

68/DPS, DPS 8 with Multics

The Multics Graphics System provides a general purpose interface through which user or application programs can create, edit, store, display, and animate graphic material.

## FEATURES

- High degree of terminal independence
- Ability to define graphic objects that may be used repeatedly in higher-level objects
- Editing facilities for graphic objects
- Ability to store graphic objects permanently

## TERMINAL INDEPENDENCE

The Graphics System is organized into two distinct parts: the terminal-independent portion and the terminal interfaces.

User and applications programs communicate exclusively with the terminal-independent portion of the system. This ensures that:

- User programs and applications routines are not restricted to one particular terminal type, but can use whatever graphic terminal is available.
- Users are not isolated from each other because of the types of terminals they use, but may freely use each other's programs on their own terminals.
- Graphic applications may be transferred easily as new and improved terminals become available.

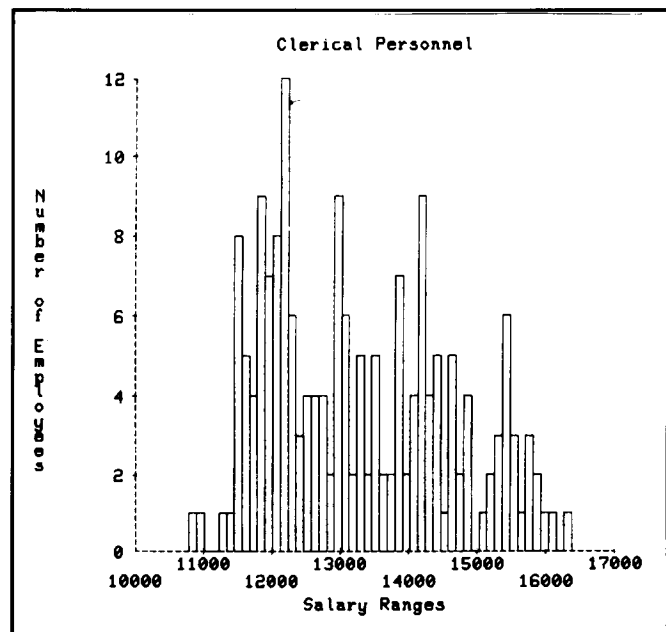
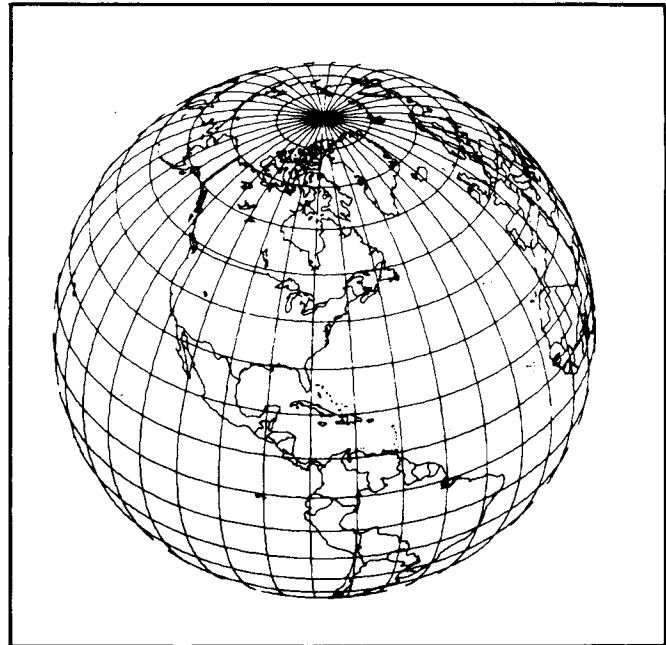
The Multics Graphics System can accept new types of graphic terminals with a minimum of coding. In most cases, the user need only specify the special characteristics of his terminal in a table and construct a program to perform any code conversion necessary. No special I/O programming is required. He may then use any existing program or graphic file and obtain comparable results on his own device.

## STRUCTURED GRAPHIC OBJECTS

Rather than treat graphic data as an unstructured collection of graphic elements (much as a sketch could be considered an unstructured collection of lines and points), the Multics Graphics System deals with structured descriptions of objects.

This organization has three advantages:

- Natural representation of most objects can be made in terms of their own inherent organization. For example, a piston, a complex object in its own



right, may be treated as an elemental object within a graphic description of an engine.

- Subpictures can be shared, thereby eliminating redundancy.
- Global picture editing capabilities are possible.

## PERMANENT GRAPHIC STORAGE

Facilities are provided so that the user can attach a name to any graphic object and store it in a Multics segment. Such objects may be used at any time by any user authorized to access the segment.

## TERMINAL-INDEPENDENT GRAPHIC TRANSMISSION

Graphic information is transmitted in a well-defined terminal-independent code. This code may be interpreted by a program and converted to the appropriate codes to drive a graphic terminal; or it may be transmitted directly to an intelligent graphic device that performs its own interpretation, with a corresponding increase in efficiency. It may also be directed to a Multics file and "played back" on any graphic device to form background scenes or standard "canned" pictures.

Graphic input sent to a Multics system is converted from its original format into this code before being forwarded to the terminal-independent portion of the system.

## SYSTEM COMPATIBILITY

Programs originally written on other computers that make use of the most widely used set of graphic subroutines may, with minimal conversion, interface in the same way with the Multics Graphics System. Interfaces to mimic other popular graphics systems can be constructed.

## DYNAMIC AND INTERACTIVE GRAPHICS

When used with a terminal of sufficient intelligence, the Multics Graphics System can perform real-time graphic operations, such as dynamic animation, incremental picture update, local picture editing under control of the terminal, and sophisticated graphic input.

## SPECIAL CHARACTER FONTS

A set of publication-quality character fonts are provided to allow the production of professional-quality charts and graphs, among other applications. The fonts, which include several varieties of standard roman, italic, script, and gothic fonts, are extracted from the Hershey character set repertoire supplied by the National Bureau of Standards.

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