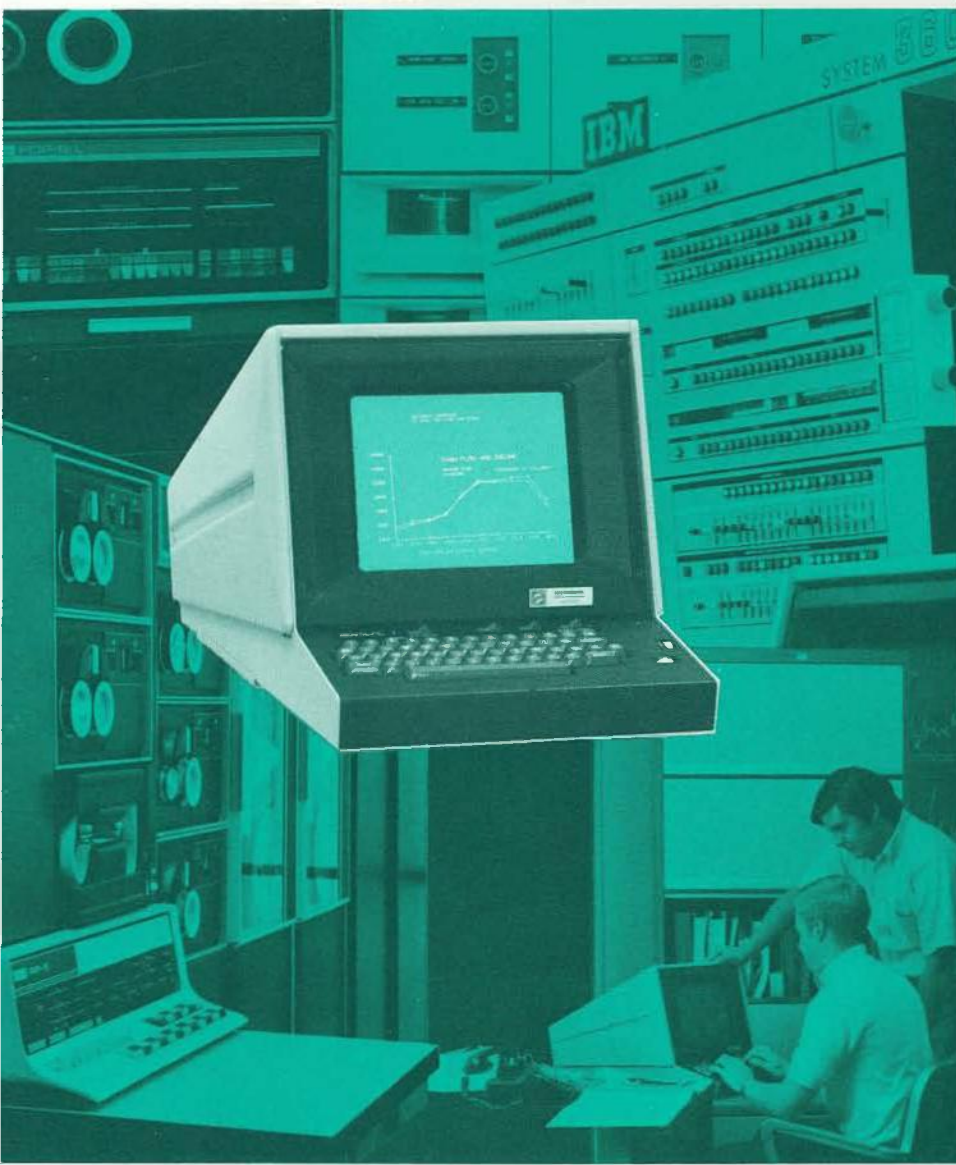




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PLOT-10

TEKTRONIX® 4010 SOFTWARE



PLOT-10 / APPLICATION INTERFACE is a series of modules using the PLOT-10 / GRAPHING module to obtain graphs directly from existing application packages. This software provides digital manipulation of graphic information. The result can be presented so that only the area of interest is displayed.

PLOT-10 / ADVANCED GRAPHING module allows the user to view alphanumeric computer data tables in the form of graphs. Data may be presented as piecharts, histograms, polar-coordinate graphs or cartesian coordinate graphs with choice of linear or logarithmic scaling, either specified or automatic. Can be combined with any of the four modules below.

PLOT-10 / TERMINAL CONTROL SYSTEM module provides a comprehensive base of graphic software to support user application programs on the 4010. The user can readily manipulate the graphic screen display. Magnification of a desired local area requires only simple control adjustments, with automated scaling and clipping.

PLOT-10 / FORTRAN II TIMESHARING module provides comprehensive facilities for controlling the terminal in a timesharing environment. It provides plotting with windowing and scissoring, scaling, rotation and axes generation. The subroutines are available on over 20 timesharing computer systems for easy access.

PLOT-10 / 360-370 module provides capability to support multiple 4010 terminals. Written in assembler language using the Execute Channel Program I/O Facility, it can be accessed from any IBM programming language by subroutine calls with IBM operating system multiprogramming fixed tasks or multiprogramming variable tasks.

PLOT-10 / MINI-COMPUTER module supports most of the popular small computers. Its use provides the operator with full input and output control of the 63 ASCII characters and symbols plus output and input graphics with a cross-hair cursor. Fortran graphing routines are available for use with a sufficiently large machine.

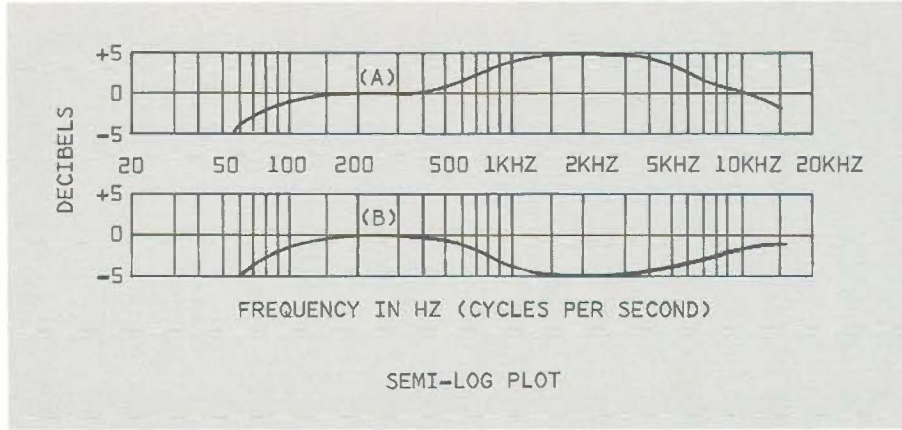


INFORMATION DISPLAY PRODUCTS

a division of



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PLOT-10/ ADVANCED GRAPHING

GENERAL DESCRIPTION

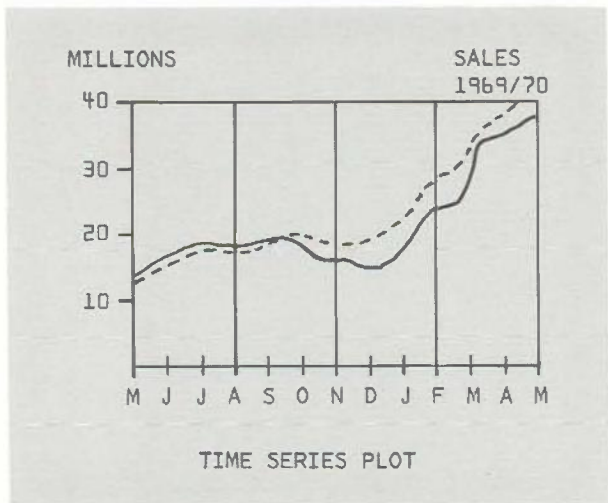
PLOT-10/Advanced Graphing software is a complete set of subroutines for fulfillment of real graphing needs in the wide range of problems encountered in today's business, scientific, and engineering environments.

All PLOT-10 Advanced Graphing modules are written in FORTRAN IV and designed to generate a variety of common plots, as well as some specialized graphs, without involving the user in the programming details.

PLOT-10/Advanced Graphing software can interface with other software products offered by Tektronix.

GENERAL DATA PLOTTING

A set of 20 easy-to-use graphing subroutines are available for pictorial representation of various kinds of data. With an appropriate choice of a routine, it is possible to draw single as well as multiple curve graphs with automatic or user-specified scaling of data in any of the four popular coordinate systems; cartesian, semi-log, log-log and polar.



GRAPH AND TITLE

For more sophisticated needs, the PLOT-10/Advanced Graphing subroutines called GRAPH and TITLE are powerful and versatile tools for drawing well-annotated multiple graphs on the same screen.

SPECIALIZED GRAPHING

Subroutines are also available for generation of polynomial fits, function plots, bode plots, histograms, pie charts, time series plots, and stock market plots, etc.

With the use of Tektronix 4010 Computer Display Terminals and the PLOT-10/Advanced Graphing software, the computer user can increase the usefulness of his output by viewing it in the form of graphs, immediately ready for use in making decisions.

DOCUMENTATION

PLOT-10/Advanced Graphing software is thoroughly documented with User's and Systems Reference Manuals complete with implementation procedures for your system.

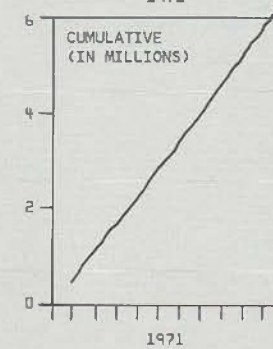
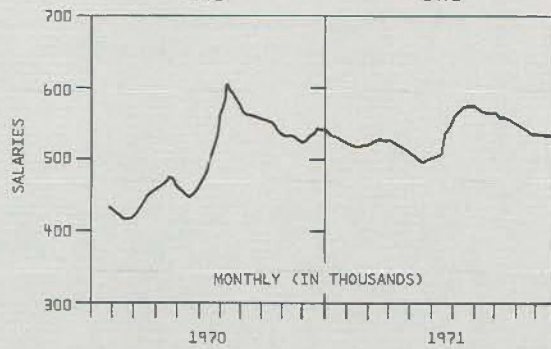
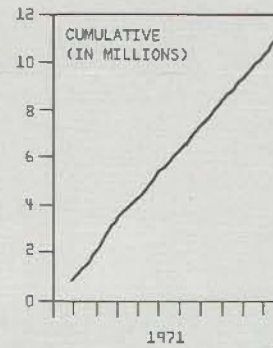
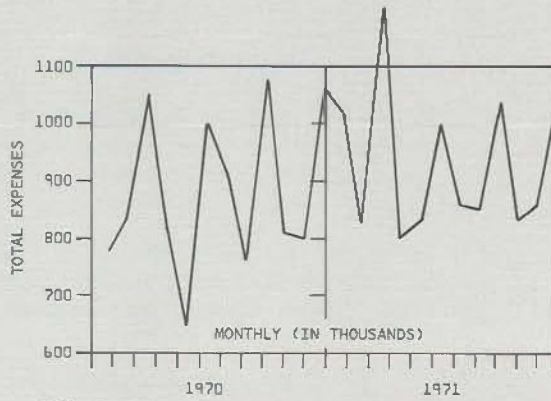
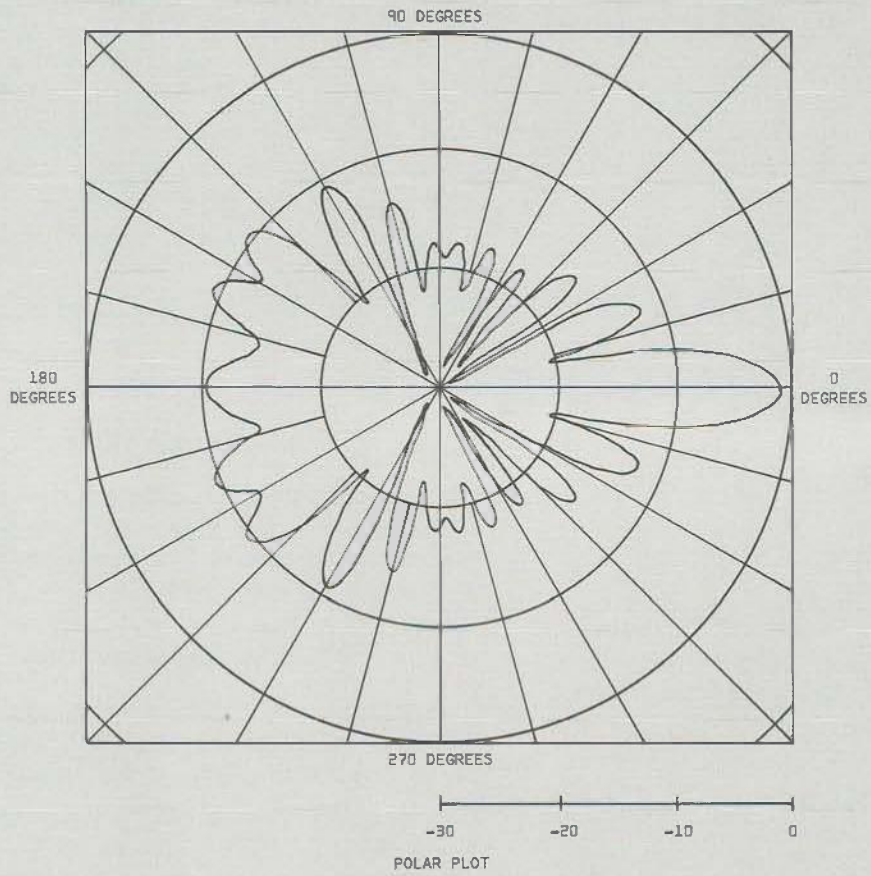
For more information on how easily PLOT-10/Advanced Graphing software can interface to your applications, please contact your nearest Tektronix Applications Engineer or write to:

Tektronix User's Library
P.O. Box 500
Beaverton, Oregon 97005

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(DRAWN BY GRAPH AND TITLE)

PLOT-10/ TERMINAL CONTROL SYSTEM

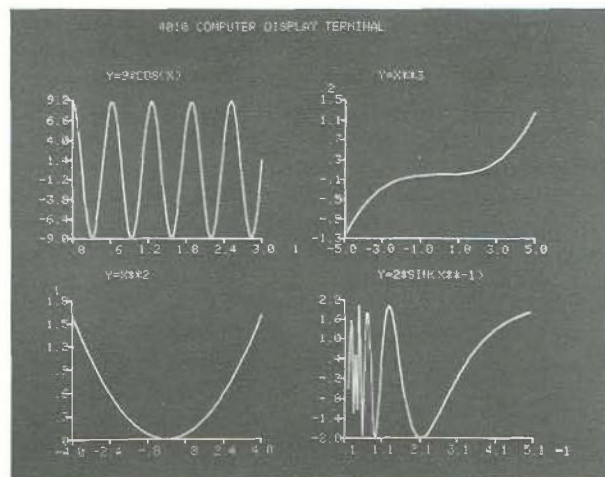
GENERAL DESCRIPTION

To provide a standard basic graphic support package which meets the needs of the different users and the multiplicity of systems, Tektronix has developed the PLOT-10/Terminal Control System. The Terminal Control System is designed for easy implementation on time-sharing computers, mini-computers, System 360/370, or other large-scale computers. PLOT-10/Terminal Control System is a comprehensive set of modular subroutines which allows essentially independent terminal programming. The user needs only to select the proper modules at load time. The design is basically system- and computer-independent, allowing the experienced programmer to work at the basic terminal level and also providing facilities for the occasional user to operate at the conceptual level.

PLOT-10/Terminal Control System has the ability to interface easily with Tektronix PLOT-10/Advanced Graphing to further enhance the user's graphing capability and will be used as the base for future Tektronix Application Programs.

TERMINAL CONTROL SYSTEM OVERVIEW

PLOT-10/Terminal Control System is designed to make the terminal as easy to use as a pencil and piece of paper. The tedious programming and general I/O handling are contained within PLOT-10/Terminal Control System. The modules communicate with each other primarily through the terminal status area. A set of common variables representing the current state of the terminal are maintained to generate output according to the user's current level of usage.



THE VIRTUAL DISPLAY

As most users visualize their graphic data as existing on paper of arbitrary size, the PLOT-10/Terminal Control System allows them to maintain this concept within their program through the use of a Virtual Display. The Virtual Display is a two-dimensional surface of indeterminate size.

All or a portion of the Virtual Display may be viewed at any time. The user is only responsible for defining the portion he wishes to have displayed. This is accomplished by establishing a window which specifies the portion of the Virtual Display to be viewed and where on the terminal screen it is to be placed. The Terminal Control System will handle the conversions and details automatically.

THE SCREEN

The Virtual Display is in contrast to The Screen, which is the software concept of the actual terminal screen. The Screen may be thought of as a discrete 1024 X 1024 matrix of addressable points of which 1024 X 780 are in the prime viewable area. The user may address these points directly as screen coordinates or he may use the inch and centimeter conversion function. By referring directly to The Screen, the user can easily control the layout of his display.

(continued)

INFORMATION DISPLAY PRODUCTS



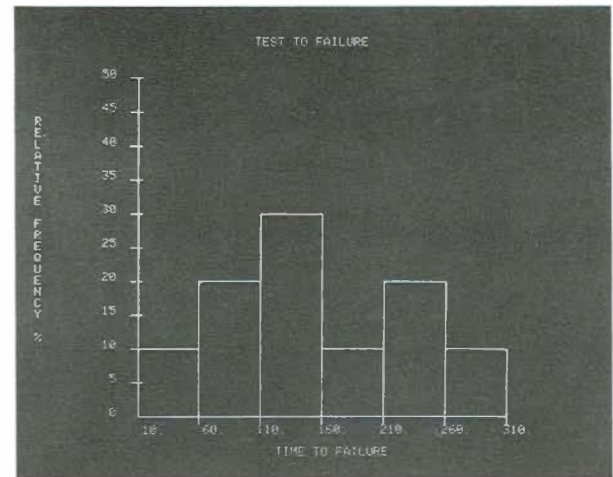
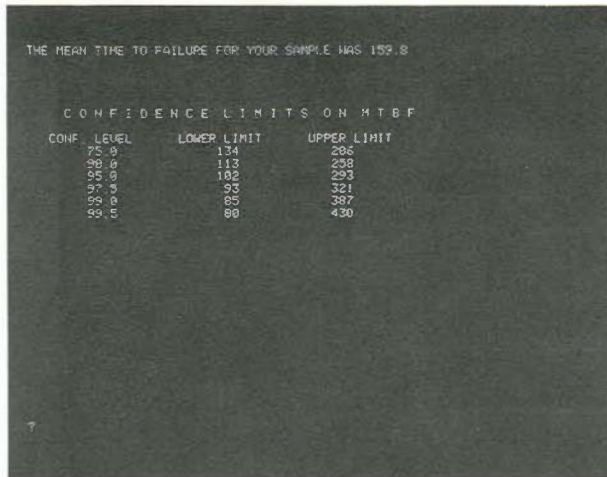
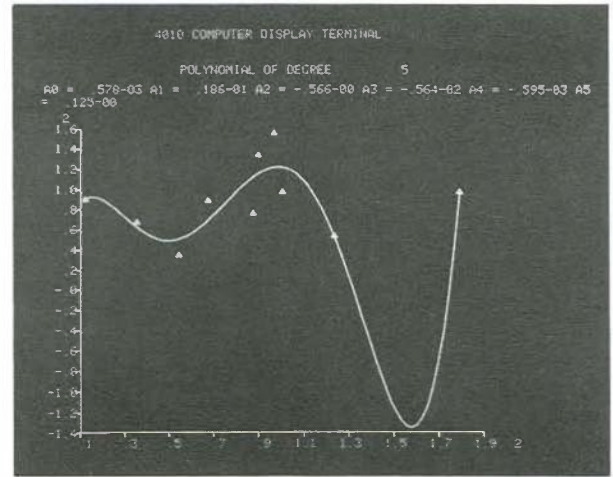
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ALPHANUMERIC DISPLAY

Along with graphical data handling, PLOT-10/Terminal Control System software also aids in the output of alphanumeric data. The user is able to set and reset horizontal and vertical tabs and may dynamically define left and right margins. PLOT-10/Terminal Control System automatically monitors alphanumeric output and the alphanumeric control commands.

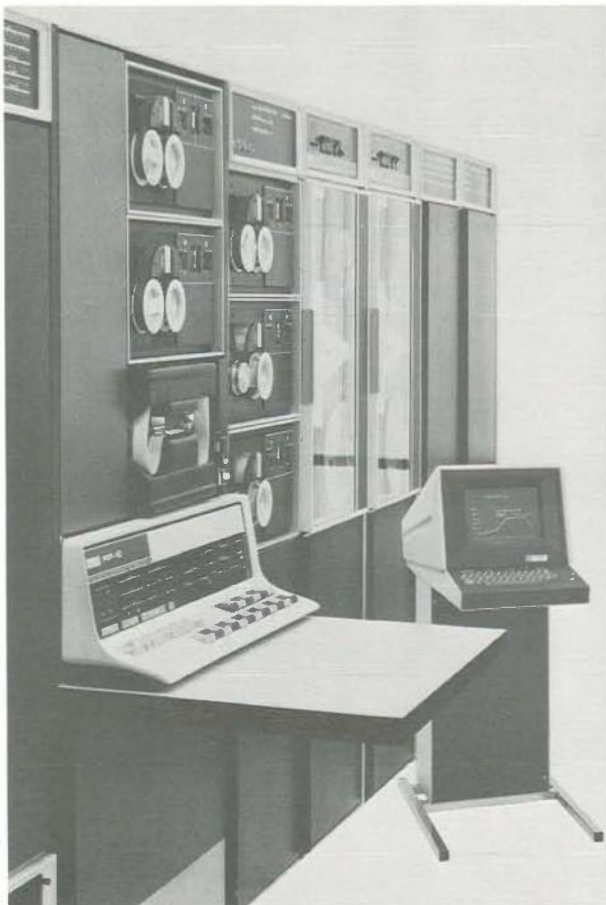
For more information about Tektronix Software, please contact your nearest Application Engineer or write to:

Tektronix User's Library
P.O. Box 500
Beaverton, Oregon 97005



PLOT-10/FORTRAN II TIMESHARING SYSTEMS

The PLOT-10/FORTRAN II subroutine software package is an extensive set of FORTRAN routines to facilitate use of the Tektronix 4010 Computer Display Terminal. By using PLOT-10/FORTRAN II software, the 4010 becomes a powerful tool for accomplishing computer graphics. The FORTRAN II timesharing package is available today on many timesharing computer systems throughout the U.S., allowing the user to easily adapt his systems to use the 4010 terminal in a graphics environment. Customers using timesharing systems with business applications can easily adapt their output to a graphic form by using FORTRAN II software. Under software control, you can perform windowing, rotation, and magnification. Flexible conventions allow windowing to be accomplished either by coordinate definition within a program or by using the built-in thumbwheel-controlled crosshair cursor upon visual inspection of a plot.



The FORTRAN II subroutine also provides the programmer an easy means for:

1. Manipulating the terminal environment, i.e., erasing the screen, making a hard copy, writing different character size, etc.
2. Plotting in any of the available modes, either absolutely or relative to the current position.
3. Drawing linear or log axes, linear or logarithmic grids.
4. Performing graphics input of either points or regional coordinates.
5. Drawing software-generated characters of any desired size or orientation.

All FORTRAN II subroutines, with two exceptions, are written in a common subset of FORTRAN. Care has been taken to avoid singular statement types, word size problems, etc., in order to maximize transferability to any operating system that supports a FORTRAN compiler.

The routines communicate with one another through a central terminal status area in order to retain compatibility with systems that do not support labeled common. Finally, the subroutines are entirely separable making them suitable for immediate inclusion in the existing FORTRAN library.

The two exceptions noted above are a character input and a character output routine. Only these two subroutines need be written in a manner particular to the I/O conventions of each operating system.

The PLOT-10/FORTRAN II package is thoroughly documented including a User's Manual and a Systems Manual with flow charts.

The PLOT-10/FORTRAN II package has been implemented on many timesharing systems. For additional information contact your nearest Tektronix Application Engineer or write:

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PLOT-10/360-370 GRAPHICS SOFTWARE

The PLOT-10/360-370 Graphics Software is designed to operate on your computer with Operating System Multiprogramming Fixed Tasks or Multiprogramming Variable Tasks. To support alphanumeric and graphics, the total software package requires minimum core (13 k storage bytes) and is designed to handle multiple 4010 Computer Display Terminals.

Terminal input/output operations are accomplished with IBM's EXECUTE CHANNEL PROGRAM software. The modules that prepare and check data for transmission or handling input are internal to the Tektronix Software System. The user interfaces to the system through a number of function-oriented calls. This allows the software to support all the programming languages commonly used on System 360/370.

The usage of this software system is similar to IBM's Basic Telecommunications Access Method in that the software provides a means to handle terminal operations. The same software may be used by the systems programmer designing a teleprocessing monitor. Installations currently using terminals can add the Tektronix system or replace their existing I/O methods with the Tektronix software.

OPERATING SYSTEMS

The PLOT-10/360-370 software operates on computers using Operating System Multiprogramming Fixed Tasks and/or Multiprogramming Variable Tasks.

The minimum core requirement for basic alphanumeric is 3,800 bytes. For basic graphics the minimum required is 4,800 bytes. The maximum requirement for the entire system, including usage of optional utility routines, is 13,000 bytes. Each terminal referenced will add 308 bytes to the totals above. An additional requirement of 1.5 k bytes dynamic storage is used during execution for transient initialization routines.

SOFTWARE ROUTINES

The software developed to support the Tektronix 4010 Computer Display Terminal in the System 360/370 environment falls into two general categories. The modules in the first category direct input/output operations. Routines in the second group perform special single functions to assist the programmer writing a terminal application.



The I/O modules are written on two levels. The two routines are called by the application programmer to do character or graphic reads and character writes or graphic plotting. Use of the level-two calls invokes the internal or level-one modules. The level-one routines do the actual I/O and perform control functions.

HARDWARE

Interfacing the Tektronix 4010 Computer Display Terminal is made through IBM's 270X-Series telecommunications control unit using the Telegraph Adapter Type II. To take advantage of the 4010's high-speed capability, a replacement oscillator card is available from Tektronix for the 2701 Control Unit allowing the user to operate at 300, 600, 1200, 2400, 4800, or 9600 baud.

IMPLEMENTATION

PLOT-10/360-370 Graphics Software is available on magnetic tape along with a complete implementation procedure and program reference material for minimum implementation time. The Advanced Graphing Software offered by Tektronix can easily be attached to the PLOT-10/360-370 Graphics Software, providing the user high-level subroutines for use in graphics on the 4010 Computer Display Terminal.

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PLOT-10/ MINI-COMPUTERS

GENERAL DESCRIPTION

Tektronix provides a PLOT-10 software package for most mini-computers. The package is easy to implement with the Tektronix 4010 Computer Display Terminal. The software consists of assembly language subroutines supporting graphic input/output and special alphanumeric characteristics.

MINI-COMPUTERS

PLOT-10/Mini-Computer software is available for the following mini-computers: DEC PDP-8 family, PDP-11, PDP-12; Data General Nova, Super Nova and Nova 1200; HP 2100 Series; Varian 620I, 620L, and 620R. Software routines for other mini-computers can be written on a contracted basis.

SOFTWARE ROUTINES

Four basic software routines are provided with each PLOT-10/Mini-Computer package to perform the following functions:

A. CHOUT (I)

This subroutine is used to output any one of the ASCII characters.

B. CHIN (I)

This subroutine is used to input any one of the ASCII characters.

C. TPLLOT (I, X, Y)

Case 1. $I = 0$

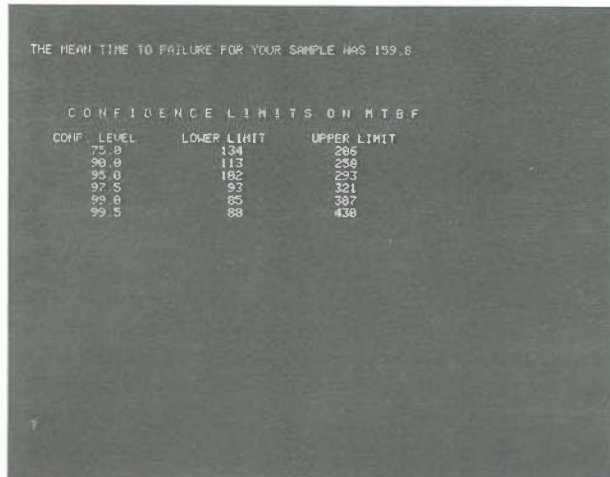
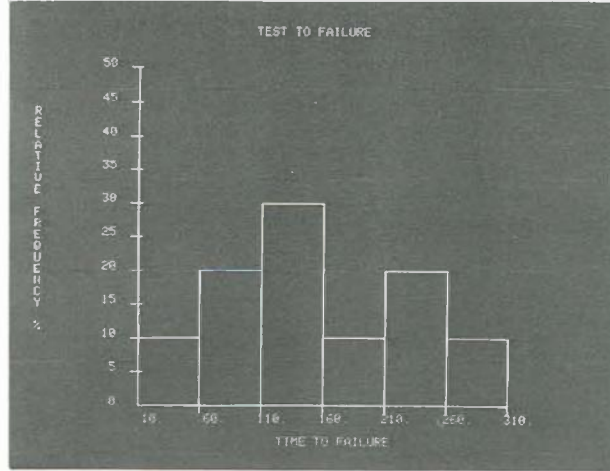
Initialize the linear interpolate mode and plot a dark vector to (X, Y).

Case 2. $I > 0$

Continues plotting assuming linear interpolate mode, i.e., intensified vectors.

Case 3. $I < 0$

Plots and intensifies point at (X, Y).



D. CURSIS (CHAR, X, Y)

This subroutine enables the graphic cursor by outputting the ASCII characters ESC and SUB via CHOUT. When a keyboard character is struck, the routine reads the keyboard character and four others representing the X, Y position of the crosshair cursor. The last four characters are decoded and returned to the caller.

DOCUMENTATION

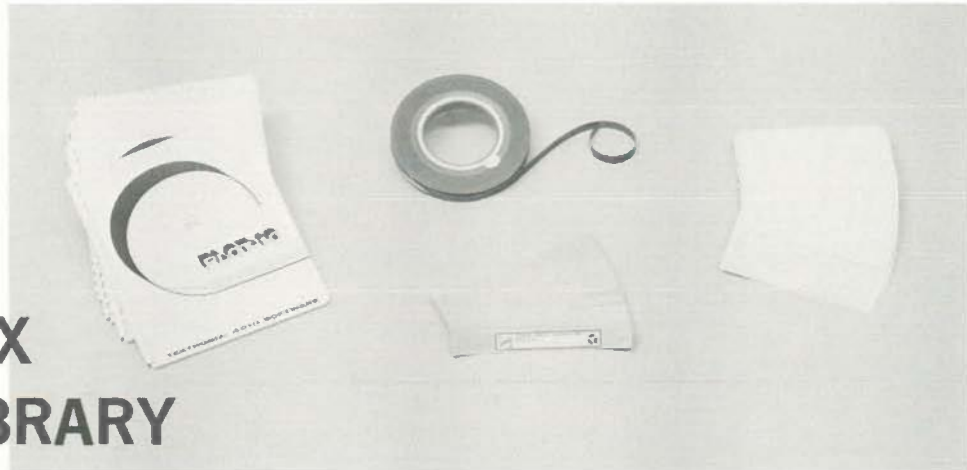
A complete set of documentation, including a Program Reference Manual and paper source tape, is provided. Depending on the mini-computer, between 150 and 200 words of storage are required for PLOT-10/Mini-Computer software.

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TEKTRONIX USER'S LIBRARY



Tektronix User's Library contains programs for Tektronix Graphic Terminals available to customers.

Our library consists of subroutines and application programs contributed by users of Tektronix products and software developed by Tektronix. Customers may share their program products by submitting them to the Tektronix User's Library.

Three types of software products are available.

Type I. Tektronix Software Products

Products designed by Tektronix, available to the customer on a lease or purchase agreement. Tektronix is responsible for maintaining the software and providing corrections to the users. With the purchase of Tektronix Graphic Computer Terminals, many of our software products are available to the customer at no charge.

Type II. Customer Programs For Sale or Lease

Programs developed and contributed by customers are listed in our Program Catalog but not available directly through the Tektronix User's Library. Customers willing to sell software products may have it listed in the Program Catalog along with the price and their mailing address. Customers wanting more information on program products may contact the contributor directly. Tektronix would not handle the distribution of programs.

Type III. Programs Contributed by Customers

Customers may contribute software subroutines or application programs to the Tektronix User's Library. The software routines or application packages will be listed in the Tektronix User's Library and available for other customers.

Tektronix provides complete documentation, including Program Reference Manual, paper source tapes, magnetic tape, cards and Tektronix Program Catalog. The catalog contains a list of timesharing companies supporting Tektronix Graphic Computer Terminals, software subroutines, application packages, and graphic software available from the customers.

Program Submittal Forms and Program Order Forms are available through our local offices. For more information on the Tektronix User's Library, please contact your local Tektronix Application Engineer or write to:

Tektronix User's Library
P.O. Box 500
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TEKTRONIX 4010 COMPUTER DISPLAY TERMINAL



The Tektronix 4010 Computer Display Terminal is designed for the timesharing user who wants a low-cost alphanumeric terminal plus interactive graphics capability. If you are using TTY-type terminals today, the 4010 Computer Display Terminal can easily perform all your applications without additional software. Its features and powerful software give you the best graphics capability for the price on the market today.

4010 DESCRIPTION

The standard 4010 Computer Display Terminal is arranged in a pedestal configuration. The display section is detachable for compact desk installation and can be located up to 5 feet away from the pedestal. The display portion of the terminal contains a high resolution storage CRT to eliminate the need for refreshing the picture. The pedestal provides support for the display section and contains the power supply, logic, storage circuitry, and other electronic components.

INTERACTIVE GRAPHICS

With the thumbwheel-controlled crosshair cursor, you have interactive graphics capability with your computer system.

HARD COPY OUTPUT

Full screen display on standard 8½ x 11-inch pages in less than 8 seconds at a very low cost per copy is now available with the Tektronix 4610 Hard Copy Unit. You can multiplex four 4010 Computer Display Terminals with one hard copy unit.

SCREEN CAPACITY

2520 characters
72 characters per line—35 lines
Unlimited number of vectors for graphics
1024 addressable points on each axis

GRAPHICS SOFTWARE SUPPORT

PLOT-10 Software supports mini-computers, timesharing systems, and System 360/370. With PLOT-10 Advanced Graphing, these modules can be attached to your present program with minimum effort, giving you input and output graphic capability.

SOFTWARE CLASSES

Tektronix offers to the customer a Graphics Workshop Course to help prepare the user to implement Tektronix Software.

FIELD OFFICES

Over 60 Sales Offices and 30 Service Centers are located throughout the United States. Your Tektronix Applications Engineer can give you details on prices, delivery schedules, lease/purchase options and maintenance contracts. Contact him through the nearest Tektronix office, listed in the white pages of your telephone directory.

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WHAT IS PLOT-10?

A complete set of software to perform business and scientific graphing with the Tektronix 4010 Computer Display Terminal.

IS PLOT-10 EASY TO USE?

Absolutely. PLOT-10 software was designed for the nontechnical programmer, with higher-level routines assuming the tedious task of programming and testing.

WHAT COMPUTERS USE PLOT-10?

PLOT-10 is designed for timesharing computers, System 360/370 and most mini-computers.

IS PLOT-10 EXPENSIVE?

No. PLOT-10 software will pay for itself in a short time by reducing your programming costs.

WHO CAN USE PLOT-10?

Anyone with a Tektronix 4010 Computer Display Terminal who wishes to immediately see his output data in graphic form.



SALES AND SERVICE LOCATIONS



THROUGHOUT THE UNITED STATES

ALABAMA
HUNTSVILLE

ARIZONA
PHOENIX

CALIFORNIA
ALHAMBRA
CONCORD
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SAN JOSE
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