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.

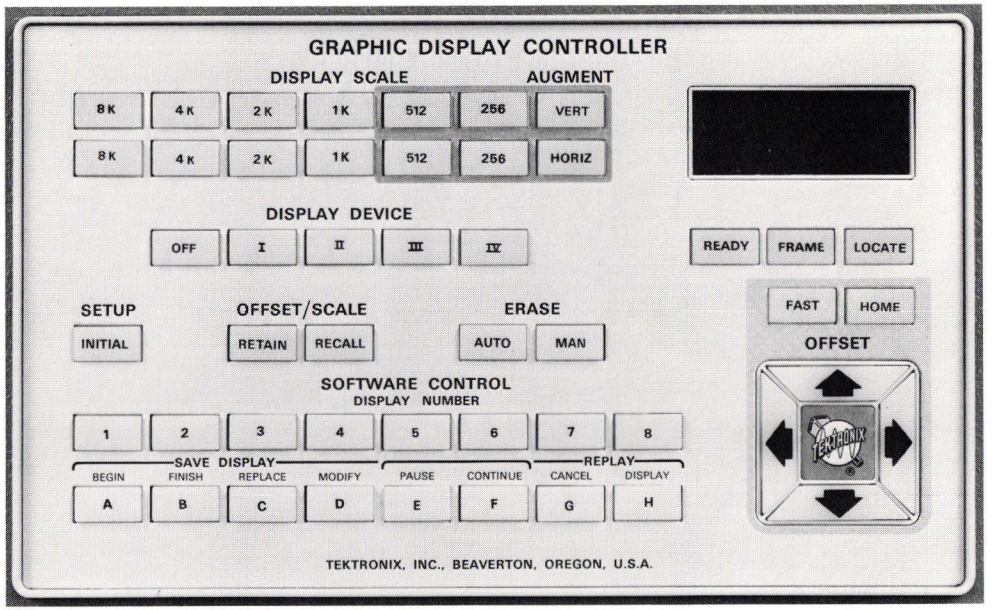
The T4005 Graphic Display

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.

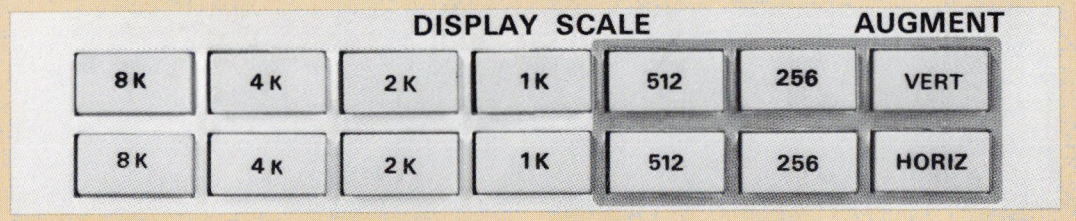
The GDC hardware performs a number of graphic editing functions such as scaling, offsetting, magnifying, framing and augmenting. These functions are often done with software in other systems. GDC hardware minimizes core storage requirements and program changes to obtain initial results. Another advantage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

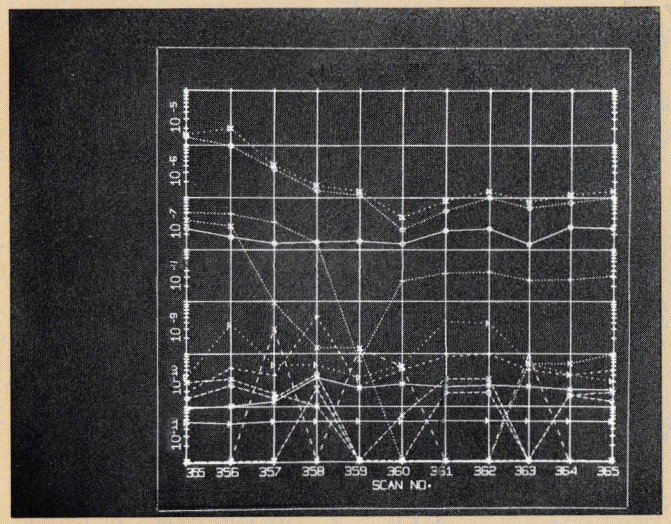
STORAGE DISPLAY DEVICE—The display device is a Tektronix developed 11-inch Direct-View Bistable Storage Tube. After the display is written once, the storage tube retains the display. This device provides a flicker-free, drift-free display of high density alphanumerics and complex graphics. In an age 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.

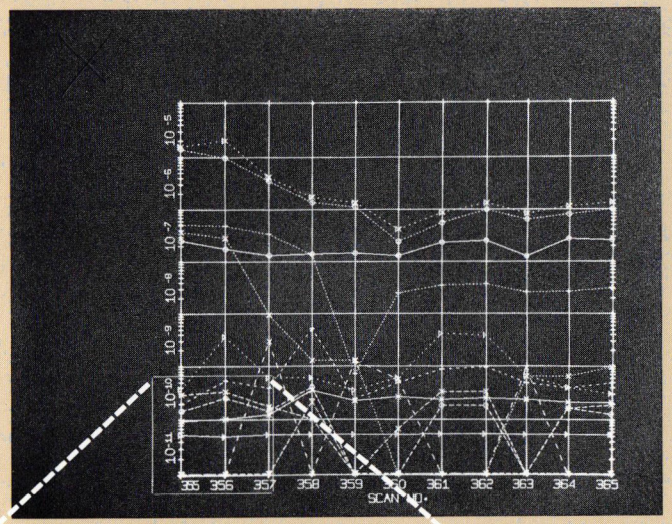


THE CONTROL PANEL

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.





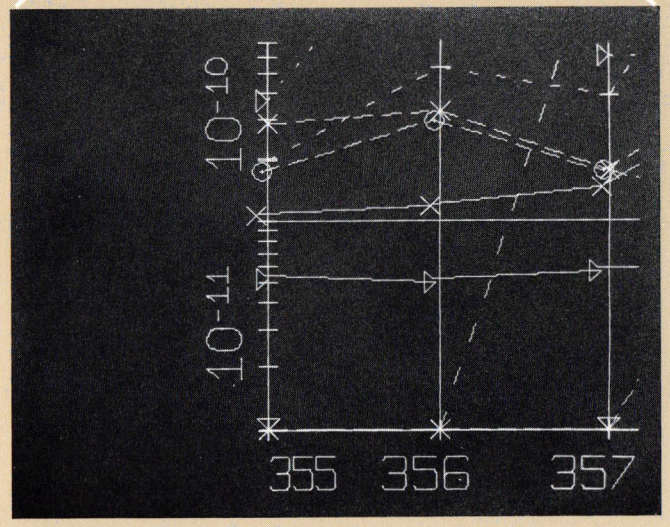


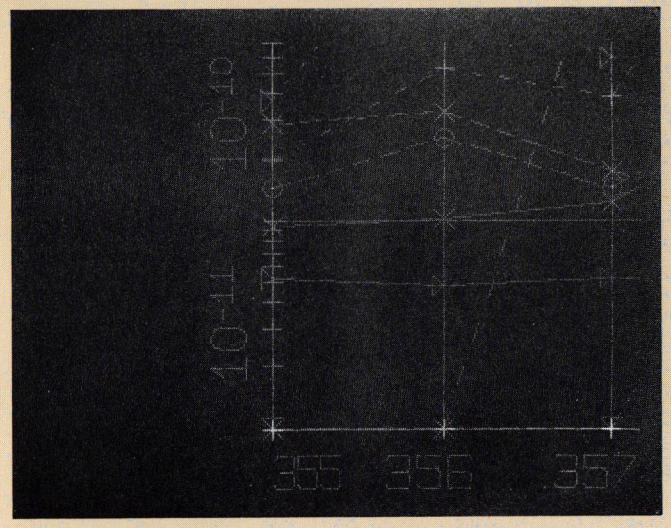
DISPLAY SCALE—selects display size and provides vertical and horizontal magnification. Aspect ratios are selectable from 32:1 to 1:32. To magnify, a scale size is selected; a scaled "Frame" is positioned to window a portion of the plot. When replayed, the "Framed" portion of the plot is replotted as a full screen display.

Capacity of the graphic matrix is 8,192 x 8,192 points. Display sizes range in factors of two from 8,192 to 256 points per axis.

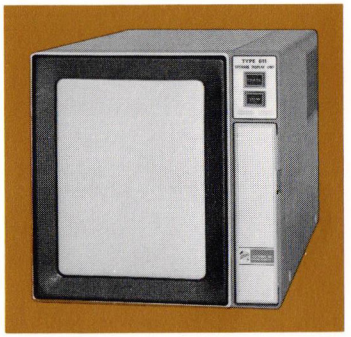
ZOOMING—is the feature that allows Framing to occur in any selected Display Scale. You may FRAME on an 8K by 8K display to produce full-screen a 2K by 2K display. This display, in turn, may be "zoomed on" by using a still smaller Frame, such as the 256 by 256 scale.

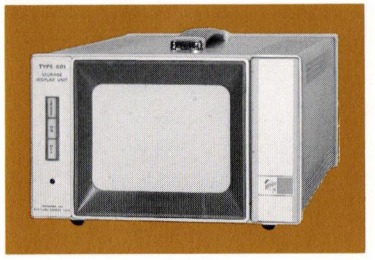
AUGMENT—is the normal operating mode in the highly magnified Display Scales of 256 and 512. This provides a bright display even though the generated dot density is low. For detailed examination of the actual computer generated dot pattern, non-augment is selected.

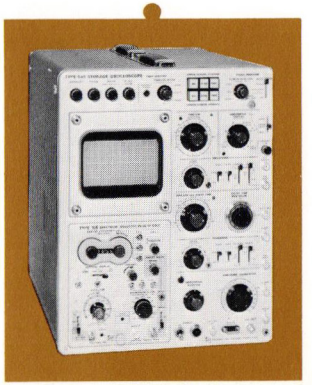




MULTIPLE DISPLAYS—The GDC can drive up to four parallel display devices in any combination: 611 11-inch Direct-View Storage Display Unit • 601 5-inch Direct-View Storage Display Unit • 4501 Scan Converter • Tektronix 549 and 564B Storage Oscilloscopes • and the T4005 display. Each device is selected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



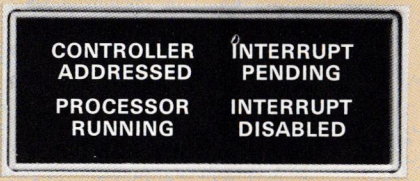


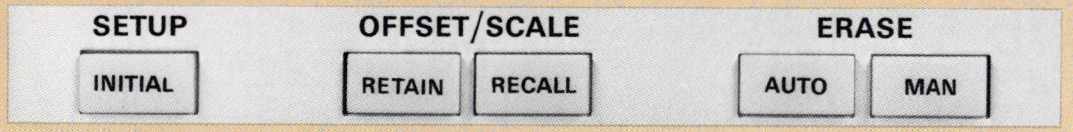


APPLICATION AREAS

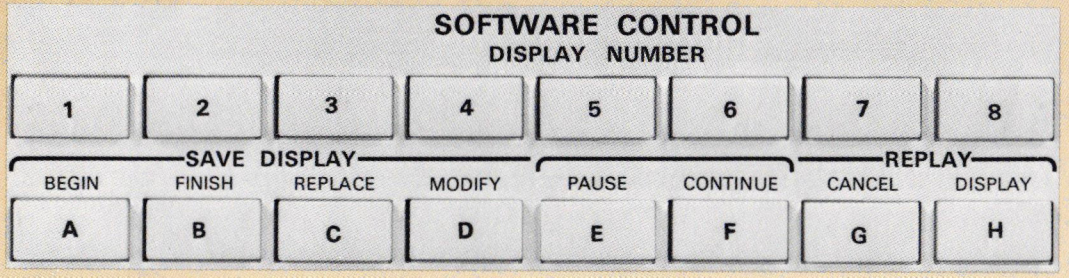
The T4005 is useful
in a vast range of applications.
Numerical and process control,
analysis, computer-aided design,
and simulation
are just a few of many applications.

STATUS INDICATORS—inform the operator of useful information such as when the GDC is being addressed by the computer, the run state of the computer, and the GDC's interrupt status.

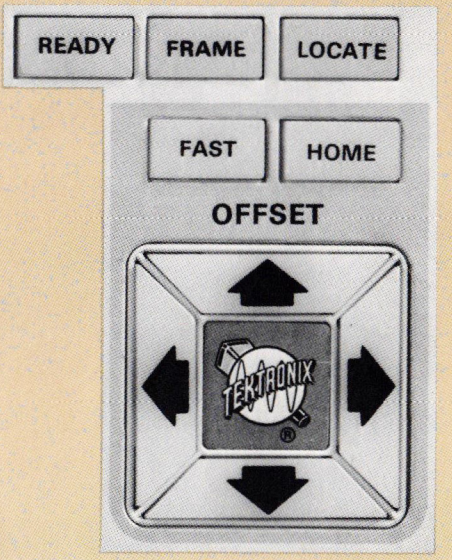




CONVENIENCE FUNCTIONS—The INITIAL button resets the GDC to a known state by zeroing registers, clearing pending interrupts and setting internal hardware to a preselected display scale. RETAIN/RECALL conveniently stores DISPLAY SCALE and OFFSET parameters that a user may use repeatedly. AUTO/MANUAL provides erase versatility to the Display Devices selected.



SOFTWARE CONTROLS—The GDC has several convenient front panel features for operator interaction with computer software. Display push buttons 1 to 8 provide "sense line" data to the computer. This data is used to select the plot to be displayed or other functions which the programmer selects. Interrupt push buttons A to H provide similar "sense line" data, and may be used as programmed interrupts. Buttons A to H also function as status indicators since they may be individually lit under program control. When desired, the interrupt structure can be disabled either manually or via software.



POSITION CONTROL AND HOW IT WORKS

OFFSET—The OFFSET operates in two modes, FRAME and LOCATE. FRAME windows that portion of the plot which is to be shown full screen. LOCATE (an "L" shaped cursor) is used to precisely define the origin of the next plot. This is useful in overlaying to compare several plots. LOCATE is also used to identify a specific point, whose precise coordinates are then transferred to the computer with a *resolution of 1 part in 8,192.*

The FRAME and LOCATE cursor are positioned electronically when the direction push buttons are pressed. The operator has a choice of two positioning rates: Normal and Fast. When a precise location is desired, the offset function is operated in the NORMAL mode. The FAST mode is six times faster than the NORMAL mode for quick FRAME and LOCATE positioning. HOME returns the FRAME and LOCATE cursor to the lower left hand corner of the display. READY places the GDC in a state to receive display commands from the computer. With the versatile position capabilities of the GDC, you will rapidly solve any positioning need.

FROM CRT DISPLAY TO PAPER COPIES WITH THE TEKTRONIX 4601 HARD COPY UNIT—The 4601 copies the full screen stored contents of the T4005 and other Tektronix Information Display Products with 11-inch DVBST's. Upon receipt of a manual or computer controlled command, a high resolution hard copy of complex displays is produced within 18 seconds. Quick, easy connections let you take the 4601 from the T4005 to a remotely located display unit for the convenience of making hard copies when and where they are most useful. You may wish to quickly make multiple copies of intermediate or final results for distribution to your associates. When you want slides, enlarged copies and overhead transparencies of the display, you can make them from the high quality 4601 paper copy.

CONFIGURATIONS AND INTERFACE OPTIONS—The T4005 Graphic Display and Graphic Display Controller are available in desk and rackmount configurations. Contact your Application Engineer for configuration and interface details.

SOFTWARE SUPPORT—Tektronix software support begins with assembler written, FORTRAN callable drivers for the T4005 control and graphic display functions, and for conventional computer plotters. Plotting packages for both floating-point and integer variables with provisions for grid generation and annotation make the GCD immediately usable without time consuming software development. Software character generation and text handling routines quickly augment program debugging and alphanumeric information display. Diagnostic routines identify system problems as being software or hardware in origin.

Tektronix is rapidly expanding application software support for Tektronix Information Display Products. Your inquiries as to the development of desired application packages are invited.

A-2430

TEKTRONIX APPLICATION ENGINEERS, especially trained in the capabilities of Tektronix Information Display Products, will gladly discuss with you the full versatility of the T4005 Graphic Display. Ask your Application Engineer questions about Tektronix Information Display Products, software support, lease and maintenance arrangements and machine compatibility. You can contact him through any Tektronix office (57 domestic—48 foreign) or directly by calling (301) 825-9000 Baltimore, (617) 894-4550 Boston; (415) 326-8500 Palo Alto. Or write Tektronix, P. O. Box 500, Beaverton, Oregon 97005.

T4005 Graphic Display **$7850**

U.S. Sales Price FOB Beaverton, Oregon

Customers outside the United States should contact the following offices:

Canada	Tektronix Canada Ltd. Offices		
Australia	Tektronix Australia Pty. Ltd. Offices		
Japan	Sony/Tektronix Offices		
Central & South America	International Marketing Beaverton, Oregon 97005		
Europe, Mid-East and Africa	TEKTRONIX DATATEK N.V. Post Box 7718 Schiphol Airport East The Netherlands	Tel. Telex: Cable:	020-452155 16565 DATATEK HOLLAND