

TEK PLOT 10
COMPUTER-AIDED DRAFTING SOFTWARE

INFORMATION
DISPLAY DIVISION

**TEKTRONIX PLOT 10
COMPUTER-AIDED
DRAFTING SOFTWARE**

Tektronix
COMMITTED TO EXCELLENCE

Tektronix PLOT 10 Computer-Aided Drafting Software To Multiply Your Options



Tektronix PLOT 10 Computer-Aided Drafting (TekniCAD) is a software drawing tool with multiple applications and multiple configurations. Now technical professionals (engineers, scientists, drafters and technical illustrators) can use their Tektronix 41 OX or 411XB terminals to produce accurate, detailed technical drawings without extensive computer experience. Compatible with Tektronix'

entire family of locally programmable display terminals, PLOT 10 TekniCAD software accesses the hardware's powerful graphics features. A wide range of resolution capabilities, memory options and screen sizes in either monochromatic or color display permits the optimum match of terminal capabilities to the drawing task. For hardcopy output, Tektronix high quality

color copiers can be easily added, as well as a variety of plotters.

PLOT 10 TekniCAD runs under CP/M-86* and Tektronix Local Programmability. This versatile software tool is written to comply with American (ANSI Y14) and International (ISO) drafting standards. The TekniCAD software employs English-language prompts and either on-screen menus or tablet menu input to speed and simplify the creation and editing of technical drawings.



*A registered tradename of Digital Research, Inc.

PLOT 10 COMPUTER-AIDED DRAFTING SPEED, SIMPLICITY AND POWER

Quick Response, Streamlined Procedures

PLOT 10 TekniCAD software is a productivity tool that keeps pace with your drafting needs by accessing the features of Tektronix display terminals.

For instance, access to dynamic graphics speeds image construction, and programmed function keys save you steps in the process of drawing construction and editing.

By accessing the terminal's refresh graphics, the software lets you move objects (symbols and text) freely around the screen until you're satisfied with their location. Tektronix color graphics displays add the dimension of color to highlight drawing items for visual verification by the operator. This allows quick identification of the items currently being drawn or edited.

The 4107, 4109 and the 411XB series terminals offer local memory which means any portion of the screen (or drawing) can be stored and quickly redrawn with newly incorporated changes. Since no additional computer is required for operation, symbols and drawing items can be recalled at any time without data transmission delays.

PLOT 10 TekniCAD also accesses the terminal's zoom/pan function enabling you to fill the entire screen with any specified portion of a drawing. The drawing section is enlarged; coordinate information is recomputed; and your drawing scale is maintained. The entire drawing or selected portions (windows) can be viewed or plotted at any time.

Based On Standards And Easily Mastered

TekniCAD's friendly user interface shortens the beginner's learning curve and improves the efficiency of experienced users. Concise, easily

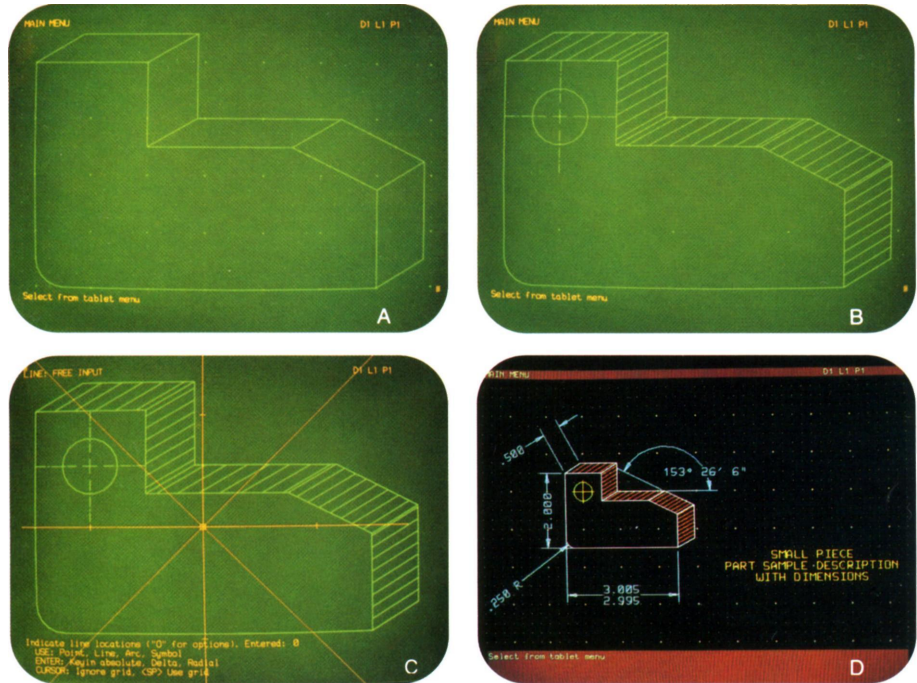


Figure 1. A) An object is drawn using a combination of the basic item types. The user-defined background grid is displayed to help position and size the figure. B) Crosshatching and symbols further define the object. C) The entire figure is defined as a workset. Then it is rescaled using one of the system's copy functions. D) The image appears on a color graphics terminal with annotation and dimensions highlighted in separate colors.

understood English prompts appear on the screen to inform you of the options available within a function. Selection steps that are not desired can be skipped using the many programmed defaults.

Compliance with International (ISO) and US (ANSI Y14) standards frees the user from concern over drawing conventions. The software is also flexible enough to be tailored to unique company standards.

TekniCAD's plot utilities support a wide range of plotters. File utilities organize and archive drawings for easy recall. Up to eight characters can be used to give drawings and symbols meaningful names (plus a 79 character description). A program to transfer drawing and symbol files from previous Tektronix drafting software packages is included to maintain the drawing compatibility of earlier customers.

Graphics Flexibility And Power

Your drawing style and accuracy is enhanced by PLOT 10 TekniCAD's many programmed functions. You can create and edit drawings with a minimum amount of error and duplicated effort (Figure 1).

The TekniCAD concept of Free Input (pioneered by Tektronix) means that you can enter drawing information anywhere on the screen. A background grid is always available to easily position and size drawing items.

Any image can be created by combining TekniCAD's eight basic item types (which are lines, points, arcs, notes, dimensions, arrows, symbols and Crosshatch). The terminal's display quality assures smooth

TekniCAD											Tektronix			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
WINDOW			COPY			MODIFY			BLANK		SYMBOL			
REDRAW	BOX	SAVE	TRANS-LATE	ROTATE	RESCALE	LEVEL	PEN	ITEM	LEVEL	PEN	REPLACE	LIST USED	ACTIVATE LIBRARY	CREATE
CENTER/SCALE	MINI-MAX	RESTORE	MATRIX	MIRROR	DASH	CLIP	STRETCH	TYPE	REGION	DRAWING				
										MERGE	RESTORE	SAVE		
ON	GRID ON/WO DISPLAY	OFF	FREE INPUT	MIDPOINT	ARC CENTER	ON ARC AT ANGLE	INTER-SECTION	ITEM	ALL BUT WORKSET			PLOT OPERATIONS	FILE OPERATIONS	
PARAMETERS			LINE			WORKSET			DELETE					
DASH	LEVEL	PEN	FREE INPUT SMOOTH	OFFSET	TANTO CURVES	PERPTO CURVES	DOUBLE/ TRIPLE	ADD ITEM	ADD REGION	LEVEL	PEN	ITEM		
ARC SMOOTH	FORMATS		ARC/CIRCLE						ADD CHAIN	REMOVE ITEM	CLEAR	TYPE	REGION	LAST ITEM
			THRU 3 POINTS	CENTER RADIUS	CENTER EDGE	2 POINTS ANGLE	FILLET/ ROUND							
ANNOATION			UNBLANK			CHECK								
COLOR	INPUT DEVICES	TABLET WINDOW	ARROW	CROSS-HATCH	C-LINE ARC	NOTE	ANGLE DIMEN	LEVEL	PEN	COORD	DISTANCE	ANGLE		
DISPLAY/SAVE EXPR	CURSOR	DEFINE CONST	HORIZ DIMEN	VERTICAL DIMEN	PARALLEL DIMEN	RADIUS DIMEN	DIAMETER DIMEN	TYPE	REGION/ WORKSET	ITEM DATA	HI-LIGHT	INTER-SECTION	END REGION	
!	@	#	\$	%	↑	&	*	()	"	CONST 1	CONST 2	CONST 3	CONST 4
1	2	3	4	5	6	7	8	9	0	/	THUMB-WHEELS	OTHER CURSOR	LOCAL ZOOM/PAN	LOCAL REDRAW
A	B	C	D	E	F	G	H	I	=	'	HARD COPY	REL/VFY MENU	PICK AP SMALLER	PICK AP LARGER
\=	\o	\e	*	\o	\u	\i	\d			+				
J	K	L	M	N	O	P	Q	R	?	-]	ESC	RUBOUT	
\A	\B	\C	\D	\E	\O	\N	\P	\Q	\R	\?				
S	T	U	V	W	X	Y	Z	SPACE	\	.	CAPS LOCK	SHIFT	RETURN	
\O	\o	\O	\o	\U	\u	\E	\S							

Figure 2. A separate 11-by-11 inch tablet menu with cursor device is available for making drawing selections. You can step through the same selection process by responding to on-screen prompts.

curves and well defined lines. TekniCAD's Copy and Modify functions allow you to move, mirror, matrix, rotate or rescale any individual item, a selected portion of any drawing, or an entire drawing.

Drawing features can be defined by adding dimensions, notes and crosshatching. Color is also available to provide greater detail, to signify a change or to highlight a feature. Configuring TekniCAD with a Tektronix color raster terminal lets you use up to 15 colors in a drawing, selected from an extensive palette.

The family-wide compatibility of PLOT 10 TekniCAD software and the Tektronix 410X and 411XB computer graphics terminals lets you select the hardware/software configuration that's right for your application.

TekniCAD's Menu-Driven Operation

Like a drafter's pencil, PLOT 10 TekniCAD is a very responsive tool. Operator/machine interaction is ordered by a tablet menu (Figure 2). The menu outlines the steps to follow when creating or editing a drawing.

Parameters

Before beginning the actual drawing, you can define system parameters. For example, you can set the drawing sheet size, basic drawing unit (e.g. inches, feet, miles, etc.), scale and other parameters. Choices are made by following on-screen menu prompts.

A drawing can be divided into as many as 250 levels. Up to 15 pens can be assigned to different drawing items. The dash type may be solid, short dash, long dash, centerline or phantom. You also choose either English or Metric units and sizes.

The parameters function group also allows you to define the color of each of the 15 pens, and of everything else you see on the screen such as the prompts, cursors and background. The color specifications map to grey levels when using monochrome raster terminals, such as the Tektronix 4112B.

Item Selection

After selecting drawing parameters, you choose from eight basic item types. These include points, lines, arcs, symbols, arrows, crosshatching, notes and dimensions.

- **Points** may be entered anywhere on the screen using the free input function. Or they may be specified as midpoints of arcs or lines. As the centerpoint of an arc. As the point on an arc defining an angle. Or as the intersection of arcs and lines.

- **Lines** may also be drawn anywhere on the screen. Lines can be input in any of five dash patterns. Multiple parallel lines can be created using the offset function. Lines may be defined as tangent to curves, perpendicular to curves or as double or triple lines. Lines may also be constrained to horizontal or vertical, or smoothed (e.g., ellipse approximation). Many options are available for line construction.

- **Arcs and Circles** may be defined through points. From a center point with radius and start and end angles. From a center point and edge location. As two points with an included angle, or as fillets or rounds.

- **Symbols** composed of any combination of lines, arcs and notes

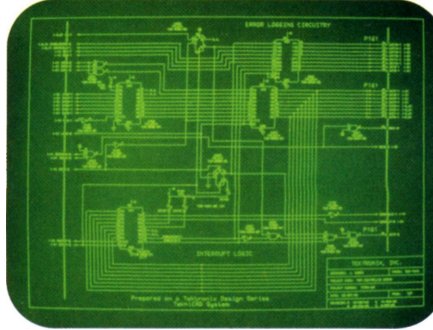


Figure 3. The 19-inch 4114B provides unparalleled quality of lines and arcs as displayed on this controller board.

can be created and stored in symbol libraries. Libraries can contain up to 60 symbols. Symbols from any number of libraries can be recalled and placed anywhere on the drawing.

- **Annotation**, such as arrows, crosshatching, notes and dimensions, can be entered anywhere in the drawing. You can define the angle, spacing and offset of any crosshatching. Notes and dimensions can appear at any angle or position.

- **Worksets** are created by defining any number of items within the drawing as a group. Worksets can then be moved, rotated, rescaled, etc. as a single unit. Up to eight worksets can be defined in a single drawing. Any part or all of your drawing can be defined as a workset.

Free Input

There are several ways to position the cursor for data input. Screen locations can be defined according to a background grid. Grid functions allow you to specify grid spacing, to turn the grid on or off and to highlight gridpoints.

Figure 4. The 4116B's 25-inch display allows easy viewing of this hybrid integrated circuit.

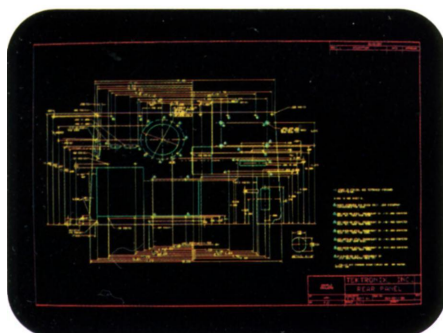
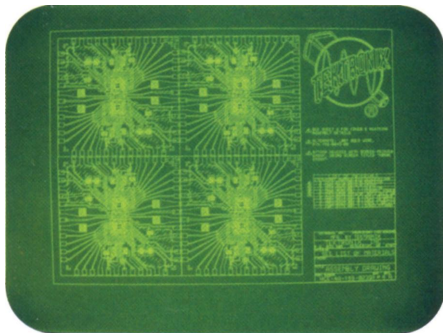


Figure 5. This mechanical drawing uses color to identify geometry, dimensions and notations. The 4115B's 19-inch screen provides very high resolution color.

The cursor will "snap to" the grid-point that is nearest the cursor. You can also "snap to" a point, a line endpoint, an arc endpoint or a symbol connection point.

The Delta Function allows you to move the cursor a specific distance relative to another point on the drawing. The Radial Function will move the cursor a relative distance defined by a radius and angle.

You can also key-in an exact coordinate position, or specify to "ignore" the grid for a cursor input.

Productivity Features

After a drawing is entered, TekniCAD offers several functions that will save time when editing and updating your work:

- The **Window functions** allow you to set apart and enlarge a portion of the drawing for focused viewing. The system's zoom/pan facilities recompute the coordinate information of the area to be enlarged, so you see a more detailed image.

- The **Copy functions** include mirror, rotate, rescale, translate and matrix options. Drawing symmetry is handled quickly and easily using these functions. For example you can create a commonly used symbol, then duplicate it in any size or orientation throughout the drawing.

- The **Check functions** will verify the accuracy of item data, coordinate information, distance, angles and intersections. These functions help assure the quality and consistency of your work.

- The **Modify functions** can move items from one level to another; alter

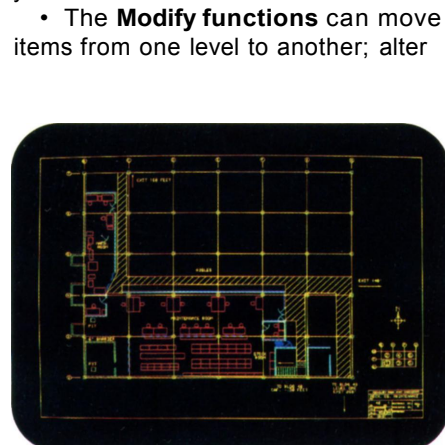


Figure 6. Facilities planning application uses color from the 4115B Computer Display Terminal to denote the various structural components such as walls, doors, desks, stairs, etc.

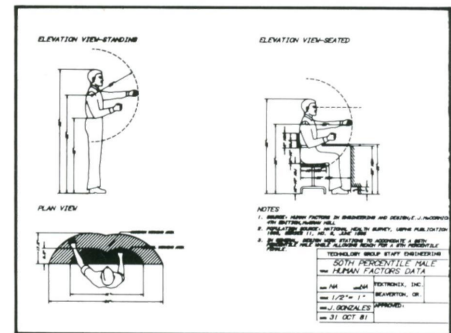


Figure 7. Technical illustration of workstation ergonomics taken from a popular text on ergonomic design.

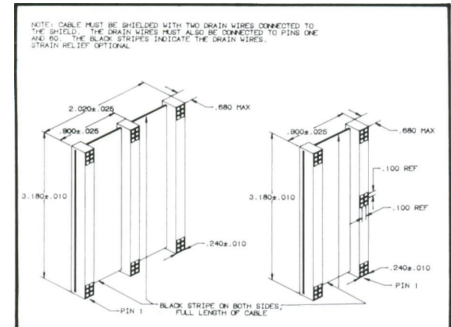


Figure 8. Technical illustration of cable connectors taken from a service manual.

item specifications; change pen numbers; change dash types; and stretch, compress or clip items. Drawing changes are easily incorporated using these functions. Complete start-overs are rarely necessary—even when a single change affects items throughout the drawing.

- The **Blanking functions** will temporarily remove any item, level, pen or workset from the screen to simplify the drawing task. The complete drawing can be restored at any time.

- The **Plot Operations** will send an entire display or selected drawing portions to a plotter.

- The **Drawing file functions** will archive drawings by name. Drawing and symbol names can be up to eight characters in length, and descriptions can contain 79 characters.

The PLOT 10 TekniCAD feature set was developed in direct response to the needs of engineers and scientists, drafters, and illustrators. If you're ready to automate your manual drawing operations, TekniCAD can accelerate your productivity gains.

Drafting Configurations With A Price Performance Edge

There's a TekniCAD configuration to meet most application requirements. One configuration includes a Tektronix color raster 4107 or 4109 Computer Display Terminal paired with the Tek 4170 Local Graphics Processing Unit.

The 4107 Terminal features a 15-inch screen and a 640 x 480-pixel displayable matrix. Up to 16 colors can be selected from a 64-color palette. With a 19-inch display, the 4109 Display Terminal would be a practical choice when your drawings include small or tightly spaced objects.

The 4170 Local Graphics Processing Unit features a standalone micro-processor, local mass storage and local memory. It runs the industry standard CP/M-86* operating system and provides local intelligence to the 4100 Series desktop terminals.

When the application involves high-density images, your PLOT 10

TekniCAD configuration could include a high performance terminal, such as the 4115B. Capable of producing 256 displayable colors from a palette of 16 million, the 4115B is well suited for the creation of multi-level electronic circuit drawings. Superior line quality is assured with display resolution of 1280 by 1024 pixels.

TekniCAD software can also be teamed with either the 19-inch 4114B or 25-inch 4116B DVST display terminal for applications that demand unmatched resolution.

The 4100 Series Color Graphics Terminals are plug-compatible with Tektronix 4691 and/or 4695 Color Graphics Copiers as well as Tektronix Digital Plotters.

Product Support

Tektronix offers a Software Subscription Service to provide continuing post-warranty coverage of enhancements and product reliability improvements.

Ordering Information

Software

4100P30	PLOT 10 TekniCAD software
Opt 12	PLOT 50 2-D Drafting Data Transfer (tape)
Opt 49	Rental Tag

Recommended Configurations

Configuration A

4107 or 4109	Computer Display Terminal
4170	Local Graphics Processing Unit
Opt 3	10 MB Hard Disk
Opt 30	256K Additional Memory
Opt 45	Mass Storage Interface
4100P30	PLOT 10 TekniCAD Software
4957	11" x 11" Graphics Tablet
4695	Color Graphics Copier

Configuration B

4115B	Computer Display Terminal
Opt 9	Color Copy Interface
Opt 10	Three-Port Peripheral Interface
Opt 13	11" x 11" Graphics Tablet
Opt 22	Add 2 Planes Display Memory
Opt 2B	Memory ECC RAM (additional 512KB)
Opt 43	Dual Disk
4100P01	LoPro (CP/M-86 + FORTRAN + DTI)
4926	10MB Winchester
119-0875-00	4 Button Cursor
4100P30	TekniCAD Software
4691	Color Graphics Copier

Configuration C

4114B	Computer Display Terminal
Opt 10	Three-Port Peripheral Interface
Opt 13	11" x 11" Graphics Tablet
Opt 2B	Memory ECC RAM (additional 512KB)
Opt 31	Color Enhanced Refresh
Opt 43	Dual Disk
4100P01	LoPro (CP/M-86 + Fortran + DTI)
4926	10MB Winchester
119-0875-00	4 Button Cursor
4100P30	TekniCAD Software
4631	Hard Copy Unit



Figure 9. One PLOT 10 TekniCAD configuration could include a high performance terminal, such as the 4115B.



Figure 10. Another configuration could include a Tektronix color raster 4107 or a 4109 Computer Display Terminal paired with the Tek 4170 Local Graphics Processing Unit and the 4957 Graphics Tablet.

Customer Training

A five-day Computer-Aided Drafting Workshop that covers various applications in depth is available. The workshop format is designed to improve operator effectiveness. Classes offer hands-on experience with instructor assistance readily available. Lectures and laboratory sessions cover the software and hardware operations, and utility support operations.

Workshops are held at regular intervals in various locations. Choose the place and time that best accommodates your schedule and reserve a space. On-site customer training is also available. For further information regarding the Tektronix IDD Workshops, call Customer Training, collect, at (503)685-3808.

User training can also be provided through Tektronix' Technical Assistance Services (TAS) Program. Contact your local Tektronix representative for TAS details.

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