

ACT SIRIUS1

GRAPHICS TOOLKIT - No. 502
GRAFIX





GRAFIX is a system-resident high-resolution graphics control program written in Intel 8086 assembly language to provide the highest possible screen support speed.

Operation

Once GRAFIX has been loaded it attaches itself to the operating system (MS-DOS) and intercepts the control codes that drive the high-resolution screen. The screen consumes 40K bytes of system RAM to provide the bit-map for the 320,000 pixels available — each additional screen in memory will consume an additional 40K bytes of system RAM. Screens can be stored on disk and retrieved under program control as required. Frequently-used screens may be left in the system RAM to allow a faster display (again under program control).

The GRAFIX package allows the user up to ten different character sets of 128 characters each, and up to eight full screens. The specific number of screens available is determined by the amount of memory. For example, in a system with 512K bytes of RAM, all ten character sets and eight screens may be used, leaving 128K bytes of RAM for program area. Smaller RAM configurations give more than acceptable performance (256K bytes of RAM is the recommended minimum configuration).

A background screen support mode allows the loading or design of a high-resolution screen to be done without being displayed on the CRT. (This prevents operator fatigue while waiting for the screen to be drawn.)

Once the screen is completely loaded or drawn, it can be quickly displayed on the CRT with one control sequence. The GRAFIX window technique allows the screen to be sectioned and supported in portions, making it possible for a text or graphic viewport to be

created under program control. This gives the operator a fixed portion in which to examine error messages, system prompts and similar information.

Ease of Use

By using an Escape control character sequence, a program can fully control all aspects of the high-resolution screen. For example, a BASIC program (or any other language) would send the following command to the GRAFIX package to clear the screen and draw a line from the current cursor position to an absolute screen position:

```
10 PRINT CHR$(27); "52"  
— this clears the screen  
20 PRINT CHR$(27); "5U"; X; Y  
— this draws the line
```

The width of the line and its attributes can also be selected by following a similar sequence. Once completed, this screen can be saved to disk or output on the system printer.

Circles, shading, arcs, windowing, dot-level addressing, cursor type selection, character set selection or load can all be accomplished with the above control sequences.

Usability

GRAFIX can be accessed with whatever language you prefer to work in. It does not require any special systems knowledge to utilise the high-resolution screen to its fullest capacity and, for the design validation process, a full debugging capability has been included within the GRAFIX package.

A GRAFIX character is composed of a 16 dot wide by 16 dot high pattern. Each of the character sets (whether predefined or created by you) has certain fixed attributes. These are:

Character Height: This is fixed for all the characters within a 128 character set. It specifies the height in dots that will be covered by the character.

Character Width: This is not fixed for all the characters within a 128 character set. It specifies the width in dots that will be required by that character.

A given character within a set (fixed width or proportionally spaced) is defined by a window starting at the lower left of the 16 x 16 dot matrix. That window has a width specified for that character and a height specified for the entire character set. One can think of any given character as being a small window which will be transferred to the specified screen. In the case of printing a line using only one character set, the cursor proceeds along the top of the boundary defined for the characters as characters are displayed, since all the characters within that given set have the same height. A string of characters to be displayed are automatically spaced from left to right by exactly the amount necessary for each character. If the character set is proportionally spaced, the printing on the screen is also proportionally spaced. A high-resolution carriage return/line feed sequence causes the high-resolution cursor to advance the number of dots down the screen specified by the height parameter for the currently enabled character set. Line width (a program-selected function) must be controlled by the programmer.

GRAFIX is suitable for business presentations where meaningful information presentation is a must, scientific applications where accurate display/hard copy of data is required, and many other uses. Programming design and coding effort required to produce excellent graphic images is minimised by the GRAFIX system.

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