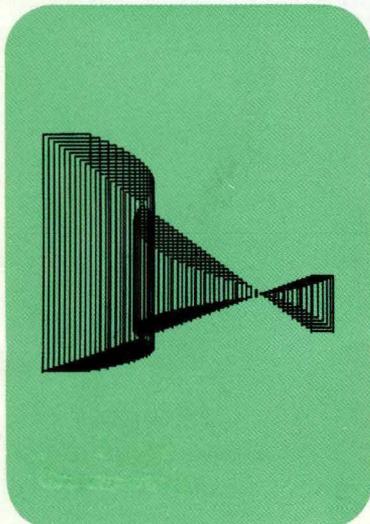
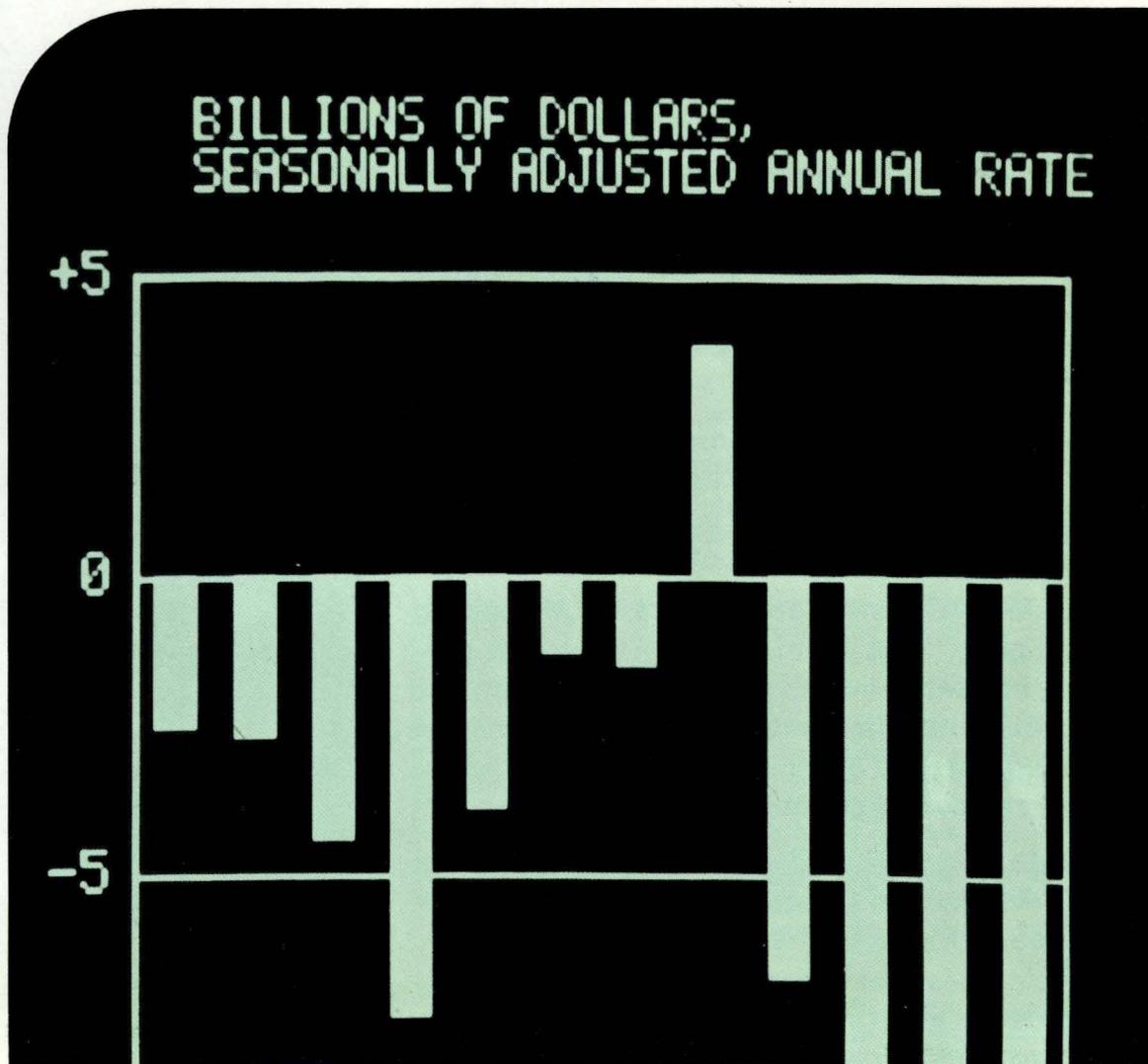
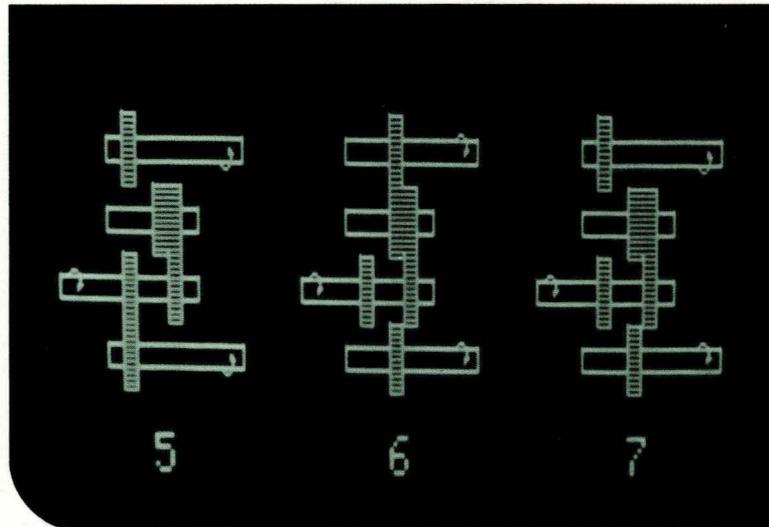
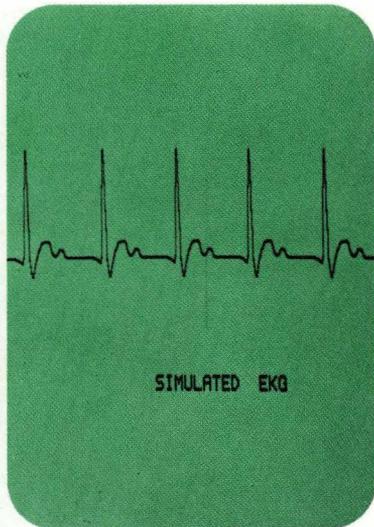


DATA DISC 6500

GRAPHIC DISPLAY SYSTEM

ME CORE DUMP

014701	002100	004701	012101
014700	000540	012100	014700
001022	002540	012110	014170
012210	014270	004414	012250
004426	012350	014370	004510
014470	004652	012510	014570
012610	014030	004140	012670
002070	004110	016200	002070
016300	002040	004140	016340
004110	016440	002070	004110
002070	004110	016600	002070
001230	002750	012130	000102
000117	000116	000123	000040
000117	000114	000114	000101
012130	000123	000105	000101
000114	000114	000131	000040
000123	000124	000105	000104
000125	000101	000114	000040
012040	002670	000053	000065
012040	002370	000055	000065
000060	012024	002070	000055
000125	000056	000123	000056
000116	000103	000105	012130
000120	000101	000131	000115
012130	002220	000114	000111
000111	000124	000131	000040
000123	012130	002200	000050
000101	000122	000040	000114
000114	000111	000124	000111
000124	000117	000040	000101
000117	000122	000105	000111
000123	000051	012150	002040



The Data Disc 6500 Graphic Display System was conceived to offer system designers a highly versatile and flexible video display of computer-generated graphics and alphanumerics at very low cost per display. Even with this low cost, due in part to the use of ordinary television monitors as terminals, the graphic capabilities provided by the system are far beyond those of any other low-cost display system available today.

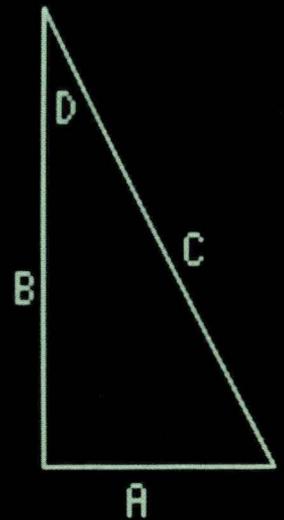
Up to 16 high-resolution or 32 standard-resolution terminals can be fed simultaneously. Each channel can be loaded to capacity without reducing the capacity of other channels.

The television monitors produce a display of greater viewing brightness than other terminals, and also offer the designer complete freedom to choose the number and size of displays he needs.

The Data Disc system combines a large-capacity Micro-Space™ disc memory with a controller containing computer interface, video-generation and video-distribution electronics to produce both alphanumeric and graphic displays of any picture describable in 250,000 points.

The Data Disc 6500 is a flexible, low-cost, "off-the-shelf" display system, offering the advantages of expandability, simplified command structure, ease of programming, and extremely versatile graphics . . . all at no more cost than other systems providing alphanumerics only.

IN THE FIGURE
AT THE RIGHT,
THE SINE OF
ANGLE D IS
DEFINED AS:



1) A/B

2) C/A

DMT 15 42 18

ORT

MKF

116 3

118 2

MO

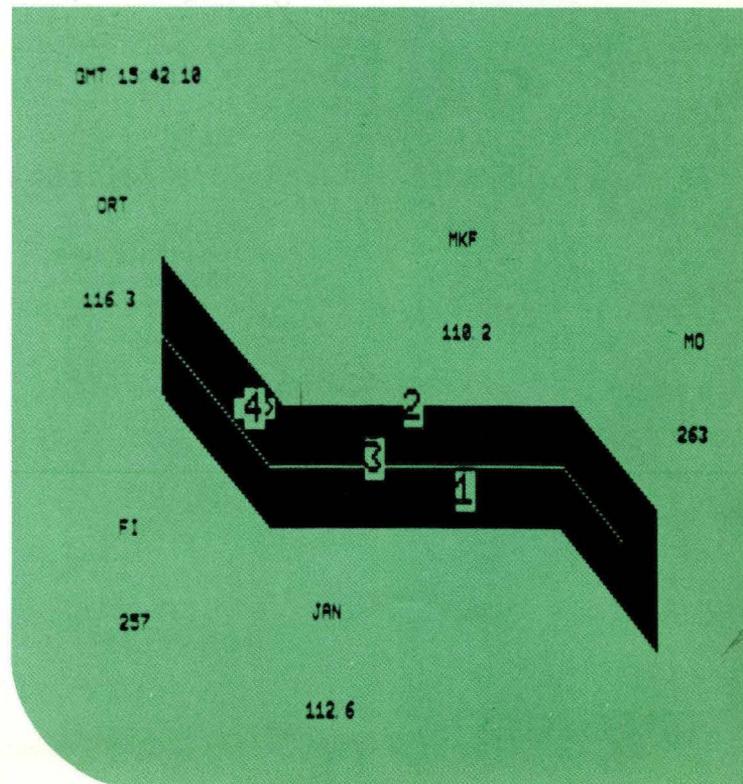
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F1

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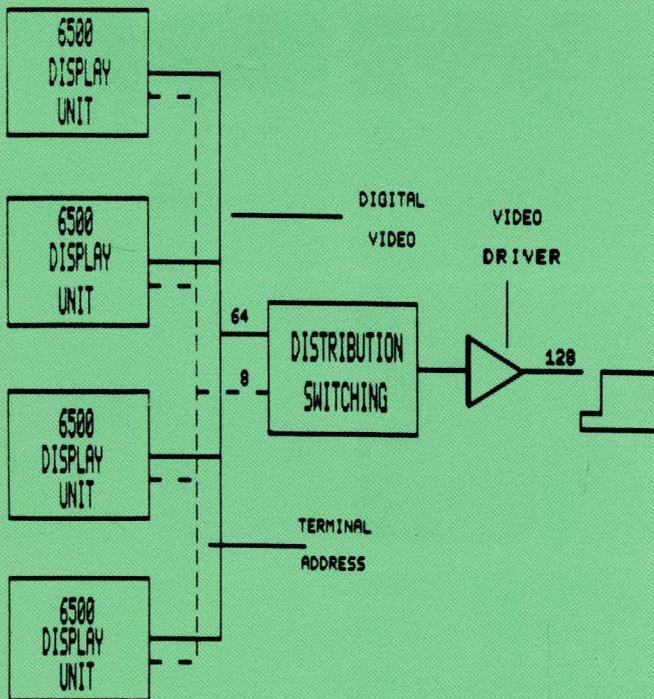
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112 6



graphics at the cost of alphanumeric only...

TIME SHARING REFRESH CHANNELS WITH DISTRIBUTION SWITCHING



FEATURES

Complete Versatility The system makes possible a different display on each screen. Up to 32 different pictures are generated by the system at one time with the full number of data points available for each display, regardless of the number of data points used by other displays in the system.

Unlimited Graphic Capability With the 6500 System you can plot curves, circles, rectangles, squares, or any picture definable in the 262,144 points available.

Writing at One Page per Second Characters can be written at rates up to 5,100 characters (more than a full page) per second. That's 3600 lines per minute or three times the speed of most line printers.

Four Character Sizes For maximum readability, characters of twice normal height and width are selectable by the computer. Tall or wide characters are also programmable for emphasis and contrast in formatting displays.

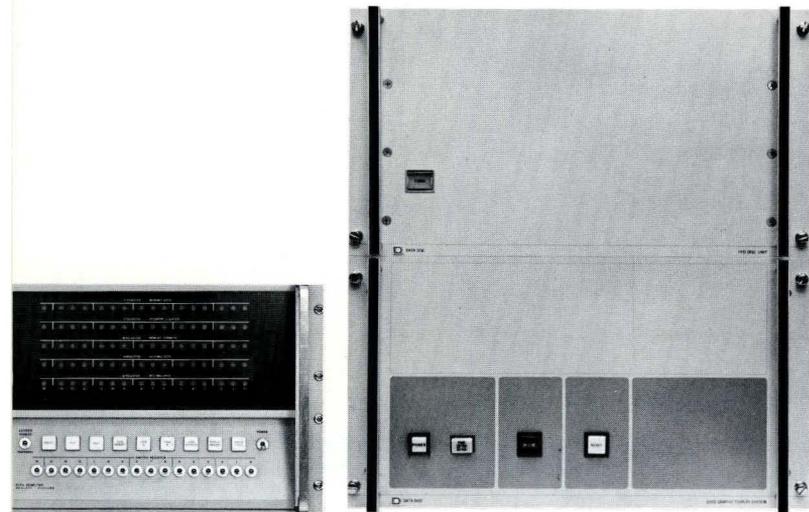
Special Characters Any special character desired can be easily created with the graphic character programming capability. Characters are created, stored, and modified with software. Foreign language characters are easy to create, save, and use.

Additions or Deletions Displayed alphanumeric or graphic characters can be individually deleted or new characters individually added without erasing other portions of the display.

Dark or Light Images Dark images can be displayed on a light background or light images contrasted against a dark background for optimum legibility and versatility in display presentation. Or both types may be mixed in the same display.

Displays in Color The 6500 System makes possible the use of up to seven colors. Even the most complex graphics can be made understandable through the use of color. Color displays may be intermixed with black and white. Each color display uses three black and white channels and a standard color monitor.

Split Screen and Zoom Capability Using the high resolution system and the appropriate programming, one page of data displayed with large size characters can be reduced in size to one quarter of the screen area and three other pages of small size characters displayed beside it. Or when paging through computer core data, pages of 64 words can be displayed four to a frame until the desired page is reached. This page can then be enlarged to full screen size using large characters.

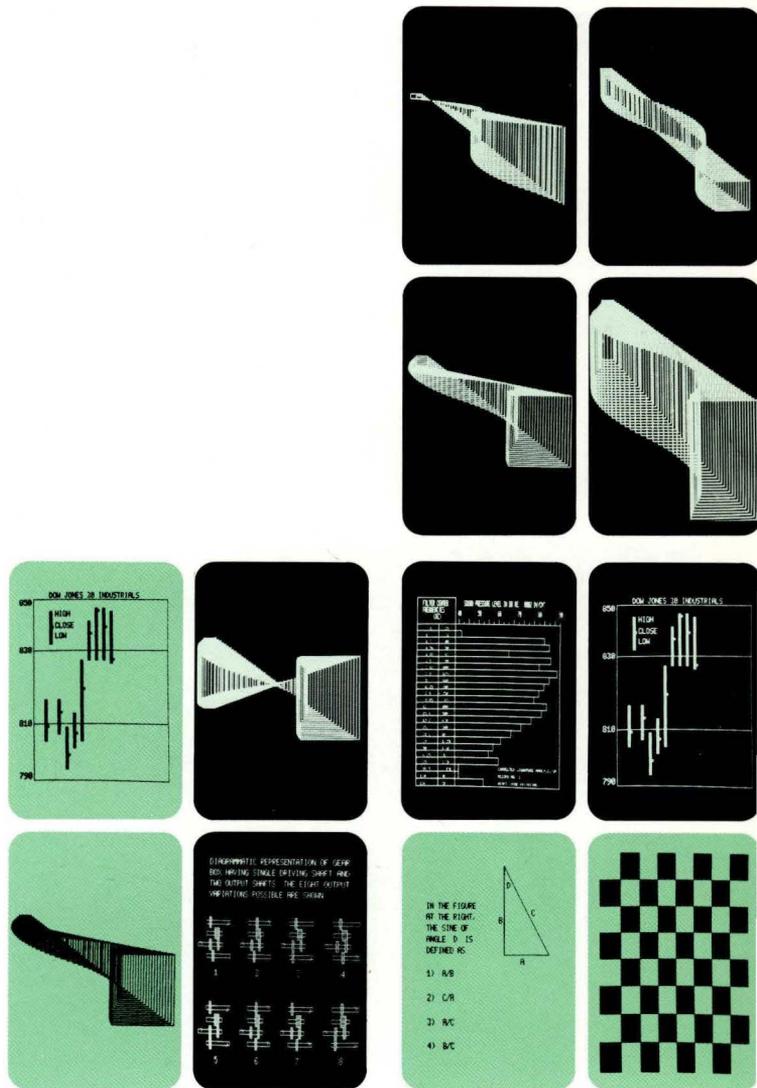


Applications for the 6500 System are as limitless as the versatility and flexibility of the system itself. In one outstanding application installed at the Massachusetts Institute of Technology (MIT), the system provides the means to "page-through" the core memory of large computer systems very rapidly. Rather than waiting for slow paper print-outs from very fast computers, each programmer in a large organization can now have an instant interactive display as an aid in programming.

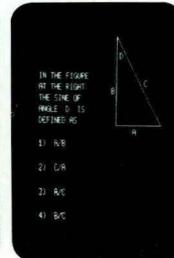
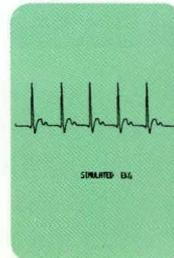
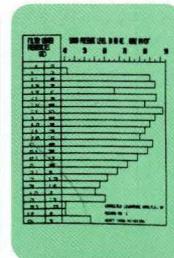
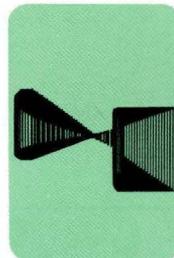
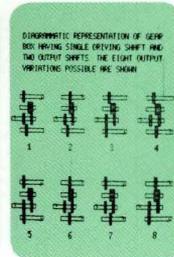
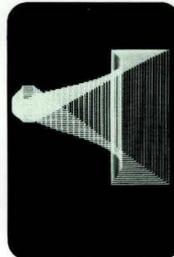
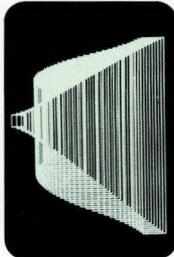
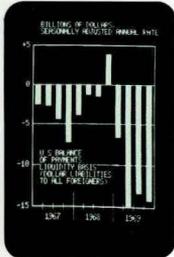
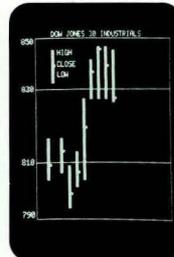
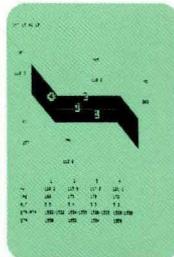
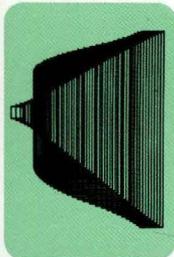
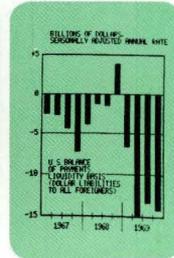
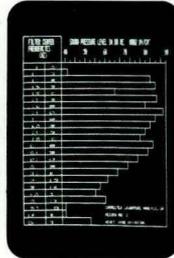
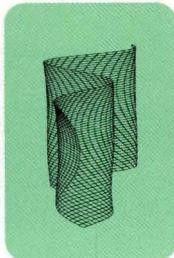
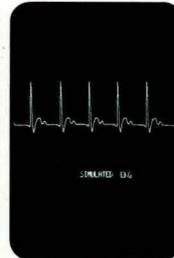
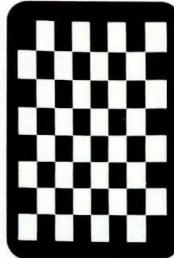
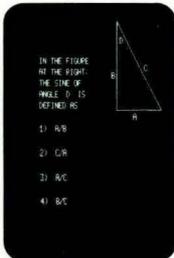
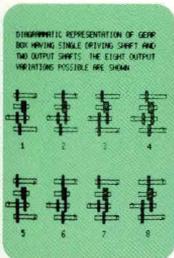
With three degrees of resolution offered, you order only the capability you need. In the high resolution system, up to 16 displays can be driven, each with 512 x 512 picture elements. Some or all of the high-resolution channels can be split to drive two medium-resolution displays, each with 256 x 512 picture elements. A standard resolution with 256 x 256 elements is a third way in which the system may be ordered.

The system includes easy interface with 16-bit computers. Interfaces for the IBM 1800, the Honeywell 316/516 series, the XDS Sigma 3, 5, and 7, and the Hewlett Packard 2114/2115/2116 line are available as standard system components. Other interfaces may be ordered.

This wide selection of interfaces, coupled with the opportunity to use the TV monitor of your choice, lets you design a readily assembled system tailored to fit unique requirements.



applications as wide as the need for better information...



HOSPITAL SYSTEMS

Data Disc systems are now in use for intensive care monitoring. Displays provide continuous surveillance of data collected from patients. Closed circuit TV systems, where they exist, can be utilized to route signals to remote monitors. In multiphasic screening clinics, displays give ready access to patient profile data.

MANAGEMENT INFORMATION SYSTEMS

The ability of the Data Disc system to accommodate large numbers of displays inexpensively means that every manager can have displayed on his own desk any information contained within the company's data processing system. Displays can replace most paper reports used in management, making more efficient use of managers' time. Analysis is speeded by presenting data in graphic rather than tabular form.

INVESTMENT ANALYSIS

The voluminous information used by investment analysts is instantly available in chart form with this kind of system. Trading data can be displayed in "point and figure" form. Every analyst can have instant access to: summary high, low, and closes; every transaction on major exchanges over a period of weeks; 100-day averages of stock prices; and number of shares traded, plus fundamental financial data on hundreds of selected companies.

COMPUTER-AIDED DESIGN

Graphic displays help the designer to select circuit parameters from graphs presented by the computer and to utilize the power of the computer to finalize the design in less time. Computer models can be created and tested. By varying parameters, performance characteristics of a number of alternative designs can be evaluated.

PROCESS CONTROL

Inquiry, status, and alarm displays can monitor all phases of the production or control process. The operator is no longer merely an observer of analog meters, subject to human error in interpretation, but becomes a specialist, able to interact with the computer, and call up the data necessary for instantaneous and efficient decision making.

AUTOMATED INSTRUCTION

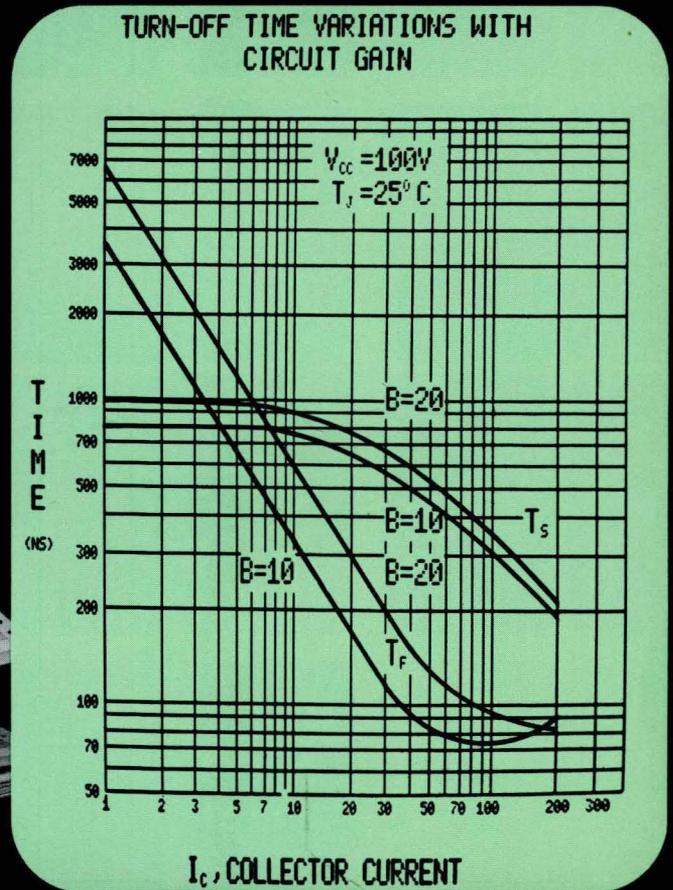
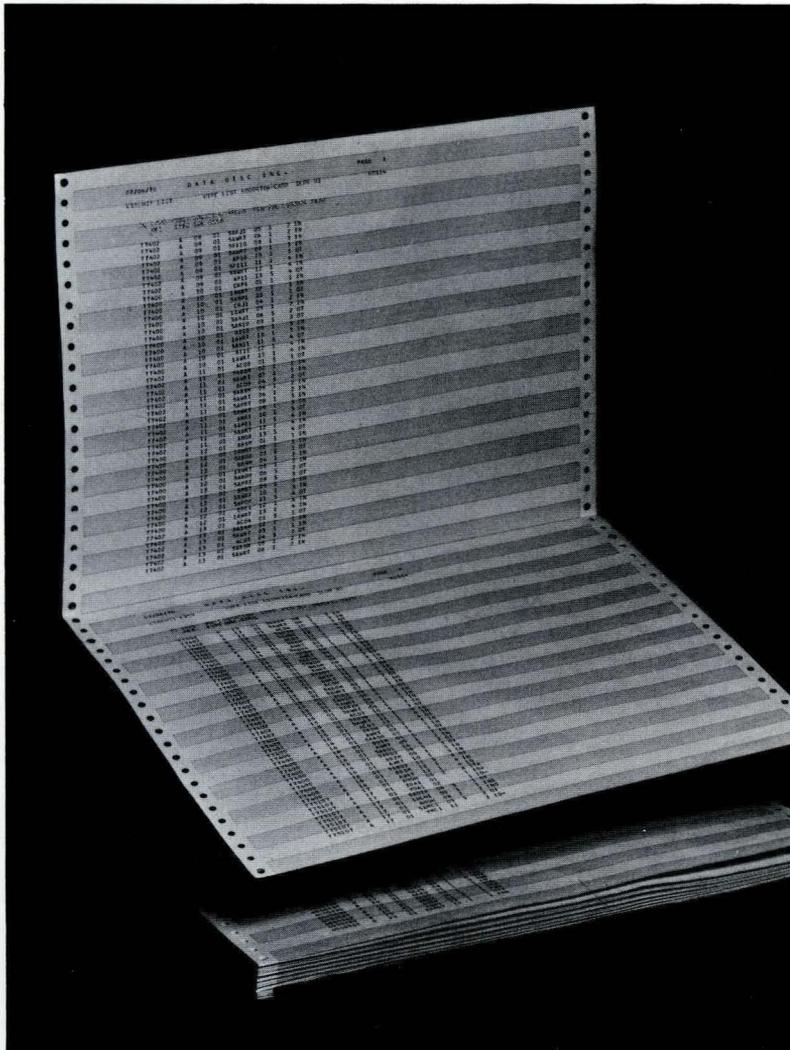
Because the Data Disc system is ideally suited to clustered displays, it offers student input/output units at the lowest cost per student. The added capability of graphics, at no additional cost, provides the educational advantages of pictures over words.

simple command structure means ease of programming...

A simple 16-bit command structure assures simplicity of programming for the Data Disc system. Only 16 commands provide complete control over all types of displays. This is in sharp contrast to other systems, some of which require as many as 200 commands.

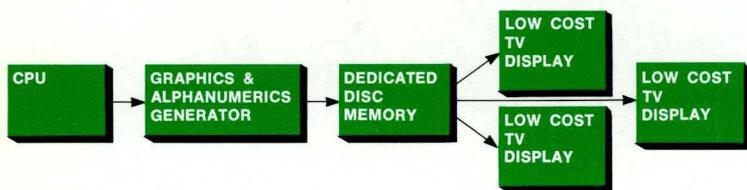
INSTRUCTION SET

XFR	Transfer Data
LAG	Load A/N Graphics control bit
LCR	Load Control Register
LTA	Load Terminal Address
LX1	Load X ₁
LX2	Load X ₂
LBX	Load both X ₁ and X ₂
LY1	Load Y ₁
LY2	Load Y ₂
LBY	Load both Y ₁ and Y ₂
LTE	Load Terminal address and Erase
ANC	A/N Character
ERS	Erase
BXF	Block Transfer
CLS	Clear System
NOD	No Op, Display

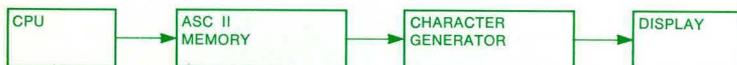


The entire page of data shown here in tabular form is also displayed much more meaningfully in the graphic display. When graphic capability such as this costs no more than alphanumeric alone, why not take advantage of the hundred and one ways

to display data . . . including color, provided by the Data Disc system. The meaning and significance of even the most complex statistics are dramatically conveyed by the right graphic techniques. The medium *is* the message.



The Data Disc design which sends instructions first to the graphics and alphanumerics generator and then to the dedicated disc memory where they are stored as video signals differs radically from other systems in which the computer memory is used as the display refresher, or from still other systems in which an auxiliary memory is used to accept data from the computer and route it to the display generator and then to the display. The 6500 System does not tie up the computer memory which is in use only when alterations are being made.



In systems of this type, a channel must be duplicated for each display. So cost is directly proportional to the number of displays.



In this system, the computer memory must continually refresh the display, thus tying up the computer. In addition, X-Y displays are more costly than TV displays.



This system comes closest to equalling the resolution and the storage and graphics capabilities of the Data Disc 6500. But its disadvantages are numerous. Storage tube displays are expensive, dim to view, and slow to erase. They possess limited tube life and offer no selective change of displayed graphics.

SPECIFICATIONS

GENERAL CAPABILITY

Display Terminal Any TV monitor.

CRT Orientation Vertical.

Refresh Rate 30 frames/second without flicker or jitter.

Rack-Mounted Equipment 21 inches high for up to 32 displays.

Power 115 Vac, 60 Hz, single phase.

Refresh Memory Dedicated Micro-Space™ Disc Memory, 5200 Series.

ALPHANUMERIC CAPABILITY

Type	High Resolution	Medium Resolution	Standard Resolution
Programmable Character Sizes	Four	Two	One
A. Single Width, Single Height	•		
B. Double Width, Single Height	•		
C. Single Width, Double Height	•	•	
D. Double Width, Double Height	•	•	•
Lines per Display	51 or 25	25	25
Characters per Line	85 or 42	85 or 42	42
Flicker-Free Characters Displayed			
All Size A Characters	4335		
All Size B Characters	2142		
All Size C Characters	2125	2125	
All Size D Characters	1050	1050	1050
Tabulation Capability			
Vertical Positions	512	256	256
Horizontal Positions	512	512	256
Graphic Points per Display	262,144	131,072	65,536

Character Repertoire 64 characters, standard ASCII subset.

Character Generation 5 by 7 matrix.

Display Size, Page Select your own screen size.

Format Capability Any character — alphanumeric or graphic — can be positioned anywhere on the screen.

Erase Capability Instantly erase screen, paragraph, line, word, or letter.

Transmit Capability* Transmit screen, paragraph, or line.

Editing Capability* Delete or insert word, line, or paragraph.

Blink Capability* Any character may be made to blink.

Split Screen Capability* Retain previous page or view up to 4 pages on one screen.

GRAPHIC CAPABILITY

Points per Display High resolution — 512 X 512; medium resolution — 256 X 512; standard resolution — 256 X 256.

Display Size, Graph Select your own screen size.

Bar Graphs Just 3 instructions per bar, positive or negative about X axis.

Area Erase Erase graphs only and save coordinates for next graph.

Continuous Function Plotting At 59 microseconds per point, your computer can calculate on the fly.

Discontinuous Function Plotting No need to feel restricted to smooth functions.

Draws Coordinates And just as easily annotates them.

Draws Grid Lines Draw lighter than coordinate lines or make them dashed.

Annotates Curves Add A/N callouts to curves as you plot them.

Shades Areas Add special shading to delineate overlapping areas of graphs.

* With dedicated processor option or under computer control.



PRICE LIST

6500 GRAPHIC DISPLAY SYSTEM

Date July 7, 1970

High Resolution Channels - 512 x 512

*2 Channels	=	\$11,000	~	\$5,500/Channel
4 Channels	=	\$20,770	~	\$5,200/Channel
8 Channels	=	\$24,770	~	\$3,096/Channel
12 Channels	=	\$30,770	~	\$2,564/Channel
16 Channels	=	\$34,770	~	\$2,173/Channel

Standard Resolution Channels - 256 x 256

*4 Channels	=	\$11,000	~	\$2,750/Channel
8 Channels	=	\$20,770	~	\$2,596/Channel
16 Channels	=	\$24,770	~	\$1,548/Channel
24 Channels	=	\$30,770	~	\$1,474/Channel
32 Channels	=	\$34,770	~	\$1,080/Channel

*This system is not field expandable.

DELIVERY: 60 - 90 Days ARO

OEM and Educational discounts available.

FOR FURTHER INFORMATION, CALL:

Chuck McEwan, Product Manager (415) 326-7602

TERMS: Net 30 days, F. O. B. Palo Alto, California

Prices are subject to change.

DATA DISC INC./Display Division

1275 California Avenue • Palo Alto, California 94304 • (415) 326-7602 • TWX 910-373-1248