Tektronix' Articles of Incorporation

State of Oregon

CORPORATION DEPARTMENT

STATE OF OREGON 1859

Certificate of Filing Articles of Incorporation

To All to Whom These Presents May Come, Greeting:

Know Ye, *That whereas* MELVIN JACK MURDOCK, CHARLES HOWARD VOLLUM, GLENN LELAND McDOWELL and MILES WILLIAM TIPPERY

having presented Articles for a Corporation organized and formed for profit under and pursuant to the Laws of the State of Oregon, and paid the organization and annual license fees in accordance with the Corporation Laws of the said state, providing for the licensing of Domestic Corporations:

Now, Therefore, I, Maurice Hudson, *Corporation Commissioner of the State of Oregon, DO HEREBY CERTIFY that said Articles of Incorporation have been filed in the office of the Corporation Commissioner; that the name assumed by said corporation is*

TEKRAD, INC.

On January 2, 1946, the founders of Tektronix filed Articles of Incorporation with the state of Oregon. However, soon the name for the company, "TekRad", was found to be confusingly similar to a trademark already registered by a California company. In an amendment recorded on February 4, 1946 the company was renamed "Tektronix".

Glenn McDowell would take ownership of Hawthorne Electronics, a retail company established to provide revenue in the early days, in exchange for his shares. Miles Tippery left the company in 1953 due to bad health.

Tippery, who was the source for both names, said deciding what to call the company was surprisingly one of the most difficult tasks they faced in getting started. "Tektronix" was unique, copyrightable and unmistakably indicated the nature of their "technical", "electronics" business.


HAPPY HOLIDAYS
I ♥ MY
diet Coke


TYPE 611
STORAGE DISPLAY UNIT
ERASE
VIEW
THE WIZARD OF IDD
TEKTRONIX, INC.

Jack Murdock's Store

When Jack Murdock graduated from Portland's Franklin High School in 1935, his father offered him two opportunities: he would either fund a college education or provide seed money to open a business. Jack chose the latter, establishing an appliance and radio store on Foster Boulevard in SE Portland. Even though it was during the depths of the Great Depression, he made the business work.

When Jack needed a person to take over the radio repair business so he could devote his full time to sales and management, he hired a Reed College physics graduate named Howard Vollum. This was the start of a more than thirty-five year friendship that laid the foundation for the creation and success of Tektronix.

Photos courtesy of the M.J. Murdock Charitable Trust.

vintageTEK museum

4027 TEKTRONIX

Full Color Graphics and Alphanumerics PLOT 10 Compatible

Color Graphics Terminal

Adding a color dimension to graphics. The 4027 Color Graphics Terminal is a compact, high performance computer terminal with a raster scan display. It has the unique capabilities of scrolling graphics and alphanumerics, with the added feature of color.

All the colors needed. Colors are selected from a 64 color palette with up to eight colors displayed simultaneously on the screen. The 4027 uses the hue, lightness, and saturation method for specifying color. Newcomers will find this method easy to grasp.

Features of the 4027 include coloring vectors, characters, symbols, and filling polygons. The firmware enables another color to border the polygon. When filling polygons, the 4027's firmware allows selection of up to 120 different user-definable patterns or color combinations for special applications. Having these capabilities available in firmware enables much more efficient memory use than if it were part of the host software and less communication time.

Easy-to-use graphic software. For representing data graphically the 4027 uses the same functional Tektronix PLOT 10 Easy Graphing host software as the 4025 Computer Display Terminal with the added feature of color. Easy Graphing offers support for up to six curves or colored bar charts, line graphs with special symbols and dashed lines, legends, titles, and grids.

For more general color graphic applications, Tektronix offers the new host PLOT 10 Interactive Graphics Library. IGL is a highly modular package offering all the support commonly required in graphic applications. PLOT 10 IGL is upward and downward compatible with the full line of Tektronix graphic display terminals.

Graphic input. Graphic input capability consists of a graphic crosshair cursor controlled by graphic cursor keys. In addition to reporting the coordinates back to the host, the terminal also reports the color of the designated coordinate.

As with the 4025, Tektronix' virtual bit map technique allows scrolling of color alphanumerics and graphics on the 4027. This same technique enables definition of multiple graphic regions for easy recall from local memory.

The standard video signal output allows connection of the 4027 to external video displays for group viewing and presentations.

A grayscale representation of the 4027 color display can be made with a Tektronix 4632 Video Hard Copy Unit. For detailed, camera-ready color copies of graphs and alphanumeric data, choose the Tektronix 4660 Series of interactive digital plotters.

4027 interface options include standard full duplex, half duplex, current loop, polling interface and IBM 3270 compatible polling controller.

And alphanumeric, too. In addition to graphic capabilities, the 4027's extensive alphanumeric capabilities include full ASCII, special and user-definable character sets, and 34 rows of 80 characters.

Contact your local Tektronix Sales Engineer today for more information on the versatile 4027 Color Graphics Terminal.

Picture Drawing

1. Sin X/X	11. Nebula	21. Grinch
2. Gothic Font	12. Fireworks	22. Tek 465
3. Wheel Section	13. Solar System	23. Rocket
4. Dish Antenna	14. Dragon	24. Death Star
5. Cooling Tower	15. Mickey Mouse	25. Laser Cannon
6. World Map	16. Tek Bug	26. Bump
7. Balloon	17. Snoopy	27. Eagle
8. 3D Wave	18. Wizard	28. 3D Plot
9. Bouncing Ball	19. R2D2	29. Darth Vader
10. Billiards	20. Cheshire Cat	30. Complex Curve

The following User Definable Keys are available:

1. Repeat Current Drawing
2. Change mode of current Image and redraw:
   (DOTS -> VECTORS or VECTORS -> DOTS)
3. Draw next picture
5. Repaint menu
11. Go to next demo (Music)

Stop program and press AUTO LOAD to go to Main Menu.

Enter the number of the drawing you would like or press
RETURN to have them drawn automatically ?

The Hawthorne Plant

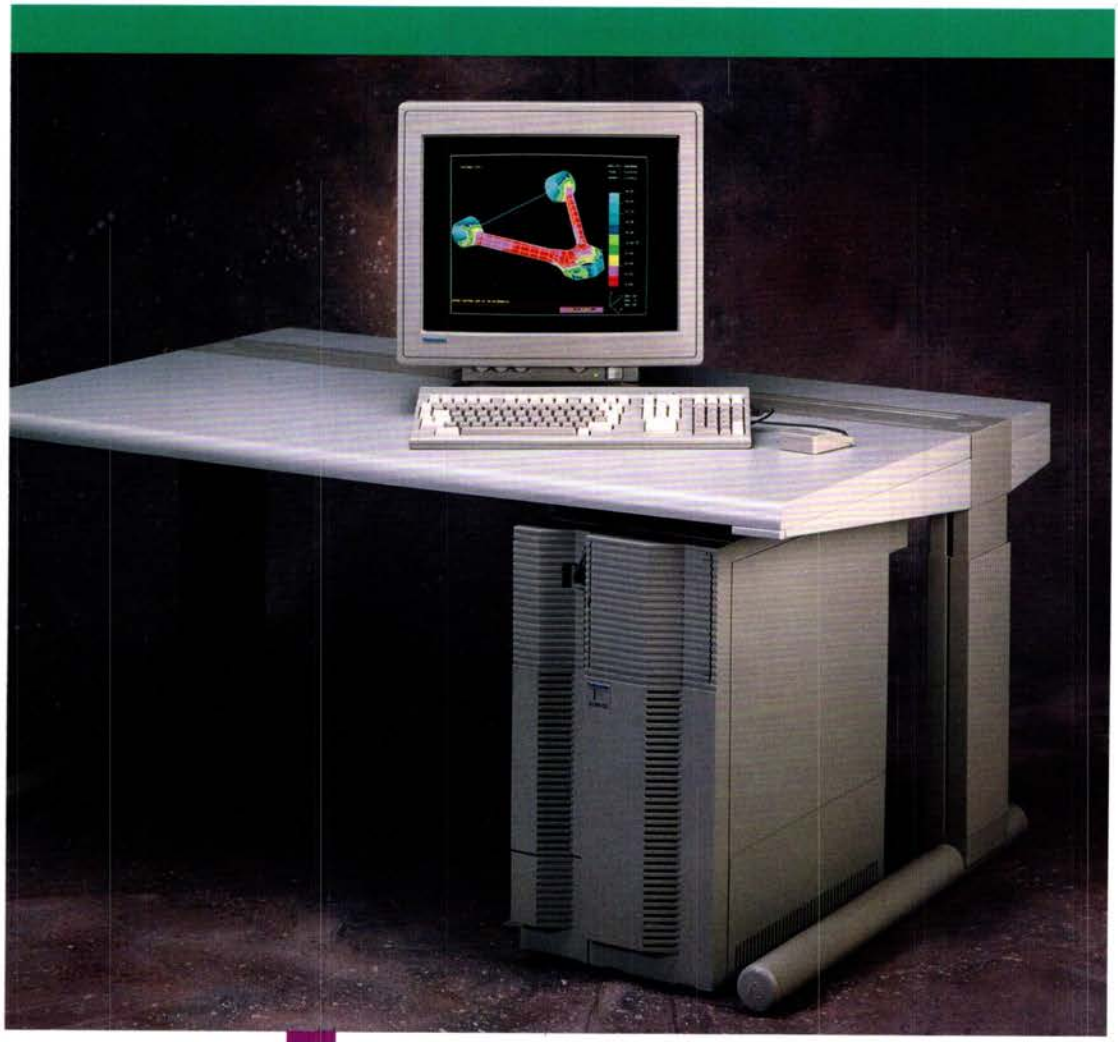
Tektronix' first home at SE 7th and Hawthorne in Portland was occupied starting in May, 1947. The building was constructed to Howard Vollum and Jack Murdock's specifications. Tektronix occupied the upper floor and the back half of the lower floor. The rest of the first floor housed the retail part of the early business, Hawthorne Electronics. The building is still in use today.

As demand for Tek products increased and the workforce grew to three production shifts, the building became cramped and parking was a serious problem. The company moved to new quarters on the Sunset Highway in 1951.

The lower photograph shows the manufacturing line for Tek's first oscilloscope product, the 511.

Tektronix XD88/20

2D Graphics Superworkstation



- **17 MIPS compute performance**
- **90,000 2D vectors per second**
- **UTek™ V—enhanced UNIX® System V**
- **X Window System™ Version 11 plus full Tek graphics window**
- **PC AT™ emulation**

Screen display courtesy of EMRC.

Powered by Tek's integrated twin-engine architecture—with the Motorola® 88000 RISC processor compute engine and Tek's high-powered graphics engine—Tektronix' XD88/20 Superworkstation delivers outstanding application throughput for demanding 2D graphics requirements. Computing performance of 17 MIPS and drawing speeds of 90,000 2D vectors per second make the XD88/20 the industry's price/performance leader for high-end 2D applications in such fields as mechanical engineering, technical data analysis, AEC, earth resources management, and graphics software development.

The workstation's 88000 processor operates at 20 MHz, includes on-chip integer and floating-point support, and provides 64 KB of high-speed cache memory through four CMMUs (four more optional). Tek's four-way memory interleaving and Futurebus architecture keep the processor pipeline full, and a high-speed SCSI interface minimizes the traditional bottlenecks often associated with disk I/O.

The system comes standard with a 156 MB hard disk and 150 MB streamer tape. Options include up to 176 MB of system memory, a flexible disk drive, a 300 MB hard disk, and one or two 600 MB hard disks.

The Industry's Best Graphics. The XD88/20 delivers the power of Tek's advanced graphics with features such as segments, true zoom and pan, multiple surfaces, a scrolling dialog area, and user-definable markers.

The workstation's 16-inch monitor—or optional 19-inch monitor—provides crisp, clear images with 1280 × 1024 addressability and 256 simultaneously displayable colors from a palette of 16.7 million shades. Tek's new hue-value-chroma (HVC) perceptual color model aids in precise color definition.

The Security of Standards. The XD88/20 Superworkstation implements accepted industry standards. System software includes UTek V, Tek's enhanced UNIX operating system. A full System V implementation, UTek V also incorporates a variety of Berkeley extensions, including the Fast File System, sockets, and C-shell. UTek V complies with the POSIX, SVID, and FIPS standards.

Tektronix®
COMMITTED TO EXCELLENCE

From the graphics leader

25-inch Graphics. The tool the innovators asked for. From the one company with the tools to build it.

The 4016-1 can be optionally configured as a local digitizing station in conjunction with Tektronix graphic tablets and local storage devices. The user can digitize graphics data into a buffered tablet file with local editing capabilities. Plot courtesy of McDonnell-Douglas Automation Company. (Land system).

We designed the 4016-1 for professionals at the frontiers of graphics.

For years, they've relied on Tektronix graphics for unmatched resolution and information capacity. Now that they're ready to explore bigger and better ideas, we're ready with a 25-inch display.

Interact with more graphics than ever before.

Now customers in network modeling, mapping, IC design and other disciplines can design and preview complete plots of virtually unlimited complexity. They can choose from four sizes of alphanumerics and display as many as 15,000 characters at once, using a 174 character per line format.

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High performance graphics is all part of the family.

You'll find, too, that in software and communications support, the 4016-1 is thoroughly compatible with the rest of our 4010 graphics family, allowing an easy upgrade to 25-inch graphics. Add local graphics transformations and circle generation. Local symbol design. Hard copy capability. Select from a full complement of intelligent peripherals like tape and disc storage, B- and C-size plotters.

From 25-inch graphics on down, we'll show you performance, software, and service at the top of its class. For more information, call our toll-free automatic answering service at 1-800-547-1512 (Oregon residents call 644-9051 collect). Or contact your local Tektronix office.

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Tel. 020-471146

Tektronix®
COMMITTED TO EXCELLENCE

Tek's First Product

Tek's first product was not an oscilloscope. While Howard Vollum was finishing the design of the 511 oscilloscope, in 1946 Tektronix offered a less complicated product in order to gradually ramp up production capability. Howard had designed a square wave generator to calibrate his oscilloscope so the "Type 101 Video Calibrator" was introduced as Tektronix' first product.

They built a total of ten instruments and sold exactly…none. Tek's first product was a complete flop.

Fortunately, that was to change in a big way.

The Inside Story

"Service to the markets, more than any single innovation, has maintained our graphics leadership."

At Tektronix, we're famous for quality assurance. And we're also famous for value assurance: that means a commitment to adapting graphics to the needs of the customers we address. And to anticipate their future needs.

You see part of that commitment demonstrated here. In low cost graphics. High information density. Simple alphanumeric and forms ruling. Local intelligence. Color. Software. Peripheral support and service.

From business and scientific graphing to complete graphic computer systems, our product development is a mutual process: As our customers demonstrate new needs, we continue to develop solutions. On the following pages you'll see where the graphics market, and thus the graphics leader, are heading.

Alphanumerics and graphics in a low-cost, ruggedized computer display terminal.

The right-tool-for-the-job philosophy is a good one. That's why the TEKTRONIX RE4012 Computer Display Terminal makes sense in military system applications. Here are sound reasons why the RE4012 is the right tool for your job:

GRAPHICS

Instead of just showing line after line of alphanumerics for area, height, speed, barometric pressure and other factors, the RE4012, alone, can also present the subject graphically. A picture is worth a thousand words to the operator—especially if he must provide a fast and accurate analysis. With pictures of coordinates, weather fronts, graphs and maps, he'll be able to understand and interpret much faster than with alphanumerics alone. And in most military applications speed and accuracy can mean the difference between winning and losing.

REFRESHED MODE

Stored and continually refreshed information can be displayed simultaneously on the RE4012 using the optional "write-thru" capability. Images can be superimposed, moved, enlarged, rotated and deleted from any desired data base image. And up to 40 characters can be displayed in this mode with negligible flicker.

ALPHANUMERICS

The RE4012 offers complete alphanumerics through the use of a full 128 character ASCII keyboard. There are 74 characters to each of 35 lines for a total of 2590 characters shown on the display.

RESOLUTION

Clarity is built into the RE4012. The 11-inch display (measured diagonally) features 1024 x 1024 addressable point locations and 780 x 1024 viewable point locations.

CONSTRUCTION

The RE4012 is built tough on the inside as well as the outside, but it still weighs in at only 80 lbs., and it's small enough to fit through a 25-inch hatch. It is also built for operator safety, having met the requirements of MIL-S-901C. Plus it has been designed with the same quality that has made Tektronix world famous for its graphic and alphanumeric equipment.

APPLICATIONS

The RE4012 opens up possibilities for both new and refined activities of a military nature including aircraft and vessel surveillance, weather monitoring, air traffic control, navigation and much more. Not only does the RE4012 offer to expand these operations but promises to do it at a lower cost than some alphanumeric-only terminals. The following examples show how the RE4012 can dovetail with your application requirements.

At Sea

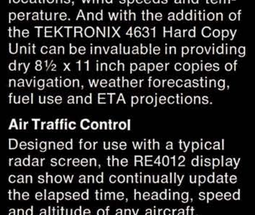
As an on-board navigation aid the RE4012 can provide graphic representation of sea-bottom topography based on sonar pulses.

Weather

The RE4012 can also display graphically isobars, cyclone headings, storm front and cold front locations, wind speeds and temperature. And with the addition of the TEKTRONIX 4631 Hard Copy Unit can be invaluable in providing dry 8½ x 11 inch paper copies of navigation, weather forecasting, fuel use and ETA projections.

Air Traffic Control

Designed for use with a typical radar screen, the RE4012 display can show and continually update the elapsed time, heading, speed and altitude of any aircraft.



Tracking

By superimposing a "refreshed" symbol representing an aircraft on a "stored" map (the optional write-thru mode), the RE4012 can graphically display the direction and location of an aircraft. In addition, these characteristics and more can be displayed alphanumerically and continuously updated. This technique may be applied to the trajectory parameters of artillery projectiles, missiles, spacecraft and satellites as well as aircraft.

Converting Raw Data To Graphics

The RE4012 is designed to convert raw alphanumeric data into X-Y coordinates for maps, charts, plots and diagrams. And that makes for easier interpretation and communication in all applications. But the real significance of the RE4012 graphics capability is that important data processing can now be tackled in rugged military environments.

Topography

Topography can be studied in detail with the window feature. By using the cross-hair cursor to frame a specific area of a large scale map that area may be enlarged to any scale desired.

DESIGNED ESPECIALLY FOR RUGGED ENVIRONMENTS

The tough-built RE4012 offers its alphanumeric and graphic talents in flying weather stations, airborne command posts and mobile computer systems. On land, sea and air this terminal helps any system visibly sharpen its reflexes as well as extend the use of existing technology.

THE COST: NO MORE THAN ALPHANUMERICS ALONE

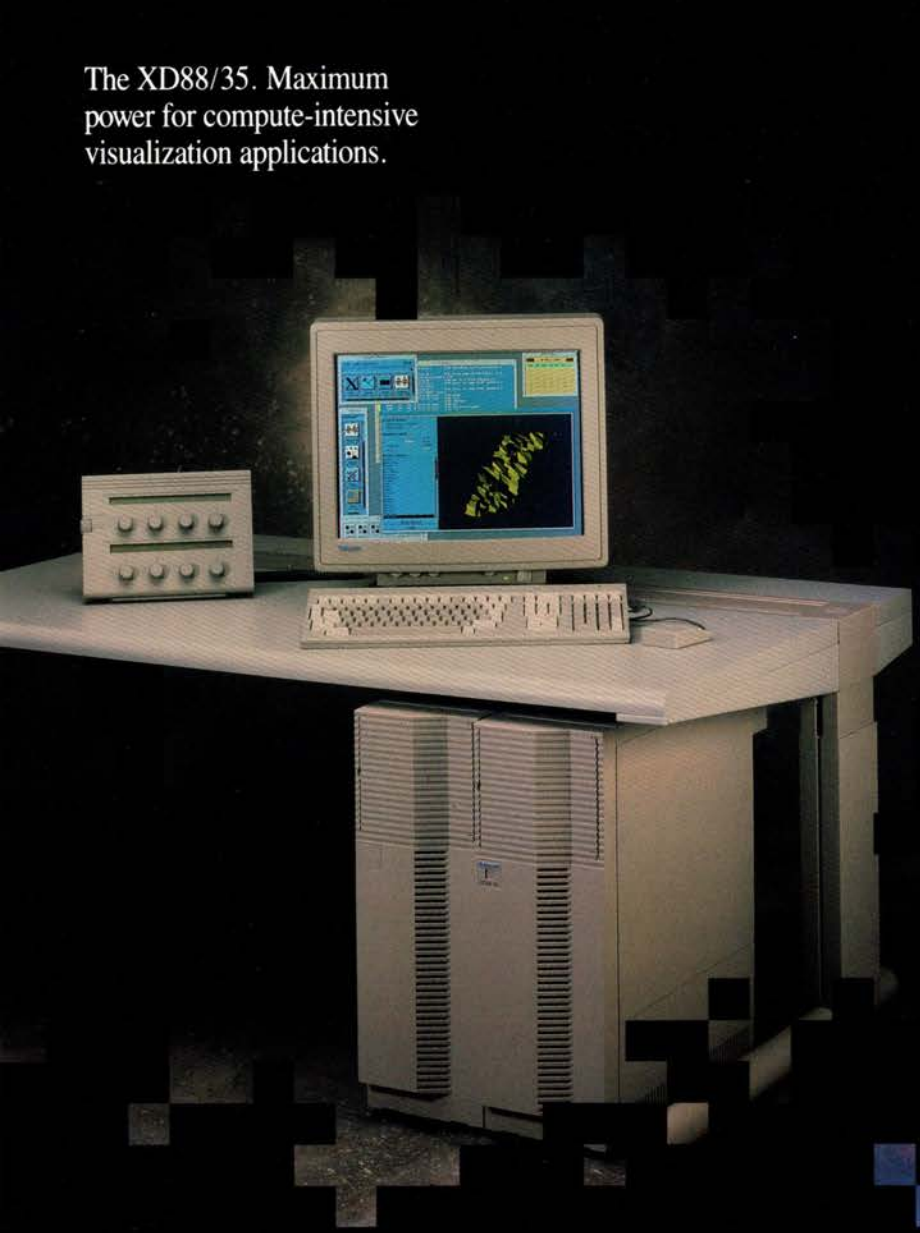
The RE4012 price is actually less than most ruggedized computer display terminals that offer only alphanumerics. Tektronix makes low-cost possible by the same dedication to simplified circuitry and advanced production technology that have made our oscilloscopes world-famous for over a quarter century.

Existing systems are easily updated, due to the RE4012's flexible interfacing and minimal software requirement for converting existing data bases to RE4012 graphics.

DYNAMIC VISUALIZATION. THE NEXT STEP.

TEKTRONIX XD88 SUPERWORKSTATIONS

The XD88/35. Maximum power for compute-intensive visualization applications.



The XD88/30. Your best value for high-performance 3D graphics, animation, imaging, and video.

The XD88/10. Low-cost superworkstation performance for the desktop.

PLOT 10 TEKTRONIX

Software for the family of Tektronix Information Display Products

Easy Graphing

Graphs play a vital part in any business operation. Tektronix PLOT 10 Easy Graphing can become an equally vital tool in the decision-making process.

PLOT 10 Easy Graphing is functional, simple, effective. Functional, because it is software that can be put to work in virtually any department. Simple, because it is designed with the nonprogrammer in mind. Effective, because it precisely illustrates facts and clarifies trends and relationships which may not be recognizable in voluminous computer output.

The standard PLOT 10 Easy Graphing package offers support for up to six curves of shaded bar charts, line graphs with special symbols and dashed lines, legends, titles, grids, hard copy, plotter control, and much more.

Combine Easy Graphing with Tektronix Information Display Products, and you can expect graphic presentations of boardroom quality. Whether you present your report directly on the screen of a 4010 or 4020 series terminal, distribute clear hard copy output, or project overhead transparencies, the result is a crisp clear picture that instantly communicates.

Our 4662 Interactive Digital Plotter, powered by Easy Graphing, will give you multi-color graphs on paper, or on acetate or Mylar® for overhead projection.

No programming is necessary. With its English language command structure, Easy Graphing is designed for those who have had little or no previous programming or graphing experience. Anyone can be using Easy Graphing after a brief perusal of the User's Manual. Most people will find that our Quick Reference Card is all that is required to produce shaded bar charts, multi-line graphs, pie charts, or color plots in camera-ready form.

It makes computer graphics about as easy to command as an office typewriter.

For those with programming experience, commands are provided to call user-written subroutines for customized graphical displays or for unique data handling requirements. Commands and data may be "Saved" between sessions.

Easy Graphing goes up easily on almost any computer. It is written in ANSI standard FORTRAN IV. The standard package typically occupies only 16K words on a 16-bit PDP-11 computer, or 77K bytes on an IBM 370. Even large time shared systems will appreciate its compact design.

Easy Graphing's special add-on options, described below, maintain our concern for a small, efficient package for graphical data representation. Ask your local Tektronix Sales Engineer for complete price and performance details on all PLOT 10 software products.

Options:

Display Manager. Adding approximately 3.5K (16 bit words) to the standard package, this option offers

4641 TEKTRONIX

Compatible with 4051 BASIC Graphic Computing System

Matrix Printer

Printed output from a thoroughly dependable package. The TEKTRONIX 4641 Matrix Printer lets you command alphanumeric printout quickly and quietly, with complete form and format versatility.

When interfaced with our 4051, the 4641 is ready for reliable performance at speeds up to 180 CPS, for all kinds of output applications.

A servo controlled carriage assures precise placement of characters, upper and lower case, on a 7 x 7 dot matrix, 132 characters per line, six lines to the vertical inch. A selectable form feed feature lets you handle a variety of format sizes, from labels to legal.

Operation is smooth and quiet, with the rugged reliability you expect from hardware with the Tektronix name on it. The printer includes a self-test function that automatically runs through all characters.

Geared for forms. A tractor-driven paper feed system facilitates dependable feeding of multipart forms. The printer will adjust for forms up to 6 parts (.020 maximum thickness) and in varying widths. Accurate vertical and horizontal character placement is provided.

Format control will adjust machine operation to 11 different form lengths. An alarm signals when paper is exhausted.

The 4641 is competitively priced with comparable matrix printer systems, with the quality control and worldwide maintenance support that's part of every Tektronix peripheral package. For programs and report generation of all kinds, it makes your system's alphanumeric printout come easy.

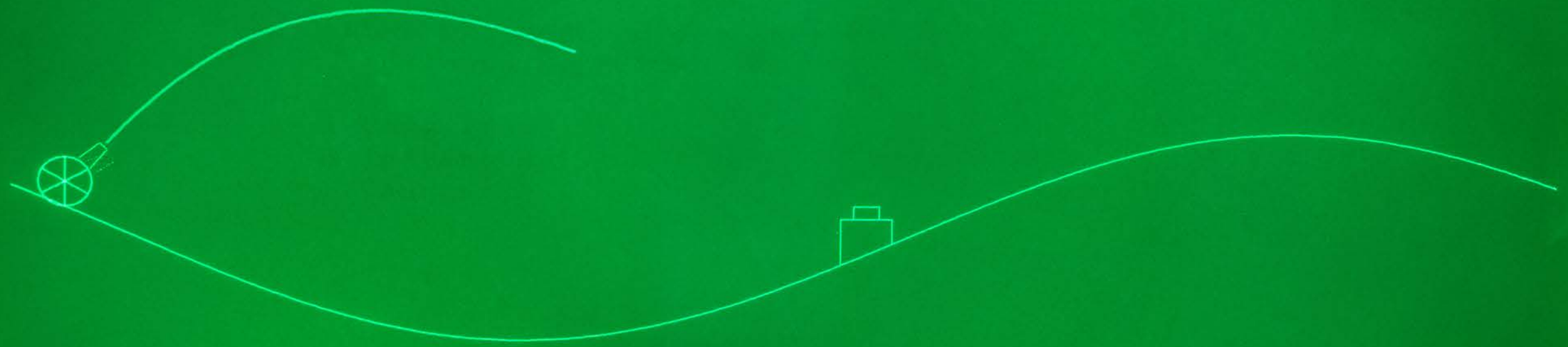
The Sunset Plant

This ad from the November 1951 issue of *Industrial Research* magazine introduces Tek's new home.

The site was chosen for its Portland address, its access to the Sunset Highway and the availability of nearby housing.

The building on the right side of the lower photo is still visible from Highway 26, near the intersection with HW 217, although it's been altered.


'85



Enter angle and speed
Angle: -90 to 90
Speed: 0 to 100


TEKTRONIX
decpack
pdp11/35

Tektronix 4010 Series Computer Graphics. When the facts are clearer, you find more time.

Bottlenecks: The stem of an hourglass is the first and last place they ever served time well.

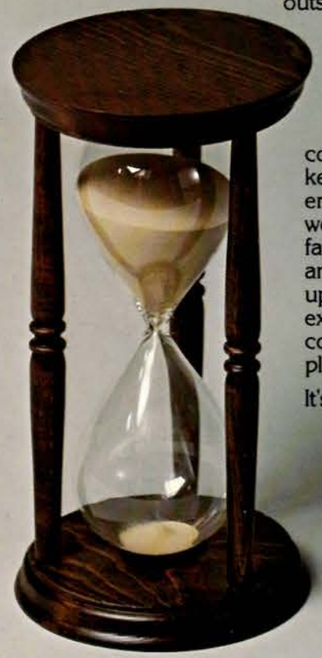
These days there's a built-in bottleneck between the huge capacity of the computer to generate information, and the equally huge capacity of the mind to use it.

The bottleneck is at the point of communication: in the slow trickle of words and equations between man and machine.

Computer graphics breaks those bottlenecks. It synthesizes concepts out of sequential information. Provides meaningful pictures instead of rambling printouts. It takes you to the edge of decision-making, instead of wasting your time with words.

That's why graphics is fast becoming commonplace to virtually all computer environments.

The Tektronix 4010 Series is far and away the world leader at providing the clearest, most accurate, most complete pictures of all. Its direct-view, bi-stable storage tube (DVST) was the first technology to make graphics widely affordable, and enabled degrees of information density, reliability and operating economy still unequalled today.



It is not only the quality of 4010 Series graphics that makes it such a time-saver. It is the quantity of choice. There is no other series so comprehensive: You can select from 11-inch screens to our 25-inch screens; from high resolution to almost microscopic precision; from TTY, ASCII or APL keyboards. You can add high performance options, now or later, like dynamic graphics and local intelligence. You can select from a library of software that has set the standard for the industry, or add any number of plug-compatible peripherals—like plotters, copiers and storage devices—that are outstanding technologies in their own right.

Finally, to all that you can add the assurance of working with Tektronix, a Fortune 500 company committed to keeping our graphics leadership. Bolstered by worldwide field offices, famous product reliability, and a philosophy of updating, not outdating existing equipment, it's a commitment you'll be pleased to draw on.

It's just a matter of time.

(Clockwise, from top) The Tektronix PLOT 10 Software Library now includes IGL, a modular and device independent package allowing addition of primary command set options and graphic extensions as needed.

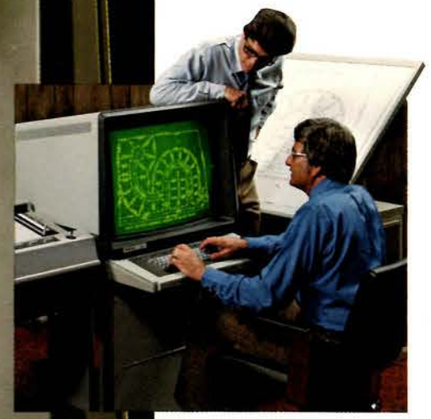
The 4012 saves time and reduces research costs by displaying graphic results from analytical instruments.

In education, the low-cost 4006-1 can intrigue students of all levels by its graphic examples.

The 25-inch 4016-1 has been readily adopted wherever precision and viewing ease are critical.

From the graphics leader

25-inch Graphics. The tool the innovators asked for. From the one company with the tools to build it.



The 4016-1 can be optionally configured as a local digitizing station in conjunction with Tektronix graphic tablets and local storage devices. The user can digitize graphics data into a buffered tablet file with local editing capabilities. Plot courtesy of McDonnell-Douglas Automation Company. (Land system).

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Tektronix®
COMMITTED TO EXCELLENCE

Howard and Jack and Tek Spirit

Co-founders Howard Vollum and Jack Murdock in their Sunset Plant offices.

Here are examples of Tek's uniqueness – the "Tek Spirit"– driven by Howard and Jack:

- Everyone was on a first-name basis: If you called him Mr. Vollum, he would tell you his name was Howard.
- Profit share in addition to regular salary: This was established early on at the Hawthorne Plant.
- A progressive education plan: On-campus classes were offered for a wide variety of applications: math, physics, chemistry, programming, electronic design, machine tool instruction and more.
- No time clocks: People were trusted.
- No reserved parking spaces: Howard was seen on many mornings walking in from the far reaches of the Bldg 50 parking lot in Beaverton.
- Celebration of employee longevity at Tek: Howard personally awarded Tek Bug diamond pins to employees with 20 years of service and higher. There were over 1,000 employees with 20 years of service by 1978.

4012/13 TEKTRONIX

4012: Full ASCII Characters set
4013: APL-compatible

Computer Display Terminal

Full ASCII, Flicker-free graphics, with APL option. Alphanumerics can transcribe computer data; Graphics can interpret and amplify that data. We've made high-resolution graphic presentation and upper- and lower-case ASCII alphanumerics available in 4012 and APL-language 4013 Computer Display Terminals.

The 4012/4013's flicker-free 27.9 cm (11-inch) screen provides up to 1024X by 780Y viewable graphic points or as many as 2500 A/N characters per display. The TTY-style keyboard simplifies input, while the thumbwheel controlled cross-hair cursor enhances graphic input.

Because it's from Tektronix, the world graphics leader, you're assured of quality engineering inside and out. The Tektronix storage display tube medium provides extensive data storage capabilities, making the 4012/4013 economical to purchase and inexpensive to maintain.

Graphics Support. When it comes to peripheral support, the 4012 and 4013 offer compatibility with options, interfaces and accessories in the Tektronix 4010 terminal family—including hard copy units, digital cartridge tape recorders, digitizing plotters, graphic tablets, and more.

Built-in or build-on graphics performance. The 4012 and 4013 models are rugged, fully-tested terminals built for a long life of dependability, whatever your application—in business, government, science, engineering, education or industrial uses—we've got both the hardware and software to help you get started.

If you're into APL, you're provided for with the 4013—with complete upper- and lower-case ASCII and 94-symbol APL, including special APL function symbols and composites. We'll give you the software support you need with our PLOT 10 APL/GRAPH II package, that takes full advantage of the terminal's natural interactivity and the APL language.

TEKWEEK

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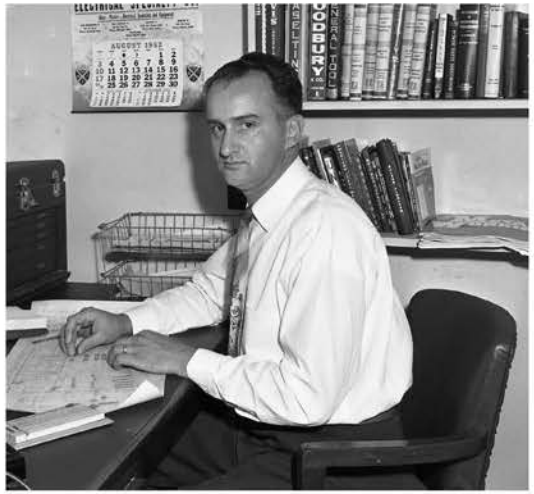
Miles Tippery, Milt Bave, Dal Dallas and Logan Belleville



Miles Tippery (top far left) met Jack Murdock in the Coast Guard and they became close friends. He had experience in radio repair and was responsible for evaluating and organizing components and testing the first Type 511s at the Hawthorne plant. He took on a role as personnel manager at Sunset.

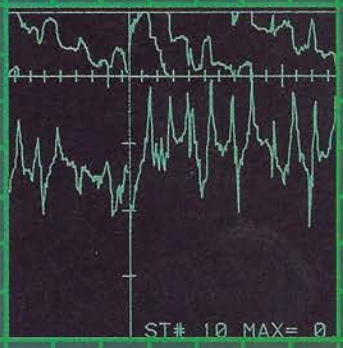
Milt Bave was also a friend of Jack's in the Coast Guard. Because of his mechanical skill and experience, Jack asked him to join the startup team to assist Howard with mechanical layout for the Type 511. He later was manager of mechanical engineering.

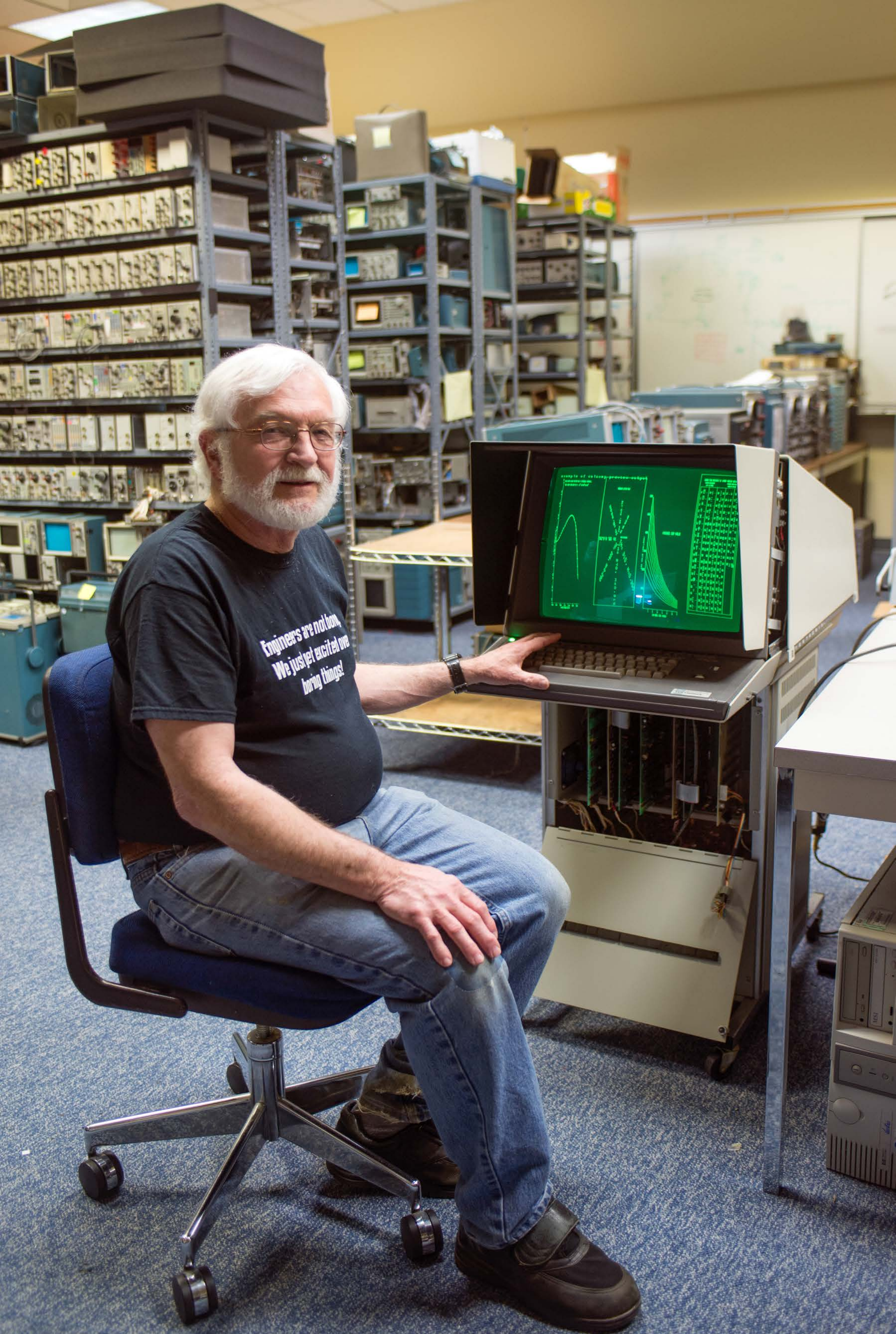
"Dal" Dallas (on the phone) was Tek's first sales engineer. He had many years of experience and an excellent contact network. He was instrumental in setting up Tek's field offices.

Logan Belleville was an experienced electronic engineer, who, like Howard worked in radar research during the war. He designed the Type 512 scope and contributed to the design of the Type 517. He also undertook management responsibilities in the early days.

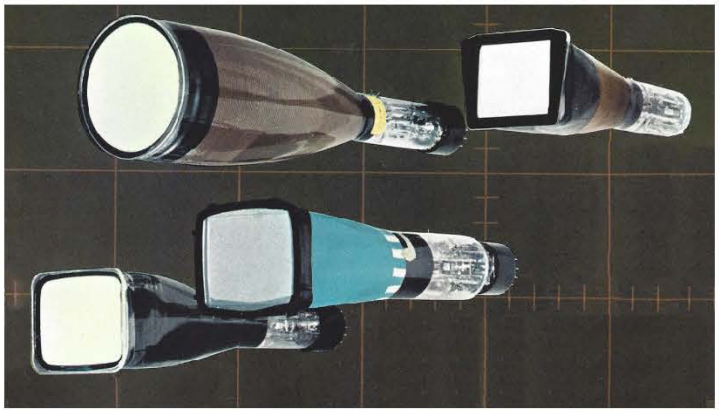
The Tektronix 4112 Computer Display Terminal

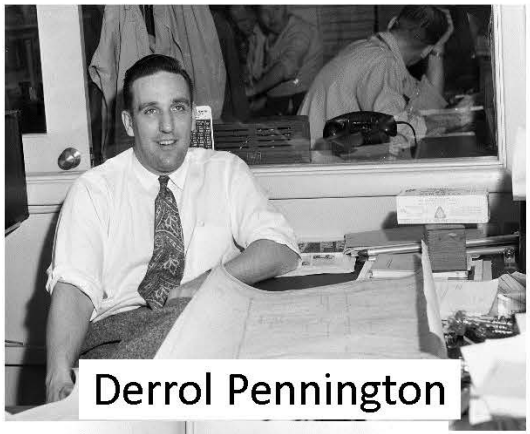
You can define from one to sixteen viewports on the 4112's 15-inch raster display. You can use local zoom and pan capability to select and magnify any portion of the 4096 x 4096 addressable points screen. Return to the full picture, and the terminal will automatically bracket the detail section last displayed.



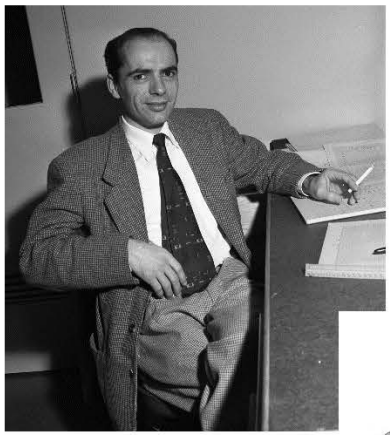

Engineers are not boring
We just get excited over
boring things!

Cathode Ray Tube Development





Derrol Pennington



Jean DeLord

Joe Griffith

By the 1950's precision resistors, capacitors, plastic knobs and transformers were being produced internally at Tek when suitable pre-existing parts were not available. In 1950 a procurement problem with what was arguably the most important single scope component, the cathode ray tube, reached a crisis level. CRT vendor quality issues and performance limitations prompted a bet-the-company decision to start making CRTs internally.

A team led by Joe Griffith, Jean DeLord and Derrol Pennington, who would later manage the CRT operation, were able to develop a CRT design and production capability in time for a Tek-built CRT to be used in the Type 531 and 535 scopes, introduced in 1954. That CRT was produced for 21 years.

Eventually Tek would employ almost one thousand people producing over 150 CRTs in two dedicated buildings on the Beaverton campus.

At upper left, the newly-developed CRTs used in the 530 scope series are shown.


rainforest
Input text followed by RETURN
Type RETURN alone to exit
Tektronix 4016-1

Tektronix 4207

Intelligent Color Graphics Terminal

- **High-contrast, vivid color images**
- **Fast, efficient picture generation**
- **Local zoom and pan**
- **Color hardcopy output**
- **Wide-ranging software compatibility**
- **Small footprint**

The Tektronix 4207 Intelligent Color Graphics Terminal delivers excellent screen quality and advanced graphics capabilities in a medium resolution display. With built-in graphics intelligence, 4207 users enjoy extensive graphics functionality—including segment processing, local zoom and pan, and multiple views and surfaces. Add the 4207's broad software compatibility and small footprint and you have the ideal choice for applications such as data analysis, 2D CAD/CAM, and process monitoring and control.

High-Quality, Distortion-Free Images. The 4207 displays 640 × 480 pixel resolution at 60 Hz, noninterlaced, with a 4 × 3 aspect ratio optimized for graphics. A high-contract, anti-glare 13-inch monitor provides sharp alphanumerics and crisp, distortion-free images.

The 4207's 4096 × 4096 virtual coordinate space lets you store detailed graphics information. And with true zoom and pan, you can enlarge portions of a picture to examine more closely.

Local Intelligence to Offload Host. Resident graphics intelligence coupled with 512K of RAM allows you to manipulate and edit graphics segments locally. Because you aren't relying on the host, picture generation is fast and efficient and application response time is significantly improved.

Hardcopy Output for Off-Screen Presentations. In supporting a wide range of hardcopy output devices, the 4207 makes it easy to turn on-screen images into high-quality presentations. The 4207 supports Tektronix ink-jet and thermal-wax printers as well as many of today's popular monochrome printers, including the Hewlett-Packard LaserJet™ and ThinkJet™, DEC® LA210, and printers compatible with Epson FX-80™ and MX-80™ protocol.

For improved user productivity, the 4207 offers background hardcopying, allowing you to continue working at the terminal while it processes your copies.

Wide-Ranging Compatibility. To protect your software investment, the 4207 offers compatibility with a large selection of application software, including Tek's own PLOT 10® family of software, plus all programs developed for the

Tektronix®
COMMITTED TO EXCELLENCE

If you asked for a resume of the 4025, we'd show you a report like the one below. It's a case where one page tells the whole story. It shows how the terminal you originally hire for elementary data entry can evolve into a forms expert, and from there into a unique graphics analyst.

We believe this is the world's finest report generation terminal. No competitive display is so properly proportioned for graphics. Or for graphics-plus-alphanumerics. With no other terminal can you put graphics anywhere onto the screen: That means total format flexibility. Graphics scrolling. Several graphs on a single page. It means alphanumeric program commands can be placed away from the graphics, rather than run through it.

Our complementary PLOT 10 Easy Graphing software is designed to be easy on the non-programmer. English-language command code and elementary tutorial manual mean anyone can be graphing interactively within minutes after first sitting down at the terminal.

But easy doesn't mean incomplete. The 4025 software support includes bar charts with multiple shadings, histograms, log plots, pie charts, periodic axes, and a wide variety of labeling options. Use the 4025 and PLOT 10 Easy Graphing to expand on an existing data base. You build graphs the way you want, without the restriction of local, limited, built-in functions.

The 4025 lets you define monitor and workspace areas on the screen, and scroll either independently. You can format graphics, alphanumerics and ruled forms in any combination.

Capabilities such as these easily outdraw any other terminal.

You can connect to a number of Tektronix peripherals for all types of copy requirements. Our 4631 copier, for example, will duplicate on-screen and buffered displays of up to 80 characters by 53 lines, and produce them as clean, dry, sharp 8½" x 11" copies. Fit for distribution to customers, management, recordskeeping.

You can command detailed, camera-ready graphic and alpha-

Tektronix peripherals provide plug-in access to many different copying and output capabilities. Our 4642 Printer, 4924 Digital Cartridge Tape Drive, 4931 Modem, and 4662 Interactive Digital Plotter all offer exceptional performance and dependability.

numeric output—in 9 colors, on up to 11"x17" paper or film—from our first-of-its-kind 4662 Interactive Digital Plotter.

For copying alphanumeric output, you'll find everything you need in our dependable 4642 Printer.

And finally, our 4924 Digital Cartridge Tape Drive, storing up to 200,000 bits per cartridge, is an inexpensive data copying device for forms, graphic formats and other data.

There's one more feature built in to the 4020 Series: Tektronix' ten years in graphics technology. Our thirty-one year corporate reputation has been built on product reliability. On our worldwide team of sales, service, instruction and applications experts.

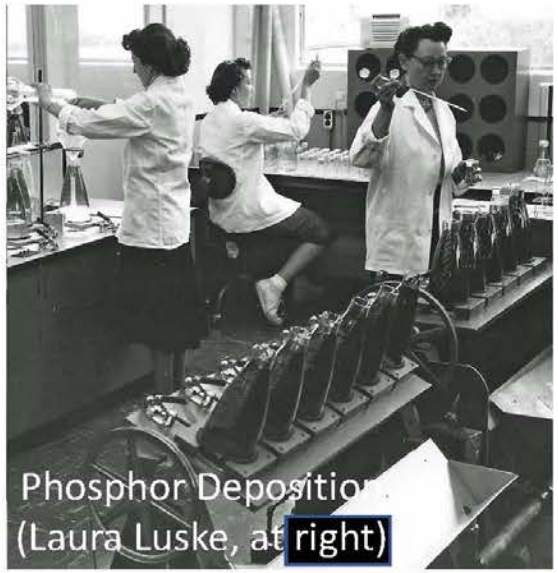
Core-conscious, user-oriented PLOT 10 software, plus a variety of tutorial and technical manuals, simplify graphics set-up and provide total documentation.

Both the 4024 and 4025 can be everything you'll ever need from a terminal. But you don't have to buy anything before you want it. Like any smart trainee, each starts with the basics and grows with the job. You can see their great potential just by looking at them. So call your local Tektronix Sales Engineer and have him bring by the 4020 Series for a personal, eye-opening interview.

Cathode RayTube Production at the Sunset Plant

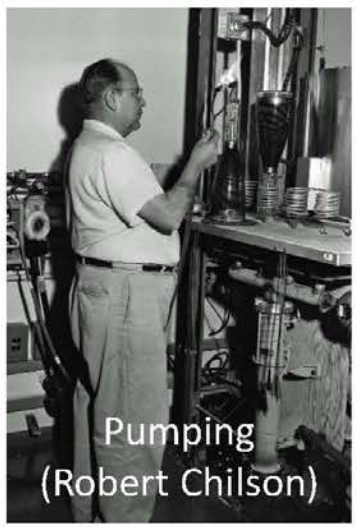

Gun Welding (Beulah Stumma)


Gun Rodding (Virginia Levins)


Phosphor Deposition
(Laura Luske, at right)

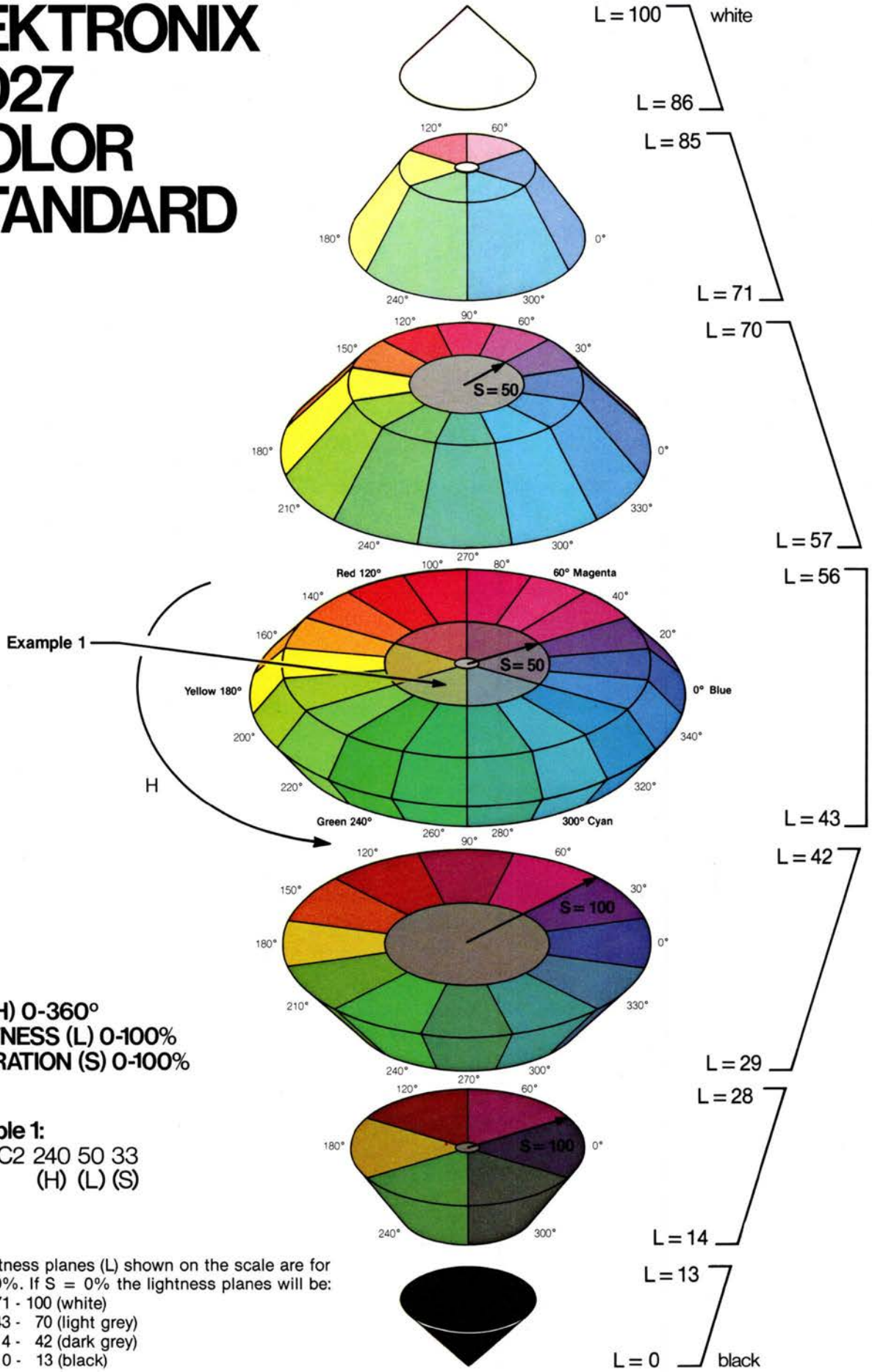

Helix Application (Rose Duarte)


Gun Seal (Byron Williams)


Pumping
(Robert Chilson)

vintageTEK museum

TEKTRONIX 4027 COLOR STANDARD



HUE (H) 0-360°
LIGHTNESS (L) 0-100%
SATURATION (S) 0-100%

Example 1:
!MAP C2 240 50 33
(H) (L) (S)

***Note:**
The lightness planes (L) shown on the scale are for S = 100%. If S = 0% the lightness planes will be:

L = 71 - 100 (white)
L = 43 - 70 (light grey)
L = 14 - 42 (dark grey)
L = 0 - 13 (black)


Progressive Sophistication
DISSPLA
TEKTRONIX

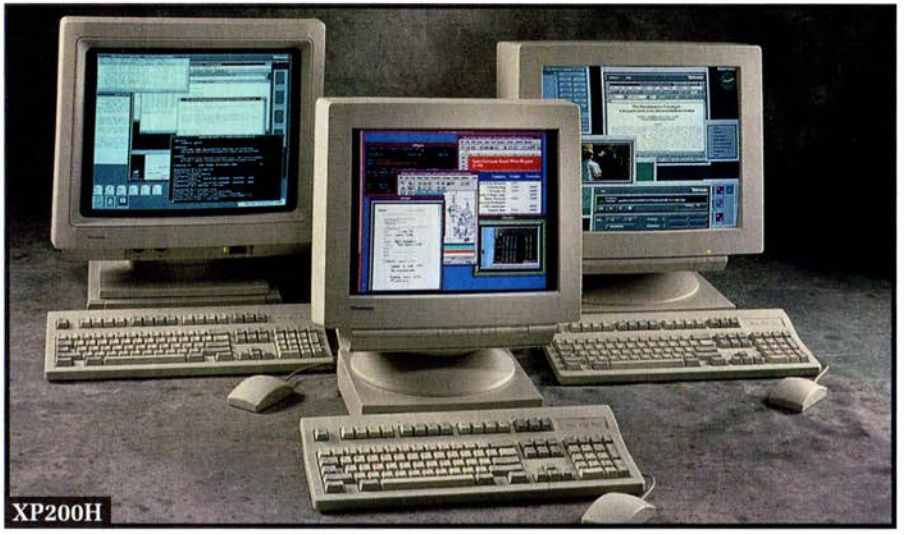
Multimedia Ready X Terminals

XP200H • XP400

TekXpress X Terminals

All TekXpress X terminals include standard: a display, base unit, mouse, 8 MB SIMM expandable to 136 MB, (4 MB SIMM expandable to 36 MB memory for XP200/H) 2 Ethernet LAN ports (1 for XP400), 2 serial ports, and physical installation guide. Software right-to-use, XpressWare X server software, and additional memory and options must be ordered additionally.

Available hardware options include; audio interface: PCMCIA, flash memory (2/4 MB), parallel port, additional memory, and for the XP400 a MPEG-1 digital video card.


XP200H

SELECTION GUIDE

XP400 Series	XP400 Logic Base	XP417C	XP419C	XP421CH	
Display Size	Base module only	17 in. color	19 in. color	21 in. color	
Resolution	Up to 1280x1024	1280x1024	1280x1024	1600x1180	
XP200 Series	**XP200 Logic Base**	**XP214M**	**XP214C**	**XP217C**	
Display Size	Base module only	14 in. mono.	14 in. color	17 in. color	
Resolution	Up to 1152x900	1024x768	1024x768	1152x900	
User Selectable				1024x768 q@72 Hz	
XP200H Series	**XP200CH Logic Base**	**XP219MH**	**XP217CH**	**XP219CH**	**XP219GH**
Display Size	Base module only	19 in. mono.	17 in. color	19 in. color	19 in. greyscale
Resolution	Up to 1280x1024	1280x1024	1280x1024	1280x1024	1280x1024

Growth at the Sunset Plant

September 1954

Late 1950's

These aerial photos of the Sunset Plant taken roughly five years apart show the dramatic growth in the site and in the workforce. Compare the dramatic size change of the parking space in the two images.

For reference, the Sunset Highway (Highway 26) runs diagonally in the upper left corner of both photos, which roughly face southwest.

St. Vincent's Hospital would later be built in part on the land shown in the lower right corner of the upper photo.

Highway 217 had not yet been built.

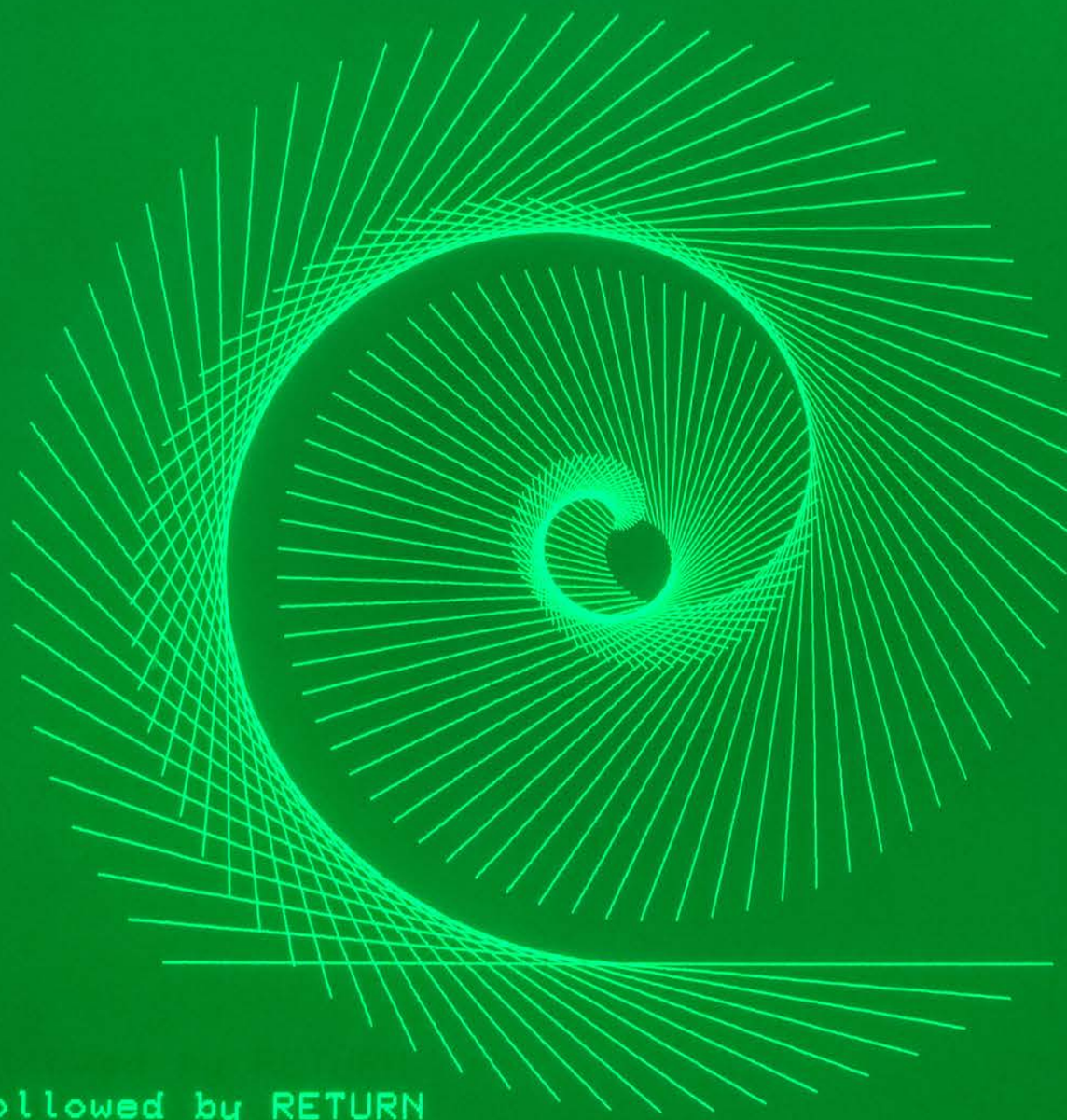
Part of Bldg 86 (marked with a star) is still there today, visible from HW 26.

Construction and move-in at the Beaverton campus had already begun at the time of the lower photo.

vintageTEK museum


'85 8 24

vintageTEK

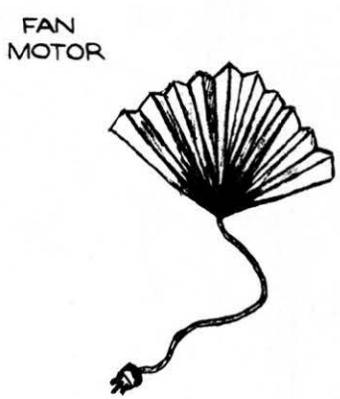


Input text followed by RETURN
Type RETURN alone to exit

Humor

Cartoons in schematics

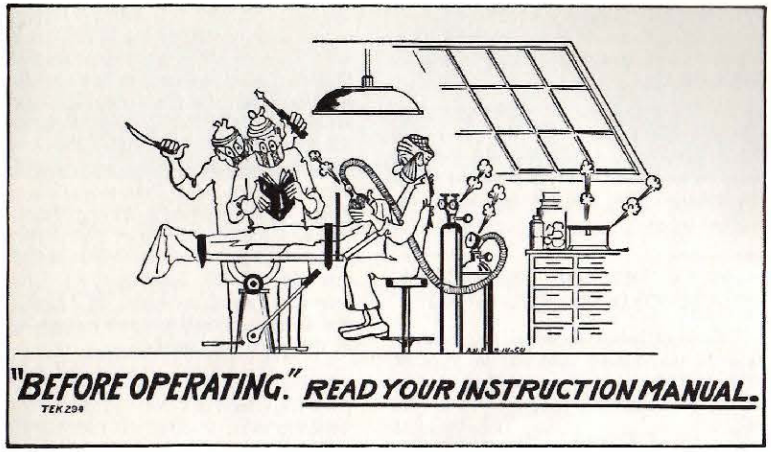
R293 Programmable Pulse Generator / Power Supply



Type 468 Scope

650 TV monitor

From *Service Scope*, a Tektronix customer newsletter



From *Tek Talk*, the first Tektronix employee

vintageTEK museum

80286/80287 processor based workstation with superb resolution and speed. Featuring as standard equipment: Dynamically Converged display, firmware advances, fast draw and panel fill rates, local zoom and pan, 4110 compatibility. Easily expanded to produce 3D wireframe and 3D shaded surface graphics.

HIGH PERFORMANCE COLOR GRAPHICS WORKSTATION

The Tek 4125 Color Graphics Workstation incorporates advanced graphics with local processing power and ultra sharp display qualities to provide CAD developers and users with increased utility and performance. It speeds development and execution of the complex, high density graphics associated with mechanical and electrical engineering, cartography and other graphics-oriented professions.

Advanced Display

The Tek 4125 employs a 19-inch color raster display operating in a 60 Hz, non-interlaced mode for flicker-free performance. An addressable pixel matrix of 1280 by 1024 assures crisp, precise resolution of the finest detail in graphic images.

A precision in-line gun CRT is employed for maximum convergence stability. This is supplemented by dynamic convergence correction that adjusts convergence as the electron beam scans, delivering a convergence accuracy of 0.3 mm over the entire display area. A neutral density filter is bonded directly to the CRT faceplate to reduce reflections and enhance contrast. The result is precise, fringe-free color presentation of intricate graphics applications. A delta gun CRT, utilizing Tektronix' proprietary Autoconvergence, is optionally available.

Segments and Local Picture Storage

Embedded in the firmware and microcode of the Tek 4125 are convenient commands for segment editing, segment subroutines and pick operations that greatly reduce development time and augment productivity. Defined segments may be altered in whole or part by deleting unwanted portions, inserting additional graphics or replacing other information completely. This eliminates the redundant technique of totally erasing then recreating entire segments and offers a more natural and efficient method of editing.

Segment subroutine commands allow referencing a segment as part of another segment. This capability is particularly useful for local storage of pictures with many repeated elements such as integrated circuit design, schematic capture and mapping. Instead of describing each object in a repetitious fashion, the drawing may be built from primitive shapes which themselves are constructed of primitive elements. Editing time is significantly reduced and memory is saved.

Tektronix®
COMMITTED TO EXCELLENCE

The Tek 4692 Color Graphics Copier can process up to 100 sheets of plain paper or 50 sheets of transparency material automatically. It delivers low cost, superior renditions of 4125 graphics with precise color registration and rich, saturated hues.

4110 Compatibility

Because the 80286/80287 processors share the same instruction set of the earlier 8086/8087 employed in the Tek 4110 series, the 4125 offers all the familiar and powerful graphics functions of that popular family. Local picture segments, fast panel fill, patterning and 2D image transformations are all supported. Local programmability is additionally available as an option. Through this compatibility, other graphics software is readily available, including Tek's own PLOT 10® software plus software from other sources.

Configurations—Expandability

The 4125 is available in a pedestal configuration (4125P) to conserve workspace or as a modular workstation for a more flexible layout. Also available are an adjustable table, display stand and chair to create an ergonomically optimum workstation for increased productivity and reduced fatigue.

An installed 4125 can be expanded to 3D wireframe performance with the 4115F58 Option 2 enhancement—giving it the functionality of a Tek 4128. Further expandability to 3D shaded surface capability is possible with the addition of the 4100F59 enhancement. Tek's commitment to compatibility and expandability allows the 4125 to grow in graphics capability and sophistication as users' needs change, protecting their investment in hardware, software and training.

Color Copier

An ideal companion product for the 4125 is the Tek 4692 Color Graphics Copier. This versatile, high performance ink jet device offers excellent hard copy reproduction of 4125 graphics with push button ease. With a resolution of 154 DPI, the 4692 delivers the most vivid, highly saturated colors available outside of color photography.

The Option 19 Color Copier Interface (also available as the 4100F19 field kit) gives the 4692 copier a color palette comparable to that of the 4125 workstation. A color matching process is used to generate a new color map that compensates for the characteristics of the 4692 copier's inks and coated papers and the differences between the color system used by the 4125 workstation. Then a dithering (or halftoning) algorithm is used to determine which color dot to print. The result is hard copy output that comes a quantum leap closer to matching the colors on the screen.

The Option 06 Projector Interface (also available as the 4100F06 field kit) provides interface capability for connecting 4125 workstations to high-performance video projectors for large screen projection of high resolution graphics images. The 4100F07 Camera/Display Interface, available only as a field upgrade kit, allows connection of a suitable electronics camera to produce a photographic copy of the 4125 screen.

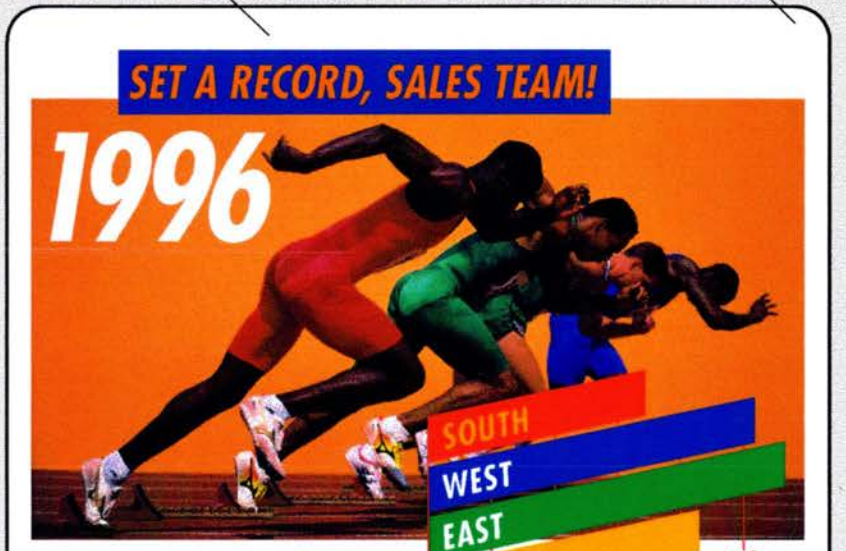
Reliability and Service

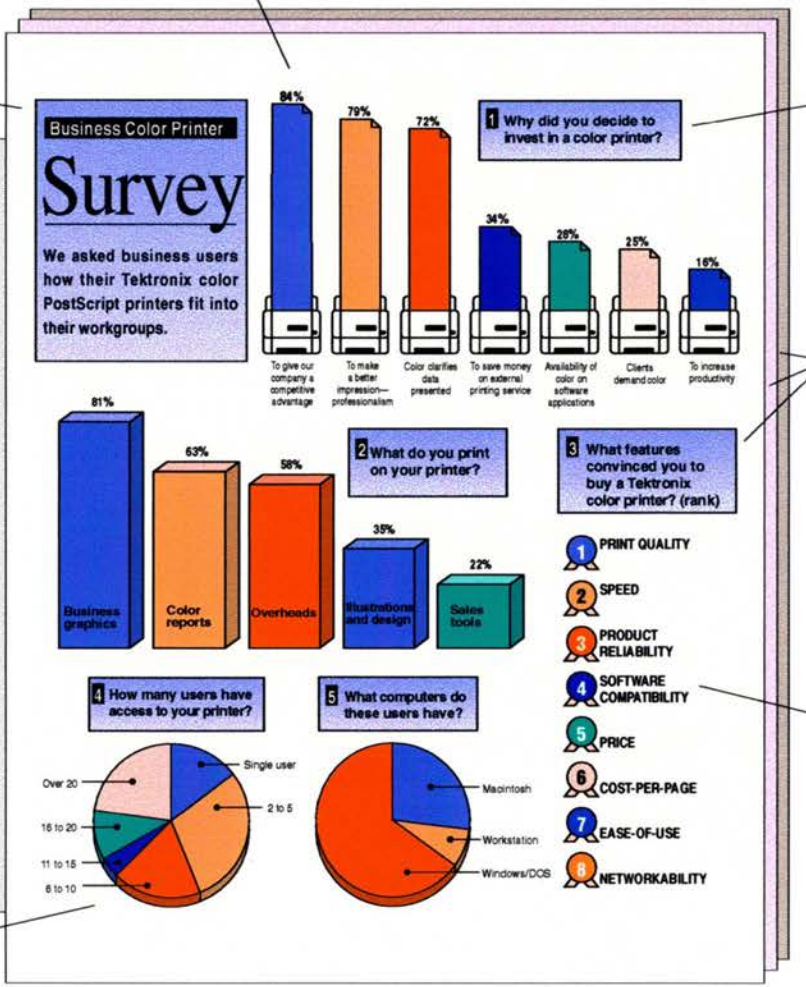
Like all Tek products, reliability was a major design goal for the 4125—as indicated by some of the most aggressive design specifications in the industry. Tek products have proved themselves in countless applications, in every conceivable environment. In the unlikely event of system failure, Tek service is there to back up every product sold.

Fast
4 ppm (pages-per-minute) on paper, 2 ppm on transparencies in full color.

Value
Affordable purchase price and low-cost per copy.

Brilliant Color
Crisp 600 x 300 dpi or 300 x 300 dpi color output for all of your projects.





Effective
Color puts a new level of persuasive power at your command.

Plain Paper
Prints on laser paper, bond, letterhead, recycled, matte, label stock, transparencies and more.

Compatible
Works with all leading software for PCs, Macs, and workstations.

World Class
Built by Tektronix, the leader in workgroup color printing.

Workgroup-Ready
Built for the demands of busy workgroups — configuration is a breeze.

The Phaser™ 340 Color Printer

A breakthrough in fast, economical, high-quality color for business.

Printed on a Tektronix Phaser™ 340 Color Printer at 600 x 300 dpi resolution.

Tektronix

TekColor

Argentina: (1) 325-5733; Australia: (2) 888-7066; België en Luxemburg: (02) 725 96 10; Brazil: (11) 543-1911; Canada: (416) 747-5000; Caribbean: (407) 334-8484; Chile: (562) 235-1190; Danmark: (44) 53 54 55; Deutschland: (0221) 9 69 69 0; E.Europe, Near East and Eire: +44 1628 403627; Egypt: +202 261 9291; España: 1 372 60 12; France: (1) 69 86 81 81; Gulf Region: 971 2 318 813; Hong Kong: (852) 598-6188; Israel: (3) 645-8777; Italia: (02) 8444219; Japan: 3-3448-4872; Kuwait: +965 2 436 045; Malaysia: (3) 293-6000 or (3) 293-9322; México: (83) 33-6622; Nederland: (040) 645645; New Zealand: (9) 415-6928; Norge: (22) 16 50 50; Österreich: +44 628 486000; Pakistan: (21) 455-5384; Puerto Rico: (809) 792-5139; Saudi Arabia: 01 477 1650; Schweiz: (042) 21 91 92; Singapore: 469-8833; S.Africa: (11) 786-3647 or (11) 444-7716; Suomi: (90) 728 2400; Sverige: (08) 629 65 00; S.Korea: (2) 538-9942; Taiwan: (2) 765-6362; Thailand:66 (2) 308-2040 to 2900; U.K.: 01628 403600; U.S.: 1-800-835-6100 & (503) 682-7377

12W-3087

Storage Cathode Ray Tubes and Scopes

Regarding Bob Anderson's invention, Howard Vollum wrote in the September 16, 1965 *Tektronix Newsletter*:

"One of the most significant technical breakthroughs made by Tektronix Engineering has been the development of low-cost, rugged, practical storage."

At a time when electronic memory was expensive, bulky and slow, transient waveforms were stored on the screen of an oscilloscope CRT using clever vacuum physics. Through the late 1950's and 1960's most of the leading instrument companies built some form of storage CRT, but they were expensive, fragile and not that effective.

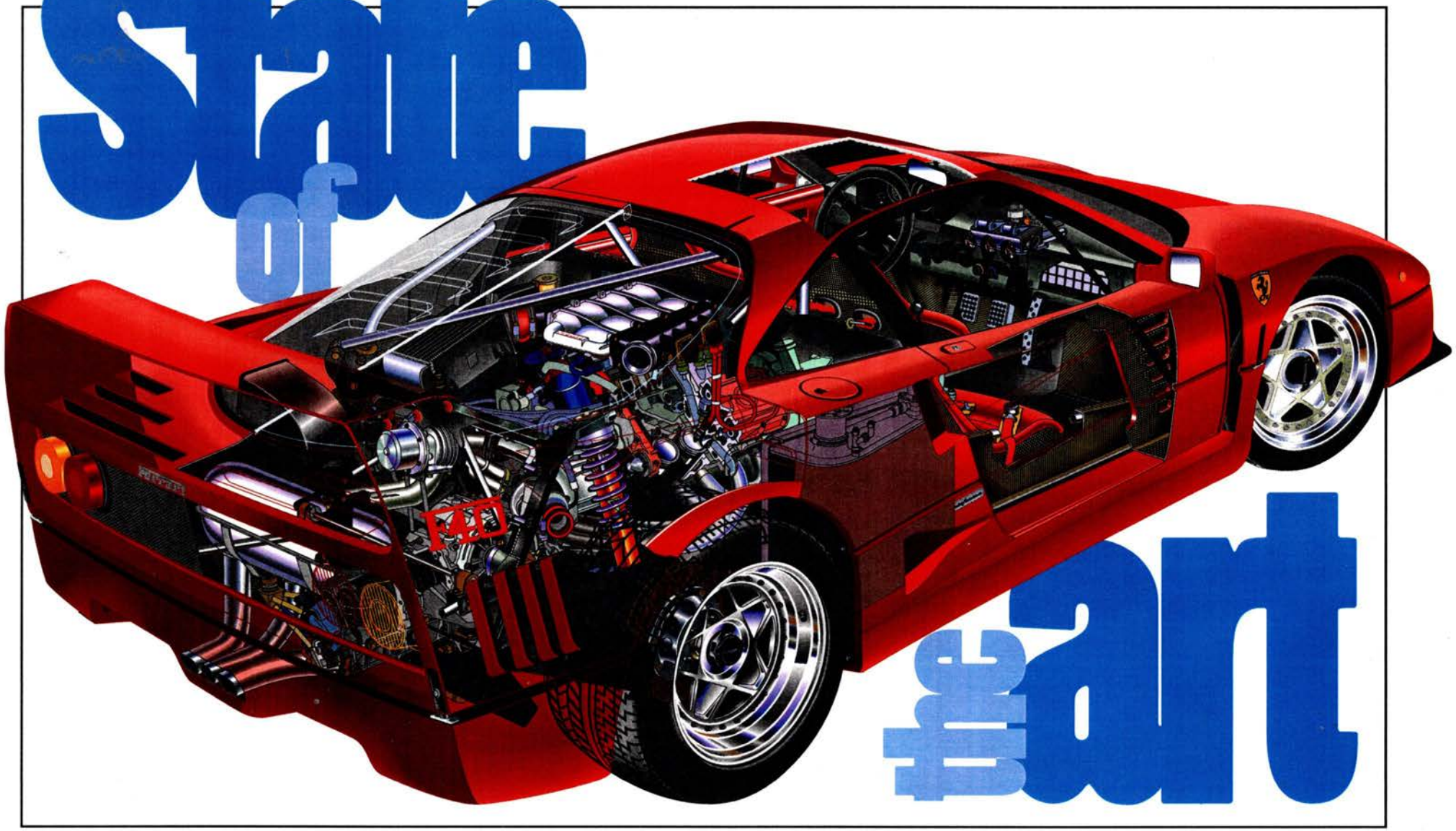
Tek engineer Bob Anderson (at upper left), invented a simple and inexpensive storage CRT that was used in the Tektronix Type 564 oscilloscope, introduced in 1962, with bandwidth up to 15 MHz, depending on the plug-in.

Bob Anderson's invention led to long line of Tektronix analog storage oscilloscopes. It also enabled Tek to create a pioneering series of products that enabled a massive new market - computer graphics, that previously didn't exist in realistic terms. Tek dominated this market for over 15 years.

One of the early storage scope uses was speech therapy for the deaf. The therapist would speak a word or phrase and the deaf child would attempt to duplicate the teacher's stored audiogram on the screen.

vintageTEK museum

State of the art



F E R R A R I

TekColor

Printed on a Tektronix Phaser™ 540 Colour Printer.

Ferrari illustration is original art by David Kimble, electronically re-created in Canvas by Deneba Software.

12W-3092

Tektronix

Argentina: (1) 325-5733; Australia: (2) 888 7066; België en Luxemburg: (02) 725 96 10; Brazil: (11) 543-1911; Canada: (416) 747-5000; Caribbean: (407) 334-8484; Chile: (2) 251-0140; Danmark: (44) 53 54 55; Deutschland: (0221) 9 69 69 0; E.Europe, Near & Mid. East: +44 1628 403627; Egypt: +202 261 9291; España: 1 372 60 12; France: (1) 69 86 81 81; Gulf Region: 971 2 318 813; Hong Kong: (852) 598-6188; Indonesia: (21) 374372; Israel: (3) 645-8777; Italia: (02) 8444219; Japan: 3-3448-4872; Kuwait: +965 2 436 045; Malaysia: (3) 293-6000 or (3) 293-9322; México: (83) 33-6622; Nederland: (040) 645645; New Zealand: (9) 415-6928; Norge: (22) 16 50 50; Österreich: +44 628 486000; Pakistan: (21) 455-5384; Puerto Rico: (809) 792-5139; Saudi Arabia: 01 477 1650; Schweiz: (042) 21 91 92; Singapore: 469-8833; S.Africa: (11) 786-3647 or (11) 444-7716; Suomi: (90) 728 2400; Sverige: (08) 629 65 00; S.Korea: (2) 538-9942; Taiwan: (2) 765-6362; Thailand:66-2-3082900 or 66-2-3082040; U.K. & Eire: 01628 403600; U.S.: 1-800-835-6100 & (503) 682-7377

RIVERS OF ROGUES

Beaverton Campus

Looking east at the newly-purchased Beaverton site in 1956, the view is from over the wing of Jack Murdock's plane. Jenkins Road runs diagonally from the far left of the picture.
Murray Blvd had not been built. It would be located in the foreground.

The star marks the location of Bernard's Airport. Traffic on Jenkins had to watch for planes taking off and landing. There were Tek employees who commuted by plane.

The airport operated until 1969 when the Beaverton Mall, later Cedar Hills Crossing, was built.

vintageTEK museum

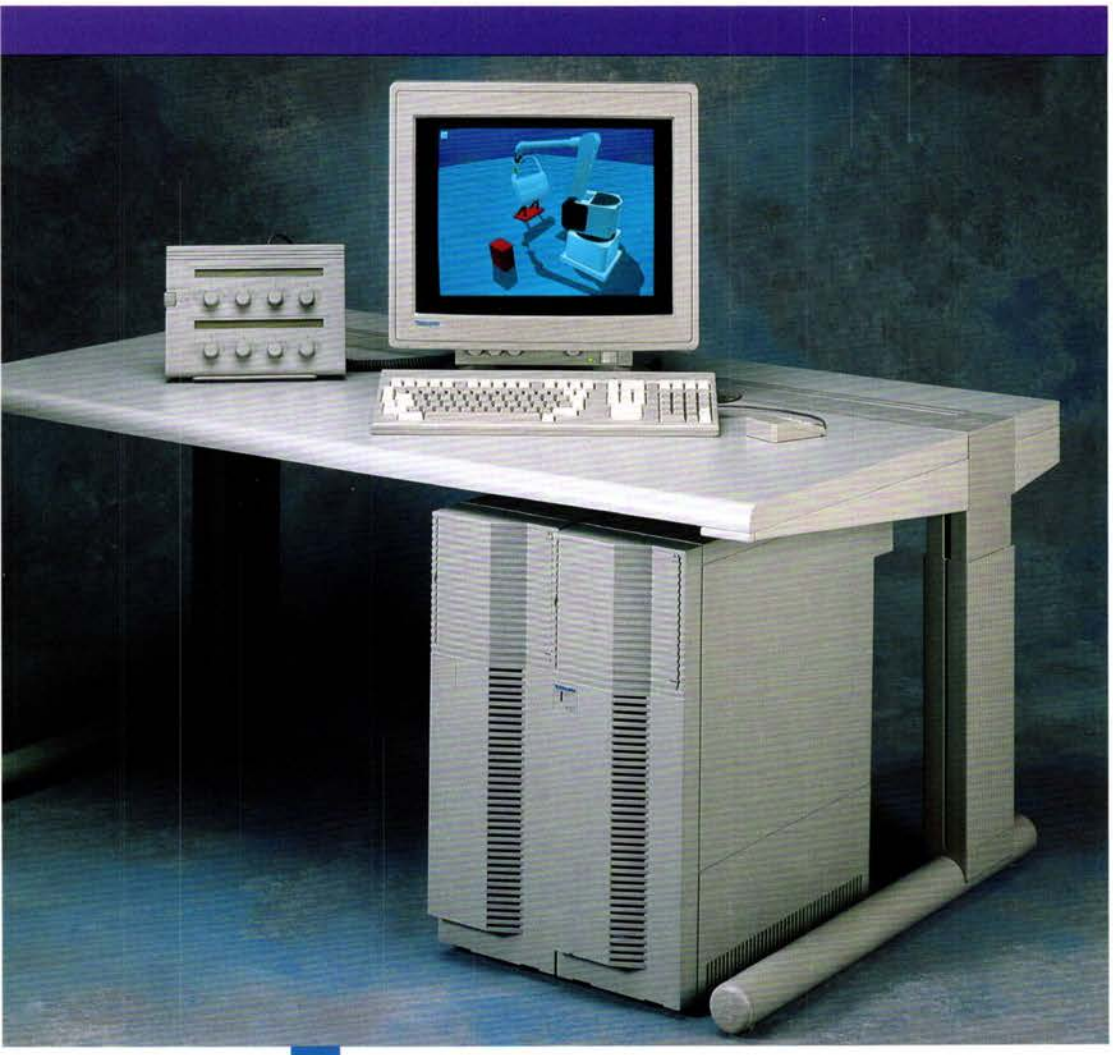
TEKTRONIX

4020 Series

From alphanumerics to graphics: Now your terminals can keep pace with your needs.

Tektronix 4337

3D Graphics Workstation



- **Engineering workstation with UTek™ enhanced UNIX® and X Window System™**
- **12 bit planes standard, 12 more optional**
- **3D wireframe, hidden line, and shaded surface graphics**
- **Diskless version available**
- **Upgradeable to Tek XD88 Superworkstation**

Screen display courtesy of Seneb Robotics, Inc.

The 4337 3D Graphics Workstation provides the highest quality image rendering of any of Tek's 4330 Series Workstations. With 12 bit planes, the 4337 can display up to 4,096 indexed colors simultaneously to provide high-resolution shading and smooth, dynamic motion. Capabilities like these are perfect for kinematics, molecular modeling, animation, simulation, stress analysis, and other tasks requiring smooth dynamic movement.

Unsurpassed 3D Graphics. The 4337 has multiple pipelined graphics processors—including Tek's custom gate arrays—for maximum graphics performance. This graphics engine can draw 340,000 3D vectors per second and 450,000 2D vectors per second, and 3D shading at a rate of 20,000 Gouraud shaded polygons per second.

The 4337's 3D features include true zoom and pan, shading, light intensity selection, parallel and perspective projection, sectioning, clipping, and all 3D rotations. More advanced users can access additional graphics features—such as sophisticated lighting and shading techniques—from the graphics processor. You can add an optional 12 planes for true color or 12 planes for double-buffered performance.

High-Powered, UNIX-Based Workstation. Along with exceptional graphics performance, the 4337 gives you a high performance, integrated UNIX-based workstation, complete with independent processor, coprocessor, and system memory and storage. I/O ports include Ethernet™ LAN, RS-232-C, Centronics®, and SCSI connections. And you can add diskless nodes to lower the cost per seat.

Wide-Ranging Software Compatibility. The UTek operating system runs the entire family of PLOT 10® graphics software as well as a large number of third-party packages performing CAD, CAE, simulation, cartography, architectural engineering, and many other applications. With the optional stereoscopic display, you can run all 3D application software for the 4337 in stereo without modification.

Tektronix®
COMMITTED TO EXCELLENCE


Tektronix

Tektronix Holland H.V. (Heerenveen)

Earl Wantland, at left, directing a tour of the new facility.

Taking introduction of the 7504 scope seriously, Tek Holland built a model.

On June 22, 1962 Earl Wantland impressed all in attendance at the formal opening of the Tektronix Heerenveen plant in the Netherlands by opening the ceremony with a speech in fluent Dutch. A native Dutchman did the translation to English. The plant was situated in the center of the northern province of Freisland. During the opening ceremony the crowd took note when the Freisland anthem was played and it was visualized on eight Tektronix oscilloscopes.

Wantland, later Tek's president, had been part of the team that started Tek's first offshore venture at Guernsey, and he was chosen to drive the creation of their second facility, reinforcing Tek's presence in Europe on the mainland.

During the plant's existence over 45 different Tek scopes, many plug-ins and several Tek computer monitors were manufactured there. The scopes ranged from the 500 series to the 7k, 11k and TDS models. As seen in the adjacent photo, the first building was designed to resemble similar structures on the Beaverton campus.

Eventually the business from the European operations resulted in an additional 3,000 jobs in Oregon.

Heerenveen engineers designed new products including the 2212 and 2216 mixed analog/digital portable scopes.

Total headcount reached approximately 800 people in 1980. The facility was closed down in 2000.

Read more about the Tektronix Holland plant at on the vintageTek Museum website

TEK 6000 FAMILY

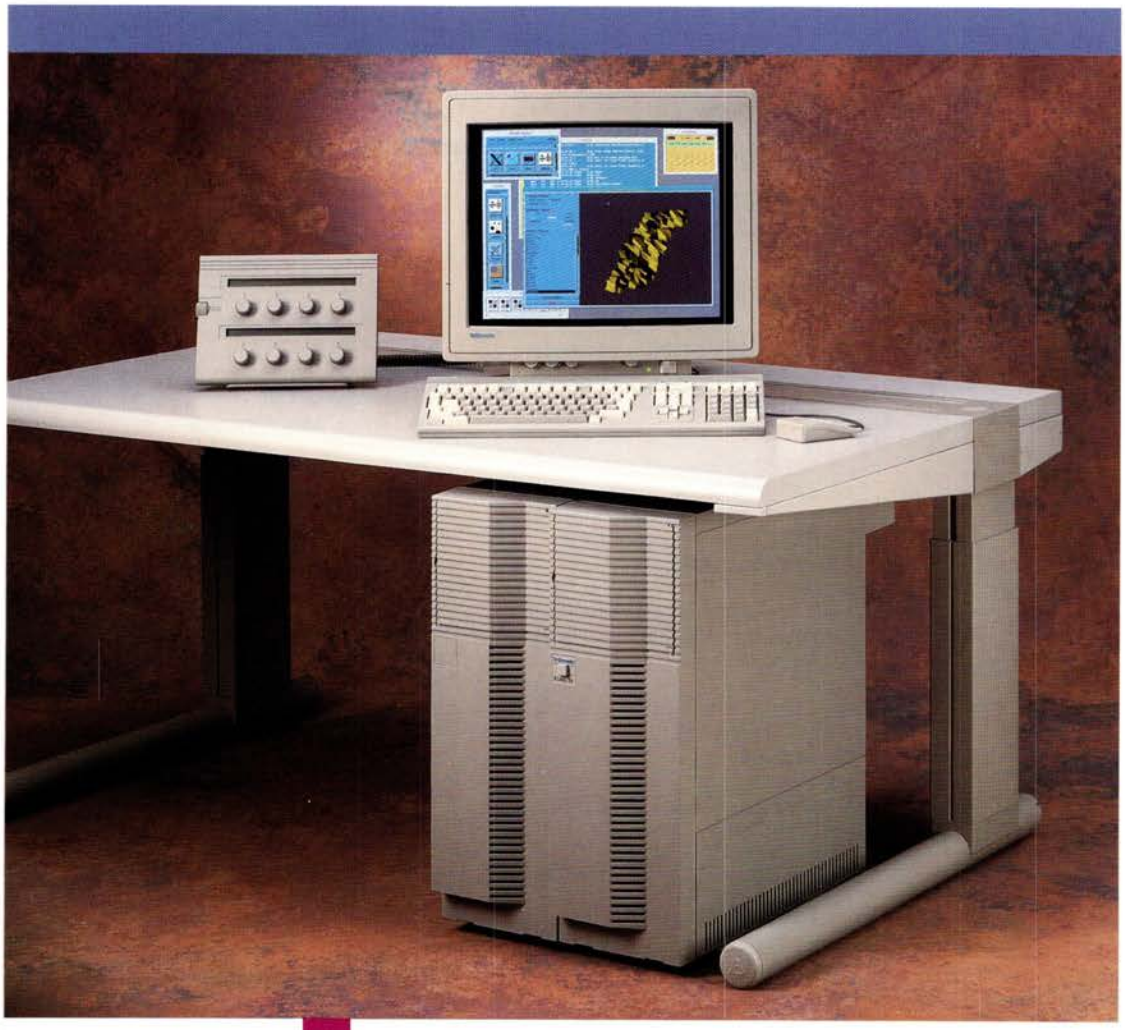
PRELIMINARY
PRODUCT DESCRIPTION

INTELLIGENT GRAPHICS WORKSTATIONS

Tektronix®
COMMITTED TO EXCELLENCE

Tektronix XD88/35

High-Performance 3D Graphics Superworkstation



- **21 MIPS, 2.5 MFLOPS compute performance**
- **One million vectors per second, 65,000 shaded polygons per second**
- **UTek™ V enhanced UNIX® System V**
- **X Window System™ Version 11 with Motif™**
- **Up to 176 MB RAM**
- **TekImaging™ image processing software included**

The Tektronix XD88/35 Graphics Superworkstation is the top performer in Tek's XD88 product family. With compute speeds of 21 MIPS, drawing speeds of one million vectors per second, and an integrated software environment that includes image processing and a Motif-based interface, the XD88/35 is the perfect platform for high-end graphics applications such as MCAE, visual simulation, earth resources, and animation.

21 MIPS, One Million Vectors per Second. The impressive performance of the XD88/35 Superworkstation comes from teaming the 25 MHz Motorola® 88100 RISC processor with a 4G graphics accelerator that generates one million vectors per second. The 88100 CPU includes such features as 64 KB of cache memory, on-chip integer and floating-point support, and four-way memory interleaving for high application performance.

The graphics system has up to 24 bit planes with a 24-bit Z-buffer, hardware-accelerated Gouraud shading, and pan and zoom. A 16-inch monitor is standard, with an optional 19-inch for viewing the most complex, detailed graphics.

Intuitive, Iconic Interface. A simple, elegant desktop user interface overlays the XD88/35's powerful hardware, making it easy to access the workstation's capabilities. This interface combines Version 11 Release 4 of the X Window System with the Motif Interface and the X.desktop™ manager. These industry- standard user interfaces are tightly integrated into the UNIX-based UTek System V operating system, which also features a number of Berkeley extensions including the Fast File System, sockets, and the C-shell.

X.desktop is a Motif-based desktop manager that provides an easy-to-use iconic front-end to UTek V. Less experienced users can access UTek's powerful capabilities using a mouse and familiar icons, while experienced UNIX users can interact with the system through a UNIX shell.

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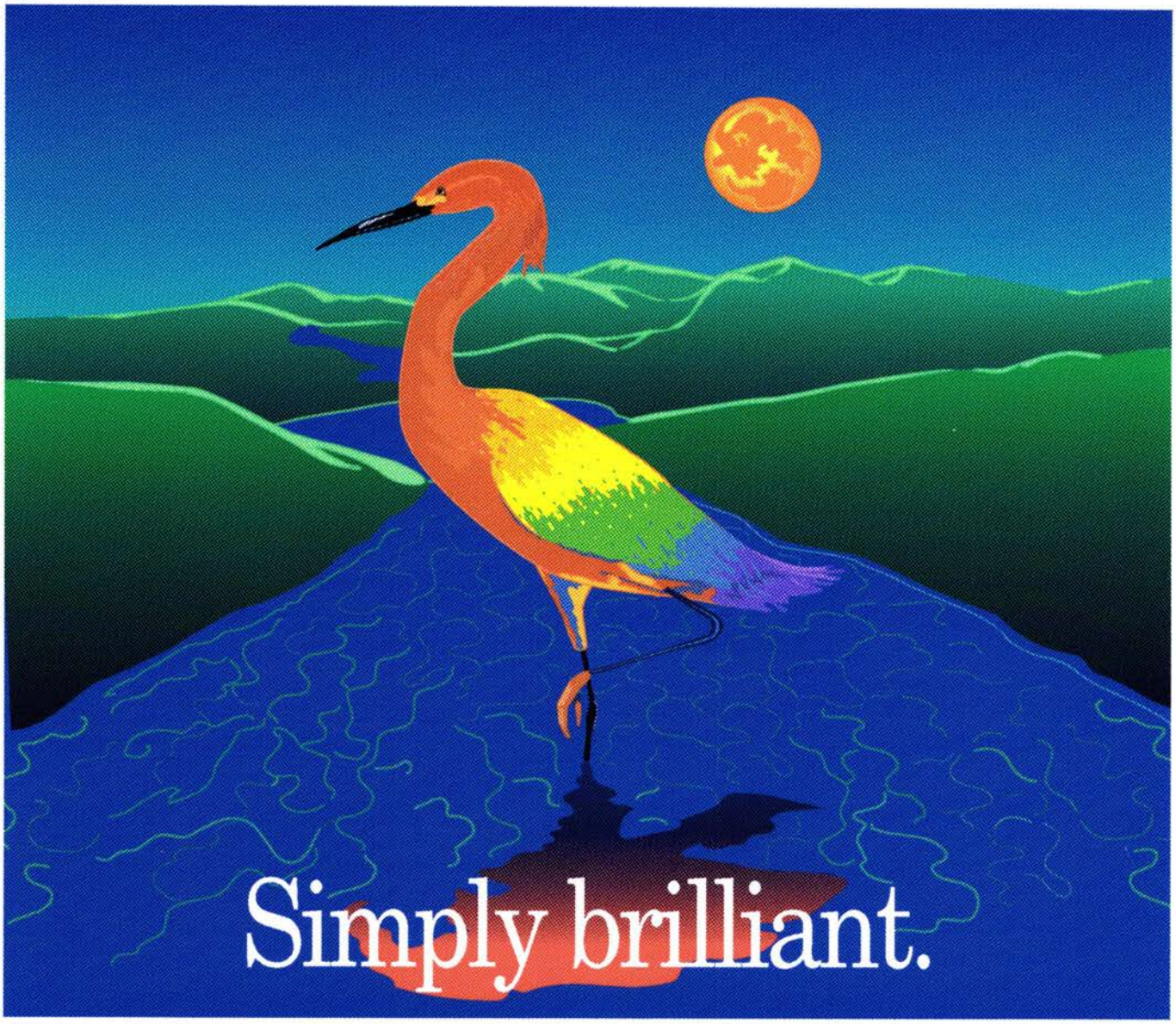

You can't get color more brilliant than this. Tektronix color printers offer the brightest, boldest color money can buy. And at prices you can afford. No other printer on the market can make you look this good.

Our serious workgroup color PostScript™ printers start at prices you won't believe. You can get PANTONE®* certified color that's Adobe PostScript™ level-2 and HP-GL™ with our industry-acclaimed TekColor™ enhancements.

Or you can step up to the best color in our Tabloid printer that uses any paper, the Phaser III PXi. Everything you need to create output that will get you noticed in the flash of a page.

And for even more options, our printers give you 16.7 million colors to choose from, at 300 dpi, with 24 Mhz RISC processors. You can print on paper or transparencies, using a PC, Mac, workstation or mainframe.

If it's great color you're after, it's Tektronix you want. No other printer will make you look this brilliant. For information and a print sample, call 1-800-835-6100.

Tektronix

For Color Printer Information, call 1-800-835-6100.

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12W-3747

TEKTRONIX
RE4012

The computer terminal designed for rugged military environments

Sony/Tektronix

Akio Morita and Howard Vollum

Type 323 Scope

In the 1950s and 1960s Japan had strict policies limiting foreign corporate ownership. With the rapid growth of the Japanese electronics market in the early 60's, Tek sought a partnership in order to sell instruments there.

Formed in 1964, Sony/Tektronix was the first 50:50 - owned American company in Japan. The foundation of the company was the personal relationship established between Howard Vollum and Akio Morita, respective company co-founders. At the time the companies had a similar employee headcount and annual revenue.

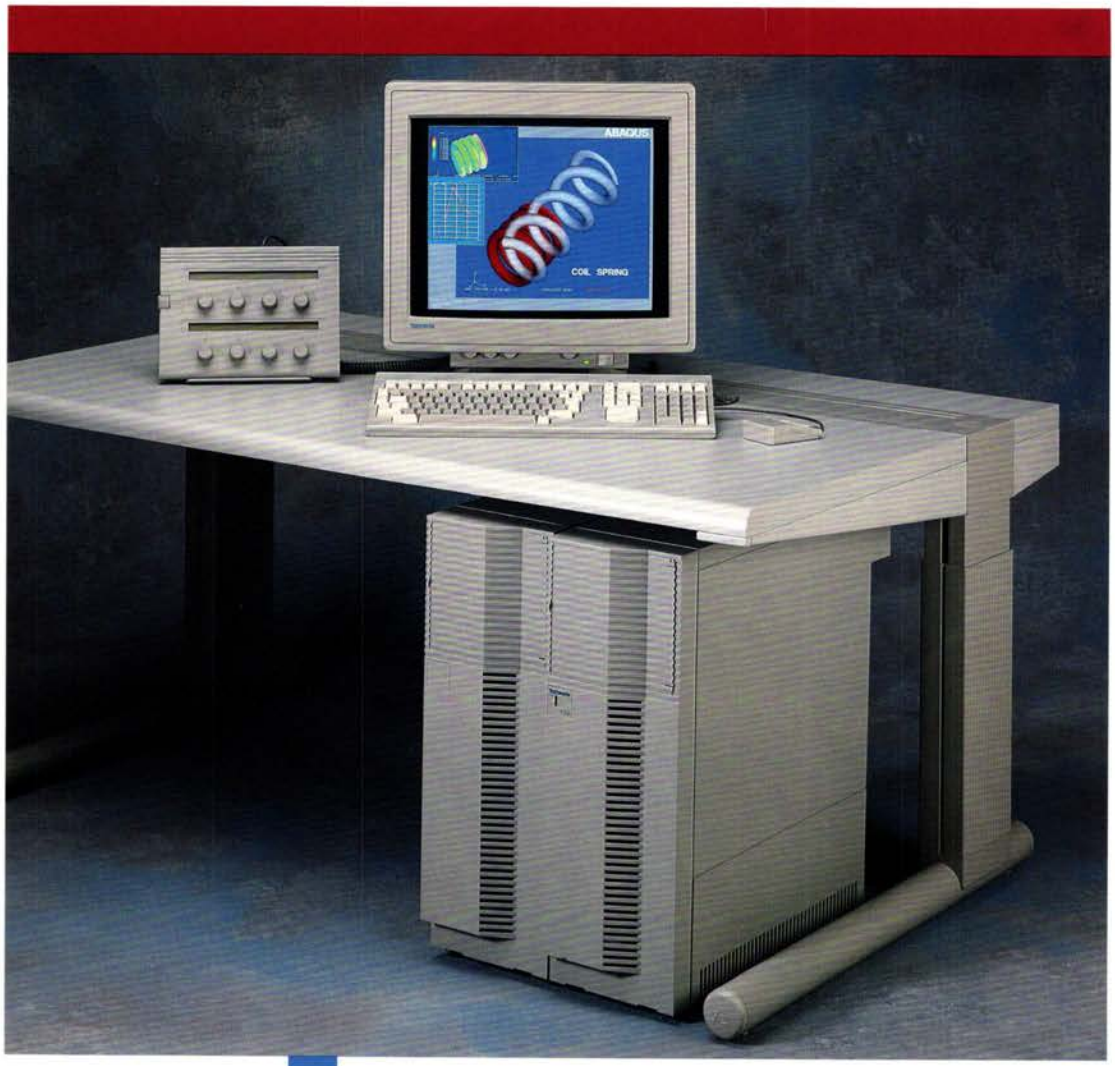
Sony/Tektronix sold Tek products in Japan and developed and sold co-branded products for markets in Japan, elsewhere in Asia and throughout the world.

The first jointly-developed product was the Type 323 mini-oscilloscope, where John Gates was the project leader. At just under seven pounds, the 4MHz instrument was introduced in 1968. Over 10,000 were sold during the eleven-year product life.

Sony/Tek continued as a joint venture until 2002 when Tektronix fully acquired the company as Tektronix Japan. Tek Japan was relocated to Beaverton in 2008.

Tektronix 4335

3D Graphics Workstation



- **Integrated engineering workstation with UTek™ enhanced UNIX® and X Window System™**
- **Diskless version available for low-cost network node**
- **3D wireframe graphics**
- **256 simultaneously displayable colors**
- **Upgradeable to Tek XD88 Superworkstation**

Screen display courtesy of HKS.

Tektronix' 4335 3D Graphics Workstation combines low-cost, high-performance graphics with integrated workstation compute power to create a highly productive graphical design environment. The combination of superior color and speed at a cost-effective price makes the 4335 an ideal platform for demanding 2D and 3D graphics applications such as GIS, mechanical CAD, and others with rigorous performance requirements.

High-Speed, Richly Colored Graphics. The 4335 uses a pipelined architecture and Tek's custom gate arrays to draw 2D vectors at a rate of 450,000 per second and 3D vectors at 340,000 per second. It comes with eight bit planes and can accommodate as many as 16 to provide 8-bit double-buffering and true color. The 4335's 3D features include true zoom and pan, parallel and perspective projection, clipping, and all 3D rotations.

Workstation Power for Peak Application Performance. The 4335 also has a 20 MHz application processor and floating point coprocessor for fast application processing. A 1.2 MB flexible disk drive and an 86 MB hard disk are standard, as is local area networking and RS-232-C, Centronics®, and SCSI ports—all of which allow for flexible configurations. A diskless configuration is available to lower the per-seat cost.

The powerful UNIX-based UTek operating system hosts the X Window System interface, popular high-level language compilers, Tek's own PLOT 10® software, and many other industry-standard third-party graphics packages.

World Class Support. Tektronix backs its products with a worldwide network of service and support professionals and a decades-long record of graphics excellence. To ensure continued service and support, you can extend the standard warranty through our optional Warranty Plus program.

Tektronix®
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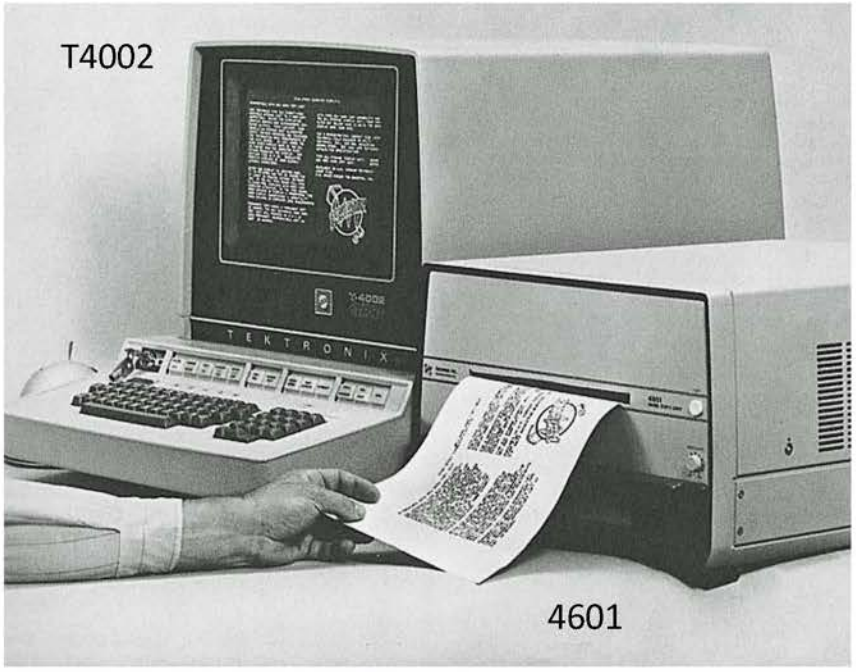
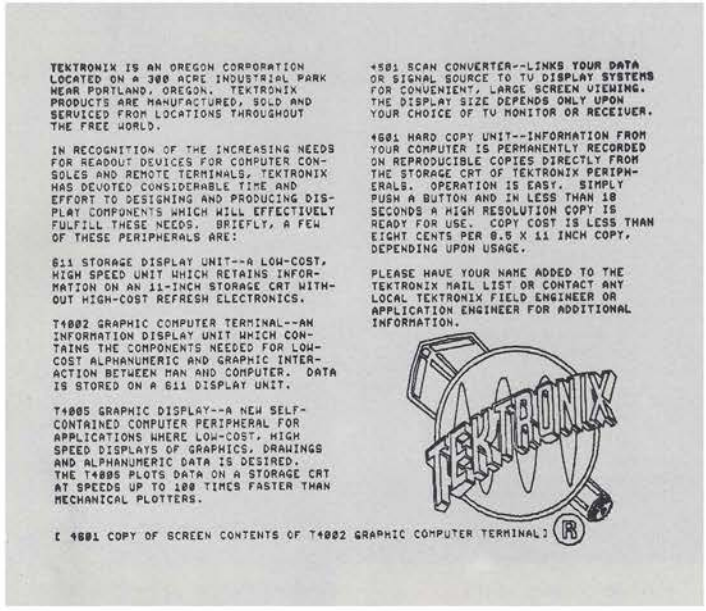
THE TEKXPRESS X STATION FAMILY.

THE BIGGEST STEP IN X.

Hardcopy for Storage Monitors



T4601 CRT



TEKTRONIX IS AN OREGON CORPORATION LOCATED ON A 300 ACRE INDUSTRIAL PARK NEAR PORTLAND, OREGON. TEKTRONIX PRODUCTS ARE MANUFACTURED, SOLD AND SERVICED FROM LOCATIONS THROUGHOUT THE FREE WORLD.

IN RECOGNITION OF THE INCREASING NEEDS FOR READOUT DEVICES FOR COMPUTER CONSOLES AND REMOTE TERMINALS, TEKTRONIX HAS DEVOTED CONSIDERABLE TIME AND EFFORT TO DESIGNING AND PRODUCING DISPLAY COMPONENTS WHICH WILL EFFECTIVELY FULFILL THESE NEEDS. BRIEFLY, A FEW OF THESE PERIPHERALS ARE:

611 STORAGE DISPLAY UNIT--A LOW-COST, HIGH SPEED UNIT WHICH RETAINS INFORMATION ON AN 11-INCH STORAGE CRT WITHOUT HIGH-COST REFRESH ELECTRONICS.

T4002 GRAPHIC COMPUTER TERMINAL--AN INFORMATION DISPLAY UNIT WHICH CONTAINS THE COMPONENTS NEEDED FOR LOW-COST ALPHANUMERIC AND GRAPHIC INTERACTION BETWEEN MAN AND COMPUTER. DATA IS STORED ON A 611 DISPLAY UNIT.

T4005 GRAPHIC DISPLAY--A NEW SELF-CONTAINED COMPUTER PERIPHERAL FOR APPLICATIONS WHERE LOW-COST, HIGH SPEED DISPLAYS OF GRAPHICS, DRAWINGS AND ALPHANUMERIC DATA IS DESIRED. THE T4005 PLOTS DATA ON A STORAGE CRT AT SPEEDS UP TO 100 TIMES FASTER THAN MECHANICAL PLOTTERS.

4501 SCAN CONVERTER--LINKS YOUR DATA OR SIGNAL SOURCE TO TV DISPLAY SYSTEMS FOR CONVENIENT, LARGE SCREEN VIEWING. THE DISPLAY SIZE DEPENDS ONLY UPON YOUR CHOICE OF TV MONITOR OR RECEIVER.

4601 HARD COPY UNIT--INFORMATION FROM YOUR COMPUTER IS PERMANENTLY RECORDED ON REPRODUCIBLE COPIES DIRECTLY FROM THE STORAGE CRT OF TEKTRONIX PERIPHERALS. OPERATION IS EASY. SIMPLY PUSH A BUTTON AND IN LESS THAN 10 SECONDS A HIGH RESOLUTION COPY IS READY FOR USE. COPY COST IS LESS THAN EIGHT CENTS PER 8.5 X 11 INCH COPY, DEPENDING UPON USAGE.

PLEASE HAVE YOUR NAME ADDED TO THE TEKTRONIX MAIL LIST OR CONTACT ANY LOCAL TEKTRONIX FIELD ENGINEER OR APPLICATION ENGINEER FOR ADDITIONAL INFORMATION.

TEKTRONIX®

[4601 COPY OF SCREEN CONTENTS OF T4002 GRAPHIC COMPUTER TERMINAL]

Photo of 4601 hardcopy

Early sales of Tek's new storage monitors were limited by an inability to make hardcopy of the screen content. Customers created impressive high resolution graphics onscreen, but it was difficult to incorporate these into a presentation or a written report.

The 4601 Hard Copy Unit solved this problem using 3M™ light-sensitive, dry-silver paper and a Tek-made CRT. The 4601 first appeared in the 1971 catalog for $3750 (almost $25k today).

The very unusual CRT incorporated a ceramic funnel and a fiber optic faceplate to columnate the emitted light. It exposed the light-sensitive paper a line at a time.

The 4601 was the first of many Tektronix hardcopy products and printers, offered into the 1990s.

XP10 SERIES

- Broad family of X terminals offering the best price/performance at the lowest possible cost.
- Full compatibility with Sun, DEC, IBM, SGI and other UNIX computer environments provides comprehensive connectivity and easier administration, with plug and play installation.
- Ergonomically designed with user-friendly features, like flicker-free tilt/swivel displays, high resolution, small footprint, and optional IBM, DEC, or UNIX keyboard.
- Validated with hundreds of UNIX applications to insure superior productivity.
- World wide sales, service and support provides flexible, expert assistance where, when and how you need it for maximizing productivity.

Designed for these Markets

Financial services
Telecommunication
Government
Retail
Healthcare
Publishing

Ideal for these Applications

OLTP
CASE
Electronic Publishing

XP11
15" Monochrome
1024x768 resolution

XP12
19" Monochrome
1280x1024 resolution

XP13
15" Gray-scale
16 shades of gray
1024x768 resolution

XP17
14" Color
256 colors
16.7 million palette
1024x768 resolution

XP18
17" Color
256 colors
16.7 million palette
1152x900 resolution

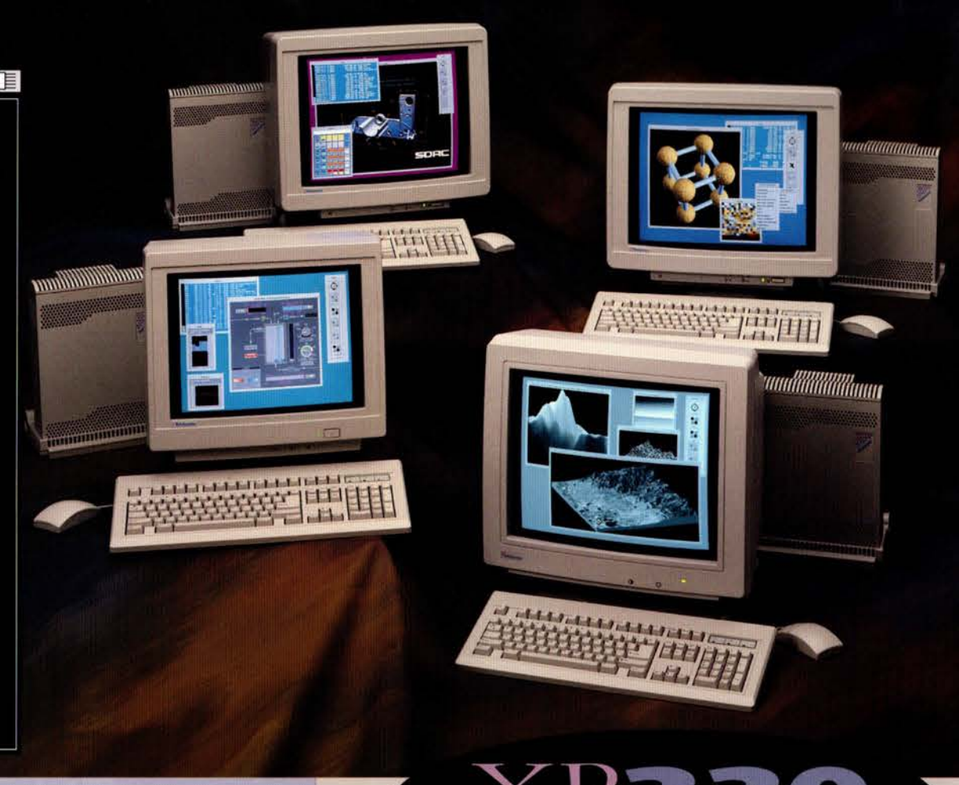
XP334
19" Grayscale
256 shades
1280x1024 resolution

XP336
17" Color
256 colors
16.7 million palette
1152x900 resolution

XP337
19" Color
256 colors
16.7 million palette
1152x900 resolution

XP338 & XP338P
19" Color
256 colors
16.7 million palette
1280x1024 resolution

(XP338P available with PEX Protocol 5.1)



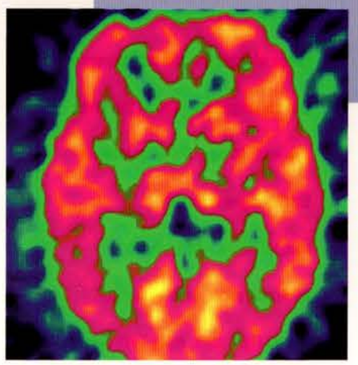
XP330 SERIES

Designed for these Markets

Military/Aerospace
Computers/Electronics
Manufacturing/Processing
Government
Petroleum/Chemicals
Telecommunications

Ideal for these Applications

Design Automation
(EDA, MCAD/CAE, CASE)
Process Control
Earth Resources



- Broad family of high performance RISC-based X terminals allows you to select the best performance for your specific application needs.
- Full compatibility with Sun, DEC, HP, IBM, SGI and other UNIX computer environments delivers workstation look-and-feel, comprehensive connectivity and easier administration.
- Aggressively priced at half the cost of a comparable workstation to provide the best value in a high performance X terminal.
- Displays with workstation resolution and quality offer unmatched visual clarity and reliability.
- Server is optimized and verified for maximum performance with a broad range of demanding technical and engineering applications to provide superior productivity.
- World wide sales, service and support provides flexible, expert assistance where, when and how you need it for maximizing productivity.

MULTIPLE DISPLAYS—The GDC can drive up to four parallel display devices in any combination: 611 11-inch Direct-View Storage Display Unit • 601 5-inch Direct-View Storage Display Unit • 4501 Scan Converter • Tektronix 549 and 564B Storage Oscilloscopes • and the T4005 display. Each device is selected manually or by program control. With this wide flexibility, outputs are displayed as needed at sites remote from the computer center.

APPLICATION AREAS

The T4005 is useful in a vast range of applications. Numerical and process control, analysis, computer-aided design, and simulation are just a few of many applications.


EXIT
vintage

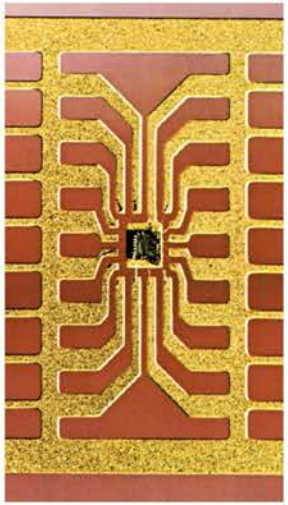
Tektronix Components

Electroplated, electroformed and photoetched parts

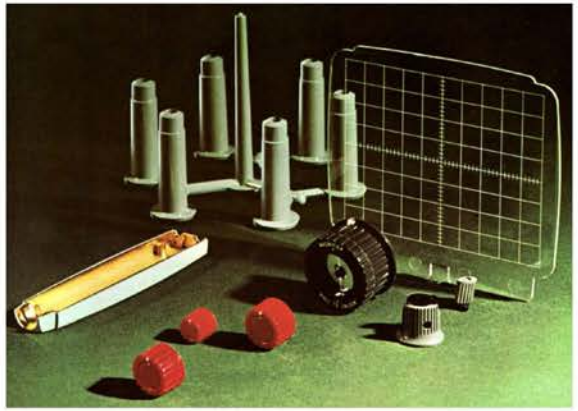
Ceramic funnels for cathode ray Tubes

Within a few years of the Tektronix' founding in 1946, there was already a willingness to produce certain components internally when those were not available with appropriate specifications or demonstrated quality. These components included precision resistors, capacitors, transformers, cables, printed circuit boards, parts made from plastics and ceramics, etched and electroplated components, sheet metal and machined parts, cathode ray tubes and integrated circuits and hybrids.

- Internal production allowed Tek to offer a lifetime warranty for its transformers.
- Tek had a 49,000 square foot building (Bldg 13) devoted entirely to ceramics – strips, CRT funnels and other parts. Most all CRTs produced after 1962 with screen sizes from 2" to 11" diagonal used ceramic funnels.
- There was a period where over two million feet of probe cables and delay lines were produced per year.



IC and lead frame from a Type 576 Curve Tracer (1969)

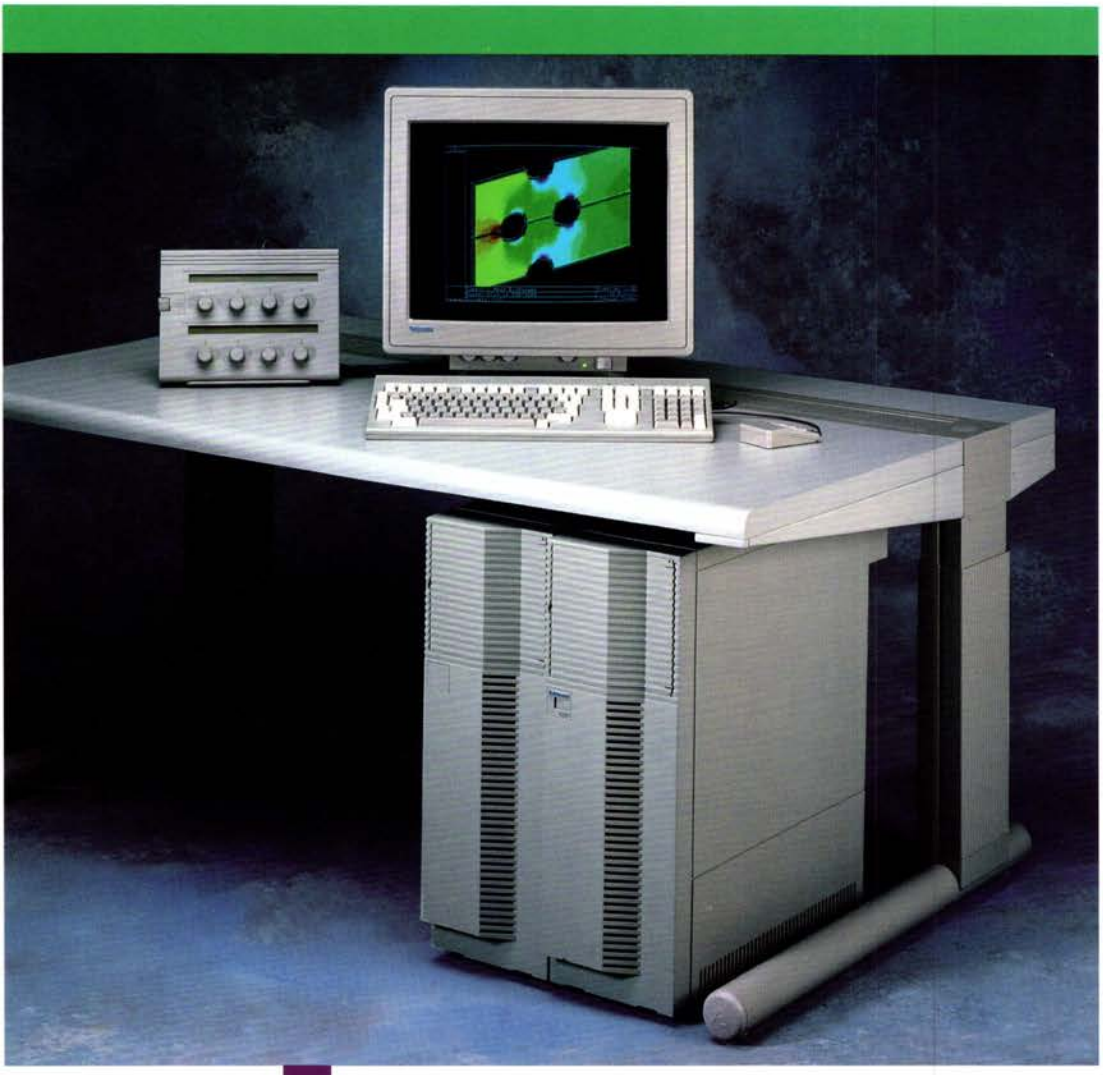


Plastic knobs, probe bodies and graticules

vintageTEK museum

Tektronix 4237

3D Graphics Netstation



- **3D wireframe, hidden line, and shaded surface graphics**
- **Pipelined processing for maximum graphics performance**
- **12-bit planes for 4096 simultaneous colors**
- **24-bit Z buffer**
- **LAN and RS-232-C connections**

Screen display courtesy of Creare.

The Tektronix 4237 Graphics Netstation provides extremely high-quality image rendering, with 12 bit planes and 4,096 indexed colors simultaneously displayable. The 4237 also features a high-speed graphics engine, making it an ideal platform for high-end mechanical CAD, molecular modeling, animation, and other applications with rigorous 3D performance requirements. To provide an easy upgrade path and fully protect your investment, you can later add a compute module to your 4237, converting it to a fully integrated engineering workstation.

Graphics Suited to Smooth Shading and Dynamic Movement. Kinematics, stress analysis, animation, and other tasks requiring dynamic movement are perfect for the 4237. And if you add the additional 12-plane frame buffer (available optionally), you get double-buffering and 24-bit true color. To view 3D images in stereo, you can outfit the 4237 with the optional stereoscopic display.

A complete 3D feature set lets you quickly create and manipulate complex images using true zoom and pan, shading (flat, Gouraud, and Phong approximation), depth-cued vectors, translucent 3D surfaces, light intensity selection, parallel and perspective projection, sectioning, clipping, 3D rotations, specular highlighting, and spotlights.

Designed to Keep Pace. The 4237 Netstation comes with an Ethernet™ LAN interface for high-speed network connection, as well as an RS-232-C host port. Meanwhile, the 4237's local intelligence improves host computing efficiency by assuming all graphics work.

Wide-Ranging Software Compatibility. To maximize the value of your current software investment, the 4237 is fully software-compatible with Tek 4120 Series graphics. You can use it with hundreds of existing graphics software packages, including Tek's PLOT 10® family of software. In addition, Tek works closely with leading software suppliers to ensure the availability of high-performance packages for 2D and 3D graphics-intensive disciplines.

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CRT Innovation

Electron gun designer Connie Wilson was one of Tek's first women engineers. She designed electron guns for the CRTs used in the Type 547, 555 and 561 oscilloscopes and the Type 529 television waveform monitor. She managed an electron gun design group during the 1960s.

Pete Perkins and Larry Virgin are shown examining an electron gun from a T611 storage CRT. Pete was also the designer of the gun for the CRT used in the Type 647 scope. Larry Virgin was the CRT designer for the Type 7613 scope. He was also a leading contributor to the 19" and 25" graphics storage CRTs.

Vilma Leeto and Jack Neff were among the first members of the Tek CRT production team. They hold a plaque commemorating the production of the 250,000th T465 portable oscilloscope CRT in 1982. Many more were produced.

Chris Curtin holds the storage CRT he co-designed that was used in the Type 7623 scope. He was the designer of the CRTs used in the Type 549 and 601 scopes and went on to be the General Manager of the CRT operation.

The TekXpress XP29. *Tek's highest-resolution color X terminal, the XP29 features a 1280 x 1024 19-inch screen.*

The TekXpress XP21. *A 17-inch monochrome X terminal, the XP21 features 1152 x 900 resolution and a 72 Hz refresh rate for superb viewability. Its high-performance dual-processor architecture makes it an exceptional transaction processing tool.*

The TekXpress XP25. *With its 1152 x 900 14-inch screen, the XP25 offers one of the smallest footprints of any high-performance full-color X terminal on the market. Consider it for high-end office automation, financial services, data analysis and other applications where desktop space is at a premium.*

The TekXpress XP23. *Featuring 16 shades of gray with 1280 x 1024 resolution on a 19-inch screen, the XP23 is ideal for desktop publishing and CASE, and for applications using graphical user interfaces such as Motif and OPEN LOOK.*

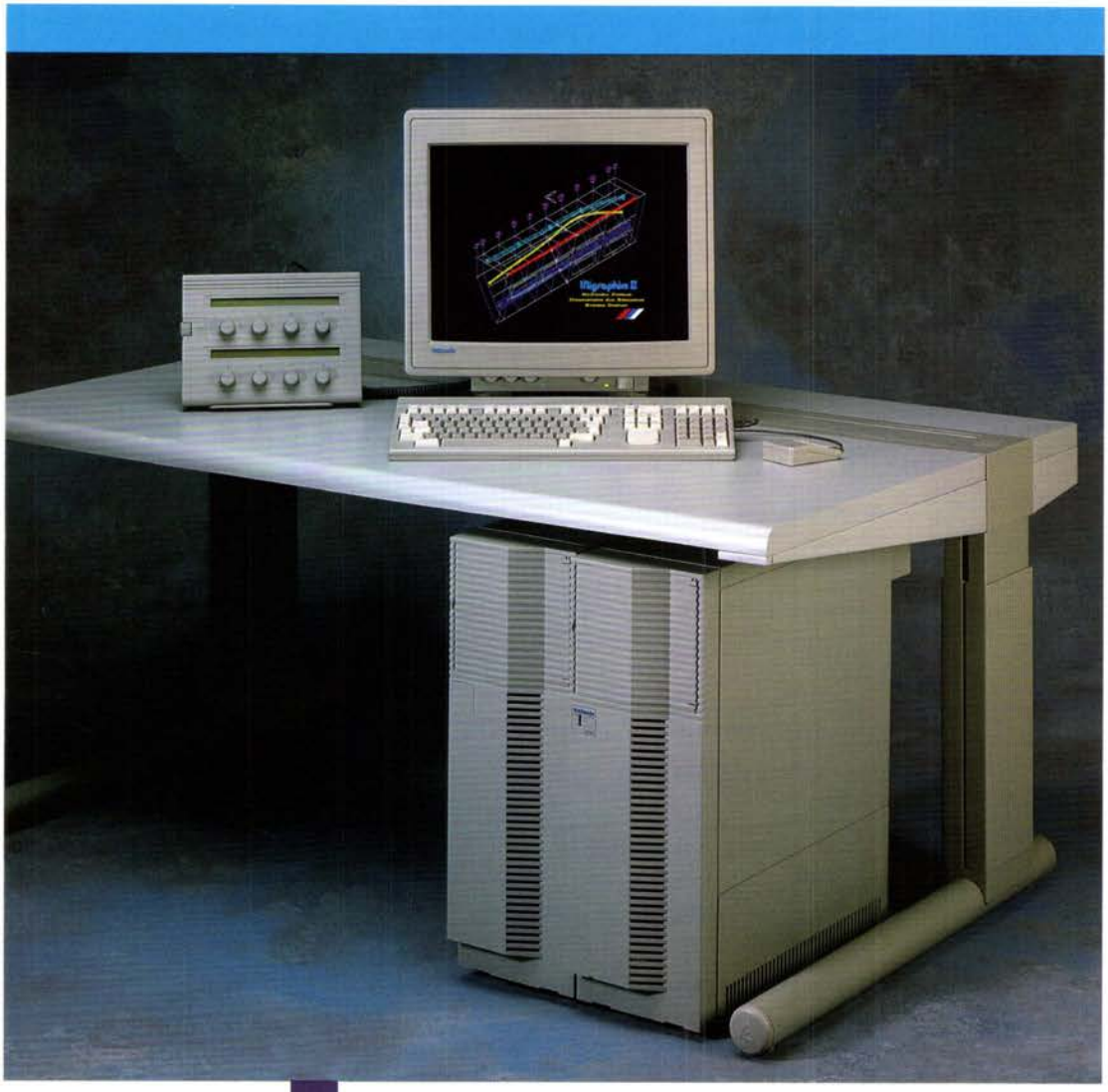
The TekXpress XP27. *Providing 1152 x 900 resolution in a 19-inch color monitor, the XP27 is a popular choice for applications networked to Sun workstations, which feature identical pixel resolution. A 72 Hz refresh rate makes for easy viewing even over long stretches.*

Not shown:
The TekXpress XP26 *features a small footprint, 17-inch monitor, 1152 x 900 resolution and a 72 Hz refresh rate.*

Not shown:
The TekXpress XP29P *is the industry's first PEX terminal, designed especially for software developers. It offers 19-inch display, 1280 x 1024 resolution and full PEX functionality utilizing the PEX 5R1 implementation.*

Tektronix 4235

3D Graphics Netstation



- 3D wireframe graphics
- Pipelined processing for maximum graphics performance
- 16 simultaneously displayable colors
- LAN and RS-232-C connections
- Upgradeable to standalone workstation

Tektronix 4235 Graphics Netstation is an excellent, low-cost, high-performance graphics terminal for today's fast-changing computing environment. The combination of superior color and speed at a cost-effective price makes the 4235 an ideal platform for high-end mechanical CAD, molecular modeling, animation, and other applications with rigorous performance requirements. Configure it as a graphics terminal on a large host computer or as a low-cost graphics node on an existing workstation.

A World of Motion, Depth, and Color. The 4235 Netstation is built around Tek's custom gate arrays, which draw 2D vectors at a rate of 450,000 per second and 3D vectors at 340,000 per second. These gate arrays are assisted by a Motorola® 68020 processor rated at 2.5 MIPS for GIN and local dynamics. Four bit planes are standard, as is a 3D feature set that includes true zoom and pan, parallel and perspective projection, clipping, and all 3D rotations. An optional stereoscopic display provides an extra level of depth perception. Touch-screen and multi-screen capability are also available.

Designed to Keep Pace. The 4235 Netstation comes with an Ethernet™ LAN interface for high-speed network connection, as well as an RS-232-C host port. Meanwhile, the 4235's local intelligence improves host computing efficiency by assuming all graphics work.

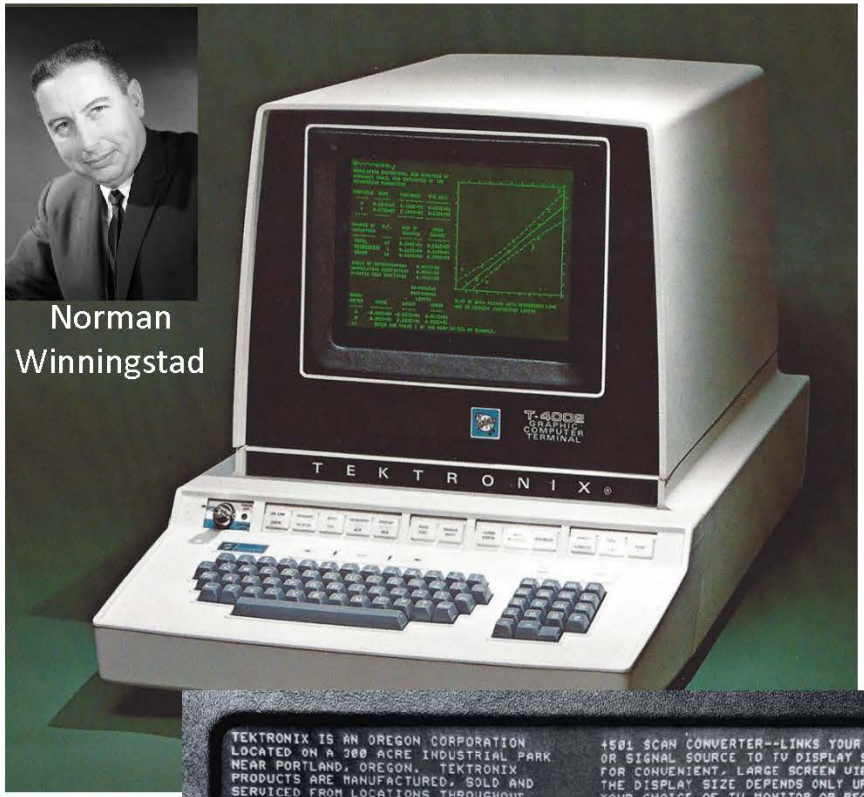
To provide even more local processing power and protect your investment, you can upgrade the 4235 to a 4236 or 4237 Netstation or to a full-fledged 3D workstation.

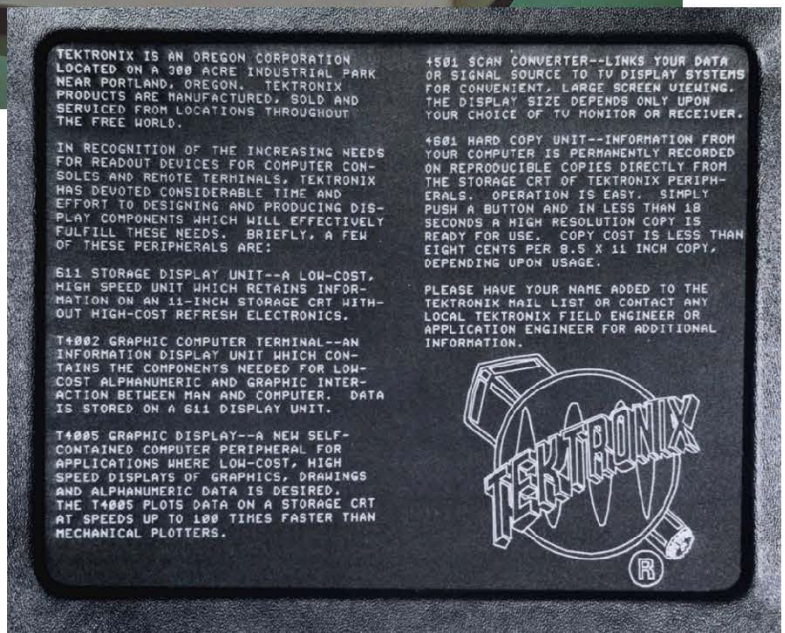
Wide-Ranging Software Compatibility. The 4235 is software-compatible with Tek 4125 and 4128 graphics, which means you can use it with hundreds of existing graphics and productivity software packages, including Tek's PLOT 10® family of software. In addition, Tek works closely with leading software suppliers to ensure the availability of high-performance packages for graphics-intensive disciplines.

Tektronix®
COMMITTED TO EXCELLENCE

Screen display courtesy of McDonnell Douglas M&E.

Direct-View Storage Tube Monitors





A few years after the introduction of Tek's 564 storage scope in 1962, reports came back to Beaverton from field engineers that 564 scopes were being "hacked", as it would be described today. Computer system developers were using the screen storage function of the 564 CRT to create a computer monitor! At the time there were no components suitable for use as video memory. The typed input and output for mainframe computers was being stored for viewing on the interfaced 564 scope screen. It was a revelation – and the start of a revolution.

Norman Winningstad, Tek engineer and up-and-coming entrepreneur, was able to convince Howard Vollum that this could be Tek's first non-oscilloscope business opportunity.

A larger screen was needed for computer use so a storage CRT with an 11" screen was developed. It was the largest CRT Tek had built up to that time. The CRT and monitor in which it was incorporated were both called "611". The monitor was employed in Tek's first computer graphic terminal, the T4002, shown in the adjacent photo. Introduced in 1968, it was the first low-cost, graphic computer terminal suitable for readout of complex graphics and high density text. It sold for $8,800 at a time when IBM graphics terminals with conventional CRTs cost $80,000 to $100,000.

A screenshot in black and white from a T4002 is shown at left. Note the quality of the rendering for the Tek bug logo. The screenshot is from the 1971 Tektronix catalog.

vintageTEK museum

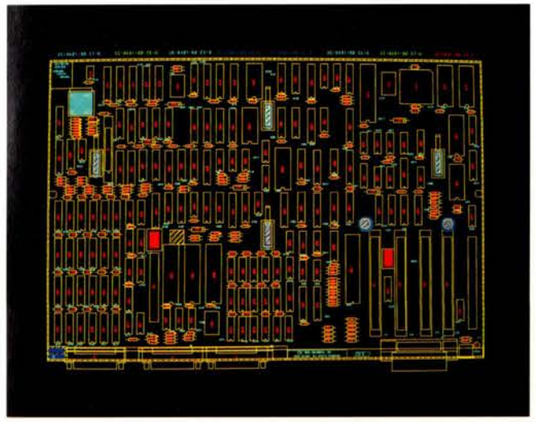
INTRODUCING THE HIGHER-SPEED, HIGHER-RESOLUTION TEK 4111 DESKTOP TERMINAL.

With its four-time increase in speed and an expanded pixel matrix of 1024x768, the Tektronix 4111 Computer Display Terminal establishes a new standard in desktop graphics. And that means more productivity for your electronics engineering, mechanical drafting, and structural analysis applications.

The 4111 provides you with an extensive set of graphics functions such as multiple views, segments, surface support, and local zoom and pan. Graphics input gains the full benefit of efficient features like rubberbanding, gridding, inking, a user-definable cursor, plus easy polygon-fill with any of 16 pre-defined or user-defined patterns.

You'll also find 256K local RAM available to store picture elements; up to 1MB can be optionally added.

The 4111 comes with advanced firmware routines and a highly interactive user interface to make your design time more productive. You can count on these powerful routines to handle segment editing, segment subroutines, pick operations, host window management, multiple scrolling dialog areas, and pop-up menus. VT-100™ compatibility offers easy access to DEC-based alphanumerics.



The compatible Tek 4692 Color Graphics Copier gives you high-quality push-button copies quickly. And with support from Tek's 4957 Graphics Tablet, you streamline graphics input.

To ensure optimum image quality, each 4111 features a 19-inch, color raster display built around a precision in-line CRT gun. A 60-Hz non-interlaced display mode and anti-reflection enhancement panel combine to minimize flicker and eye-fatigue.

Use four bit planes and up to 16 of 4096 colors simultaneously. You can specify up to eight colors in the dialog area alone. Because each bit plane can be treated as a separate display surface, you can easily manipulate layers of data — a feature particularly useful in IC and printed circuit-board design applications.

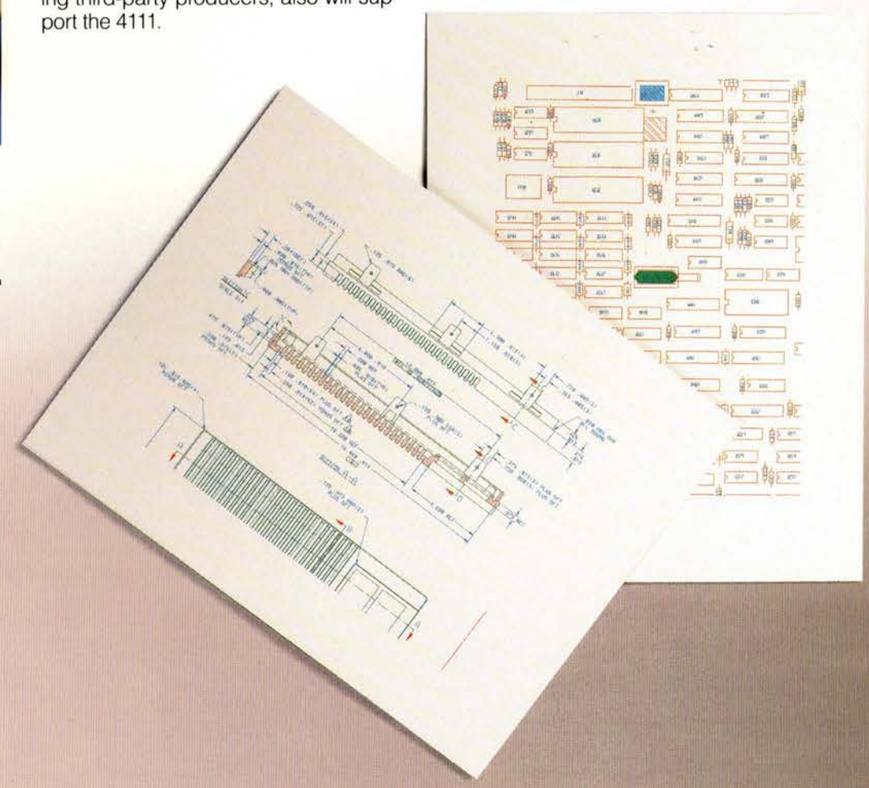
In addition, you can expect a number of 4111 capabilities ordinarily found only on higher-priced systems. The efficiently designed keyboard offers thumbwheels, a numeric keypad, and eight dedicated programmable keys, so you can adapt the keyboard to a particular application or a preferred style of interaction.

Choose from a broad range of software packages. The 4111 is compatible with PLOT 10 GKS, IGL, and Computer Aided Drafting (TekniCAD), which simplifies the creating and editing of technical drawings. What's more, Tek's Solution Vendor Program, with its many application packages from leading third-party producers, also will support the 4111.

You'll also find full support for graphics input as well as color hard copy and transparency output. A mouse and joystick can be attached as can the Tek 4957 lap-size and 4958 table-size Graphics Tablets. Tek's 4690 Series of Color Copiers are supported, including the Tek 4692 Color Graphics Copier. It provides sharp 154 dots-per-inch addressability, and delivers precise 8½ x 11 inch streak-free color results in less than two minutes.

And like the entire Tektronix graphics product line, the 4111 is backed worldwide by Tek's responsive, highly-trained support team.

To put the new standard for desktop graphics to work in your environment, contact your local representative for information on the Tek 4111 Computer Display Terminal, or call 1-800-547-1512. In Oregon, 1-800-452-1877.



Tektronix XD88/30

3D Graphics Superworkstation

- **17 MIPS compute performance**
- **1 million vectors per second and 65,000 shaded polygons per second***
- **UTek™ V—enhanced UNIX® System V**
- **X Window System™ Version 11 plus full 3D Tek window**
- **Up to 176 MB of RAM**
- **PC AT™ emulation**

*Requires Option 4G

Screen display courtesy of SDRC.

Tektronix' XD88/30 3D Graphics Superworkstation teams the Motorola® 88000 RISC processor with Tek's high-powered 3D graphics engine to achieve top throughput for compute-intensive graphics applications. The workstation's 88000 processor—operating at 20 MHz—includes such features as 64 KB of cache memory, on-chip integer and floating-point support, and four-way memory interleaving to keep application performance high.

The graphics engine produces drawing speeds of 340,000 3D vectors per second, 450,000 2D vectors per second, and 20,000 shaded polygons per second, in the base configuration. The Option 4G pipeline boosts graphics responsiveness to 1 million vectors per second. The result is unbeatable price/performance for high-end applications such as mechanical CAE, simulation, AEC, computer animation, earth resources management, and graphics software development.

Tek's innovative architecture provides the technology independence and growth potential of the Futurebus as well as the configuration flexibility of the VMEbus™ with 6U Euro card compatibility. From the scalability of the 88000 processor family through the modularity of the Tek workstation architecture, the XD88/30 ensures extended product life.

Super Graphics. Support for advanced 3D graphics applications includes true color capability with up to 24 bit planes and a palette of 16.7 million shades. Also available are double-buffering for smooth motion, a 24-bit Z (depth) buffer, Gouraud shading, true zoom and pan, and wireframe, shaded surface, and stereoscopic displays. A 16-inch monitor is standard, with a 19-inch monitor available as an option.

The XD88/30 gives you exceptional convenience in transferring your workstation graphics to video, paper, or transparency output. With Tek's digital video interface, you can record a design session in real-time or render studio-quality animations frame-by-frame. Tek's ink-jet and color image printers provide a range of hardcopy solutions.

Established Standards, Leading Software. The XD88/30 conforms to a broad range of established and emerging standards. System software includes

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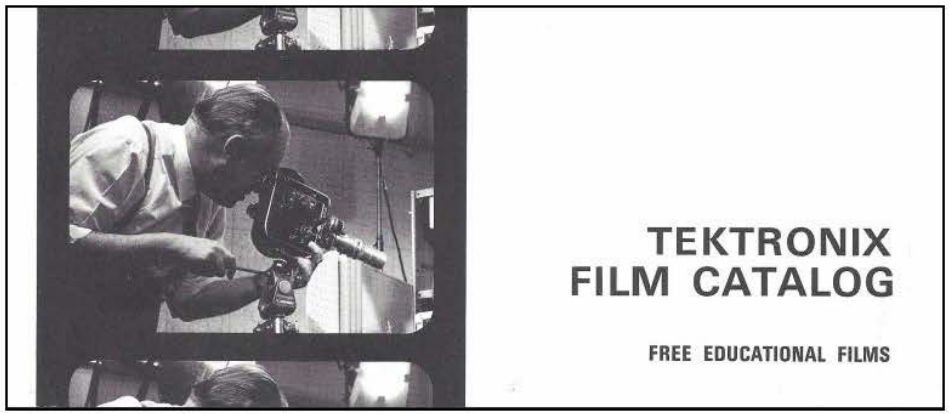
Films Produced at Tek



The Oscillograph Draws a Graph (1963)

Demo of a 4002 storage monitor

Circuit Boards – Design and Manufacture (1969)

Frank Hood was one of Tek's early design engineers. Photography and filmmaking were two of his hobbies and he made use of both in his work at Tektronix. He produced a number of educational and promotional films during his 22 years at Tek. Several of these and other Tek-made films are available for viewing on the vintageTek website. Check out the video gallery.

One of Frank's earliest Tek films is from 1955: *A Precision CRT*, describing how cathode ray tubes were made. It was shown to thousands of high school students in addition to engineers and scientists, as were many of his movies.

Films on the vintageTek website include:

- Overviews of Tek from 1968, 1977, 1979 and 1996
- Howard Vollum speaking to an Area Rep group in 1977
- Tours of Tek Beaverton, Guernsey and Herenveen
- Educational videos on a number of scope-related topics
- Several marketing videos for early products

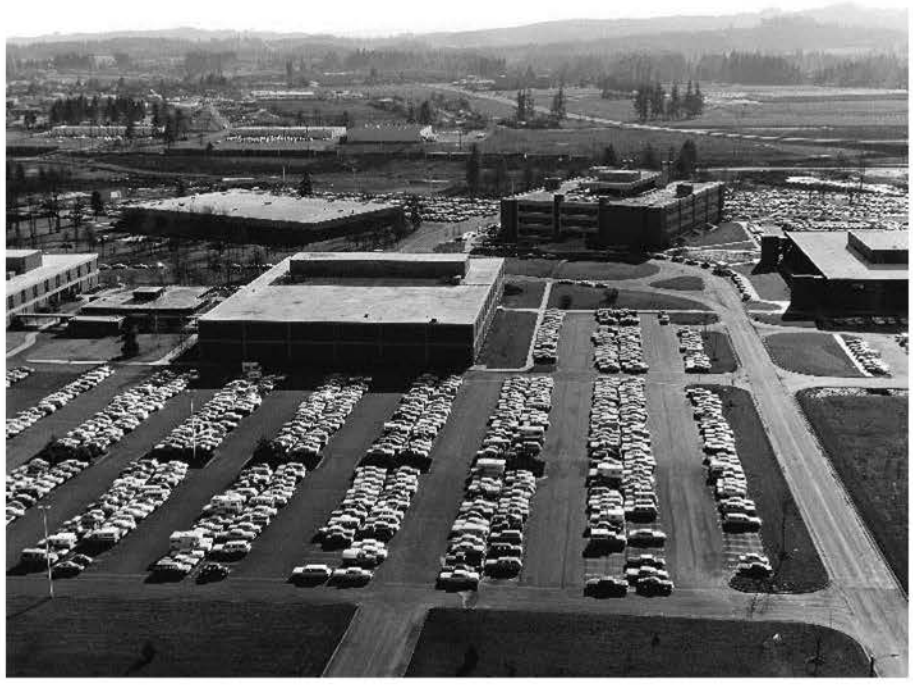
vintageTEK museum


Tektronix 4114

Beaverton Aerial Site Photos

This 1968 photo is composed similarly to the aerial shot taken from Jack Murdock's plane of the unbuilt Beaverton site (Slide 32). Again, Jenkins Road runs diagonally on the left side of the image. From building 55 in the foreground going clockwise: 47 (Assembly West), 39 (Assembly East) 19 (Metals/Plastics), 13 (Ceramics), 38 (Electrochem), 46 (CRT) and 50 (Technical Center) are present.

Building 58, to be located in the foreground near buildings 55 and 50, was not built until 1973.



Looking south, building 47 and the corner of 39 are in the foreground beyond the very full parking lot. Left to right further back are buildings 46 (now demolished), 50 and 55.

Murray Road has not been built. Canyon Road and St. Mary's are in the distance.

More photos and details are found on the vintageTek website. Search: "Beaverton Campus".

vintageTEK museum


EXIT

TEK 4200 SERIES TERMINALS

WHY TEK BUILDS A BETTER GRAPHICS TERMINAL FOR IBM AND DEC THAN IBM AND DEC.

The terminals of most mainframe builders are little more than slaves to the host. But Tek's 4200 Series gives you local manipulation, powerful graphics, and the option to use any host you choose.

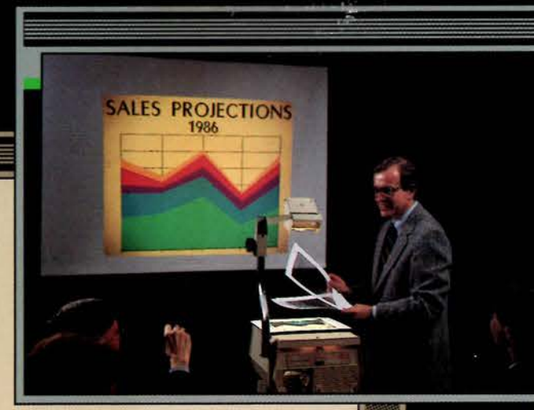
Only the 4200 Series offers up to 1.5 MB of memory, with the local capabilities that let you use your host most efficiently.

Only the 4200 Series offers dual connection to both IBM and DEC and other ASCII hosts. You can work with up to six databases concurrently.

Only the 4200 Series delivers interactive true zoom and pan with the other superb graphic and alphanumeric features made famous by Tektronix.

Tek Software and peripheral compatibility is without equal in the graphics industry. The 4200 Series is supported by more than 175 world-class software vendors offering a full range of solutions for MIS, manufacturing and engineering.

To bring your applications to life, you can use the 4200-compatible 4690 Family of color printers. Or other popular monochrome and color output devices.



4200 Series are immediately available from authorized distributors or by contacting your local Tektronix representative. For information:
call 1-800-225-5434.
In Oregon, 1-235-7202.

Comparison of Graphics Terminals

	TEK	DEC	IBM
DEC Host Compatible	Yes	Yes	No
IBM Host Compatible	Yes	No	Yes
Multiple Active Sessions	Yes	Yes	No
Tek 4010-4100 Command Set	Yes	No	No
Segments	Yes	No	No
True Zoom and Pan	Yes	No	No
IBM GDDM (Graphical Data Display Manager) Support	Yes	No	Yes
Graphics Addressability of 4096 × 4096	Yes	No	No
VT200 Alphanumerics	Yes	Yes	No
Background Hardcopy	Yes	No	No
Separate Graphics and Alphanumeric Regions	Yes	No	Yes

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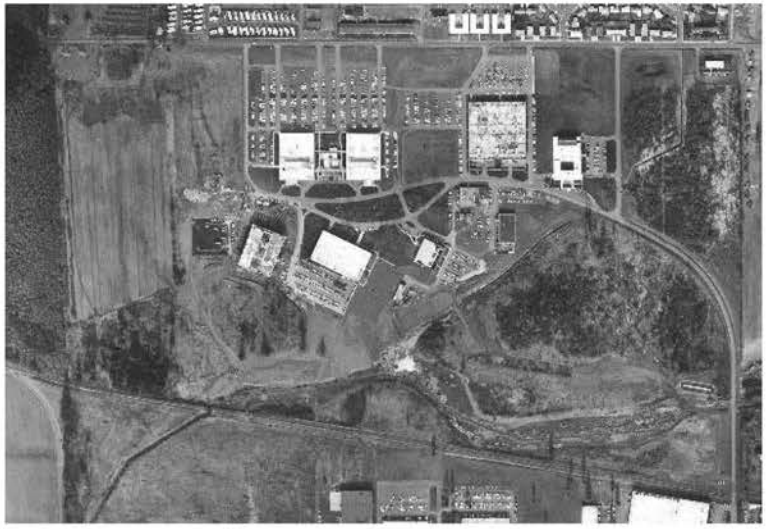
Beaverton Aerial Site Photos

Pre1960: CW from the upper left: 47 (Assembly West), 45 (Cafeteria), 39 (Assembly East), 28 (Utilities), 19 Metals/ Plastics), 13 (Ceramics), 46 (CRT, under construction)



1965: 38 (Electrochem), 46 (CRT), 50 (Tech Center)

The Tek Building Maintenance Group had aerial photos taken regularly of Tek property. These four shots show the buildout of the Beaverton Campus from the late 1950's through 1985. Jenkins Rd runs across the top in all photos. More photos and details are found on the vintageTek website. Search: "Beaverton Campus".

1976: 16 (Mech Products), 48 (Electron Devices), 58 (Gen'l Purpose), 55 (Operations), Murray Rd is complete (Left Side)

1985: 46A (CRT), 78 (Automated Warehouse, 59 (Microelectronics)

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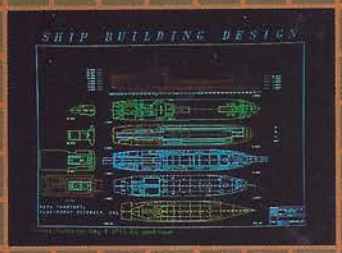
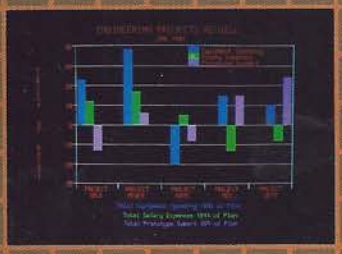




(Top) The extra dimension that color brings to data discrimination can be helpful in such multi-layer designs as circuit boards, buildings, or ships.

(Middle) Before-and-after eruption comparison of the Mt. St. Helens topology demonstrates the excellent resolution and added effect of color in the presentation.

(Bottom) The Local Easy Graphing Option allows users to quickly produce multi-color tables, graphs and charts like this without host communication.

SMART COLOR FROM TEKTRONIX: FOR A COMMAND OF GRAPHICS NEVER POSSIBLE BEFORE.

Tektronix®
COMMITTED TO EXCELLENCE

Never has a C-size plotter done so much. So fast. So simply.

No other plotter, large or small, makes so much capability so easy to control. The 4663 defines the state-of-the-art in smart plotting devices: its intelligence has been applied within a total human engineering context to make each step as easy as entering a command or pushing a button.

The simplicity of the control panel speaks for itself. Eight major control groups enable access to a variety of clearly defined commands via shift switches. The "Plot Control" group, for example, enables a pause in plotting with continued data buffering; a solid line outline of the viewport; or tic marks indicating viewport corners. Pen control functions allow for fine-tuning of pen pressure to best accommodate inks, pen points and media.

Tektronix 4663 software subroutines, part of our PLOT 10 Terminal Control System and PLOT 10 Interactive Graphics Library, are a comprehensive series of commands made especially easy by thorough step-by-step documentation.

Note too, that the 4663 draws curves that are really curve forms: no additional controller box is necessary. It uses its intelligence to draw both axes simultaneously—not as x and y stairsteps. It draws alphanumerics on a high resolution 15 x 7 matrix, in any size, shape or angle, with several language fonts available. It includes an advanced self-testing program and diagnostics that pinpoint errors whether from noisy lines, input data or machine malfunction.

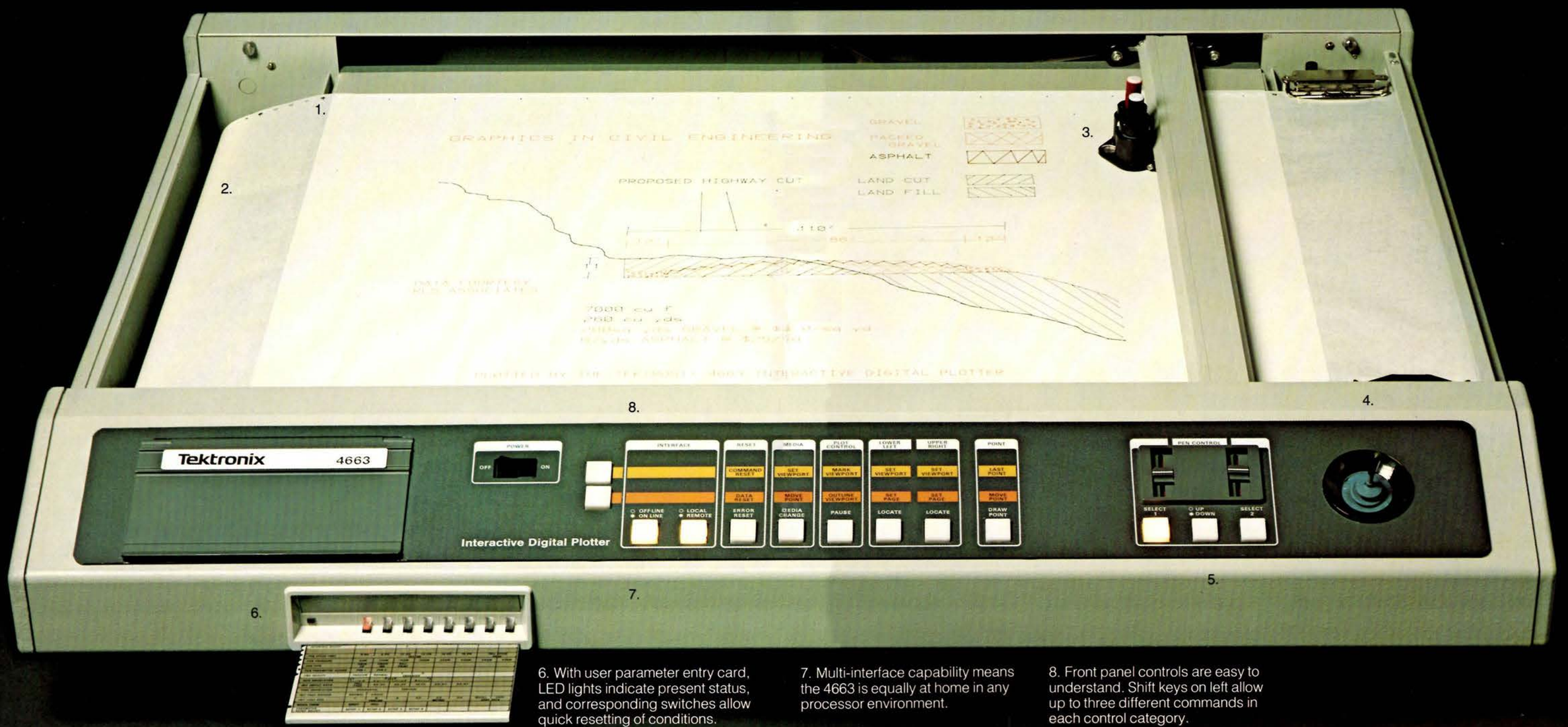
1. Manual media change is standard, but optional programmable feed is available.

2. The plotter can accommodate roll-feed or single sheet media up to 432mm x 559mm (17″ x 22″).

3. Dual programmable pens may be of varying points, widths and colors.

4. Built-in joystick gives you infinite flexibility in drawing and in digitizing points to terminal or processor.

5. Individual pen controls include fine tuning of pen pressure.

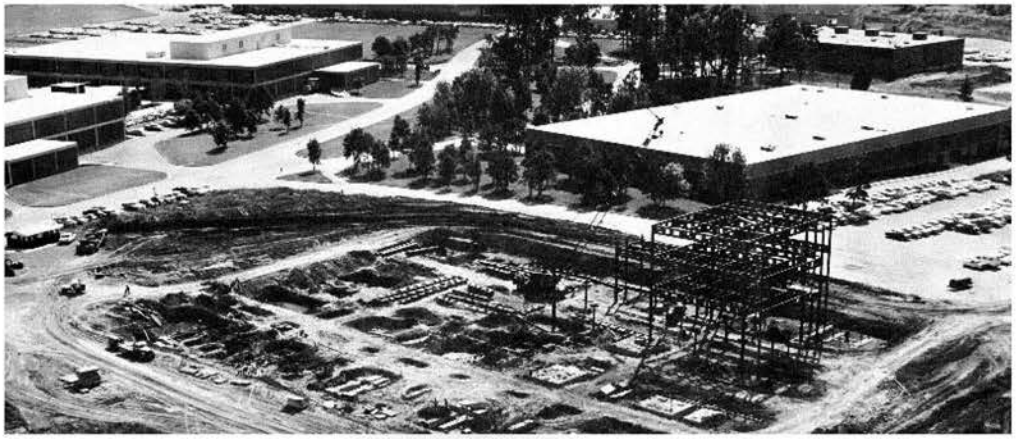


6. With user parameter entry card, LED lights indicate present status, and corresponding switches allow quick resetting of conditions.

7. Multi-interface capability means the 4663 is equally at home in any processor environment.

8. Front panel controls are easy to understand. Shift keys on left allow up to three different commands in each control category.

The Technical Center - Building 50



Tektronix continued to expand through the late 1950s and early 1960s, launching their most aggressive building expansion with the construction of the five-story Building 50 Technical Center. The structure was to house the engineering model shop, environmental test, the analytical chemistry laboratory, engineering tube lab, display and semiconductor device research, advanced instrument engineering, computer research, corporate offices, a cafeteria, and later, the home of Tek Labs.

The construction site was formerly a marsh so in order to secure the foundation, ninety-foot long pilings were driven into the ground. In spite of this attempt to stabilize the building, it settled, resulting in floors that were not level. Before this was corrected, pencils rolled off desks and engineering benches, which had to be shimmed.

The upper photo, looking northeast, shows Building 50 under construction. Building 46 (CRT) is found across the street to the right and Buildings 39 and 47 (Assembly East and West, respectively) are at the top left. This photo is from the 1964 Annual Report.

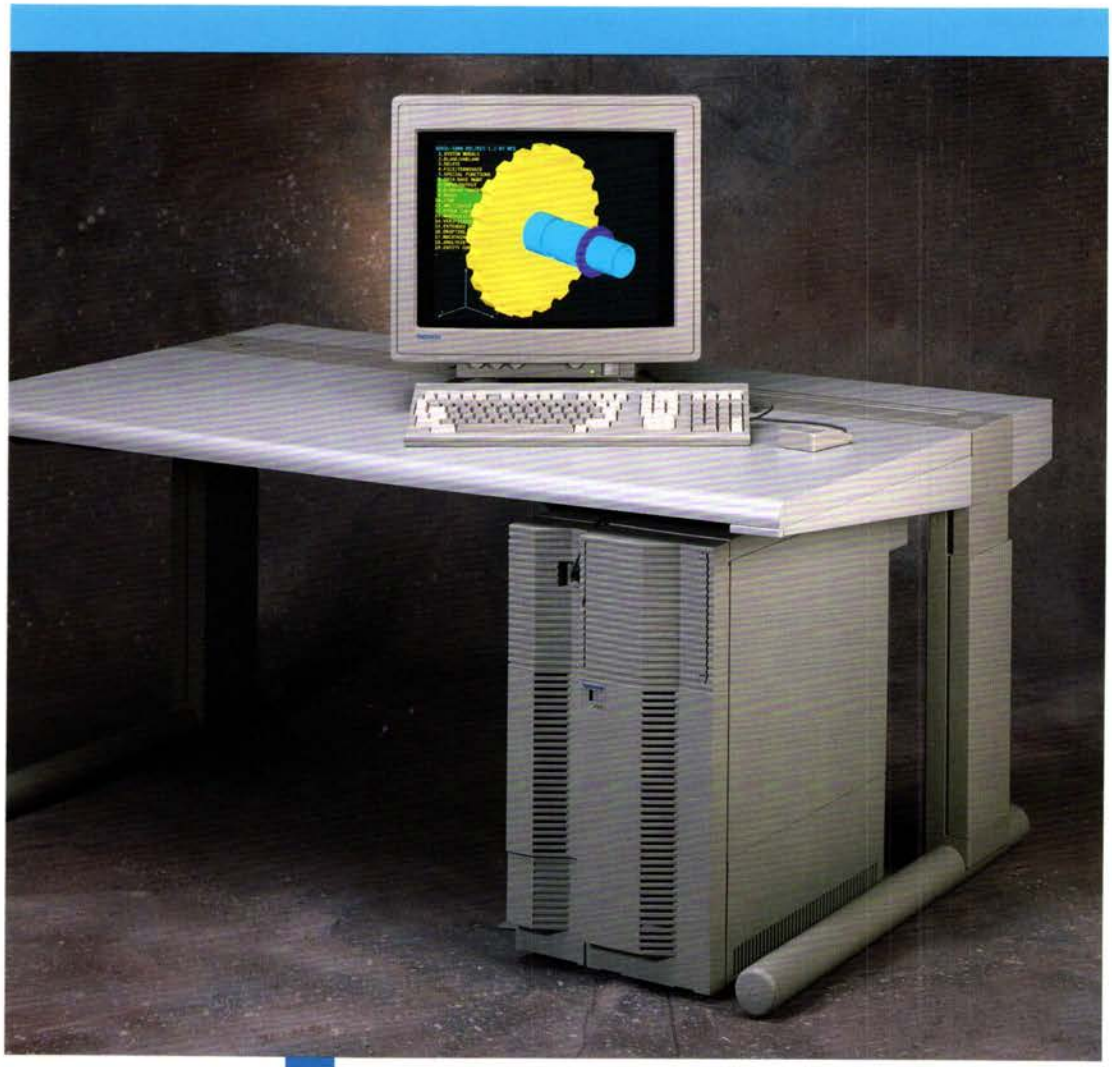
A later view of construction from the front of the building is found in the middle photo.

The lower photo, from March 28, 1966, shows the completed Technical Center. Note the bridge to Building 48.


ZACOMA

Tektronix 4325

2D Graphics Workstation



- **Integrated engineering workstation with UTek™ enhanced UNIX® and X Window System™**
- **90,000 2D vectors per second**
- **256 simultaneously displayable colors**
- **Diskless node for lost cost per seat**
- **Upgradeable to Tek XD88 Superworkstation**

Screen display courtesy of Manufacturing and Consulting Services, inc.

Tektronix' 4325 Graphics Workstation provides the standalone workstation power, advanced graphics features, and excellent resolution needed to think and design in 2D. The 4325 is an ideal platform for mechanical design, cartography, and other graphics- and compute-intensive applications.

Top Graphics Performance. The 4325 can draw a 100,000-vector picture in a single second, thanks to a pipelined graphics engine built around Tek's custom gate arrays. The 4325's advanced graphics features include segment manipulation and a 32-bit virtual graphics co-ordinate space for powerful zoom operations, layer manipulation, scrolling dialog areas, and user-definable markers for creating custom icons. Each 1280 × 1024 image can include up to 256 colors from a palette of 16.7 million shades.

Standalone Workstation Power. Augmenting the 4325's powerful graphics engine is a Motorola® 68020 processor and 68881 coprocessor to provide maximum throughput in a host-independent environment. Four MB of system memory is standard, as are an 86 MB hard disk and 1.2 MB flexible disk drive. Interfacing capabilities include dual RS-232-C peripheral ports, a Centronics® port, and a SCSI port. A diskless version of the 4325 offers a low cost-per-seat configuration that puts design power into the hands of more users.

The 4325 comes standard with software that includes Tek's UNIX-based UTek operating system, the X Window System, and a high-performance C compiler. Many software options are also available.

In addition, the 4325 is compatible with a large number of graphics software packages, including Tek's own PLOT 10® family.

World Class Support. Tektronix backs its products with a worldwide network of service and support professionals and a decades-long record of graphics excellence. To ensure continued service and support, you can extend the standard warranty through our optional Warranty Plus program.

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A personalized, high-resolution display terminal that offers superior price/performance characteristics for CAD applications such as electronics engineering, mechanical drafting and structural analysis.

COMPUTER DISPLAY TERMINAL

The 4111's low cost and powerful capabilities make it an ideal personalized display system for CAD professionals. The 4111 starts with 1024 by 768 pixels of addressability and a drawing rate of 8750 vectors per second. Then it adds sophisticated graphics and push-button color-copier support—all backed by a worldwide network of service and support professionals. The result is a system that delivers superior quality and performance at an affordable price.

To produce sharp, clear images, the 4111's 32-bit virtual graphics space provides four billion by four billion addressable points, displayed in a 1024 by 768 pixel matrix. For optimum image quality, the 19-inch, color raster display is built around a precision in-line gun CRT.

The terminal operates in a 60-Hz, non-interlaced mode that minimizes both flicker and eye strain that often result. An anti-reflection enhancement panel further minimizes user fatigue.

Four bit planes are standard, allowing the simultaneous display of 16 colors for graphics, eight of which can be used in the dialog area. Each bit plane can be treated as a separate display surface, permitting the manipulation of layers of data—a feature that is particularly useful with multi-layer drawings such as IC design and printed circuit board design.

The 4111's 4096-color palette provides a broad range of shades from which to choose.

4100 Series compatibility is designed in. An extensive set of graphics functions are available, including multiple views, segments, surface support, and local zoom and pan. Also supported are such graphics input features as rubber-banding, gridding, inking, a user-definable cursor, and easy polygon-fill with any of 16 pre-defined patterns or a user defined pattern. The 256 KB local RAM is available to store picture elements for later use; up to 1 MB can optionally be added.

Advanced firmware routines aid the applications programmer in developing graphics software with a very interactive operator interface and excellent performance. Included in the 4111's firmware are routines that handle:

- Segment editing
- Segment subroutines
- Pick operations
- Host window management
- Multiple scrolling dialog areas
- Pop-up menus

A variety of host software packages can be used with the 4111, including Tek's own PLOT 10® packages, such as PLOT 10 Computer Aided Drafting (TekniCAD) and PLOT 10 Computer Aided Presentation Software (TekniCAP).

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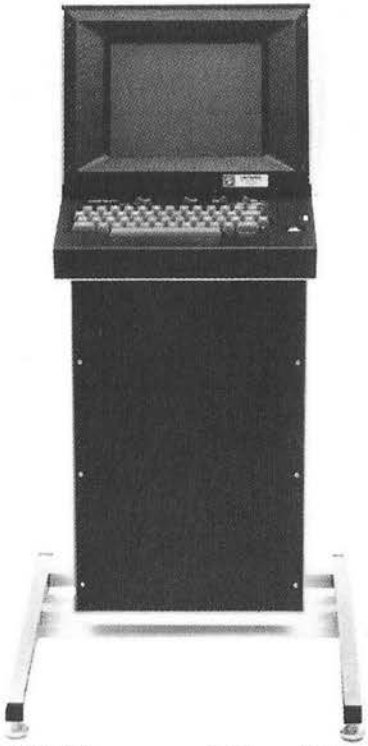
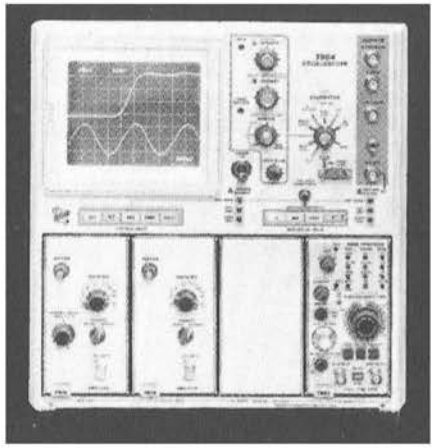
1971 – Tek's 25th Anniversary



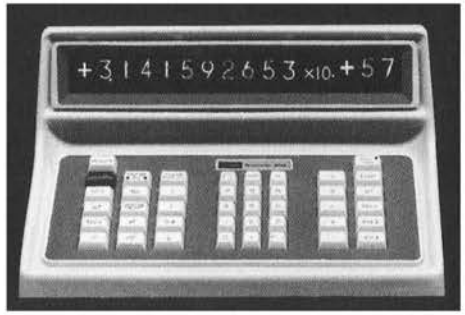
4010 Low-cost Graphics Terminal



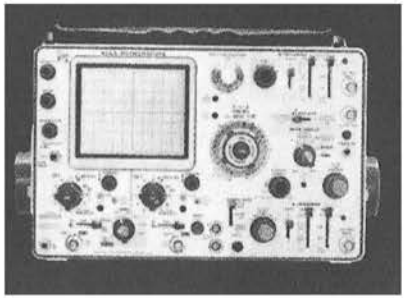
7904 500MHz General Purpose Oscilloscope

The year 1971 marked Tek's 25th birthday. The annual report announced that during the fifteen-month period since the start of the prior fiscal year, exactly one hundred ten new products were introduced or announced. Only a few of those products are shown here.

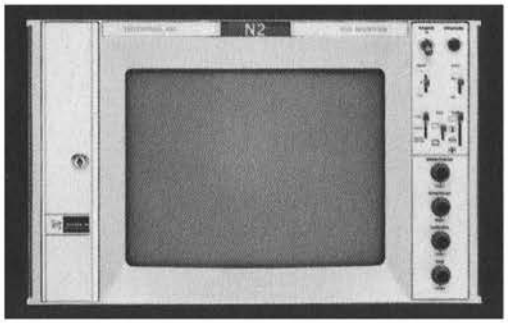
Did you know Tek made a programmable calculator? Or a controller for machine tools? Or a graphics plotter? You can see the entire 1971 Annual Report (and all the reports through 1985) on the vintageTek website.



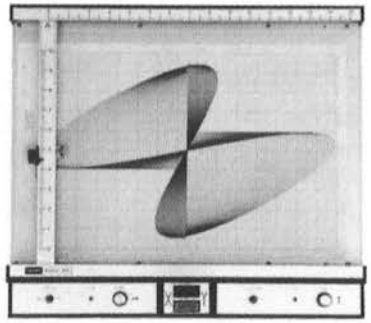
909 Scientist Calculator



454A 150MHz Dual-Trace Portable Oscilloscope



650 Color Reference Television Monitor



915 Graphics Plotter

1701 Machine Control Unit

vintageTEK museum

A performance leader with industry standard Tek color graphics and VT100® compatible alphanumerics. Featuring resident intelligent graphics routines and versatile graphic input and output device support.

INTELLIGENT COLOR GRAPHICS TERMINAL

- **True Zoom and Pan**
- **Optional Mouse**
- **Local Graphic Segments**
- **Background Graphics Copy Support**
- **Downloadable Characters**
- **IBM 3270 Coax Interface Option**

The Tektronix 4207 Intelligent Color Graphics Terminal delivers high performance color graphics in a compact, space saving package. It is the ideal choice as a graphics station in engineering computing environments. The Tek 4207 has a palette of 64 separate colors. A Tektronix interactive color interface permits easy selection and display of any 16 colors on screen at the same time. This wide choice of colors makes individual portions of complex CAD drawings easier to differentiate and graphic representations more readily understood.

The Tek 4207 displays 640 × 480 lines of pixel resolution at 60 Hz, non-interlaced. Its 4 × 3 aspect ratio is optimized for graphics. Individual pixel spacing is identical in both the vertical and horizontal axis resulting in distortion-free images. A high contrast, anti-glare 13-inch CRT with .31mm dot pitch provides sharp alphanumerics and crisp, clean displays.

Zoom and pan. The 4207 also offers true local zoom and pan. Users may zoom in on a section of the graphic and with a simple keystroke produce a new image displayed in full detail of the 4207's 4096 × 4096 addressability (terminal space).

Resident graphic intelligence. The Tek 4207 features built-in intelligent graphics functions and 256K of system RAM (additional 1MB optional). This memory supports local storage and manipulation of picture segments. This not only reduces host communication time, it also improves the interaction and response of graphics applications.

User definable viewports and surfaces. The Tek 4207 supports multiple views. Up to 64 separate views may be user defined and displayed in their own independent viewports. This permits viewing different portions of an image simultaneously or displaying different images concurrently for comparison purposes

The Tek 4207 also permits users to draw on surfaces independent of each other for more natural graphics creation, without extraneous information cluttering the screen. Surfaces can additionally be made visible or invisible, or overlayed to produce a composite image. Both surfaces and views may be combined for the multi-level images employed in printed circuit board design.

Gin. A 2-speed joydisk is integrated into the 4207's detachable keyboard for selecting and manipulating graphics. A three button mouse and tablet support are optionally available for additional functionality. Expanded interactive graphics input features include inking, rubberbanding and segment picking.

Graphics applications. Many sophisticated applications are available for the Tek 4207. Besides running programs developed for the Tek 4107A, it is compatible with programs written for Tek 4010, 4100/A and 4200 Series terminals. The 4207 is upward compatible with programs written for the Tek 4120 Series.

Mouse shown in photograph above is optional.
Graphics courtesy of PDA Engineering

Tektronix®
COMMITTED TO EXCELLENCE

TEK 4612

VIDEO
HARD COPY UNIT

Desktop graphics copier: High quality, low-cost black and white hard copy from raster scan video displays.

DEC-COMPATIBLE GRAPHICS COPIER

The Tektronix 4612 Video Hard Copy Unit is plug-to-plug compatible with DEC:

- **VT180 (personal computer)**
- **VT125**
- **VT105**
- **DEC MINC**
- **Other VT100 series terminals including those with retrofit graphics**
- **VT100 compatible terminals**
- **Many other video displays and signal sources.**

A perfect match. The 4612 is the ideal companion to DEC VT125's and other graphics-enhanced VT100 compatible terminals in applications where superior line quality graphics hard copy is required.

Interfacing couldn't be easier. Just plug the 4612's BNC cable into the composite video out port of your display terminal and you're done. No software writing or firmware alterations are necessary—ever!

High-quality graphics and alphanumeric copy from unique Tektronix electrostatic technology. The 4612 uses Tektronix' own implementation of quiet, non-impact electrostatic technology. The exclusive Tektronix process combines high addressability—over 250 horizontal dot placements per inch—with horizontal and vertical dot overlap. This results in a high-quality image with lines that are dark and smooth.

Faithful copies of the densest display graphics in just 24 seconds. The 4612 copies graphics and alphanumerics exactly as they appear on your display. And copy time is never affected by the density of the image.

Designed for simple convenience. At the press of a single button, the 4612 delivers vertical format copies that have the look and feel of plain paper. A paper-out light signals when it's time for a new roll of paper. Paper reloading every 540 copies takes only a few seconds. Just drop the roll in, pull out the end of the paper, and close the lid.

The dry toner used in the 4612 also offers special convenience. Once every few thousand copies it takes just a moment to open the front panel, and add a few ounces of dry toner. No ribbons or liquid chemicals to work with, no concentrates to add.

Compatible with video signal sources. The Tektronix 4612 Video Hard Copy Unit can serve up to four workstations at once with four-channel multiplexing (Option 2 for unit sharing). The 4612 is compatible with a wide variety of raster scan terminals, monitors, and other video signal sources, including those which produce RS-170, RS-330, or RS-375A signals.

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Oregon only 800/644-9051
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11/80 SWW

12AX—4634

Tektronix

Video Copiers

The three most practical approaches to a complete range of raster scan video copy needs.

Jack Murdock 1917 - 1971

Photo courtesy of the M.J. Murdock Charitable Trust

Eulogy from Tektronix 1971 Annual Report

The life of M. J. Murdock, Tektronix founder and board chairman, ended in a seaplane tragedy May 16 when he drowned in the Columbia river. He was 53.

Jack and I became friends 34 years ago, well before Tektronix began. A warm, outgoing man, he was also humble and unassuming, and probably the best listener I have ever met. Despite his business achievements and national stature, he was publicly not well known. This was by choice; he was an unpretentious man who shunned the limelight.

Jack had not been involved in our day-to-day operations for some years, but as board chairman he continued to contribute sound advice and invaluable insights. In the earlier days, he led largely by setting an example. His orientation toward the customer's point of view, his informality and his disregard of status symbols have all become part of the way Tektronix operates. His influence will live on in our practices and policies.

The world is always poorer when a positive influence is lost. So it will miss Jack Murdock, a good man and a close friend to so many of us.

Howard Vollum

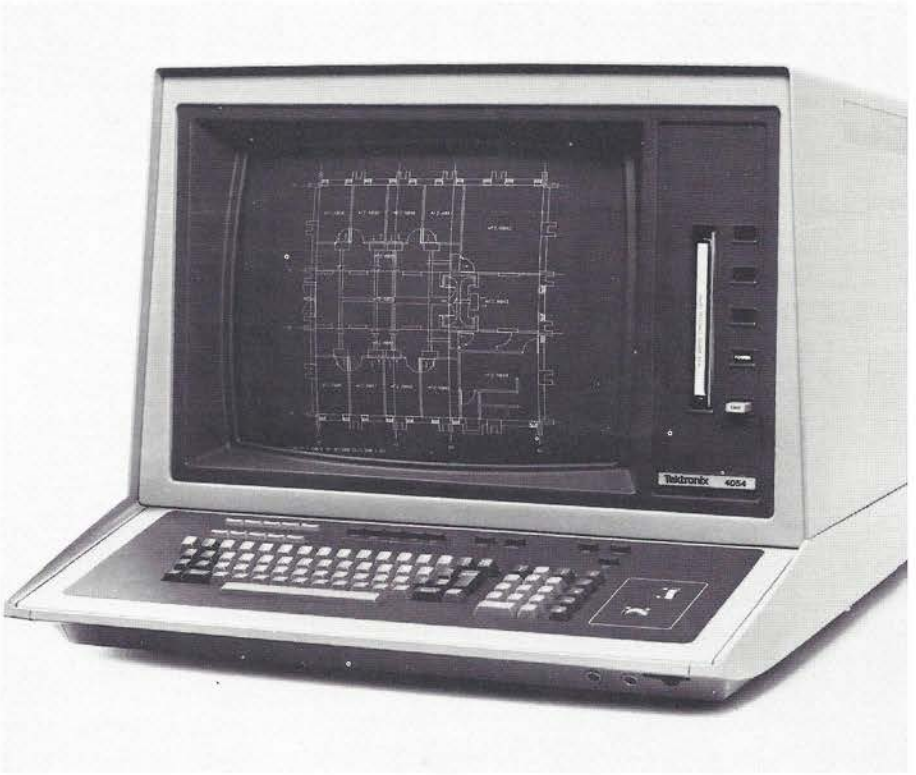
August 5, 1971 President

4054

TEKTRONIX

19″ screen desktop computing system with enhanced graphics and powerful BASIC.

Graphic Computing System



Unequaled graphics and powerful, fast computing in an integrated desktop computer. The 4054 is the only desktop computer that combines easy-to-learn, extended BASIC with the unique features of a large-screen, high resolution Tektronix display. For rapid calculation, the 4054 has a fast processor with microcoded floating point. The state-of-the-art graphics capabilities of the 4054 provide for demand hard copy of any combination of text and high-density graphics (with optional hard copy unit). Fast processing coupled with simultaneous text and graphics display offer an excellent fit for many sophisticated graphics environments. In addition, the 4054's memory capacity can be expanded from a standard 32K bytes, up to 64K bytes. The 4054 comes standard with a GPIB interface conforming to IEEE Standard 488-1975. Through this interface, a variety of printers, plotters, graphics tablets and/or mass storage units may be connected, offering a powerful solution for most application requirements.

The 4054 features software compatibility with the rest of the 4050 Series of desktop computers. Our 4051 set the standard for high performance, affordable desktop computing. The 4052 utilizes a new processor and offers a larger memory capacity. Programs developed on the 4051 and 4052 will operate on the 4054, giving 4054 users access to a wealth of PLOT 50 software, already written and debugged, thus reducing program development costs often associated with new systems.

The 4050 Series has a long list of proven peripheral products. GPIB (General Purpose Interface Bus) and RS232-C interfacing coupled with easy-to-program BASIC I/O commands allow considerable versatility in designing your own system. Furthermore, additional peripherals can be readily integrated as your application needs change or grow.

Superior Graphic and Alphanumeric Display. The 4054, with 4096 (x) by 4096 (y) resolution — 13 million addressable points — has all the graphics capability you will need for even the most complex display. With ASCII stroke-generated characters programmable in four sizes and eight fonts, the 4054 has the tools to alphanumerically dress up your output to suit any professional requirement, including previewing of 132 column line printer output.

For your graphing needs there are 36 distinct dot-dashed patterns, selectable under program control, providing for maximum effect of represented data. For interactivity the 4054 has a thumbwheel driven, true cross-hair cursor. All of these features are implemented using the extended BASIC of the 4054.

Friendly extended BASIC provides the simplicity desired by the beginner together with the flexibility and power required by the experienced programmer. Device independent keywords make program and data input/output operations easy in either binary or ASCII formats. Fast, built-in BASIC functions such as SINE, LOG, SQR, etc. plus a complete set of matrix functions provide powerful computation at your fingertips. Add easy-to-use BASIC graphic commands such as MOVE, DRAW, etc. and it is easy to see the potential uses of the 4054.


TYPE 611
STORAGE DISPLAY UNIT
VIEW
ERASE
POWER OFF
CONTROL LOCK
ON LINE
LOCAL
TRANSMIT
RECEIVE
ASCII
TTY
KEYBOARD
AUX
DISPLAY
AUX
PAGE
FULL
MARGIN
SHIFT
COMM
ERROR
DATA
RECEIVED
INTERRUPT
DIRECT
COMPOSE
FULL
CLEAR
SEND

AFFORDABLE HIGH-QUALITY COLOR TERMINALS, HARD COPIES, AND OFF-LINE CAPABILITY FOR EVERY DESK AND BENCHTOP.

Tektronix' new desktop products continue more than 15 years of Tek computer graphics leadership. Their development brings high quality graphics and color hard copy within easy reach of every professional.

Designed and priced as individual desktop tools, the Tek 4100 Series features color graphics performance far beyond that of any personal computer or any other comparably-priced terminal.

With its RS-232-C interface, Tek PLOT 10 IGL support, and upward-compatibility with Tek's high-performance 4110 Series terminals, the 4100 desktop series permits easy system integration and facilitates expansion whenever and to whatever degree required.

At introduction, the series includes three desktop terminals—priced from just $3,995 for the fully-equipped 4105—that answer a range of graphics requirements.

Engineers, scientists and programmers will find a 4100 Series configuration that is ideally suited for a large proportion of their graphic and alphanumeric work, permitting more discriminating use of the most sophisticated terminals and systems.

Apparent throughout the series are the advantages of graphics as a foundation of terminal technology—not as an afterthought to alphanumerics. Graphics data throughput is as fast as 19.2 kilobaud. Displays are 60 Hz non-interlaced refresh for flicker-free viewing. Polygons are quickly filled with colors, color shading or patterns, and colors are changed via function keys, with no programming required.

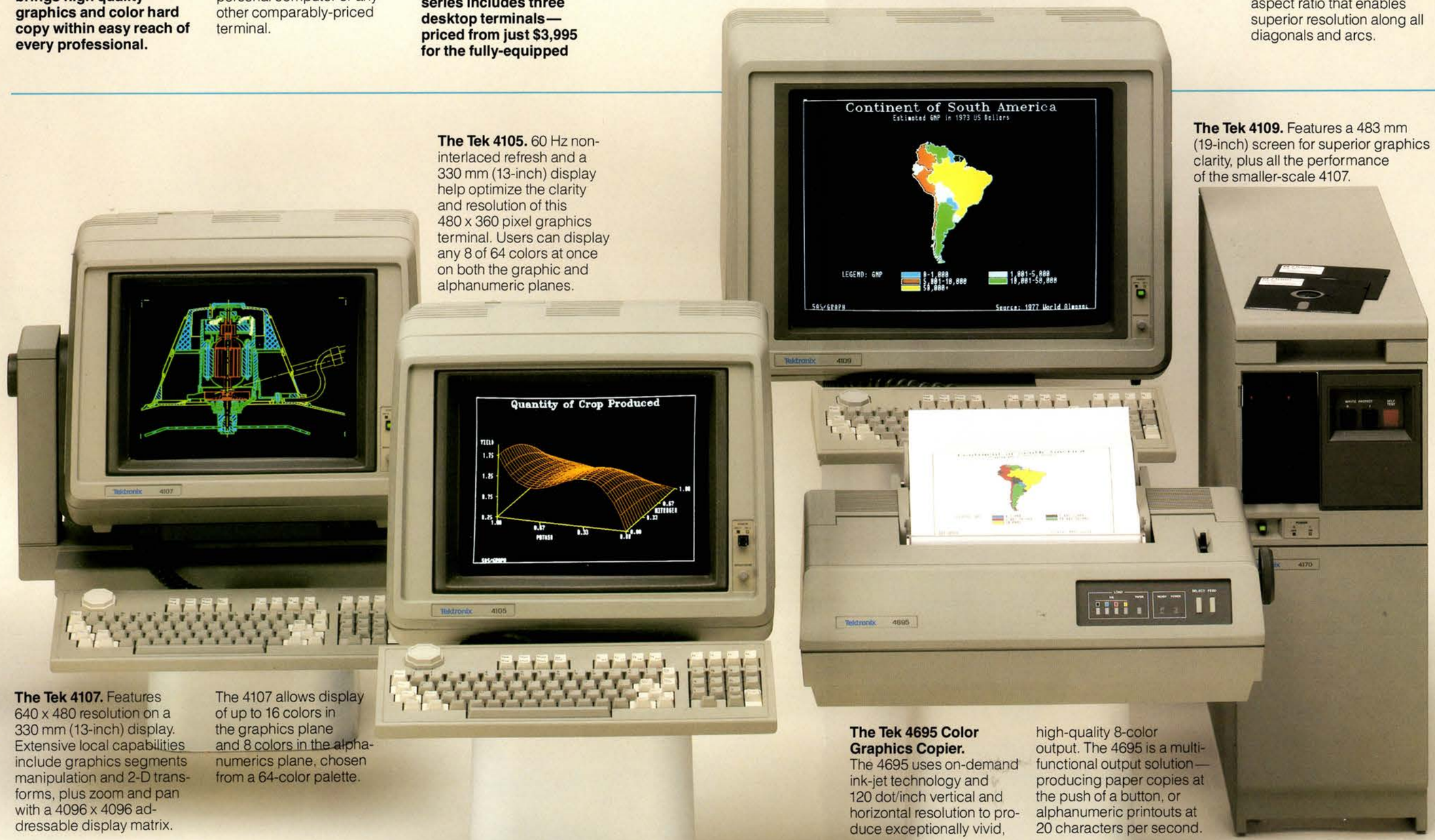
The keyboard itself is of a detached, low-profile design, and includes Tek's innovative Joydisk for easy graphics input. Also available for the 4105 and 4107 is an adjustable display stand with tilt, swivel, elevate and glide capability.

Unlike most graphics derived from alphanumeric technologies, Tek 4100 desktop terminal displays feature an ideal 4:3 graphics aspect ratio that enables superior resolution along all diagonals and arcs.

Yet all this comes with an excellent array of alphanumeric functions for editing and word processing requirements, designed to ANSI X3.64 standards. Text within the graphics area can be specified in various sizes and rotated. Separate graphic and alphanumeric planes permit users to easily add graphics anywhere within the text and to copy graphics and alphanumerics together or individually.

The Tek 4105. 60 Hz non-interlaced refresh and a 330 mm (13-inch) display help optimize the clarity and resolution of this 480 x 360 pixel graphics terminal. Users can display any 8 of 64 colors at once on both the graphic and alphanumeric planes.

The Tek 4109. Features a 483 mm (19-inch) screen for superior graphics clarity, plus all the performance of the smaller-scale 4107.



The Tek 4107. Features 640 x 480 resolution on a 330 mm (13-inch) display. Extensive local capabilities include graphics segments manipulation and 2-D transforms, plus zoom and pan with a 4096 x 4096 addressable display matrix.

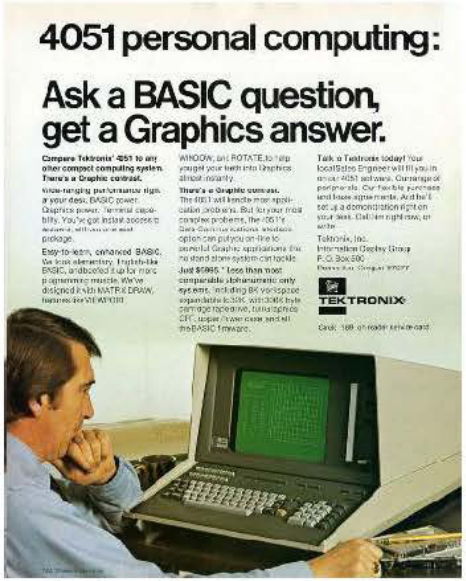
The 4107 allows display of up to 16 colors in the graphics plane and 8 colors in the alphanumerics plane, chosen from a 64-color palette.

The Tek 4695 Color Graphics Copier. The 4695 uses on-demand ink-jet technology and 120 dot/inch vertical and horizontal resolution to produce exceptionally vivid, high-quality 8-color output. The 4695 is a multifunctional output solution—producing paper copies at the push of a button, or alphanumeric printouts at 20 characters per second.

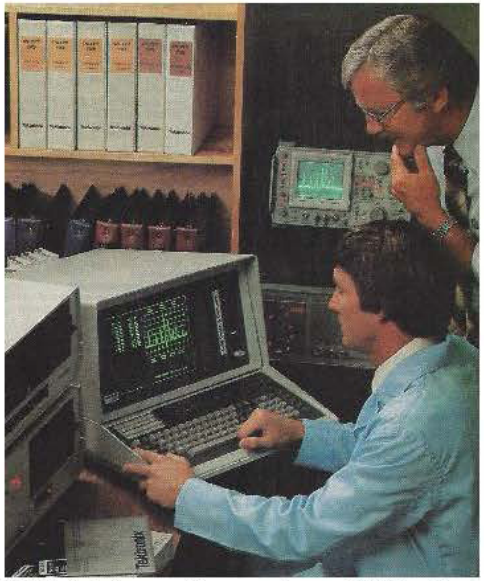
The Tek 4170 Graphics Processing Unit. An option soon to be expected of all terminals, the 4170 lets you plan for the future now, by letting you add standalone computing whenever you need it. It allows 4100 desktop series terminal users to program and pre- or post-process off-line, thus saving time and offloading the host, while they maintain the integrity of the data base.

Tek Desktop Computers: 4051, 4052 & 4054

4052 and 4054 Tektronix Desktop Graphics Computers



4051 Ad from April 1976



4052 Ad from November 1981. Note software notebooks on the shelf.

In November 1975 Tektronix introduced a transformational product called the 4051. Tek literature initially had some ambiguity as to whether it was a "Graphics Computer System" or a "Desktop Computer", but it didn't matter. Customers loved it.

The 4051 was a follow-on to the Tek calculator line and the 400X line of computer graphics terminals. It consisted of a 1024x768 Direct View Storage Tube (DVST), a 3M tape system (essentially an industrial-strength cassette tape with 300kB capacity), and a Motorola 6800 running BASIC language. The maximum RAM available was 32kB. There was no video memory – screen content was stored on Tek's proprietary DVST. Note that the IBM Personal Computer was not introduced for another eight years.

The 4051 sold for $7,500 ($35,700 today).

Thousands of programs were created for the 405X computers, including some great games.

There was an upgrade to an AMD processor in the 4052 which increased performance by a factor of thirty. The 4054 was offered in the 1980 catalog. With a 19-inch DVST, screen resolution was increased to 4096x3072.

An engineer with a 4051 on their desk was a happy camper!

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1984

4107 Color Graphic Terminal

The 4107 was one of three low cost color desktop graphic terminals introduced in 1983. The 4107 displayed 256 colors with 640 x 480 resolution which made it ideal for a variety of scientific, engineering, and business applications. Tektronix vector graphics optimized good performance with low bandwidth and telephone connections. Tektronix graphic terminals were the industry standard for advanced

Tektronix 4107A

Tektronix 4207

4319

"Graphics typically cuts data processing from 2½ weeks to 36 hours. With better quality in the end."

George Sanderson
Senior Research Section Supervisor
Sperry Division
Sperry Corporation
Great Neck, N.Y.

Sperry military systems must come in on-time and within bid. Tektronix Graphics is keeping them on target.

With much of their work on sophisticated navigational systems based on competitive government contracts, Sperry must commit to firm deadlines as well as firm costs. Since 1977, engineers at Sperry have relied on Tektronix computer graphics for ways to do bigger and better jobs in less and less time.

Savings in design time has been dramatic, but that's only a fraction of the graphics advantage: It's not unusual, for example, for prototype designs to pass every test the first time through—because the speed of graphics lets engineers make multiple passes through a model instead of one or two.

Then too, graphics opens up dialogue among disciplines: "Engineers, designers and computer people can all talk the language of visual images," says Sperry's George Sanderson. "And when people can converse, fewer mistakes get made."

Using Tektronix' high-resolution 19″ and 25″ terminals, Sperry personnel continue to find new ways to work faster. One engineer was able to convert his schematic into complete manufacturing data in two days; without graphics it might have taken weeks. A single systems analyst completed a massive software documentation project, involving hundreds of flow charts, within five months.

"Without graphics," says Sanderson, "it would have taken two or three times as long.

As the world's graphics leader, Tektronix can guide you through once unthinkable timelines. See your Tektronix sales engineer, or call toll-free, 1-800-547-1512 (in Oregon, call 644-9051 collect).

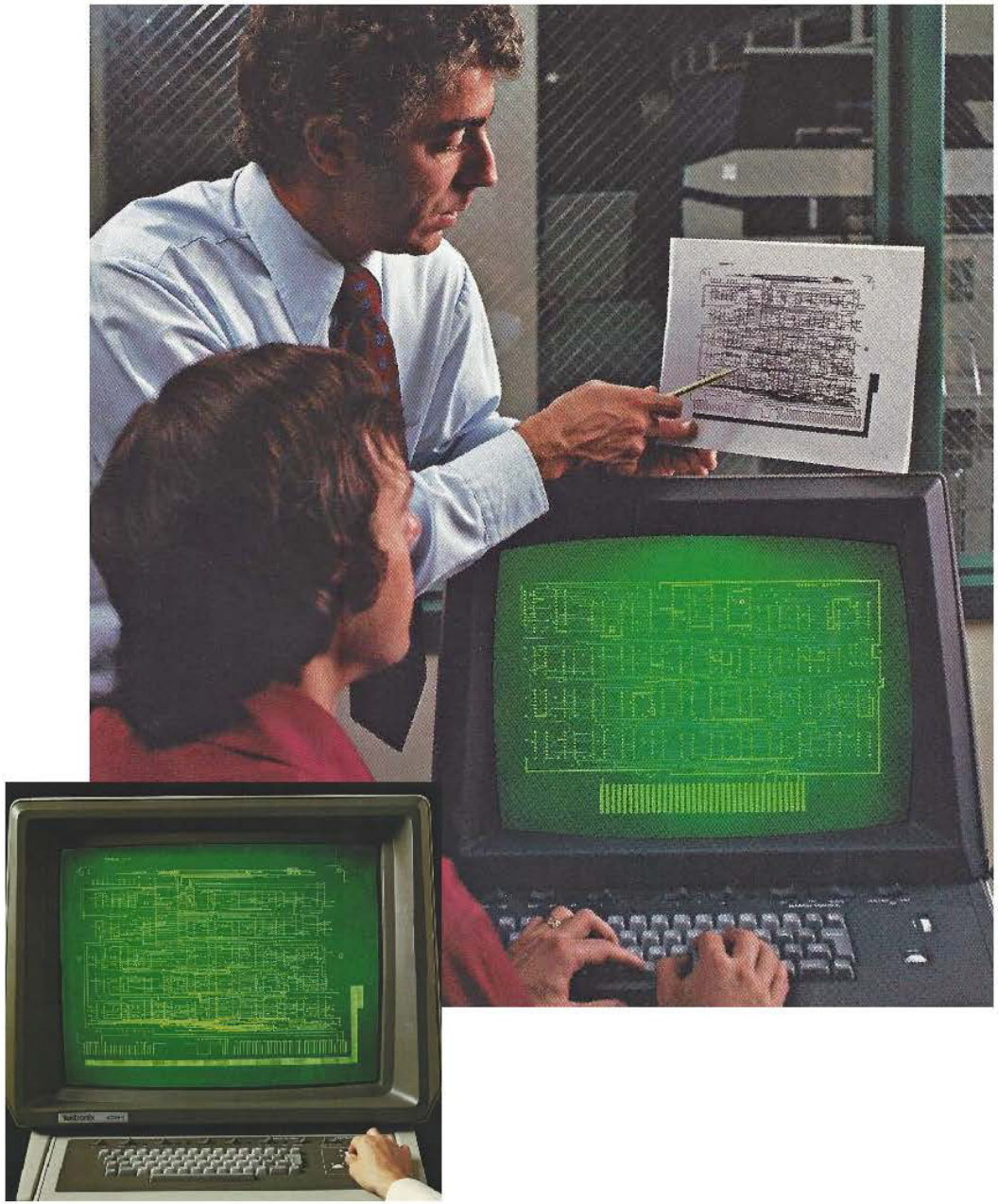
Tektronix, Inc.
Information Display Division
P.O. Box 1700
Beaverton, Or 97075

Tektronix International, Inc.
European Marketing Centre
Post Box 827
1180 AV Amstelveen
The Netherlands

THE GRAPHICS STANDARD

Tektronix®
COMMITTED TO EXCELLENCE

4014 and 4016 Computer Graphics Terminals



Carl Machover, a pioneer in computer graphics, was quoted as saying: "Before the storage tube, computer graphics was a cure for no known disease – an expensive one at that. After the storage tube, CG became a cure for every known disease".

The 4014 Computer Display Terminal was the world's best-selling graphics display terminal, introduced in 1972. Used with remote mainframe computers, it featured a 19-inch DVST (Direct View Storage Tube) developed and manufactured at Tektronix. Screen resolution was 4096x3120 viewable points.

In 1979 the 25-inch 4016 terminal was introduced, the largest graphics terminal in volume production. It is shown in the lower left.

With these terminals and others to follow, Tek was the dominant force in the first decades of computer graphics displays.

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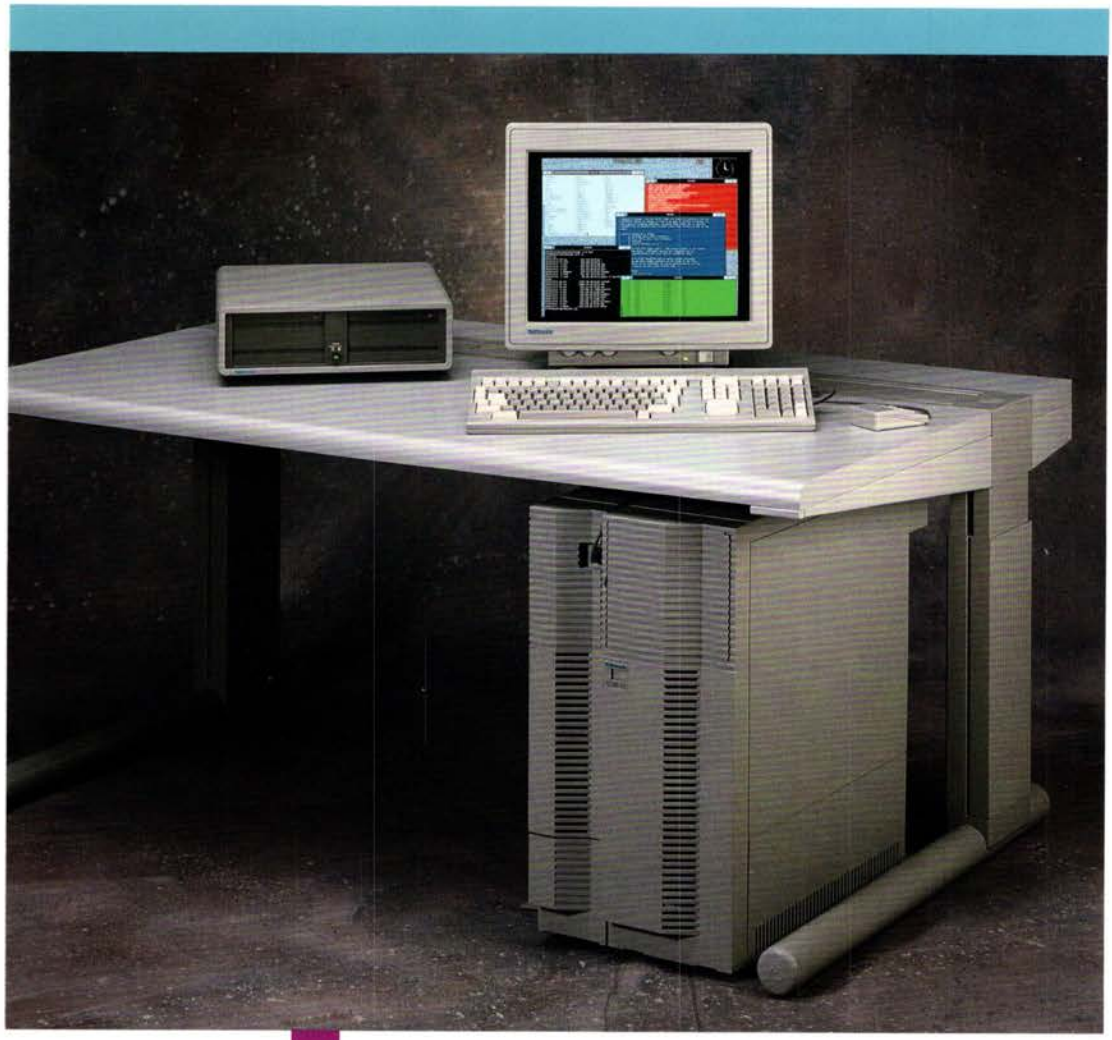
Tektronix XD88/05 Server Node



- **17 MIPS compute performance**
- **1.8 GB disk storage**
- **2.3 GB helical streamer tape**
- **High-speed SCSI interface**
- **10 Mb Ethernet™ LAN with TCP/IP and NFS™**
- **UTek™ V— enhanced UNIX® System V.3 operating system**
- **16 MB of RAM**

XD88/05 shown with optional display, keyboard, and mouse.

Tektronix' XD88/05 Server Node provides 17 MIPS of computing power, ample mass storage capacity, extensive peripherals support, and high-speed Ethernet networking for maximum user productivity in networked computing environments. The XD88/05 comes standard with three 600 MB disk drives for 1.8 GB of disk storage, as well as a 2.3 GB helical streamer tape. Four RS-232-D ports are standard, along with a high-speed SCSI interface and a Centronics® parallel interface, thus enabling the server node to support a broad range of printers, plotters, terminals, and other devices. The server node's VMEbus™ with 6U Euro card compatibility further expands configuration flexibility.

For users wanting to add an integrated display to the server node, a 16-inch 1280 × 1024 monitor with a keyboard and mouse are optional.

Optimize Your Network. Expensive peripherals are easier to justify when all authorized net users can access them. With the XD88/05 on your network, users can share peripherals without affecting an individual user's workstation performance—and you can isolate users from noisy devices.

Memory-mapped interfaces, hardwired interrupts, disk caching, and a high-speed SCSI interface to mass storage devices team up to maximize disk access performance.

System software includes UTek V, Tek's enhanced UNIX operating system. A full System V implementation, UTek V also incorporates a variety of Berkeley extensions, including the Fast File System, sockets, and C-shell. UTek V complies with the POSIX, SVID, and FIPS standards. The XD88/05 also comes standard with TCP/IP Ethernet and Network File System (NFS).

Tektronix®
COMMITTED TO EXCELLENCE

TEK 4112A COMPUTER DISPLAY TERMINAL

THE GRAPHICS STANDARD

The most powerful graphics terminal in its price range.

There's a new low base price for the Tek 4112A that makes it not only the most advanced graphics terminal ever tailored for data analysis, but the greatest value, too.

The 4112A includes, standard, the power to manipulate picture segments locally. To zoom and pan within a 4096 x 4096 addressable matrix. To display up to 64 viewports.

Your options are wide open: Add multiple bit planes for up to eight shades of gray and three surface overlays. Pre- and post-process off-line with Tek's new Local Programmability: its CP/M-86®* operating system and FORTRAN language open up a world of software. Enjoy total compatibility with all Tek 4110A Series terminals.

Configure it to your needs, then price it with your Tek Sales Engineer.

For literature and phone number of your nearest Tek sales office, call:

1-800-547-1512.

Oregon only, call 1-800-452-1877.

Demand The Graphics Standard.

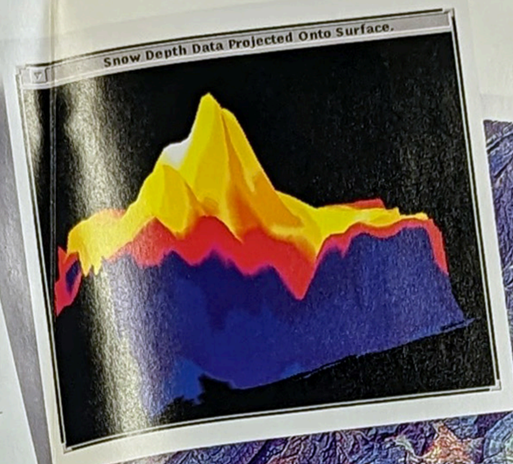
Tektronix®

COMMITTED TO EXCELLENCE

World-class overheads. Up to 600 x 300 dpi. Up to 2 pages per minute! Dual tray option switches from paper to transparencies by desktop command. Smart!

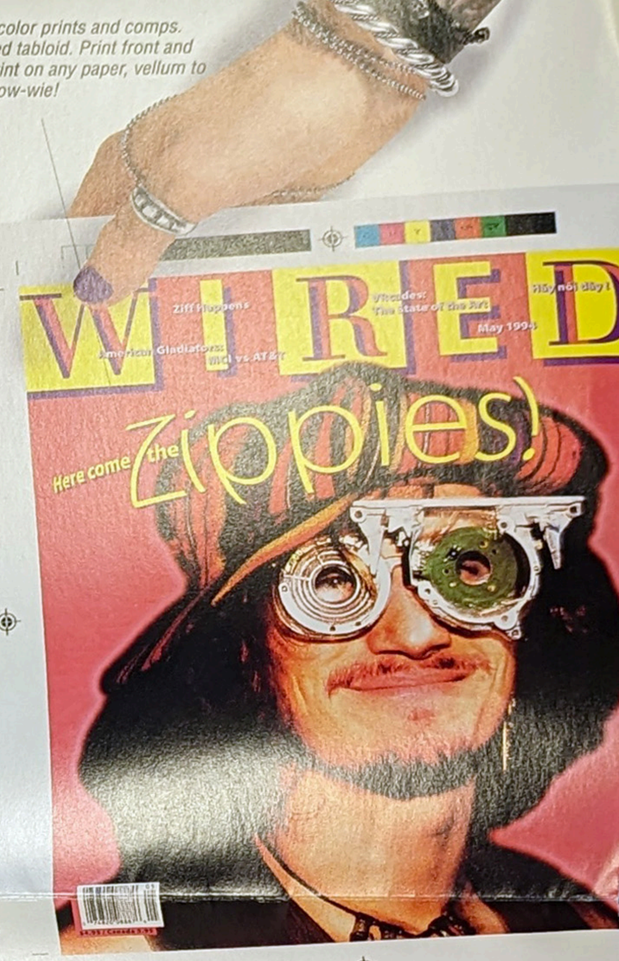
Print high impact color images on glossy covers and info-rich color on plain pages inside. Workgroup performance priced for competition. Dynamic!

Background blends and skintones are airbrush smooth using the only desktop color laser technology that prints in continuous tones, instead of halftone dots. Impressive!



Amazingly precise, photorealistic color. Full-page or tabloid-bleed. Matchless pre-film proofs. Spot on!

Vibrant color prints and comps. Full-bleed tabloid. Print front and back. Print on any paper, vellum to cover. Zow-wie!



Color is color, 'til you see our new spectrum.

All Phaser Color Printers offer:

- 300 dpi or higher
- Adobe™ PostScript™ Level 2
- Paper prints or transparencies
- Support for PCs, Macs, workstations and networks — simultaneously
- Pantone's color approval
- RISC-speed print processing
- TekColor™ image enhancement
- A Tektronix one year warranty
- Top technical support.

These are a Phaser color printer's standard specifications. Now check the chart for unique performance features best suited to your customer or workgroup. Get output samples. Arrange a seminar. Request a demo. Experience customer satisfaction and reseller success. Now you've covered the entire spectrum.

Phaser Color Printers for the Business Office				
Paper size				
Letter A/A4	Letter A/A4	Letter A/A4	Letter A/A4	Letter A/A4
Media type				
Plain paper Glossy paper and transparency	Laser paper Special paper and transparency	Laser paper Special paper and transparency	Laser paper Special paper and transparency	Laser paper and transparency
Print time				
1-2 minutes/page	30 seconds/page	30 seconds/page	30 seconds/page	~15 seconds/page
Resolution				
360 dpi	300 dpi	600 x 300 dpi or 300 dpi	600 x 300 dpi or 300 dpi	600 dpi Continuous tone
Key options				
Additional memory Network options	Dual input trays, Laser paper capability	Dual input trays, Laser paper capability	Dual input trays, Laser paper capability, Network options	CopyStation Add'l input trays Network options
Print technology				
Ink-jet	Thermal transfer	Thermal transfer	Thermal transfer	Color laser
NEW Phaser 140	Phaser 200e	Phaser 220e	Phaser 220i	NEW Phaser 540

Phaser Color Printers for the Professions			
Flexible 4 x 6 ins. to 12 x 18 ins.	Flexible 4 x 6 ins. to 12 x 18 ins.	Letter A/A4 Letter extra	Tabloid/B Tabloid extra
Any paper and transparency	Any paper and transparency	Special paper and transparency	Special paper and transparency
2 minutes/page	1 minute/page	2 minutes/page	3 minutes/tab page
300 dpi	300 dpi	300 dpi Continuous tone	300 dpi Continuous tone
Additional memory Large format paper tray	Additional memory Large format paper tray Network options	Additional memory Dual input trays Network options	Additonal memory Network options
Solid ink	Solid ink	Dye sublimation	Dye sublimation
Phaser III PXi	Phaser 300i	NEW Phaser 440	Phaser 480

Tektronix

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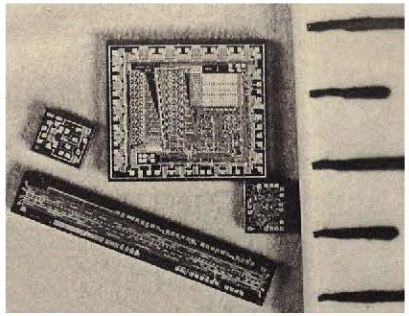
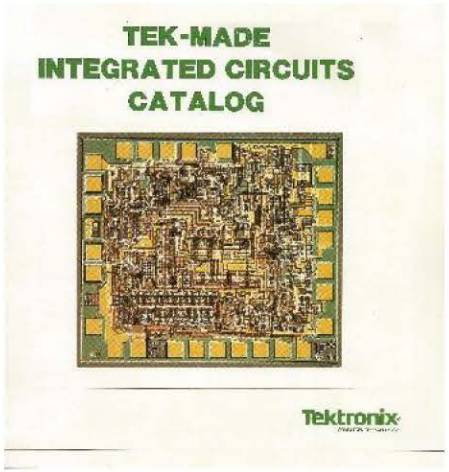
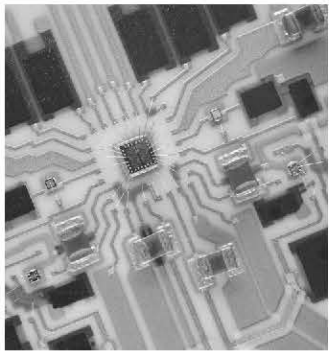
Integrated Circuit Operation



Tek ICs, 1981. For scale, a ruler showing 1/16" marks is included

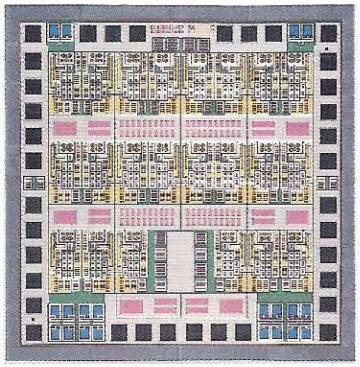


Tek IC catalog for internal-use only (1983)

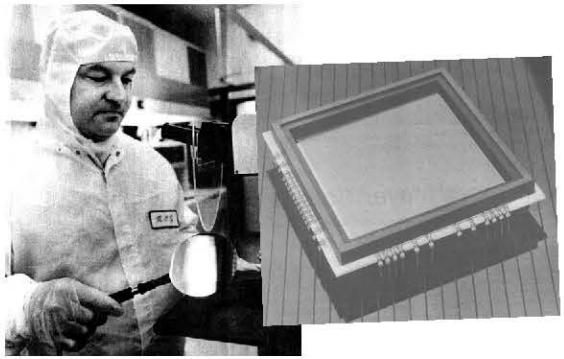


A hybrid circuit used in the 2465 scope in 1984

Building 59 in 1980



A QuickChip™ IC



Morley Blouke and a 2048 x 2048 pixel CCD

As yet another example of Tektronix' willingness to produce its own components when suitable commercial parts weren't available or acceptable, Tek developed an internal integrated circuit (IC) fabrication capability in the 1960s. The first Tek ICs were used in the 7000-series scopes introduced in 1969. These were produced in Building 50, but a full-fledged production facility was later located in Building 48.

The Integrated Circuit Operation (ICO) developed a series of bipolar and CMOS processes for use in high speed and high voltage ICs employed in Tek's 400-series oscilloscopes, 7k scopes and plug-ins, scope probes, television products and other Tek instruments. Many of these ICs were packaged on ceramic substrates as hybrid circuits.

In 1980 the Tek ICO moved into Building 59, a custom-designed 226,000 square foot facility on the Beaverton campus. It was the last major building built on the property.

The operation published detailed catalogs describing their products for Tek use only. The 1983 edition had 332 pages.

However, in 1986 the QuickChip™ line of analog ICs was offered commercially. It featured circuits capable of unity-gain bandwidth of 6.5GHz and a digital clock rate of 500MHz.

One of the most noteworthy uses for Tek's IC technology was in the development of imaging CCDs (charge coupled devices) for astronomical imaging. In an effort led by Morley Blouke (photo at left), Tek CCDs were among the largest and highest resolution available. CCDs from Tek were incorporated into the original Hubble Telescope, but they were swapped out when the defective optics were replaced (not the fault of the CCDs) several years after Hubble was placed in orbit.

In 1994 Tek sold the IC Operation and Building 59 to Maxim Integrated. The CCD line was spun out of Tektronix as Scientific Image Technology, Inc. (SITe). They produced CCDs used in the Hubble.

TEK 4113 COMPUTER DISPLAY TERMINAL

THE GRAPHICS STANDARD

Do more with color, with less time on the host.

The 4113: the clear leader in local graphics manipulation and flicker-free color display. Available in pedestal or desk configuration, the 4113 lets you work with 4096 available colors. With an easy-to-view 60 Hz non-interlaced display. With local graphics segments that minimize host communications. With two optional, integral floppy disk drives and up to 800K bytes RAM.

Tek backs your investment with PLOT 10 IGL, the most popular SIGGRAPH core software in use today, as well as with the broadest and most compatible line of graphics products in the world.

For literature or the address and phone number of the Tek sales office nearest you, call:

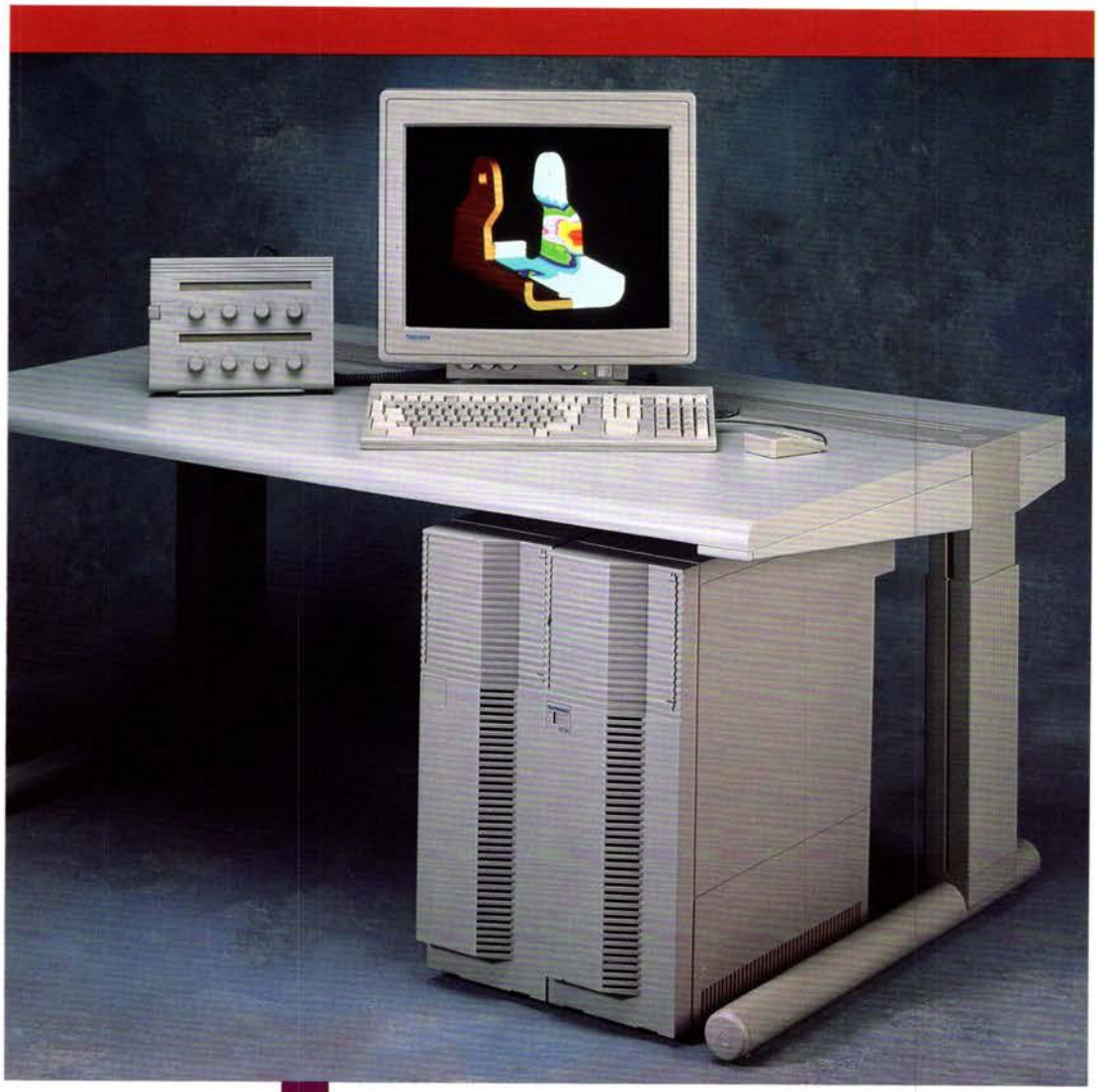
1-800-547-1512.
Oregon only, call
1-800-452-1877.

Demand The Graphics Standard.

Tektronix®
COMMITTED TO EXCELLENCE

Tektronix 4236

3D Graphics Netstation



- **3D wireframe, hidden line, and shaded surface graphics**
- **Eight bit planes for simultaneous display of 256 colors**
- **24-bit Z buffer**
- **LAN and RS-232-C connections**
- **Upgradeable to standalone workstation**

Screen display courtesy of PDA Engineering.

The Tektronix 4236 Graphics Netstation simultaneously displays up to 256 colors for clear image definition in applications such as high-end mechanical CAD, molecular modeling, animation, kinematics, and stress analysis. Custom gate arrays provide the speed necessary to draw 2D vectors at a rate of 450,000 per second and 3D vectors at a rate of 340,000 per second. A Motorola® 68020 processor assists by controlling input devices and local dynamics.

You can even expand the 4236 to a full-fledged, integrated graphics workstation using a field upgrade kit.

A Dedicated, High-Performance Graphics Engine. The 4236 Netstation's pipelined graphics architecture provides all the processing power and memory needed to support the extremely dense graphics needed for complex scientific and engineering applications. For double-buffering, you can expand the standard eight bit planes to 16. The 4236's 3D feature set includes true zoom and pan, Gouraud shading, depth-cued vectors, surface translucency, light intensity selection, parallel and perspective projection, sectioning, clipping, and all 3D rotations. More advanced users can access additional graphics features—including sophisticated lighting and shading techniques—at the graphics processor level.

Ports to the Outside World. The 4236 can serve as a graphics terminal in a traditional mainframe environment or as a low-cost graphics node on an existing workstation. It includes an Ethernet™ LAN interface and RS-232-C ports for standardized connection to host computers, workstations, and peripheral devices.

Wide-Ranging Software Compatibility. To extend the life of your software investment, the 4236 is fully software-compatible with Tek 4120 Series graphics. You can use it with hundreds of existing graphics software packages, including Tek's PLOT 10® family of software. In addition, Tek works closely with leading software suppliers to ensure the availability of high-performance packages for 2D and 3D graphics-intensive disciplines.

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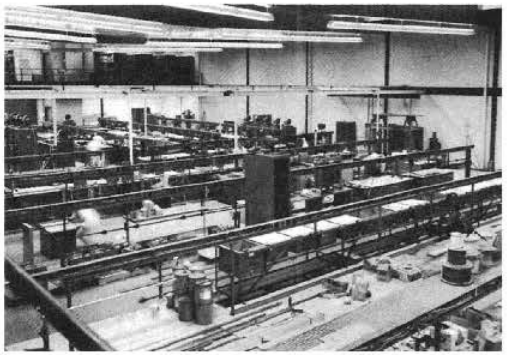
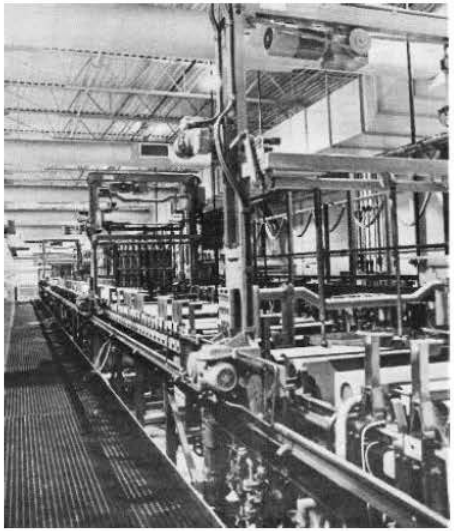
EXAMPLE OF CALCOMP PREVIEW OUTPUT
AVERAGE CAR VALUE
Tektronix 4016-1

Electrochem

Electrochem products from the October 1969 Tektronix Calendar



Etching and anodizing lines in Building 38



Electroplating line at the F1 facility in Forest Grove

Chemical processing of metal and plastic was started at Tek before 1950 when photoetching of scope front panels was undertaken. In the mid-1950s low-volume production of printed circuit boards was started. These processes and other similar activities were consolidated into the Electrochemical Group in 1960 and they moved into their home for two decades, Building 38, in 1963. The building was doubled in size in 1968.

Electrochem, as it was later called, housed a broad range of processes that included electroplating, anodizing, photolithography, electroforming and etching. Perhaps their most well-known product was printed circuit boards, but electrochem components and processes were used by virtually every Tek product group. In particular, Electrochem's decorative, but durable, external finishes were a feature of Tektronix instruments throughout their tenure.

In 1983, the group moved to the new F1 building in Forest Grove. In 1984 it was spun out of Tek as the Merix Corporation. Merix is now part of TTM Technologies.

A multi-purpose, low cost, high performance color graphics terminal. Featuring VT100® compatible alphanumerics and versatile graphics input and output device capabilities.

INTELLIGENT COLOR GRAPHICS TERMINAL

- **16 Graphic Colors**
- **True Zoom and Pan**
- **Mouse Option**
- **Local Graphics Segments**
- **Background Graphics Copy Support**
- **User Definable Dialog Characters**
- **IBM 3270 Coax Interface Option**

The Tektronix 4205 Intelligent Color Graphics Terminal offers a greater price/performance ratio than any previous Tektronix desktop terminal. It establishes a new standard for high performance, low cost graphics. The Tek 4205 can display graphics in 16 colors from a total palette of 64 different colors, resulting in more readily comprehensible drawings or graphs. It provides 480 × 360 lines of pixel resolution in a 4 × 3 aspect ratio that is optimized for graphics. Individual pixel spacing is the same in both vertical and horizontal directions for distortion-free images. The 13-inch high contrast, antiglare CRT delivers vivid colors and outstanding brightness. A .31mm dot pitch and 60 Hz non-interlaced refresh rate provides sharp alphanumerics and crisp, clean displays.

Zoom and pan. True local zoom and pan provides additional performance. As users zoom in on a portion of an image, the new image is displayed in the full detail of the 4205's 4096 × 4096 addressability (terminal space). In this way, finely detailed images are available from a medium resolution display at a most affordable cost.

Resident terminal graphics. Major new benefits of the Tek 4205 include expanded memory and segment support. With 128K of system RAM (additional 1MB optional) and graphics intelligence resident in the terminal, the interaction and response of applications are improved as host communication time is reduced.

Host-defined picture segments may be stored locally in RAM for display, manipulation and editing.

Multiple views and surfaces. The Tek 4205 also supports multiple views. Up to 64 separate views may be user defined and displayed in independent viewports. This permits viewing different portions of an image simultaneously or displaying different images concurrently for comparison purposes.

Surface support is additionally implemented in the 4205 for more efficient graphics creation and editing without unnecessary information cluttering the screen. Users can draw on surfaces independent of each other, make surfaces visible or invisible, or overlay two or more surfaces for a composite image. Surfaces and views may be combined to create the multi-level images common in printed circuit board designs and other technical information.

Precise graphic input. The 4205's detachable keyboard features a two-speed joydisk that allows users to select and move graphics objects about the screen. A three button mouse which plugs directly into the keyboard is optionally available for additional functionality. Interactive input features have expanded to include inking, rubberbanding and segment picking.

Industry standard application software. The Tek 4205 will run programs developed for the Tek 4105A. It is compatible with programs written for Tek 4010, 4100/A and 4200 Series terminals. The 4207 is upward compatible with programs written for the Tek 4120 Series.

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Mouse shown in photograph above is optional.

Graphics are PLOT 10 TekniCAD

4016-1 TEKTRONIX

High Resolution 63.5cm (25 Inch) Display

Computer Display Terminal

63.5cm (25-inch) screen for displaying high density graphic information. The 4016-1 allows designers of electronic circuit boards, utility networks, automotive components, schematic diagrams, street maps or similar applications to work with fine detail while maintaining the total picture perspective.

With its big 63.5cm (25-inch) diagonal screen, 4096 by 3120 viewable high resolution, and finely etched 10 mil wide vectors, the 4016-1 is uniquely suited for displaying highly complex graphics. Using a direct view bistable storage tube (DVST) display, graphic lines are sharp, stable and flicker-free, making it easy to study the finer details of a map or design. The thumbwheel-controlled crosshair cursor also makes it easy to interact precisely with this detail.

Over 15,000 displayable characters. Besides being able to display and interact with more high density graphic information than any other terminal available, the 4016-1 provides high density alphanumerics for labeling designs and maps. Over 15,000 characters may be displayed simultaneously and may be formatted in 179 alphanumeric characters per line pages like a line printer or as two 85 character per line pages like an open book.

The latter format is particularly useful for developing software and scanning large amounts of alphanumeric output. Three other large character formats are standard with the 4016-1, the largest of which is suitable for group viewing.

Complete Tektronix 4014-1 compatibility. The 4016-1 was designed for complete compatibility with Tektronix 4014-1 application software, communication support, and other Tektronix peripheral devices commonly used with the 4010 series of terminals. The 4016-1 is supported by the family of PLOT 10 software products and proven 4010 series communications interfacing.

Plug-in intelligence. Using the modular 4010 bus structure, all of the Tektronix plug-in intelligence options can be used with the 4016-1. Add-on low cost options include up to 26K of usable graphics display memory, scaling, relative graphics, clipping, circular arc generation, rotation by 1° increments, user definable stroke characters, programmable keyboard, GPIB interfacing to the intelligent 4924 Digital Cartridge Tape Drive, 4907 File Manager, and 4662 Interactive Digital Plotter, and local control of these peripherals plus the 4953 or 4954 Graphics Tablet.

Commands also allow a user to digitize data with distance, time or gradient filtering, edit graphics from a host computer, local 4907, 4924 storage device or Option 40 programmed key; access local programmable storage devices; or use off-line plotting of graphics.

Added enhancements. The 4016-1 includes a convenient detachable keyboard and detachable display.

A variety of hardware enhancements are also standard in the 4016-1. They include hardware generated solid, dashed, and dotted lines, point plotting with software controllable point sizes, incremental "relative graphics" plotting, and four hardware character formats.

Hard copy compatibility provides 8½-inch by 11-inch hard copies from a standard Tektronix 4631 Hard Copy Unit.

Contact your local Tektronix Sales Engineer today for more information on the 4016-1 Computer Display Terminal.


NET SALES (M$)
[1974]
271.4•11.2%
[1973]
202.0•8.4%
[1972]
167.5•6.9%
[1971]
149.4•6.2%
[1970]
168.9•7%
[1969]
151•6.2%
[1968]
135•5.6%
[1967]
454.9•18.9%
[1976]
366.6•15.2%
[1975]
336.6•14%
Tektronix 4025
Tektronix

Tektronix Products in 1979

This photo from a 1979 brochure shows a cross section of that year's Tektronix product offerings.

7912HB in MP1101 Programmable Digitizer

4010-1 Computer Terminal

5111 Storage Scope

4016-1 Computer Terminal

GMA125 OEM Graphics Monitor

4052 Graphics Computer

8002A Micro-processor Lab

414 Patient Monitor

528 Waveform Monitor

650HR TV Monitor

4907 File Manager

634 Video Monitor

4054 Graphics Computer

7104 Scope

4663 Digital Plotter

7603 Scope with C53 camera

520A Vectorscope

1450 Demodulator

GMA102A OEM Graphics Monitor

T932A Scope

4027 Color Graphics Terminal

833 Data Communi-cations Tester

577 Curve Tracer

7603 Scope

TM515 Traveler Mainframe

465B Scope

4024 Computer Terminal

576 Curve Tracer

NTSC Generator

1502 TDR Cable Tester

vintageTEK museum

Tektronix 4205

Intelligent Color Graphics Terminal

- **Affordable, high-quality graphics**
- **Fast picture generation**
- **Local zoom and pan**
- **Multiple views and surfaces**
- **DEC® and IBM® connectivity**

Screen display courtesy of Computer Associates International, Inc.

The Tektronix 4205 Intelligent Color Graphics Terminal brings advanced but affordable graphics to a variety of applications, including business graphics, technical data analysis, and financial analysis. From a 16-color palette to such advanced features as local segment processing and zoom and pan, the 4205 offers outstanding value in an interactive, multipurpose graphics terminal. Moreover, with the 4205's upward compatibility built in, your software investment is protected as your application requirements grow.

Advanced But Affordable Graphics. As the lowest priced Tektronix color graphics terminal, the 4205 offers excellent value with its advanced features and capabilities. Its local segment processing means fast, efficient picture generation, since redraws don't rely on the host.

The 4205's 4096 × 4096 virtual coordinate space lets you store detailed graphics information. And with true zoom and pan, you can enlarge portions of a picture, producing finely detailed images on a 480 × 360 pixel display.

For more efficient graphics creation and editing, the 4205 supports multiple views and surfaces. You can display up to 64 separate graphic images in different windows for viewing different portions of the same image or viewing different images simultaneously. You can also draw on independent graphics surfaces, make them visible or invisible, or overlay two or more surfaces for a composite image. These operations are especially useful for such tasks as creating multilevel images for printed circuit board design.

Total Applications Solutions. To protect your software investment, the 4205 is compatible with a wide range of applications, including the Tektronix' industry standard PLOT 10™ family and all software written for Tek 4100 and 4010 Series terminals. And like all Tektronix terminals, the 4205 supports hundreds of application software packages from leading vendors around the world.

Connectivity Extends Application Software Base. Besides the standard RS-232-C communications link to DEC hosts, the 4205 is available with an optional IBM 3270 coax

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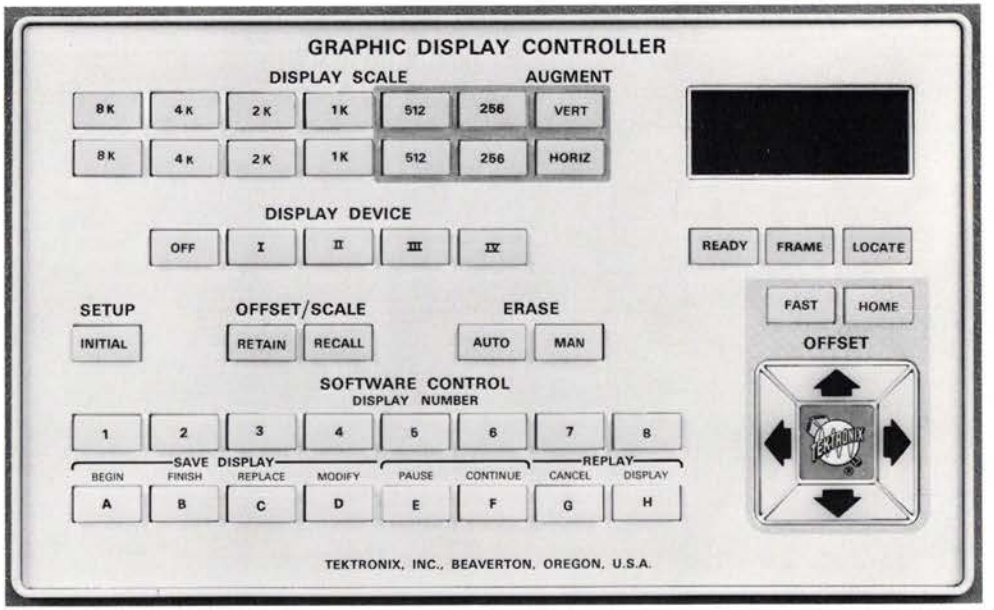
The T4005 Graphic Display

The T4005 is composed of two parts—a Graphic Display Controller (GDC) and a Tektronix 11-inch Bistable Storage Display Unit.

GRAPHIC DISPLAY CONTROLLER—The GDC contains the operator controls, and the hardware which processes computer outputs into the data required for graphic and alphanumeric displays.

The GDC hardware performs a number of graphic editing functions such as scaling, offsetting, magnifying, framing and augmenting. These functions are often done with software in other systems. GDC hardware minimizes core storage requirements and program changes to obtain initial results. Another advantage of the Graphics Display Controller is its ability to drive four distinct display devices under both manual and software control.

STORAGE DISPLAY DEVICE—The display device is a Tektronix developed 11-inch Direct-View Bistable Storage Tube. After the display is written once, the storage tube retains the display. This device provides a flicker-free, drift-free display of high density alphanumerics and complex graphics. In an age of noise, it's pleasant to have computer outputs displayed without the impact and positioning noise of mechanical devices. In many cases you'll find the display rate of the Tektronix storage device is faster than the computer algorithms producing the display.



THE CONTROL PANEL

Several unique features, readily accessible through the control panel, make the T4005 Graphic Display far more versatile than similar CRT display devices. The control panel is functionally arranged for quick understanding and easy operation. With little if any instruction, the user rapidly learns how to take full advantage of the complete versatility and advanced features of the T4005.


4023
TEKTRONIX
WAIT
KEYBOARD LOCK
LOCAL
ON LINE
ON 1 OFF
ON 2 OFF
DIRECT
BUFFER
POWER

Color Displays Come to Tek

4027

4113

4105 – a Unicorn Monitor

4115B

As remarkable as Tek's Direct View Storage Tubes were, these CRTs could not render a full color image. Historically, the only CRT able to display full color was the shadow mask tube, mass produced for color TVs in the second half of the 20th century. However, the resolution of color TV tubes was too low for computer graphics use and in addition, prohibitively expensive video memory was required for computer graphics applications.

By late 1970s both of these shortcomings were gradually being remedied, largely by Tek competitors, and the natural attraction to a full color image caused Tek monochrome monitors to look dated.

Tek offered its first color monitor, the 4027, in 1978. It had a 11-inch screen with modest 640x350 resolution, but it was a product beachhead for color graphics at Tek. The Information Display Division had considerable experience in the design of computer monitors and development of graphics software. They also had a huge installed customer base. However, Tek's proprietary CRT edge was lost since a commercially-available, full-color tube had to be utilized. As part of the color graphics initiative, Dr. Jerry Murch was hired to provide direction on the effective use of color in computer graphics.

While the screen resolution of the 19-inch 4113 monitor was limited to 640x480, it had the ability to manipulate an image of 4096x4096 addressable points, the same as Tek's DVST monitors. With the introduction of the 4115B in mid-1983, the Stars Wars-themed proclamation that the "Graphics Empire Strikes Back" in *TekWeek* added to the momentum. The 4115B offered 1920x1280 screen resolution, industry-leading fast graphics and proprietary CRT technology. Tek was back in the lead of computer graphics.

The introduction of the Unicorn line of low-cost color terminals in 1983 further strengthened Tek's leading role in computer graphics.

vintageTEK museum

Tektronix SF4208

Industrial Color Graphics Terminal

- **NEMA-2 compliance**
- **Sealed keyboard**
- **Touch-screen option**
- **Overheat sensor**
- **Simultaneous DEC® and IBM® connections**

The Tektronix SF4208 Industrial Color Graphics Terminal is a rugged, high-performance graphics terminal designed specifically for the demanding conditions of the manufacturing environment. The SF4208 satisfies the needs of manufacturing personnel for a powerful but easy-to-use graphics terminal able to withstand the rigors of the shop floor. It is the ideal choice for manufacturing tasks from mechanical drawing preview to production assembly.

Built for Harsh Conditions. The SF4208 fully complies with the NEMA-2 standard, providing an environmentally protected terminal that incorporates a special filtered air-flow cooling system to protect against dripping liquids, dust, and dirt. The sealed VT200™-style keyboard keeps out spills and dirt while maintaining full keyboard functionality. A special glare- and impact-resistant CRT shield is static-charge grounded and easily replaced if necessary. For extremely dirty environments, the entire system can be rack-mounted into a standard 19-inch NEMA-12 cabinet.

Operates Under a Broad Range of Conditions. The SF4208 operates in temperature extremes from 32° to 122°F and in relative humidity between 10%—95%, noncondensing. If the terminal begins to overheat, a warning light alerts users—and if it becomes too hot, a special sensor shuts it down before damage can occur.

Touch Screen to Simplify Use. For convenient data entry, you can equip the SF4208 with an optional touch screen, which incorporates highly reliable infrared technology. Barcode readers and barcode slot readers are also available.

Full Graphics Functionality. As a member of Tek's 4200 Series of color graphics terminals, the SF4208 incorporates the standard Tek graphics features, including a 64-color palette, local zoom and pan, windowing, and segment processing. Outstanding display quality with 640 × 480 resolution ensures crisp clear images. The SF4208 has 512 KB of RAM with another megabyte of RAM available as an option.

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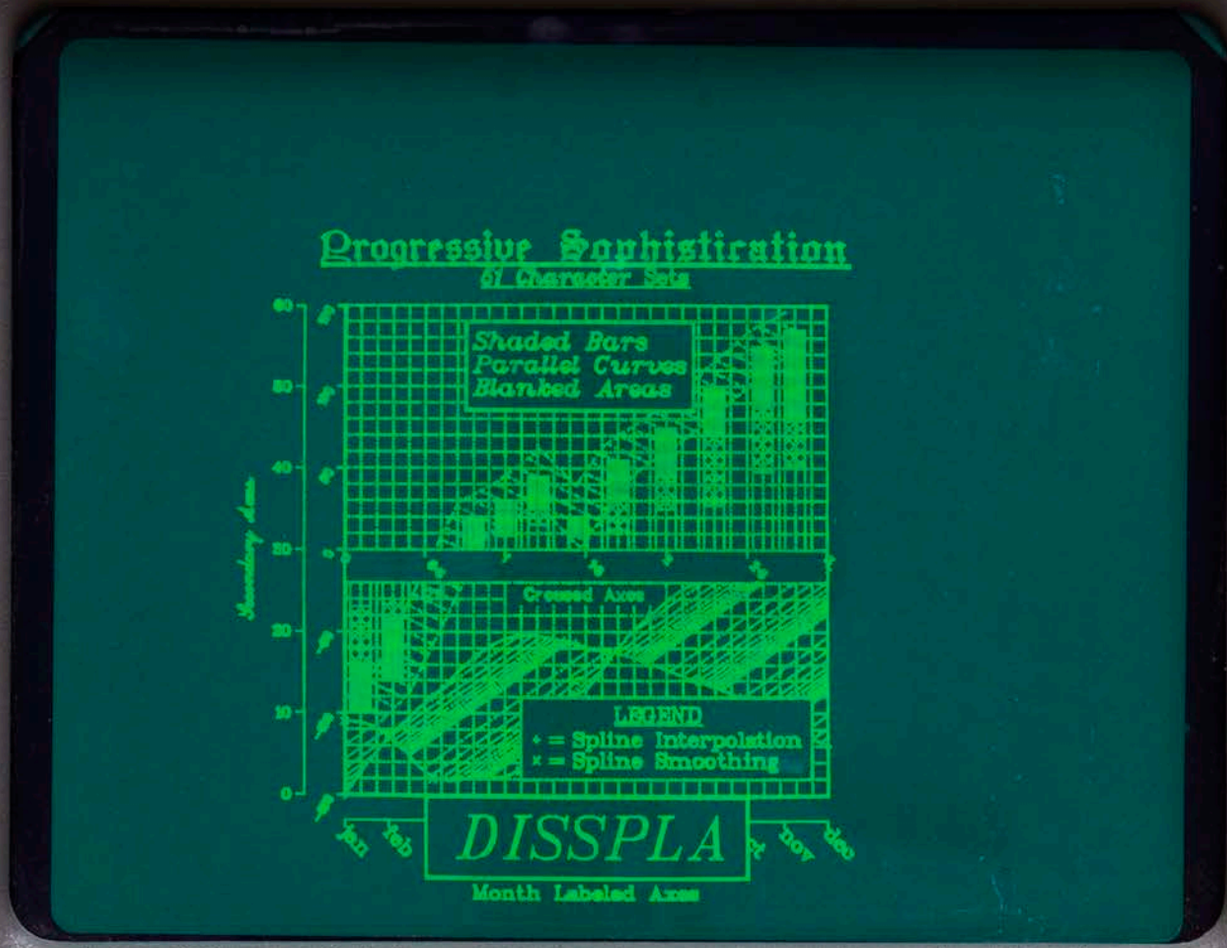


E4010-1
TEKTRONIX

Picture Drawing

1. Sin X/X	11. Nebula	21. Grinch
2. Gothic Font	12. Fireworks	22. Tek 465
3. Wheel Section	13. Solar System	23. Rocket
4. Dish Antenna	14. Dragon	24. Death Star
5. Cooling Tower	15. Mickey Mouse	25. Laser Cannon
6. World Map	16. Tek Bug	26. Bump
7. Balloon	17. Snoopy	27. Eagle
8. 3D Wave	18. Wizard	28. 3D Plot
9. Bouncing Ball	19. R2D2	29. Darth Vader
10. Billiards	20. Cheshire Cat	30. Complex Curve

The following User Definable Keys are available:
1. Repeat Current Drawing
2. Change mode of current Image and redraw:
(DOTS -> VECTORS or VECTORS -> DOTS)
3. Draw next picture
5. Repaint menu
11. Go to next demo (Music)

Stop program and press AUTO LOAD to go to Main Menu.

Enter the number of the drawing you would like or press
RETURN to have them drawn automatically

4081
TEKTRONIX

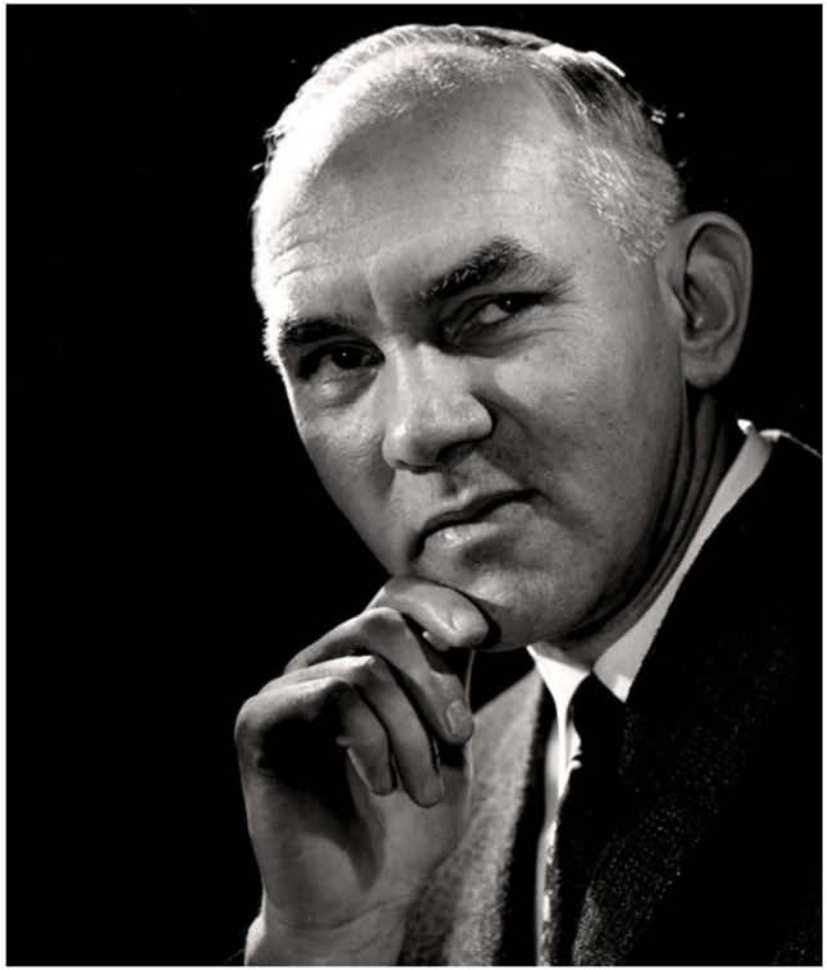
BUSY

I/O

POWER

LINE EDITOR

Howard Vollum 1913 – 1986



The man who planted Silicon Forest

A dedication ceremony for the Howard Vollum Memorial Garden was held on August 14, 1987 in front of the Technical Center. Area Rep employee, Julie Stark, shared a story at the ceremony, quoting Frank Hood, Tek engineer and company photographer and videographer:

> "In the 1950's Tektronix was hiring people at an astonishing rate. One day a man with a slightly rumpled suit, sans necktie, came into the personnel office. He looked around, then proceeded to walk down the hallway. A woman stopped him and explained that everyone was busy, but if he would take a seat, she would give him a job application. The man obliged, writing, 'Name: Howard Vollum, Position Desired: assembly worker, or engineer.' "

RE4012: the top of a very tough line.

Single-unit construction, modular functional assemblies, and no-stress CRT mount simplify RE4012 maintenance and assure operator safety. Automatic origin shifting, discrete connectors on the circuit cards, ceramic IC's and heavy-duty components throughout maximize CRT life and overall reliability. "Whisper" fans assure quiet operation.

The RE4012 has its tough outer shell, but under the surface it's still a sophisticated terminal with versatile interfacing available to readily adapt it to most computer systems. And wherever duty takes it, maintenance and service are nearby. Tektronix has field offices throughout all major U.S. and world-wide markets, with computer display terminal specialists standing by to help.

Tektronix has long been a respected supplier to commercial and government projects. Talk with your Tektronix sales representative: the RE4012 is available now, and its applications can open new horizons in rugged environments.

PRODUCT DATA

OPERATIONAL CHARACTERISTICS:

Alphanumeric Mode:

Display Medium:
Direct View Storage CRT.

Display Size:
11-inch diagonal.
approx. 7.9x6.0 in.; 20x15.2 cm.

Character Generator:
7x9 dot matrix (ROM).
Approx. 1,000 characters/sec.
Approx. 0.087x0.106 in.; .22x.27 cm
Full ASCII, 94 printing characters (upper and lower case).

Format:
74 characters per line.
35 lines per display.
2,590 characters per display.

Cursor:
Pulsating 7x9 dot matrix.

Alphanumeric Speed:
Approx. 10,000 WPM (Avg. 6 characters per word).

Graphic Display Mode:

Vector Drawing Time:
2.6 ms for standard terminal. With fast-graph option, variable depending on vector length.

Graphic Matrix:
1024X x 1024Y addressable points. 1024X x 780Y viewable points: 100 per in., 39.4 per cm.

Graphics Input Mode:
Thumb-wheel controlled cross-hair cursor 4 through 1023X, 0 through 780Y.

Length error:
<1%.

Usable Storage Time:
Approx. 15 minutes in view status and 1 hour in hold status without permanent damage to the storage target.

Line Straightness:
0.5% deviation from mean.

Line Voltage Ranges:

110 V AC	220 V AC
Low	
110V ± 10%	220V ± 10%
Medium	
115V ± 10%	220V ± 10%
High	
120V ± 10%	230V ± 10%
	240V ± 10%

Input power:
135W typical with standard terminal configuration. Line frequency 48-66 Hz.

ENVIRONMENTAL CHARACTERISTICS:

Temperature:

Operating: −15° to +55°C
Non-operating: −55° to +75°C
As per Procedure 1, Method 501, 502, Mil-Std-810B

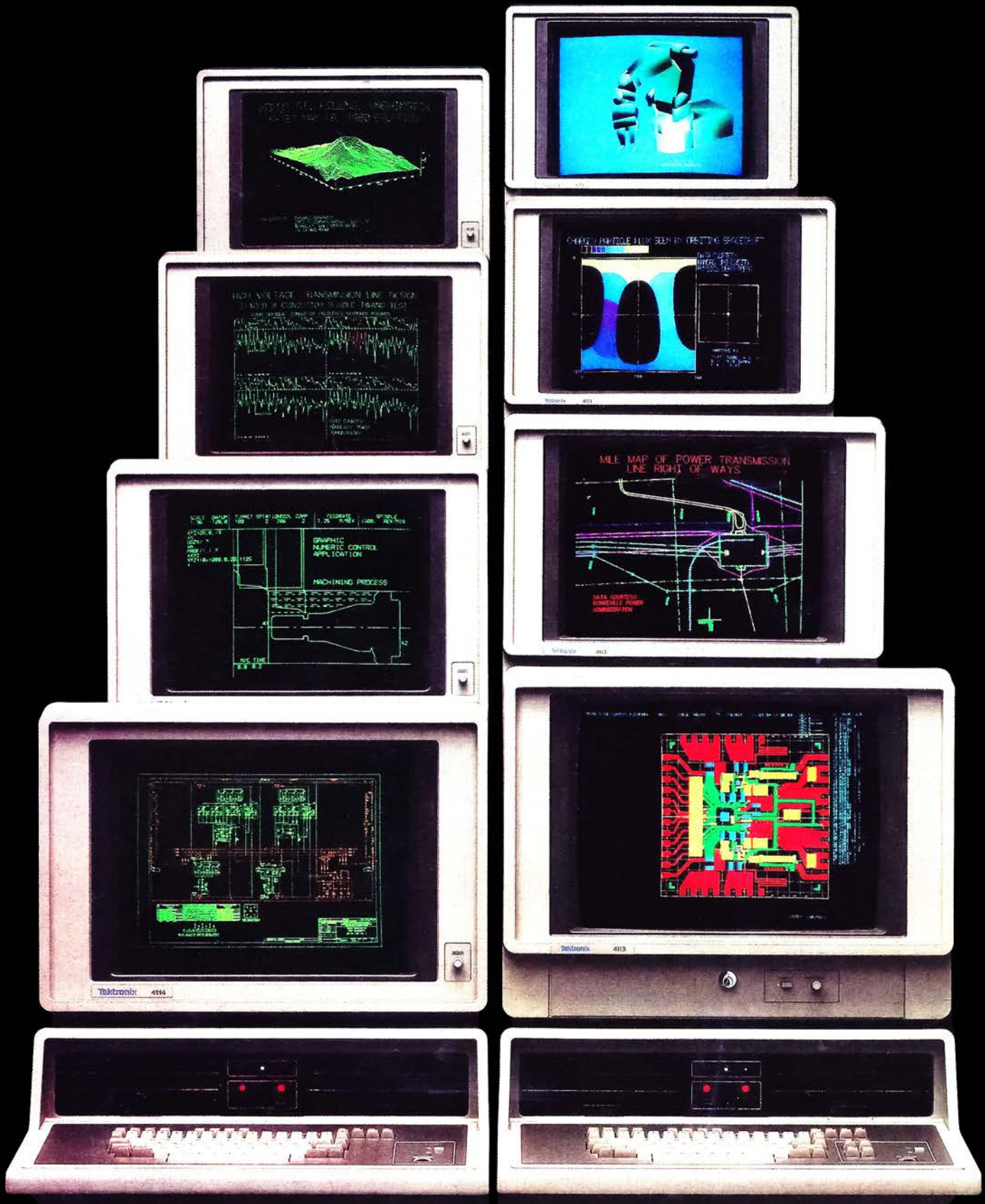
Entire CRT assembly unplugs and is replaceable as a single unit . . . in about a minute.

Complete keyboard, including 128-character ASCII, character repeat enabled simply by holding a key down.

Convenient front panel controls include fuse diagnostic light, variable brightness control for "write-through" mode, and control for hard copy scan brightness.

Plug-in maintenance. Entire terminal logic is contained on four cards for rapid serviceability.

Integral thumb-wheel controls, on the keyboard, offer true convenience of graphic input, facilitates "menu-picking" and sequential alteration of data base.



Plotter. Hard Copy.

Color Hardcopy

Ink preparation for the Tek 4692 Color Printer

4692 Color Printer

Phaser 320 Color Printer

Phaser™ printer shape-keyed solid ink

Ink Chemist is not a job description you would expect to find at an electronics company. This observation was made to accompany the photo at the upper left in discussing Tek's first color printer product in the 1984 Annual Report. Not satisfied with what was available off-the-shelf, a group was assembled in Tek Labs who formulated an improved ink set for Tek's 4692, shown at left. It was one of the first full color ink jet printers sold commercially. The 4692 and other hardcopy offerings provided color prints to support new Tektronix color monitors.

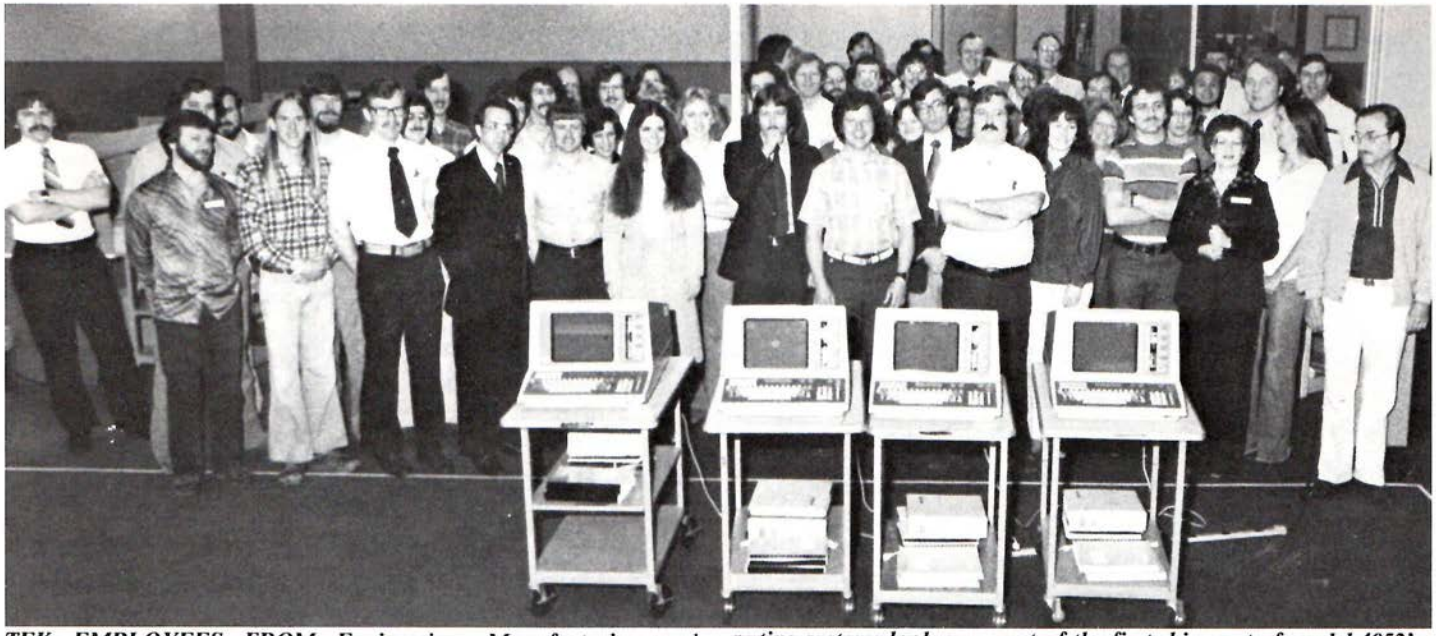
Even today, for the highest contrast and richest color, most ink jet printers need specially coated paper to avoid ink wicking into paper and thus compromising color saturation.

To address this issue, Tektronix found a clever solution. Tek engineers retained the speed and flexibility of ink jet printing, but created a solid wax-based ink that was melted in the print head and jetted to the paper as a liquid. The ink solidified on the surface of the paper before it could be absorbed, retaining the full color richness. Excellent color saturation and contrast was achieved on virtually any media – from two mil rice paper to vellum.

The Phaser™ line of printers got its name from the phase-change the ink underwent from solid to liquid and back to solid during printing. Unlike earlier Tektronix color hardcopy systems, the Phaser printer line was designed and built entirely at Tek.

The Tektronix Phaser 340 was offered as a successful networked office color printer solution in 1995. A sample of a shape-keyed ink block is shown in the adjacent photo. The unique shape for each color prevented mixing. In 1995 two Tektronix chemists, Wayne Jaeger and Don Titterington, were awarded the prestigious Howard Vollum Award for technical achievement for their work in developing the Phaser printer ink.

In 1999 Tek sold the printer business to Xerox Corp.



TEK EMPLOYEES FROM Engineering, Manufacturing and Marketing who aided in developing the new desktop graphic computing systems look over part of the first shipment of model 4052's, which join the successful model 4051 in the international market.

Desktop systems family grows

Tek's Graphic Computing Systems (IDD) recently introduced internationally two desktop graphic computing systems.

The new 4052 and 4054 are upward extensions of the successful model 4051, a personally manageable desktop computer. The new additions complement the 4051 to create a three-member family with broad appeal in the growing desktop computer market, according to Hiro Moriyasu (GCS General manager).

Marketing representatives conducted field training courses in March and response to the products was enthusiastic, Hiro said.

THE COMPANY THAT SET THE STANDARD FOR DESKTOP GRAPHICS NOW RAISES IT.

Tektronix®
COMMITTED TO EXCELLENCE

Other Oregon & Washington Sites

Wilsonville

Clark County WA

Walker Rd

Union Avenue

Tektronix had several properties in addition to the Sunset plant and Beaverton campus:

Wilsonville OR: On the east side of Interstate 5, the Wilsonville facility opened in September 1975. It was home to the Information Display Group, eventually comprising three office buildings and a warehouse on 265 acres.

Clark County WA: Opened in 1981 on a 270 acre site north of HW 14, the Clark County facility housed the Instruments Division. The atrium photo at left was used in the 1982 annual report.

Walker Road: Located at the corner of Walker Rd and SW 185th, the final acquisition deal involved an exchange for the Sunset Plant. It was a 38 acre site with three buildings, housing the Design Automation Group (moving there in 1977), Semiconductor Test Systems and Logic Analyzers.

Merlo Road: Portable Patient Monitors Division was located at Merlo Road in a leased building from the mid-1970s to 1980 when the business unit was sold to Squibb.

Redmond OR: Opened in 1982 in a one-time aircraft hangar near the Redmond airport, it was home for Communications Network Analyzers, employing as many 140 people.

Union Ave: Celebrated as Tek's return to Portland during its opening in 1980, the facility, located at NE Killingsworth and Union, manufactured 200 and 300 series scopes and employed as many as 50 people.

Property was also purchased in Lebanon OR and in Fairview, near Gresham in the early 1980s, but was never used.

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PLUG-IN THE PERIPHERALS THAT COMPLETE YOUR JOB.

An optional three-port peripheral interface on the 4113 enables local control of Tektronix peripherals that are graphic standards in their own right. Enjoy automatic, multi-color plotting on the B-size 4662 Interactive Digital Plotter with 8-pen turret option. Or command big plotter capabilities in a personal, C-size plotter with the dual-pen 4663.

Both Tektronix plotters draw graphics and alphanumerics on paper, Mylar® or acetate, at high speed, with exacting precision, and with one of the largest choices of colors, inks and pen points you can find.

The Tektronix 4632, one of a number of Tektronix plug-in fiber optics copiers, produces gray-scale working copies of color displays in seconds, at the push of a button. Copies are high-contrast, dry, and cost just pennies a page to produce. No toners or chemicals are required.

If your graphics requirements also include additional data storage, graphic tablets or printers, your Tektronix Sales Engineer can show you a range of outstanding price and performance values in all these areas and more. No one else can match the depth and breadth of our ongoing graphics support.

For further information, contact:

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Portland, OR 97208
For additional literature, or the address and phone number of the Tektronix Sales Office nearest you, contact:
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Photo Credits:

Front cover: Data in Solids Modeling Display shown courtesy of General Electric CAE International.

Changed Particle Flux Display data courtesy of University of Kansas, Department of Physics.

Mt. St. Helens Data courtesy of Washington University, Geophysics Department.

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So your 4010 Series terminal is your entry into a system of peripherals and support services that are industry leaders in their own right.

Look at your choices in quick, high quality output: At the push of a button, our 4631 Hard Copy Unit provides clean, dry, 8½ x 11" paper copies of on-screen displays. Perfect for permanent files and binder reports.

Our B-size 4662 and C-size 4663 interactive digital plotters draw graphics and alphanumerics on paper, mylar or acetate, in up to nine colors, with high speed and exacting precision. Featuring many capabilities formerly found, if at all, on much larger, more costly drums and flatbeds, they show why Tektronix is the leader in intelligent small plotters.

We can answer digitizing and data storage needs of nearly any dimension. You can specify graphic tablets in hand-held or table size.

Access convenient local storage with our digital cartridge tape drives. Or plug in our advanced 4907 File Management System, offering up to 1.89 million byte capacity in triple disk configuration.

From alphanumeric printers to graphic joysticks, our mastery of detail goes far beyond what you see on the screen.

For 30 years, our name has been synonymous with reliable high technology products. Starting with one of the industry's most rigorous quality assurance programs and ending with a small army of responsive, highly-trained service people stationed in more than 60 countries around the world, we're committed to keeping our customers up and running.

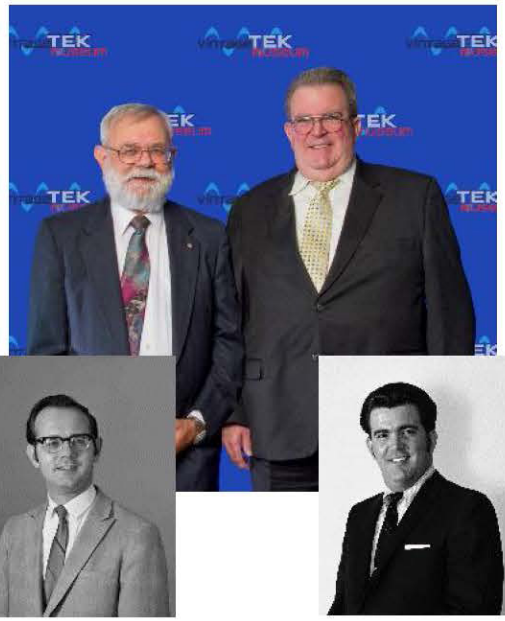
You'll find your local Tektronix sales engineer a reliable source of advice on the best 4010 Series configuration for your application and growth picture; on available volumes from the PLOT 10 Software Library; on a variety of sales or leasing agreements and maintenance contracts.

Call him soon. He can take you as close as possible to the point of running out of problems before you run out of time.

Your 4010 Series terminals are supported by plug-in hard copy units; highly precise, amazingly versatile small plotters; cartridge tape storage and flexible disk file manager; tablets, joysticks, printers, our standard-setting software library—in short, all the tools you need for your race against time.

(Inset) Our table-size graphic tablet makes an ideal digitizing companion to 4010 big-screen graphics.

vintageTEK Museum



Stan Griffiths and Ed Sinclair
vintageTEK co-founders

What do the Thomas Edison National Historical Park, the Hewlett-Packard garage, Signal Hill, the Computer History Museum and the Alexander Graham Bell laboratory have in common with vintageTEK? They are all sites listed along with vintageTEK on the *10 sites of electrical history to visit on your next road trip*, an article written by Brian Santo, contributing writer for *Electronic Products*.

vintageTEK is a 501 (C)(3) organization founded by Stan Griffiths and Ed Sinclair, former Tek field engineers, on September 10, 2010. The museum and website is dedicated to displaying functioning Tektronix products which enabled generations of scientists, engineers and technicians in creating the future and to the memory of those Tektronix employees that created this legacy. Our mission is to encourage the next generation of students to pursue careers in the fields of engineering, science, and technology by sharing this knowledge and history and supporting STEM programs in our community.

The museum is found online at vintagetek.org/ and on the Tek Campus in Building 13 at 13489 SW Karl Braun Drive. Check the website for current open hours. Phone: 503 644-0161.

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Multimedia Ready X Terminals

XP200H • XP400

XPRESSWARE SOFTWARE FEATURES

Boot Options	X Server code downloadable from host or optionally from Flash Memory; local boot server
Boot Protocols	TFTP, NFS, Optional; MOP/DAP
Network Protocols	Standard: TCP/IP, TFTP, NFS, BOOTP, RARP; Optional: Serial Xpress, DECnet, LAT
Network Management	Standard: DNS, SNMP, MIBII, PING, Boot Monitor, DECnet Mirror, DECnet Trigger
Parameter Set-up	Motif-like setup menu system and remote configuration files
Printer Support	Network printers, local print screen local BSD print spooler
Server	X server based on X11 Release 5
Server Extensions	Shape, Input, Multibuffer, font caching, Xidle and Xtest extensions Optional: XBlink extension, XIE imaging extension
Local Clients Standard	TekXpress Window Manager, VT220 Window Manager, VT220, TELNET, Console, Protocol Independent Chooser, Setup, Local Client Launcher, local clock, low memory indicator Optional: true OSF/Motif V2.0 window manager, DECnet (Cterm, LAT), Serial Xpress, true OPEN LOOK window manager, Tek340 emulator, 3270 emulator, 3278 print emulator, IBM graphics 3179G emulator, XIE
Multimedia Local Clients	Local audio player, local audio mixer, local XIE viewer, local MPEG video player
Multi-user PC Application Access	WinDD™ local client for running PC/Windows™ applications without emulation
Host-based Clients	Sun Audio Redirect driver, Adobe DPS/NX Display Postscript™ file viewer, Adobe Acrobat™ PDF file reader
Terminal Emulation	VT340, 3270 (Models 2, 3, 4, 5), 3170G (Models 2, 3, 4, 5), VT220, VT100
Fonts	27 Resident, 700+ available on server tape
Font Service	TFTP, NFS, Flash, Serial Xpress, DAP
Platforms	Sun, HP, DEC (OS/1, Alpha Open VMS, ULTRIX, VMS), IBM, RS/6000, SGI and other UNIX platforms
Media Forms	CD-ROM, Cartridge Tape, TK-50, 8 mm, 4 mm

NEW GRAPHIC DISPLAY

for computer applications

Tektronix announces the New, High Speed T4005 Graphic Display, a computer peripheral designed for low-cost displays of high density alphanumeric and complex graphic data.

There is an unlimited range of applications where the speed of the T4005 will optimize use of programmer and computer time. Its many advantages make the T4005 invaluable in computer installations where there is an interest in effective man-computer communications. The T4005 can be interfaced to most computers and it is supported by extensive software for plotting, character generation and text handling.


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Restoration Room
No Public Access
4051 Graphic System
The 4051 Graphics System was the world's first desktop personal computer introduced in 1975. It featured integrated easy to program BASIC language, tape storage, and a high resolution 1024 X 780 graphic display. The General purpose Interface Bus (GPIB) allowed connec
Tektronix
Standard Dry-Silver Paper
1984
4909 Multi-User File Management System
The 4909 is an example of early 1980's mass storage. This 140 pound system used 32MByte removable disks for state of the art file management. It could support up to 10 users via GPIB and had a battery backup clock for time stamping files. This system could be expanded up to 768 Mbytes for a colossal system. The 1984 $16,000 price equates to a cost of $500/MByte compared to today's cost of under $0.10/MByte! Note this obsolete 32 MByte SD card contains the same amount of data storage!
32
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For information call 800-835-6100
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