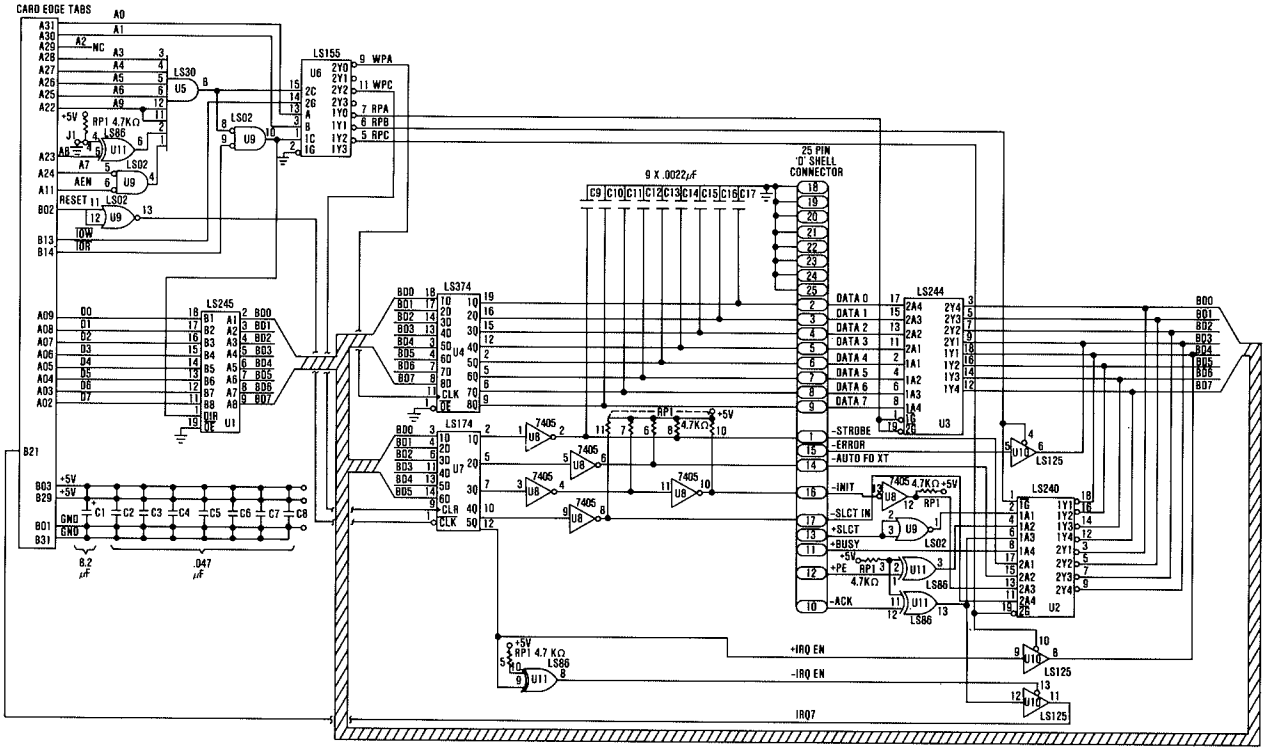
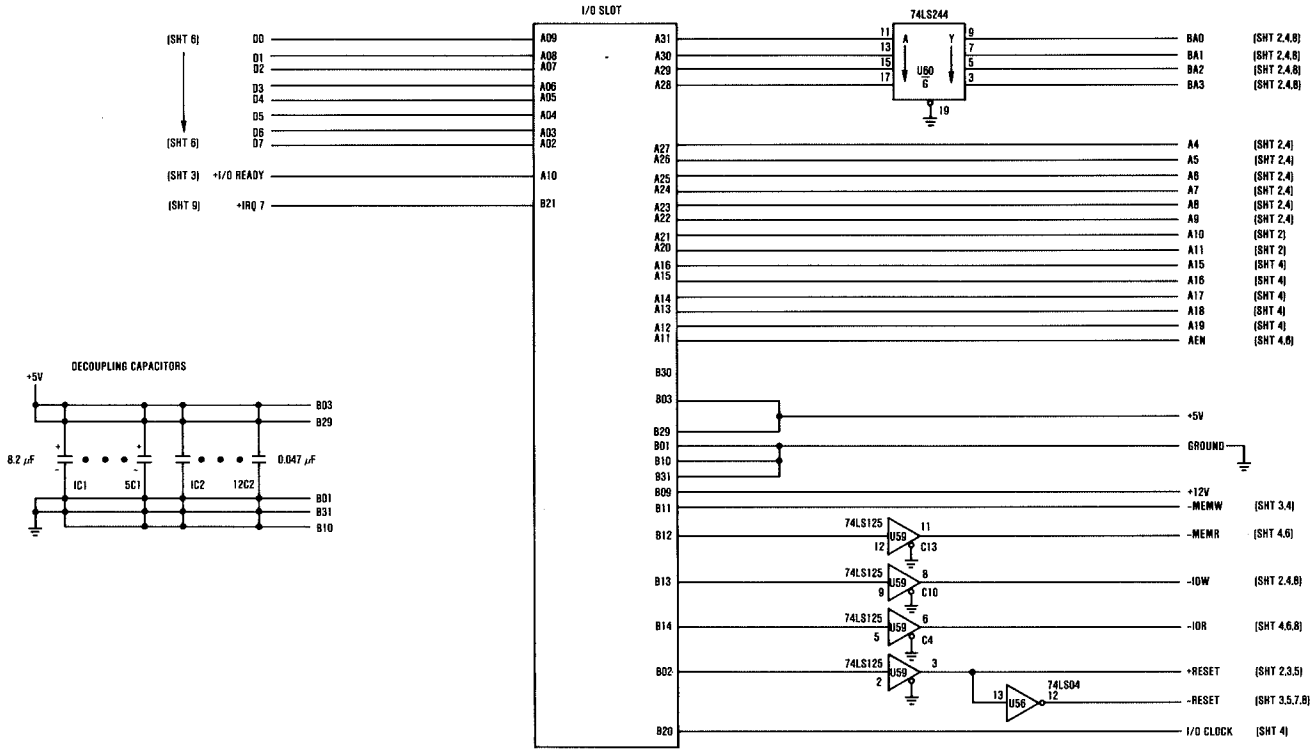
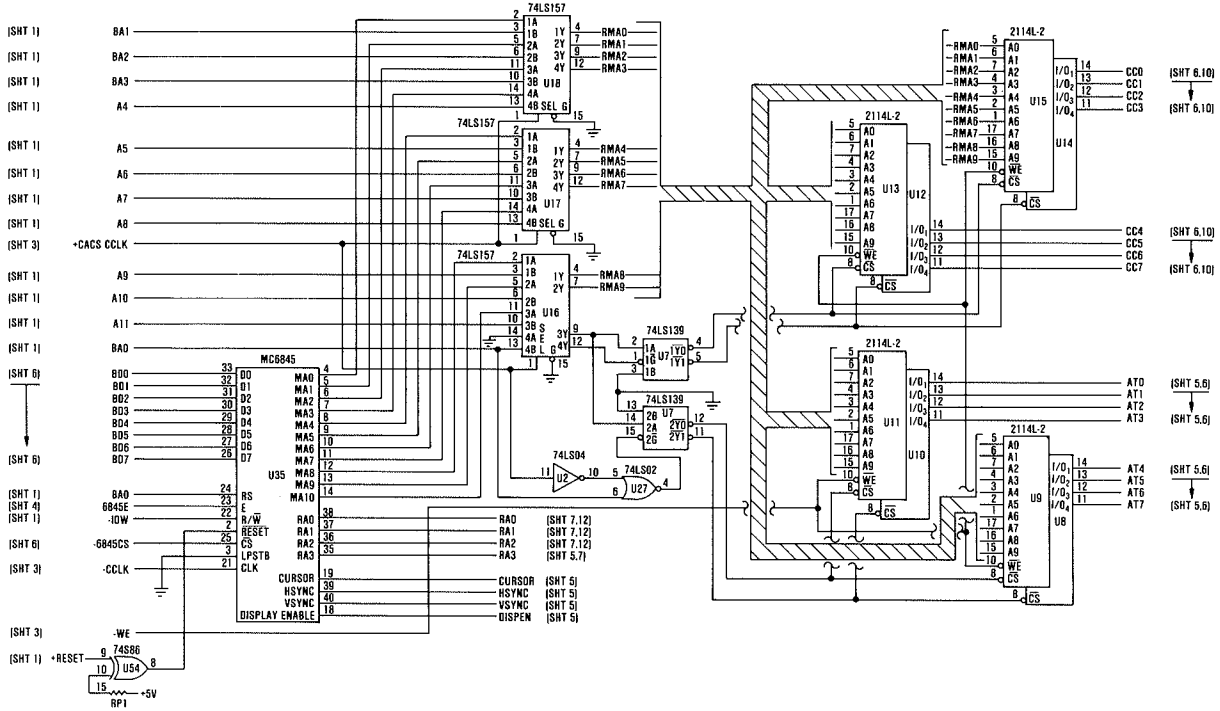


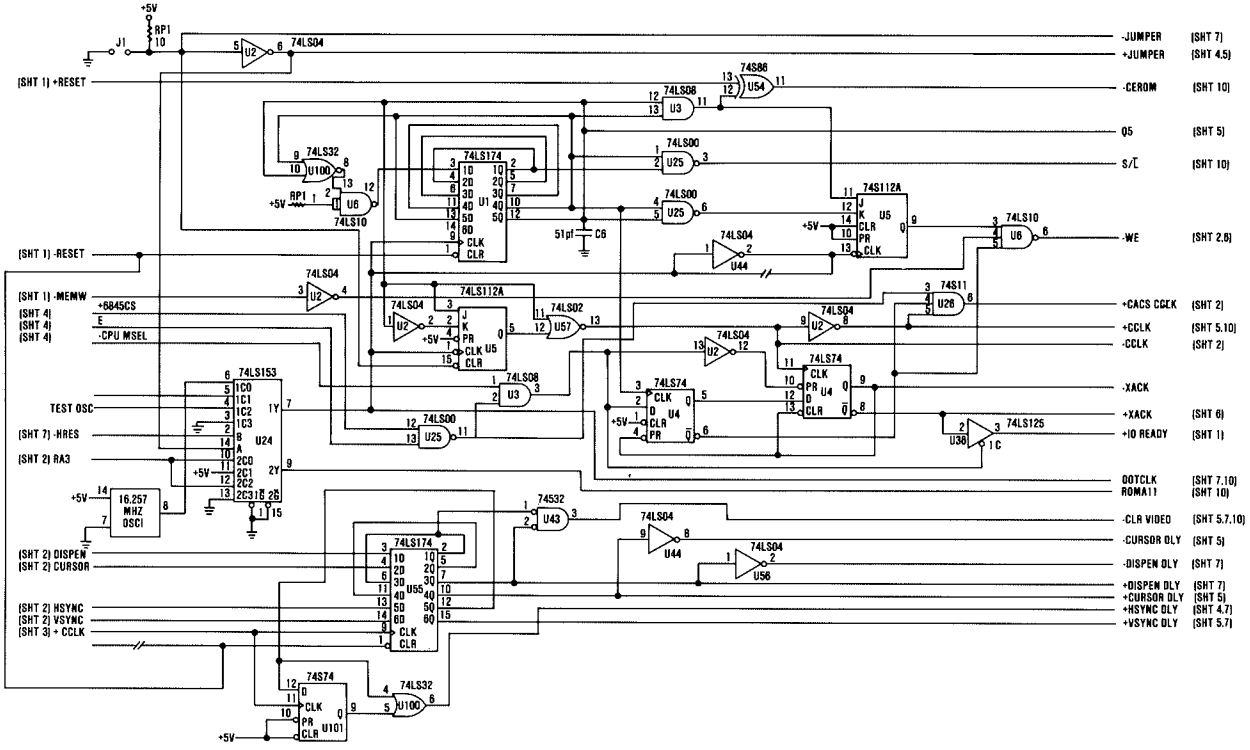
Printer Adapter (Sheet 1 of 1)



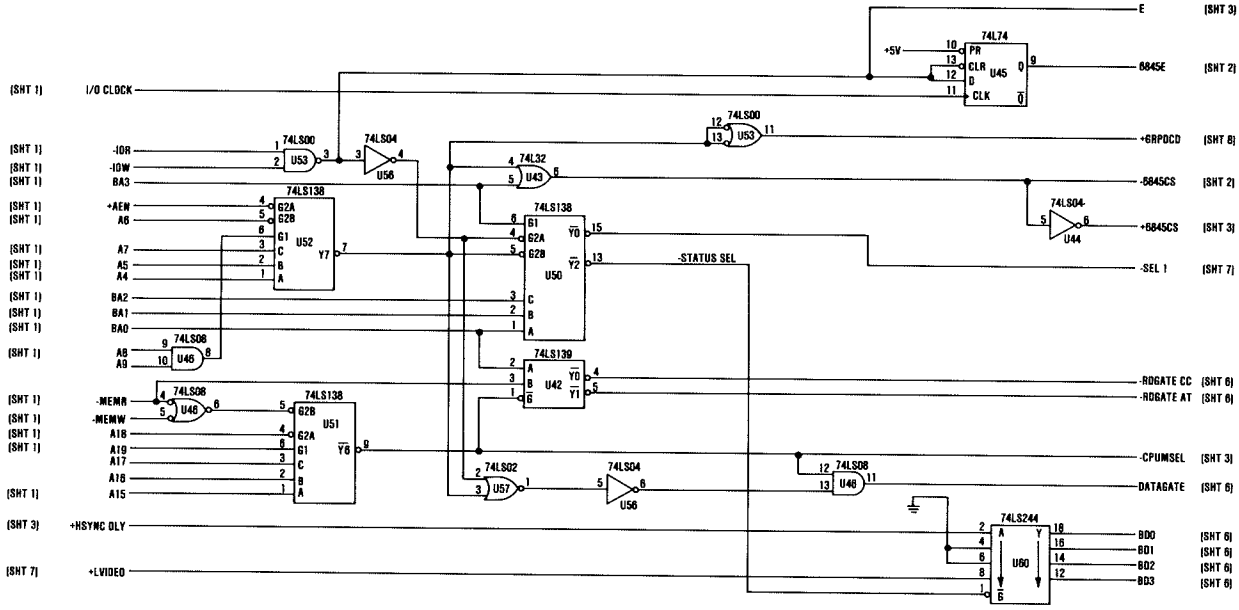
Monochrome Display Adapter (Sheet 1 of 10)



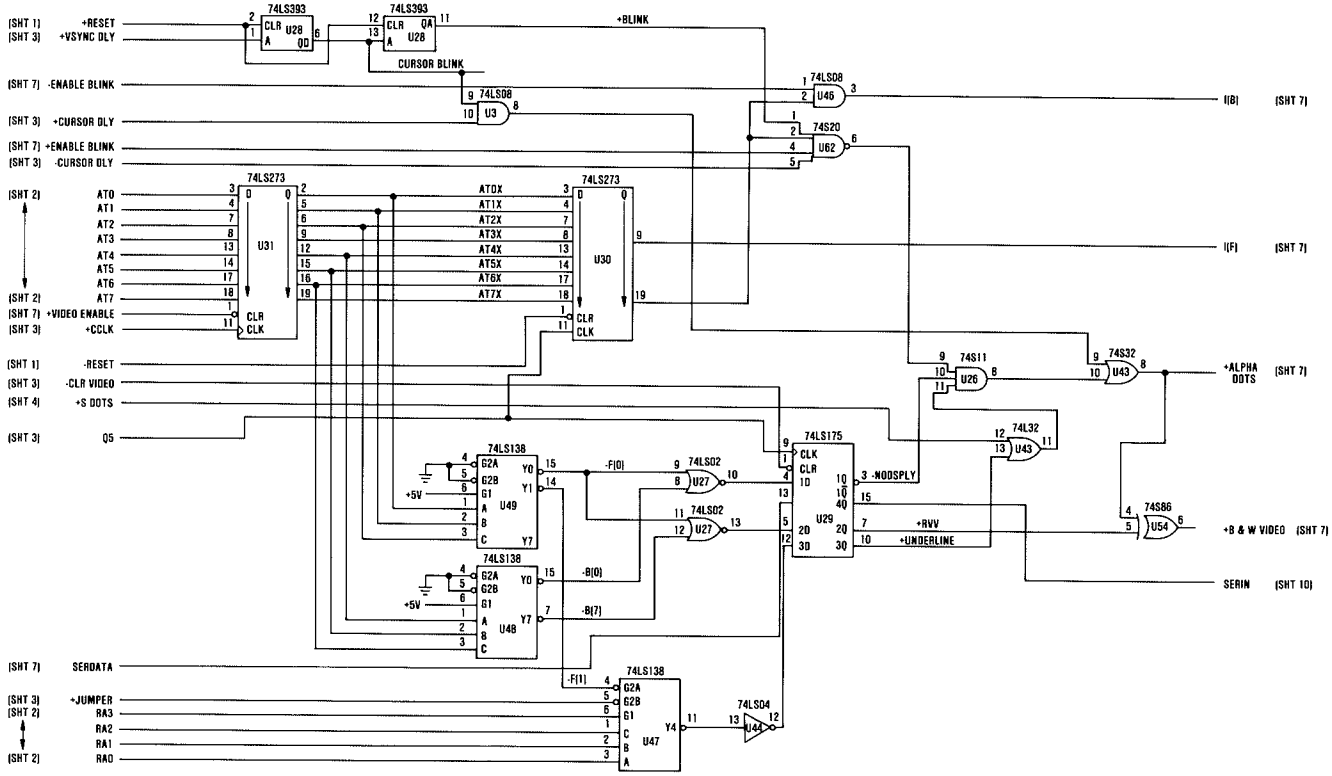
Monochrome Display Adapter (Sheet 2 of 10)



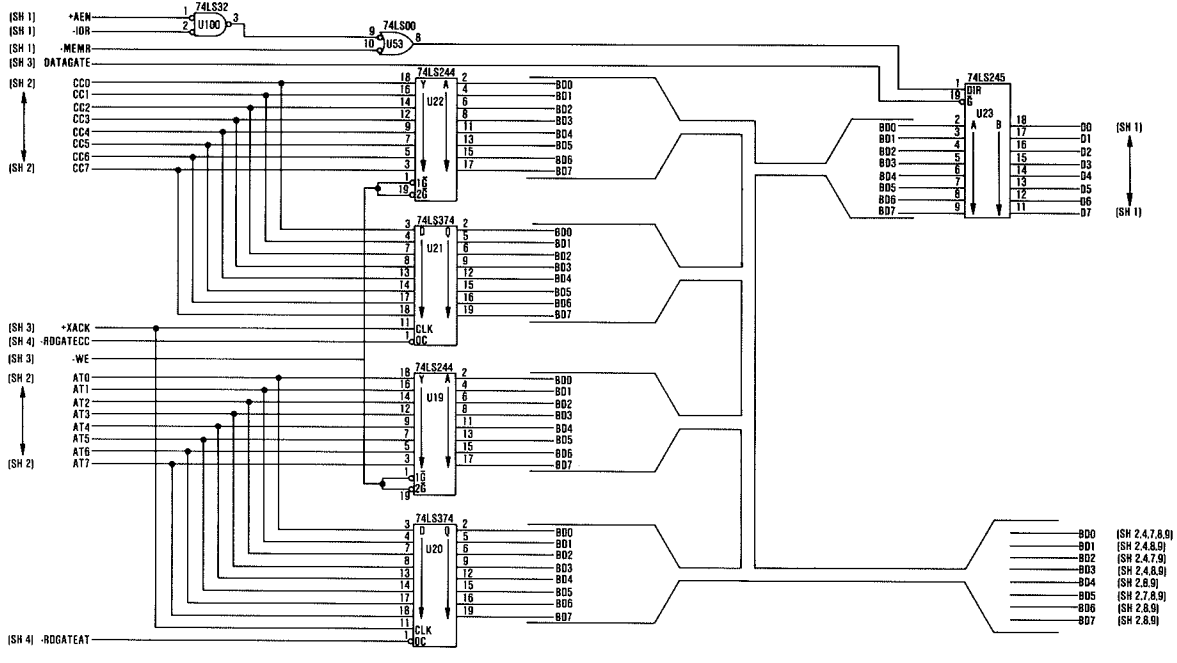
Monochrome Display Adapter (Sheet 3 of 10)



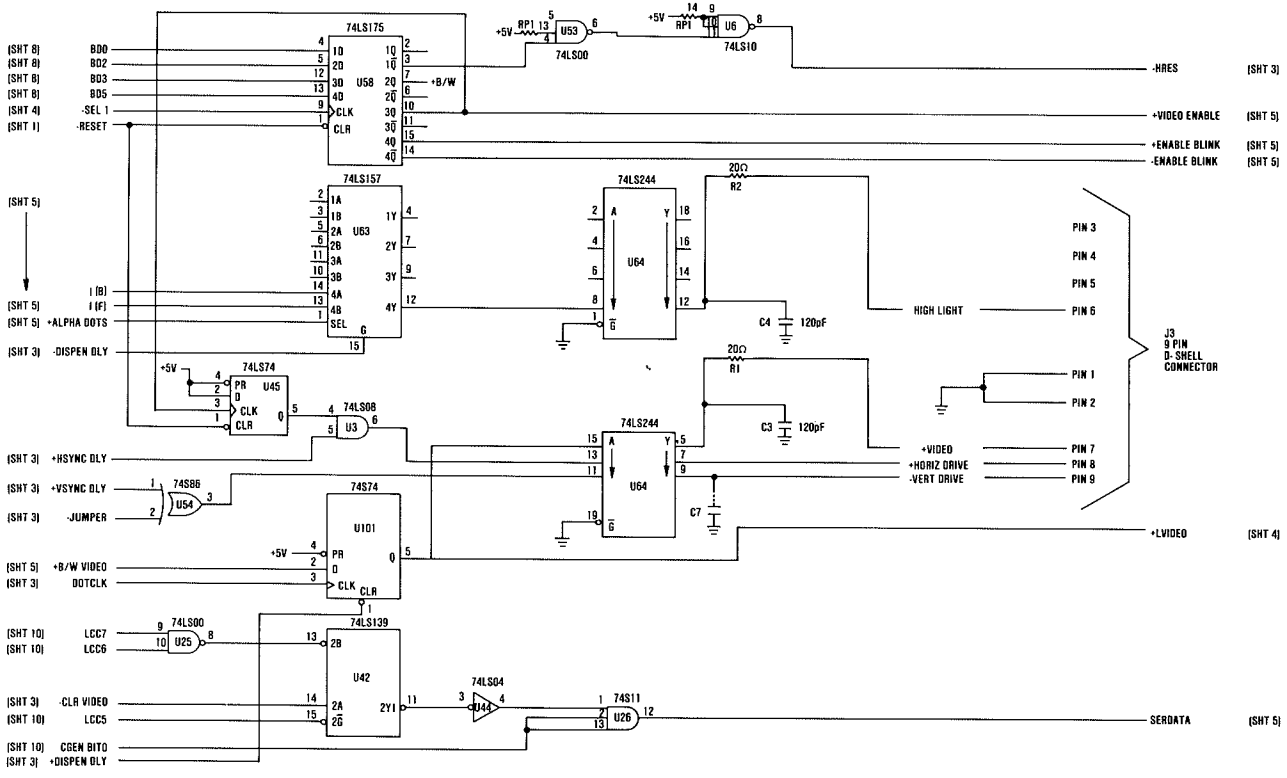
Monochrome Display Adapter (Sheet 4 of 10)



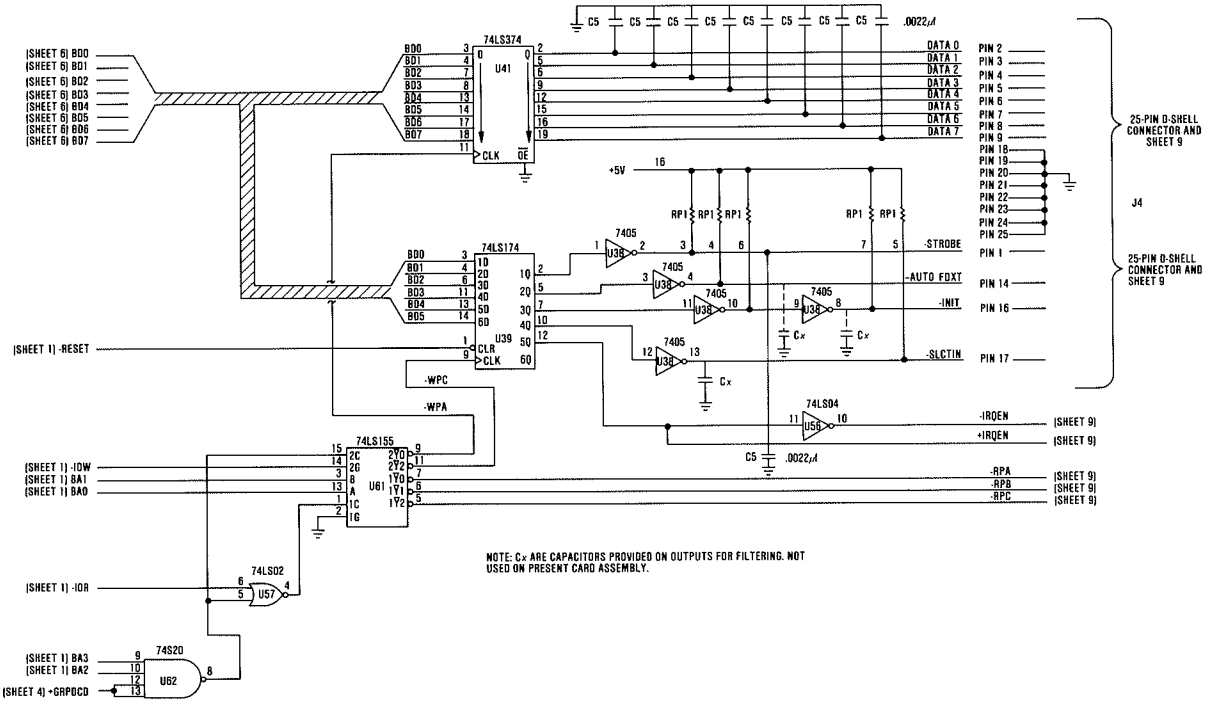
Monochrome Display Adapter (Sheet 5 of 10)



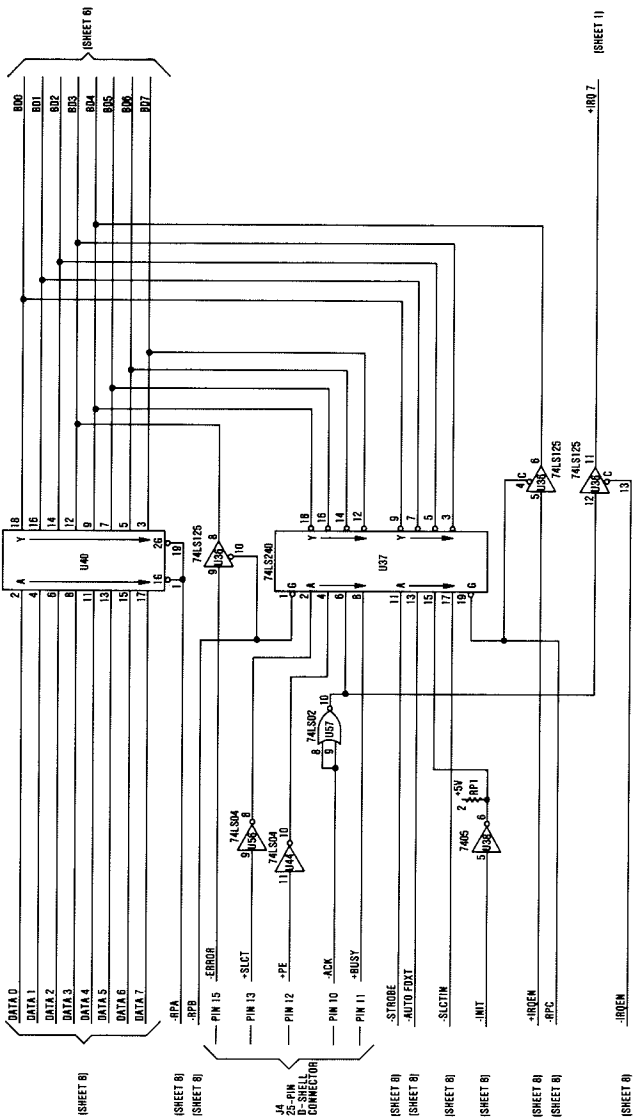
Monochrome Display Adapter (Sheet 6 of 10)



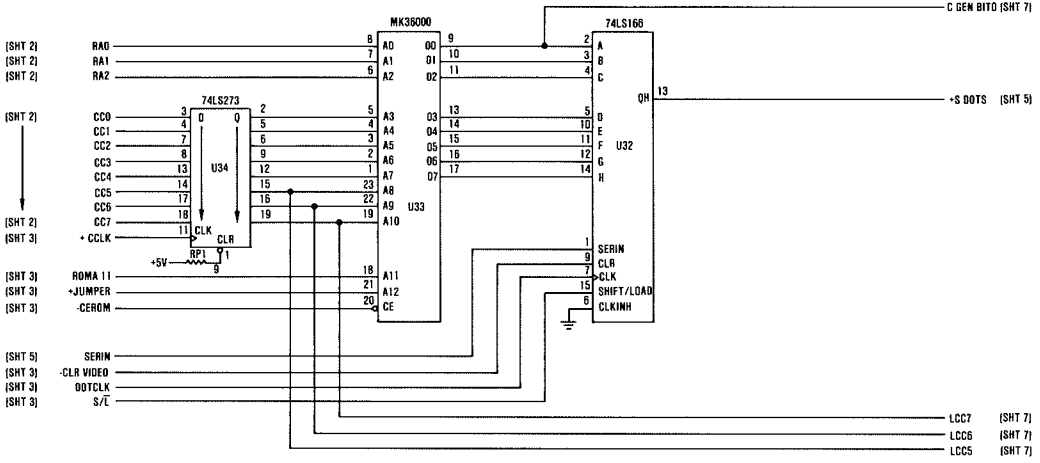
Monochrome Display Adapter (Sheet 7 of 10)



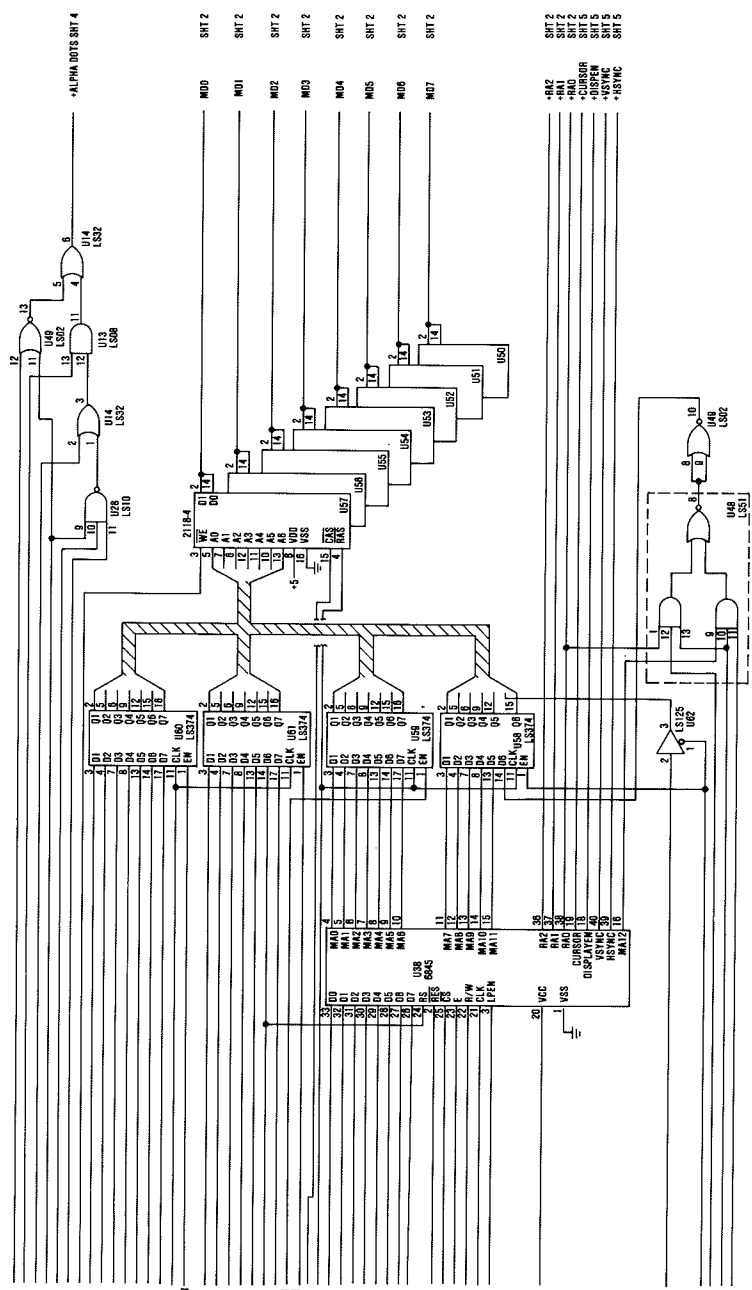
Monochrome Display Adapter (Sheet 8 of 10)



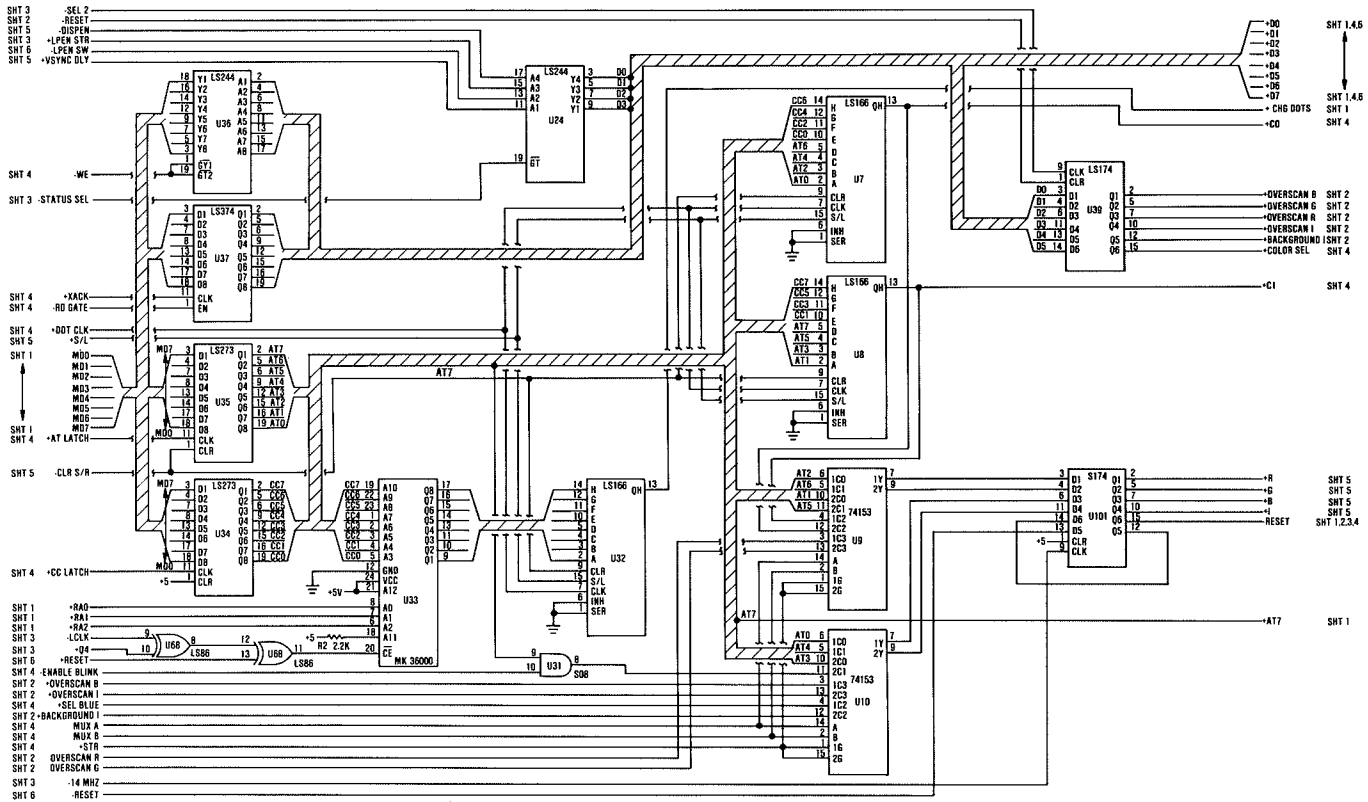
Monochrome Display Adapter (Sheet 9 of 10)



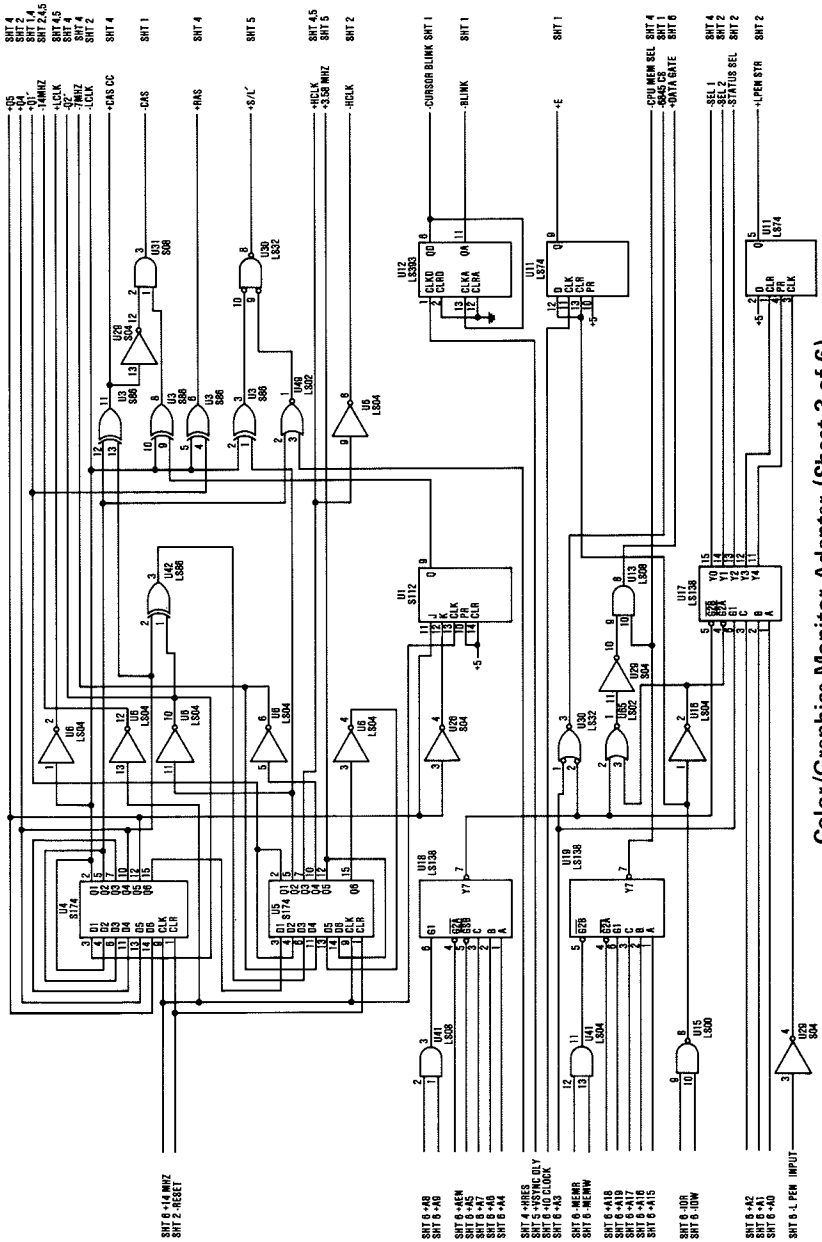
Monochrome Display Adapter (Sheet 10 of 10)

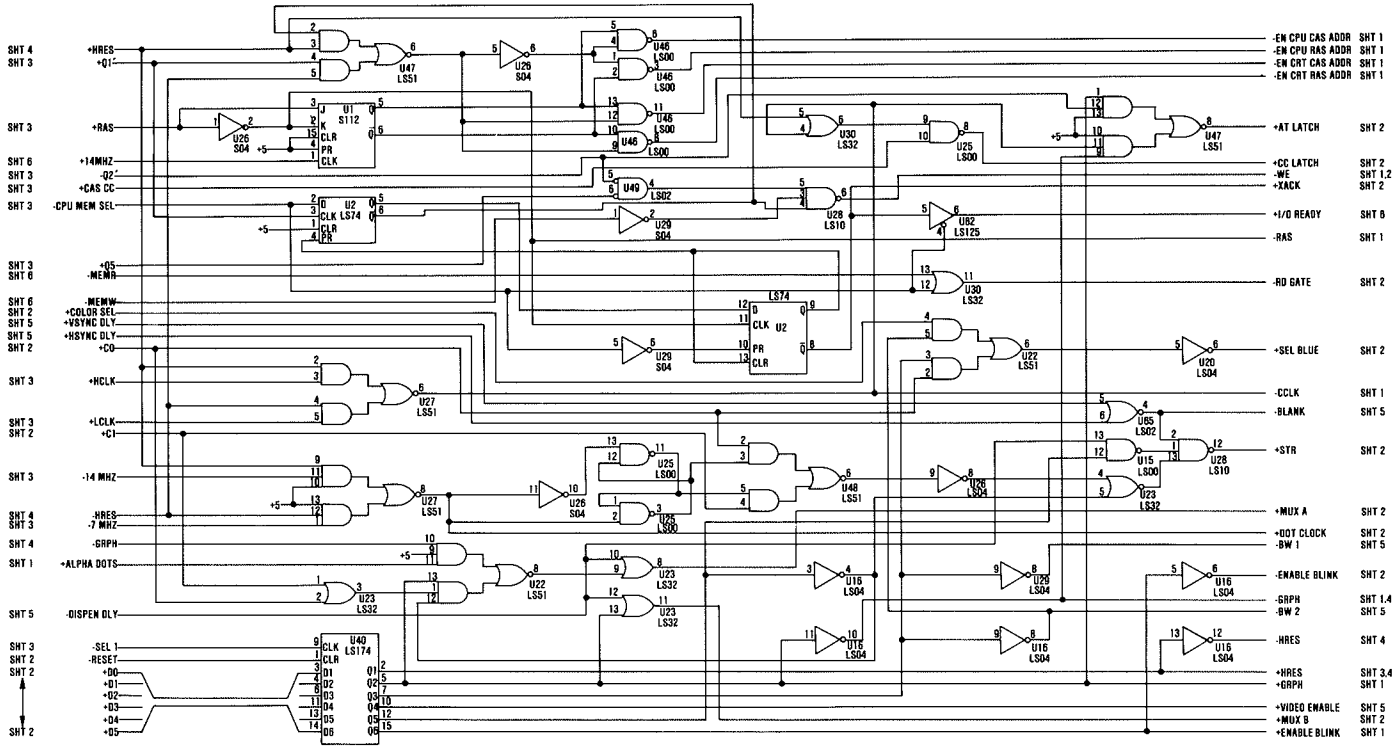


Color/Graphics Monitor Adapter (Sheet 1 of 6)

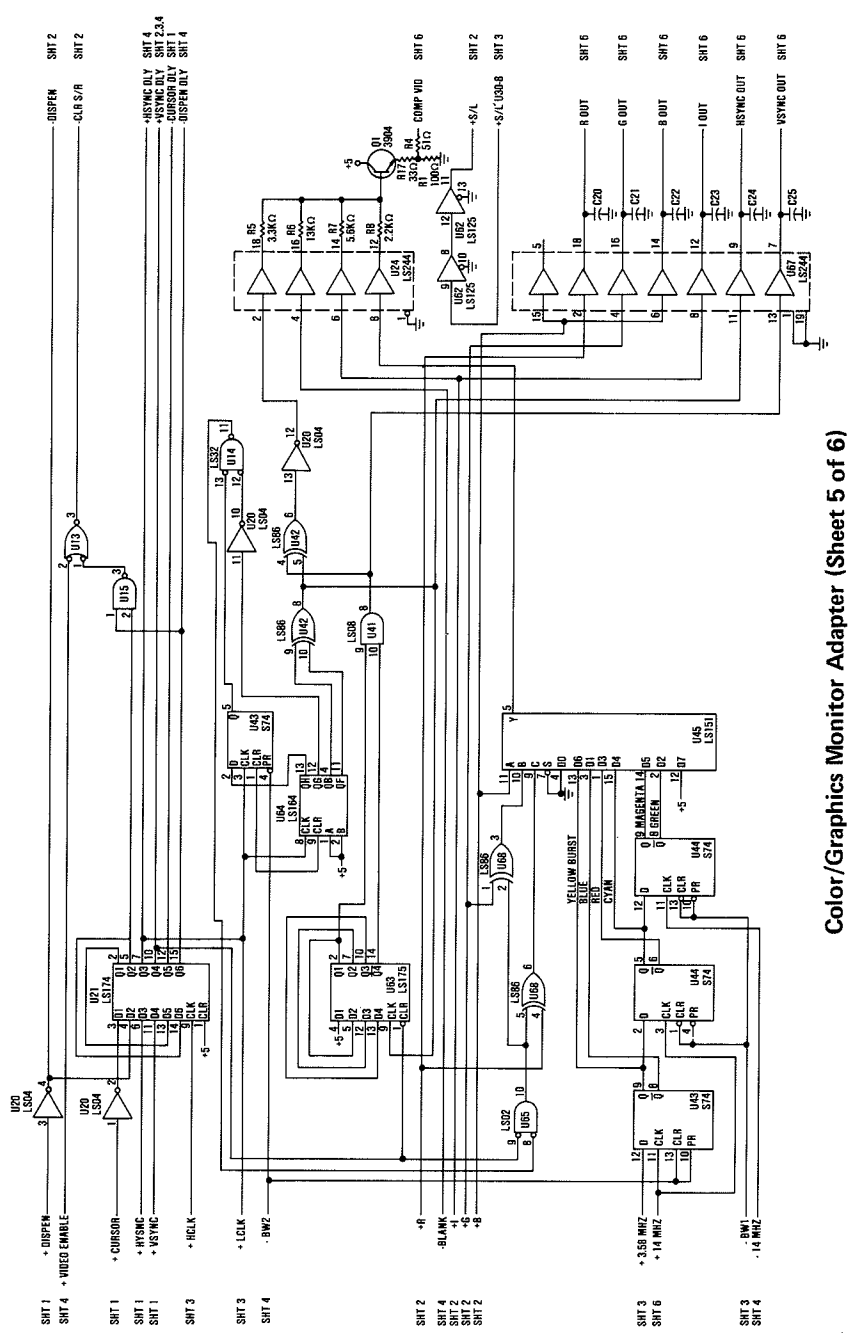


Color/Graphics Monitor Adapter (Sheet 2 of 6)

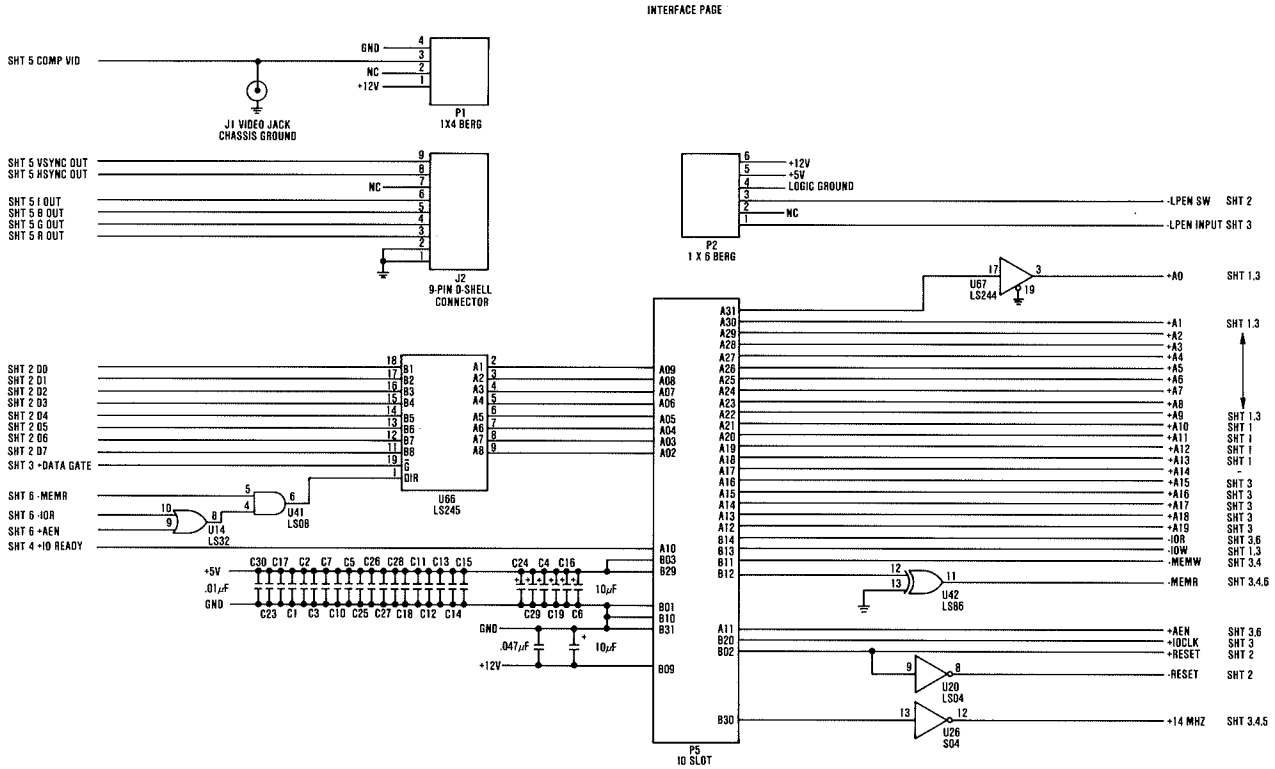

Color/Graphics Monitor Adapter (Sheet 3 of 6)



Color/Graphics Monitor Adapter (Sheet 4 of 6)



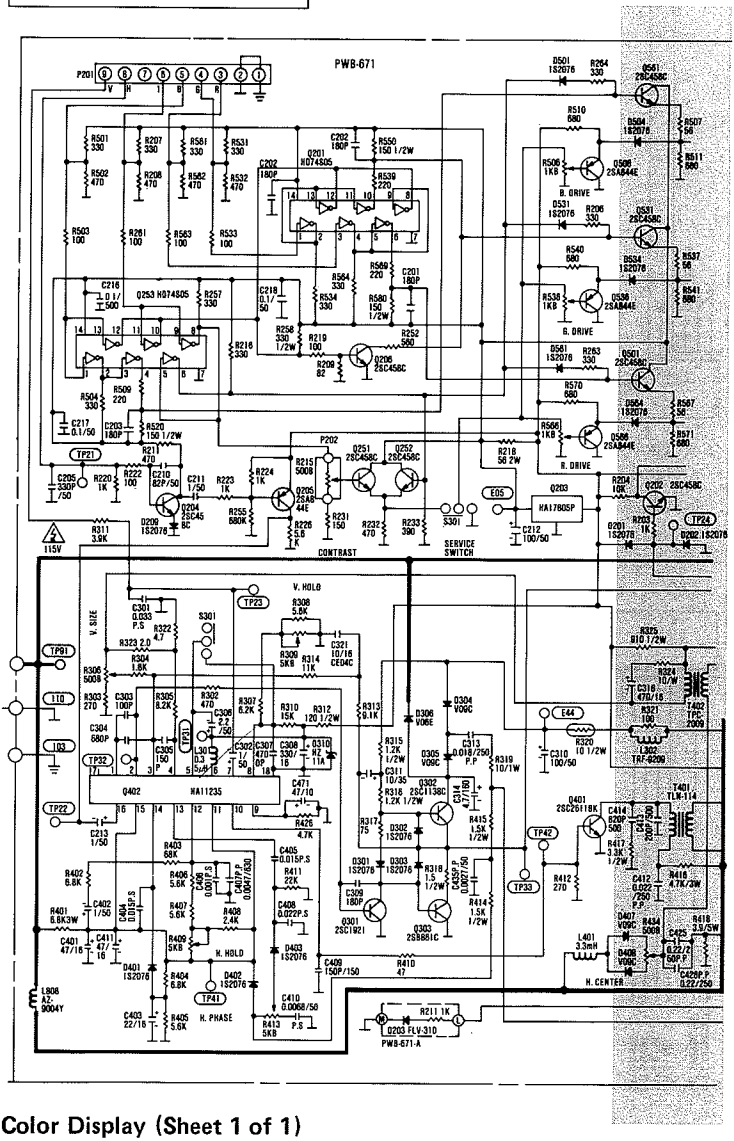
Color/Graphics Monitor Adapter (Sheet 5 of 6)



Color/Graphics Monitor Adapter (Sheet 6 of 6)

DANGER

HAZARDOUS VOLTAGES UP TO 450 VOLTS EXIST ON THE PRINTED CIRCUIT BOARDS

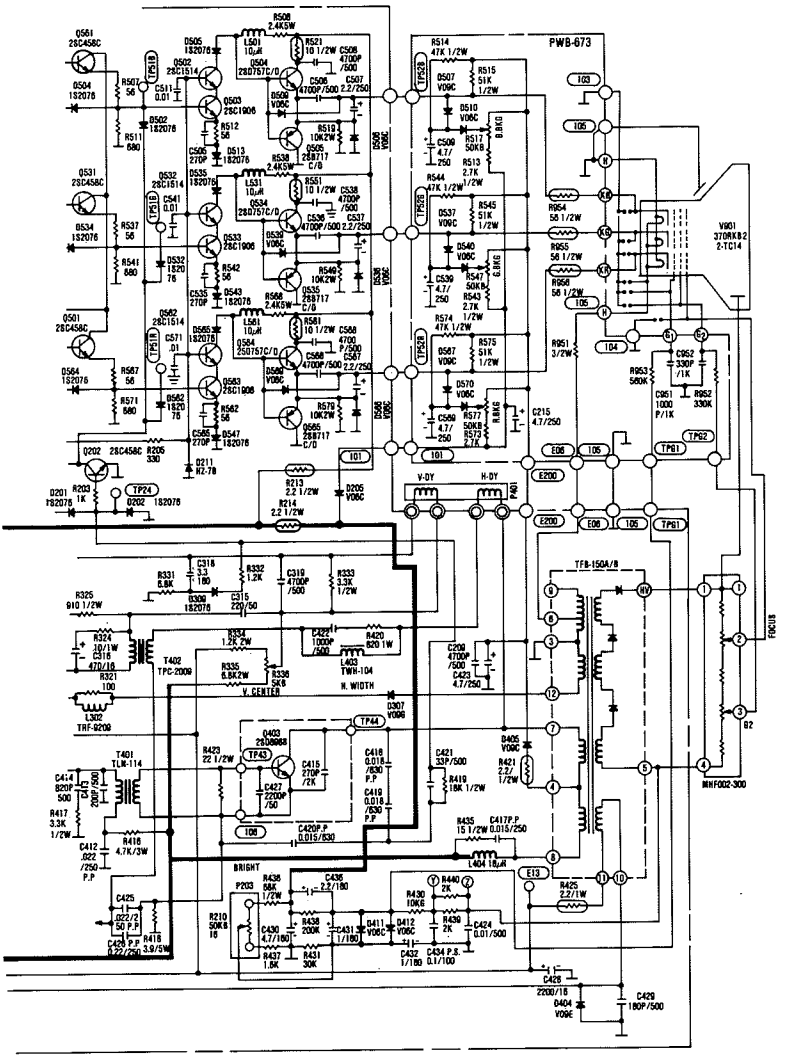


Color Display (Sheet 1 of 1)

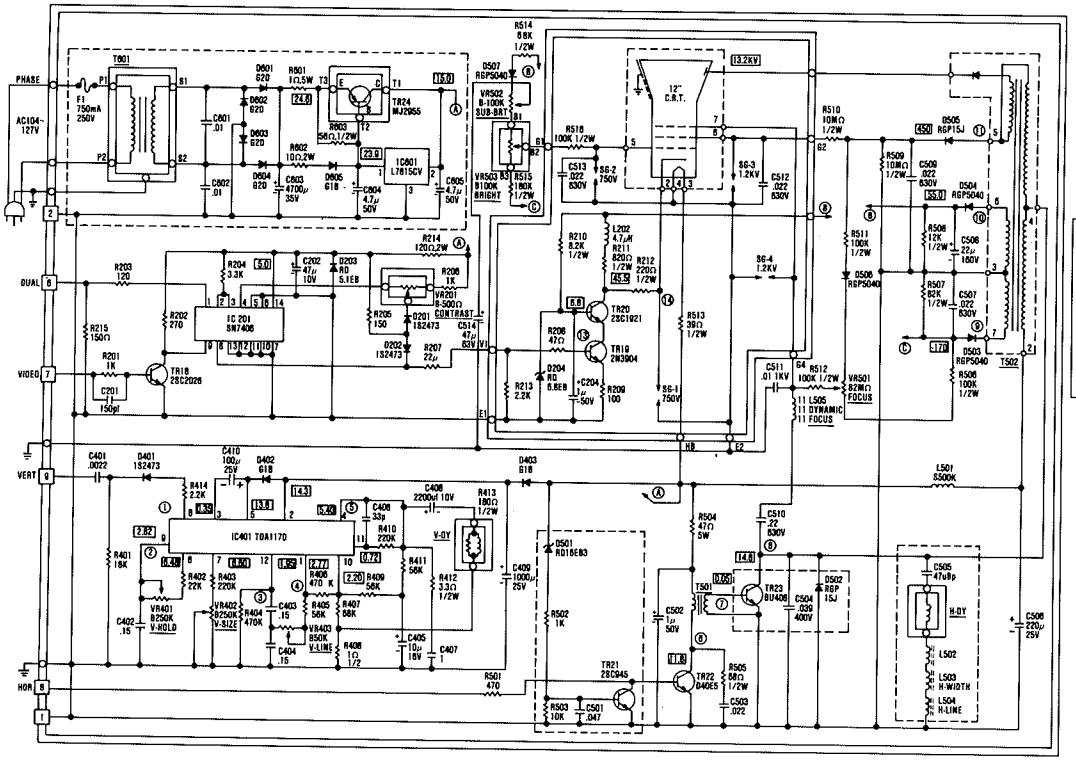
DANGER

HAZARDOUS VOLTAGES UP TO 450 VOLTS EXIST ON THE PRINTED CIRCUIT BOARDS

NOTES:
1. RESISTOR VALUES ARE IN OHMS K = 1000 OHMS.
2. ALL RESISTORS ARE 1/2 WATT EXCEPT WHERE OTHERWISE INDICATED.
3. CAPACITOR VALUES ARE IN μF UNLESS OTHERWISE INDICATED P = PF.
4. ALL CAPACITORS ARE 50 VOLTS UNLESS OTHERWISE INDICATED.



Color Display (Sheet 1 of 1)



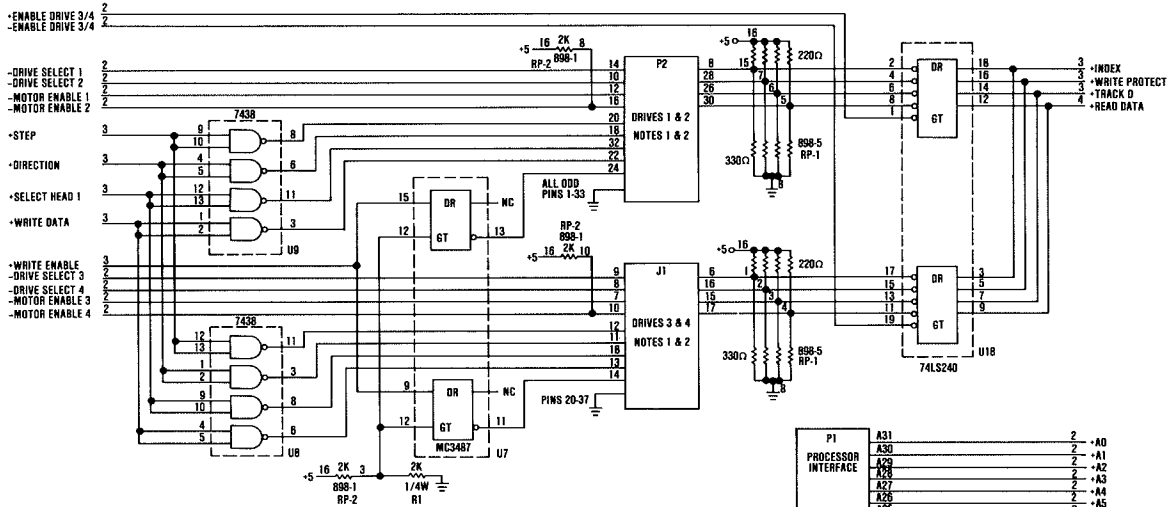
DANGER

HAZARDOUS VOLTAGES UP TO 450 VOLTS EXIST ON THE PRINTED CIRCUIT BOARDS

NOTES:
1. RESISTOR VALUES ARE IN (OHM) Ω K = 1000Ω M = 1,000,000Ω
2. ALL RESISTOR ARE 1/4W EXCEPT WHERE OTHERWISE INDICATED.
3. ALL CAPACITORS ARE 50V EXCEPT WHERE OTHERWISE INDICATED.
4. CAPACITORS VALUES ARE μF UNLESS OTHERWISE INDICATED μ = μF = 10⁶.
5. AC WIRING INFORMATION
   PHASE = BLACK/BROWN WIRE
   NEUTRAL = WHITE/BLUE WIRE
   GROUND = GREEN AND YELLOW WIRE

IMPORTANT: THE PHASE WIRE MUST GO TO THE FUSED SIDE OF TRANSFORMER.

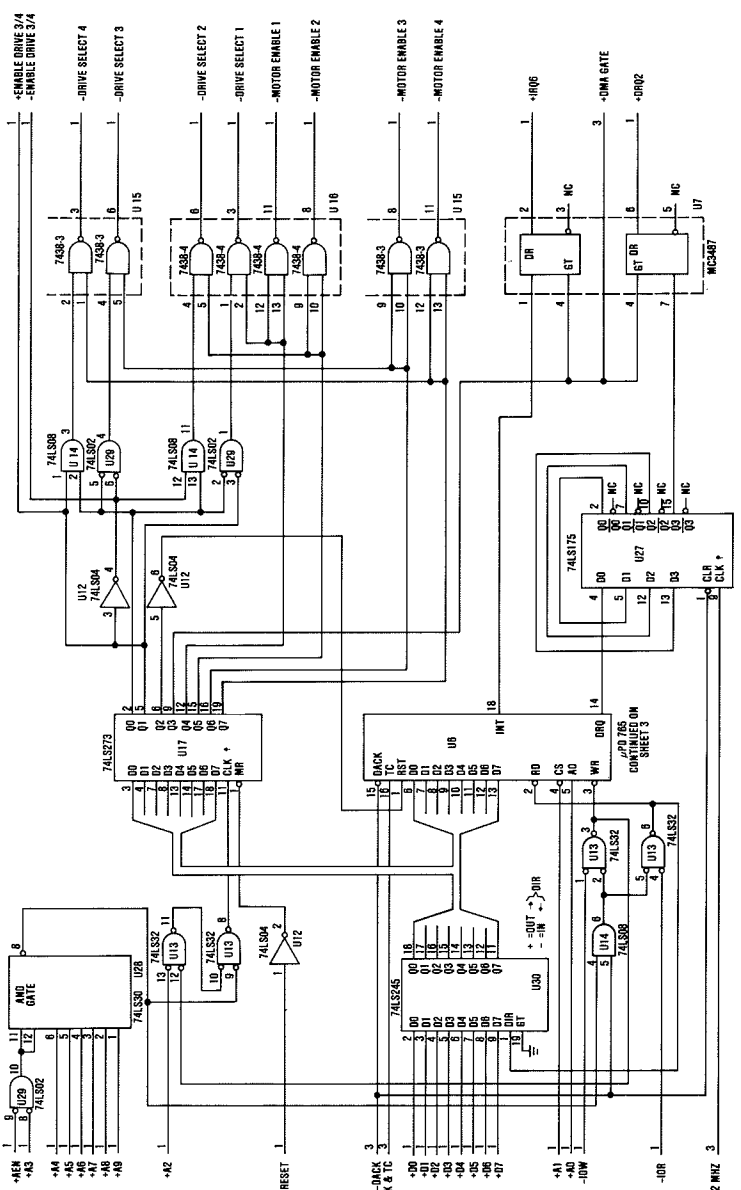
Monochrome Display (Sheet 1 of 1)



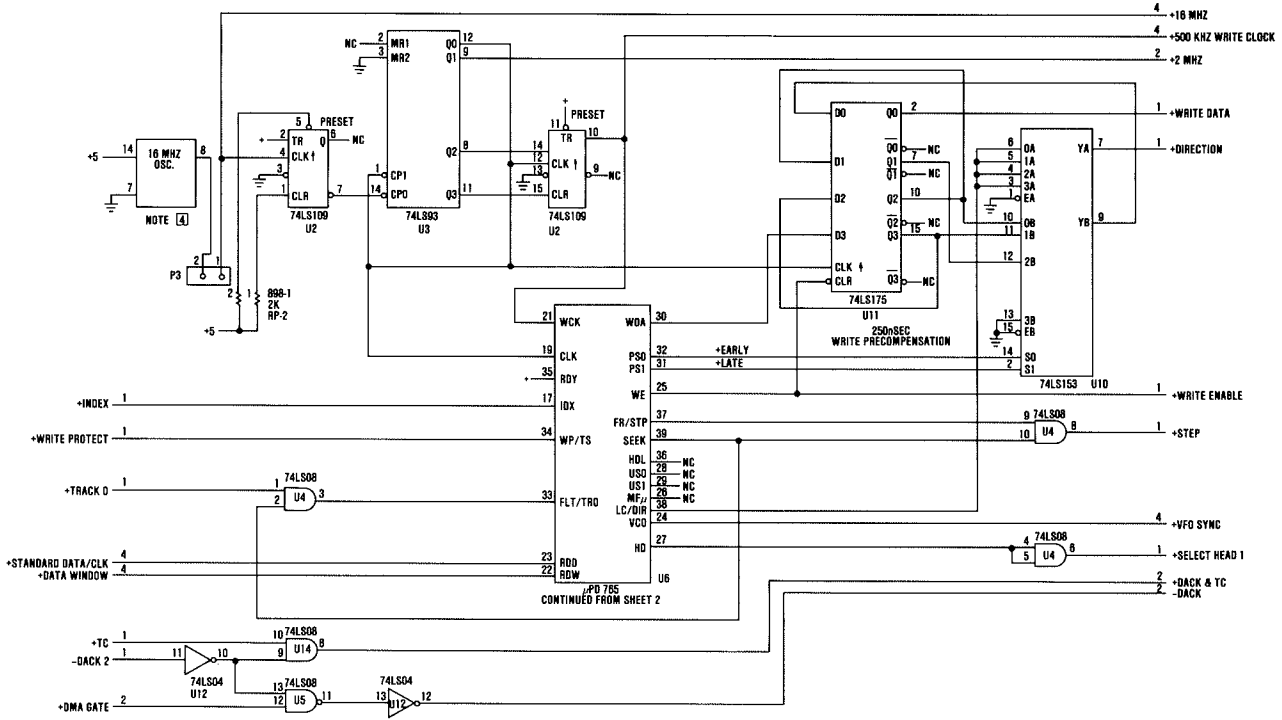
NOTES:

1. SIGNALS ON DRIVE PINS 10 THRU 16 ARE SWAPPED BY THE DRIVE CABLE BETWEEN DRIVES 1 & 2 (AND 3 & 4) AS FOLLOWS:
   10 TO 16
   11 " 15
   12 " 14
   13 " 13
   14 " 12
   15 " 11
   16 TO 10
2. ALL DRIVES ARE JUMPERED FOR MULTIPLEX OPERATION. HEAD LOAD WITH DRIVE SELECT AND DRIVE SELECT VIA INPUT PIN 12. TERMINATING R-PACS ARE LEFT IN DRIVES 1 & 3 ONLY
3. .047μFD SHOULD BE ADJACENT TO MODULES MC3487, 7438, 74S74, 16 MHZ OSC. RP-1, MC4044, MC4024, 74LS151 & 74LS191 8.2μFD CAPS SHOULD BE NEAR ASSOCIATED P1 PINS.
4. ALL SIGNAL LINES HIGHER THAN OR EQUAL TO 1MHZ SHOULD BE KEPT TO THE SHORTEST POSSIBLE LENGTH. THIS IS A PRIMARY DESIGN GOAL
5. MAKE NO CONNECTION TO UNUSED PINS ON THE VCO, CHARGE PUMP & DATA SEPARATOR MODULES
6. ALL VOLTAGE AND GROUND CONNECTORS TO THE VCO, CHARGE PUMP AND ASSOCIATED DISCRETE COMPONENTS SHOULD BE SEPARATE FROM OTHER CIRCUITS AND THEN JOINED TO THE OTHER CIRCUITS AT ONE POINT

5-1/4 Inch Diskette Drive Adapter (Sheet 1 of 4)

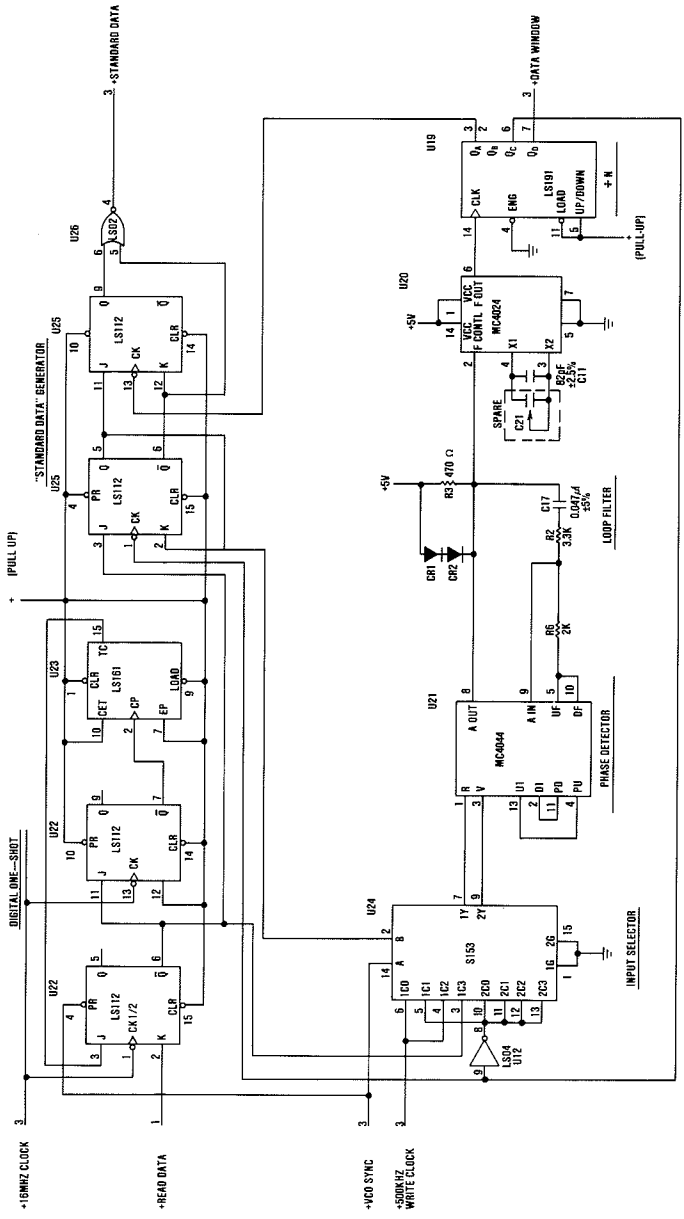


5-1/4 Inch Diskette Drive Adapter (Sheet 2 of 4)

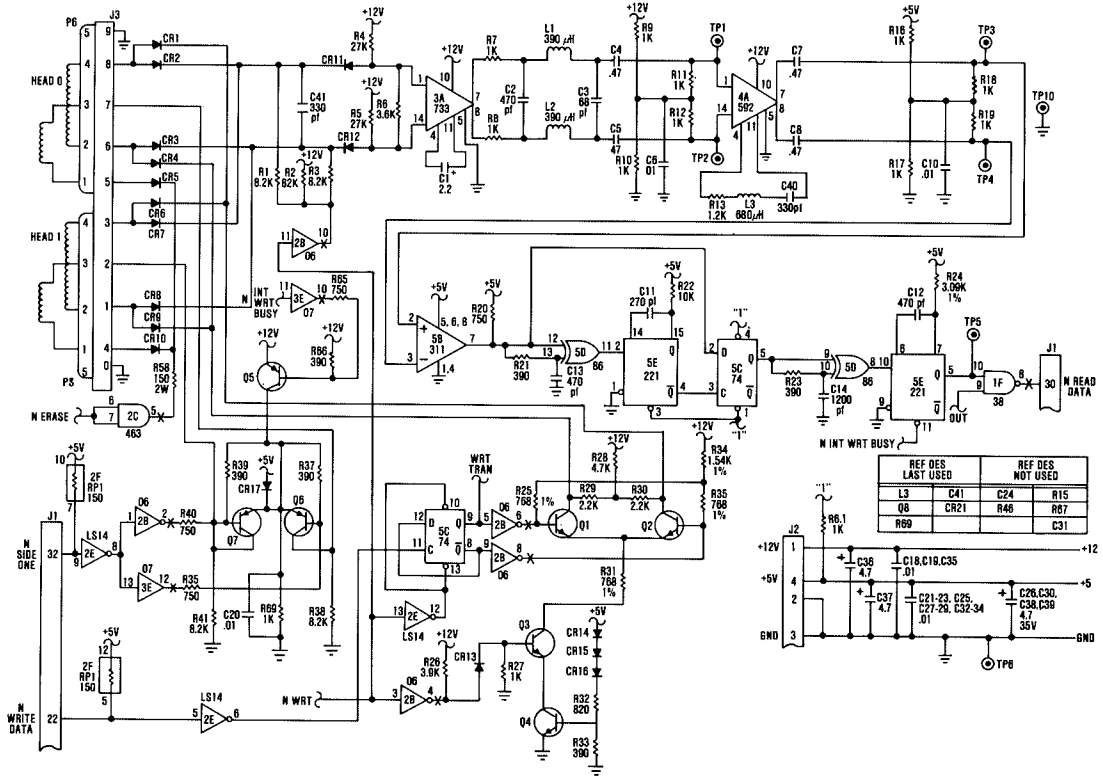


NOTE:
U4 (74LS08) PINS 12 AND 13 ARE CONNECTED ONLY ON CARDS BUILT USING RAW CARD P/N 5001293

5-1/4 Inch Diskette Drive Adapter (Sheet 3 of 4)

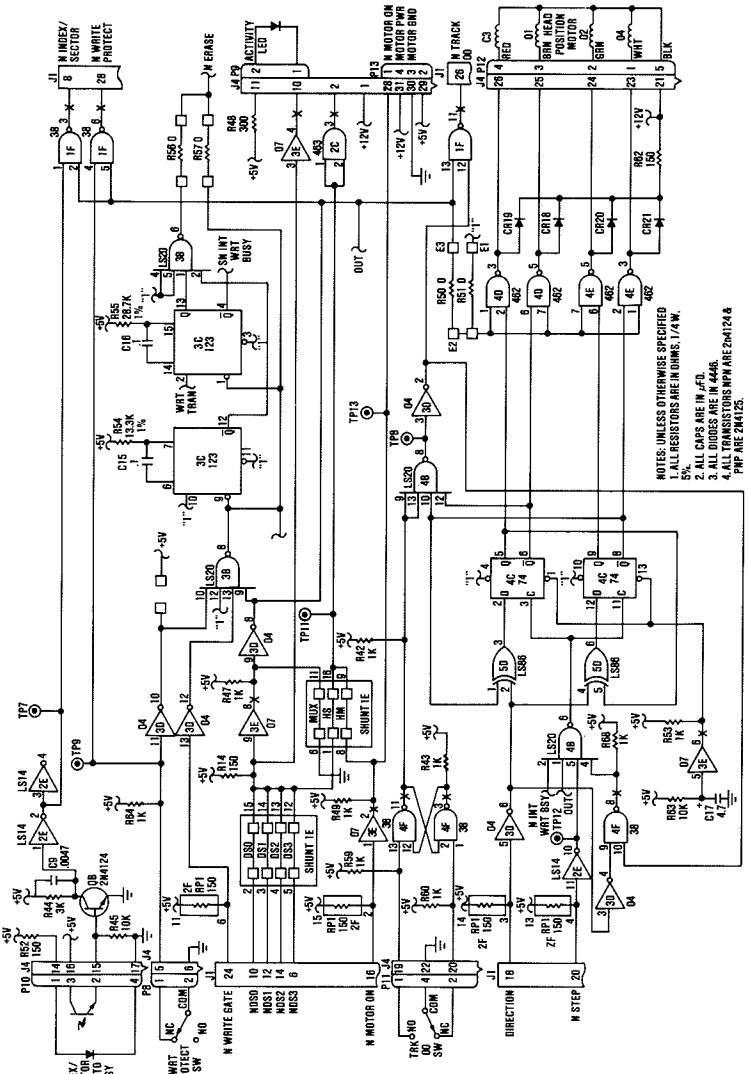


5-1/4 Inch Diskette Drive Adapter (Sheet 4 of 4)

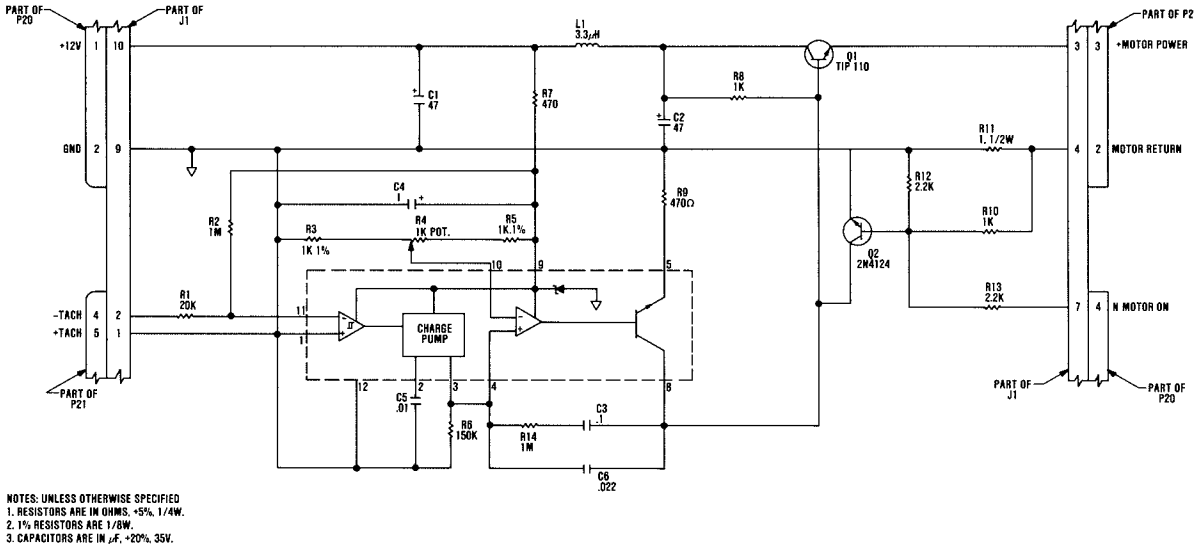


REF DES LAST USED		REF DES NOT USED	
L3	C41	C24	R15
Q8	CR21	R46	R67
R69			C31

5-1/4 Inch Diskette Drive Type 1 (Sheet 1 of 3)

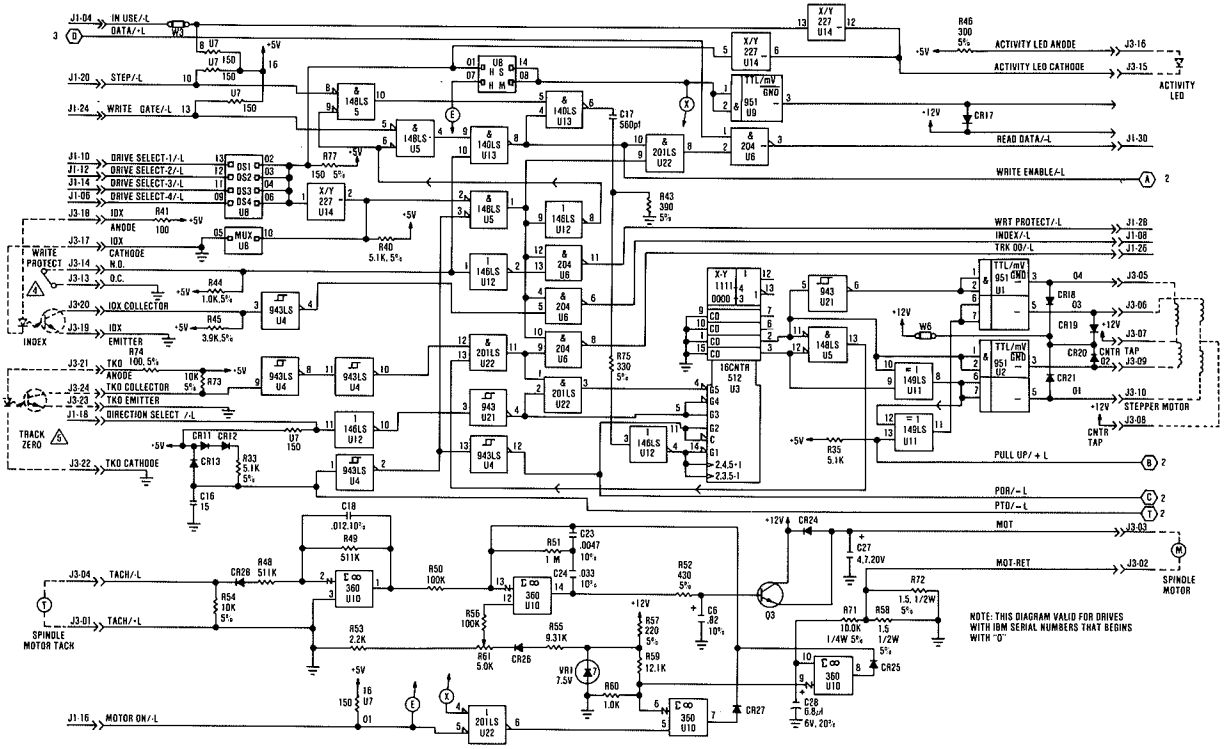


5-1/4 Inch Diskette Drive Type 1 (Sheet 2 of 3)

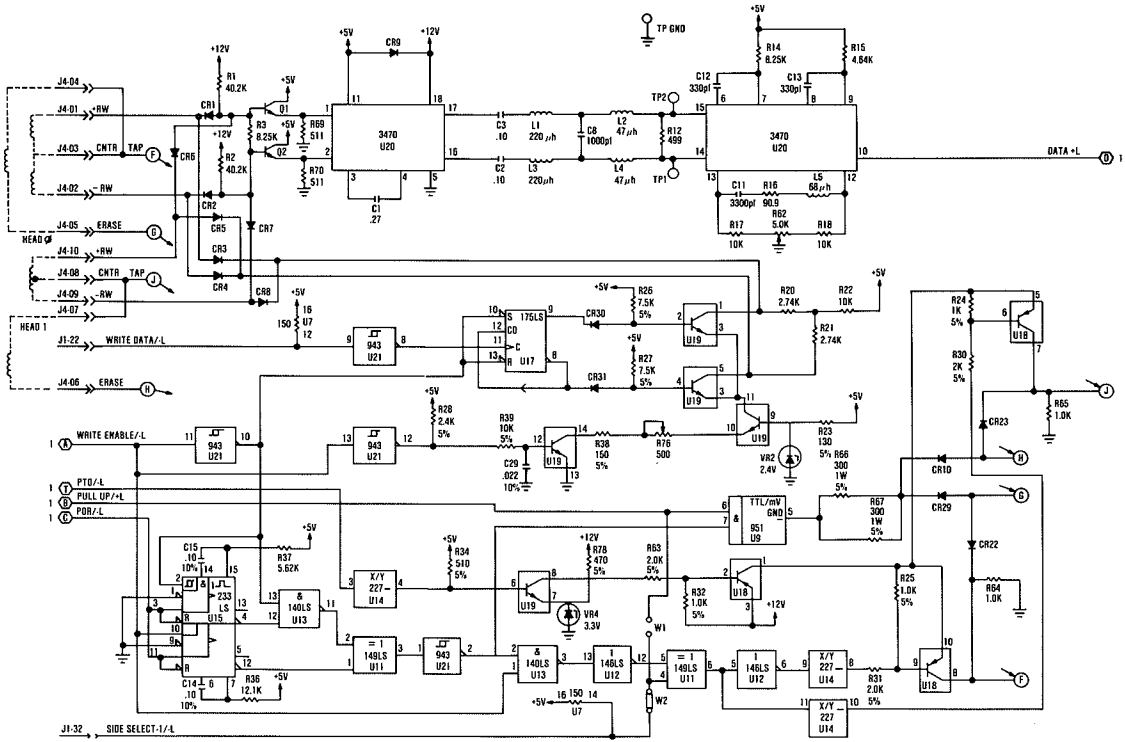


NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTORS ARE IN OHMS, ±5%, 1/4W.
2. 1% RESISTORS ARE 1/8W.
3. CAPACITORS ARE IN μF, ±20%, 35V.

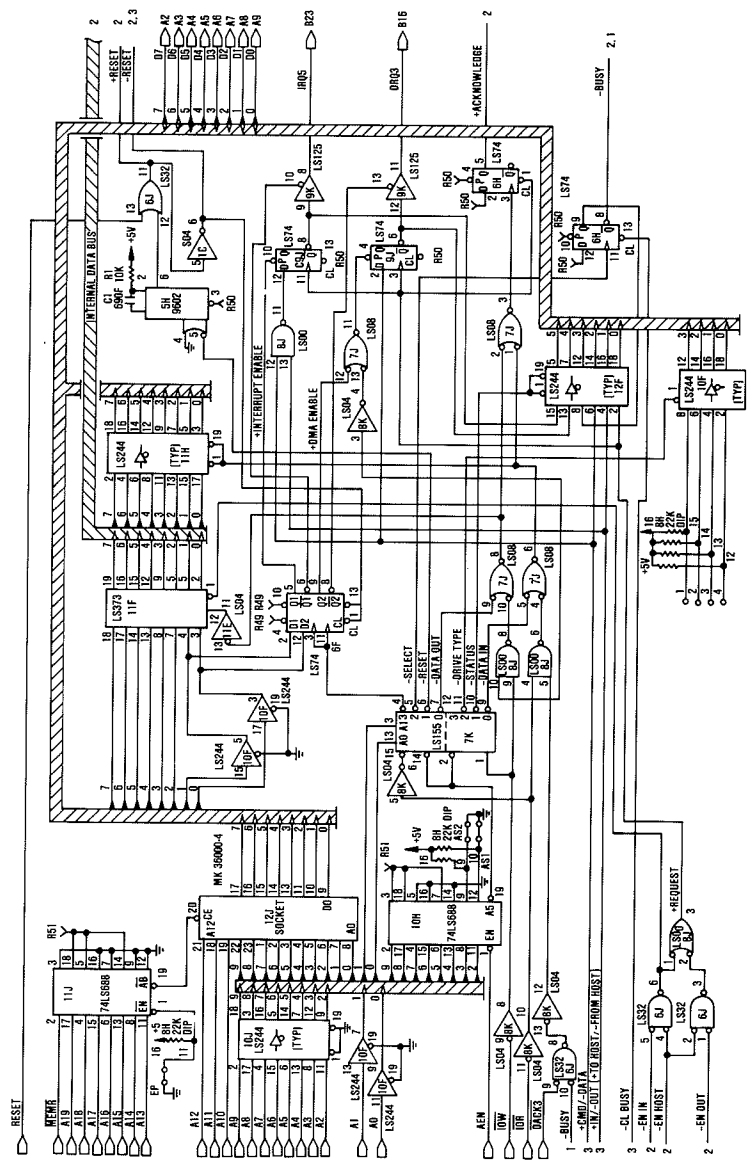
5-1/4 Inch Diskette Drive Type 1 (Sheet 3 of 3)



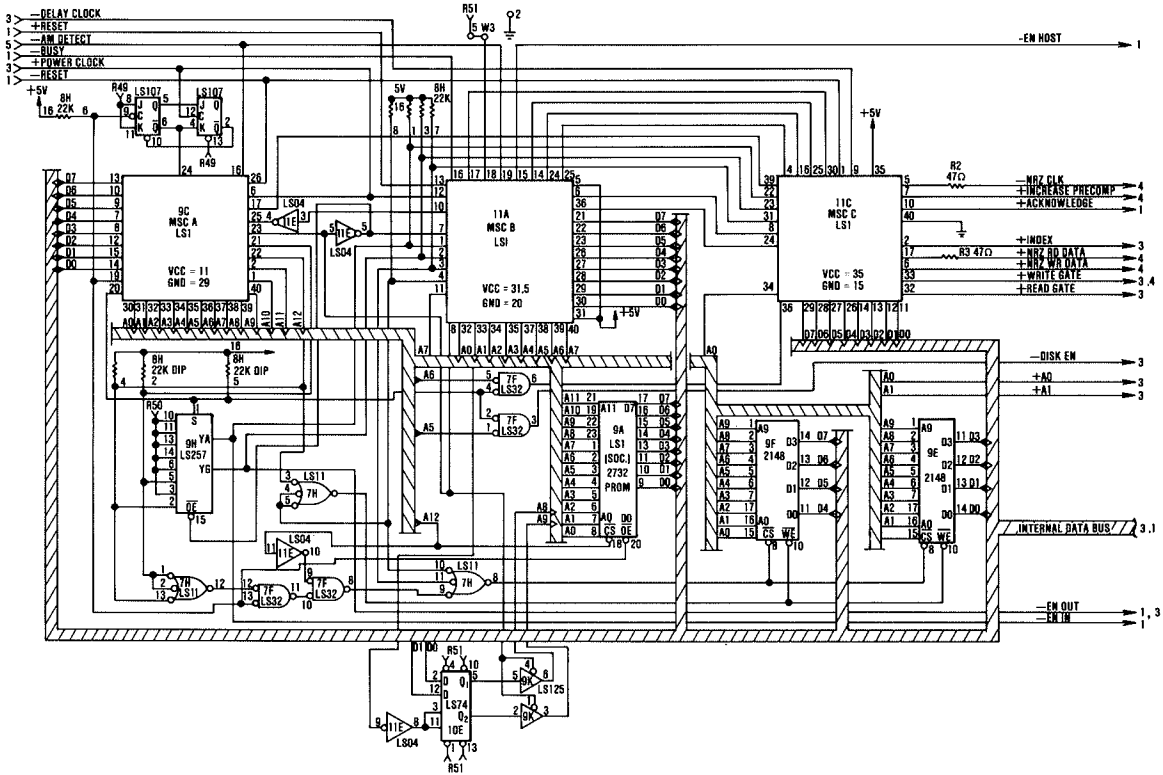
5-1/4 Inch Diskette Drive Type 2 (Sheet 1 of 2)



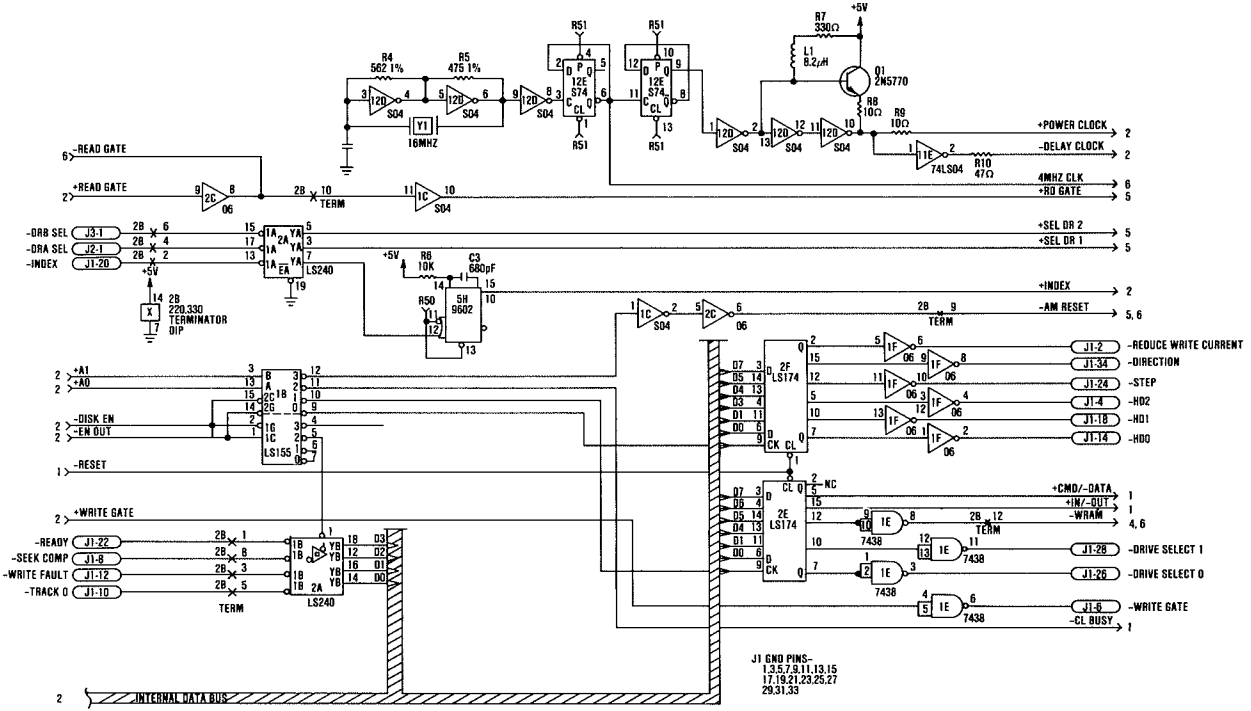
5-1/4 Inch Diskette Drive Type 2 (Sheet 2 of 2)



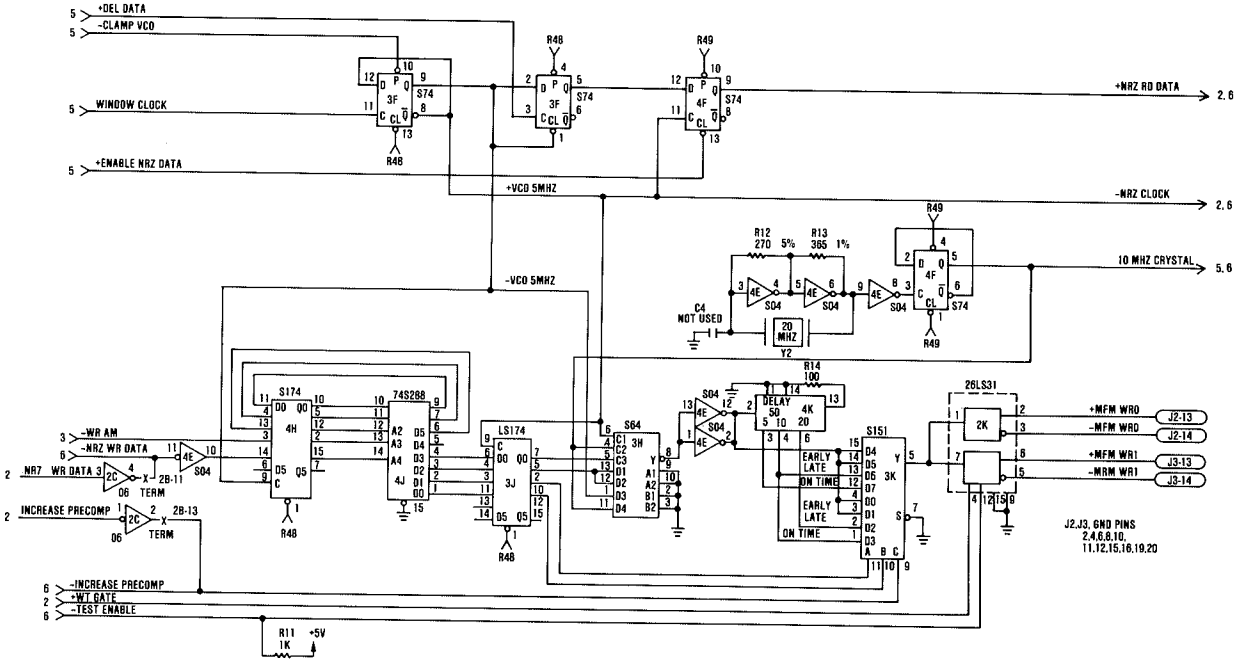
Fixed Disk Drive Adapter (Sheet 1 of 6)



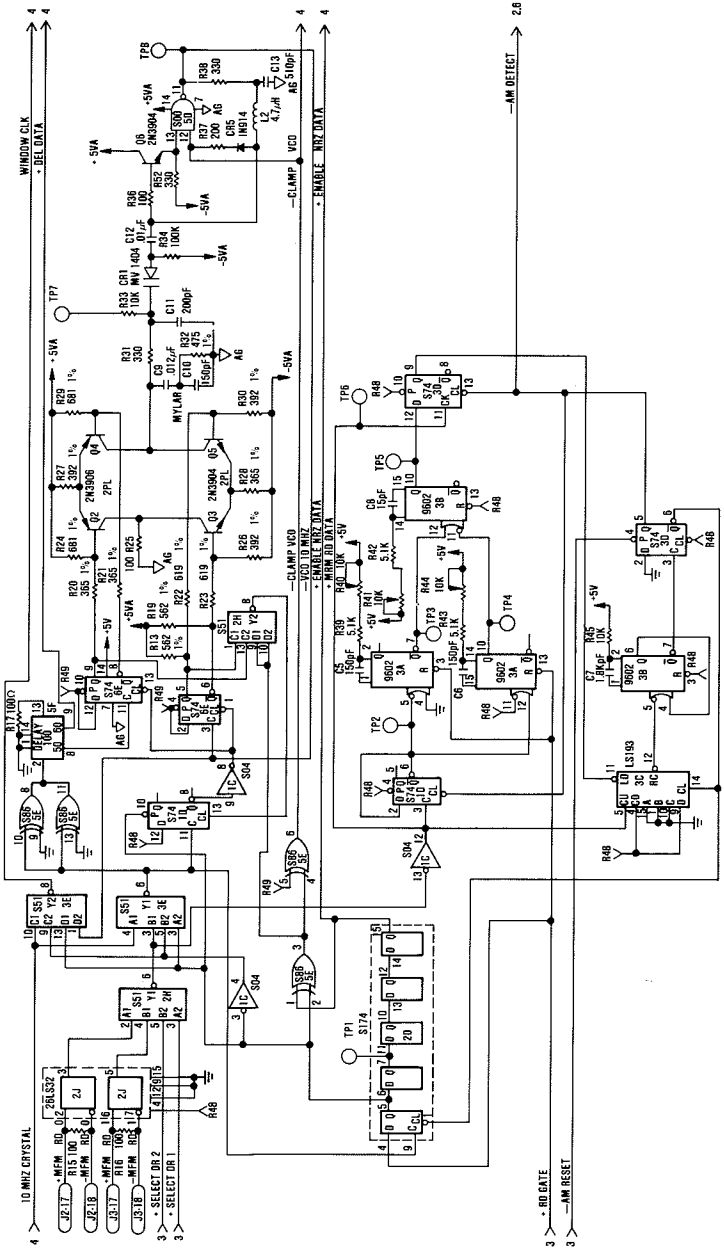
Fixed Disk Drive Adapter (Sheet 2 of 6)



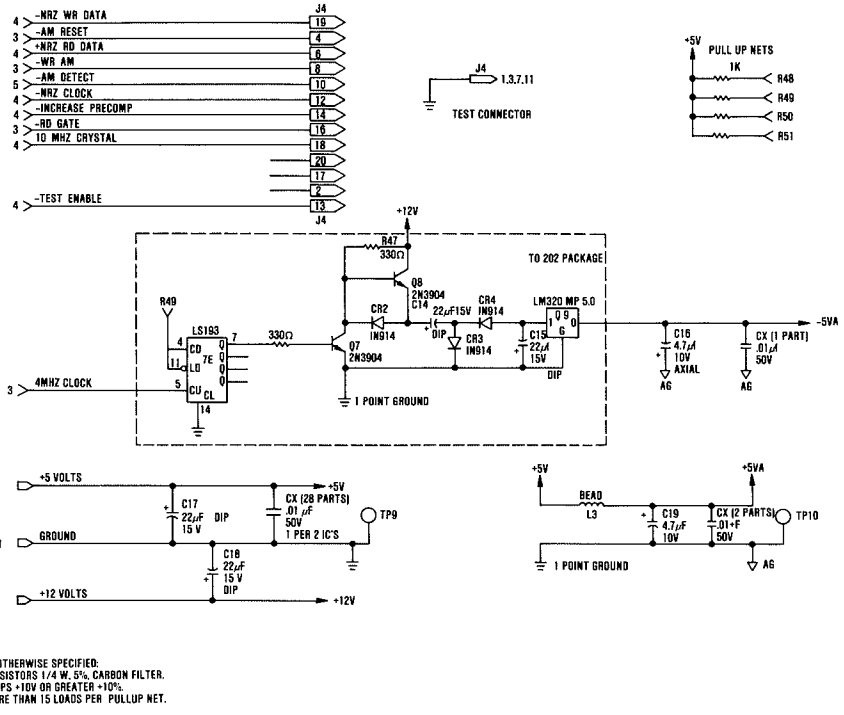
Fixed Disk Drive Adapter (Sheet 3 of 6)



Fixed Disk Drive Adapter (Sheet 4 of 6)

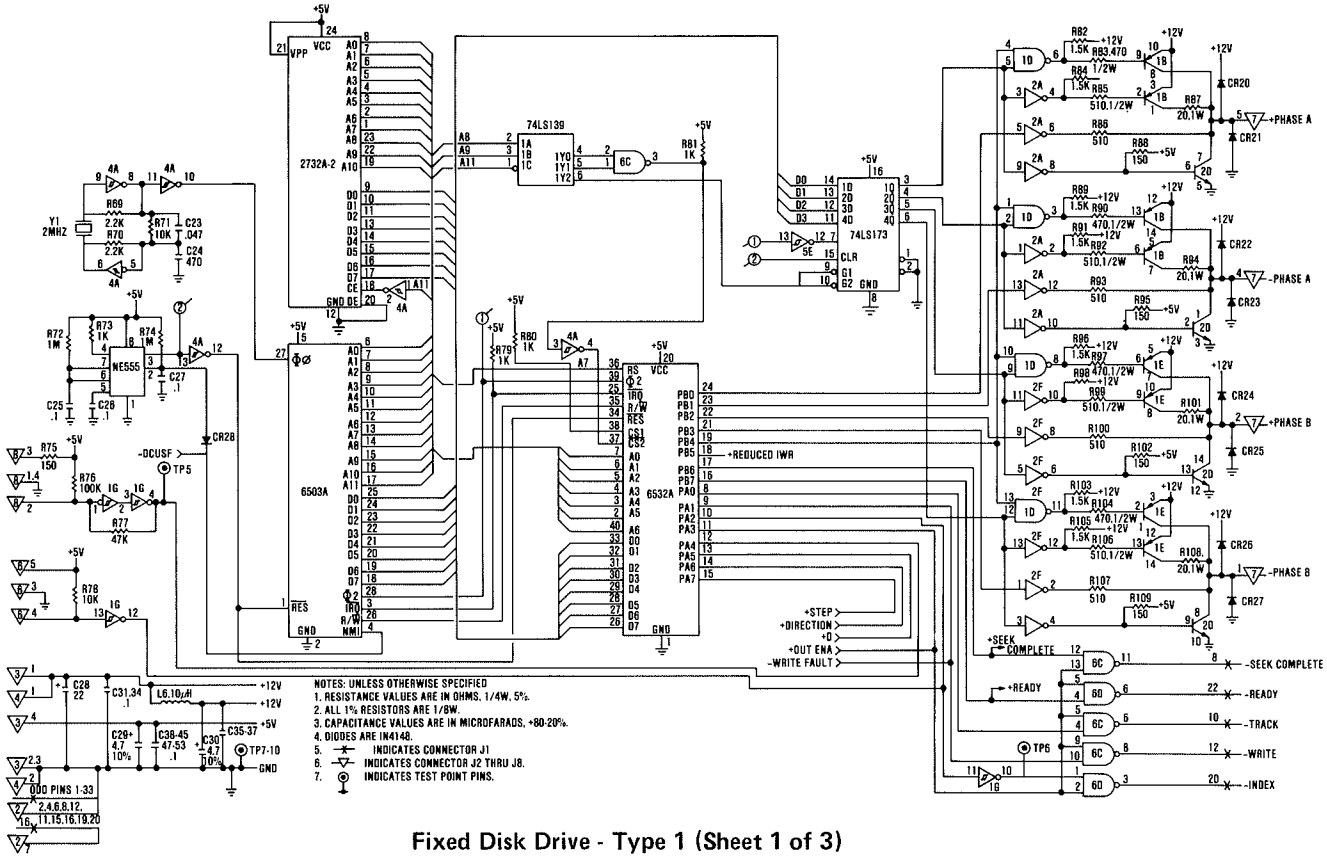


Fixed Disk Drive Adapter (Sheet 5 of 6)

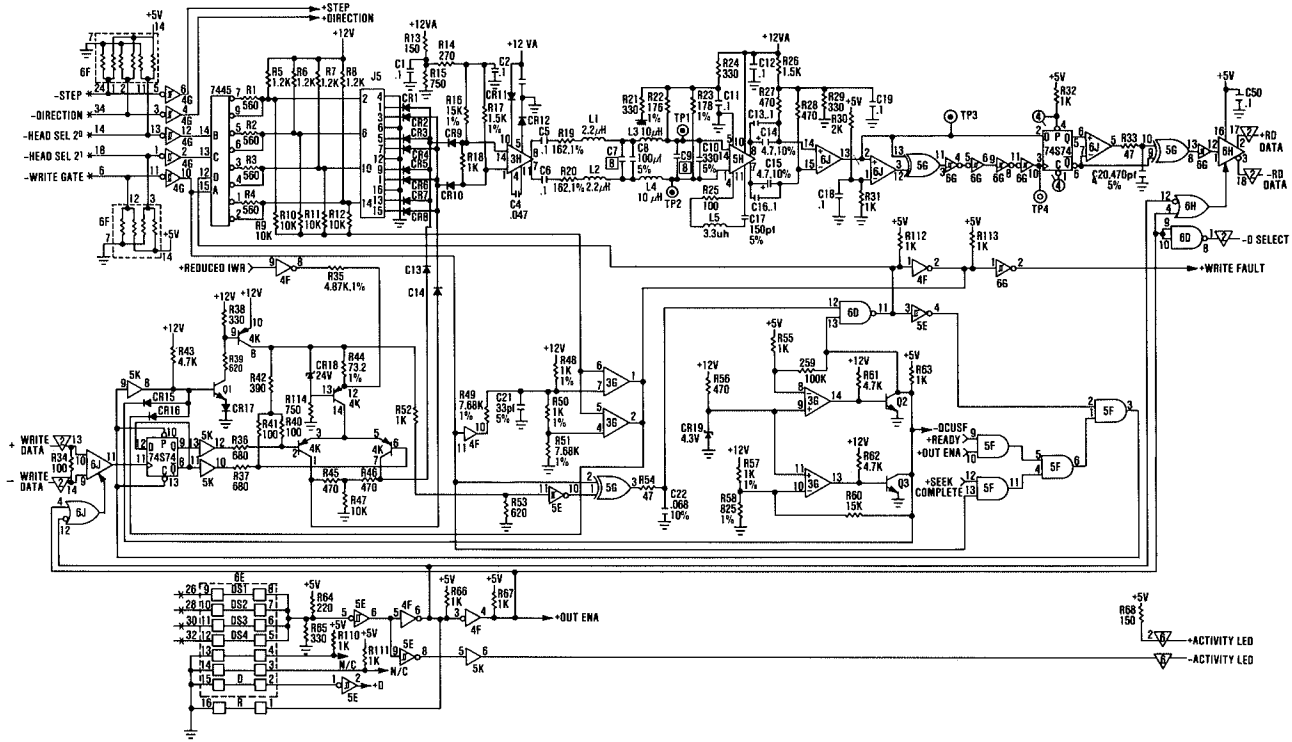


NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTORS 1/4 W, 5%, CARBON FILTER.
2. ALL CAPS +10V OR GREATER +10%.
3. NO MORE THAN 15 LOADS PER PULLUP NET.

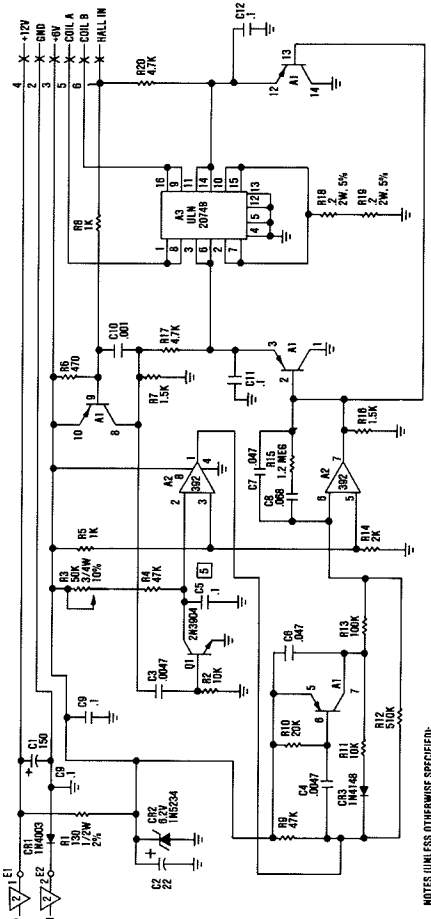
Fixed Disk Drive Adapter (Sheet 6 of 6)



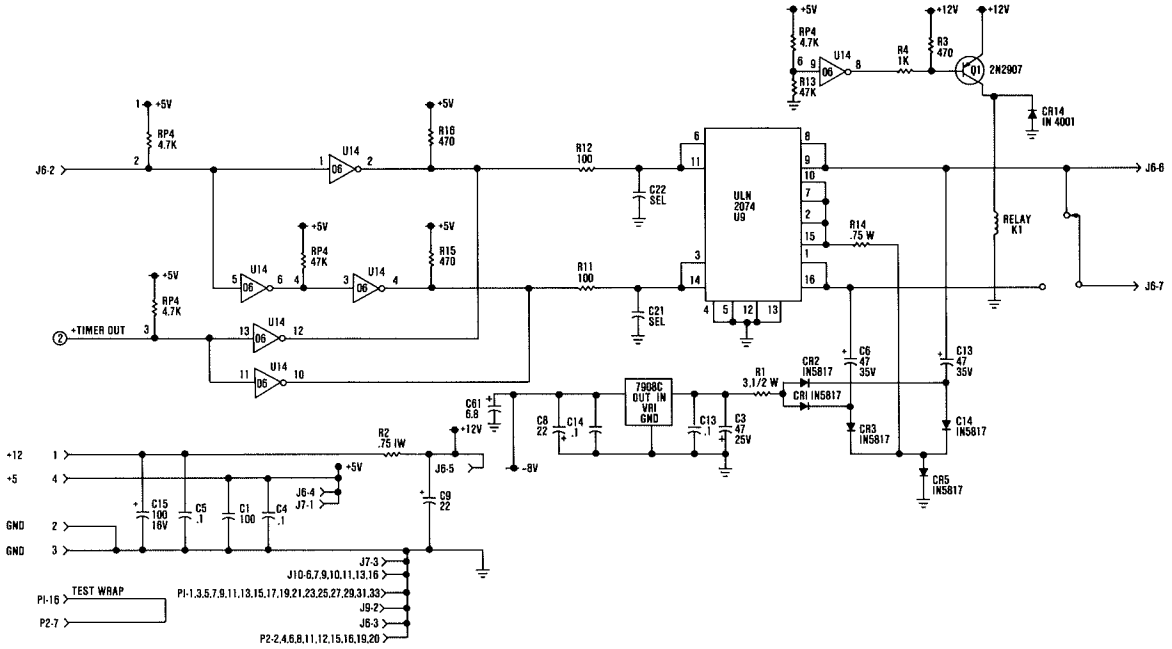
Fixed Disk Drive - Type 1 (Sheet 1 of 3)



Fixed Disk Drive - Type 1 (Sheet 2 of 3)

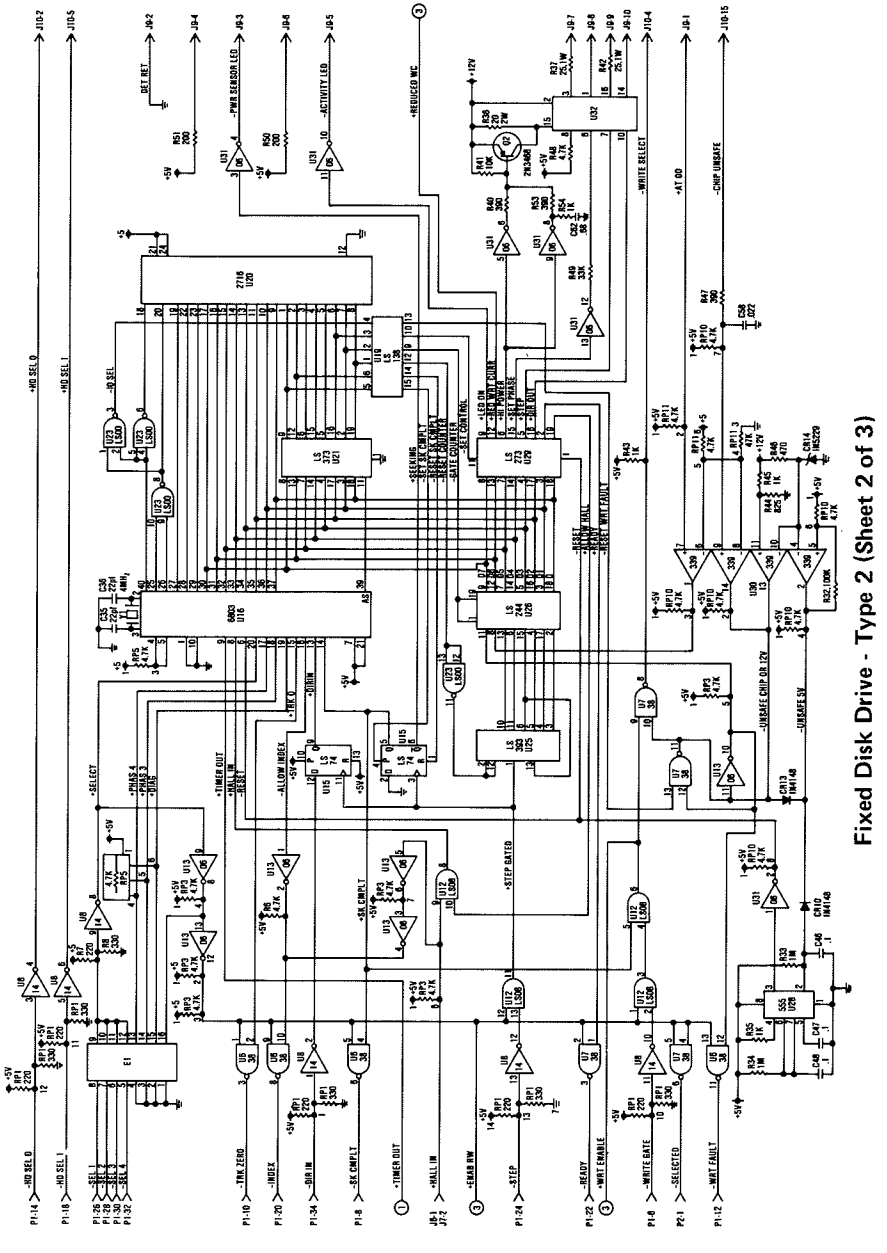


Fixed Disk Drive - Type 1 (Sheet 3 of 3)

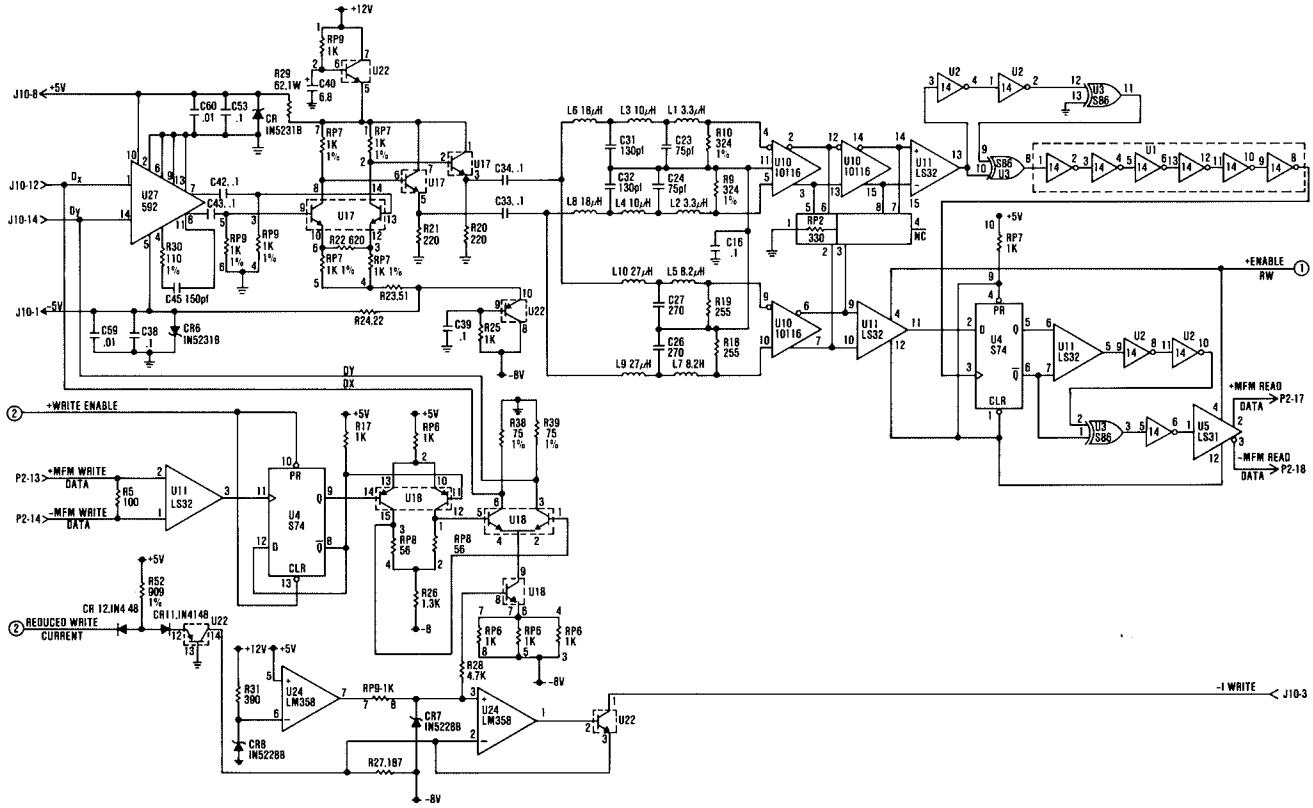


NOTES:
1. SHEET TO SHEET CONNECTION IS AS FOLLOWS:
   SHEET NO.
2. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4W 5% VALUE IN OHMS
   CAPACITORS +80-20% VALUE IN μF
3. E1 IS A PROGRAMMABLE JUMPER SOCKET

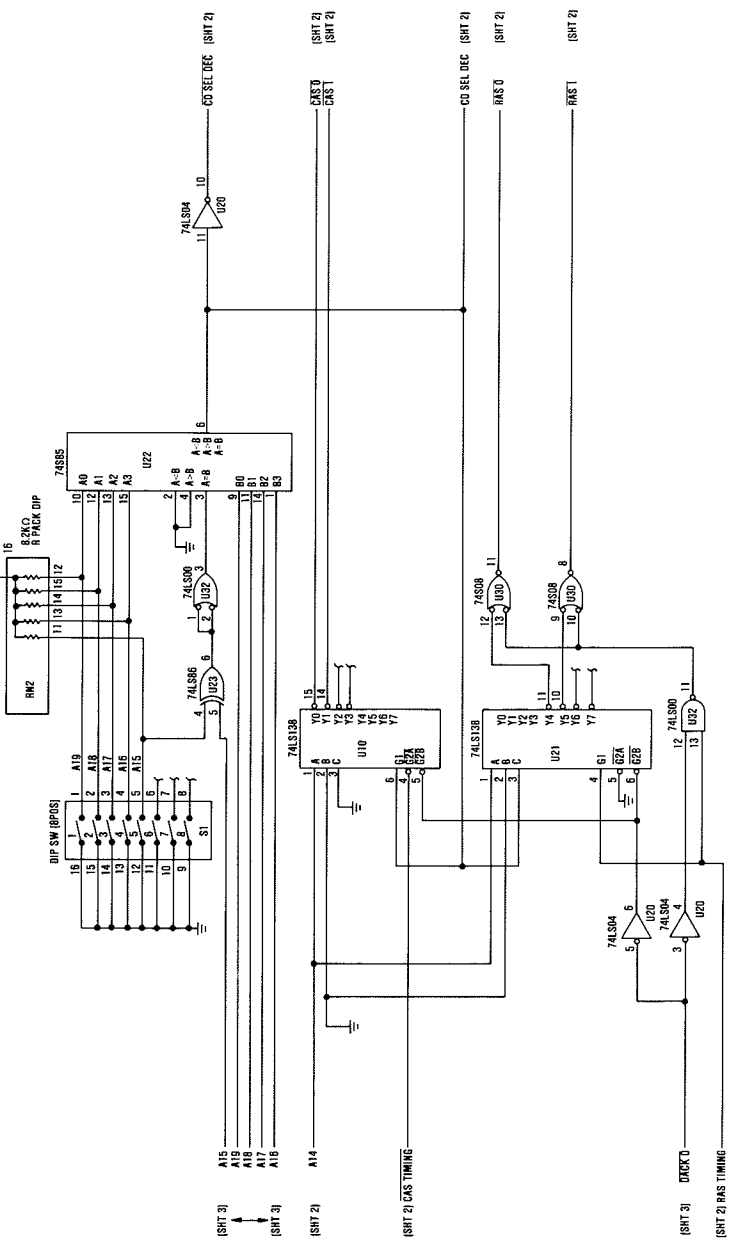
Fixed Disk Drive - Type 2 (Sheet 1 of 3)



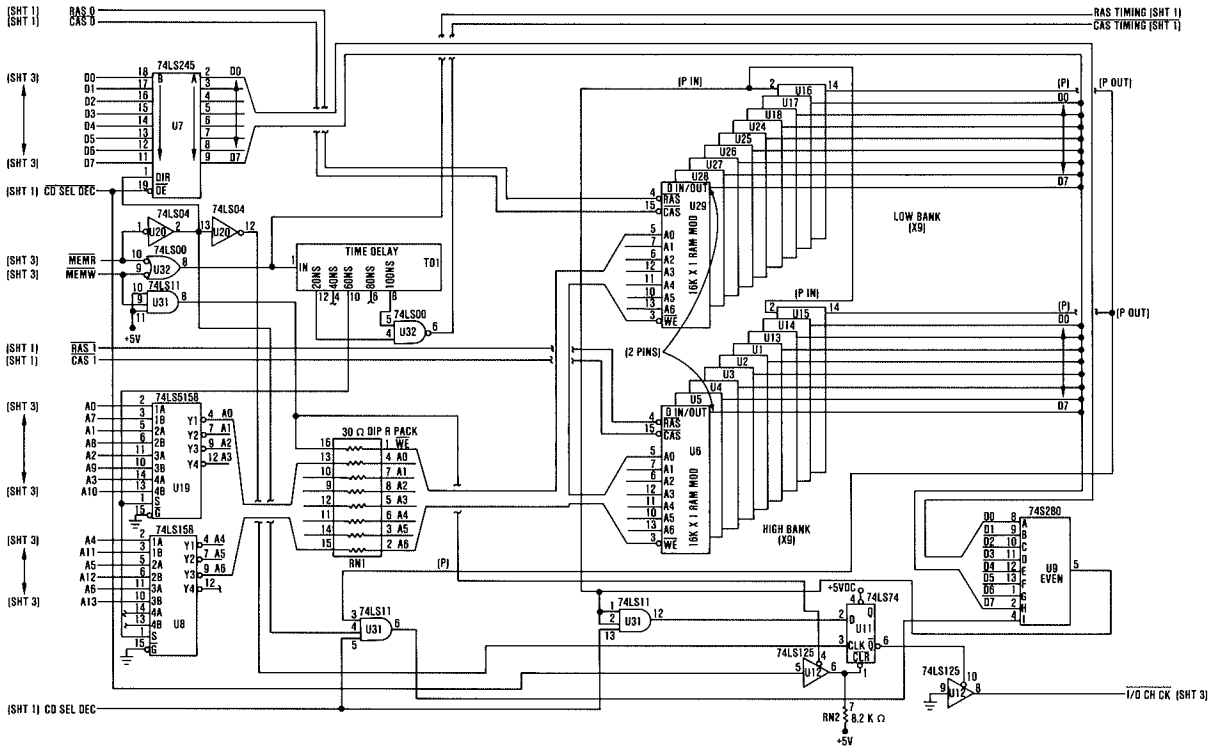
Fixed Disk Drive - Type 2 (Sheet 2 of 3)



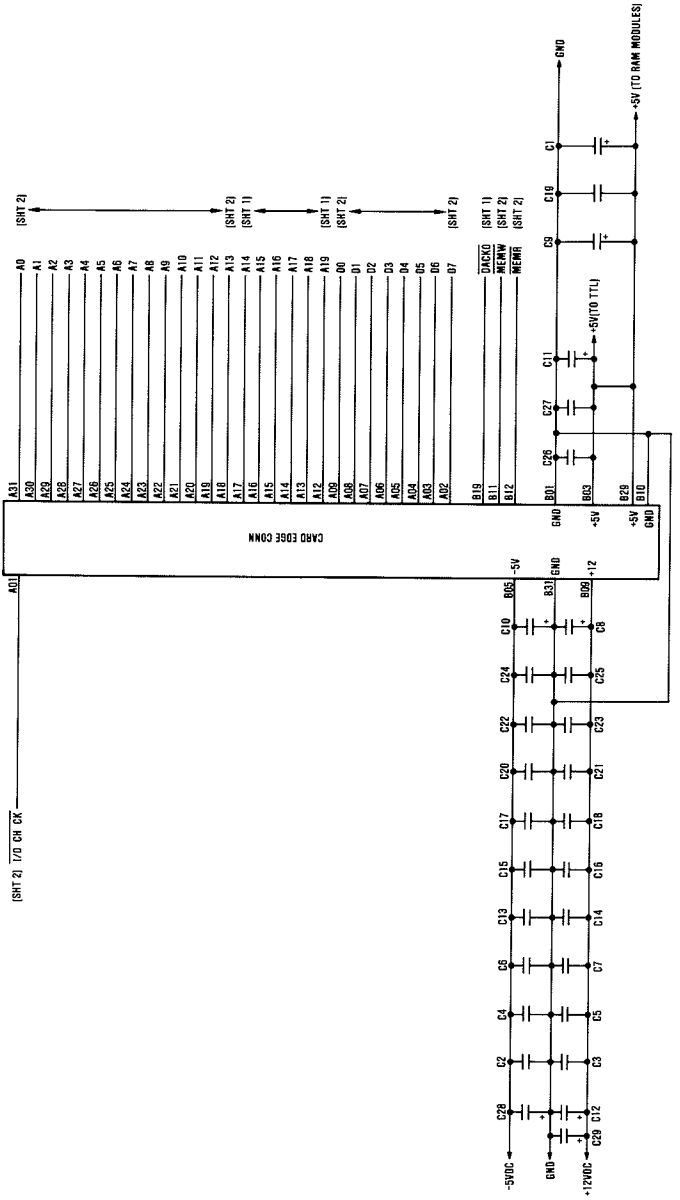
Fixed Disk Drive - Type 2 (Sheet 3 of 3)



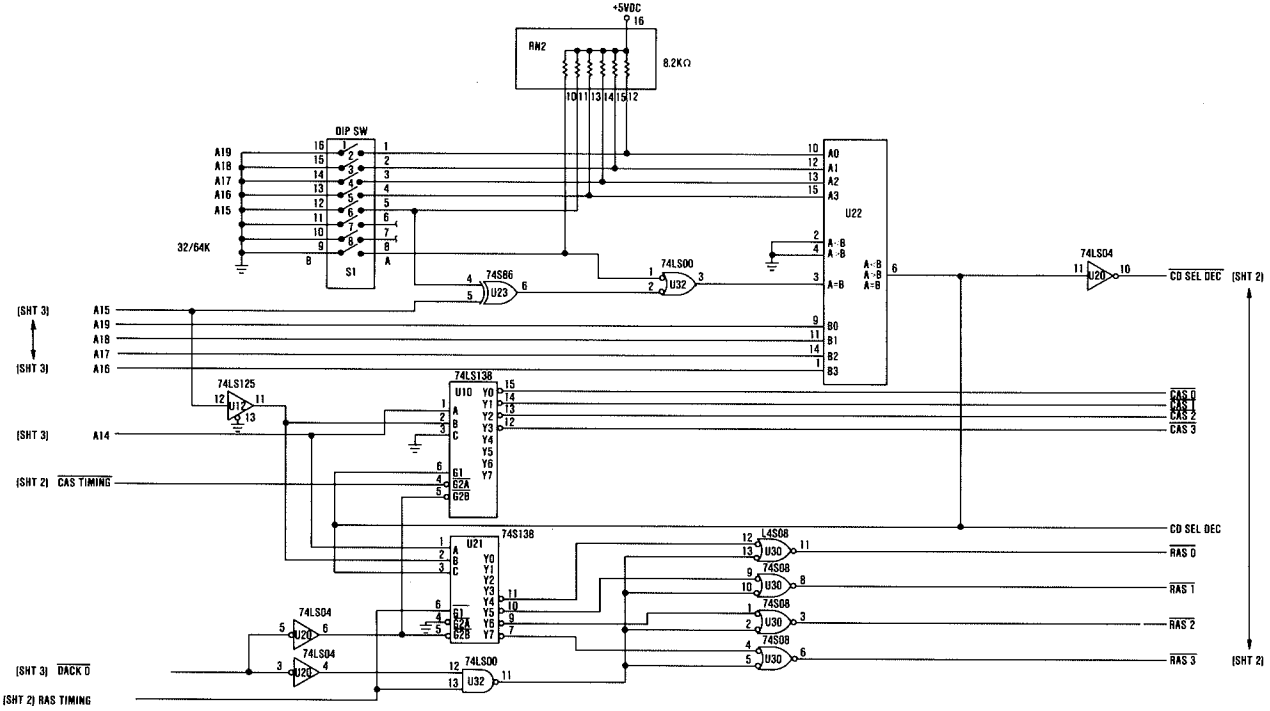
32K Memory Expansion Option (Sheet 1 of 3)



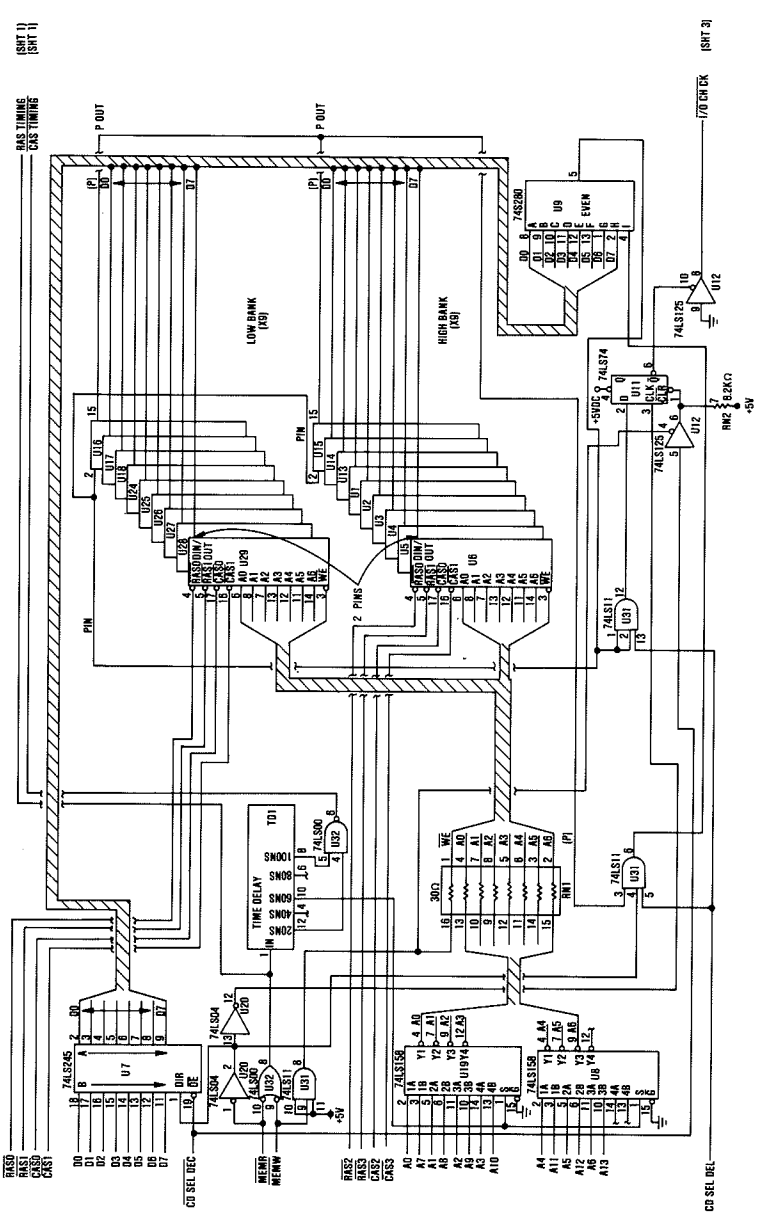
32K Memory Expansion Option (Sheet 2 of 3)



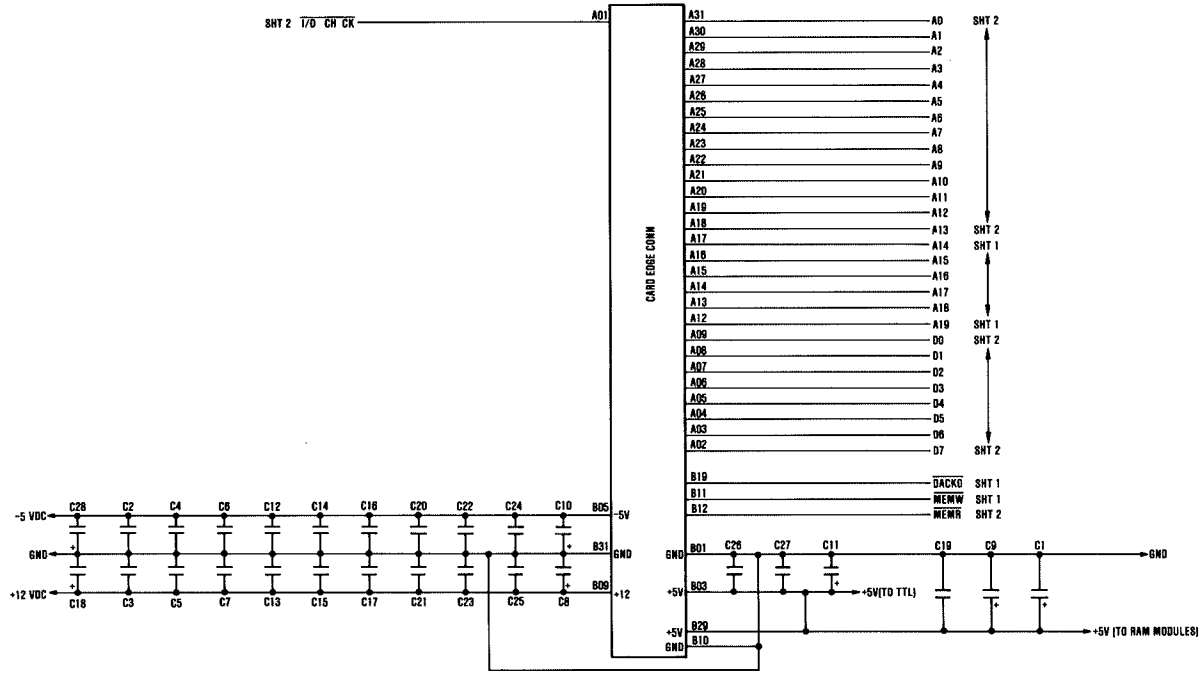
32K Memory Expansion Option (Sheet 3 of 3)



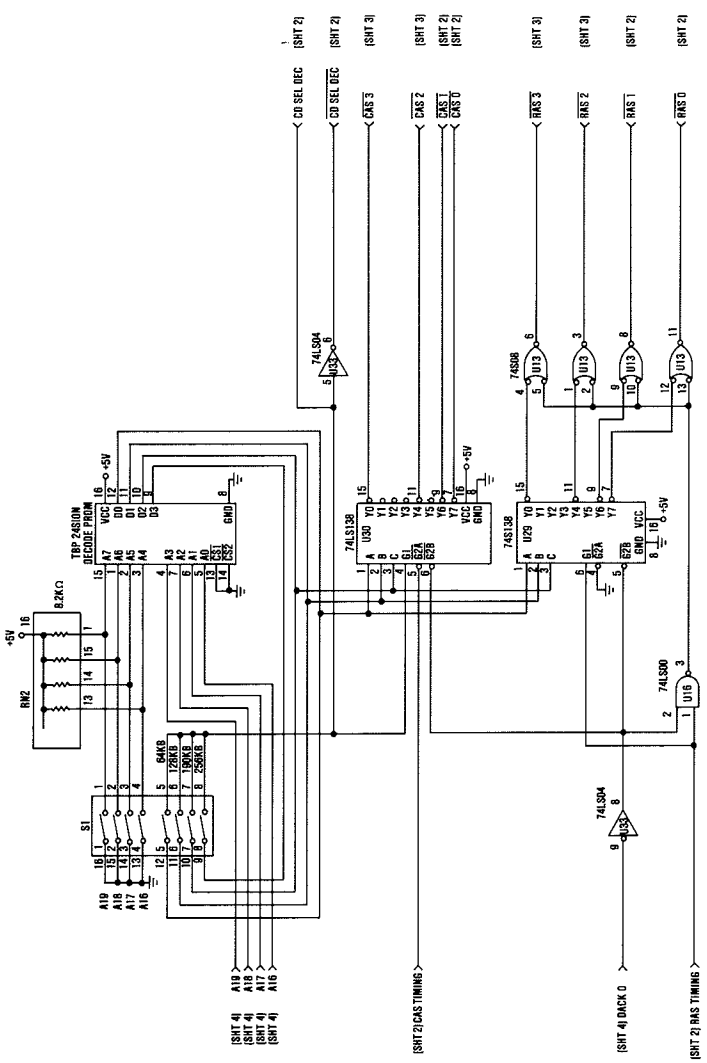
64K Memory Expansion Option (Sheet 1 of 3)

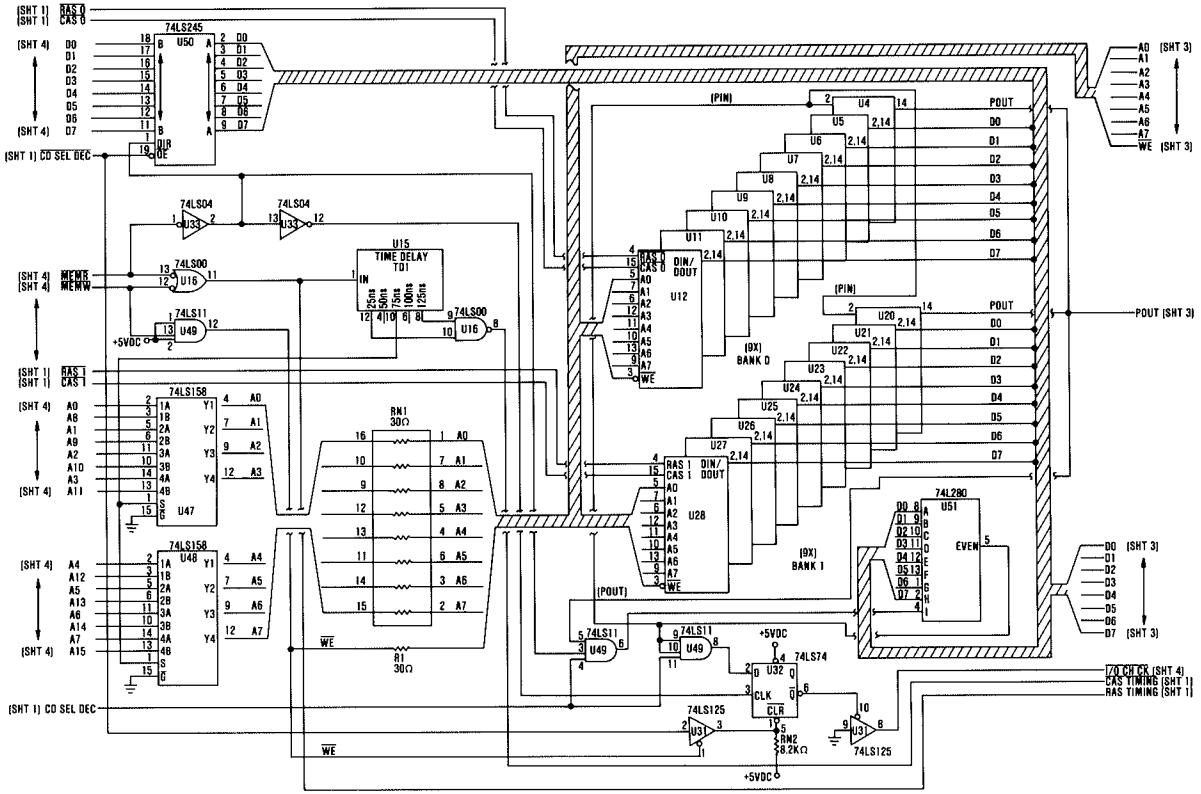


64K Memory Expansion Option (Sheet 2 of 3)

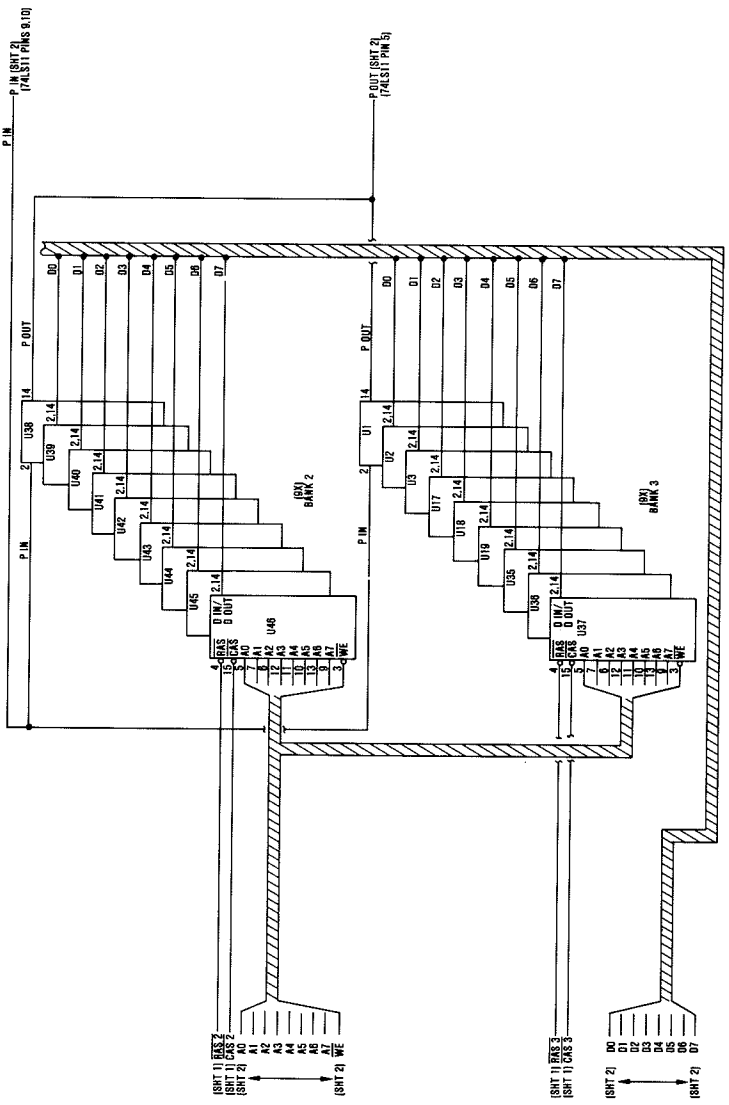


64K Memory Expansion Option (Sheet 3 of 3)

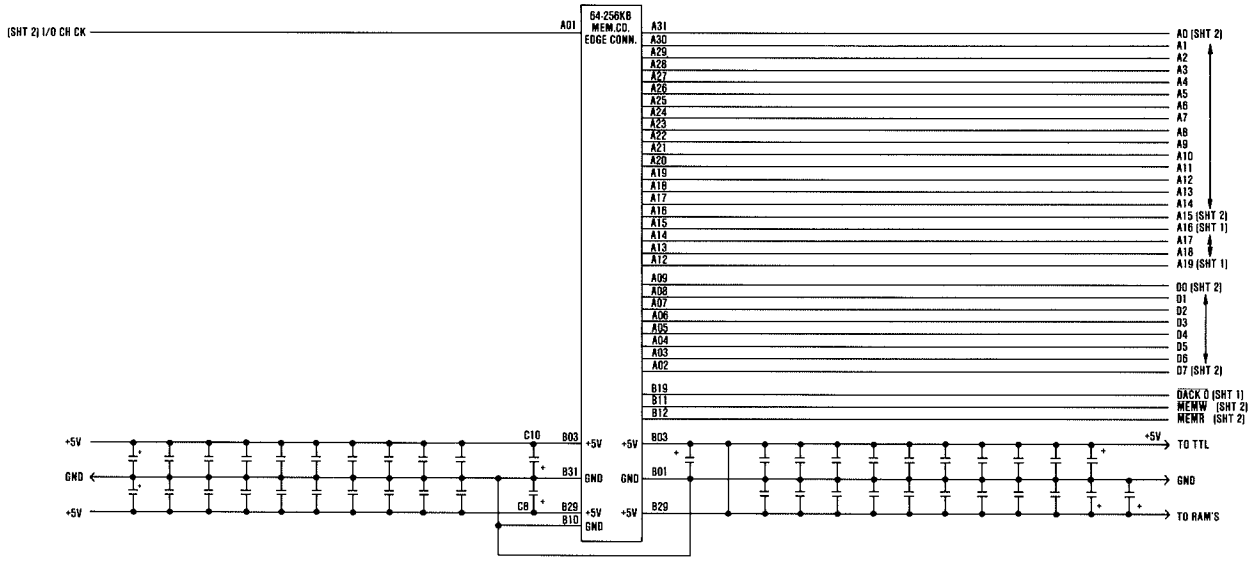

64/256K Memory Expansion Option (Sheet 1 of 4)
CD SEL DEC
CD SEL DEC
CAS 3
CAS 2
CAS 1
CAS 0
RAS 3
RAS 2
RAS 1
RAS 0
74LS04
74S08
74LS138
74LS00
TBP24S10N
DECODE PROM
8.2KΩ
RN2
S1
64KB
128KB
192KB
256KB
A19
A18
A17
A16
[SHT 4]
[SHT 2] CAS TIMING
[SHT 4] DACK 0
[SHT 2] RAS TIMING
[SHT 2]
[SHT 3]



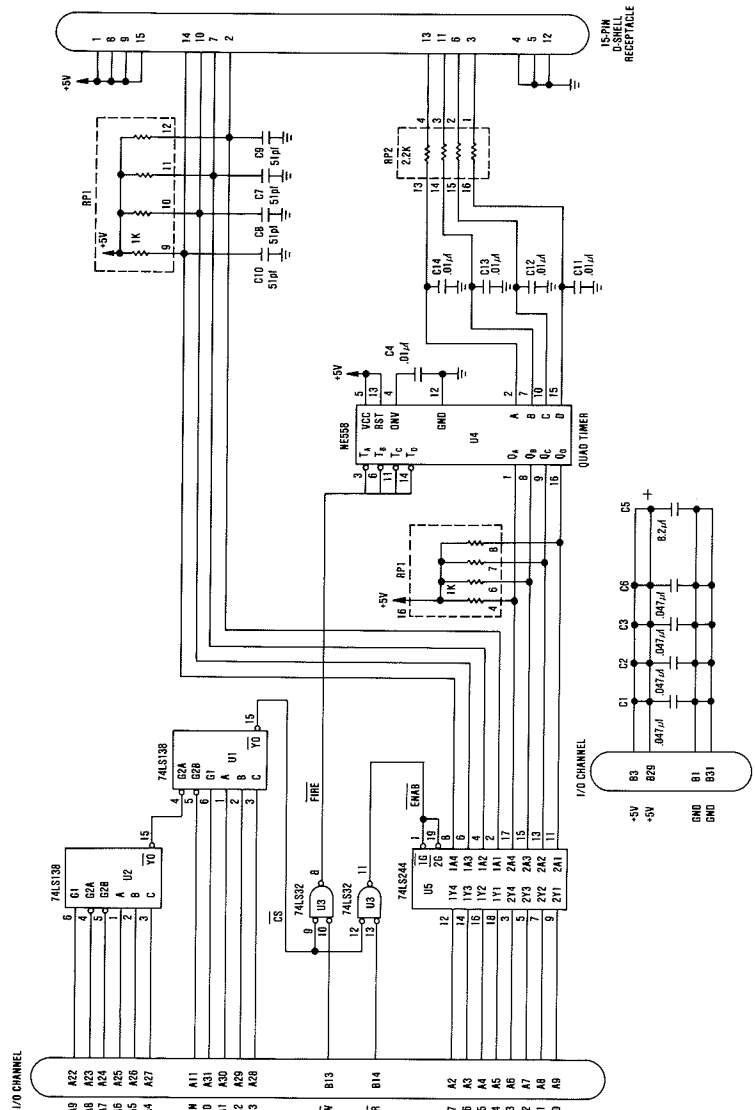
64/256K Memory Expansion Option (Sheet 2 of 4)



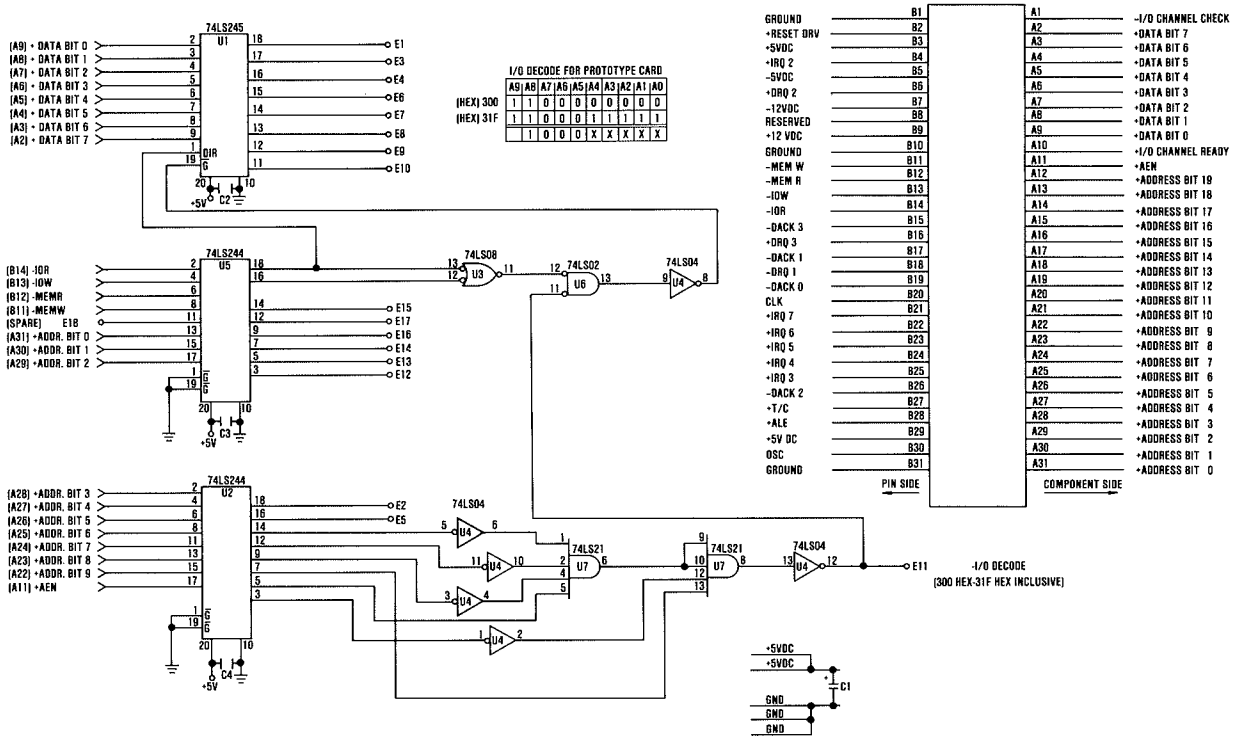
64/256K Memory Expansion Option (Sheet 3 of 4)



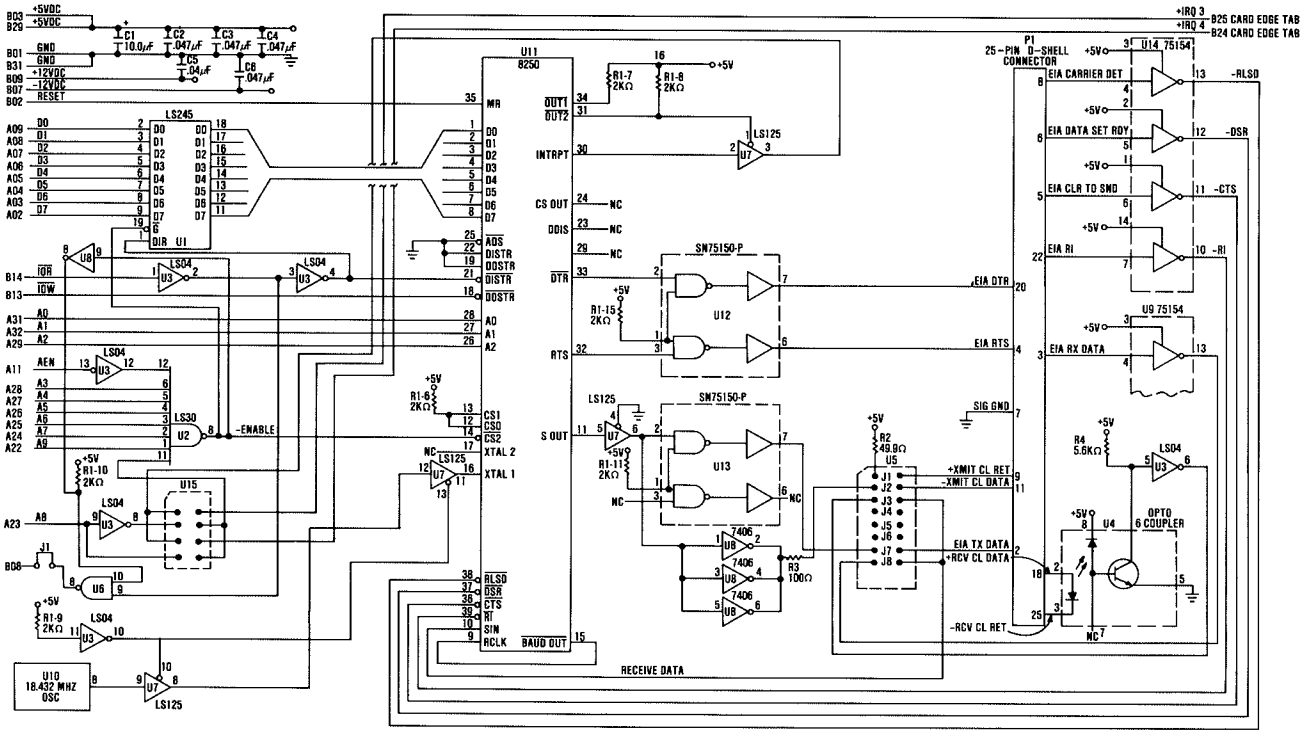
64/256K Memory Expansion Option (Sheet 4 of 4)



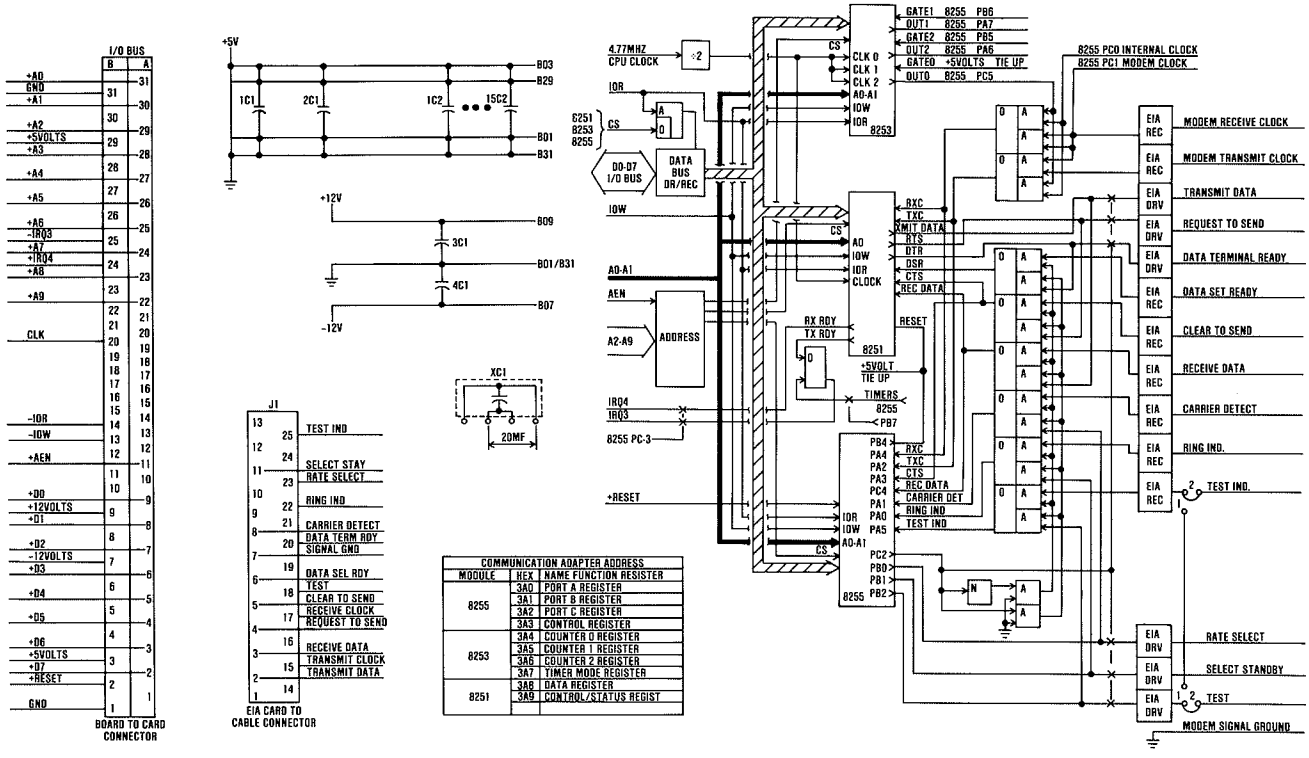
Game Control Adapter (Sheet 1 of 1)



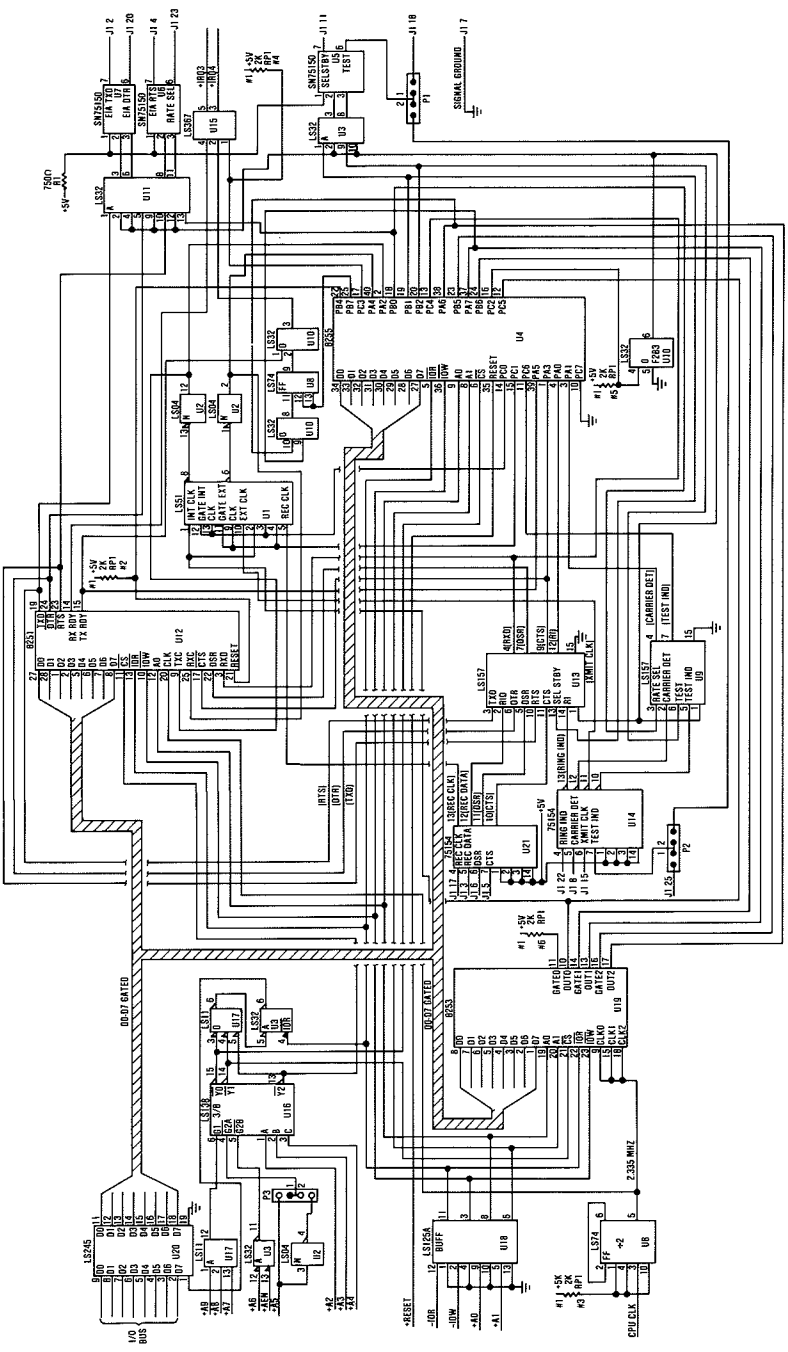
Prototype Card (Sheet 1 of 1)



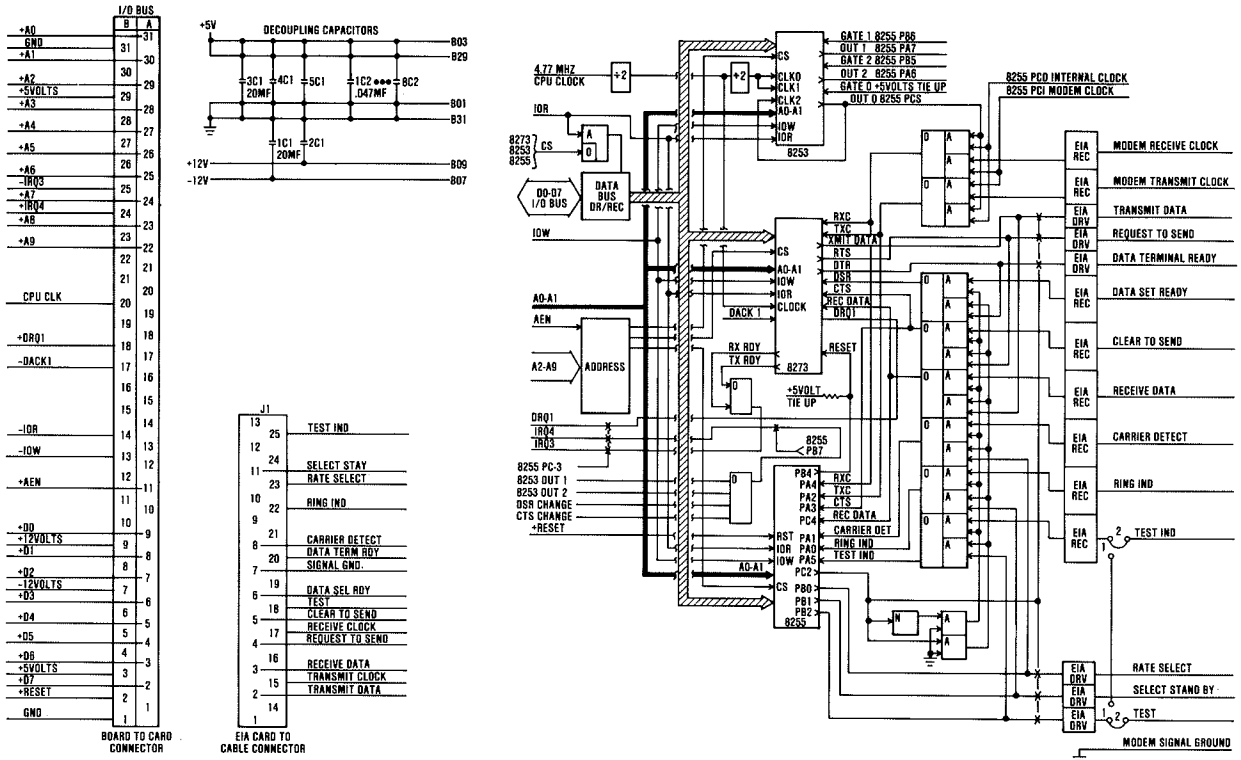
Asynchronous Communications Adapter (Sheet 1 of 1)



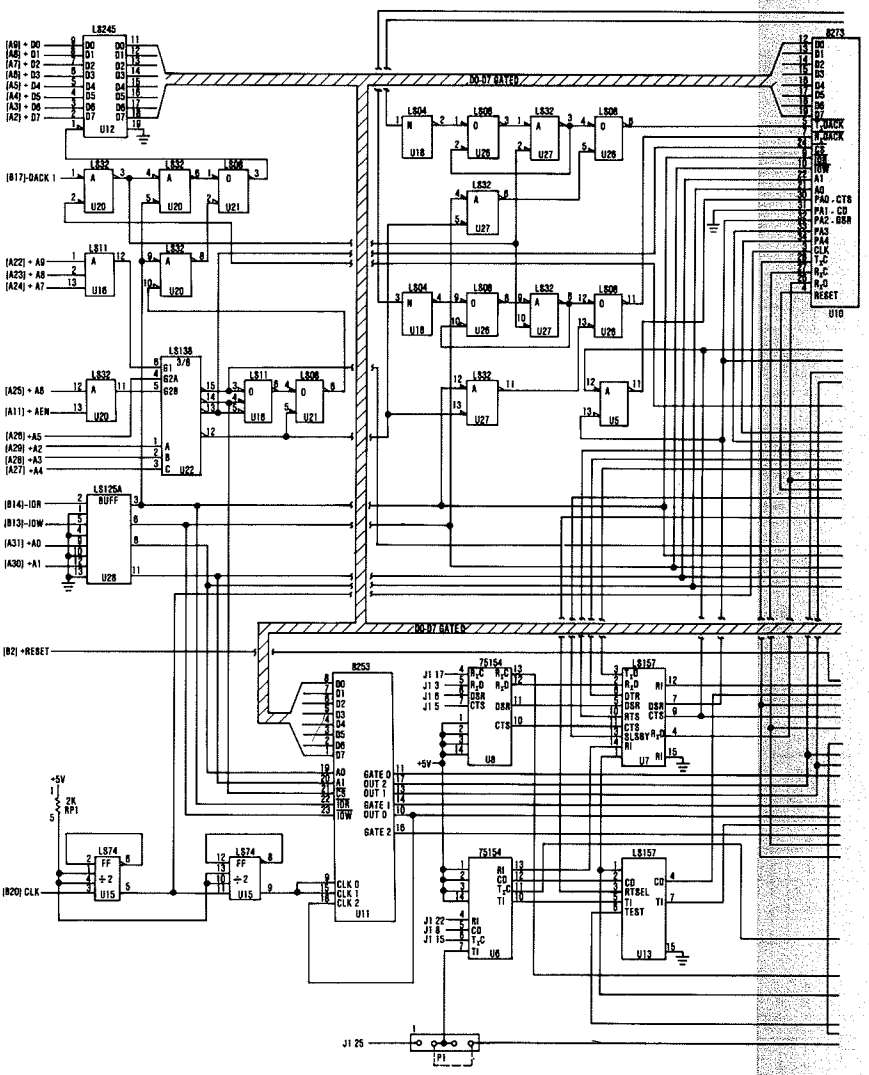
Binary Synchronous Communications Adapter (Sheet 1 of 2)



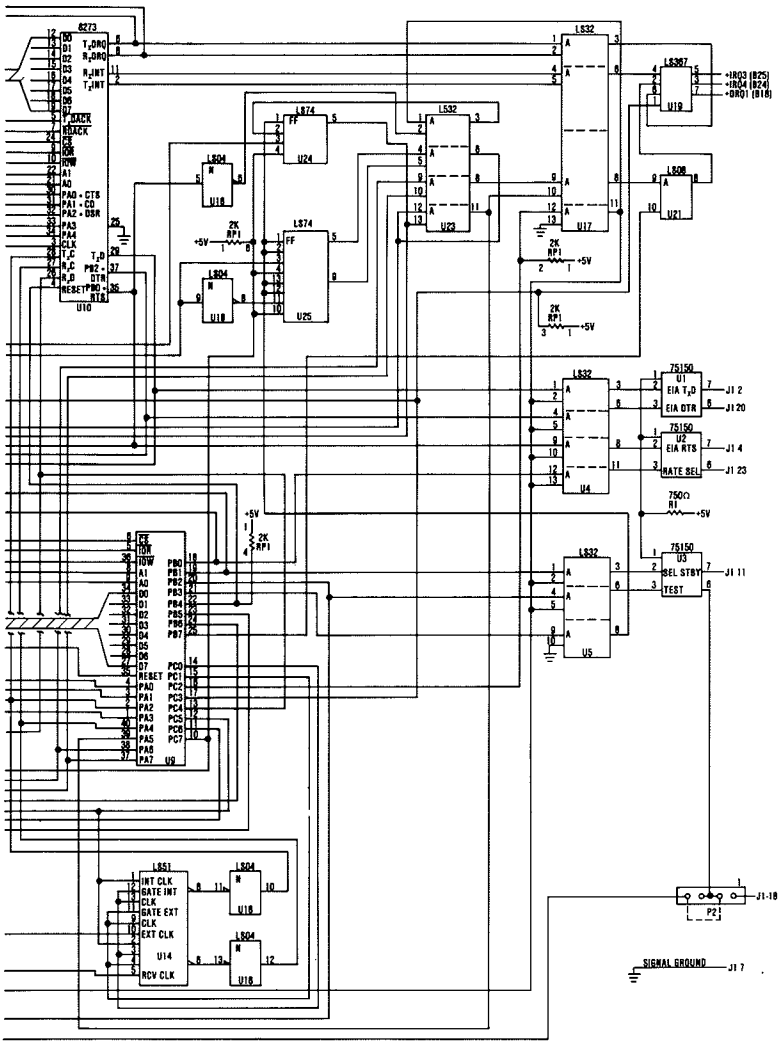
Binary Synchronous Communications Adapter (Sheet 2 of 2)



SDLC Communications Adapter (Sheet 1 of 2)



SDLC Communications Adapter (Sheet 1 of 2)



SDLC Communications Adapter (Sheet 2 of 2)

Notes:

APPENDIX E: SPECIFICATIONS

System Unit

Size:
- Length--19.6 in (500 mm)
- Depth--16.1 in (410 mm)
- Height--5.5 in (142 mm)

Weight:
- 20.9 lb (9.5 kg) Without a diskette drive unit
- 25.0 lb (11.4 kg) With one diskette drive unit

Power Cable:
- Length--6 ft (1.83 m)
- Size--18 AWG

Environment:
- Air Temperature
  - System ON, 60° to 90° F (15.6° to 32.2° C)
  - System OFF, 50° to 110° F (10° to 43° C)
- Humidity
  - System ON, 8% to 80%
  - System OFF, 20% to 80%

Heat Output:
- 1083 BTU/hr

Noise Level:
- 56 dB Without printer
- 66 dB With printer

Electrical:
- Nominal--120 Vac
- Minimum--104 Vac
- Maximum--127 Vac
- kVA--0.3175 (maximum)

Keyboard

Size:
- Length--19.6 in (500 mm)
- Depth--7.87 in (200 mm)
- Height--2.2 in (57 mm)

Weight:
- 6.5 lb (2.9 kg)

Color Display

Size:
- Length--15.4 in (392 mm)
- Depth--15.6 in (407 mm)
- Height--11.7 in (297 mm)

Weight:
- 26 lb (11.8 kg)

Heat Output:
- 240 BTU/hr

Power Cable:
- Length--6 ft (1.83 m)
- Size--18 AWG

Signal Cable:
- Length--5 ft (1.5 m)
- Size--22 AWG

Expansion Unit

Size:
- Length--19.6 in (500 mm)
- Depth--16.1 in (410 mm)
- Height--5.5 in (142 mm)

Weight:
- 33 lb (14.9 kg)

Power Cable:
- Length--6 ft (1.83 m)
- Size--18 AWG

Signal Cable:
- Length--3.28 ft (1 m)
- Size--22 AWG

Environment:
- Air Temperature
  - System ON, 60° to 90° F (15.6° to 32.2° C)
  - System OFF, 50° to 110° F (10° to 43° C)
- Humidity
  - System ON, 8% to 80%
  - System OFF, 20% to 80%

Heat Output:
- 717 BTU/hr

Electrical:
- Nominal--120 Vac
- Minimum--104 Vac
- Maximum--127 Vac

Monochrome Display

Size:
- Length--14.9 in (380 mm)
- Depth--13.7 in (350 mm)
- Height--11 in (280 mm)

Weight:
- 17.3 lb (7.9 kg)

Heat Output:
- 325 BTU/hr

Power Cable:
- Length--3 ft (0.914 m)
- Size--18 AWG

Signal Cable:
- Length--4 ft (1.22 m)
- Size--22 AWG

80 CPS Printers

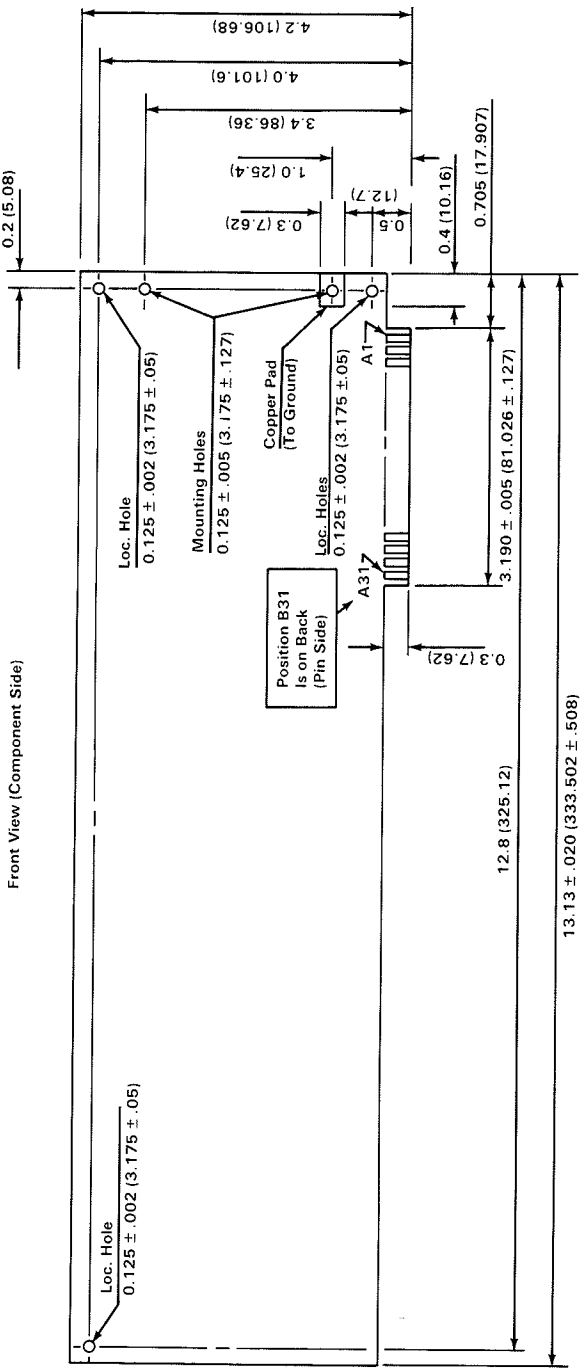
Size:
- Length--15.7 in (400 mm)
- Depth--14.5 in (370 mm)
- Height--4.3 in (110 mm)

Weight:
- 12.9 lb (5.9 kg)

Power Cable:
- Length--6 ft (1.83 mm)
- Size--22 AWG

Heat Output:
- 341 BTU/hr (maximum)

Electrical:
- Nominal--120 Vac
- Minimum--104 Vac
- Maximum--127 Vac



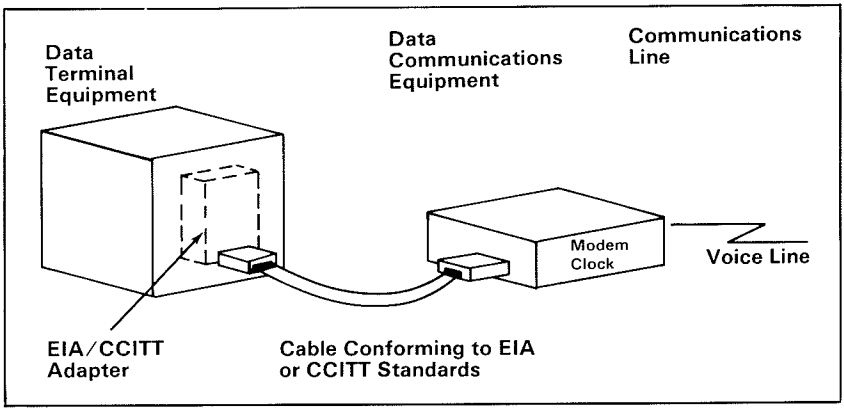
Notes:

1. All Card Dimensions are ± .010 (.254) Tolerance (With Exceptions Indicated on Drawing or in Notes).
2. Max. Card Length is 13.15 (334.01) Smaller Length is Permissible.
3. Loc. and Mounting Holes are Non-Plated Thru. (Loc. 3X, Mtg. 2X).
4. 31 Gold Tabs Each Side, 0.100 ± .0005 (2.54 ± .0127) Center to Center, 0.06 ± .0005 (1.524 ± .0127) Width.
5. Numbers in Parentheses are in Millimeters. All Others are in Inches.

APPENDIX F: COMMUNICATIONS

Information processing equipment used for communications is called data terminal equipment (DTE). Equipment used to connect the DTE to the communications line is called data communications equipment (DCE).

An adapter is used to connect the data terminal equipment to the data communications line as shown in the following illustration:



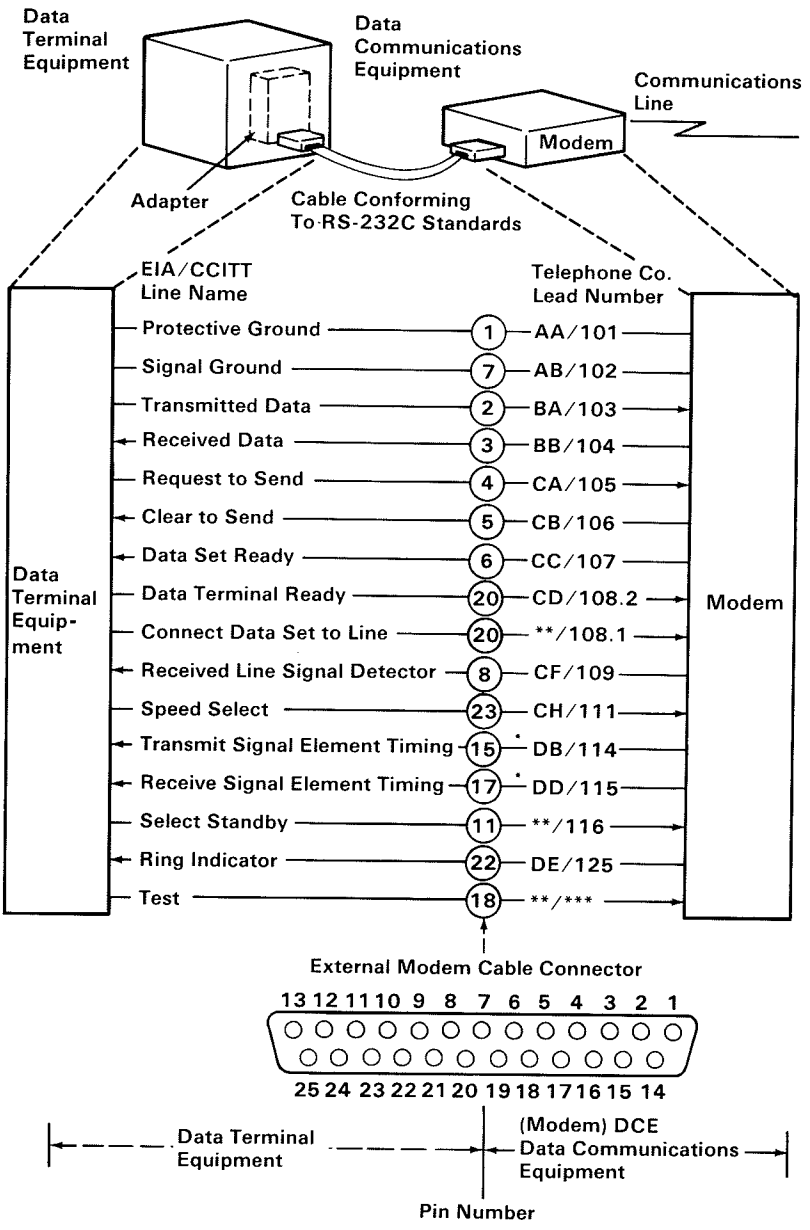
The EIA/CCITT adapter allows data terminal equipment to be connected to data communications equipment using EIA or CCITT standardized connections. An external modem is shown in this example; however, other types of data communications equipment can also be connected to data terminal equipment using EIA or CCITT standardized connections.

EIA standards are labeled RS-x (Recommended Standards-x) and CCITT standards are labeled V.x or X.x, where x is the number of the standard.

The EIA RS-232 interface standard defines the connector type, pin numbers, line names, and signal levels used to connect data terminal equipment to data communications equipment for the purpose of transmitting and receiving data. Since the RS-232 standard was developed, it has been revised three times. The three revised standards are the RS-232A, the RS-232B, and the presently used RS-232C.

The CCITT V.24 interface standard is equivalent to the RS-232C standard; therefore, the descriptions of the EIA standards also apply to the CCITT standards.

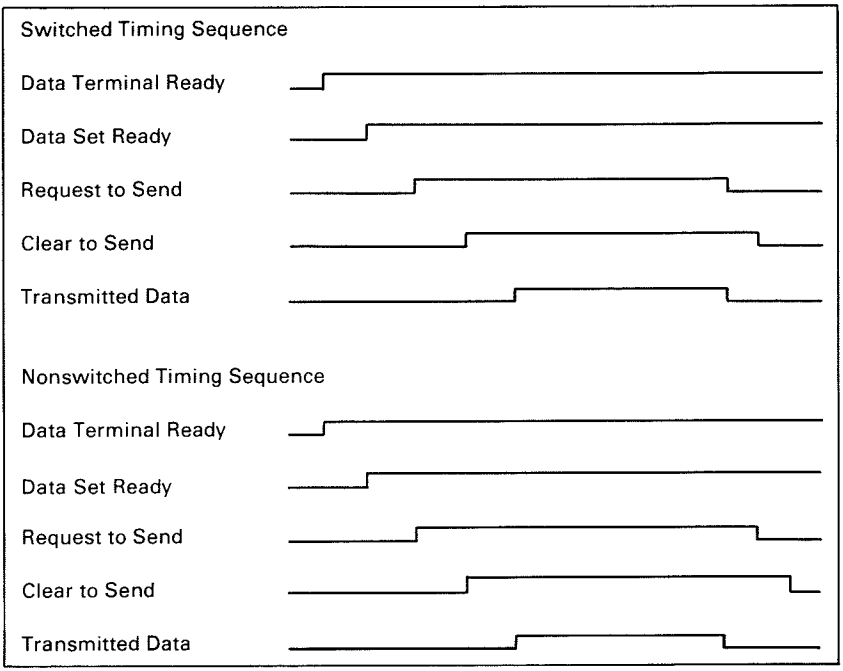
The following is an illustration of data terminal equipment connected to an external modem using connections defined by the RS-232C interface standard:



*Not used when business machine clocking is used.
**Not standardized by EIA (Electronics Industry Association).
***Not standardized by CCITT

Establishing a Communications Link

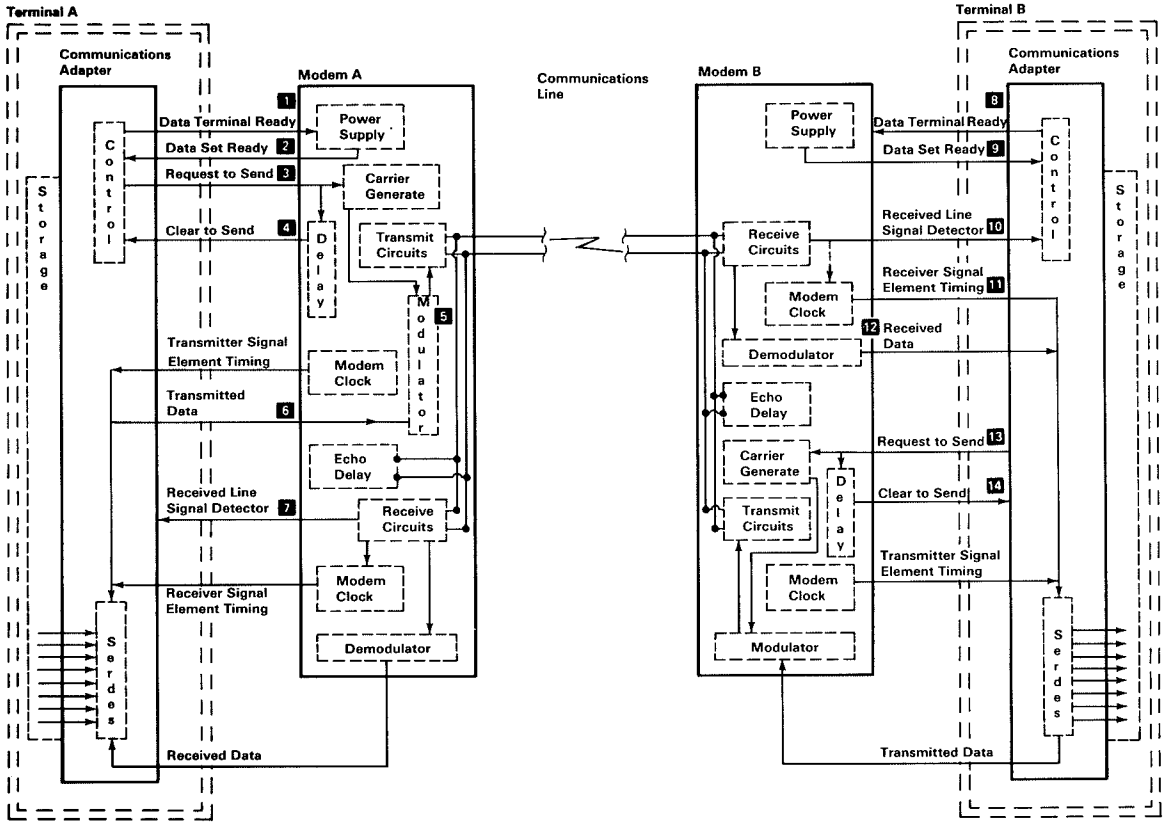
The following bar graphs represent normal timing sequences of operation during the establishment of communications for both switched (dial-up) and nonswitched (direct line) networks.



The following examples show how a link is established on a nonswitched point-to-point line, a nonswitched multipoint line, and a switched point-to-point line.

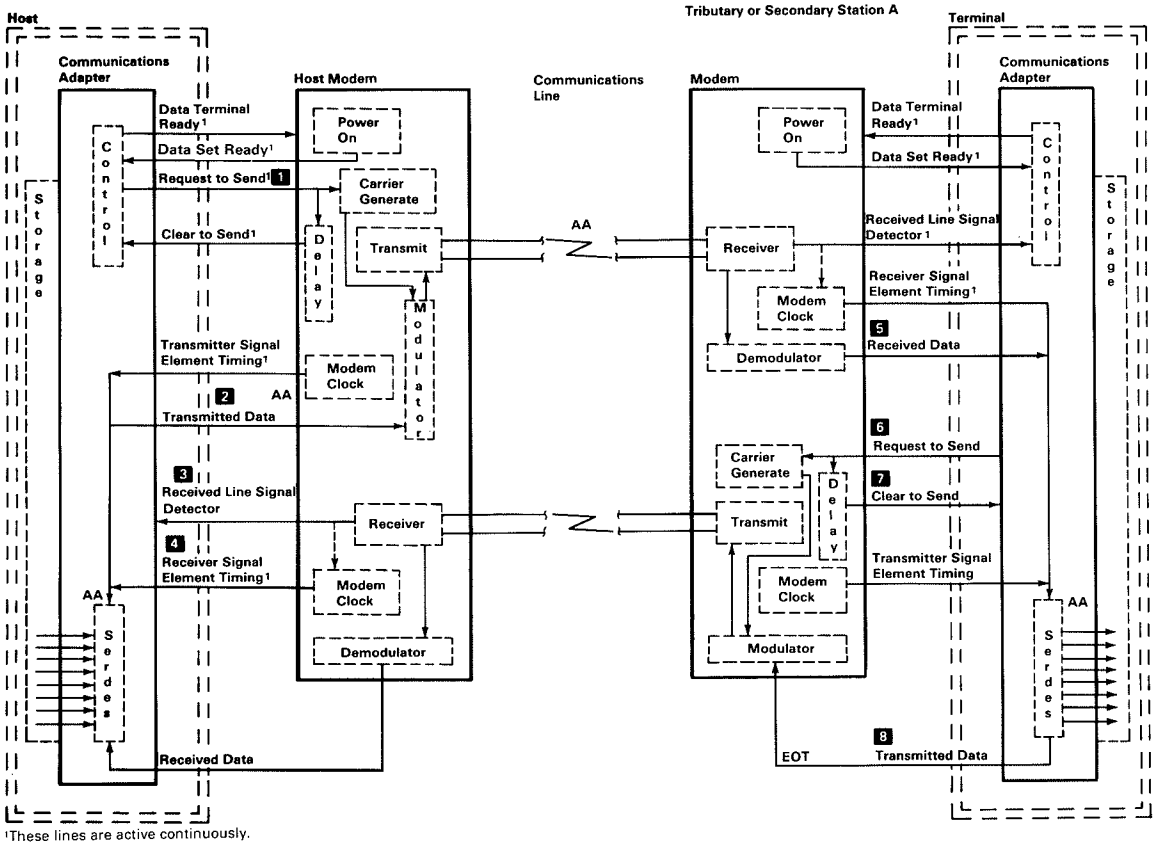
Establishing a Link on a Nonswitched Point-to-Point Line

1. The terminals at both locations activate the 'data terminal ready' lines 1 and 8.
2. Normally the 'data set ready' lines 2 and 9 from the modems are active whenever the modems are powered on.
3. Terminal A activates the 'request to send' line 3, which causes the modem at terminal A to generate a carrier signal.
4. Modem B detects the carrier, and activates the 'received line signal detector' line (sometimes called data carrier detect) 10. Modem B also activates the 'receiver signal element timing' line (sometimes called receive clock) 11 to send receive clock signals to the terminal. Some modems activate the clock signals whenever the modem is powered on.
5. After a specified delay, modem A activates the 'clear to send' line 4, which indicates to terminal A that the modem is ready to transmit data.
6. Terminal A serializes the data to be transmitted (through the serdes) and transmits the data one bit at a time (synchronized by the transmit clock) onto the 'transmitted data' line 6 to the modem.
7. The modem modulates the carrier signal with the data and transmits it to the modem B 5.
8. Modem B demodulates the data from the carrier signal and sends it to terminal B on the 'received data' line 12.
9. Terminal B deserializes the data (through the serdes) using the receive clock signals (on the 'receiver signal element timing' line) 11 from the modem.
10. After terminal A completes its transmission, it deactivates the 'request to send' line 3, which causes the modem to turn off the carrier and deactivate the 'clear to send' line 4.
11. Terminal A and modem A now become receivers and wait for a response from terminal B, indicating that all data has reached terminal B. Modem A begins an echo delay (50 to 150 milliseconds) to ensure that all echoes on the line have diminished before it begins receiving. An echo is a reflection of the transmitted signal. If the transmitting modem changed to receive too soon, it could receive a reflection (echo) of the signal it just transmitted.
12. Modem B deactivates the 'received line signal detector' line 10 and, if necessary, deactivates the receive clock signals on the 'receiver signal element timing, line 11.
13. Terminal B now becomes the transmitter to respond to the request from terminal A. To transmit data, terminal B activates the 'request to send' line 13, which causes modem B to transmit a carrier to modem A.
14. Modem B begins a delay that is longer than the echo delay at modem A before turning on the 'clear to send' line. The longer delay (called request-to-send to clear-to-send delay) ensures that modem A is ready to receive when terminal B begins transmitting data. After the delay, modem B activates the 'clear to send' line 14 to indicate that terminal B can begin transmitting its response.
15. After the echo delay at modem A, modem A senses the carrier from modem B (the carrier was activated in step 13 when terminal B activated the 'request to send' line) and activates the 'received line signal detector' line 7 to terminal A.
16. Modem A and terminal A are now ready to receive the response from terminal B. Remember, the response was not transmitted until after the request-to-send to clear-to-send delay at modem B (step 14).


Terminal A
Communications Adapter
Modem A
Communications Line
Modem B
Terminal B
Communications Adapter
Control
Storage
Serdes
Data Terminal Ready 1
Data Set Ready 2
Request to Send 3
Clear to Send 4
Transmitter Signal Element Timing
Transmitted Data 6
Received Line Signal Detector 7
Receiver Signal Element Timing
Received Data
Power Supply
Carrier Generate
Delay
Transmit Circuits
Modulator 5
Modem Clock
Echo Delay
Receive Circuits
Demodulator
Data Terminal Ready 8
Data Set Ready 9
Received Line Signal Detector 10
Receiver Signal Element Timing 11
Received Data 12
Request to Send 13
Clear to Send 14
Transmitter Signal Element Timing
Modulator
Transmitted Data

Establishing a Link on a Nonswitched Multipoint Line

1. The control station serializes the address for the tributary or secondary station (AA) and sends its address to the modem on the 'transmitted data' line 2.
2. Since the 'request to send' line and, therefore, the modem carrier, is active continuously 1, the modem immediately modulates the carrier with the address, and, thus, the address is transmitted to all modems on the line.
3. All tributary modems, including the modem for station A, demodulate the address and send it to their terminals on the 'received data' line 5.
4. Only station A responds to the address; the other stations ignore the address and continue monitoring their 'received data' line. To respond to the poll, station A activates its 'request to send' line 6, which causes the modem to begin transmitting a carrier signal.
5. The control station's modem receives the carrier and activates the 'received line signal detector, line 3 and the 'receiver signal element timing' line 4 (to send clock signals to the control station). Some modems activate the clock signals as soon as they are powered on.
6. After a short delay to allow the control station modem to receive the carrier, the tributary modem activates the 'clear to send' line 7.
7. When station A detects the active 'clear to send' line, it tansmits its response. (For this example, assume that station A has no data to send; therefore, it transmits an EOT 8.)
8. After transmitting the EOT, station A deactivates the 'request to send' line 6. This causes the modem to deactivate the carrier and the 'clear to send' line 7.
9. When the modem at the control station (host) detects the absence of the carrier, it deactivates the 'received line signal detector' line 3.
10. Tributary station A is now in receive mode waiting for the next poll or select transmission from the control station.

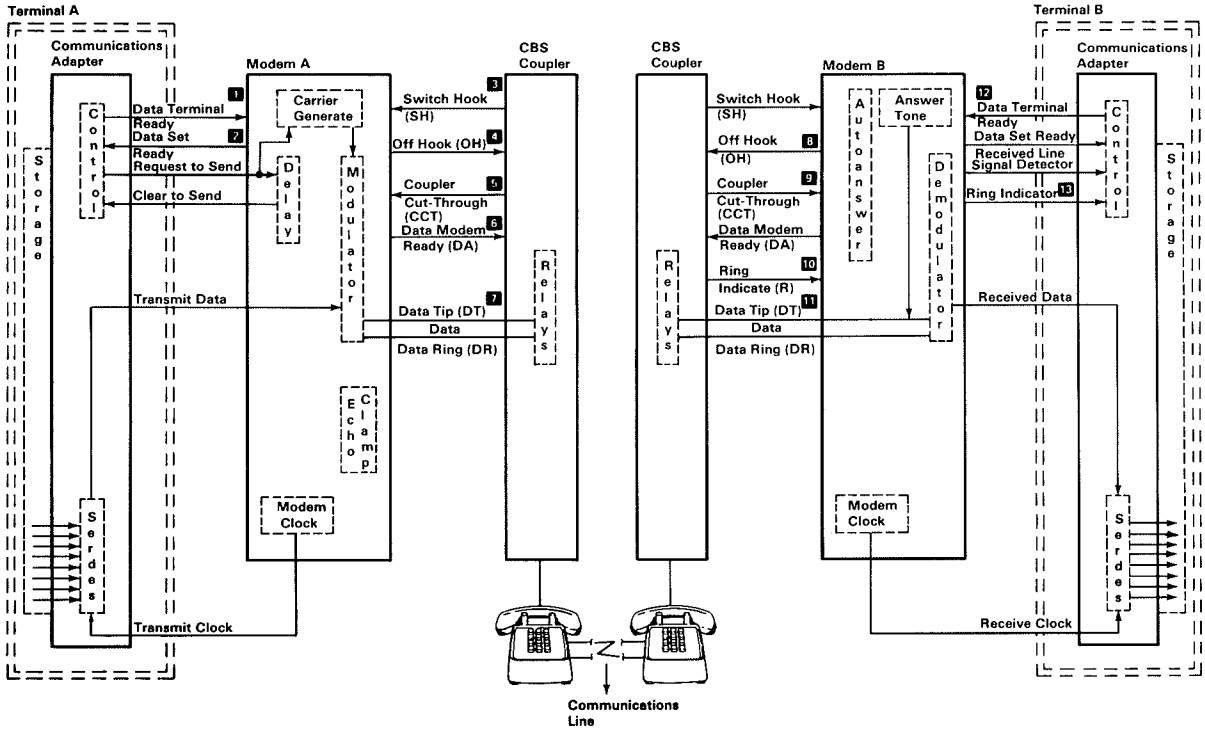


¹These lines are active continuously.

Establishing a Link on a Switched Point-To-Point Line

1. Terminal A is in communications mode; therefore, the 'data terminal ready' line 1 is active. Terminal B is in communication mode waiting for a call from terminal A.
2. When the terminal A operator lifts the telephone handset, the 'switch hook' line from the coupler is activated 3.
3. Modem A detects the 'switch hook' line and activates the 'off hook' line 4, which causes the coupler to connect the telephone set to the line and activate the 'coupler cut-through' line 5 to the modem.
4. Modem A activates the 'data modem ready' line 6 to the coupler (the 'data modem ready' line is on continuously in some modems).
5. The terminal A operator sets the exclusion key or talk/data switch to the talk position to connect the handset to the communications line. The operator then dials the terminal B number.
6. When the telephone at terminal B rings, the coupler activates the 'ring indicate' line to modem B 10. Modem B indicates that the 'ring indicate' line was activated by activating the 'ring indicator' line 13 to terminal B.
7. Terminal B activates the 'data terminal ready' line to modem B 12, which activates the autoanswer circuits in modem B. (The 'data terminal ready' line might already be active in some terminals.)
8. The autoanswer circuits in modem B activate the 'off hook' line to the coupler 8.
9. The coupler connects modem B to the communications line through the 'data tip' and 'data ring' lines 11 and activates the 'coupler cut-through' line 9 to the modem. Modem B then transmits an answer tone to terminal A.
10. The terminal A operator hears the tone and sets the exclusion key or talk/data switch to the data position (or performs an equivalent operation) to connect modem A to the communications line through the 'data tip' and 'data ring' lines 7.
11. The coupler at terminal A deactivates the 'switch hook' line 3. This causes modem A to activate the 'data set ready' line 2 indicating to terminal A that the modem is connected to the communications line.

    The sequence of the remaining steps to establish the data link is the same as the sequence required on a nonswitched point-to-point line. When the terminals have completed their transmission, they both deactivate the 'data terminal ready' line to disconnect the modems from the line.


Terminal A
Communications Adapter
Storage
Control
Serdes
Modem A
Carrier Generate
Delay
Modulator
Echo Clamp
Modem Clock
Transmit Clock
Data Terminal Ready
Data Set Ready
Request to Send
Clear to Send
Transmit Data
CBS Coupler
Relays
Switch Hook (SH)
Off Hook (OH)
Coupler Cut-Through (CCT)
Data Modem Ready (DA)
Data Tip (DT)
Data
Data Ring (DR)
Modem B
Autoanswer
Answer Tone
Demodulator
Ring Indicate (R)
Terminal B
Received Line Signal Detector
Ring Indicator
Received Data
Receive Clock
Communications Line

Notes:

APPENDIX G: SWITCH SETTINGS

The following switch settings are divided between two groups. The first group contains the switch settings for the 16/64K system board. The second group contains the 64/256K system board switch settings.

Determine the system board type and refer to the appropriate group of switch settings for all applications.

Switch Settings (16KB-64KB CPU) G-3

Switch Settings (64KB-256KB CPU) G-29

Notes:

Switch Settings (16KB-64KB CPU)

System Board Switch Settings G-5
System Board Switch Settings G-5
5-1/4" Diskette Drives Switch Settings G-6
Display Type Switch Settings G-6
Math Coprocessor Switch Settings G-7

Memory Option Switch Settings G-8
16K Total Memory G-8
32K Total Memory G-8
48K Total Memory G-8
64K Total Memory G-8
96K Total Memory G-9
128K Total Memory G-10
160K Total Memory G-11
192K Total Memory G-12
224K Total Memory G-13
256K Total Memory G-14
288K Total Memory G-15
320K Total Memory G-16
352K Total Memory G-17
384K Total Memory G-18
416K Total Memory G-19
448K Total Memory G-20
480K Total Memory G-21
512K Total Memory G-22
544K Total Memory G-23
576K Total Memory G-24
608K Total Memory G-25
640K Total Memory G-26

Extender Card Switch Settings G-27

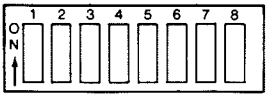
Notes:

Switch Setting Charts

System Board Switches

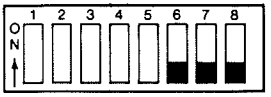
WARNING: **Before you change any switch settings, make a note of how the switches are presently set.**

Switch Block 1



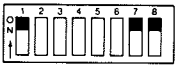
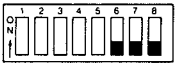
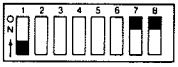
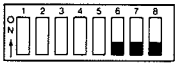
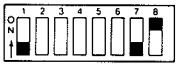
Switch	Function
1,7,8	Number of 5-1/4 inch diskette drives installed
2	Math Coprocessor
3,4	System board memory switches
5,6	Type(s) of display(s) connected

Switch Block 2



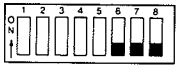
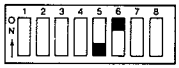
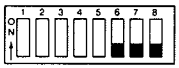
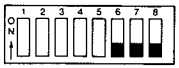
Switch	Function
1,2,3,4,5	Amount of memory options installed
6,7,8	Always in the Off position

Number of 5-1/4 Inch Diskette Drives Installed

	Switch Block 1	Switch Block 2
0 – Drives		
1 – Drive		
2 – Drives		

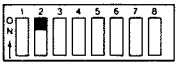
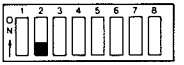
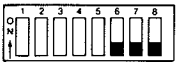
Type(s) of display(s) connected

WARNING: **If an IBM Monochrome Display is connected to your system. Switch Block 1, switches 5 and 6, must always be Off. Damage to your display can result with any other switch settings.**

	Switch Block 1	Switch Block 2	
IBM Monochrome Display (or IBM Monochrome Display plus another display)			
Color Display (Do not use if an IBM Monochrome Display is connected)			40x25 Mode
			80x25 Mode

Note: The 40x25 mode means there will be 40 characters across the screen and 25 lines down the screen. The 80x25 mode means there will be 80 characters across the screen and 25 lines down the screen. The 80x25 mode, when used with home televisions and various displays, can cause loss of character quality.

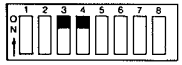
Math Coprocessor

	Switch Block 1	Switch Block 2
With Math Coprocessor		
Without Math Coprocessor		

Memory Switch Settings
(16KB-64KB CPU) System Board

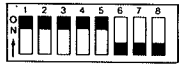
16K Total Memory

System Board Switches	Switch Block 1	Switch Block 2



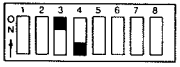
32K Total Memory

System Board Switches	Switch Block 1	Switch Block 2



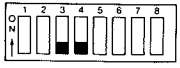
48K Total Memory

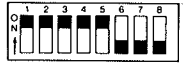
System Board Switches	Switch Block 1	Switch Block 2



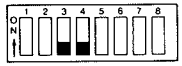
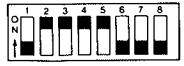
64K Total Memory

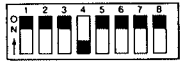
System Board Switches	Switch Block 1	Switch Block 2



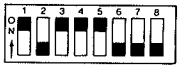


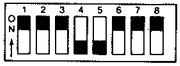
96K Total Memory
32K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2
		

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 32K option			

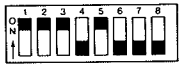
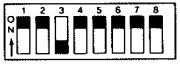
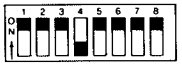
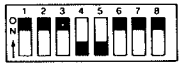
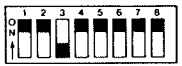
128K Total Memory
64K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2 

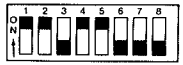
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K installed			
1 - 64K option			
2 - 32K options			

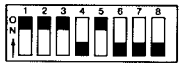
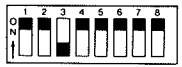
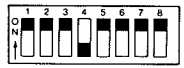
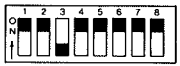
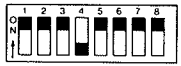
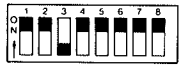
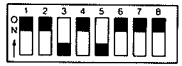
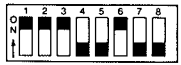
160K Total Memory
96K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2

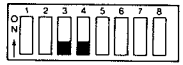
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K installed 1 - 32K option			
1 - 64K option 1 - 32K option			
3 - 32K options			  

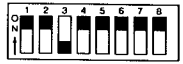
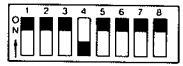
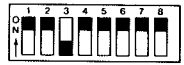
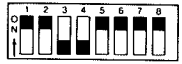
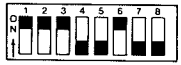
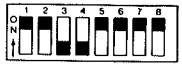
192K Total Memory
128K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2 

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K option installed 1 - 64K option			
2 - 64K options		 	
1 - 64/256K option with 64K installed 2 - 32K options			
1 - 64K option 2 - 32K options			 
1 - 64/256K option with 128K installed			

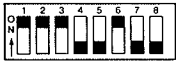
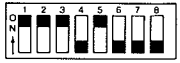
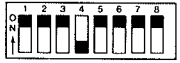
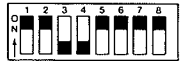
224K Total Memory
160K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K installed 1 - 64K option 1 - 32K option			
2 - 64K options 1 - 32K option		 	
1 - 64/256K option with 128K installed 1 - 32K option			

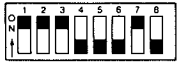
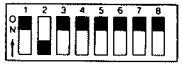
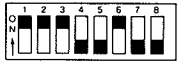
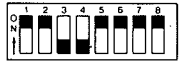
256K Total Memory
192K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2

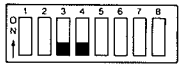
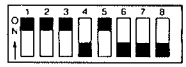
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed			
1 - 64/256K option with 128K installed 1 - 64K option			
1 - 64/256K option with 64K installed 2 - 64K options		 	
3 - 64K options		 	
1 - 64/256K option with 128K installed 2 - 32K options			

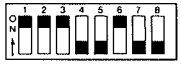
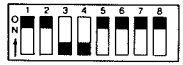
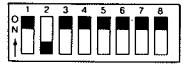
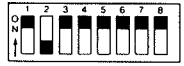
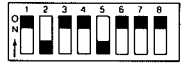
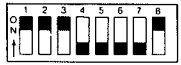
288K Total Memory
224K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2

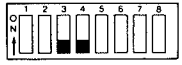
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed 1 - 32K option			
1 - 64/256K option with 128K installed 1 - 64K option 1 - 32K option			

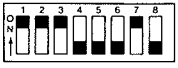
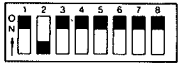
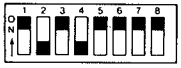
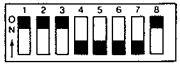
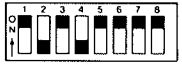
320K Total Memory
256K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

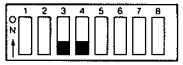
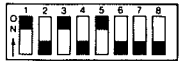
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 128K installed 2 - 64K options		 	
1 - 64/256K option with 192K installed 1 - 64K option			
1 - 64/256K option with 192K installed 2 - 32K options			 
1 - 64/256K option with 256K installed			

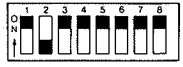
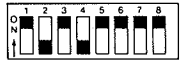
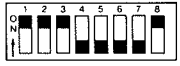
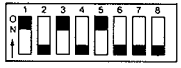
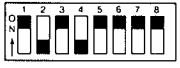
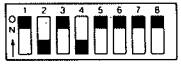
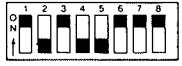
352K Total Memory
288K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2

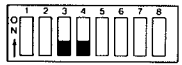
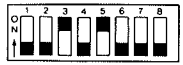
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed 1 - 64K option 1 - 32K option			
1 - 64/256K option with 256K installed 1 - 32K option			

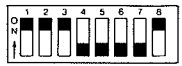
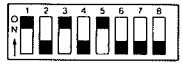
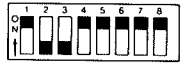
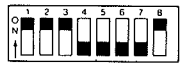
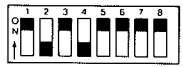
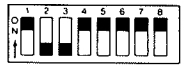
384K Total Memory
320K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

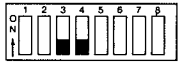
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed 2 - 64K options		 	
1 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed	 		
1 - 64/256K option with 256K installed 1 - 64K option			
1 - 64/256K option with 256K installed 2 - 32K options			 

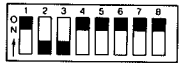
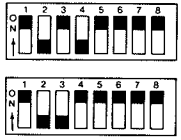
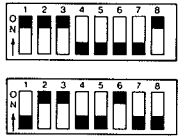
416K Total Memory
352K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

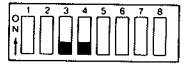
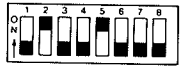
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed 1 - 32K option	 		
1 - 64/256K option with 256K installed 1 - 64K option 1 - 32K option			

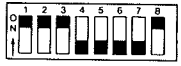
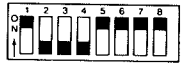
448K Total Memory
384K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2

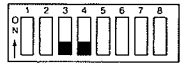
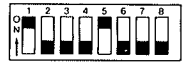
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed 1 - 64K option			
1 - 64/256K option with 256K installed 2 - 64K options			
1 - 64/256K option with 256K installed 1 - 64/256K option with 128K installed			

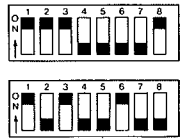
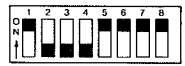
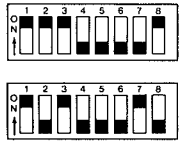
480K Total Memory
416K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

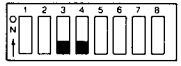
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 128K installed 1 - 32K option	 		

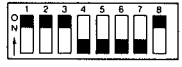
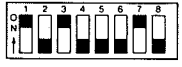
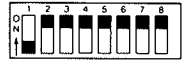
512K Total Memory
448K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

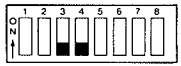
	64/256K Option Card Switches	64K Option Card Switches	64K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 128K installed 1 - 64K option			
1 - 64/256K option with 256K installed 1 - 64/256K option with 192K installed			

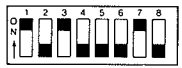
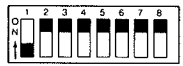
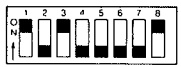
544K Total Memory
480K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2

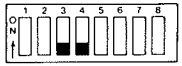
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 192K installed 1 - 32K option	 		

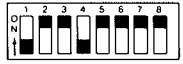
576K Total Memory
512K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 192K installed 1 - 64K option			
2 - 64/256K option with 256K installed			

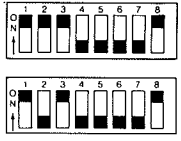
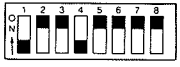
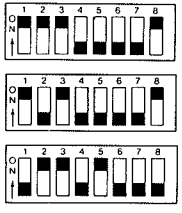
608K Total Memory
544K + (64K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2

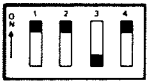
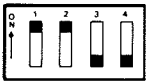
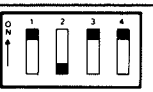
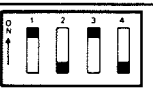
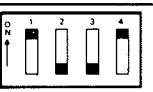
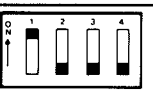
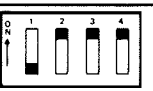
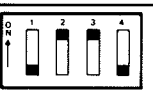
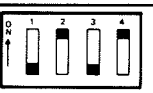
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
2 - 64/256K option with 256K installed 1 - 32K option	 		

640K Total Memory
576K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
2 - 64/256K option with 256K installed 1 - 64K option			
2 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed			

Extender Card Switch Settings

System Memory	Extender Card Switch Block	Memory Segment
16K to 64K		1
96K to 128K		2
160K to 192K		3
224K to 256K		4
288K to 320K		5
352K to 384K		6
416K to 448K		7
480K to 512K		8
544K to 576K		9
608K to 640K		A

Appendix G

Notes:

Switch Settings (64KB-256KB CPU)

System Board Switch Settings G-31
- System Board Switch Settings G-31
- 5-1/4" Diskette Drives Switch Settings G-32
- Display Type Switch Settings G-32
- Math Coprocessor Switch Settings G-32

Memory Option Switch Settings G-34
- 64K Total Memory G-34
- 128K Total Memory G-34
- 192K Total Memory G-34
- 256K Total Memory G-34
- 288K Total Memory G-35
- 320K Total Memory G-36
- 352K Total Memory G-37
- 384K Total Memory G-38
- 416K Total Memory G-39
- 448K Total Memory G-40
- 480K Total Memory G-41
- 512K Total Memory G-42
- 544K Total Memory G-43
- 576K Total Memory G-44
- 608K Total Memory G-45
- 640K Total Memory G-46

Extender Card Switch Settings G-47

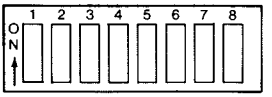
Notes:

Switch Setting Charts

System Board Switches

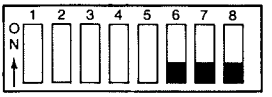
WARNING: **Before you change any switch settings, make a note of how the switches are presently set.**

Switch Block 1



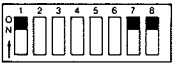
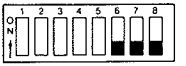
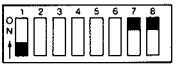
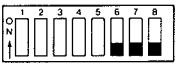
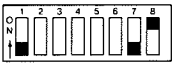
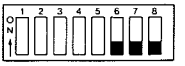
Switch	Function
1,7,8	Number of 5-1/4 inch diskette drives installed
2	Math Coprocessor
3,4	System board memory switches
5,6	Type(s) of display(s) connected

Switch Block 2



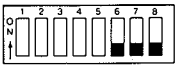
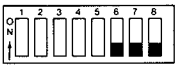
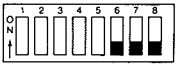
Switch	Function
1,2,3,4,5	Amount of memory options installed
6,7,8	Always in the Off position

Number of 5-1/4 Inch Diskette Drives Installed

	Switch Block 1	Switch Block 2
0 – Drives		
1 – Drive		
2 – Drives		

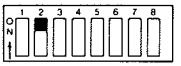
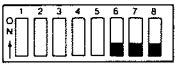
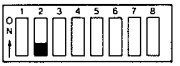
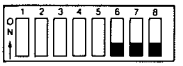
Type(s) of display(s) connected

WARNING: **If an IBM Monochrome Display is connected to your system. Switch Block 1, switches 5 and 6, must always be Off. Damage to your display can result with any other switch settings.**

	Switch Block 1	Switch Block 2	
IBM Monochrome Display (or IBM Monochrome Display plus another display)			
Color Display (Do not use if an IBM Monochrome Display is connected)			40x25 Mode
			80x25 Mode

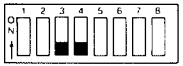
Note: The 40x25 mode means there will be 40 characters across the screen and 25 lines down the screen. The 80x25 mode means there will be 80 characters across the screen and 25 lines down the screen. The 80x25 mode, when used with home televisions and various displays, can cause loss of character quality.

Math Coprocessor

	Switch Block 1	Switch Block 2
With Math Coprocessor		
Without Math Coprocessor		

Memory Switch Settings
(64KB-256KB CPU) System Board

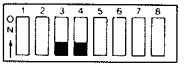
64K Total Memory

System Board Switches	Switch Block 1	Switch Block 2
		

128K Total Memory

System Board Switches	Switch Block 1	Switch Block 2

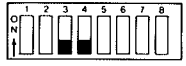
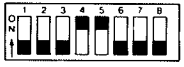
192K Total Memory

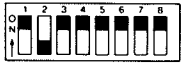
System Board Switches	Switch Block 1	Switch Block 2
		

256K Total Memory

System Board Switches	Switch Block 1	Switch Block 2

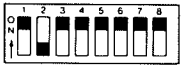
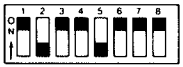
288K Total Memory
32K + (256K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

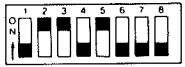
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 32K option			

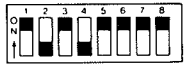
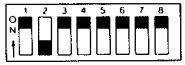
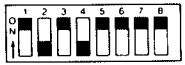
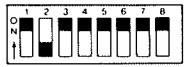
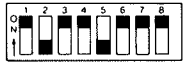
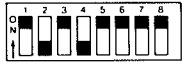
320K Total Memory
64K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K installed			
1 - 64K option			
2 - 32K options			 

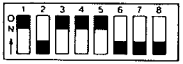
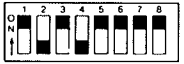
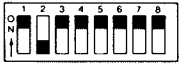
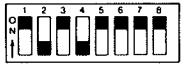
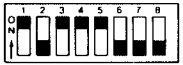
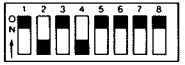
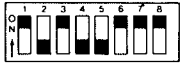
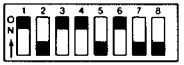
352K Total Memory
96K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2 

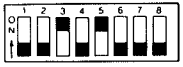
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K installed 1 - 32K option			
1 - 64K option 1 - 32K option			
3 - 32K options			  

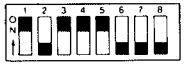
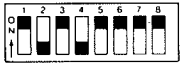
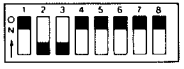
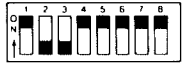
384K Total Memory
128K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2

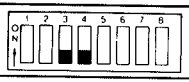
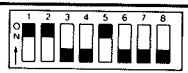
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K option installed 1 - 64K option			
2 - 64K options		 	
1 - 64/256K option with 64K installed 2 - 32K options			 
1 - 64K option 2 - 32K options			
1 - 64/256K option with 128K installed			

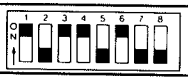
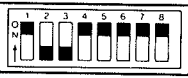
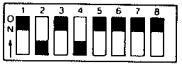
416K Total Memory
160K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2 

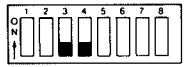
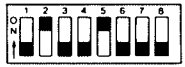
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 64K installed 1 - 64K option 1 - 32K option			
2 - 64K options 1 - 32K option		 	
1 - 64/256K option with 128K installed 1 - 32K option			

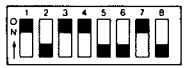
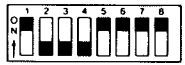
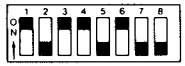
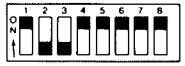
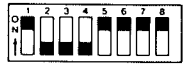
448K Total Memory
192K + (256K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

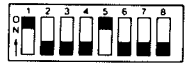
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed			
1 - 64/256K option with 128K installed 1 - 64K option			
1 - 64/256K option with 64K installed 2 - 64K options		 	
3 - 64K options		 	
1 - 64/256K option with 128 installed 2 - 32K options			

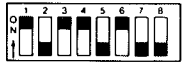
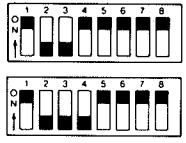
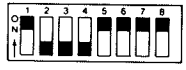
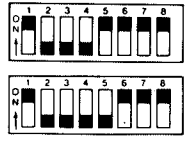
480K Total Memory
224K + (256K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2 

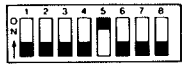
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed 1 - 32K option			
1 - 64/256K option with 128K installed 1 - 64K option 1 - 32K option			

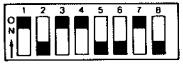
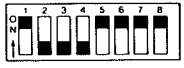
512K Total Memory
256K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2 

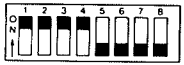
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 128K installed 2 - 64K options			
1 - 64/256K option with 192K installed 1 - 64K option			
1 - 64/256K option with 192K installed 2 - 32K options			
1 - 64/256K option with 256K installed			

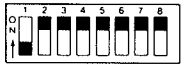
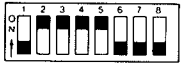
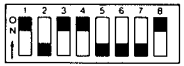
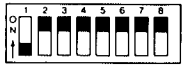
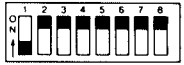
544K Total Memory
288K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2
		

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed 1 - 64K option 1 - 32K option			
1 - 64/256K option with 256K installed 1 - 32K option			

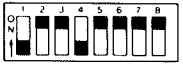
576K Total Memory
320K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2 

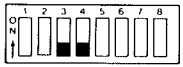
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 192K installed 2 - 64K options		 	
1 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed	 		
1 - 64/256K option with 256K installed 1 - 64K option			
1 - 64/256K option with 256K installed 2 - 32K options			

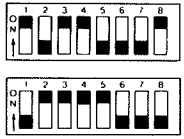
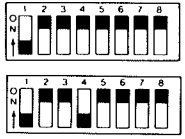
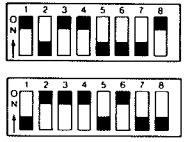
608K Total Memory
352K + (256K on System Board)

System Board Switches	Switch Block 1	Switch Block 2

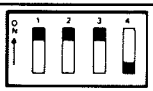
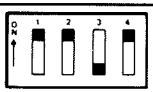
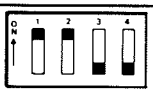
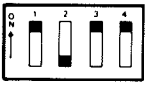
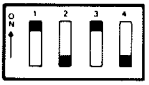
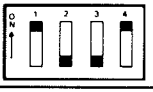
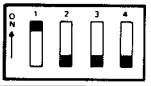
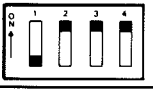
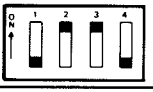
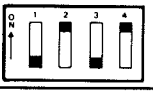
	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed 1 - 32K option			
1 - 64/256K option with 256K installed 1 - 64K option 1 - 32K option			

640K Total Memory
384K + (256K on System Board)

System Board Switches	Switch Block 1 	Switch Block 2

	64/256K Option Card Switches	64K Option Card Switches	32K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed 1 - 64K option			
1 - 64/256K option with 256K installed 2 - 64K options			
1 - 64/256K option with 256K installed 1 - 64/256K option with 128K installed			

Extender Card Switch Settings

System Memory	Extender Card Switch Block	Memory Segment
16K to 64K		1
96K to 128K		2
160K to 192K		3
224K to 256K		4
288K to 320K		5
352K to 384K		6
416K to 448K		7
480K to 512K		8
544K to 576K		9
608K to 640K		A

Notes:

GLOSSARY

μs: Microsecond.

adapter: An auxiliary system or unit used to extend the operation of another system.

address bus: One or more conductors used to carry the binary-coded address from the microprocessor throughout the rest of the system.

all points addressable (APA): A mode in which all points on a displayable image can be controlled by the user.

alpanumeric (A/N): Pertaining to a character set that contains letters, digits, and usually other characters, such as punctuation marks. Synonymous with alphanumeric.

American Standard Code for Information Interchange (ASCII): The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), used for information interchange among data processing systems, data communication systems and associated equipment. The ASCII set consists of control characters and graphic characters.

A/N: Alphanumeric.

analog: (1) pertaining to data in the form of continuously variable physical quantities. (2) Contrast with digital.

AND: A logic operator having the property that if P is a statement, Q is a statement, R is a statement,...,then the AND of P, Q, R,...is true if all statements are true, false if any statement is false.

APA: All points addressable.

ASCII: American Standard Code for Information Interchange.

assembler: A computer program used to assemble. Synonymous with assembly program.

asynchronous communications: A communication mode in which each single byte of data is synchronized, usually by the addition of start/stop bits.

BASIC: Beginner's all-purpose symbolic instruction code.

basic input/output system (BIOS): Provides the device level control of the major I/O devices in a computer system, which provides an operational interface to the system and relieves the programmer from concern over hardware device characteristics.

baud: (1) A unit of signaling speed equal to the number of discrete conditions or signal events per second. For example, one baud equals one-half dot cycle per second in Morse code, one bit per second in a train of binary signals, and one 3-bit value per second in a train of signals each of which can assume one of eight different states. (2) In asynchronous transmission, the unit of modulation rate corresponding to one unit of interval per second; that is, if the duration of the unit interval is 20 milliseconds, the modulation rate is 50 baud.

BCC: Block-check character.

beginner's all-purpose symbolic instruction code (BASIC): A programming language with a small repertoire of commands and a simple syntax, primarily designed for numerical application.

binary: (1) Pertaining to a selection, choice, or condition that has two possible values or states. (2) Pertaining to a fixed radix numeration system having a radix of two.

binary digit: (1) In binary notation, either of the characters 0 or 1. (2) Synonymous with bit.

binary notation: Any notation that uses two different characters, usually the binary digits 0 and 1.

binary synchronous communications (BSC): A standardized procedure, using a set of control characters and control character sequences for synchronous transmission of binary-coded data between stations.

BIOS: Basic input/output system.

bit: In binary notation, either of the characters 0 or 1.

bits per second (bps): A unit of measurement representing the number of discrete binary digits which can be transmitted by a device in one second.

block-check character (BCC): In cyclic redundancy checking, a character that is transmitted by the sender after each message block and is compared with a block-check character computed by the receiver to determine if the transmission was successful.

boolean operation: (1) Any operation in which each of the operands and the result take one of two values. (2) An operation that follows the rules of boolean algebra.

bootstrap: A technique or device designed to bring itself into a desired state by means of its own action; that is, a machine routine whose first few instructions are sufficient to bring the rest of itself into the computer from an input device.

bps: Bits per second.

BSC: Binary synchronous communications.

buffer: (1) An area of storage that is temporarily reserved for use in performing an input/output operation, into which data is read or from which data is written. Synonymous with I/O area. (2) A portion of storage for temporarily holding input or output data.

bus: One or more conductors used for transmitting signals or power.

byte: (1) A binary character operated upon as a unit and usually shorter than a computer word. (2) The representation of a character.

CAS: Column address strobe.

cathode ray tube (CRT): A vacuum tube display in which a beam of electrons can be controlled to form alphanumeric characters or symbols on a luminescent screen, for example by use of a dot matrix.

cathode ray tube display (CRT display): (1) A device that presents data in visual form by means of controlled electron beams. (2) The data display produced by the device as in (1).

CCITT: Comite Consultatif International Telegrafique et Telephonique.

central processing unit (CPU): A functional unit that consists of one or more processors and all or part of internal storage.

channel: A path along which signals can be sent; for example, data channel or I/O channel.

characters per second (cps): A standard unit of measurement for printer output.

code: (1) A set of unambiguous rules specifying the manner in which data may be represented in a discrete form. Synonymous with coding scheme. (2) A set of items, such as abbreviations, representing the members of another set. (3) Loosely, one or more computer programs, or part of a computer program. (4) To represent data or a computer program in a symbolic form that can be accepted by a data processor.

column address strobe (CAS): A signal that latches the column addresses in a memory chip.

Comite Consultatif International Telegrafique et Telephonique (CCITT): Consultative Committee on International Telegraphy and Telephony.

computer: A functional unit that can perform substantial computation, including numerous arithmetic operations, or logic operations, without intervention by a human operator during the run.

configuration: (1) The arrangement of a computer system or network as defined by the nature, number, and the chief characteristics of its functional units. More specifically, the term configuration may refer to a hardware configuration or a software configuration. (2) The devices and programs that make up a system, subsystem, or network.

conjunction: (1) The boolean operation whose result has the boolean value 1 if, and only if, each operand has the boolean value 1. (2) Synonymous with AND operation.

contiguous: (1) Touching or joining at the edge or boundary. (2) Adjacent.

CPS: Characters per second.

CPU: Central processing unit.

CRC: Cyclic redundancy check.

CRT: Cathode ray tube.

CRT display: Cathode ray tube display.

CTS: Clear to send. Associated with modem control.

cyclic redundancy check (CRC): (1) A redundancy check in which the check key is generated by a cyclic algorithm. (2) A system of error checking performed at both the sending and receiving station after a block-check character has been accumulated.

cylinder: (1) The set of all tracks with the same nominal distance from the axis about which the disk rotates. (2) The tracks of a disk storage device that can be accessed without repositioning the access mechanism.

daisy-chained cable: A type of cable that has two or more connectors attached in series.

data: (1) A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or automatic means. (2) Any representations, such as characters or analog quantities, to which meaning is, or might be assigned.

decoupling capacitor: A capacitor that provides a low-impedance path to ground to prevent common coupling between states of a circuit.

Deutsche Industrie Norm (DIN): (1) German Industrial Norm. (2) The committee that sets German dimension standards.

digit: (1) A graphic character that represents an integer, for example, one of the characters 0 to 9. (2) A symbol that represents one of the non-negative integers smaller than the radix. For example, in decimal notation, a digit is one of the characters from 0 to 9.

digital: (1) Pertaining to data in the form of digits. (2) Contrast with analog.

DIN: Deutsche Industrie Norm.

DIN connector: One of the connectors specified by the DIN standardization committee.

DIP: Dual in-line package.

direct memory access (DMA): A method of transferring data between main storage and I/O devices that does not require processor intervention.

disk: Loosely, a magnetic disk unit.

diskette: A thin, flexible magnetic disk and a semi-rigid protective jacket, in which the disk is permanently enclosed. Synonymous with flexible disk.

DMA: Direct memory access.

DSR: Data set ready. Associated with modem control.

DTR: Data terminal ready. Associated with modem control.

dual in-line package (DIP): A widely used container for an integrated circuit. DIPs are pins usually in two parallel rows. These pins are spaced 1/10 inch apart and come in different configurations ranging from 14-pin to 40-pin configurations.

EBCDIC: Extended binary-coded decimal interchange code.

ECC: Error checking and correction.

edge connector: A terminal block with a number of contacts attached to the edge of a printed circuit board to facilitate plugging into a foundation circuit.

EIA: Electronic Industries Association.

EIA/CCITT: Electronics Industries Association/Consultative Committee on International Telegraphy and Telephony.

end-of-text-character (ETX): A transmission control character used to terminate text.

end-of-transmission character (EOT): A transmission control character used to indicate the conclusion of a transmission, which may have included one or more texts and any associated message headings.

EOT: End-of-transmission character.

EPROM: Erasable programmable read-only memory.

erasable programmable read-only memory (EPROM): A storage device whose contents can be changed by electrical means. EPROM information is not destroyed when power is removed.

error checking and correction (ECC): The detection and correction of all single-bit, double-bit, and some multiple-bit errors.

ETX: End-of-text character.

extended binary-coded decimal interchange code (EBCDIC): A set of 256 characters, each represented by eight bits.

flexible disk: Synonym for diskette.

firmware: Memory chips with integrated programs already incorporated on the chip.

gate: (1) A device or circuit that has no output until it is triggered into operation by one or more enabling signals, or until an input signal exceeds a predetermined threshold amplitude. (2) A signal that triggers the passage of other signals through a circuit.

graphic: A symbol produced by a process such as handwriting, drawing, or printing.

hertz (Hz): A unit of frequency equal to one cycle per second.

hex: Abbreviation for hexadecimal.

hexadecimal: Pertaining to a selection, choice, or condition that has 16 possible values or states. These values or states usually contain 10 digits and 6 letters, A through F. Hexadecimal digits are equivalent to a power of 16.

high-order position: The leftmost position in a string of characters.

Hz: Hertz.

interface: A device that alters or converts actual electrical signals between distinct devices, programs, or systems.

k: An abbreviation for the prefix kilo; that is, 1,000 in decimal notation.

K: When referring to storage capacity, 2 to the tenth power; 1,024 in decimal notation.

KB: Kilobyte; 1,024 bytes.

kHz: A unit of frequency equal to 1,000 hertz.

kilo (k): One thousand.

latch: (1) A feedback loop in symmetrical digital circuits used to maintain a state. (2) A simple logic-circuit storage element comprising two gates as a unit.

LED: Light-emitting diode.

light-emitting diode (LED): A semi-conductor chip that gives off visible or infrared light when activated.

low-order position: The rightmost position in a string of characters.

m: (1) Milli; one thousand or thousandth part. (2) Meter.

M: Mega; 1,000,000 in decimal notation. When referring to storage capacity, 2 to the twentieth power; 1,048,576 in decimal notation.

mA: Milliampere.

machine language: (1) A language that is used directly by a machine. (2) Another term for computer instruction code.

main storage: A storage device in which the access time is effectively independent of the location of the data.

MB: Megabyte, 1,048,576 bytes.

mega (M): 10 to the sixth power, 1,000,000 in decimal notation. When referring to storage capacity, 2 to the twentieth power, 1,048,576 in decimal notation.

megabyte (MB): 1,048,576 bytes.

megahertz (MHz): A unit of measure of frequency. 1 megahertz equals 1,000,000 hertz.

MFM: Modified frequency modulation.

MHz: Megahertz.

microprocessor: An integrated circuit that accepts coded instructions for execution; the instructions may be entered, integrated, or stored internally.

microsecond (μs): One-millionth of a second.

milli (m): One thousand or one thousandth.

milliampere (mA): One thousandth of an ampere.

millisecond (ms): One thousandth of a second.

mnemonic: A symbol chosen to assist the human memory; for example, an abbreviation such a "mpy" for "multiply."

mode: (1) A method of operation; for example, the binary mode, the interpretive mode, the alphanumeric mode. (2) The most frequency value in the statistical sense.

modem: (Modulator-Demodulator) A device that converts serial (bit by bit) digital signals from a business machine (or data terminal equipment) to analog signals which are suitable for transmission in a telephone network. The inverse function is also performed by the modem on reception of analog signals.

modified frequency modulation (MFM): The process of varying the amplitude and frequency of the "write" signal. MFM pertains to the number of bytes of storage that can be stored on the recording media. The number of bytes is twice the number contained in the same unit area of recording media at single density.

modulo check: A calculation performed on values entered into a system. This calculation is designed to detect errors.

monitor: (1) A device that observes and verifies the operation of a data processing system and indicates any specific departure from the norm. (2) A television type display, such as the IBM Monochrome Display. (3) Software or hardware that observes, supervises, controls, or verifies the operations of a system.

ms: Millisecond; one thousandth of a second.

multiplexer: A device capable of interleaving the events of two or more activities, or capable of distributing the events of an interleaved sequence to the respective activities.

NAND: A logic operator having the property that if P is a statement, Q is a statement, R is a statement,...,then the NAND of P,Q,R,...is true if at least one statement is false, false if all statements are true.

nanosecond (ns): One-thousandth-millionth of a second.

nonconjunction: The dyadic boolean operation the result of which has the boolean value 0 if, and only if, each operand has the boolean value 1.

non-return-to-zero inverted (NRZI): A transmission encoding method in which the data terminal equipment changes the signal to the opposite state to send a binary 0 and leaves it in the same state to send a binary 1.

NOR: A logic operator having the property that if P is a statement, Q is a statement, R is a statement,...,then the NOR of P,Q,R,...is true if all statements are false, false if at least one statement is true.

NOT: A logical operator having the property that if P is a statement, then the NOT of P is true if P is false, false if P is true.

NRZI: Non-return-to-zero inverted.

ns: Nanosecond; one-thousandth-millionth of a second.

operating system: Software that controls the execution of programs; an operating system may provide services such as resource allocation, scheduling, input/output control, and data management.

OR: A logic operator having the property that if P is a statement, Q is a statement, R is a statement,...,then the OR of P,Q,R,...is true if at least one statement is true, false if all statements are false.

output: Pertaining to a device, process, or channel involved in an output process, or to the data or states involved in an output process.

output process: (1) The process that consists of the delivery of data from a data processing system, or from any part of it. (2) The return of information from a data processing system to an end user, including the translation of data from a machine language to a language that the end user can understand.

overcurrent: A current of higher than specified strength.

overvoltage: A voltage of higher than specified value.

parallel: (1) Pertaining to the concurrent or simultaneous operation of two or more devices, or to the concurrent performance of two or more activities. (2) Pertaining to the concurrent or simultaneous occurrence of two or more related activities in multiple devices or channels. (3) Pertaining to the simultaneity of two or more processes. (4) Pertaining to the simultaneous processing of the individual parts of a whole, such as the bits of a character and the characters of a word, using separate facilities for the various parts. (5) Contrast with serial.

PEL: Picture element.

personal computer: A small home or business computer that has a processor and keyboard that can be connected to a television or some other monitor. An optional printer is usually available.

picture element (PEL): (1) The smallest displayable unit on a display. (2) Synonymous with pixel, PEL.

pinout: A diagram of functioning pins on a pinboard.

pixel: Picture element.

polling: (1) Interrogation of devices for purposes such as to avoid contention, to determine operational status, or to determine readiness to send or receive data. (2) The process whereby stations are invited, one at a time, to transmit.

port: An access point for data entry or exit.

printed circuit board: A piece of material, usually fiberglass, that contains a layer of conductive material, usually metal. Miniature electronic components on the fiberglass transmit electronic signals through the board by way of the metal layers.

program: (1) A series of actions designed to achieve a certain result. (2) A series of instructions telling the computer how to handle a problem or task. (3) To design, write, and test computer programs.

programming language: (1) An artificial language established for expressing computer programs. (2) A set of characters and rules, with meanings assigned prior to their use, for writing computer programs.

PROM: Programmable read-only memory.

propagation delay: The time necessary for a signal to travel from one point on a circuit to another.

radix: (1) In a radix numeration system, the positive integer by which the weight of the digit place is multiplied to obtain the weight of the digit place with the next higher weight; for example, in the decimal numeration system, the radix of each digit place is 10. (2) Another term for base.

radix numeration system: A positional representation system in which the ratio of the weight of any one digit place to the weight of the digit place with the next lower weight is a positive integer. The permissible values of the character in any digit place range from zero to one less than the radix of the digit place.

RAS: Row address strobe.

RGBI: Red-green-blue-intensity.

read-only memory (ROM): A storage device whose contents cannot be modified, except by a particular user, or when operating under particular conditions; for example, a storage device in which writing is prevented by a lockout.

read/write memory: A storage device whose contents can be modified.

red-green-blue-intensity (RGBI): The description of a direct-drive color monitor which accepts red, green, blue, and intensity signal inputs.

register: (1) A storage device, having a specified storage capacity such as a bit, a byte, or a computer word, and usually intended for a special purpose. (2) On a calculator, a storage device in which specific data is stored.

RF modulator: The device used to convert the composite video signal to the antenna level input of a home TV.

ROM: Read-only memory.

ROM/BIOS: The ROM resident basic input/output system, which provides the device level control of the major I/O devices in the computer system.

row address strobe (RAS): A signal that latches the row addresses in a memory chip.

RS-232C: The standard set by the EIA for communications between computers and external equipment.

RTS: Request to send. Associated with modem control.

run: A single continuous performance of a computer program or routine.

scan line: The use of a cathode beam to test the cathode ray tube of a display used with a personal computer.

schematic: The description, usually in diagram form, of the logical and physical structure of an entire data base according to a conceptual model.

SDLC: Synchronous Data Link Control.

sector: That part of a track or band on a magnetic drum, a magnetic disk, or a disk pack that can be accessed by the magnetic heads in the course of a predetermined rotational displacement of the particular device.

serdes: Serializer/deserializer.

serial: (1) Pertaining to the sequential performance of two or more activities in a single device. In English, the modifiers serial and parallel usually refer to devices, as opposed to sequential and consecutive, which refer to processes. (2) Pertaining to the sequential or consecutive occurrence of two or more related activities in a single device or channel. (3) Pertaining to the sequential processing of the individual parts of a whole, such as the bits of a character or the characters of a word, using the same facilities for successive parts. (4) Contrast with parallel.

sink: A device or circuit into which current drains.

software: (1) Computer programs, procedures, rules, and possibly associated documentation concerned with the operation of a data processing system. (2) Contrast with hardware.

source: The origin of a signal or electrical energy.

source circuit: (1) Generator circuit. (2) Control with sink.

SS: Start-stop transmission.

start bit: Synonym for start signal.

start-of-text character (STX): A transmission control character that precedes a text and may be used to terminate the message heading.

start signal: (1) A signal to a receiving mechanism to get ready to receive data or perform a function. (2) In a start-stop system, a signal preceding a character or block that prepares the receiving device for the reception of the code elements. Synonymous with start bit.

start-stop (SS) transmission: Asynchronous transmission such that a group of signals representing a character is preceded by a start signal and followed by a stop signal. (2) Asynchronous transmission in which a group of bits is preceded by a start bit that prepares the receiving mechanism for the reception and registration of a character and is followed by at least one stop bit that enables the receiving mechanism to come to an idle condition pending the reception of the next character.

stop bit: Synonym for stop signal.

stop signal: (1) A signal to a receiving mechanism to wait for the next signal. (2) In a start-stop system, a signal following a character or block that prepares the receiving device for the reception of a subsequent character or block. Synonymous with stop bit.

strobe: (1) An instrument used to determine the exact speed of circular or cyclic movement. (2) A flashing signal displaying an exact event.

STX: Start-of-text character.

Synchronous Data Link Control (SLDC): A protocol for the management of data transfer over a data communications link.

synchronous transmission: Data transmission in which the sending and receiving devices are operating continuously at the same frequency and are maintained, by means of correction, in a desired phase relationship.

text: In ASCII and data communication, a sequence of characters treated as an entity if preceded and terminated by one STX and one ETX transmission control, respectively.

track: (1) The path or one of the set of paths, parallel to the reference edge on a data medium, associated with a single reading or writing component as the data medium moves past the component. (2) The portion of a moving data medium such as a drum, tape, or disk, that is accessible to a given reading head position.

transistor-transistor logic (TTL): A circuit in which the multiple-diode cluster of the diode-transistor logic circuit has been replaced by a multiple-emitter transistor.

TTL: Transistor-transistor logic.

TX Data: Transmit data. Associated with modem control. External connections of the RS-232C asynchronous communications adapter interface.

video: Computer data or graphics displayed on a cathode ray tube, monitor or display.

write precompensation: The varying of the timing of the head current from the outer tracks to the inner tracks of the diskette to keep a constant write signal.

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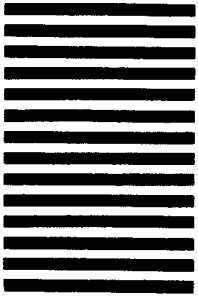

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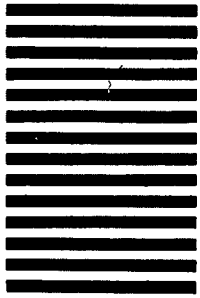

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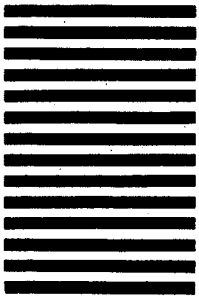

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