



*Personal Computer
Hardware Reference
Library*

IBM 5-1/4" Diskette Drive

6361486

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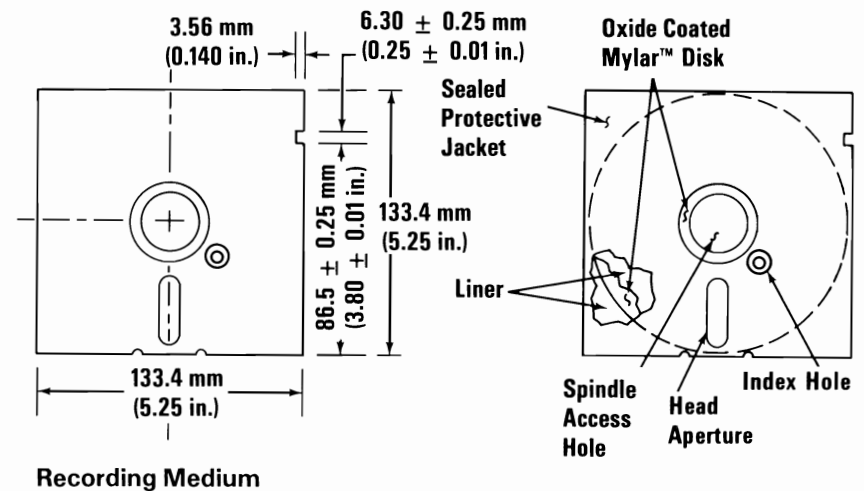
Description

The system unit has space and power for one or two 5-1/4 inch diskette drives. A drive can be single-sided or double-sided with 40 tracks for each side. The diskette drive is a self-contained unit consisting of a spindle drive system, a read positioning system, and a read/write/erase system.

The diskette drive uses modified frequency modulation (MFM) to read and write digital data, with a track-to-track access time of 6 milliseconds.

The IBM 5-1/4" Diskette Drive uses a standard 133.4 millimeter (5.25 inch) diskette. Single-sided, double-density, soft-sectored diskettes are used for single-sided drives. Double-sided drives use double-sided, double-density, soft-sectored diskettes.

This recording medium is a flexible magnetic disk enclosed in a protective jacket. The protected disk, free to rotate within the jacket, is continuously cleaned by the soft fabric lining of the jacket during normal operation. Read/write/erase head access is made through an opening in the jacket. Openings for the drive hub and diskette index hole are also provided. The following figure is a simplified drawing of the diskette used with the IBM 5-1/4" Diskette Drive.



To insert a diskette, the operator raises the latch at the front of the diskette drive and inserts the diskette in the slot. Plastic guides in the slot ensure the diskette is in the correct position. Closing the latch centers the diskette and clamps it to the drive hub. After 250 milliseconds, the servo-controlled dc motor starts and drives the hub at a constant speed of 300 rpm. The head positioning system, which consists of a 4-phase stepper-motor and band assembly with its associated electronics, moves the magnetic head so it comes in contact with the desired track of the diskette. The stepper-motor and band assembly uses one-step rotation to cause a one-track linear movement of the magnetic head. No operator intervention is required during normal operation. During a write operation, a 0.33-millimeter (0.013-inch) data track is recorded, then tunnel-erased to 0.30 millimeter (0.012 inch). If the diskette is write-protected, a Write Protect sensor disables the drive's circuitry, and an appropriate signal is sent to the interface.

Data is read from the diskette by the data-recovery circuitry, which consists of a low-level read amplifier, differentiator, zero-crossing detector, and digitizing circuits. All data decoding is done by the adapter card.

The diskette drive also has the following sensor systems:

1. The Track 00 switch, which senses when the head/carriage assembly is at track 00.
2. The Index sensor, which consists of an LED light source and phototransistor. This sensor is positioned to generate a digital signal when an index hole is detected.
3. The Write Protect sensor disables the diskette drive's electronic circuits whenever a write-protect tab is applied to the diskette.

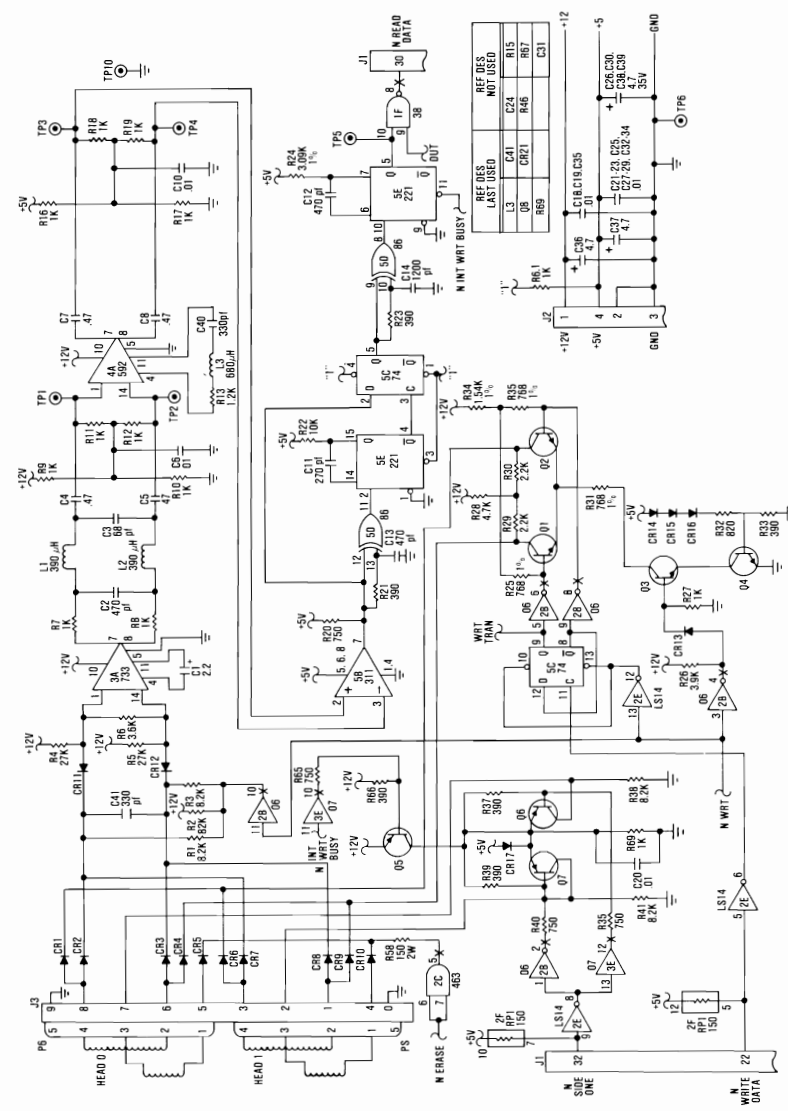
For interface information and programming considerations, refer to "IBM 5-1/4" Diskette Drive Adapter" in this manual.

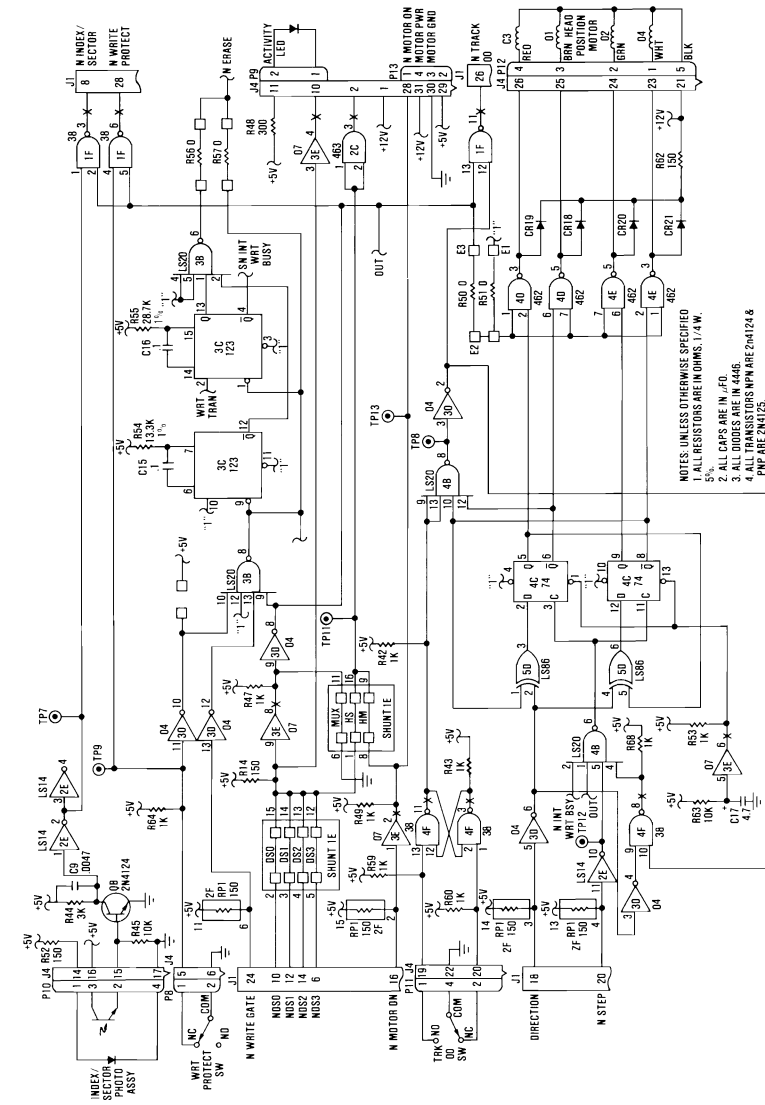
Specifications

Size (maximum)	
Height	86 mm (3.4 in.)
Width	149 mm (5.9 in.)
Depth	203 mm (8.0 in.)
Weight	2.04 kg (4.5 lb)
Power	+12 Vdc \pm 5 %, (900 mA average)
	+5 Vdc \pm 5 %, (600 mA average)
Media	Industry-compatible 5-1/4 inch diskette
Tracks per Inch	48
Number of Tracks	40
Temperature (exclusive of media)	
Operating	10 to 44°C (50 to 112°F)
Non-operating	-40 to 60°C (-40 to 140°F)
Relative humidity (exclusive of media)	
Operating	20 to 80 % (non-condensing)
Non-operating	5 to 95 % (non-condensing)
Seek Time	6 ms track-to-track
Head Settling Time	15 ms (last track addressed)
Error Rate	
Recoverable	1 per 10 ⁹ bits read
Irrecoverable	1 per 10 ¹² bits read
Seek Errors	1 per 10 ⁶ seeks
Head Life	20,000 hours (normal use)
Media Life	3.0 X 10 ⁶ passes per track
Disk Speed	
Long term	300 rpm \pm 1.5 %
Instantaneous	300 rpm \pm 3.0 %
Start Time	500 ms (maximum)
Transfer Rate	250K bps
Recording Mode	MFM

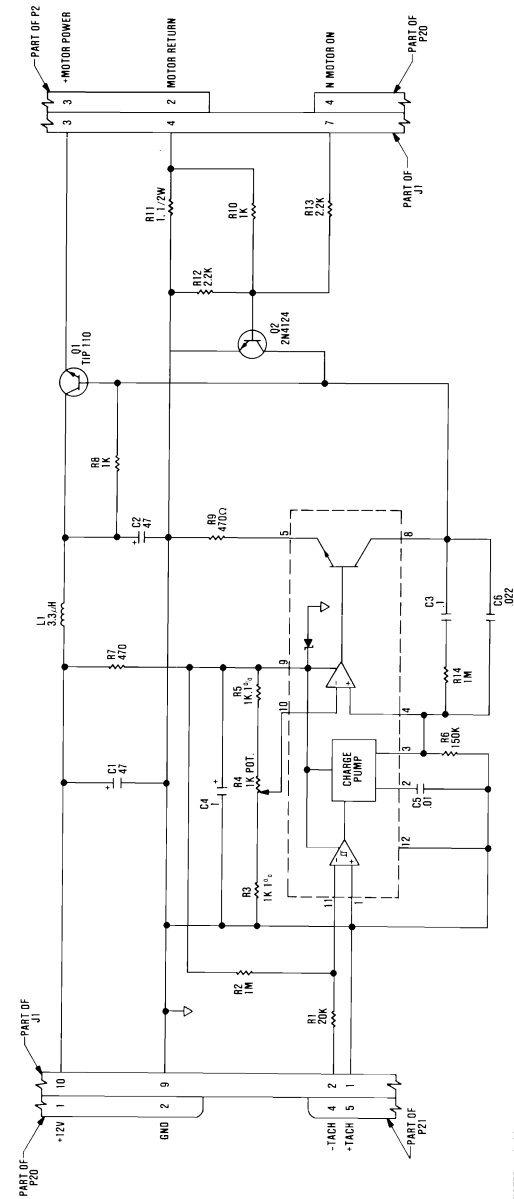
Mechanical and Electrical Specifications

Logic Diagrams



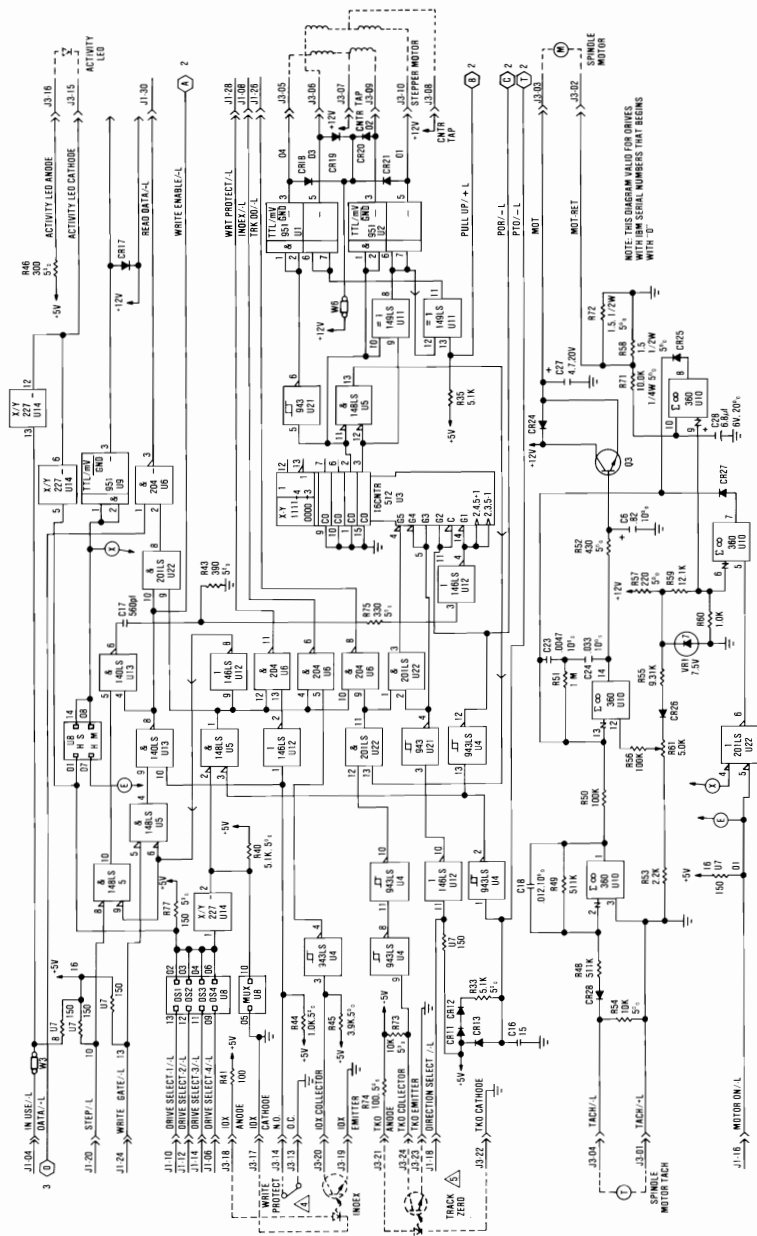


5-1/4 Inch Diskette Drive – Type 1 (Sheet 2 of 3)

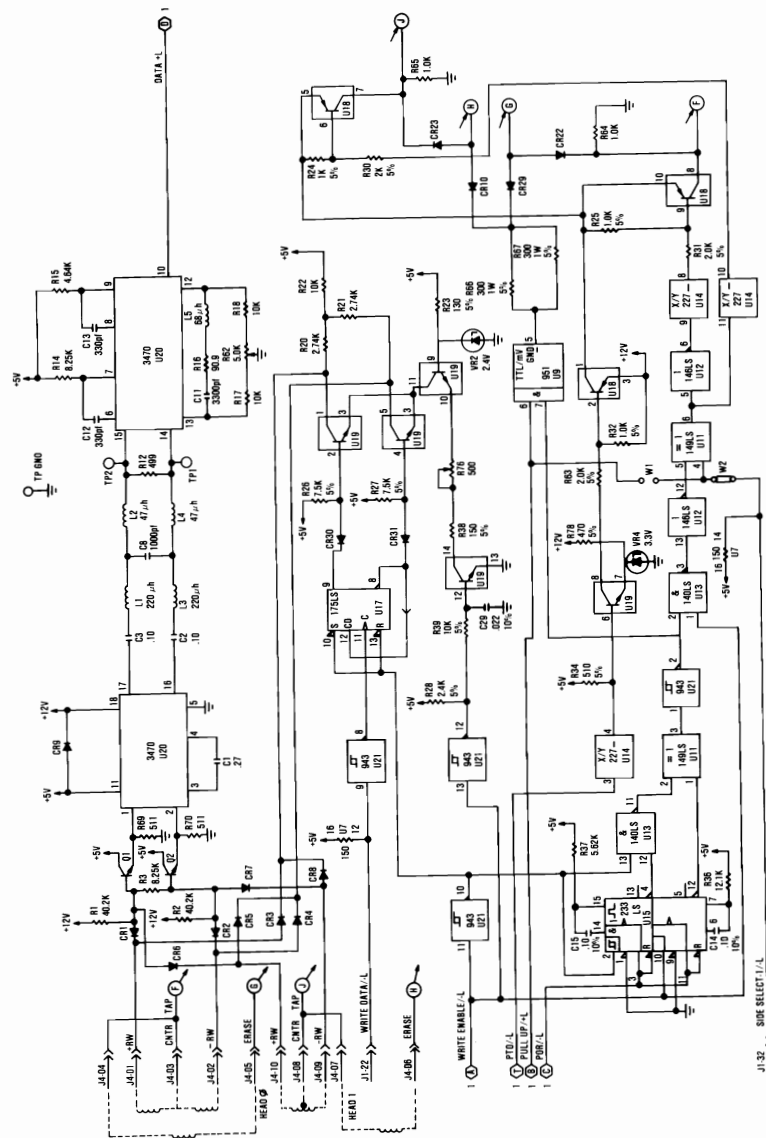


NOTES: UNLESS OTHERWISE SPECIFIED
1. RESISTORS ARE IN OHMS. $+5^{\circ}\text{C}$. $1/4\text{W}$.
2. 1°C RESISTORS ARE $1/8\text{W}$.
3. CAPACITORS ARE IN μF . $+20^{\circ}\text{C}$. 35V .

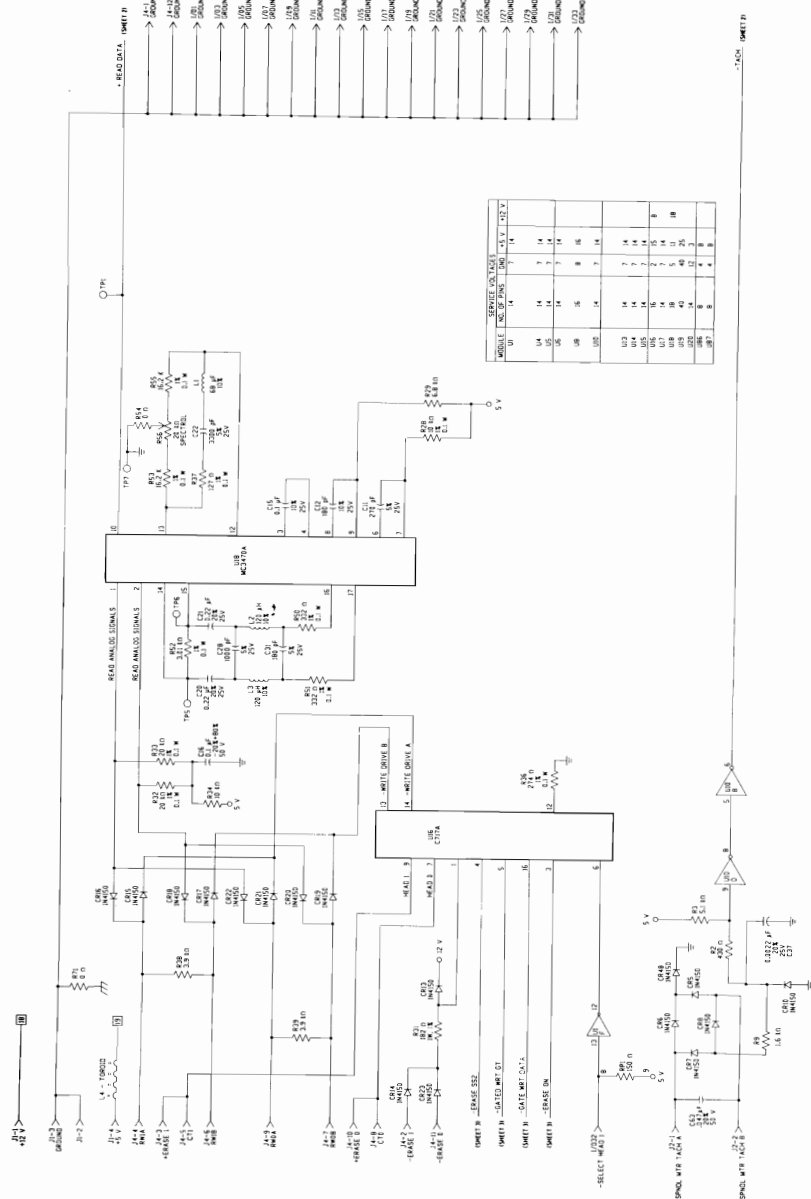
5-1/4 Inch Diskette Drive – Type 1 (Sheet 3 of 3)



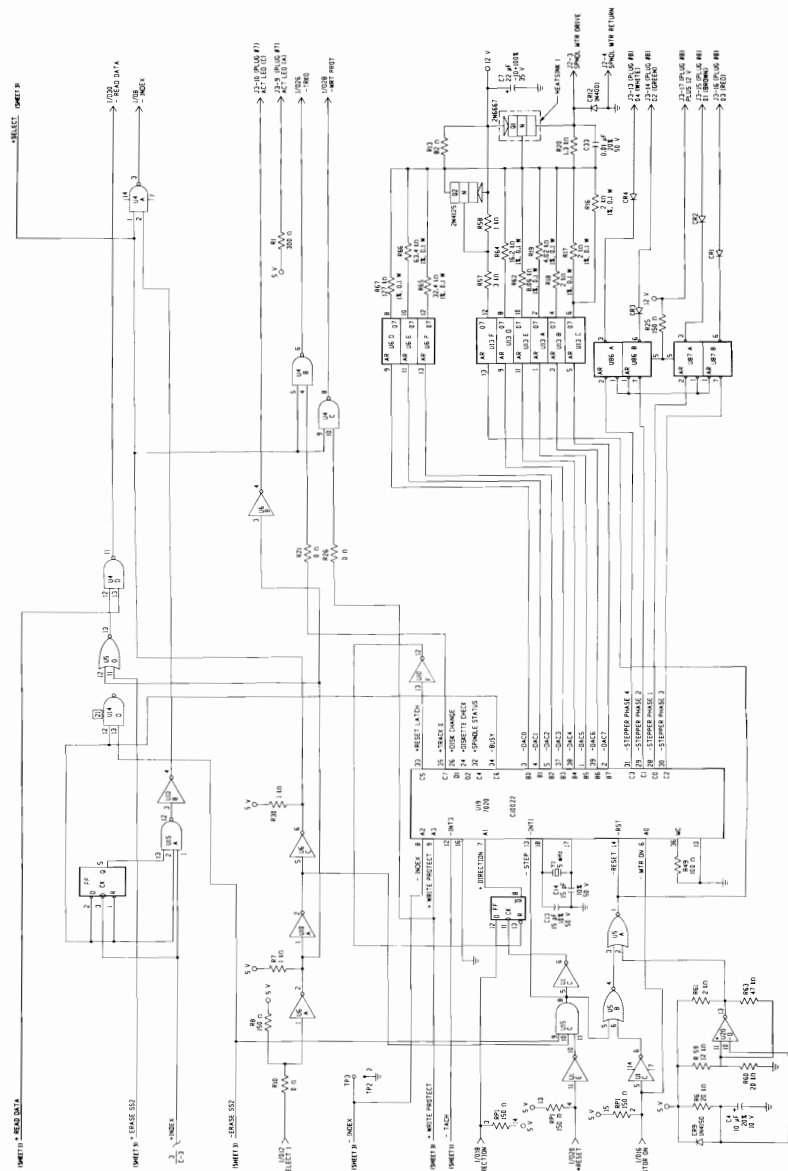
5-1/4 Inch Diskette Drive - Type 2 (Sheet 1 of 2)



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



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



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

