FEATURES

- Interfaces to any 8, 16 or 32 bit host computer
- Command I/O, DMA and RS-232 to host computer
- Self-contained 80 nsec cycle time microprocessor for applications programming
- Composite video outputs
- Grayscale look-up table; display 256 simultaneous gray levels selected from 4096 levels
- Color look-up table; display 4096 simultaneous colors selected from more than 16 million combinations
- Full refresh, flicker-free 60 Hz raster scan rate
- Switch selectable interlaced and non-interlaced mode of display
- Very high speed random pixel updating; memory is x, y addressable
- Up to 8 different simultaneous monochrome outputs
- Cursor size and shape are user-definable
- Alphanumeric character generator
- Special characters and symbols
- Gamma-corrected grayscale video output
- Instantaneous, non-destructive zoom
- 4-directional scrolling
- Memory readback
- Housed in its own compact chassis with power supply

FAST RANDOM DISPLAY PROCESSING

The Lexidata System 3400 offers uniquely flexible and powerful Image/Graphics processing for medium resolution raster-scan requirements. Combining very fast (750 nsec/pixel) random updating via a dedicated memory controller with a fully programmable 80 nsec cycle time microprocessor, the 3400 is the perfect answer for ultra-high speed applications. For the first time ultrasound and nuclear scanning, weather radar, flight simulation, color graphics, etc. can be handled by raster-scan technology.

Fulfilling its role as a very intelligent peripheral, the 3400 operates with a minimum of host CPU interaction. Compact packaging provides a single-chassis design with self-contained power supply and cooling. Interfacing the 3400 is simply a matter of plugging in a standard cable connected I/O card into the user's host computer.

SYSTEM 3400
VIDEO IMAGE PROCESSOR
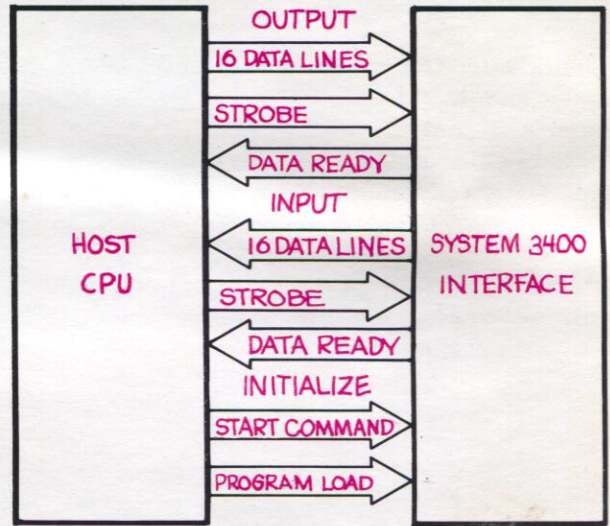
Lexidata Corporation
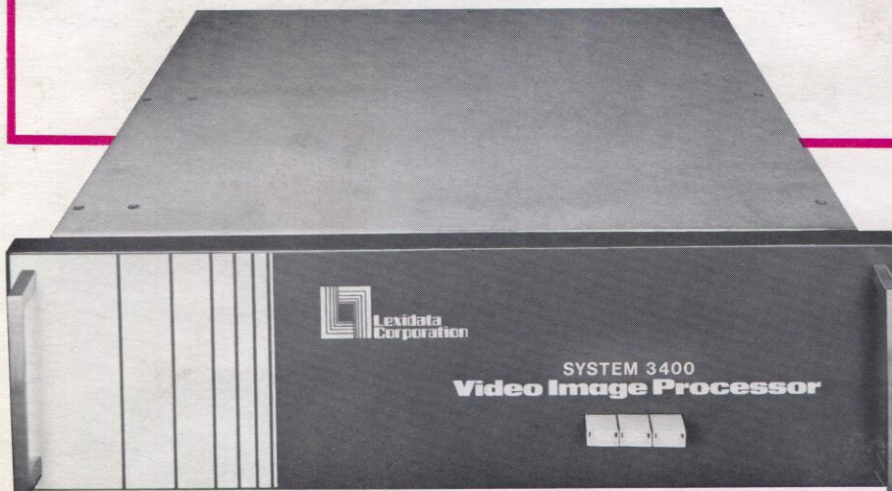
AVRIL 78

POWERFUL IMAGING FUNCTIONS

Design Considerations

The System 3400 will interface to any 8, 16 or 32 bit host computer over DMA, Command I/O, or RS-232 links. It can accept data rates as high as 2 Megabytes/sec which is faster than most minicomputer data output. Its memory is organized in planes of 320 x 256 x 1 bit. Each memory plane may be configured to be part of the Graphics/Image Memory or the Overlay Memory. The system allows up to sixteen 320 x 256 memory planes for color or black-and-white viewing. All memory is x, y addressable.

Functions such as high speed blinking between two or more images to aid comparison, side-by-side display of up to twenty 64 x 64 images, zoom, scrolling, or inverting the displayed intensity (from white on black to black on white), etc., make the System 3400 a versatile tool for convenient display of Image and Graphics data.

OUTPUT
16 DATA LINES
STROBE
DATA READY
INPUT
16 DATA LINES
STROBE
DATA READY
INITIALIZE
START COMMAND
PROGRAM LOAD

HOST CPU

SYSTEM 3400 INTERFACE

Standard High Speed Interface: suitable for I/O to DEC, HP, DG, Interdata, Prime and other popular cpu's.

Software support for the System 3400 includes a set of FORTRAN or BASIC callable subroutines. These routines all run in the 3400 microprocessor and thus require minimal processor overhead in the host computer. In addition, users can custom-program the system in a powerful microprocessor ASSEMBLY language to meet format, process, storage, retrieval, and output demands.
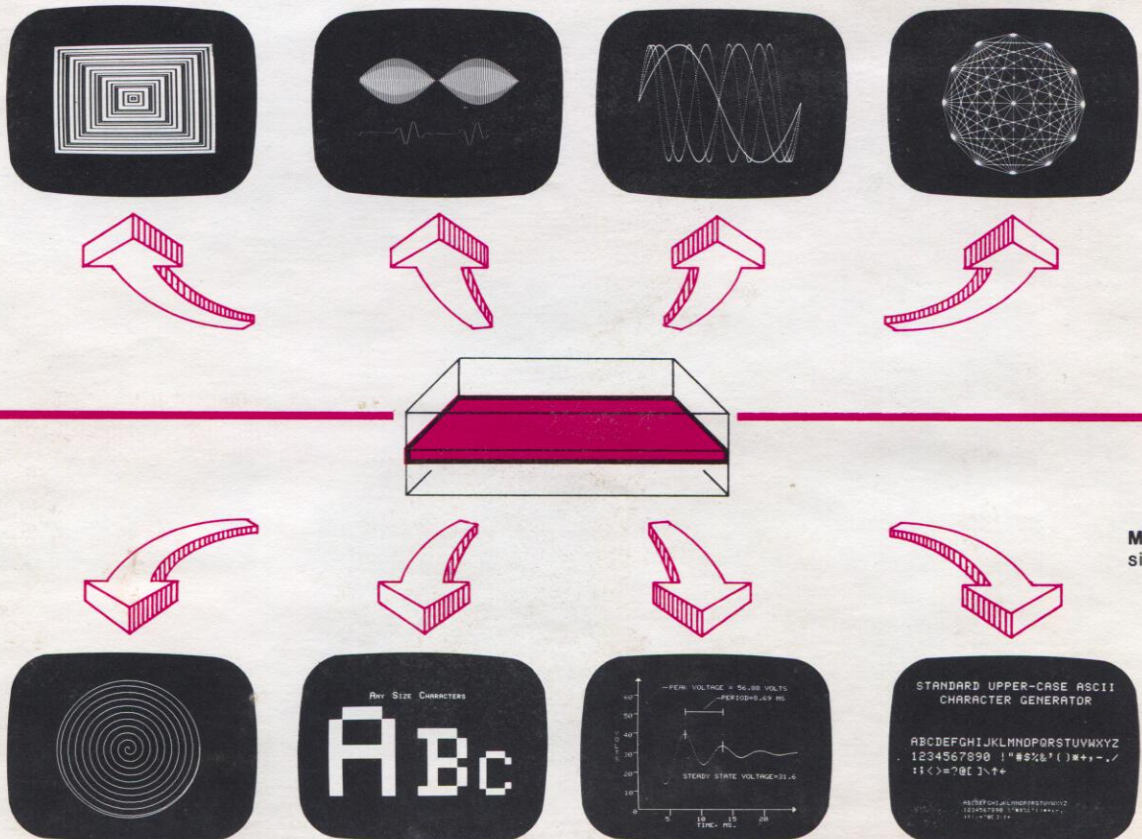
Multiple Monito
simultaneous m

FLEXIBLE ROUTINES

Lexidata supplies the following FORTRAN or BASIC callable subroutines:

**Initialize:** Resets the 3400 and erases the entire refresh memory.

Image Readback: Reads a block of data from the 3400 refresh memory into the host computer.

Image Update: Writes a block of data from the host computer into the 3400 refresh memory.

Vector Generation: Writes or erases a vector in the overlay memory.

RELIABLE

The System 3400 is built to give you long, uninterrupted, trouble-free service. All components undergo strict quality assurance (mil. std. 883 for digital components and mil. std. 750 for transistors). Final testing includes an exercised burn-in for a minimum of 168 hours which eliminates infant mortality problems. Lexidata systems are extremely reliable.
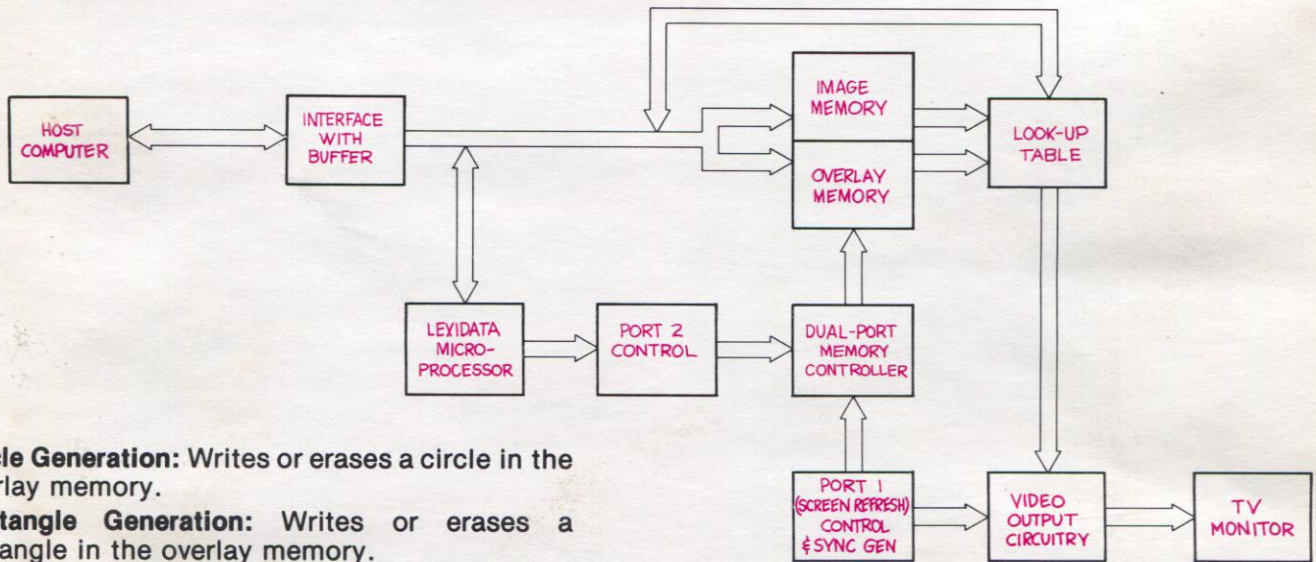
SYSTEM 3400 ARCHITECTURE

Circle Generation: Writes or erases a circle in the overlay memory.

Rectangle Generation: Writes or erases a rectangle in the overlay memory.

Character Generation: Writes or erases alphanumeric characters in the display memory.

Decimal Number Conversion: Converts a binary number to decimal characters and writes it into the overlay memory.

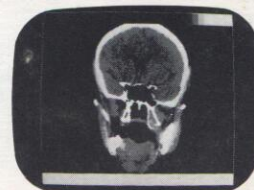**Erase:** Erases all or part of the refresh memory.

Video View Selection (Option): Selects Zoom factor and Scrolling position.

Video Look-Up Table Loading (Option): Calculates the necessary data values and writes them into the Look-Up Table.

ngement: up to 8 different
hrome outputs.

Single Monitor arrangement: grayscale or color output.

SPECIFICATIONS

Video Output: EIA standard RS-170 or RS-343A composite sync and blanking; 60 Hz vertical scan rate, 15.75 KHz horizontal; 0 to -1 Volt into 75 Ohms. Microprogram selectable interlaced/non-interlaced mode of display. Scan rate can also be set to 25, 30, or 50 Hz.

Alphanumeric Character Generation: 5 x 7 Dot Matrix: 320 x 256; 32 lines at 53 characters
256 x 256; 32 lines at 42 characters
Standard 64 character ASCII upper cases font supplied, but other fonts or special symbols are also available on special order.

Cursor: Size and shape of non-destructive cursor is user-definable.

Grayscale Look-Up Table (Option): Program controlled mapping of either 10, 11, or 12 bits of intensity data to 8 bits of grayscale video output. Up to 256 levels of gray can be displayed simultaneously, selected from up to 4096.

Color Look-Up Table (Option): Program controlled mapping of 10 bits of intensity data to three 8 bit video outputs, one each for the red, green, and blue guns of a RGB color monitor. Up to 4096 colors can be displayed simultaneously, selected from $2^{24}-1$ combinations. A grayscale look-up table may be operated in parallel to a color look-up table.

Picture Memory: Standard Configurations

Display (Pixels)	Bit(s) of Intensity and Overlay Data
320 x 256	1 to 16
256 x 256	1 to 16

Data Update: DMA, Command I/O or RS-232

Input Device Options: Interfaced via host computer — Joystick, Trackball, Keyboard, Light-Pen, Floppy or Hard Surface Disk, RS-232, Magnetic Tape, Plotter and Printer

Pixel Update Times: Based on average time to update System 3400 Picture Memory from new data in host computer memory —
Random or Sequential Update; 750 nsec/pixel
Random or Sequential Readback; 1 μsec/pixel

Zoom (Option): 2X, 4X, and 8X over any of the screen area without destroying original stored image in refresh memory

Scrolling (Option): 4-directional of non-magnified 320 x 256 image by continuously loading display memory from host computer; 4-directional of magnified (zoomed) image without host interaction

Blinking and Multiple Images (Option): User-programmable high speed blinking rate; display side-by-side up to twenty 64 x 64 images

Compatibility: Interface options to any 8, 12, or 16 bit parallel link; a 32 bit minicomputer will operate with the System 3400 through a modified 16 bit parallel interface

Software: FORTRAN or BASIC callable subroutines as described earlier are provided with each System 3400 purchase. Custom software programming is also available from Lexidata.

Data Transfer Rate: Up to 2 Megabytes per second from host computer

Gamma Correction (Option): Factory programmed to user specifications

Power Requirements: 110/220 VAC, 50/60 Hz, 2.5A at 110 VAC

Power Consumption: 300 W average

Environmental Requirements: Temperature 0° to 55°C operating, -35° to 70°C storage;
Relative humidity to 90% operating, to 95% storage (non-condensing);
Altitude to 10,000 ft. operating, to 50,000 ft. storage

Dimensions: 5-1/4" high x 19" wide x 18" deep

Weight: 50 pounds including power supply

Lexidata Corporation