TEK 4114

Direct view storage tube with local picture segments, 2-D transforms, refresh support and fast redraw. Compatible with the Tektronix 4010 Series.

COMPUTER DISPLAY TERMINAL

New standards of fast graphics throughput. Enhanced user interactivity with reduced host overhead. The 4114 has been designed to satisfy the evolving needs of graphics users for faster, more versatile throughput in high density graphics applications. Its local intelligence and expandable memory can significantly reduce the delays and costs associated with over dependence on the host computer.

The 4114 has been designed to be compatible with the popular Tektronix 4010 Series of computer display terminals. Programs developed for the 4014, for example, may require only minor software revisions —mostly to account for expanded capabilities—in order to run on the 4114. By using the modular device drivers and advanced feature support of the Tektronix PLOT 10 Interactive Graphics Library (IGL), updating existing programs for the new 4114 capabilities is a simple process.

In addition, there is great commonality among all members of the new 4110 Series: project teams can share programs and peripherals while utilizing the 4110 Series terminal best suited for each application's need.

The display: more to see than ever. The 4114 is designed around a 483 mm (19-inch) direct-view bistable storage tube. Its 4096X by

4096Y addressable points (4096X by 3120Y displayable points) provide resolution high enough for the most complex engineering and scientific graphics. The 4114 offers enhanced text display with as many as 16 hardware-generated sizes of stroke upper-and-lower case ASCII characters. A large number of dot-dash line styles and markers, plus rubberbanding capability, simplify graphics development. Thumbwheel-controlled symbols enable easy placement and revision of display elements.

An intelligent evolution of graphics efficiency. Through its advanced local intelligence and its capacity to do much more per host command, the 4114 achieves new standards of productivity. Specific features of this intelligence include:

Local picture segments. A segment is a group of graphic primitives describing a portion or segment of a picture, retained as a unit in local memory to be redrawn or manipulated at any time by using the 4114's local "segments" capability. Also, eight programmable function keys are provided for user-definable functions that may be used locally.

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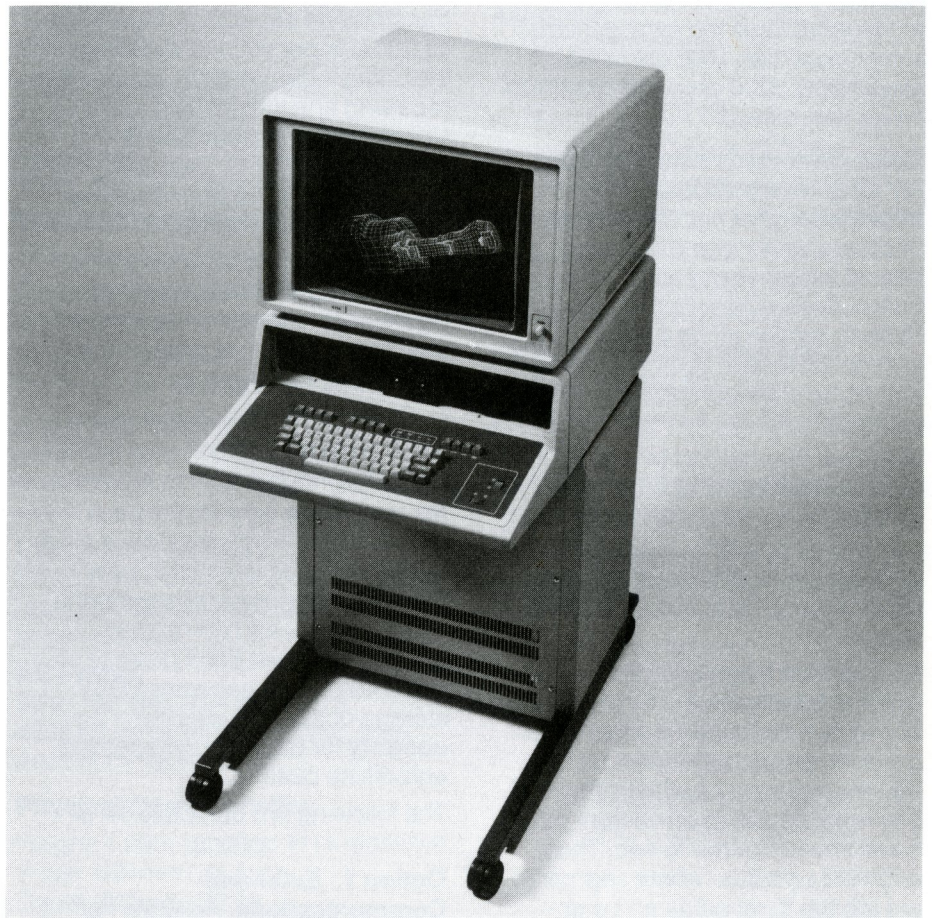
Schematic components, symbols, titles and text can be defined as segments, then stored and recalled, without requiring a string of commands from the host for each new step. The result is a vast reduction in the volume and cost of communications traffic.

2-D transforms. Local segments can be rotated, scaled or translated (moved around the screen), with only a simple command from the host to initiate the process.

Refresh support. Enhancing the 4114 capability is the local generation of more than 1500 cm or approximately 3000 short vectors of flicker-free refresh.

Color enhanced refresh option for easy recognition of refresh information. For high density applications and those with a great deal of refresh manipulation, Tektronix offers a Color Enhanced Refresh version of the 4114. In this version, all refresh vectors appear in amber, for clear contrast with stored vectors.

Memory. Standard 4114 memory includes 32K bytes of RAM and 56K bytes of ROM. RAM memory is expandable up to 800K bytes total, permitting a tremendous amount of information to be available as local segments.

Fast redraw augments the powers of local intelligence. The redrawing of displays contained in local memory is no longer dependent on communications baud rate. For example, 26,000 short vectors may be redrawn in under ½ sec. Thus, segment updates (where segments are too big to refresh) can be accomplished with very minimal delay and host involvement.

Definable, refresh dialog area. A particularly convenient feature of the 4114, the dialog area lets the user define the size and location of a scrollable dialog area—all in refresh. This area can be redefined and repositioned at any time, assuring that host-terminal data traffic need never clutter the graphics workspace.

Communications: faster rates, streamlined features. Host communications costs can be further reduced by the 4114's high-speed transmission capability: from 50 to 19,200 bits per second sustained, including independently specifiable receiving and transmitting rates. Communications interface is standard RS-232-C. Data are standard seven-bit asynchronous serial ASCII, plus parity bit.

A flagging feature allows both the terminal and the host computer to signal each other when to start and stop transmission, to prevent overflowing the input queues.

For better error detection and automatic retransmission of data blocks, a block mode option is available.

Mass storage option. Single or dual integral flexible disk drive mass storage may be specified, for convenient local storage of segments, fonts, macros, and completed graphic displays. Each diskette offers a 494K byte capacity. Mass storage option includes the capacity for background spooling and offline plotting.

The following is a complete list of available 4114 options:

Option 1. Extended Communications. Includes half-duplex and block mode.

Option 2. Current-Loop Interface. Converts input and output terminal processor card signals from RS-232-C signal levels to 20-milli-ampere current-loop signals.

Option 4. Special Keyboards. These provide the keyboard and firmware for specific language requirements, including United Kingdom (option 4A), Swedish (Option 4C), APL (option 4E), and Danish-Norwegian (option 4F).

Option 10. Three-Port Peripheral Interface. A single interface with three RS-232 connectors and associated firmware that permit the terminal to be used with a plotter, printer or other RS-232-C device, without that device being placed between the terminal and the host computer. Also enables background spooling.

Option 13. 11″ × 11″ Graphic Tablet with pen.

Option 14. 30″ × 40″ Graphic Tablet with pen. Include controller, tablet and interface. They allow easy, accurate digitizing of virtually any graph or drawing with pen point, one-button or four-button cursor. These tablets represent a two-fold increase in accuracy over previous tablets. Note that these tablet options are compatible with 4110 Series terminals only. Other graphic tablets are not compatible with the 4110 terminals.

Option 24. Additional 32K bytes of RAM.

Option 25. Additional 64K bytes of RAM.

Option 26. Additional 96K bytes of RAM.

Option 27. Additional 128K bytes of RAM.

Option 28. Additional 256K bytes of RAM.

Option 29. Additional 512K bytes of RAM.

Option 31. Color Enhanced Refresh.

Option 40. Ten-Slot Peripheral Bus Extender. Nominal line voltage.

Option 41. Ten-Slot Peripheral Bus Extender. 90-110V line voltage.

Option 42. Single Flexible Disk and Disk Controller.

Option 43. Dual Flexible Disk and Disk Controller. Flexible disk units and controller provide the convenience and security of local removable mass storage media with up to 494K bytes of user file storage per diskette. The diskettes may be formatted to optimize the directory size to maintain from 368 to 1872 user files. Each file is referenced by name which may be from one to nine characters long.

Option 52. Specify Voltage and Hz.

Option A1 — 220V/16A 50 Hz operation. Universal Euro Plug.

Option A2 — 240V/13A 50 Hz operation. UK Plug.

Option A3 — 240V/10A 50 Hz operation. Australian Plug.

Option A4 — 240V/15A 60 Hz operation. North American Plug.

All options and displays will be set for 50 Hz operation when these options specify 50 Hz.

Specifications

Display

Medium: Direct view storage tube

4096 by 4096 addressable points;
4096 by 3072 displayable points;
Enhanced refresh;
Fast redraw

Display Area:
368.3 mm (14.5 in) by
276.9 mm (10.9 in) high

Keyboard

Normal Keyboard:
72 typewriter paired upper and lower case, programmable and auto repeating, (five lighted);

Eight user-definable programmable function keys

Other Controls:
Thumbwheels to control graphic cursor
Audible bell alarm

Alphanumeric Mode

Standard Character Set:
Full ASCII set of 94 displayable characters, or 128 displayable characters in "snoopy mode."

Optional Character Sets:
APL (Option 4E)
United Kingdom (Option 4A)
Swedish (Option 4C)
Danish/Norwegian (Option 4F)
User Definable (Option 4G)

Character Format: stroke

Graphics Mode

Addressability:
4096 by 4096

Graphic Command Syntax:
PLOT 10 compatible

Line Types:
Solid, dashed, defocused

Drawing Speed (Storage):
134 meters per second

Drawing Speed (Refresh):
537 meters per second

Graphic Primitives:
Vectors, user defined text, etc.

Interactive Graphics:
Thumbwheels control graphic cursor; keys control scrolling and alpha cursor position.

Computer Interfaces

Basic data communications interface, EIA RS232C compatible, full- or half-duplex.

AC Power

90 to 132 VAC, 11A maximum, 48 to 62 Hz or 180 to 250 Vac, 5.5A maximum, 48 to 62 Hz

Physical Characteristics

Height: 1.29m (51 in)
Width: 597mm (23.5 in)
Depth: 813mm (32 in)

Weight:
107.5 kg (237 lb)

Companion Products

4611 Hard Copy Unit
4631 Hard Copy Unit
4662 Interactive Digital Plotter
4663 Interactive Digital Plotter

Software

PLOT 10 Software provides access to proven graphics software. Existing 4014 applications programs that use Terminal Control System (TCS) will run on the 4114 in emulation mode. New applications programs that take advantage of the advanced features of the 4114 use PLOT 10 Interactive Graphics Library (IGL).

Graphic Tablet Characteristics
(Options 13 and 14)

Proximity Distance:
Data will be stable if pen stylus or cursor is held stable within 3.97 mm (0.156 in) of tablet surface.

Proximity Area:
Option 13: 280 by 280 mm (11 by 11 in)
Option 14: 760 by 1020 mm (30 by 40 in)

Resolution:
.127 mm (0.005 in)

Accuracy:
+ .025 mm (0.010 in)

Repeatability:
+ .127 mm (0.005 in)

Dimensions of Option 13 Tablet:
Active surface is 279 mm wide by 279 mm high (11 × 11 in)

Dimensions of Option 14 Tablet:
Active surface is 1.016 m wide by 762 mm high (30 by 40 in)

Flexible Disk Characteristics
(Options 42 and 43)

8 inch single-sided double-density diskette.

IBM compatible soft-sectored recording format.

Cyclic redundancy checking and automatic data recovery retry for reliability.

Direct memory access.

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