Tektronix introduces new computer graphics series

4112 features raster technology

To many computer graphics customers, the ability to control an image and manipulate a display is more important than screen capacity. For those users, Tektronix has introduced the 4112 Computer Display Terminal. The 4112 is a monochrome raster device that combines moderate memory with sophisticated graphics with powerful local intelligence to provide users with new standards of high interactivity and low host overhead.

The 4112 is one of two instruments just introduced by Tek as part of its new 4110 Series of intelligent graphics terminals. The other, the 4144, incorporates the exclusive Tektronix bistable storage tube (DVST) to bring new interactivity, communications economy, and speed enhancements to graphics applications requiring the large screen, high density, and fine line quality that the DVST provides.

Base price for the 4112 is $9,600. "The 4112 has been engineered to be as compatible as possible with our 4010 Series of DVST terminals," says Mike Kondra (Terminals Marketing manager). "The 4112 Series has long set the standards of the industry. Current users can move to the 4112 or incorporate it into multi-terminal environments without sacrificing existing programs.

Users of the 4112 will be able to command the vast processing power of host-based computing while enjoying a number of enhanced throughput features to substantially reduce the costs and delays associated with host communications. Most notable is the 4112's capacity for locally retained picture segments, whereby a group of MOVE and DRAW commands can be defined, then stored, recalled and manipulated locally, significantly enhancing interactivity while reducing dependence on the host.

This capability will allow an architect, for example, to define and store on RAM or disk commonly used graphic symbols for doors, windows, electrical fixtures, plumbing, and landscaping.

In addition, the designer or analyst is able to address much more detail than that normally associated with raster graphics. Behind the 4112's 640 X 480 displayable point matrix is an addressable matrix of 4096 X 4096 points—the same as the 19-inch high resolution 4101. A local memory buffer and panel function lets the user scan the internal display space and magnify any selected area. Then, a full 15" screen size for detailed study and manipulation. The 4112's expanded size and position of a separately scrollable dialog area anywhere on-screen, so transactions between screen terminal and host never interfere with the graphics work area.

To further facilitate analysis, the 4112 transmits up to 16 viewports to exist on the screen. Designers, for example, can simultaneously display multiple graphs for comparison. (The 9-inch high 4110 terminal has no such zoom and pan for each defined viewport).

The 4112 can be optionally configured to display a variety ofricula, and graphics and text planes—then superimpose one over the other. The gray scale effect can be used in conjunction with an easy panel flooding function by which any closed figure can be drawn and its interior shaded by varying intensity levels, or by user-defined (50 level) (gradation).

Supporting these local capabilities is a large memory capacity, literally over 4 to 64K bytes total, plus optional integral flexible disk storage offering 512K byte capacity per disk. On-line, too, 4112 users can look forward to increased productivity and interactivity by greatly expanding the local memory capacity for locally retained picture segments, whereby a group of MOVE and DRAW commands can be defined, then stored, recalled and manipulated locally, significantly reducing dependence on the host.

This capability allows an engineer, for example, to define and store on RAM or disk commonly used graphic symbols such as, background graphics, piping, valves and symbols code. Supporting the picture segments feature and further decreasing host dependence are two-dimensional transforms—allowing the ability to locally rotate, translate and scale picture segments. To facilitate such transforms without erasure of repainting the storage tube, the 4112 has been augmented with up to 3000 short vectors of flicker-free refresh capability.

In addition, users can quickly update the screen by utilizing the 4112's new fast paint feature. For example, an integrated circuit mask containing some 26,000 short vectors stored in RAM, can be erased and redrawn on the screen in less than one-half second. A particularly convenient 4112 capability, a by-product of the 4112 refresh capability, is a definable refreshed dialog area. The size and position of this text area can be defined by the user anywhere on-screen at any time. Scrollable by thumb wheel control, it ensures that transactions between the terminal and the host remain clear of the graphics workspace.

To improve the readability of refreshed information, Tektronix has introduced a Color Enhanced Refresh version of the 4112. Instead of displaying the refreshed vectors in the usual green of the DVST display, the 4112 Option 33 highlights the refresh in orange-red. Picture elements subject to transformation remain clearly visible in high-density mapping, CAD/CAM (computer-aided design/manufacturing) and other applications subject to a high degree of interactivity.

On-line, too, 4112 users can look forward to increased productivity and interactivity, thanks to selectable data communications rates as high as 19,200 baud. Tektronix expects state-of-the-art users to immediately exploit the maximum rate to move large amounts of data at highest possible speeds; to other customers, it will offer a long-term standard.

To support the expanded local capability of the 4112, memory capacity has been increased considerably: RAM is expandable up to 80,000 bytes total. Optional single or dual flexible disk mass storage is available with 512K byte capacity per disk.

Compatibility gets attention

Tektronix engineers were particularly attentive in the design of the 4114 to ensure its compatibility with the iconic Tektronix 4014. In this, since its introduction in 1975, has become the world standard in graphics terminals. Virtually all existing 4014-1 applications software will function similarly on the 4114, with modifications required only to gain access to the 4114's advanced features.

There is also commonality between the 4114 and the new 4112 raster terminal.

Peripherals, memory, bus structure, keyboard and data communications interfaces are all identical, so users can transfer their skills and programs from one terminal to another with a minimum of readjustment.

Users will also find complete operation support for the 4114 and the 4112 already in print in the "User's Guide, with Independent Graphics Library (IGL). Existing 4010 Series applications programs based on the PLOT I/O Terminals (702) will run on the 4114 in 4010 Series emulation mode. Appropriate device drivers, special character fonts and segments support can be added as IGL modules.

4114 meets high density needs

Tektronix has introduced the 4114 Computer Display Terminal to meet the increasing high-density graphics need of the engineering and scientific fields. The 4114, an evolution from the popular Tektronix 4010 Series, meets users' need for greater interactivity and reduced host overhead.

The 4114 and its high-contrast counter-part, the 4114 Option 31, are part of the new 4110 Series of intelligent graphics terminals. Base price for the 4114 is $17,500. The 4114 Option 31 Color Enhanced Refresh is priced at $19,500.

"Some of our current graphics customers have reached the point at which the time and cost of communicating with the host computer are the greatest obstacles to productivity," says Mike Kondra (Terminals Marketing manager). "Barley ten years ago, the market hardly knew what to do with high resolution graphics. We can't get it fast enough. That's both a success story and a challenge that we've met with the 4114 and 4112.

The users of the 4114 will benefit from the readability and high information content associated with the 19-inch direct view DVST (direct view storage tube) display. They can take advantage of the vast processing power of host-based computing, while exploiting a number of enhanced throughput capabilities. Most notable is the 4114's capacity for locally retained picture segments, whereby a group of MOVE and DRAW commands can be defined, then stored, recalled and manipulated locally, significantly reducing dependence on the host.

This capability allows an engineer, for example, to define and store on RAM (random access memory) or disk commonly used graphic elements such as symbols, background graphics, piping, valves and symbols code.

Supporting the picture segments feature and further decreasing host dependence are two-dimensional transforms—the ability to locally translate, rotate and scale picture segments. To facilitate such transforms without erasure of repainting the storage tube, the 4114 has been augmented with up to 3000 short vectors of flicker-free refresh capability.

In addition, users can quickly update the screen by utilizing the 4114's new fast paint feature. For example, an integrated circuit mask containing some 26,000 short vectors stored in RAM, can be erased and redrawn on the screen in less than one-half second. A particularly convenient 4114 capability, a by-product of the 4114 refresh capability, is a definable refreshed dialog area. The size and position of this text area can be defined by the user anywhere on-screen at any time. Scrollable by thumb wheel control, it ensures that transactions between the terminal and the host remain clear of the graphics workspace.

To improve the readability of refreshed information, Tektronix has introduced a Color Enhanced Refresh version of the 4114. Instead of displaying the refreshed vectors in the usual green of the DVST display, the 4114 Option 33 highlights the refresh in orange-red. Picture elements subject to transformation remain clearly visible in high-density mapping, CAD/CAM (computer-aided design/manufacturing) and other applications subject to a high degree of interactivity.

On-line, too, 4114 users can look forward to increased productivity and interactivity, thanks to selectable data communications rates as high as 19,200 baud. Tektronix expects state-of-the-art users to immediately exploit the maximum rate to move large amounts of data at highest possible speeds; to other customers, it will offer a long-term standard.

To support the expanded local capability of the 4114, memory capacity has been increased considerably: RAM is expandable up to 80,000 bytes total. Optional single or dual flexible disk mass storage is available with 512K byte capacity per disk.