

SAMS

CD9 08975

COMPUTERFACTS™

TECHNICAL SERVICE DATA

ATARI®
MODEL 810
DISK DRIVE



FEATURES: COMPLETE SCHEMATICS • PRELIMINARY SERVICE CHECKS • TROUBLESHOOTING TIPS •
EASY-READ WAVEFORMS • REPLACEMENT PARTS LISTS • SEMICONDUCTOR CROSS-REFERENCE

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PRELIMINARY SERVICE CHECKS

ENCLOSED

SAFETY PRECAUTIONS

See page 19.

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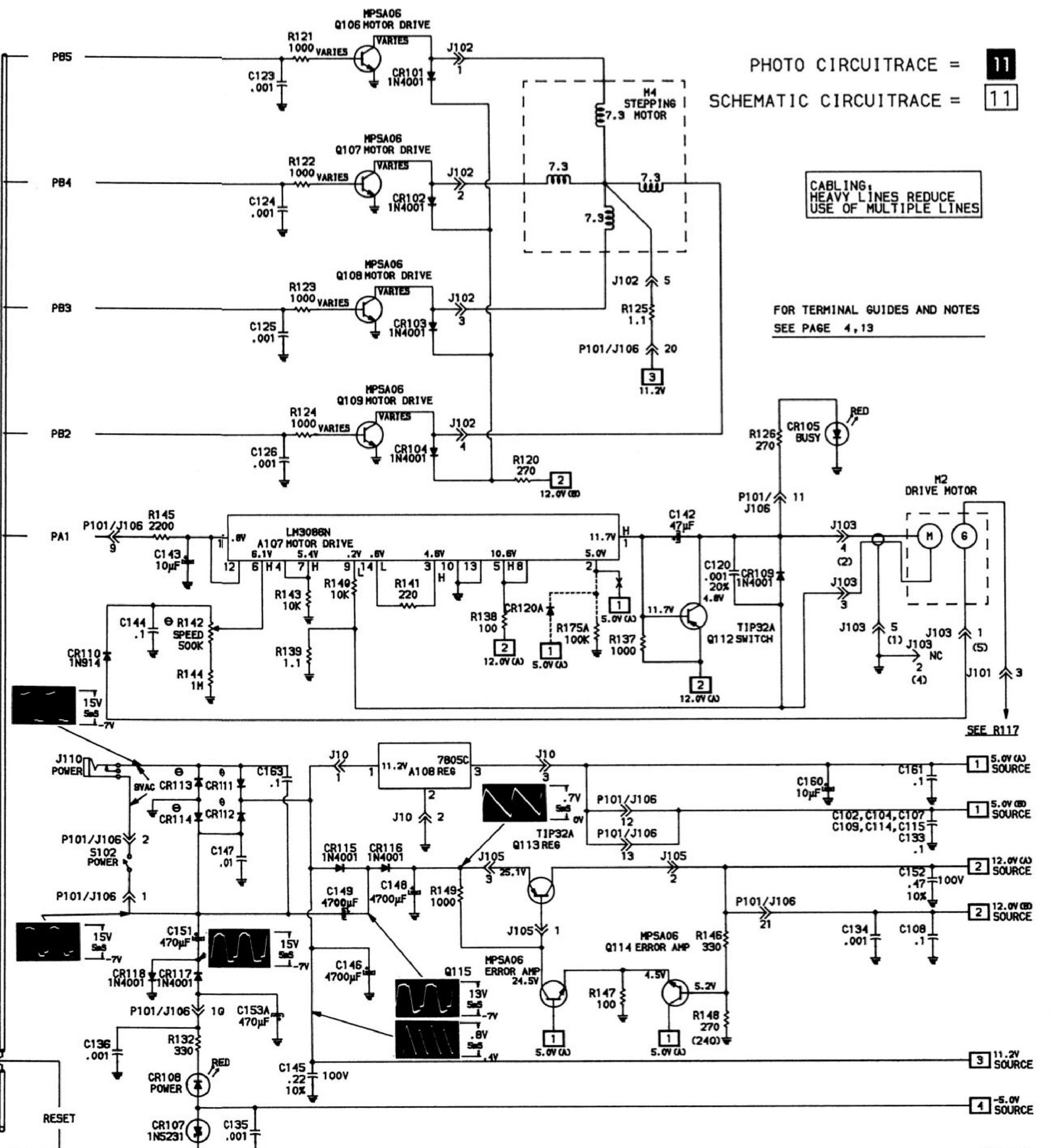
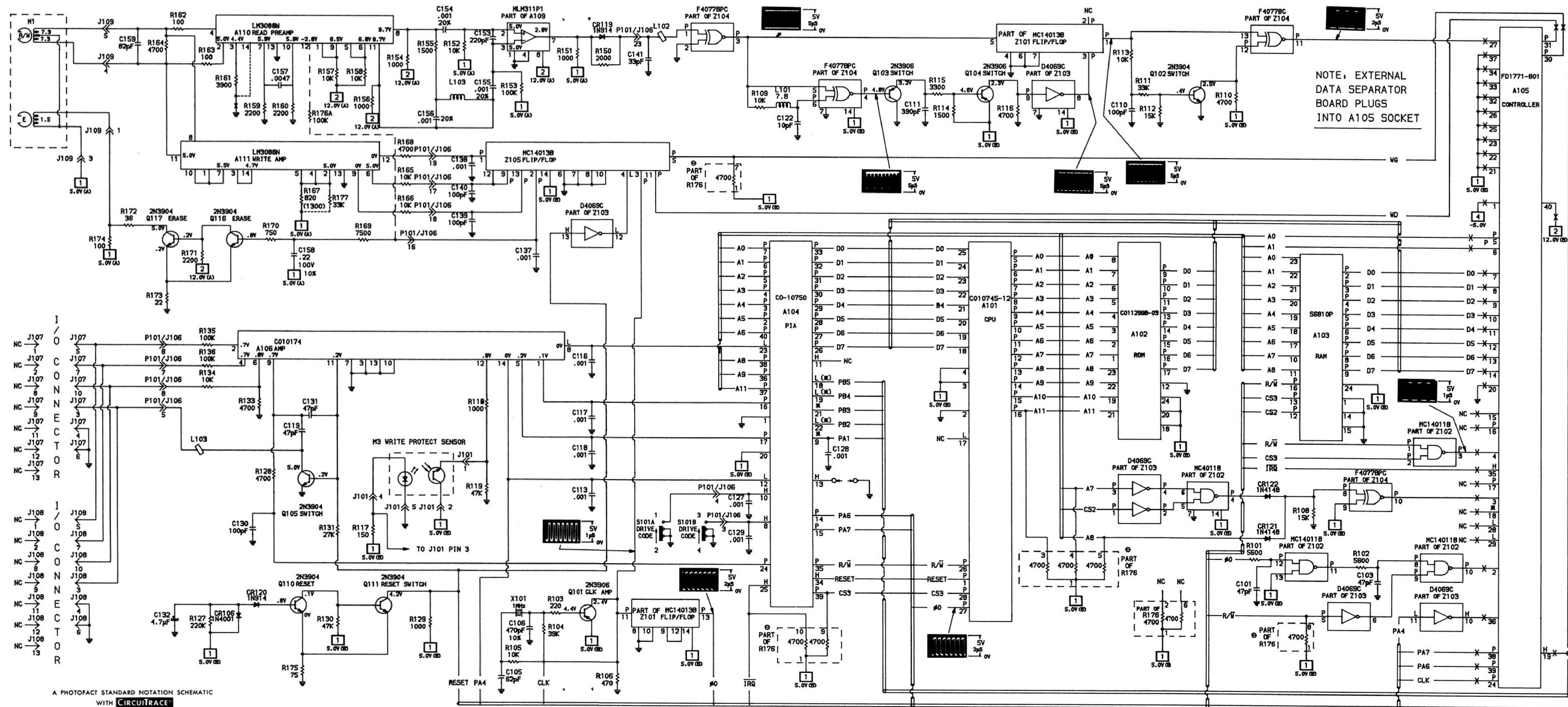
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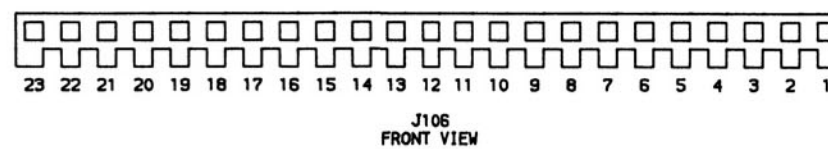
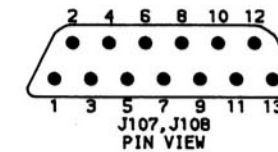
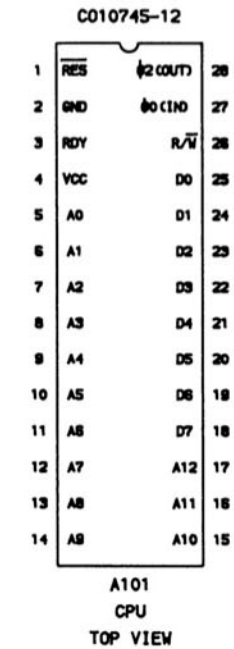
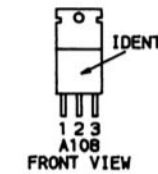
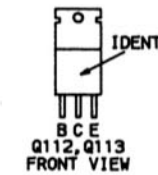
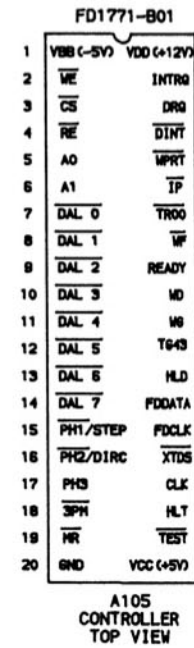
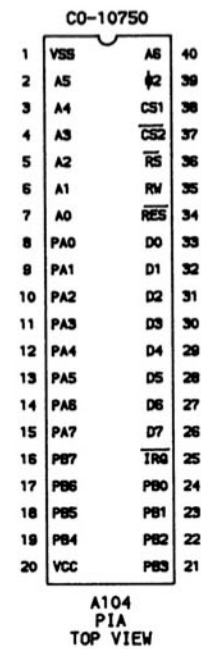
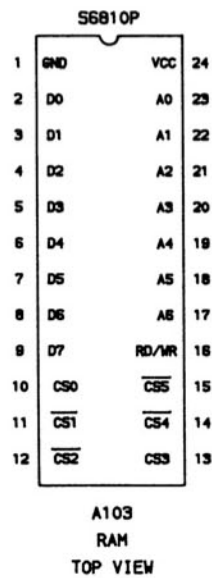
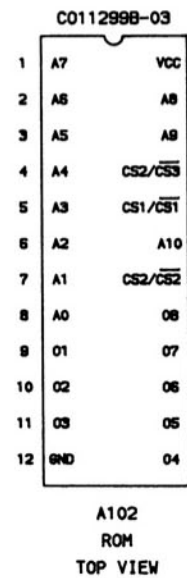
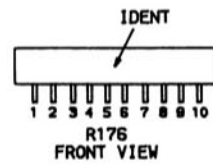
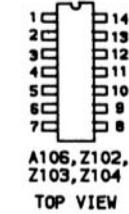
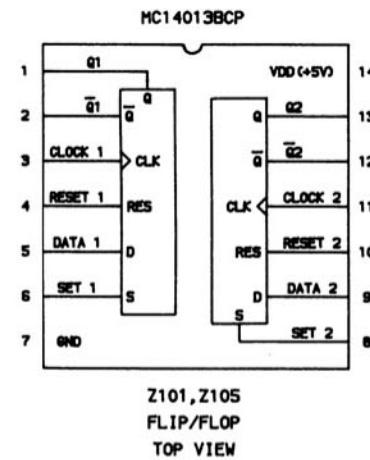
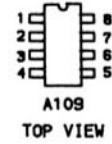
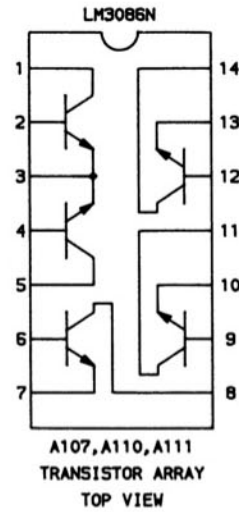
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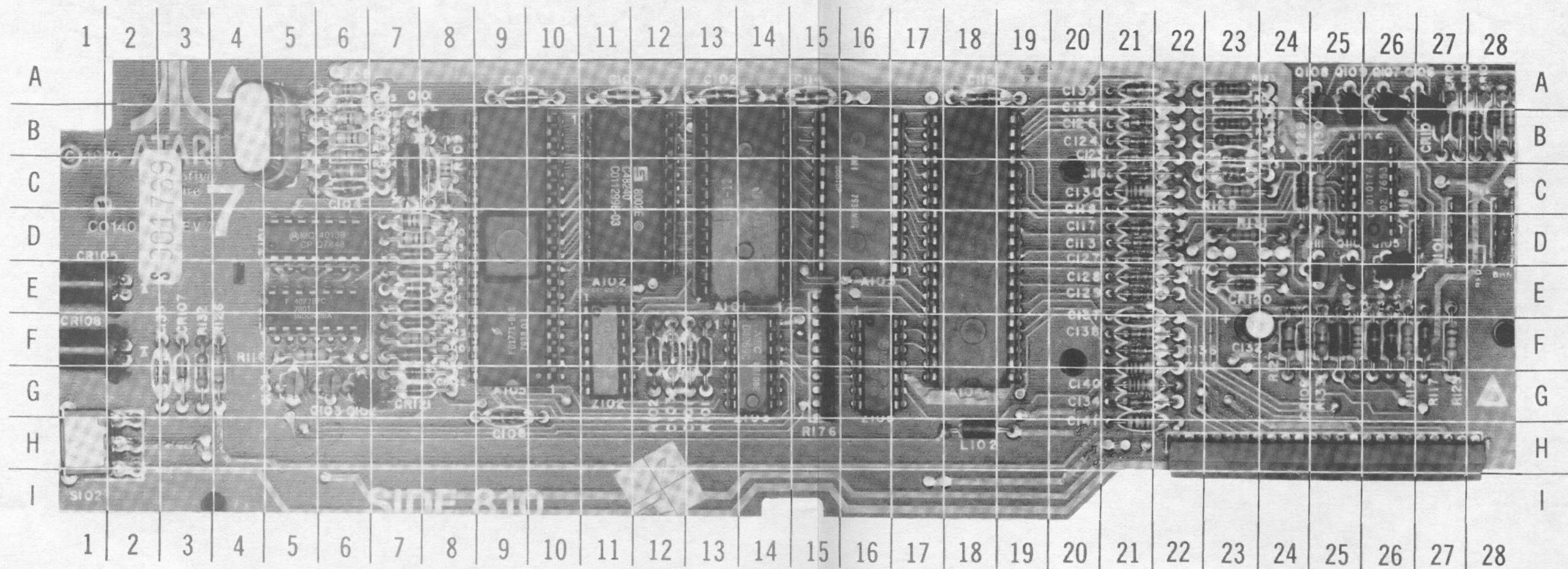


IC PINOUTS & TERMINAL GUIDES

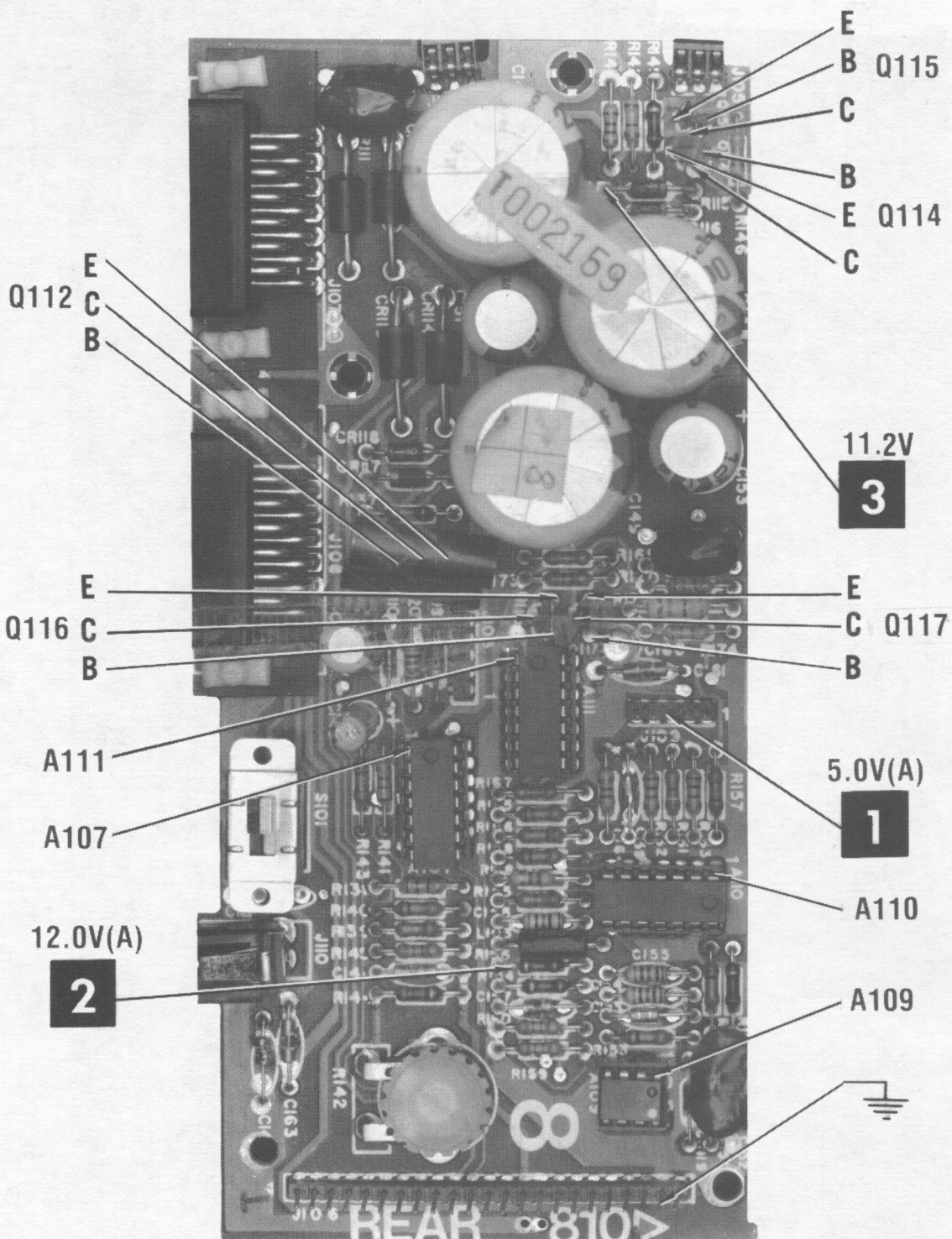


GridTrace LOCATION GUIDE

A101	D-14	C122	C-8	CR105	E-1	R101	F-13	R126	G-4
A102	C-11	C123	B-21	CR106	F-24	R102	F-12	R127	F-24
A103	C-16	C124	B-21	CR107	G-3	R103	B-6	R128	C-23
A104	D-18	C125	A-21	CR108	F-1	R104	C-6	R129	C-24
A105	D-9	C126	B-21	CR120	E-23	R105	B-6	R130	C-25
A106	C-26	C127	D-21	CR121	G-7	R106	A-6	R131	D-23
C101	F-13	C128	E-21	CR122	G-7	R108	F-7	R132	G-3
C102	A-13	C129	E-21	J101	D-27	R109	C-8	R133	F-25
C103	F-12	C130	C-21	J102	D-28	R110	F-7	R134	F-25
C104	C-6	C131	C-23	L101	C-7	R111	D-7	R135	F-26
C105	A-6	C132	F-23	L102	H-18	R112	E-7	R136	F-26
C106	B-6	C133	A-21	L103	F-25	R113	D-7	R175	E-23
C107	A-11	C134	G-21	P101	H-25	R114	E-7	R176	F-15
C108	G-9	C135	G-3	Q101	B-8	R115	F-7	S102	H-1
C109	A-9	C136	F-21	Q102	G-6	R116	F-5	X101	B-5
C110	D-7	C137	F-21	Q103	G-6	R117	F-27	Z101	D-5
C111	E-7	C138	F-21	Q104	G-5	R118	D-27	Z102	F-11
C113	D-21	C139	F-21	Q105	E-26	R119	F-26	Z103	G-14
C114	A-15	C140	G-21	Q106	A-27	R120	B-28	Z104	E-5
C115	A-18	C141	H-21	Q107	A-26	R121	B-23	Z105	F-16
C116	C-21	CR101	B-27	Q108	A-25	R122	B-23		
C117	D-21	CR102	B-27	Q109	A-25	R123	A-23		
C118	C-21	CR103	B-28	Q110	E-25	R124	A-23		
C119	B-23	CR104	B-28	Q111	E-25	R125	F-27		



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PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA					
			NOTES	NTE PART No.	ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
A101	C010745-12	(1)		NTE6507	ECG6507			
A102	C011299B-03							
A103	S6810P							
A104	C0-10750							
A105	FD1771-B01							
A106	C010174							
A107	LM3086N							
A108	7805C							
A109	MLM311P1							
A110,111	LM3086N							
CR101 thru CR104	1N4001							
CR106	1N4001							
CR107	1N5231							
CR109	1N4001							
CR110	1N914							
CR111 thru CR114								
CR115 thru CR118	1N4001							
CR119,120 CR120A	1N914							
CR121,122 Q101	1N4148 2N3906							
Q102	2N3904							
Q103,104	2N3906							
Q105	2N3904							
Q106 thru Q109	MPSA06							
Q110,111	2N3904							

(1)

(1) Used in some versions.

6D9

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6 PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA					
			NOTES	NTE PART No.	ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
Q112, 113 Q114, 115 Q116, 117 Z101 Z102	TIP32A MPSA06 2N3904 MC14013B MC14011B			NTE292 NTE123AP NTE123AP NTE4013B NTE4011B	ECG292 ECG123AP ECG123AP ECG4013B ECG4011B	SK3441/292 SK3854/123AP SK3854/123AP SK4013B SK4011B	WEP781/292 WEP736/123A WEP736/123A WEP4013B/4013B WEP4011B/4011B	121-Z9048 121-Z9000A 121-Z9000A 905-186 221-Z9133
Z103 Z104 Z105	D4069C F4077BPC MC14013B			NTE4069 NTE4077B NTE4013B	ECG4069 ECG4077B ECG4013B	SK4069UB SK4077B SK4013B	WEP4069/4069 WEP4013B/4013B WEP4013B/4013B	905-260 905-186 905-186

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
R176	CPU BOARD Resistor Network (1)			

(1) Contains Nine (9 ea.) 4700 Ohm.

COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
L101 L103	Choke Choke			

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R142	ANALOG BOARD Speed	500K		

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MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
CR105 CR108 L102 L103 M1 M2 M3 M4 S101 S102 X101	LED LED Ferrite Bead Ferrite Bead Head Motor Sensor Motor Switch Switch Crystal		Busy, Red Power, Red Read/Write/Erase Drive Write Protect Stepping Drive Code Select Power 1MHz

WIRING DATA

Shielded Hook-up Wire	Use BELDEN No. 8401 or 8421 (Single-Conductor) 8208 (Two-Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8529 (Solid) Available in 13 Colors 8522 (Stranded) Available in 13 Colors

TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS' Engineers to obtain measurements and is compatible with most types used by field service technicians.

TEST EQUIPMENT (COMPUTERFACTS)

Equipment Name	B & K Precision Equipment No.	Sencore Equipment No.	
OSCILLOSCOPE	1570A,1590A,1596	SC61	
LOGIC PROBE	DP51		
LOGIC PULSER	DP101		
DIGITAL VOM	2830	DVM37,DVM56,SC61	
ANALOG VOM	277		
ISOLATION TRANSFORMER	TR110,1604,1653,1655	PR57	
FREQUENCY COUNTER	1803,1805	FC71,SC61	
COLOR BAR GENERATOR	1211A,1248,1251,1260	CG25,VA62	
RGB GENERATOR	1260		
FUNCTION GENERATOR	3020		
HI-VOLTAGE PROBE VOM/DMM Accessory probes	HV-44	HP200	
TEMPERATURE PROBE	TP-28		
CRT ANALYZER	467,470	CR70	

TROUBLESHOOTING

POWER SUPPLY

Plug in Power Pack and check for 10.9V AC at the output plug. If voltage is missing replace Power Pack. If voltage is present, plug in the Power Pack to Connector J110 on the Disk Drive. Turn Power ON. Check for 12.0V at the cathode of Diode CR111. If 12V is missing check power Connector J110, Diodes CR111, CR112, CR113 and CR114 and check Regulator IC (A108). If the 12V is present check for 5V at pin 3 of IC A108. If the 5V is missing check IC A108 by substitution. If 5V is low check Error Amp Transistors (Q114 and Q115) by substitution. Check for 12V at collector of Regulator Transistor (Q113). If the 12V is missing check voltages and components associated with Q113 and Diodes CR115 and CR116. Check for -5V at anode of Zener Diode CR107. If -5V is missing check Zener Diode CR107 and Power LED (CR108).

MICROPROCESSOR (CPU) OPERATION

Check Reset line, pin 1 of CPU IC (A101) while turning On Disk Drive. The logic reading should be Low for about .2 seconds, then go High and stay High. If the reset circuit is not working, check Reset Transistors (Q111 and Q110) and Resistor R175.

Check for 0.534MHz waveform at pin 27 of CPU IC (A101). If waveform is missing at pin 27 of CPU IC (A101), check for 1MHz waveform at pin 11 of IC Z101. If waveform is present at pin 11 of IC Z101 check IC Z101 by substitution. If waveform is missing at pin 11 of IC Z101 check Crystal X101, Clock Amp Transistor (Q101) and associated components.

Check for pulses on data lines (pins 18 thru 25) and Address lines (pins 5 thru 9 and 10 thru 16) of CPU IC (A101). If

pulses are missing, check for 5V at pins 3 and 4 of IC A101 and check for 0.534MHz clock signal on pin 27 of IC A101.

DISK DRIVE INOPERATIVE

If Drive Motor is not running check Connector J103 for good connection. Check for 1.1 ohms between pin 3 of Connector J103 and ground. If the resistance is more than 1.1 ohms check resistor R139. Check resistances of the Drive Motor windings, 7.8 ohms between pins 3 and 4, 9.1 ohms between pins 4 and 5 of Connector J103 and 178.5 ohms bces of the Drive Motor windings, 7.8 ohms between pins 3 and 4, 9.1 ohms between pins 4 and 5 of Connector J103 and 178.5 ohms between pin 1 of Connector J105 and pin 3 of Connector J101. If resistances are not correct, replace Drive Motor (M2).

If Drive Motor is good, check voltage on pin 25 of PIA IC (A104), it should measure about .1V when the Disk Drive is at rest and 5V when running. Check for a logic Low on pin 14 of IC A104 when Drive is running and a logic High when Drive is at rest. If the voltage and logic readings are not correct on pins 14 and 25 of IC A104, check PIA IC (A104), Controller IC (A105), CPU IC (A101) and ROM IC (A102) by substitution.

STEPPING MOTOR INOPERATIVE

Check for 12V at pins 1 thru 5 of Connector J102. If voltage is missing at pin 5 of Connector J102 check for 12V at pin 20 of Connector J106. If the voltage is missing at pins 1 thru 4 of Connector J102, check resistances of Stepping Motor windings, 75 Ohms between pin 5 and pins 1 thru 4 of Connector J102. If any winding checks open replace Stepping Motor.

GENERAL OPERATING INSTRUCTIONS

Connect an ATARI 400 or 800 Computer to the Disk Drive. Load Disk Drive with DOS. Turn Disk Drive On then turn Computer On, Disk Drive will boot the DOS program. If DOS 1.0 or 2.0 is used, strike the Return Key to display the DOS menu. If DOS 2.5 is used the DOS menu will come up automatically. NOTE: If the Basic cartridge is installed in the Computer, type DOS and press the Return key to display the menu. To display the current disk directory, select menu option A and press the Return Key twice. If there is more than one Disk Drive connected to the Computer, select the drive desired by typing D1: or D2: then press the Return key.

FORMATTING A DISKETTE

A blank diskette must be formatted before it can be used. DOS Menu I will format a new diskette. To boot a formatted diskette use the DOS menu H.

LOADING PROGRAMS IN BASIC

To run the Disk Drive with Basic select DOS menu B. Type Run "D1:name.Ext" and press the return key.

SAVING BASIC PROGRAMS

To save a Basic program to the Disk Drive, type SAVE "D1:program name" and press the Return Key.

ERROR CODES

NUMBER	MEANING	REMARKS
2	Out of Memory	Not enough RAM to run the program.
128	Break Abort	Appears if Break key is pressed while a program is running.
135	Read-Only Error	Trying to write to protected diskette.
138	Device Time-Out	
144	Disk Error	
162	Disk Full	Disk has no more sectors.
165	Bad File Name	
167	File Locked	Files cannot be modified before being unlocked.
169	Directory Full	Directory limit is 64 Files.
170	File Not Found	File not in the current disk directory.

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

Remove four rubber feet from cabinet bottom. Remove four philips screws from cabinet bottom. Place Disk Drive upright and remove cabinet top.

BASE PLATE AND FRONT PANEL REMOVAL

Remove five screws holding common base plate to cabinet bottom and remove base plate from cabinet bottom. Remove the front panel from the base plate.

SIDE (CPU) BOARD REMOVAL

Disconnect Connectors J101 (Write Protect Connector) and

J102 (Stepping Motor Connector) from the Side board. Remove three screws holding Side board and ground shield to base plate. Disconnect Side board from Rear board by lifting the Side board straight up until Connector J106 is disconnected from Rear board. Remove RF shield from Side board.

REAR (ANALOG) BOARD REMOVAL

Remove Side board from base plate. Disconnect Connector J103 (Drive Motor Connector) from Rear board. Disconnect Connector J109 (HEAD I/O Connector) from Rear board. Remove four screws holding Rear board to base plate. Lift Rear board carefully from right side to disconnect Connectors J10 and J105. Remove Rear board from base plate.

SCHEMATIC NOTES

—*— Circuitry not used in some versions

--- Circuitry used in some versions

• See parts list

⚡ Ground

Waveforms and voltages taken from ground, unless noted otherwise.

Waveforms taken with triggered scope and Sweep/Time switch in Calibrate position, scope input set for DC coupling on 0 reference voltage waveforms. Switch to AC input to view waveforms after DC reference is measured when necessary. Each waveform is 7cm. width with DC reference voltage given at the bottom line of each waveform.

Time in μ sec. per cm, given with p-p reading at the end of each waveform.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltages maintained as shown at input.

Voltages measured with digital meter, no signal.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less, 5% unless noted.

Electrolytic capacitors are 50 volts or less, 20% unless noted.

Resistors are $\frac{1}{2}W$ or less, 5% unless noted.

Value in () used in some versions.

Measurements with switching as shown, unless noted.

An Atari 800 Computer was used to operate the Disk Drive. Voltages, Waveforms, and Logic readings were taken while running the following Basic program.

```
10 PRINT "THIS IS A DISK TEST"
20 OPEN #7,8,0,"D:SAMS.FIL"
30 FOR X = 1 TO 200
40 PRINT #7 "THIS IS A DISK TEST"
50 NEXT X
60 CLOSE #7
70 GOTO 10
```

Logic Probe Display

L = Low

H = High

P = Pulse

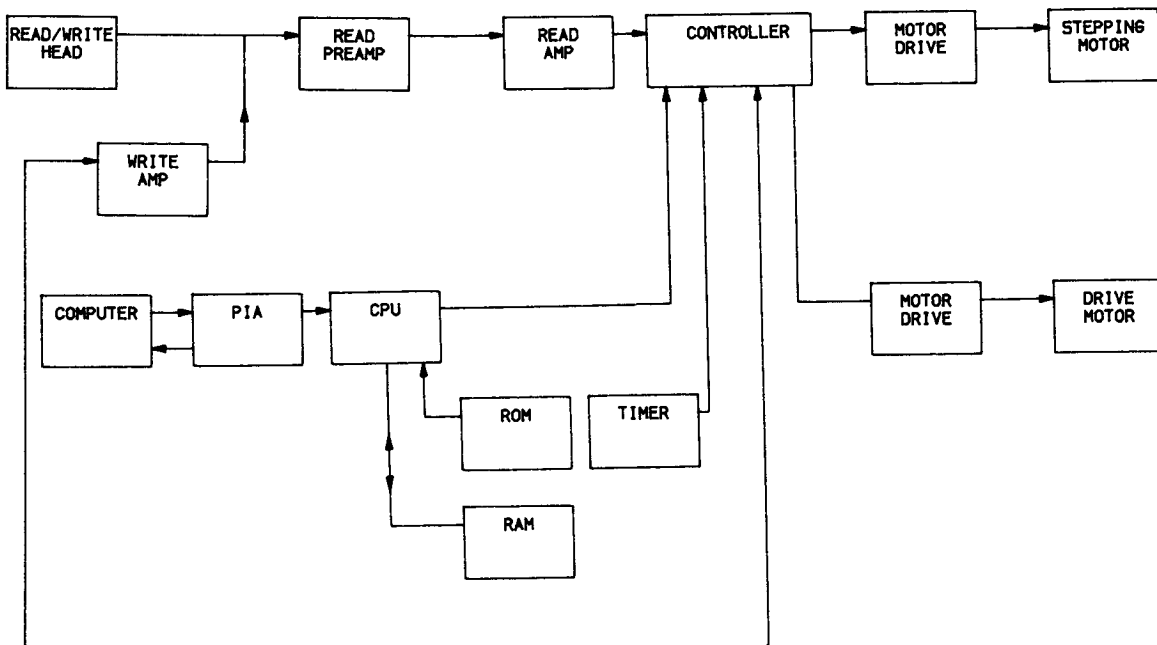
* = Open (No Light On)

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LINE DEFINITIONS

A0 THRU A11 Address
CLK Clock
CS, CS1 Chip Select Lines
CS3 Clocking Signal
D0 THRU D7 Data
DINT Disk Initialization
DRQ Data Request
HLT Head Load Timing
ICR Interrupt Request
IRQ Index Pulse
MR Master Reset
PA1, PA4, PA6, PA7 Port A Bits 1, 4, 6, 7

PB2, PB3, PB4, PB5 Port B Bits 2, 3, 4, 5
R/W Read/Write
RDY Ready, Disk Read/Write
RE Read Enable
RESET Reset
TEST Test
TR00 Track 00 Sensor
WD Write Data
WE Write Enable
WF Write Fault
WG Write Gate
WPT Write Protect



SAFETY PRECAUTIONS

1. Use an isolation transformer for servicing.
2. Maintain AC line voltage at rated input.
3. Remove AC power from the Disk Drive before servicing or installing electrostatically sensitive devices. Examples of typical ES devices are integrated circuits and semiconductor "chip" components.
4. Use extreme caution when handling the printed circuit boards. Some semiconductor devices can be damaged easily by static electricity. Drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available discharging wrist strap device. This should be removed prior to applying power to the unit under test.
5. Use a grounded-tip, low voltage soldering iron.
6. Use an isolation (times 10) probe on scope.
7. Do not remove or install board with AC power On.
8. Do not use freon-propelled sprays. These can generate electrical charges sufficient to damage semiconductor devices.
9. This Disk Drive is equipped with a grounded three-pronged AC plug. This plug must fit into a grounded AC power outlet. Do not defeat the AC plug safety feature.
10. Periodically examine the AC power cord for damaged or cracked insulation.
11. The Disk Drive cabinet is equipped with vents to prevent heat build-up. Never block, cover, or obstruct these vents.
12. Instructions should be given, especially to children, that objects should not be dropped or pushed into the vents of the cabinet. This could cause shock or equipment damage.
13. Never expose the Disk Drive to water. If exposed to water turn the unit off. Do not place the Disk Drive near possible water sources.
14. Never leave the Disk Drive unattended or plugged into the AC outlet for long periods of time. Remove AC plug from AC outlet during lightning storms.
15. Do not allow anything to rest on AC power cord.
16. Unplug AC power cord from outlet before cleaning Disk Drive.
17. Never use liquids or aerosols directly on the Disk Drive. Spray on cloth and then apply to the Disk Drive cabinet. Make sure the Disk Drive is disconnected from the AC power line.

LOGIC CHART

PIN NO.	IC A101	PIN NO.	IC A101	PIN NO.	IC A102	PIN NO.	IC A102	PIN NO.	IC A103	PIN NO.	IC A103
1	H	15	P	1	P	13	P	1	L	13	P
2	L	16	P	2	P	14	P	2	P	14	L
3	H	17	L	3	P	15	P	3	P	15	L
4	H	18	P	4	P	16	P	4	P	16	P
5	P	19	P	5	P	17	H	5	P	17	P
6	P	20	P	6	P	18	H	6	P	18	P
7	P	21	P	7	P	19	P	7	P	19	P
8	P	22	P	8	P	20	P	8	P	20	P
9	P	23	P	9	P	21	P	9	P	21	P
10	P	24	P	10	P	22	P	10	P	22	P
11	P	25	P	11	P	23	P	11	P	23	P
12	P	26	P	12	L	24	P	12	P	24	H
13	P	27	P								
14	P	28	P								

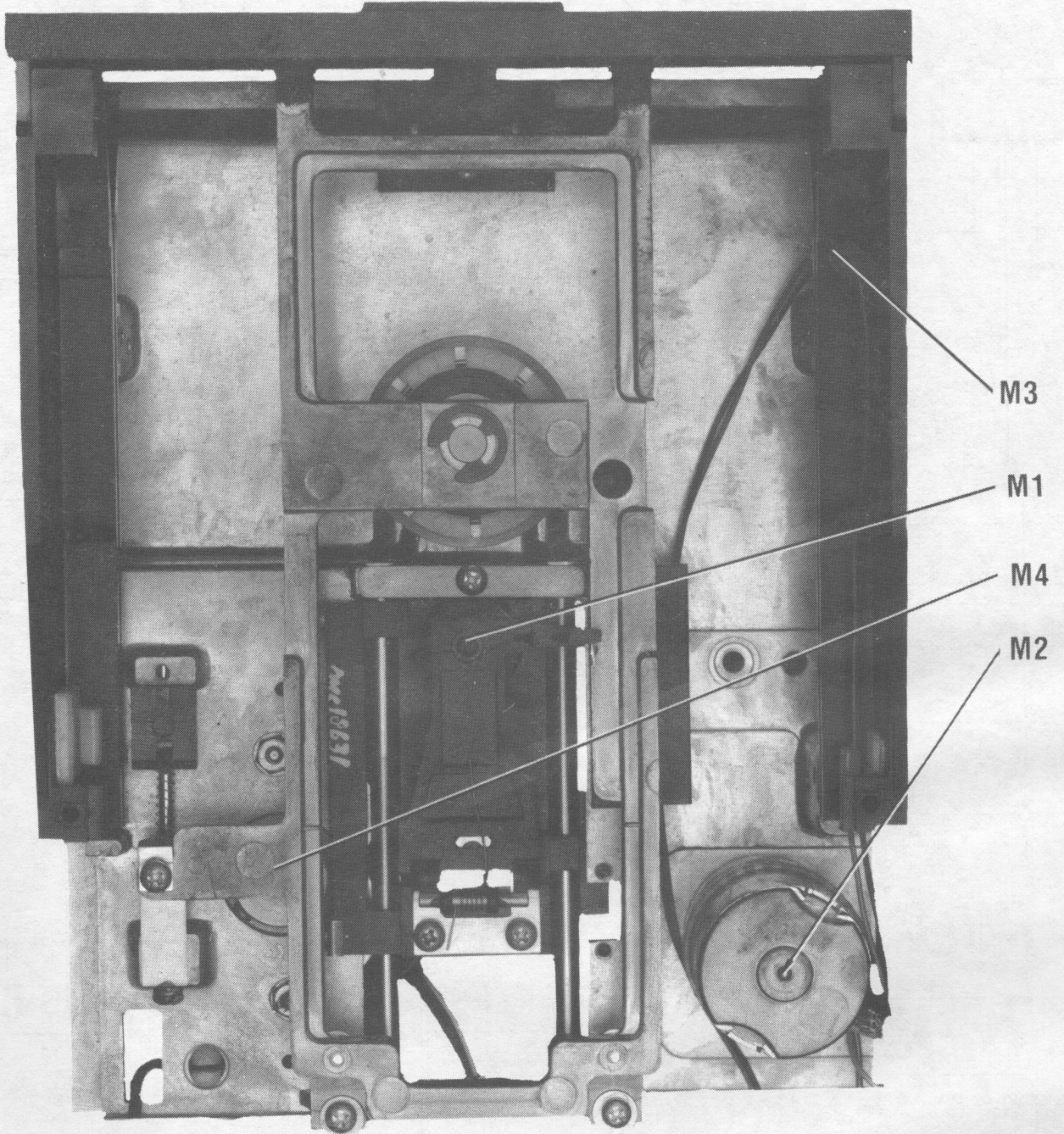
PIN NO.	IC A104	PIN NO.	IC A104	PIN NO.	IC A105	PIN NO.	IC A105	PIN NO.	IC Z101	IC Z102	IC Z103	IC Z104	IC Z105
1	L	21	*	1	L	21	H	1	P	P	P	P	P
2	P	22	P	2	P	22	H	2	P	P	P	L	P
3	P	23	L	3	P	23	H	3	P	P	P	P	P
4	P	24	P	4	P	24	P	4	L	P	P	P	L
5	P	25	H	5	P	25	H	5	P	P	P	P	P
6	P	26	P	6	P	26	H	6	L	P	P	P	L
7	P	27	P	7	P	27	P	7	L	L	L	L	L
8	H	28	P	8	P	28	L	8	L	P	P	P	L
9	*	29	P	9	P	29	L	9	P	P	P	H	P
10	H	30	P	10	P	30	P	10	L	P	H	P	L
11	H	31	P	11	P	31	P	11	P	P	L	P	P
12	L	32	P	12	P	32	H	12	P	P	L	P	P
13	H	33	P	13	P	33	H	13	P	H	H	P	P
14	P	34	H	14	P	34	H	14	H	H	H	H	H
15	P	35	P	15	P	35	H	15					
16	P	36	P	16	P	36	H	16					
17	P	37	P	17	P	37	H	17					
18	P	38	P	18	*	38	P	18					
19	P	39	P	19	H	39	P	19					
20	H	40	P	20	L	40	H	20					

L = Low

H = High

P = Pulse

* = Open No light On.



PRELIMINARY SERVICE CHECKS

This data provides the user with a time-saving service tool which is designed for quick isolation and repair of Disk Drive malfunctions.

Check all interconnecting cables for good connection and correct hookup before making service checks.

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

Remove four rubber feet from cabinet bottom. Remove four philips screws from cabinet bottom. Place Disk Drive upright and remove cabinet top.

BASE PLATE AND FRONT PANEL REMOVAL

Remove five screws holding common base plate to cabinet bottom and remove base plate from cabinet bottom. Remove the front panel from the base plate.

SIDE (CPU) BOARD REMOVAL

Disconnect Connectors J101 (Write Protect Connector) and J102 (Stepping Motor Connector) from the Side board. Remove three screws holding Side board and ground shield to base plate. Disconnect Side board from Rear board by lifting the Side board straight up until Connector J106 is disconnected from Rear board. Remove RF shield from Side board.

REAR (ANALOG) BOARD REMOVAL

Remove Side board from base plate. Disconnect Connector J103 (Drive Motor Connector) from Rear board. Disconnect Connector J109 (HEAD I/O Connector) from Rear board. Remove four screws holding Rear board to base plate. Lift Rear board carefully from right side to disconnect Connectors J10 and J105. Remove Rear board from base plate.

TEST EQUIPMENT AND TOOLS

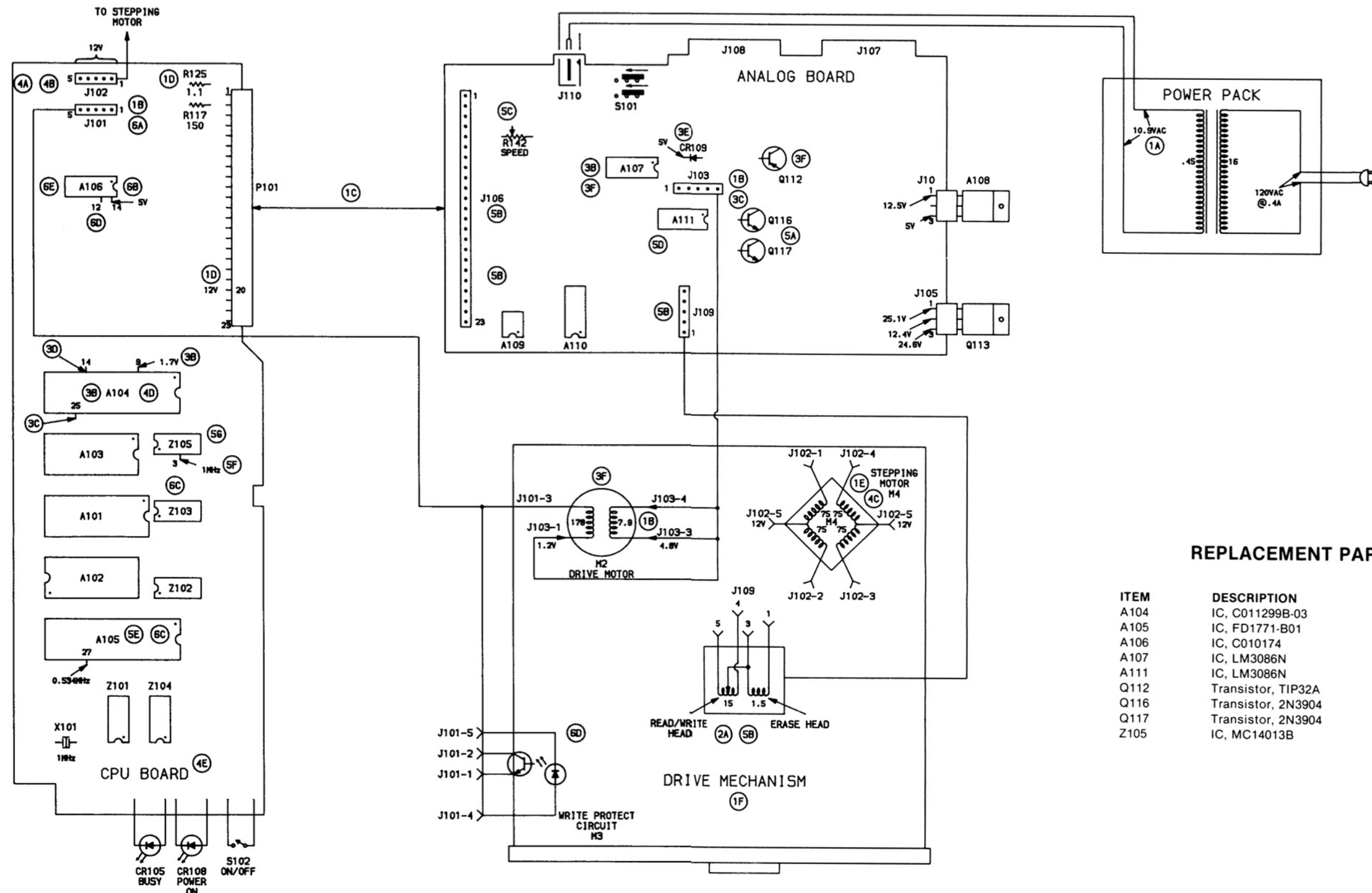
TEST EQUIPMENT

Digital Volt/Ohm Meter
Logic Probe

TOOLS

Phillips Screwdriver
Methyl alcohol or 91% isopropyl alcohol
Cotton swabs or lint-free cloth
Spray contact cleaner

PRELIMINARY SERVICE CHECKS (Continued)



CD9 ATARI
MODEL 810

REPLACEMENT PARTS

ITEM	DESCRIPTION
A104	IC, C011299B-03
A105	IC, FD1771-B01
A106	IC, C010174
A107	IC, LM3086N
A111	IC, LM3086N
Q112	Transistor, TIP32A
Q116	Transistor, 2N3904
Q117	Transistor, 2N3904
Z105	IC, MC14013B

PRELIMINARY SERVICE CHECKS (Continued)

SERVICE CHECKS

MATCH THE NUMBERS ON THE INTERCONNECTING DIAGRAM AND PHOTOS WITH THE NUMBERS ON THE SERVICE CHECKS TO BE PERFORMED.

①

POWER SUPPLY

- (A) No power, check for 10.9V AC at output of power pack. If 10.9V AC is missing replace power pack.
- (B) If Power LED is ON and Drive Motor does not run, check resistances of Drive Motor windings. If resistance is not correct, replace Drive Motor.
- (C) Stepping Motor (M4) does not run. Check Connector P101 on the CPU board and Connector J106 on the Analog board for good connections.
- (D) If Stepping Motor still does not run, check for 12V at pin 20 of Connector P101, if 12V is present, check Resistor R125 for 1.1 Ohms.
- (E) If Resistor R125 is open check resistances of Stepping Motor (M4) windings.
- (F) If resistances of Stepping Motor are not correct replace the drive mechanism.

②

DISK OPERATION IS ERRATIC

- (A) Clean the Head with a lint free cloth dampened with 91% isopropyl alcohol.
NOTE: Head cleaning diskettes are not recommended because they may be too abrasive.

③

DRIVE MOTOR DOES NOT TURN DISK

- (A) Check drive belt.
- (B) Check for 1.7V on pin 9 of PIA IC (A104) if voltage is not present check IC's A104 and A107 by substitution.
- (C) Check voltage at pin 25 of PIA IC (A104), if -5V check Connector J103 for good connections.
- (D) Check logic reading on pin 14 of PIA IC (A104), it should go logic Low when the drive is running, then change to logic High when the drive stops. If logic reading is not correct check IC A104 by substitution.
- (E) Check for 5V at the cathode of Diode CR109.
- (F) If 5V is present check the Drive Motor. If 5V at the cathode of CR109 is missing check Motor Drive IC (A107) and Switch Transistor (Q112).

④

STEPPING MOTOR INOPERATIVE

- (A) Check Connector J102 for loose connection.
- (B) Check for 12V at pins 1 thru 5 of J102.
- (C) If voltage is missing at any pin of J102 check resistances of Stepping Motor windings. If resistances are not correct replace the Drive Mechanism.
- (D) If 12V is present on all pins of Connector J102 check PIA IC (A104) by substitution.
- (E) If IC A104 is good and the Stepping Motor still does not operate, replace the CPU board.

⑤

WRITE FUNCTION INOPERATIVE

- (A) Check Erase Transistors (Q116 and Q117).
- (B) Clean the Read/Write Head and check Connector J109 for good connections.
- (C) Check adjustment of Speed Control (R142).
- (D) Check the Write Amp IC (A111) by substitution.
- (E) Check Controller IC (A105) by substitution.
- (F) Check 1MHz clock at pin 3 of IC Z105.
- (G) Check Flip/Flop IC (Z105) by substitution.

⑥

WRITE PROTECT DOES NOT FUNCTION

- (A) Check Connector J101 for good connections.
- (B) Check for 5V at pin 14 of Amp IC (A106) with a write protected disk inserted in the Disk Drive.
- (C) If 5V is present check IC's A105 and Z103 by substitution.
- (D) If 5V is missing check voltage at pin 12 of IC A106. If voltage measures about 0.8V check the Write Protect Sensor (M3) by substitution.
- (E) If the voltage at pin 12 of IC A106 measures 0V check IC A106 by substitution.

PRELIMINARY SERVICE CHECKS (Continued)

GENERAL OPERATING INSTRUCTIONS

Connect an ATARI 400 or 800 Computer to the Disk Drive. Load Disk Drive with DOS. Turn Disk Drive On then turn Computer On, Disk Drive will boot the DOS program. If DOS 1.0 or 2.0 is used, strike the Return Key to display the DOS menu. If DOS 2.5 is used the DOS menu will come up automatically. NOTE: If the Basic cartridge is installed in the Computer, type DOS and press the Return key to display the menu. To display the current disk directory, select menu option A and press the Return Key twice. If there is more than one Disk Drive connected to the Computer, select the drive desired by typing D1: or D2: then press the Return key.

FORMATTING A DISKETTE

A blank diskette must be formatted before it can be used. DOS Menu I will format a new diskette. To boot a formatted diskette use the DOS menu H.

LOADING PROGRAMS IN BASIC

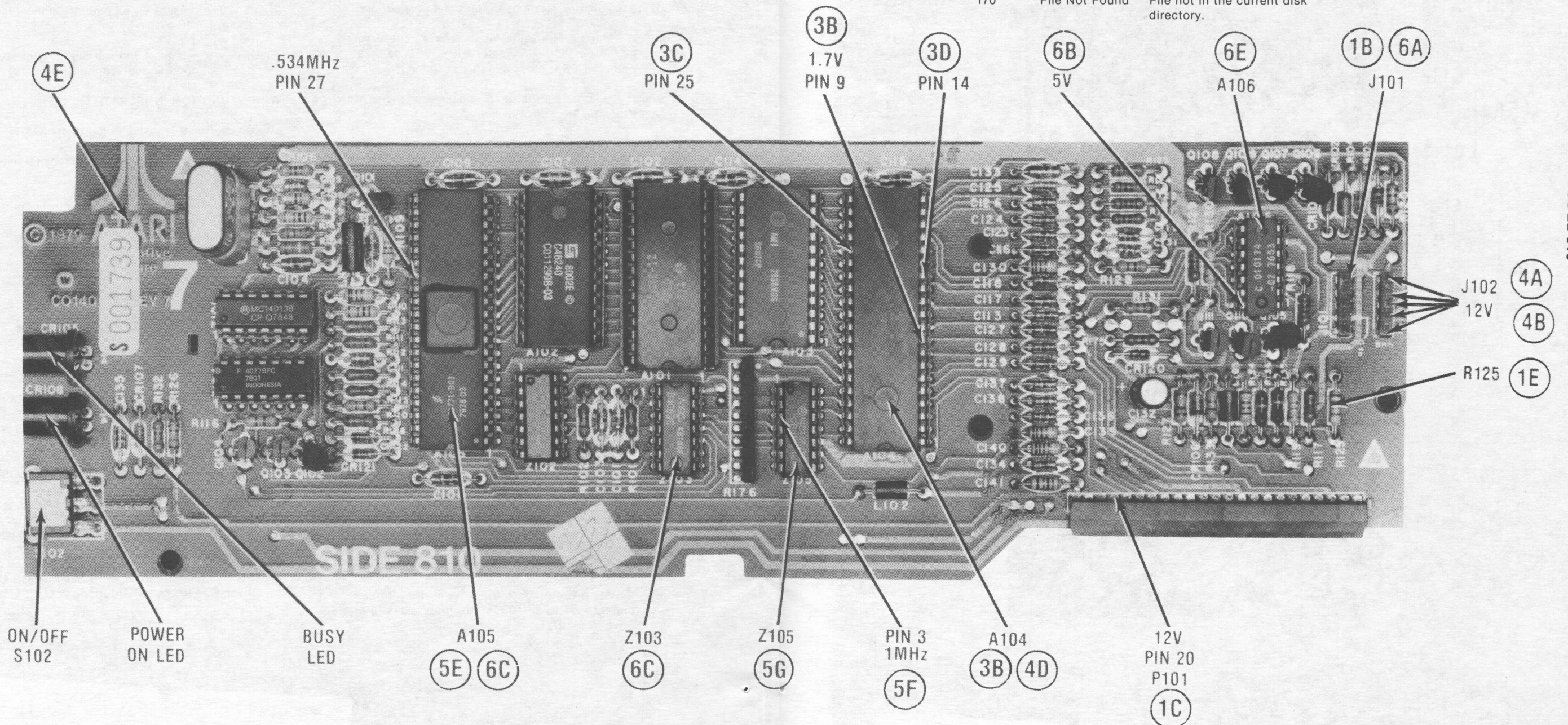
To run the Disk Drive with Basic select DOS menu B. Type Run "D1:name.Ext" and press the return key.

SAVING BASIC PROGRAMS

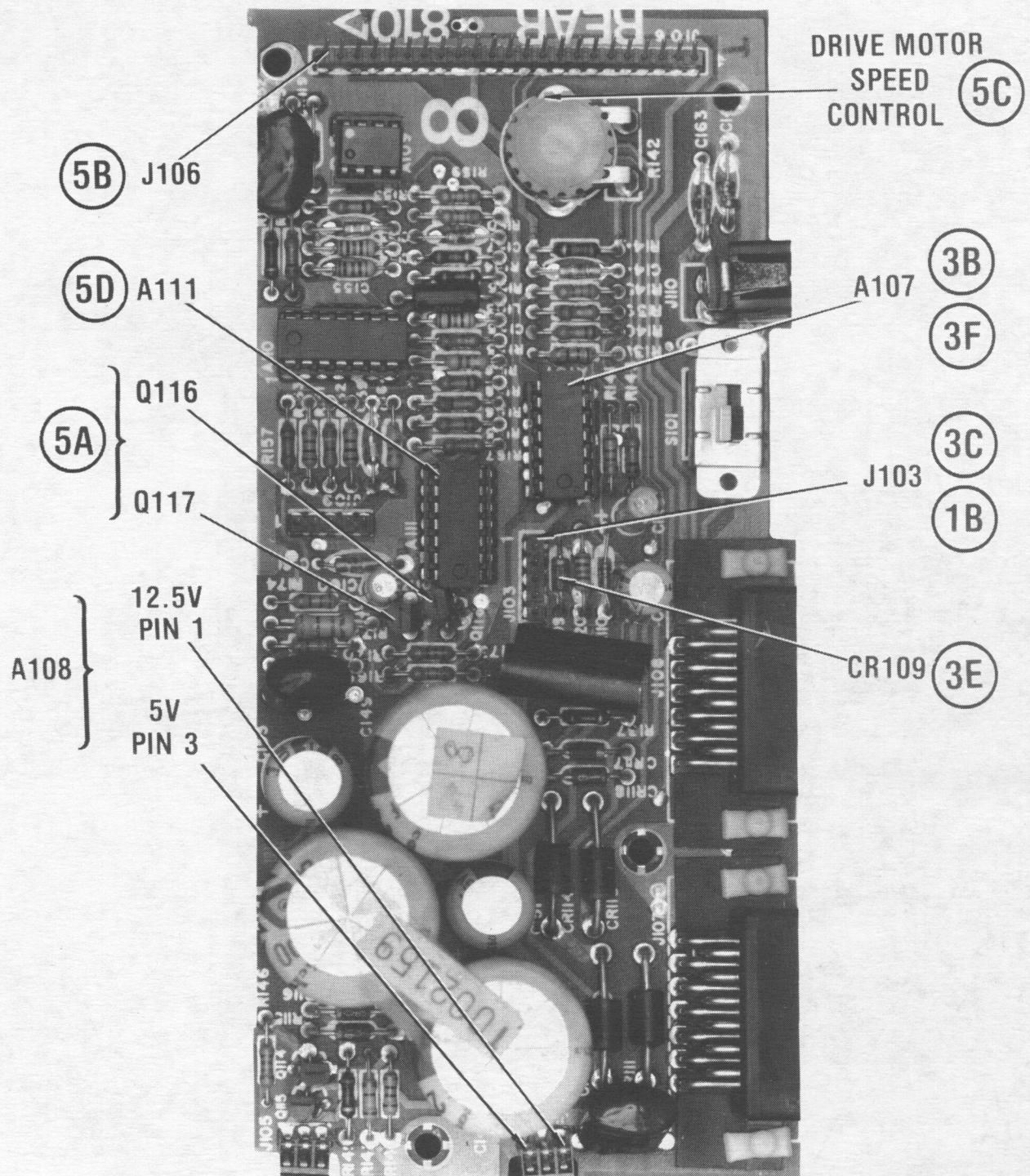
To save a Basic program to the Disk Drive, type SAVE "D1:program name" and press the Return Key.

ERROR CODES

NUMBER	MEANING	REMARKS
2	Out of Memory	Not enough RAM to run the program.
128	Break Abort	Appears if Break key is pressed while a program is running.
135	Read-Only Error	Trying to write to protected diskette.
138	Device Time-Out	
144	Disk Error	
162	Disk Full	Disk has no more sectors.
165	Bad File Name	
167	File Locked	Files cannot be modified before being unlocked.
169	Directory Full	Directory limit is 64 Files.
170	File Not Found	File not in the current disk directory.



PRELIMINARY SERVICE CHECKS (Continued)



PRELIMINARY SERVICE CHECKS (Continued)

PREVENTATIVE MAINTENANCE

ENVIRONMENT

Computers perform best in a clean, cool area that is below 80 degrees Fahrenheit and free of dust and smoke particles. Even though home Computers are not affected by cigarette smoke as much as commercial Computers are affected, it is better to maintain a smoke-free area around the Computer. Do not block cabinet vents of any of the Computer system; Computer, Monitor, Printer, or other power devices.

ELECTRICAL POWER

Variations in the line voltage can affect the Computer. Try to avoid these fluctuations by using an AC receptacle that is on a power line not used by appliances or other heavy current demand devices. A power-surge protector, power-line conditioner, or non-interruptible power supply may be needed to cure the problem. **Do not** switch power On and Off frequently.

KEYBOARD

Liquids spilled into the Keyboard can ruin it. Immediately after a spill occurs, disconnect the Computer power plug from AC power outlet. Then, if circuitry or contacts are contaminated, disassemble the Keyboard and carefully rinse the Keyboard printed circuit board with distilled water and let it dry. Use a cotton swab to clean between the keys. Use a non-abrasive contact cleaner and lint-free wipers on accessible connectors and contacts.

DISK DRIVES

Clean the read/write heads of the Disk Drives about once a month or after 100 hours usage. Use only an approved head cleaning kit.

Handle carefully to preserve proper disk head alignment. A sudden bump or jolt to the Disk Drives can knock the disk head out of alignment. If the disk drive must be transported, place an old disk in slot and close door during transport.

Store disks in their protective covers and never touch the disk surface. Observe the disk handling precautions usually found on the back of disk protective covers.

PRINTERS

Carefully vacuum the Printer regularly. Wipe surface areas clean using a light all-purpose cleaner. Do not oil the machine. The oil will collect abrasive grit and dust. The dust will act as a blanket. This can cause components to overheat and fail.

STATIC ELECTRICITY

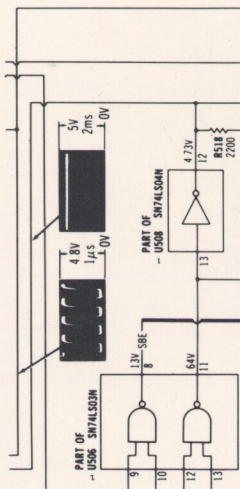
Static electricity discharge can affect the Computer. In order to minimize the possibility, use anti-static mats, sprays, tools and materials, and maintain good humidity in the Computer environment.

MONITOR

Use an isolation transformer with any Monitor that does not come as part of the system since some Monitors use a HOT chassis (chassis connected to one side of the AC line). The face of the Monitor should never be left on for long periods of time at high brightness level except when pattern is being changed periodically. Use caution when cleaning anti-glare screens, to preserve the glare-reduction feature.

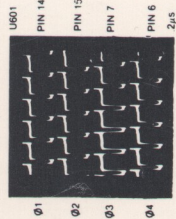
The following information is just a sample of the many valuable time saving features contained in this exclusive Sams **COMPUTERFACTS** publication:

- Preliminary Service Checks section is an easy to use, step by step guide for the experienced technician or hobbyist, and even beginners.
- SAMS famous industry accepted standardized notation schematics containing CIRCUITRACE®, GRIDTRACE™, waveforms, voltages and stage identification.



- Step by Step Troubleshooting guides the technician through the necessary procedures to quickly locate the problem.

TROUBLESHOOTING



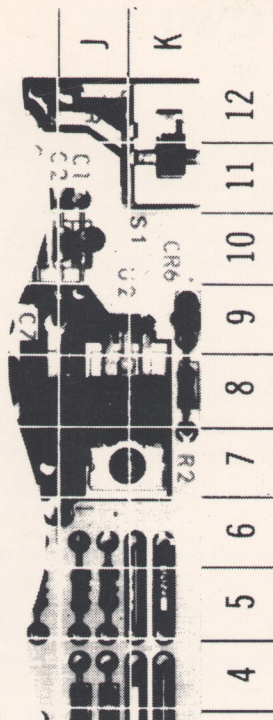
MICROPROCESSOR CHIP (CPU) OPERATION

Verify the processor is functioning by checking the signals on the address lines (pins 10 thru 24 of IC U6000) and the data lines (pins 41 thru 56) using a logic probe or a scope. If a logic probe is used, refer to the "Logic Chart" for the correct readings. If a scope is used, the waveforms on the address lines (except pins 22 and 23 which have no signal in Power Up mode) should be similar to Figure 1. The waveforms on the data lines should be similar to Figure 2.

- Logic Chart containing logic probe readings to isolate defective circuitry and components.

PIN NO.	IC U100	PIN NO.	IC U100	PIN NO.	IC U102	IC U103	IC U104	IC U105	IC U106	IC U107	IC U108	IC U109
1	P	21	P	1	J	J	J	J	J	J	J	J
2	P	22	P	2	P	P	P	P	P	P	P	P
3	P	23	P	3	P	P	P	P	P	P	P	H

- Quick Component Location using the SAMS exclusive **GridTrace**, **CircuitTrace**, and component photographs.



- Complete Components Parts List in an easy to use format with field replacements shown when possible. SAMS unique semiconductor, chip and IC cross-reference gives you many replacements to choose from and is available at your Electronic Distributor.

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	MFR. PART NO.	REPLACEMENT DATA					ZENITH PART NO.
			ECG PART NO.	GENERAL ELECTRIC PART NO.	MOTOROLA PART NO.	NTE PART NO.	RCA PART NO.	WORKMAN PART NO.
0102	15533	1149-2576	EC9819	GE-514	1N4935	NTE519	SK9091/177	MEP925/519
0103	15533	1149-2527	ECG109	1N60	1N4935	NTE519	SK3088	MEP134/109
0201	1N4004GP	1201-4205	ECG116	GE-504A	1N4004	NTE116	SK3312	MEP157
0503 thru 0503	15533	1149-2576	EC9519	GE-514	1N4935	NTE519	SK9091/177	MEP925/519

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