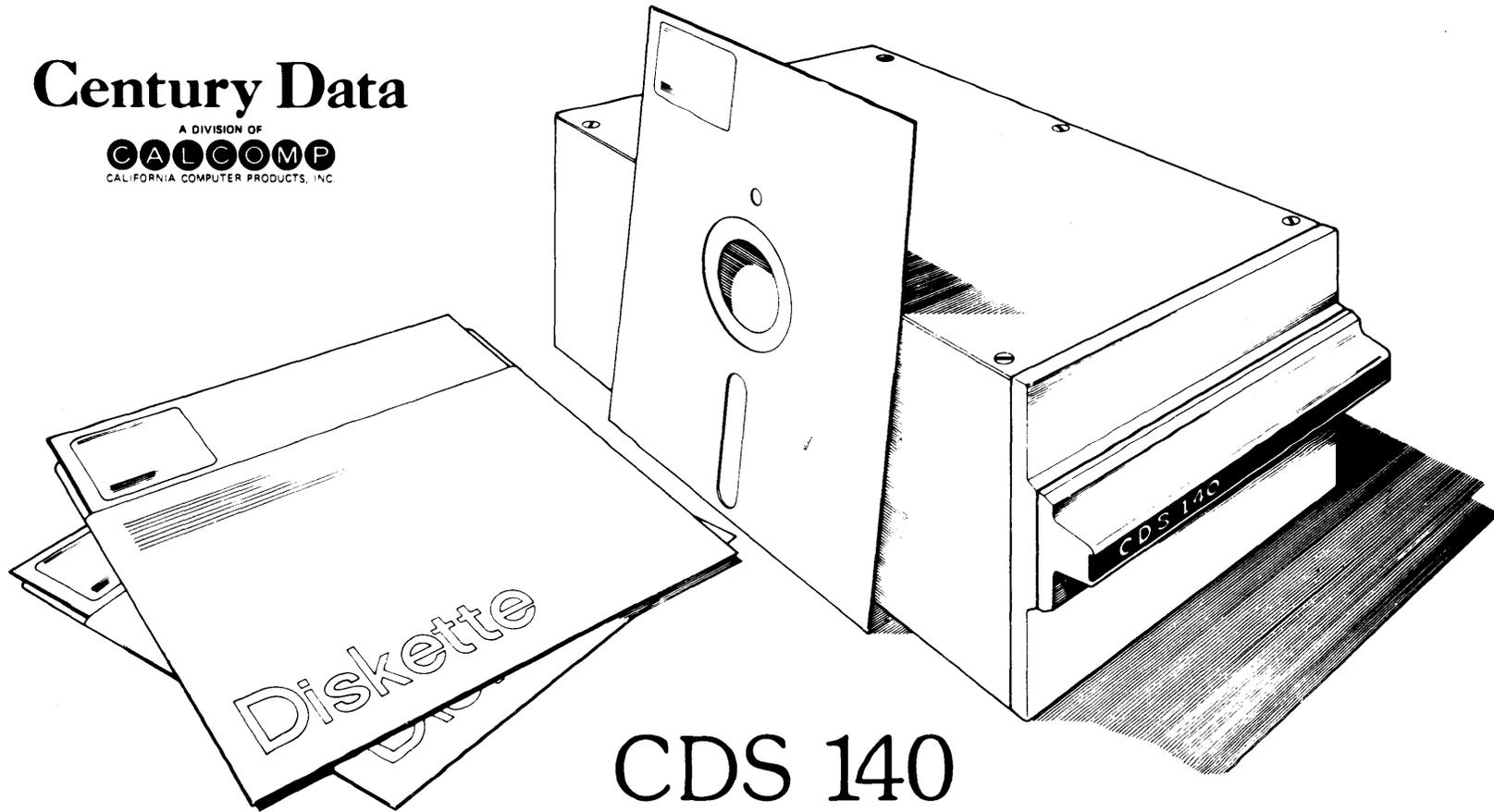


Century Data

A DIVISION OF
CALCOMP
CALIFORNIA COMPUTER PRODUCTS, INC.



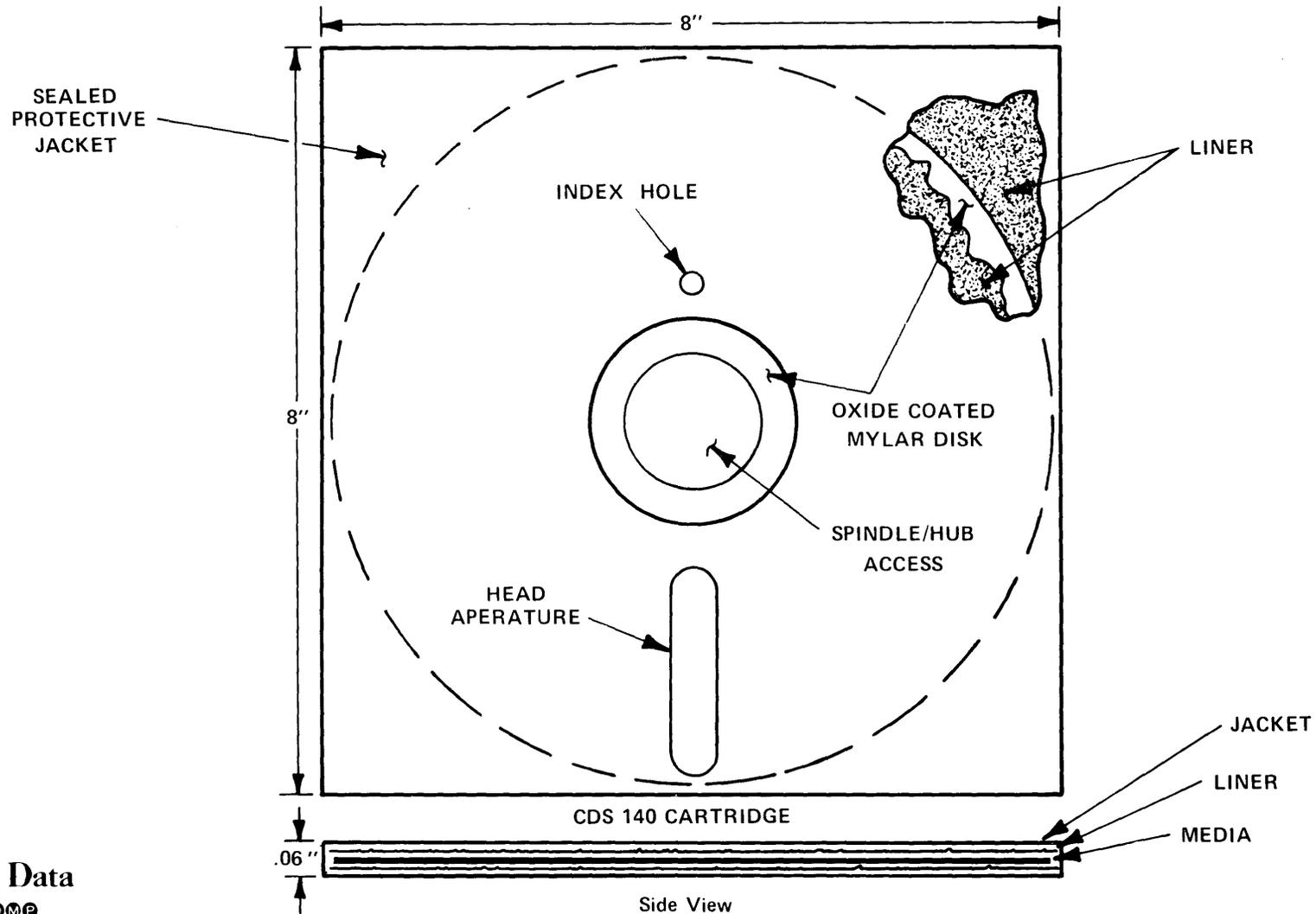
CDS 140

The Century Data Systems

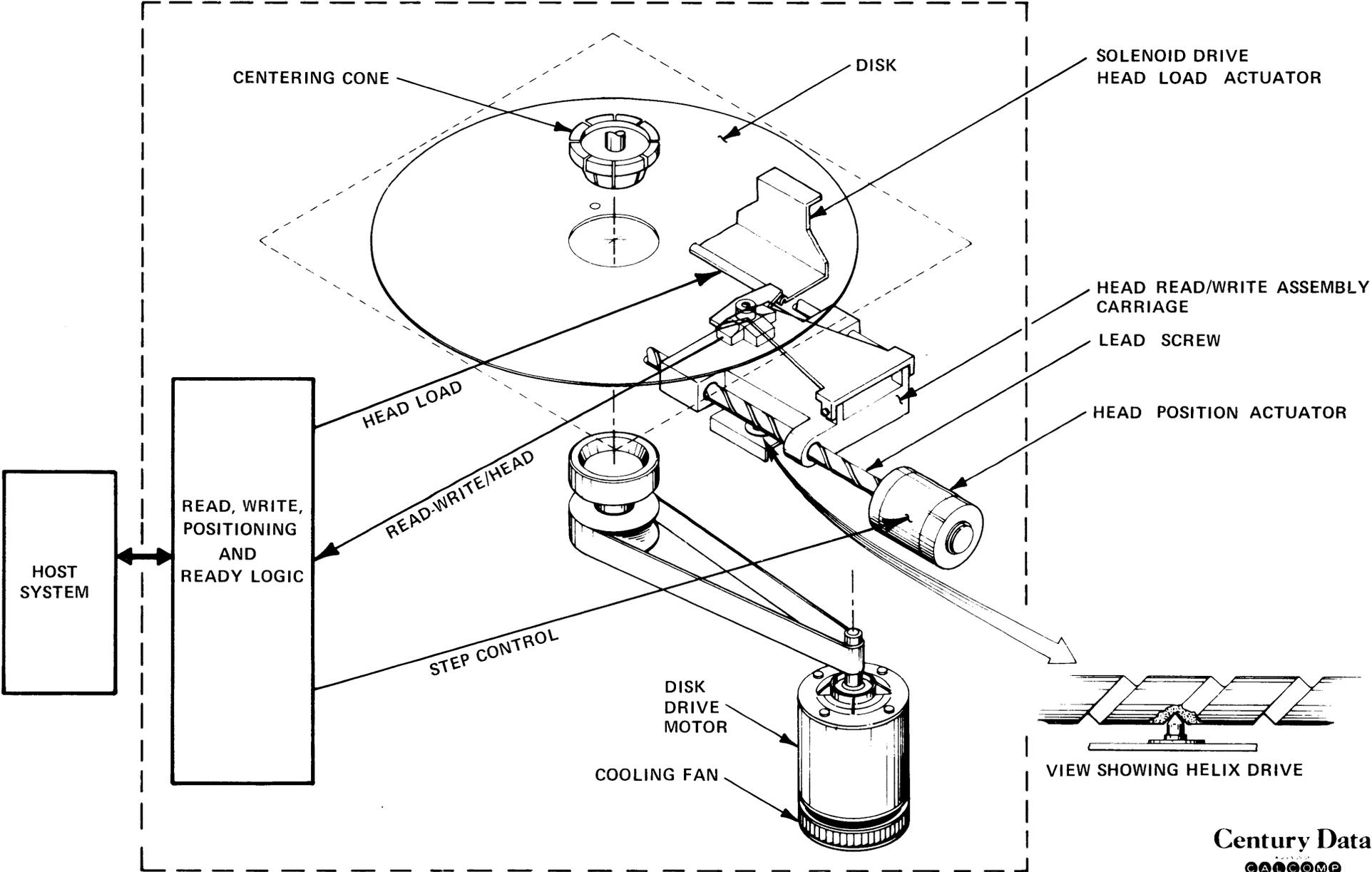
FLOPPY DISK PROGRAM

THE FLOPPY DISK

A low cost, replaceable media for mass memory & I/O applications



THE CDS 140



TYPICAL APPLICATION

Product

- Data Entry
- Buffered Terminals
- Intelligent Terminals
- Small Business Systems
- Point of Sale
- Mini CPU I/O and Memory Expansion
- Initial Program Load
- Word Processing
- Automated Test Equipment
- Look up Tables
- Process Control
- Numerical Control
- Factory Data Collection
- Graphic Terminals
- Programmable Calculators

Traditional Media

- Punched Card, 1/2 tape, Cassette, Shared Rigid Disc
- Paper Tape
- Cartridge Disk/Cassette
- Cartridge Disk, Punched Card
- Cassette, Shared Rigid Disc
- Paper Tape, Cassette, Punched Card
- Punched Card
- Magnetic Card
- Paper Tape
- Cartridge Disc
- Paper Tape
- Paper Tape
- Paper Tape, Cassette
- Paper Tape, Cassette
- Cassette, Magnetic Card

FLOPPY DISK ADVANTAGES

LOW COST

- Less than 0.02 cents / bit

RELIABILITY

- Data Integrity_____ Error Rates 1×10^9
- Hardware Reliability___ 5000 hr. MTBF

PERFORMANCE

- Random Access_____ 6MS T-T
- High Throughput_____ 250Kb
- Capacity_____ 2-3 million bits

FLOPPY DISK ADVANTAGES

STANDARDIZATION

- Industry Standards
- Interchangeability
- Media Availability

CONVENIENCE

- Easily Stored
- Easily Mailed
- 1 Disk Equals 3000 Cards,
1/2 mile of Paper Tape
- Low Cost Media \$8.00

THE CDS 140 FLOPPY DISK

A comprehensive PROGRAM tailored to meet the low cost replaceable media memory requirements of the O.E.M.

At Century the CDS 140 Program Means:

- **Product**
- **Company**
- **Support**
- **Price**

PRODUCTION SPECIFICATIONS

PRODUCT
COMPANY
SUPPORT
PRICE

CDS/IBM

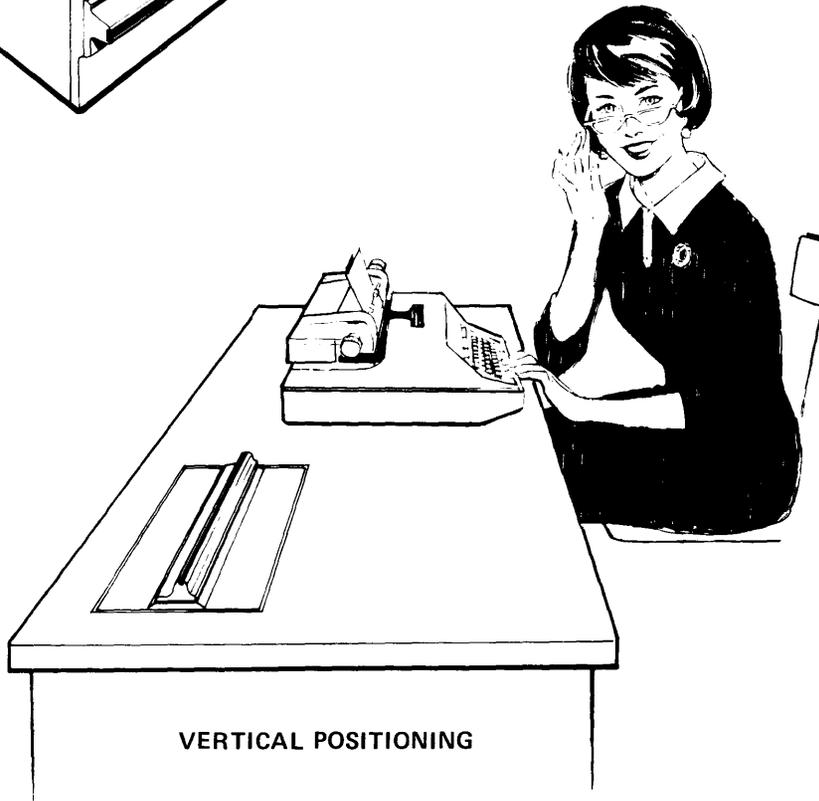
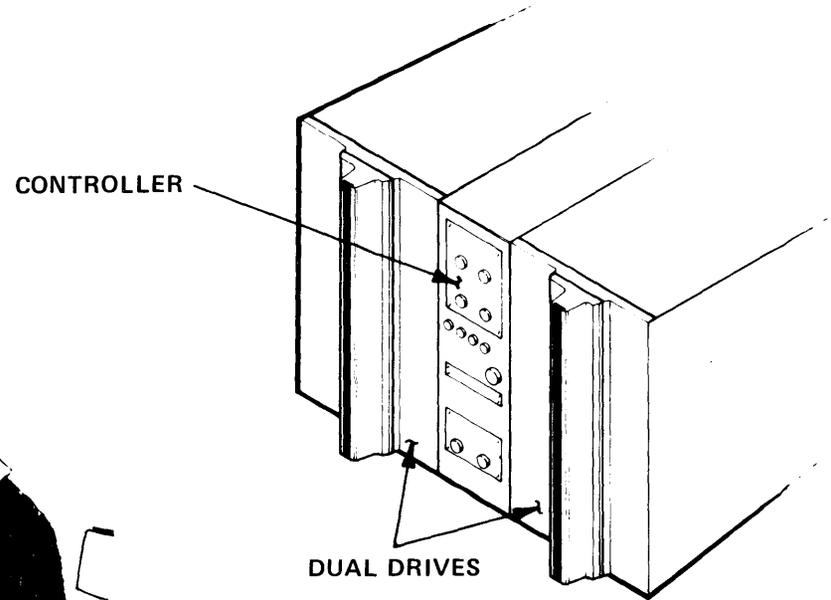
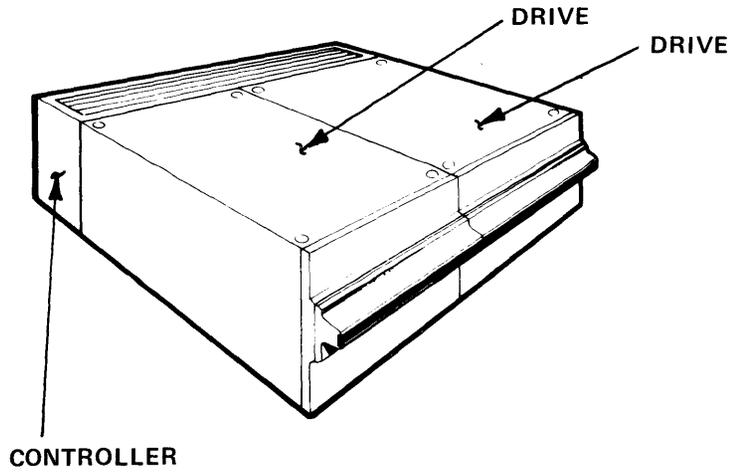
Speed	360 rpm	83 MS Avg Latency
Data Density	3200 bpi	Double Frequency Encoding
Transfer Rate	250 Kbit	
Tracks	77	48 TPI
Sectors	26	
Record Size	128 Bytes	
Capacity Formatted	2x10 ⁶ bits	3x10 ⁶ Unformatted
Head Design	Single Gap tunnel erase	

<u>CDS</u>		<u>IBM</u>
6 MS	Track to Track Access Time	50 MS
10 MS	Head Settle Time	100 MS
16 MS	Head Load Time	100 MS

SIGNIFICANT OEM ORIENTED FEATURES OF THE CDS 140

- **Designed for controller simplicity**
 - **Only two DC voltages required**
 - **Device select (standard)**
 - **Daisy chaining (standard)**
 - **Data decoding (standard)**
 - **No turn on sequencing**
 - **Self cooling**
 - **Simple changeover to all AC power sources**
 - **Positive ready indication to controller**
 - **Cartridge properly loaded**
 - **DC power OK**
 - **Disk up to speed**
- **Packaged for OEM Flexibility**
 - **Compact 4.9" x 8.4" x 15"**
 - **2 per 5" of retma space**
 - **Mountable in 3 planes**

PACKAGING CONCEPTS



OPTIONS

DATA DECODING

- **Standard** **One shot data separator**
- **Option** **VFO to handle IBM format**

WRITE PROTECT

- **Standard**
 Soft ware controlled.
- **Option**
 Operator controlled via reflective tag.

SECTORIZING

- **Standard**
 **Preformatted media, sectors generated
 from recorded data**
- **Option**
 Up to 32 holes in media

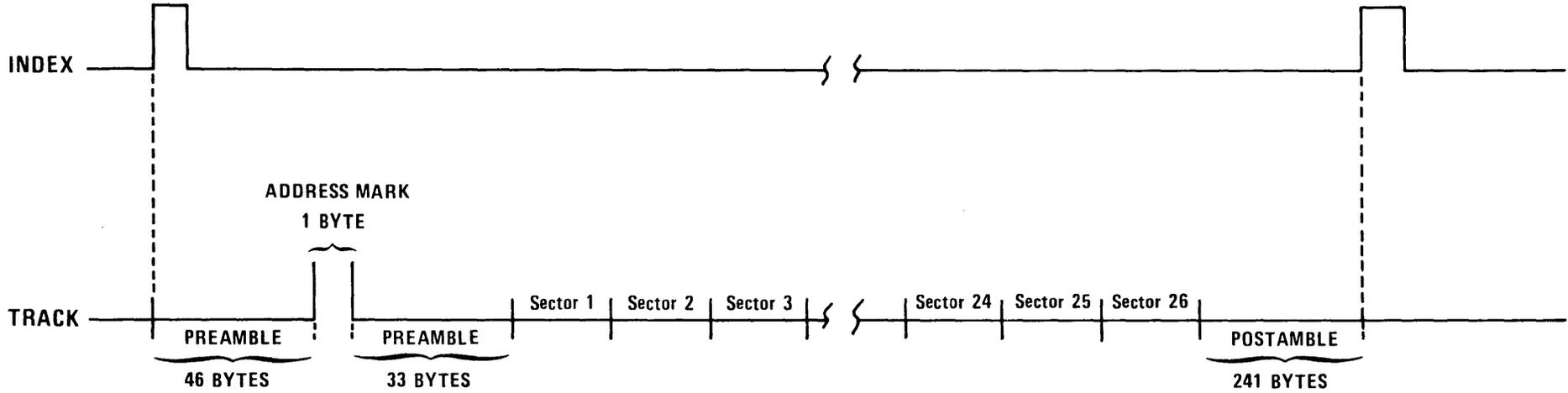
COMPATIBILITY

- **Media** **Uses IBM Diskette or equivalent**

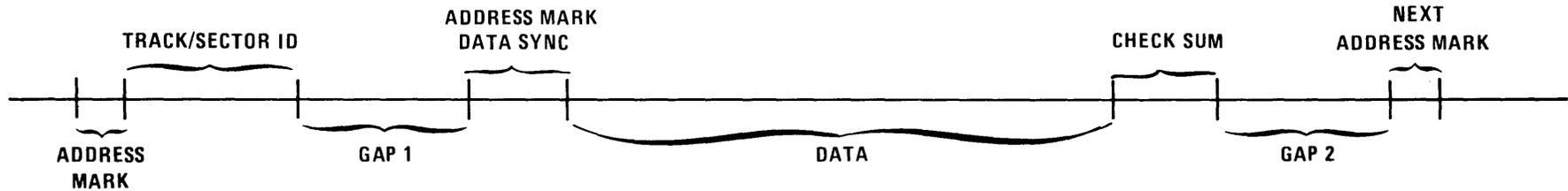
- **Format** **Data interchangeable with the 3740**
OR
Special formats for OEM applications yield:
 - **Lower controller costs**
 - **Simpler software**
 - **Higher capacities**

- **Interface** **None**

IBM TRACK FORMAT



IBM SECTOR FORMAT



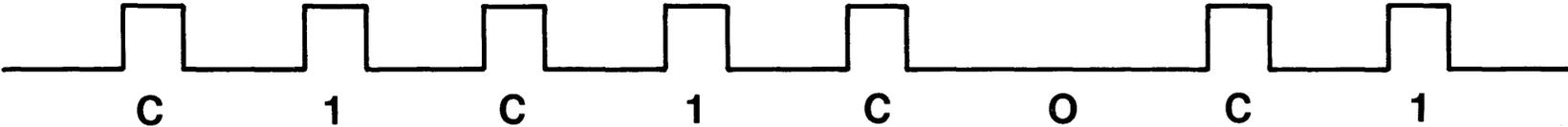
FIELD	LENGTH
ADDRESS MARK	1 BYTE
TRACK/SECTOR ID	6 BYTES
GAP 1	17 BYTES
DATA SYNC	1 BYTE
DATA	128 BYTES
CHECK SUM	2 BYTES
GAP 2	33 BYTES
TOTAL	188 BYTES

$$\text{EFFICIENCY} = \frac{\text{DATA BYTES}}{\text{TOTAL BYTES}} \times 100\%$$

$$= \frac{128}{188} \times 100\% = 68\%$$

ADDRESS MARKS

Standard Data Byte using Double Frequency Encoding



Address Marks Missing Clocks



PERFORMANCE DESIGN GOALS

Criteria Heavy duty application, 1 sector read, 1 seek per 2 seconds, 40 hrs/week

- **Component Life** 10,000 hours minimum (5 years)
- **MTBF** 5,000 hours minimum (2.5 years)
- **Error Rates** Soft error 1×10^9 bits
Hard error 1×10^{12} bits
- **MTTR** Less than 1 hour
- **Media Life** 1×10^6 passes/track
2 years in heavy duty application
- **Head Life** Over 10,000 hours in heavy duty application

COMPANY

PRODUCT
COMPANY
SUPPORT
PRICE

- **Founded 1968**
- **Today a wholly owned Division of CalComp**
- **Major products of CDS**
 - 2311,2314,3330 type disk drives and controllers**
 - 3400 series tape drives and controllers**
 - Special high technology OEM drives**
- **Facilities 400,000 sq. ft.**
- **Personnel 1500 +**
- **Sales & Service US & Major European Cities**

Major Strengths

- **Largest independent manufacturer of disk drives**
 - **State of the Art memory products**
 - **Volume automated production**
 - **OEM orientation**

SIGNIFICANT CUSTOMERS

- **BURROUGHS**
- **UNIVAC**
- **CALCOMP**
- **BASF**
- **DATA GENERAL**
- **VARIAN**
- **G.E.**
- **CMC**
- **CDC**
- **GENERAL AUTOMATION**
- **TAKACHIHO**
- **GT & E**
- **DIVA**
- **A TOTAL OF OVER 50
ACTIVE OEM PROGRAMS**

FLOPPY DISK EXPERIENCE

- 1972 CDS 123 for 230 systems (3330 equivalent)**
- 1973 CDS 110 First OEM oriented Floppy Disk**
- 1974 Production starts on CDS 140 designed, tooled and corporate commitments for a production run of 50,000 + units.**

SUPPORT

PRODUCT
COMPANY
SUPPORT
PRICE

SUPPORT GOALS

To meet the special requirements of the OEM customer with this unique product and marketplace

- Low cost
- State-of-the-art
- Key systems component
- Easily replaced in field
- New technology to most OEM's

CDS OFFERS:

- Technical support
- Training programs
- Logistic planning
- Support services

TECHNICAL SUPPORT

- **Technical liaison**
- **Development assistance**
- **Application notes**
- **Compatibility aids**

TRAINING

Class I Designed for the OEM customers:

- **QA**
- **Test**
- **Sales**
- **Production**

Class II Designed for the OEM customers:

- **Engineering**
- **Programming**
- **Field service**

LOGISTIC PLANNING

- **Provisioning**
- **Maintenance**

CUSTOMIZED FOR OEM'S INDIVIDUAL

- **Application**
- **Duty cycle**
- **Service capabilities**
- **Installed base**
- **Allowable down time**

SUPPORT SERVICES

- **Field service**
- **Warranty (90 days)**
- **Factory repair service**

PRICE

- **Tooled & equipped to remain competitive as the market expands.**
- **Q1 - \$750**
- **Q500 \approx \$525**
- **Larger quantities based on RFQ**

SALES PROGRAMS AVAILABLE

- **Multiyear contracts**
- **Cross product discounts**
- **Licensing agreements**
 - **Minimum order**
 - **Fixed payment**
 - **Transfer of full documentation with training**
 - **Kits if required**
 - **Royalties**