



*Personal Computer
Hardware Reference
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IBM Slimline Diskette Drive

6361484

IBM Slimline Diskette Drive

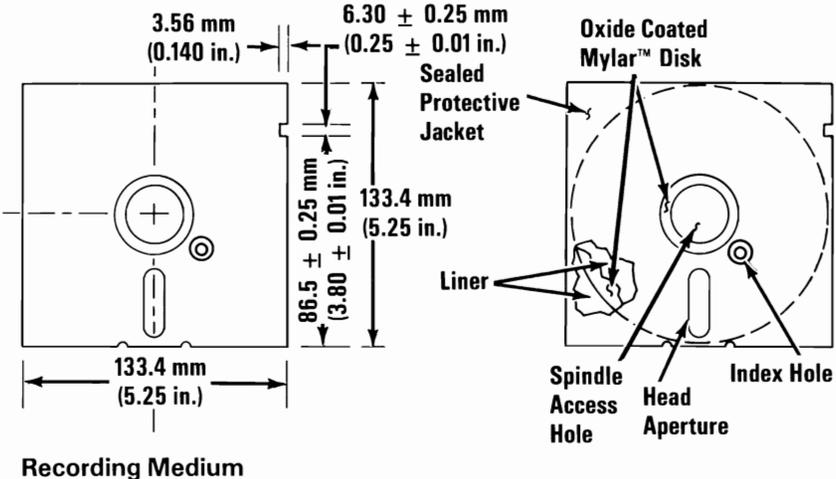
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Description

The IBM Portable Personal Computer has space and power for one or two 5-1/4 inch slimline diskette drives. Each drive can use single-sided or double-sided diskettes with 40 tracks on each side. The drive is completely self contained, and consists of a spindle drive system, a head positioning system, and a read/write/erase system.

The 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 load a diskette, the operator twists the latch at the front of the diskette drive counter-clockwise and inserts the diskette into the slot. Plastic guides in the slot ensure the diskette is in the correct position. Twisting the latch clockwise 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 diskette drive uses modified frequency modulation (MFM) to read and write digital data with a track to track access time of 6 milliseconds. It reaches operating speed in 0.5 seconds and drives the hub at a constant 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 drives 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:

- The track 00 switch, which senses when the head/carriage assembly is at track 00.
- The index sensor, which consists of a light emitting diode (LED) light source and phototransistor. This sensor is positioned so that a digital signal is generated when the index hole is detected.
- The write-protect sensor disables the diskette-drive write circuits whenever the diskette has a write-protect tab.

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

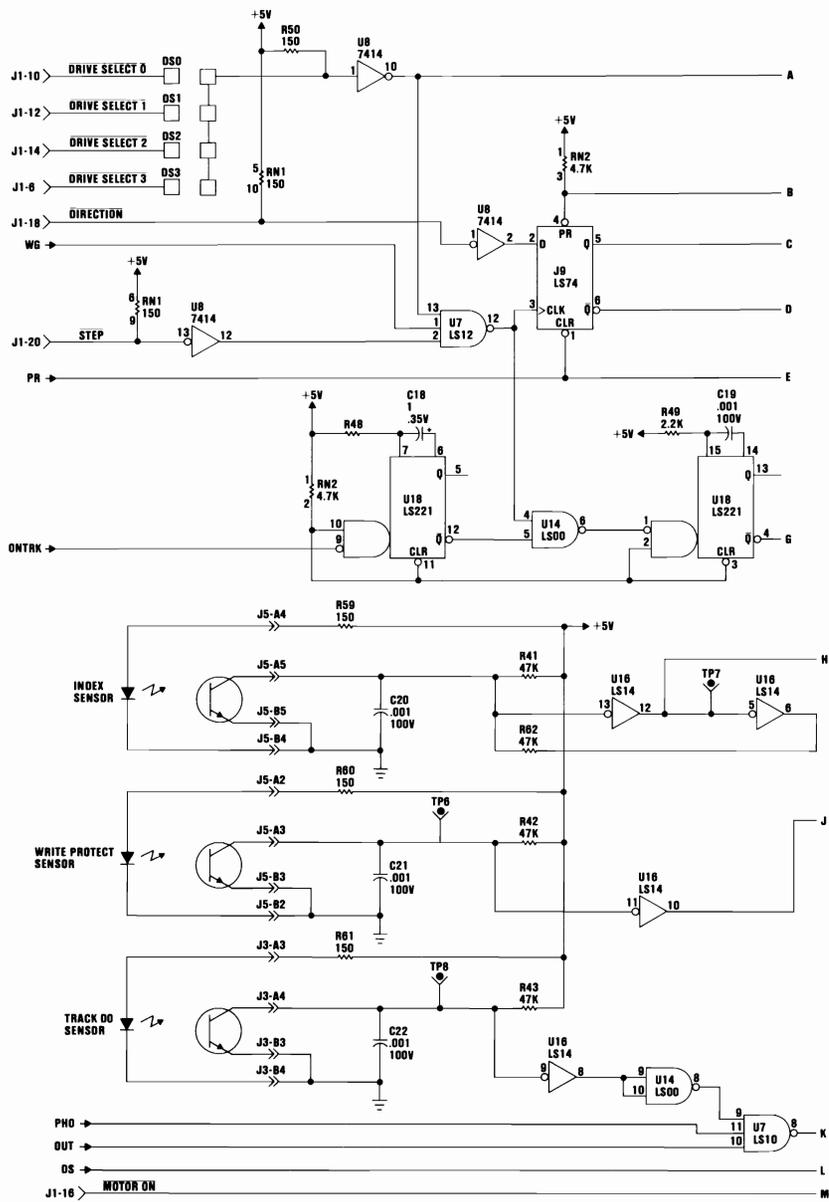
Specifications

Size (maximum)	
Height	42 mm (1.6 in.)
Width	146 mm (5.8 in.)
Depth	203 mm (8.0 in.)
Weight	1.1 kg (2.4 lb)
Power	+12 Vdc $\pm 5\%$ +5 Vdc $\pm 5\%$
Media	Industry-compatible 5-1/4 inch diskette
Tracks per Inch	48
Number of Tracks	40
Temperature (exclusive of media)	
Operating	10 to 50°C (41 to 122°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	21 ms (from last step pulse)
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 bits/sec
Recording Mode	MFM

Mechanical and Electrical Specifications

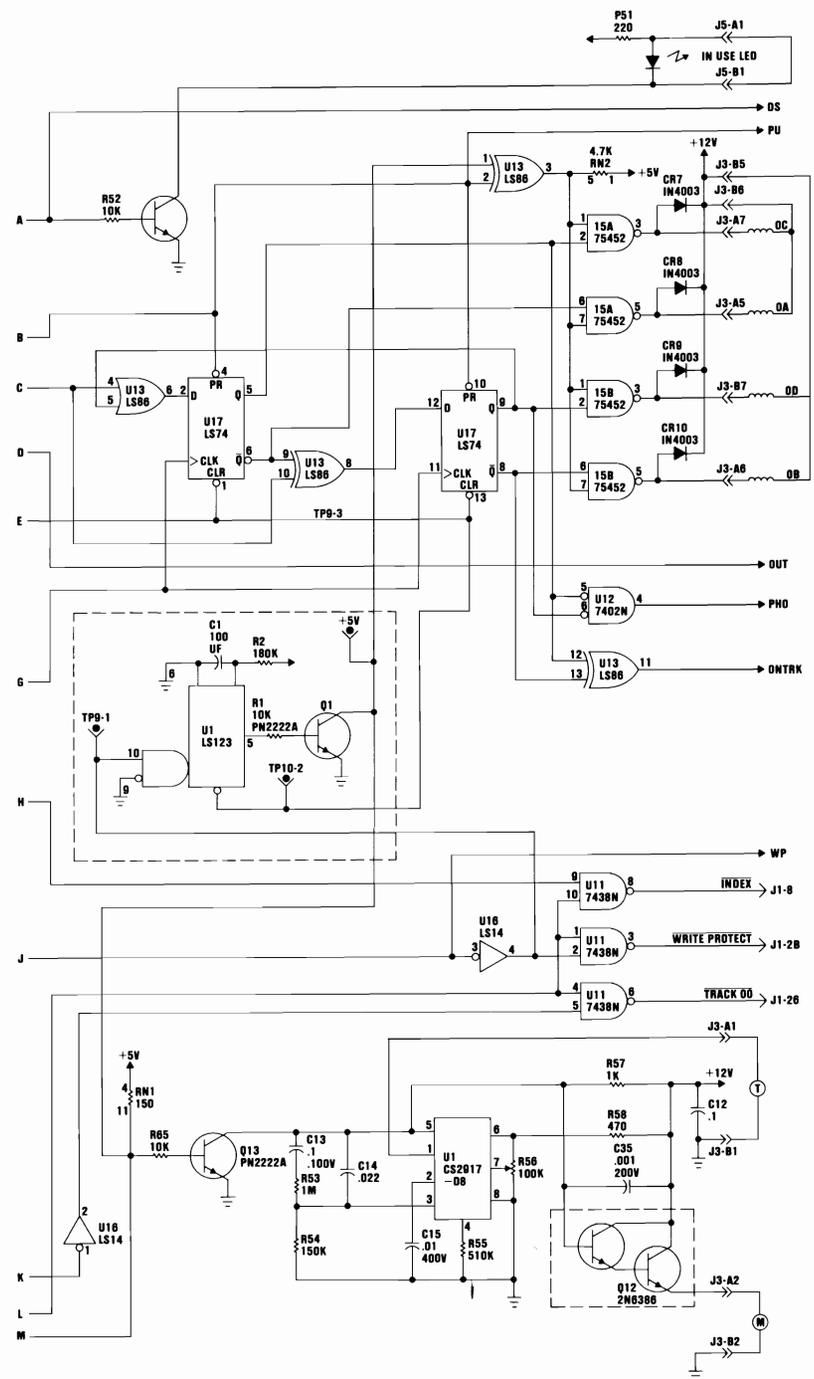
Logic Diagrams

The following pages contain the logic diagrams for the IBM Slimline Diskette Drive.

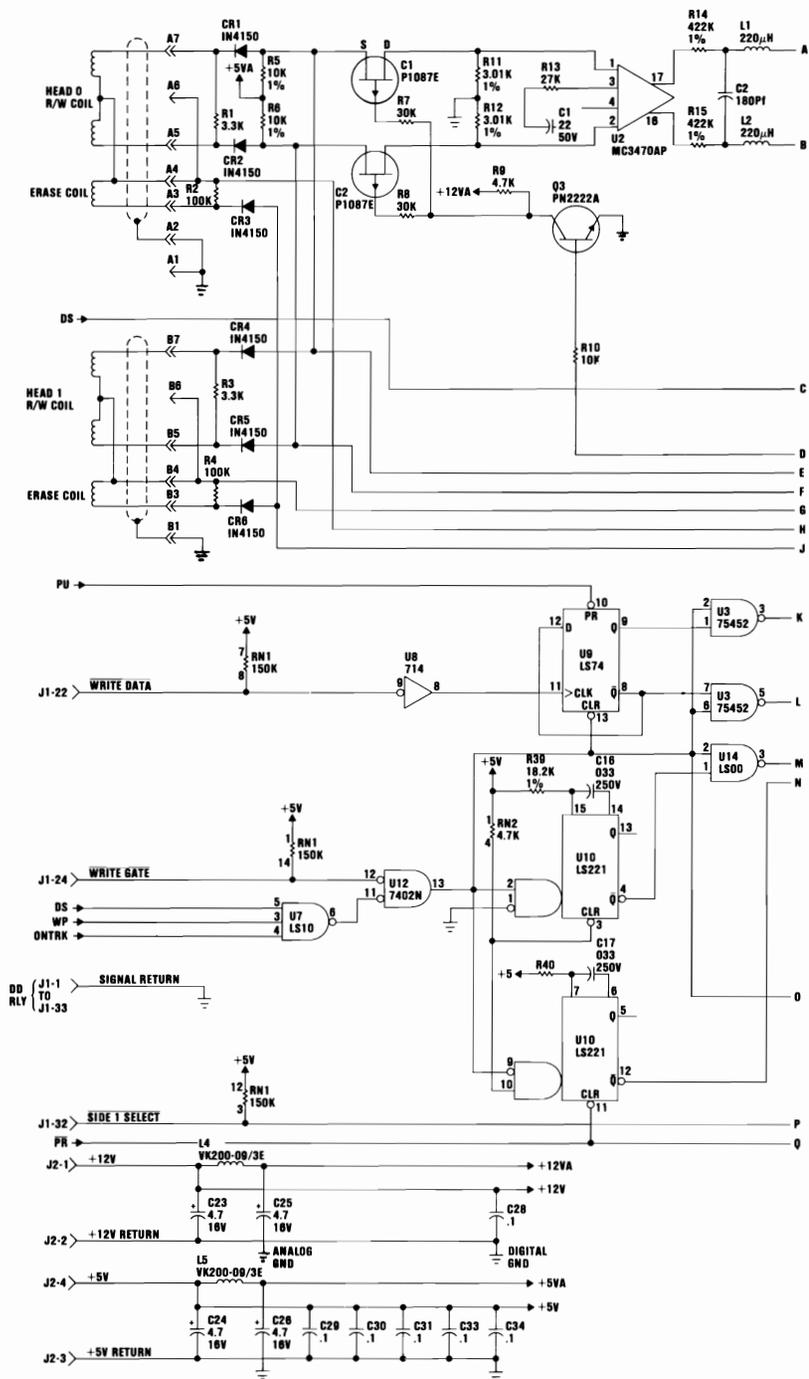


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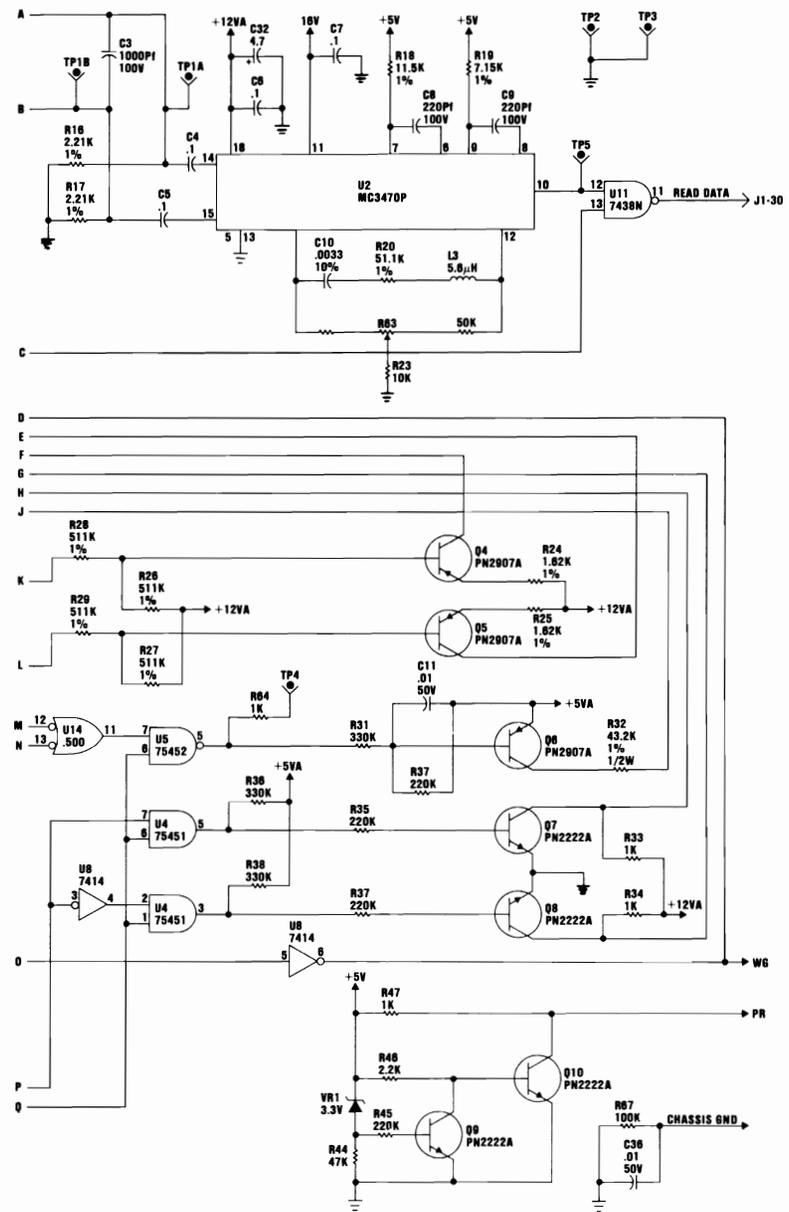


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Notes: