CALCOMP

1015A DUAL DENSITY DISK STORAGE SYSTEM

The CalComp 1015A System is a high capacity direct access storage system which interfaces directly to the selector channel of System 360/30 (and higher) and System 370 computers. The 1015A is a direct replacement for the IBM 2314/B and features storage at a far lower cost per bit and with less floor space.

The 1015A Controller provides control and on-line diagnostics for one to nine physical spindles, **representing 16 logical elements on-line (466 million bytes on-line)** plus one spare spindle. Address plugs for the nine spindles are mounted on the 1015A cabinet. This controller has the same physical dimensions as the CD14A controller. The Two Channel Switch option is available.

The 1015A Controller also accommodates CalComp CD12 or CD22 single density disk drives. Up to eight physical spindles of any mix of single and dual density may be attached to the 1015A. With a mixed system, however, there may be some restrictions or limitations to device address assignments since the single-density spindles are limited to device addresses 0 through 7. Device address assignments are alterable in the field.

CalComp's Model 215 Disk Drive features two physical spindles, each in its own drawer, and provides 116.7 million bytes of storage. Each physical spindle contains two logical elements, responding to different logical device addresses. The spindle features double track density (406 cylinders recorded in the same width as 203 tracks on 2314-type systems) on a standard IBM 2316 (or equivalent) disk pack, arranged so that the cylinders for the two logical elements are interleaved. Each logical element is equivalent in capacity and format to one 2314/B spindle. There is one set of read/write heads per physical spindle. Model 215 and 213 disk drives are able to read disk packs recorded in single-density by CalComp CD14/22, CD14/12 or IBM 2314 systems.

The Model 213 is a one physical spindle version of the 215 and features two logical elements.
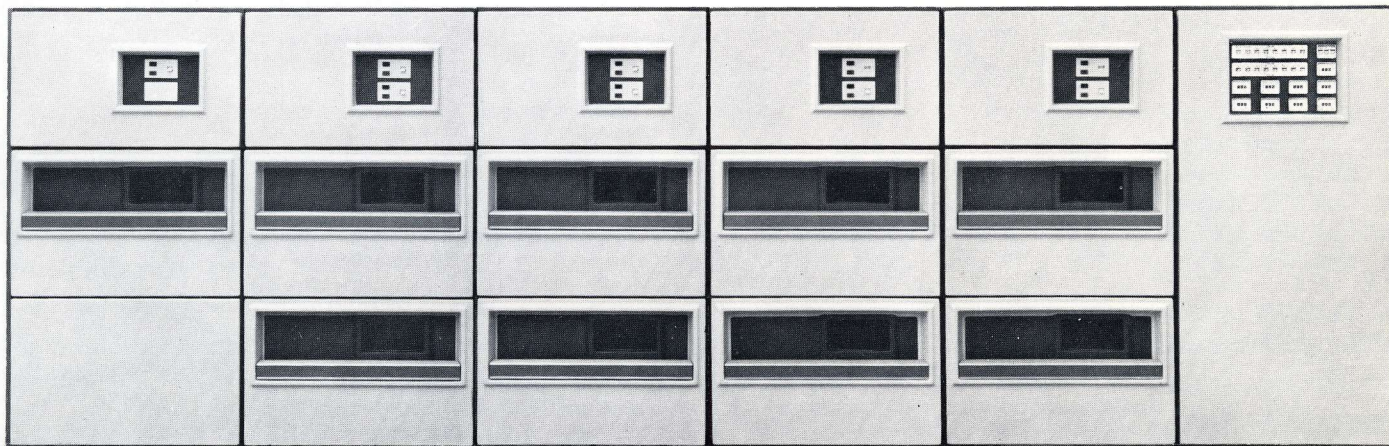
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SOFTWARE AND DATA ORGANIZATION

The 1015A System is transparent to Systems 360 and 370 software and is 2314B software compatible, with the exception of software which is IBM 2314B time dependent.

Since there is one set of read/write heads servicing two logical elements, the organization of customer data sets is the primary consideration affecting access timings. Proper allocation of these data sets should yield performance comparable to that of a CD22/14 system. The following rules will improve performance:

— High activity data sets should be placed on different physical spindles to avoid read/write head contention;

— If two relatively high activity data sets must be placed on the same physical spindle, they should be interleaved with each other on the two logical elements (occupy the same relative cylinder addresses);

— The Volume Table of Contents (VTOC) for the two logical elements should be handled in the same manner as a high activity data set;

— Data sets should be arranged to prevent conflicts in mounting and dismounting packs.

1015A DUAL DENSITY DISK STORAGE SYSTEM SPECIFICATIONS

The 1015A Disk Storage System consists of a CalComp 1015A Controller and a combination of CalComp 215 and 213 Disk Drives.

1. CalComp 1015A Controller — provides control functions for 213 and 215 disk drives and the interface to System/360 and 370 selector channels.

2. CalComp 215 Disk Drive — Two (2) 406 cylinder spindles housed in one cabinet providing a capacity of 116 million bytes on-line (58 million per spindle).

3. CalComp 213 Disk Drive — One (1) 406 cylinder spindle housed in a cabinet the same size as the CalComp 215. Provides on-line capacity of 58 million bytes.

CONFIGURATIONS

Hardware Type and Quantity	On-line Storage Capacity (million bytes)
1015A plus one 213	58.3
1015A plus one 215	116.7
1015A plus one 215 and one 213	175.0
1015A plus two 215's	233.4
1015A plus two 215's and one 213	291.7
1015A plus three 215's	350.0
1015A plus three 215's and one 213	408.3
1015A plus four 215's	466.8
1015A plus four 215's and one 213	466.8 plus one spare spindle

In addition, single density spindles may be inter-mixed in the system.

SPECIFICATIONS:

Transfer Rate
312,000 bytes per second

Access Time (Single Logical Element)
Track-to-track — 12 milliseconds
Maximum — 55 milliseconds
Average — 35 milliseconds

Rotational Speed
2400 RPM (25 milliseconds per revolution)

Start/Stop Times
Start-Up Time — 90 sec. (to allow for disk pack temperature stabilization)
Stop Time — 12 sec.

COMPATIBILITY:

IBM 2314-1, or 2314A Series, or 2314B/2319B Direct Access Storage Facility
IBM 2316 Disk Pack (or equivalent)
CalComp CD14/12 and CD14/22 Disk Systems
IBM 360/30 (and above) and 370 Systems (Selector Channel)

POWER REQUIREMENTS:

208V or 230 V AC ($\pm$10%), 3 Phase; 60 $\pm$ 0.5 Hz (50 $\pm$ 0.5 Hz available)
1015A Run Current: 2.5 Amps rms
215 Start Current (per physical spindle): 20 Amps rms, 7 sec; 215 Run Current (per physical Spindle): 4.3 Amps rms
213 Start Current (per physical Spindle): 20 Amps rms, 7 sec; 213 Run Current (per physical Spindle): 4.3 Amps rms

OPERATING ENVIRONMENT:

Temperature: 60° to 90°F. Maximum rate of change 15° per hour.
Relative Humidity: 10 to 80 percent. Rate of change shall not cause condensation.

HEAT DISSIPATION:

Model 1015A: 1230 BTU/hour
Model 215:   5000 BTU/hour (two drives)
Model 213:   2500 BTU/hour (one drive)

DIMENSIONS:

Model 1015A   — 30-in. wide; 34-in. deep; 60-in. high. Floor space required — 7.0 sq. ft. (with side panels)

Models 215 - 213 — 32-in. wide; 33-in. deep; 60.5-in. high. Floor space required — 7.4 sq. ft. (with side panels)

Total floor spare for controller and sixteen logical element system: 32.8 sq. ft. (cabinets bolted together without side panels between)

SHIPPING WEIGHT:

Model 1015A — 725 lb crated for shipment; 650 lb operating.
Model 215   — 925 lb crated for shipment; 850 lb operating.
Model 213   — 635 lb crated for shipment; 510 lb operating.

DATA FORMAT:

Variable; controlled by 1015A internal microprogram with record length specified by computer.

COLORS:

Standard IBM Blue, Red, Gray or Yellow.