# TEK 4115B

**High-performance color with unparalleled resolution and speed. Featuring digital convergence, up to eight work surfaces, local zoom and pan and compatibility with 4010, 4100 and 4110 Series hardware and software.**

# HIGH PERFORMANCE COLOR GRAPHICS TERMINAL



**The Tektronix 4115B high resolution Computer Display Terminal combines high-performance graphics with unmatched display quality.**
The high speed 4115B display controller redraws a high density mechanical drawing or typical gate array design in less than a second. With its 32-bit coordinate space, optimally converged display, and up to 256 simultaneously displayable colors, the 4115B extends the leading edge of graphics display.

In addition, the 4115B offers all the powerful local graphics functions of the Tektronix 4110 Series—including local picture segments and true zoom and pan. The high performance terminal answers the stringent demands of graphics users performing high density applications, from integrated circuit design to mechanical design and mapping.

**Unsurpassed display resolution.**
The 4115B's 483mm (19-inch) raster-scan display achieves unparalleled line quality with resolution of 1280×1024 pixels. Superior visual resolution is further enhanced by a precise contrast ratio; by low reflection and low glare, maintained via a neutral-density filter, and by exact control of display convergence. A 60 Hz non-interlaced refresh rate also assists display clarity and productivity by greatly reducing flicker and resultant eye fatigue.

**Digital Convergence**—Consistently excellent color and resolution are assured by Tek's integrated digital convergence technique. Convergence is controlled to within 0.3 mm over the entire display area, resulting in sharp characters and lines, even in the corners.

**Autoconvergence.** Tek's autoconvergence option automatically corrects the natural drift that occurs in the alignment of the color writing beams in the CRT. Technical skills are not required to achieve optimum convergence.

**Multiple bit planes.** Users can work with up to eight separate display surfaces, each containing a full complement of pixels (1280×1024). This permits the manipulation of data as "layers," with user control over visibility, useful in multi-layer applications such as IC and printed circuit board design.

The multiple bit planes feature also allows the user to simultaneously display up to 256 colors—from a palette of 16 million colors—for such uses as smooth shading of solid objects.

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**Scrollable dialog areas.** Menus, communications dialog and other alphanumeric data can be directed to a separate dialog area of user defined proportions, and scrolled, so text does not interfere with the graphics portion of the display. Alphanumerics data can be displayed as 34 rows of 80 characters or 64 rows of 160 characters in multiple colors. ANSI X3.64 characteristics have been implemented for cursor and text manipulation.

**Instantaneous response.** An 8086 CPU and 8087 co-processor are teamed with a bipolar bit-slice graphics processor to yield fast response times: a typical graphics image of 50,000 vectors can be drawn in less than a second. Panel-fills can be accomplished at a rate of 10,000 rectangles per second. Large rectangular areas may be color filled at a rate of 125 million pixels per second.

**19.2K data transmission.** Communication of PLOT 10 graphics commands between host and terminal can proceed at a sustained rate of 19.2K baud unflagged over a standard RS-232-C interface. The 4115B optionally supports Direct Memory Access (DMA) communications with host computers. Data transfer rates up to 1M byte per second are achieved at distances up to 1000 feet.
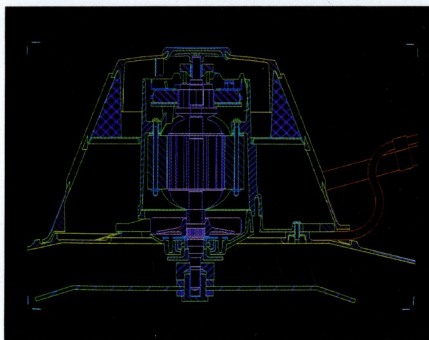
**Expanded addressability.** A 32-bit device coordinate space offers addressability of up to 4 billion × 4 billion points. Addressability is user selectable, ranging from 12 to 32 bits, for compatibility with existing 4110 Series software. To make full use of its addressability, the 4115B includes local true zoom and pan functions, enabling the user to isolate and display at maximum resolution any detail within the entire coordinate space.

**4110 Series/PLOT 10 compatible.** The 4115B is fully supported by the Tektronix PLOT 10 Interactive Graphics Library (IGL), and is designed for ease of integration with other 4110 Series terminals and with software available from other sources. Among the other 4115B features common to the 4110 Series, are:

■ **Local picture segments.** User-defined picture elements can be stored in local memory, then



M4115B's separate display, keyboard and processing modules offer flexibility in configuring workstations.







4115B's high resolution meets the stringent demands in such applications as mechanical design, IC design and mapping.
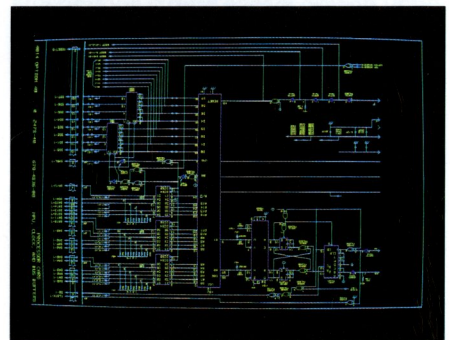
recalled, scaled and positioned as needed. Figures, symbols and text can be defined in up to 32K segments.

■ **Multiple viewports.** The viewing window can be divided into as many as 64 viewports, with separate zoom and pan for each, and placed anywhere on the display.

■ **Panel-fill, patterning, and 2-D image transformations.** These local dynamic capabilities can be easily performed directly from the keyboard. A versatile algorithm provides highspeed fill of arbitrary polygons. In addition to color and 16 predefined fill patterns, the user can also define fill patterns.

■ **Dialog area text manipulation.** ANSI X3.64 characteristics include cursor steering, character underline and blink, and alternate colors.

Applications programs developed on other 4110 Series terminals utilizing these features may be easily transferred to the 4115B.

**Tek's 4691 Color Graphics Copier provides color output at the push of a button.**

**Standalone processing.** A separate 4110 Series Local Programmability package provides the power to develop and execute programs, to access terminal graphics firmware, and to control peripherals locally. Local Programmability includes a CP/M-86®* operating system, assembly or high level language compiler, utility programs and terminal interface subroutines. In addition, a local version of PLOT 10 IGL and FORTRAN 86®** are available to run under CP/M-86.

**Color copier.** The optional color copier interface provides plug compatibility with the high performance Tektronix 4691 Color Graphics Copier, a push button, ink-jet device with 150 dots per inch resolution. The 4691 copier can be multiplexed to as many as four 4115B's or driven by the host. The 4115B can also interface with the Tek 4634 Monochrome Copier. Both the color copier and Tek 4662 and 4663 digital plotters may be driven in a background mode while the user proceeds with the graphics application.

**Configuration flexibility.** The 4115B can be configured either as a pedestal unit with detached low-profile keyboard or ordered as M4115B with separate display, processing, and keyboard modules for flexibility in configuring workstations. Local memory can be expanded to 800K bytes of RAM. Mass storage is available in combinations of single or dual flexible and Winchester disk drives.

## Ordering Information

Standard with the 4115B Computer Display Terminal or M 4115B modular configuration are:

—Low profile, detached keyboard
—483 mm (19 in) raster-scan display
—0.3 mm digital convergence
—4 bit planes (16 displayable colors from a palette of 16 million)
—Scrollable, alphanumeric dialog area with 64 lines of 160 characters or 34 lines of 80 characters
—32 bit coordinate space
—8086 Intel CPU with 8087 co-processor
—288K user memory
—RS-232-C communications
—Monochrome copier interface

Standard accessories include:
Host programmer's Reference Manual
Operator's Manual
4110 Series Command Reference Manual
2 power cords
6 keyboard overlays
Display cables and RS-232-C cable

**Options:**

| | | |
|---|---|---|
| Opt. | 01 | Extended Communications Interface |
| Opt. | 02 | Current Loop Interface |
| Opt. | 2A | Additional 256K Bytes RAM with ECC |
| Opt. | 2B | Additional 512K Bytes RAM with ECC |
| Opt. | 3A | DMA Interface for DEC VAX Computers |
| Opt. | 3B | 30 Foot Cable for Opt. 3A (must be ordered separately) |
| Opt. | 4A | United Kingdom Keyboard |
| Opt. | 4C | Swedish Keyboard |
| Opt. | 4F | Danish/Norwegian Keyboard |
| Opt. | 4K | Katakana Keyboard |
| Opt. | 09 | 4691 Color Graphics Copier Interface |
| Opt. | 10 | Three-Port Peripheral Interface |
| Opt. | 13 | Graphic Tablet—11 × 11 in |
| Opt. | 14 | Graphic Tablet—30 × 40 in |
| Opt. | 22 | Additional 2 Planes Display Memory |
| Opt. | 23 | Additional 4 Planes Display Memory |
| Opt. | 28 | Additional 256K Bytes RAM |
| Opt. | 29 | Additional 512K Bytes RAM |
| Opt. | 31 | Autoconverged Display |
| Opt. | 42 | Single Flexible Disk and Controller |
| Opt. | 43 | Dual Flexible Disk and Controller |
| Opt. | 45 | Mass Storage Interface |
| Opt. | A1 | Universal European Plug—220V/16A 50 Hz Operation |
| Opt. | A2 | United Kingdom Plug—240V/13A 50 Hz Operation |
| Opt. | A3 | Australian Plug—240V/10A 50 Hz Operation |
| Opt. | A4 | North American Plug—240V/15A 60 Hz Operation |
| Opt. | A5 | Switzerland Plug—240V/6A 50 Hz Operation |

**Compatible Peripheral Products**
4691 Color Graphics Copier
4634 Hard Copy Unit
4662 and 4663 Interactive Digital Plotters
4926 10MB Hard Disk

Some of the products, options and services mentioned in this brochure are not available outside the USA. Contact your local Tektronix representative for details.

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