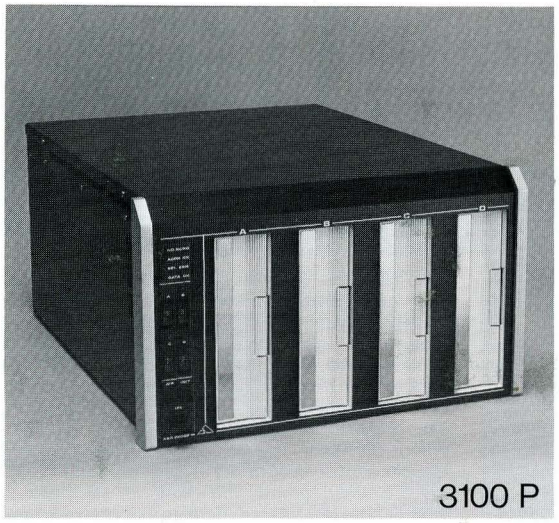
IBM-Compatible Floppy Disk Subsystem

AED 3100 Series



3100 P

- Programmable Formatter permits ideal record size
- IBM 3740 or 3600 compatible
- Field-proven compatibility and reliability
- Two or four drives per cabinet
- Completely packaged, ready to use
- 15 Interfaces shown inside

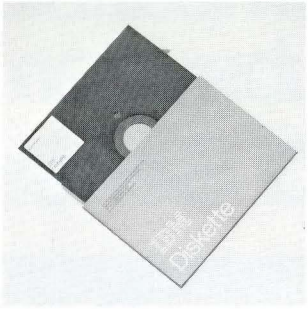
3100 LP

3100 LP/2

ADVANCED ELECTRONICS DESIGN, INC.

IBM Compatible Floppy Disk Subsystem

Diskette

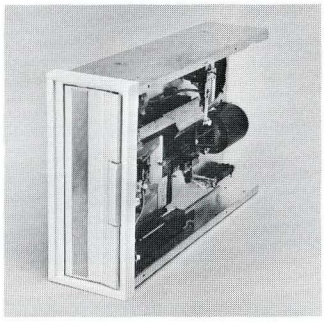


- Interchangeable with diskettes used in the IBM 3740 and 3600.
- 77 tracks per diskette.
- From 1 to 110 sectors per track (programmable).
- From 2540 to 1 word per sector (programmable).
- Up to 195,580 words per diskette
- Soft errors – 10^{-9}.
- Hard errors – 10^{-12}.
- Life – over 10^{6} passes per track.
- Both sides of Diskette usable.

The Advanced Electronics Diskette is fully compatible with the IBM Diskette (Part No. 5565706-Initialized) and therefore may be read and written by the IBM 3740 and 3600 systems. The polyester substrate covered by a digital oxide is contained in a lubricated jacket for safe, easy handling and long life. When not mounted in a disk drive, the diskette is stored in a protective envelope. Non IBM-Diskettes are write-protected in accordance with ANSI recommendation. IBM compatible diskettes may be read and written on one side with non-IBM compatible formatted data or programs on the reverse side. Non-IBM compatible formats can be stored on both sides of the Diskette.

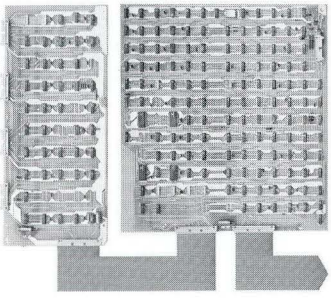
Floppy Disk Drive

- IBM Compatible head.
- Independent seek mechanism.
- Transfer rate – 250K bits/sec.
- Access – 10 ms per track.
- Latency – 167 ms per revolution.
- Head Life – 20,000 hours.
- MTBF – 10,000 hours.
- MTTR – .5 hour.
- Motor speed is line frequency independent.



The PERTEC FD 400 reads and writes IBM-compatible diskettes at a constant speed of 360 rpm. The DC motor is completely independent of line frequency, a highly desirable feature for varying line-frequency conditions. To insert a diskette into the drive, the user depresses the door latch to expose the diskette carriage, and slips the diskette into this carriage making sure it is secured behind the retainer tab. The diskette will rotate and be ready for data transfer only when the door is closed and the latch is engaged. A DC stepper-motor accurately moves the long-life ceramic READ/WRITE head across the track at 10 msecs. track-to-track. Frequency Modulated data is transferred between the head and the diskette at 250,000 bits per second.

Formatter & Drive Electronics

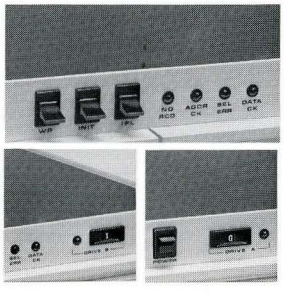


- Programmable Formatter
- IBM Compatible Format (3740 or 3600).
- Format Compatible with Minicomputer Operating Systems.
- Separate Drive Electronics
- Two Byte CRC.
- Read Before Write Address Verification.

The Formatter electronics and four-drive electronics modules are on two printed circuit boards. The Formatter is under program control of the host CPU, thus permitting Diskettes to be initialized appropriate to the application. For example, the host operating system can reside on a Diskette with 8 sectors per track (256 16 bit-words per record) while data can reside on IBM compatible Diskettes (26 sectors per track). The Formatter also includes the Cyclical Redundancy Check (CRC) circuit, clocking, and the Initial Program Load circuit. The Drive Board contains independent electronics for Drives A, B, C, and D. Address verification is performed by the Drive Electronics after the respective head has reached the appropriate track and sector, but prior to data transfer.

Control Panels

- Status Indicators Aid Diagnostics.
- Selectable Drive Addresses.
- Initialize Under Programmable Format Control.
- IPL For Quick Restarts.
- Write Protect Drive 0 Diskette.

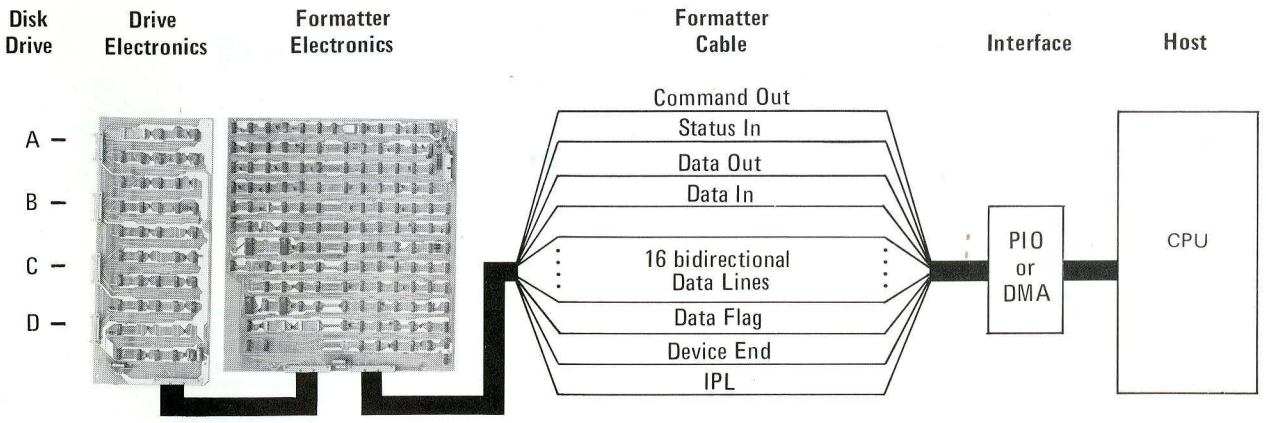


3100LP

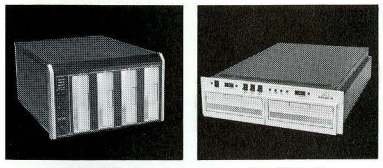
3100P

These Panels combine control functions with status indication. One Light Emitting Diode (LED) with each unit select switch indicates which drive was last accessed and also that the DC power supply is functioning. The unit select switches permit drive A, B, C, and D to be designated units 0, 1, 2, or 3 on a mutually exclusive basis. The status indicators are never on except when the operator or the hardware has caused an error. The INIT switch permits the Formatter to accept the INITIALIZE command from the host system and allows address marks to be written on the disk. Lifting the WP switch protects Drive "0" from any WRITE function. An attempted WRITE into protected Drive "0" will cause a Write Protect Error. The IPL switch generates a READ Sector 00, Track 00 of Unit 0, quickly boot-strapping the host system having a Direct Memory Access interface to the Floppy Disk sub-system.

Interfacing the 3100 Series

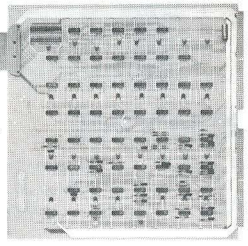


Formatter to Interface Cable – 23 Signals

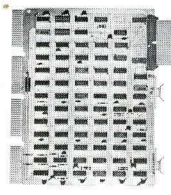


3100P 3100LP

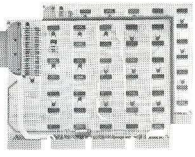
Types of interfaces:–
DMA – Direct Memory Access
PIO – Programmed Input Output
BPIO – Buffered PIO
MUX – Multiplexer Channel
SELCH – Selector Channel
B.I.C. – Burst Interlace Control



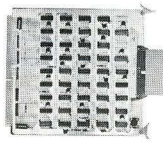
NOVA/Eclipse (DMA)



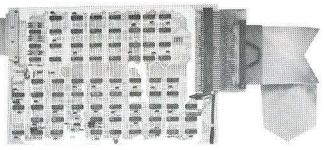
PDP 11/03 (DMA) LSI-11



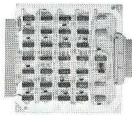
PDP-8A, E, F & M (DMA & PIO)



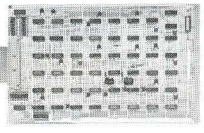
HP 2100 21MX (DMA)



PDP-11 (DMA) Unibus®

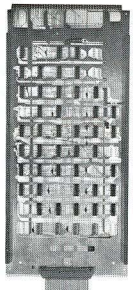


TI 980A (PIO)



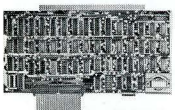
Varian 620 V73 (B.I.C.)

Alpha-16

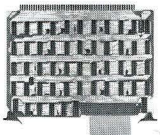


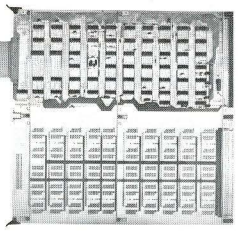
Lockheed SUE (DMA)

Altair (DMA) IMSAI



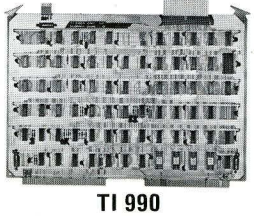
Intellec 8 MOD 80 (DMA)



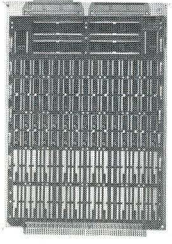


Interdata 70's, 7/16 7/32 & 8/32 (MUX or SELCH)

IBM System 7. Direct connection to System 7 plugs.



TI 990 (BPIO)



Microdata 1600 (DMA)

If you wish to build your own interface for the 3100P, full information and an AED Interface Kit are available.

If IBM density is not required, ask us for our double-density AED 6200 Series brochure.

®Registered Trademark of Digital Equipment Corp.

IBM Compatible Floppy Disk Subsystem

FORMATTER

To calculate maximum number of sectors per track or maximum number of bytes per sector:

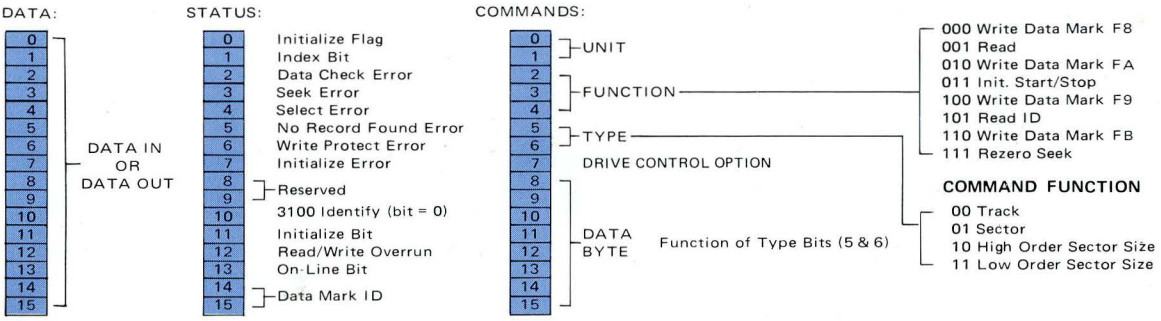
$$S = \text{sectors per track} = \frac{5{,}134}{N + 44.5} \quad \text{OR} \quad N = \text{bytes per sector} = \frac{5{,}134 - 44.5S}{S}$$

Note: An expanded formula should be used for sectors greater than 313 bytes.

EXAMPLES				IBM 3600 Standard			IBM 3741 Standard	
Sectors/track (typical)	1	2	4	8	15	16	26	32 110
Bytes/sector (8 bit data)	5080	2048	1024	512	256	256	128	110 2
Bytes/diskette/side	391,160	315,392	315,392	315,392	295,680	315,392	256,256	271,040 16,940

Cyclical Redundancy Check (CRC) code — During INITIALIZE, a 2-byte CRC is computed for each sector-track and appended to the sector/track address. During each Write, the Address CRC is verified and computed for each record and appended to each data record. During each Read, both the Address CRC and Data CRC are verified against recomputed CRC's.

REGISTERS



SPECIFICATIONS

DRIVES	AED 3100P A	AED 3100P B	AED 3100P C	AED 3100P D	AED 3100LP A	AED 3100LP B	AED 3100LP/2 C	AED 3100LP/2 D
VOLTAGE (AC):	Either 110-130 or 220-260				Either 110-130 or 220-260		Combined power from 3100LP and 3100LP/2	
AMPERES (total current) 115V AC:	2	2.3	2.7	3.0	2.0	2.3	2.7	3.0
AMPERES (total current) 230V AC:	1	1.2	1.4	1.5	1.0	1.2	1.4	1.5
LINE FREQUENCY	either 50 or 60 Hz				either 50 or 60 Hz		same as 3100LP	
WEIGHT:	46 lbs. 21 kg.	60 lbs. 27 kg.	75 lbs. 34 kg.	89 lbs. 40 kg.	42 lbs. 19 kg.	56 lbs. 25 kg.	37 lbs. 17 kg.	51 lbs. 23 kg.
CABINET SIZE:	H10.5" x W16.8" x D21.6" H26.7 cm x W42.7 cm x D54.8 cm				H5.25" x W17.7" x D25.0" H13.3 cm x W45.0 cm x D63.5 cm		H5.25" x W17.7" x D25.0" H13.3 cm x W45.0 cm x D63.5 cm	

OPERATING LIMITS: TEMPERATURE: 50° F-100°F (10°C-38°C) ALTITUDE: –500 ft. to 10,000 ft. (–152 m to 3048 m)
RELATIVE HUMIDITY LIMITS: 20% to 80% with a maximum wet bulb temperature at 78°F (25°C)

OPTIONS

Drive A and the formatter logic are included in the basic AED 3100P and 3100LP; however, sufficient DC power and space are available to add up to three additional Floppy Disk Drives—B, C, & D in the AED 3100P cabinet. The AED 3100LP cabinet will also receive Drive B. The AED 3100LP/2 cabinet is slaved to the basic AED 3100LP and will receive drives C & D. The 3100LP/2 receives power and signals via the cable set provided which connects it to the 3100LP unit.

Diskettes

One diagnostic diskette is provided with the AED 3100P or 3100LP if AED provides the interface. Additional diskettes, including the protective envelopes, may be ordered from AED. Special formatting is available at additional cost. Ask about our quantity purchase agreement.

Storage Bin

This open compartment occupies the space normally taken by a drive. Each storage bin holds 15 diskettes (3100P only).

Chassis Slides

The basic AED cabinets are equipped with rubber feet for table top mounting. The optional Chassis Slides include hardware for mounting the AED cabinet in a RETMA Standard Rack with front-to-back mounting bars on 24 inch (61 cm) centers. Non-RETMA Standard Racks may require special Chassis Slides or extenders, which should be described in the order.

Door Panel

The Control Panel switches and indicators in the AED 3100P may be recessed behind this Door Panel.

Interface

Direct Memory Access, Programmed Input/Output, Buffered, Burst Interlace Controller, and Multiplex/Selector Channel Interfaces for various computers, microprocessors, intelligent terminals, and programmable calculators are available for the AED 3100P and 3100LP.

Interface Kit

The user may wish to design the interface. An AED 3100P Interface Kit is available which includes power cables, a 6 ft. (183 cm) formatter cable, connectors, and a printed circuit board 8¼ in. x 12¼ in. (21 cm x 31 cm) which fits into the AED 3100P cabinet. The user can add IC sockets and pins, then wirewrap the interconnections.

Special Interface Cables

Interfaces which plug into the host computer are provided with a 6 ft. (183 cm) Formatter Bus Cable. Longer formatter cables are available at extra cost. For those interfaces which mount inside the AED 3100P or 3100LP cabinet, special computer cables, such as the UNIBUS®, are available at extra cost.

Extender Cables

An Extender Cable is available for servicing the drive outside the AED cabinet. Signal and DC power lines and connectors are included in this cable.

SOFTWARE

Each AED 3100P or 3100LP, with an AED Interface, includes a Floppy Disk with Diagnostics and documentation. Software Drivers compatible with computer manufacturers' Operating Systems and AEDOS (Advanced Electronic's Disk Operating System) are available at extra cost for a variety of computers.

WARRANTY & SERVICE

The AED 3100 Series and Options are guaranteed to be free from defects in workmanship, materials or design for a period of 90 days from date of invoice. During this warranty period the buyer ships the malfunctioning part or system to Advanced Electronics Design, Inc. freight collect. We repair it and return it to the buyer freight collect. AED-paid freight costs apply, however, only to the 48 contiguous states and Canada; outside this area round-trip freight costs are paid by the buyer. See AED's "Conditions of Sale."

ADVANCED ELECTRONICS DESIGN, INC.
COMPUTER PERIPHERALS DIVISION

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