

FEATURES

- Interfaces to most minicomputers including Nova, Eclipse, and PDP-11
- Resolution up to 1280 x 1024 pixels
- Full refresh, flicker-free 60 Hz raster scan rate for images up to 640 x 512 pixels
- Color look-up table; display 1024 simultaneous colors
- Up to 16 bit storage for each pixel
- Display up to 256 levels of grayscale
- Variable grayscale and color mapping
- Gamma-corrected video output
- Rapid pixel update times — as fast as 600 nsec/pixel
- Composite video outputs
- User programmable alphanumeric generator
- User-definable cursor
- Non-destructive alphanumeric and vector overlays
- Non-destructive zoom with 4-directional scrolling
- Interlaced and non-interlaced displays
- Random and sequential pixel update
- Memory readback

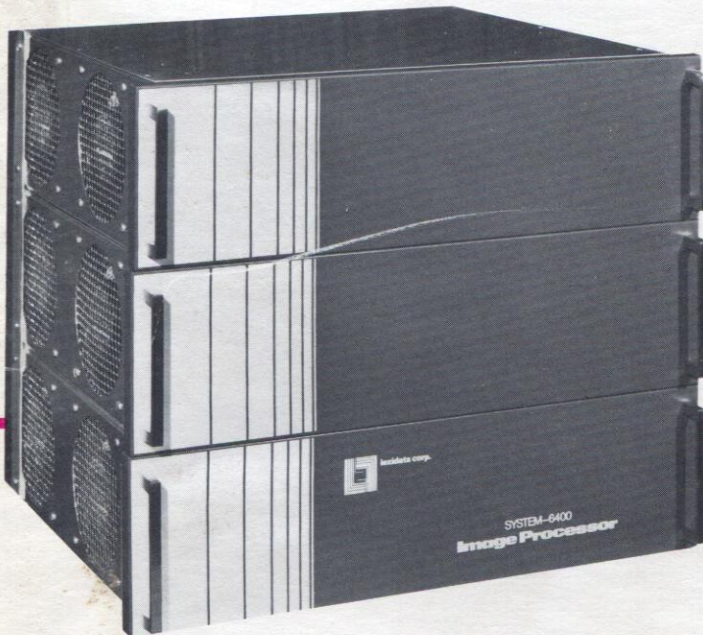
- Command I/O and DMA to host computer
- Dual processor video control — programmable on 2 levels
- Peripheral options

A COMPREHENSIVE VIDEO IMAGING SYSTEM

Operation

The Lexidata System 6400 performs high speed image processing without compromising modularity and programming flexibility. It can operate as a peripheral output device to many of the minicomputers on the market today, or as a stand-alone system as well. The user may select color, grayscale, or black and white outputs.

Traditional image processing systems are adequate for images of low resolutions and narrow intensity ranges but cannot cope with the demands of a high resolution, wide intensity environment. The System 6400 is specifically



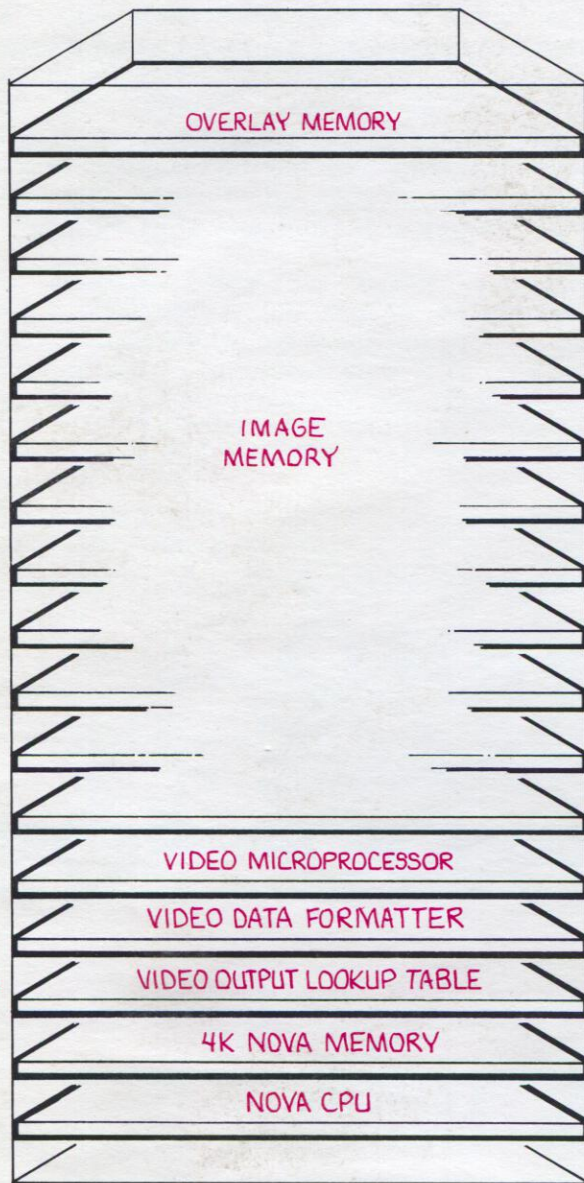
SYSTEM 6400 VIDEO IMAGE PROCESSOR



NOV 76 - NOV 78

designed to meet these demands. And it does this by a dual processor architecture comprising a dedicated Nova 3 CPU and a Lexidata high-speed, bi-polar video microprocessor. The system maintains an overall flexibility because it includes:

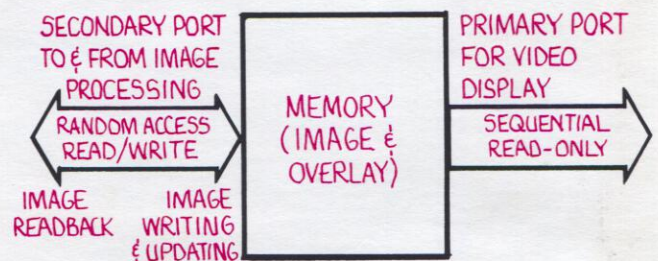
- programming on both processor levels
- dual-port Image/Overlay Memory
- special image formatting hardware
- full I/O buffering
- variable video output look-up tables



Organization of System Components

DUAL PORT MEMORY SPEEDS DISPLAY AND UPDATE

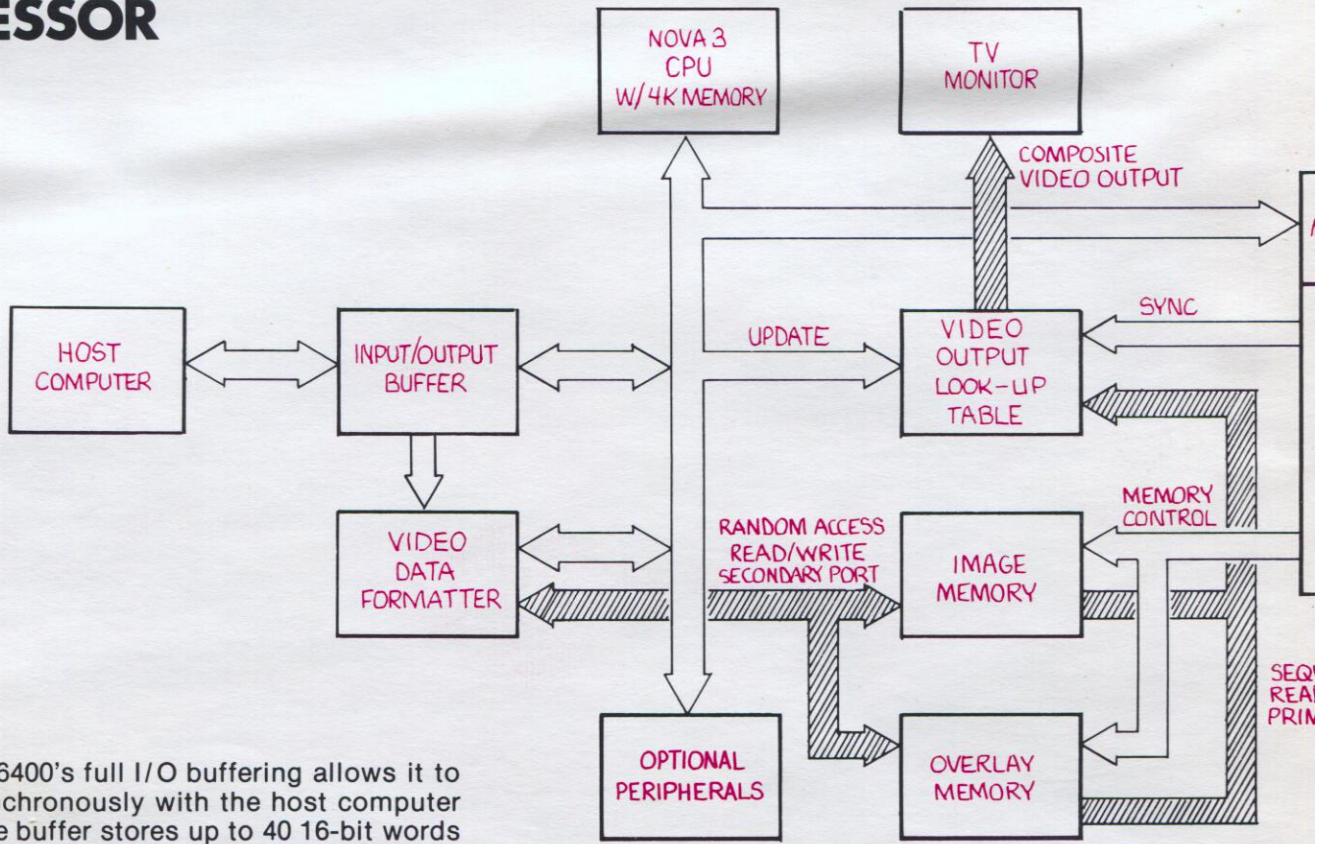
Because the System 6400 picture memory is organized into Image and Overlay Memory, it can superimpose multiple monochrome displays upon a grayscale image in memory. Colors may be prioritized in a multiple color overlay. The host computer can readback full picture memory; either image or overlay or both are callable without disturbing the original picture memory. The Image/Overlay Memory has variable configurations to meet different requirements.



Dual Port Memory Architecture

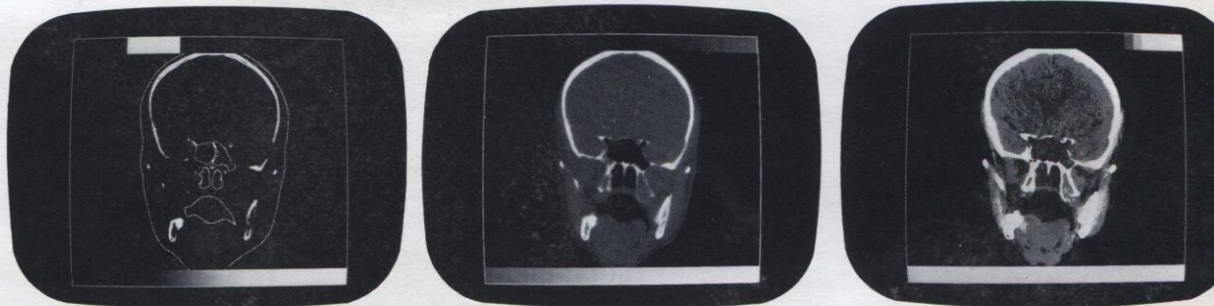
Both Image and Overlay Memory is dual port. The primary port is a sequential read-only output for video picture display. The secondary port is a random access read/write port for full data operations. The ports allow each function of picture memory to operate independently for speed of display and update.

A HIGHLY EFFICIENT PROCESSOR



System 6400 Architecture

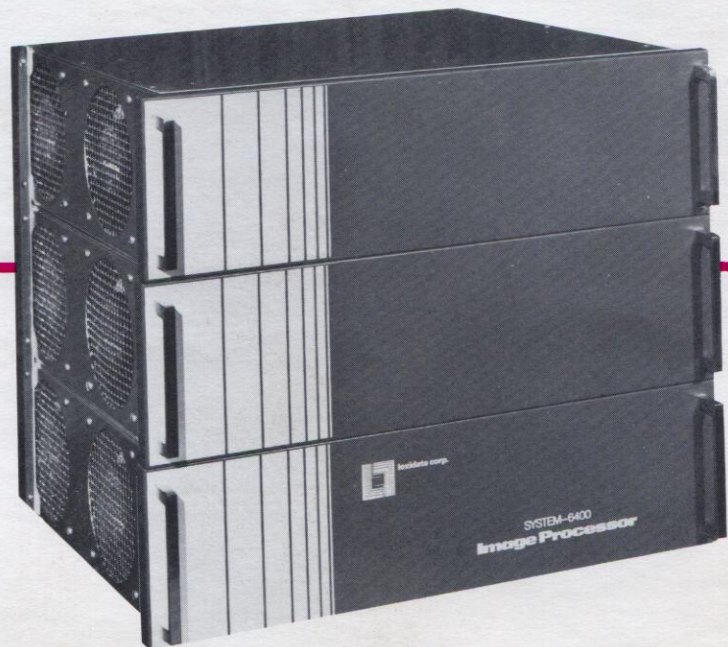
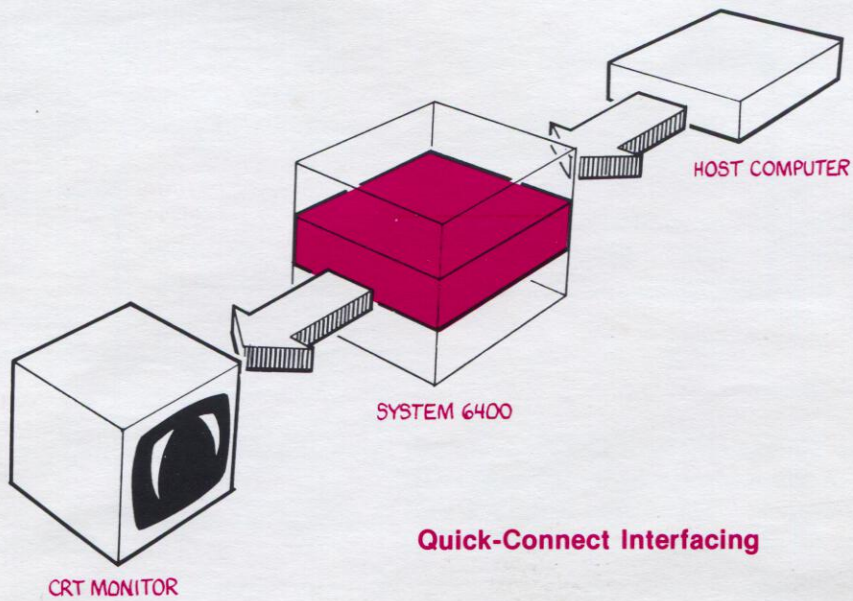
The System 6400's full I/O buffering allows it to operate asynchronously with the host computer data bus. The buffer stores up to 40 16-bit words to or from the host. And, in fact, can process data as fast as the host computer can provide it. A dual processor design helps to achieve this superior throughput by assigning specific data handling duties to each processor. For example, the System 6400's Nova 3 CPU performs system control and execution of video commands from routines resident in 4K of Nova memory. The bi-polar video microprocessor handles co-ordination of the dual-port Picture Memory and synchronization of the video. Microprograms reside in read/write memory for alteration at any time. Since these microprograms control video synchronization, the user can readily change the video output format.



EASY INTERFACING

Installation is simply a matter of connecting your host computer and TV monitor into the System 6400. And almost immediately, you're operating with high-speed video image processing.

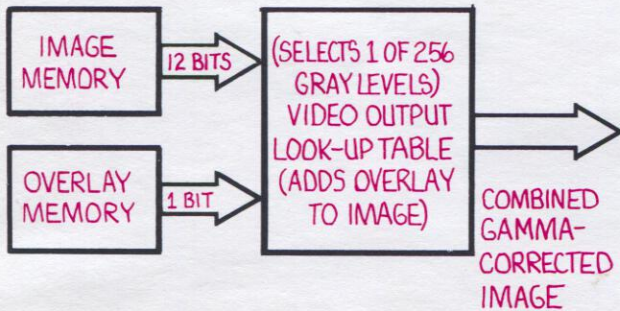
A program library of standard display routines is provided.



Using different video output look-up table mapping each display can reveal selective information from the same stored data.

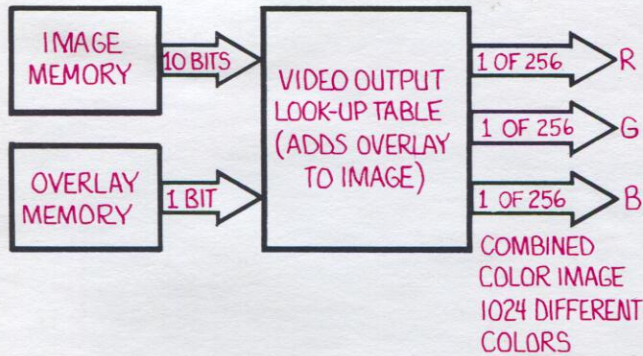
VERSATILE VIDEO OUTPUT LOOK-UP TABLE

With gamma-corrected grayscale, the Table selects 1 of 256 gray levels per pixel mapped from up to 16 bits of intensity information stored in Image Memory. And it adds the monochrome overlays to the image. In Overlay Memory, multiple independent overlays may be stored depending on the number of intensity information bits required.



Grayscale

With color, the Table selects 1 of 256 levels per pixel for each of the 3 inputs to a standard RGB Monitor. The result is 1024 different colors that are displayable on any 1 frame. The user has a



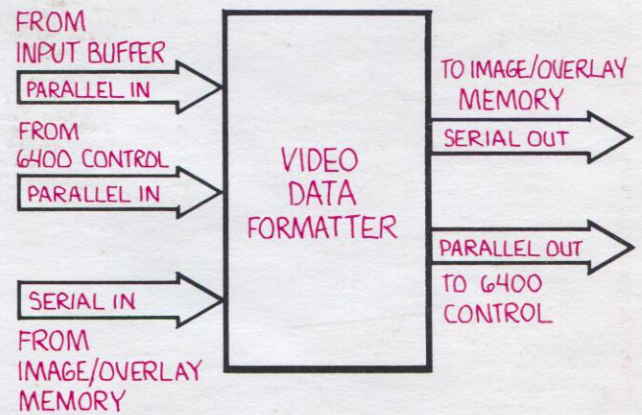
Color

virtually limitless number of colors to choose from.

The Video Output Look-Up Table is variable and may be altered during a single vertical retrace on command from the host computer.

LOW PROCESSOR OVERHEAD - FAST DISPLAY SPEED

The Video Data Formatter in the System 6400 converts parallel computer data into serial video data for the Image/Overlay Picture Memory, and vice versa. This built-in system conversion greatly reduces processor overhead and significantly increases display speed.



Video Data Formatter

SPECIFICATIONS

Video Output: EIA Standard RS170 or RS343A composite sync and blanking, 0 to -1 Volt into 75 Ohms. Programmable for any horizontal drive frequency from 15.75 to 31.5 KHz depending on frame rate and vertical resolution desired. Any frame rate from 25 to 60 Hz may be selected. Standard Output for 640 x 512 display: 60 Hz frame rate, non-interlaced — 31.5 KHz 30 Hz frame rate, interlaced — 15.75 KHz

Alphanumeric Character Generation: Standard 64 character ASCII upper case font supplied with 2 output sizes; other fonts are available on special order, or can be programmed by user.

Display	Dot Matrix	Maximum Char/Line	Maximum Lines	Char/Line at Optimum Legibility	Lines at Optimum Legibility
1280 x 1024	5 x 7	213	128	160	102
	10 x 14	116	68	80	51
640 x 512	5 x 7	106	64	80	51
	10 x 14	58	34	40	25

Cursor: User definable

Grayscale: Up to 256 gamma-corrected levels

Grayscale/Color Look-Up Table: Maps 10 to 12 bits of intensity data into three 8-bit video levels for RGB Color Monitor and one Black-and-White Monitor

Up to 1024 colors may appear on the same frame; all under program control

Picture Memory: Up to 5.24 million bits of picture information

Standard Configurations

Display (Pixels)	Bit(s) of Intensity and Overlay Data
1280 x 1024	1 to 4
640 x 512	1 to 16
512 x 512	1 to 16
256 x 256	1 to 32
128 x 128	1 to 32

Requirements for bit(s) of intensity data:

Black-and-White monochrome — 1

Preassigned color and 16-level grayscale — 4

Full 256-level grayscale — 8

Full 1024 colors — 10

Pixel Update Times: Based on average times to update System 6400 Picture Memory from new data in host computer memory

Sequential Update; 600 nsec/pixel

Random Update; 60 μ sec/pixel

Sequential Readback; 10 μ sec/pixel

Random Readback; 45 μ sec/pixel

Zoom: 2X, 4X, and 8X over any of the screen area

Does not alter the stored image

Horizontal and vertical scroll of magnified image

Compatibility: Any standard minicomputer through a 16-bit parallel, bi-directional TTL data bus; these include Nova, Eclipse, and PDP-11

Data Transfer Rate: To and from host computer: Host to System 6400; 830K words/sec average System 6400 to host; 100K words/sec average Peak; 1.4M words/sec input or output

Power Requirements: 110/220 VAC, 50/60 Hz \pm 10%, 7A at 110 VAC

Power Consumption: 700 W average

Environmental Requirements: Temperature 0 to 55°C operating, -35 to 70°C storage

Relative humidity to 90% operating, 95% storage

Altitude to 10,000 Ft operating, 50,000 Ft storage

Dimensions: 15-3/4" high x 19" wide x 18" deep

Weight: 136 pounds — typical configuration including power supplies

Peripheral Options: Standard Raster Scan Monitor (B & W or color, up to 512 lines),

High Resolution Raster Scan Monitor (B & W or color, up to 1024 lines),

Keyboard, Joystick, Trackball, Light-Pen, Telecommunications Modem, Floppy or Hard Surface Disk, Magnetic Tape, RS232 TTY, Printer, and Plotter

