WINC05

5¼" Winchester and floppy disk storage system.
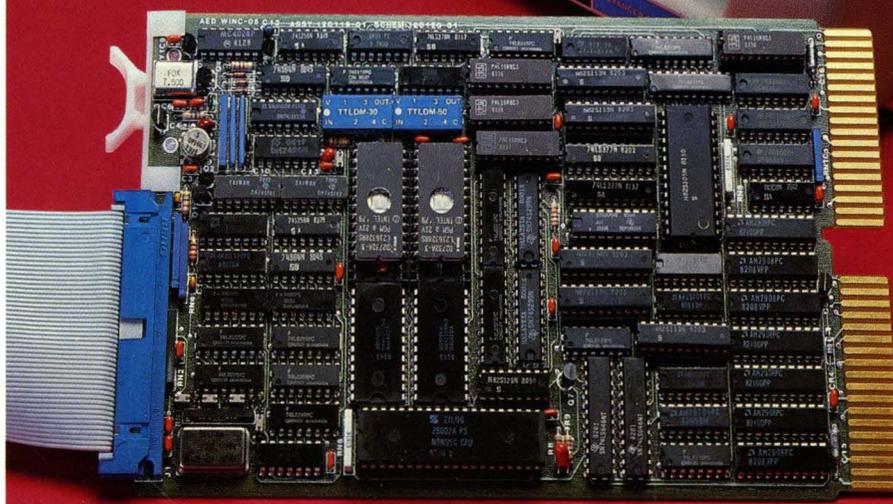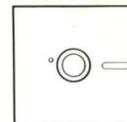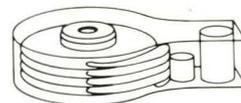
Winchester and floppy cor

WINC05 is the latest and most advanced member of the AED disk storage systems family, and the logical outgrowth of AED's 11 years' experience manufacturing disk controller products. It offers complete RL01/02 and RX02 emulation with one dual-wide card, enabling you to combine a 5¼" Winchester drive and a 5¼" or 8" floppy drive for the exact disk system package you require.

WINC05 comes as a complete disk subsystem, with drives, built-in power supply, controller, and connecting cables. It is housed in an attractive cabinet which can be used on a desktop or mounted in a standard 19-inch rack. The controller card may also be purchased separately by customers who wish to add their own drives.

The Q-Bus® compatible WINC05 controller card plugs directly into the card cage of your LSI-11, providing immediate accommodation of a 5.2, 10.4, 15.6, or 31.2 Megabyte Winchester (formatted), and a .5 or 1.0 Megabyte floppy (formatted). A UNIBUS® compatible, quad-wide version is available for PDP-11 users as well.

The controller is completely compatible with DEC operating systems and diagnostics, and permits accommodation of higher-capacity Winchesters, removable Winchesters, and tape backup (complete details available from AED).

ADVANCED TECHNOLOGY

WINC05 incorporates a high-speed 16-bit MOS microprocessor (Z8000) and fused programmable logic arrays on a single, six-layer card. This card contains the equivalent of 90 integrated circuits.

The WINC05 design permits upgrading to higher data transfer rates. It also provides flexibility to use drives made by different manufacturers and to accommodate future changes in the 5¼" disk storage marketplace. Plus, WINC05 is capable of formatting 5.2 Megabytes (true RL01) instead of the standard 5 Megabytes on a 6.38 Megabyte unformatted drive.

SINGLE-BOARD EMBEDDED CONTROLLER

The WINC05 card plugs directly into the DEC CPU card cage. The CPU "sees" the controller as two logical, fully-transparent controllers — Winchester and floppy. In actuality, however, it is a single dual-width, Q-Bus® compatible card. AED is one of the few manufacturers also offering a quad-wide UNIBUS® compatible card for PDP-11 based systems.
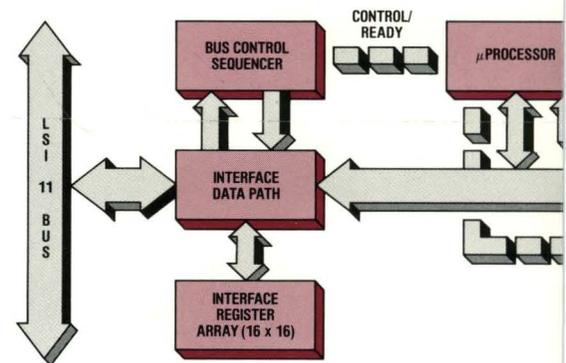
HIGH SYSTEM DATA THROUGHPUT

The WINC05 controller is designed to optimize system data throughput. Most manufacturers use burst transfer rate — or data throughput on single disk sectors under optimum conditions — as a measure of system speed. But WINC05 is rated, instead, according to average performance levels typically seen by users.

For example, WINC05's burst transfer rate is 625 Kilobytes per second, but its data transfer rate over the entire disk is 259 Kilobytes per second — a much more reliable index of overall performance.

DEC-OPERATING SYSTEM COMPATIBILITY

WINC05 is fully compatible with all DEC operating systems, including RT-11, RSX-11M, RSTS/E, and RSX-11M-PLUS. It is also compatible with DEC diagnostic programs. RSX-11M compatibility ensures access to WINC05 by multiple terminals in multi-user systems.

INTEGRAL DIAGNOSTICS AND FORMAT ROUTINE

To ensure the fast and accurate isolation of system malfunctions, a diagnostic program is included with each WINC05 system shipped. An integral program command sequence makes drive formatting simple.

SUPPORT OF DEC'S 22-BIT ADDRESSING

WINC05's support of DEC's 22-bit addressing enables users to upgrade their main memory capabilities at a later time. In addition, WINC05's support of 4-level interrupt priority provides greatest system configuration flexibility.

DOUBLE-SIDED, DOUBLE-DENSITY CAPABILITY

The WINC05 accommodates single and double sided 8'' RX02 double density format diskettes. Also, it is compatible with DEC's recently announced 5¼'' double density format (RX50).

MANUFACTURED FOR HIGH RELIABILITY

WINC05 undergoes a comprehensive product acceptance program, which includes extensive static and dynamic components testing, bare and loaded board testing, 72 hour burn-in of incoming drives, and final system burn-in for a total of 72 hours (24 hours at elevated temperature).

These stringent testing procedures serve to identify and eliminate potential defects in WINC05 before shipping. As a result, the customer can expect a MTBF (mean time between failure) well in excess of 10,000 hours.

WINC05 is built to MIL-Q-9858A, MIL-I-45208A, and MIL-STD-45662A, making the system suitable for use in environments far more severe than those encountered in the vast majority of applications. In addition, the system complies with recently established FCC requirements.

DC DRIVE MOTORS

WINC05 systems use DC drive motors only. Since these motors aren't frequency or voltage sensitive, WINC05 can operate universally without hardware modifications.

ON-BOARD BOOTSTRAP

WINC05 features an on-board 512 Byte bootstrap ROM which allows booting from either the Winchester or floppy drives in the system. It also permits booting from any other standard disk device (e.g., RK05, RK07, RM02, or RP06). Having the bootstrap on-board makes a separate BDV11 bootstrap card unnecessary, and saves a backplane slot. The on-board bootstrap also allows off-line formatting of both the Winchester and floppy drives.

SUPPORT OF MOST DRIVES

WINC05 uses a low-cost drive configuration PROM, allowing easy support of most vendors' Winchester drives. In fact, WINC05 will support any 5¼'' drive with an ST506/412 interface.

90-DAY WARRANTY

All AED computer peripherals are backed by a 90-day warranty against defects in workmanship and design. Within the 48 contiguous States and Canada, the customer sends the malfunctioning unit back to AED, freight collect. AED will repair the unit at no cost and return it freight collect. Outside this area, the customer pays the round-trip freight costs.
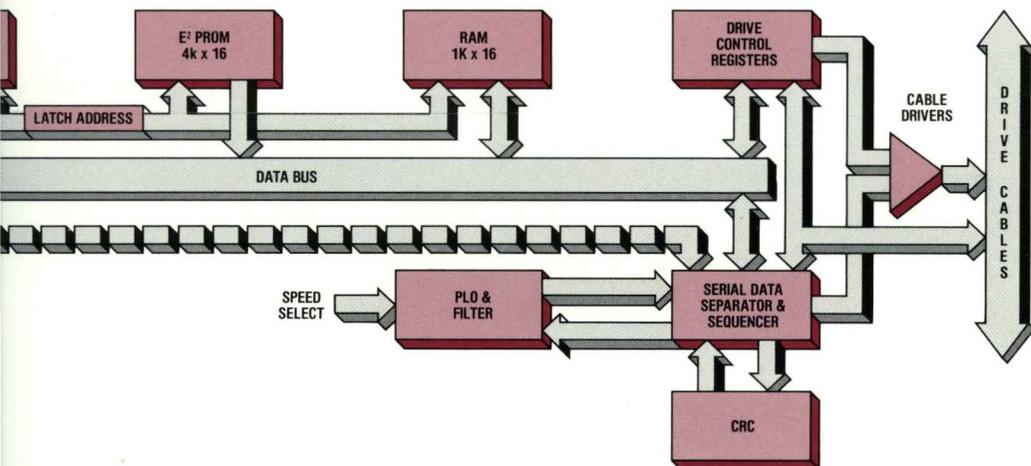
WINC05 Specifications

Drive Characteristics

Emulation	RL01	RL02	(8" floppy) RX02
Capacity per drive (formatted)	5.2 Mb	10.4 Mb	1.0 Mb
Drives per controller	2	2	2
Average access time	93 ms	93 ms	——
Minimum seek time	18 ms	18 ms	18 ms
Average seek time	85 ms	85 ms	91 ms
Maximum seek time	205 ms	205 ms	243 ms
Average rotational latency	8.3 ms	8.3 ms	87 ms
Interleave factor	2:1	2:1	2:1
Burst transfer rate	625 Kb/sec	625 Kb/sec	62.5 Kb/sec
Net transfer rate (over entire disk, includes seeks)	259 Kb/sec	259 Kb/sec	18.3 Kb/sec

Error Rates

Hard (bits read)	1 per 10^{12}	1 per 10^{12}
Soft (bits read)	1 per 10^{10}	1 per 10^{9}
Seek (seeks)	1 per 10^{6}	1 per 10^{6}
Error Control	16-bit CRC	16-bit CRC

Logical Data Organization

Heads	2	2	2
Cylinders	256	512	77
Sectors	40	40	26
Bytes per sector	256	256	256

Physical Data Organization

Heads	4	4	2
Cylinders	153	306	77
Sectors	34	34	26
Bytes/Sector	256	256	256

Physical Dimensions

Width: 17.6 inches
Height: 5.2 inches
Depth: 16 inches

Power Requirements

AC Power
100/115 Volts AC— ± 10%, 50/60 Hz— ± 0.5 Hz,
     2.6 amps operating (max)
     4.1 amps starting (max)
215/230 Volts AC— ± 10%, 50/60 Hz— ± 0.5 Hz,
     1.3 amps operating (max)
     2.0 amps starting (max)
     300 watt maximum
Controller power
 + 5V— ± 5%, 3.2 amps typical
          4.5 amps (max)
+ 12 V— ± 10%, 0.2 amps (max)
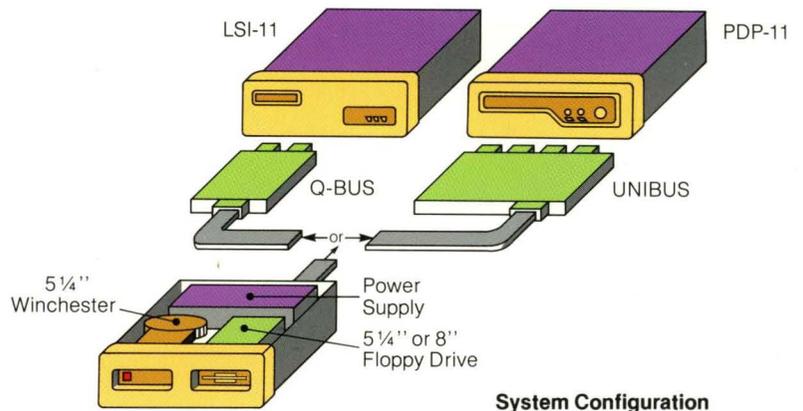
System Configuration

ADVANCED ELECTRONICS DESIGN, INC.