GMS BOARD

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HASCI KEYBOARD
POWER SUPPLY BOARD
SYSTEM BOARD
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GGS BOARD
See Folder CSCS4-A

DISK DRIVE BOARD
See Folder CSCS4-C

MONITOR BOARD
See Folder CSCS4-D

CSCS4-B EPSON MODEL QX-10

INDEX

SAMS™ **Howard W. Sams & Co., Inc.**
4300 West 62nd Street, P.O. Box 7092, Indianapolis, Indiana 46206 U.S.A.

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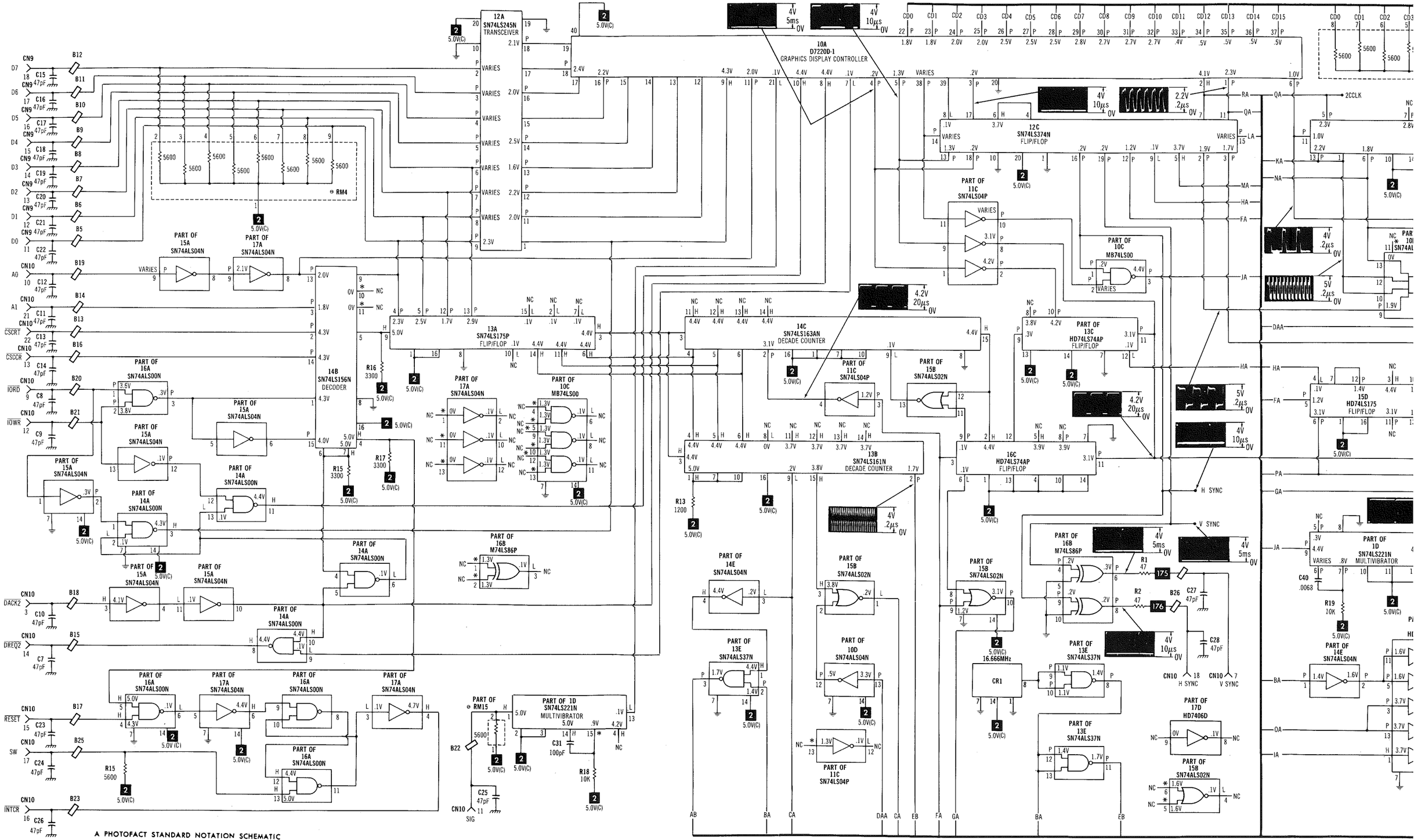
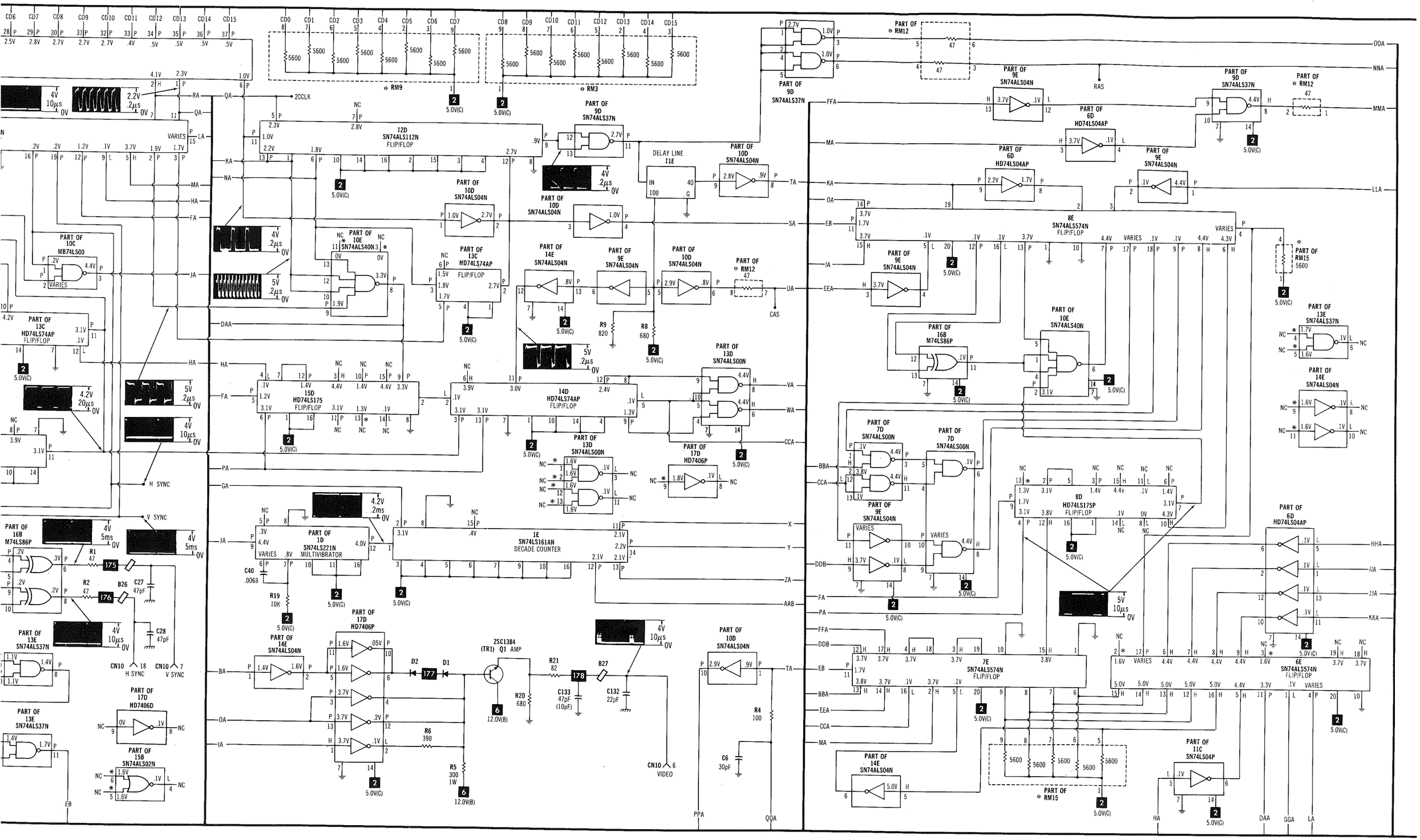


A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE™



EPSON
MODEL QX-10

TROUBLESHOOTING

GMS BOARD

VIDEO

No video display on the Monitor. Check the video clock waveform at pin 2 of Decade Counter IC (13B). If the waveform is missing, refer to the "Video Clock and Dividers" section of this Troubleshooting guide. If the waveform is present, check for a video waveform at pin 6 of Connector CN10. If the waveform is present, check Connectors CN10 and CN4 for good connections. If the waveform is missing at pin 6 of Connector CN10, check for pulses at pin 4 of IC 17D. If pulses are present at pin 4, check the voltages and components associated with Transistor Q1. If pulses are missing at pin 4 of IC 17D, check for pulses at pin 3 of IC 17D. If pulses are present at pin 3, check IC 17D by substitution. If pulses are missing at pin 3 of IC 17D, check for pulses at pin 7 of Flip/Flop IC (8E). If pulses are present at pin 7, check IC 8E by substitution. If pulses are missing at pin 7, check for pulses at pin 1 of IC 10E. If pulses are present at pin 1 of IC 10E, and pin 5 of IC 10E reads a Logic High and the waveform on pin 2 of IC 10E is correct, check IC 10E by substitution. If pulses are missing at pin 1 of IC 10E, check for pulses at pin 13 of IC 16B. If pulses are present at pin 13 of IC 16B, and pin 12 of IC 16B reads a Logic Low, check IC 16B by substitution. If pulses are missing at pin 13 of IC 16B, check for pulses at pin 9 of IC 8E. If pulses are present at pin 9 of IC 8E, check IC 8E by substitution. If pulses are missing at pin 9 of IC 8E, check for pulses at pin 1 of IC 7D. If pulses are present at pin 1 of IC 7D and pin 12 of IC 7D reads a Logic Low, check IC 7D by substitution. If pulses are missing at pin 1 of IC 7D, check for pulses at pin 3 of IC 8E. If pulses are present at pin 3 of IC 8E, check IC 8E by substitution. If pulses are missing at pin 3 of IC 8E, check for pulses at pin 1 of IC 9E. If pulses are present at pin 1 of IC 9E, check IC 9E by substitution.

SYNC

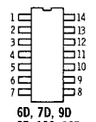
No vertical sync. Check the waveform at pin 6 of IC 16B. If the waveform is present, check Resistor R1, Capacitor C27, and also check pin 7 of Connector CN10 and pin 5 of Connector CN4 for good connections. If the waveform is missing at pin 6 of IC 16B, check the waveform at pin 4 of IC 16B. If the waveform is present, check IC 16B by substitution. If the waveform is missing at pin 4 of IC 16B, check the waveform at pin 4 of Graphics Display Controller IC (10A). If the waveform is present at pin 4 of IC 10A, check Flip/Flop IC (12C) by substitution. If the waveform is missing at pin 4 of IC 10A, check IC 10A by substitution.

No horizontal sync. Check the waveform at pin 8 of IC 16B. If the waveform is present at pin 8 of IC 16B, check Resistor R2, Capacitor C28 and also check pin 18 of Connector CN10 and pin 4 of Connector CN4 for good connections. If the waveform is missing at pin 8 of IC 16B, check the waveform at pin 9 of IC 16B. If the waveform is present at pin 9 of IC 16B, check IC 16B by substitution. If the waveform is missing at pin 9 of IC 16B, check the waveform at pin 3 of Graphics Display Controller IC (10A). If the waveform is present at pin 3 of IC 10A, check Flip/Flop IC (12C) by substitution. If the waveform is missing, check IC 10A by substitution.

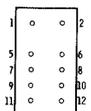
VIDEO CLOCK AND DIVIDERS

Check the 16.666MHz Oscillator Crystal (CR1) by checking for a frequency of 16.666MHz at pin 9 of IC 13E. If the frequency is incorrect or the oscillator not working, check Crystal CR1 by substitution. If the oscillator is working properly, check the waveforms at pin 3 and 11 of IC 13E. If either waveform is missing, check IC 13E by substitution. If the waveforms are present at IC 13E, check the waveforms at pins 5 and 9 of Flip/Flop IC (12D). If either waveform is missing, check IC 12D by substitution.

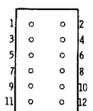
IC PINOUTS, TERMINAL GUIDES



6D, 7D, 9D
9E, 10C, 10D
10E, 11C, 13D
13E, 14A, 14E
15A, 15B, 16A
16B, 17A, 17D
TOP VIEW



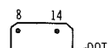
CN9
WIRING VIEW



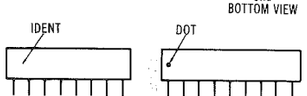
CN10
WIRING VIEW

Q1
BOTTOM VIEW

OUT G IN
11E
BOTTOM VIEW

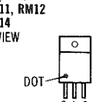


CR1
BOTTOM VIEW



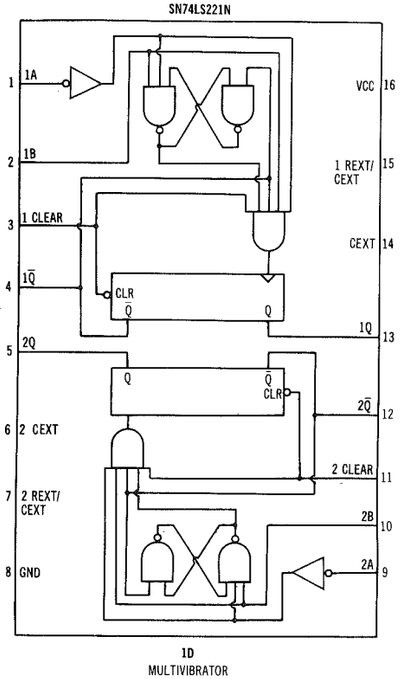
RM1, RM2, RM5
RM6, RM7, RM8
RM10, RM11, RM12
RM13, RM14
FRONT VIEW

RM3, RM4, RM9, RM15
FRONT VIEW



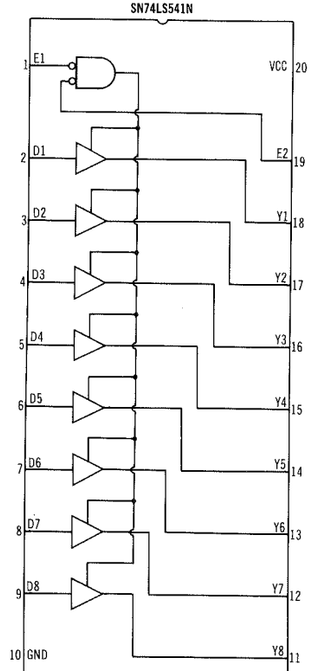
SR1
TOP VIEW

SN74LS221N



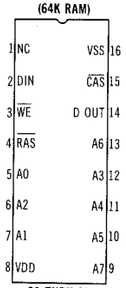
1D
MULTIVIBRATOR
TOP VIEW

SN74LS541N



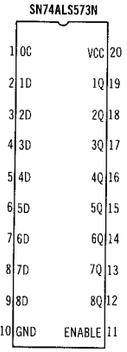
1C, 7C
BUFFER
TOP VIEW

D4164C-2
(64K RAM)



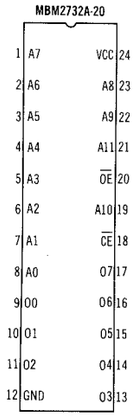
2A THRU 9A
1B THRU 8B
RAM
TOP VIEW

SN74ALS573N



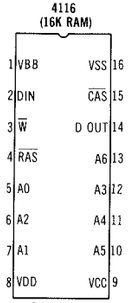
8C, 9C
LATCH
TOP VIEW

MBM2732A-20



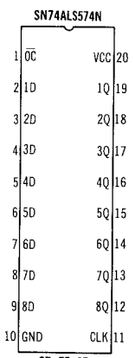
2E
ROM
TOP VIEW

4116
(16K RAM)



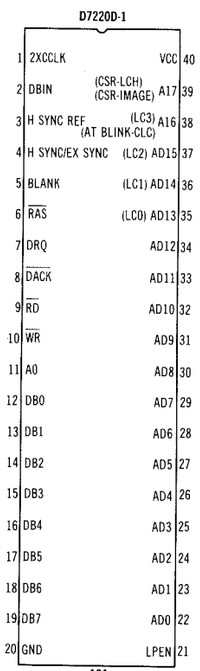
2A THRU 9A
1B THRU 8B
RAM
TOP VIEW

SN74ALS574N



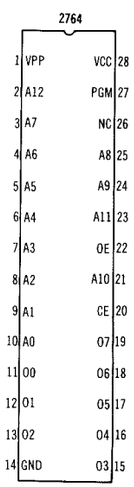
6E, 7E, 8E
FLIP/FLOP
TOP VIEW

D7220D-1



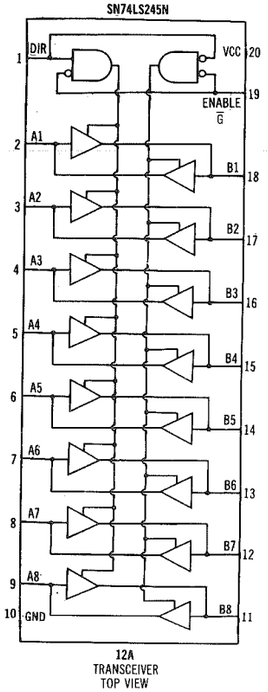
10A
GRAPHICS DISPLAY CONTROLLER
( ) CHARACTER DISPLAY MODE
TOP VIEW

2764



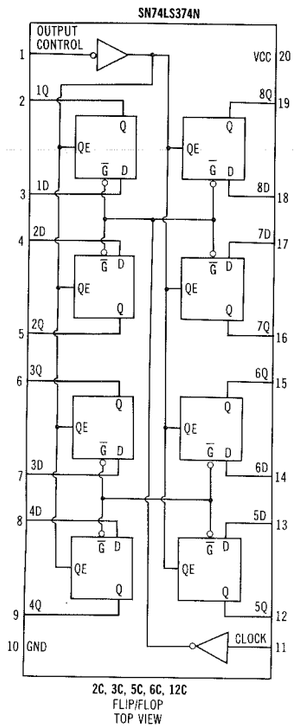
2E
ROM
TOP VIEW

SN74LS245N



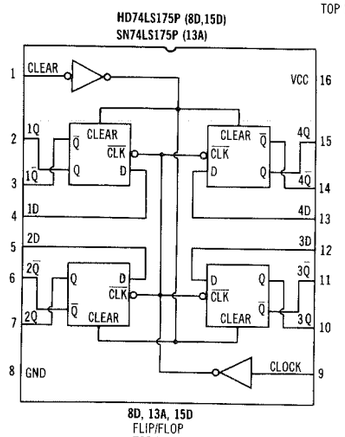
12A
TRANSCEIVER
TOP VIEW

SN74LS374N



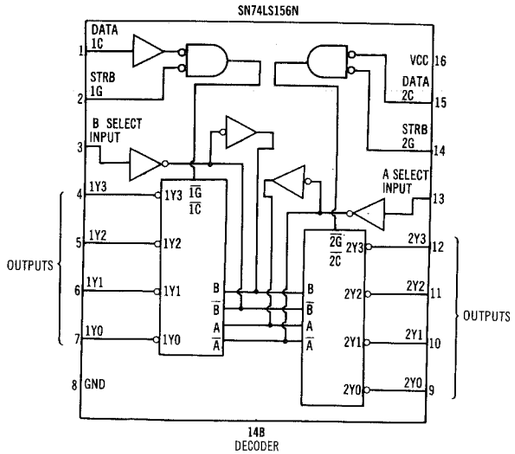
2C, 3C, 5C, 6C, 12C
FLIP/FLOP
TOP VIEW

HD74LS175P (8D,15D)
SN74LS175P (13A)



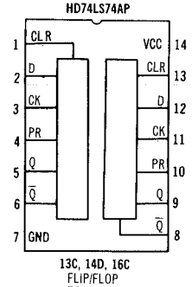
8D, 13A, 15D
FLIP/FLOP
TOP VIEW

SN74LS156N



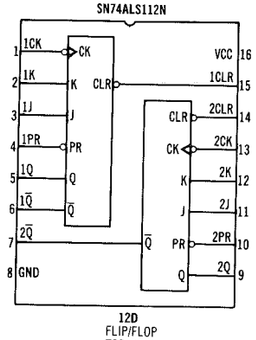
14B
DECODER
TOP VIEW

HD74LS74AP



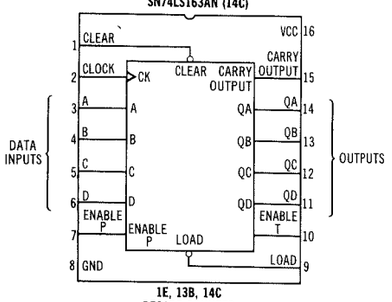
13C, 14D, 16C
FLIP/FLOP
TOP VIEW

SN74ALS112N



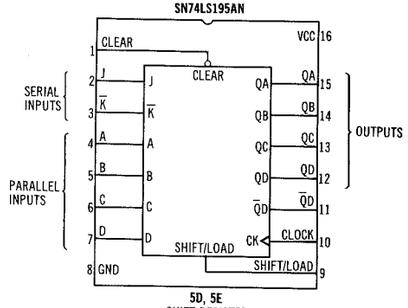
12D
FLIP/FLOP
TOP VIEW

SN74LS161AN (1E)
SN74S161N (13B)
SN74LS163AN (14C)



1E, 13B, 14C
DECADE COUNTER
TOP VIEW

SN74LS195AN

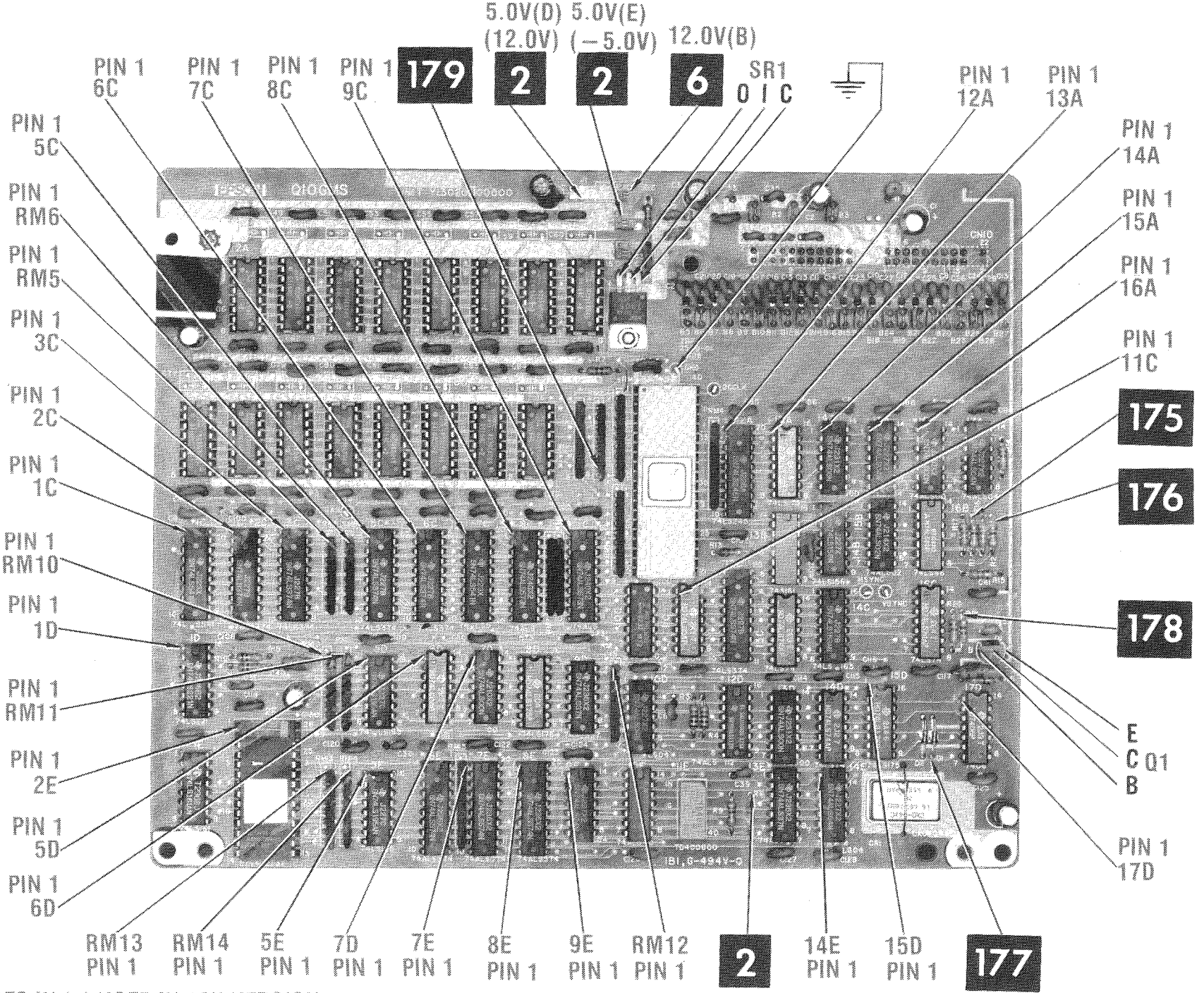


5D, 5E
SHIFT REGISTER
TOP VIEW

CSCS4-B

EPSON
MODEL QX-10

A Howard W. Sams GRIDTRACE™ Photo **GMS BOARD**



VOLTAGES IN ( ) USED IN 16K VERSION

LOGIC CHART

CSCS4-B

EPSON
MODEL QX-10

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

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

Logic Probe Display
L = Low
H = High
P = Pulse
* = Open (No light On)

Note: Logic probe readings taken with computer turned On, no keys pressed, unless otherwise noted.

LOGIC CHART (Continued)

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

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

Logic Probe Display
L = Low
H = High
P = Pulse
* = Open (No light On)

Note: Logic probe readings taken with computer turned On, no keys pressed, unless otherwise noted.

LOGIC CHART (Continued)

PIN NO.	IC 14B	IC 14C	IC 14D	IC 14E	IC 15A	IC 15B	IC 15D	IC 16A	IC 16B	IC 16C	IC 17A	IC 17D
1	P	H	H	P	P	L	H	P	*	H	*	H
2	P	P	L	P	P	P	L	P	*	H	L	L
3	P	H	P	L	H	H	H	P	L	P	L	P
4	H	H	H	H	L	L	L	H	P	H	H	P
5	H	H	L	H	P	*	P	H	L	H	L	P
6	H	H	H	L	P	*	P	L	P	L	H	P
7	H	H	L	L	L	L	P	L	L	L	L	L
8	L	L	P	L	P	L	L	H	P	P	P	L
9	P	L	P	*	P	P	P	H	P	P	P	*
10	*	H	H	L	H	P	P	L	L	H	L	P
11	*	H	P	*	L	P	P	L	P	P	*	P
12	*	H	P	P	P	H	P	H	L	P	L	P
13	P	H	P	P	P	L	*	H	P	H	*	P
14	P	H	H	H	H	H	L	H	H	H	H	H
15	P	H					H					
16	H	H					H					

Note: Logic probe readings taken with computer turned On, no keys pressed, unless otherwise noted.

Logic Probe Display
L = Low
H = High
P = Pulse
* = Open (No light On)

PARTS LIST AND DESCRIPTION

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NEW-TONE PART No.	WORKMAN PART No.
RM1	Resistor Network (1)	X115444701		
RM2	Resistor Network (1)	X115444701		
RM3	Resistor Network (2)	X110885621		
RM4	Resistor Network (2)	X110885621		
RM5	Resistor Network (1)	X115444701		
RM6	Resistor Network (1)	X115444701		
RM7	Resistor Network (1)	X115444701		
RM8	Resistor Network (1)	X115444701		
RM9	Resistor Network (2)	X110885621		
RM10	Resistor Network (1)	X115444701		
RM11	Resistor Network (1)	X115444701		
RM12	Resistor Network (1)	X115444701		
RM13	Resistor Network (1)	X115444701		
RM14	Resistor Network (1)	X115444701		
RM15	Resistor Network (2)	X110885621		

(1) Contains four (4 ea.) 47 10% 1/4W.
(2) Contains eight (8 ea.) 5600 10% 1/8W.

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
B1 thru B3	Ferrite Beaad	Y130202002	
B5 thru B27	Ferrite Bead	Y130202002	
CR1	Quartz Crystal	X504003800	16.666MHz
11E	Delay Line	X440046000	
	P.C. Board	Y130206000	GMS, 32K RAM, For U.S. (ASCII)
	P.C. Board	Y130209000	GMS, 32K RAM, For Europe
	P.C. Board	Y130210000	GMS, 128K RAM, For U.S. (HASCI)

PARTS LIST AND DESCRIPTION

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					
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
D1,2	1S2075K	X320010079	GE-514	NTE519	ECG519	SK3100/519	WEP925/519	103-131
Q1	2SC1384	X302138400	GE-47	NTE293	ECG293	SK3849/293	WEP914/297	121-Z9066
SR1	7905		GE-961	NTE961	ECG961	SK3671/961		HE-442-630
	79M05	X440069050	GE-961	NTE961	ECG961	SK3671/961		HE-442-630
1B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
1C	SN74LS541N	X420305410		NTE74LS541	ECG74LS541			
1D	SN74LS221N	X420302210		NTE74LS221	ECG74LS221	SK74LS221		
1E	SN74LS161AN	X420301610	74LS161A	NTE74LS161A	ECG74LS161A	SK74LS161		HE-443-757
2A,B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
2C	SN74LS374N	X420303740	74LS374	NTE74LS374	ECG74LS374			HE-443-863
2E	MBM2732A-20-QGA-1	Y130800701(3)						
	2732A-2-QGE-1	Y130800501(4)						
	2764A-2							
3A,B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
3C	SN74LS374N	X420303740	74LS374	NTE74LS374	ECG74LS374			HE-443-863
4A,B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
5A,B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
5C	SN74LS374N	X420303740	74LS374	NTE74LS374	ECG74LS374			HE-443-863
5D,E	SN74LS195AN	X420301950	74LS195A	NTE74LS195A	ECG74LS195A	SK74LS195		HE-443-718
6A,B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904

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					
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
6C	SN74LS374N	X420303740	74LS374	NTE74LS374	ECG74LS374			HE-443-863
6D	HD74LS04P	X420300040	74LS04	NTE74LS04	ECG74LS04	SK74LS04		HE-443-755
6E	SN74ALS574N	X420505740						
7A,B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
7C	SN74LS541N	X420305410		NTE74LS541	ECG74LS541			
7D	SN74ALS00N	X420500000						
7E	SN74ALS574N	X420505740						
8A,B	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
8C	SN74ALS573N	X420505730						
8D	HD74LS175P	X420301750	74LS175	NTE74LS175	ECG74LS175	SK74LS175		HE-443-752
8E	SN74ALS574N	X420505740						
9A	D4164C-2	X400141640(1)	4164-15		ECG2164			
	D416	X400104162(2)		NTE2117	ECG2117			HE-443-904
9C	SN74ALS573N	X420505730						
9D	SN74ALS37N	X420500370						
9E	SN74ALS04N	X420500040						
10A	D7220D-1	X400072200						
10C	MB74LS00	X420300000	74LS00	NTE74LS00	ECG74LS00	SK74LS00		HE-443-728
10D	SN74ALS04N	X420500040						
10E	SN74ALS40N	X420500400						
11C	HD74LS04P	X420300040	74LS04	NTE74LS04	ECG74LS04	SK74LS04		HE-443-755
12A	SN74LS245N	X420302450	74LS245	NTE74LS245	ECG74LS245	SK74LS245		HE-443-885
12C	SN74LS374N	X420303740	74LS374	NTE74LS374	ECG74LS374			HE-443-863
12D	SN74ALS112N	X420501120						
13A	HD74LS175P	X420301750	74LS175	NTE74LS175	ECG74LS175	SK74LS175		HE-443-752
13B	SN74S161N	X420201610	74LS161A	NTE74LS161A	ECG74LS161A	SK74LS161		HE-443-757
13C	HD74LS74AP	X420300740	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-443-730
13D	SN74ALS00N	X420500000						

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					
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
13E	SN74ALS37N	X420500370						
14A	SN74ALS00N	X420500000						
14B	SN74LS156N	X420301560		NTE74LS156	ECG74LS156	SK74LS156		
14C	SN74LS163AN	X420301630	74LS163A	NTE74LS163A	ECG74LS163A	SK74LS163		
14D	HD74LS74AP	X420300740	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-443-730
14E	SN74ALS04N	X420500040						
15A	SN74ALS04N	X420500040						
15B	SN74ALS02N	X420500020						
15D	HD74LS175P	X420301750	74LS175	NTE74LS175	ECG74LS175	SK74LS175		HE-443-752
16A	SN74ALS00N	X420500000						
16B	M74LS86P	X420300860	74LS86	NTE74LS86	ECG74LS86	SK74LS86		HE-443-891
16C	HD74LS74AP	X420300740	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-443-730
17A	SN74ALS04N	X420500040						
17D	HD7406P	X420100060	GE-7406	NTE7406	ECG7406	SK7406		HE-443-698

(1) Used In U.S.A. HASCI Keyboard Versions.
(2) Used In U.S.A. ASCII Keyboard Versions.
(3) Used In U.S.A. Models.
(4) Used In European Models.

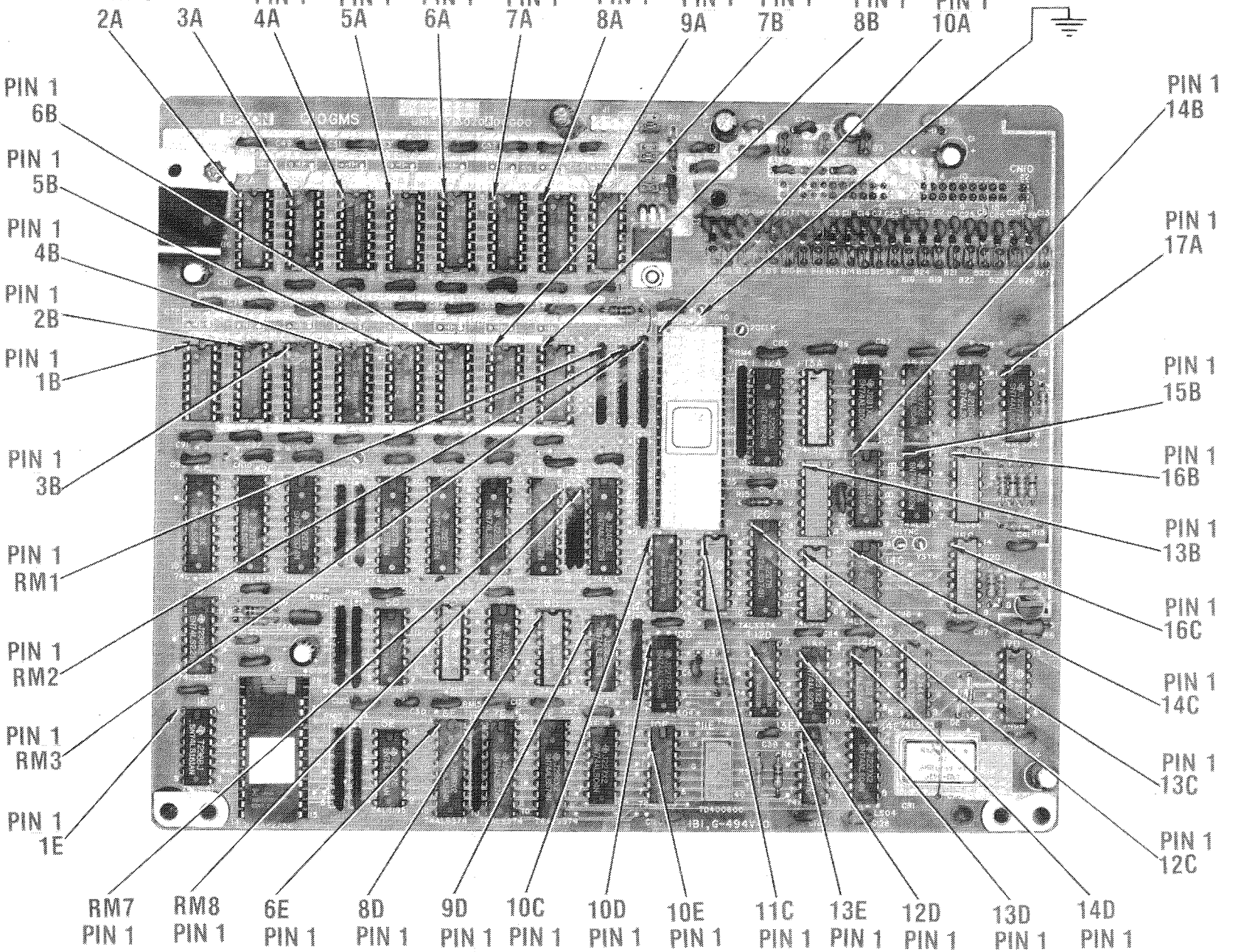
LINE DEFINITIONS

A0 Thru A15 ..... Address Lines
AA
AAB
AB
AB0 Thru AB15
ACK ..... Acknowledge
AD0 Thru AD15 ..... Bidirectional Address Lines
ADR0 Thru ADR15 ..... Address Lines
ALF ..... Autoline Feed
B
BA
BB
BB1
BBA
BD0 Thru BD7 ..... Bidirectional Data Lines
BD0A Thru BD15A ..... Bidirectional Data Lines
BSAK ..... Bus Acknowledge
C
CA
CA0 Thru CA7
CCA
CASA
CAS1 Thru CAS4
CAS
CC
CD0 Thru CD15
CE ..... Control Enable
CES
CLK
CLKA
CS ..... Chip Select
CS-1
CSCCR ..... CRT Drive Board Select
CSCRT ..... CRT Drive Board Select
CTS ..... Clear to Send
d
d6 Thru d8
D
D0 Thru D7 ..... Data Lines
DA
DAA
DACK ..... Data Acknowledge
DACK-2 ..... DMA Acknowledge
DAK ..... Acknowledge
DAK1 Thru DAK4
DAKF ..... DMA Acknowledge
DAKS1 Thru DAKS4 ..... DMA Acknowledge
DB
DB1 Thru DB7 ..... Data Line
DBIN ..... Data Buffer Input
DCD ..... Data Carrier Detect
DD
DLATCH ..... Data Latch
DIR ..... Direction
DOTA Thru DOTH
DREQ ..... Data Request
DREQ-1 Thru DREQ-2 ..... DMA Transfer Request
DRQF ..... DMA Request
DRQS1 THru DRQS4 ..... DMA Request
DSR
DTB0 Thru DBT7 ..... Data Lines
DTR ..... Data Terminal Ready
e1 Thru e3
E1
E
EA
EB
EE
EEA
EOP
EOPF ..... End of Process
EOPS ..... End of Process
ERR ..... Error
F
FA
FF
FFA
g1
g4
G
GA
GG
GGA
HA
HDS ..... Side Select
HH
HHA
HLD ..... Head Load
HSYNC ..... Horizontal Sync
I
IA
II
IIA
IMAG
INT ..... Interrupt Request
INDX ..... Index
INTCR ..... Light peninterrupt request
INTF1 & INTF2
INTR ..... Interrupt Request
INTSL1 Thru INTSL4
IORD ..... Input/Output Read
IOWD ..... Input/Output Write
IRD ..... I/O Read
IR0
IRQ7
IWR ..... I/O Write
IWS
J1 Thru J7
J
JA
JJ
JJA
K1 Thru K6
K
KA
KK
KKA
L
LA
LC0 Thru LC3
LGT1
LL
LLA

LINE DEFINITIONS (Continued)

M3 Thru M10 ..... Memory Lines
M
MA
MA0 Thru MA7 ..... Memory Address Lines
MD0 Thru MD15 ..... Data Lines
MEG
MEMX ..... External Memory select
MM
MMA
MRD ..... Memory Read
MT ..... Motor On
MW
MWR ..... Memory Write
N
NA
NN
NNA
OA
OC
OO
OOA
OUT2
P
PA
PP
PPA
PRI ..... Priority Output
PWF ..... Power Failure
PWD ..... Power Failure Detection
Q
QA
QE
QQ
QQA
R
RA
RAS ..... Row Address Strobe
RAS1 Thru RAS4
RD ..... Read Data
RD-1 & RD2 ..... Read Data
RDY ..... Ready
RDYF ..... DMA Ready
RDYS ..... DMA Ready
RES
RESET ..... Reset
RESET-1 & RESET-2 ..... Reset
REV ..... Reverse Channel
RFSH ..... Refresh
RFSH-1 & H-2 ..... Refresh
RSIN ..... Reset Input
RST ..... Reset
RR
RTS ..... Request to Send
RXC ..... Receive Clock
RXD ..... Received Data
RXDA
RUS
S
SA
SEL ..... Select
SIG ..... Light Pen Signal
SCRT
SLO ..... Select Out
SS
STB ..... Strobe
SQW
SW ..... Light Pen Switch
STP ..... Step
T
TA
TO ..... Track 0
TXD ..... Transmitted Data
TT
U
UA
UA0 Thru UA7
UB0 Thru UB15
UD0 Thru UD7
US0 Thru US3
VA
VSYNC ..... Vertical Sync
W
W1 Thru W4
WA
WAIT ..... Wait
WCLK ..... Write Clock
WD ..... Write Data
WG ..... Write Gate
WINDOW
WR ..... Write
WRT ..... Write
X
Y
Z
ZA
Ø ..... Single Phase Clock
ØCLK ..... Phase Clock
3M
4
10RD ..... Read Data
10WR ..... Write Data Strobe

Any Bar above any alphabetical or numerical combination indicates line active in a low (0) state.



EPSON
MODEL QX-10

CSCS4-B

GMS BOARD GridTrace LOCATION GUIDE

B1	A-10	C26	B-13	C94	F-4	R2	F-14	5E	J-4
B2	A-10	C27	B-12	C95	F-5	R3	I-9	6A	B-5
B3	A-11	C28	B-14	C96	F-5	R4	I-9	6B	E-5
B5	C-9	C30	I-4	C97	F-6	R5	H-14	6C	G-5
B6	C-9	C31	I-2	C98	F-6	R6	H-14	6D	H-5
B7	C-9	C32	A-10	C99	F-1	R7	D-7	6E	J-5
B8	C-10	C33	A-9	C100	F-2	R8	J-10	7A	B-6
B9	C-10	C34	A-10	C101	F-3	R9	J-10	7B	E-6
B10	C-10	C35	A-10	C102	F-4	R12	A-8	7C	G-6
B11	C-10	C36	A-10	C103	F-5	R13	F-10	7D	H-6
B12	C-10	C37	A-12	C104	F-6	R14	E-14	7E	J-6
B13	C-11	C38	A-9	C105	F-7	R15	G-14	8A	B-6
B14	C-11	C39	J-10	C106	F-7	R16	F-13	8B	E-6
B15	C-11	C40	H-3	C107	F-10	R17	F-13	8C	G-6
B16	C-11	C41	G-13	C108	H-2	R18	H-2	8D	H-6
B17	C-12	C42	A-9	C109	H-4	R19	H-2	8E	J-6
B18	C-12	C43	A-9	C110	H-6	R20	H-13	9A	B-7
B19	C-12	C44	D-8	C111	H-7	R21	H-13	9C	G-7
B20	C-13	C45	B-8	C112	H-8	RM1	E-7	9D	I-7
B21	C-12	C46	A-2	C113	H-9	RM2	E-7	9E	J-7
B22	C-13	C48	A-3	C114	H-10	RM3	E-8	10A	E-8
B23	C-13	C50	A-4	C115	H-11	RM4	E-9	10C	G-8
B24	C-12	C52	A-4	C116	H-12	RM5	G-3	10D	I-8
B25	C-13	C54	A-5	C117	H-13	RM6	G-4	10E	J-8
B26	C-14	C56	A-6	C118	I-1	RM7	G-7	11C	G-9
B27	C-14	C58	A-6	C119	I-2	RM8	G-7	11E	J-9
C1	A-12	C61	C-2	C120	I-4	RM9	F-8	12A	E-10
C2	A-12	C62	C-3	C121	I-5	RM10	J-3	12C	G-10
C3	A-9	C63	C-3	C122	I-6	RM11	J-4	12D	I-10
C4	A-7	C64	C-4	C123	I-6	RM12	I-8	13A	E-10
C5	C-1	C65	C-5	C124	J-7	RM13	J-3	13B	F-10
C6	I-9	C66	C-6	C125	J-13	RM14	J-4	13C	G-10
C7	B-11	C67	C-6	C126	K-8	RM15	J-5	13D	I-10
C8	B-13	C68	C-7	C127	K-10	SR1	C-8	13E	J-10
C9	B-12	C69	D-1	C128	K-11	1B	E-1	14A	E-11
C10	B-12	C70	D-2	C129	F-11	1C	G-1	14B	F-11
C11	B-11	C71	D-3	C130	I-3	1D	H-1	14C	G-11
C12	B-12	C72	D-4	C131	J-14	1E	J-1	14D	I-11
C13	B-11	C73	D-5	C132	B-14	2A	B-2	14E	J-11
C14	B-11	C74	D-5	C133	H-14	2B	E-2	15A	E-12
C15	B-10	C75	D-6	C134	A-7	2C	G-2	15B	F-12
C16	B-10	C76	D-7	CN9*	B-11	2E	J-2	15D	I-12
C17	B-10	C85	D-10	CN10*	B-13	3A	B-3	16A	E-13
C18	B-10	C86	D-10	CR1	J-12	3B	E-3	16B	F-13
C19	B-9	C87	D-11	D1	I-13	3C	G-3	16C	G-13
C20	B-9	C88	D-12	D2	I-13	4A	B-3	17A	E-13
C21	B-9	C89	D-13	J1	A-8	4B	E-3	17D	I-13
C22	B-9	C90	D-14	J2	A-8	5A	B-4		
C23	B-11	C91	F-1	J3	B-8	5B	E-4		
C24	B-13	C92	F-2	Q1	H-14	5C	G-4		
C25	B-13	C93	F-3	R1	F-13	5D	H-4		

*Located on bottom of board.

SCHEMATIC NOTES

—✱— Circuitry not used in some versions
- - - Circuitry used in some versions
θ See parts list
⏚ Ground
Chassis

Waveforms and voltages taken from ground, unless noted otherwise

Voltages, Waveforms and Logic Probe readings for main board taken with Computer in Power Up mode, no keys pressed, unless otherwise noted.

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 7 cm. width with DC reference voltage given at the bottom line of each waveform.

Time in μsec. 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.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

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

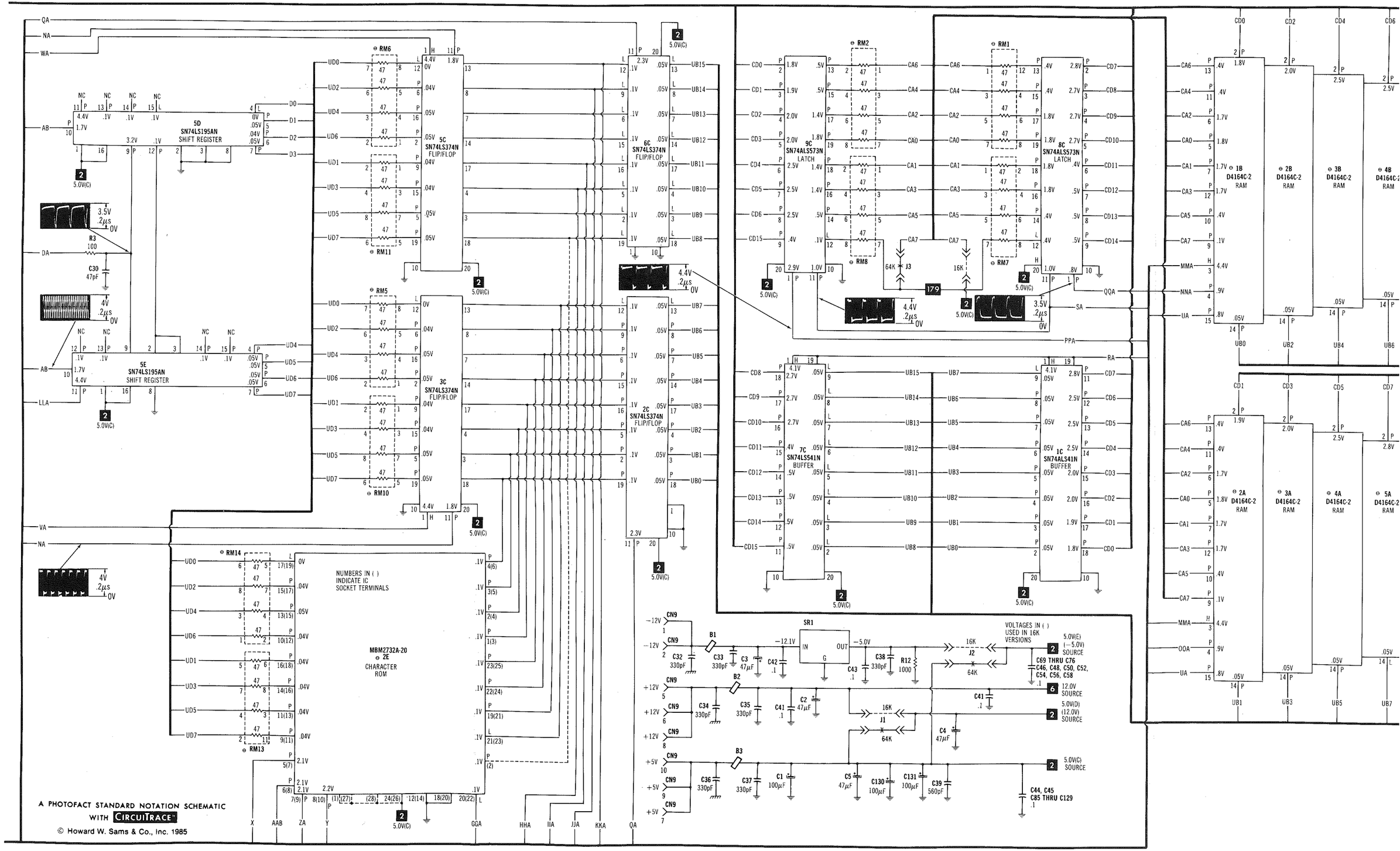
Electrolytic capacitors are 50 volts or less, 20% unless noted.

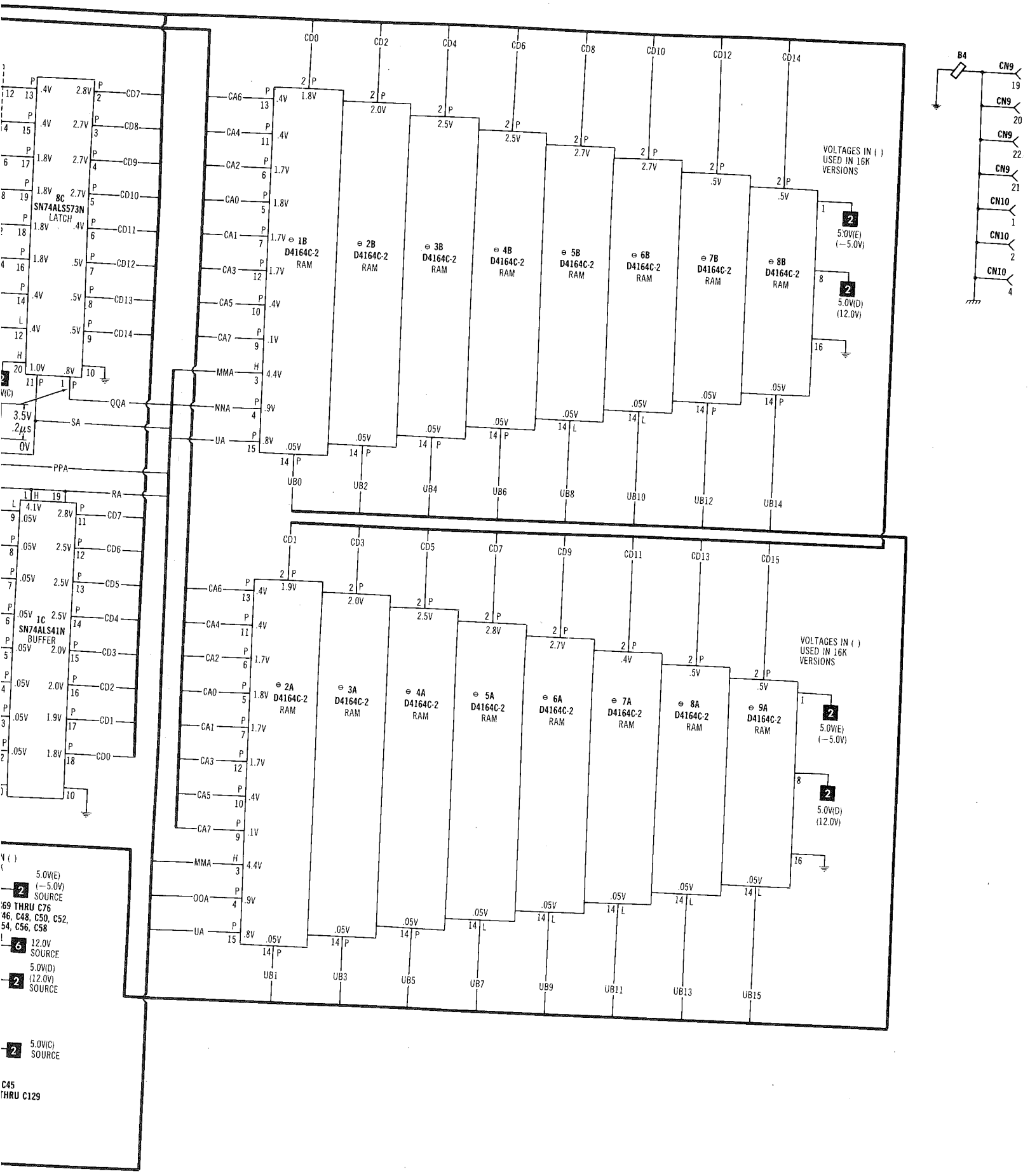
Resistors are ½W or less, 5% unless noted.

Value in ( ) used in some versions.

Measurements with switching as shown, unless noted.

Logic Probe Display
L = Low
H = High
P = Pulse
* = Open (No light On)


QA
NA
WA
AB
DA
LLA
VA
5D SN74LS195AN SHIFT REGISTER
5E SN74LS195AN SHIFT REGISTER
R3 100
C30 47pF
RM6
RM5
RM11
RM10
5C SN74LS374N FLIP/FLOP
3C SN74LS374N FLIP/FLOP
6C SN74LS374N FLIP/FLOP
2C SN74LS374N FLIP/FLOP
RM14
RM13
MBM2732A-20 2E CHARACTER ROM
NUMBERS IN ( ) INDICATE IC SOCKET TERMINALS
RM2
RM1
RM8
RM7
9C SN74ALS573N LATCH
8C SN74ALS573N LATCH
7C SN74LS541N BUFFER
1C SN74ALS41N BUFFER
64K
16K
179
1B D4164C-2 RAM
2B D4164C-2 RAM
3B D4164C-2 RAM
4B D4164C-2 RAM
2A D4164C-2 RAM
3A D4164C-2 RAM
4A D4164C-2 RAM
5A D4164C-2 RAM
SR1
B1
B2
B3
J1
J2
VOLTAGES IN ( ) USED IN 16K VERSIONS
5.0V(C) SOURCE
12.0V SOURCE
5.0V(D) (12.0V) SOURCE
5.0V(E) (−5.0V) SOURCE
C44, C45 C85 THRU C129 .1
C69 THRU C76 C46, C48, C50, C52, C54, C56, C58 .1
A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE™
© Howard W. Sams & Co., Inc. 1985


8C
SN74ALS573N
LATCH
1C
SN74ALS41N
BUFFER
1B
2B
3B
4B
5B
6B
7B
8B
2A
3A
4A
5A
6A
7A
8A
9A
D4164C-2
RAM
VOLTAGES IN ( ) USED IN 16K VERSIONS
5.0V(E) (−5.0V)
5.0V(D) (12.0V)
5.0V(C) SOURCE
12.0V SOURCE
B4
CN9
CN10
PPA
SA
QQA
RA
NNA
OOA
MMA
UA
C45 THRU C129
C69 THRU C76
C46, C48, C50, C52, C54, C56, C58