Commodore

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A4000

Pilot Production Release #300
Document distributed August 28, 1992

Contents

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A4000

Pilot Production Release #300
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Contents (cont'd from page 1)

APPROVED VENDOR LIST

This sheet must be removed from this document before the document is shown or transmitted to a vendor.

Commodore Part Number	Vendor	Vendor Part Number
313248-01	CHINON	FB-357A
313248-03	CHINON	(TBD)

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET i OF iiii

PROCUREMENT SPECIFICATION

This sheet must be removed from this Part Specification document before the document is shown or transmitted to a vendor.

REVISION: A
USED ON: A3000/A3000T
AS CPN: 313248-01

VENDOR PRODUCT INFORMATION

1. DEVICE IDENTIFICATION

VENDOR	CHINON
PRODUCT DESCRIPTION	3.5 Floppy Disk Drive
MODEL NUMBER	FB357A
PCB:	
PCBA:	
FIRMWARE:	

2. VENDOR DOCUMENTATION

PRODUCT MANUAL
PRODUCT SPECIFICATION
SCHEMATIC

3. OPTIONS:

4. LOCATION OF MANUFACTURE (Top Assembly)

Country
Facility
Lines

5. COMMENTS:

A. 313248-01 includes no bezel and does contain button specific to A3000/A3000T.

B. Refer to sheet iiii of iiii for jumper configuration.

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET ii OF iiii

PROCUREMENT SPECIFICATION

This sheet must be removed from this Part Specification document before the document is shown or transmitted to a vendor.

REVISION: A
USED ON: A4000
AS CPN: 313248-03

VENDOR PRODUCT INFORMATION

1. DEVICE IDENTIFICATION

VENDOR	CHINON
PRODUCT DESCRIPTION	3.5 Floppy Disk Drive
MODEL NUMBER	(TBD)
PCB:	
PCBA:	
FIRMWARE:	

2. VENDOR DOCUMENTATION

PRODUCT MANUAL
PRODUCT SPECIFICATION
SCHEMATIC

3. OPTIONS:

4. LOCATION OF MANUFACTURE (Top Assembly)

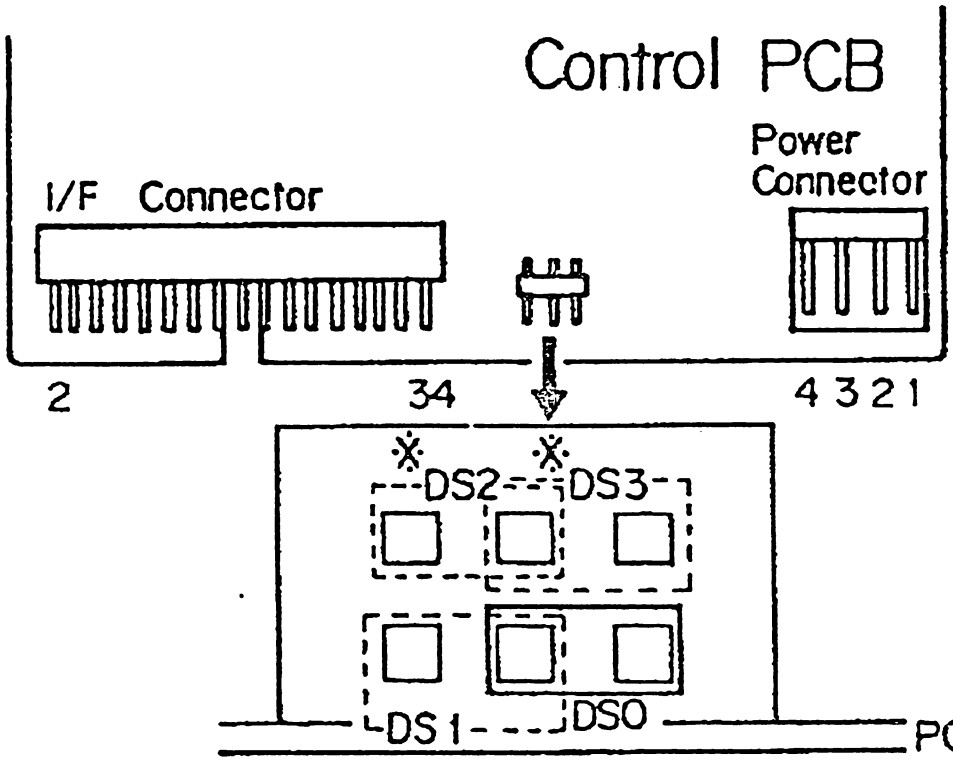
Country
Facility
Lines

5. COMMENTS:

A. 313248-03 includes 101.6 mm bezel and standard button.

B. Refer to sheet iiii of iiii for jumper configuration.

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET iii OF iiii



※ Option

JUMPER CONFIGURATION - CHINON FZ-357A

Commodore			TITLE FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER 313248	REV. A	SCALE	SHEET iiii OF iiii

APPLICATION		REVISION			
NEXT ASSY.	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A3000/A3000T/A4000	A	SPECIFICATION RELEASE	3-18-92	JCB

1.0 GENERAL

This product Specification describes the requirements for a dual speed, double sided, micro-flexible disk drive. This 3.5 inch disk drive shall be designed and manufactured for use as an internal peripheral device for the Amiga A3000, A3000T, and A4000 computers. The flexible disk drive as described herein shall be purchased as an OEM product. This device shall be 32mm in height.

1.1 APPLICABLE DOCUMENTS

Commodore Engineering Policy 1/02.010; OEM Environmental Requirements
UL 478/114; Electronic Data processing Units and Systems
CSA 22.2 Data processing Equipment #143 and #154 Consumer and Commercial Products
Commodore/Amiga FDD EMI Susceptibility Test Procedure TP009
FCC Part 15 subpart J Class B computing equipment

1.2 SOURCES

Refer to Approved Vendor List

1.3 USAGE

1.3.1 A3000/A3000T - 313248-01 (no bezel, contains button specific to A3000 and A3000T)

1.3.2 A4000 -313248-03 (101.6 mm bezel and standard button)

COMMODORE P. N.	STATUS				
313248-01	ACTIVE				
313248-02	INACTIVE				
313248-03	ACTIVE				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
ANGLES +/- 1 DEGREE
2 PLACE DECIMALS +/- 0.02
3 PLACE DECIMALS +/- 0.010

DRAWN Mike Rivers		DATE 5/7/92
SYSTEM ENG.		DATE 5/8/92
TEST ENG		DATE
COMP. ENG Harvey Harman		DATE
CIRCUIT ENG.		DATE

Commodore

1200 WILSON DRIVE
WEST CHESTER, PA. 19380
(215) 431-9100

TITLE:

FLEXIBLE DISK DRIVE,
DUAL SPEED, 2MB, 3.5 INCH

SIZE	DRAWING NUMBER
A	313248
SCALE	SHEET 1 OF 34

1.2 GENERAL DESCRIPTION

This unit shall feature: low power consumption (0.97 W in stand-by mode, and 1.8W in operation mode). Quiet, high precision lead screw head positioning mechanism, producing a single track-to-track seek time of 3 msec. A "soft-landing" mechanism to protect the head and disk against disk-loading impact. Higher track density allows 2MB capacity with double-density (MFM) unformatted disk. Metal in Gap (MIG) head to allow 1MB compatibility with existing drives. A 2HD switch to automatically set the drive to either 1MB or 2MB mode. In Amiga mode the drive shall read and write 2DD disks at 300 rpm and 2HD disks at 150 rpm. In PC mode the drive shall read and write both 2DD and 2HD disks at 300 rpm.

Refer to table 1 - General Requirements.

This specification reflects the industry standard 90 mm (3.5 in) disk drive. Areas where the vendor shall take extra caution are:

1)The location and size of the eject button.
2) The color of the LED (yellow).

1.3 FUNCTIONAL DESCRIPTION

1.3.1 Read/Write and Control Electronics

The read/write mechanism shall consist of two (2) read/write heads, a head position actuator drive and an elevator assembly. The control electronics shall include read/write amplifier and transition detector, drive select circuits, control logic, side select circuits, index and write protect circuits and spindle motor/drive control circuits. The logic in the drive shall prevent the head from stepping outward when it is on the zero track.

1.3.2 Drive Mechanism

The 150/300 RPM spindle is powered by a direct drive, brushless DC motor under the control of the servo speed circuitry. A magnetic chucking device in conjunction with a stainless steel hub on the media shall provide precise media positioning. A mechanical interlock shall insure proper media insertion.

1.4 TIMING RELATIONSHIPS

Using Table 2, locate the appropriate Figure for the applicable Timing Relationship.

1.5 DESTINATION (Geographic)

There are no Alternating Current (AC) or frequency (Hz) requirements for this flexible disk drive. Therefore, restrictions on the country/area where it may function do not apply. This floppy disk drive assembly shall conform with all UL, FCC,TUV, FTZ, and CSA regulatory requirements.

Table 1

PARAMETER			CHARACTERISTIC	
RECORDING MODE			MFM	
Storage Capacity	UNFORMATTED	Per Disk	2M bytes	1 M byte
		Per Track	12.5 K bytes	6.25 K bytes
	FORMATTED	Per Disk	1,474.56 K bytes	737.28 K bytes
		Per Track	9,216 bytes	4,606 bytes
		Sector Number	18	9
		Per Sector	512 bytes	
Recording Density			17,434 BPI	8,717 BPI
Data Transfer Rate			250(500) K bits per second	250 K bit per second
Access Time	Power-on to Ready Time		0.5 sec or less Note 2	
	Single Track Seek Time		3 msec	
	Average Access Time		95 msec	
	Settling Time		15 msec	
	Average Latency Time		200(100) msec	100 msec
Rotation Speed			150(300) rpm	300 rpm
Number of Tracks			160 Note 1	
Number of Cylinders			80 Note 1	
Track Density			135 TPI	
Number of Heads			2	
Number of Indices			1	
Track Radius	Outer Track	Side 0	39.5 mm	
		Side 1	38.0 mm	
	Inner Track	Side 0	24.6875	
		Side 1	23.1875	

Long-Term Speed Variation: Less than +/- 1.5 %
Instantaneous Speed Variation: +/- 3.0 % ISV Average (see note 3)

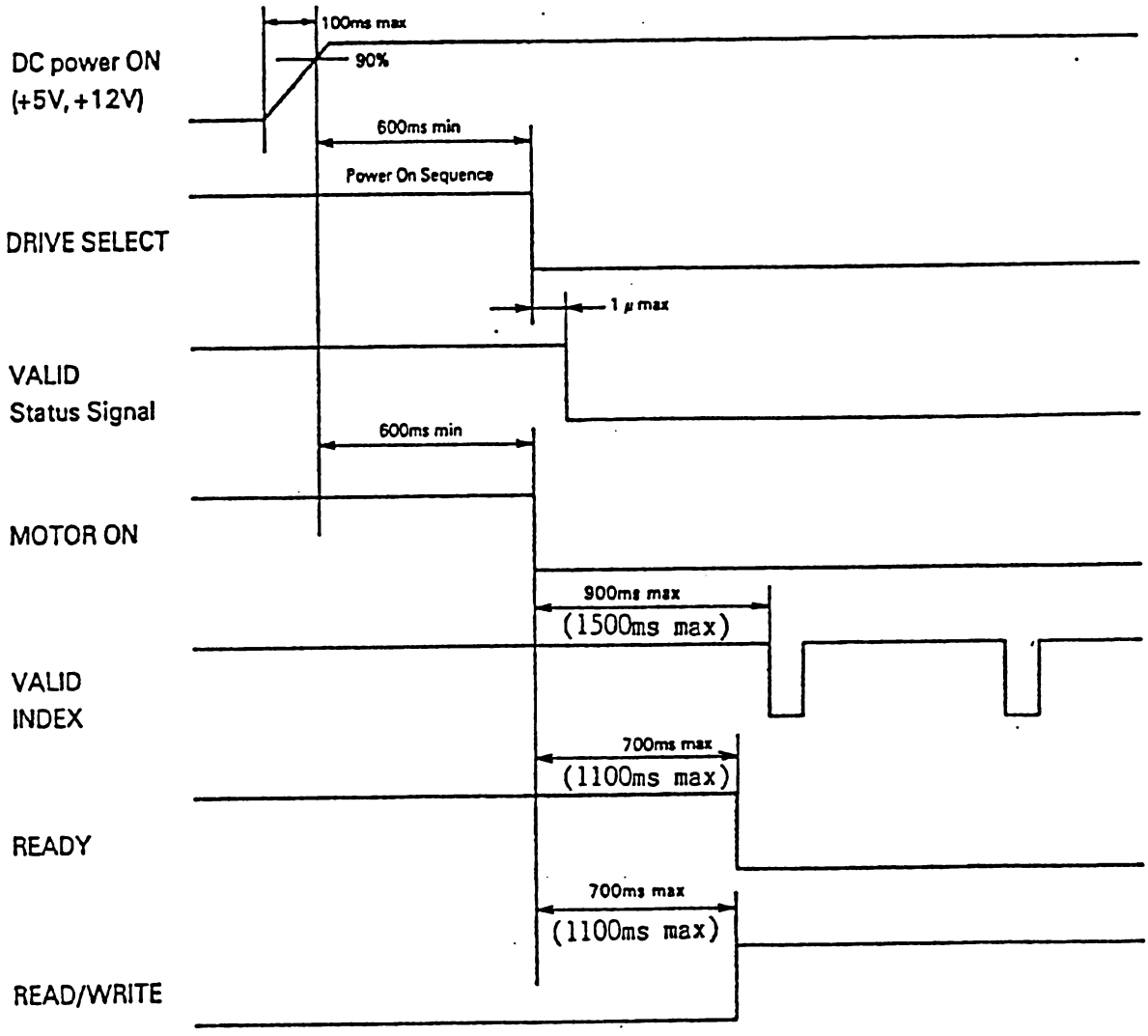
Window Margin: Greater than 800 nanoseconds on 'Specified Test Track MFM' Method;
PLO Separator and Zero Write Compensation
Overwrite Ratio (TRACK 0): - 26 dB Signal Level after Erasure

( ) indicates PC mode

1- While the disks are formatted for 160 cylinders on 80 tracks (0 to 79) the drive must allow access to tracks 80 and 81.
2- Time Required for the motor to reach the normal operating speed after startup.
3- Instantaneous speed variation may be higher, provided the result of Average Speed Variation and Instantaneous Speed Variation does not exceed 3%.

TABLE 2 - TIMING RELATIONSHIPS

FUNCTION	FIGURE
CONTROL TIMING	1
READ TIMING	2
WRITE TIMING	3
ACCESS TIMING	4
READ DATA TIMING	5
WRITE DATA TIMING	6
WRITE TIMING	7
STEP MOTOR-ON	8
RADIAL ALIGNMENT	9
DISK CHANGE SIGNAL	16



The drive requires a power-on sequence delay of 600 ms. DRIVE SELECT is ignored during this delay time.

( ) : 2MB / 150rpm MODE

FIGURE 1
CONTROL TIMING

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 5 OF 34

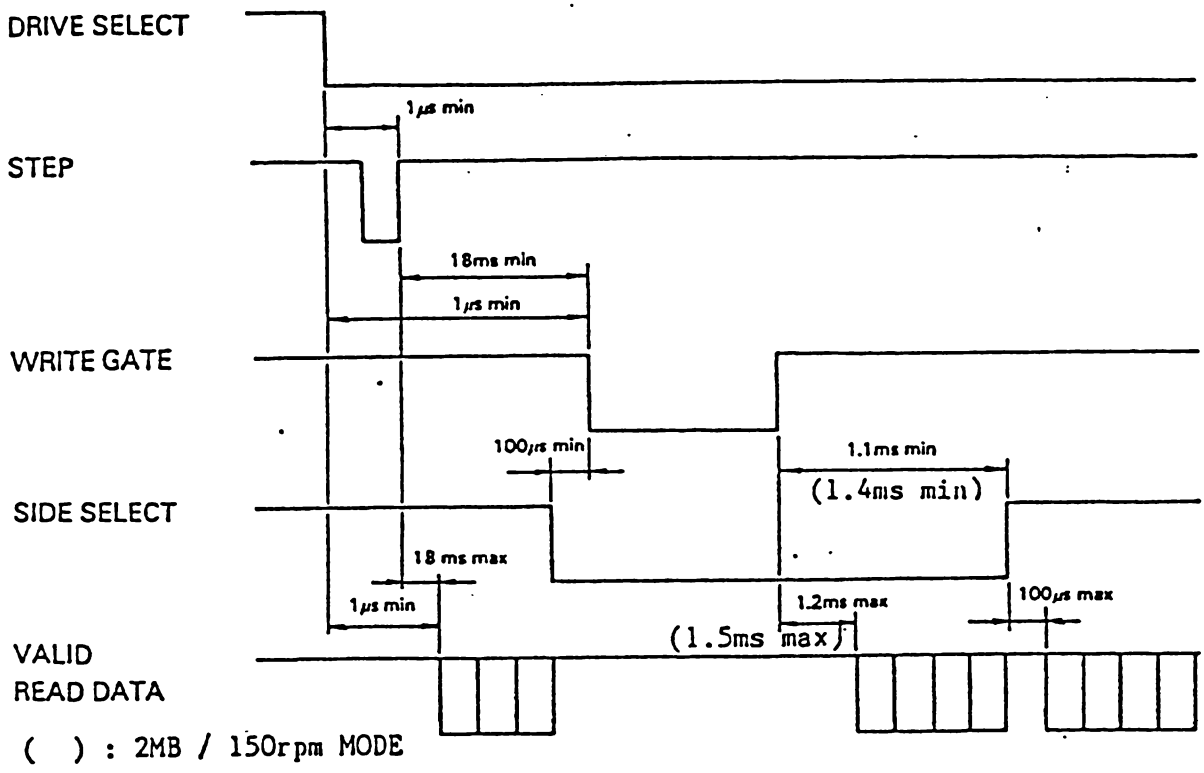


FIGURE 2
READ TIMING

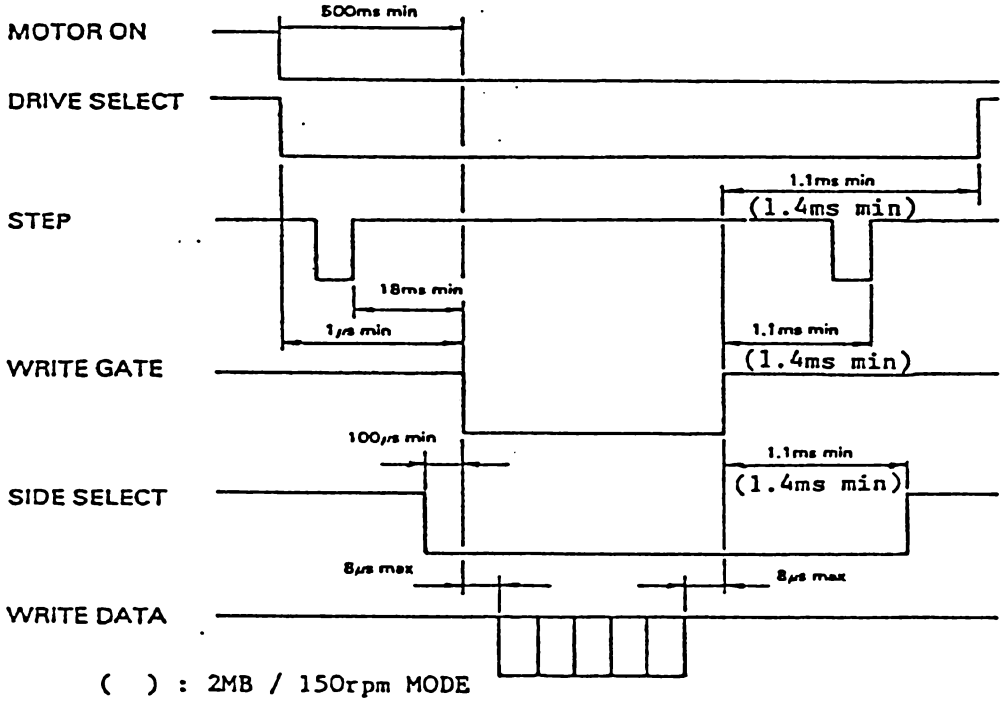


FIGURE 3 - WRITE TIMING

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 6 OF 34

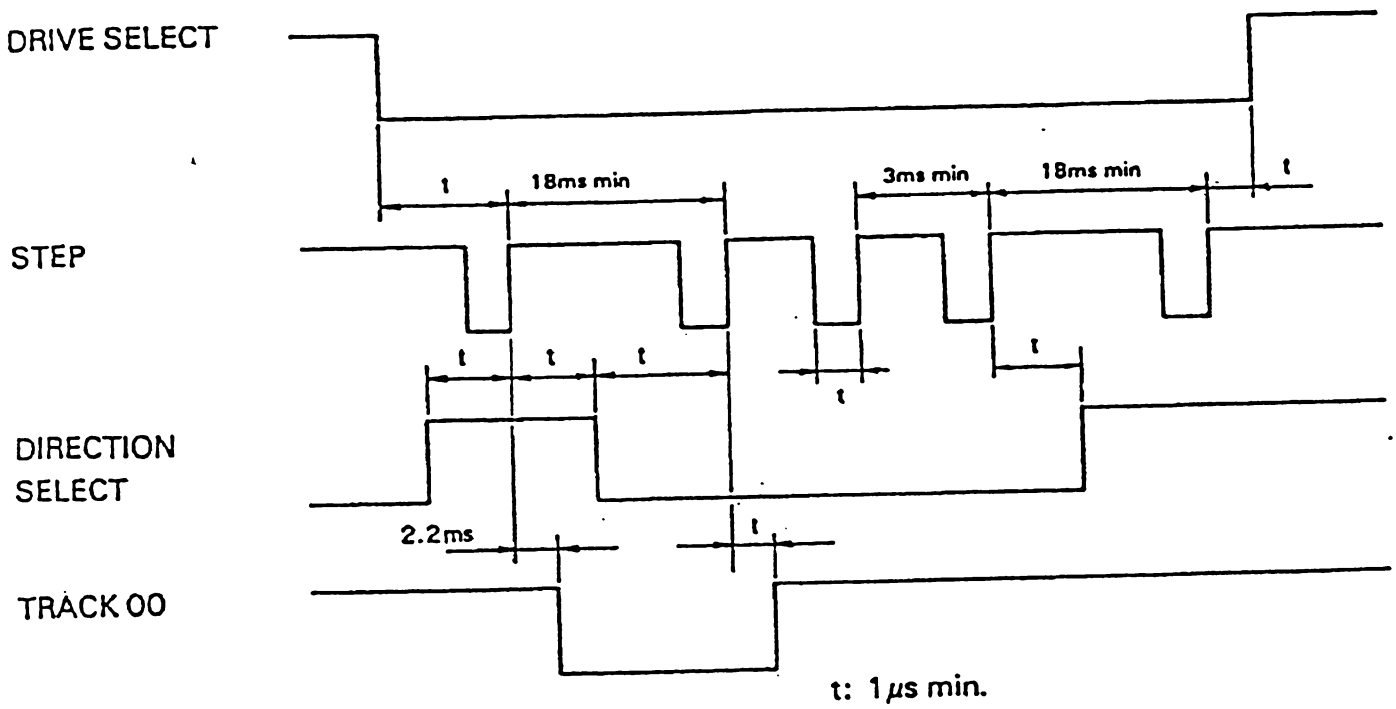


FIGURE 4 - ACCESS TIMING

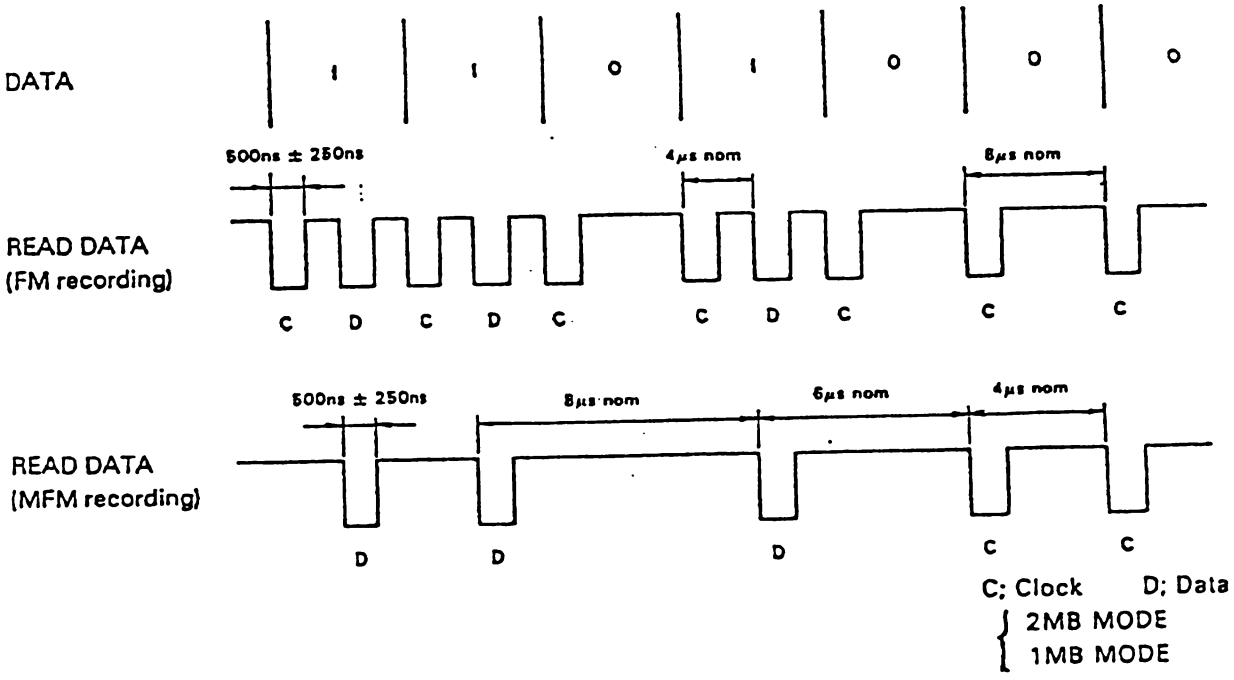


FIGURE 5 - READ DATA TIMING

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 7 OF 34

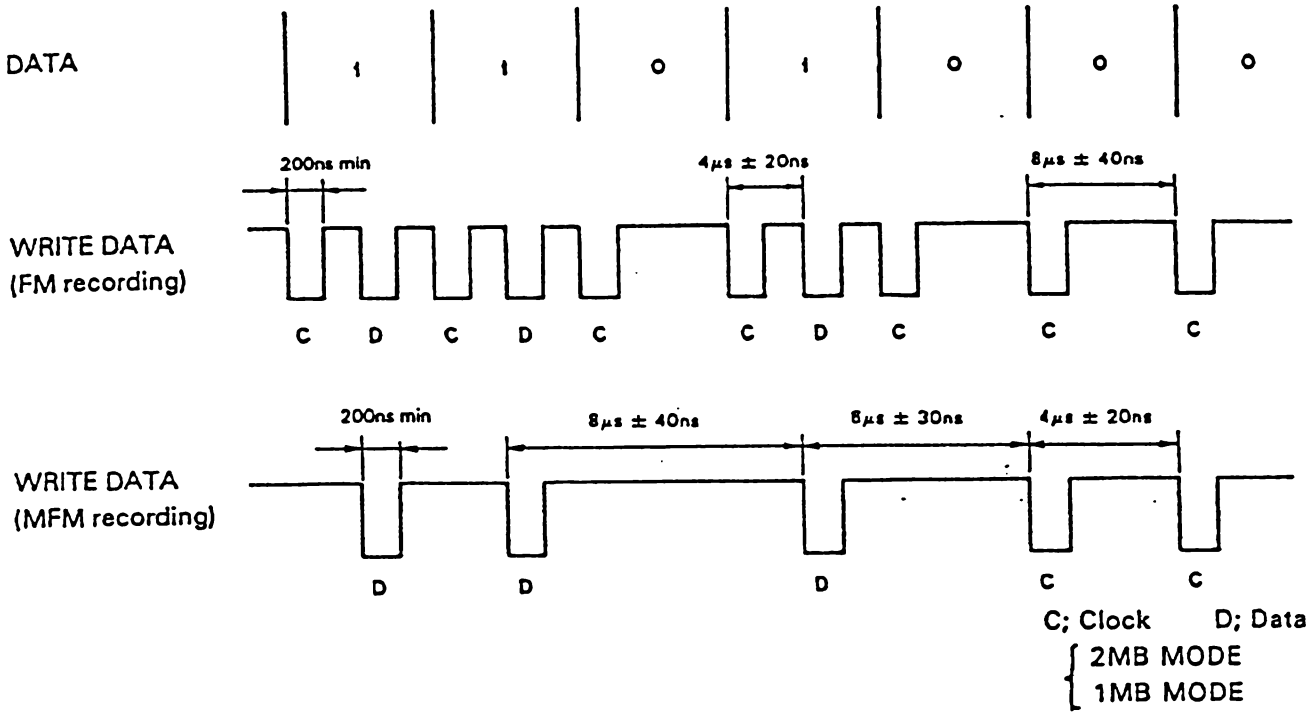


FIGURE 6 - WRITE DATA TIMING

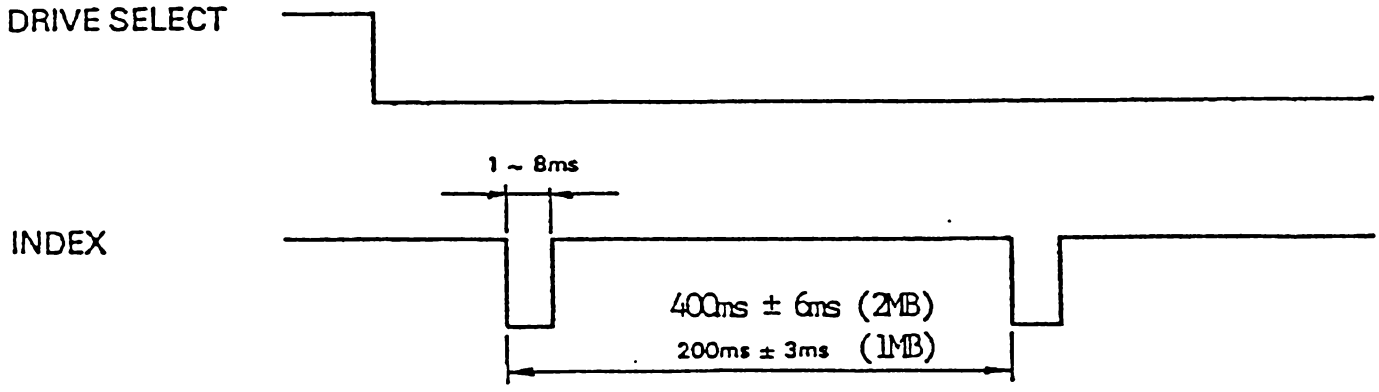


FIGURE 7 - WRITE TIMING

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 8 OF 34

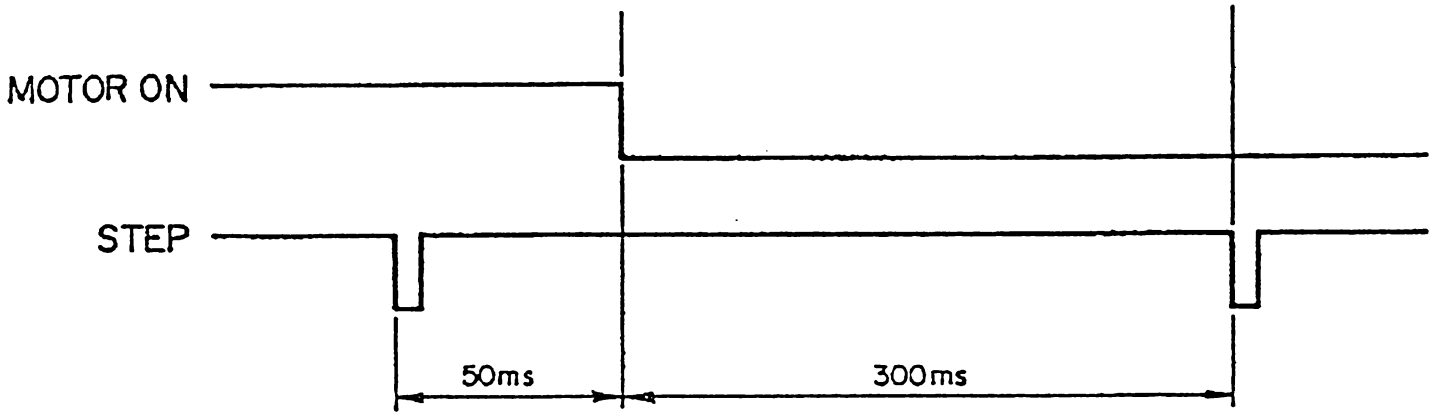


FIGURE 8 - STEP-MOTOR ON TIMING

Commodore			TITLE FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER 313248	REV. A	SCALE	SHEET 9 OF 34

1.6 RESTRICTIONS

The internal housekeeping logic and mechanical operation may vary between Vendors, provided the requirements of this specification are attained.

1.7 CONFIGURATION - MULTIPLE FDD's

The flexible disk drive may be operated as a 'Daisy-Chain' or 'Star' (Radial) (Figure 4) configuration. System configuration is limited to four (4) FDD's, (0,1,2,3).

1.8 ALIGNMENT

Alignment test should be preformed at 25°C +/- 5% with a relative humidity of 50% +/- 5%. The test procedure is outlined in the drive exerciser manuals. The following limits shall apply:

RADIAL ALIGNMENT	±25 µm max (lobe Δ <20% per Dysan Interregator plus)
INDEX to BURST	400 ± 200 µs at 300rpm
2F/1F SIGNAL AMPLITUDE	50%
AZIMUTH	+/-30 minutes max.

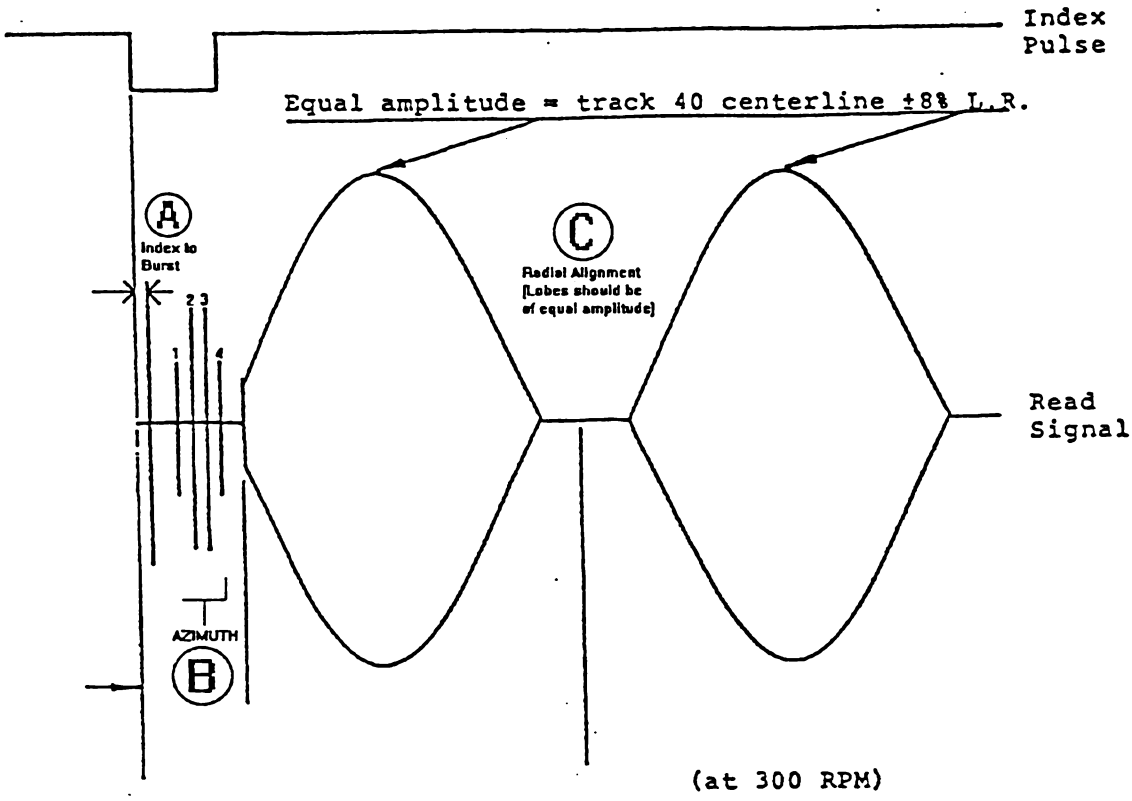
1.9 EMI SUSCEPTIBILITY TEST (as per Commodore Qualification Test Procedure TP009)

1.9.1 READ MARGIN:

A floppy drive tester shall be used while reading and recording in the READ (Window) margin on tracks 00, 40, and 79. The CRT simulator coil shall be held 1" from the drive in worst case location. Refer to test procedure TP009 for details.

1.9.2 SEEK TEST:

Install drive in system and insert Commodore-Amiga 3ms - 10ms SEEK TEST DISK. SEEK TEST shall be allowed to run for 15 minutes to assure that the drive is error-free. Refer to test procedure TP009 for details.



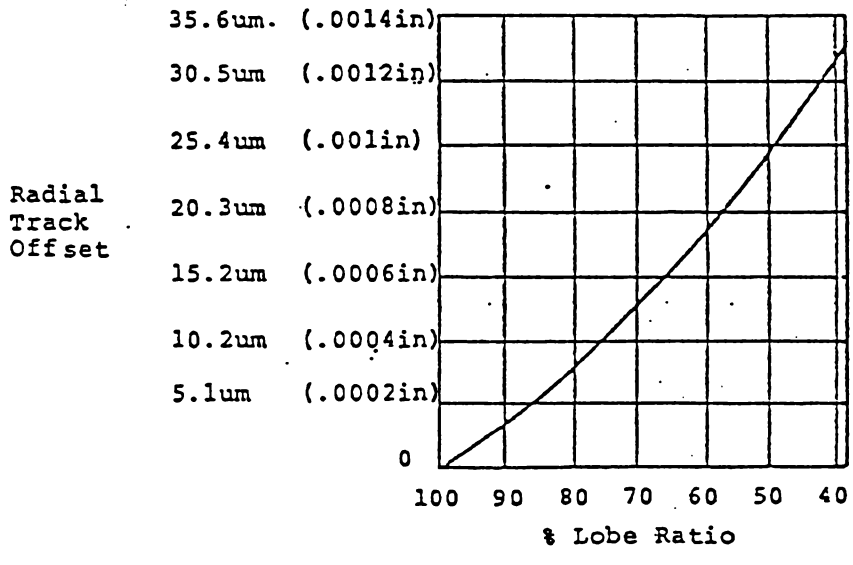


FIGURE 9 - RADIAL ALIGNMENT

A = 400 +/- 200 µs
B = Traces 1&4, 2&3 should be of equal amplitude
C = Lobes should be less than 28 %

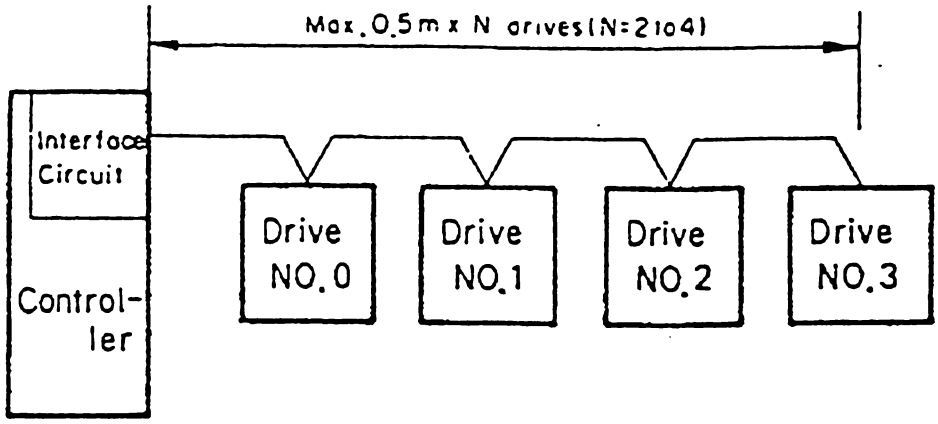
READ Resolution Check
READ Res.=(%resolution)(2Fampl./1F ampl.)(100)

Catseye Interpretation
R=(H-[(2xE)-S]/2
Where
R= Max useable range of pattern in inches.
H=Head Width in inches.
S=Width of unrecorded separation area between tracks in inches.
E= Pattern of eccentricity in inches.

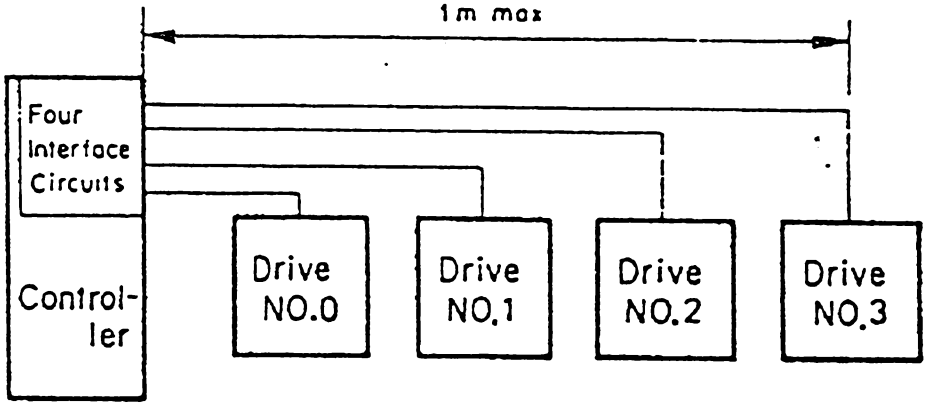
radial off-track displacement for given lobe ratio:

RO=[(1-LR)/(1+LR)]*[[H+[(2*E)-S]/2]
Where:
H = Head Width in inches
S= Width of unrecorded separation area between tracks in inches
E= Pattern eccentricity in inches.
RO = Radial off-track distance in inches
LR = Lobe Ratio (min lobe ampl/max lobe ampl)

Commodore	TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH			
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE:	SHEET 11 OF 34



Daisy Chain Configuration
(Four (4) Drives Maximum)



Star Configuration

NOTE: When only one (1) FDD is connected, the cable length shall not exceed one (1) meter.

FIGURE 10 - DISK CHAIN CONFIGURATIONS

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
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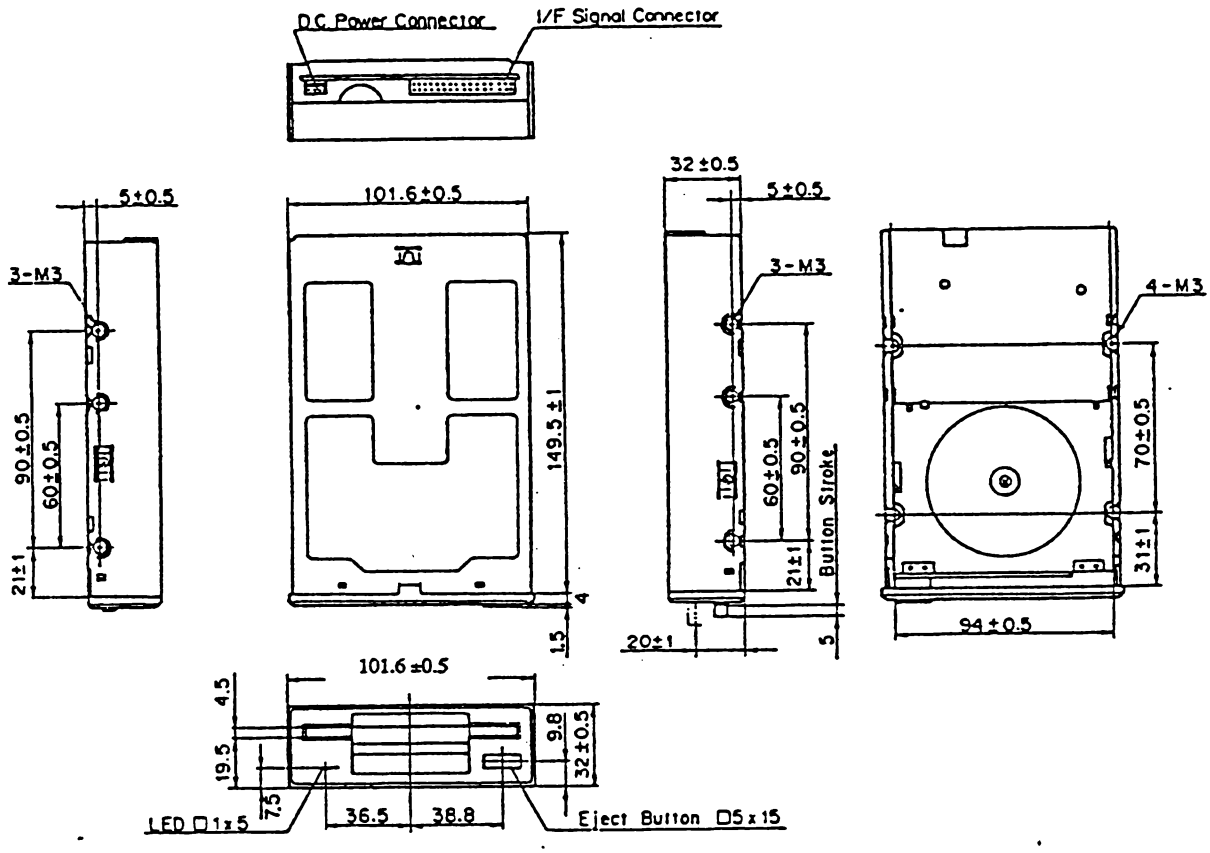


Note: Bezel only on -03 model)

FIGURE 11
DRIVE DIMENSIONS

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 13 OF 34

2.0 PHYSICAL REQUIREMENTS

2.1 PHYSICAL PARAMETERS

The FDD shall conform to the physical Mounting Locations and Dimensional Parameters as illustrated in Figure 5.

2.2 WEIGHT

Unit Weight shall not exceed 450 grams.

2.3 CABINET

Enclosure, not required.

2.4 CONTROLS and INDICATORS

2.4.1 Control Button - Eject

The Eject Button shall be accessible from the front of the disk drive for easy operator actuation. Refer to Section 2.1 (physical Parameters), for the required location. The eject button color shall be

2.4.2 Power-On Sequence (refer to flowchart, figure 7)

Some drives move the head to position 0 on power-on. This is allowed, but not required.

3.0 ELECTRICAL REQUIREMENTS

3.1 POWER and CURRENT

Refer to Table 5.

3.2 POWER SUPPLY INTERFACE

Refer to table 5.

3. 3 GROUNDING

Refer to Figure 11 for the applicable Ground Configuration.

3.4 I/O INTERFACE

Refer to table 6 for the applicable Interface Cable Configuration.

3.5 SIGNAL VOLTAGE LEVELS

The signal voltage shall engage the disk drive controller at the TTL level. For all I/O signals, LOW shall be the active level.

The input signal level shall be: LOW level 0.00V to +0.40V HIGH level +2.40V to +5.25V
Input Impedance 1 KΩ (center)

The output signal level shall be: LOW level 0.00V to +0.40V HIGH level 2.4 to +5.25V max (byreceiving the end terminator)

The output current shall be 48mA max. (LOW level) and 250μA (HIGH level). The input impedance shall be 1K ohms min.

For Daisy-chain connection, the formula is 1K ohm/n., where n is any number up to four-(4) interconnected disk drive units, (0,1,2,3).

3.6 INPUT SIGNALS

The interface signal has 11 input signal lines and 6 output signal lines.

MODE SELECT

This line (pin 1) shall control Amiga vs PC mode (low = Amiga/high = PC).

DRIVE SELECT 0 to 3 lines:

When one of these signal lines goes to LOW level, the drive corresponding to the signal line is selected and opens the I/O gate. Up to four drives shall be controlled using these four signal lines. The drive corresponding to one of the DRIVE SELECT 0 to 3 signal lines is determined by the position of the drive select programming device.

The programming device may be jumper pads or header/jumper combinations.

MOTOR-ON signal line:

This line controls the ON/OFF state of the spindle motor. when set to LOW level, the spindle motor operates. When set to HIGH level, the motor stops. 0.5 seconds (max) is the required start-up time for the spindle motor. This signal functions independently of the DRIVE SELECT signals.

It is preferred, but not required, that the Motor-On signal be ignored if no disk is inserted.

DIRECTION SELECT signal line:

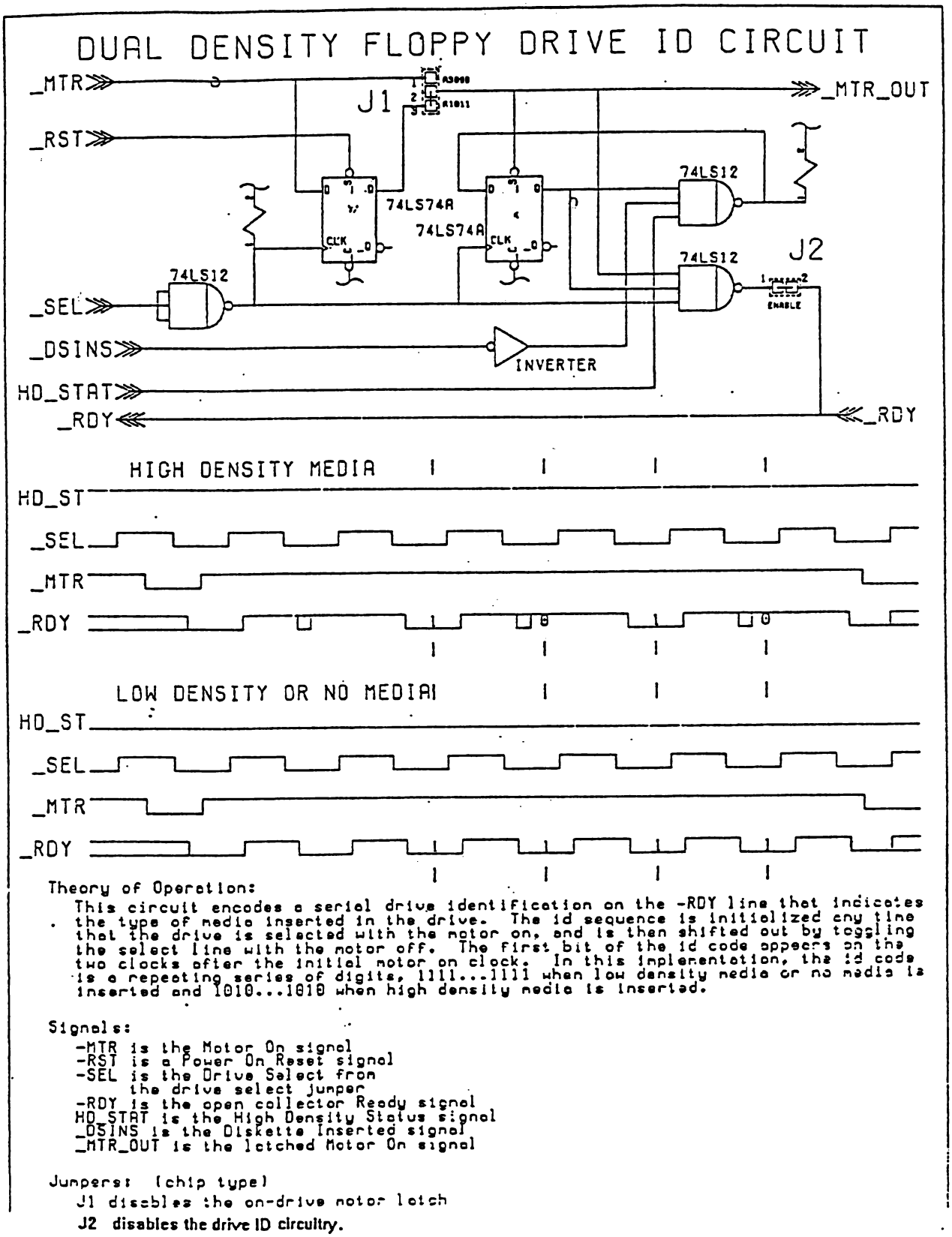
This signal determines the direction of head movement when a pulse is detected on the STEP signal line. When set to LOW level and a STEP signal pulse is detected, the head moves toward the disk center. When set to HIGH level and the STEP signal is detected, the head moves out from the disk center. The logic level of this signal will be retained no less than one (1) microsecond after the trailing edge of the STEP pulse.

STEP signal line:

This signal line controls the head movement. The drive head will step one track in the direction selected by the DIRECTION SELECT signal when the STEP signal changes from LOW to HIGH level. This signal is not accepted when the FDD is in WRITE mode. The head must be stabilized within 18ms (max) after the trailing edge of the last STEP pulse, and the FDD is ready for data read/write operation. This signal is also used as DISK CHANGE signal reset.

STEP pulses shall not cause head motion if DIRECTION is outward, and the Track "00" detect is already active.

It is preferred that head step be disabled if Track "00" is active and there is no disk inserted.



Theory of Operation:

This circuit encodes a serial drive identification on the -RDY line that indicates the type of media inserted in the drive. The id sequence is initialized any time that the drive is selected with the motor on, and is then shifted out by toggling the select line with the motor off. The first bit of the id code appears on the two clocks after the initial motor on clock. In this implementation, the id code is a repeating series of digits, 1111...1111 when low density media or no media is inserted and 1010...1010 when high density media is inserted.

Signals:

-MTR is the Motor On signal
-RST is a Power On Reset signal
-SEL is the Drive Select from the drive select jumper
-RDY is the open collector Ready signal
HD_STAT is the High Density Status signal
_DSINS is the Diskette Inserted signal
_MTR_OUT is the latched Motor On signal

Jumpers: (chip type)

J1 disables the on-drive motor latch
J2 disables the drive ID circuitry.

FIGURE 12 - DRIVE ID CIRCUIT

Commodore	TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH			
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 16 OF 34

WRITE GATE signal lines:

This signal line specifies the write and read status. When this signal line is set to LOW level, a write-enable status occurs and the data is stored on the disk surface by the WRITE DATA signal. When this signal line is set to HIGH level, a read-status occurs. After the writing operation, there is a maximum delay of 1.4 mS before a valid READ DATA signal appears on the interface.

WRITE DATA signal line:

Data written to the disk is transferred by the write data signal line. With the decline of the pulse on this signal line (when the signal line changes from HIGH level to LOW level), data is written to the disk.

SIDE (0/1) SELECT signal line:

This line selects the appropriate head. When this signal line is set to HIGH level, the side "0" head shall be selected; When set to LOW level, side "1" head is selected. Side "0" indicates the single sided R/W surface. The operation is complete 100 microseconds (max) after the change of the SIDE SELECT signal line.

IN USE signal line:

The LED indicator glows when this signal line is set to LOW level. This signal line operates regardless of the DRIVE SELECT signals.

At the vendors option, the Motor-On signal (pin 16) may be used instead of IN USE.

MODE SELECT Signal Line:

Setting this line to LOW level selects Amiga-MODE, and setting it to HIGH level selects PC-MODE. Changing the status of this line causes the reset of the FDD. Therefore, it is necessary to turn off the spindle motor once before selecting MODE status and turn it on again according to the power-on sequence. Refer to POWER-ON Sequence for details.

MODE	A-MODE	PC MODE
MEDIA		
2DD	300rpm	300 rpm
2HD	150 rpm	300rpm

3.7 OUTPUT SIGNALS

These signal are to be driven by open collector outputs. They must return to the high state when the drive is not selected. As an alternate method to open collectors a tristatable driver can be used, and the outputs tristated when the drive is not selected. See appendix A for the recommended interface circuit.

TABLE 3 - POWER-ON SEQUENCE FLOWCHART

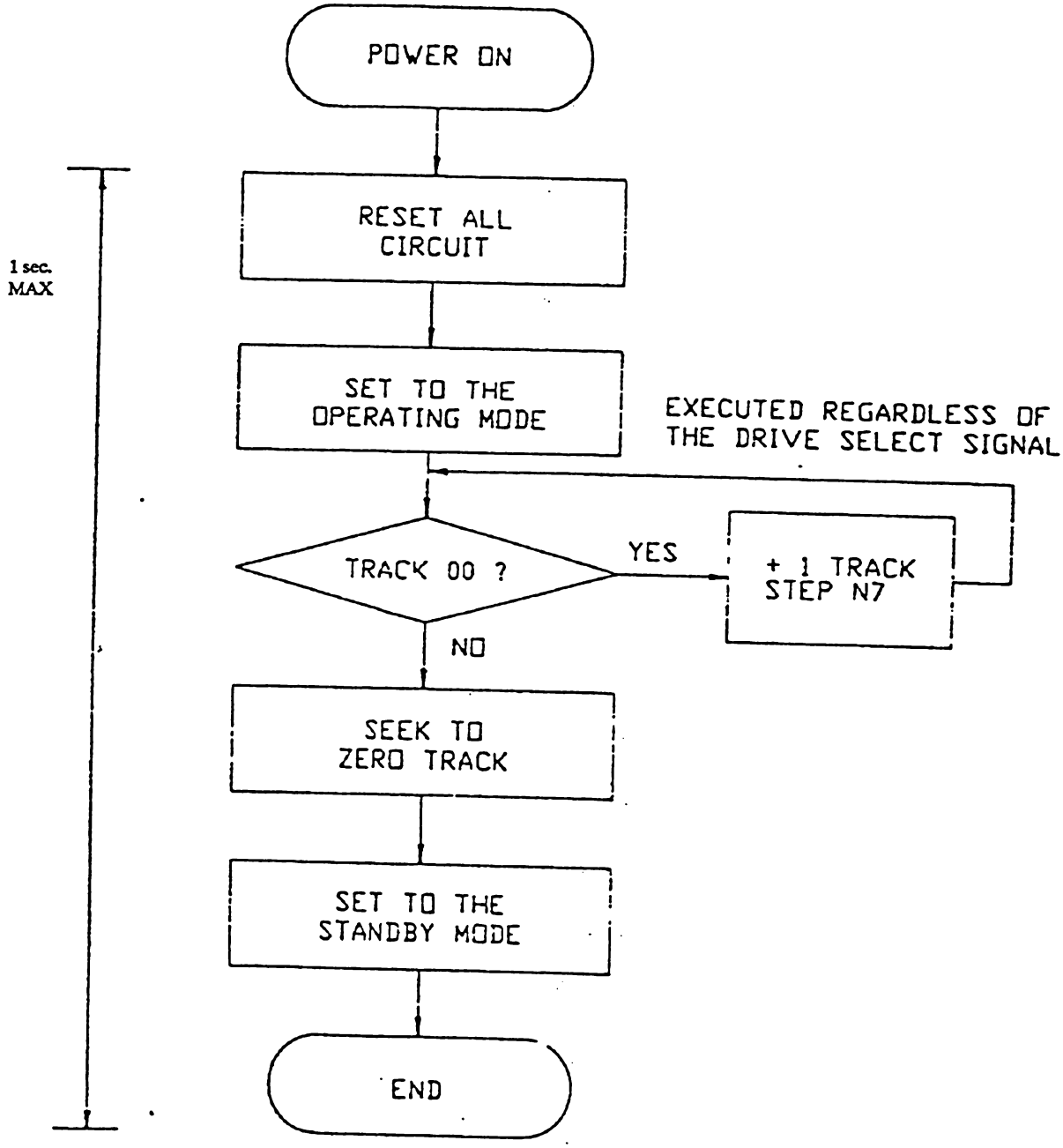


FIGURE 13 - POWER-ON TIMING

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 18 OF 34

INDEX signal line:

When one (1) rotation of the disk occurs, this signal line outputs a LOW level pulse indicating the beginning of the track. A decline in the pulse signal (when this signal line changes from HIGH level to LOW level) indicates the beginning of the track.

TRACK "00" signal line:

When this signal line set to LOW level, it indicates that the head is located at track "00" position.

WRITE PROTECT signal line

When this signal line is LOW it indicates the disk cannot be written to. At the vendor's option, this signal line may also be set to LOW level when no disk is positioned in the drive. The write function must become inoperative with a write-protected disk is inserted.

READ DATA signal line:

This is the amplified, pulse shaped data that has been read from the disk media.

READY signal line:

The drive must set this line low when it is ready to receive Read and Write operations. Typically this signal will be set when the drive motor is known to be operating at full speed. After setting the MOTOR ON signal, the host will wait until the ready signal is LOW before attempting Read or write operations. The signal shall go high when the drive can not accept data.

DISK CHANGE signal:

This signal line is set to LOW level, by POWER-ON or when a disk is ejected, and is set to HIGH level by a STEP pulse input when a disk is present. If no disk is present the input of a STEP pulse will not change the state of DISK CHANGE.

READY signal:

When this signal is set to LOW, the disk is inserted and the number of disk rotations is fixed. When the READY signal is ON, read and write operations can be performed. Immediately after the MOTOR ON signal is turned ON, power is supplied. After the disk is inserted, check that the READY signal is ON before performing read and write operations.

HIGH DENSITY STATUS:

This signal is output on the READY line when the ready signal is off. By turning the Density Status line on and off, this signal output will toggle between "High and Low" level with a 2MB disk inserted and is "LOW" when a 1MB disk inserted.

Input Signal Line Terminator

This device shall be operable with either daisy chain or star chain systems. There is no need to disconnect the terminal resistor even with the daisy chain system. each of the input signal lines has a 1 kΩ terminal resistor. When a number of input signal line terminators are connected by the daisy chain system, resistance will differ, depending on the number of drives. When two drives are connected, resistance shall be 500 Ω.

TABLE 4 - POWER CONNECTOR

PIN:	SIGNAL:
1	+ 5 V DC
2	GND (+ 5 V, RETURN)
3	GND (+12 V, RETURN)
4	+12V DC

TABLE 5 - POWER and CURRENT REQUIREMENTS

Power Supply	DC: +12V +5%, Current 160mA +380mA surge average.			
Power Consumption	POWER SUPPLY	5 V	12V	POWER
	Standby	172 mA TYP	9 mA MAX	0.97 W TYP
	Read	190 mA TYP	67 mA TYP	1.75 W TYP
	Write	195 mA TYP	67 mA TYP	1.78 W TYP
	Seek	110 mA TYP	185 mA TYP	2.77 W TYP
	Starting Current	100 mA TYP	400 mA MAX	5.30 W MAX
Ripple voltage allowance	DC +12	Less than 150 mVp-p (including spike noise)		
	DC +5 V	Less than 100 mVp-p (including spike noise)		

TABLE 6 - CONNECTOR I/O (PIN-OUTS)

PIN:	D:	SIGNAL:	PIN:	SIGNAL:
2	O	DISK CHANGE	1	MODE SELECT (PC/AMIGA)
4	I	IN USE	3	GND or No Connect*
6	I	DRIVE SELECT 3	5	GND
8	O	INDEX	7	GND
10	I	DRIVE SELECT 0	9	GND
12	I	DRIVE SELECT 1	11	GND
14	I	DRIVE SELECT 2	13	GND
16	I	MOTOR-ON	15	GND
18	I	DIRECTION SELECT	17	GND
20	I	STEP	19	GND
22	I	WRITE DATA	21	GND
24	I	WRITE GATE	23	GND
26	O	TRACK 00	25	GND
28	O	WRITE PROTECT	27	GND
30	O	READ DATA	29	GND
32	I	HEAD SELECT (0,1)	31	GND
34	O	READY & HIGH DENSITY STATUS	33	GND

* The drive must withstand either Ground or No connect on both pins 1 and 3.

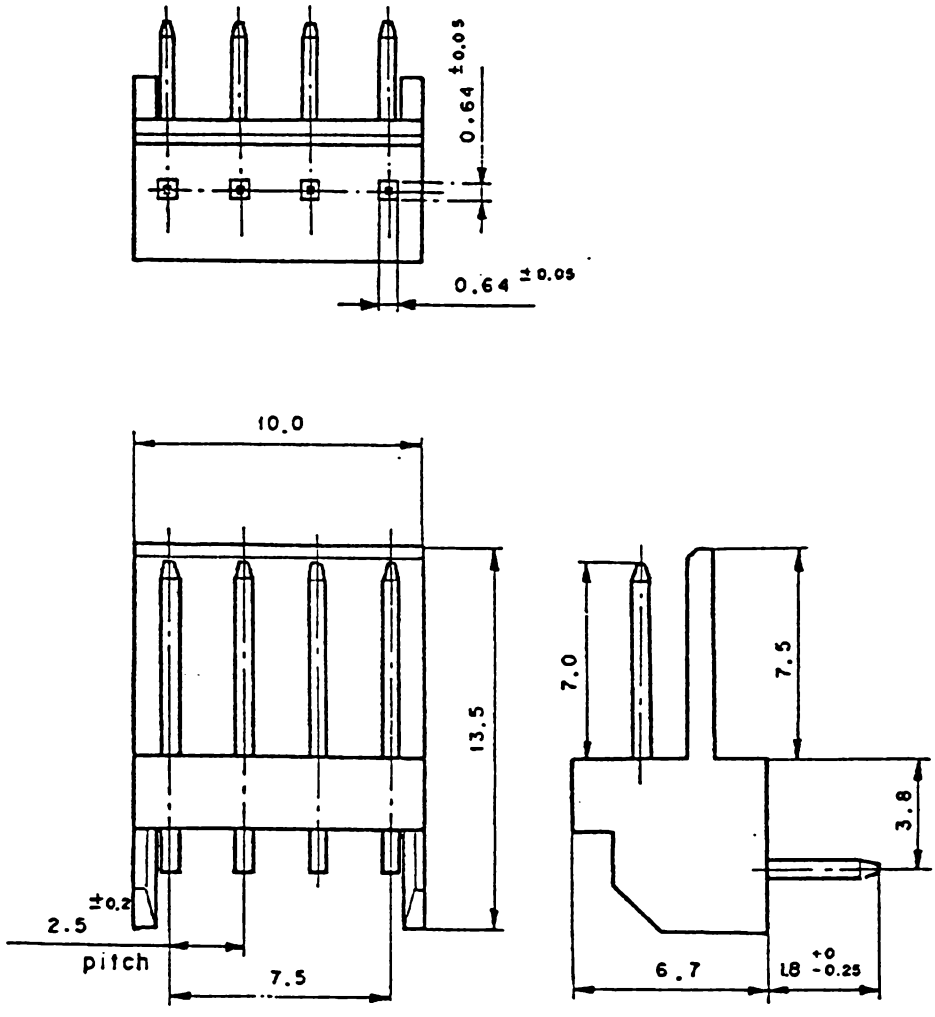


FIGURE 14
POWER CONNECTOR DIMENSIONS

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 22 OF 34

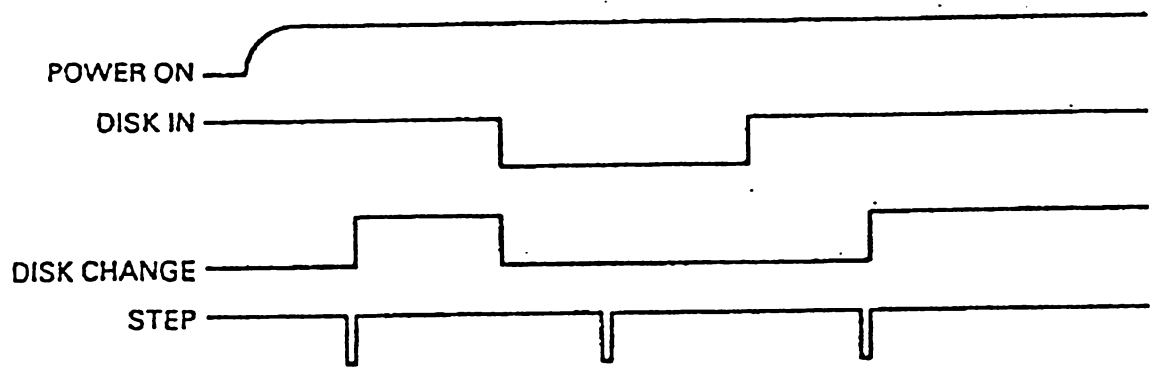


FIGURE 15 - DISK CHANGE SIGNAL

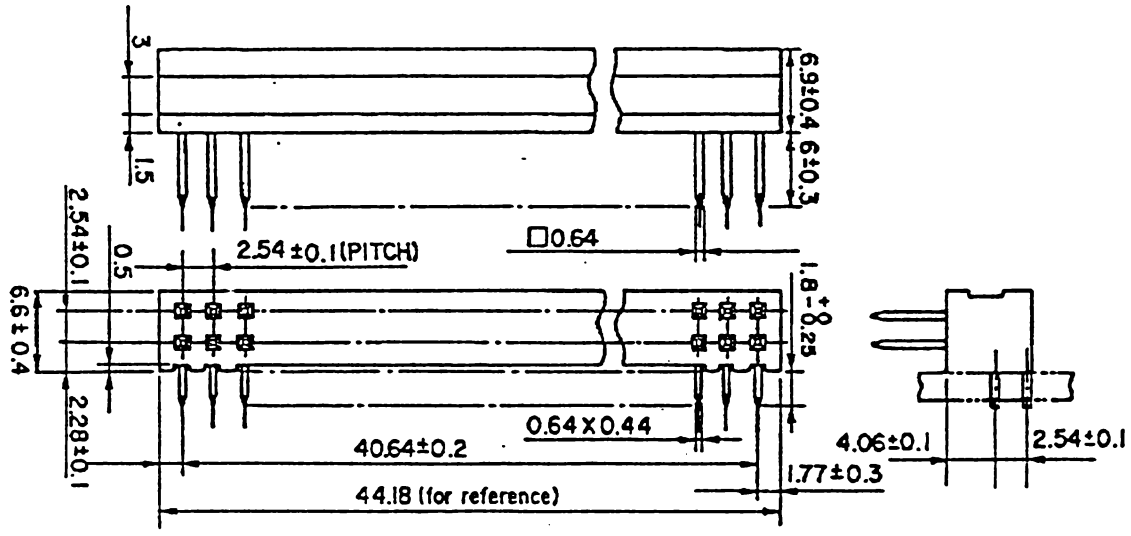


FIGURE 16
INTERFACE SIGNAL
CONNECTOR DIMENSIONS

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 23 OF 34

4.0 ENVIRONMENTAL REQUIREMENTS

The FDD shall meet its specified performance requirements under the environmental conditions of Table 7; Temperature, Humidity, Vibration, Shock, and Noise.

TABLE 7 - ENVIRONMENTAL REQUIREMENTS

PARAMETER	REQUIREMENT
TEMPERATURE Operational: Storage: Change rate:	 +5 to +50 degrees C -20 to +60 degrees C (-40 C to +60 C in-transit) 10 °C per Hour (operational)
HUMIDITY Operational: Storage:	 20% to 80% RH maximum wet bulb (at +29 degrees C) 5% to 90% RH no condensation 8% to 90% RH no condensation
VIBRATION Operational: Storage: (with HEAD Protector Installed)	 FDD unit shall perform all read/write operations (no seek) according to specification, with continuous vibration of less than 0.6 g (+10%), from 5 Hz to 500 Hz (along the X, Y, Z plane). FDD unit, as packaged for shipment, shall withstand 3.0 g, from 5 Hz to 500 Hz, along each of three (3) mutually perpendicular axes.
SHOCK Operational: Non-Operational: In-Transit: (with HEAD Protector Installed)	 Less than 5 g (10 ms) 1/2 sine wave Less than 30 g (10 ms) 1/2 sine wave Less than 60 g (10 ms) 1/2 sine wave
ACOUSTIC NOISE	40 dBA or less, at 1 meter, with a step rate of 3 ms and 4 ms per track.

5.0 RELIABILITY REQUIREMENT

FDD shall meet or exceed the requirements specified in Table 8.

TABLE 8 - RELIABILITY REQUIREMENTS

PARAMETER			SPECIFICATION
Drive		MTBF	10,000 POH
		MTTR	0.5 Hours
		Drive Life	Five Years
Error Rate		Software Errors	10^{-9} times/bit
		Hardware Errors	10^{-12} times/bit
		Seek Errors	10^{-6} times/bit
Life	Drive	Number of Mountings of the Media	30,000 times or more
		Seek	10,000,000 seeks or more
		Head	10,000 H or more
	Media	Number of Identical Track Passes	3,000,000 passes or more
		Number of Mountings	10,000 times or more

NOTE:
1. Media to be used - SONY OM-D4440, OM-D4444
2. Maintainence is not required under normal use conditions.

5.1 TEST SUITE

Unit shall pass Commodore test suite for click test (seek with no disk) and resonance test. (Commodore Part Number to be determined.)

6.0 SAFETY REQUIREMENTS

6.1 REGULATORY STANDARDS

The FDD unit shall comply with the electrical requirements specified in Table 9, according to the applicable geographic area.

TABLE 9 - REGULATORY STANDARDS

STANDARD	DESCRIPTION
USA/Canada:	
UL 478	Electronic Data Processing Units and Systems
FCC Publ. 65	FCC Class B Part 15 - subpart J, Title 47, Part 15 -S
CSA 22.2	Data Processing Equipment, Consumer and Commercial Products
IEC 435	Data Processing Equipment

6.2 HAZARDOUS MATERIALS

No components containing Poly-Chlorinated Byphenyl (PCB) shall be used in this Floppy Disk Drive assembly.

7.0 DRIVE SELECTION

7.1 DRIVE SELECT

When the Floppy Disk Drive unit is shipped from the FDD manufacturer, the drive select device shall be set for one (1) installed drive in position (address) zero (0).

The FDD shall be supplied with a user accessible, manual selection (programming) device or jumper pad, for determining the drive address (0, 1, 2, 3), as required for multiple disk drive installations.

7.2 DRIVE SELECT DEVICE (Hardware Programming Device)

The drive select device shall be in a convenient location.

8.0 REQUIRED DOCUMENTATION

The Vendor shall provide Commodore Business Machines (CBM) with the Service Manual. This Manual shall include a complete and current set of Electrical and Physical (Mechanical) Schematics, a complete and current part's List (Bill of Material) and an accurate and intelligible Assembly Service Directive. This Manual shall be suitable for CBM to properly support the floppy Disk Drive Assembly. All documents shall be legible and reproducible.

8.1 ENGINEERING CHANGES

Any changes to Form, Fit or Function shall be agreed to prior to implementation of these changes.

8.2 BAR CODE

The vendor shall affix a barcoded label(s) in accordance with Commodore Bar Code Specification # 310071.

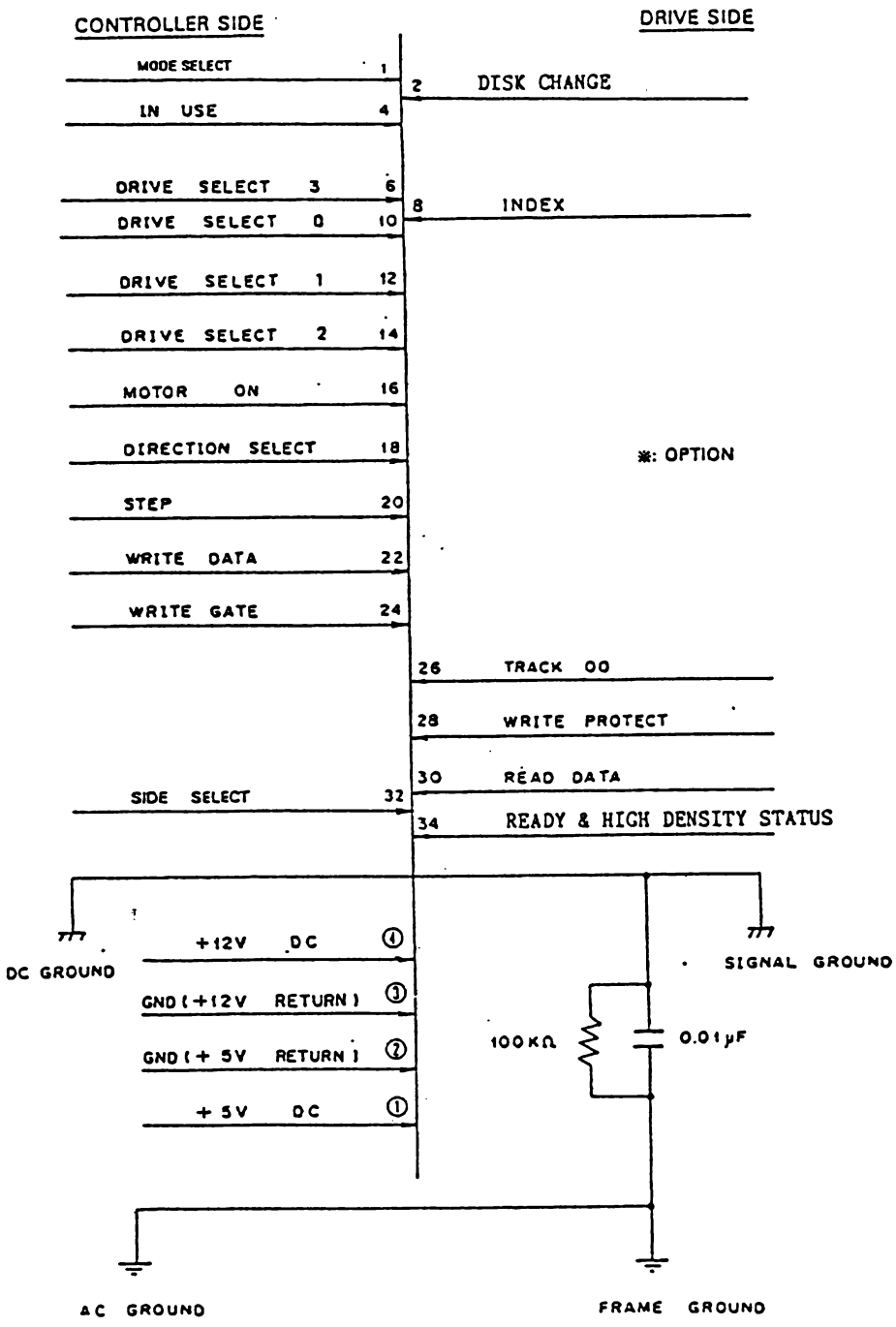


FIGURE 17
MOUNTING CONFIGURATION

Commodore			TITLE FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER 313248	REV. A	SCALE	SHEET 28 OF 34

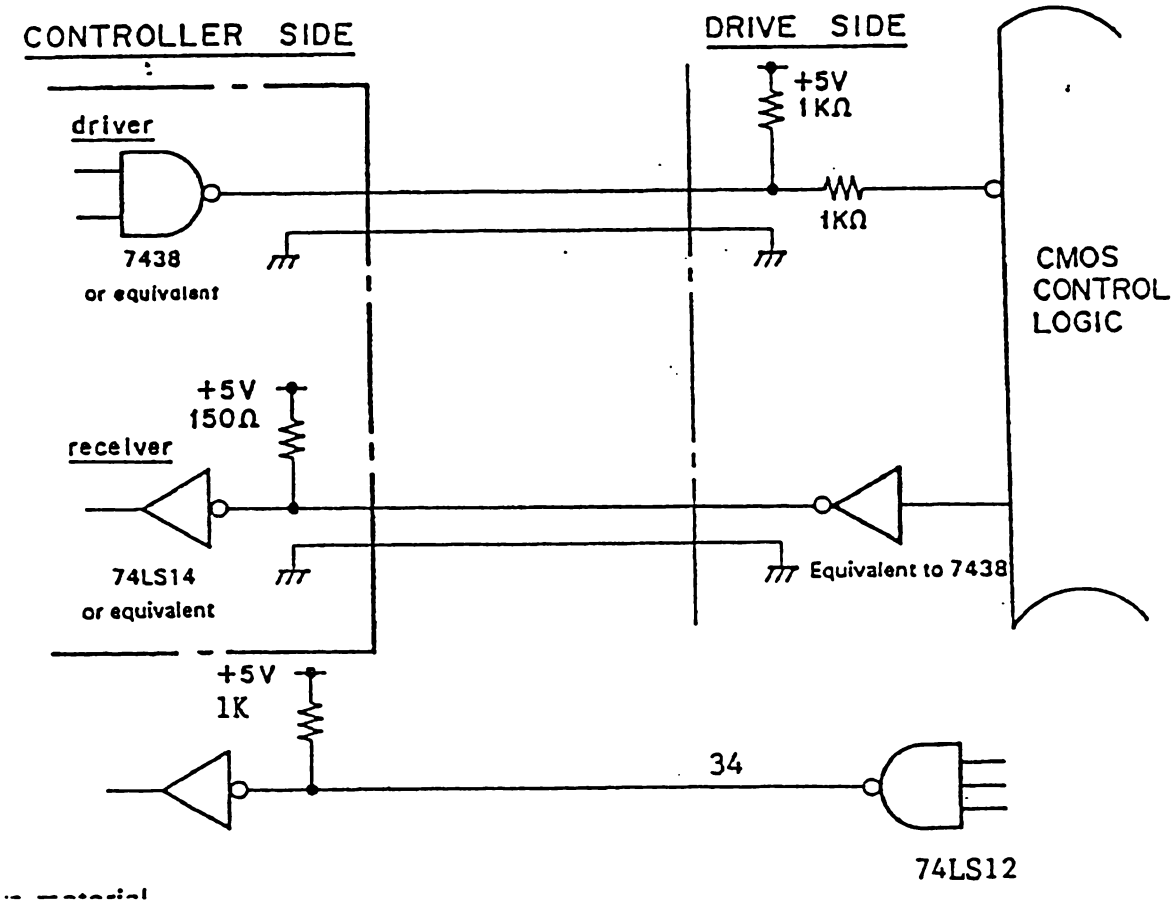


FIGURE 18
I/O CIRCUIT

Commodore			TITLE FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER 313248	REV. A	SCALE	SHEET 29 OF 34

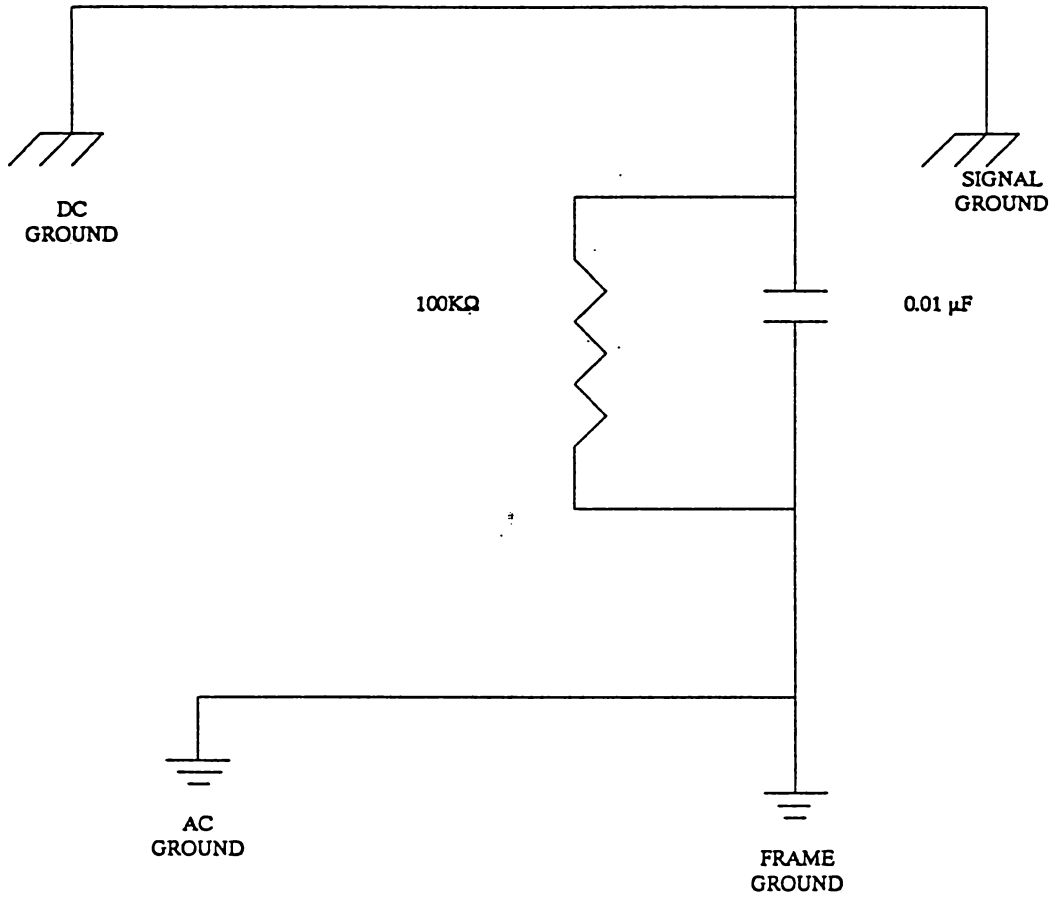


FIGURE 19
GROUND CIRCUIT

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER	REV.	SCALE	SHEET 30 OF 34
	313248	A		

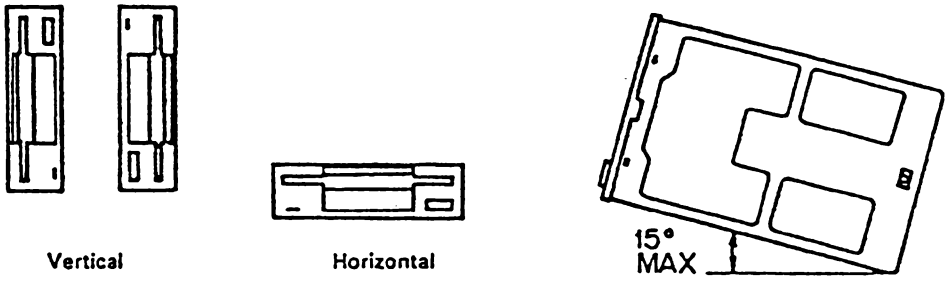
Item	Specification
Mounting position	
	

FIGURE 19
INSTALLATION CONDITIONS

Commodore			TITLE: FLEXIBLE DISK DRIVE, DUAL SPEED, 2MB, 3.5 INCH	
SIZE	DRAWING NUMBER: 313248	REV.: A	SCALE	SHEET 31 OF 34

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FIGURES

TABLES

ABBREVIATIONS/MNEMONICS

AC	alternating current
BPI	bit per inch
CRC	cycle redundancy check
DC	direct current
DS	drive select
DS/DD	double sided/double density
FDD	floppy disk drive
FM	frequency modulation
ISV	instantaneous speed variation
LED	light emitting diode
MFM	modified FM
MTBF	mean time between failures
MTTR	mean time to repair
OEM	original equipment manufacture
PCB	printed circuit board
PM	preventive maintenance
P-P	peak to peak
RH	relative humidity
RPM	revolutions per minute
R/W	read/write
TP	test point
TPI	track per inch
TTL	transistor-transistor-logic

APPLICATION		REVISION			
NEXT ASSY.	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A4000	A	PILOT PRODUCTION RELEASE	3-13-92	

1.0 DESCRIPTION

The A4000 computer is a new member of the Amiga family, based on the AA chip set. It is housed in a desktop case with a separate keyboard. Expansion capabilities are provided via four internal Zorro II/III expansion connectors and a CPU slot.

A block diagram is shown on the following page.

1.1 ELECTRICAL SPECIFICATIONS

1.1.1 CPU

The CPU for the A4000 is contained on a separate CPU card. This allows a single motherboard to be combined with one of several different CPU cards to create different system configurations. Currently, there are two different CPU cards that have been defined.

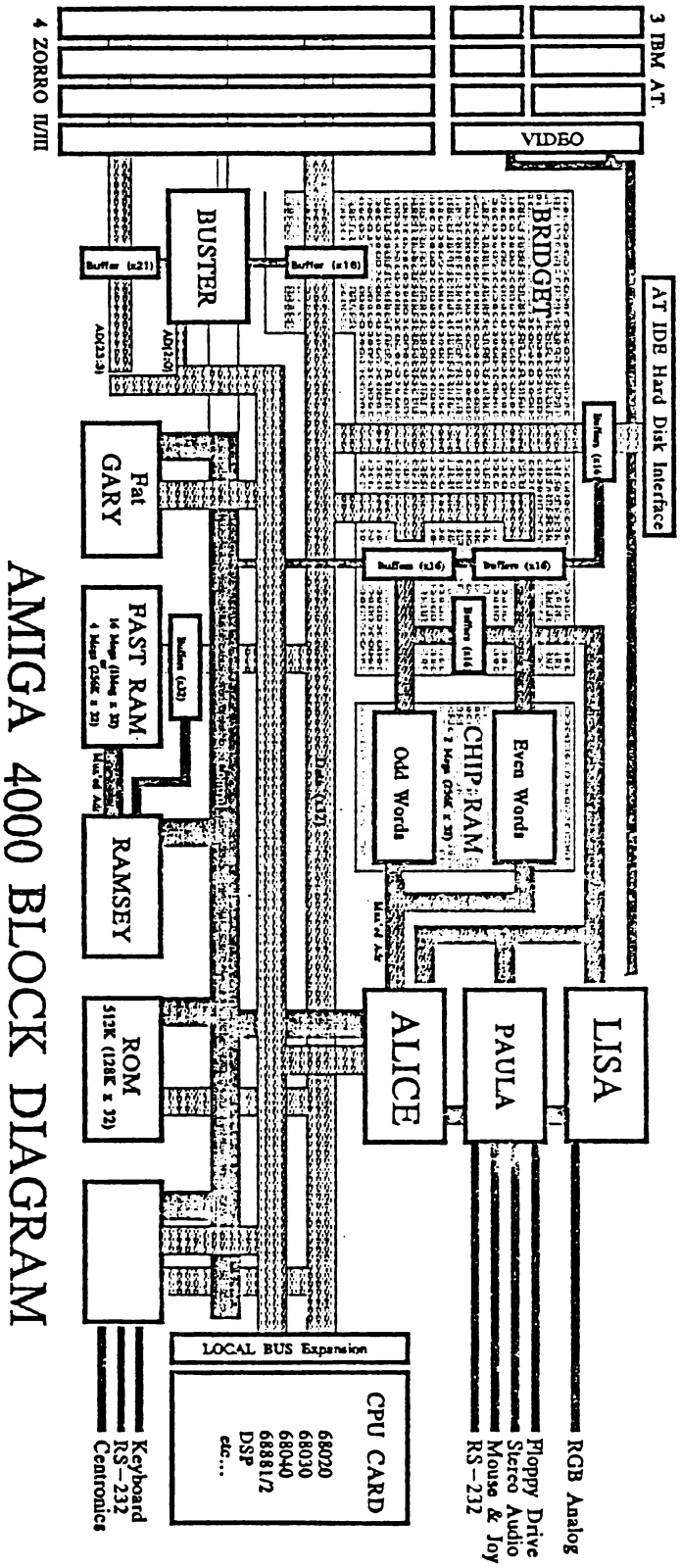
68020/68030 CPU card:

This card has PCB QFP footprints for both the MC68020 and the MC68030. Either (or both) of these two processors can be soldered to the board and used - a jumper on the CPU card selects between the 68020 or the 68030.

There are also two footprints for an optional 68881 or 68882 math coprocessor on this CPU card. The QFP PCB outline can be used for factory installed FPU's, and the PGA footprint is available for user installations. A jumper on the CPU card selects between the two possible locations.

COMMODORE P. N.	STATUS				
364570-01	ACTIVE				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES: ANGLES +/- 1 DEGREE 2 PLACE DECIMALS +/- 0.02 3 PLACE DECIMALS +/- 0.010	DRAWN Mike Rivers	DATE	Commodore 1200 WILSON DRIVE WEST CHESTER, PA. 19380 (215) 431-9100
	SYSTEM ENG.	DATE	
	TEST ENG	DATE	
	COMP. ENG Drew Shannon	DATE	TITLE: FUNCTIONAL SPECIFICATION, A4000
	CIRCUIT ENG.	DATE	
			SIZE A / DRAWING NUMBER 364570
			SCALE / SHEET 1 OF 15



Commodore			TITLE FUNCTIONAL SPECIFICATION , A4000	
SIZE	DRAWING NUMBER 364570	REV. A	SCALE	SHEET 2 OF 15

Normally, the FPU is driven by the motherboard's 25 Mhz clock. However, a separate oscillator can be installed by the user to clock the FPU at a higher rate. A jumper selects between the two different clock sources.

68040 CPU card:

This CPU card can be used with a 25 Mhz 68040, 68EC040 or 68LC040. The '040 resides in a PGA socket.

1.1.2 FAST RAM

- Up to 16 Megabytes
- 4 72 pin SIMM sockets
- 32 bit CPU interface
- Page or Static Column mode
- 80 nsecs

The SIMMs are 72 pin JEDEC standard. Many 72 pin SIMMs are 36 bits wide. This machine requires only 32 bits of data. If a 36 bit SIMM is used, then the extra 4 bits are simply ignored.

FASTRAM is controlled by the same RAMSEY chip used in the A3000. RAMSEY was designed to terminate cycles via *STERM. Since the 68020 only has *DSACKs, external logic is required to provide *DSACKs to the CPU in a synchronous fashion.

BURST mode is still functional for FASTRAM, but the 68020 does not have this capability. If a 68030 is installed in the coprocessor slot, it is desirable to have this turned on. Therefore, the test for static column DRAMs should be left in the ROM, and the BURST bit turned on just as is done with the A3000. However, the test for static column DRAMs must be done differently. Instead of writing four longwords with the static column bit set, and then reading them back with it off, the four longwords should be written with the bit set off, and then read back with it turned on. This is necessary because JEDEC standard SIMMs do not make use of an output enable (*OE) pin for the DRAMs. When static column mode is turned on, all writes to the DRAM are done as late writes. Without the *OE pin, the SIMMs cannot do late writes. The test will fail, indicating the correct result, but more significantly the data being written to the DRAMs will collide with data coming out of them, which is undesirable. Static column SIMMs must be custom made. One of the no connect pins will be assigned to act as the *OE pin. Only after it is determined that the DRAMs are the static column type should a write to DRAM in static column mode EVER be allowed.

The test described above for static column DRAMS should not be done with a 68020. The software should check that the processor is a 68030 or 68040 before doing this test. Since the 68020 uses DSACKS, this test will not perform properly.

If static column DRAMs are installed, PAGE MODE operation is functional as well (when the bit is turned on).

1MB SIMM = 256k x 32/36
4MB SIMM = 1M x 32/36

FAST RAM SIMM TYPES

TOTAL FASTRAM	ADDRESS	SIMM CONFIGURATIONS
1 MB	07f00000-07ffffff	1 1MB SIMM
2 MB	07e00000-07ffffff	2 1MB SIMM
3 MB	07d00000-07ffffff	3 1MB SIMM
4 MB	07c00000-07ffffff	4 1MB SIMM
		1 4MB SIMM
8 MB	07800000-07ffffff	2 4MB SIMM
12 MB	07400000-07ffffff	3 4MB SIMM
16 MB	07000000-07ffffff	4 4MB SIMM

FAST RAM CONFIGURATIONS

1.1.3 CHIP RAM

- Up to 2 Megabytes via 1 72 pin SIMM
- 32 bit CPU interface
- 32/16 bit CHIP interface
- Page or Static Column mode
- 80 nsecs

The base machine will contain 1 MB of CHIP RAM, and is expandable up to 2 MB on the motherboard. The first 1 MB resides on the CHIP RAM SIMM, configured as 256k x 32. If 2 megabytes of CHIP RAM is desired, then this SIMM must be replaced with a single 512k x 32 SIMM.

The 2 MB of CHIPRAM appears at 0000000-01fffff. Any uninstalled CHIPRAM in this 2 MB will read back as 'garbage'.

TOTAL CHIPRAM	CONFIGURATIONS
1 MB	1 256k x 32/36 SIMM
2 MB	1 512k x 32/36SIMM

CHIP RAM CONFIGURATIONS

1.1.4 ROM

Sockets are provided on the motherboard for two 128k x 16 ROMs. ROM appears at 0f80000-0ffffff. A jumpers is provided on the motherboard to adjust ROM speed.

J0	CPU cycles	Tacc
0	5	160 nsecs
1	6	200 nsecs

ROM JUMPER SETTINGS

Since the same FATGARY chip as in the A3000 is being used, some external logic was required to provide the required functionality. Since FATGARY terminates ROM accesses with *STERM, an external PAL is required to convert this to synchronous *DSACKs for use with a 68020.

Writes to the ROM address range will cause a bus timeout to occur.

1.1.6 REAL TIME CLOCK

- Ricoh RTC with 26 x 4 bit battery backed RAM
- The A4000 uses the same Ricoh RTC as in the A3000.

1.1.7 FLOPPY DISKS

- 1 internal floppy drive standard (2 speed, high density, 1.7M)
- Up to 2 internal floppy drives (df0: & df1:)
- Up to 2 external (df2: & df3:)

A single 1.7M internal floppy disk comes installed in the machine. The circuitry on the motherboard can support two internal drives. The standard disk is installed in the topmost drive bay, and uses the front bezel as its faceplate (32 or 25 mm). A second drive can be added in either of the lower two bays. Drives in these two bays require their own bezels. Also, the lowest bay is limited to a 25 mm drive only.

External drives (df2: & df3:) must be installed via the 23 pin external connector. A jumper is provided on the motherboard to redirect df0: out the external connector. The first external drive would then be df0:, and the second external drive would be df3:

The internal floppy connector is wired such that df0: is connected before the twist in the floppy cable wire. DF1: would be after the twist.

1.1.8 HARD DISK

- Built in 16 bit IDE interface (internal connections only)
- 2 drive support

An internal 40 pin connector is provided for the addition of up to two 16 bit AT IDE compatible hard disk drives.

Hard drives can be installed in two places. A single slim line (sub half height) hard disk can be mounted in the bottom bay of the bracket in the front of the machine (below the floppy). In addition, a single half height, or two sub half height hard disks can be installed alongside the power supply in the back of the machine.

The IDE (AT) hard drive requires two mutually exclusive chip selects. Refer to the following tables for address range in which each is active. The state machine shown (Figure 2) is used for IDE accesses. Note that consecutive accesses cannot be performed nearly as fast a single access. This would suggest that the optimum algorithm for access of IDE data would consist of single accesses of IDE data interleaved with single accesses of the target/source data buffer.

Data register accesses can be performed faster than control register accesses. Accesses to the control registers are called "8 bit accesses" while those to the data register are called "16 bit accesses". Shown below is a table that gives addresses for all registers related to the IDE sub-system.

A13	A12	A5	A1	Address	Function
0	0	1	X	$0DD0XXX	Reserved for SCSI
0	1	1	0	$0DD1XX0	Reserved for mode register 0
0	1	1	1	$0DD1XX2	Reserved for mode register 1
1	0	1	0	$0DD2XX0	_CS1, 16 bit speed
1	0	1	1	$0DD2XX2	_CS1, 8 bit speed
1	1	1	0	$0DD3XX0	IDE interrupt register
1	1	1	1	$0DD3XX2	_CS2, 8 bit speed

Note that A5 must be high for all accesses. This is because contention with RAMSEY results if this is not done.

The A4000 supports four different timings. They represent reads and writes at 8 bit and 16 bit speeds. These timings are shown on the following pages.

The disk drive address lines DA0, DA1, and DA2 are connected to processor address lines A2, A3, and A4 respectively. This results in the following memory map:

A1000 address	Addr on AT address	Valid Data	Read Function	Write Function
$0DD1020	-	D31	None	Mode Reg0 (reserved)
$0DD1022	-	D31	None	Mode Reg1 (reserved)
$0DD3020	-	D31	IDE int reg	None
$0DD303A	3F6	8 bits	Alternate Status	Device Control
$0DD303E	3F7	8 bits	Drive address	Not used
$0DD2026	1F1	8 bits	Error Register	Features
$0DD202A	1F2	8 bits	Sector Count	Sector Count
$0DD202E	1F3	8 bits	Sector Number	Sector Number
$0DD2032	1F4	8 bits	Cylinder Low	Cylinder Low
$0DD2036	1F5	8 bits	Cylinder High	Cylinder High
$0DD203A	1F6	8 bits	Drive/Head	Drive/Head
$0DD203E	1F7	8 bits	Status	Command
$0DD2020	1F0	16 bits	Data	Data

Locations $0DD1020 and $0DD1022 are reserved for the mode registers. These are currently not implemented. When implemented, they will allow faster transfer rates from hard drives that support such rates. Part of the ID of a drive is information that allows the driver to decide which 'mode' is the fastest that the drive supports. Modes are defined as follows:

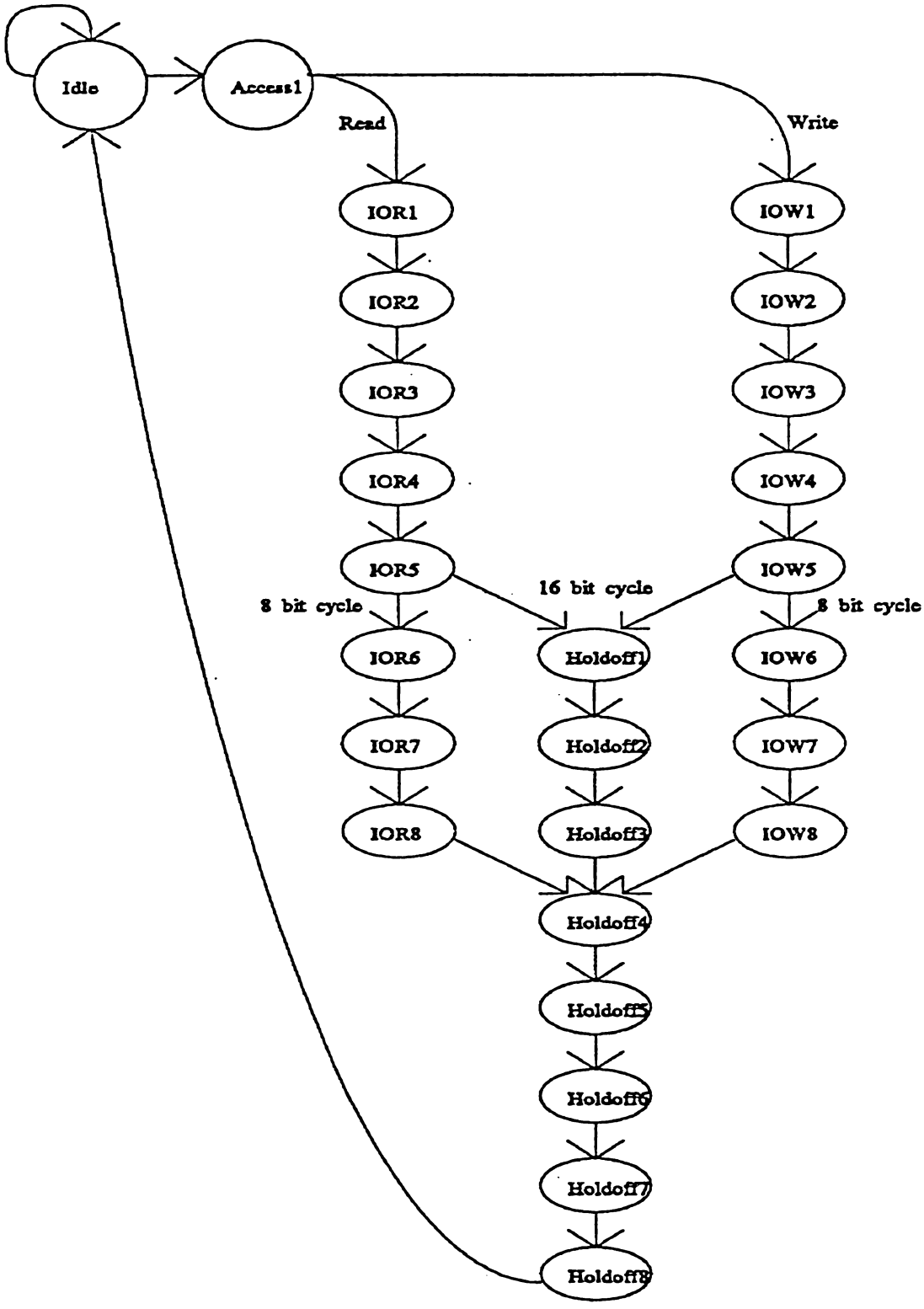


FIGURE 2 - STATE MACHINE

Commodore			TITLE: FUNCTIONAL SPECIFICATION , A4000	
SIZE	DRAWING NUMBER: 364570	REV. A	SCALE	SHEET 7 OF 15

Mode Reg1	Mode Reg0	Mode type	Max. transfer rate
0	0	mode 0	3.3 MB/sec
0	1	mode 1	5.2 MB/sec
1	0	mode 2	8.3 MB/sec
1	1	Undefined	

As currently implemented, only mode 0 is available.

Location $0DD3000 contains the IDE interrupt register. This register returns a value of 1 if an interrupt is pending from the IDE hard disk, and a value of 0 if an interrupt is not pending from this source. Writing to this register has no effect.

1.1.9 AUDIO

Two external RCA jacks are provided for stereo audio output (pre-amp levels). As in the A3000, right and left channels are shorted together to provide combined monoraul audio if only a single RCA plug is installed. Separate right and left stereo is provided when male RCA plugs are inserted into the BOTH of the RCA jacks.

External audio in is provided on pin 18 of the RS232 DB25 connector. This audio is mixed into the right channel. Audio out is also provided on the DB25 connector on pin 11, which is sent from the left audio channel.

An internal connector on the PCB allows for additional Right and Left audio to be mixed in. This allows internal expansion devices (such as a DSP) to provide stereo audio as well.

1.1.10 KEYBOARD

- detachable
- full size with keypad

The same keyboard as is used with the A3000 will be used with one modification - a new connector (6 pin MINI DIN).

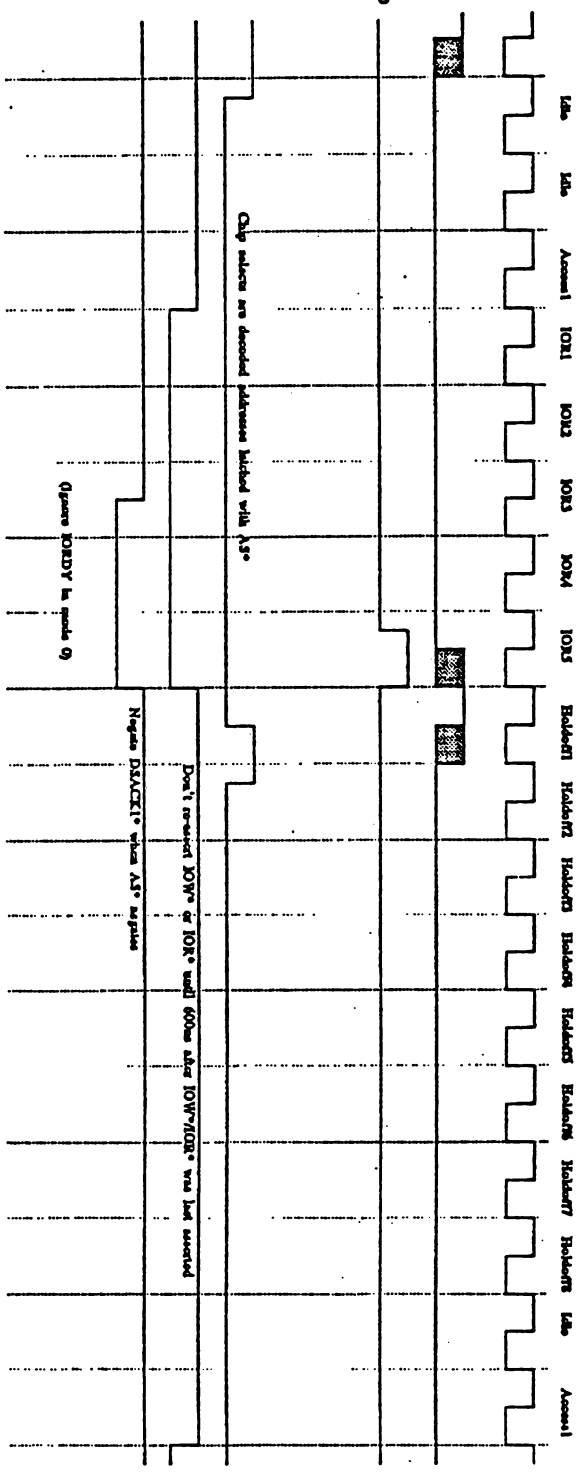
1.1.11 EXPANSION SLOTS

- 4 ZORRO II/III expansion card slots
- video slot in line with 1 ZORRO slot
- 200 pin processor connector

Four horizontal expansion card slots are provided. One slot (bottom) contains a 100 pin ZORRO II/III compatible connector in line with the two connector video slot. The remaining three slots have both ZORRO II/III and IBM AT connectors.

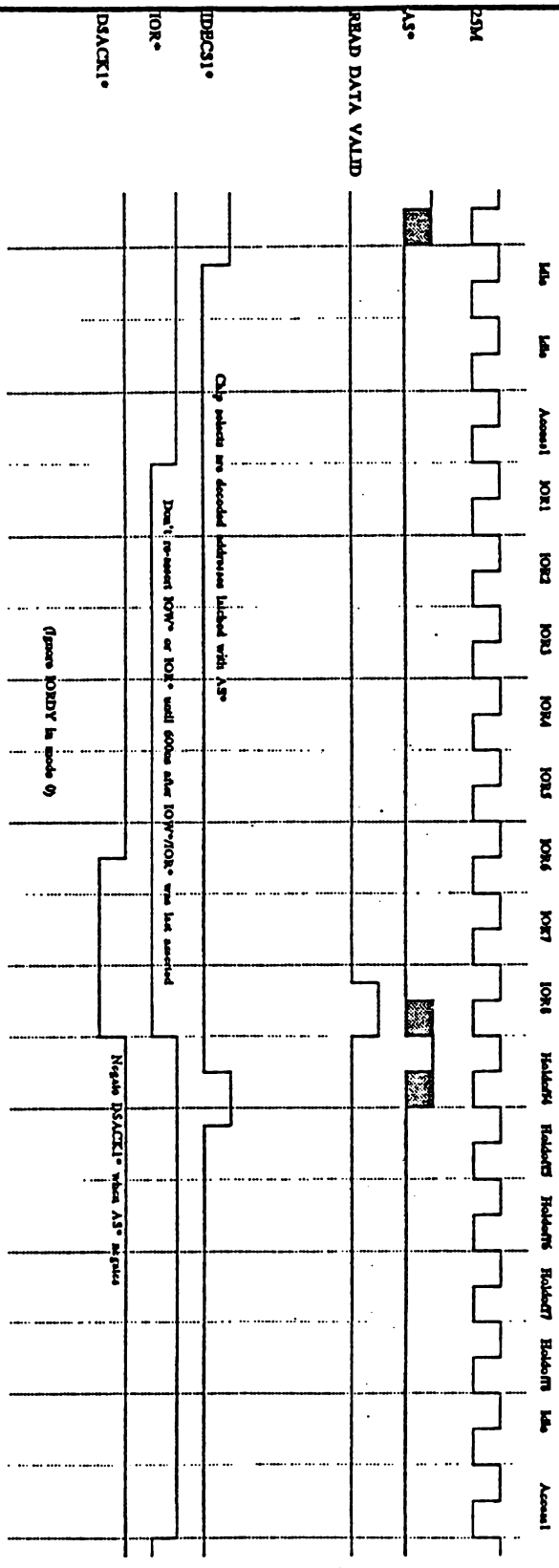
Video cards that were designed for the A2000 have certain limitations in this casework. In the A3000 we provided an adapter bracket that allowed boards designed for the A2000 video slot to be used in the A3000. It attached to the large flat metal bracket on the video card and allowed it to be connected to a standard expansion slot opening. In the A4000, however, there is not enough room for the old bracket to remain (it sticks out the side of the box). Consequently, the old video slot bracket must be removed from the video card, and a new 'custom' bracket installed. This bracket is custom to each video card, and must be provided by each of the separate manufacturers since the location of the mounting holes is not standard.

Mode 0 read, 16 bit



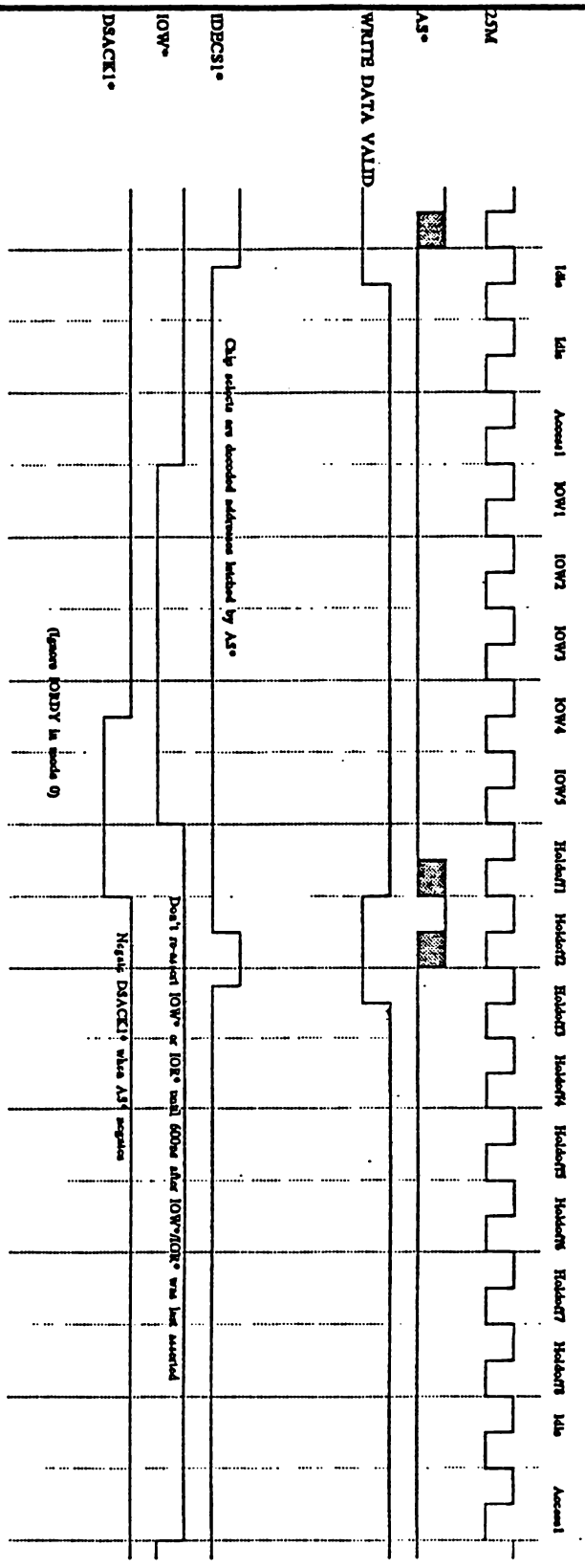
Commodore			TITLE: FUNCTIONAL SPECIFICATION , A4000	
SIZE	DRAWING NUMBER: 364570	REV. A	SCALE	SHEET 9 OF 15

Mode 0 read, 8 bit



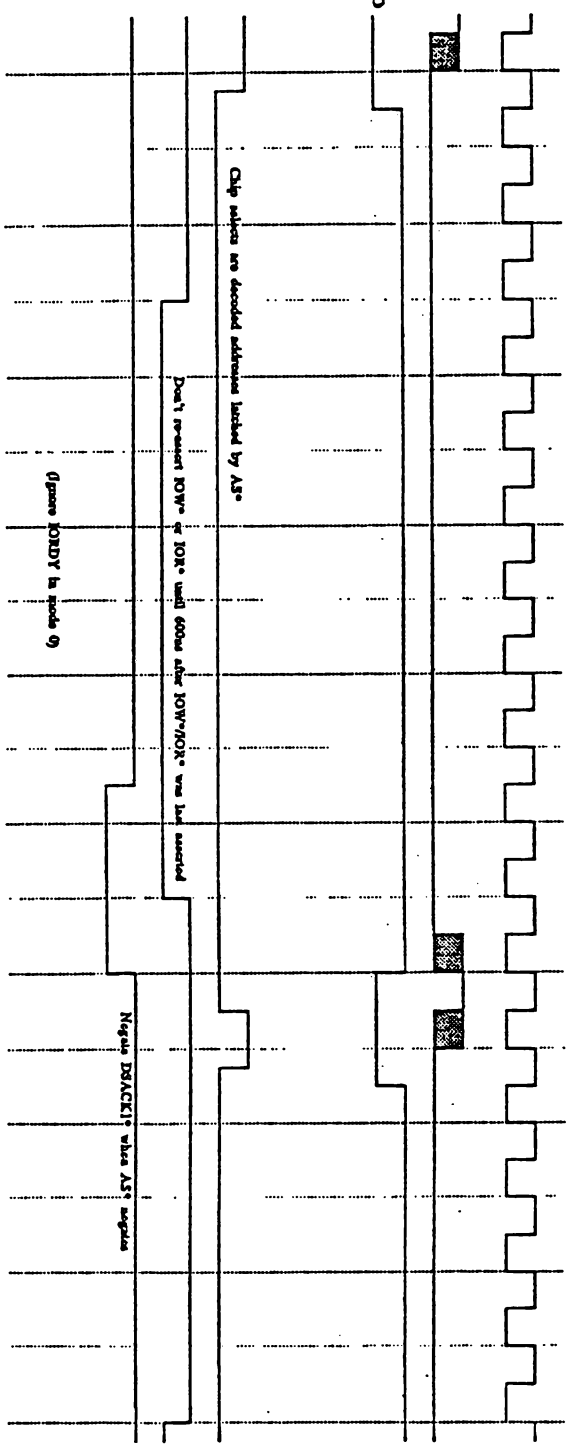
Commodore			TITLE: FUNCTIONAL SPECIFICATION , A4000	
SIZE	DRAWING NUMBER: 364570	REV. A	SCALE	SHEET 10 OF 15

Mode 0 write, 16 bit



Commodore			TITLE: FUNCTIONAL SPECIFICATION , A4000	
SIZE	DRAWING NUMBER: 364570	REV. A	SCALE	SHEET 11 OF 15

Mode 0 write, 8 bit



Commodore			TITLE: FUNCTIONAL SPECIFICATION , A4000	
SIZE	DRAWING NUMBER: 364570	REV. A	SCALE	SHEET 12 OF 15

A 200 pin KEL connector is provided on the motherboard which provides direct access to the processor bus signals. This connector is physically and electrically compatible with the coprocessor slot of the A3000. The board area available, however, is significantly smaller.

Since no processor exists on the motherboard of the A4000, this processor slot must be occupied by a CPU card for the machine to function. However, different CPU cards can be plugged into this slot in order to alter or enhance the system (such as future processors, or coprocessors).

1.1.12 MEMORY MAP

00000000-001FFFFF	2 MB	CHIP RAM (ROM at 0F80000 gets mapped to 0000000-0FFFFFF during overlay)
00200000-009FFFFF	8 MB	ZORRO II expansion space
00A00000-00BFFFFF	1.5 MB	ZORRO II expansion space
00B80000-00BFCFFF	448 KB	not used
00BFD000-00BFDFFF	4 KB	CIA #1
00BFE000-00BFEFFF	4 KB	CIA #0
00BFF000-00BFFFFF	4 KB	
00C00000-00CFFFFF	1 MB	Chip register shadow
00D00000-00D9FFFF	640 KB	unused
00DA0000-00DAFFFF	64 KB	
00DB0000-00DBFFFF	64 KB	unused
00DC0000-00DCFFFF	64 KB	Real time clock
00DD0000-00DD0FFF	4 KB	RESERVED (SCSI)
00DD1000-00DD3FFF	12 KB	IDE registers
00DD4000-00DDFFFF	48 KB	unused
00DE0000-00DE7FFF	32 KB	RAMSEY/GARY registers (supervisor space)
00DE8000-00DEFFFF	32 KB	unused
00DF0000-00DF7FFF	32 KB	unused
00DF8000-00DFBFFF	16 KB	Auxilliary interrupt control
00DFC000-00DFFFFF	16 KB	Chip registers
00E00000-00E7FFFF	512 KB	RESERVED (System ROM expansion)
00E80000-00E8FFFF	64 KB	ZORRO II autoconfig space
00E90000-00EFFFFF	512 KB	ZORRO II I/O space
00F00000-00F7FFFF	512 KB	Cartridge space
00F80000-00FFFFFF	512 KB	System ROM
01000000-017FFFFF	8 MB	RESERVED (CHIP RAM expansion)
01800000-06FFFFFF	88MB	reserved (motherboard FASTRAM expansion)
07000000-07FFFFFF	16 MB	motherboard FASTRAM
08000000-0FFFFFFF	128 MB	coprocessor slot expansion
10000000-7FFFFFFF	(~2 GB)	ZORRO III expansion space
80000000-FEFFFFFF	(~2 GB)	reserved
FF000000-FF00FFFF	64 KB	ZORRO III autoconfig space
FF010000-FFFFFFFF		reserved

1.2 CASEWORK

Basically, the same casework used for the desktop PC compatibles is to be used. A different front bezel with a single molded floppy 'face' is required. Also, the internal floppy bracket is unique to line up the floppy properly with the new bezel.

external floppy	DB23M	rear
parallel port	DB25F	rear (stacked)
serial port	DB25M	rear (stacked)
video	DB23F	rear
keyboard	6 pin mini DIN	rear
mouse/joysticks	2 DB9	side (unstacked)
R/L audio	2 RCA jacks	rear (unstacked)
option plate	screw in plate	rear

EXTERNAL PORT CONNECTIONS

1.3 POWER SUPPLY

A custom power supply is needed to meet the shape requirements of the case. The power supply requirements are as follows:

+5	20.0 amps
+12	4.0 amps (8A surge)
-12	600 milliamps

The -12 capacity has been increased from the original PC spec (up from 300 to 600 ma) so that -5 (up to 200 ma) can be created on the motherboard with a -5 volt regulator.

The power supply will shut down if significantly more than the rated current is drawn from any of the voltages. Therefore, user voltages available at some of the external connectors are protected. However, since more than 8 amps is available from the power supply for +5, the +5 available at external connectors is current limited by a polyswitch 'fuse'. The polyswitches act like circuit breakers that open up when their maximum rating is exceeded. When the load is removed, they will automatically reset (after cooling off, which may take 30 secs or more)

The 50/60 hertz TICK signal used in past Amigas has been generated in the power supply. However, the PC power supply does not have this capability. Therefore, the 8520 counter is connected to the Vertical Sync signal (as was done in the A500).

Refer to Power Supply specification 391173.

1.4 ASICs

1.4.1 FAT RAMSEY

RAMSEY is the FASTRAM controller that was designed for the A3000. It can be used for the A4000 with the addition the following:

1 16R4-10 : *STERM to *DSACK conversion

Refer to Fat Ramsey specification 390541.

1.4.2 FAT GARY

FAT GARY is a large 'glue' chip designed for the A3000 which performs a variety of tasks. It can be used in the A3400 with the addition of the following:

1 16R4-10 : *STERM to *DSACK conversion

Refer to Fat Gary specification 390540.

1.4.3 BUSTER

BUSTER can be used in the same fashion as in the A3000, and does not require any additional logic. Refer to Buster specification 390539.

1.4.4 BRIDGET

This is a new Gate Array which replaces the following TTL chips:

6 74F646's
4 74F245's

This results in reduced cost (~$10.00), reduced real estate and easier routing. BRIDGET can be used unchanged for the A3000 and other ECS/AA designs.

BRIDGET was be done with NCR's technology and processing. This was necessary for two reasons - pin count and speed.

Refer to Bridget specification 391380.

APPLICATION		REVISION			
NEXT ASSY.	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	CDTV-CR A4000	A	SPECIFICATION RELEASE	8/18/92	ACB

1.0 DESCRIPTION

This specification describes the requirements for a quad analog switch/multiplexer/demultiplexer. It shall be equivalent to a 74HC4066, and have the following features:

- Fast Switching and Propagation Switch
- High ON/OFF Output Voltage Ratio
- Diode Protection on All Outputs
- Low Noise

1.1 CONFIGURATION

This device shall be contained in a standard 14-pin small outline plastic package with pinouts as in Figure 1 and package dimensions as in Figure 3.

1.2 SOURCES

Refer to Approved Vendor List.

1.3 APPLICABLE DOCUMENTS

Commodore Engineering Policy 1.02.007 Integrated Circuit Qualification Procedure
Commodore Engineering Policy 1.02.008 Integrated Circuit Process Test Specification

SHAPE #Z00476 (N)

COMMODORE P. N.	STATUS				
391311-01	ACTIVE				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES (MILLIMETERS). TOLERANCES: ANGLES +/- 1 DEGREE 2 PLACE DECIMALS +/- 0.02 (0.50) 3 PLACE DECIMALS +/- 0.010 (0.25)	DRAWN joanne sugzdinis	DATE	**Commodore** 1200 WILSON DRIVE WEST CHESTER, PA. 19380 (215) 431-9100
	SYSTEM ENG.	DATE 8/5/92	
	TEST ENG	DATE	
	COMP. ENG Drew Shannon	DATE	TITLE: IC, SM, 74HC4066, Quad Analog Switch/Multiplexer/Demultiplexer
	CIRCUIT ENG.	DATE	
			SIZE A | DRAWING NUMBER 391311
			SCALE | SHEET 1 OF 6

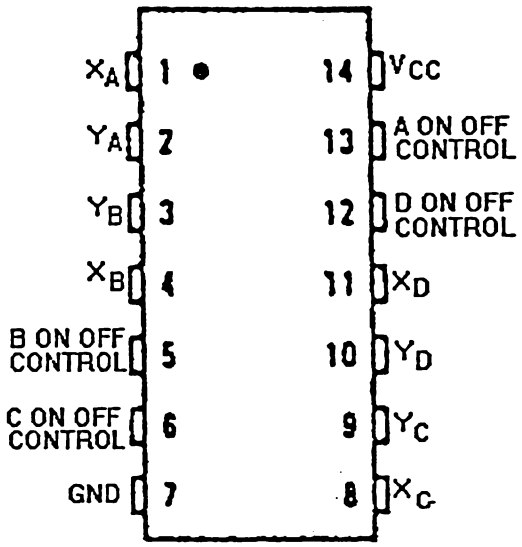


FIGURE 1 - PINOUTS

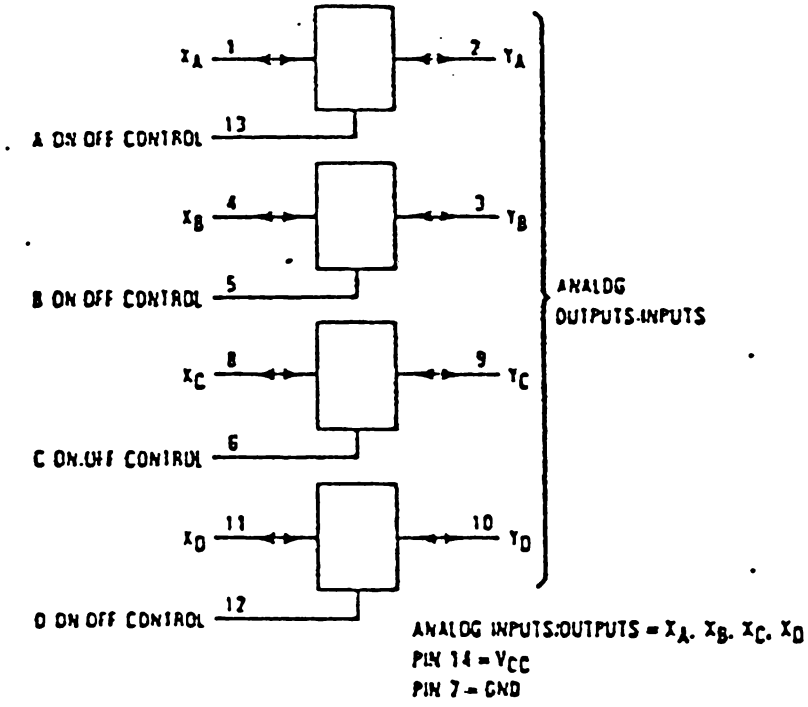


FIGURE 2 - LOGIC DIAGRAM

Commodore			TITLE: IC, SM, 74HC4066, Quad Analog Switch/ Multiplexer/Demultiplexer	
SIZE: A	DRAWING NUMBER: 391311	REV.: A	SCALE:	SHEET 2 OF 6

APPLICATION		REVISION			
NEXT ASSY.	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A4000	A	SPECIFICATION RELEASE	8/5/92	

1.0 DESCRIPTION

This specification describes the requirements for an 8-bit parallel-in/serial-out shift register . It shall be equivalent to a 74HCT166 , and have the following features:

- synchronous serial data input
- clock enable
- TTL compatibility
- parallel to serial converter expansion
- asynchronous master reset

1.1 CONFIGURATION

This device shall be contained in a standard 16-pin small outline plastic package with pinouts as in Figure 1 and package dimensions as in Figure 3.

1.2 SOURCES

Refer to Approved Vendor List.

1.3 APPLICABLE DOCUMENTS

Commodore Engineering Policy 1.02.007 Integrated Circuit Qualification Procedure
Commodore Engineering Policy 1.02.008 Integrated Circuit Process Test Specification

SHAPE #SMIC23 (N)

COMMODORE P. N.	STATUS				
391480-01	ACTIVE				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES (MILLIMETERS). TOLERANCES: ANGLES +/- 1 DEGREE 2 PLACE DECIMALS +/- 0.02 (0.50) 3 PLACE DECIMALS +/- 0.010 (0.25)	DRAWN joanne sugzdinis	DATE	**Commodore** 1200 WILSON DRIVE WEST CHESTER, PA. 19380 (215) 431-9100
	SYSTEM ENG.	DATE 8/5/92	
	TEST ENG	DATE	
	COMP. ENG Drew Shannon	DATE	TITLE: IC, SM, 74HCT166, SHIFT REGISTER
	CIRCUIT ENG.	DATE	
			SIZE A / DRAWING NUMBER 391480
			SCALE / SHEET 1 OF 6

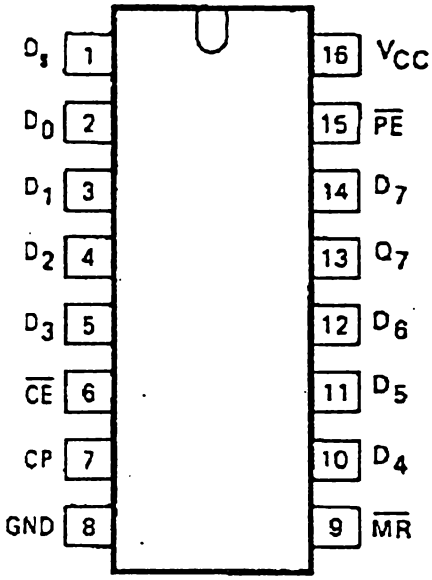


FIGURE 1 - PINOUTS

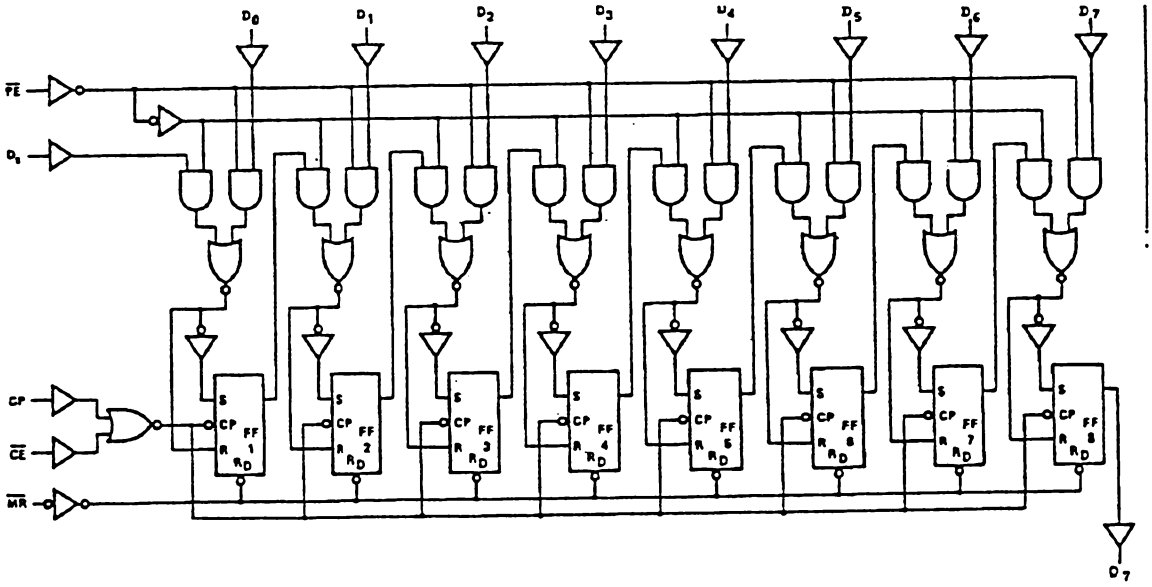


FIGURE 2 - LOGIC DIAGRAM

Commodore			TITLE: IC, SM, 74HCT166, SHIFT REGISTER	
SIZE: A	DRAWING NUMBER: 391480	REV.: A	SCALE:	SHEET 2 OF 6

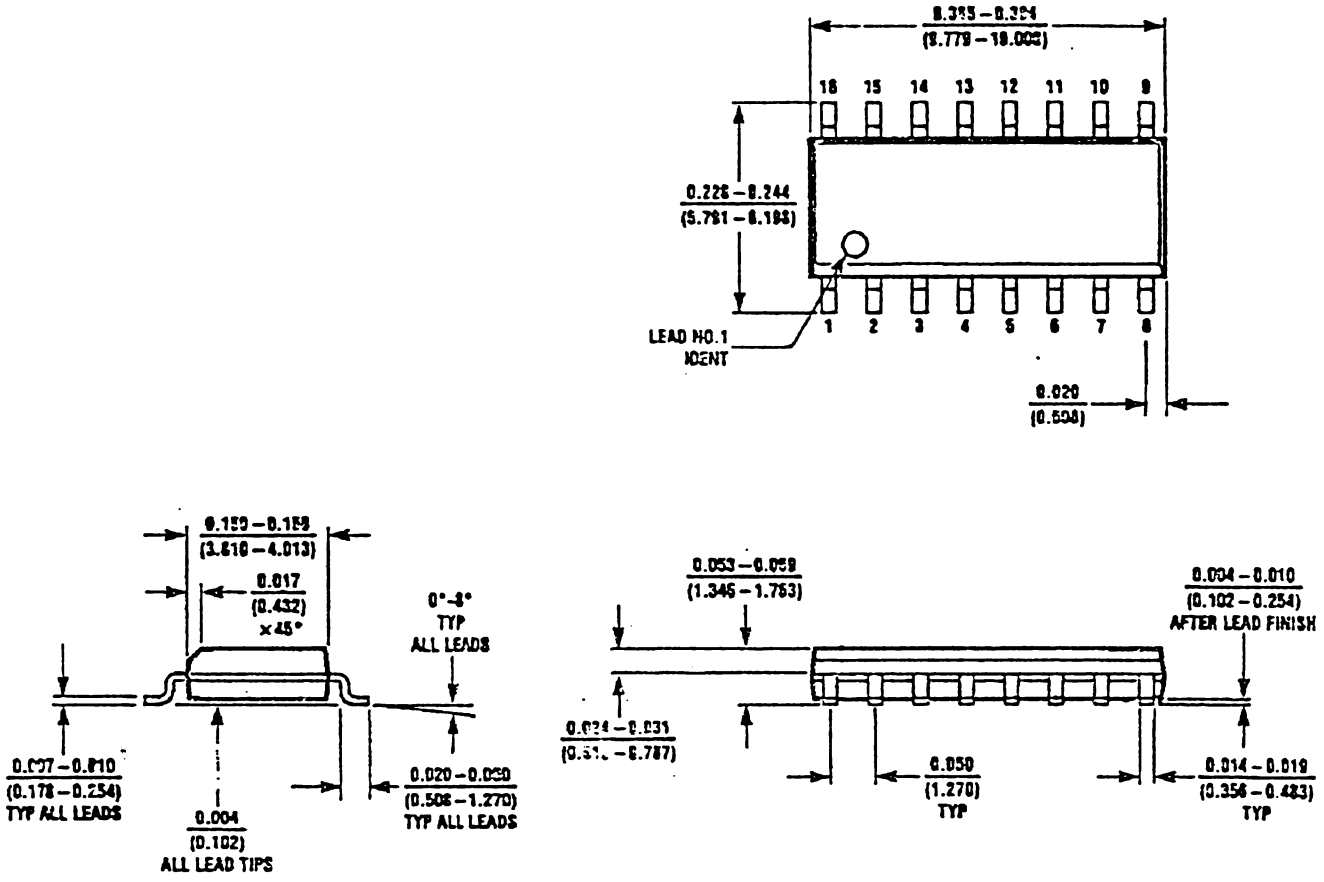


FIGURE 3 - PACKAGE DIMENSIONS

Commodore			TITLE: IC, SM, 74HCT166, SHIFT REGISTER	
SIZE: A	DRAWING NUMBER: 391480	REV.: A	SCALE:	SHEET 3 OF 6

2.0 ELECTRICAL CHARACTERISTICS

2.1 ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	MIN	MAX	UNIT	CONDITIONS
V_{CC}	DC supply voltage	-0.5	+7	V	
$\pm I_{IK}$	DC input diode current		20	mA	for $V_I < -0.5$ or $V_I > V_{CC}+0.5V$
$\pm I_{OK}$	DC output diode current		20	mA	for $V_O < -0.5$ or $V_O > V_{CC}+0.5V$
$\pm I_O$	DC output source or sink current standard outputs bus driver outputs		 25 35	 mA	for $-0.5V < V_O < V_{CC}+0.5V$
$\pm I_{CC}$; $\pm I_{GND}$	DC V_{CC} or GND current for: standard outputs bus-driver outputs		 50 70	 mA	
T_{stg}	storage temperature	-65	+150	°C	
P_{tot}	power dissipation		500	mW	above +70°C: derate linearly with 8 mW/K

Maximum Ratings are those values beyond which damage to the device may occur.
Functional operation should be restricted to recommended operating conditions.

2.2 RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT	CONDITIONS
V_{CC}	DC supply voltage	4.5	5.0	5.5	V	
V_I	DC input voltage range	0		VCC		
V_O	DC output voltage range	0		VCC		
T_{amb}	operating ambient temperature	-40		+85	°C	
t_r, t_f	input irse and fall times		6.0	500	ns	V_{CC} = 2.0V V_{CC} = 4.5V V_{CC} = 6.0V

2.3 FUNCTION TABLE

OPERATING MODE	INPUTS					Qn REGISTER		OUTPUT
	PE	CE	CP	Ds	D_0 - D_7	Q_0	Q_1 - Q_6	Q_7
parallel load	l l	l l	↑ ↑	X X	l - l h - h	L H	L - L H - H	L H
serial shift	h h	l l	↑ ↑	l h	X - X X - X	L H	q0 - q5 q0 - q5	q6 q6
hold "do nothing"	X	h	X	X	X - X	q0	q1 - q6	q7

H = HIGH voltage level, h = HIGH voltage level one set-up time prior to the LOW-to-HIGH CP transition.
L = LOW voltage level, l = LOW voltage level one setup time prior to the LOW-to-HIGH CP transition.
q = lower case letters indicate the state of the referenced output one setup time prior to the LOW-to-HIGH CP transition.
X = don't care
↑ = LOW-to-HIGH CP transition

2.4 D.C. ELECTRICAL CHARACTERISTICS

SYM-BOL	PARAMETER	CONDITIONS		T_A =+25°C	T_A =-40°C to +85 °C	UNIT
V_{IH}	Minimum High Level Input Voltage			2.0	2.0	V
V_{IL}	Maximum Low Level Voltage			0.8	0.8	
V_{OH}	Minimum High Level Output Voltage	V_{IN} = V_{IH} or V_{IL}	$\|I_{OUT}\|$ = 20 µA $\|I_{OUT}\|$ =4.0 mA, V_{CC} = 4.5V $\|I_{OUT}\|$ = 4.8 mA, V_{CC} = 5.5V	V_{CC} -0.1 3.98 4.98	V_{CC} -0.1 3.84 4.84	
V_{OL}	Maximum Low Level Voltage	V_{IN} = V_{IH} or V_{IL}	$\|I_{OUT}\|$ = 20 µA $\|I_{OUT}\|$ =4.0 mA, V_{CC} = 4.5V $\|I_{OUT}\|$ = 4.8 mA, V_{CC} = 5.5V	0.1 0.26 0.26	0.1 0.33 0.33	
I_{IN}	Maximum Input Current	V_{IN} = V_{CC} or GND, V_{IH} or V_{IL}		±0.1	±1.0	µA
I_{CC}	Maximum Quiescent Current	V_{IN} = V_{CC} or GND, I_{OUT} = 0 µA		8.0	80	µA
		V_{IN} = 2.4V or 0.5V (1)		1.2	1.4	mA

Measured per input pin. All other inputs held at V_{CC} or ground.

2.5 A.C. CHARACTERISTICS

SYMBOL	PARAMETER	T_A = 25°C	T_A = -40 to +85°C	UNIT
f_{MAX}	Maximum Operating Frequency	31	25	MHz
t_{PHL}, t_{PLH}	Maximum Propagation Delay Clock to Q_H	34	43	ns
t_{PHL}, t_{PLH}	Maximum Propagation Delay Clear to Q_H	33	41	
t_{su}	Minimum Set-Up Time Shift/Load High to Clock	16	20	
t_{su}	Minimum Set-Up Time Data before Clock	16	20	
t_{REM}	Minimum Removal Time Clear to Clock	0	0	
t_H	Maximum Hold Time Data after Clock	3	3	
t_r, t_f	Maximum Output Rise and Fall Time	15	19	
t_W	Minimum Pulse Width Clear or Clock	16	20	
C_{PD}	Power Dissipation Capacitance	100		pF
C_{IN}	Maximum Input Capacitance	10	10	

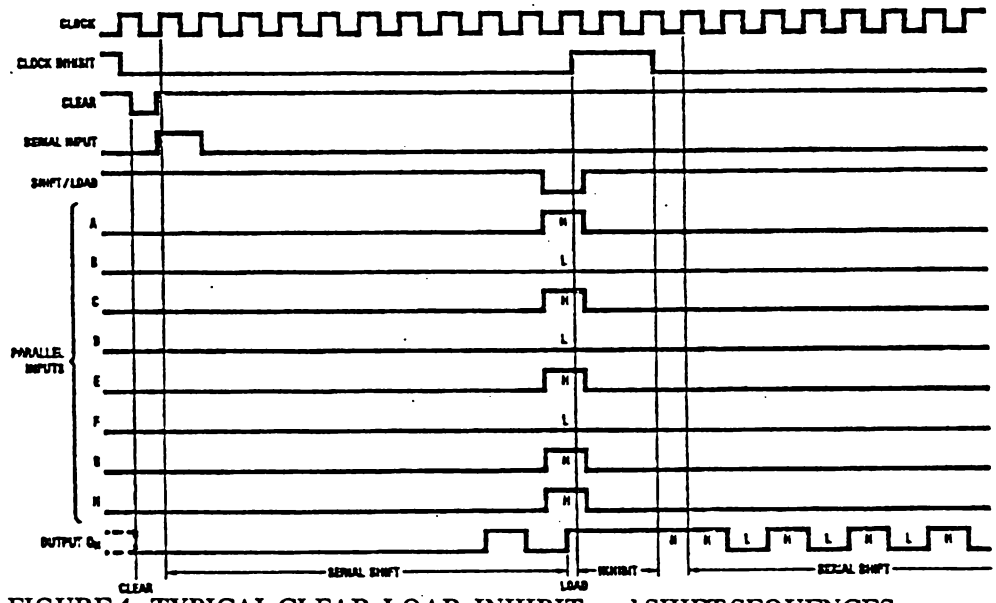


FIGURE 4 - TYPICAL CLEAR, LOAD, INHIBIT, and SHIFT SEQUENCES

Commodore	TITLE: IC, SM, 74HCT166, SHIFT REGISTER			
SIZE	DRAWING NUMBER	REV. A	SCALE	SHEET 5 OF 6

3.0 PHYSICAL REQUIREMENTS

3.1 MARKING

Parts shall be marked with Manufacturer's Part Number, Manufacturer's Identification, and EIA Date Code.

3.2 PACKAGING

The interconnected logic circuitry shall be contained in a 16-pin standard small outline package with exterior dimensions per Figure 3.

4.0 ENVIRONMENTAL REQUIREMENTS

Units furnished to the requirements of this specification shall meet the following environmental resistance requirements (vendors shall furnish supporting documentation upon request):

Operating Temperature	0 to 70 deg. C
Operating Humidity	5 to 95% RH non-condensing
Operating Altitude	0 to 3000 meters
Storage Temperature	- 20 to + 85 deg. C
Storage Humidity	5 to 95% RH non-condensing
Storage Altitude	0 to 15,000 meters.

4.1 PROCESS QUALIFICATION TESTS

Integrated circuits supplied to the requirements of this specification shall meet the requirements of Engineering Policy No. 1.02.008. Supporting documentation shall be supplied by vendor upon request.

4.2 ENVIRONMENTAL TEST CONDITIONS

Devices shall comply with the following environmental resistance tests per Commodore Engineering Policy 1.02.007.

1. Temperature/humidity (85 deg. C and 85% RH non-condensing) for 168 hours.
2. Operating life (1000 hours at 70 deg. C ambient temperature)
3. Solderability per MIL-STD-883, Method 2003
4. Pressure cooker (15 psig, 121 deg. C, and 100% RH for 24 hours)
5. Solvent resistance per MIL-STD-883,Method 2015, using water and trichloroethane
6. Solder temperature resistance (250 deg. C for ten seconds)
7. ESD requirement MIL-STD 1686 Group 3

Note: Devices shall meet this specification's operating performance requirements after the above tests are completed.

4.3 MINIMUM ACCEPTANCE LEVEL

The minimum acceptance level of any lot shall be an AQL of 0.65 as defined by MIL-STD 105 single sampling techniques.

4.4 AGE OF DEVICES

Unit shall be rejected if EIA Date Code indicates an age of three (3) or more years.

APPROVED VENDOR LIST

This sheet must be removed from this document before the document is shown or transmitted to a vendor.

Commodore Part Number	Vendor	Vendor Part Number
391480-01	MOTOROLA	MC74HCT166D
	NATIONAL	MM74HCT166M
	SIGNETICS	74HCT166D

Commodore			TITLE: IC, SM, 74HCT166, SHIFT REGISTER	
SIZE: A	DRAWING NUMBER: 391480	REV.: A	SCALE:	SHEET i OF i

APPLICATION		REVISION			
NEXT ASSY.	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A4000	A	SPECIFICATION RELEASE	5/18/92	JCB

1.0 DESCRIPTION

This specification describes the requirements for a single-sided, 1M x 32 bit (4MB) DRAM SIMM module no more than 1 inch in height . It shall have the following features:

- three state data output
- early-write common I/O capability
- $\overline{RAS}$ -only refresh, $\overline{CAS}$ before $\overline{RAS}$ refresh, and hidden refresh
- unlatched data out at cycle end

1.1 CONFIGURATION

This device shall be contained in a 72-lead single-in-line memory module (SIMM) package with pinouts as in Figure 1 and package dimensions as in Figure 3.

1.2 SOURCES

Refer to Approved Vendor List.

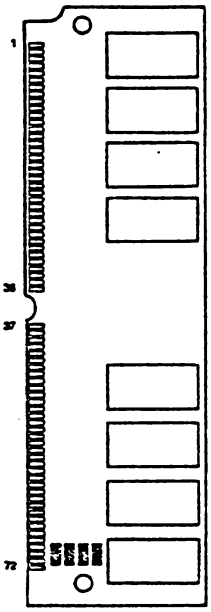
1.3 APPLICABLE DOCUMENTS

Commodore Engineering Policy 1.02.007 Integrated Circuit Qualification Procedure
Commodore Engineering Policy 1.02.008 Integrated Circuit Process Test Specification

SHAPE #Z00546 (F)

COMMODORE P. N.	STATUS				
391518-01	ACTIVE				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES (MILLIMETERS). TOLERANCES: ANGLES +/- 1 DEGREE 2 PLACE DECIMALS +/- 0.02 (0.50) 3 PLACE DECIMALS +/- 0.010 (0.25)	DRAWN joanne sugzdinis	DATE	Commodore 1200 WILSON DRIVE WEST CHESTER, PA. 19380 (215) 431-9100
	SYSTEM ENG.	DATE 5/18/92	
	TEST ENG	DATE	
	COMP. ENG Drew Shannon	DATE	TITLE: IC, MEM, SIMM (DRAM), 1M x 32 (4MB), 80 ns
	CIRCUIT ENG.	DATE	
			SIZE A / DRAWING NUMBER 391518
			SCALE / SHEET 1 OF 7



PIN OUT

Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	V_{SS}	13	A1	25	DQ22	37	NC	49	DQ8	61	DQ13
2	DQ0	14	A2	26	DQ7	38	NC	50	DQ24	62	DQ30
3	DQ16	15	A3	27	DQ23	39	V_{SS}	51	DQ9	63	DQ14
4	DQ1	16	A4	28	A7	40	$\overline{CAS0}$	52	DQ25	64	DQ31
5	DQ17	17	A5	29	NC	41	$\overline{CAS2}$	53	DQ10	65	DQ15
6	DQ2	18	A6	30	V_{CC}	42	$\overline{CAS3}$	54	DQ26	66	NC
7	DQ18	19	NC	31	A8	43	$\overline{CAS1}$	55	DQ11	67	PD1
8	DQ3	20	DQ4	32	A9	44	$\overline{RAS0}$	56	DQ27	68	PD2
9	DQ19	21	DQ20	33	NC	45	NC	57	DQ12	69	PD3
10	V_{CC}	22	DQ5	34	$\overline{RAS2}$	46	NC	58	DQ28	70	PD4
11	NC	23	DQ21	35	NC	47	$\overline{W}$	59	V_{CC}	71	NC
12	A0	24	DQ6	36	NC	48	NC	60	DQ29	72	V_{SS}

FIGURE 1 - PINOUTS

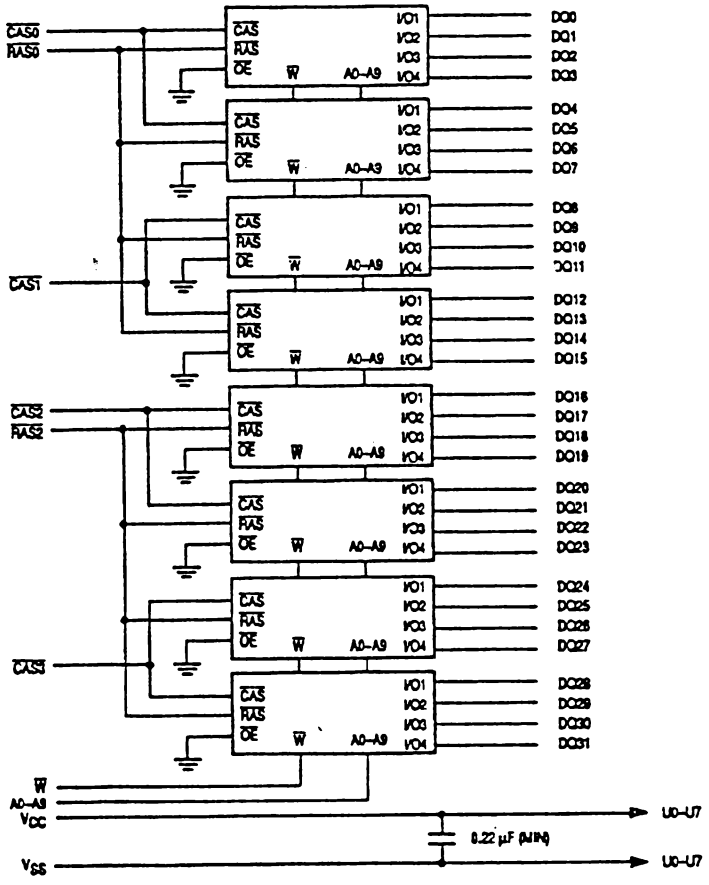
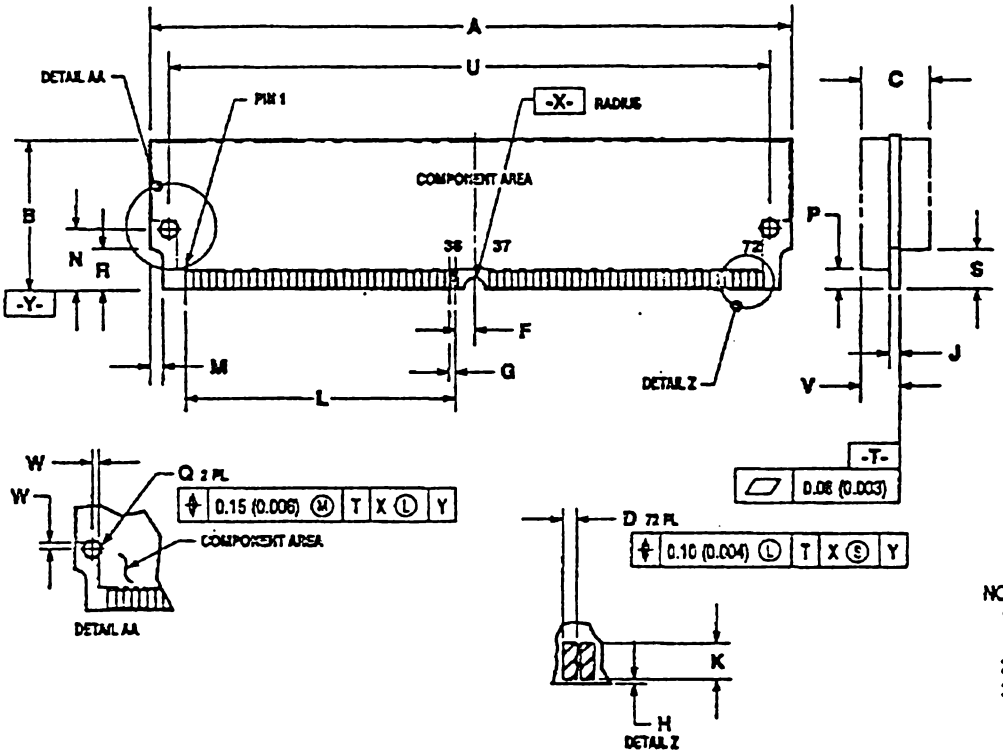


FIGURE 2 - LOGIC DIAGRAM

Commodore			TITLE: IC, MEM, SIMM (DRAM), 1M x 32 (4MB), 80 ns	
SIZE: A	DRAWING NUMBER: 391518	REV.: A	SCALE:	SHEET 2 OF 7



DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	107.82	108.08	4.245	4.255
B	25.27	25.53	0.995	1.005
C	—	9.14	—	0.360
D	1.02	1.07	0.040	0.042
F	3.18 BSC		0.125 BSC	
G	1.27 BSC		0.050 BSC	
H	—	0.25	—	0.010
J	1.19	1.37	0.047	0.054
K	0.25	—	0.100	—
L	44.45 REF		1.750 REF	
M	1.90	2.16	0.075	0.035
N	10.16 BSC		0.400 BSC	
P	3.18	—	0.125	—
Q	3.12	3.22	0.123	0.127
R	6.22	6.48	0.245	0.255
S	5.72	—	0.225	—
U	101.19 BSC		3.994 BSC	
V	—	5.28	—	0.208
W	1.12	—	0.044	—
X	1.52	1.63	0.060	0.064

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CARD THICKNESS APPLIES ACROSS TABS AND INCLUDES PLATING AND/OR METALIZATION.

FIGURE 3 - PACKAGE DIMENSIONS

Commodore	TITLE: IC, MEM, SIMM (DRAM), 1M x 32 (4MB), 80 ns			
SIZE: A	DRAWING NUMBER: 391518	REV.: A	SCALE:	SHEET 3 OF 7

2.0 ELECTRICAL CHARACTERISTICS

2.1 ABSOLUTE MAXIMUM RATINGS

Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to recommended operating conditions.

SYMBOL	PARAMETER	VALUE
V_{CC}	Power Supply Voltage	-1 to +7 V
V_{IN}, V_{OUT}	Voltage Relative to V_{SS} (any pin but V_{CC})	-1 to +7 V
I_{OUT}	Data Output Current per DQ Pin	50 mA
P_D	Power Dissipation	4.8 W
T_A	Operating Temperature Range	0 to +70 °C
T_{STG}	Storage Temperature Range	-25 to +125°C

2.2 RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
V_{CC}	Supply Voltage	4.5	5.0	5.5	V
V_{SS}	Supply Voltage	0	0	0	
V_{IH}	Logic High Voltage, all inputs	2.4	-	6.5	
V_{IL}	Logic Low Voltage, all inputs	-1.0	-	0.8	

NOTE: All voltages referenced to V_{SS}.

2.3 D.C. ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	MIN	MAX	UNIT
I_{CC1}	Vcc power supply current, t_{RC} = 150 ns	-	840	mA
I_{CC2}	Vcc power supply current (Standby), ($\overline{RAS}$ = $\overline{CAS}$ = V_{IH})	-	16	
I_{CC3}	Vcc power supply current during $\overline{RAS}$ only refresh cycles	-	840	
I_{CC4}	Vcc power supply current during fast page mode cycle	-	560	
I_{CC5}	Vcc power supply current (standby) ($\overline{RAS}$ = $\overline{CAS}$ = Vcc-0.2V	-	8	
I_{CC6}	Vcc power supply current during $\overline{CAS}$ before $\overline{RAS}$ refresh cycle	-	840	
$I_{LKG(I)}$	Input leakage current ($V_{SS} \le V_{IN} \le V_{CC}$)	-80	+80	µA
$I_{LK(O)}$	Output leakage current ($\overline{CAS}$ at logic 1, $V_{SS} \le V_{OUT} \le V_{CC}$)	-10	10	
V_{OH}	Ouptput high voltage (I_{OH} = -5 mA)	2.4	-	V
V_{OL}	Output low voltage (I_{OL} = 4.2mA)	-	0.4	

NOTES:
1. Current is a function of cycle rate and output loading. Maximum current is measured at the fastest cycle rate with the output open.
2. Column address can be changed once or less while $\overline{RAS}$ = V_{IL} and $\overline{CAS}$ = V_{IH}.

2.4 CAPACITANCE

SYMBOL	PARAMETER	VALUE
C_{I1}	Input capacitance (A0 - A9)	50 pF
C_{I2}	Input capacitance (W)	66 pF
C_{I3}	Input capacitance ($\overline{RAS0}$, $\overline{RAS2}$)	38 pF
C_{I4}	Input capacitance ($\overline{CAS0}$ - $\overline{CAS3}$)	24 pF
C_{DQ}	I/O capacitance (DQ0 - DQ31)	17 pF

NOTE: Capacitance must be measured with a Boonton Meter or effective capacitance calculated from the equation "C = 1 $\Delta t/\Delta V$".

2.5 A.C. CHARACTERISTICS (NOTES 1, 2, 3, 4)

SYMBOL	ALT.	PARAMETER	MIN	MAX	UNIT
t_{RELREL}	t_{RC}	Random Read or Write Cycle Time (5)	150		ns
t_{CELCEL}	t_{PC}	Page Mode Cycle Time	50		
t_{RELQV}	t_{RAC}	Access Time from $\overline{RAS}$ (6, 7)		80	
t_{CELQV}	t_{CAC}	Access Time from $\overline{CAS}$ (6, 8)		20	
t_{AVQV}	t_{AA}	Access Time form Column Address (6, 9)		40	
t_{CEHQV}	t_{CPA}	Access Time from Precharge $\overline{CAS}$ (6)		45	
t_{CELQX}	t_{CLZ}	$\overline{CAS}$ to Output in Low-Z (6)	0		
t_{CEHQZ}	t_{OFF}	Output Buffer and Turn-Off Delay (10)	0	20	
t_T	t_T	Transition Time (Rise and Fall)	3	50	
t_{REHREL}	t_{RP}	$\overline{RAS}$ Precharge Time	60		
t_{RELREH}	t_{RAS}	$\overline{RAS}$ Pulse Width	80	10,000	
t_{RELREH}	t_{RASP}	$\overline{RAS}$ Pulse Width (Fast Page Mode)	80	100,000	
t_{CELREH}	t_{RSH}	$\overline{RAS}$ Hold Time	25		
t_{RELCEH}	t_{CSH}	$\overline{CAS}$ Hold Time	80		
t_{CELCEH}	t_{CAS}	$\overline{CAS}$ Pulse Width	20	10,000	
t_{RELCEL}	t_{RCD}	$\overline{RAS}$ to $\overline{CAS}$ Delay Time (11)	20	60	
t_{RELAV}	t_{RAD}	$\overline{RAS}$ to Column Address Delay Time (12)	15	40	

NOTES:

1. V_{IH} min and V_{IL} max are reference levels for measuring timing of input signals. Transition times are measured between V_{IH} and V_{IL}.
2. Initial pause of 200µs is required after power-up followed by 8 $\overline{RAS}$ cycles to insure proper operation.
3. Transition time specification applies for all signals. All input signals must transition between V_{IH} and V_{IL} in a monotonic manner.
4. Ac measurement is $t_T = 5.0$ ns
5. Specification for t_{RC}(min) is used to indicate cycle time at which proper operation over full temperature is assured.
6. Measured with current load equivalent to 2 TTL loads and 100 pF with data trip points set at $V_{OH} = 2.0V$ and $V_{OL} = 0.8V$.
7. Assumes that $t_{RCD} \leq t_{RCD}$ (max.).
8. Assumes that $t_{RCD} \geq t_{RCD}$ (max.).
9. Assumes that $t_{RAD} \geq t_{RAD}$(max).
10. t_{OFF} (max) defines the time at which the output achieves open circuit condition. Not referenced to output voltage levels.
11. Operation within the t_{RCD}(max) time limit ensures that t_{RAC} (max) can be met.
12. Operation within the t_{RAD} (max) limit ensures that t_{RAC}(max) can be met.

2.5 A.C. CHARACTERISTICS (CONTINUED)

SYMBOL	ALT.	PARAMETER	MIN	MAX	UNIT
tCEHREL	tCRP	$\overline{CAS}$ to $\overline{RAS}$ Precharge Time	5		
tCEHCEL	tCP	$\overline{CAS}$ Precharge Time (Page Mode Cycle Only)	10		
tAVREL	tASR	Row Address Setup Time	0		
tRELAX	tRAH	Row Address Hold Time	10		
tAVCEL	tASC	Column Address Setup Time	0		
tRELAX	tCAH	Column Address Hold Time	15		
tCELAX	tAR	Column Address Hold Time Referenced to $\overline{CAS}$	60		
tAVREH	tRAL	Column Address to RAS Lead Time	40		
tWHCEL	tRCS	Read Command Setup Time	0		ns
tCEHWX	tRCH	Read Command Hold Time Referenced to $\overline{CAS}$ (13)	0		
tREHWX	tRRH	Read Command Hold Time Referenced to $\overline{RAS}$ (13)	0		
tCELWH	tWCH	Write Command Hold Time Referenced to $\overline{CAS}$	15		
tRELWH	tWCR	Write Command Hold Time Referenced to $\overline{RAS}$	60		
tWLWH	tWP	Write Command Pulse Width	15		
tWLREH	tRWL	Write Command to $\overline{RAS}$ Lead Time	20		
tWLCEH	tCWL	Write Command to CRAS Lead Time	20		
tDVCEL	tDS	Data in Setup Time (14)	0		
tCELDX	tDH	Data in Hold Time (14)	15		
tRELDX	tDHR	Data in Hold Time Referenced to $\overline{RAS}$	60		
tRVRV	tRFSH	Refresh Period		16	ms
tWLCEL	tWCS	Write Command Setup Time (15)	0		
tRELCEL	tCSR	$\overline{CAS}$ Setup Time for $\overline{CAS}$ before $\overline{RAS}$ Refresh	10		
tRELCEH	tCHR	$\overline{CAS}$ Hold Time for $\overline{CAS}$ before $\overline{RAS}$ Refresh	30		ns
tREHCEL	tRPC	$\overline{CAS}$ Precharge to $\overline{CAS}$ Active Time	0		
tCEHCEL	tCPT	$\overline{CAS}$ Precharge Time for $\overline{CAS}$ before $\overline{RAS}$ Counter Test	40		
tCEHCEL	tCPN	$\overline{CAS}$ Precharge Time	10		

NOTES:
13. Either tRRH or tRCH must be satisfied for a read cycle.
14. These parameters are referenced $\overline{CAS}$ leading edge in random write cycles.
15. twcs is not a restrictive operating parameter.

3.0 PHYSICAL REQUIREMENTS

3.1 MARKING

Parts shall be marked with Manufacturer's Part Number, Manufacturer's Identification, and EIA Date Code.

3.2 PACKAGING

The interconnected logic circuitry shall be contained in a 72-lead single in-line memory module (SIMM) package with exterior dimensions per Figure 3.

4.0 ENVIRONMENTAL REQUIREMENTS

Units furnished to the requirements of this specification shall meet the following environmental resistance requirements (vendors shall furnish supporting documentation upon request):

Operating Temperature	0 to 70 deg. C
Operating Humidity	5 to 95% RH non-condensing
Operating Altitude	0 to 3000 meters
Storage Temperature	- 20 to + 85 deg. C
Storage Humidity	5 to 95% RH non-condensing
Storage Altitude	0 to 15,000 meters

4.1 PROCESS QUALIFICATION TESTS

Integrated circuits supplied to the requirements of this specification shall meet the requirements of Engineering Policy No. 1.02.008. Supporting documentation shall be supplied by vendor upon request.

4.2 ENVIRONMENTAL TEST CONDITIONS

Devices shall comply with the following environmental resistance tests per Commodore Engineering Policy 1.02.007.

1. Temperature/humidity (85 deg. C and 85% RH non-condensing) for 168 hours.
2. Operating life (1000 hours at 70 deg. C ambient temperature)
3. Solderability per MIL-STD-883, Method 2003
4. Pressure cooker (15 psig, 121 deg. C, and 100% RH for 24 hours)
5. Solvent resistance per MIL-STD-883,Method 2015, using water and trichloroethane
6. Solder temperature resistance (250 deg. C for ten seconds)
7. ESD requirement MIL-STD 1686 Group 3

Note: Devices shall meet this specification's operating performance requirements after the above tests are completed.

4.3 MINIMUM ACCEPTANCE LEVEL

The minimum acceptance level of any lot shall be an AQL of 0.65 as defined by MIL-STD 105 single sampling techniques.

4.4 AGE OF DEVICES

Unit shall be rejected if EIA Date Code indicates an age of three (3) or more years.

APPROVED VENDOR LIST

This sheet must be removed from this document before the document is shown or transmitted to a vendor.

Commodore Part Number	Vendor	Vendor Part Number
391518-01	MOTOROLA	MCM32100S-80
	MICRON	MT8D132M-80
	TEXAS INSTRUMENTS	TM124BBK32-80

Commodore	TITLE: IC, MEM, SIMM (DRAM), 1M x 32 (4MB), 80 ns			
SIZE: A	DRAWING NUMBER: 391518	REV.: A	SCALE:	SHEET i OF i

APPLICATION		REVISION			
NEXT ASSY.	USED ON	LTR	DESCRIPTION	DATE	APPROVED
	A4000	A	SPECIFICATION RELEASE	2/5/92	GCA

1.0 DESCRIPTION

This specification describes the requirements for a 1M x 32 bit (4MB) DRAM SIMM module no more than 1 inch in height. It shall consist of sixteen 256K x 4 DRAMS and sixteen 0.22 µF minimum decoupling. It shall have the following features:

- three state data output
- early-write common I/O capability
- $\overline{RAS}$ -only refresh, $\overline{CAS}$ before $\overline{RAS}$ refresh, and hidden refresh
- unlatched data out at cycle end

1.1 CONFIGURATION

This device shall be contained in a 72-lead single-in-line memory module (SIMM) package with pinouts as in Figure 1 and package dimensions as in Figure 3.

1.2 SOURCES

Refer to Approved Vendor List.

1.3 APPLICABLE DOCUMENTS

Commodore Engineering Policy 1.02.007 Integrated Circuit Qualification Procedure
Commodore Engineering Policy 1.02.008 Integrated Circuit Process Test Specification

SHAPE #Z00546 (F)

COMMODORE P. N.	STATUS				
391517-01	ACTIVE				

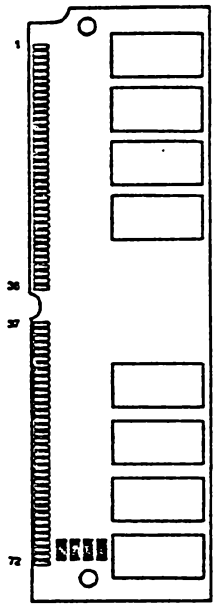
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES (MILLIMETERS).
TOLERANCES:
ANGLES +/- 1 DEGREE
2 PLACE DECIMALS +/- 0.02 (0.50)
3 PLACE DECIMALS +/- 0.010 (0.25)

DRAWN joanne sugzdinis		DATE
SYSTEM ENG.		DATE 3/3/92
TEST ENG		DATE
COMP. ENG Drew Shannon		DATE
CIRCUIT ENG.		DATE

Commodore
1200 WILSON DRIVE
WEST CHESTER, PA. 19380
(215) 431-9100

TITLE:
IC, MEM, SIMM (DRAM),
512K x 32 (2MB), 80 ns

SIZE	DRAWING NUMBER
A	391517
SCALE	SHEET 1 OF 7



PIN OUT

Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	V_{SS}	13	A1	25	DQ22	37	NC	49	DQ8	61	DQ13
2	DQ0	14	A2	26	DQ7	38	NC	50	DQ24	62	DQ30
3	DQ16	15	A3	27	DQ23	39	V_{SS}	51	DQ9	63	DQ14
4	DQ1	16	A4	28	A7	40	$\overline{CAS0}$	52	DQ25	64	DQ31
5	DQ17	17	A5	29	NC	41	$\overline{CAS2}$	53	DQ10	65	DQ15
6	DQ2	18	A6	30	V_{CC}	42	$\overline{CAS3}$	54	DQ26	66	NC
7	DQ18	19	NC	31	A8	43	$\overline{CAS1}$	55	DQ11	67	PD1
8	DQ3	20	DQ4	32	NC	44	$\overline{RAS0}$	56	DQ27	68	PD2
9	DQ19	21	DQ20	33	$\overline{RAS3}$	45	$\overline{RAS1}$	57	DQ12	69	PD3
10	V_{CC}	22	DQ5	34	$\overline{RAS2}$	46	NC	58	DQ28	70	PD4
11	NC	23	DQ21	35	NC	47	$\overline{W}$	59	V_{CC}	71	NC
12	A0	24	DQ6	36	NC	48	NC	60	DQ29	72	V_{SS}

PIN NAMES

A0–A8	Address Inputs
DQ0–DQ31	Data Input/Output
$\overline{CAS0}$–$\overline{CAS3}$	Column Address Strobe
PD1–PD4	Presence Detect
$\overline{RAS0}$–$\overline{RAS3}$	Row Address Strobe
$\overline{W}$	Read/Write Input
V_{CC}	Power (+ 5 V)
V_{SS}	Ground
NC	No Connection

All power supply and ground pins must be connected for proper operation of the device.

FIGURE 1 - PINOUTS

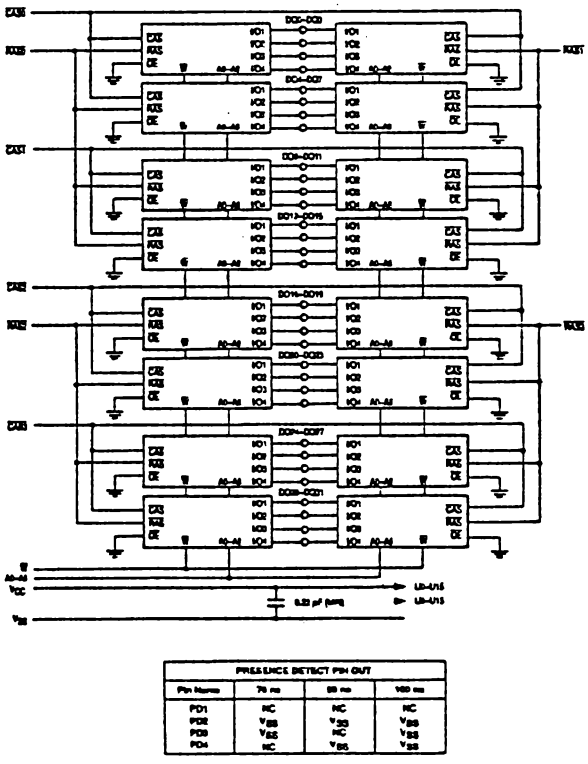
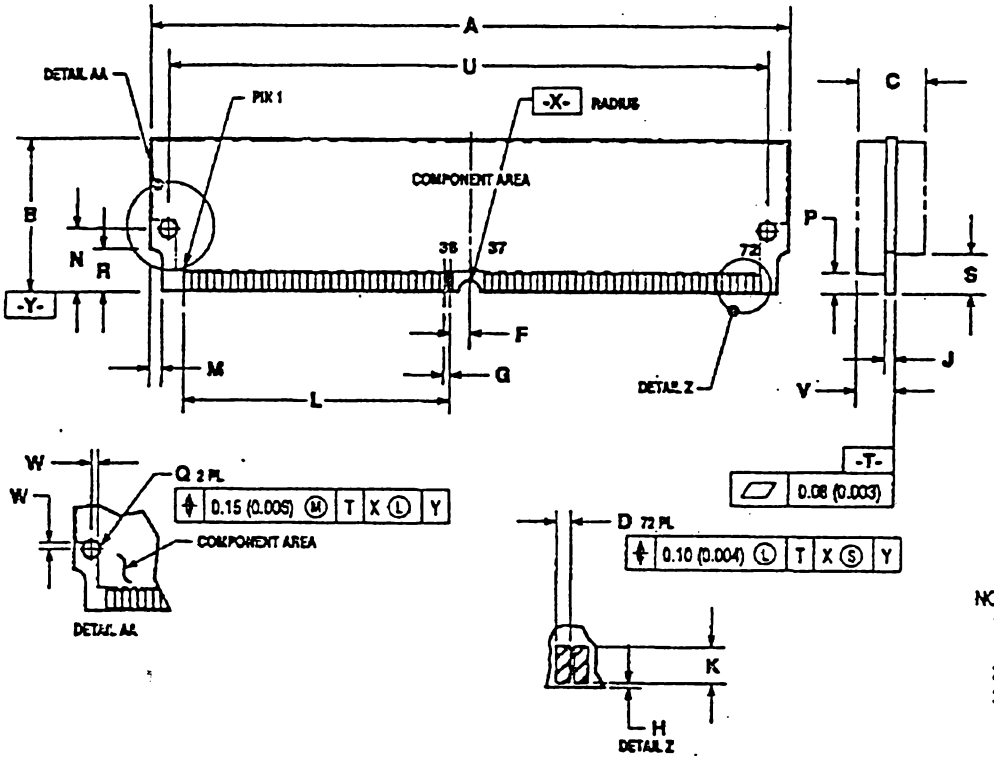


FIGURE 2 - LOGIC DIAGRAM

Commodore			TITLE: IC, MEM, SIMM (DRAM), 512K x 32 (2MB), 80 ns	
SIZE: A	DRAWING NUMBER: 391517	REV.: A	SCALE:	SHEET 2 OF 7



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	107.82	108.08	4.245	4.255
B	25.27	25.53	0.995	1.005
C	—	9.14	—	0.360
D	1.02	1.07	0.040	0.042
F	3.18 BSC		0.125 BSC	
G	1.27 BSC		0.050 BSC	
H	—	0.25	—	0.010
J	1.19	1.37	0.047	0.054
K	0.25	—	0.100	—
L	44.45 REF		1.750 REF	
M	1.90	2.16	0.075	0.085
N	10.16 BSC		0.400 BSC	
P	3.18	—	0.125	—
Q	3.12	3.22	0.123	0.127
R	6.22	6.48	0.245	0.255
S	5.72	—	0.225	—
U	101.19 BSC		3.984 BSC	
V	—	5.28	—	0.208
W	1.12	—	0.044	—
X	1.52	1.63	0.060	0.064

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CARD THICKNESS APPLIES ACROSS TABS AND INCLUDES PLATING AND/OR METALIZATION.

FIGURE 3 - PACKAGE DIMENSIONS

Commodore			TITLE: IC, MEM, SIMM (DRAM), 512K x 32 (2MB), 80 ns	
SIZE: A	DRAWING NUMBER: 391517	REV.: A	SCALE:	SHEET 3 OF 7

2.0 ELECTRICAL CHARACTERISTICS

2.1 ABSOLUTE MAXIMUM RATINGS

Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to recommended operating conditions.

SYMBOL	PARAMETER	VALUE
V_{CC}	Power Supply Voltage	-1 to +7 V
V_{IN}, V_{OUT}	Voltage Relative to V_{SS} (any pin but V_{CC})	-1 to +7 V
I_{OUT}	Data Output Current per DQ Pin	50 mA
P_D	Power Dissipation	4.92 W
T_A	Operating Temperature Range	0 to +70 °C
T_{STG}	Storage Temperature Range	-25 to +125°C

2.2 RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
V_{CC}	Supply Voltage	4.5	5.0	5.5	V
V_{SS}	Supply Voltage	0	0	0	
V_{IH}	Logic High Voltage, all inputs	2.4	-	6.5	
V_{IL}	Logic Low Voltage, all inputs	-1.0	-	0.8	

NOTE: All voltages referenced to V_{SS}.

2.3 D.C. ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	MIN	MAX	UNIT
I_{CC1}	V_{CC} power supply current, t_{RC} = 150 ns	-	576	mA
I_{CC2}	V_{CC} power supply current (Standby), ($\overline{RAS}$ = $\overline{CAS}$ = V_{IH})	-	32	
I_{CC3}	V_{CC} power supply current during $\overline{RAS}$ only refresh cycles	-	576	
I_{CC4}	V_{CC} power supply current during fast page mode cycle	-	416	
I_{CC5}	V_{CC} power supply current (standby) ($\overline{RAS}$ = $\overline{CAS}$ = V_{CC}-0.2V	-	16	
I_{CC6}	V_{CC} power supply current during $\overline{CAS}$ before $\overline{RAS}$ refresh cycle	-	576	
$I_{LKG(I)}$	Input leakage current ($V_{SS} \le V_{IN} \le V_{CC}$)	-160	160	µA
$I_{LK(O)}$	Output leakage current ($\overline{CAS}$ at logic 1, $V_{SS} \le V_{OUT} \le V_{CC}$)	--20	20	
V_{OH}	Ouptput high voltage (I_{OH} = -5 mA)	2.4	-	V
V_{OL}	Output low voltage (I_{OL} = 4.2mA)	-	0.4	

NOTES:
1. Current is a function of cycle rate and output loading. Maximum current is measured at the fastest cycle rate with the output open.
2. Column address can be changed once or less while $\overline{RAS}$ = V_{IL} and $\overline{CAS}$ = V_{IH}.

2.4 CAPACITANCE

SYMBOL	PARAMETER	VALUE
C_{I1}	Input capacitance (A0 - A8)	90 pF
C_{I2}	Input capacitance ($\overline{W}$)	122 pF
C_{I3}	Input capacitance ($\overline{RAS0}$-$\overline{RAS3}$)	38 pF
C_{I4}	Input capacitance ($\overline{CAS0}$-$\overline{CAS3}$)	38 pF
C_{DQ}	I/O capacitance (DQ0 - DQ31)	24 pF

NOTE: Capacitance must be measured with a Boonton Meter or effective capacitance calculated from the equation "C = 1 $\Delta t/\Delta V$".

2.5 A.C. CHARACTERISTICS (NOTES 1, 2, 3, 4)

SYMBOL	ALT.	PARAMETER	MIN	MAX	UNIT
t_{RELREL}	t_{RC}	Random Read or Write Cycle Time (5)	150		ns
t_{CELCEL}	t_{PC}	Page Mode Cycle Time	45		
t_{RELQV}	t_{RAC}	Access Time from $\overline{RAS}$ (6, 7)		80	
t_{CELQV}	t_{CAC}	Access Time from $\overline{CAS}$ (6, 8)		20	
t_{AVQV}	t_{AA}	Access Time form Column Address (6, 9)		40	
t_{CEHQV}	t_{CPA}	Access Time from Precharge $\overline{CAS}$ (6)		40	
t_{CELQX}	t_{CLZ}	$\overline{CAS}$ to Output in Low-Z (6)	0		
t_{CEHQZ}	t_{OFF}	Output Buffer and Turn-Off Delay (10)	0	20	
t_T	t_T	Transition Time (Rise and Fall)	3	50	
t_{REHREL}	t_{RP}	$\overline{RAS}$ Precharge Time	60		
t_{RELREH}	t_{RAS}	$\overline{RAS}$ Pulse Width	80	10,000	
t_{RELREH}	t_{RASP}	$\overline{RAS}$ Pulse Width (Fast Page Mode)	80	100,000	
t_{CELREH}	t_{RSH}	$\overline{RAS}$ Hold Time	20		
t_{RELCEH}	t_{CSH}	$\overline{CAS}$ Hold Time	80		
t_{CELCEH}	t_{CAS}	$\overline{CAS}$ Pulse Width	20	10,000	
t_{RELCEL}	t_{RCD}	$\overline{RAS}$ to $\overline{CAS}$ Delay Time (11)	20	60	
t_{RELAV}	t_{RAD}	$\overline{RAS}$ to Column Address Delay Time (12)	15	40	

NOTES:
1. V_{IH} min and V_{IL} max are reference levels for measuring timing of input signals. Transition times are measured between V_{IH} and V_{IL}.
2. Initial pause of 200µs is required after power-up followed by 8 $\overline{RAS}$ cycles to insure proper operation.
3. Transition time specification applies for all signals. All input signals must transition between V_{IH} and V_{IL} in a monotonic manner.
4. Ac measurement is t_T = 5.0 ns
5. Specification for t_{RC}(min) is used to indicate cycle time at which proper operation over full temperature is assured.
6. Measured with current load equivalent to 2 TTL loads and 100 pF with data trip points set at V_{OH} = 2.0V and V_{OL} = 0.8V.
7. Assumes that $t_{RCD} \leq t_{RCD}$ (max.).
8. Assumes that $t_{RCD} \geq t_{RCD}$ (max.).
9. Assumes that $t_{RAD} \geq t_{RAD}$(max).
10. t_{OFF} (max) defines the time at which the output achieves open circuit condition. Not referenced to output voltage levels.
11. Operation within the t_{RCD}(max) time limit ensures that t_{RAC} (max) can be met.
12. Operation within the t_{RAD} (max) limit ensures that t_{RAC}(max) can be met.

2.5 A.C. CHARACTERISTICS (CONTINUED)

SYMBOL	ALT.	PARAMETER	MIN	MAX	UNIT
tCEHREL	tCRP	$\overline{CAS}$ to $\overline{RAS}$ Precharge Time	5		ns
tCEHCEL	tCP	$\overline{CAS}$ Precharge Time (Page Mode Cycle Only)	10		
tAVREL	tASR	Row Address Setup Time	0		
tRELAX	tRAH	Row Address Hold Time	10		
tAVCEL	tASC	Column Address Setup Time	0		
tRELAX	tCAH	Column Address Hold Time	15		
tCELAX	tAR	Column Address Hold Time Referenced to $\overline{CAS}$	60		
tAVREH	tRAL	Column Address to RAS Lead Time	40		
tWHCEL	tRCS	Read Command Setup Time	0		
tCEHWX	tRCH	Read Command Hold Time Referenced to $\overline{CAS}$ [13]	0		
tREHWX	tRRH	Read Command Hold Time Referenced to $\overline{RAS}$ [13]	0		
tCELWH	tWCH	Write Command Hold Time Referenced to $\overline{CAS}$	15		
tRELWH	tWCR	Write Command Hold Time Referenced to $\overline{RAS}$	60		
tWLWH	tWP	Write Command Pulse Width	15		
tWLREH	tRWL	Write Command to $\overline{RAS}$ Lead Time	20		
tWLCEH	tCWL	Write Command to CRAS Lead Time	20		
tDVCEL	tDS	Data in Setup Time [14]	0		
tCELDX	tDH	Data in Hold Time [14]	15		
tRELDX	tDHR	Data in Hold Time Referenced to $\overline{RAS}$	60		
tRVRV	tRFSH	Refresh Period		8	ms
tWLCEL	tWCS	Write Command Setup Time [15]	0		ns
tRELCEL	tCSR	$\overline{CAS}$ Setup Time for $\overline{CAS}$ before $\overline{RAS}$ Refresh	10		
tRELCEH	tCHR	$\overline{CAS}$ Hold Time for $\overline{CAS}$ before $\overline{RAS}$ Refresh	30		
tREHCEL	tRPC	$\overline{CAS}$ Precharge to $\overline{CAS}$ Active Time	0		
tCEHCEL	tCPT	$\overline{CAS}$ Precharge Time for $\overline{CAS}$ before $\overline{RAS}$ Counter Test	40		
tCEHCEL	tCPN	$\overline{CAS}$ Precharge Time	10		

NOTES:
13. Either tRRH or tRCH must be satisfied for a read cycle.
14. These parameters are referenced $\overline{CAS}$ leading edge in random write cycles.
15. twcs is not a restrictive operating parameter.

3.0 PHYSICAL REQUIREMENTS

3.1 MARKING

Parts shall be marked with Manufacturer's Part Number, Manufacturer's Identification, and EIA Date Code.

3.2 PACKAGING

The interconnected logic circuitry shall be contained in a 72-lead single in-line memory module (SIMM) package with exterior dimensions per Figure 3.

4.0 ENVIRONMENTAL REQUIREMENTS

Units furnished to the requirements of this specification shall meet the following environmental resistance requirements (vendors shall furnish supporting documentation upon request):

Operating Temperature	0 to 70 deg. C
Operating Humidity	5 to 95% RH non-condensing
Operating Altitude	0 to 3000 meters
Storage Temperature	- 20 to + 85 deg. C
Storage Humidity	5 to 95% RH non-condensing
Storage Altitude	0 to 15,000 meters

4.1 PROCESS QUALIFICATION TESTS

Integrated circuits supplied to the requirements of this specification shall meet the requirements of Engineering Policy No. 1.02.008. Supporting documentation shall be supplied by vendor upon request.

4.2 ENVIRONMENTAL TEST CONDITIONS

Devices shall comply with the following environmental resistance tests per Commodore Engineering Policy 1.02.007.

1. Temperature/humidity (85 deg. C and 85% RH non-condensing) for 168 hours.
2. Operating life (1000 hours at 70 deg. C ambient temperature)
3. Solderability per MIL-STD-883, Method 2003
4. Pressure cooker (15 psig, 121 deg. C, and 100% RH for 24 hours)
5. Solvent resistance per MIL-STD-883, Method 2015, using water and trichloroethane
6. Solder temperature resistance (250 deg. C for ten seconds)
7. ESD requirement MIL-STD 1686 Group 3

Note: Devices shall meet this specification's operating performance requirements after the above tests are completed.

4.3 MINIMUM ACCEPTANCE LEVEL

The minimum acceptance level of any lot shall be an AQL of 0.65 as defined by MIL-STD 105 single sampling techniques.

4.4 AGE OF DEVICES

Unit shall be rejected if EIA Date Code indicates an age of three (3) or more years.

APPROVED VENDOR LIST

This sheet must be removed from this document before the document is shown or transmitted to a vendor.

Commodore Part Number	Vendor	Vendor Part Number
391518-01	MOTOROLA	MCM32512S-80
	MICRON	MT16D51232M-80
	TEXAS INSTRUMENTS	TM512CBK32-80

Commodore	TITLE: IC, MEM, SIMM (DRAM), 512K x 32 (2MB), 80 ns			
SIZE: A	DRAWING NUMBER: 391517	REV.: A	SCALE:	SHEET i OF i

PART NUMBER	DESCRIPTION
364822-01	PCB Assembly, A4000Daughter Card

REVISIONS				
ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	Advance Engineering Release	6/3/92	S. BERLIN
	A	PILOT PRODUCTION RELEASE	8-13-92	S. Berlin

Commodore	PCB Assembly, A4000 Daughter Board	Drawn by J. Augenbraun	Drawing # 364822
			Sheet 1 of 3

QTY. REQ. PER DASH #										ITM			
10	09	08	07	06	05	04	03	02	01	#	PART NO.	DESCRIPTION	REF DES / NOTES
									Ref	1	364821-01	Schematic, A4000 Daughter Board	
									1	2	364823-01	Artwork, A4000 Daughter Board	
									Ref	3	364820-01	Fab, A4000 Daughter Board	
										4			
									1	5	380227-01	IC, 74HCT32	U600
									1	6	901522-30	IC, 7407	U601
										7			
									6	8	380388-04	Resistor Network, SIP, 220/330 8 x 10	RP602-RP607
									1	9	380388-01	Resistor Network, SIP, 220/330 4 x 6	RP608
									S	10	380388-04	Resistor Network, SIP, 220/330 8 x 10	RP608
									5	11	902410-10	Resistor Network, SIP, 1K 9 x 10	RP752 - RP756
									1	12	902410-08	Resistor Network, SIP, 4.7K 9 x 10	RP751
										13			
									2	14	901550-58	Resistor, 1/4W, 470 Ohm	R601 R603
									6	15	901550-01	Resistor, 1/4W, 1K Ohm	R600 R602 R605 R606 R607 R608
										16			
										17			
									44	18	900462-61	Capacitor, Ceramic Axial 1000 pF axial	C756 - C799
									2	19	390082-01	Capacitor, Ceramic Axial .1 uF axial	C604 C606
									2	20	900101-53	Capacitor, Electrolytic Axial 22uF 16V	C751 C752
									3	21	900101-47	Capacitor, Electrolytic Axial 220uF 16V	C600-C602
										22			
										23			
									4	24	903446-04	Connector, Card Edge 36 pin	CN621 CN754 CN755 CN756
									1	25	903446-08	Connector, Card Edge 54 pin	CN622
									3	26	903446-02	Connector, Card Edge 62 pin	CN751 - CN753
									4	27	903446-06	Connector, Card Edge 100 pin	CN600-CN603
										28			
									1	29	903025-01	Ferrite Bead, Axial	FB601
										30			
										31			
										32			
										33			
										34			
										35			
										36			
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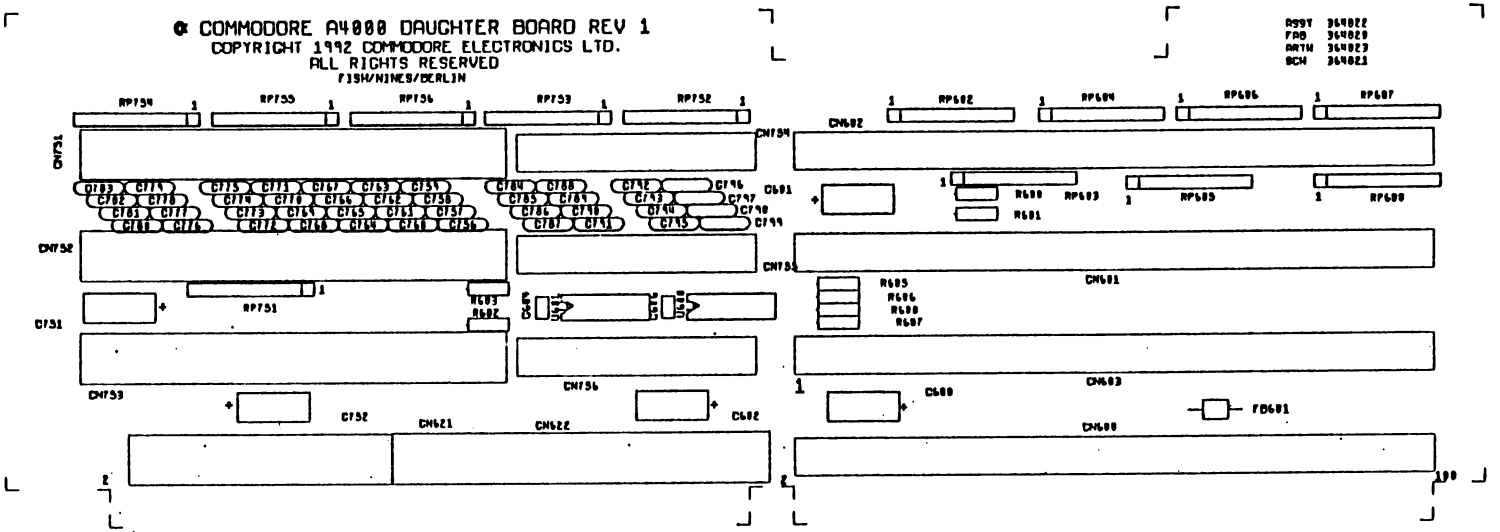
										48			
										49			
										50			

Commodore	Title: PCB Assembly, A4000 Daughter Board	Drawn by: J. Augenbraun	Drawing #: 364822 REV: A
			Sheet 2 of 3

REVISIONS				
LTR	ZONE	DESCRIPTION.	DATE	APPROVED
		SEE SHEET 1		

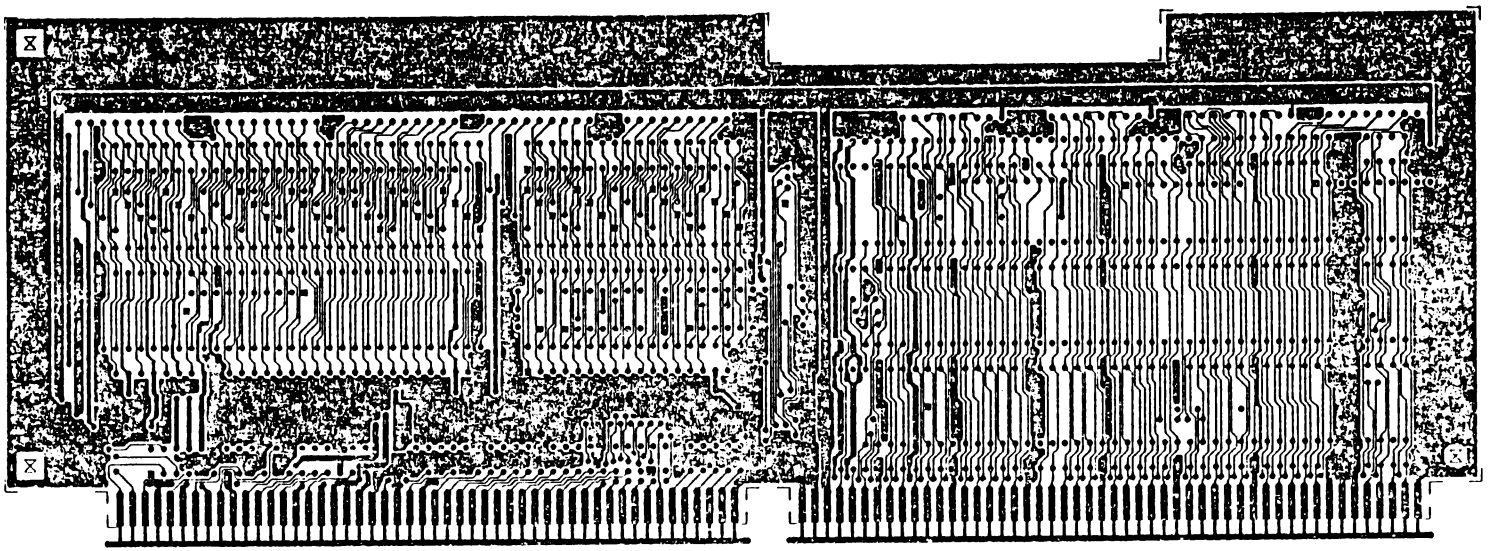


COMMODORE WCHEST
A4000 DAUGHTER BOARD REV 1
8-11-92
SILKSCREEN

commodore	TITLE: PCB ASSEMBLY A4000 DAUGHTER CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364822		
		CHKD:		APPR:			SHEET 3 OF 3		

CENTENNIAL BLUEPRINT M7X4

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PILOT PRODUCTION RELEASE	8-17-92	JCB

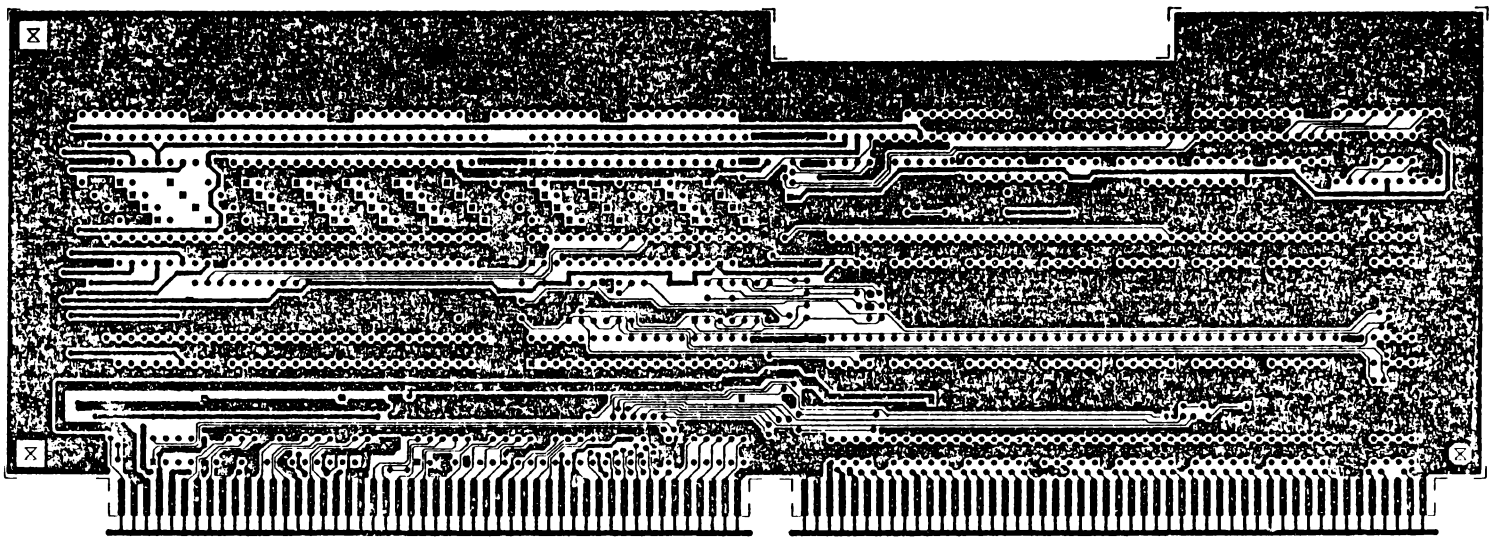


COMMODORE WCHEST
A4000 DAUGHTER BOARD REV 1
8-11-92
COMPONENT SIDE

UNLESS OTHERWISE SPECIFIED TOLERANCES ON: DECIMALS .X ± .XX ± .XXX ± ∠'S ±	DRAWN BY:	DATE	commodore
	CHKD:		ARTWORK - A4000 DAUGHTER CARD
	ENGR:		
	APPR:		
MATERIAL:	USED ON	NEXT ASSY	SIZE B · 364823 · REV A
FINISH:			SCALE · SHEET 1 OF 5

ADVANCED REPRO

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
-		SEE SHEET 1		

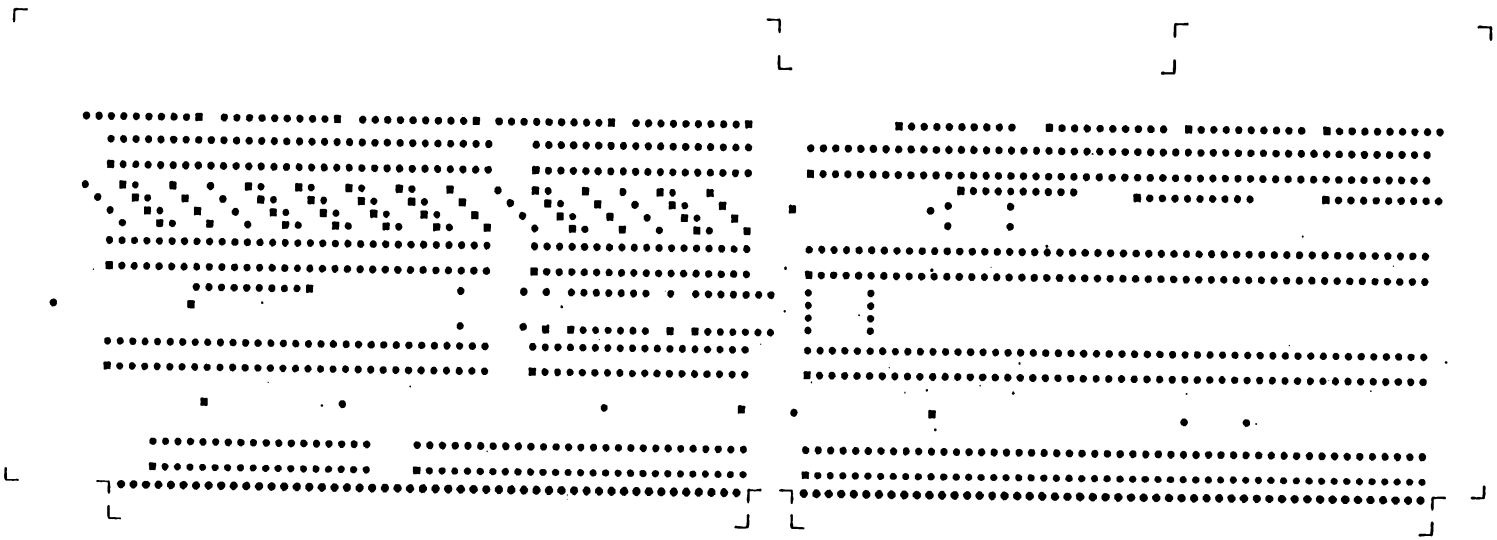


COMMODORE WCHEST
A4000 DAUGHTER BOARD REV 1
8-11-92
SOLDER SIDE

CONFIDENTIAL DOCUMENT

commodore	TITLE: ARTWORK - A4000 DAUGHTER CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364823	
		CHKD:		APPR:			SHEET 2 OF 5	

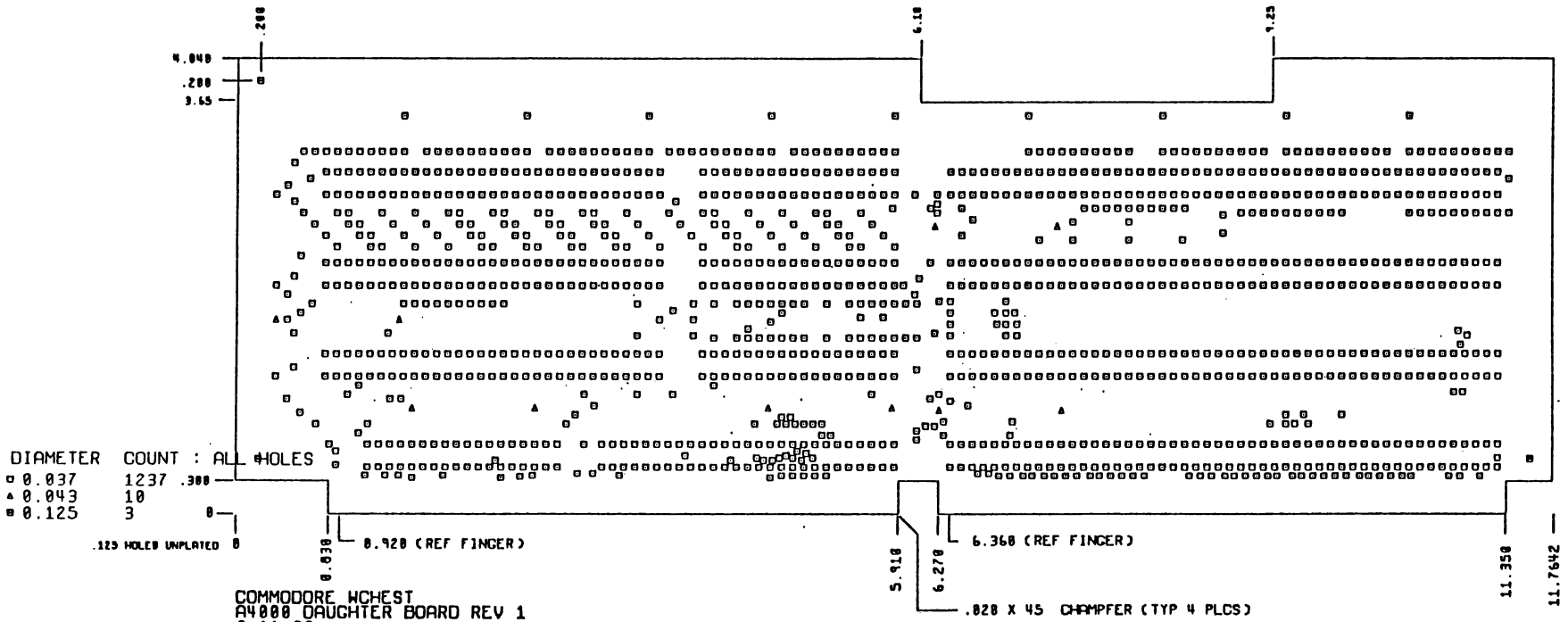
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



COMMODORE WCHEST
A4000 DAUGHTER BOARD REV 1
8-11-92
SOLDERMASK

commodore	TITLE: ARTWORK - A4000 DAUGHTER CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364823		
		CHKD:		APPR:			SHEET 3 OF 5		

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



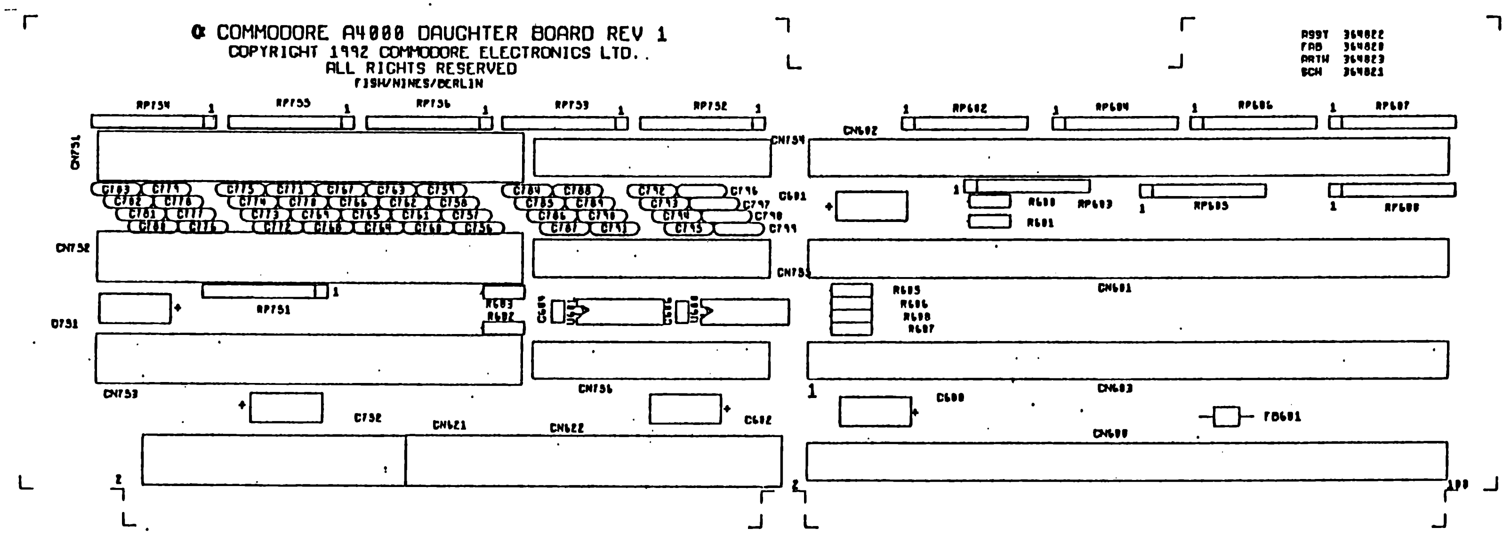
DIAMETER	COUNT : ALL HOLES
▫ 0.037	1237
▲ 0.043	10
▪ 0.125	3

COMMODORE WCHEST
A4000 DAUGHTER BOARD REV 1
8-11-92
DRILL LEGEND

commodore	TITLE: ARTWORK - A4000 DAUGHTER CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364823
		CHKD:		APPR:			SHEET 4 OF 5

CENTENNIAL BLUEPRINT N2P14

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



COMMODORE WCHEST
A4000 DAUGHTER BOARD REV 1
8-11-92
SILKSCREEN

commodore	TITLE: ARTWORK - A4000 DAUGHTER CARD	DRAWN BY:	DATE	ENGR:	SIZE	DRAWING NUMBER
		CHKD:		APPR:	B	364823
						SHEET 5 OF 5

PART NUMBER	DESCRIPTION
364828-01	BASE(BASIC)ASSEMBLY,A4000

REVISIONS				
ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE	6/3/92	G. BERLIN
	A	PILOT PRODUCTION RELEASE	8-13-92	G. Berlin

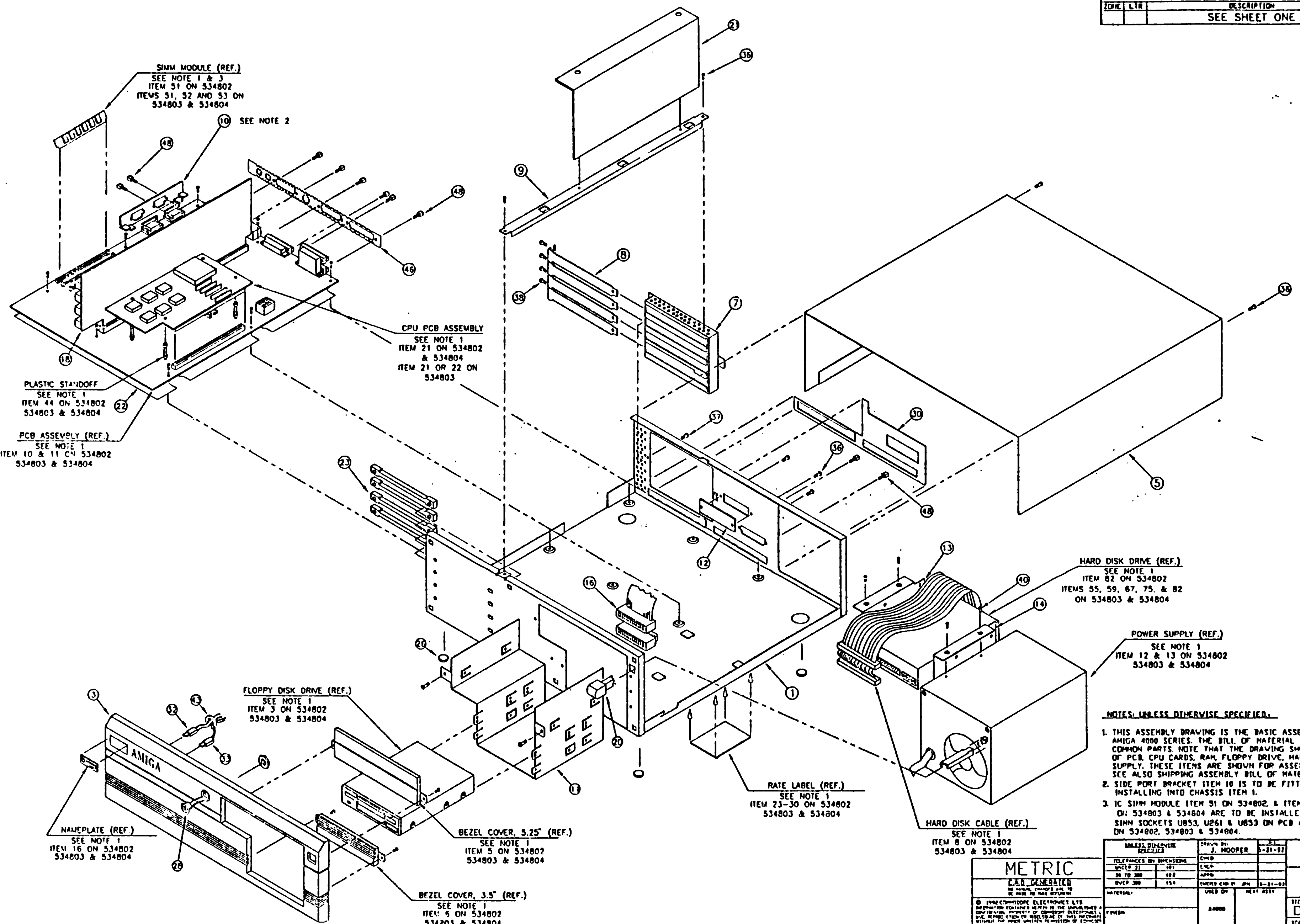
1. SHEET 3 OF 3 SIZE D
ASSY. DWG 364828

Commodore	TITLE BASE(BASIC)ASSEMBLY,A4000	Drawn by J. Hooper	Drawing # 364828
			Sheet 1 of 3

QUANTITY REQUIRED PER DASH #																							ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
																								1	1	363851-01	CHASSIS	
																									2			
																								1	3	364079-01	BEZEL,FRONT	
																								1	4			
																								1	5	363850-01	COVER	
																									6			
																								1	7	364859-01	BRACKET,OPTION CARD	
																								4	8	310120-01	PANEL,EXTENSION CARD	
																								1	9	363818-02	BRACE,CHASSIS TOP	
																								1	10	364454-02	BRACKET,SIDE PORT	
																								1	11	364206-01	BRACKET,FDD SUPPORT	
																								1	12	364465-01	COVER PLATE,REAR OPTION	
																								1	13	363819-01	SUPPPORT, HDD, LEFT HAND	
																								1	14	363819-02	SUPPPORT, HDD, RIGHT HAND	
																									15			
																								1	16	380742-05	CABLE,ASSEMBLY,FDD	
																								1	17			
																								1	18	364822-01	CARD,EXPANSION SLOT RISER	
																									19			
																								1	20	363830-01	BUTTON,POWER	
																								1	21	364938-01	INSULATION SHEET, HDD	PLACE BETWEEN ITEMS 13 & 18
																								1	22	364231-01	INSULATION,SHEET	
																								4	23	251118-01	GUIDE,CARD	
																									24			
																									25			
																								4	26	310080-01	FEET,RUBBER	
																									27			
																								1	28	363774-02	KEYSWITCH ASSEMBLY	Wrap 3 turns around item 43
																									29			
																								1	30	369179-01	LABEL,BACK PANEL	
																									31			
																								1	32	363772-02	LED ASSEMBLY, POWER ON	Wrap 3 turns around item 43
																								1	33	363773-02	LED ASSEMBLY, HARD DISK DRIVE	Wrap 3 turns around item 43
																									34			
																									35			
																								16	36	906800-05	SCREW,3Mx6.0 MACH,PHL PAN HD	Fasten items 5, 9, 11, 12 to item 1
																								1	37	906800 01	SCREW,3Mx4.0 MACH,PHL PAN HD	FOR ITEM 7
																								4	38	390329-01	SCREW,3.5Mx5.0 PHL PAN HD	FOR ITEM 8 TO ITEM 7
																									39			
																								4	40	906803-01	SCREW,3Mx6.0 FLAT HEAD	FOR ITEM 13 & 14 TO ITEM 9
																									41			
																									42			
																								1	43	906115-08	TORROID	
																									44			
																									45			
																								1	46	364509-01	CLIP,GROUNDING	
																									47			
																								10	48	390251-01	STANDOFF,HEX, M/F M3x0.5/4-40	
																									49			
																									50			

Commodore	Title: BASE(BASIC) ASSEMBLY,A4000	Drawn by: J. HOOPER	Drawing #: 364628
			REV: A
			Sheet 2 of 3

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET ONE		



NOTES: UNLESS OTHERWISE SPECIFIED.

1. THIS ASSEMBLY DRAWING IS THE BASIC ASSEMBLY FOR THE COMMODORE AMIGA 4000 SERIES. THE BILL OF MATERIAL CONSISTS OF ALL THE COMMON PARTS. NOTE THAT THE DRAWING SHOWS ALL COMBINATIONS OF PCB, CPU CARDS, RAM, FLOPPY DRIVE, HARD DRIVE AND POWER SUPPLY. THESE ITEMS ARE SHOWN FOR ASSEMBLY REFERENCE ONLY. SEE ALSO SHIPPING ASSEMBLY BILL OF MATERIAL.
2. SIDE PORT BRACKET ITEM 10 IS TO BE FITTED ONTO PCB BEFORE INSTALLING INTO CHASSIS ITEM 1.
3. IC SIMM MODULE ITEM 51 ON 534802, & ITEMS 51, 52 & 53 ON 534803 & 534604 ARE TO BE INSTALLED INTO SIMM SOCKETS U853, U261 & U853 ON PCB ASSEMBLY ITEM'S 10 & 11 ON 534802, 534803 & 534804.

METRIC

C.A.D. GENERATED

DRAWN BY: J. HOOPER 5-21-92

Commodore

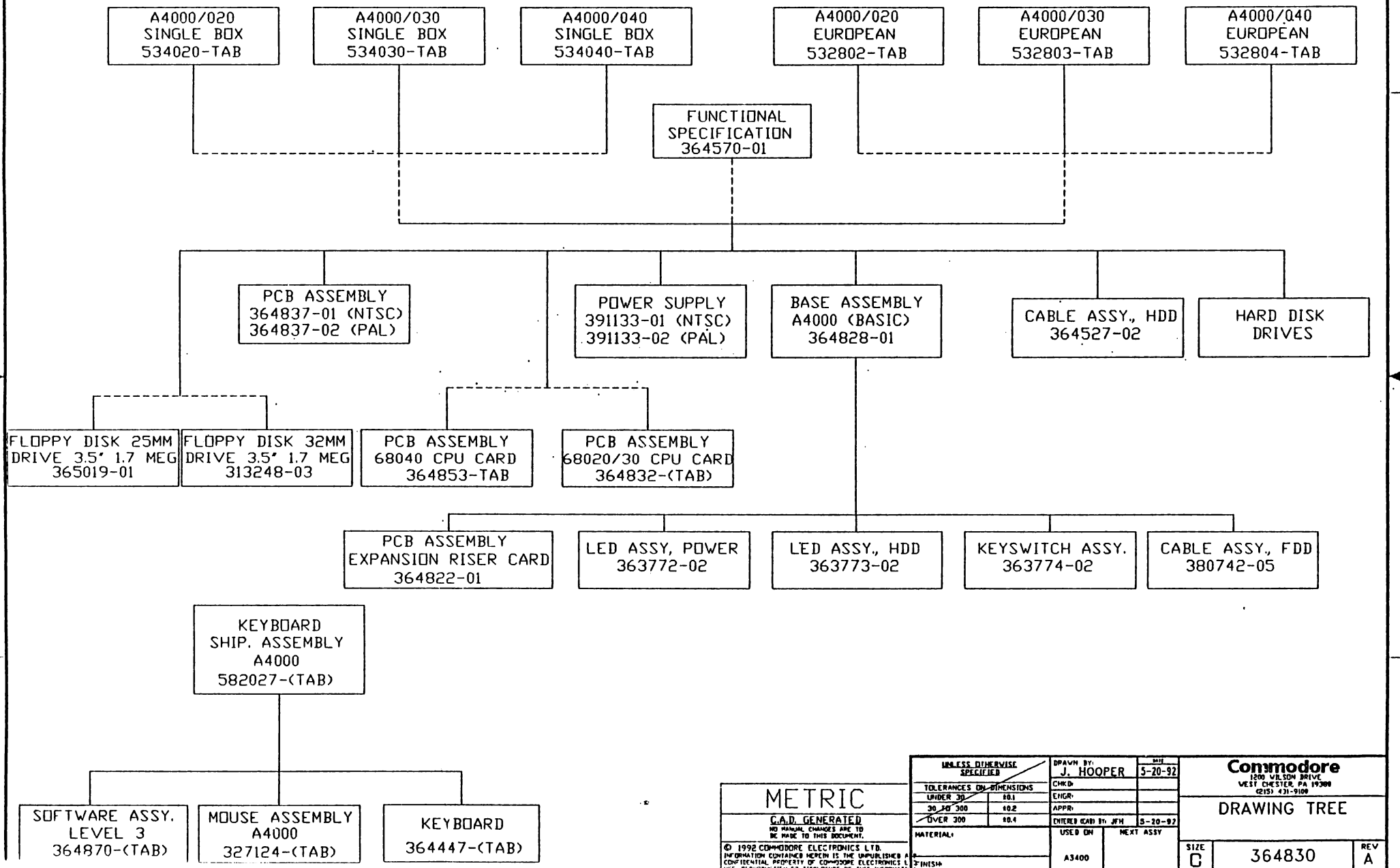
BASE ASSEMBLY
A4000

SIZE D | 364828 | REV A

SCALE 1/3 | SHEET 3 OF 3

*** THIS DRAWING IS FOR REFERENCE ONLY ***

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE		
	A	PILOT PRODUCTION RELEASE	9-17-92	ACB



METRIC

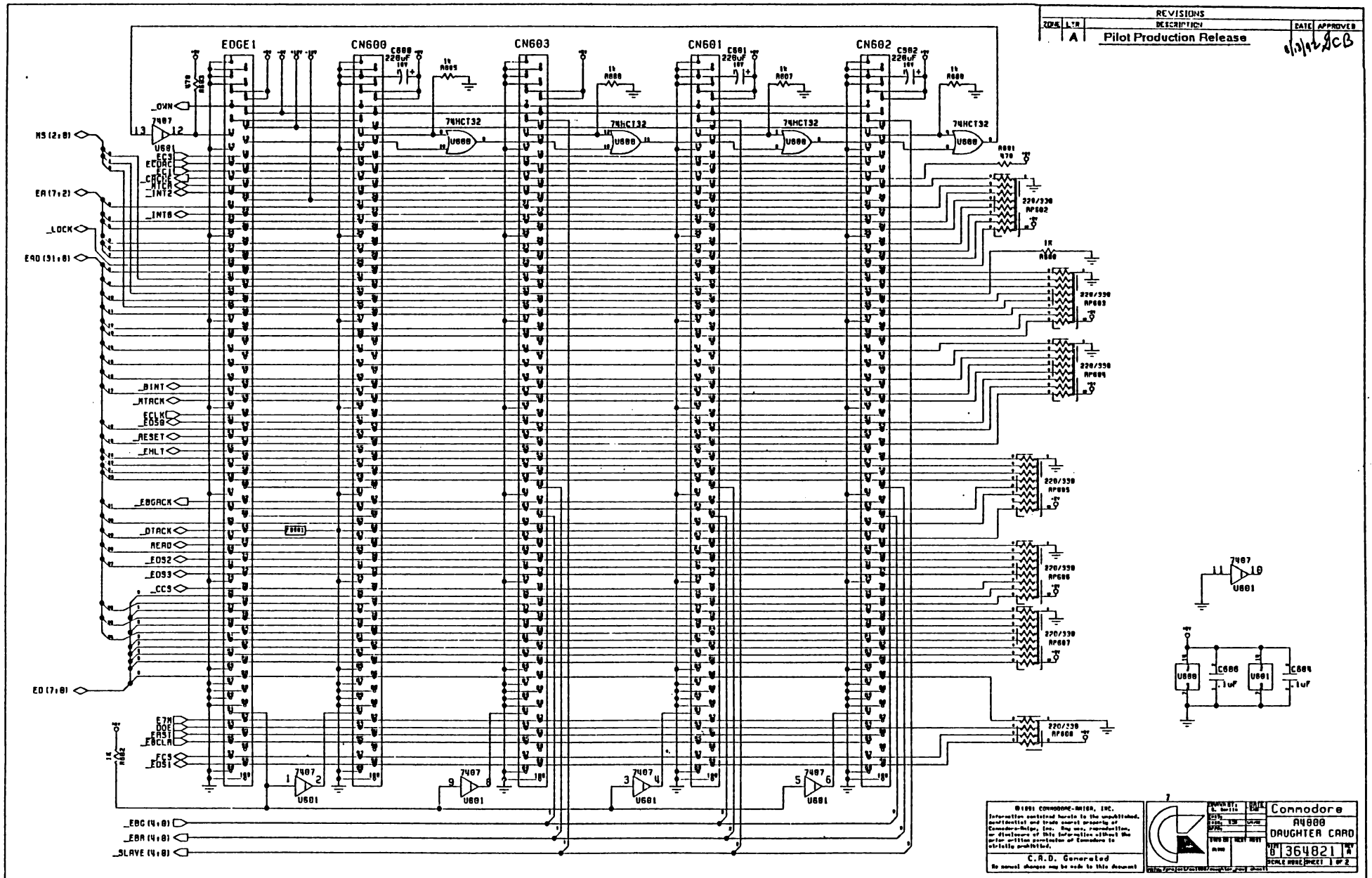
C.A.D. GENERATED
NO MANUAL CHANGES ARE TO BE MADE TO THIS DOCUMENT.

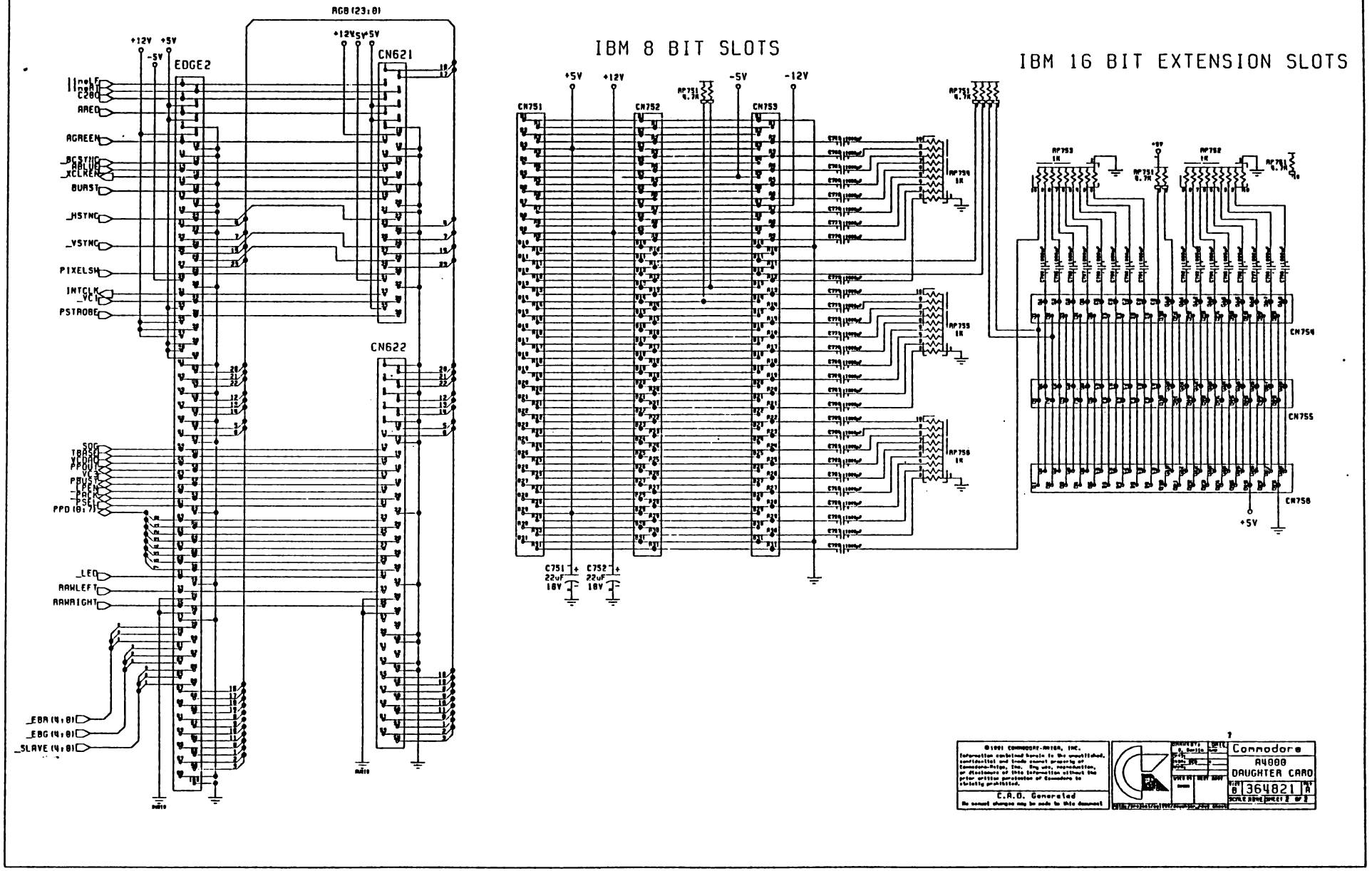
UNLESS OTHERWISE SPECIFIED		DRAWN BY: J. HOOPER	DATE 5-20-92
TOLERANCES ON DIMENSIONS		CHK'D	
UNDER 30	±0.1	ENGR	
30 TO 300	±0.2	APPR	
OVER 300	±0.4	ENTERED (CAD) BY: JFH	5-20-92
MATERIAL:		USED ON	NEXT ASSY
FINISH:		A3400	

Commodore
1200 WILSON DRIVE
WEST CHESTER, PA 19380
(215) 431-9100

DRAWING TREE

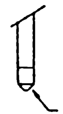
SIZE		REV
C	364830	A


REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
A | Pilot Production Release
EDGE1
CN600
CN603
CN601
CN602
74HCT32
7407
_OWN
RS[2:0]
EA[7:2]
_LOCK
ED0[31:0]
_INT2
_INT6
_BINT
_MTACK
ECLK
_EDS0
_RESET
_EHLT
_EBGACK
_DTACK
READ
_EDS2
_EDS3
_CCS
ED[7:0]
E7M
DOE
_EAS1
_EBCLR
FC3
_EDS1
_EBG[4:0]
_EBR[4:0]
_SLAVE[4:0]
220/330 RP602
220/330 RP603
220/330 RP604
220/330 RP605
220/330 RP606
220/330 RP607
220/330 RP608
C606 .1uF
C604 .1uF
Commodore
A4000
DAUGHTER CARD
364821
C.A.D. Generated
No manual changes may be made to this document


IBM 8 BIT SLOTS
IBM 16 BIT EXTENSION SLOTS
EDGE2
CN621
CN622
CN751
CN752
CN753
CN754
CN755
CN758
RGB(23:0)
+12V
+5V
-5V
-12V
AREQ
AGREEN
BURST
_HSYNC
_VSYNC
PIXELSW
INTCLK
PSTROBE
_LEO
RAWLEFT
RAWRIGHT
_EBA(4:0)
_EBG(4:0)
_SLAVE(4:0)
C751 22uF 18V
C752 22uF 18V
Commodore
A4000
DAUGHTER CARD
364821
C.A.D. Generated

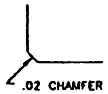
ZONE	REV	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE	5/4/92	G. Berlin
	A	PILOT PRODUCTION RELEASE	1/13/92	[signature]

REVISIONS



.02 X 45° CHAMFER

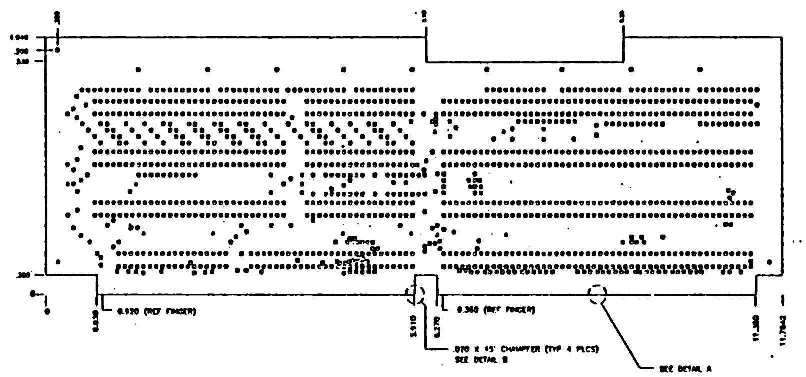
DETAIL A
ENLARGED AND
ROTATED 90°



.02 CHAMFER

DETAIL B
4 PLS. TYP.

DIAMETER	COUNT	: ALL HOLES
0.037	1237	
0.043	10	
0.125	3	



NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BOARDS SHALL BE FABRICATED IN ACCORDANCE WITH THE BEST COMMERCIAL PRACTICES. FABRICATE PER COMMODORE SPEC. NO. 1.01.007.
2. MATERIAL:
   - A. BASE LAMINATE: COPPER CLAD, GLASS BASE, EPOXY RESIN, (FR4 GRADE OR EQUIVALENT) 1 OZ. COPPER ON EXTERNAL LAYERS. PER MIL-P-13949.
   - B. THICKNESS AND ACCUMULATION OF INDIVIDUAL LAYER TOLERANCES SHALL BE OPTIMIZED TO ACHIEVE AN OVERALL THICKNESS OF 1.57 (0.062)
   - C. BONDING AGENT, PREIMPREGNATED B-STAGE EPOXY GLASS CLOTH SHALL BE IN ACCORDANCE WITH MIL-G-55636.
3. PLATING EXTERNAL LAYERS AND THRU HOLES:
   - A. THE HOLE WALLS SHALL BE PREPARED FOR PLATING BY SENSITIZING WITH ELECTROLESS COPPER PROVIDING THE CONDUCTIVE BASE FOR SUBSEQUENT PLATINGS.
   - B. ELECTRO-DEPOSITED COPPER SHALL BE IN ACCORDANCE WITH MIL-C-14550, CLASS 1, 0.025 (0.001) MINIMUM THICKNESS.
   - C. SOLDER PLATE TO BE 60 / TIN, 40 / LEAD, ±10 / AND SHALL BE AN AVERAGE MINIMUM THICKNESS OF 0.0051 (0.0002) WITH NO SINGLE MEASUREMENT LESS THAN 0.0025 (0.0001) AFTER REFLOW.
   - D. COPPER DEPOSITED ON SURFACE CONDUCTORS SHALL BE A MINIMUM THICKNESS OF 0.061 (0.0024).
   - E. SOLDER PLATING SHALL COVER ALL EXPOSED COPPER ON TRACES AND PADS, WITH A MINIMUM THICKNESS OF 0.051 (0.002) AFTER REFLOW.
   - F. THE PLATING SHALL BE HOMOGENOUS AND COMPLETELY COVER CONDUCTORS WITHOUT PITS, PINHOLES, OR OTHER NON-UNIFORMITIES.
   - G. ANNULAR RINGS SHALL BE COMPLETE AND UNBROKEN SURROUNDING EACH ROUND TERMINAL PAD BY A MINIMUM OF 0.050 (0.002).
4. CONNECTOR AREA:
   - A. LOW STRESS NICKEL PLATING SHALL BE A MINIMUM OF 0.0076 (0.0003) AND .025 (0.001) MAX. IN ACCORDANCE QQ-N-290 CLASS II, TYPE IV.
   - B. GOLD PLATING SHALL BE A MINIMUM OF 0.0076 (0.00003) AND SHALL BE IN ACCORDANCE WITH MIL-G-45240, TYPE II, GRADE C, CLASS 1.
5. HOLES WHOSE LOCATIONS ARE NOT DIMENSIONED ARE TO BE CENTERED ON THE PAD AREA WITHIN 0.178 (0.007) OF THE CENTER OF THE PAD.
6. FRONT TO BACK REGISTRATION SHALL BE WITHIN 0.127 (0.005)
7. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
8. ALL TOOLING HOLE DIAMETERS ARE TO HAVE A TOLERANCE OF +0.080 (+0.003), -0.000 (-0.000).
9. ARTWORK PROVIDED PER COMMODORE SPEC. NO. 1.01.007 SECT. 4.2
10. THIS FAB. DWG. IS USED WITH ARTWORK NO. 313369-01.
11. SILKSCREEN COMPONENT SIDE USING ARTWORK SUPPLIED.
12. SOLDERMASK BOTH SIDES PER IPS-SM840.
13. HOLES INDICATED AS BEING ON GRID SHALL BE CENTERED WITHIN 0.076 (0.003) OF THIER TRUE POSITION POINT, REF. BY X-Y DATA.
14. BOARDS SHALL BE IDENTIFIED WITH THE VENDORS U.L. REGISTERED LOGO ON THE COMPONENT SIDE.
15. PC BOARD LAYUP:
    - LAYER 1 ----- COMPONENT SIDE
    - LAYER 2 ----- SOLDER SIDE

C.A.D. GENERATED

TOLERANCES ON DECIMALS: .01 / .005 / .003 / 1/2	DRAWN BY: N. ALCOTT	8/13/92	Commodore
MATERIAL: SEE NOTE 2		8/13/92	FABRICATION DRAWING AMIGA 4 SLOT RISER
FINISH: SEE NOTE 3	USED ON: A4000		SIZE D — 364820 — REV A
			SCALE 1:1 — SHEET 1 OF 1

PART NUMBER	DESCRIPTION
364832-01	Processor Card, 25 MHz 68020, no FPU
364832-02	Processor Card, 25 MHz 68020, 25 MHz 68882
364832-03	Processor Card, 25 MHz 68030, no FPU
364832-04	Processor Card, 25 MHz 68030, 25 MHz 68882
364832-05	Processor Card, 25 Mhz, 68030, 68020, FPU, ROM ReMap

REVISIONS

ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	Advanced Engineering Release	6/3/92	G. BERLIN
	A	PILOT PRODUCTION RELEASE	6-13-92	G. Berlin

Commodore	PCB ASSY, 68020/68030 CPU Card	Drawn by J. Augenbraun	Drawing # 364832
			Sheet 1 of 4

QTY. REQ. PER DASH #											ITM	PART NO.	DESCRIPTION	REF DES / NOTES
10	09	08	07	06	05	04	03	02	01		#			
											1			
					R	R	R	R	R		2	364835	Schematic	
					R	R	R	R	R		3	364834	PCB Fab	
					1	1	1	1	1		4	364833	Artwork	
											5			
											6			
					1	1	1	1	1		7	390818-06	CAPACITOR, SM, MLC, NPO, 100pF (1206)	C102
					4	4	4	4	4		8	390818-02	CAPACITOR, SM, MLC, NPO, 220pF (1206)	C101B C104B C200C C202C
					1	1	1	1	1		9	390853-01	CAPACITOR, SM, MLC, X7R, .01uF (1206)	C103A
					2	2	2	2	2		10	310027-02	CAPACITOR, SM, CERAMIC, 0.1uF (1206)	C100A C102A
					4	4	4	4	4		11	390797-02	CAPACITOR, SM, CERAMIC, Z5U, .22uF (1210)	C101A C104A C200A C202A
					4	4	4	4	4		12	391097-03	CAPACITOR, SM, ELEC, ALUM, 22uF 16V 'C'	C101C C104C C200B C202B
											13			
											14			
											15			
											16			
											17			
											18			
					-	-	-	5	5		19	310026-45	RESISTOR, CHIP, 1/8W, 5%, 1 OHM (1206)	R103-R105 R202 R203
					-	5	5	-	-		20	310026-45	RESISTOR, CHIP, 1/8W, 5%, 1 OHM (1206)	R103-R105 R204 R205
					3	3	3	3	3		21	311026-01	RESISTOR, CHIP, 1/8W, 5%, 47 OHM (1206)	R109 R112 R113
					2	2	2	2	2		22	310026-05	RESISTOR, CHIP, 1/8W, 5% 100 OHM (1206)	R101 R102
					6	6	6	6	6		23	310026-08	RESISTOR, CHIP, 1/8W, 5%, 4.7K OHM (1206)	R100 R106 R107 R108 R110 R111
											24			
											25			
											26			
											27			
											28			
											29			
											30			
											31			
											32			
					1	-	1	-	1		33	391321-04	Socket, SM PLCC for 68881/68882	U101
					1	-	-	1	1		34	391413-03	IC, 68020 CPU, 132 QFP, 25MHz	U200
					1	1	1	-	-		35	390399-04	IC, 68030 CPU, 132 QFP, 25 MHz	U202
					1	1	-	1	-		36	390434-02	IC, MC68882 FPU 25 Mhz PLCC	U101
					1	-	-	-	-		37	391485-01	IC, PAL, 22V10-10 Programmed PLCC, ROM Remap	U100 Programmed into PN 391392-03
					1	1	1	1	1		38	390868-01	IC, SMD, 74F174, SOIC	U102
					1	1	1	1	1		39	391323-01	IC, SMD, 74F38, SOIC	U105
											40			
											41		NOT STUFFED	U103
											42			
											43			
											44			
											45			
											46			
											47			
											48			
											49			
											50			

Commodore	Title: PCB ASSY, 68020/68030 CPU Card	Drawn by: J. Augenbraun	Drawing # 364832 / REV A
			Sheet 2 of 4

QTY. REQ. PER DASH#										ITM			
10	09	08	07	06	05	04	03	02	01	#	PART NO.	DESCRIPTION	REF DES / NOTES
					4	-	-	-	-	51	903326-03	3 x .1" SIL	J103 J201-J203
					2	2	2	2	2	52	903326-03	3 x .1" SIL	J100 J101
										53			
					1	1	1	1	1	54	390556-01	CONNECTOR, 200 PIN KEL	CN10
					2	2	2	2	2	55	390043-01	SHORTING BARS (SHUNTS)	J100 J101
					4	-	-	-	-	56	390043-01	SHORTING BARS (SHUNTS)	J103 J201-J203
										57			
										58			
										59			
										60			
										61			
										62		JUMPER DESCRIPTIONS	
										63			
										64		J100 (FPU select: 1-2 = PLCC, 2-3 = PGA)	-02,-04,-05 pins 1 & 2; -01,-03 pins 2 & 3
										65		J101 (FPU clock: 1-2 = on board, 2-3 = CPU)	pins 2 & 3
										66		J103 (Map enable: 1-2 = disable, 2-3 = enable)	-01,-02,-03,-04 no shunt; -05 pins 2 & 3
										67		J201 (68020 select: 1-2 = no 68020, 2-3 = 68020)	-01,-02,-03,-04 no shunt; -05 pins 1 & 2
										68		J202 (68030 select: 1-2 = 68030, 2-3 = no 68030)	-01,-02,-03,-04 no shunt; -05 pins 1 & 2
										69		J203 (020/030 select: 1-2 = 68030, 2-3= 68020)	-01,-02,-03,-04 no shunt; -05 pins 1 & 2
										70			
										71			
										72		* NOTES:	
										73			
										74		MASK THE HOLES FOR U103 & U104 SO THAT	
										75		THEY ARE NOT FILLED DURING WAVE	
										76		SOLDERING.	
										77			
										78			
										79			
										80			
										81			
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										93			
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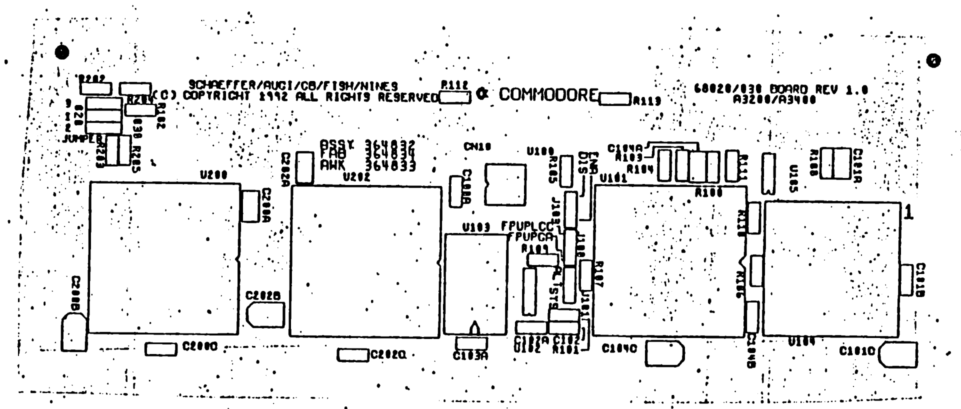
										95			
										96			
										97			
										98			
										99			
										100			

Commodore	Title: PCB ASSY, 68020/68030 CPU Card	Drawn by: J. Augenbraun	Drawing #: 364832 / REV: A
			Sheet 3 of 4

REVISIONS

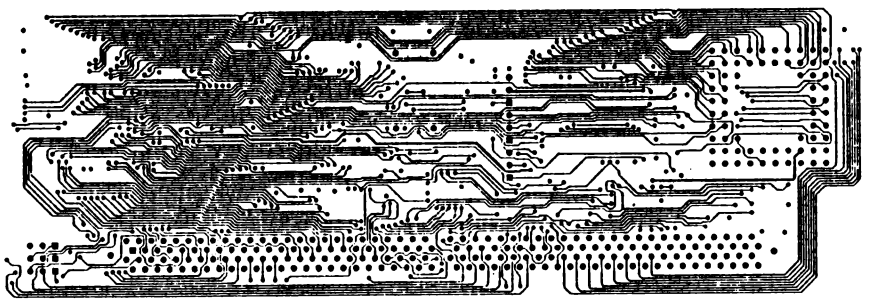
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



SILKSCREEN

commodore	TITLE: PCB ASSEMBLY 68020/030 CPU CARD	DRAWN BY: / CHKD:	DATE	ENGR: / APPR:	SIZE B	DRAWING NUMBER 364832 SHEET 4 OF 4

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PILOT PRODUCTION RELEASE	8-13-92	



COMPONENT SIDE

UNLESS OTHERWISE SPECIFIED	DRAWN BY:	DATE
TOLERANCES ON: DECIMALS .X ± .XX ± .XXX ± ∠'S ±	CHKD:	
	ENGR:	
	APPR:	
MATERIAL:	USED ON	NEXT ASSY
FINISH:		

commodore

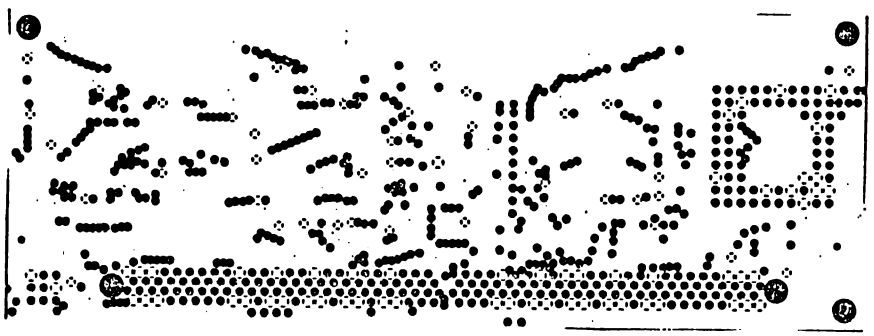
ARTWORK -

G8020/030 CPU CARD

SIZE		REV
B	364833	A
SCALE	SHEET 1 OF 7	

ADVANCED REPRO

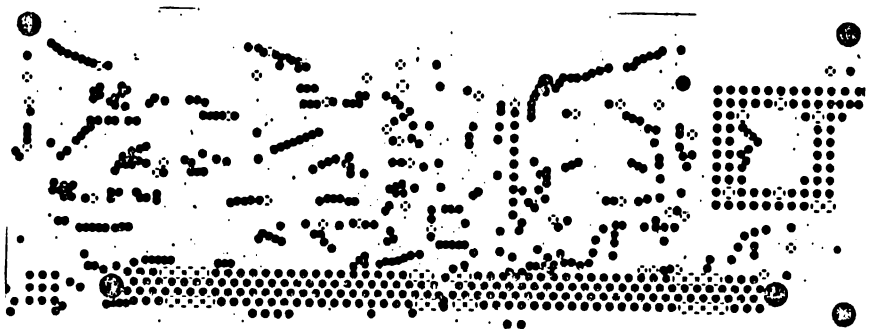
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



LAYER 2 GROUND

commodore	TITLE: ARTWORK - 6802/030 CPU CARD 68020/030	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364833		
		CHKD:		APPR:			SHEET 2 OF 7		

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

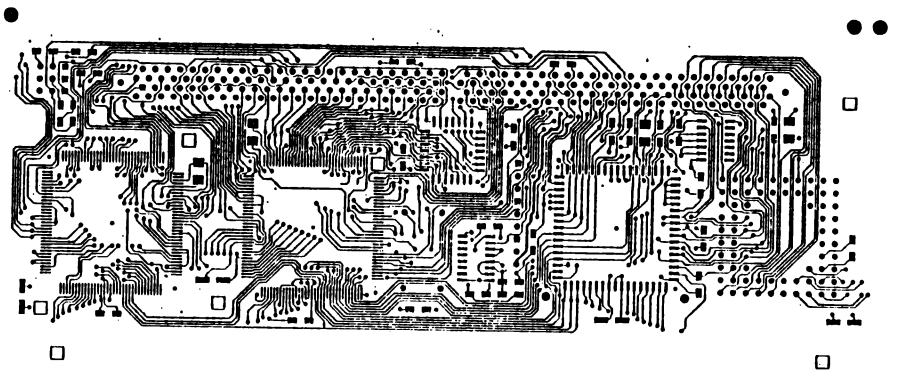


LAYER 3 VCC

CENTENNIAL BLUEPRINT NSN 14

commodore	TITLE: ARTWORK - 6802/030 CPU CARD 68020/030	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364833
		CHKD:		APPR:			SHEET 3 OF 7

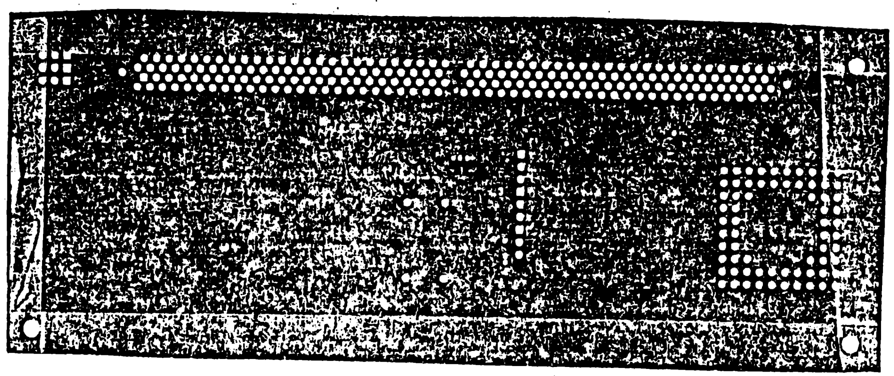
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



SOLDER SIDE

commodore	TITLE: ARTWORK - 6802/030 CPU CARD 68020/030	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364833	
		CHKD:		APPR:			SHEET 4 OF 7	

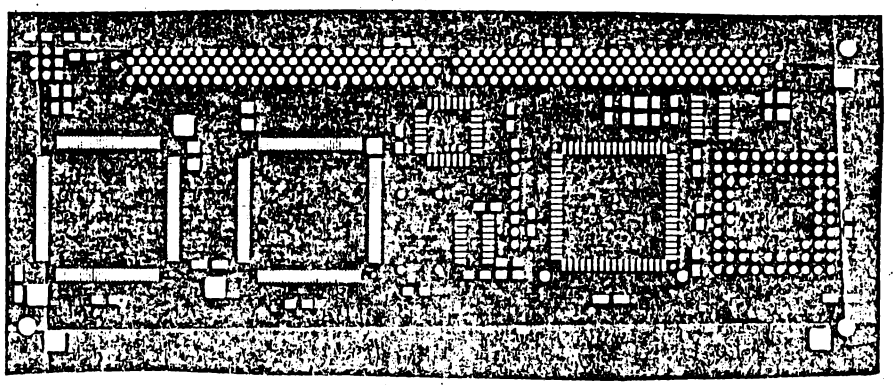
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



SOLDER MASK COMPONENT SIDE

commodore	TITLE: ARTWORK - 6802/030 CPU CARD 68020/030	DRAWN BY: / CHKD:	DATE	ENGR: / APPR:	SIZE B	DRAWING NUMBER 364833 SHEET 5 OF 7

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

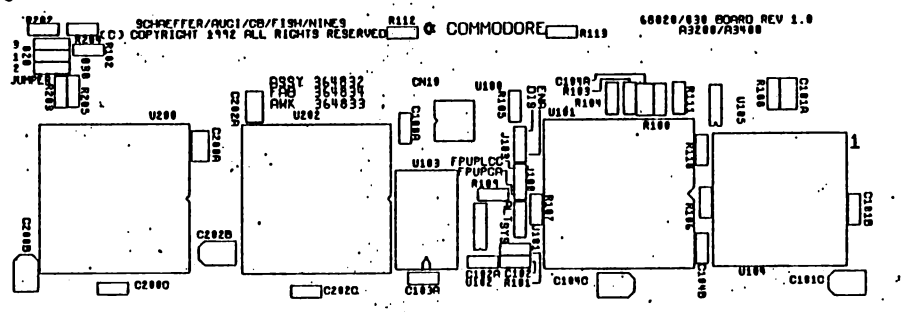


SOLDER MASK SOLDER SIDE

commodore	TITLE: ARTWORK - 6802/030 CPU CARD 68020/030	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364833
		CHKD:		APPR:			SHEET 6 OF 7

CENTENNIAL BLUEPRINT

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

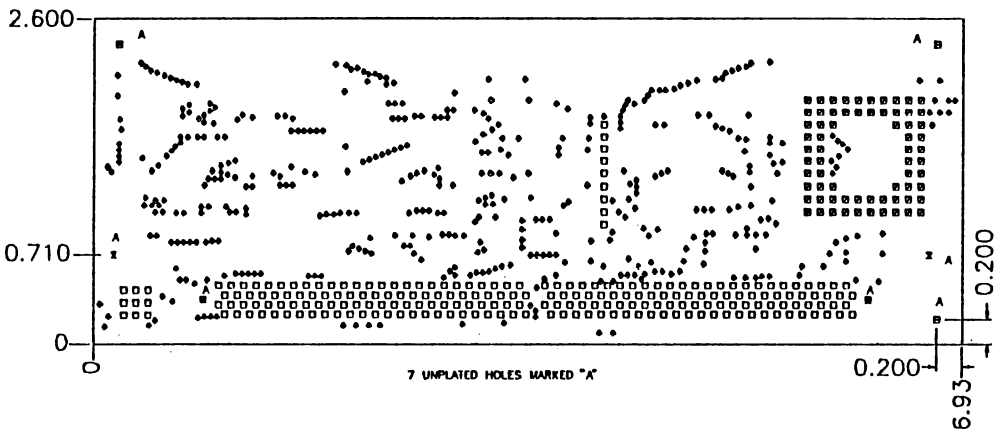


SILKSCREEN

commodore	TITLE: ARTWORK - 6802/030 CPU CARD 68020/030	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364833
		CHKD:		APPR:			SHEET 7 OF 7

CENTENNIAL BLUEPRINT

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	Pilot Production Release	3-13-92	J Berlin



NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BOARDS SHALL BE FABRICATED IN ACCORDANCE WITH THE BEST COMMERCIAL PRACTICES. FABRICATE PER COMMODORE SPEC. NO. 1.01.007.
2. MATERIAL:
   A. BASE LAMINATE: COPPER CLAD, GLASS BASE, EPOXY RESIN, (FR4 GRADE OR EQUIVALENT) 1 OZ. COPPER ON EXTERNAL LAYERS. PER MIL-P-13949.
   B. THICKNESS AND ACCUMULATION OF INDIVIDUAL LAYER TOLERANCES SHALL BE OPTIMIZED TO ACHIEVE AN OVERALL THICKNESS OF 1.57 (0.062)
   C. BONDING AGENT, PREIMPREGNATED B-STAGE EPOXY GLASS CLOTH SHALL BE IN ACCORDANCE WITH MIL-G-55636.
3. PLATING EXTERNAL LAYERS AND THRU HOLES:
   A. THE HOLE WALLS SHALL BE PREPARED FOR PLATING BY SENSITIZING WITH ELECTROLESS COPPER PROVIDING THE CONDUCTIVE BASE FOR SUBSEQUENT PLATINGS.
   B. ELECTRO-DEPOSITED COPPER SHALL BE IN ACCORDANCE WITH MIL-C-14550, CLASS 1, 0.025 (0.001) MINIMUM THICKNESS.
   C. HOT AIR LEVEL WITH 37% TIN 63% LEAD MIXTURE OVER LANDS AND PADS AND SHALL BE AN AVERAGE THICKNESS OF .0003 INCHES WITH NO SINGLE MEASURMENT OF LESS THAN .0002 INCHES AT CREST OF SMD PADS AND A MINIMUN AVERAGE OF .0002 INCHES IN PLATED THRU HOLES.
   D. COPPER DEPOSITED ON SURFACE CONDUCTORS SHALL BE A MINIMUM THICKNESS OF 0.061 (0.0024).
   E. THE PLATING SHALL BE HOMOGENOUS AND COMPLETELY COVER CONDUCTORS WITHOUT PITS, PINHOLES, OR OTHER NON-UNIFORMITIES.
   F. ANNULAR RINGS SHALL BE COMPLETE AND UNBROKEN SURROUNDING EACH ROUND TERMINAL PAD BY A MINIMUM OF 0.050 (0.002).
4. HOLES WHOSE LOCATIONS ARE NOT DIMENSIONED ARE TO BE CENTERED ON THE PAD AREA WITHIN 0.178 (0.007) OF THE CENTER OF THE PAD.
5. FRONT TO BACK REGISTRATION SHALL BE WITHIN 0.127 (0.005)
6. ALL DIMENSIONS ARE IN MILLIMETERS (INCHES).
7. ALL TOOLING HOLE DIAMETERS ARE TO HAVE A TOLERANCE OF +0.080 (+0.003), -0.000 (-0.000).
8. ARTWORK PROVIDED PER COMMODORE SPEC. NO. 1.01.007 SECT. 4.2
9. THIS FAB. DWG. IS USED WITH ARTWORK NO. 364833-01
10. SILKSCREEN COMPONENT SIDE USING ARTWORK SUPPLIED.
11. SOLDERMASK OVER BARE COPPER BOTH SIDES.
12. HOLES INDICATED AS BEING ON GRID SHALL BE CENTERED WITHIN 0.076 (0.003) OF THIER TRUE POSITION POINT, REF. BY X-Y DATA.
13. BOARDS SHALL BE IDENTIFIED WITH THE VENDORS U.L. REGISTERED LOGO ON THE COMPONENT SIDE.
14. PC BOARD LAYUP:
    LAYER 1 ----- COMPONENT SIDE
    LAYER 2 ----- GROUND
    LAYER 3 ----- VCC
    LAYER 4 ----- SOLDER SIDE

DIAMETER	COUNT	: ALL HOLES
0.037	218	
0.034	68	
0.1	2	
0.125	3	
0.042	4	
0.02	431	
0.157	2	

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

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON: DECIMALS
.X ±.01 | .XX ±.005 | .XXX ±.003 | ∠'S ± 1/2°
MATERIAL: SEE NOTE 2
FINISH: SEE NOTE 3

		DATE
DRAWN BY:	N. ALCOTT	6/11/92
CHKD:		
ENGR:		
APPR:		
ENTERED (CAD) BY:	NCA	6/11/92

USED ON: A4000
NEXT ASSY:

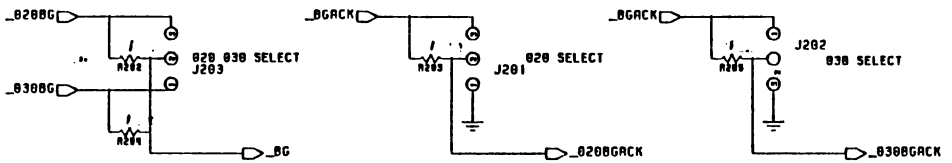
Commodore
1200 WILSON DRIVE
WEST CHESTER, PA 19380
(215) 431-9100

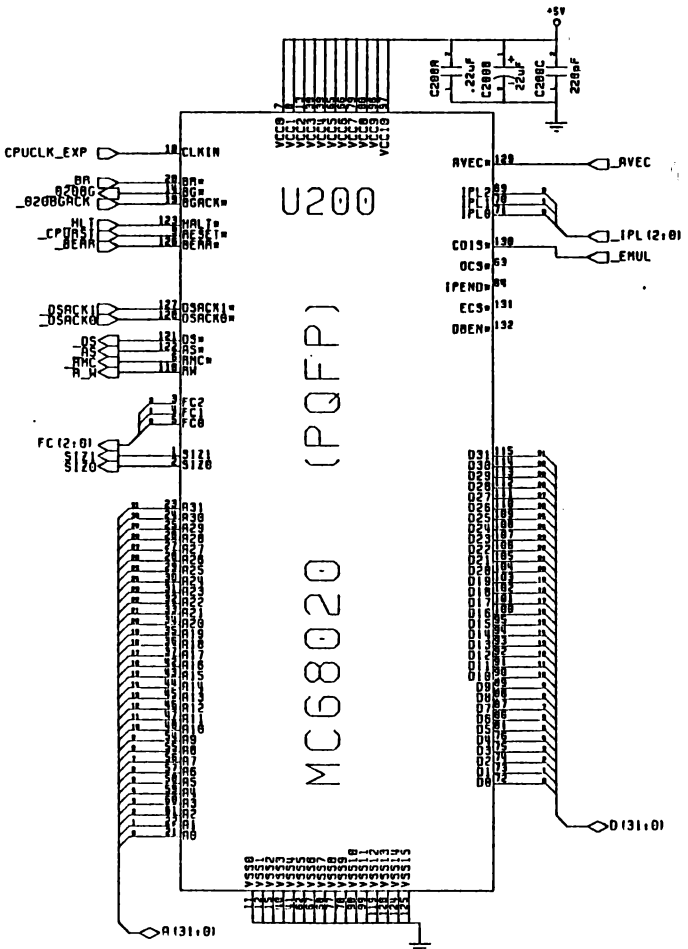
FABRICATION DRAWING,
020/030 PROCESSOR CARD

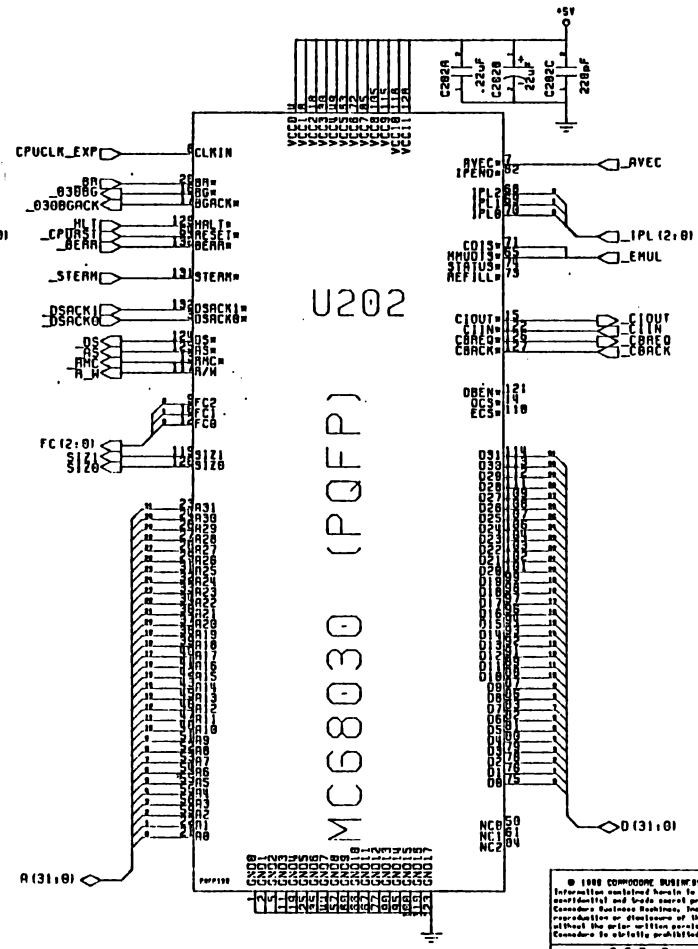
SIZE		REV
B	364834	A

SCALE 1:1 | SHEET1 OF 1

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
1		Advance Engineering Release	6-5-92	JCB
A		Pilot Production Release	8-13-92	JCB







CPU Card

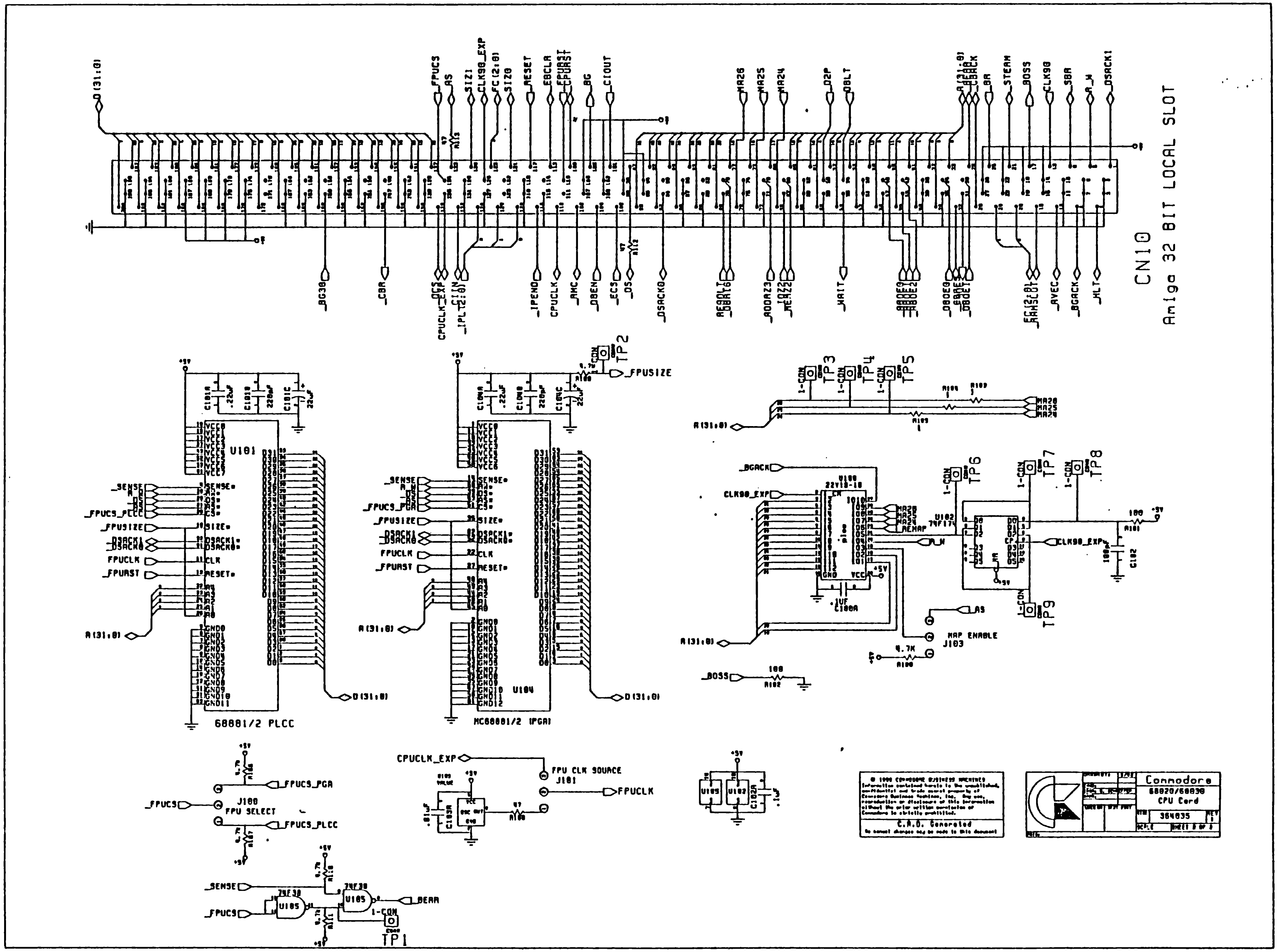
REV

Commodore

68020/68030

964035 A

SCALE SHEET 1 OF 8


CN10
Amiga 32 BIT LOCAL SLOT
U101
68881/2 PLCC
U104
MC68881/2 (PGA)
_FPUSIZE
A(31:0)
D(31:0)
FPU SELECT
_FPUCS_PGA
_FPUCS_PLCC
J100
CPUCLK_EXP
FPU CLK SOURCE
J101
FPUCLK
MAP ENABLE
J103
_BGACK
CLK90_EXP
_BOSS
_SENSE
_FPUCS
_BERR
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
C.A.D. Generated
Commodore
68020/68030
CPU Card
364835

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
1		ADVANCE ENGINEERING RELEASE	6-3-92	BCB
2		REVISED PER ECO 920423	4/15/91	B BARTLING
A		PILOT PRODUCTION RELEASE	8-13-92	J. Burki

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON:
DECIMALS .X ± .XX ± .XXX ± ∠'S ±

DRAWN BY: | DATE
CHKD:
ENGR:
APPR:

MATERIAL: | USED ON | NEXT ASSY

commodore

SCHEMATIC - A4000

PCB ASSEMBLY

SIZE C | 364836 | REV A

4 3 2 .1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED

D

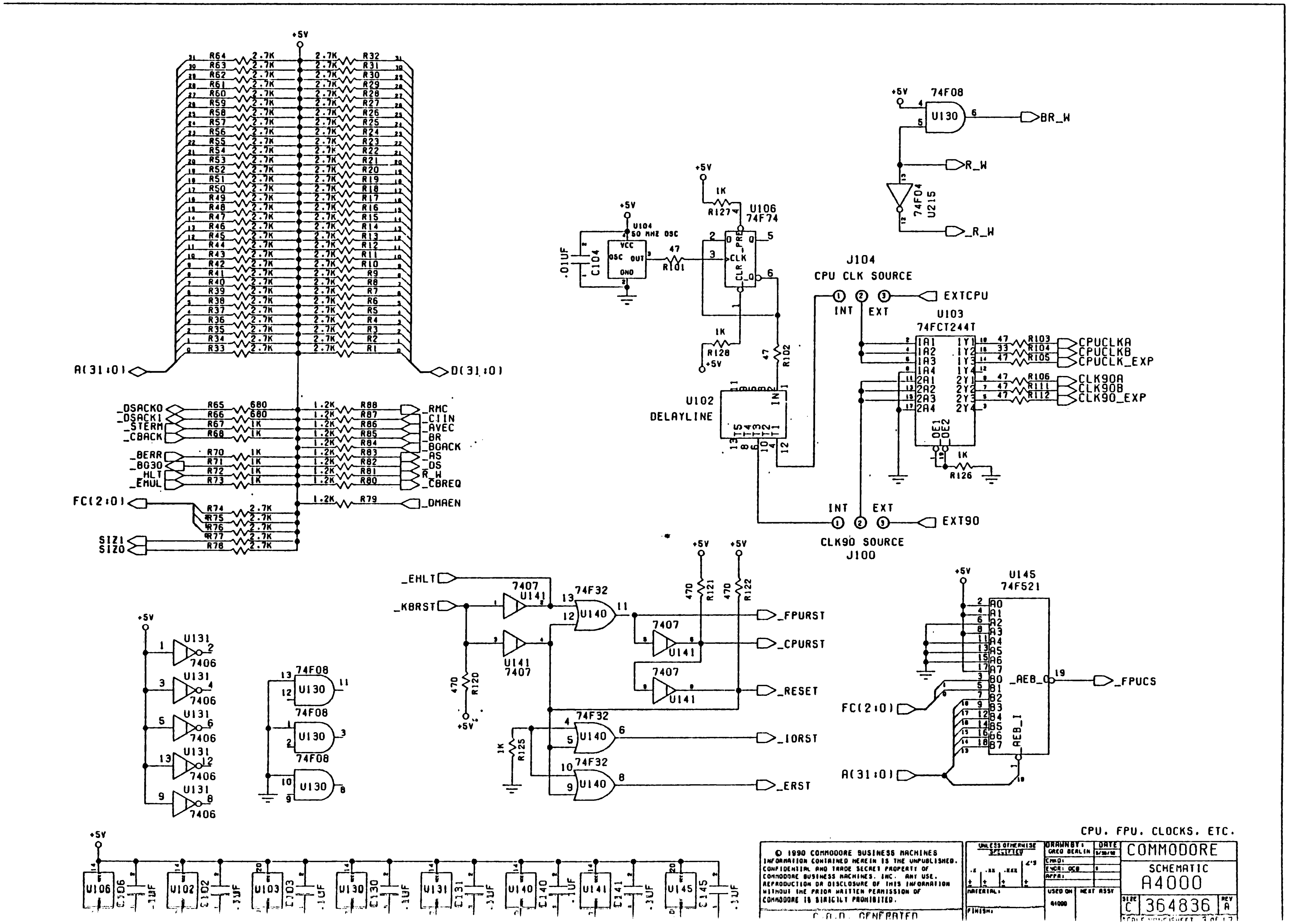
C

B

A

RESERVED FOR FUTURE USE

UNLESS OTHERWISE SPECIFIED TOLERANCES ON: DECIMALS .X ± .XX ± .XXX ± ∠ ± MATERIAL:	DRAWN BY: / DATE CHKD: ENGR: APPR: USED ON / NEXT ASSY	commodore SCHEMATIC - A4000 PCB ASSEMBLY SIZE C / 364836 / REV A


+5V
R64 2.7K 2.7K R32
R33 2.7K 2.7K R1
A(31:0)
D(31:0)
_DSACK0
_DSACK1
_STERM
_CBACK
_BERR
_B030
_HLT
_EMUL
FC(2:0)
SIZ1
SIZ0
_RMC
_CIIN
_AVEC
_BR
_BGACK
_AS
_DS
R_W
_CBREQ
_DMAEN
U104 50 MHZ OSC
C104 .01UF
R101 47
R127 1K
U106 74F74
R128 1K
R102 47
U102 DELAYLINE
J104 CPU CLK SOURCE
INT EXT
EXTCPU
U103 74FCT244T
R103 R104 R105
CPUCLKA
CPUCLKB
CPUCLK_EXP
R106 R111 R112
CLK90A
CLK90B
CLK90_EXP
R126 1K
EXT90
CLK90 SOURCE J100
74F08 U130
BR_W
R_W
74F04 U215
_R_W
_EHLT
_KBRST
7407 U141
74F32 U140
R120 470
R121 470
R122 470
_FPURST
_CPURST
_RESET
R125 1K
_IORST
_ERST
U145 74F521
_AEB_O
_FPUCS
_AEB_I
U131 7406
C106 C102 C103 C130 C131 C140 C141 C145 .1UF
CPU. FPU. CLOCKS. ETC.
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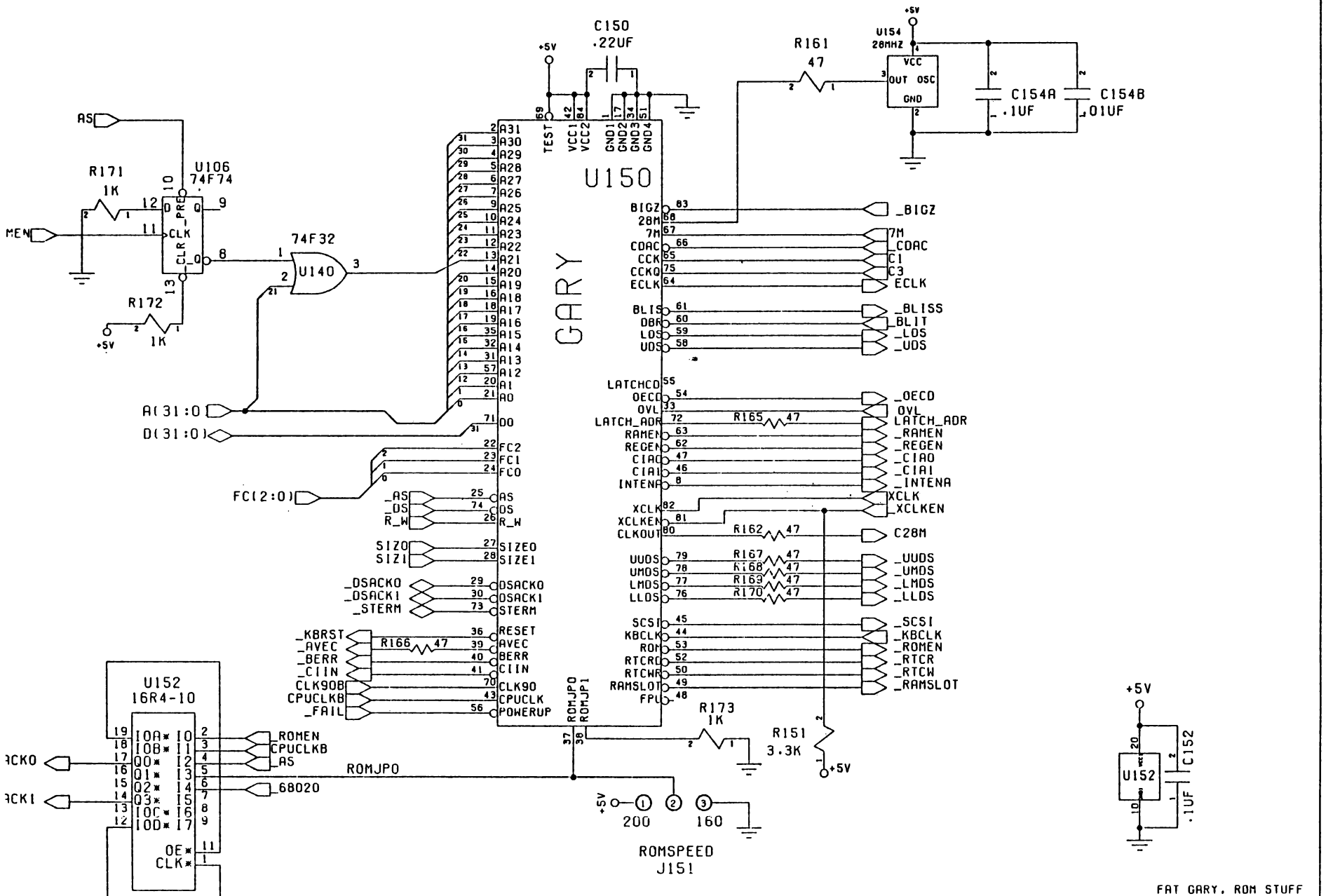
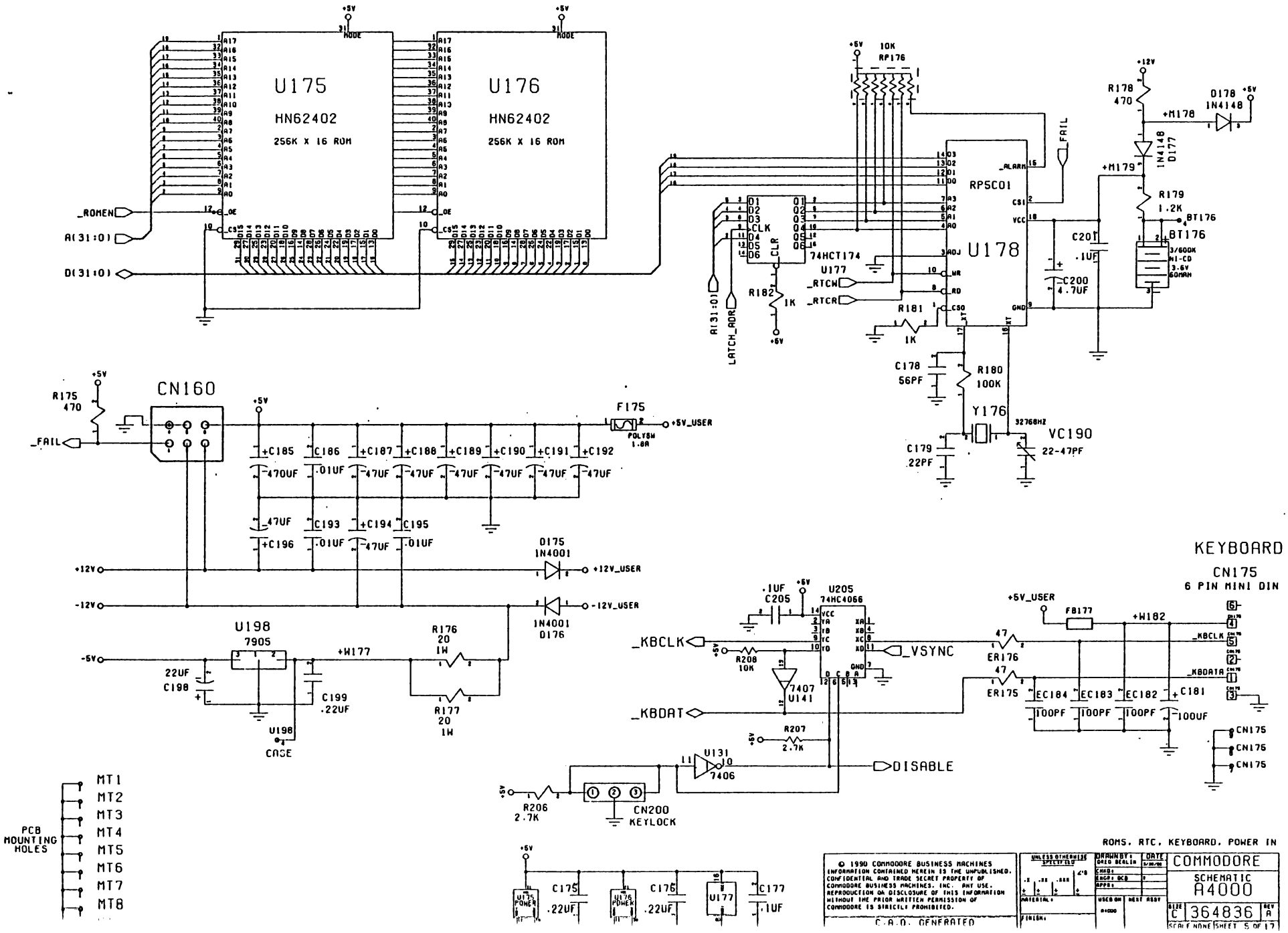
C.A.D. GENERATED
DRAWN BY: GREG BERLIN
COMMODORE
SCHEMATIC
A4000
C 364836 A



UNLESS OTHERWISE SPECIFIED
.X ±
.XX ±
.XXX ±
∠'S ±
MATERIAL:

DRAWN BY: GREG BERLIN
DATE 9/30/88
CHKD:
ENGR: GCB
APPR:
USED ON A4000
NEXT ASSY

COMMODORE
SCHEMATIC
A4000
SIZE C 364836 REV D


U175
HN62402
256K X 16 ROM
U176
HN62402
256K X 16 ROM
_ROMEN
A(31:0)
D(31:0)
RP176
10K
RP5C01
U178
74HCT174
U177
_RTCW
_RTCR
_ALARM
_FAIL
R178
470
D178
1N4148
+M178
D177
1N4148
+M179
R179
1.2K
BT176
3/600K
NI-CD
3.6V
60MAH
C201
.1UF
C200
4.7UF
R182
1K
R181
1K
C178
56PF
R180
100K
Y176
32768HZ
VC190
22-47PF
C179
.22PF
LATCH_ADR
CN160
R175
470
_FAIL
F175
POLYSW
1.0A
+5V_USER
+C185
+C186
+C187
+C188
+C189
+C190
+C191
+C192
470UF
.01UF
47UF
+C196
+C193
+C194
C195
D175
1N4001
+12V_USER
-12V_USER
1N4001
D176
U198
7905
22UF
C198
C199
.22UF
+W177
R176
20
1W
R177
20
1W
U198
CASE
KEYBOARD
CN175
6 PIN MINI DIN
.1UF
C205
U205
74HC4066
_KBCLK
_KBDAT
R208
10K
7407
U141
_VSYNC
R207
2.7K
U131
7406
DISABLE
R206
2.7K
CN200
KEYLOCK
+5V_USER
FB177
+W182
47
ER176
ER175
EC184
EC183
EC182
C181
100PF
100UF
PCB
MOUNTING
HOLES
MT1
MT2
MT3
MT4
MT5
MT6
MT7
MT8
C175
.22UF
C176
.22UF
C177
.1UF
ROMS, RTC, KEYBOARD, POWER IN
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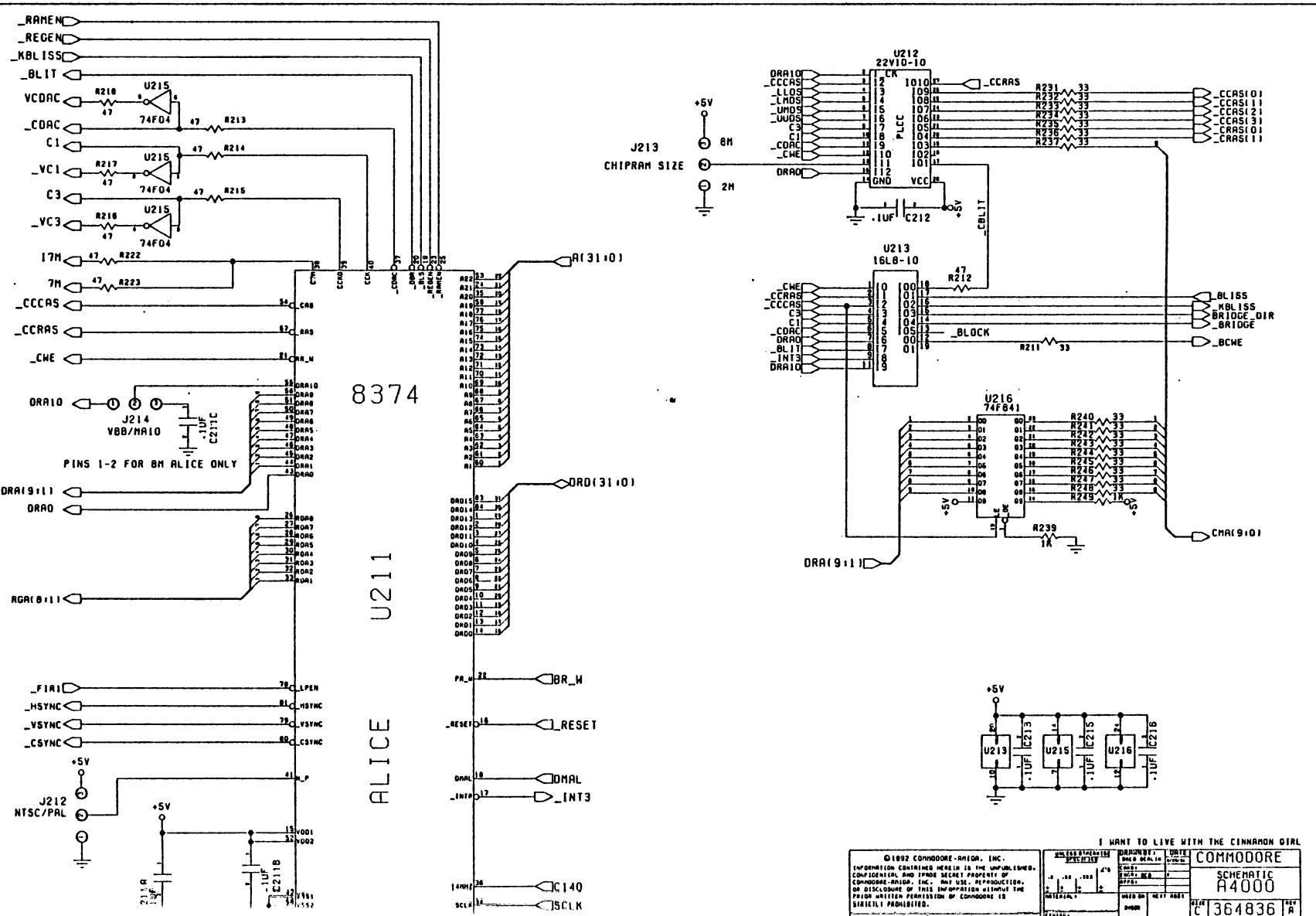
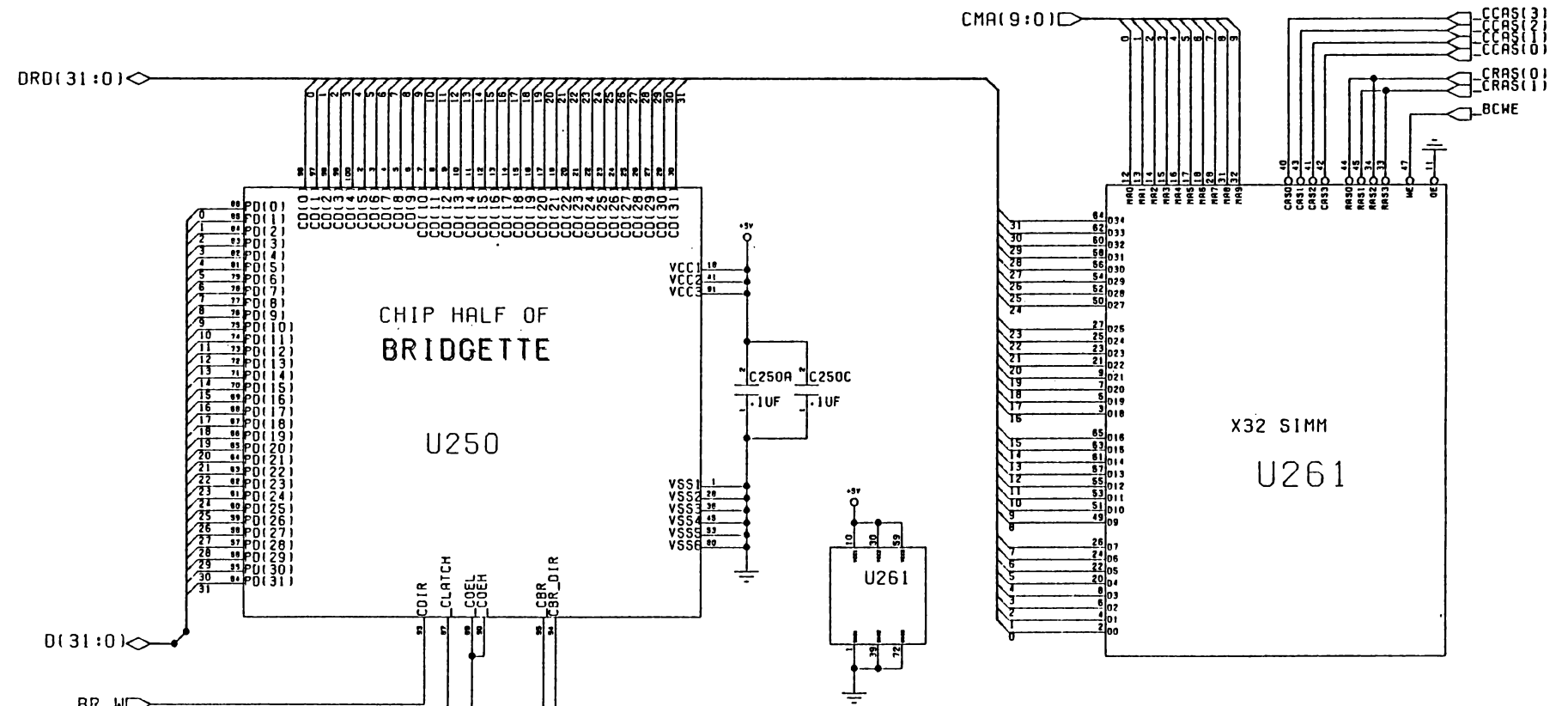
DATE
CHKD:
ENGR: DCB
APPD:
MATERIAL:
FINISH:
USED ON
NEXT ASSY
COMMODORE
SCHEMATIC
A4000
SIZE C
364836
REV A
SCALE NONE
SHEET 5 OF 17


_RAMEN
_REGEN
_KBLISS
_BLIT
VCOAC
_COAC
C1
_VC1
C3
_VC3
I7M
7M
_CCCAS
_CCRAS
_CWE
DRA10
DRA(9:1)
DRA0
RGA(8:1)
_FIRE
_HSYNC
_VSYNC
_CSYNC
J212
NTSC/PAL
+5V
U215
74F04
R218
R217
R216
R213
R214
R215
R222
R223
J214
VBB/MA10
PINS 1-2 FOR 8M ALICE ONLY
.1UF
C211C
C211A
C211B
8374
ALICE U211
A(31:0)
DRD(31:0)
BR_W
_RESET
DMAL
_INT3
C14Q
5CLK
U212
22V10-10
PLCC
_CCRAS
R231
R232
R233
R234
R235
R236
R237
_CCAS(0)
_CCAS(1)
_CCAS(2)
_CCAS(3)
_CRAS(0)
_CRAS(1)
J213
CHIPRAM SIZE
8M
2M
.1UF
C212
_CBLIT
U213
16L8-10
R212
_BLISS
_KBLISS
_BRIDGE_DIR
_BRIDGE
_BLOCK
_BCWE
R211
U216
74F841
R240
R241
R242
R243
R244
R245
R246
R247
R248
R249
R239
CMA(9:0)
C213
C215
C216
I WANT TO LIVE WITH THE CINNAMON GIRL
©1992 COMMODORE-AMIGA, INC.
COMMODORE
SCHEMATIC
A4000
364836



UNLESS OTHERWISE SPECIFIED

DRAWN BY: OMCO BERLIN
DATE: 5/16/90
CHKD:
ENGR: OCB
APPR:

MATERIAL:
FINISH:

USED ON: A4000
NEXT ASSY

PATH: //PROJECT/AA1000/PCB_REV1 CHIPRAM

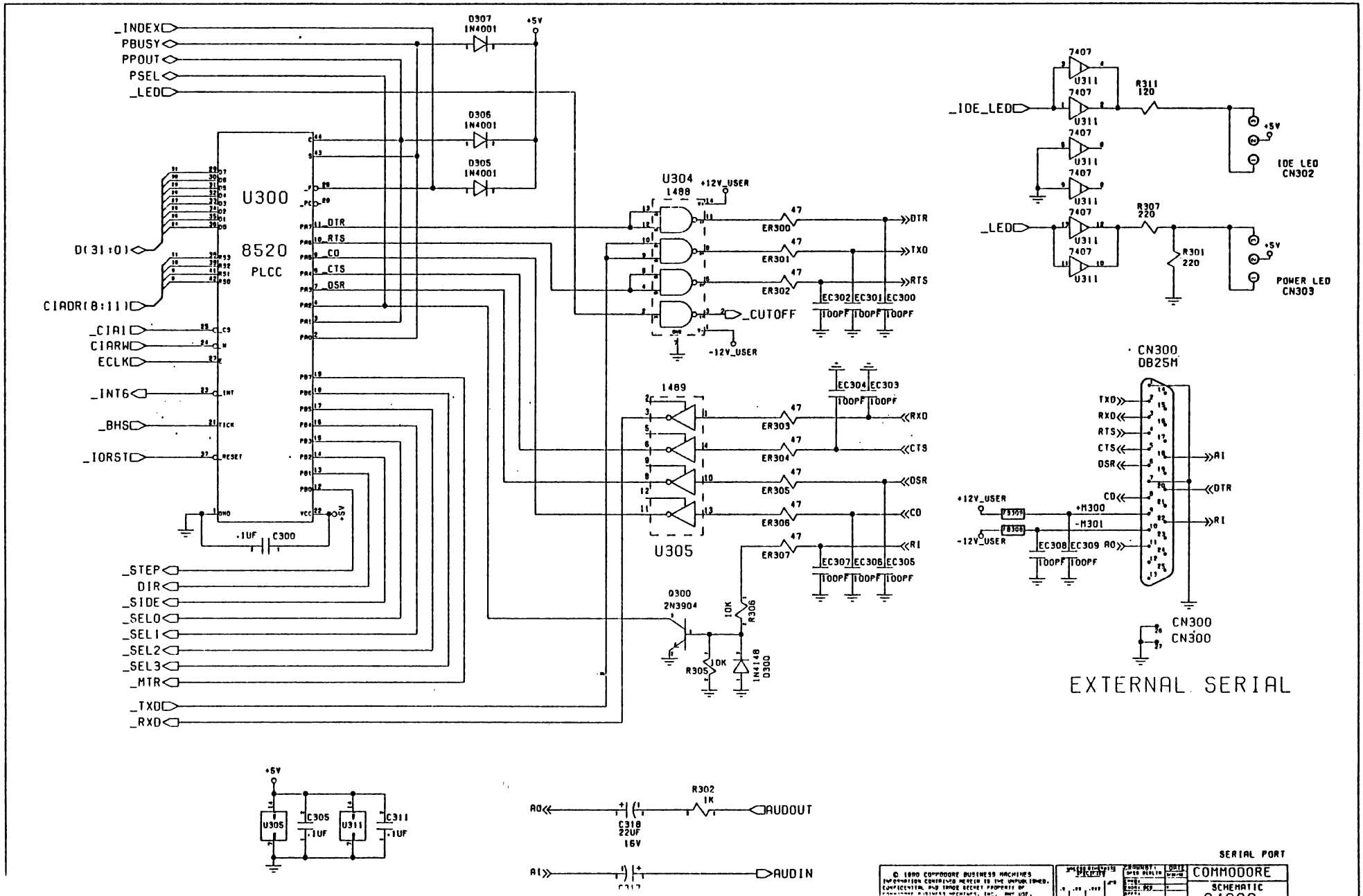
CHIP RAM

COMMODORE
SCHEMATIC
A4000

SIZE C | 364836 | REV A

SCALE NONE SHEET 7 OF 17

250-299


_INDEX
PBUSY
PPOUT
PSEL
_LED
D307 IN4001
D306 IN4001
D305 IN4001
+5V
U300
8520
PLCC
D(31:0)
CIADR(8:1)
_CIAI
CIARW
ECLK
_INT6
_BHS
_IORST
_DTR
_RTS
_CO
_CTS
_DSR
.1UF C300
U304 1488
+12V_USER
-12V_USER
ER300 47
ER301 47
ER302 47
_CUTOFF
EC302 100PF
EC301 100PF
EC300 100PF
DTR
TXD
RTS
1489
U305
ER303 47
ER304 47
ER305 47
ER306 47
ER307 47
EC304 100PF
EC303 100PF
EC307 100PF
EC306 100PF
EC305 100PF
RXD
CTS
DSR
CO
RI
Q300 2N3904
R306 10K
R305 10K
IN4148 D300
_STEP
DIR
_SIDE
_SEL0
_SEL1
_SEL2
_SEL3
_MTR
_TXD
_RXD
7407 U311
R311 120
_IDE_LED
IDE LED CN302
R307 220
R301 220
_LED
POWER LED CN303
CN300 DB25M
TXD
RXD
RTS
CTS
DSR
CD
RI
DTR
+12V_USER
-12V_USER
F5309
F8306
+M300
-M301
EC308 100PF
EC309 AO
CN300
CN300
EXTERNAL SERIAL
+5V
U305
C305 .1UF
U311
C311 .1UF
AO
R302 1K
C318 22UF 16V
AUDOUT
AI
C317
AUDIN
SERIAL PORT
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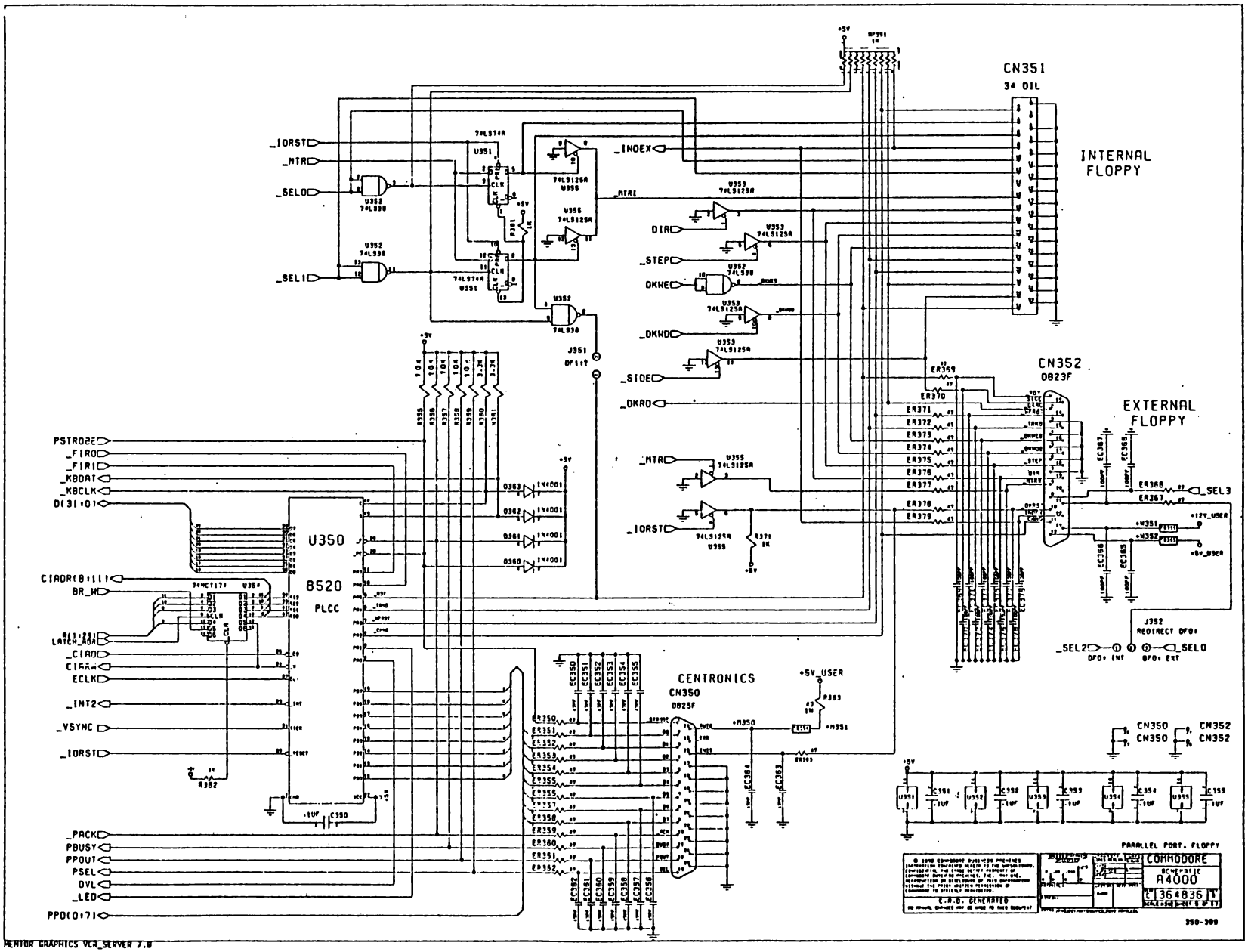
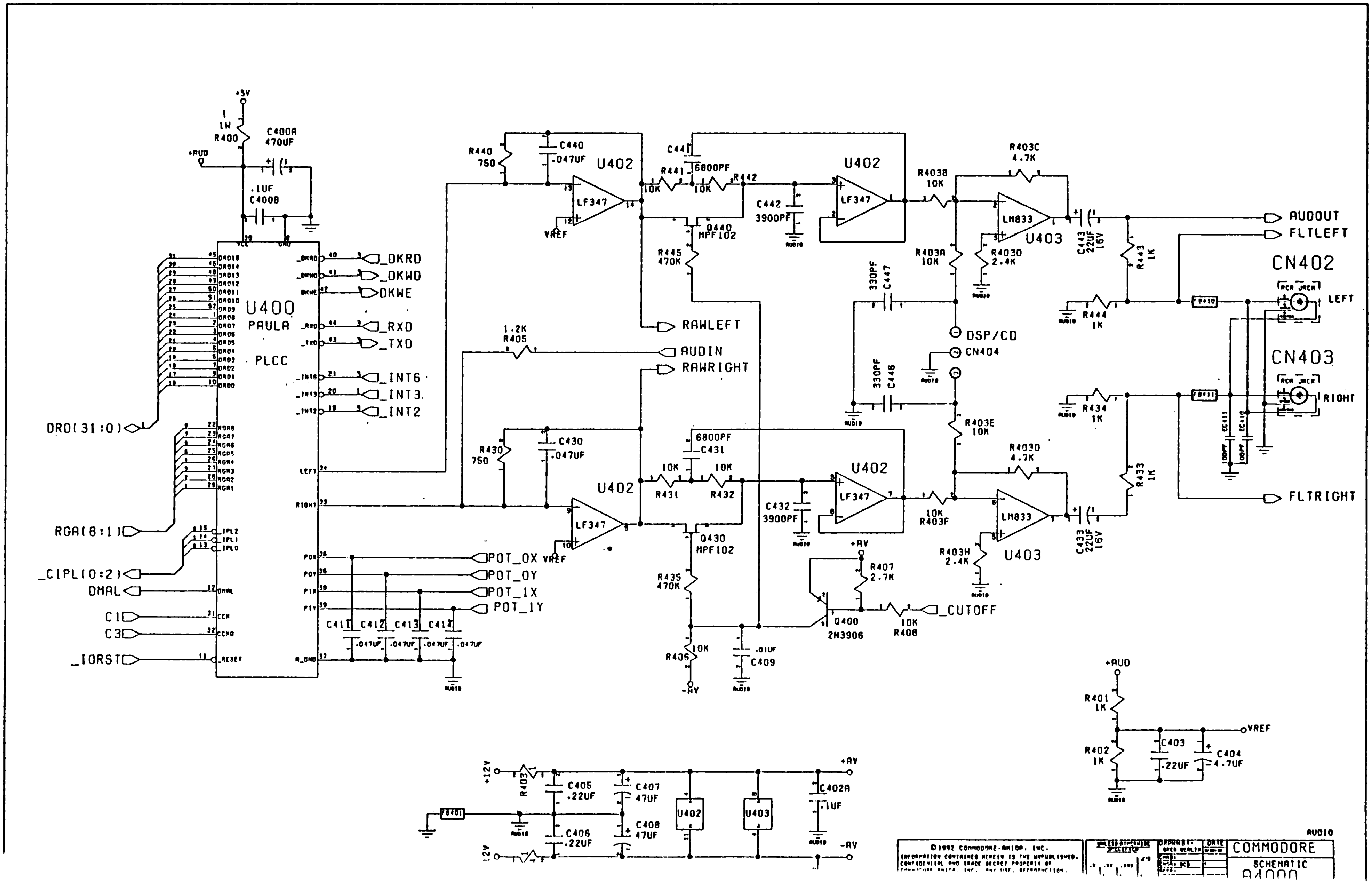
COMMODORE
SCHEMATIC
A4000


CN351
34 DIL
INTERNAL
FLOPPY
CN352
DB23F
EXTERNAL
FLOPPY
U350
8520
PLCC
CENTRONICS
CN350
DB25F
_IORST
_MTR
_SEL0
_SEL1
_INDEX
DIR
_STEP
DKWE
_DKWD
_SIDE
_DKRD
PSTROBE
_FIR0
_FIR1
_KBDAT
_KBCLK
DB(3:0)
CIADR(8:1)
BR_W
_CIA0
ECLK
_INT2
_VSYNC
_PACK
PBUSY
PPOUT
PSEL
OVL
_LED
PPD(0:7)
_SEL3
_SEL2
_SEL0
J352
REDIRECT DF0:
DF0: INT
DF0: EXT
+5V_USER
PARALLEL PORT, FLOPPY
COMMODORE
A4000
C 364836
MENTOR GRAPHICS VCR_SERVER 7.0


+5V
1
1W
R400
C400A
470UF
+AUD
.1UF
C400B
U400
PAULA
PLCC
DRD(31:0)
RGA(8:1)
_CIPL(0:2)
DMAL
C1
C3
_IORST
_DKRD
_DKWD
DKWE
_RXD
_TXD
_INT6
_INT3
_INT2
POT_0X
POT_0Y
POT_1X
POT_1Y
C411
C412
C413
C414
.047UF
R440
750
C440
.047UF
U402
LF347
VREF
R441
10K
C441
6800PF
R442
10K
C442
3900PF
Q440
MPF102
R445
470K
RAWLEFT
1.2K
R405
AUDIN
RAWRIGHT
R430
750
C430
.047UF
C431
6800PF
R431
10K
R432
10K
C432
3900PF
Q430
MPF102
R435
470K
R406
10K
-AV
C409
.01UF
+AV
R407
2.7K
Q400
2N3906
R408
10K
_CUTOFF
R403B
10K
R403C
4.7K
LM833
U403
R403D
2.4K
R403A
10K
C443
22UF
16V
R443
1K
R444
1K
AUDOUT
FLTLEFT
CN402
RCA JACK
LEFT
C447
330PF
DSP/CD
CN404
C446
330PF
R403E
10K
R434
1K
CN403
RCA JACK
RIGHT
R403F
10K
R403H
2.4K
C433
22UF
16V
R433
1K
FLTRIGHT
+AUD
R401
1K
R402
1K
C403
.22UF
C404
4.7UF
VREF
+12V
R403
C405
.22UF
C407
47UF
C406
.22UF
C408
47UF
12V
C402A
.1UF
FB401
AUDIO
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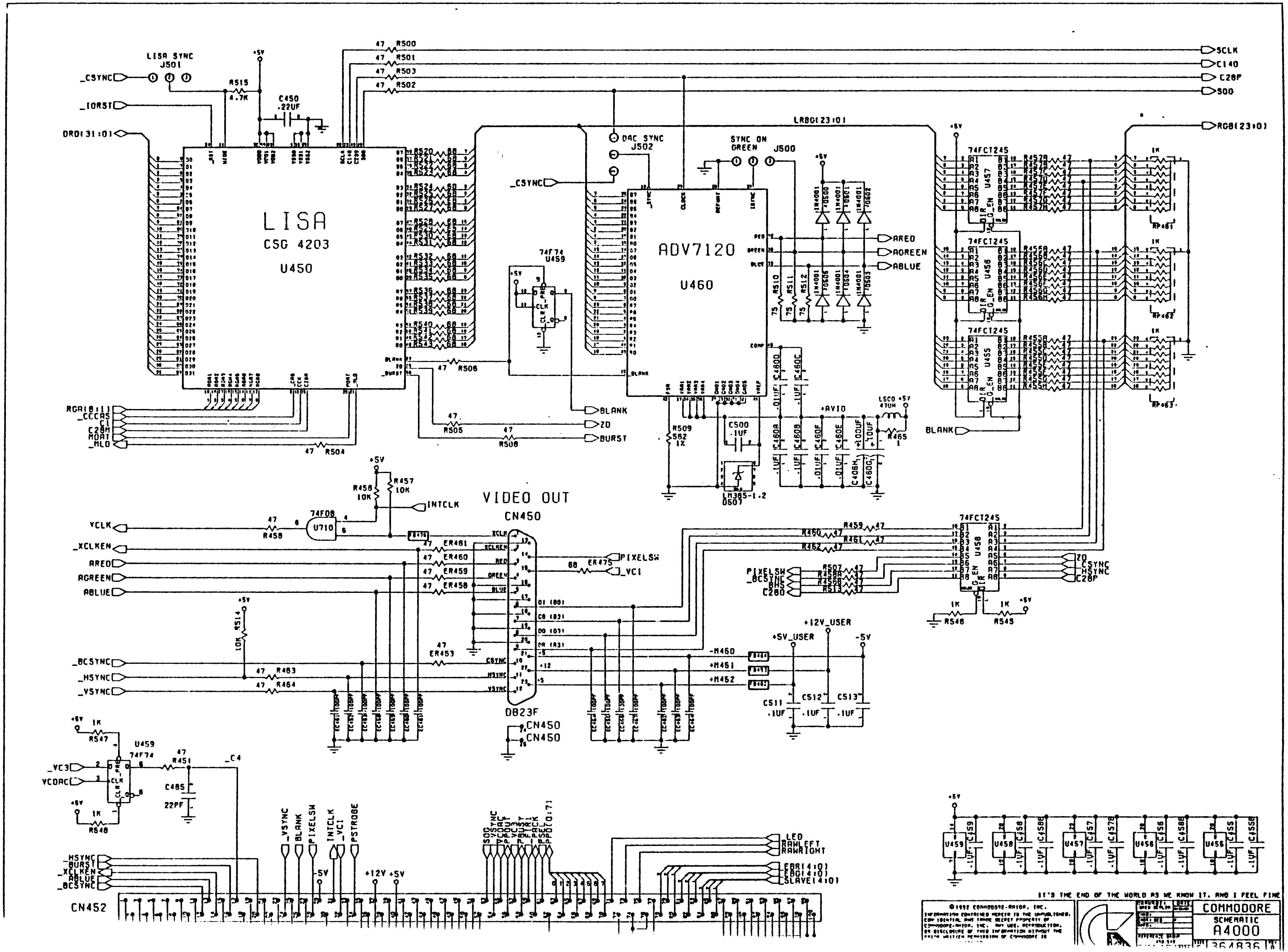
COMMODORE
SCHEMATIC
A4000


LISA SYNC
J501
_CSYNC
_IORST
DRD(31:0)
R515
4.7K
C450
.22UF
+5V
47 R500
47 R501
47 R503
47 R502
SCLK
C14O
C28P
S00
LRGB(23:0)
RGB(23:0)
LISA
CSG 4203
U450
DAC SYNC
J502
SYNC ON GREEN
J500
ADV7120
U460
74F74
U459
74FCT245
U457
U456
U455
U458
AREO
AGREEN
ABLUE
BLANK
ZD
BURST
47 R506
47 R505
47 R508
47 R504
RGA(8:1)
_CCCAS
C1
C28M
MDAT
_MLO
R509
562
1%
C500
.1UF
LM385-1.2
D507
+AV10
L500
47UH
R465
1
VIDEO OUT
CN450
YCLK
47
R458
74F08
U710
R456
10K
R457
10K
INTCLK
_XCLKEN
ARED
AGREEN
ABLUE
ER461
ER460
ER459
ER458
PIXELSW
_VC1
68
ER475
_BCSYNC
_HSYNC
_VSYNC
ER453
47 R463
47 R464
R514
10K
DB23F
-M450
+M451
+M452
+5V_USER
+12V_USER
-5V
C511
C512
C513
.1UF
R459 47
R460 47
R461 47
R462 47
R507
R458A
R458B
R513
PIXELSW
_BCSYNC
BHS
C28D
CSYNC
HSYNC
C28P
1K
R546
R545
R547
74F74
U459
47
R451
_C4
_VC3
VCDAC
C485
22PF
R548
_HSYNC
_BURST
_XCLKEN
ABLUE
_BCSYNC
CN452
_VSYNC
BLANK
PIXELSW
INTCLK
_VC1
PSTROBE
-5V
+12V
+5V
SOG
LED
RAWLEFT
RAWRIGHT
EBR(4:0)
EBG(4:0)
SLAVE(4:0)
IT'S THE END OF THE WORLD AS WE KNOW IT, AND I FEEL FINE
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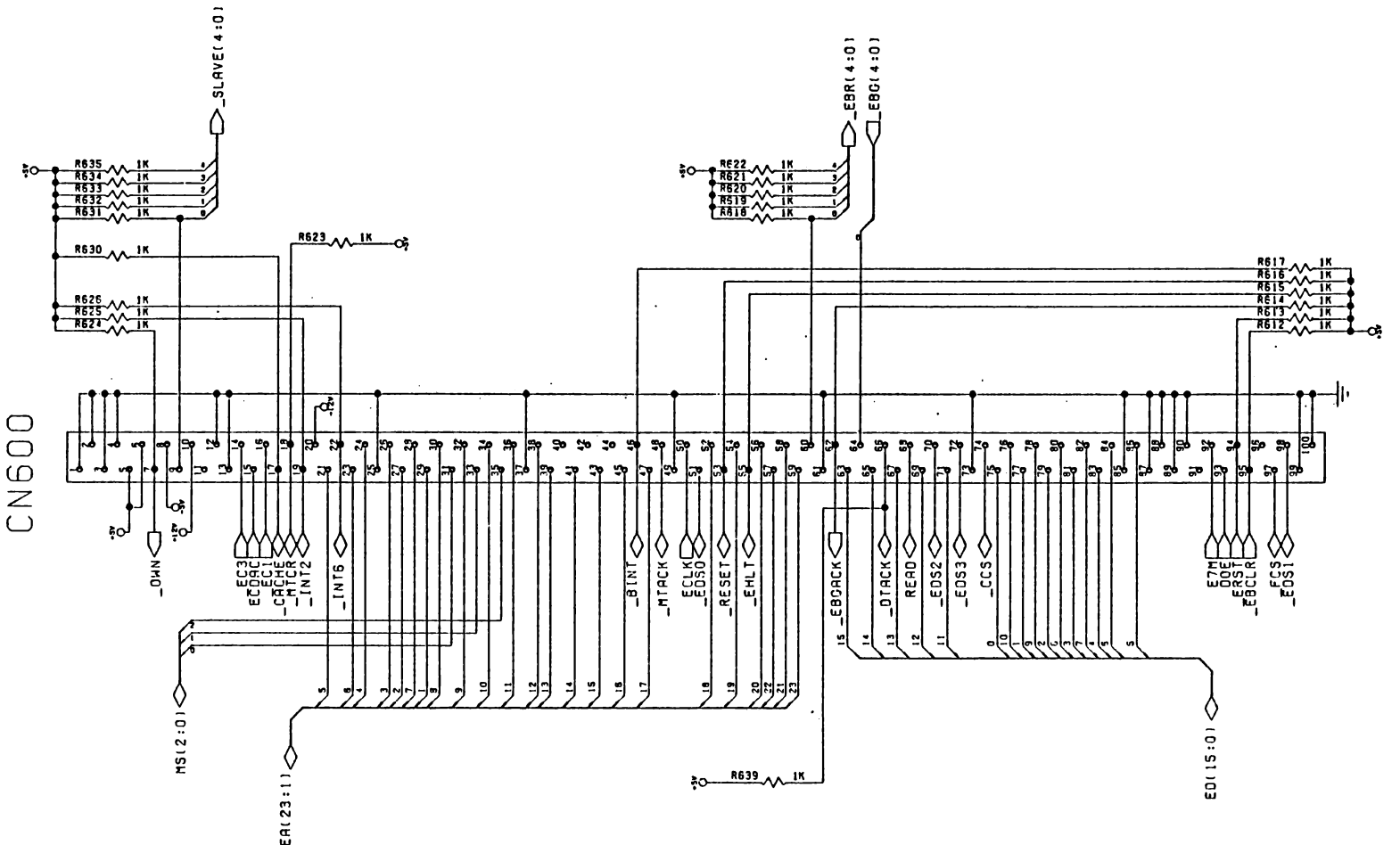
COMMODORE
SCHEMATIC
A4000
364836



EXPANSION BUS CONNECTOR

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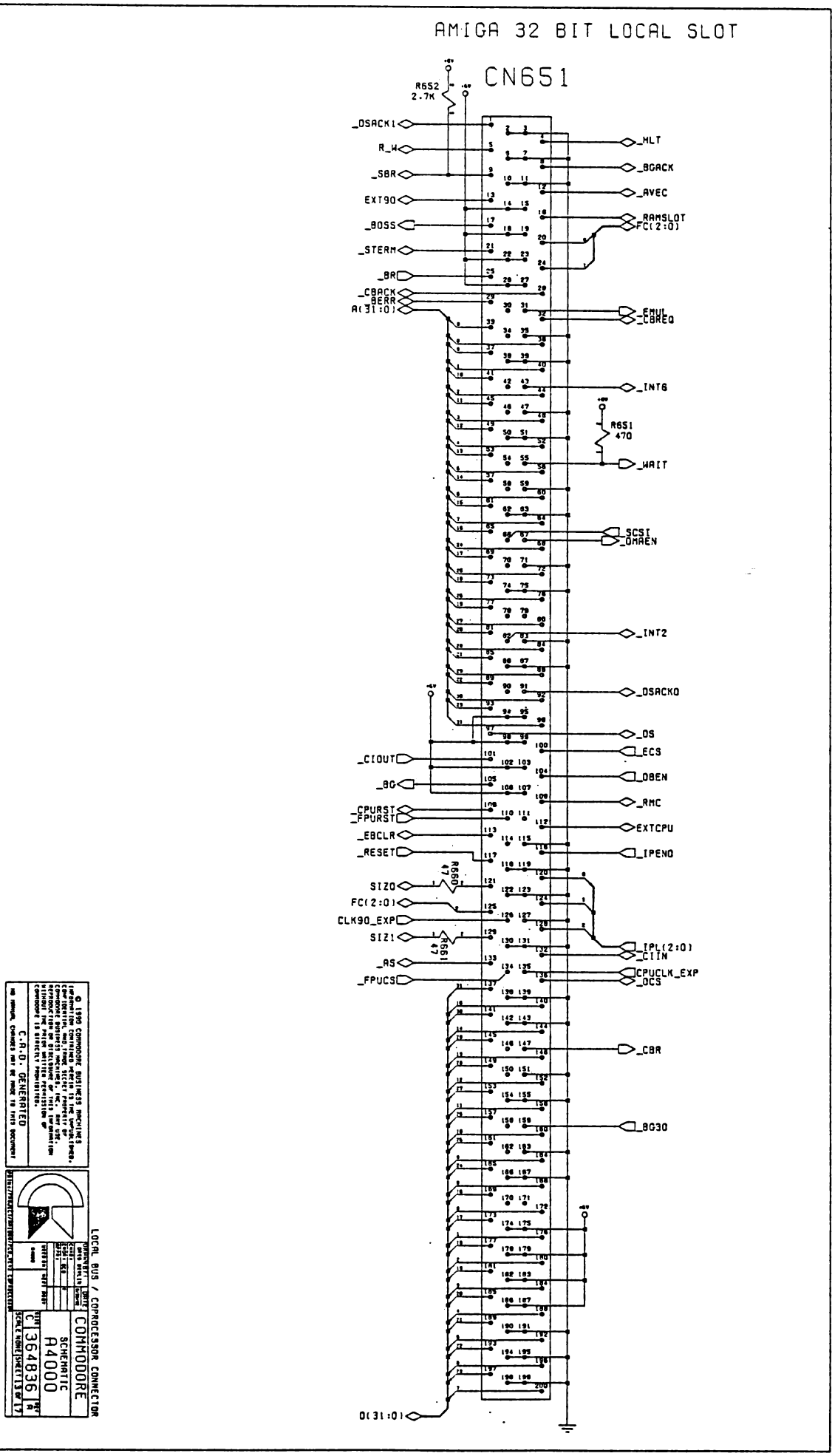
ENGR: DCB
APPR:
DATE 5/30/90
USED ON A4000
NEXT ASSY

COMMODORE
SCHEMATIC
A4000
SIZE C 364836 REV A
SCALE NONE SHEET 12 OF 17

PATH: /PROJECT/AA1000/PCB_REV1 180PIN

600-649



LOCAL BUS / COPROCESSOR CONNECTOR

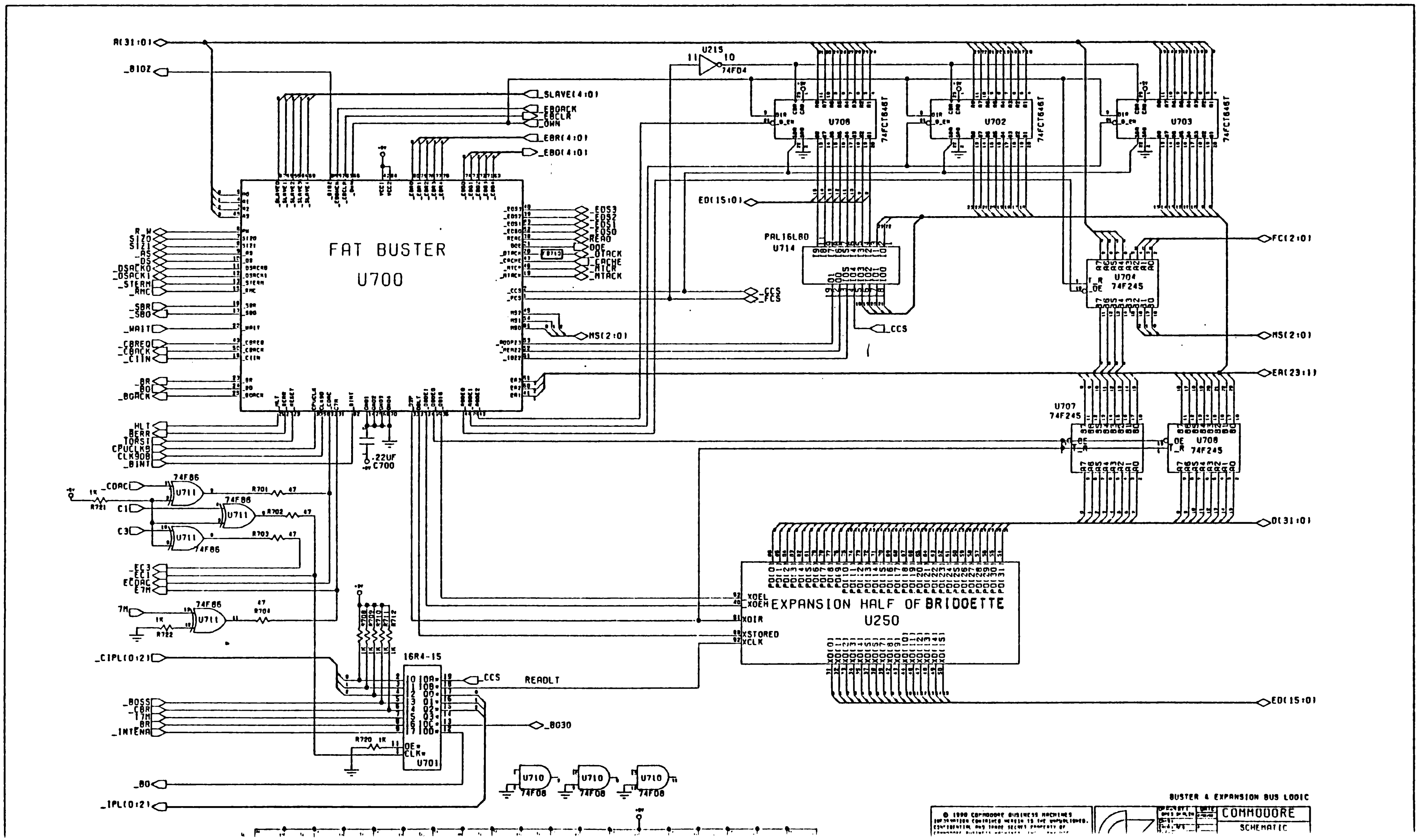
COMMODORE

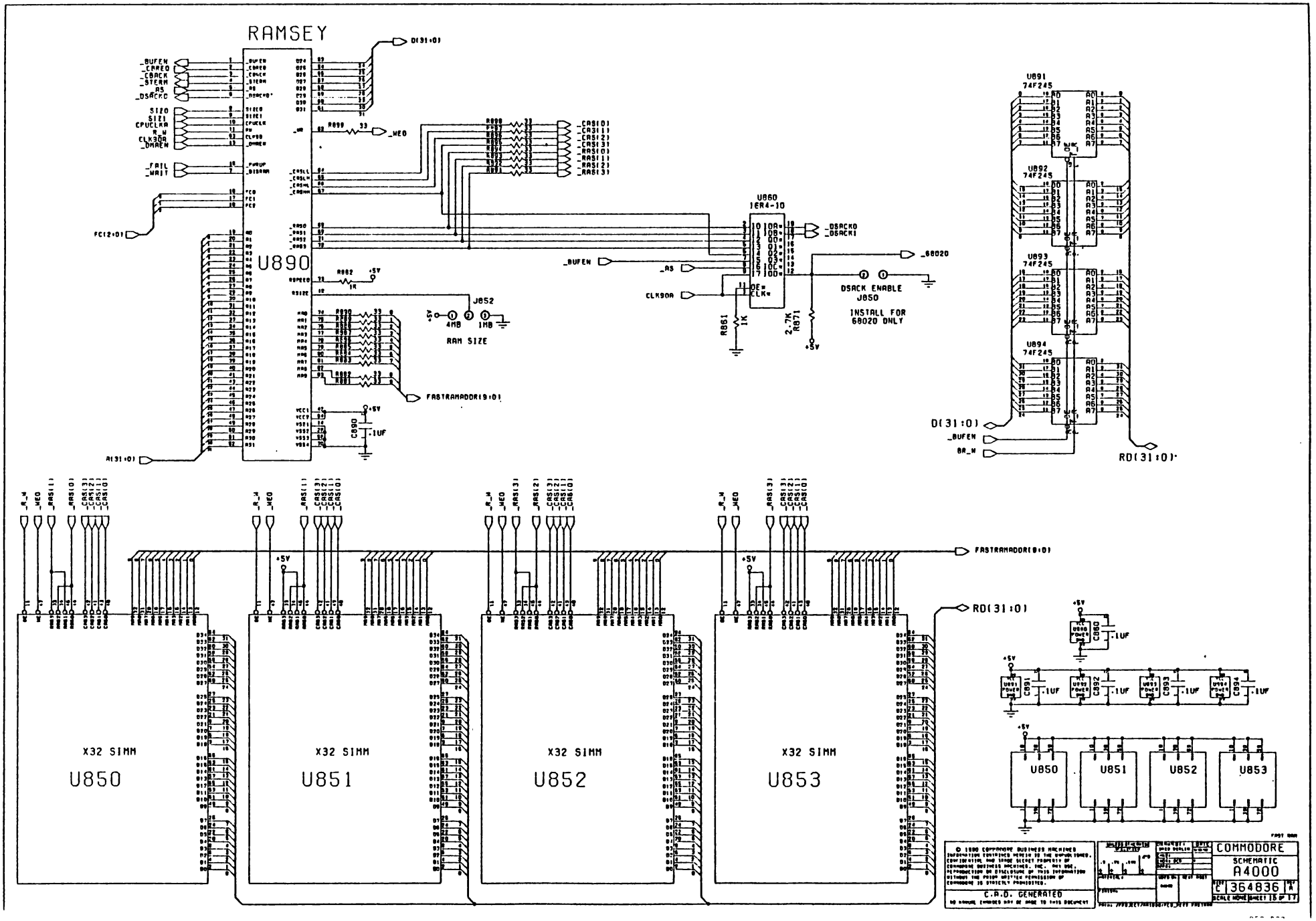
SCHEMATIC
A4000

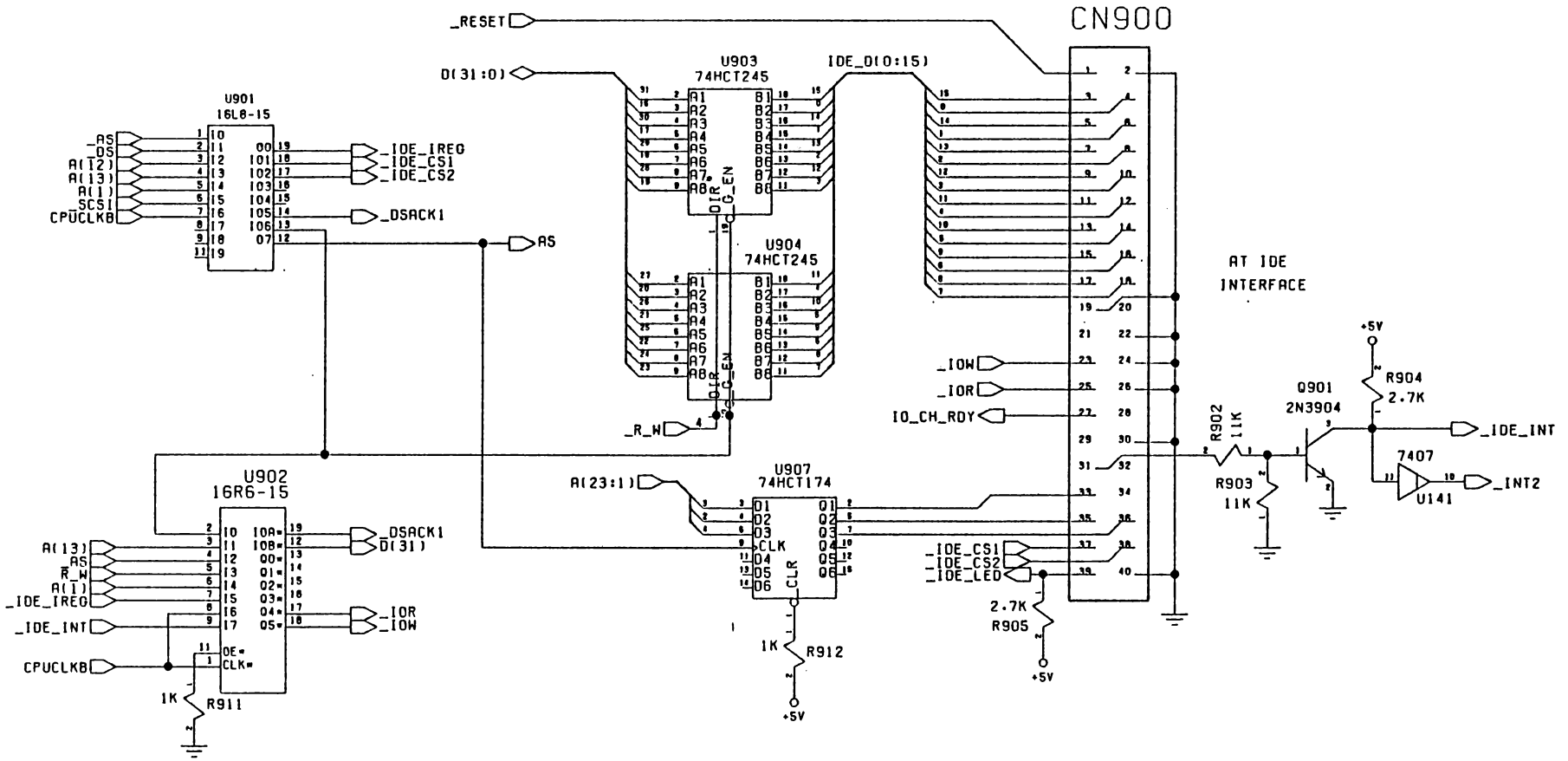
C 364836 REV A

SCALE NONE SHEET 13 OF 17

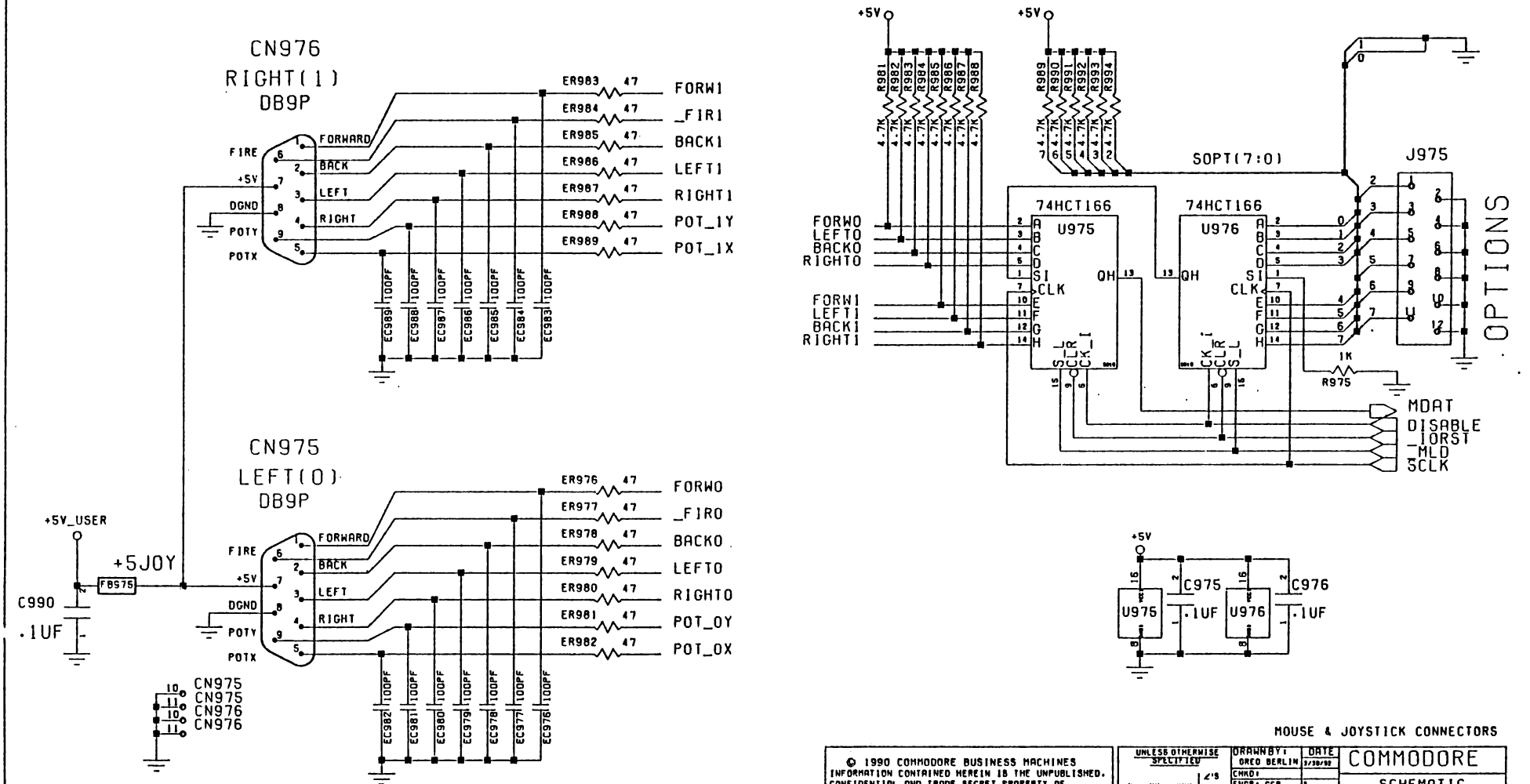
650-699


FAT BUSTER
U700
EXPANSION HALF OF BRIDGETTE
U250
A(31:0)
_BIOZ
_SLAVE(4:0)
_EBOACK
_EBCLR
_OWN
_EBR(4:0)
_EBG(4:0)
ED(15:0)
EA(23:1)
D(31:0)
FC(2:0)
MS(2:0)
_CCS
_FCS
PAL16L8D
U714
U215
74F04
U706
U702
U703
74FCT646T
U704
74F245
U707
74F245
U708
74F245
U711
74F86
U701
16R4-15
U710
74F08
C700
.22UF
R701
R702
R703
R704
R720
R721
R722
READLT
_B030
_BG
_IPL(0:2)
_CIPL(0:2)
_BOSS
_CBR
_INTENA
7M
_CDAC
C1
C3
_EC3
_EC1
ECDAC
E7M
XOEL
XOEH
XDIR
XSTORED
XCLK
_EDS3
_EDS2
_EDS1
_EDS0
READ
_DOE
_DTACK
_CACHE
_MTCK
_MTACK
R_W
SIZ0
SIZ1
_AS
_DS
_DSACK0
_DSACK1
_STERM
_RMC
_SBR
_SBG
_WAIT
_CBREQ
_CBACK
_CIIN
_BR
_BG
_BGACK
_HLT
_BERR
_IORST
CPUCLKB
CLK90B
_BINT
BUSTER & EXPANSION BUS LOGIC
COMMODORE
SCHEMATIC


RAMSEY
U890
U860
U891
U892
U893
U894
U850
U851
U852
U853
X32 SIMM
X32 SIMM
X32 SIMM
X32 SIMM
RAM SIZE
INSTALL FOR
68020 ONLY
DSACK ENABLE
J850
J852
4MB
1MB
COMMODORE
SCHEMATIC
A4000
C 364836 A
C.A.D. GENERATED



COMMODORE
SCHEMATIC
A4000
SIZE C | 364836 | REV A
SCALE NONE | SHEET 16 OF 17
900-949



MOUSE & JOYSTICK CONNECTORS

C.A.D. GENERATED
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.X ± .XX ± .XXX ± ∠'S ±
MATERIAL:
FINISH:

DRAWN BY: OREO BERLIN DATE: 9/30/90
CHKD:
ENGR: GCB
APPR:
USED ON: A4000
NEXT ASSY: ?

COMMODORE
SCHEMATIC
A4000
SIZE C | 364836 | REV A
SCALE NONE | SHEET 17 OF 17

PATH: /PROJECT/AA1000/PCB_REV1 JOYSTICKS

975-999

PART NUMBER	DESCRIPTION
364837-01	PCB Assembly, A4000 NTSC
364837-02	PCB Assembly, A4000 PAL

REVISIONS				
ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	Advance Engineering Release	6/4/92	G. BERLIN
	2	REVISED PER ECO 920423	6/25/92	B. Bartling
	A	PILOT PRODUCTION RELEASE	8-17-92	D. Berlin

Commodore	PCB Assembly, A4000	Drawn by J. Augenbraun	Drawing # 364837
			Sheet 1 of 8

QTY. REQ. PER DASH #										ITM	PART NO.	DESCRIPTION	REF DES / NOTES
10	09	08	07	06	05	04	03	02	01	#			
								R	R	1	364836-01	Schematic	
								R	R	2	364838-01	PCB Fab	
								1	1	3	364839-01	Artwork	
										4			
										5		CAPACITORS	
										6			
								2	2	7	390818-01	CAPACITOR, SM, MLC, NPO, 22pF (1206)	C485 C179
								29	29	8	390818-04	CAPACITOR, SM, MLC, NPO, 47pF (1206)	EC976-EC989 EC350-EC364
								1	1	9	390818-05	CAPACITOR, SM, MLC, NPO, 56pF (1206)	C178
								44	44	10	390818-06	CAPACITOR, SM, MLC, NPO, 100pF (1206)	EC102-EC184 EC300-EC309 EC365-EC379 EC410 EC411 EC451-EC464
								2	2	11	390818-10	CAPACITOR, SM, MLC, NPO, 330pF (1206)	C446, C447
								2	2	12	390853-08	CAPACITOR, SM, MLC, X7R, 3900pF (1206)	C432 C442
								2	2	13	390853-09	CAPACITOR, SM, MLC, X7R, 6800pF (1206)	C431 C441
										14			
								9	9	15	390853-01	CAPACITOR, SM, MLC, X7R, .01uF (1206)	C104 C154B C186 C193 C195 C409 C460D C460E C460F
								6	6	16	390853-04	CAPACITOR, SM, MLC, X7R, .047uF (1206)	C411-C414 C430 C440
								64	64	17	310027-02	CAPACITOR, SM, CERAMIC, 0.1uF (1206)	C102 C103 C106 C130 C131 C140 C141 C145 C152 C154A C177 C201 C205 C211A
										18			C211B C211C C212 C213 C215 C216 C250A C250C C300 C305 C311 C350-C355
										19			C400B C402A C402B C455-C459 C460A C460B C460C C500 C860 C890-C894
										20			C901-C904 C907 C975 C976 C990 C511-C513,C455B C456D C457B C458B
								21	21	21	390797-02	CAPACITOR, SM, CERAMIC, Z5U, .22uF (1210)	
								21	21	22	390797-02	CAPACITOR, SM, CERAMIC, Z5U, .22uF (1210)	C150 C175 C176 C199 C403 C405 C406 C450
										23			C700-C704 C706-C708 C710 C711 C714
								2	2	24	391097-06	CAPACITOR, SM, ELEC, ALUM, 4.7uF 25V 'A'	C200 C404
								1	1	25	391097-07	CAPACITOR, SM, ELEC, ALUM, 10uF 25V 'C'	C460G
								5	5	26	391097-03	CAPACITOR, SM, ELEC, ALUM, 22uF 16V 'C'	C198 C317 C318 C433 C443
								10	10	27	391097-04	CAPACITOR, SM, ELEC, ALUM, 47uF 16V 'D'	C187-C192 C194 C196 C407 C408
								1	1	28	391097-01	CAPACITOR, SM, ELEC, ALUM, 100uF 6.3V 'D'	C181
								2	2	29	390101-03	CAPACITOR, ELEC, ALUM, RADIAL, 470uF 16V	C185 C400A
										30			
								1	1	31	251029-06	CAPACITOR, TRIMMER, CERAMIC, 6.8-45pF	VC190
										32			
										33			
										34			
										35			
										36			
										37			
										38		TRANSITORS, DIODES, FERRITES	
										39			
								2	2	40	391121-01	IC, SMD, NPN, TRANSISTOR, 2N3904 (SOT23)	Q300 Q901
								1	1	41	391122-01	IC, SMD, PNP, TRANSISTOR, 2N3906 (SOT23)	Q400
								2	2	42	391145-01	TRANSISTOR, SM, N-CHANNEL JFET MMDF102L	Q430 Q440
										43			
								15	15	44	391327-01	DIODE, SM, 1N4001 (MELF)	D175 D176 D305-D307 D360-D363, D500-D505
								3	3	45	391129-01	DIODE, SMT, 1N4148 (SOT23)	D177 D178 D300
										46			
								15	15	47	391092-01	FILTER, FERRITE, SMT (1812)	FD177 FD308 FD309 FD364-FD366 FB401 FB410 FD411 FD462 FD463 FD464 FB476
										48			FD710, FD975
										49			
								1	1	50	391138-05	INDUCTOR,SM,.47uH (1210)	L500

Commodore	Title: PCB Assembly, A4000	Drawn by: J. Augenbraun	Drawing #: 364837 / REV: A
			Sheet 2 of 6

QTY. REQ. PER DASH #										ITM	PART NO.	DESCRIPTION	REF DES / NOTES
10	09	08	07	06	05	04	03	02	01	#			
										51			
										52		RESISTORS	
										53			
								1	1	54	391093-01	RESISTOR, SM, 1W, 5%, 1 OHM (2512)	R400
								2	2	55	391093-07	RESISTOR, SM, 1W, 5%, 20 OHM (2512)	R176 R177
								1	1	56	391093-04	RESISTOR, SM, 1W, 5%, 47 OHM (2512)	R333
								2	2	57	310026-45	RESISTOR, CHIP, 1/8W, 5%, 1 OHM (1206)	R403 R404
								1	1	58	310026-24	RESISTOR, CHIP, 1/8W, 5%, 120 OHM (1206)	R311
								37	37	59	310026-43	RESISTOR, CHIP, 1/8W, 5%, 33 OHM (1206)	R104 R211 R231-R237 R240 R248 R881-R899
								139	139	60	310026-01	RESISTOR, CHIP, 1/8W, 5%, 47 OHM (1206)	R101-R103 R105 R106 R111 R112 R161 R162 R212-R218 R222 R223 R451
										61			R458-R464 R500-R508 R513 R520-R543 R701-R704 ER175 R458A R458B R660 R661
										62			ER176 ER300-ER307 ER350-ER363 ER367-ER379 ER453 ER458-ER461 ER475
										63			ER976-ER989 R165-R170
										64			
								24	24	65	391509-04	RESISTOR, CHIP, 1/10W, 5%, 47 OHM (0805)	R455A, R455B R455C R455D R455E R455F R455G R455H
										66			R456A R456B R456C R456D R456E R456F R456G R455H
										67			R457A R457B R457C R457D R457E R457F R457G R457H
										68			
								3	3	69	310026-29	RESISTOR CHIP, 1/8W, 5%, 75 OHM (1206)	R510-R512
								2	2	70	310026-30	RESISTOR, CHIP, 1/8W, 5%, 220 OHM (1206)	R301 R307
								6	6	71	310026-21	RESISTOR, CHIP, 1/8W, 5%, 470 OHM (1206)	R120-R122 R175 R178 R651
								2	2	72	310026-56	RESISTOR, CHIP, 1/8W, 5%, 680 OHM (1206)	R65 R66
								2	2	73	310026-57	RESISTOR, CHIP, 1/8W, 5%, 750 OHM (1206)	R430 R440
								66	66	74	310026-07	RESISTOR, CHIP, 1/8W, 5%, 1.0K OHM (1206)	R67 R68 R70-R73 R125-R128 R171- R173 R181 R182 R239 R249 R302 R371 R381
										75			R382 R401 R402 R433 R434 R443 R444 R545 R548R612-R626 R630-R635 R939
										76			R708-R712 R720-R722 R861 R862 R911 R912 R975
								12	12	77	310026-54	RESISTOR, CHIP, 1/8W, 5%, 1.2K OHM (1206)	R79 R68 R179 R405
								2	2	78	310026-51	RESISTOR, CHIP, 1/8W, 5%, 2.4K OHM (1206)	R403D R403H
								76	76	79	310026-16	RESISTOR, CHIP, 1/8W, 5%, 2.7K OHM (1206)	R1-R64 R74-R78 R206 R207 R407 R652 R871 R904 R905
								3	3	80	310026-46	RESISTOR, CHIP, 1/8W, 5%, 3.3K OHM (1206)	R151 R360 R361
								17	17	81	310026-08	RESISTOR, CHIP, 1/8W, 5%, 4.7K OHM (1206)	R515 R403C R403G R981-R994
								21	21	82	310026-17	RESISTOR, CHIP, 1/8W, 5%, 10 K OHM (1206)	R208 R305 R306 R406 R408 R431 R432 R441 R442 R457 R465 R514
										83			R403A R403B R403E R403F R355-R359
								2	2	84	310026-55	RESISTOR, CHIP, 1/8W, 5%, 11 K OHM (1206)	R902 R903
								1	1	85	310026-31	RESISTOR, CHIP, 1/8W, 5%, 100K OHM (1206)	R180
								2	2	86	310026-19	RESISTOR, CHIP, 1/8W, 5%, 470K OHM (1206)	R435 R445
								1	1	87	391154-27	RESISTOR, CHIP, 1/8W, 1%, 562 OHM (1206)	R509
										88			
								3	3	89	902412-14	RES. NETWK., SIP, 9 PIN, 8 ELEMENT, 1K OHM	RP461-RP463
								1	1	90	902410-10	RES. NETWK., SIP, 10 PIN, 9 ELEMENT, 1K OHM	RP351
								1	1	91	902442-35	RES. NETWK., SIP, 8 PIN, 7 ELEMENT, 10K OHM	RP176
										92			
										93			
								1	1	94	325566-27	OSCILLATOR, 50 MHz, T.H. Can	U104
								-	1	95	325566-14	OSCILLATOR, 28.63636 MHz, T.H. can	U154 (NTSC)
								1	-	96	252344-01	OSCILLATOR, 28.37516 MHz, T.H.can	U154 (PAL)
								1	1	97	900560-01	CRYSTAL, 32.768 KHz, T.H.	Y176
										98			
										99			
										100			

Commodore	Title: PCB Assembly, A4000	Drawn by: J. Augenbraun	Drawing #: 364837 REV: A
			Sheet 3 of 6

QTY. REQ. PER DASH #										ITM	PART NO.	DESCRIPTION	REF DES / NOTES
10	09	08	07	06	05	04	03	02	01	#			
										101			
										102			
										103		INTEGRATED CIRCUITS	
										104			
										105			
										106			
								1	1	107	391513-01	IC, KICKSTART ROM (LOW)	U176
								1	1	108	391514-01	IC, KICKSTART ROM (HIGH)	U175
										109			
								1	1	110	391010-01	IC, CSG, 8374, ALICE, 84PIN PLCC	U211
								1	1	111	391227-01	IC, CSG, 4203, LISA, 84PIN PLCC	U450
								1	1	112	391077-01	IC, 8364R7 PAULA PLCC 52	U400
								2	2	113	391078-02	IC, SM, LSI, Complex Int Adapt 8520A-1 PLCC 44	U300 U350
								1	1	114	390525-01	IC, RICOH, Real Time Clock, RP5C01, DIP	U178
								1	1	115	391494-01	IC, VIDEO DAC, TRIPLE 8-BIT, ADV7120, PLCC 44	U460
								1	1	116	390540-02	IC, LSI, FAT GARY, F008B, PLCC84	U150
										117			
								1	1	118	390541-07	IC, FAT RAMSEY, F012G, PLCC 84	U890
										119			
								1	1	120	391380-01	IC, BRIDGETTE, PQFP 100	U250
								1	1	121	390539-09	IC, LSI, FAT BUSTER, F013I, PLCC84	U700
										122			
										123			
								1	1	124	391473-01	IC, SMD, Op Amp, Dual, LM833	U403
								1	1	125	391103-01	IC, SMD, Op Amp, Quad JFET, LF347	U402
								1	1	132	390585-01	DELAY LINE, 5 TAP, 25 ns, DIP	U102
								1	1	127	391087-01	IC, SMD, Quad Line Driver, 1488 SOIC	U304
								1	1	128	391086-01	IC, SMD, Quad Line Receiver, 1489 SOIC	U305
								1	1	129	391421-01	Voltage Reference, 1.2V, SO-8	D507
								1	1	130	901527-03	IC, Voltage Regulator, Fixed Output, TO-220, 7905	U198
										131			
										133			
										133			
										134			
										135			
										136			
								1	1	137	391479-02	IC, PAL, 16R4-10 Programmed PLCC, ROM DSACKs	U152 Programmed into PN 351359-03
								1	1	138	391478-01	IC, PAL, 22V10-10 Programmed PLCC,Chip CAS Gen	U212 Programmed into PN 391392-03
								1	1	139	391477-01	IC, PAL, 16L8-10 Programmed PLCC, Chip RAM Ctrl	U213 Programmed into PN 391412-01
								1	1	140	391476-01	IC, PAL, 16R4-15 Programmed PLCC, Arb & Int.	U701 Programmed into PN 391359-04
								1	1	141	391475-01	IC, PAL, 16L8-10 Programmed PLCC, Zorro Decode	U714 Programmed into PN 391199-03
								1	1	142	391406-01	IC, PAL, 16L8-15 Programmed PLCC, IDE Decode	U901 Programmed into PN 391199-04
								1	1	143	391405-01	IC, PAL, 16R6-15 Programmed PLCC, IDE state	U902 Programmed into PN 391403-02
								1	1	144	391436-02	IC, PAL, 16R4-10 Programmed PLCC, RAM DSACKs	U860 Programmed into PN 351359-03
										145			
										146			
										147			
										148			
										149			
										150			

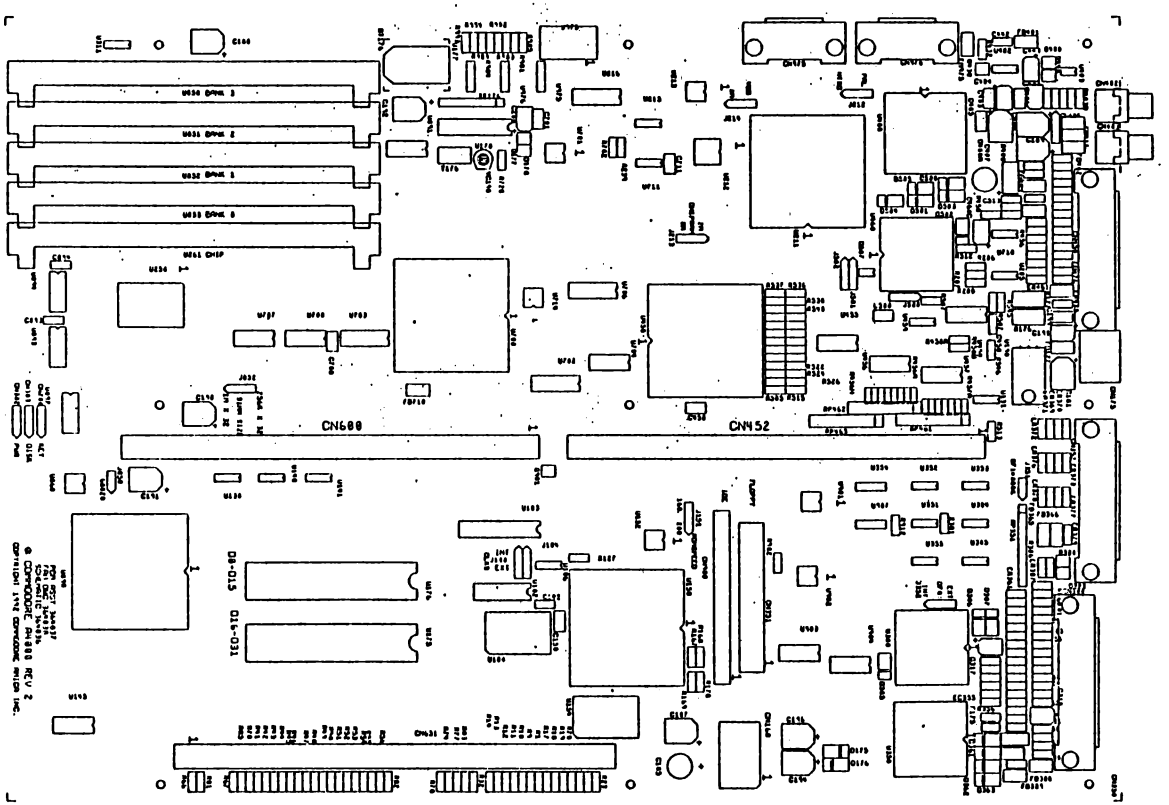
Commodore	Title: PCB Assembly, A4000	Drawn by: J. Augenbraun	Drawing #: 364837 / REV: A
			Sheet 4 of 6

QTY. REQ. PER DASH #										ITM			
10	09	08	07	06	05	04	03	02	01	#	PART NO.	DESCRIPTION	REF DES / NOTES
										151			
										152			
										153		INTEGRATED CIRCUITS, CON'D	
										154			
								1	1	155	391276-01	7406, SOIC package	U131
								2	2	156	391188-01	7407, SOIC package	U311 U141
								1	1	157	391499-01	74F521, SOIC package	U145
								1	1	158	391088-01	74F04, SOIC package	U215
								2	2	159	391183-01	74F08, SOIC package	U130 U710
								1	1	160	391175-01	74F32, SOIC package	U140
								2	2	161	391320-01	74F74, SOIC package	U106 U459
								1	1	162	391325-01	74F86, SOIC package	U711
								7	7	163	391375-01	74F245, SOIC package	U704 U707 U708 U891-U894
								1	1	164	391481-01	74F841, SOIC package	U216
								3	3	165	391374-02	74FCT646T, SOIC package	U702 U703 U706
										166			
								1	1	167	391400-01	74FCT244T, DIP package	U103
								4	4	168	391474-01	74FCT245T, SOIC package	U455-U458
										169			
								2	2	170	391480-01	74HCT166, SOIC package	U975 U976
								3	3	171	391377-01	74HCT174, SOIC package	U177 U354 U907
										172			
								2	2	173	391100-01	74HCT245, SOIC package	U903 U904
										174			
								1	1	175	391326-01	74LS38, SOIC package	U352
								1	1	176	391141-01	74LS74A, SOIC package	U351
								2	2	177	391191-01	74LS125A, SOIC package	U353 U355
								1	1	178	391311-01	74HC4066, SOIC package	U205
										179			
										180		SOCKETS	
										181			
								3	3	182	391321-06	Socket, 20 PIN PLCC surface mount	U213 U701 U714 (EMB BUILD ONLY)
								1	1	183	390768-04	Socket, 20 PIN .3 DIP machine pin	U103 (Clock distribution)
								1	1	184	391321-05	Socket, 28 PIN PLCC surface mount	U212 (EMB BUILD ONLY)
								2	2	185	900150-06	Socket, 40 PIN .6 DIP	U175 U176 (ROM's)
								2	2	186	391321-01	Socket, SM PLCC, 84 pin	U211 U450 (EMB BUILD ONLY)
								5	5	187	391368-01	Socket, 72 PIN 22.5 DEG. SIMM	U261 U850-U853
								8	8	188	390719-01	Socket, single pin (.040 hole)	U104 U154
										189			
										190			
										191		MISC ELECTRICAL	
										192			
								1	1	193	380393-02	Battery, NICAD, RECHARGEABLE, 3.6V	BT176
								S	S	194	380393-03	Battery, NICAD, RECHARGEABLE, 3.6V	BT176
								1	1	195	390924-01	Varistor Switch, Self Resetting 1.65A	F175
										196			
										197			
										198			
										199			
										200			

Commodore	Title: PCB Assembly, A4000	Drawn by: J. Augenbraun	Drawing #: 364837 / REV: A
			Sheet 5 of 6

QTY. REQ. PER DASH #										ITM			
10	09	08	07	06	05	04	03	02	01	#	PART NO.	DESCRIPTION	REF DES / NOTES
										201			
										202		CONNECTORS	
										203			
								1	1	204	903345-06	12 DIL .1" x .1" HEADER	J975
								1	1	205	903345-17	34 DIL .1" x .1" HEADER	CN351
								1	1	206	903345-20	40 DIL .1" x .1" HEADER	CN900
								2	2	207	903326-02	2 x .1" SIL	J351 J850
								16	16	208	903326-03	3 x .1" SIL	CN404 J100 J104 J151 J212-J214 J352 J500-J502 J852 CN200 CN302 CN303
										209			
										210			
										211			
										212			
								2	2	213	390242-01	DB9 MALE	CN975 CN976
								1	1	214	390242-03	DB23 MALE	CN450
								1	1	215	390241-03	DB23 FEMALE	CN352
								1	1	216	390625-04	stacked DB25 male/female (missionary)	CN350+CN300
										217			
										218			
								1	1	219	390851-04	6 PIN MINI DIN, female	CN175
								10	10	220	390043-01	SHORTING BARS (SHUNTS)	J100 J104 J120 J151 J152 J212 J214 J352 J850 J852
								1	1	221	903349-01	6 PIN CONNECTOR (POWER IN)	CN160
								1	1	222	252122-02	RCA JACK (red)	CN403
								1	1	223	252122-01	RCA JACK (white)	CN402
								2	2	224	903446-06	100 PIN EDGE CARD CONNECTOR	CN452 CN600
								1	1	225	390557-01	200 PIN KEL CONNECTOR	CN651
										226			
										227			
										228		UNSTUFFED COMPONENTS	
										229		R465	
										230		C40GH	
										231			
										232			
										233			
										234		JUMPER SETTINGS	JUMPER DESCRIPTION
										235			
										236		J100 (CLK90 clock source) detrmined by assy config	pins 1-2 = Internal (020/030), pins 2-3 = External (040)
										237		J104 (CPU Clock source) determined by assy config	pins 1-2 = Internal, pins 2-3 = External
										238			
										239		J151 (ROM Speed) pins 1-2	pins 1-2 = 200ns, pins 2-3 = 160ns
										240		J213 (CHIP RAM SIZE) pins 1-2	pins 1-2 = 2 Meg, pins 2-3 = 8 Meg
										241		J351 (DFI) No shunt	Shunt = DFI: = 880k
										242		J352 (Redirect DF0) pins 1-2	pins 1-2 = Internal, pins 2-3 = External
										243		J850(RAM/ROM) Install ONLY when CPU is 68020 bd	shunt = DSACK, no shunt = no DSACKs
										244		J852 (RAM SIZE) determined by assembled config.	pins 1-2 = 1m x 32, pins 2-3 = 256k x 32
										245			
										246		J212 (NTSC/PAL) pins: 1-2 = -01, pins 2-3 = -02	pins 1-2 = NTSC, pins 2-3 = PAL
										247		J214 pins 2-3	
										248		J500 (SYNC ON GREEN) pins 2-3	pins 1-2 = no, pins 2-3 = yes
										249		J501 pins 2-3	
										250		J502 pins 2-3	

Commodore	Title: PCB Assembly, A4000	Drawn by: J. Augenbraun	Drawing # 364837 / REV A
			Sheet 6 of 6



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
SEE SHEET				

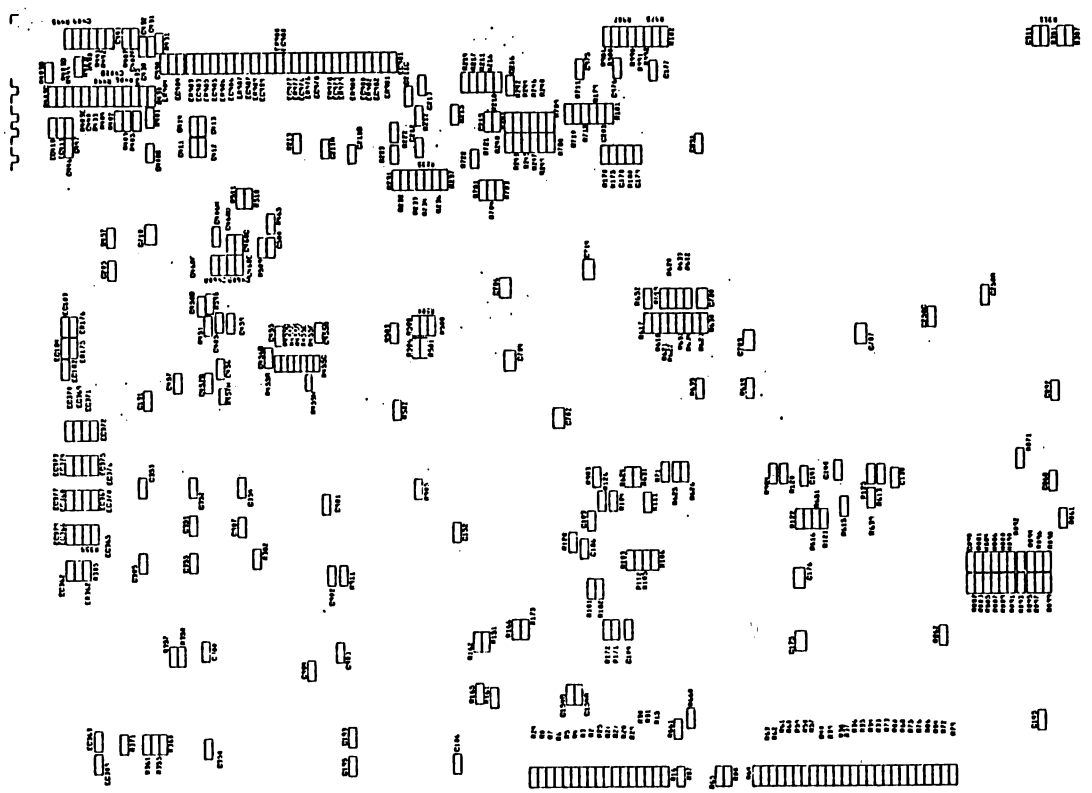
commodore

PCB ASSY
A4000

SIZE C | 364837 | REV A

SCALE | SHEET 7 OF 8

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



commodore

PCB ASSEMBLY
A4000

SIZE C | 364837 | REV A

SCALE | Sheet 8 of 8

ZONE	REV	DESCRIPTION	DATE	APPROVED
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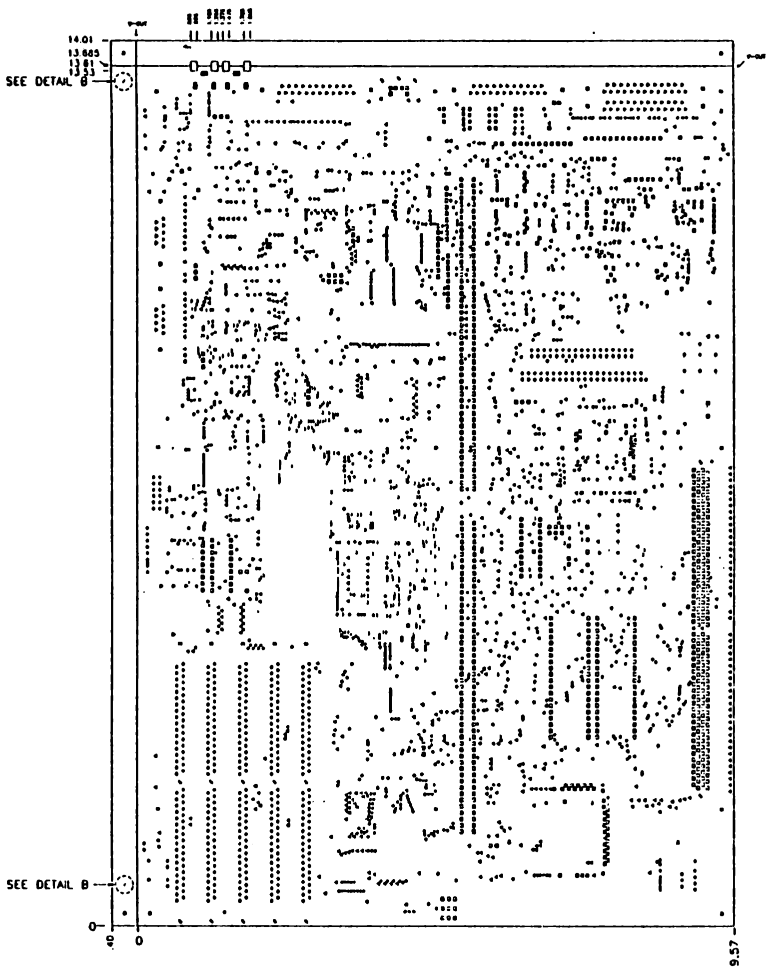


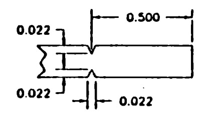
COMMODORE WCHEST
A4000 REV 2
(7-27-92)
DRILL LEGEND

DIAMETER	COUNT : ALL HOLES	
0.037	835	
0.052	123	
0.031	939	
0.034	240	
0.125	13	
0.042	454	
0.073	7	
0.02	1232	
0.068	18	NOPLATING
0.093	15	
0.078	5	
0.136	8	
0.157	4	NOPLATING
0.125	7	NOPLATING
0.018	300	
0.125 x 20	2	NOPLATING
0.04 x 10	4	
0.13 x 04	2	

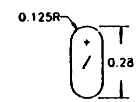
REV 2
(COMPONENT SIDE SHOWN)

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BOARDS SHALL BE FABRICATED IN ACCORDANCE WITH THE BEST COMMERCIAL PRACTICES. FABRICATE PER COMMODORE SPEC. NO. 1.01.007.
2. MATERIAL:
   - A. BASE LAMINATE: COPPER CLAD, GLASS BASE, EPOXY RESIN, (FR4 GRADE OR EQUIVALENT) 1 OZ. COPPER ON EXTERNAL LAYERS. PER MIL-P-13949.
   - B. THICKNESS AND ACCUMULATION OF INDIVIDUAL LAYER TOLERANCES SHALL BE OPTIMIZED TO ACHIEVE AN OVERALL THICKNESS OF 1.57 (0.062)
   - C. BONDING AGENT, PREIMPREGNATED B-STAGE EPOXY GLASS CLOTH SHALL BE IN ACCORDANCE WITH MIL-G-55636.
3. PLATING EXTERNAL LAYERS AND THRU HOLES:
   - A. THE HOLE WALLS SHALL BE PREPARED FOR PLATING BY SENSITIZING WITH ELECTROLESS COPPER PROVIDING THE CONDUCTIVE BASE FOR SUBSEQUENT PLATINGS.
   - B. ELECTRO-DEPOSITED COPPER SHALL BE IN ACCORDANCE WITH MIL-C-14550, CLASS 1, 0.025 (0.001) MINIMUM THICKNESS.
   - C. HOT AIR LEVEL WITH 37% TIN 63% LEAD MIXTURE OVER LANDS AND PADS AND SHALL BE AN AVERAGE THICKNESS OF .0003 INCHES WITH NO SINGLE MEASURMENT OF LESS THAN .0002 INCHES AT CREST OF SMD PADS AND A MINIMUN AVERAGE OF .0002 INCHES IN PLATED THRU HOLES.
   - D. COPPER DEPOSITED ON SURFACE CONDUCTORS SHALL BE A MINIMUM THICKNESS OF 0.061 (0.0024).
   - E. THE PLATING SHALL BE HOMOGENOUS AND COMPLETELY COVER CONDUCTORS WITHOUT PITS, PINHOLES, OR OTHER NON-UNIFORMITIES.
   - F. ANNULAR RINGS SHALL BE COMPLETE AND UNBROKEN SURROUNDING EACH ROUND TERMINAL PAD BY A MINIMUM OF 0.050 (0.002).
4. HOLES WHOSE LOCATIONS ARE NOT DIMENSIONED ARE TO BE CENTERED ON THE PAD AREA WITHIN 0.178 (0.007) OF THE CENTER OF THE PAD.
5. FRONT TO BACK REGISTRATION SHALL BE WITHIN 0.127 (0.005)
6. ALL DIMENSIONS ARE IN INCHES.
7. ALL TOOLING HOLE DIAMETERS ARE TO HAVE A TOLERANCE OF +0.080 (+0.003), -0.000 (-0.000).
8. ARTWORK PROVIDED PER COMMODORE SPEC. NO. 1.01.007 SECT. 4.2
9. THIS FAB DWG. IS USED WITH ARTWORK NO. 364839-01
10. SILKSCREEN BOTH SIDES USING ARTWORK SUPPLIED.
11. SOLDERMASK OVER BARE COPPER BOTH SIDES.
12. HOLES INDICATED AS BEING ON GRID SHALL BE CENTERED WITHIN 0.075 (0.003) OF THIER TRUE POSITION POINT, REF. BY X-Y DATA.
13. BOARDS SHALL BE IDENTIFIED WITH THE VENDORS U.L. REGISTERED LOGO ON THE COMPONENT SIDE.
14. PC BOARD LAYUP:
    - LAYER 1 ----- COMPONENT SIDE
    - LAYER 2 ----- VCC
    - LAYER 3 ----- GROUND
    - LAYER 4 ----- SOLDER SIDE



DETAIL A
SCALE: 8/1
V-CUT CROSS SECTION



DETAIL B
SCALE: 4/1
2 PLACES

C.A.D. GENERATED

TOLERANCES ON DECIMALS: .01 | .005 | .003 | ∠ 1/2

MATERIAL: SEE NOTE 2

FINISH: SEE NOTE 3

DRAWN BY: N. ALCOTT 6/16/92

USED ON: A4000

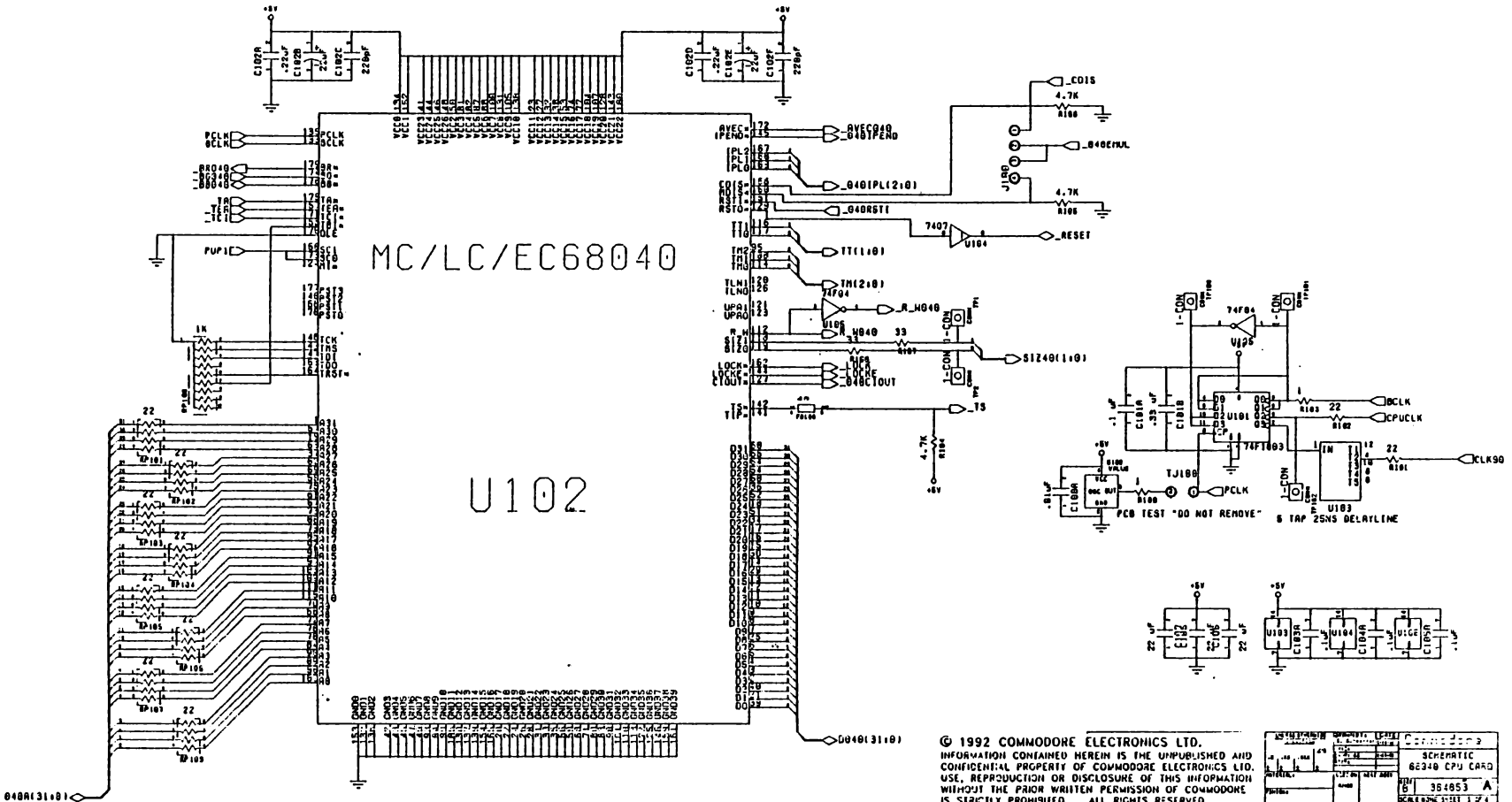
Commodore

FABRICATION DRAWING, A4000 MAIN BOARD

SIZE D | 364838 | REV A

SCALE 1:1 | SHEET 1 OF 1

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PILOT PRODUCTION RELEASE	8-13-92	J. Bahi

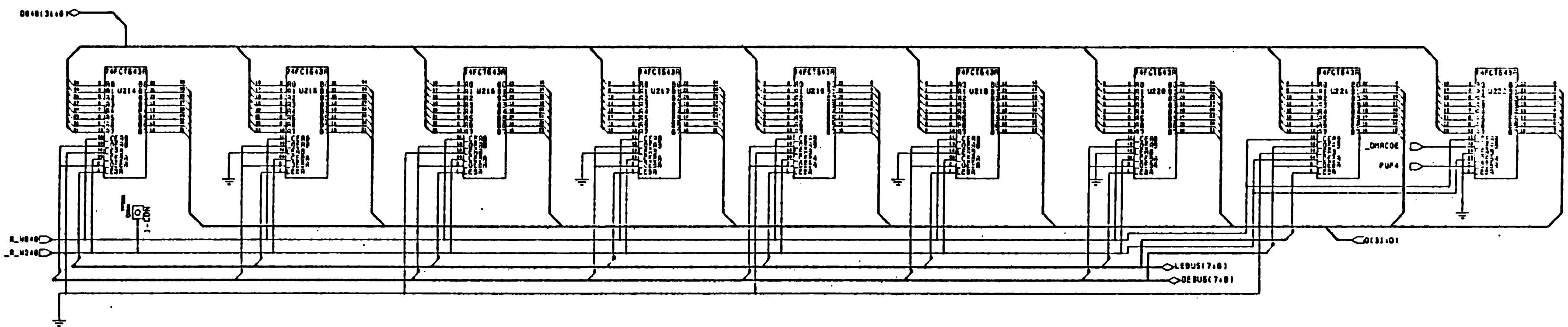


Commodore

SCHEMATIC
68340 CPU CARD

SIZE B 364853 A

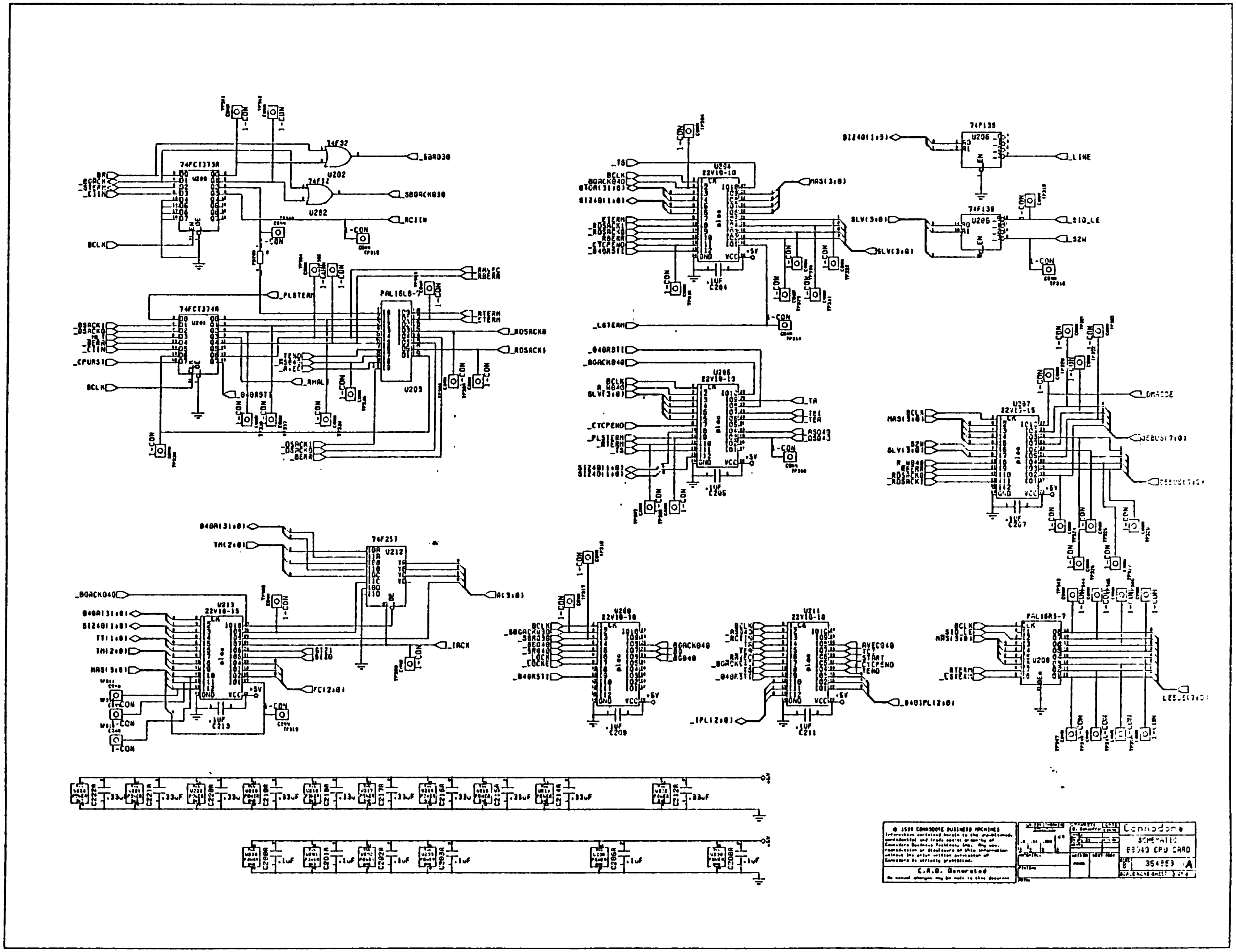
SCALE NONE SHEET 3 OF 4

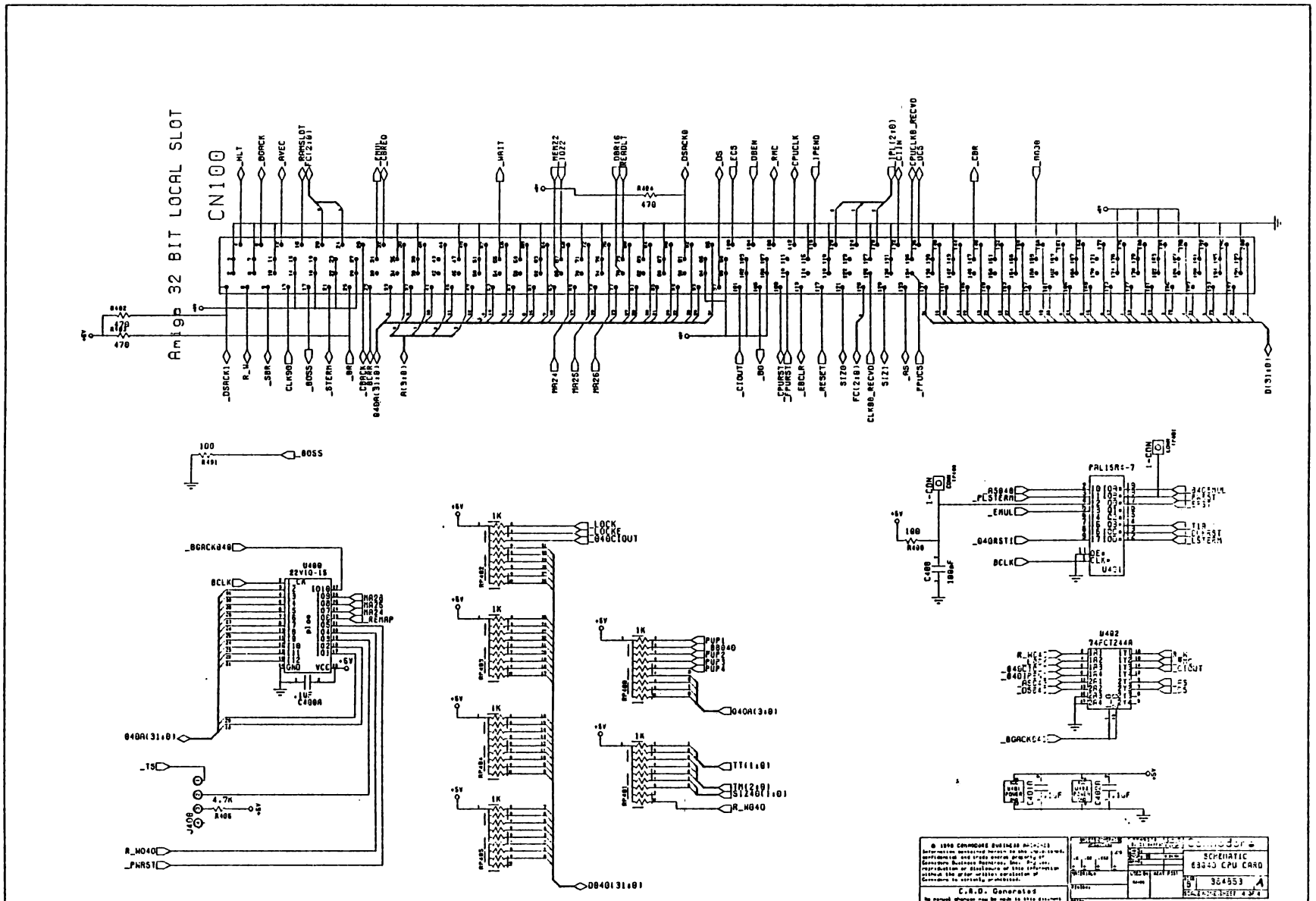


C.A.D. Generated

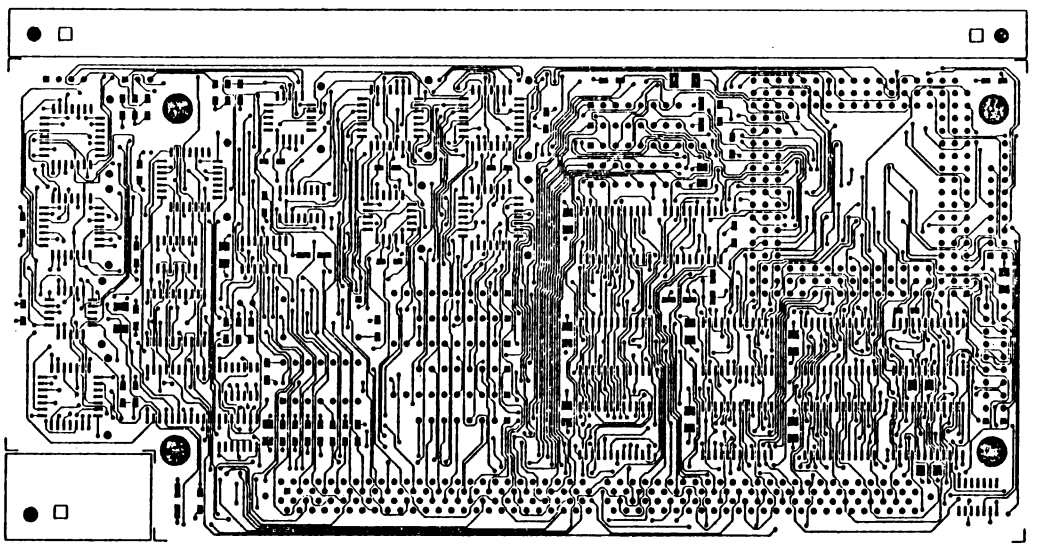
Commodore

SCHEMATIC


74F32
U202
_SBR030
_SBGACK030
_ACIIN
74FCT373A
U200
74FCT374A
U201
PAL16L8-7
U203
_PLSTERM
_RAVEC
_RBERR
_RTERM
_CTERM
_RDSACK0
_RDSACK1
_RMAL
_040RSTI
_TS
U204
22V10-10
MAS[3:0]
SIZ40[1:0]
SLV[3:0]
_LSTERM
C204
74F139
U206
_LINE
SIQ_LE
_S2W
U205
_TA
_TBI
_TEA
AS040
DS040
_CYCPEND
C205
U207
_DMACDE
DEBUS[7:0]
C207
74F257
U212
TM[2:0]
A[3:0]
_BGACK040
U213
22V10-15
SIZ40[1:0]
TT[1:0]
_IACK
FC[2:0]
C213
U209
22V10-10
_BGACK030
_040RSTI
C209
U211
22V10-10
AVEC040
_ICT
_START
_CYCPEND
_TEND
_040IPL[2:0]
_IPL[2:0]
C211
PAL16R8-7
U208
LEBUS[7:0]
_BTERM
_CSTERM
1-CON
.33uF
.1uF
+5V
© 1990 COMMODORE BUSINESS MACHINES
C.A.D. Generated
Commodore
SCHEMATIC
68040 CPU CARD
354353
A


Amiga 32 BIT LOCAL SLOT
CN100
SCHEMATIC
68040 CPU CARD
C.A.D. Generated

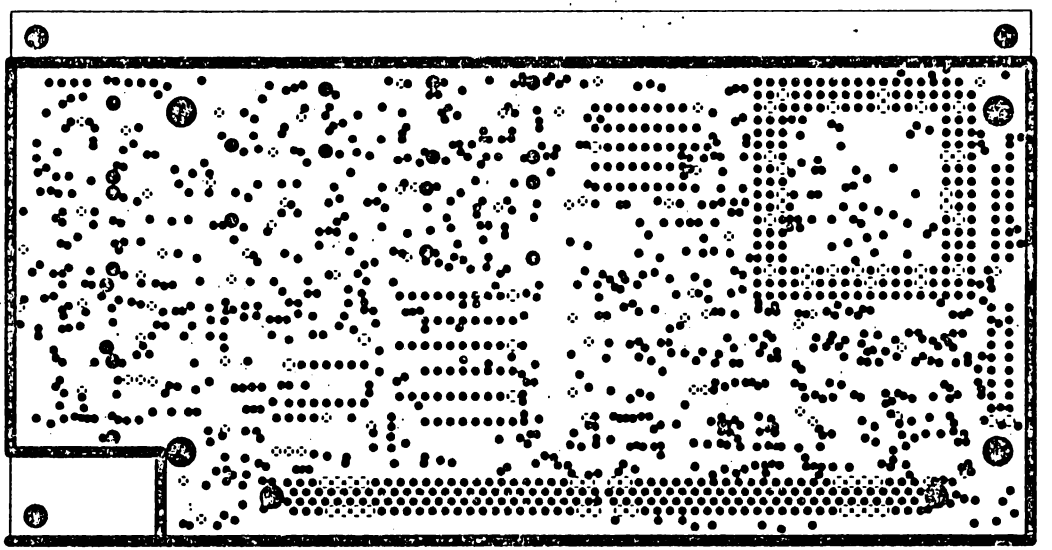
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		PILOT PRODUCTION RELEASE	8-13-92	J. Burk



© COMMODORE ELECTRONICS LTD
A3640 (68040) BOARD REV 3.0
COMPONENT SIDE

UNLESS OTHERWISE SPECIFIED TOLERANCES ON: DECIMALS .X ± .XX ± .XXX ± ∠'S ±	DRAWN BY:	DATE	Commodore
	CHKD:		ARTWORK -
	ENGR:		68040 CPU CARD
	APPR:		
MATERIAL:	USED ON	NEXT ASSY	SIZE B 364854 REV A
FINISH:			SCALE SHEET 1 OF 8

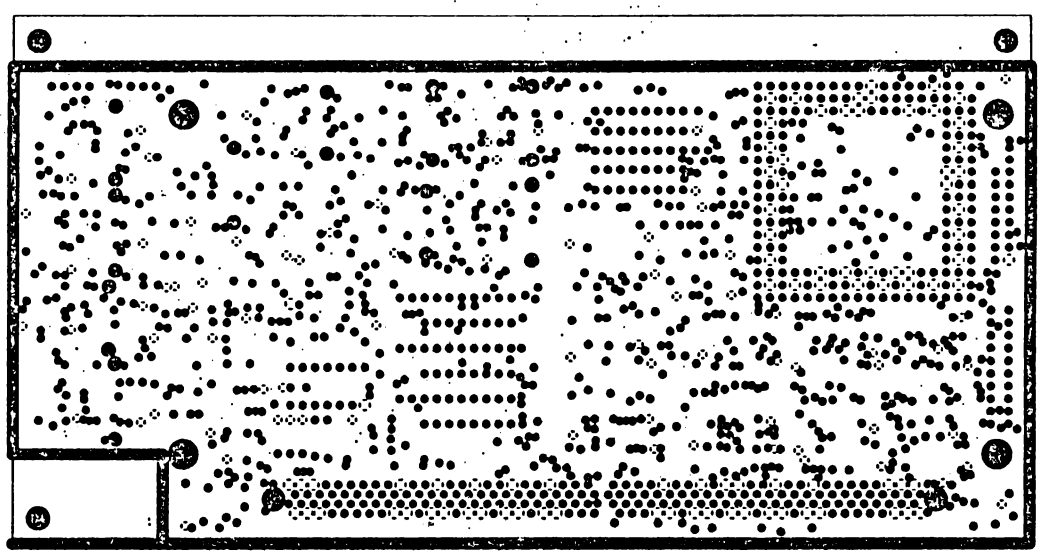
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



A3640 (68040) BOARD REV 3.0
VOLTAGE PLANE

commodore	TITLE: ARTWORK – 68040 CPU CARD	DRAWN BY:	DATE	ENGR:		SIZE	DRAWING NUMBER		
		CHKD:		APPR:		B	364854		
							SHEET 2	OF	8

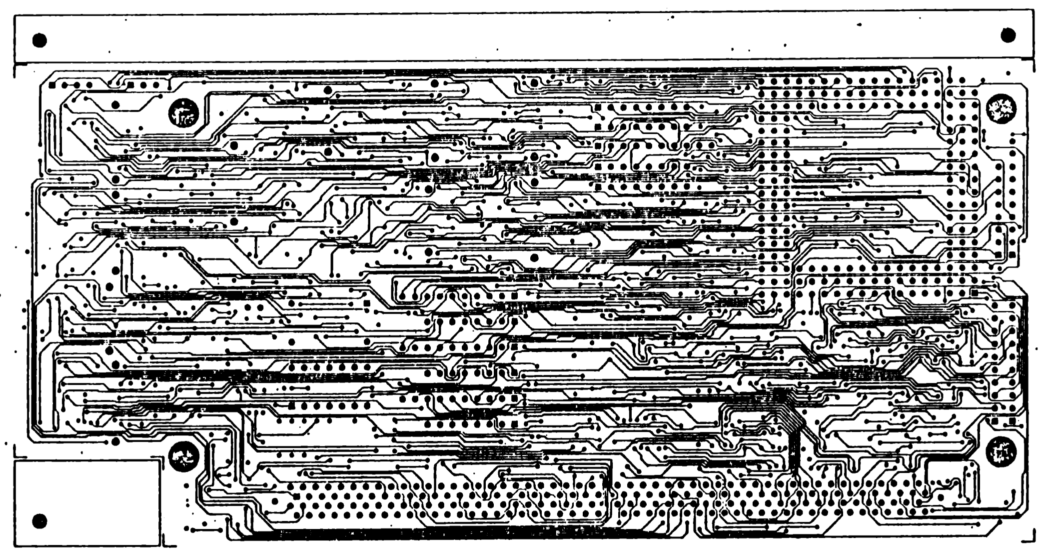
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



© COMMODORE ELECTRONICS LTD
A3640 (68040) BOARD REV 3.0
GROUND PLANE

commodore	TITLE: ARTWORK - 68040 CPU CARD	DRAWN BY:	DATE	ENGR:		SIZE	DRAWING NUMBER 364854		
		CHKD:		APPR:		B	SHEET 3 OF 8		

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



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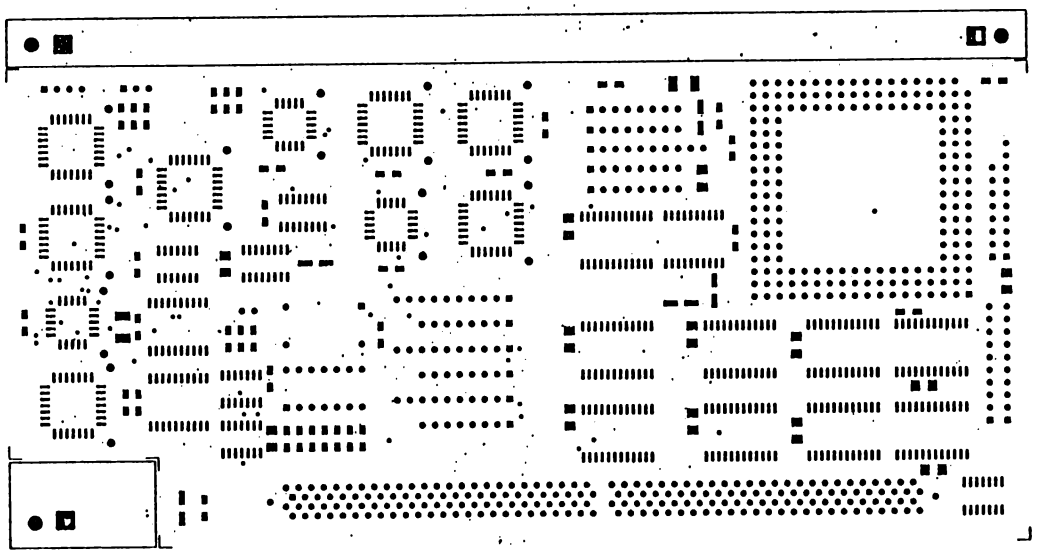
A3640 (68040) BOARD REV 3.0
SOLDER SIDE

commodore	TITLE: ARTWORK - 68040 CPU CARD	DRAWN BY:	DATE	ENGR:	SIZE	DRAWING NUMBER
		CHKD:		APPR:	B	364854
						SHEET 4 OF 8

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

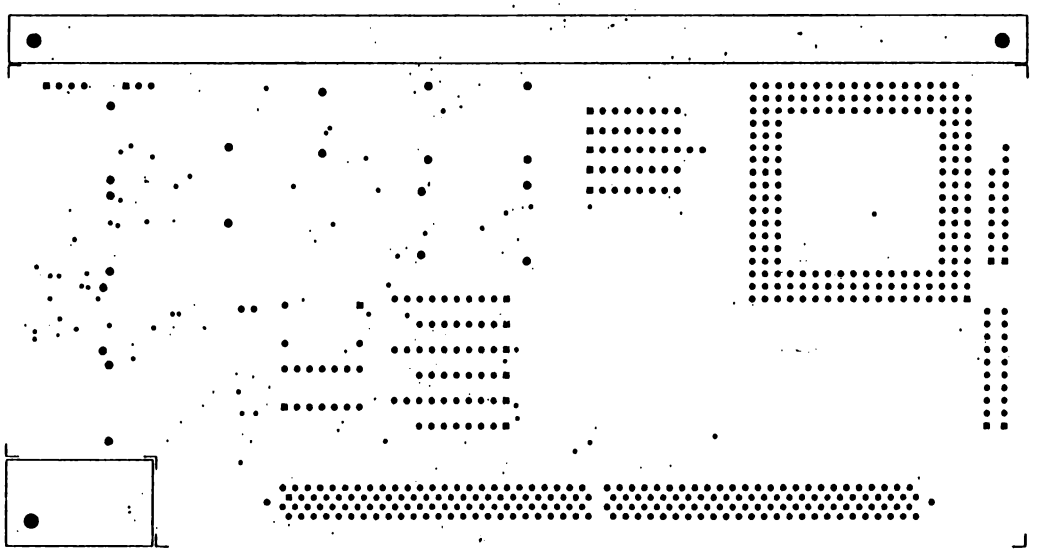


© COMMODORE ELECTRONICS LTD
A3640 (68040) BOARD REV 3.0
SOLDERMASK TOP

commodore	TITLE: ARTWORK - 68040 CPU CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364854
		CHKD:		APPR:			SHEET 5 OF 8

CENTENNIAL BLUEPRINT N2941

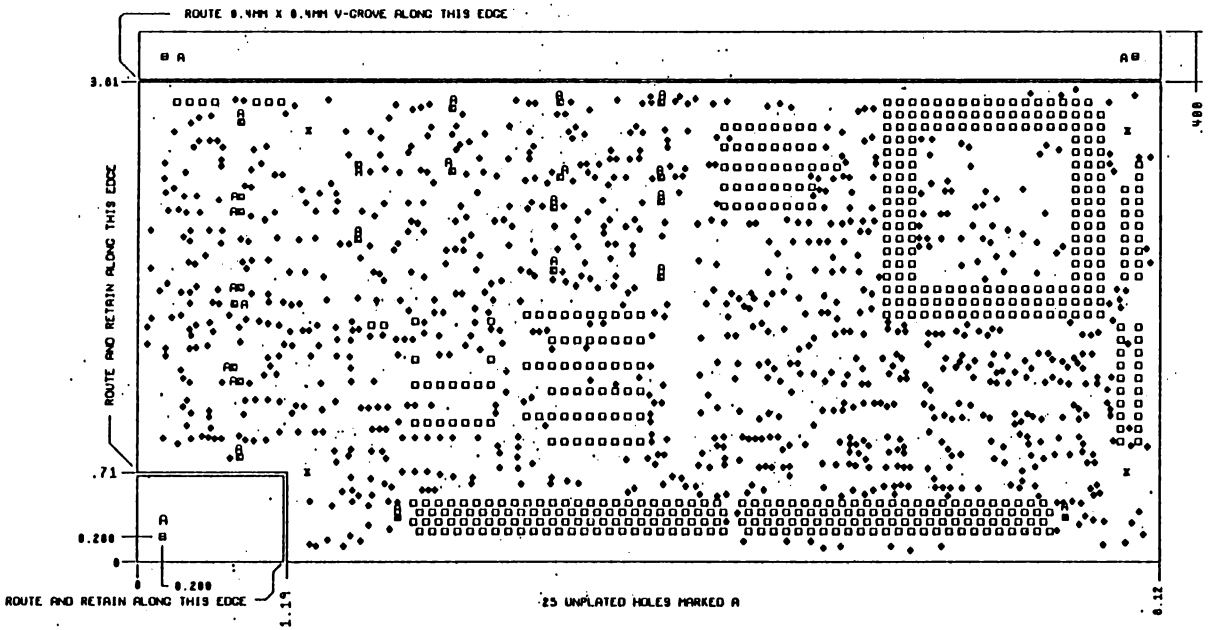
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



A3640 (68040) BOARD REV 3.0
SOLDERMASK BOTTOM

commodore	TITLE: ARTWORK - 68040 CPU CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364854
		CHKD:		APPR:			SHEET 6 OF 8

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		

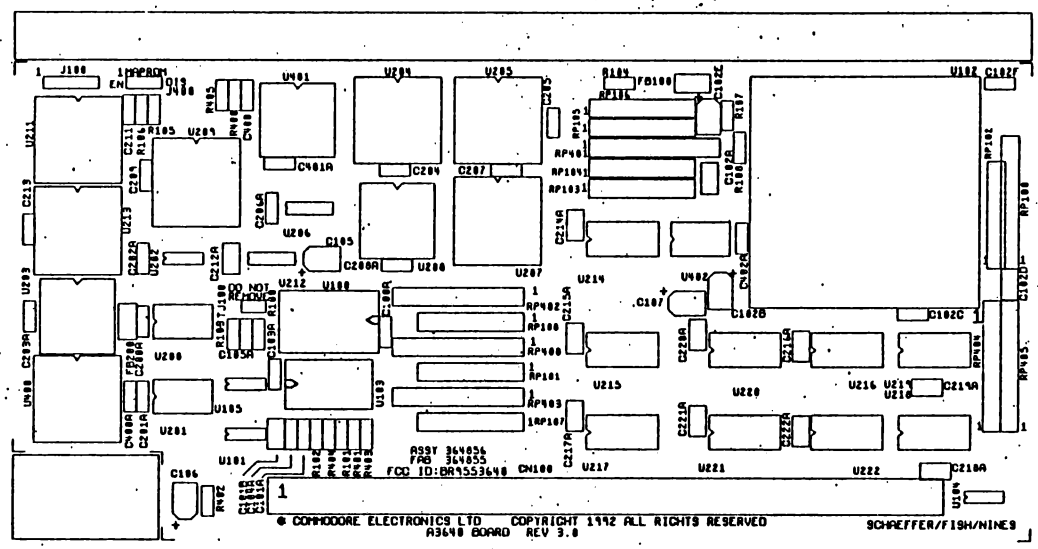


© COMMODORE ELECTRONICS LTD
A3640 (68040) BOARD REV 3.0
DRILL LEGEND

DIAMETER	COUNT : ALL HOLES
▫ 0.037	540
▪ 0.1	2
⊡ 0.125	3
• 0.02	925
x 0.157	4
▫ 0.07	20

commodore	TITLE: ARTWORK – 68040 CPU CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364854
		CHKD:		APPR:			SHEET 7 OF 8

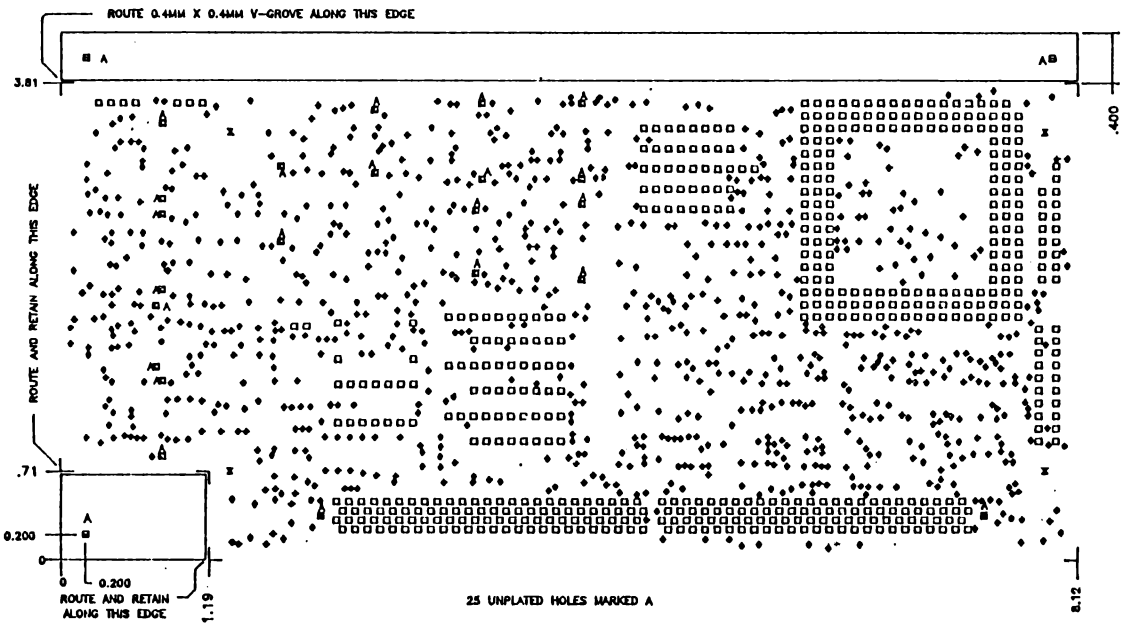
REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



© COMMODORE ELECTRONICS LTD
A3640 (68040) BOARD REV 3.0
SILKSCREEN

commodore	TITLE: ARTWORK - 68040 CPU CARD	DRAWN BY:	DATE	ENGR:		SIZE	DRAWING NUMBER
		CHKD:		APPR:		B	364854
							SHEET 8 OF 8

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	PILOT PRODUCTION RELEASE	8-13-92	J Bull



NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BOARDS SHALL BE FABRICATED IN ACCORDANCE WITH THE BEST COMMERCIAL PRACTICES. FABRICATE PER COMMODORE SPEC. NO. 1.01.007.
2. MATERIAL:
   - A. BASE LAMINATE: COPPER CLAD, GLASS BASE, EPOXY RESIN, (FR4 GRADE OR EQUIVALENT) 1 OZ. COPPER ON EXTERNAL LAYERS. PER MIL-P-13949.
   - B. THICKNESS AND ACCUMULATION OF INDIVIDUAL LAYER TOLERANCES SHALL BE OPTIMIZED TO ACHIEVE AN OVERALL THICKNESS OF 1.57 (0.062)
   - C. BONDING AGENT, PREIMPREGNATED B-STAGE EPOXY GLASS CLOTH SHALL BE IN ACCORDANCE WITH MIL-G-55636.
3. PLATING EXTERNAL LAYERS AND THRU HOLES:
   - A. THE HOLE WALLS SHALL BE PREPARED FOR PLATING BY SENSITIZING WITH ELECTROLESS COPPER PROVIDING THE CONDUCTIVE BASE FOR SUBSEQUENT PLATINGS.
   - B. ELECTRO-DEPOSITED COPPER SHALL BE IN ACCORDANCE WITH MIL-C-14550, CLASS 1, 0.025 (0.001) MINIMUM THICKNESS.
   - C. HOT AIR LEVEL WITH 37% TIN 63% LEAD MIXTURE OVER LANDS AND PADS AND SHALL BE AN AVERAGE THICKNESS OF .0003 INCHES WITH NO SINGLE MEASURMENT OF LESS THAN .0002 INCHES AT CREST OF SMD PADS AND A MINIMUN AVERAGE OF .0002 INCHES IN PLATED THRU HOLES.
   - D. COPPER DEPOSITED ON SURFACE CONDUCTORS SHALL BE A MINIMUM THICKNESS OF 0.061 (0.0024).
   - E. THE PLATING SHALL BE HOMOGENOUS AND COMPLETELY COVER CONDUCTORS WITHOUT PITS, PINHOLES, OR OTHER NON-UNIFORMITIES.
   - F. ANNULAR RINGS SHALL BE COMPLETE AND UNBROKEN SURROUNDING EACH ROUND TERMINAL PAD BY A MINIMUM OF 0.050 (0.002).
4. HOLES WHOSE LOCATIONS ARE NOT DIMENSIONED ARE TO BE CENTERED ON THE PAD AREA WITHIN 0.178 (0.007) OF THE CENTER OF THE PAD.
5. FRONT TO BACK REGISTRATION SHALL BE WITHIN 0.127 (0.005)
6. ALL DIMENSIONS ARE IN INCHES.
7. ALL TOOLING HOLE DIAMETERS ARE TO HAVE A TOLERANCE OF +0.080 (+0.003), -0.000 (-0.000).
8. ARTWORK PROVIDED PER COMMODORE SPEC. NO. 1.01.007 SECT. 4.2
9. THIS FAB. DWG. IS USED WITH ARTWORK NO. 364854-01
10. SILKSCREEN COMPONENT SIDE USING ARTWORK SUPPLIED.
11. SOLDERMASK OVER BARE COPPER BOTH SIDES.
12. HOLES INDICATED AS BEING ON GRID SHALL BE CENTERED WITHIN 0.076 (0.003) OF THIER TRUE POSITION POINT, REF. BY X-Y DATA.
13. BOARDS SHALL BE IDENTIFIED WITH THE VENDORS U.L. REGISTERED LOGO ON THE COMPONENT SIDE.
14. PC BOARD LAYUP:
    - LAYER 1 ----- COMPONENT SIDE
    - LAYER 2 ----- GROUND
    - LAYER 3 ----- VCC
    - LAYER 4 ----- SOLDER SIDE

DIAMETER	COUNT	: ALL HOLES
□ 0.037	540	
■ 0.1	2	
⊞ 0.125	3	
◆ 0.02	925	
⧗ 0.157	4	
⊡ 0.07	20	

Rev. 3 Shown

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

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON: DECIMALS

.X	.XX	.XXX	∠'s
±.01	±.005	±.003	±1/2°

MATERIAL: SEE NOTE 2

FINISH: SEE NOTE 3

		DATE
DRAWN BY:	N. ALCOTT	6/11/92
CHKD:		
ENGR:		
APPR:		
ENTERED (CAD) BY:	NCA	6/11/92

USED ON: A4000
NEXT ASSY:

Commodore
1200 WILSON DRIVE
WEST CHESTER, PA 19380
(215) 431-9100

FABRICATION DRAWING,
A3640

SIZE		REV
B	364855	A

SCALE 1:1 SHEET1 OF 1

PART NUMBER	DESCRIPTION
364856-01	PCB Assembly, 68040 CPU Card, 68040
364856-02	PCB Assembly, 68040 CPU Card, 68EC040

REVISIONS				
ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	Advance Engineering Release	6/5/92	G. BERLIN
	A	PILOT PRODUCTION RELEASE	8-3-92	G. Berlin

Commodore	68040 CPU Card	Drawn by S. Schaeffer	Drawing # 364856
			Sheet 1 of 4

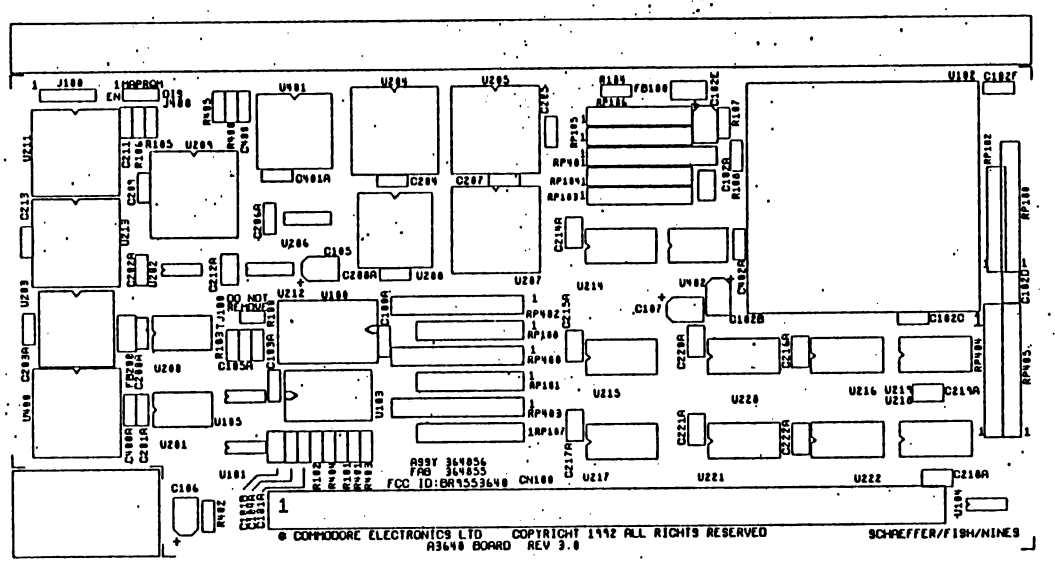
QTY. REQ. PER DASH #										ITM	PART NO.	DESCRIPTION	REF DES / NOTES
10	09	08	07	06	05	04	03	02	01	#			
										1			
								ref	ref	1	364853-01	Schematic	
								ref	ref	2	364855-01	PCB Fab	
								ref	ref	3	364854-01	Artwork	
										4			
										5		CAPACITORS	
								1	1	6	390853-01	CAPACITOR,SM,MLC,X7R,.01uF (1206)	C100A
								1	1	7	390818-06	CAPACITOR,SM,MLC,NPO,100pF (1206)	C400
								19	19	8	310027-02	CAPACITOR,SM,CERAMIC, 0.1uF (1206)	C101A C103A C104A
										9			C105A C200A C201A C202A
										10			C203A C204 C205 C206A C207
										11			C208A C209 C211 C213
										12			C400A C401A C402A
								11	11	13	390797-01	CAPACITOR,SM,CERAMIC,Z5U,.33uF (1210)	C212A C214A C215A C216A
										14			C217A C218A C219A C220A
										15			C221A C222A C101B
								2	2	16	390797-02	CAPACITOR,SM,CERAMIC,Z5U,.22uF (1210)	C102D C102A
								2	2	17	390818-02	CAPACITOR,SM,MLC,NPO,220pF (1206)	C102C C102F
								4	4	18	391097-03	CAPACITOR,SM,ELEC,ALUM, 22uF 16V 'C'	C105 C106 C102E C102B
										19			
										20		RESISTORS	
								2	2	21	310026-43	RESISTOR, CHIP, 1/8W, 5%, 33 OHM (1206)	R107, R108
								2	2	22	310026-05	RESISTOR,CHIP,1/8W, 5%, 100 OHM (1206)	R400 R401
								3	3	23	310026-21	RESISTOR,CHIP,1/8W, 5%, 470 OHM (1206)	R402 R403 R404
								4	4	24	310026-08	RESISTOR,CHIP,1/8W, 5%, 4.7K OHM(1206)	R104 R105 R106 R405
								2	2	25	310026-06	RESISTOR,CHIP,1/8W, 5%, 22 OHM (1206)	R101 R102
								2	2	26	310026-45	RESISTOR,CHIP,1/8W, 5%,1 OHM (1206)	R100 R103
								7	7	27	902410-10	RES.NTWK,SIP, 10PIN, 9 ELEMENT,1K OHM	RP100 RP400 RP401 RP402 RP403 RP404 RP405
										28			
								8	8	29	326149-01	RES.NTWK,SIP, 8PIN, 4 ELEMENT, 22 OHM	RP102 RP103 RP104 RP105 RP101 RP106 RP107 RP108
										30			
										31		ICs TTL	
										32			
								1	1	33	390789-02	IC, SMD, 74FCT244AT	U402
								1	1	34	390784-02	IC, SMD, 74FCT374AT	U201
								1	1	35	390786-02	IC, SMD, 74FCT373AT	U200
								1	1	36	391175-01	IC, SMD, 74F32	U202
								1	1	37	390091-02	IC, SMD, 74F257	U212
								1	1	38	391176-01	IC, SMD, 74F139	U206
								1	1	39	391088-01	IC, SMD, 74F04	U105
								1	1	40	391188-01	IC, SMD, 7407	U104
								9	9	41	391487-01	IC, SMD, 74FCT543T	U214 U215 U216 U217 U218 U219 U220 U221 U222
										42			U219 U220 U221 U222
										43			
										45			
										46			
										47			
										48			
										49			
										50			

Commodore	Title: 68040 CPU Card	Drawn by: S. Schaeffer	Drawing # 364856 / REV A
			Sheet 2 of 4

QTY. REQ. PER DASH #										ITM	PART NO.	DESCRIPTION	REF DES / NOTES		
10	09	08	07	06	05	04	03	02	01	#					
										51					
								1	1	51	391486-01	IC, SMD, 74F1803	U101		
										52					
										53		ICs MISC			
										54					
								1	1	55	390555-01	DELAY LINE 5 TAP 25NS, DIP	U103		
								1	1	56	325566-27	OSCILLATOR, Crystal controlled, 50Mhz	U100		
										57					
										58		HEADERS			
								2	2	59	903326-04	4 x .1" SIL	J100 J400		
								1	1	60	903326-02	2 x .1" SIL	TJ100		
										61		OTHER CONNECTORS			
										62					
								4	4	63	390043-01	SHORTING BARS	J100 J100 J400 TJ100		
								1	1	64	390556-01	200 PIN KEL CONNECTOR (MALE)	CONN200		
										65					
										66		FERRITES			
								2	2	67	391092-01	FILTER,FERRITE,SMT (1812)	FB100 FB200		
										68					
										69		SOCKETS			
										70					
								1	1	71	391492-01	SOCKET 179 PIN PGA for 68040	U102		
								1	1	72	391493-01	HEAT SINK AND CLIP FOR 68040 SOCKET	U102		
										73					
										74					
										75					
										76					
										77		MICROPROCESSORS			
										78					
								-	1	79	390796-01	MC68040	U102		
								1	-	80	391466-01	MC68EC040	U102		
										81					
										82		PALs			
								1	1	83	391467-01	IC, PAL, 22V10-15 PROGRAMMED PLCC,TAXLAT	U213		
								1	1	84	391468-01	IC, PAL, 22V10-15 PROGRAMMED PLCC,OEBUS	U207		
								1	1	85	391469-01	IC, PAL, 22V10-15 PROGRAMMED PLCC,MAPPER	U400		
								1	1	86	391470-01	IC, PAL, 22V10-10 PROGRAMMED PLCC,BUSCON	U204		
								1	1	87	391471-01	IC, PAL, 22V10-10 PROGRAMMED PLCC,BUSTERM	U205		
								1	1	88	391472-01	IC, PAL, 22V10-10 PROGRAMMED PLCC,BCTL	U209		
								1	1	89	391491-01	IC, PAL, 22V10-10 PROGRAMMED PLCC,START	U211		
								1	1	90	391490-01	IC, PAL, 16V8-10 PROGRAMMED PLCC,TERM	U203		
								1	1	91	391489-01	IC, PAL, 16V8-10 PROGRAMMED PLCC,LEBUS	U208		
								1	1	92	391488-01	IC, PAL, 16V8-10 PROGRAMMED PLCC,INST	U401		
									-	93					
										94					
										96					
										97		J100 (*CDIS *MDIS)	short pins 1-2 & pins 3 4		
										98		J400 MAPROM) 1-2 ENABLED, 2-3 DISABLED	short pins 1-2		
										99		TJ100 (TEST)	short pins 1-2		
										100					

Commodore	Title: 68040 CPU Card	Drawn by: S. Schaeffer	Drawing #: 364856 REV: A
			Sheet 3 of 3

REVISIONS				
LTR	ZONE	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



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A3640 (68040) BOARD REV 3.0
SILKSCREEN

commodore	TITLE: PCB ASSEMBLY 68040 CPU CARD	DRAWN BY:	DATE	ENGR:		SIZE B	DRAWING NUMBER 364856	
		CHKD:		APPR:			SHEET 4 OF 4	

CENTENNIAL BLUEPRINT M27-44

PART NUMBER	DESCRIPTION
534030-01	A4000/030 US 3F1.44M1M + 1M
534030-02	A4000/030 CN 3F1.44M1M + 1M
534030-03	A4000/030 US 3F1.44M3H40MB2M + 2M
534030-04	A4000/030 CN 3F1.44M3H40MB2M + 2M
534030-05	A4000/030 US 3F1.44M3H50MB2M + 2M
534030-06	A4000/030 CN 3F1.44M3H50MB2M + 2M
534030-07	A4000/030 US 3F1.44M3H80MB2M + 2M
534030-08	A4000/030 CN 3F1.44M3H80MB 2M + 2M
534030-09	A4000/030 US 3F1.44M3H120MB2M + 2M
534030-10	A4000/030 CN 3F1.44M3H120MB2M + 2M
534030-11	A4000/030 US 3F1.44M3H200MB2M + 2M
534030-12	A4000/030 CN 3F1.44M3H200MB2M + 2M
534030-13	A4000/030 US 3F1.44M3H40MB2M + 2M W/FPU
534030-14	A4000/030 CN 3F1.44M3H40MB2M + 2M W/FPU
534030-15	A4000/030 US 3F1.44M3H50MB2M + 2M W/FPU
534030-16	A4000/030 CN 3F1.44M3H50MB2M + 2M W/FPU
534030-17	A4000/030 US 3F1.44M3H80MB2M + 2M W/FPU
534030-18	A4000/030 CN 3F1.44M3H80MB2M + 2M W/FPU
534030-19	A4000/030 US 3F1.44M3H120MB2M + 2M W/FPU
534030-20	A4000/030 CN 3F1.44M3H120MB2M + 2M W/FPU
534030-21	A4000/030 US 3F1.44M3H200MB2M + 2M W/FPU
534030-22	A4000/030 CN 3F1.44M3H200MB2M + 2M W/FPU

REVISIONS				
ZN	LTR	DESCRIPTION	DATE	APPROVED
	A	PILOT PRODUCTION RELEASE	8-13-92	J Burke

1. SHEET 4 OF 4 SIZE D
ASSY. DWG 534030

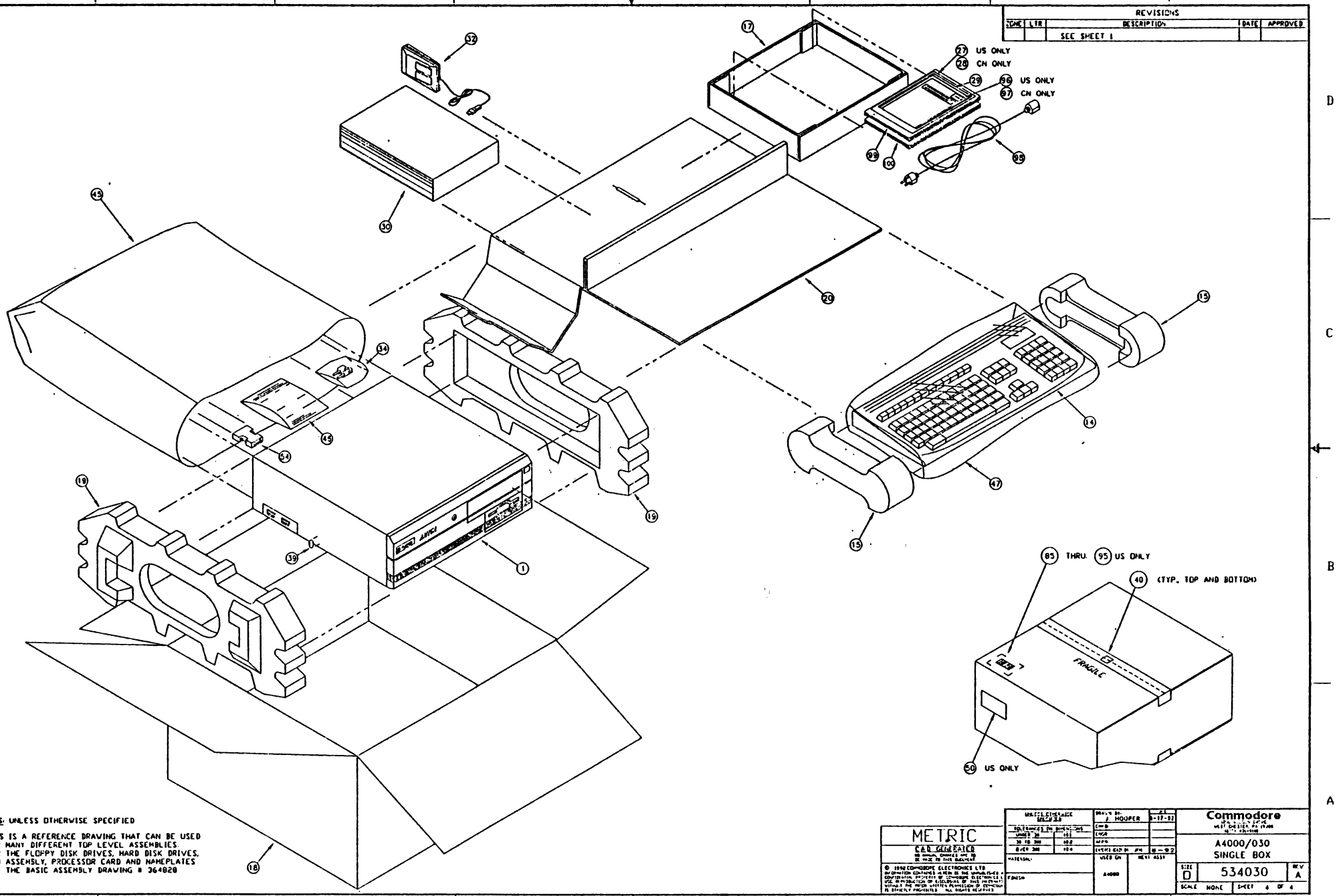
Commodore	TITLE A4000/030 SINGLE BOX	Drawn by J. HOOPER	Drawing # 534030
			Sheet 1 of 4

QUANTITY REQUIRED PER DASH #																								ITM			
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#	PART NO.	DESCRIPTION	REF DES / NOTES
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	364828-01	BASE ASSEMBLY	
																									2			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	365019-01	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 25 mm	
			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	4	313248-03	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 32 mm	SUB FOR ITEM 3
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	364904-01	BEZEL COVER, 5.25" FLOPPY DISK	
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	364239-01	BEZEL COVER, 3.5" FLOPPY DISK, 25 MM	USE WITH ITEM 3
			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	7	364905-01	BEZEL COVER, 3.5" FLOPPY DISK, 32 MM	USE WITH ITEM 4
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	8	364527-02	CABLE ASSEMBLY, HARD DISK DRIVE	
																									9			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10	364837-01	PCB ASSEMBLY,NTSC	SET J100 & J104 TO PINS 1-2
																									11			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12	391173-01	POWER SUPPLY,NTSC	
																									13			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	364447-01	KEYBOARD ASSEMBLY	US
			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	15	318243-01	ENDCAP KEYBOARD	
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	365018-02	NAMEPLATE, A4000/030	
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	365046-01	BOX TRAY	
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	365045-01	PACKING BOX,A4000	
			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	19	364201-01	ENDCAP	
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	20	365047-01	KEYBOARD, SOFTWARE & MOUSE PARTITION	
			-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	21	364832-03	PCB ASSEMBLY, 68030 CPU CARD, NO FPU	
			1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	22	364832-04	PCB ASSEMBLY, 68030 CPU CARD, WITH FPU	
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23	369274-01	LABEL,RATING-MADE IN GERMANY	120V PRODUCT
			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	24	369274-02	LABEL,RATING-MADE IN HONG KONG	120V PRODUCT
			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	25	369274-03	LABEL,RATING-MADE IN PHILLIPINES	120V PRODUCT
			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	26	369274-07	LABEL,RATING-MADE IN UK	120V PRODUCT
			-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	27	400804-01	SERVICE SUB-ASSEMBLY	US
			1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	28	318882-02	WARRANTY CARD	CN
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29	318896-04	SOFTWARE LICENSE AGREEMENT	
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	364870-01	AMIGA SOFTWARE ASSY., LEVEL 3 V3.0	ENGLISH
																									31			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	32	327124-07	MOUSE ASSY., 1.2M CABLE W/FERRITE	
																									33			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	34	251006-01	BAG, PLASTIC	FOR KEYS OF KEYSWITCH
																									35			
																									36			
																									37			
																									38			
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	39	325090-02	SEAL, WARRANTY	
			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	40	368084-01	SEAL, TAMPER EVIDENT	PLACEON BOX FLAPS
			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	41	906003-01	SCREW M3 X 6.0, SELF TAPPING	FOR DEZEL COVERS
			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	42	906610-04	SCREW,#6-32x.25LG	FOR HDD
			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	43	906800-03	SCREW,M3x.05x0.01G	FOR FDD
			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	44	364861-01	STANDOFF, PLASTIC	FOR CPU CARD
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	45	320408-04	BAG,FLAT 650mm x 650mm	FOR CPU
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	46	324257-01	BAG,DRYING AGENT	PLACE INTO ITEM 45
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	47	251006-02	BAG,FLAT 580mm x 350mm	FOR KEYBOARD
																					-				48			
																									49			
			-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	50	368803-01	LABEL, GOLD SERVICE	US ONLY

Commodore	Title: A4000/030 SINGLE BOX	Drawn by: J. HOOPER	Drawing # 534030 REV A
			Sheet 2 of 4

QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	O9	O8	O7	O6	O5	O4	O3	O2	O1				
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	51	391396-01	IC,SIMM MODULE, 256kx32 80ns	U261 U853, SET J852 TO 2-3
			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	52	391396-01	IC,SIMM MODULE, 256kx32 80ns	U853 U852, SET J852 TO 2-3
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	53	391517-01	IC,SIMM MODULE, 512kx32 80ns	U261
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	54	390602-01	VIDEO ADAPTER 15 PIN TO 23 PIN	PLACE IN ITEM 45
			-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	55	364745-01	3.5" HARD DISK, 1",40MB,CONNER CP3000	
			-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	56	364290-01	3.5" HARD DISK, 1",40MB, SEAGATE ST351A	sub for item
			-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	57	316583-08	LABEL,HDD "40 MB, CONNER CP3000"	use with item 55
			-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	58	316583-09	LABEL,HDD "40 MB, SEAGATE ST351A"	use with item 56
			-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	59	312966-05	3.5" HARD DISK,1",80MB,QUANTUM LPS 85AT	
			-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	60	312966-04	3.5" HARD DISK,1",80MB,CONNER CP30084E	sub for item 59
			-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	61	312966-03	3.5" HARD DISK,1",80MB,SEAGATE ST3096A	sub for item 59
			-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	62	312966-02	3.5" HARD DISK,1",80MB,WD WDAC280	sub for item 59
			-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	63	316583-10	LABEL,HDD "80 MB QUANTUM LPS 85AT"	use with item 59
			-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	64	316583-11	LABEL,HDD "80 MB CONNER CP30084E"	use with item 60
			-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	65	316583-12	LABEL,HDD "80 MB SEAGATE ST3096A"	use with item 61
			-	-	-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	66	316583-13	LABEL,HDD "80MB WD WDAC280"	use with item 62
			-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	67	364517-04	3.5" HARD DISK,1",120MB,QUANTUM LPS 120AT	
			-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	68	364517-03	3.5" HARD DISK,1",120MB,SEAGATE ST3144A	sub for item 67
			-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	69	364517-02	3.5" HARD DISK,1",120MB,CONNER CP30104	sub for item 67
			-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	70	364517-01	3.5" HARD DISK,1",120MB,WD WDAC2120	sub for item 67
			-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	71	316583-14	LABEL,HDD "120 MB QUANTUM LPS 120AT"	use with item 67
			-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	72	316583-15	LABEL,HDD "120 MB SEAGATE ST3144A"	use with item 68
			-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	73	316583-16	LABEL,HDD "120 MB CONNER CP30104"	use with item 69
			-	-	S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	74	316583-17	LABEL,HDD "120MB WD WDAC2120"	use with item 70
			1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	75	311639-01	3.5" HARD DISK,1.625",200MB,SEAGATE ST1239A	
			S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-	-	76	311639-02	3.5" HARD DISK,1.625",200MB,WD WDAP4200	sub for item 75
			1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	77	316583-18	LABEL,HDD "200 MB SEAGATE ST1239A"	use with item 75
			S	S	-	-	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-	-	78	316583-19	LABEL,HDD "200 MB WD WDAP4200"	use with item 76
			-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	79	311839-01	3.5" HARD DISK,1",52MB,QUANTUM LPS 52AT	
			-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	1	1	-	-	-	-	80	316583-07	LABEL,H.D.D."QUANTUM PRODRIVE 52AT"	use with item 79
																									81			
																									82			
																									83			
																									84			
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	85	369594-01	LABEL,UPC, WITHOUT HDD, NO FPU	
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	86	369594-02	LABEL,UPC, 40MB HDD, NO FPU	
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	87	369594-03	LABEL,UPC, 50MB HDD, NO FPU	
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	88	369594-04	LABEL,UPC, 80MB HDD, NO FPU	
			-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	89	369594-05	LABEL,UPC, 120MB HDD, NO FPU	
			-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	90	369594-06	LABEL,UPC, 200MB HDD, NO FPU	
			-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	91	369594-07	LABEL,UPC, 40MB HDD, WITH FPU	
			-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92	369594-08	LABEL,UPC, 50MB HDD, WITH FPU	
			-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93	369594-09	LABEL,UPC, 80MB HDD,WITH FPU	
			-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94	369594-10	LABEL,UPC, 120MB HDD, WITH FPU	
			-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	369594-11	LABEL,UPC, 200MB HDD, WITH FPU	
			-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	96	312341-02	DISK EXCHANGE CARD	US
			1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	97	310556-02	DISK EXCHANGE CARD	CN
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	98	903508-16	POWER CORD, BLACK US/CANADA	UL/CSA
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	99	368924-01	USER'S GUIDE A4000	ENGLISH
			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	371001-01	USER'S GUIDE A4000 HDD	ENGLISH

Commodore	Title: A4000/030 SINGLE BOX	Drawn by: J. HOOPER	Drawing #: 534030
			REV: A
			Sheet 3 of 4



NOTES: UNLESS OTHERWISE SPECIFIED

1. THIS IS A REFERENCE DRAWING THAT CAN BE USED FOR MANY DIFFERENT TOP LEVEL ASSEMBLIES. FOR THE FLOPPY DISK DRIVES, HARD DISK DRIVES, PCB ASSEMBLY, PROCESSOR CARD AND NAMEPLATES SEE THE BASIC ASSEMBLY DRAWING # 364020

METRIC
C&D GENERATED

DRAWN BY: J. HOOPER 8-17-92
USED ON: A4000
NEXT ASSY:

Commodore
A4000/030
SINGLE BOX
SIZE D | 534030 | REV A
SCALE NONE | SHEET 4 OF 4

PART NUMBER	DESCRIPTION
534040-01	A4000/040 US 3F1.44M1M + 1M
534040-02	A4000/040 CN 3F1.44M1M + 1M
534040-03	A4000/040 US 3F1.44M3H40MB2M + 2M
534040-04	A4000/040 CN 3F1.44M3H40MB2M + 2M
534040-05	A4000/040 US 3F1.443H50MB2M + 4M
534040-06	A4000/040 CN 3F1.443H50MB2M + 4M
534040-07	A4000/040 US 3F1.44M3H80MB2M + 4M
534040-08	A4000/040 CN 3F1.44M3H80MB2M + 4M
534040-09	A4000/040 US 3F1.44M3H120MB2M + 4M
534040-10	A4000/040 US 3F1.44M3H120MB2M + 4M
534040-11	A4000/040 US 3F1.44M3H200MB2M + 4M
534040-12	A4000/040 US 3F1.44M3H200MB2M + 4M

REVISIONS				
ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE		
	A	PILOT PRODUCTION RELEASE	8-13-92	A Bell

1. SHEET 4 OF 4 SIZE D
ASSY. DWG 534040

Commodore	TITLE A4000/040 SINGLE BOX	Drawn by J. HOOPER	Drawing # 534040
			Sheet 1 of 4

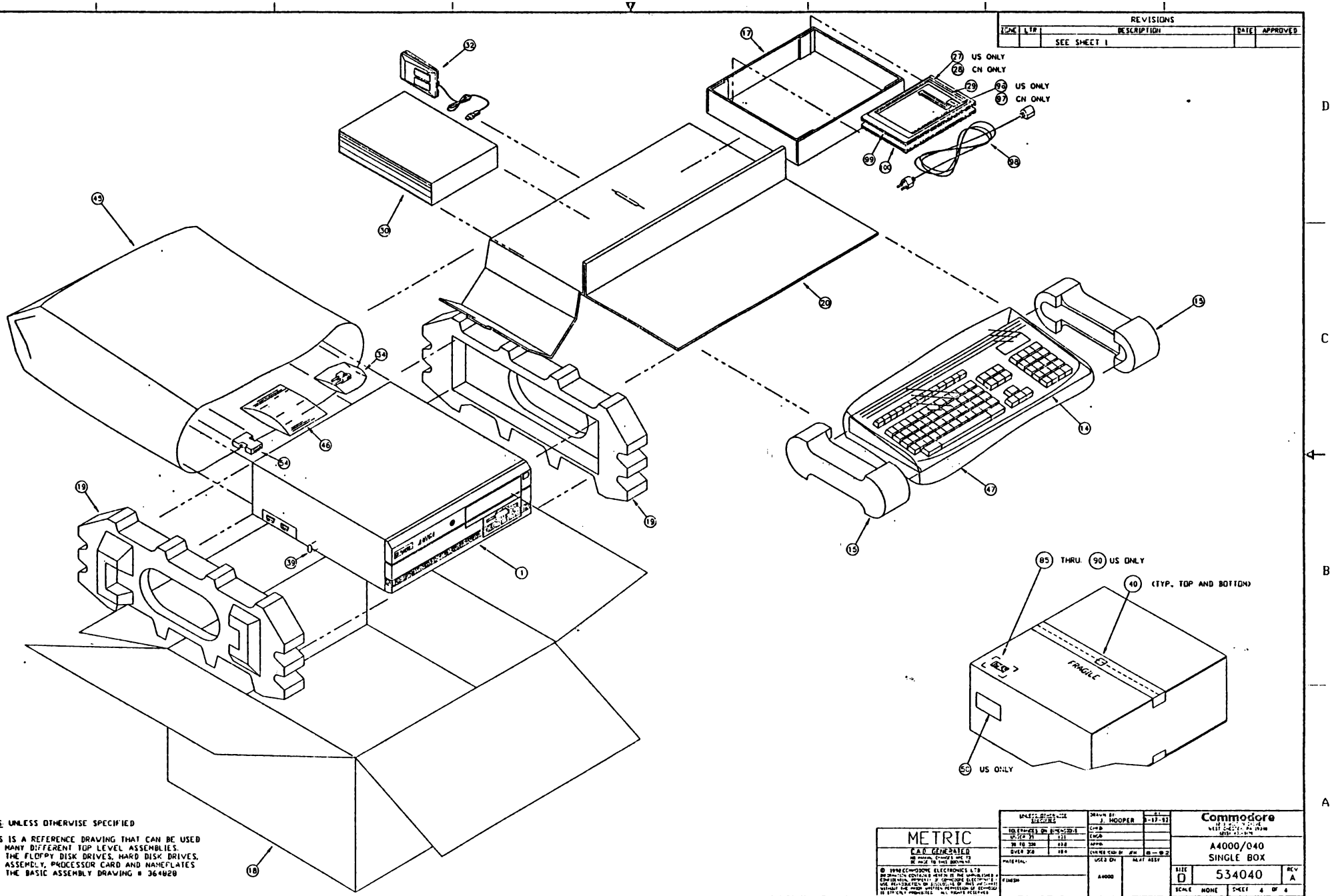
QUANTITY REQUIRED PER DASH #																							ITM			
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#	PART NO.	DESCRIPTION	REF DES / NOTES
													1	1	1	1	1	1	1	1	1	1	1	1	364820-01	BASE ASSEMBLY	
																									2			
													1	1	1	1	1	1	1	1	1	1	1	1	3	365019-01	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 25 mm	
													S	S	S	S	S	S	S	S	S	S	S	S	4	313248-03	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 32 mm	SUB FOR ITEM 3
													1	1	1	1	1	1	1	1	1	1	1	1	5	364904-01	BEZEL COVER, 5.25" FLOPPY DISK	
													1	1	1	1	1	1	1	1	1	1	1	1	6	364239-01	BEZEL COVER, 3.5" FLOPPY DISK, 25 MM	USE WITH ITEM 3
													S	S	S	S	S	S	S	S	S	S	S	S	7	364905-01	BEZEL COVER, 3.5" FLOPPY DISK, 32 MM	USE WITH ITEM 4
													1	1	1	1	1	1	1	1	1	-	-	8	364527-02	CABLE ASSEMBLY, HARD DISK DRIVE	
																									9			
													1	1	1	1	1	1	1	1	1	1	1	1	10	364837-01	PCB ASSEMBLY,NTSC	SET J100 & J104 TO PINS 2-3
																									11			REMOVE U104
													1	1	1	1	1	1	1	1	1	1	1	1	12	391173-01	POWER SUPPLY,NTSC	
																									13			
													1	1	1	1	1	1	1	1	1	1	1	1	14	364447-01	KEYBOARD ASSEMBLY	US
													2	2	2	2	2	2	2	2	2	2	2	2	15	318243-01	ENDCAP KEYBOARD	
													1	1	1	1	1	1	1	1	1	1	1	1	16	365018-03	NAMEPLATE, A4000/040	
													1	1	1	1	1	1	1	1	1	1	1	1	17	365046-01	BOX TRAY	
													1	1	1	1	1	1	1	1	1	1	1	1	18	365045-01	PACKING BOX,A4000	
													2	2	2	2	2	2	2	2	2	2	2	2	19	364201-01	ENDCAP	
													1	1	1	1	1	1	1	1	1	1	1	1	20	365047-01	KEYBOARD, SOFTWARE & MOUSE PARTITION	
													1	1	1	1	1	1	1	1	1	1	1	1	21	364856-01	PCB ASSEMBLY, 68040 CPU CARD	
																									22			
													1	1	1	1	1	1	1	1	1	1	1	1	23	369274-01	LABEL,RATING-MADE IN GERMANY	120V PRODUCT
													S	S	S	S	S	S	S	S	S	S	S	S	24	369274-02	LABEL,RATING-MADE IN HONG KONG	120V PRODUCT
													S	S	S	S	S	S	S	S	S	S	S	S	25	369274-03	LABEL,RATING-MADE IN PHILLIPINES	120V PRODUCT
													S	S	S	S	S	S	S	S	S	S	S	S	26	369274-07	LABEL,RATING-MADE IN UK	120V PRODUCT
													-	1	-	1	-	1	-	1	-	1	-	1	27	400804-01	SERVICE SUB-ASSEMBLY	US
													1	-	1	-	1	-	1	-	1	-	1	-	28	318862-02	WARRANTY CARD	CN
													1	1	1	1	1	1	1	1	1	1	1	1	29	318896-04	SOFTWARE LICENSE AGREEMENT	
													1	1	1	1	1	1	1	1	1	1	1	1	30	364870-01	AMIGA SOFTWARE ASSY., LEVEL 3 V3.0	ENGLISH
																									31			
													1	1	1	1	1	1	1	1	1	1	1	1	32	327124-07	MOUSE ASSY., 1.2M CABLE W/FERRITE	
																									33			
													1	1	1	1	1	1	1	1	1	1	1	1	34	251006-01	BAG, PLASTIC	FOR KEYS OF KEYSWITCH
																									35			
																									36			
																									37			
																									38			
													1	1	1	1	1	1	1	1	1	1	1	1	39	325090-02	SEAL, WARRANTY	
													2	2	2	2	2	2	2	2	2	2	2	2	40	368084-01	SEAL,TAMPER EVIDENT	PLACE ON BOX FLAPS
													4	4	4	4	4	4	4	4	4	4	4	4	41	906883-01	SCREW M3 X 6.0, SELF TAPPING	FOR BEZEL COVERS
													4	4	4	4	4	4	4	4	4	4	-	-	42	906610-04	SCREW,#6-32x.25LG	FOR HDD
													4	4	4	4	4	4	4	4	4	4	4	4	43	906800-03	SCREW,M3x.05x0.0LG	FOR FDD
													4	4	4	4	4	4	4	4	4	4	4	4	44	364861-01	STANDOFF, PLASTIC	FOR CPU CARD
													1	1	1	1	1	1	1	1	1	1	1	1	45	320408-04	BAG,FLAT 650mm x 650mm	FOR CPU
													1	1	1	1	1	1	1	1	1	1	1	1	46	324257-01	BAG,DRYING AGENT	PLACE INTO ITEM 45
													1	1	1	1	1	1	1	1	1	1	1	1	47	251006-02	BAG,FLAT 580mm x 350mm	FOR KEYBOARD
																									48			
																									49			
													-	1	-	1	-	1	-	1	-	1	-	1	50	368803-01	LABEL, GOLD SERVICE	US ONLY

Commodore	Title: A4000/040 SINGLE BOX	Drawn by: J. HOOPER	Drawing #: 534040 / Sheet 2 of 4 / REV: A

QUANTITY REQUIRED PER DASH #																							ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
																									51			
													1	1	1	1	1	1	1	1	1	1	1	1	52	391518-01	IC,SIMM MODULE, 1M x32 80ns	U853 , SET J852 TO 1-2
													1	1	1	1	1	1	1	1	1	1	1	1	53	391517-01	IC,SIMM MODULE, 512kx32 80ns	U261
													1	1	1	1	1	1	1	1	1	1	1	1	54	390602-01	VIDEO ADAPTER 15 PIN TO 23 PIN	PLACE IN ITEM 45
													-	-	-	-	-	-	-	-	1	1	-	-	55	364745-01	3.5" HARD DISK, 1",40MB,CONNER CP3000	
													-	-	-	-	-	-	-	-	S	S	-	-	56	364290-01	3.5" HARD DISK, 1",40MB, SEAGATE ST351A	sub for item
													-	-	-	-	-	-	-	-	1	1	-	-	57	316583-08	LABEL,HDD "40 MB, CONNER CP3000"	use with item 55
													-	-	-	-	-	-	-	-	S	S	-	-	58	316583-09	LABEL,HDD "40 MB, SEAGATE ST351A"	use with item 56
													-	-	-	-	1	1	-	-	-	-	-	-	59	312966-05	3.5" HARD DISK,1",80MB,QUANTUM LPS 85AT	
													-	-	-	-	S	S	-	-	-	-	-	-	60	312966-04	3.5" HARD DISK,1",80MB,CONNER CP30084E	sub for item 59
													-	-	-	-	S	S	-	-	-	-	-	-	61	312966-03	3.5" HARD DISK,1",80MB,SEAGATE ST3096A	sub for item 59
													-	-	-	-	S	S	-	-	-	-	-	-	62	312966-02	3.5" HARD DISK,1",80MB,WD WDAC280	sub for item 59
													-	-	-	-	1	1	-	-	-	-	-	-	63	316583-10	LABEL,HDD "80 MB QUANTUM LPS 85AT"	use with item 59
													-	-	-	-	S	S	-	-	-	-	-	-	64	316583-11	LABEL,HDD "80 MB CONNER CP30084E"	use with item 60
													-	-	-	-	S	S	-	-	-	-	-	-	65	316583-12	LABEL,HDD "80 MB SEAGATE ST3096A"	use with item 61
													-	-	-	-	S	S	-	-	-	-	-	-	66	316583-13	LABEL,HDD "80MB WD WDAC280"	use with item 62
													-	-	1	1	-	-	-	-	-	-	-	-	67	364517-04	3.5" HARD DISK,1",120MB,QUANTUM LPS 120AT	
													-	-	S	S	-	-	-	-	-	-	-	-	68	364517-03	3.5" HARD DISK,1",120MB,SEAGATE ST3144A	sub for item 67
													-	-	S	S	-	-	-	-	-	-	-	-	69	364517-02	3.5" HARD DISK,1",120MB,CONNER CP30104	sub for item 67
													-	-	S	S	-	-	-	-	-	-	-	-	70	364517-01	3.5" HARD DISK,1",120MB,WD WDAC2120	sub for item 67
													-	-	1	1	-	-	-	-	-	-	-	-	71	316583-14	LABEL,HDD "120 MB QUANTUM LPS 120AT"	use with item 67
													-	-	S	S	-	-	-	-	-	-	-	-	72	316583-15	LABEL,HDD "120 MB SEAGATE ST3144A"	use with item 68
													-	-	S	S	-	-	-	-	-	-	-	-	73	316583-16	LABEL,HDD "120 MB CONNER CP30104"	use with item 69
													-	-	S	S	-	-	-	-	-	-	-	-	74	316583-17	LABEL,HDD "120MB WD WDAC2120"	use with item 70
													1	1	-	-	-	-	-	-	-	-	-	-	75	311639-01	3.5" HARD DISK,1.625",200MB,SEAGATE ST1239A	
													S	S	-	-	-	-	-	-	-	-	-	-	76	311639-02	3.5" HARD DISK,1.625",200MB,WD WDAP4200	sub for item 75
													1	1	-	-	-	-	-	-	-	-	-	-	77	316583-18	LABEL,HDD "200 MB SEAGATE ST1239A"	use with item 75
													S	S	-	-	-	-	-	-	-	-	-	-	78	316583-19	LABEL,HDD "200 MB WD WDAP4200"	use with item 76
													-	-	-	-	-	-	1	1	-	-	-	-	79	311839-01	3.5" HARD DISK,1",52MB,QUANTUM LPS 52AT	
													-	-	-	-	-	-	1	1	-	-	-	-	80	316583-07	LABEL,H.D.D."QUANTUM PRODRIVE 52AT"	use with item 79
																									81			
																									82			
																									83			
																									84			
													-	-	-	-	-	-	-	-	-	-	-	1	85	369595-01	LABEL,UPC, WITHOUT HDD	
													-	-	-	-	-	-	-	-	-	1	-	-	86	369595-02	LABEL,UPC, 40MB HDD	
													-	-	-	-	-	-	-	1	-	-	-	-	87	369595-03	LABEL,UPC, 50MB HDD	
													-	-	-	-	-	1	-	-	-	-	-	-	88	369595-04	LABEL,UPC, 80MB HDD	
													-	-	-	1	-	-	-	-	-	-	-	-	89	369595-05	LABEL,UPC, 120MB HDD	
													-	1	-	-	-	-	-	-	-	-	-	-	90	369595-06	LABEL,UPC, 200MB HDD	
																									91			
																									92			
																									93			
																									94			
													1	-	1	-	1	-	1	-	1	-	1	-	95	312882-02	WARRANTY CARD	CN
													-	1	-	1	-	1	-	1	-	1	-	1	96	312341-02	DISK EXCHANGE CARD	US
													1	-	1	-	1	-	1	-	1	-	1	-	97	318556-02	DISK EXCHANGE CARD	CN
													1	1	1	1	1	1	1	1	1	1	1	1	98	903508-18	POWER CORD, BLACK US/CANADA	UL/CSA
													1	1	1	1	1	1	1	1	1	1	1	1	99	368924-01	USER'S GUIDE A4000	ENGLISH
													1	1	1	1	1	1	1	1	1	1	1	1	100	371001-01	USER'S GUIDE A4000 HDD	ENGLISH

Commodore	Title: A4000/040 SINGLE BOX	Drawn by: J. HOOPER	Drawing # 534040 REV A
			Sheet 3 of 4

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		



NOTES: UNLESS OTHERWISE SPECIFIED

1. THIS IS A REFERENCE DRAWING THAT CAN BE USED FOR MANY DIFFERENT TOP LEVEL ASSEMBLIES. FOR THE FLOPPY DISK DRIVES, HARD DISK DRIVES, PCB ASSEMBLY, PROCESSOR CARD AND NAMEPLATES SEE THE BASIC ASSEMBLY DRAWING # 364020

METRIC
CAD GENERATED

DRAWN BY J. HOOPER 5-17-93
USED ON A4000
NEXT ASSY

Commodore
A4000/040
SINGLE BOX
SIZE D | 534040 | REV A
SCALE NONE | SHEET 4 OF 4

PART NUMBER	DESCRIPTION
534802-01	A4000/020 U.S. WITHOUT HDD, 1M + 1M
534802-02	A4000/020 U.S. WITH HDD 50MB, 1M + 1M
534802-03	A4000/020 EU. WITHOUT HDD, 1M + 1M
534802-04	A4000/020 EU. WITH HDD 50MB, 1M + 1M

REVISIONS				
ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE	6/3/92	G. BERLIN
	A	PILOT PRODUCTION RELEASE	8-13-92	G Berlin

1. SHEET 4 OF 4 SIZE D
ASSY. DWG 534802

Commodore	TITLE A4000/020	Drawn by J. HOOPER	Drawing # 534802
			Sheet 1 of 4

QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
																					1	1	1	1	1	364828-01	BASE ASSEMBLY	
																									2			
																					1	1	1	1	3	365019-01	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 25 mm	
																					S	S	S	S	4	313248-03	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 32 mm	SUB FOR ITEM 3
																					1	1	1	1	5	364904-01	BEZEL COVER, 5.25" FLOPPY DISK	
																					1	1	1	1	6	364239-01	BEZEL COVER, 3.5" FLOPPY DISK, 25 MM	USE WITH ITEM 3
																					S	S	S	S	7	364905-01	BEZEL COVER, 3.5" FLOPPY DISK, 32 MM	USE WITH ITEM 4
																					1	-	1	-	8	364527-02	CABLE ASSEMBLY, HARD DISK DRIVE	
																									9			
																					-	-	1	1	10	364837-01	PCB ASSEMBLY,NTSC	
																					1	1	-	-	11	364837-02	PCB ASSEMBLY,PAL	
																					-	-	1	1	12	391173-01	POWER SUPPLY,NTSC	
																					1	1	-	-	13	391173-02	POWER SUPPLY,PAL	
																									14			
																									15			
																					1	1	1	1	16	365018-01	NAMEPLATE, A4000/020	
																									17			
																					1	1	1	1	18	364339-03	PACKING BOX,A4000	
																					2	2	2	2	19	364201-01	ENDCAP	
																									20			
																					1	1	1	1	21	364832-01	PCB ASSEMBLY, 68020 CPU CARD	SET J100 & J104 TO PINS 1-2
																									22			
																					-	-	1	1	23	369274-01	LABEL,RATING-MADE IN GERMANY	120V PRODUCT
																					-	-	S	S	24	369274-02	LABEL,RATING-MADE IN HONG KONG	120V PRODUCT
																					-	-	S	S	25	369274-03	LABEL,RATING-MADE IN PHILLIPINES	120V PRODUCT
																					-	-	S	S	26	369274-07	LABEL,RATING-MADE IN UK	120V PRODUCT
																					1	1	-	-	27	369274-04	LABEL,RATING-MADE IN GERMANY	240V PRODUCT
																					S	S	-	-	28	369274-05	LABEL,RATING-MADE IN HONG KONG	240V PRODUCT
																					S	S	-	-	29	369274-06	LABEL,RATING-MADE IN PHILLIPINES	240V PRODUCT
																					S	S	-	-	30	369274-08	LABEL,RATING-MADE IN UK	240V PRODUCT
																									31			
																									32			
																									33			
																					1	1	1	1	34	251006-01	BAG, PLASTIC	FOR KEYS OF KEYSWITCH
																									35			
																									36			
																									37			
																									38			
																					1	1	1	1	39	325090-02	SEAL, WARRANTY	
																					-	-	2	2	40	368084-01	SEAL,TAMPER EVIDENT	PLACEON BOX FLAPS
																					4	4	4	4	41	906383-01	SCREW M3 X 6.0, SELF TAPPING	FOR BEZEL COVERS
																					4	-	4	-	42	906610-04	SCREW,#6-32x.25LG	FOR HDD
																					4	4	4	4	43	906800-03	SCREW,M3x.05x8.0LG	FOR FDD
																					2	2	2	2	44	364861-01	STANDOFF, PLASTIC	FOR CPU CARD
																					1	1	1	1	45	320408-04	BAG,FLAT 650mm x 650mm	FOR CPU
																					1	1	1	1	46	324257-01	BAG,DRYING AGENT	PLACE INTO ITEM 45
																									47			
																									48			
																									49			
																					-	-	1	1	50	368803-01	LABEL, GOLD SERVICE	US ONLY

Commodore	Title A4000/020	Drawn by J. HOOPER	Drawing # 534802 / REV A / Sheet 2 of 4

QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
																					2	2	2	2	51	391396-01	IC,SIMM MODULE, 256kx32 80ns	U261 U853, SET J852 TO 2-3
																									52			
																									53			
																					1	1	1	1	54	390682-01	VIDEO ADAPTER 15 PIN TO 23 PIN	PLACE IN ITEM 45
																									55			
																									56			
																									57			
																									58			
																									59			
																									60			
																									61			
																									62			
																									63			
																									64			
																									65			
																									66			
																									67			
																									68			
																									69			
																									70			
																									71			
																									72			
																									73			
																									74			
																									75			
																									76			
																									77			
																									78			
																									79			
																									80			
																									81			
																					1	-	1	-	82	311839-01	3.5" HARD DISK,1",52MB,QUANTUM LPS 52AT	
																					1	-	1	-	83	316583-07	LABEL,H.D.D."QUANTUM PRODRIVE 52AT"	use with item 82
																									84			
																					-	-	-	1	85	369478-02	LABEL,UPC, WITHOUT HDD, NO FPU	
																					-	-	1	-	86	369478-01	LABEL,UPC, 50MB HDD, NO FPU	
																									87			
																									88			
																									89			
																									90			
																									91			
																									92			
																									93			
																									94			
																									95			
																									96			
																									97			
																									98			
																									99			
																									100			

Commodore	Title A4000/020	Drawn by J. HOOPER	Drawing # 534802 REV A
			Sheet 3 of 4

PART NUMBER	DESCRIPTION
534803-01	A4000/030 U.S. WITHOUT HDD, 1M + 1M, NO FPU
534803-02	A4000/030 U.S. WITH HDD 50MB, 1M + 1M, NO FPU
534803-03	A4000/030 EU. WITHOUT HDD, 1M + 1M, NO FPU
534803-04	A4000/030 EU. WITH HDD 50MB, 1M + 1M, NO FPU
534803-05	A4000/030 U.S. WITH HDD 40MB, 2M + 2M, NO FPU
534803-06	A4000/030 EU WITH HDD 40MB, 2M + 2M, NO FPU
534803-07	A4000/030 U.S. WITH HDD 80MB, 2M + 2M, NO FPU
534803-08	A4000/030 EU. WITH HDD 80MB, 2M + 2M, NO FPU
534803-09	A4000/030 U.S. WITH HDD 120MB, 2M + 2M, NO FPU
534803-10	A4000/030 EU WITH HDD 120MB, 2M + 2M, NO FPU
534803-11	A4000/030 U.S. WITH HDD 200MB, 2M + 2M, NO FPU
534803-12	A4000/030 EU. WITH HDD 200MB, 2M + 2M, NO FPU
534803-13	A4000/030 U.S. WITH HDD 40MB, 2M + 2M, FPU
534803-14	A4000/030 EU WITH HDD 40MB, 2M + 2M, FPU
534803-15	A4000/030 U.S. WITH HDD 80MB, 2M + 2M, FPU
534803-16	A4000/030 EU. WITH HDD 80MB, 2M + 2M, FPU
534803-17	A4000/030 U.S. WITH HDD 120MB, 2M + 2M, FPU
534803-18	A4000/030 EU WITH HDD 120MB, 2M + 2M, FPU
534803-19	A4000/030 U.S. WITH HDD 200MB, 2M + 2M, FPU
534803-20	A4000/030 EU. WITH HDD 200MB, 2M + 2M, FPU

REVISIONS

ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE	6/3/92	G. BERLIN
	A	PILOT PRODUCTION RELEASE	8-13-92	G. Berlin

1. SHEET 4 OF 4 SIZE D
ASSY. DWG 534803

Commodore	TITLE A4000/030	Drawn by J. HOOPER	Drawing # 534803
			Sheet 1 of 4

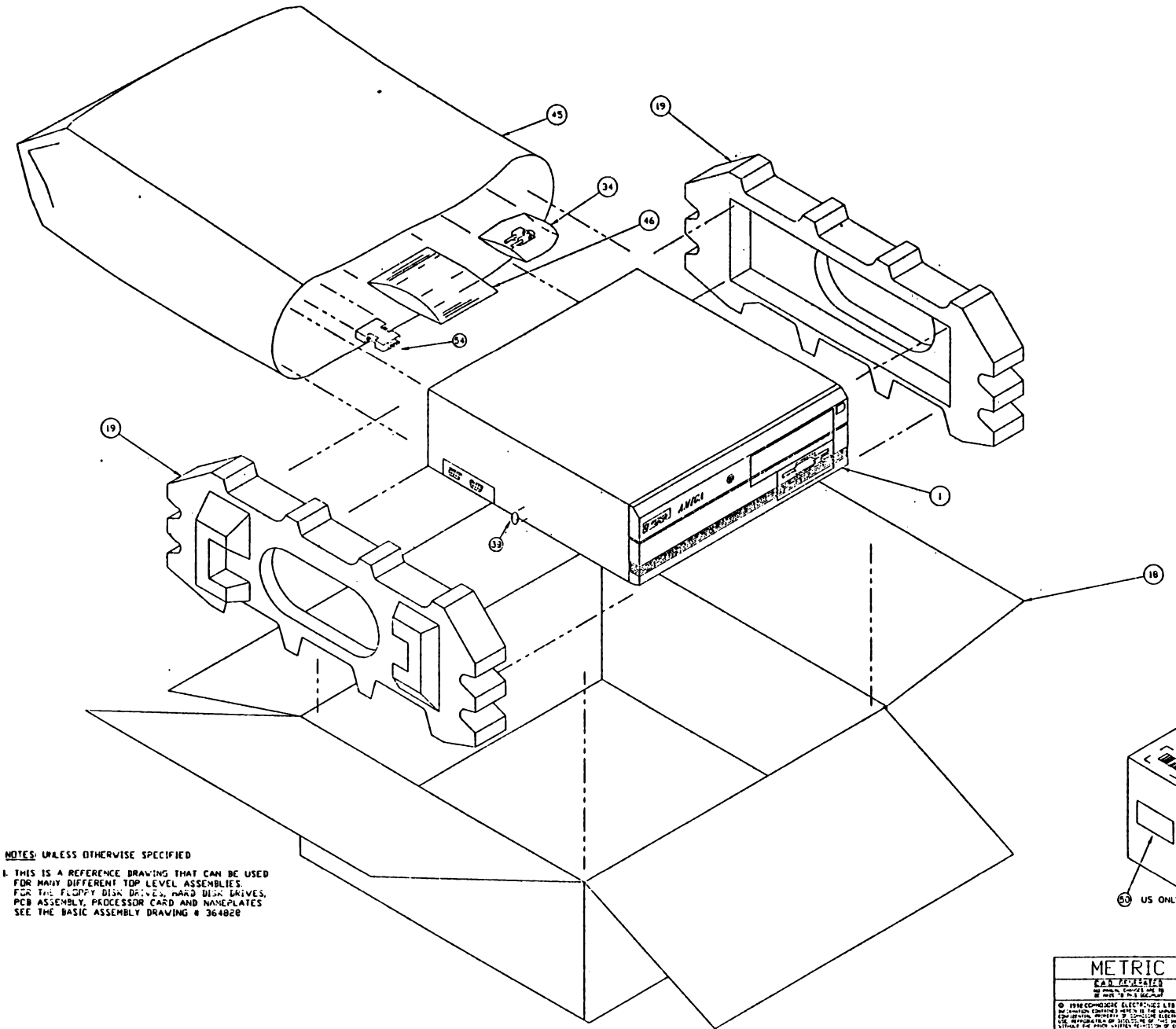
QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	364028-01	BASE ASSEMBLY	
																									2			
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	365019-01	FLOPPY DISK DRIVE 3.5" , 1.7 MEG, 25 mm	
					S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	4	313248-03	FLOPPY DISK DRIVE 3.5" , 1.7 MEG, 32 mm	SUB FOR ITEM 3
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	364904-01	DEZEL COVER, 5.25" FLOPPY DISK	
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	364239-01	DEZEL COVER, 3.5" FLOPPY DISK, 25 MM	USE WITH ITEM 3
					S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	7	364905-01	DEZEL COVER, 3.5" FLOPPY DISK, 32 MM	USE WITH ITEM 4
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	-	8	364527-02	CABLE ASSEMBLY, HARD DISK DRIVE	
																									9			
					-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	-	1	1	10	364837-01	PCB ASSEMBLY,NTSC	SET J100 & J104 TO PINS 1-2
					1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	1	-	-	11	364837-02	PCB ASSEMBLY,PAL	
					-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	-	1	1	12	391173-01	POWER SUPPLY,NTSC	
					1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	1	-	-	13	391173-02	POWER SUPPLY,PAL	
																									14			
																									15			
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	365018-02	NAMEPLATE, A4000/030	
																									17			
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	364339-03	PACKING BOX,A4000	
					2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	19	364201-01	ENDCAP	
																									20			
					-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	21	364832-03	PCB ASSEMBLY, 68030 CPU CARD, NO FPU	
					1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	22	364832-04	PCB ASSEMBLY, 68030 CPU CARD, WITH FPU	
					-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	-	1	1	23	369274-01	LABEL,RATING-MADE IN GERMANY	120V PRODUCT
					-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	-	S	S	24	369274-02	LABEL,RATING-MADE IN HONG KONG	120V PRODUCT
					-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	-	S	S	25	369274-03	LABEL,RATING-MADE IN PHILLIPINES	120V PRODUCT
					-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	-	S	S	26	369274-07	LABEL,RATING-MADE IN UK	120V PRODUCT
					1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	1	-	-	27	369274-04	LABEL,RATING-MADE IN GERMANY	240V PRODUCT
					S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	S	-	-	28	369274-05	LABEL,RATING-MADE IN HONG KONG	240V PRODUCT
					S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	S	-	-	29	369274-06	LABEL,RATING-MADE IN PHILLIPINES	240V PRODUCT
					S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	-	S	S	-	-	30	369274-08	LABEL,RATING-MADE IN UK	240V PRODUCT
																									31			
																									32			
																									33			
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	34	251006-01	BAG, PLASTIC	FOR KEYS OF KEYSWITCH
																									35			
																									36			
																									37			
																									38			
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	39	325090-02	SEAL, WARRANTY	
					-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	-	2	2	40	368084-01	SEAL,TAMPER EVIDENT	PLACEON BOX FLAPS
					4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	41	906083-01	SCREW M3 X 6.0, SELF TAPPING	FOR DEZEL COVERS
					4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	-	4	-	42	906610-04	SCREW,#6-32x.25LG	FOR HDD
					4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	43	906800-03	SCREW,M3x.05x8.0LG	FOR FDD
					2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	44	364861-01	STANDOFF, PLASTIC	FOR CPU CARD
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	45	320408-04	BAG,FLAT 650mm x 650mm	FOR CPU
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	46	324257-01	BAG,DRYING AGENT	PLACE INTO ITEM 45
																									47			
																									48			
																									49			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	50	368403-01	LABEL, GOLD SERVICE	US ONLY

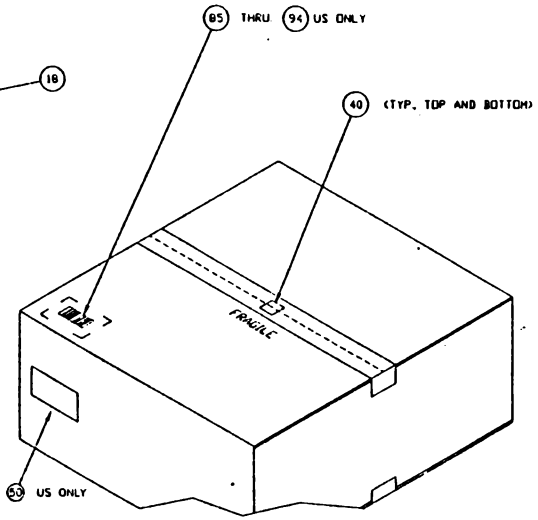
Commodore	Title A4000/030	Drawn by J. HOOPER	Drawing # 534803 REV A
			Sheet 2 of 4

QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	O9	O8	O7	O6	O5	O4	O3	O2	O1	#			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	51	391396-01	IC,SIMM MODULE, 256kx32 80ns	U261 U853, SET J852 TO 2-3
					2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	52	391396-01	IC,SIMM MODULE, 256kx32 80ns	U853 U852, SET J852 TO 2-3
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	53	391517-01	IC,SIMM MODULE, 512kx32 80ns	U261
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	54	390682-01	VIDEO ADAPTER 15 PIN TO 23 PIN	PLACE IN ITEM 45
					-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	55	364745-01	3.5" HARD DISK, 1",40MB,CONNER CP3000	
					-	-	-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	56	364290-01	3.5" HARD DISK, 1",40MB, SEAGATE ST351A	sub for item
					-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	57	316583-08	LABEL,HDD "40 MB, CONNER CP3000"	use with item 55
					-	-	-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	58	316583-09	LABEL,HDD "40 MB, SEAGATE ST351A"	use with item 56
					-	-	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	59	312966-05	3.5" HARD DISK,1",80MB,QUANTUM LPS 85AT	
					-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	60	312966-04	3.5" HARD DISK,1",80MB,CONNER CP30084E	sub for item 59
					-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	61	312966-03	3.5" HARD DISK,1",80MB,SEAGATE ST3096A	sub for item 59
					-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	62	312966-02	3.5" HARD DISK,1",80MB,WD WDAC280	sub for item 59
					-	-	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	63	316583-10	LABEL,HDD "80 MB QUANTUM LPS 85AT"	use with item 59
					-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	64	316583-11	LABEL,HDD "80 MB CONNER CP30084E"	use with item 60
					-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	65	316583-12	LABEL,HDD "80 MB SEAGATE ST3096A"	use with item 61
					-	-	-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	66	316583-13	LABEL,HDD "80MB WD WDAC280"	use with item 62
					-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	67	364517-04	3.5" HARD DISK,1",120MB,QUANTUM LPS 120AT	
					-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	68	364517-03	3.5" HARD DISK,1",120MB,SEAGATE ST3144A	sub for item 67
					-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	69	364517-02	3.5" HARD DISK,1",120MB,CONNER CP30104	sub for item 67
					-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	70	364517-01	3.5" HARD DISK,1",120MB,WD WDAC2120	sub for item 67
					-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	71	316583-14	LABEL,HDD "120 MB QUANTUM LPS 120AT"	use with item 67
					-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	72	316583-15	LABEL,HDD "120 MB SEAGATE ST3144A"	use with item 68
					-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	73	316583-16	LABEL,HDD "120 MB CONNER CP30104"	use with item 69
					-	-	S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	74	316583-17	LABEL,HDD "120MB WD WDAC2120"	use with item 70
					1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	75	311639-01	3.5" HARD DISK,1.625",200MB,SEAGATE ST1239A	
					S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-	-	76	311639-02	3.5" HARD DISK,1.625",200MB,WD WDAP4200	sub for item 75
					1	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	77	316583-18	LABEL,HDD "200 MB SEAGATE ST1239A"	use with item 75
					S	S	-	-	-	-	-	-	S	S	-	-	-	-	-	-	-	-	-	-	78	316583-19	LABEL,HDD "200 MB WD WDAP4200"	use with item 76
																									79			
																									80			
																									81			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	82	311839-01	3.5" HARD DISK,1",52MB,QUANTUM LPS 52AT	
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	83	316583-07	LABEL,I.D.D."QUANTUM PRODRIVE 52AT"	use with item 82
																									84			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	85	369478-02	LABEL,UPC, WITHOUT HDD, NO FPU	
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	86	369478-01	LABEL,UPC, 50MB HDD, NO FPU	
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	87	369478-03	LABEL,UPC, 40MB HDD, NO FPU	
					-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	88	369478-04	LABEL,UPC, 80MB HDD, NO FUP	
					-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	89	369478-05	LABEL,UPC, 120MB HDD, NO FPU	
					-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	90	369478-06	LABEL,UPC, 200MB HDD, NO FPU	
					-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	91	369478-07	LABEL,UPC, 40MB HDD, WITH FPU	
					-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92	369478-08	LABEL,UPC, 80MB HDD, WITH FPU	
					-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93	369478-09	LABEL,UPC, 120MB HDD,WITH FPU	
					-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94	369478-10	LABEL,UPC, 200MB HDD, WITH FPU	
																									95			
																									96			
																									97			
																									98			
																									99			
																									100			

Commodore	Title	A4000/030	Drawn by	J. HOOPER
			Drawing #	534803
			REV	A
			Sheet 3	of 4

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		





NOTES: UNLESS OTHERWISE SPECIFIED

1. THIS IS A REFERENCE DRAWING THAT CAN BE USED FOR MANY DIFFERENT TOP LEVEL ASSEMBLIES. FOR THE FLOPPY DISK DRIVES, HARD DISK DRIVES, PCB ASSEMBLY, PROCESSOR CARD AND NAMEPLATES SEE THE BASIC ASSEMBLY DRAWING # 364828

METRIC

DRAWN BY: J. HOOPER — 9-11-92

Commodore

A4000/030

SIZE D | 534803 | REV A

SCALE 1:3 | SHEET 4 OF 4

PART NUMBER	DESCRIPTION
534804-01	A4000/040 U.S. WITHOUT HDD, 1M + 1M
534804-02	A4000/040 U.S. WITH HDD 50MB, 1M + 1M
534804-03	A4000/040 EU. WITHOUT HDD, 1M + 1M
534804-04	A4000/040 EU. WITH HDD 50MB, 1M + 1M
534804-05	A4000/040 U.S. WITH HDD 40MB, 2M + 4M
534804-06	A4000/040 EU WITH HDD 40MB, 2M + 4M
534804-07	A4000/040 U.S. WITH HDD 80MB, 2M + 4M
534804-08	A4000/040 EU. WITH HDD 80MB, 2M + 4M
534804-09	A4000/040 U.S. WITH HDD 120MB, 2M + 4M
534804-10	A4000/040 EU WITH HDD 120MB, 2M + 4M
534804-11	A4000/040 U.S. WITH HDD 200MB, 2M + 4M
534804-12	A4000/040 EU. WITH HDD 200MB, 2M + 4M

REVISIONS

ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE	6/3/92	G. BERLIN
	A	PILOT PRODUCTION RELEASE	8-13-92	

1. SHEET 4 OF 4 SIZE D
ASSY. DWG 534804

Commodore	TITLE A4000/040	Drawn by J. HOOPER	Drawing # 534804
			Sheet 1 of 4

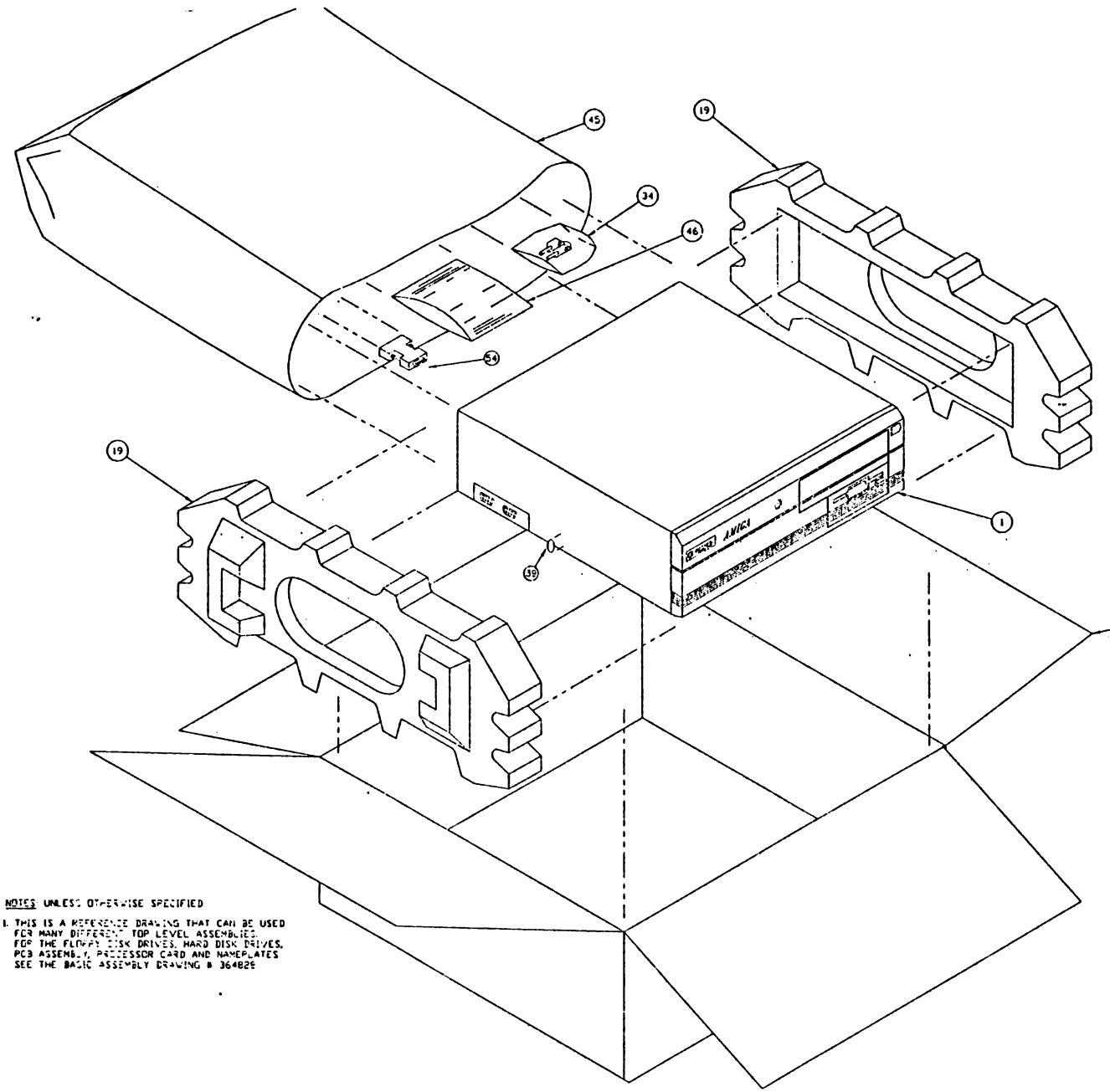
QUANTITY REQUIRED PER DASH #																							ITM #	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01				
													1	1	1	1	1	1	1	1	1	1	1	1	1	364828-01	BASE ASSEMBLY	
																									2			
													1	1	1	1	1	1	1	1	1	1	1	1	3	365019-01	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 25 mm	
													S	S	S	S	S	S	S	S	S	S	S	S	4	313248-03	FLOPPY DISK DRIVE 3.5", 1.7 MEG, 32 mm	SUB FOR ITEM 3
													1	1	1	1	1	1	1	1	1	1	1	1	5	364904-01	BEZEL COVER, 5.25" FLOPPY DISK	
													1	1	1	1	1	1	1	1	1	1	1	1	6	364239-01	BEZEL COVER, 3.5" FLOPPY DISK, 25 MM	USE WITH ITEM 3
													S	S	S	S	S	S	S	S	S	S	S	S	7	364905-01	BEZEL COVER, 3.5" FLOPPY DISK, 32 MM	USE WITH ITEM 4
													1	1	1	1	1	1	1	1	-	1	-		8	364527-02	CABLE ASSEMBLY, HARD DISK DRIVE	
																									9			
													-	1	-	1	-	1	-	1	-	-	1	1	10	364837-01	PCB ASSEMBLY,NTSC	SET J100 & J104 PINS 2-3
													1	-	1	-	1	-	1	-	1	1	-	-	11	364837-02	PCB ASSEMBLY,PAL	REMOVE U104 FOR 040 CARD)
													-	1	-	1	-	1	-	1	-	-	1	1	12	391173-01	POWER SUPPLY,NTSC	
													1	-	1	-	1	-	1	-	1	1	-	-	13	391173-02	POWER SUPPLY,PAL	
																									14			
																									15			
													1	1	1	1	1	1	1	1	1	1	1	1	16	365018-03	NAMEPLATE, A4000/040	
																									17			
													1	1	1	1	1	1	1	1	1	1	1	1	18	364339-03	PACKING BOX,A4000	
													2	2	2	2	2	2	2	2	2	2	2	2	19	364201-01	ENDCAP	
																									20			
													1	1	1	1	1	1	1	1	1	1	1	1	21	364856-01	PCB ASSEMBLY, 68040 CPU CARD	
																									22			
													-	1	-	1	-	1	-	1	-	-	1	1	23	369274-01	LABEL,RATING-MADE IN GERMANY	120V PRODUCT
													-	S	-	S	-	S	-	S	-	-	S	S	24	369274-02	LABEL,RATING-MADE IN HONG KONG	120V PRODUCT
													-	S	-	S	-	S	-	S	-	-	S	S	25	369274 03	LABEL,RATING-MADE IN PHILLIPINES	120V PRODUCT
													-	S	-	S	-	S	-	S	-	-	S	S	26	369274-07	LABEL,RATING-MADE IN UK	120V PRODUCT
													1	-	1	-	1	-	1	-	1	1	-	-	27	369274-04	LABEL,RATING-MADE IN GERMANY	240V PRODUCT
													S	-	S	-	S	-	S	-	S	S	-	-	28	369274-05	LABEL,RATING-MADE IN HONG KONG	240V PRODUCT
													S	-	S	-	S	-	S	-	S	S	-	-	29	369274-06	LABEL,RATING-MADE IN PHILLIPINES	240V PRODUCT
													S	-	S	-	S	-	S	-	S	S	-	-	30	369274-08	LABEL,RATING-MADE IN UK	240V PRODUCT
																									31			
																									32			
																									33			
													1	1	1	1	1	1	1	1	1	1	1	1	34	251006-01	BAG, PLASTIC	FOR KEYS OF KEYSWITCH
																									35			
																									36			
																									37			
																									38			
													1	1	1	1	1	1	1	1	1	1	1	1	39	325090-02	SEAL, WARRANTY	
													-	2	-	2	-	2	-	2	-	-	2	2	40	360004-01	SEAL,TAMPER EVIDENT	PLACE ON BOX FLAPS
													4	4	4	4	4	4	4	4	4	4	4	4	41	906883-01	SCREW M3 X 6.0, SELF TAPPING	FOR BEZEL COVERS
													4	4	4	4	4	4	4	4	4	-	4	-	42	906610-04	SCREW,#6-32x.25LG	FOR HDD
													4	4	4	4	4	4	4	4	4	4	4	4	43	906800-03	SCREW,M3x.05x6.0LG	FOR FDD
													4	4	4	4	4	4	4	4	4	4	4	4	44	364861-01	STANDOFF, PLASTIC	FOR CPU CARD
													1	1	1	1	1	1	1	1	1	1	1	1	45	320408-04	BAG,FLAT 650mm x 650mm	FOR CPU
													1	1	1	1	1	1	1	1	1	1	1	1	46	324257-01	BAG,DRYING AGENT	PLACE INTO ITEM 45
																									47			
																									48			
																									49			
													-	-	-	-	-	-	-	-	-	-	1	1	50	360003-01	LABEL, GOLD SERVICE	US ONLY

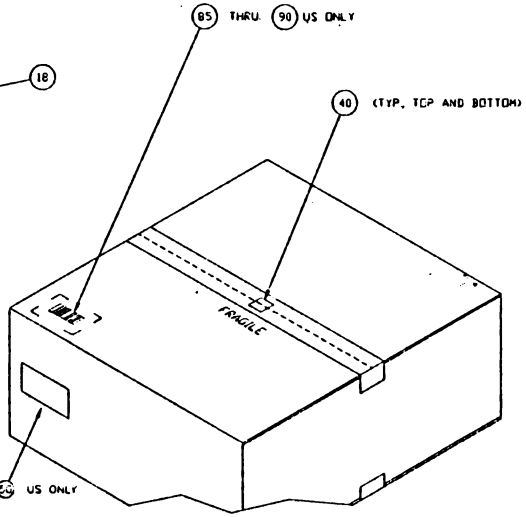
Commodore	Title: A4000/040	Drawn by: J. HOOPER	Drawing #: 534804
		REV: A	Sheet 2 of 4

QUANTITY REQUIRED PER DASH #																							ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
																									51			
													1	1	1	1	1	1	1	1	1	1	1	1	52	391518-01	IC,SIMM MODULE, 1M x32 80ns	U853 , SET J852 TO 1-2
													1	1	1	1	1	1	1	1	1	1	1	1	53	391517-01	IC,SIMM MODULE, 512kx32 80ns	U261
													1	1	1	1	1	1	1	1	1	1	1	1	54	390682-01	VIDEO ADAPTER 15 PIN TO 23 PIN	PLACE IN ITEM 45
													-	-	-	-	-	-	1	1	-	-	-	-	55	364745-01	3.5" HARD DISK, 1",40MB,CONNER CP3000	
													-	-	-	-	-	-	S	S	-	-	-	-	56	364290-01	3.5" HARD DISK, 1",40MB, SEAGATE ST351A	sub for item
													-	-	-	-	-	-	1	1	-	-	-	-	57	316583-08	LABEL,HDD "40 MB, CONNER CP3000"	use with item 55
													-	-	-	-	-	-	S	S	-	-	-	-	58	316583-09	LABEL,HDD "40 MB, SEAGATE ST351A"	use with item 56
													-	-	-	-	1	1	-	-	-	-	-	-	59	312966-05	3.5" HARD DISK,1",80MB,QUANTUM LPS 85AT	
													-	-	-	-	S	S	-	-	-	-	-	-	60	312966-04	3.5" HARD DISK,1",80MB,CONNER CP30084E	sub for item 59
													-	-	-	-	S	S	-	-	-	-	-	-	61	312966-03	3.5" HARD DISK,1",80MB,SEAGATE ST3096A	sub for item 59
													-	-	-	-	S	S	-	-	-	-	-	-	62	312966-02	3.5" HARD DISK,1",80MB,WD WDAC280	sub for item 59
													-	-	-	-	1	1	-	-	-	-	-	-	63	316583-10	LABEL,HDD "80 MB QUANTUM LPS 85AT"	use with item 59
													-	-	-	-	S	S	-	-	-	-	-	-	64	316583-11	LABEL,HDD "80 MB CONNER CP30084E"	use with item 60
													-	-	-	-	S	S	-	-	-	-	-	-	65	316583-12	LABEL,HDD "80 MB SEAGATE ST3096A"	use with item 61
													-	-	-	-	S	S	-	-	-	-	-	-	66	316583-13	LABEL,HDD "80MB WD WDAC280"	use with item 62
													-	-	1	1	-	-	-	-	-	-	-	-	67	364517-04	3.5" HARD DISK,1",120MB,QUANTUM LPS 120AT	
													-	-	S	S	-	-	-	-	-	-	-	-	68	364517-03	3.5" HARD DISK,1",120MB,SEAGATE ST3144A	sub for item 67
													-	-	S	S	-	-	-	-	-	-	-	-	69	364517-02	3.5" HARD DISK,1",120MB,CONNER CP30104	sub for item 67
													-	-	S	S	-	-	-	-	-	-	-	-	70	364517-01	3.5" HARD DISK,1",120MB,WD WDAC2120	sub for item 67
													-	-	1	1	-	-	-	-	-	-	-	-	71	316583-14	LABEL,HDD "120 MB QUANTUM LPS 120AT"	use with item 67
													-	-	S	S	-	-	-	-	-	-	-	-	72	316583-15	LABEL,HDD "120 MB SEAGATE ST3144A"	use with item 68
													-	-	S	S	-	-	-	-	-	-	-	-	73	316583-16	LABEL,HDD "120 MB CONNER CP30104"	use with item 69
													-	-	S	S	-	-	-	-	-	-	-	-	74	316583-17	LABEL,HDD "120MB WD WDAC2120"	use with item 70
													1	1	-	-	-	-	-	-	-	-	-	-	75	311639-01	3.5" HARD DISK,1.625",200MB,SEAGATE ST1239A	
													S	S	-	-	-	-	-	-	-	-	-	-	76	311639-02	3.5" HARD DISK,1.625",200MB,WD WDAP4200	sub for item 75
													1	1	-	-	-	-	-	-	-	-	-	-	77	316583-18	LABEL,HDD "200 MB SEAGATE ST1239A"	use with item 75
													S	S	-	-	-	-	-	-	-	-	-	-	78	316583-19	LABEL,HDD "200 MB WD WDAP4200"	use with item 76
																									79			
																									80			
																									81			
													-	-	-	-	-	-	-	-	1	-	1	-	82	311839-01	3.5" HARD DISK,1",52MB,QUANTUM LPS 52AT	
													-	-	-	-	-	-	-	-	1	-	1	-	83	316583-07	LABEL,H.D.D."QUANTUM PRODRIVE 52AT"	use with item 82
																									84			
													-	-	-	-	-	-	-	-	-	-	-	1	85	369477-02	LABEL,UPC, WITHOUT HDD	
													-	-	-	-	-	-	-	-	-	-	1	-	86	369477-01	LABEL,UPC, 50MB HDD	
													-	-	-	-	-	-	-	1	-	-	-	-	87	369477-03	LABEL,UPC, 40MB HDD	
													-	-	-	-	-	1	-	-	-	-	-	-	88	369477-04	LABEL,UPC, 80MB HDD	
													-	-	-	1	-	-	-	-	-	-	-	-	89	369477-05	LABEL,UPC, 120MB HDD,	
													-	1	-	-	-	-	-	-	-	-	-	-	90	369477-06	LABEL,UPC, 200MB HDD	
																									91			
																									92			
																									93			
																									94			
																									95			
																									96			
																									97			
																									98			
																									99			
																									100			

Commodore	Title A4000/040	Drawn by J. HOOPER	Drawing # 534804 / REV A / Sheet 3 of 4

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
		SEE SHEET 1		





NOTES: UNLESS OTHERWISE SPECIFIED

1. THIS IS A REFERENCE DRAWING THAT CAN BE USED FOR MANY DIFFERENT TOP LEVEL ASSEMBLIES. FOR THE FLOPPY DISK DRIVES, HARD DISK DRIVES, PCB ASSEMBLY, PROCESSOR CARD AND NAMEPLATES SEE THE BASIC ASSEMBLY DRAWING # 364828

METRIC

DRAWN BY: J. HOOPER 8-11-92

Commodore

A4000/040

SIZE D | 534804 | REV A

SCALE 1:3 | SHEET 4 OF 4

PART NUMBER	DESCRIPTION	
582027-01	KEYBOARD SHIP ASSEMBLY	US
582027-02	KEYBOARD SHIP ASSEMBLY	CN
582027-03	KEYBOARD SHIP ASSEMBLY	UK
582027-04	KEYBOARD SHIP ASSEMBLY	GR
582027-05	KEYBOARD SHIP ASSEMBLY	FR
582027-06	KEYBOARD SHIP ASSEMBLY	IT
582027-07	KEYBOARD SHIP ASSEMBLY	SP
582027-08	KEYBOARD SHIP ASSEMBLY	SG
582027-09	KEYBOARD SHIP ASSEMBLY	SF
582027-10	KEYBOARD SHIP ASSEMBLY	AU
582027-11	KEYBOARD SHIP ASSEMBLY	NR
582027-12	KEYBOARD SHIP ASSEMBLY	SD
582027-13	KEYBOARD SHIP ASSEMBLY	FN
582027-14	KEYBOARD SHIP ASSEMBLY	NE
582027-15	KEYBOARD SHIP ASSEMBLY	DN
582027-16	KEYBOARD SHIP ASSEMBLY	BF
582027-17	KEYBOARD SHIP ASSEMBLY	DD
582027-18	KEYBOARD SHIP ASSEMBLY	AL
582027-19	KEYBOARD SHIP ASSEMBLY	CE
582027-20	KEYBOARD SHIP ASSEMBLY	PG

REVISIONS

ZN	LTR	DESCRIPTION	DATE	APPROVED
	1	ADVANCE ENGINEERING RELEASE	6/3/92	G. BERLIN
	A	PILOT PRODUCTION RELEASE	5-13-92	

1. SHEET OF SIZE
   ASSY. DWG.
NOTES:

Commodore	KEYBOARD SHIP ASSEMBLY, A4000	Drawn by DKA	Drawing # 582027
			Sheet 1 of 4

QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
					1	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	1	364447-01	KEYBOARD ASSEMBLY	US
					-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	364447-02	KEYBOARD ASSEMBLY	UK
					-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	3	364447-03	KEYBOARD ASSEMBLY	GR
					-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	S	-	4	364447-05	KEYBOARD ASSEMBLY	FR
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	5	364447-04	KEYBOARD ASSEMBLY	IT
					-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	6	364447-06	KEYBOARD ASSEMBLY	SP
					-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	7	364447-07	KEYBOARD ASSEMBLY	SW
					-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	8	364447-09	KEYBOARD ASSEMBLY	NR
					-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	9	364447-10	KEYBOARD ASSEMBLY	SD/FN
					-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	364447-08	KEYBOARD ASSEMBLY	DN
																									11			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	12	366981-01	Label, Carton, US	US
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	13	366981-02	Label, Carton, Canada	CN
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	14	366981-03	Label, Carton, UK	UK
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	15	366981-04	Label, Carton, Germany	GR
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	16	366981-05	Label, Carton, France	FR
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	17	366981-06	Label, Carton, Italy	IT
					-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	18	366981-07	Label, Carton, Spain	SP
					-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	19	366981-08	Label, Carton, Swiss German	SG
					-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	20	366981-09	Label, Carton, Swiss French	SF
					-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	21	366981-10	Label, Carton, Austria	AU
					-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	22	366981-11	Label, Carton, Norway	NR
					-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	23	366981-12	Label, Carton, Sweden	SD
					-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	24	366981-13	Label, Carton, Finland	FN
					-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	25	366981-14	Label, Carton, Netherlands	NE
					-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	366981-15	Label, Carton, Denmark	DN
					-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	366981-16	Label, Carton, Belgium, French	DF
					-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	366981-17	Label, Carton, Belgium Dutch	DD
					-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	366981-18	Label, Carton, Australia	AL
					-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	366981-19	Label, Carton, CEL Trade	CE
					1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	366981-20	Label, Carton, Portugal	PG
																									32			
																									33			
																									34			
																									35			
					2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	36	318243-01	Endcap, Keyboard	
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	37	380425-03	Container, Shipping	
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	38	251006-02	Bag, Flat, 580mm x 350mm	
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	39	324252-07	Tape, adhesive transparent, 50mm	
																									40			
					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	41	327124-05	Mouse Assy., 1.2M cable, limestone beige, no ferrite	
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	42	327124-07	Mouse Assy., 1.2M cable, limestone beige, w/ferrite	
																									43			
																									44			
																									45			
																									46			
																									47			
																									49			
																									50			
																									50			

Commodore	Title: KEYBOARD SHIP ASSEMBLY, A4000	Drawn by: DKA	Drawing #: 582027	Rev: A	Sheet 2 of 4

QUANTITY REQUIRED PER DASH #																						ITM #	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	O9	O8	O7	O6	O5	O4	O3	O2	O1				
																									51			
																									52			
																									53			
																									54			
																									55			
																									56			
																									57			
					1	1	1	1	-	1	1	1	1	1	-	-	-	1	-	-	-	1	1	1	58	364870-01	AMIGA SOFTWARE ASSEMBLY, LEVEL 3 V3.0	ENGLISH
																									59			
																									60			
					-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	-	-	61	364870-04	AMIGA SOFTWARE ASSEMBLY, LEVEL 3 V3.0	GERMAN
					-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-	S	-	62	364870-05	AMIGA SOFTWARE ASSEMBLY, LEVEL 3 V3.0	FRENCH
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	63	364870-06	AMIGA SOFTWARE ASSEMBLY, LEVEL 3 V3.0	ITALIAN
																									64			
																									65			
																									66			
																									67			
																									68			
																									69			
																									70			
																									71			
																									72			
																									73			
																									74			
																									75			
																									76			
																									77			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	78	400804-01	Service Sub-Assembly	US
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	79	318882-02	Warranty Card	CN
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	80	325349-01	Warranty Card	UK
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	81	320046-06	Warranty Card	GR
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	82	325254-01	Warranty Card	FR
					-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	368014-02	Warranty Card	AL
					-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	84	380933-01	Warranty Card	SW
					-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85	318876-02	Service Center List	AL
					1	1	1	1	1	1	1	1	1	1	S	1	1	1	1	1	S	1	1	1	86	318896-04	Software License Agreement	
					-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	87	318708-01	Software License Agreement	GR
																									88			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	89	318556-02	Disk Exchange Card	CN
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	90	312341-02	Disk Exchange Card	US
																									91			
																									92			
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	93	903508-18	POWER CORD, BLACK US/Canada	UL/CSA
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	94	903508-21	POWER CORD, BLACK UK	BSI
					1	1	-	1	1	1	1	1	1	1	1	-	-	1	1	1	1	-	-	-	95	903508-19	POWER CORD, BLACK	VDE
					-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	96	903508-20	POWER CORD, BLACK Switzerland	SEV
					-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97	903508-22	POWER CORD, BLACK Australia	
																									98			
																									99			
																									100			

Commodore	Title: KEYBOARD SHIP ASSEMBLY, A4000	Drawn by: DKA	Drawing #: 582027 REV: A
			Sheet 3 of 4

QUANTITY REQUIRED PER DASH #																						ITM	PART NO.	DESCRIPTION	REF DES / NOTES
25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	#			
					1	1	1	1	-	1	1	1	1	1	-	-	-	1	-	-	-	1	1	1	101	368924-01	MANUAL, USER'S GUIDE A4000	ENGLISH
					-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	-	-	102	368927-01	MANUAL, USER'S GUIDE A4000	GERMAN
					-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-	S	-	103	368925-01	MANUAL, USER'S GUIDE A4000	FRENCH
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	104	368926-01	MANUAL, USER'S GUIDE A4000	ITALIAN
					-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	105	371023-01	MANUAL, USER'S GUIDE A4000	SWEDISH
																									106			
																									107			
																									108			
																									109			
																									110			
					1	1	1	1	-	1	1	1	-	1	-	-	-	1	-	-	-	1	1	1	111	371001-01	MANUAL, HARD DISK USER'S GUIDE	EN
					-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	-	-	112	371004-01	MANUAL, HARD DISK USER'S GUIDE	GR
					-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-	S	-	113	371002-01	MANUAL, HARD DISK USER'S GUIDE	FR
					-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	114	371003-01	MANUAL, HARD DISK USER'S GUIDE	IT
					-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	115	371028-01	MANUAL, HARD DISK USER'S GUIDE	SD
																									116			
																									117			
																									118			
																									119			
																									120			
																									121			
																									122			
																									123			
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