Honeywell

SERIES 60 (LEVEL 6)

CDU9101/9102/9103/9104 Cartridge Disk Units

The Cartridge Disk Units provide low-cost data storage for 6/30 Model users with medium-sized file requirements. Storage capacities of 2.5 to 10MB (for the 256-byte sector format) or 2.8 to 11.2MB (for the 576-byte sector format) are available for a single device, with one controller able to connect up to four devices.

The rack-mountable units pull out from the front to provide easy access for top-loading the removable cartridge. A removable disk and a fixed disk can be mounted on the same spindle, providing a file copying capability with a single device. File protect switches control each disk separately.

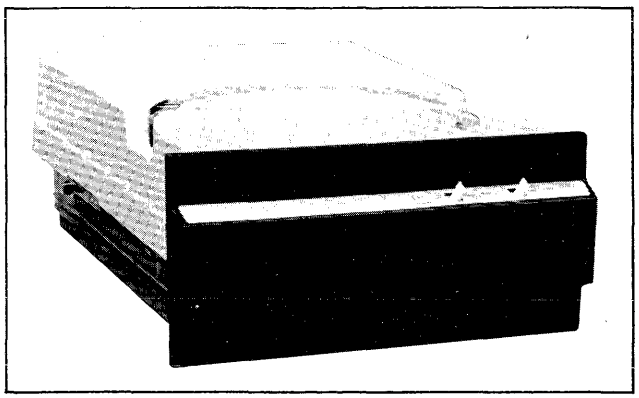
The Cartridge Disk Units are available in models with either a removable cartridge only, or with both a removable disk and a fixed disk. Low-density units have data recorded at 100 tracks per inch (tpi); high-density units are recorded at 200 tpi. The units have data capacities as follows:

- CDU9101 Cartridge Disk Drive, low density, removable disk only – 2.5/2.8 million bytes
- CDU9102 Cartridge Disk Drive, low density, fixed and removable disks – 5.0/5.6 million bytes
- CDU9103 Cartridge Disk Drive, high density, removable disk only – 5.0/5.6 million bytes
- CDU9104 Cartridge Disk Drive, high density, fixed and removable disks – 10.0/11.2 million bytes

The Cartridge Disk Units interface with the Level 6 processor by means of a Mass Storage Controller (MSC9101) and a Cartridge Disk Device-Pac (CDM9101). The MSC9101 can connect and control up to four CDU9101/9102 low-density units or up to four CDU9103/9104 high-density units.

FEATURES

- Combines transportability of magnetic tape with random access features of disk
- Ideal for applications requiring fast access to a medium-sized data base; average random access to 10 million bytes is less than 50 milliseconds



- Maximum total data storage capacity of 20/22.4 million words (40/44.8 million bytes); Direct Memory Access transfers data at 156K words per second
- 200 tpi recording allows 408 cylinders per spindle, each with a capacity of 12K or 24K bytes accessible with no head movement
- Up to four disk units per control; choice of all high-density or all low-density disk drives
- Each track can have a maximum of 12 or 24 individually addressable records; software interlace of record addresses minimizes rotational latency time; all records include check words for data integrity
- Single removable cartridge disk or removable and fixed cartridge disk units; disk-to-disk copying capability on the same unit.

OPERATION

Depending upon the format selected, each track consists of 12/24 fixed-length sectors that are clocked by fixed slots inscribed into the circumference of a disk. Records start at the beginning of a sector, with a maximum of 12/24 records of up to 576/256 bytes each per track. Larger records can be written linking two or more sectors. The

maximum record length is 6912 (12 x 576)/6144 (24 x 256) bytes, linking all 12/24 sectors on one track. See Figure 1.

To seek a particular cylinder and disk, a word containing the platter and cylinder must be output to the controller. A second setup word is also output that contains the track and header (sector number) of the record to be written or read.

Each record consists of two parts, a header (one 32-bit record identifier) and data (256 or 576 byte sectors). Each part is followed by a check word that is automatically validated on read operations.

There are four modes of reading or writing:

- Write format
- Write record
- Read record
- Read track (headers or headers and data)

All reads and writes are under control of Direct Memory Access (DMA), with the address and range registers in the controller describing the area in memory that is being written from or read into.

The first operation that must be performed is a write format operation which writes 12 or 24 headers, one per sector, on a track, and zero-fills the data fields. A write record then writes a single record which may consist of multiple sectors after matching on the proper header. Writing is terminated either by DMA end-of-range or by an unsuccessful search. A read operation again matches on a header and reads data until an end-of-range is reached. A read-track operation reads the header words and data starting with Sector 0 in succession until an end-of-track or end-of-range is reached.

SOFTWARE

The Cartridge Disk Units are supported by Level 6 GCOS/BES I/O drivers and executive routines for the 24 fixed-length sector format only. A test maintenance program assists in fault isolation and maintenance of the equipment.

MEDIA

A Honeywell Type M4024 cartridge disk (or equivalent) is used for either the low- or high-density unit and is not supplied. For ordering information regarding supplies and accessories, refer to the *Honeywell Computer Supplies Catalog,* Order No. BY62, or contact your Honeywell Marketing Representative.

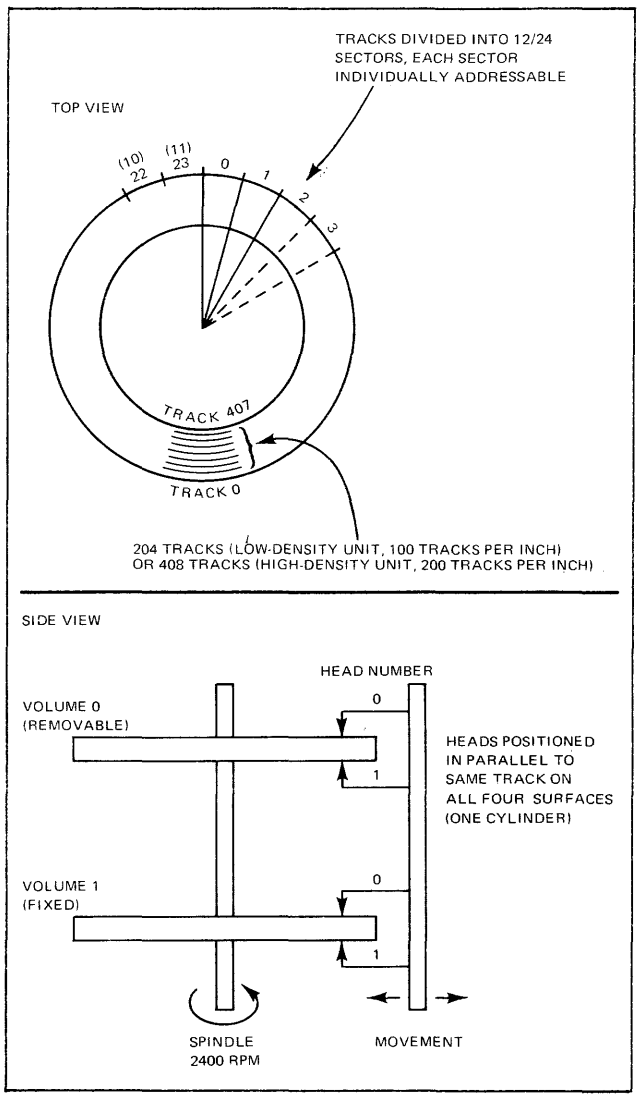


Figure 1. Physical Organization of Cartridge Disk

SPECIFICATIONS

Capacity	CDU9101	CDU9102	CDU9103	CDU9104
Bytes/Sector	256/576	256/576	256/576	256/576
Sectors/Track	24/12	24/12	24/12	24/12
Bytes/Track	6144/6912	6144/6912	6144/6912	6144/6912
Tracks/Cylinder	2	4	2	4
Bytes/Cylinder	12,288/13,824	24,576/27,648	12,288/13,824	24,576/27,648
Cylinders/Unit	204	204	408	408
Bytes/Unit	2.5/2.8MB	5.0/5.6MB	5.0/5.6MB	10.0/11.2MB
Units/Controller	4	4	4	4
Bytes/Controller	10.0/11.2MB	20.0/22.5MB	20.0/22.5MB	40.1/45.1MB

SIMULTANEITY: During data transfer on one unit, simultaneous seek operations can be performed on all other units attached to the same controller.
AVERAGE LATENCY (ROTATIONAL): 12.5 ms
SEEK TIMES: Same Cylinder[1] – 0; Track to Track – 9 ms; Average Random – 35 ms; Maximum (408 tracks) – 65 ms;
Transfer Rate – 2.5 million bits/second; 312K bytes/second
CONTROLLER: MSC9101 controls up to four disk units of the same density.

DEVICE INTERFACE: A single Device-Pac (CDM9101) interfaces up to four disk units.

[1]Cartridge disk (fixed and removable) cannot be crossed without initiation of a seek operation.

Specifications may change as design improvements are introduced.

Honeywell

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