate resistors Vid0, Vid1, Vid2, Vid3, and Vid4.

To set CPU_VCORE with resistors on Hummvee:

- 1). Stuff resistor RA with 4.99KΩ, 1%.
- 2). Stuff resistor RB with 0Ω.
- 3). NO STUFF resistors Vid0, Vid1, Vid2, Vid3, and Vid4.

Power Supply Output Table Using MLB Strapping Resistors "0" = 0 Ω Resistor "1" = NO STUFF					
Vid0	Vid1	Vid2	Vid3	Vid4	Volts Out
1	1	1	1	0	1.300
0	1	1	1	0	1.350
1	0	1	1	0	1.400
0	0	1	1	0	1.450
1	1	0	1	0	1.500
0	1	0	1	0	1.550
1	0	0	1	0	1.600
0	0	0	1	0	1.650
1	1	1	0	0	1.700
0	1	1	0	0	1.750
1	0	1	0	0	1.800
0	0	1	0	0	1.850
1	1	0	0	0	1.900
0	1	0	0	0	1.950
1	0	0	0	0	2.000
0	0	0	0	0	2.050
1	1	1	1	1	No CPU
0	1	1	1	1	2.100
1	0	1	1	1	2.200
0	0	1	1	1	2.300
1	1	0	1	1	2.400
0	1	0	1	1	2.500
1	0	0	1	1	2.600
0	0	0	1	1	2.700
1	1	1	0	1	2.800
0	1	1	0	1	2.900
1	0	1	0	1	3.000
0	0	1	0	1	3.100
1	1	0	0	1	3.200
0	1	0	0	1	3.300
1	0	0	0	1	3.400
0	0	0	0	1	3.500

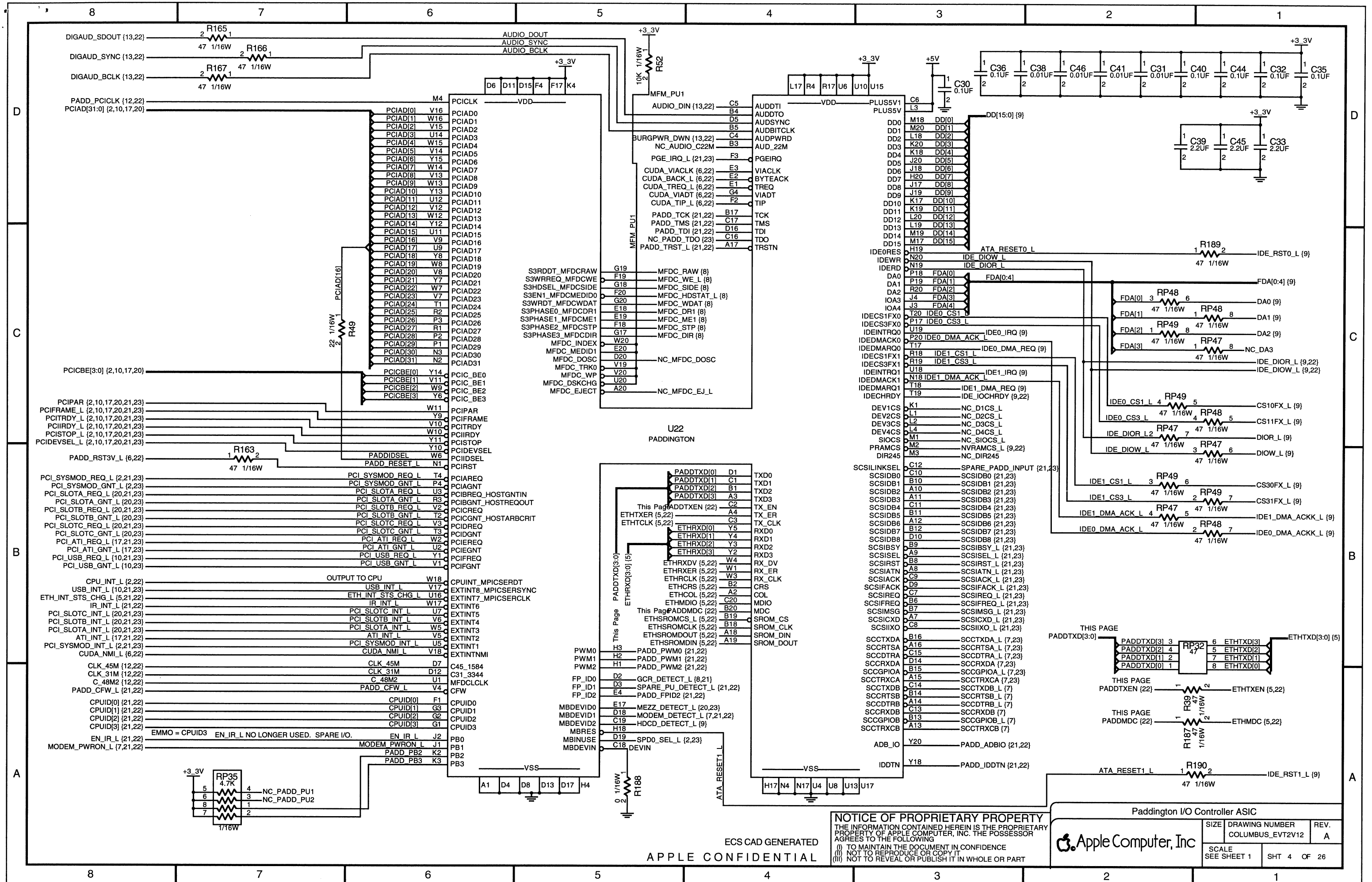
MLB CONTROL
SET FOR 2.600 V

NEEDS NEW TABLE

Power Supply Output Table Using System Module (Hummvee) RH and RL Configuration Resistors					
RA (MLB)	R2 (On Hummvee)	RH (On Hummvee)	RL (On Hummvee)	VCORE ON COLUMBUS	VCORE ON SUV (WS)
10K, 1%	8870, 1%	2.74M, 1%	0	2.6510	2.6318
10K, 1%	8870, 1%	220K, 1%	0	2.7030	2.6835
10K, 1%	8870, 1%	OPEN	271, 1%	2.6049	2.5861
10K, 1%	8870, 1%	OPEN	649, 1%	2.5509	2.5324
10K, 1%	8870, 1%	OPEN	1.00K, 1%	2.5044	2.4863
10K, 1%	8870, 1%	OPEN	1.43K, 1%	2.4518	2.4340
10K, 1%	8870, 1%	OPEN	1.87K, 1%	2.4023	2.3849

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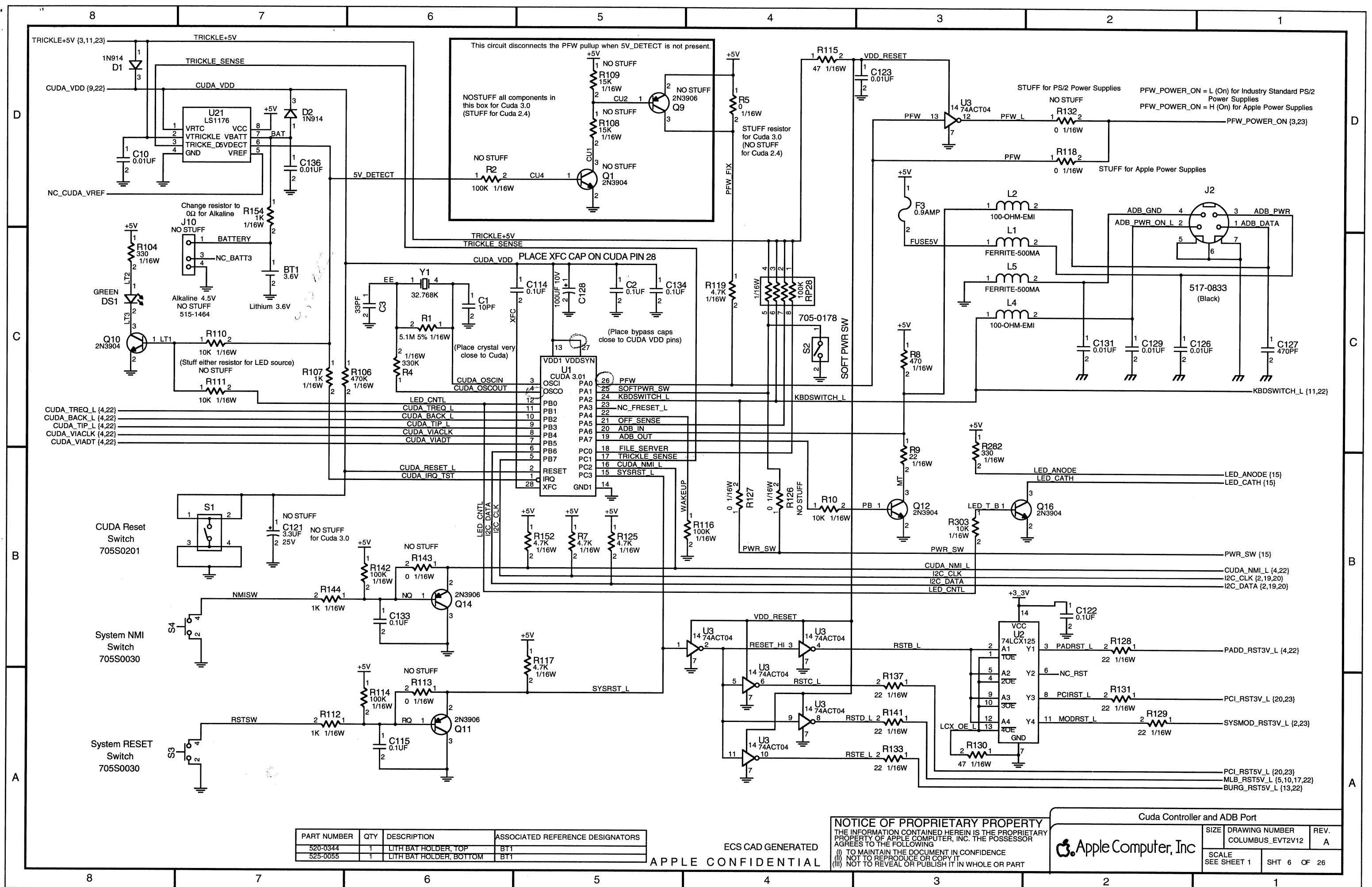
Power Connector and Voltage Regulator			
SIZE	DRAWING NUMBER	REV.	
	COLUMBUS_EVT2V12	A	
SCALE	SHT	OF	
SEE SHEET 1	3	26	



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Paddington I/O Controller ASIC		
SIZE	DRAWING NUMBER	REV.
SCALE	COLUMBUS_EVT2V12	A
SEE SHEET 1	SHT 4 OF 26	



PART NUMBER	QTY	DESCRIPTION	ASSOCIATED REFERENCE DESIGNATORS
520-0344	1	LITH BAT HOLDER, TOP	BT1
525-0055	1	LITH BAT HOLDER, BOTTOM	BT1

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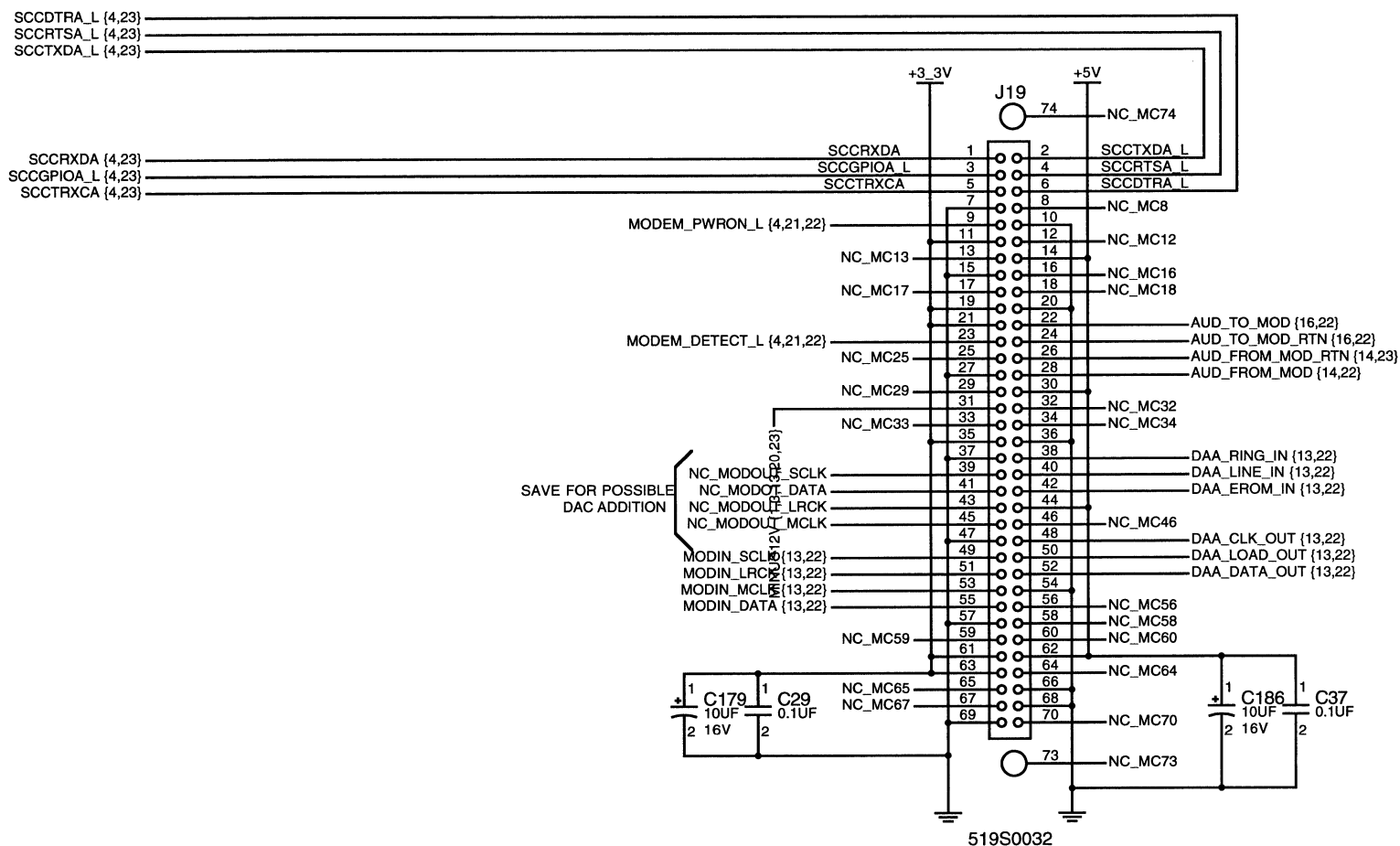
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Cuda Controller and ADB Port

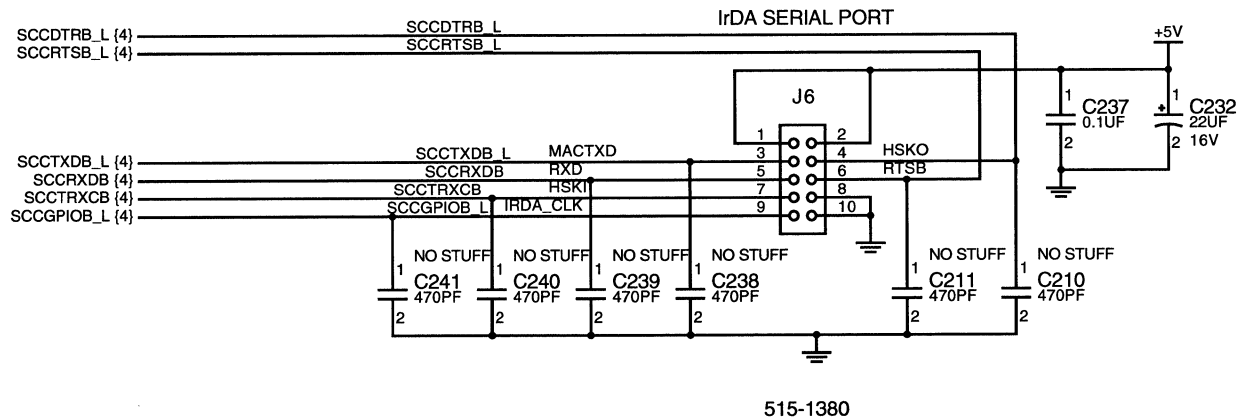
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SIZE	DRAWING NUMBER	REV.
SCALE	COLUMBUS EVT2V12	A
SEE SHEET 1	SHT 6 OF 26	

SERIAL MODEM PORT



SERIAL PRINTER PORT

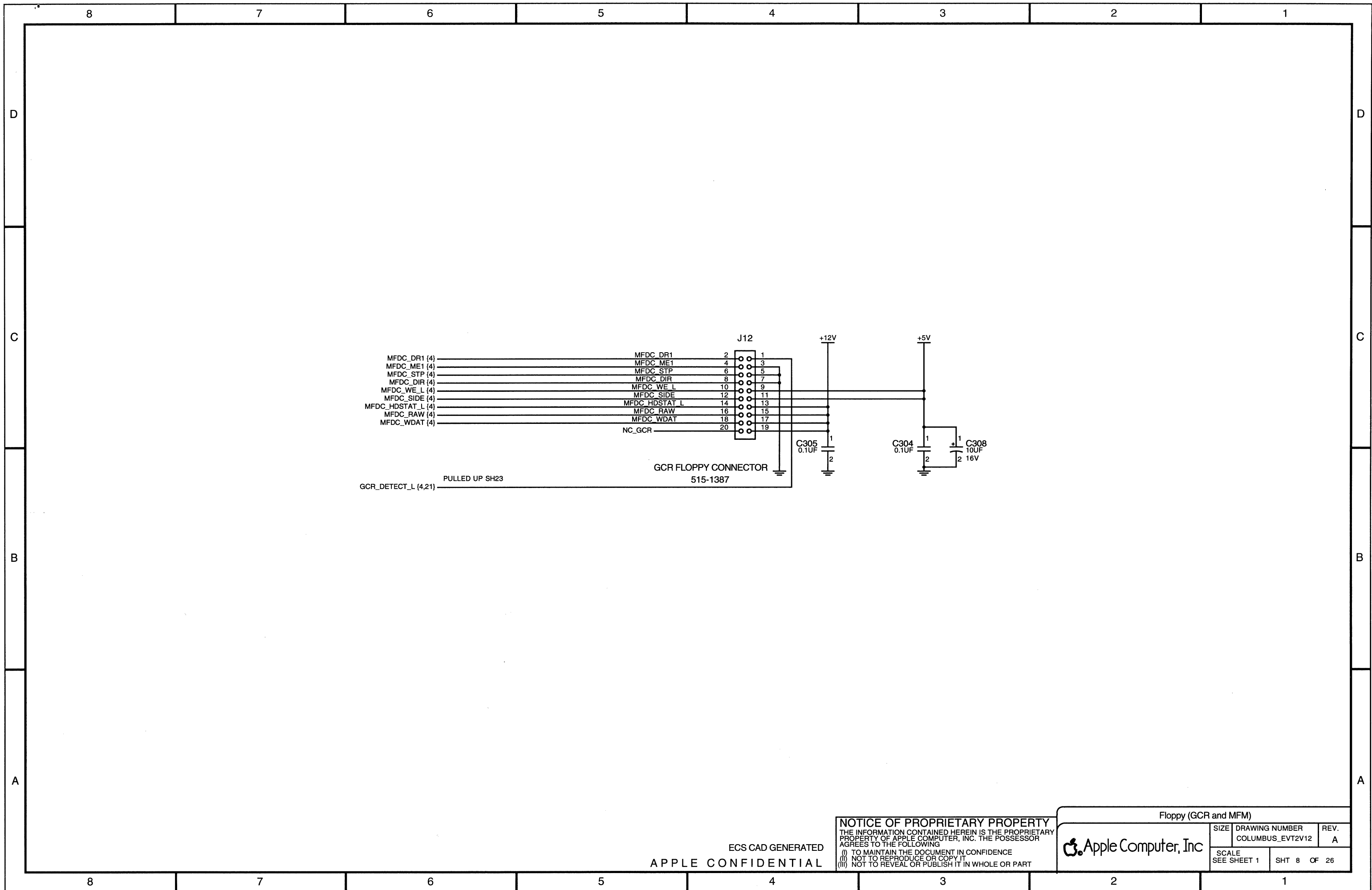


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Serial (Modem, Printer, and IrDA) Transceiver and Ports		
SIZE	DRAWING NUMBER	REV.
	COLUMBUS_EVT2V12	A
SCALE	SHT 7 OF 26	
SEE SHEET 1		

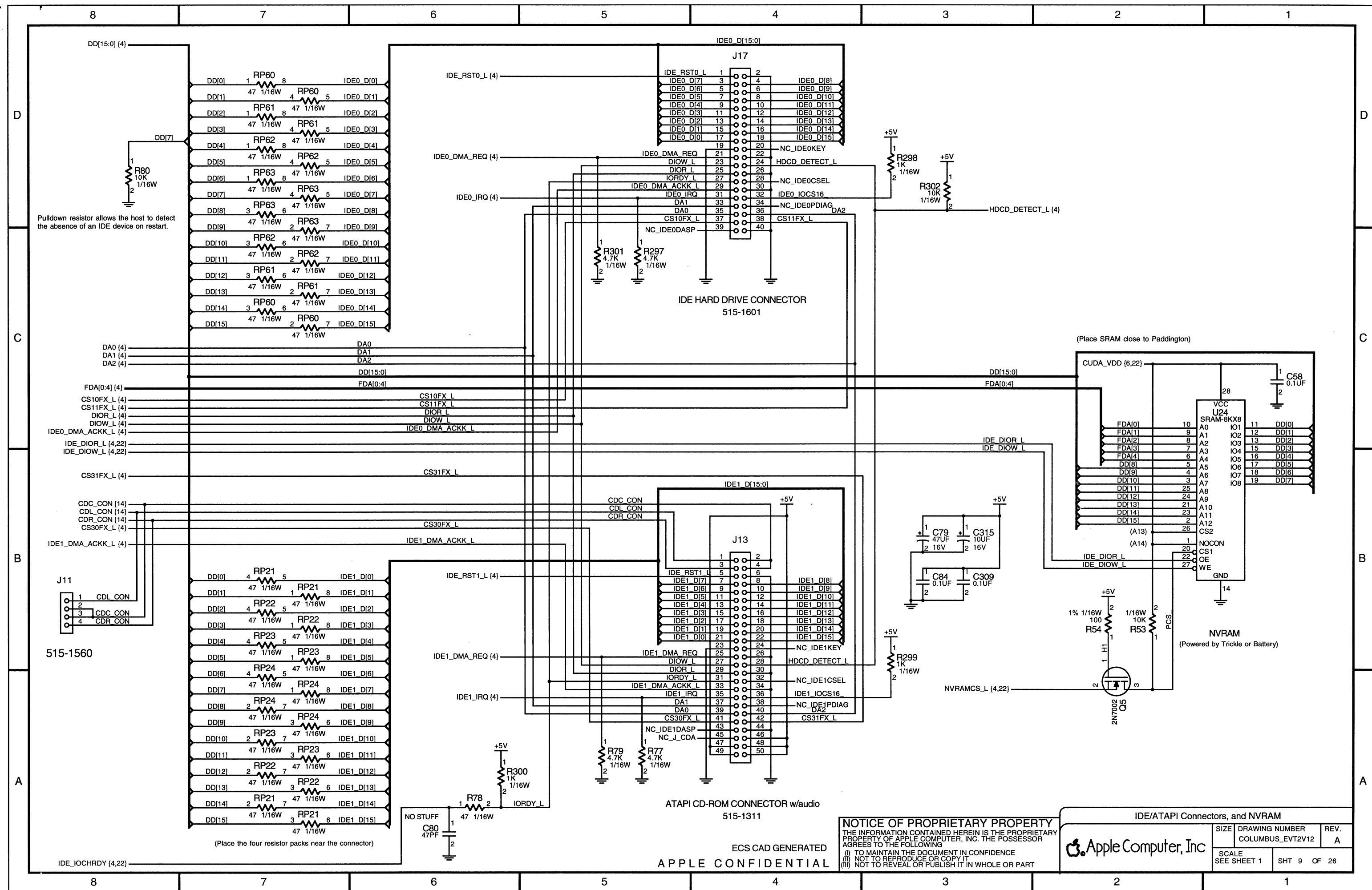


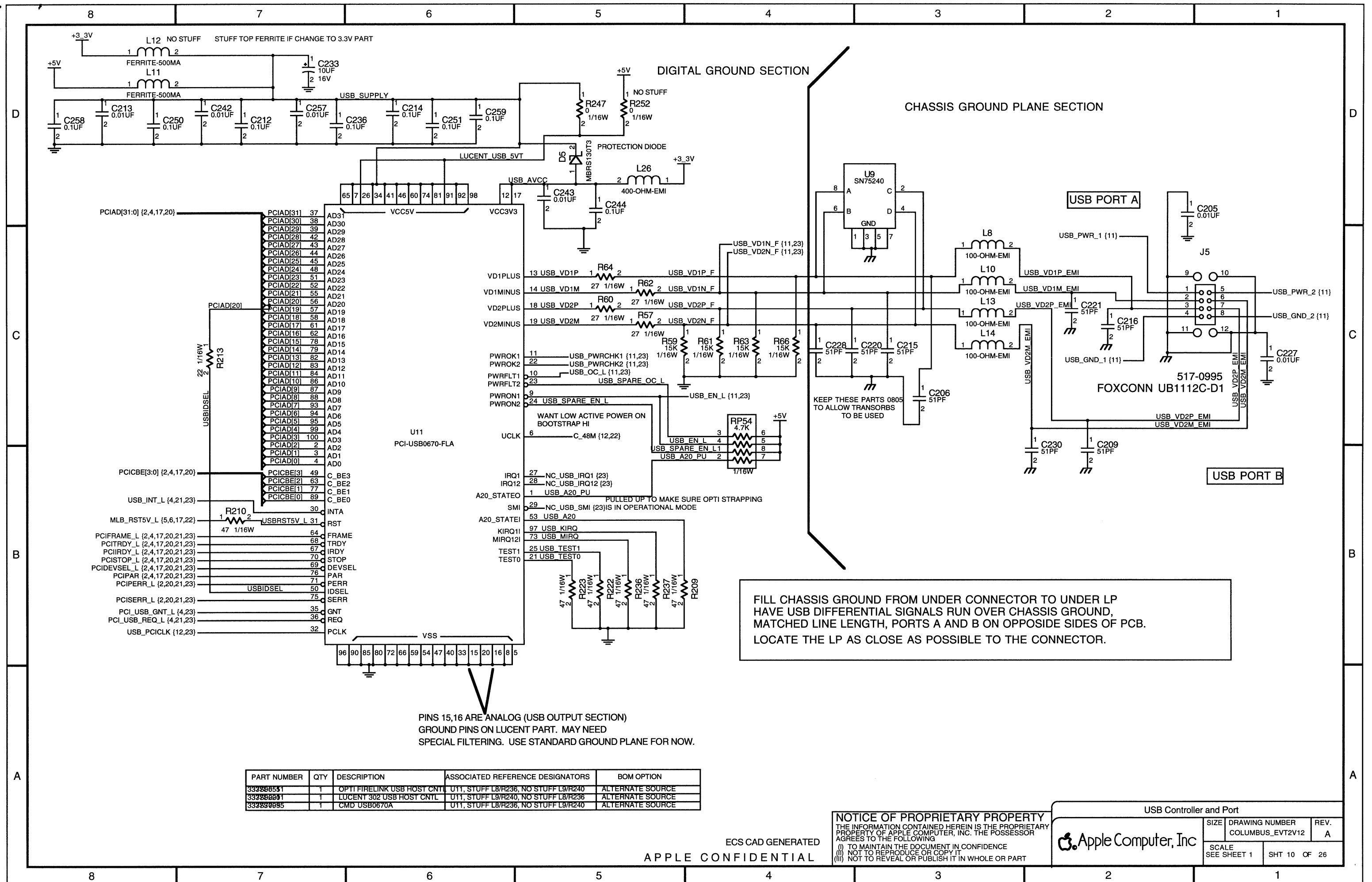


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Floppy (GCR and MFM)		
Apple Computer, Inc	SIZE	DRAWING NUMBER
	COLUMBUS_EVT2V12	REV. A
SCALE		SHT 8 OF 26
SEE SHEET 1		





PART NUMBER	QTY	DESCRIPTION	ASSOCIATED REFERENCE DESIGNATORS	BOM OPTION
33358551	1	OPTI FIRELINK USB HOST CNTL	U11, STUFF L8/R236, NO STUFF L9/R240	ALTERNATE SOURCE
33358551	1	LUCENT 302 USB HOST CNTL	U11, STUFF L9/R240, NO STUFF L8/R236	ALTERNATE SOURCE
33358551	1	CMD USB0670A	U11, STUFF L8/R236, NO STUFF L9/R240	ALTERNATE SOURCE

PINS 15,16 ARE ANALOG (USB OUTPUT SECTION)
GROUND PINS ON LUCENT PART. MAY NEED
SPECIAL FILTERING. USE STANDARD GROUND PLANE FOR NOW.

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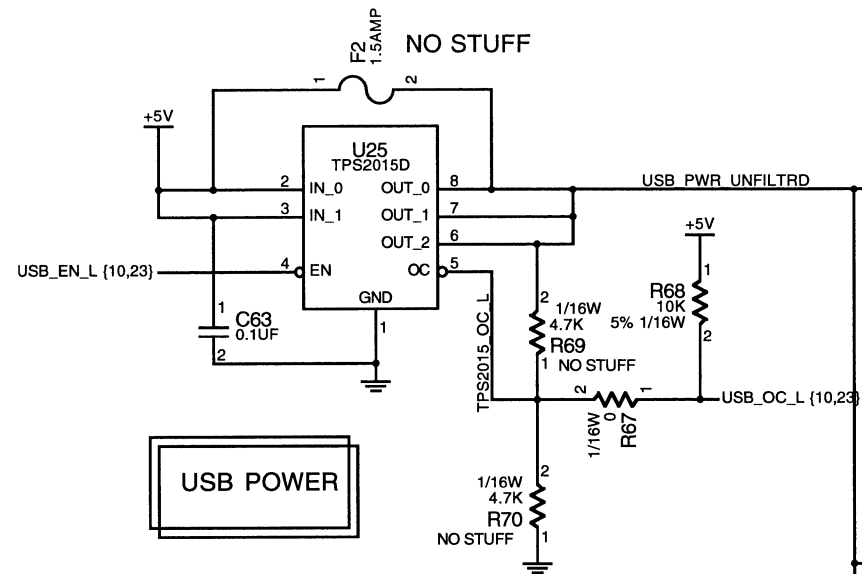
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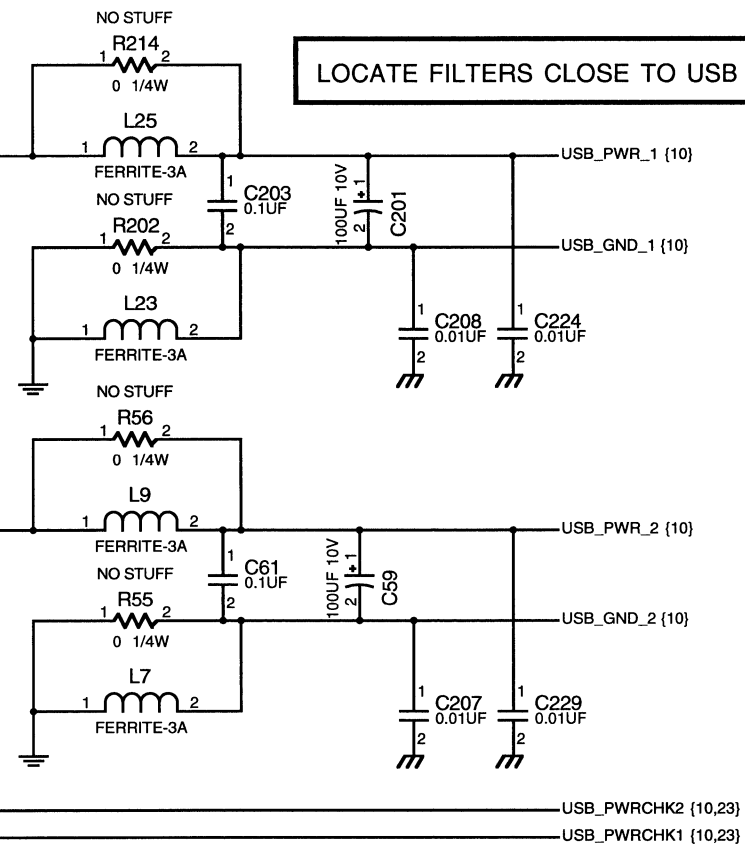
USB Controller and Port

Apple Computer, Inc

SIZE	DRAWING NUMBER	REV.
	COLUMBUS_EVT2V12	A
SCALE	SHT	OF
SEE SHEET 1	10	26

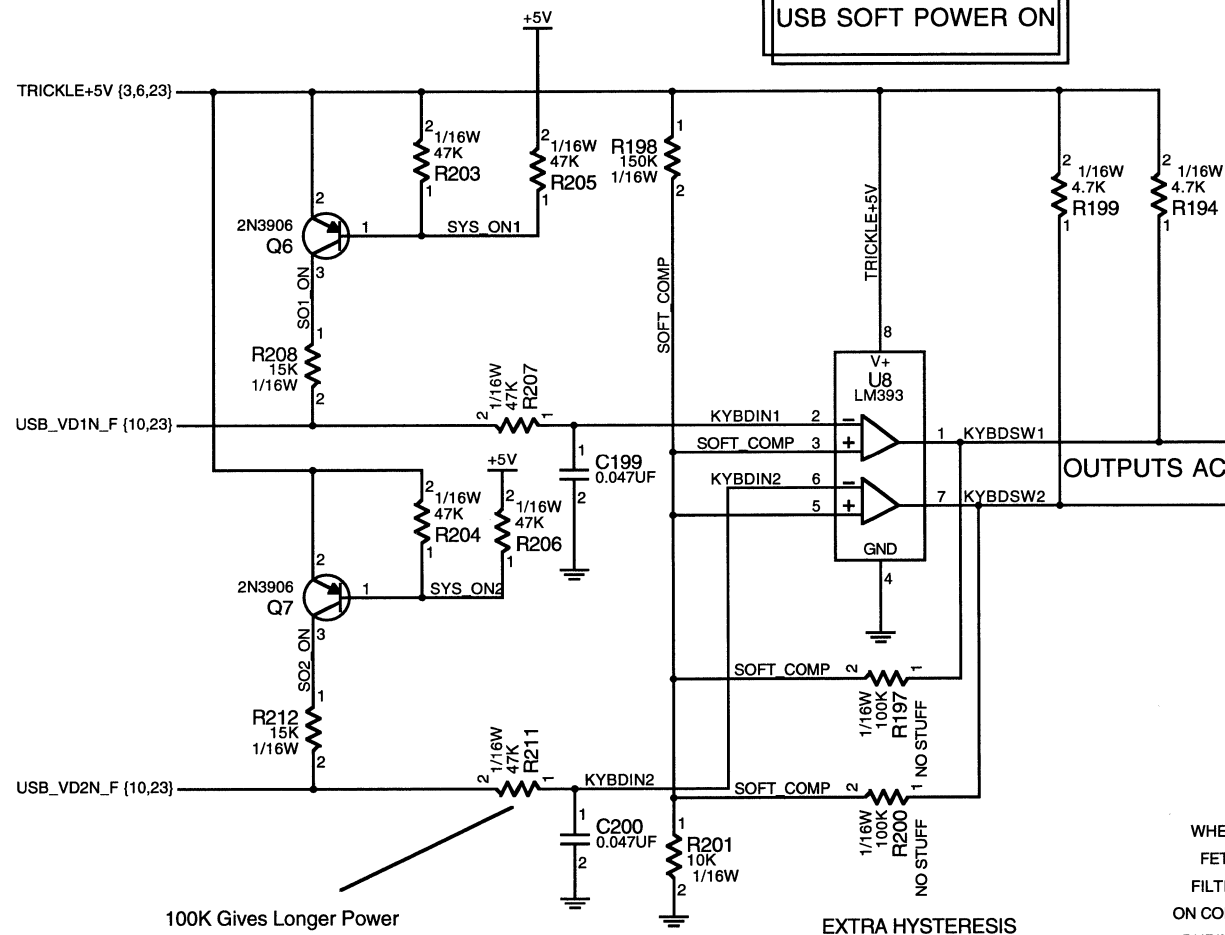


LOCATE FILTERS CLOSE TO USB CONNECTOR



HIGH SPEED USB PULLS UP D+ WITH 1.5KOHM. USE D- FOR THIS CIRCUIT.

USB SOFT POWER ON



WHEN SYSTEM 5V ON
FETS SHORT TO GND
FILTERS NOISE GLITCH
ON COMPARATOR OUTPUT
DURING POWER DOWN

TRANSISTORS ACHIEVE INVERSION OF KYBDSW
SIGNALS, PLUS WIRE-OR TO ADB
KBD SWITCH INPUT

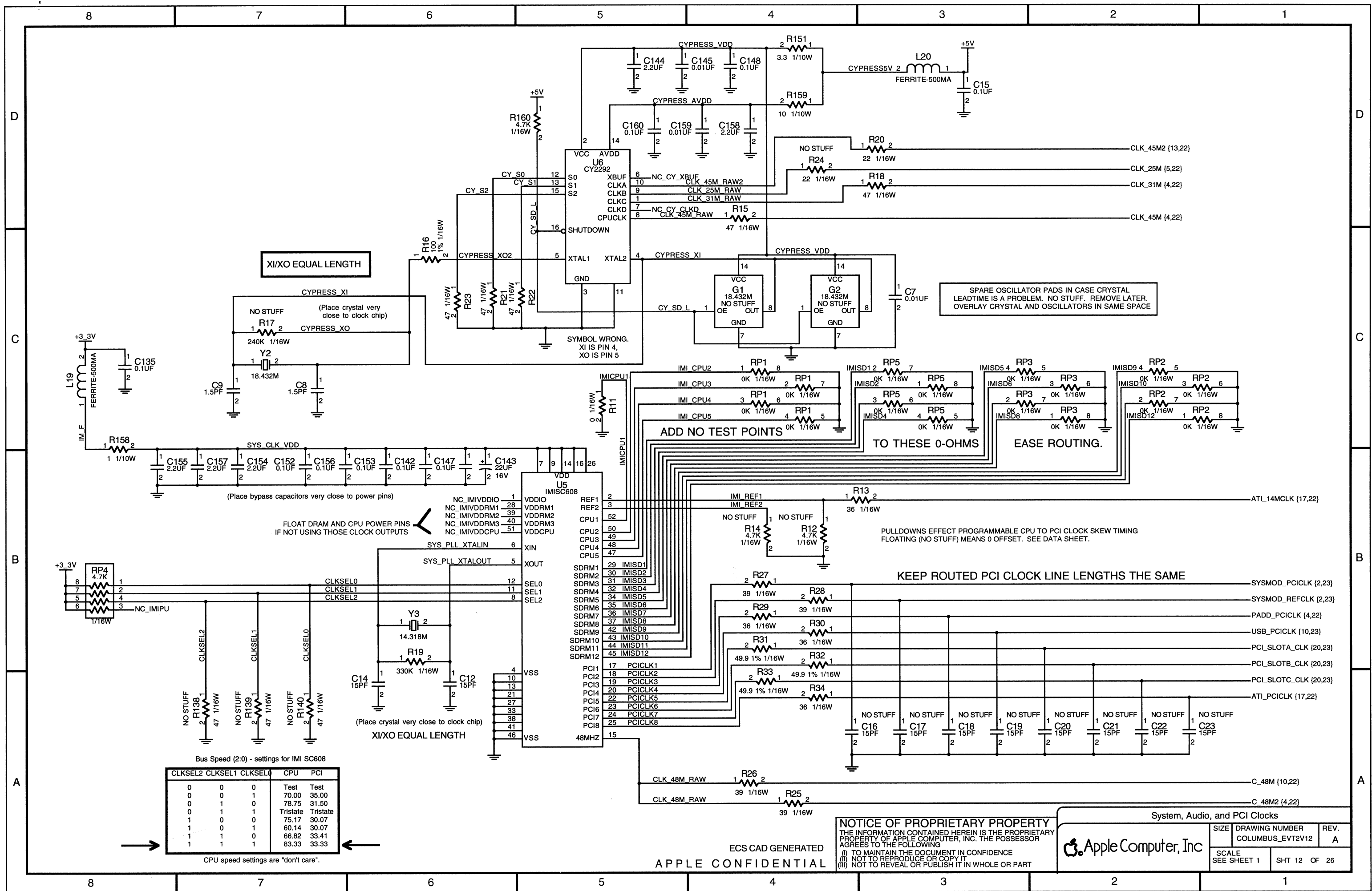
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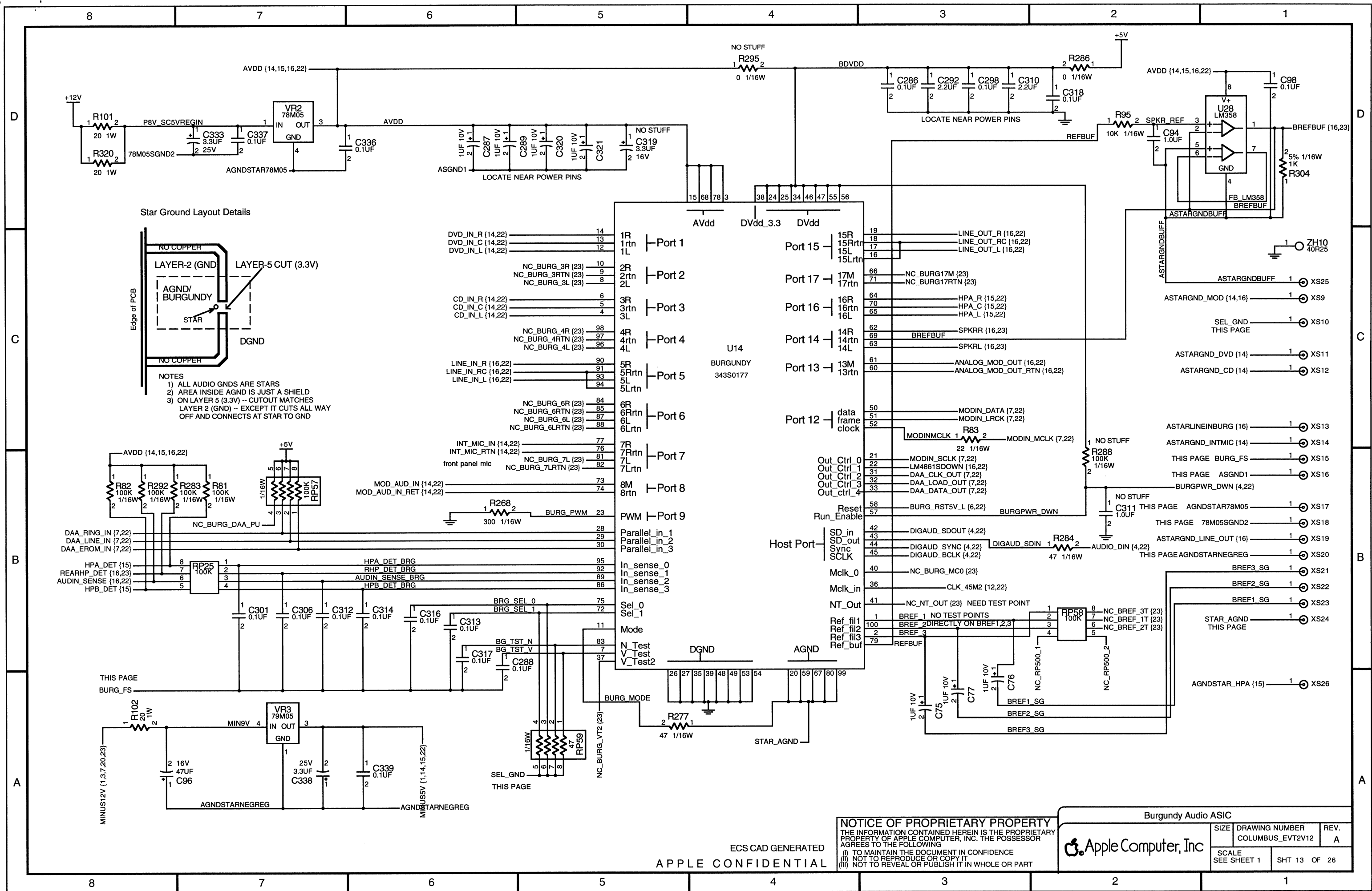
USB Power and Soft Power On

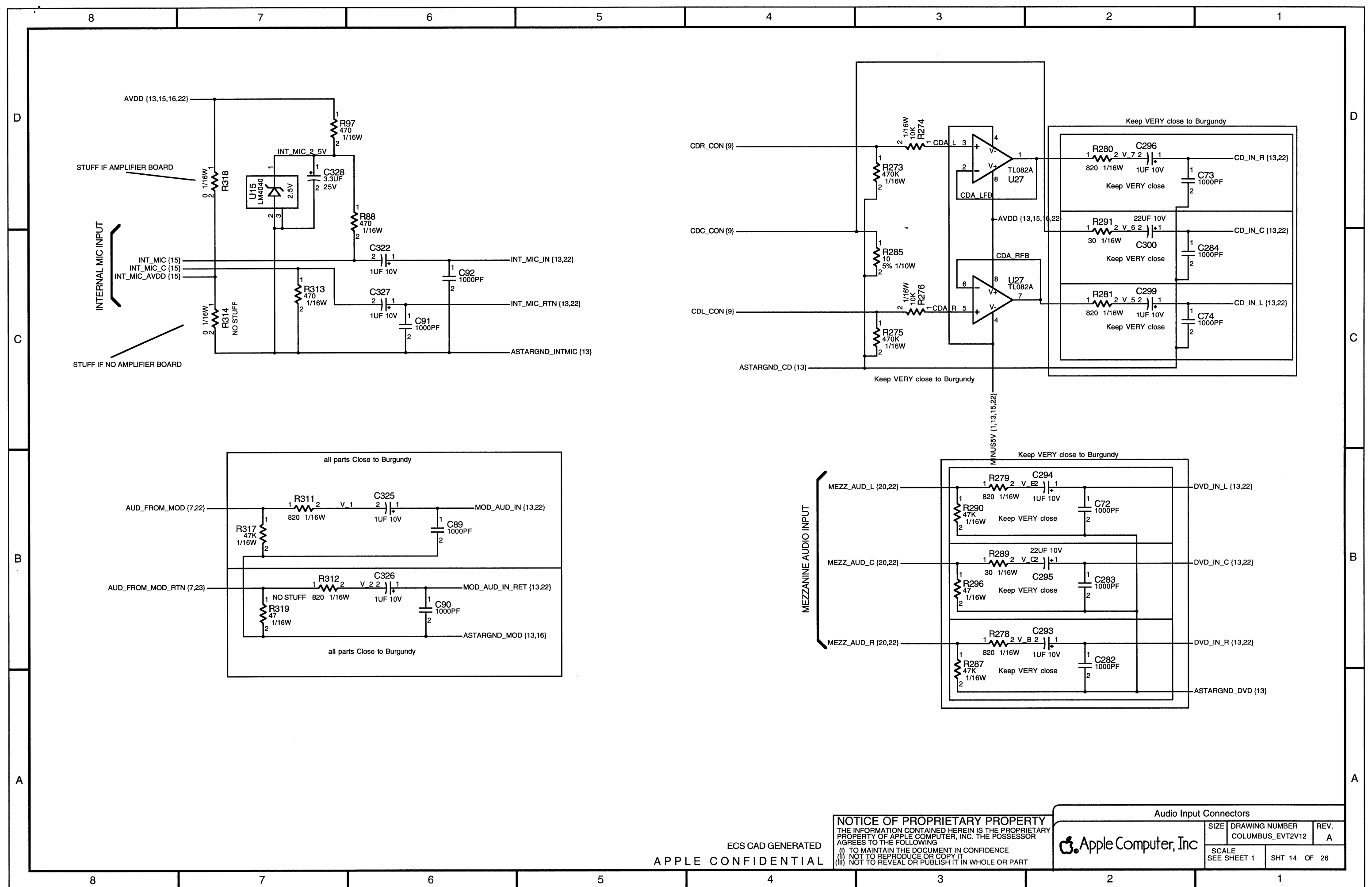
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SIZE	DRAWING NUMBER	REV.
	COLUMBUS_EVT2V12	A
SCALE	SHT 11 OF 26	
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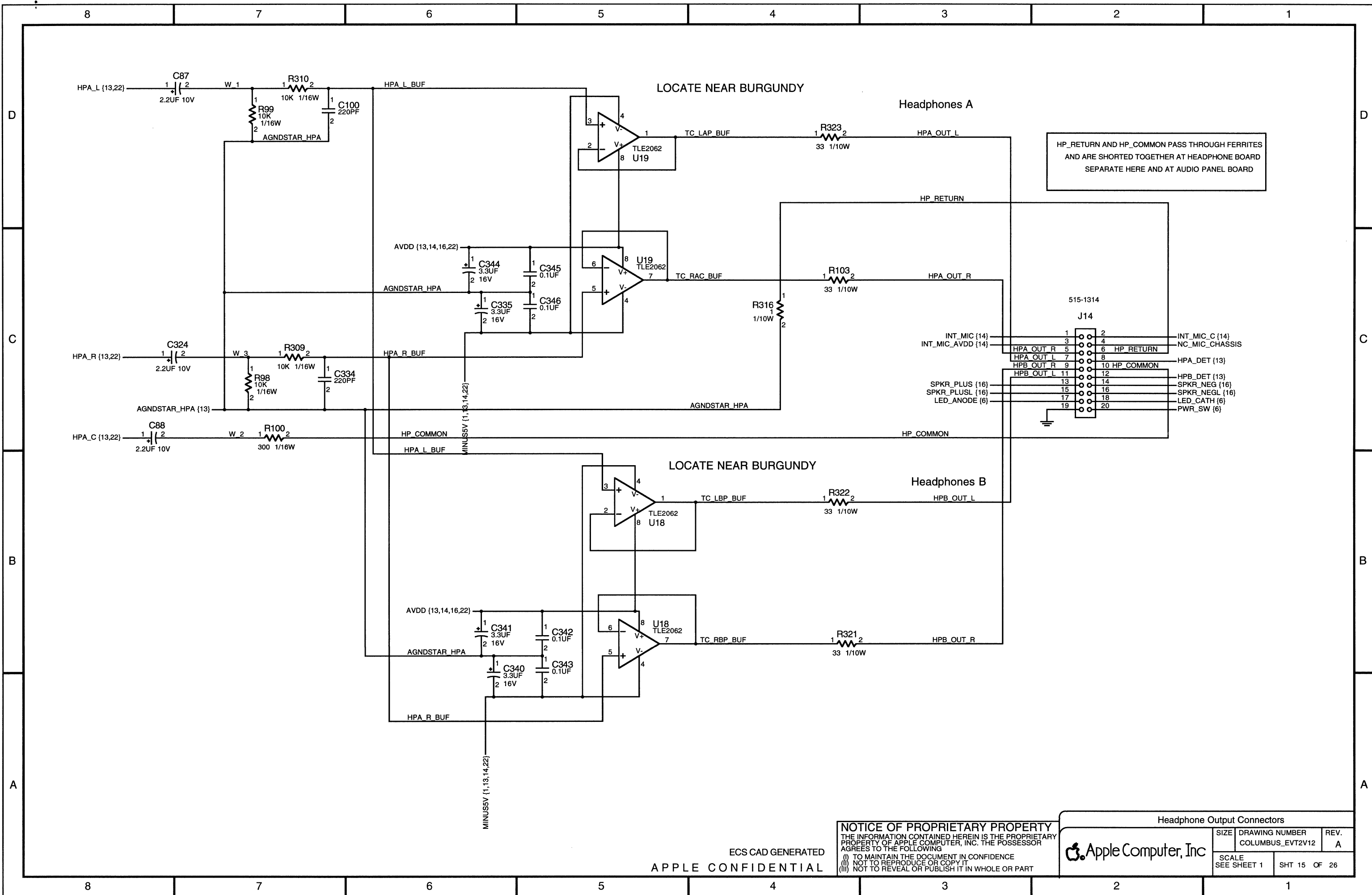


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Audio Input Connectors		
SIZE	DRAWING NUMBER	REV.
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SCALE	SHT 14 OF 26	
SEE SHEET 1		



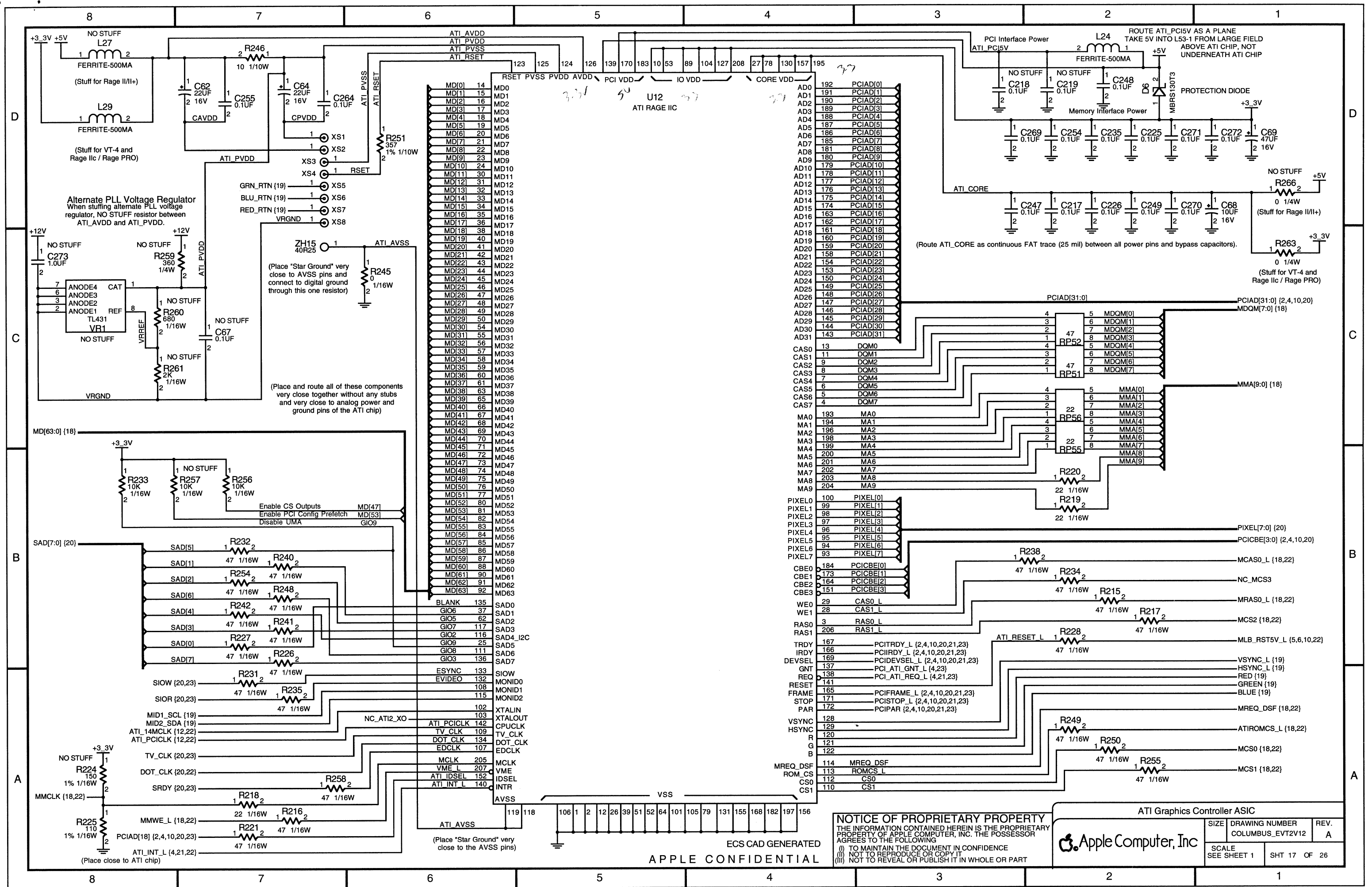


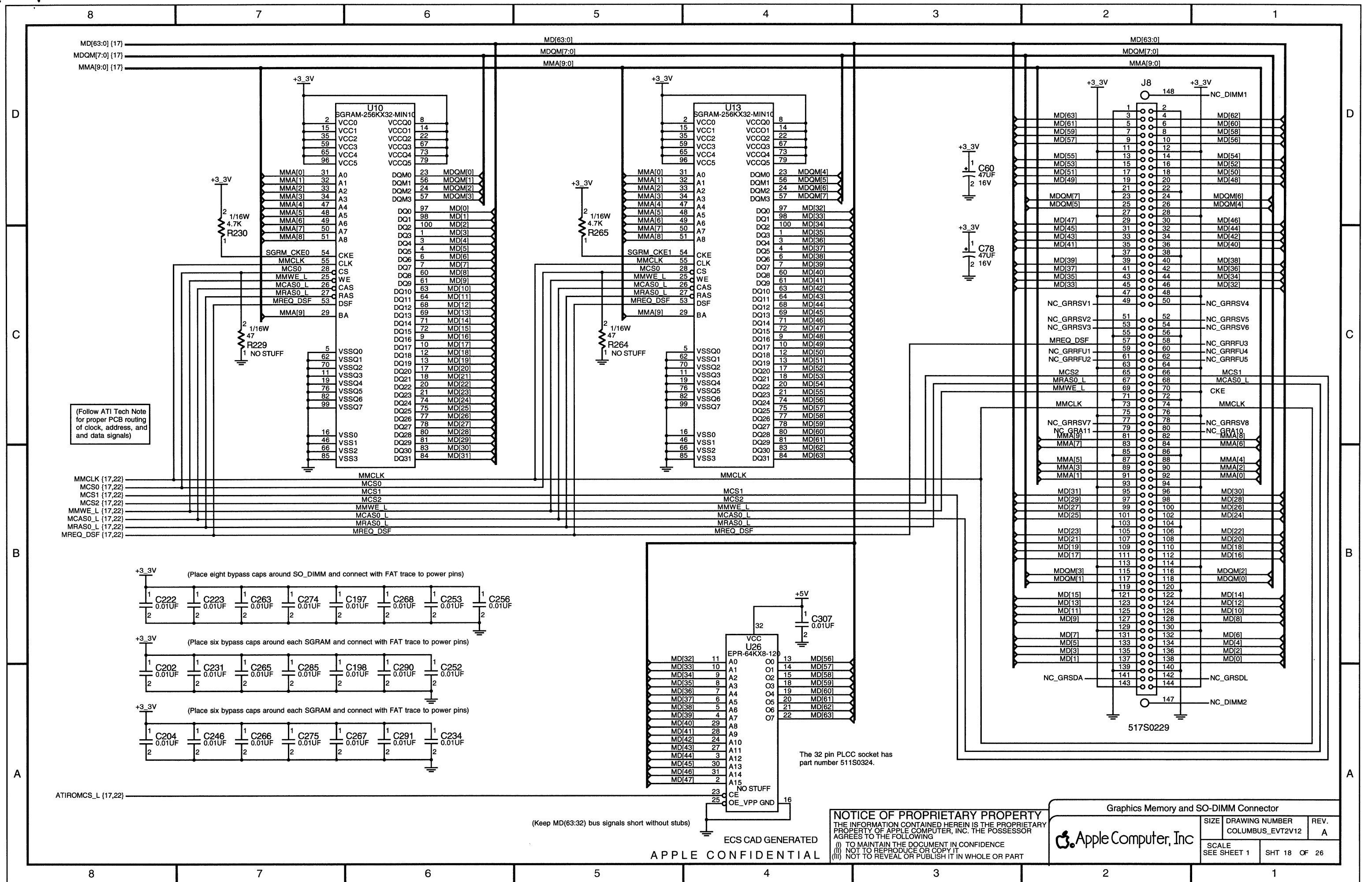
HP_RETURN AND HP_COMMON PASS THROUGH FERRITES
AND ARE SHORTED TOGETHER AT HEADPHONE BOARD
SEPARATE HERE AND AT AUDIO PANEL BOARD

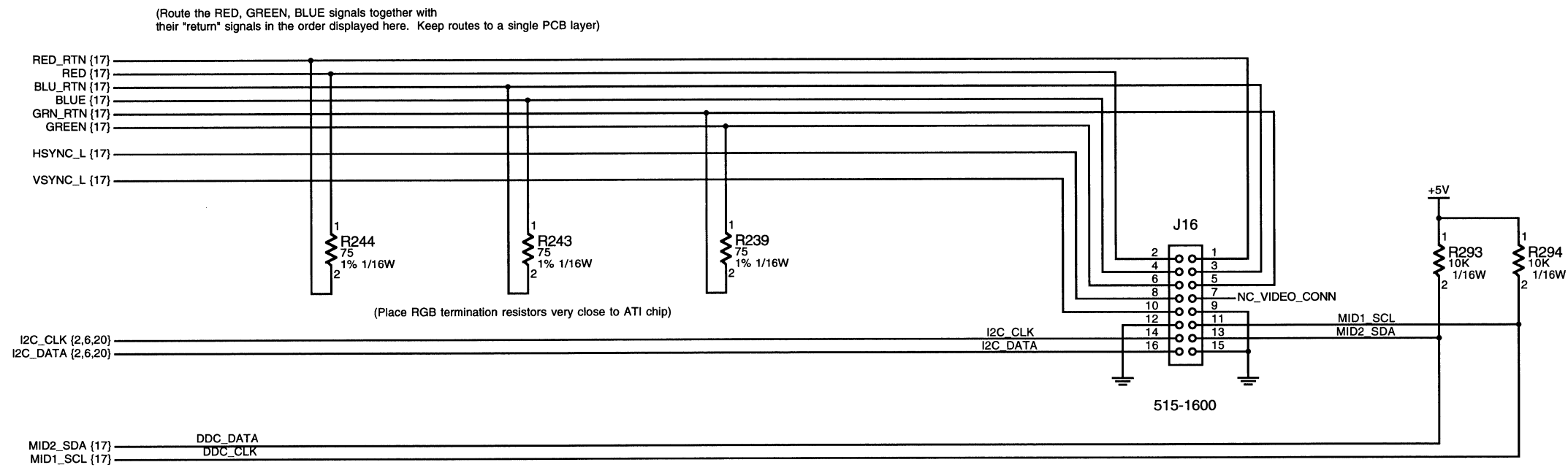
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Headphone Output Connectors		
Apple Computer, Inc.	SIZE	DRAWING NUMBER
	SCALE	REV.
SEE SHEET 1	SHT 15 OF 26	A





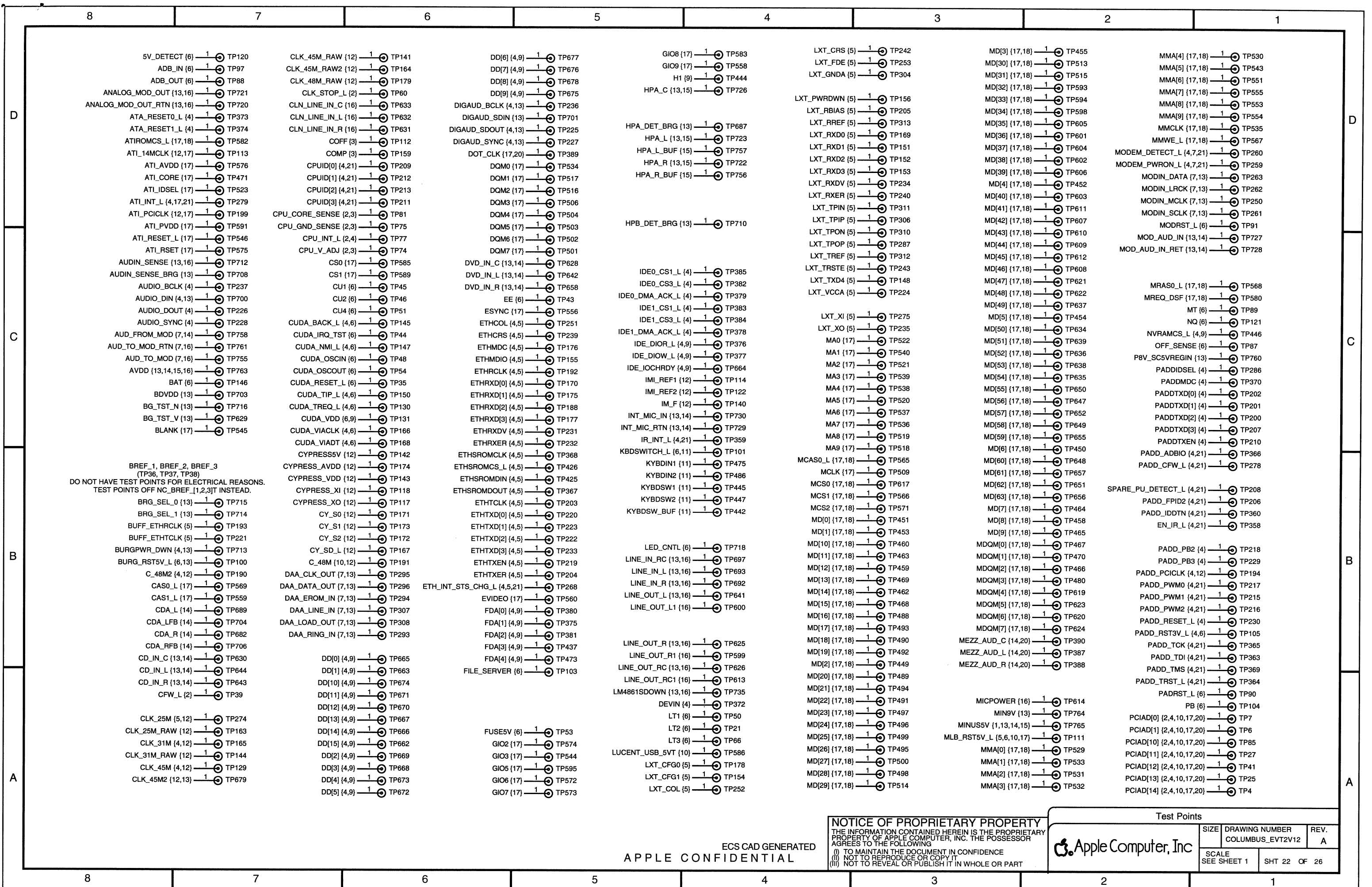


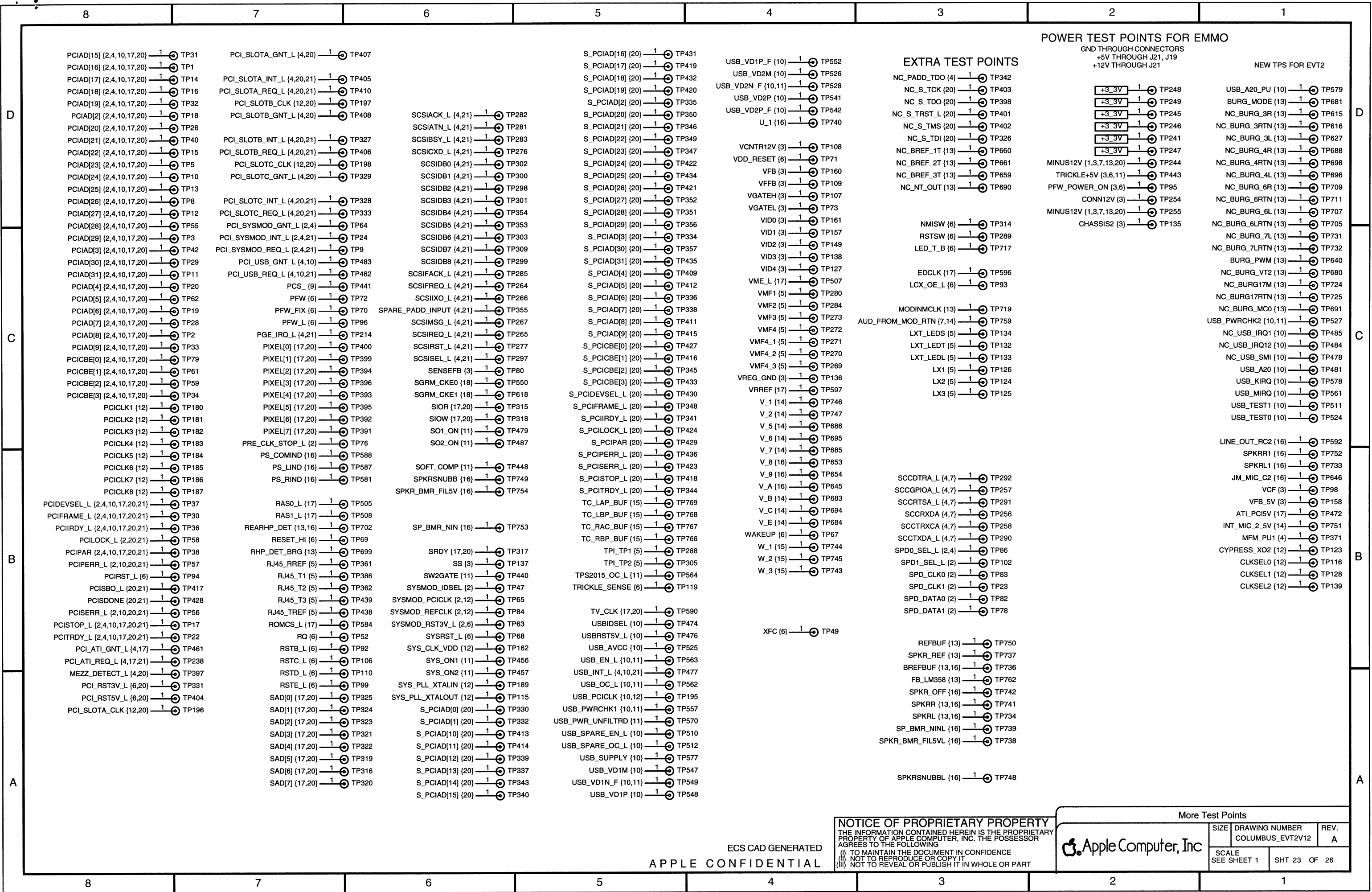
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RGB Output and Video Connector			
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	SCALE	COLUMBUS_EVT2V12	A
SEE SHEET 1		SHT 19 OF 26	





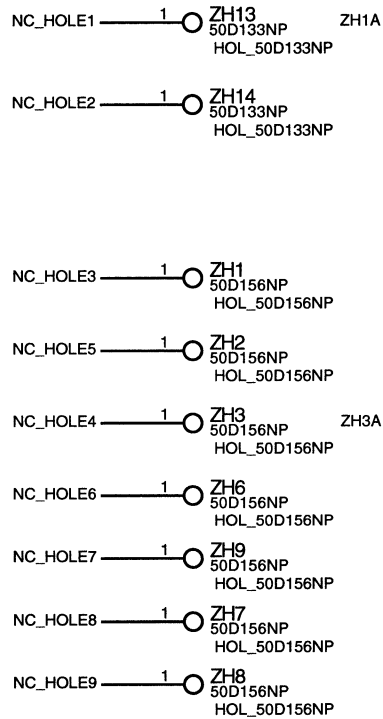


NET NAME	NET WIDTH	VOLTAGE LEVEL	FREQUENCY	NET SHIELD
	(MILS)	OPTIONAL	MHz	

CRITICAL NETS -- ROUTE FAT, THIN UP LATER FOR GUARD BAND

ATI_14MCLK	15	3.3	14.318	
ATI_PCICLK	15	3.3	33.41	
C_48M	15	3.3	48	
CLK_25M	15	5	25	
CLK_25M_RAW	15	5	25	
CLK_31M	15	5	31.3344	
CLK_31M_RAW	15	5	31.3344	
CLK_45M	15	5	45.1584	
CLK_45M_RAW	15	5	45.1584	
CLK_45M_RAW2	15	5	45.1584	
CLK_45M2	15	5	45.1584	
CLK_48M_RAW	15	3.3	48	
CYPRESS_XI	15		18.432	
CYPRESS_XO	15		18.432	
IMI_REF1	15	3.3	14.318	
LXT_XI	15		25	
LXT_XO	15		25	
PADD_PCICLK	15	3.3	33.41	
PCI_SLOTA_CLK	15	3.3	33.41	
PCI_SLOTB_CLK	15	3.3	33.41	
PCI_SLOTC_CLK	15	3.3	33.41	
PCICLK1	15	3.3	33.41	
PCICLK2	15	3.3	33.41	
PCICLK3	15	3.3	33.41	
PCICLK4	15	3.3	33.41	
PCICLK5	15	3.3	33.41	
PCICLK6	15	3.3	33.41	
PCICLK7	15	3.3	33.41	
PCICLK8	15	3.3	33.41	
SYS_PLL_XTALIN	15		14.318	
SYS_PLL_XTALOUT	15		14.318	
SYSMOD_PCICLK	15	3.3	33.41	
SYSMOD_REFCLK	15	3.3	33.41	
USB_PCICLK	15	3.3	33.41	
C_48M2	15	3.3	48	

PCB MOUNTING HOLES



NET NAME	NET WIDTH	VOLTAGE LEVEL	FREQUENCY	NET SHIELD
	(MILS)	OPTIONAL	MHz	

PLANES

+5V	25	5		
+3_3V	25	3.3		
GND	25	0		
CHASSIS	25	0		

OTHER SUPPLY VOLTAGES

+12V	25	12		
MINUS12V	25	-12		
TRICKLE+5V	25	5		
CPU_VCORE	25	2.5		

POWER SUPPLY

VREG_GND	10	0		
CONN12V	25	12		
VCNTR12V	25	12		
UF_VCORE	25	2.5		
VGATEH	25			
VGATEL	25			
VCF	25	5		
VFB_5V	25	5		
CHASSIS2	25	0		
PLUS12V_DRIVE	25	12		
PLUS5V_DRIVE	25	5		
DRIVE_12VGND	25	0		
DRIVE_5VGND	25	0		

FAST ETHERNET

LXT_VCCA	25	5		
LXT_GNDA	25	0		

CUDA

CUDA_VDD	25	5		
BATTERY	25	5		
BAT	25	5		
FUSE5V	25	5		
ADB_PWR	25	5		
ADB_GND	25	0		
VDD_RESET	25	5		

USB

USB_AVCC	25	3.3		
USB_PWR_UNFILTRD	25	5		
USB_PWR_1	25	5		
USB_PWR_2	25	5		
USB_GND_1	25	0		
USB_GND_2	25	0		
USB_SUPPLY	25	5		
LUCENT_USB_5VT	10	5		

CLOCKS

CYPRESS5V	15	5		
CYPRESS_VDD	15	5		
CYPRESS_AVDD	15	5		
IM_F	25	3.3		
SYS_CLK_VDD	25	3.3		

NET NAME	NET WIDTH	VOLTAGE LEVEL	FREQUENCY	NET SHIELD
	(MILS)	OPTIONAL	MHz	

BURGUNDY

AVDD	25	5		
P8V_SC5VREGIN	15	12		
BDVDD	25	5		
ASTARGND_MOD	5	0		
SEL_GND	5	0		
ASTARGND_DVD	5	0		
ASTARGND_CD	5	0		
ASTARLINEINBURG	5	0		
ASTARGND_INTMIC	5	0		
BURG_FS	5	0		
ASGND1	5	0		
AGNDSTAR78M05	5	0		
78M05SGND2	5	0		
ASTARGND_LINE_OUT5	0			
AGNDSTARNEGREG	5	0		
BREF3_SG	5	0		
BREF2_SG	5	0		
BREF1_SG	5	0		
STAR_AGND	5	0		
ASTARGNDBUFF	5	0		
AGNDSTAR_HPA	5	0		
MIN9V	15	-12		
SPKR_BMR_FIL5V	15	5		
SPKR_BMR_FIL5VL	15	5		
MICPOWER	10	5		
JACK_PWR	10	5		

ATI

ATI_CORE	25	5		
ATI_AVDD	10	5		
ATI_PVDD	10	5		
ATI_PVSS	10	0		
ATI_AVSS	10	0		
VRGND	10	0		
CPVDD	5	0		
CAVDD	5	0		
ATI_RSET	5	0		
RSET	5	0		
GRN_RTN	5	0		
BLU_RTN	5	0		
RED_RTN	5	0		
ATI_PCISV	25	5		

LAYER	THICKNESS (MILS)	TRACE WIDTH
TOP ELECTRICAL	0.7	5.0
PREPREG	4.2	
INNER PLANE	1.4	
CORE	4	
INNER ELECTRICAL	1.4	5.0
PREPREG	38.6	
INNER ELECTRICAL	1.4	5.0
CORE	4	
INNER PLANE	1.4	
PREPREG	4.2	
BOTTOM ELECTRICAL	0.7	5.0
MATERIAL ELECTRICAL = COPPER PREPREG = EPOXY CORE = FR4		BOARD THICKNESS 62

SPEC SIZES

0.5oz copper
4±1mils
1oz copper
4±1mils
1oz copper
WHATEVER IT TAKES FOR .062
1oz copper
4±1mils
1oz copper
4±1mils
0.5oz copper
62±7mils

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HSL Information



SIZE	DRAWING NUMBER	REV.
	COLUMBUS_EVT2V12	A
SCALE	SHT 24 OF 26	
SEE SHEET 1		

ECS CAD GENERATED
APPLE CONFIDENTIAL

EVT1 REVISION HISTORY AS OF 12/5/97

This is the initial version of schematic and PCB design.

BRIEF CHANGE HISTORY

V7 BRIAN G'S WRAPUP EDITS

V8 EMI INPUT, PART NUMBER/BOM CLEANUP, COSMETICS, SERIAL PORTS CHANGE (SH8)
MINOR NET/DISCRETE CHANGES, HSL CLEANUP

V9 ALL EDITS ON SHEET 6 -- NAT'L SHARE DISCRETES WITH LXT FAST ETHERNET. DELETE R-PACK SH5 TOO.
SIMPLIFY NATIONAL PAGE SO THAT MIRRORING OF PARTS IS EASIER.

V10 CHANGED CLOCK CHIP, CHANGED SERIAL PORTS, OTHER MINOR TWEAKS

V11 BACKANNOTATION, LOTS OF CONNECTOR CHANGES, TWEAKS.

V12 PREPARED FOR BURGUNDY CHANGES, DELETE PHYTER, ADDED MFM FLOPPY

V13 CHANGED SOUND STUFF FOR BURGUNDY

V14 UPDATED MODEM CONN, EMI FIXES, AND OTHER CORRECTIONS

V15 ADD TEST POINTS

V16 UPDATE MEZZANINE CONNECTOR, UPDATE RESET SWITCHES

V17 MINOR CORRECTIONS AND UPDATED PINOUT ON MEZANNINE CONNECTOR J17

V18A-E MINOR UPDATES & FEEDBACK FROM DESIGN REVIEW 11/25/97

V19 MINOR UPDATES

V20 UPDATES, MORE TEST POINTS, MOUNTING HOLES

V21 REFERENCE DESIGNATOR RENUMBERING, COMMENT CLEANUP

V22-23 UPDATES FOR MOVING HD/CD CONNECTORS TO BACK OF PCB FOR EVT1-2 BUILD

NO STUFFS FOR PRODUCTION		
PN	NEW QTY	REMOVED
127S1012	15	C97
127S3306	3	C205
131S1021	20	C213
131S4722	1	C134 C209 C210 C211 C214 C215 C223
132S1046	68	C64 C132 C137 C138 C231
132S1056	81	C59 C61 C201 C202 C364 C365 C169
138S0312	4	C207 C208
155S0070	11	L1 L4
155S0076	0	L2 L3
378S0038	1	DS2 DS3 DS4
131S1034 CPNR 103893	16	C62 C63
113S1332	1	R144 R143 R138
515-1081	0	J23
515-1387	0	J21
515-1562	0	J3
517-0833	0	J2
705-0178	0	S2
740S0500	0	F2

CHART SLIGHTLY INACCURATE FOR EVT2 DUE TO CHANGES
WILL CATCH UP CHART WHEN THERE'S TIME

8		7		6		5		4		3		2		1	
REFERENCE DESIGNATOR LOCATIONS														REFERENCE DESIGNATIONS	
BT1 6-C7		C90 14-B6	C181 5-A8	C272 17-D1	G1 12-C4	R14 12-B4	R105 2-C2	R196 11-B5	R287 14-A3	RP54 10-B4	ZH8 24-B6	LAST USED		NOT USED	
C1 6-C6	C91 14-C6	C182 5-D6	C273 17-C8	G2 12-C4	R15 12-D4	R106 6-C7	R197 11-A6	R288 13-B2	RP55 17-C2	ZH9 24-C6	BT1				
C2 6-C5	C92 14-C6	C183 5-B4	C274 18-B7	J1 2-B3	R16 12-C6	R107 6-C7	R198 11-B7	R289 14-B3	RP56 17-C2	ZH10 13-C1	C346				
C3 6-C6	C93 16-A6	C184 5-D4	C275 18-A7	J2 6-C2	R17 12-C7	R108 6-D5	R199 11-C6	R290 14-B3	RP57 13-B7	ZH13 24-D6	D6				
C4 2-A5	C94 13-D2	C185 5-B3	C276 16-C3	J3 3-D8	R18 12-D3	R109 6-D5	R200 11-A6	R291 14-C2	RP58 13-B2	ZH14 24-D6	DS4				
C5 2-A5	C95 16-B6	C186 7-C4	C277 16-B3	J4 5-C1	R19 12-B6	R110 6-C7	R201 11-A7	R292 13-B8	RP59 13-A5	ZH15 17-C7	F3				
C6 3-C5	C96 13-A8	C187 5-B4	C278 16-C3	J5 10-C2	R20 12-D3	R111 6-C7	R202 11-D3	R293 19-C3	RP60 9-D7		G2				
C7 12-C3	C97 16-B7	C188 5-C3	C279 16-C3	J6 7-B4	R21 12-C6	R112 6-A6	R203 11-C7	R294 19-C2	RP61 9-D7		J20				
C8 12-C7	C98 13-D1	C189 5-C2	C280 16-C3	J7 16-D1	R22 12-C5	R113 6-A6	R204 11-B7	R295 13-D4	RP62 9-D7		L35				
C9 12-C7	C99 16-D7	C190 20-B2	C281 16-B4	J8 18-A2	R23 12-C6	R114 6-A6	R205 11-C7	R296 14-B3	RP63 9-D7		Q16				
C10 6-D8	C100 15-D7	C191 5-C3	C282 14-A2	J9 16-C1	R24 12-D4	R115 6-D4	R206 11-B7	R297 9-C5	S1 6-B7		R323				
C11 3-C2	C101 3-B2	C192 5-C3	C283 14-B2	J10 6-C7	R25 12-A4	R116 6-B4	R207 11-B7	R298 9-D3	S2 6-C4		RP63				
C12 12-A6	C102 2-D8	C193 5-B2	C284 14-C2	J11 9-B8	R26 12-A4	R117 6-A5	R208 11-B7	R299 9-A3	S3 6-A7		S4				
C13 3-C2	C103 2-D7	C194 20-C2	C285 18-A7	J12 8-C4	R27 12-B4	R118 6-D2	R209 10-B5	R300 9-A6	S4 6-B7		T1				
C14 12-A6	C104 2-D7	C195 5-C3	C286 13-D3	J13 9-A4	R28 12-B4	R119 6-C4	R210 10-B7	R301 9-C5	T1 5-C3		U1				
C15 12-D3	C105 2-D7	C196 5-C2	C287 13-D6	J14 15-C2	R29 12-B4	R120 3-B4	R211 11-A7	R302 9-D3	U2 6-B5		U2				
C16 12-A4	C106 2-D7	C197 18-B7	C288 13-A6	J15 3-D8	R30 12-B4	R121 3-B2	R212 11-A7	R303 6-B3	U3 6-D3		U3				
C17 12-A3	C107 2-D8	C198 18-A7	C289 13-D6	J16 19-C3	R31 12-B4	R122 3-A4	R213 10-C7	R304 13-D1	U4 3-B4		U4				
C18 12-A3	C108 2-D7	C199 11-B7	C290 18-A6	J17 9-C4	R32 12-B4	R123 3-A2	R214 11-D3	R305 16-B7	U5 12-A6		U5				
C19 12-A3	C109 2-D7	C200 11-A7	C291 18-A6	J18 3-C5	R33 12-A4	R124 3-B2	R215 17-B2	R306 16-B7	U6 12-C5		U6				
C20 12-A2	C110 3-B2	C201 11-D3	C292 13-D3	J19 7-B4	R34 12-A4	R125 6-B5	R216 17-A7	R307 16-B6	U7 5-B6		U7				
C21 12-A2	C111 2-C6	C202 18-A8	C293 14-B2	J20 20-A4	R35 21-A7	R126 6-B4	R217 17-B2	R308 16-D7	U8 11-B6		U8				
C22 12-A2	C112 2-D1	C203 11-D3	C294 14-B2	L1 6-C3	R36 21-A8	R127 6-B4	R218 17-A7	R309 15-C7	U9 10-C4		U9				
C23 12-A2	C113 2-D1	C204 18-A8	C295 14-B2	L2 6-D3	R37 21-A8	R128 6-B2	R219 17-B2	R310 15-D7	U10 18-B7		U10				
C24 3-D6	C114 6-C5	C205 10-C2	C296 14-D2	L3 3-B3	R38 21-A8	R129 6-A2	R220 17-B2	R311 14-B7	U11 10-B7		U11				
C25 3-D4	C115 6-A6	C206 10-C3	C297 16-B6	L4 6-C3	R39 4-A1	R130 6-A3	R221 17-A7	R312 14-B7	U12 17-A6		U12				
C26 3-D3	C116 2-D1	C207 11-C3	C298 13-D3	L5 6-C3	R40 5-A6	R131 6-A2	R222 10-B5	R313 14-C7	U13 18-B5		U13				
C27 3-D6	C117 3-B2	C208 11-D3	C299 14-C2	L6 3-C1	R41 21-B2	R132 6-D2	R223 10-B5	R314 14-C7	U14 13-A5		U14				
C28 3-C6	C118 2-D2	C209 10-B2	C300 14-C2	L7 11-C3	R42 5-B8	R133 6-A3	R224 17-A8	R315 16-D7	U15 14-D7		U15				
C29 7-C5	C119 2-C4	C210 7-A4	C301 13-B7	L8 10-C3	R43 5-A8	R134 3-C3	R225 17-A8	R316 15-C4	U16 16-A7		U16				
C30 4-D3	C120 2-D2	C211 7-A4	C302 16-C6	L9 11-C3	R44 5-A8	R135 3-C6	R226 17-B7	R317 14-B7	U17 16-A7		U17				
C31 4-D2	C121 6-B7	C212 10-D7	C303 16-B3	L10 10-C3	R45 5-A8	R136 3-B3	R227 17-B7	R318 14-D7	U18 15-B5		U18				
C32 4-D1	C122 6-B2	C213 10-D8	C304 8-B3	L11 10-D8	R46 5-B8	R137 6-A3	R228 17-B2	R319 14-B7	U19 15-D5		U19				
C33 4-D1	C123 6-D3	C214 10-D6	C305 8-B4	L12 10-D8	R47 5-B8	R138 12-A7	R229 18-C7	R320 13-D8	U20 2-A6		U20				
C34 5-A8	C124 3-B3	C215 10-C3	C306 13-B7	L13 10-C3	R48 5-B8	R139 12-A7	R230 18-D7	R321 15-B4	U21 6-D8		U21				
C35 4-D1	C125 3-B1	C216 10-C2	C307 18-B4	L14 10-C3	R49 4-C7	R140 12-A7	R231 17-A7	R322 15-B4	U22 4-A6		U22				
C36 4-D3	C126 6-C2	C217 17-D2	C308 8-B3	L15 16-B3	R50 21-C2	R141 6-A3	R232 17-B7	R323 15-D4	U23 5-D2		U23				
C37 7-C3	C127 6-C1	C218 17-D3	C309 9-B3	L16 16-C3	R51 20-D3	R142 6-B6	R233 17-B8		U24 9-B2		U24				
C38 4-D3	C128 6-C5	C219 17-D2	C310 13-D3	L17 16-C3	R52 4-D5	R143 6-B6	R234 17-B2	RP1 12-C4	U25 11-D6		U25				
C39 4-D2	C129 6-C2	C220 10-C4	C311 13-B2	L18 16-C3	R53 9-B2	R144 6-B6	R235 17-A7	RP2 12-C2	U26 18-A4		U26				
C40 4-D2	C130 3-B4	C221 10-C2	C312 13-B7	L19 12-C8	R54 9-B2	R145 5-B5	R236 10-B5	RP3 12-C2	U27 14-C3		U27				
C41 4-D2	C131 6-C2	C222 18-B8	C313 13-B6	L20 12-D3	R55 11-C3	R146 3-B4	R237 10-B5	RP4 12-B8	U28 13-D2		U28				
C42 20-B2	C132 3-B5	C223 18-B7	C314 13-B6	L21 5-A8	R56 11-C3	R147 3-B5	R238 17-B3	RP5 12-C3	VR1 17-C8		VR1				
C43 20-C2	C133 6-B6	C224 11-D2	C315 9-B3	L22 5-A8	R57 10-C5	R148 5-B4	R239 19-C5	RP6 21-D7	VR2 13-D7		VR2				
C44 4-D1	C134 6-C5	C225 17-D2	C316 13-B6	L23 11-D3	R58 11-C4	R149 5-B5	R240 17-B7	RP7 21-C7	VR3 13-A7		VR3				
C45 4-D1	C135 12-C8	C226 17-D2	C317 13-A6	L24 17-D2	R59 10-C5	R150 3-B6	R241 17-B7	RP8 21-B7	XS1 17-D7		XS1				
C46 4-D2	C136 6-D7	C227 10-C1	C318 13-D2	L25 11-D3	R60 10-C5	R151 12-D4	R242 17-B7	RP9 21-B8	XS2 17-D7		XS2				
C47 20-B1	C137 3-D1	C228 10-C4	C319 13-D5	L26 10-D5	R61 10-C4	R152 6-B5	R243 19-C6	RP10 20-B7	XS3 17-D7		XS3				
C48 20-C1	C138 3-D2	C229 11-C2	C320 13-D5	L27 17-D8	R62 10-C5	R153 3-B6	R244 19-C7	RP11 20-C7	XS4 17-D7		XS4				
C49 20-B2	C139 3-D1	C230 10-B2	C321 13-D5	L28 16-D3	R63 10-C4	R154 6-C7	R245 17-C6	RP12 20-A7	XS5 17-D7		XS5				
C50 20-C2	C140 3-C5	C231 18-A7	C322 14-C6	L29 17-D8	R64 10-C5	R155 3-B6	R246 17-D7	RP13 20-C7	XS6 17-D7		XS6				
C51 20-B2	C141 3-B5	C232 7-B3	C323 16-D8	L30 16-D4	R65 11-C5	R156 3-C4	R247 10-D5	RP14 20-D7	XS7 17-D7		XS7				
C52 20-C2	C142 12-B6	C233 10-D7	C324 15-C8	L31											