System Schematics

Service Addendum

A1200

Commodore

Commodore
AMIGA

Commodore Business Machines, Inc.
Technology Group
1200 Wilson Drive, West Chester, Pennsylvania 19380, USA.

REVISION HISTORY

REV	DESCRIPTION	DATE	APRVL	MANAGER
0	ENGINEERING PROTOTYPE	03/13/92	GRR	
1	ADVANCE ENGINEERING RELEASE	06/29/92	GRR	
A	PILOT PRODUCTION RELEASE	09/09/92	GRR	
B	REVISED PER ECO #0695	11-13-92	DSH	

JUMPERS AND STUFF

REF	TYPE	DESCRIPTION	PAGE
R246	SMT	NTSC COLOR BURST	4
R202	SMT	PAL COLOR BURST	4
R625	SMT	KEYBOARD MPU CLOCK	9
R624	SMT	KEYBOARD/SYSTEM RESET	9

CONNECTORS

REF	TYPE	DESCRIPTION	PAGE
CN1	DB9P	MOUSE/JOYSTICK 1	5
CN2	DB9P	MOUSE/JOYSTICK 2	5
CN3	RCA-J	RIGHT AUDIO OUTPUT	5
CN4	RCA-J	LEFT AUDIO OUTPUT	5
CN5	DB23S	EXTERNAL FLOPPY	8
CN6	DB25P	RS232 SERIAL PORT	7
CN7	DB25S	PARALLEL PRINTER PORT	7
CN8	SQ DIN	POWER SUPPLY CONNECTOR	13
CN9	DB23P	VIDEO OUTPUT	6
CN10	RCA-J	COMPOSITE VIDEO	4
CN11	DIL-34	INTERNAL FLOPPY SIGNAL	8
CN12	SIL-4	INTERNAL FLOPPY POWER	8
CN13	MEM-30	KEYBOARD MEMBRANE	9
CN14	SIL-4	INTERNAL FLOPPY POWER	8
CN13	MEM-30	KEYBOARD MEMBRANE	9
CN14	SIL-4	KEYBOARD STATUS LED'S	9
CN15	PCMCIA	PC "MEMORY CARD"	11
P9	EDGE-80	MEMORY BUS EXPANSION	12

SIGNAL GLOSSARY

SIGNAL	DESCRIPTION (AREA)	PAGES
28MHZ	28.63636 MHZ MASTER CLOCK	
7MHZ	7.15909 MHZ PROCESSOR CLOCK	
A[23:1]	PROCESSOR ADDRESS BUS (68000)	
ACK	DATA ACKNOWLEDGE (PARALLEL PORT)	
AS	ADDRESS STROBE (68000)	
AUDIN	AUDIO INPUT (RS232 PORT)	
AUDOUT	AUDIO OUTPUT (RS232 JACK)	
BERR	BUS ERROR (68000)	
BG	BUS GRANT (68000)	
BGACK	BUS GRANT ACKNOWLEDGE (68000)	
BLISS	BLITTER SLOWDOWN (CHIPS)	
BLIT	CHIP MEMORY ACCESS (CHIPS)	
BR	BUS REQUEST (68000)	
BUSY	DEVICE BUSY (PARALLEL PORT)	
CASL/U	COLUMN ADDRESS STROBE (DRAM)	
CCK/CCKQ	COLOR CLOCK / QUADRATURE (CHIPS)	
CDAC	7.15909 MHZ QUADRATURE CLOCK (CHIPS)	
CHNG	MEDIA CHANGE (FLOPPY)	
CLKRD/WR	READ-TIME CLOCK READ / WRITE (RTC)	
COMP	MONOCHROME COMPOSITE VIDEO (VIDEO)	
CSYNC	COMPOSITE SYNC (VIDEO)	
CTS	CLEAR TO SEND (RS232 PORT)	
D[15:0]	PROCESSOR DATA BUS (68000)	
DIR	STEP DIRECTION (FLOPPY)	
DKRD	DISK READ DATA (FLOPPY)	
DKWD	DISK WRITE DATA (FLOPPY)	
DKWE	DISK WRITE ENABLE (FLOPPY)	
DMAL	CHIP DMA REQUEST LINE (CHIPS)	
DRA[8:0]	DRAM ADDRESS BUS (DRAM)	
DRD[15:0]	DRAM DATA BUS (DRAM)	
DSR	DATA SET READY (RS232 PORT)	
DTACK	DATA TRANSFER ACKNOWLEDGE (68000)	
DTR	DATA TERMINAL READY (RS232 PORT)	
E	PERIPHERAL ENABLE CLOCK (68000)	
EXTICK	EXPANSION PRESENT / RTC TICK	
FC[2:0]	FUNCTION CODE (68000)	
FIRE0/1	FIRE BUTTON 0/1 (JOYSTICKS)	
HLT	PROCESSOR HALT (68000)	
HSYNC	HORIZONTAL SYNC (VIDEO)	
INDEX	INDEX PULSE (FLOPPY)	
INT[2,3,6]	INTERRUPT REQUEST (CHIPS)	
IORESET	I/O RESET	
IPL[2:0]	INTERRUPT PRIORITY LEVEL (68000)	
KBCLOCK	KEYBOARD CLOCK (KEYBOARD)	
KBDATA	KEYBOARD DATA (KEYBOARD)	
KBRESET	KEYBOARD RESET (KEYBOARD)	
LDS/UDS	UPPER / LOWER DATA STROBES (68000)	
LED	POWER ON LED / AUDIO FILTER DISABLE	
LEFT/RIGHT	LEFT RIGHT AUDIO (AUDIO)	

SIGNAL	DESCRIPTION (AREA)	PAGES
LPEN	LIGHT PEN TRIGGER (JOYSTICKS)	
MTR	MOTOR ON (FLOPPY)	
MTR0	MOTOR ON - DRIVE 0 (FLOPPY)	
MOV/MOH	MOUSE 0 QUADRATURE V/H (JOYSTICKS)	
M1V/M1H	MOUSE 1 QUADRATURE V/H (JOYSTICKS)	
OVL	OVERLAY ROM OVER RAM	
OVR	OVERRIDE SYSTEM DECODING	
PIXELSW	GENLOCK PIXEL SWITCH (VIDEO)	
POT0X/0Y	POT LINES 0 X/Y (JOYSTICKS)	
POT1X/1Y	POT LINES 1 X/Y (JOYSTICKS)	
POUT	PAPER OUT (PARALLEL PORT)	
PPD[7:0]	PARALLEL PORT DATA (PARALLEL PORT)	
RAMEN	RAM ENABLE (CHIPS)	
REGEN	CHIP REGISTER ENABLE (CHIPS)	
RAS0/1	ROW ADDRESS STROBE (DRAM)	
RDY	DRIVE READY (FLOPPY)	
RESET	GENERAL RESET	
RGA[8:1]	REGISTER ADDRESS BUS (CHIPS)	
R/G/B	RED / GREEN / BLUE (VIDEO)	
RI	RING INDICATE (RS232 PORT)	
ROMEN	ROM ENABLE (ROM)	
RTS	REQUEST TO SEND (RS232 PORT)	
RST	PROCESSOR RESET (68000)	
RXD	RECEIVE DATA (RS232 PORT)	
RW	PROCESSOR READ/WRITE (68000)	
SEL	SELECT (PARALLEL PORT)	
SEL[3:0]	DRIVE SELECT (FLOPPY)	
SIDE	SIDE SELECT (FLOPPY)	
STEP	STEP IN/OUT COMMAND (FLOPPY)	
TRK0	TRACK ZERO SENSE (FLOPPY)	
TXD	TRANSMIT DATA (RS232 PORT)	
VMA	VALID MEMORY ADDRESS (68000)	
VPA	VALID PERIPHERAL ADDRESS (68000)	
VSYNC	VERTICAL SYNC (VIDEO)	
WE	WRITE ENABLE (DRAM)	
WPRO	WRITE PROTECT SENSE (FLOPPY)	
XCLK	EXTERNAL GENLOCK CLOCK (VIDEO)	
XCLKEN	EXTERNAL CLOCK ENABLE (VIDEO)	
XRDY	EXTERNAL DATA READY	
	** CREDIT CARD AND IDE STUFF? **	

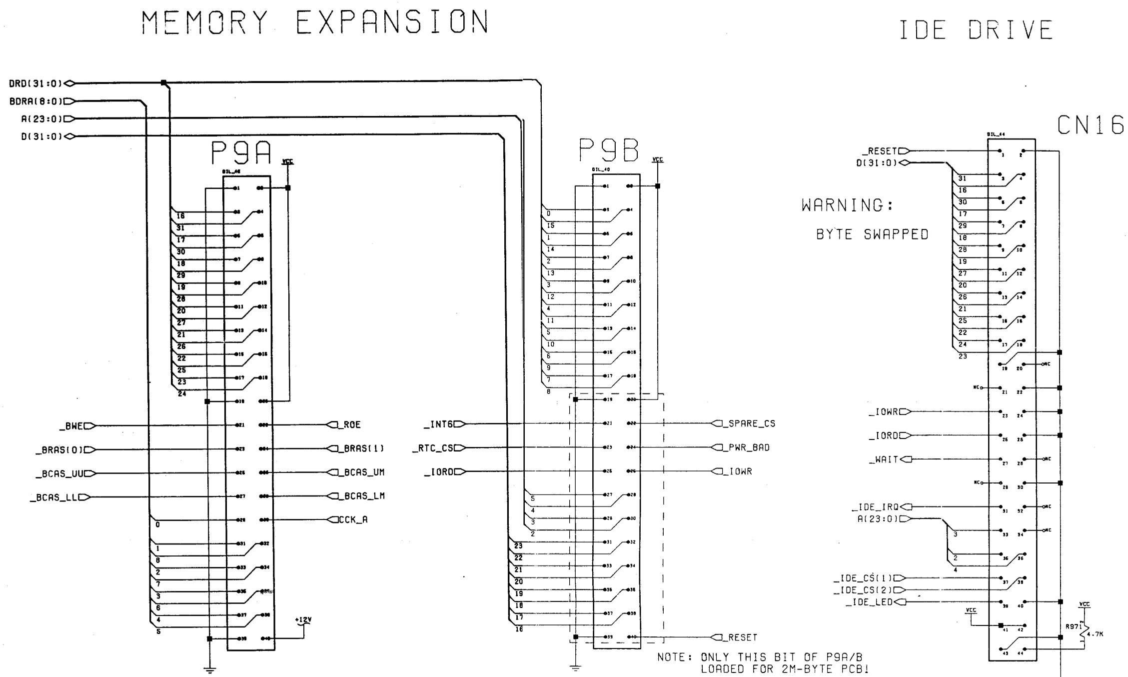
KEY COMPONENTS

REF	CHIP	DESCRIPTION	PAGE
U1	68000	68000 PROCESSOR 16MHZ	2
U2	8374	ALICE (AA AGNUS)	2
U3	8364	PAULA	5
U4	4203	LISA (AA DENISE)	4
U5	F023A	AA GAYLE (CBM ASIC)	2,8,11
U6	ASST	ROM 512KX16, 150 NS	10
U7	8520	AMIGA VIA, 1 MHZ	7
U1[illegible]-11	28F10	FLASH MEMORY 128KX8	10
U1[illegible]	CXA1145	SONY VIDEO ENCODER	4
U1[illegible]	68HC05	AMIGA KEYBOARD MPU	9
U4[illegible]	PST518	LOW VOLTAGE SENSE IC	9
U1[illegible]	LF347	BIMOS OP-AMP	5
	TL084	BICMOS OP-AMP	ALT
U16-17	ASST	DRAM 256KX16, 80NS	3
U18-19	ASST	DRAM 256KX16 OPTIONAL	3
U2[illegible]	391???	BUDGIE (ASIC)	2
U28	1488	EIA LINE DRIVER	7
U29	1489	EIA LINE RECEIVER	7
U30	BT101	TRIPLE 8-BIT VIDEO DAC	4
X1	OSC	TTL 28.63636 MHZ NTSC	2
	OSC	TTL 28.37512 MHZ PAL	ALT
Y4[illegible]51	XTAL	4.43619MHZ PAL BURST	4
Y[illegible]21	XTAL	3MHZ CERAMIC RESONATOR	9
X2	ASST	PAL VIDEO MODULATOR	4
	ASST	NTSC VIDEO MODULATOR	4

DIRECTORIES AND REVISION HISTORY

COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"
SIZE C | 364717 | 6
SCALE | SHEET 1 OF 13

A1200 REV 1->1D PCB



A1200 REV 1->1D PCB

MEMORY EXPANSION AND THE IDE DRIVE

C.A.D. GENERATED
NO MANUAL CHANGES MAY BE MADE TO THIS DOCUMENT

COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"

USED ON: C/A1200 | NEXT ASSY: 364719

SIZE C | 364717 | B

SCALE | SHEET 12 OF 13

_CSYNC
RGA(9:1)
DRD(31:0)
_BCAS_XX
_RST
CCK
MDAT
_MLD
SCLK
14MHZ
28MHZ
E375
E376
E377
22PF
68
27
E132
LISA
4203
U4
74HCT244
U32
_RESET
CCK_B
_CSYNC_B
PIXELSW
DR
DG
DB
DI
+VID
1N914
D231A
D232A
D233A
D231B
D232B
D233B
R233D 470
R233C 470
R233B 470
R233A 470
R231C 49.9
R231B 49.9
R231A 49.9
R232A 24.9
R232B 24.9
R232C 24.9
AR
AG
AB
U30
BT101
VIDEO DAC
VIDEO DAC
C215 .1UF
R215 1K
C216 .01UF
R216 15
R217 511
D215 LM385 1.2V
D215A
74F139
U23
BLANK
BURST
BLANK
SYNC
CLOCK
C221 .1UF
C222 .1UF
BPF
Z221
R223 1.2K/910
VVREF
R224 820
DELAY LINE
Z222
R221 1.2K/820
R222 1K
R225
C211 .22UF
C212 .22UF
C213 .22UF
U12
CXA1145
ENCODER
COMPOSITE
COLOR
CN10
C237 470UF
C236 100UF
R234D 75
R235 360
E231 100PF
RCA JACK
R232E 75
MONO
C214 10UF
R237 100
C235 100UF
R238
MODULATOR
X2
X28
RF OUT
HI/LO
TUNE
MODULATOR
E232 4.7
.01UF
100UF
C239
180/360
R236
_NTSC
CCKQ_A
R202 1K
R204 4.7K
R209 10K
Q201 2N3904
R203 D/R
R246 2.7K/M
R209 ADDED REV 1B PCB
C459 .22UF
R459 27K
C460 10UF
C461 .22UF
VVREF
PAL ONLY
R241 4.7K
C242 15PF
4.33619MHZ
Y451
C244 .01UF
C243 1000PF
L241 1.2UH
R242 6.8K
R243 10K
R244 1K
R245 M/2.7K
Q461 2N3904
C246 .01UF
C245 56PF
C241 56PF
CC04
A1200 REV 1->1D PCB
NOTE: COMPONENTS DESIGNATED AS EXXX MAY BE LOADED WITH EMI FLITERS. FERRITE BEADS OR RESISTORS
DENISE IS PRETTY MUCH INTO VIDEO...

COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"
SIZE C 364717 REV 1D
SCALE
SHEET 4 OF 13
MENTOR GRAPHICS VCR_SERVER 7.0

CHANNEL Z
10/10/92

OOPS!

ALL THIS STUFF SERVES TO CORRECT ONE MINOR GAYLE BUG AND A NUMBER OF ALICE DEFICIENCIES NOT YET CORRECTED.

ASSUMING THE CHANGES ARE IMPLEMENTED IN THE PRODUCTION GAULE CHIP, THEN ALL THIS SILLYNESS IS BEST ERASED...

REFERENCE	OLD GAYLE	NEW GAYLE
XU1	74F74	NONE
XU2	74F02	NONE
XU3	74F74	NONE
U26X	74F86	NONE
XJ4	0 OHM	OUT
XJ1	OUT	0 OHM
XJ2	OUT	0 OHM
XJ3	OUT	0 OHM
U26	NOTE	74LS86

U20 BUDGIE 391425 CLOCK PART

NOTE: PAL USES 28.37516 MHZ

U1 MC68EC020

U0 MC68881

U2 8374 ALICE

U5 4145F023A AA_GAYLE

XU9

00PS! - 32-BIT / SLOW ROM
XJ9 IN - ADD ROM WAIT

CONTROL FUNCTIONS

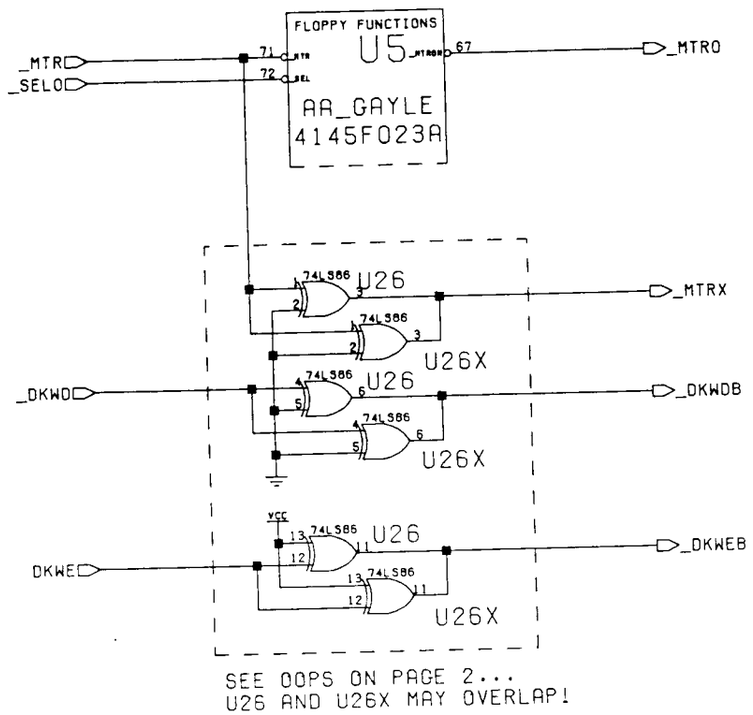
PROCESSOR AND OTHER USEFUL COMPONENTS

NOTE: VARIOUS COMPONENTS ARE FOR EMI CONTROL AND MAY BE LOADED WITH FUNNY THINGS...

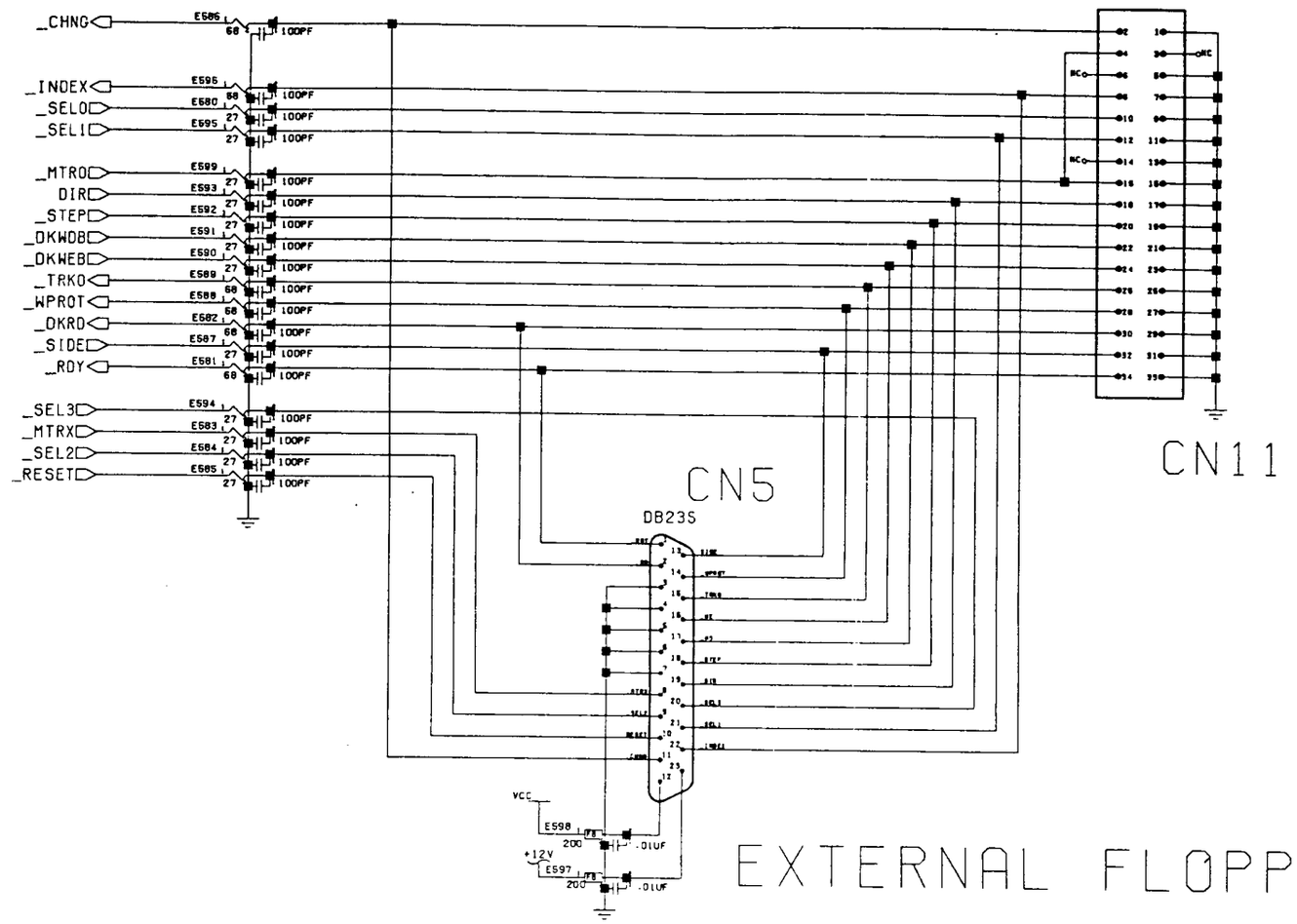
A1200 REV 1->1D PCB

COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"
SIZE C 364717 1D
SCALE
SHEET 2 OF 13

FLOPPY LOGIC

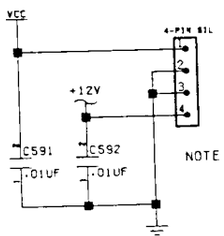


INTERNAL FLOPPY



EXTERNAL FLOPPY

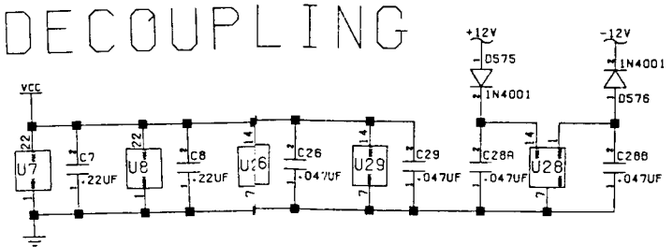
FLOPPY POWER



CN12

NOTE: SOME DRIVES ARE +5 ONLY...

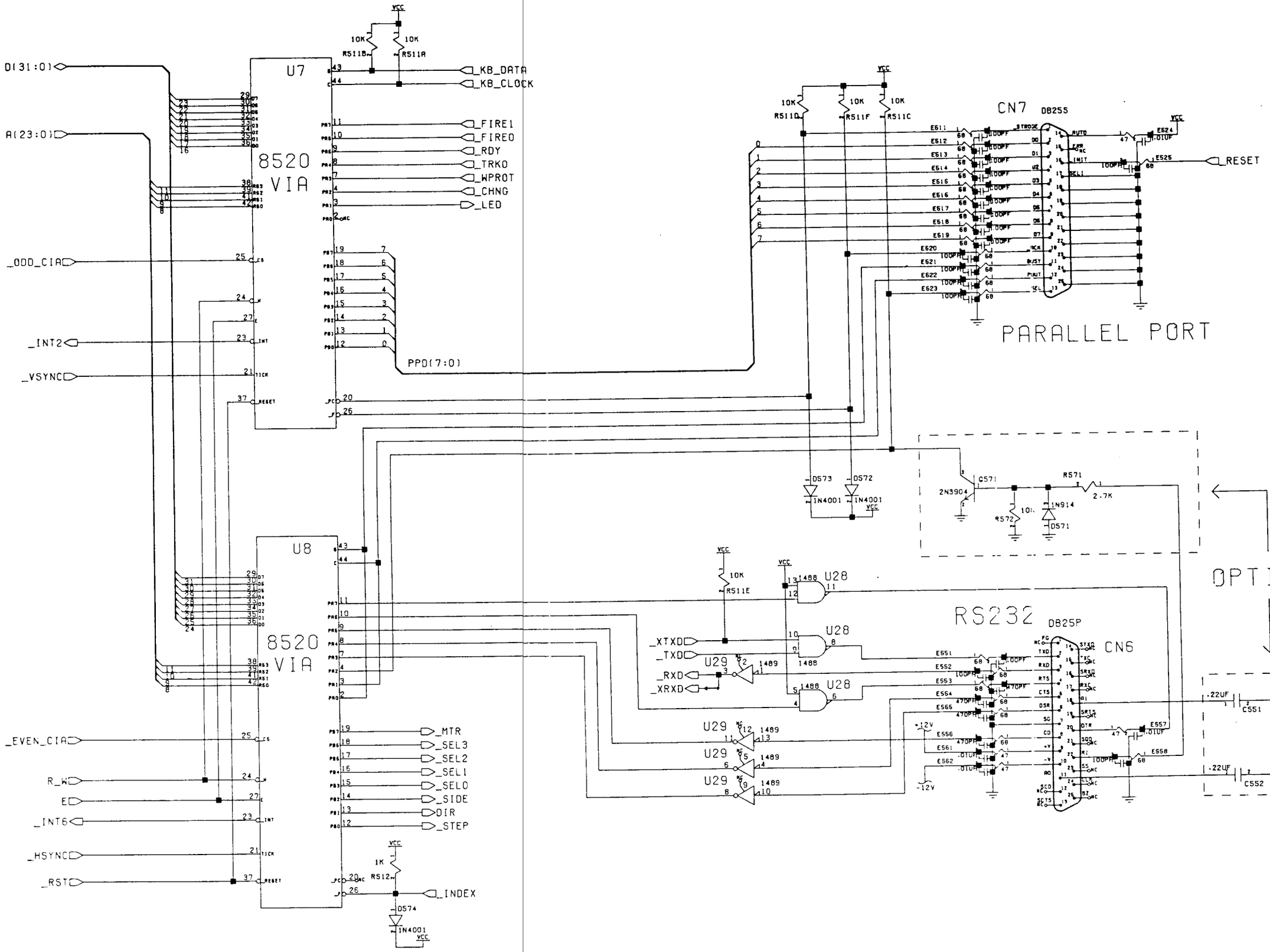
DECOUPLING



A1200 REV 1->1D PCB

THE REST OF THE FLOPPY STUFF

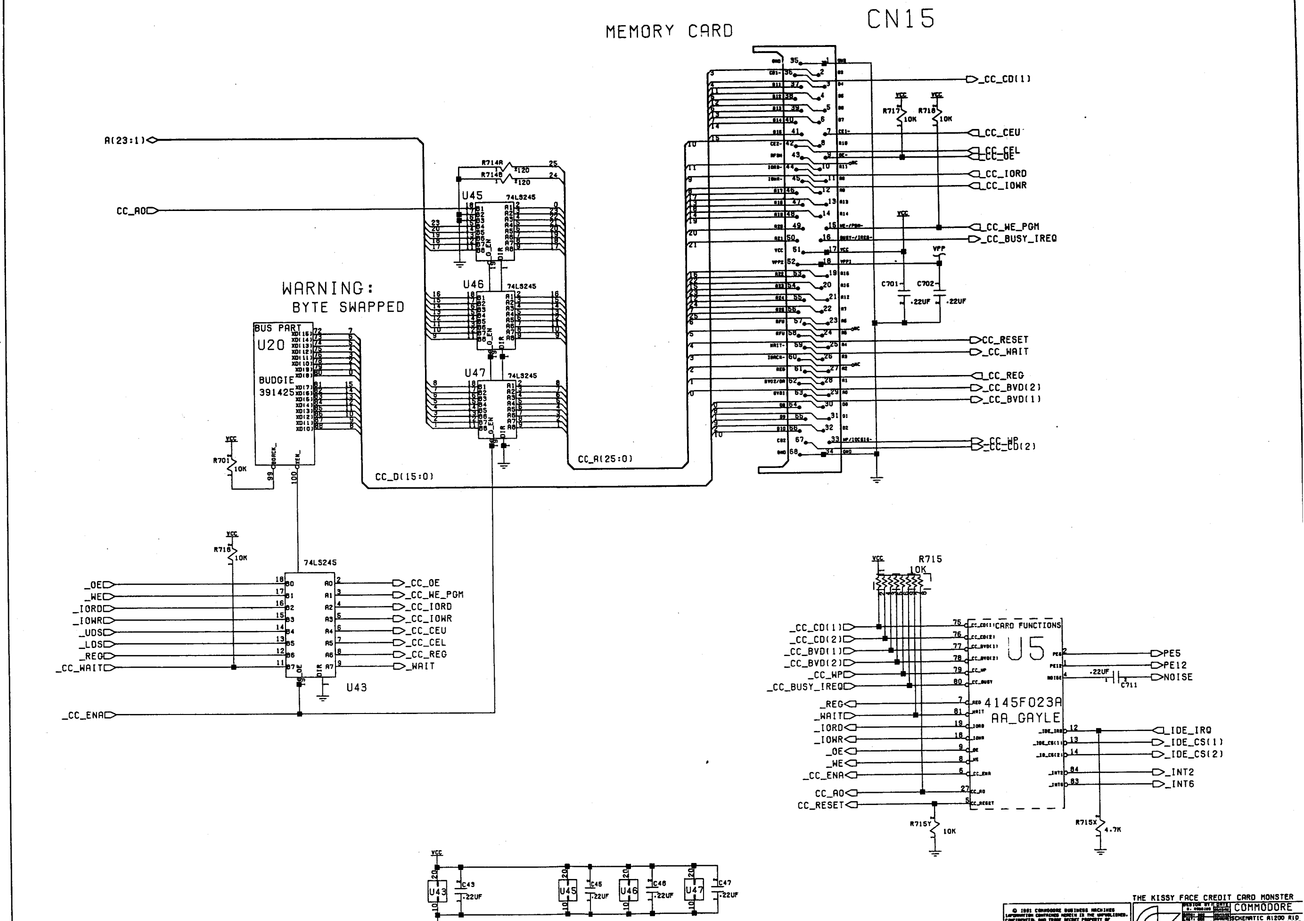
COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"
SIZE C 364717 REV 8
SCALE
SHEET 8 OF 13



A1200 REV 1->1D PCB

SERIAL AND PARALLEL PORTS

COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL 2"
SIZE C 364717 REV E
SCALE
SHEET 7 OF 13



A1200 REV 1->1D PCB

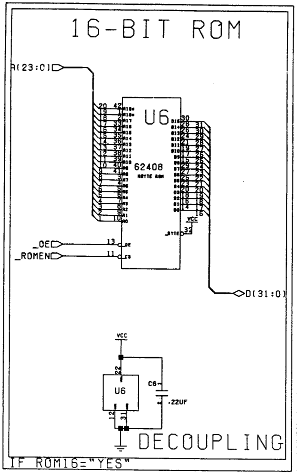
THE KISSY FACE CREDIT CARD MONSTER

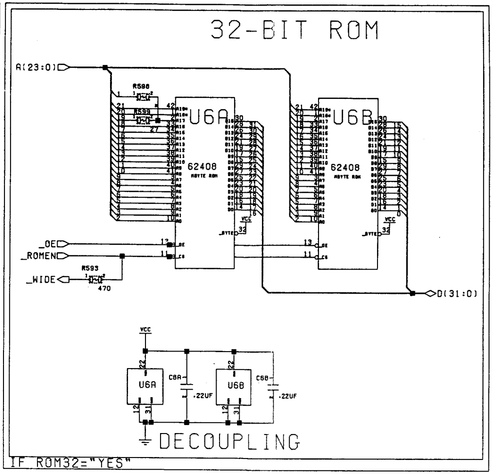
COMMODORE

SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"

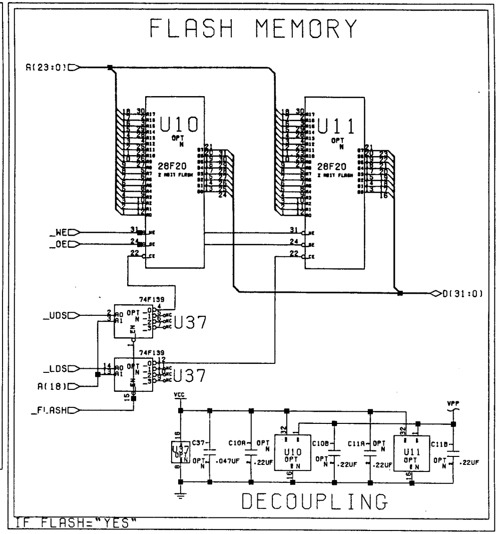
C 364717

C.A.D. GENERATED
NO MANUAL CHANGES MAY BE MADE TO THIS DOCUMENT

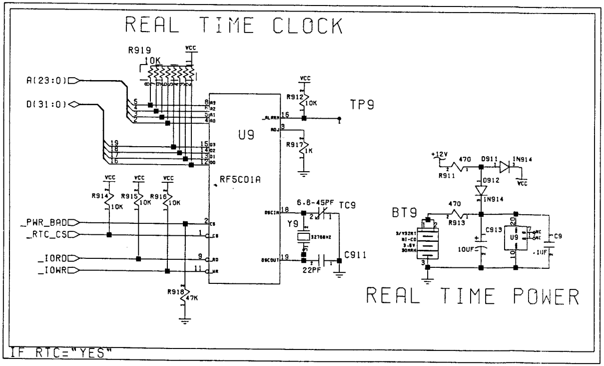




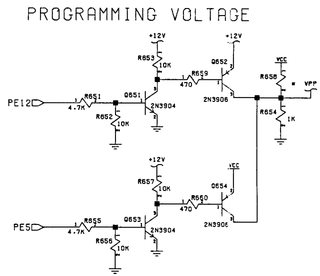
16 AND 32-BIT SOCKETS MAY OVERLAP!



OPTIONAL FLASH MEMORY



OPTIONAL REAL-TIME CLOCK/CALENDAR



A1200 REV 1->1D PCB

ROM - PLAIN AND FANCY - DODADS TOO1

C.A.D. GENERATED
NO MANUAL CHANGES MAY BE MADE TO THIS DOCUMENT

COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"
SIZE C 364717 B
SCALE
SHEET 10 OF 13

DRD(31:0)

DRA(9:0)

BDRA(8:0)

D(31:0)

DRAM

U18-19 OPTIONAL

391425 BUDGIE

BRIDGE/DRAM PART

_RAS

_CAS

_DWE

_DBR

A(1)

A(0)

SIZE_1

SIZE_0

R_W

_DS

_OEB

_RST

_ROE

_BRAS(1)

_BRAS(0)

_BCAS_UU

_BCAS_UM

_BCAS_LM

_BCAS_LL

_BWE

_BCAS_XX

_UDS

_LDS

U18-19 OPTIONAL

DECOUPLING

DECOUPLING

A1200 REV 1->1D PCB

MEMORY AND...WELL. I USED TO REMEMBER

COMMODORE

SCHEMATIC A1200 RID
C/A1200 MAIN BOARD
"CHANNEL Z"

SIZE C 364717 E

SCALE

SHEET 3 OF 13

KEYBOARD TAIL

CN13

KEYBOARD MPU

U13

68HC05C

KEYBOARD MICRO

22PF Y621 C621 3MHZ R628 1M 22PF C622

OSC2 OSC1

INC1 INC2 INC3 INC4

R621 4.7KX9

PD7 PD5 PD4 PD3 PD2 PD1 PD0

PC7 PC6 PC5 PC4 PC3 PC2 PC1 PC0 R622 100

PB7 PB6 PB5 PB4 PB3 PB2 PB1 PB0

PA7 PA6 PA5 PA4 PA3 PA2 PA1 PA0

TCMP TCAP

R624 4.7KX9

R625

R626

R623 10K

_KB_CLOCK

_KB_DATA

_KB_RESET

IRQ

RESET

R629 10K

RMSVA43A U49

C629 .33UF

POWER OK

_PWR_BAD

KB LEDS

_IDE_LED R631 10K R632 4.7K Q631 2N3906

_CC_ENA R637 R638 Q634

OPTIONAL

_MTRO R633 10K R634 4.7K Q632 2N3906

_LED R635 10K R636 4.7K Q633 2N3906 R639 100

8-PIN SIL

CN14

U13 POWER C13 .22UF

THE NEW HOME OF THE KEYBOARD VIRUS

COMMODORE

SCHEMATIC A1200 RIO C/A1200 MAIN BOARD "CHANNEL 2"

SIZE C 364717 B

SCALE

SHEET 9 OF 13

A1200 REV 1->1D PCB

MOUSE/JOYSTICK PORTS

LEFT JOY
CN1
DB9P CN1A

RIGHT JOY
CN2
DB9P

U34
74LS166

R370
4.7K

U3
PAULA
8364

_IPL(2:0)
_IPL2
_IPL1
_IPL0

DRD(31:0)
DRD15
DRD14
DRD13
DRD12
DRD11
DRD10
DRD9
DRD8
DRD7
DRD6
DRD5
DRD4
DRD3
DRD2
DRD1
DRD0

RGA(8:1)
RGA8
RGA7
RGA6
RGA5
RGA4
RGA3
RGA2
RGA1

DMAL
CCK
CCKQ
_RST
RESET

POTOY
POTOX
POT1Y
POT1X

_FIRE0
_FIRE1

POY
POX
P1Y
P1X

C312 C311 C314 C313
.047UF .047UF .047UF .047UF

C352 C362
.22UF

_INT6
_INT3
_INT2

_RXD
_TXD

_DKRD
_DKWD
DKWE

RIGHT
LEFT

MDAT
_MLD
CCK_A
_RESET

NOISE
AUDIN
IRIGHT
ILEFT

U15
LF347
/TL084

AVREF

Q331 Q321
MPF102

C331 C332 C333 C334
C321 C322 C323 C324
3900PF
6800PF
22UF-NP

R329 R339 R331 R332 R333 R335 R336
R321 R322 R323 R324 R325 R326 R327 R337 R345
10K
1.5K
2K
470K
22K

CN3
CN4
RCA JACK
RIGHT
LEFT

MONO
AUDOUT

_LED
U28
1488
Q341
2N3906
R347 2.7K
R346 10K
R349 33K
R348 4.7K
C349 .01UF
+PV
+AV
-AV

NOTE: LED OFF, FILTERS BYPASSED

AUDIO FILTERS

PAULA PREFERS THE TRADITIONAL MODES

C.A.D. GENERATED
NO MANUAL CHANGES MAY BE MADE TO THIS DOCUMENT

DESIGN BY: | DATE:
D. SHIELDS | 03/27/90
APPD:
MFG'D:
LAST: QFB | 05/08/92

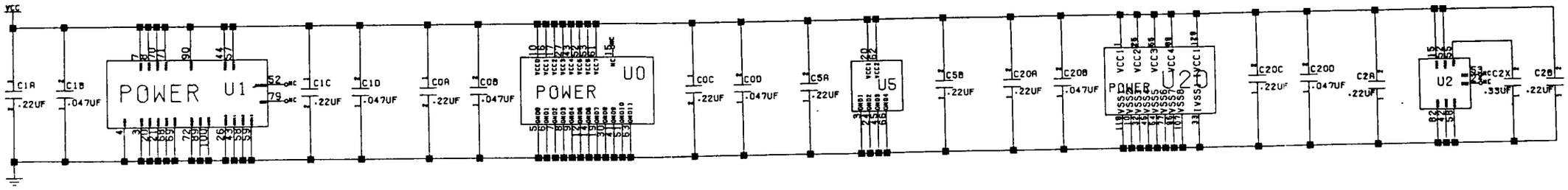
COMMODORE
SCHEMATIC A1200 RID
C/A1200 MAIN BOARD
"CHANNEL Z"

SIZE C | 364717 | REV B
SCALE | SHEET 5 OF 13

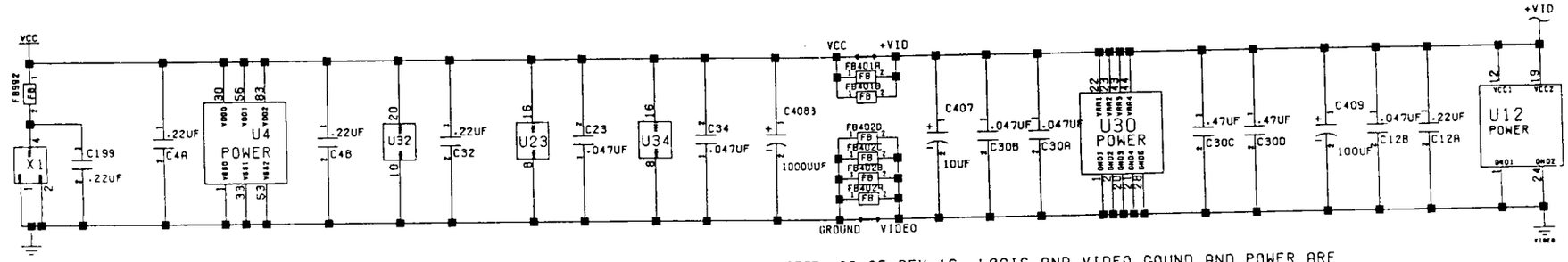
PATH: /PROJECT/A500/CHANNEL_Z | REV: | SHEETS

A1200 REV 1->1D PCB

GENERAL DECOUPLING



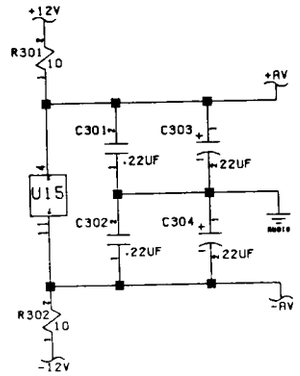
VIDEO DECOUPLING



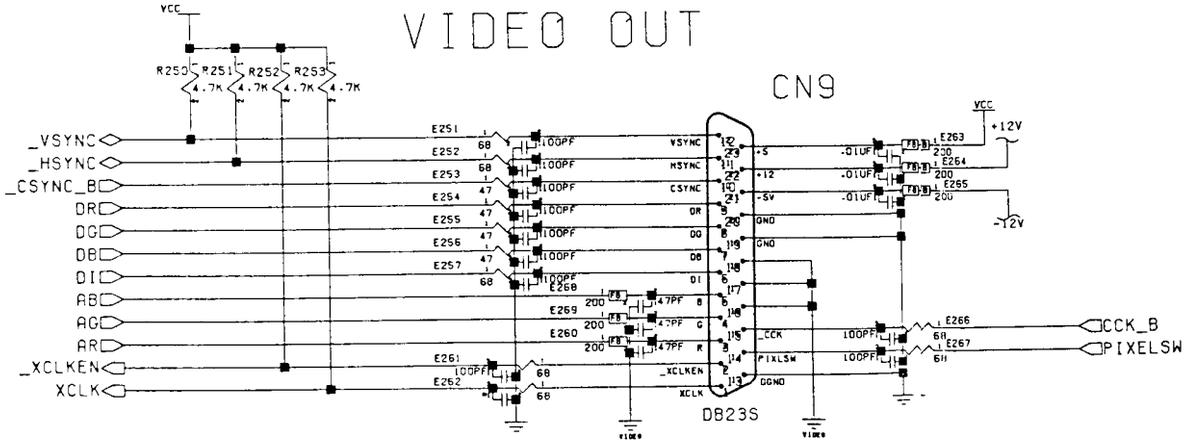
NOTEE: AS OF REV 1C, LOGIC AND VIDEO GOUND AND POWER ARE
THE SAME NET, BUT REOUTED DISCRETELY EXCEPT AT DAC1

ALSO ADDED C30C AND C30D FOR OVERKILL DAC DECOUPLING.

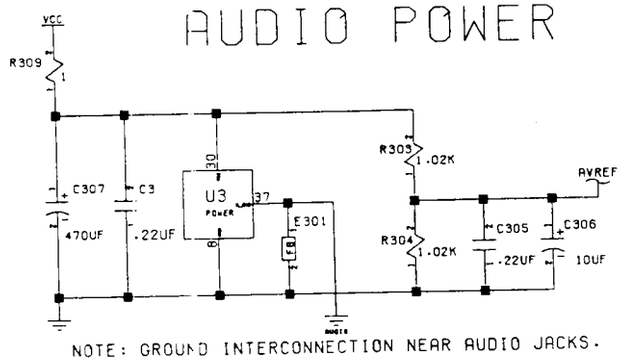
AUDIO DECOUPLING



VIDEO OUT



AUDIO POWER



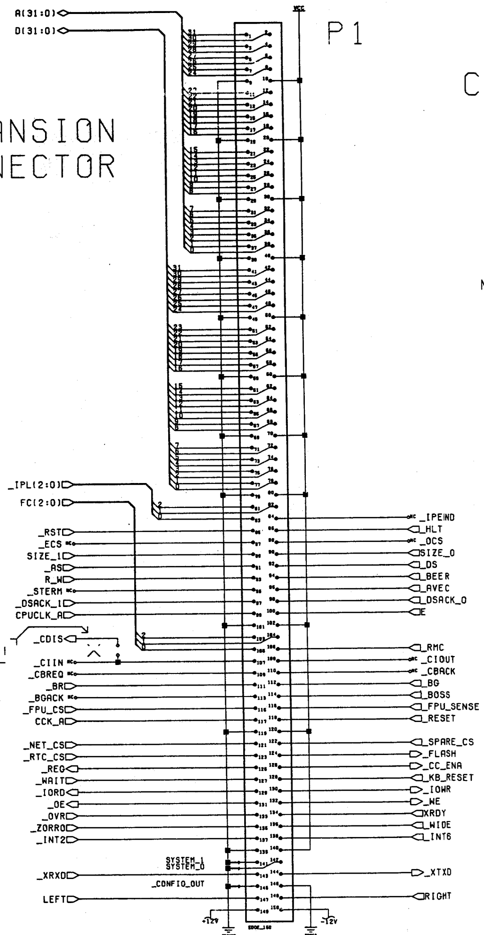
NOTE: GROUND INTERCONNECTION NEAR AUDIO JACKS.

PARTY OUT OF BOUNDS, WHAT A MESS...

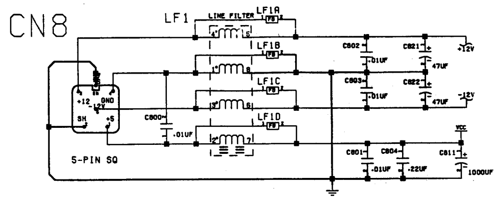
COMMODORE
SCHEMATIC A1200 R1D
C/A1200 MAIN BOARD
"CHANNEL Z"
SIZE C | 364717 | B
SCALE | SHEET 6 OF 13

A1200 REV 1->1D PCB

EXPANSION CONNECTOR

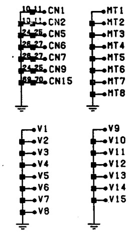


POWER INPUT

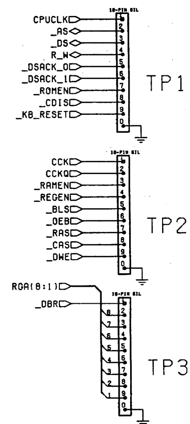


NOTE: HEAVY LINES INDICATE A SINGLE POINT CONNECTION

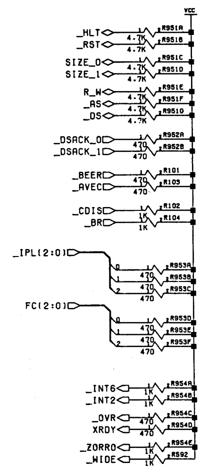
HOLES &C.



TEST ACCESS



TERMINATION



SYSTEM CONFIGURATION BITS

SYSTEM 1	SYSTEM 0	CPU/CPUCLK
0	0	EC020/14MHZ
0	1	020/14MHZ
1	0	030/14MHZ
1	1	030/>14MHZ

A1200 REV 1->1D PCB

POWER DISTRIBUTION AND DECOUPLING

COMMODORE

SCHEMATIC A1200 R1D C/A1200 MAIN BOARD "CHANNEL Z"

364717

SHEET 13 OF 13

C.A.D. GENERATED