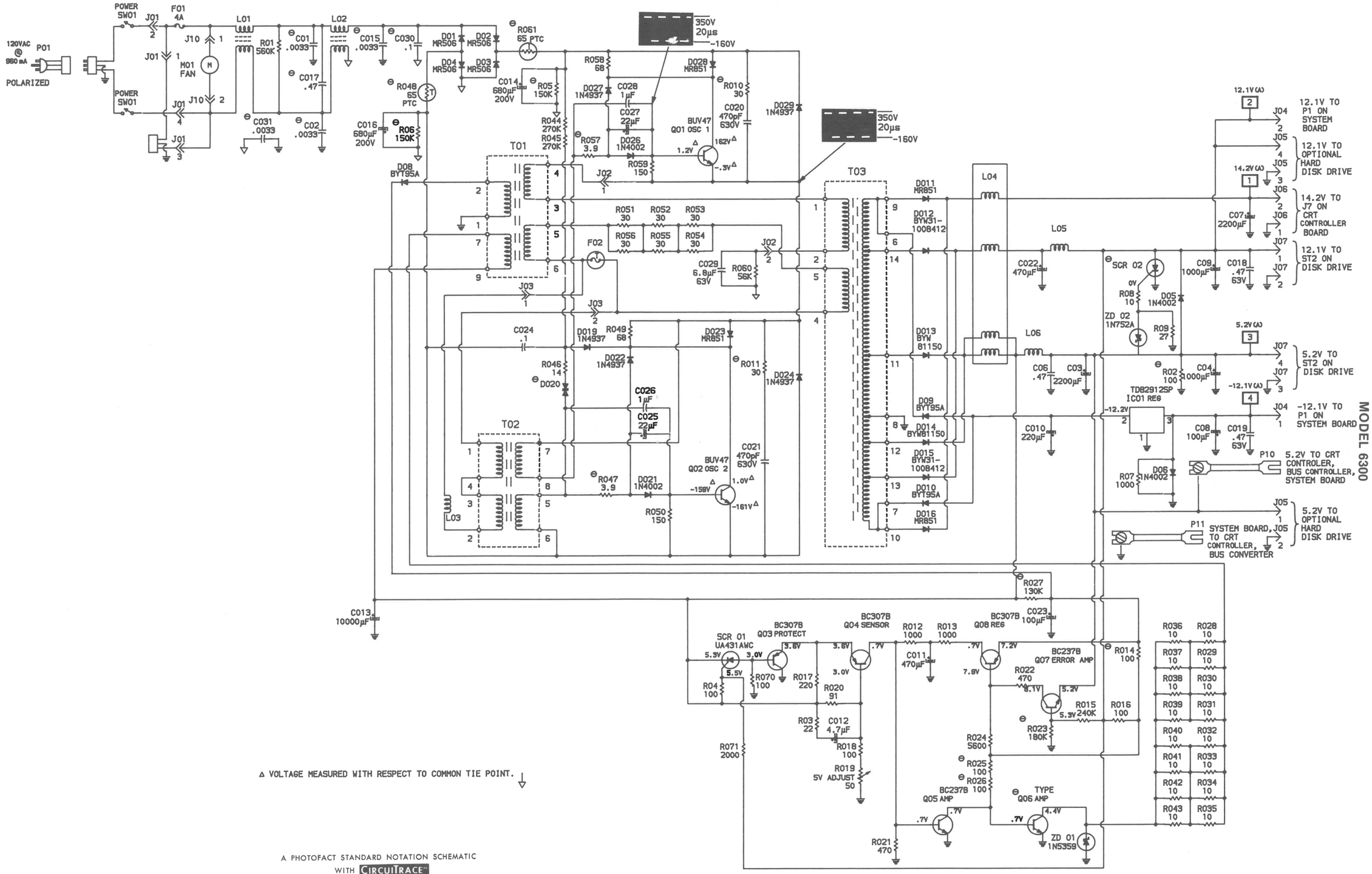


△ VOLTAGE MEASURED WITH RESPECT TO COMMON TIE POINT.

TROUBLESHOOTING (Continued)

SERIAL PORT

Serial port does not work. Disconnect any peripheral equipment connected to the Serial Port Connector (J3). Check the waveform at pin 16 of the Serial Interface IC (3R) and check the frequency (1.8432MHz). If the waveform is missing, check the waveform at pin 3 of IC 8X. If the waveform is present at pin 3 of IC 8X, check IC 8X. If the waveform is missing at pin 3 of IC 8X check IC 4S and Crystal 4R. If the frequency is not correct at pin 16 of IC 8X, check Crystal 4R. If waveform and frequency are good at pin 16 of IC 8X, plug in a Serial Loopback socket, see TEST PLUGS, Serial Loopback Socket into Connector J3. Type in and run the following Basic program:

```
10 OUT 1019,131
20 OUT 1016,128: OUT 1017,1
30 OUT 1019,3
40 OUT 1020,0: OUT 1020,15
50 OUT 1016,255: GOTO 40
```

The program sets the baud rate to 300 baud and causes pulses to appear at pins 11, 31, 32, 33 and 34 of IC 3R. The waveform at pin 11 of IC 3R should look like Figure A, pin 15 of IC 3R should look like Figure B and pins 31 thru 34 of IC 3R should look like Figure C. The peak to peak voltage on pins 31 and 34 of IC 3R should be 5V and pins 32 and 33 should be 3.0V.

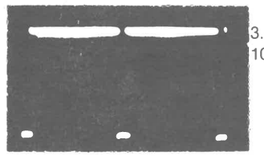


Figure A

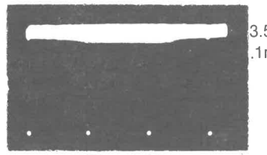


Figure B

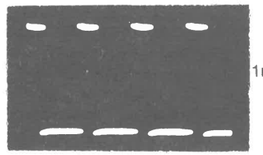


Figure C

While the program is runnning, check for pulses at pins 14, 18 and 21 of IC 3R. If pulses are missing at pin 14, check IC 6E. If pulses are missing at pin 18 or 21, check IC 10G. If pulses are present at pins 14, 18 and 21 of IC 3R, check the waveforms at pins 11, 15 and 31 thru 34 of IC 3R. If any waveform is missing or not correct check IC 3R. If the waveforms are correct, check for pulses at pins 6, 8 and 11 of Line Driver IC (1W). If pulses are missing at pin 6, 8, or 11 of IC 1W, check IC 1W and Diodes D1 and D2. If pulses are present at IC 1W, check for pulses at pins 3, 6, 8 and 11 of Line Receiver IC (2W) and pins 3, 6, and 8 of Line Receiver IC (2U). If pulses are missing at pins 3, 6, 8 or 11 of IC 2W, check IC 2W. If pulses are missing at pins 3, 6, or 8 of IC 2U, check IC 2U.

To check the Interrupt Request function (pin 30) of IC 3R, turn the Computer Off and remove the Serial Loopback socket from Connector J3. Turn the Computer back On, load BASICA and type in and run the following program:

```
10 OUT 1020,15: OUT 1017,15
20 OUT 1016,255: GOTO 10
```

While the program is running, check for a logic Low at pin 4 and pulses at pins 5 and 6 of IC 6X. If pin 4 does not read logic Low or pulses are missing at pin 5 of IC 6X, check IC 3R. If the readings are good at pins 4 and 5 and pulses are missing at pin 6 of IC 6X, check IC 6X.

REAL TIME CLOCK

Clock or calendar function does not work. Make sure jumpers C and E on the System Board are shorted, located next to the Real Time Clock IC (9D). Check the voltage of the 3V Battery (M1) on the System. Replace the Battery (M1) on the System. Replace the Battery if the voltage checks low. If the Jumpers and Battery check good, check the frequency of Crystal Y2 (32.768kHz) at pin 15 of IC 9D. If the frequency is not correct check Capacitors C95 and C96 and Crystal Y2. If the frequency checks good, type in and run the following Basic program.

```
10 CLS
20 LOCATE 1,1: PRINT TIME$: GOTO 20
```

While the program is running, check for pulses at pins 1, 2, and 3 of IC 9D. If pulses are missing at pin 1, check IC 8C. If pulses are missing at pins 2 or 3, check IC 7K. If pulses are present at pins 1, 2 and 3, check IC 9D.

POWER SUPPLY

5V ADJUST

Connect input of DC voltmeter to 5V terminal on power supply. If power supply has no load connected to it, connect two #1133 6 volt lamps in parallel to the 5V terminal and a 10 ohm, 20W resistor to the 12V terminal. Turn power supply On and adjust 5V Adjust Control (R1) for a voltage of 5.0V. R1 is located next to the connector for the Hard Disk Drive and can be accessed without removing the power supply board from the case.

POWER SUPPLY DESCRIPTION

When the AC Power Switch is closed 120VAC is applied to the Bridge Rectifier Diodes (D01 thru D04), developing 161V* at the cathode of D02 and – 161V* at the anode of D01. These voltages are applied to the collector of Transistor Q01 and the emitter of Transistor Q02 respectively. When this voltage is applied Transformers T01, T02 and T03 are pulsed into operation and continue to operate provided there are no defective components or defective circuitry. The pulses developed by Transformers T01, T02 and T03 are rectified by several diodes producing the desired source voltages. Windings on Transformers T01 and T02 inductively couple pulses to the base of Transistors Q01 and Q02 for turn On and turn Off signals. Should the AC voltage decrease Transistors Q01 and Q02 will remain turned On for a longer period of time causing a higher current. This increased current produces higher amplitude pulses which are rectified maintaining the desired output source voltages. If the AC voltage increases Transistors Q01 and Q02 will conduct for a shorter period of time causing less current. This produces lower amplitude pulses which keeps the output source voltage constant.

*Measured from isolated ground.

LOGIC CHART (Continued)

SYSTEM BOARD

PIN NO.	IC 4E	IC 4F	IC 4G	IC 4GH	IC 4K	IC 4L	IC 4M	IC 4Q	IC 4S	IC 4T	IC 4U	IC 5C	IC 5D	IC 5K
1	P	P	P	P	P	P	P	P	P	H	L	P	H	P
2	P	P	P	P	P	P	P	P	P	L	H	P	H	P
3	P	P	P	P	P	P	P	P	P	P	L	P	P	P
4	P	P	P	P	P	P	P	P	P	P	H	L	P	P
5	P	P	P	P	P	P	P	P	P	H	L	P	H	P
6	P	P	P	P	P	P	P	P	P	P	H	P	P	P
7	P	P	P	P	P	P	P	L	L	L	L	L	P	P
8	H	H	H	H	L	P	P	P	P	L	L	H	L	L
9	P	P	P	P	P	P	P	P	H	L	H	*	P	P
10	P	P	P	P	P	L	L	P	H	L	H	*	H	P
11	P	P	P	P	P	P	P	P	P	P	L	H	P	P
12	P	P	P	P	P	P	P	P	H	H	P	*	P	P
13	P	P	P	P	P	P	P	P	P	P	P	*	P	P
14	P	P	P	P	P	P	P	H	H	P	H	H	P	P
15	P	P	P	P	L	P	P			L			H	L
16	L	L	L	L	H	P	P			H			H	H
17						P	P							
18						P	P							
19						L	P							
20						H	H							

PIN NO.	IC 5P	IC 5Q	IC 5S	IC 5T	IC 5U	IC 5W	IC 6A	IC 6B	IC 6C	IC 6D	IC 6E	PIN NO.	IC 6E	IC
1	P	P	P	H	H	L	H	P	*	P	P	21	P	
2	P	P	H	H	L	H	P	P	*	P	P	22	P	
3	P	P	P	P	P	H	P	P	H	P	P	23	H	
4	P	P	H	H	H	L	L	L	H	P	P	24	H	
5	P	P	H	P	H	*	L	L	H	L	P			
6	P	P	H	L	P	L	L	H	L	P	P			
7	L	H	H	P	L	L	L	L	L	L	P			
8	P	L	L	L	H	L	P	H	P	P	H			
9	P	L	H	P	H	H	P	L	P	P	P			
10	P	H	H	L	H	L	H	L	P	P	P			
11	P	P	H	L	H	H	P	L	P	P	P			
12	P	L	H	P	L	L	P	H	L	P	L			
13	P	P	P	L	H	H	P	H	*	P	L			
14	H	L	P	P	H	H	H	H	H	H	P			
15		P	P	L							H			
16		H	H	P							P			
17				H							P			
18				P							P			
19				H							P			
20				H							P			

LOGIC CHART (Continued)

SYSTEM BOARD

PIN NO.	IC 2W	IC 3A	IC 3B	IC 3BC	IC 3C	IC 3D	IC 3E	IC 3F	IC 3G	IC 3GH	IC 3J	PIN NO.	IC 3J
1	L	P	P	P	P	P	P	P	P	P	L	21	L
2	L	P	P	P	P	P	P	P	P	P	P	22	P
3	H	P	P	P	P	P	P	P	P	P	P	23	H
4	L	P	P	P	P	P	P	P	P	P	P	24	P
5	L	P	P	P	P	P	P	P	P	P	P	25	P
6	H	P	P	P	P	P	P	P	P	P	P	26	P
7	L	P	P	P	P	P	P	P	P	P	P	27	P
8	H	H	H	H	H	H	H	H	H	H	H	28	P
9	L	P	P	P	P	P	P	P	P	P	P	29	P
10	L	P	P	P	P	P	P	P	P	P	P	30	H
11	H	P	P	P	P	P	P	P	P	P	P	31	H
12	L	P	P	P	P	P	P	P	P	P	P	32	P
13	L	P	P	P	P	P	P	P	P	P	P	33	L
14	H	P	P	P	P	P	P	P	P	P	P	34	P
15		P	P	P	P	P	P	P	P	P	P	35	P
16		L	L	L	L	L	L	L	L	L	P	36	P
17											L	37	P
18											P	38	P
19											P	39	P
20											L	40	H

PIN NO.	IC 3N	IC 3P	IC 3Q	IC 3R	PIN NO.	IC 3R	PIN NO.	IC 3U	IC 3W	IC 4A	IC 4B	IC 4BC	IC 4C	IC 4D
1	P	L	L	P	21	P	1	L	H	P	P	P	P	P
2	P	P	P	P	22	L	2	H	H	P	P	P	P	P
3	P	H	P	P	23	H	3	P	P	P	P	P	P	P
4	P	P	P	P	24	P	4	P	L	P	P	P	P	P
5	P	P	L	P	25	L	5	L	P	P	P	P	P	P
6	P	P	P	P	26	P	6	L	L	P	P	P	P	P
7	P	P	P	P	27	P	7	P	P	P	P	P	P	P
8	P	P	H	P	28	P	8	P	L	P	P	P	P	P
9	P	P	P	P	29	*	9	L	P	P	P	P	P	P
10	L	L	L	H	30	L	10	L	L	P	P	P	P	P
11	P	P	P	H	31	H	11	H	L	P	P	P	P	P
12	P	P	H	H	32	H	12	L	P	P	P	P	P	P
13	P	P	P	H	33	H	13	P	L	P	P	P	P	P
14	P	P	P	P	34	H	14	P	P	P	P	P	P	P
15	P	P	L	P	35	L	15	L	L	P	P	P	P	P
16	P	P	P	P	36	H	16	L	P	L	L	L	L	L
17	P	*	P	P	37	H	17	P	L					
18	P	P	P	P	38	H	18	P	L					
19	P	P	H	L	39	H	19	L	H					
20	H	H	H	L	40	H	20	H	H					

TROUBLESHOOTING (Continued)

POWER SUPPLY

Note: Use an isolation transformer with a step down control when servicing power supply. Disconnect power supply from Computer and Disk Drives to avoid possible damage from high voltages that may be produced while servicing power supply. Connect a load to the 5V source connector on the power supply. Two #1133 6 volt lamps in parallel may be used as a load for the 5V source. If lamps are used use caution to avoid possible burns as the lamps get very hot.

If there is no output from power supply, check AC Fuse (F01). If fuse is open, check Bridge Rectifier Diodes (D01 through D04), Transistors Q01, Q02, Electrolytics C014, C016, Capacitors C017 and C030. If fuse is good apply 120VAC and check for 173V* and – 172V* at the collector of Transistor Q01 and the emitter of Q02 respectively. If these voltages are missing, check the power switch and thermistors R048 and R061. If the voltages are present disconnect J02 and J03 and check for – 136V* at the emitter of Q01 and – 136V* at the collector of Q02. If these voltages are missing, check the components associated with Transistors Q01 and Q02. If the proper voltages are present on Q01 and Q02, check Transformers T01, T02, T03 and associated components for defects.

POWER SUPPLY SHUTDOWN

The Power Supply will shutdown if the 5V source should increase beyond a certain value. Zener Diode ZD2 will be triggered into conduction, triggering SCR (SCR02) which shuts down the Power Supply. Should this condition exist remove all loads from the Power Supply and check the source voltages. If all voltages are normal or less than normal, check Zener Diode (ZD2) and SCR2. If the source voltages are more than 10% higher check voltages and components associated with Transistors Q06, Q05, Q04, Q08, Q03 and SCR01.

Voltages Taken in Shutdown

Q06		Q05		Q08		Q01		Q02	
E	0V	E	0V	E	7.3V	E	1.4V	E	– 163V
B	.6V	B	.71V	B	6.2V	B	2.7V	B	– 162V
C	0V	C	.64V	C	7.0V	C	165V	C	2.5V

SCR2	
K	0V
G	0V
A	2.5V

TEST PLUGS

PARALLEL LOOPBACK PLUG

Use a male 25 pin subminiature "D" Connector (DB-25) and connect the following pins together: pin 1 to pin 13, pin 2 to pin 15, pin 12 to pin 14, pin 10 to pin 16, pin 11 to pin 17.

SERIAL LOOPBACK SOCKET

Use a female 25 pin subminiature "D" Connector (DB-25) and connect the following pins together: pin 1 to pin 7, pin 2 to pin 3, pin 4 to pin 5 and pin 8, pin 6 to pin 20 and pin 22, pin 11 to pin 21, pin 15 to pin 17 and pin 23, pin 18 to pin 25.

POWER SUPPLY INPUT BOARD

LOGIC CHART (Continued)

SYSTEM BOARD

PIN NO	IC 1B	IC 1D	IC 1E	IC 1F	IC 1G	IC 1J	IC 1K	IC 1L	IC 1M	IC 1N	IC 1Q	IC 1S	IC 1T	IC 1U
1	L	P	P	P	P	P	P	P	P	P	L	H	H	P
2	H	P	P	P	P	P	P	P	P	P	P	H	L	P
3	*	*	P	*	P	P	P	P	P	P	P	P	P	P
4	L	P	P	P	P	P	P	P	P	P	P	H	P	P
5	*	P	P	P	P	P	P	P	P	P	P	P	H	P
6	L	P	P	P	P	P	P	P	P	P	P	L	L	P
7	L	L	P	L	P	P	P	P	P	P	P	P	P	P
8	L	P	P	P	P	P	P	P	P	P	P	L	P	P
9	*	P	P	P	P	P	P	P	P	P	P	P	L	P
10	L	P	L	P	L	L	L	L	L	L	L	L	L	L
11	*	P	P	P	P	P	P	P	P	P	P	L	H	P
12	L	P	P	P	P	P	P	P	P	P	P	P	L	P
13	*	P	P	P	P	P	P	P	P	P	P	L	P	P
14	H	H	P	H	P	P	P	P	P	P	P	P	P	P
15			P		P	P	P	P	P	P	H	L	L	P
16			P		P	P	P	P	P	P	P	P	H	P
17			P		P	P	P	P	P	P	P	H	P	P
18			P		P	P	P	P	P	P	P	P	P	P
19			P		P	P	P	P	P	P	L	P	H	P
20			H		H	H	H	H	H	H	H	H	H	H

PIN NO.	IC 1W	IC 2A	IC 2B	IC 2BC	IC 2C	IC 2D	IC 2E	IC 2F	IC 2G	IC 2GH	IC 2N	IC 2P	IC 2Q	IC 2U
1	L	P	P	P	P	P	P	P	P	P	P	P	P	L
2	*	P	P	P	P	P	P	P	P	P	P	P	P	L
3	L	P	P	P	P	P	P	P	P	P	P	P	P	H
4	H	P	P	P	P	P	P	P	P	P	P	P	P	L
5	H	P	P	P	P	P	P	P	P	P	P	P	H	L
6	L	P	P	P	P	P	P	P	P	P	P	P	H	H
7	L	P	P	P	P	P	P	P	P	P	P	P	P	L
8	L	H	H	H	H	H	H	H	H	H	P	P	L	H
9	H	P	P	P	P	P	P	P	P	P	P	P	L	L
10	H	P	P	P	P	P	P	P	P	P	L	L	H	L
11	L	P	P	P	P	P	P	P	P	P	P	H	P	H
12	H	P	P	P	P	P	P	P	P	P	P	L	L	L
13	H	P	P	P	P	P	P	P	P	P	P	L	*	L
14	H	P	P	P	P	P	P	P	P	P	P	P	H	H
15		H	H	H	H	H	H	H	H	H	P	P	P	
16		L	L	L	L	L	L	L	L	L	P	P		
17											P	P		
18											P	H		
19											P	P		
20											H	H		

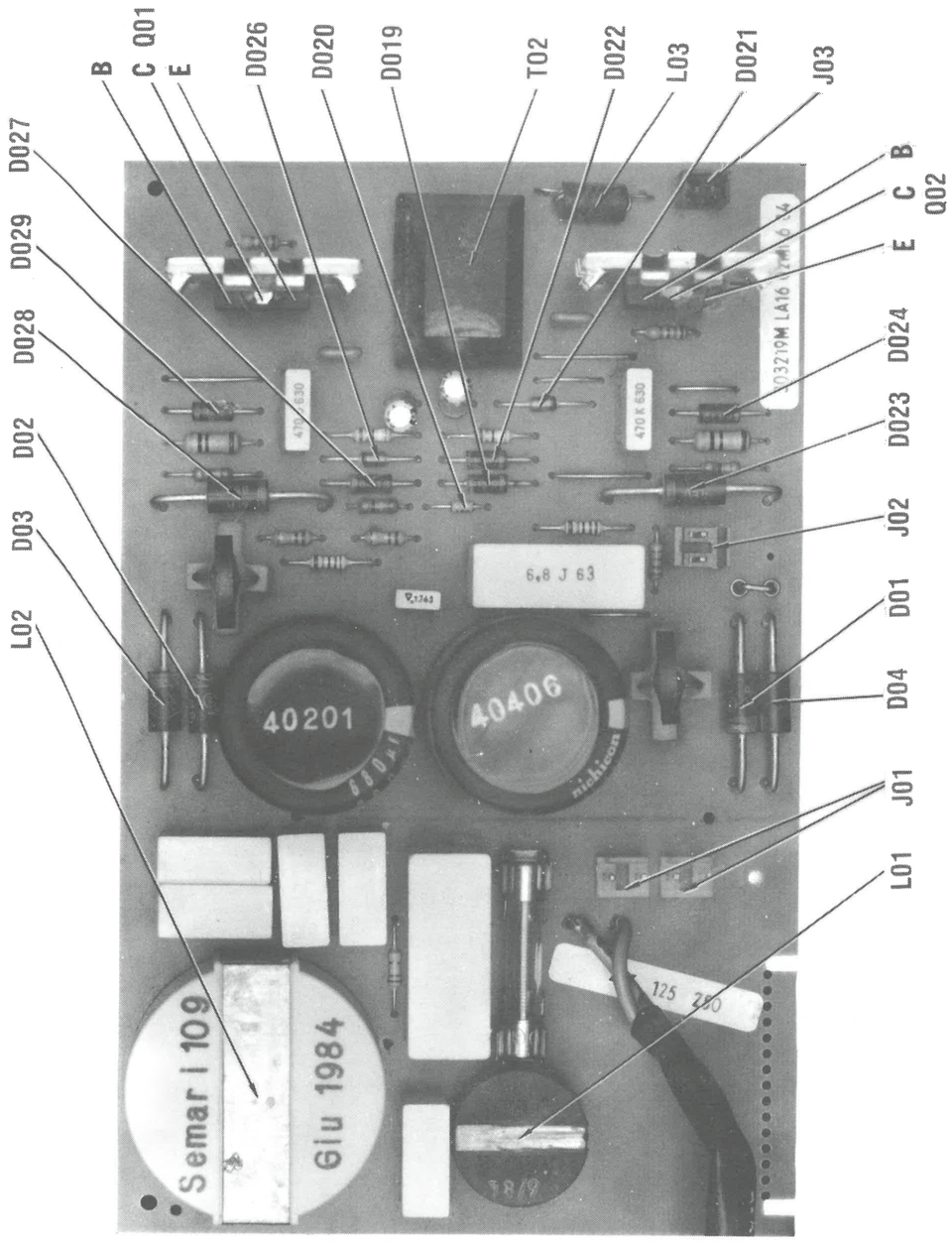
LOGIC CHART (Continued)

DISK DRIVE INTERFACE

PIN NO.	IC 8J	IC 8K	IC 8N	IC 8P	IC 8Q	IC 9H	IC 9J	IC 9K	IC 9L	PIN NO.	IC 9L	PIN NO.	IC 9N
1	P		H		P	P			L	21	P	1	H
2	H		H		P	H			P	22	P	2	L
3	H	P	P		P	L			P	23	P	3	P
4	P	P	P	P	P	L	P	P	P	24	P	4	P
5	P	P	H	P	P	L	P	P	P	25	P	5	H
6	P	P	L	H	P	L	P	P	P	26	H	6	L
7	H		P		P	L			P	27	H(11)	7	L
8	L	L	P	P	L	P	L(8)		P	28	P	8	L
9	P	H	L	L	P	P	L(3)		P	29	H(3)	9	H
10	P	H	L	P	P	P	H(8)		P	30	P	10	
11	P	L	H		P	P	L(3)		P	31	P	11	
12	P		L		P	L	L(3)		P	32	P	12	P
13	P		P		P	P	P		P	33	L(8)	13	P
14	P		P		P	H			P	34	L(1)	14	H
15	P		H		P				P	35	H		
16	H		H		H				P	36	H		
17			P						P	37	P		
18			P						P	38	L(6)		
19			L						P	39	L(3)		
20			H						L	40	H		

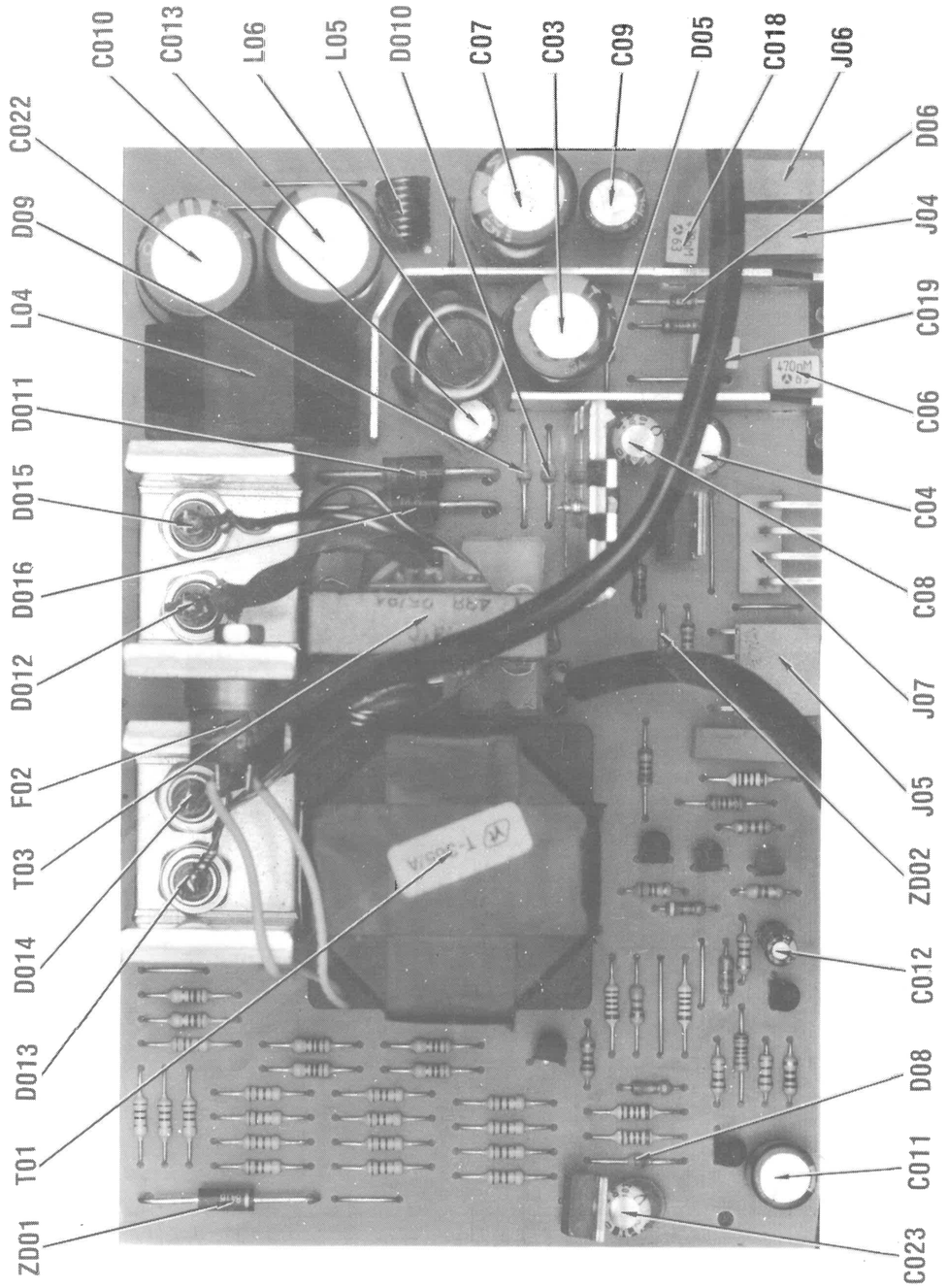
PIN NO.	IC 9P	IC 9Q	IC 9R	IC 9S	IC 10H	IC 10K	IC 10L	IC 10M	IC 10N	IC 10P	IC 10R	IC 10S
1	P	L	P	L	P	L(9)	L	L(3)	H(11)	L	P	H
2	P	P	H	H	P	H(8)	L	L(3)	H(11)	L	P	
3	P	H	P	P	P	H(2)	H	H(3)	L(10)	L	P	H
4	H	P	H	H	P	L(1)		L(6)	H	P	P	H
5	P	L	P	L	P			L(6)		P	P	L
6	P	H	P	H	P			H(7)		P	P	P
7	L	L	L	L	L			L		P	L	L
8	P	L	P	P	P	P	H	P		L		H
9	H	L	P	P	P	P	L	P		P	*	L
10	P	P	H	H	H	P	L	P		P	P	*
11	P	L	P	P		P	L	P		P	P	*
12	H	H	H	P		P	H	P		P	P	*
13	P	P	P	H		P	H	P		P	P	*
14	H	P	H	H				H		P	H	H
15		P								L		
16		H								H		

(1) Probe indicated H if diskette is write protected.
(2) Probe indicated L if diskette is write protected.
(3) Probe indicates P when Head is moving.
(6) Probe indicates H when Head is moving in and L when Head is moving out from the center of the diskette.
(7) Probe indicates L when Head is moving in and H when Head is moving out from the center of the diskette.
(8) Probe indicates H when the Head is on track 00 and L when off track 00.
(9) Probe indicates L when the Head is on track 00 and H when off track 00.
(10) Probe indicates L when Head 0 is selected, H when Head 1 is selected.
(11) Probe indicates H when Head 0 is selected, L when Head 1 is selected.



CSCS14
ATT
MODEL 6300

POWER SUPPLY INPUT BOARD



POWER SUPPLY REGULATOR BOARD

LOGIC CHART (Continued)

KEYBOARD

PIN NO.	IC U1	IC U2	IC U3	IC U4	IC U5	IC U6	PIN NO.	IC U6	PIN NO.	IC U7	PIN NO.	IC U7	PIN NO.	IC U8
1	H(1)	H	P	P	L	L	21	P	1	P	21	H	1	P
2	L(1)	H	P	P	P	P	22	P	2	P	22	P	2	P
3	P	L	*	P	P	P	23	P	3	P	23	P	3	P
4	L	H	L	P	L	H	24	P	4	P	24	H	4	P
5	L	H	*	*	P	H	25	H	5	P			5	P
6	H	L	L	L	P	P	26	H	6	P			6	P
7	L	H	L	L	L	H	27	H	7	P			7	P
8	H(4)	L	L	L	P	H	28	L(1)	8	P			8	L
9	L(2)	H	*	H	L	P	29	L(1)	9	P			9	P
10	H(4)	L	H(5)	L	P	P	30	L(2)	10	P			10	P
11	L(2)	H	L(3)	*	P	P	31	L(3)	11	P			11	P
12	H(1)	H	H(5)	L	L	P	32	H	12	L			12	P
13	L(1)	L	L(3)	H	P	P	33	H	13	P			13	P
14	H	H	H	H	H	P	34	L	14	P			14	P
15		H				P	35	H	15	P			15	P
16		H				P	36	H	16	P			16	H
17						P	37	H	17	P			17	
18						P	38	L(1)	18	L			18	
19						P	39	L	19	P			19	
20						L	40	H	20	P			20	

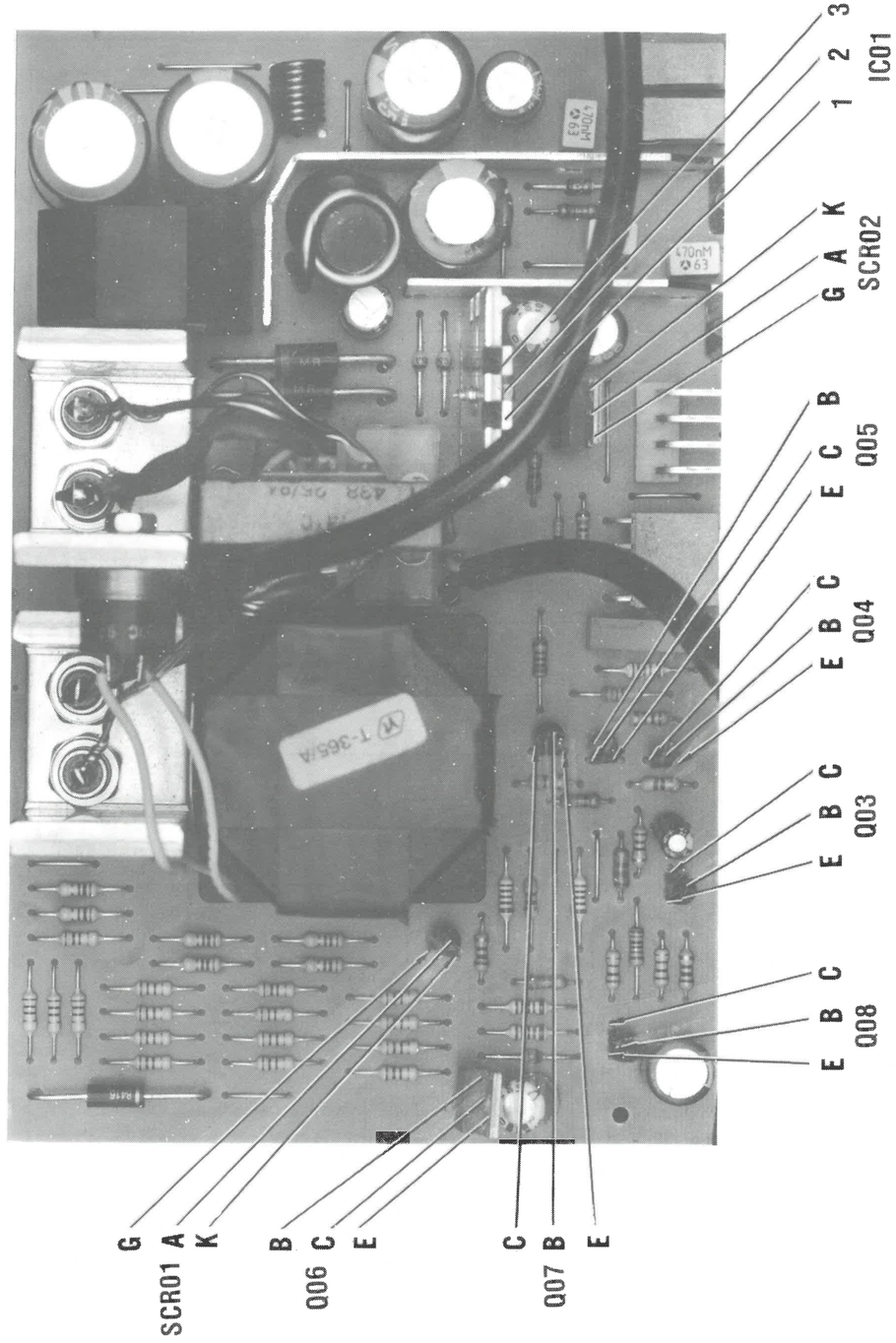
PIN NO.	IC U9	IC U10	IC U11	IC U12	IC U13	IC U14
1	P	L	L	H	H	H
2	P	P	P	H	H	H
3	P	P	P	H	H	H
4	P	P	P	*	H	*
5	P	P	P	H	P	H
6	P	P	P	*	L(1)	*
7	P	P	P	H	L	H
8	L	P	P	*	L	*
9	P	P	P	H	P	H
10	P	L	L	*	P	*
11	P	P	P	H	P	H
12	P	P	P	L	H	L
13	P	P	P	H	H	H
14	P	P	P	H	H	H
15	P	P	P		H	
16	H	P	P		H	
17		P	P			
18		P	P			
19		P	P			
20		H	H			

(1) Probe indicates P when a key is pressed.
(2) Probe indicates H if LED1 is on.
(3) Probe indicates H if LED2 is on.
(4) Probe indicates L if LED1 is on.
(5) Probe indicates L if LED2 is on.

LOGIC CHART

BUS CONVERTER BOARD

PIN NO.	IC U15	IC U16	IC U17	IC U18	IC U19	IC U20	IC U21	IC U22	IC U23	IC U24	IC U25	IC U26	IC U27	IC U28
1	P	L	H	H	H	P	H	P	P	*	L	H	H	H
2	P	P	H	P	P	P	H	P	P	*	P	H	P	P
3	P	P	H	P	P	P	H	P	P	H	P	L	L	P
4	P	H	H	P	P	P	H	P	P	P	H	L	L	P
5	P	H	H	P	P	P	H	P	H	H	H	H	L	P
6	P	H	H	P	P	H	L	H	P	H	L	H	L	P
7	L	H	L	P	P	L	L	L	L	L	L	H	H	L
8	P	L	H	P	P	H	L	H	P	H	L	L	L	P
9	P	P	H	P	P	P	L	H	H	H	*	L	P	P
10	H	P	H	L	L	H	L	P	P	H	*	P	H	P
11	L	P	H	L	P	H	L	P	H	P	P	L	L	P
12	P	P	H	P	P	H	H	P	H	P	P	H	L	P
13	P	P	H	P	P	P	H	P	H	P	H		L	P
14	H	P	H	P	P	H	H	H	H	H	H		P	H
15		L		P	P		H						L	
16		H		P	P		H						H	
17				P	P									
18				P	P									
19				P	P									
20				H	H									



POWER SUPPLY REGULATOR BOARD