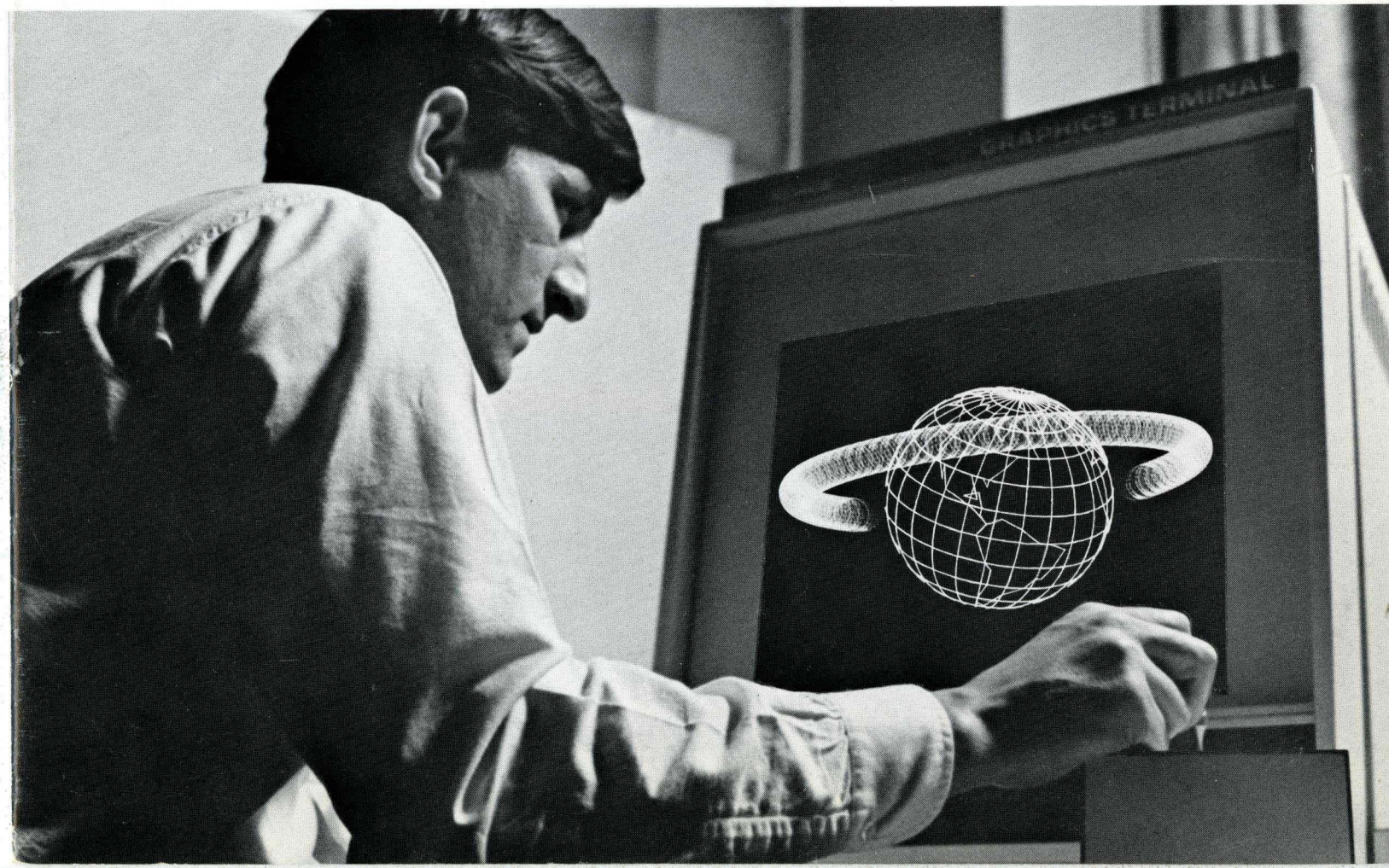


Adage Graphics Terminal

MODEL 10
MODEL 30
MODEL 50

adage



AGT /10
AGT /30
AGT /50

The Adage Graphics Terminal was developed to meet a growing need for on-line graphical communication between the user and the computer facility.

Outputting computer results in traditional ways using alphanumeric text often fails to describe their real meaning. For many processing tasks graphical input is the best way, and sometimes the only way, to state the problem successfully. And in many applications, such as those found in the fields of computer-aided design and pattern recognition, complete control by the operator to manipulate and modify displayed images is essential.

The Adage Graphics Terminal is a general-purpose CRT display system designed especially for interactive graphics applications. It incorporates its own internal computer and, in some models, coordinate transformation hardware to produce dynamic displays of three-dimensional objects which can be translated, rotated and scaled continuously. Inclusion of this image manipulation capability and provision for mass storage on tape or disk together with comprehensive systems software results in a terminal with a high degree of autonomy. It can be connected to a central computer system without presenting an excessive burden upon the response time and arithmetic capabilities of the central system. Or, it can be used in a "stand alone" mode with access to an external data base via magnetic tape, punched cards or paper tape.

applications

The high degree of man/machine interaction inherent in the Adage Graphics Terminal has proved to be of substantial benefit in a wide range of disciplines. AGT systems are now in operation in government facilities, in the oil industry, in processing and manufacturing plants, in the aerospace industry, and in university research laboratories.

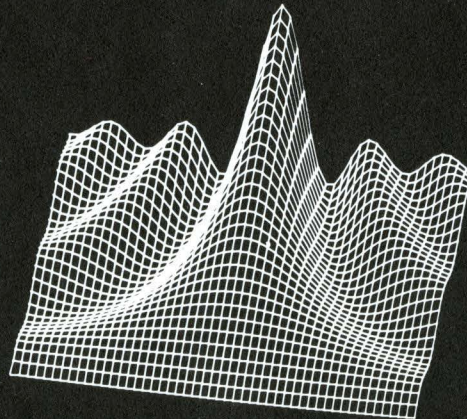
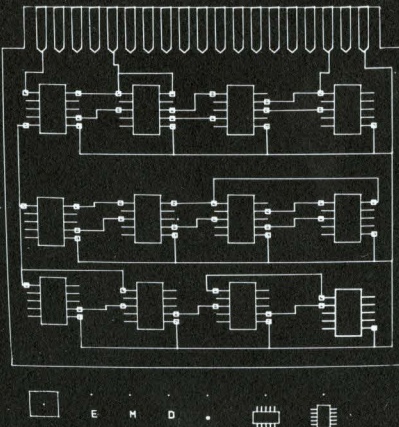
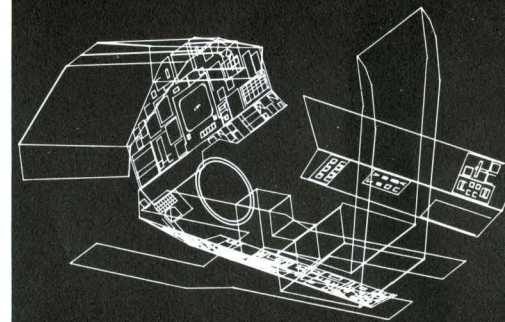
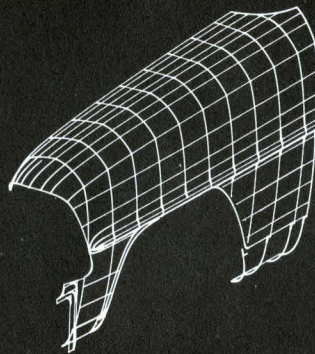
Scientists at one university are creating and interacting with molecular structures of certain drugs; the graphics system frees them from tedious, drawn-out laboratory testing or laborious model making required by classical methods. Other researchers are using an Adage

terminal as a general-purpose simulator with special emphasis on three-dimensional dynamic displays. A third university group is developing new techniques in information retrieval and decision making. Aerospace applications include the use of Adage computer graphics for automating PC-board production and for supporting engineering design of new aircraft. One government agency is using its display system for simulating submarine tracking and intercept guidance systems. Another agency is applying an AGT to simulate lunar terrain as seen from a spacecraft. Computer-aided signal analysis is the prime application for a number of other users, some of whom are studying communications data, seismic signals, physiological measurements, and speech patterns.

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system organization

An Adage Graphics Terminal is comprised of three functional segments: **digital processor, display generation hardware, and operator facilities.**

The **digital processor** included in each terminal is the Adage DPR2, a powerful 30-bit word length computer, with core memory sizes ranging from 4K to 32K words, and mass storage options. Its structure and arithmetic capability make the DPR2 ideal for display list processing, I/O interfacing, and for processing graphics commands.

Display generation hardware includes the scope-driving circuitry for generating vectors and characters, for windowing in three dimensions, and for adjusting beam intensity as a function of the Z dimension as an aid to depth perception. This section of an AGT may also contain a matrix multiplier subsystem so that coordinate transformations necessary for dynamic displays can be included among the image manipulations accomplished locally, with minimum recourse to the

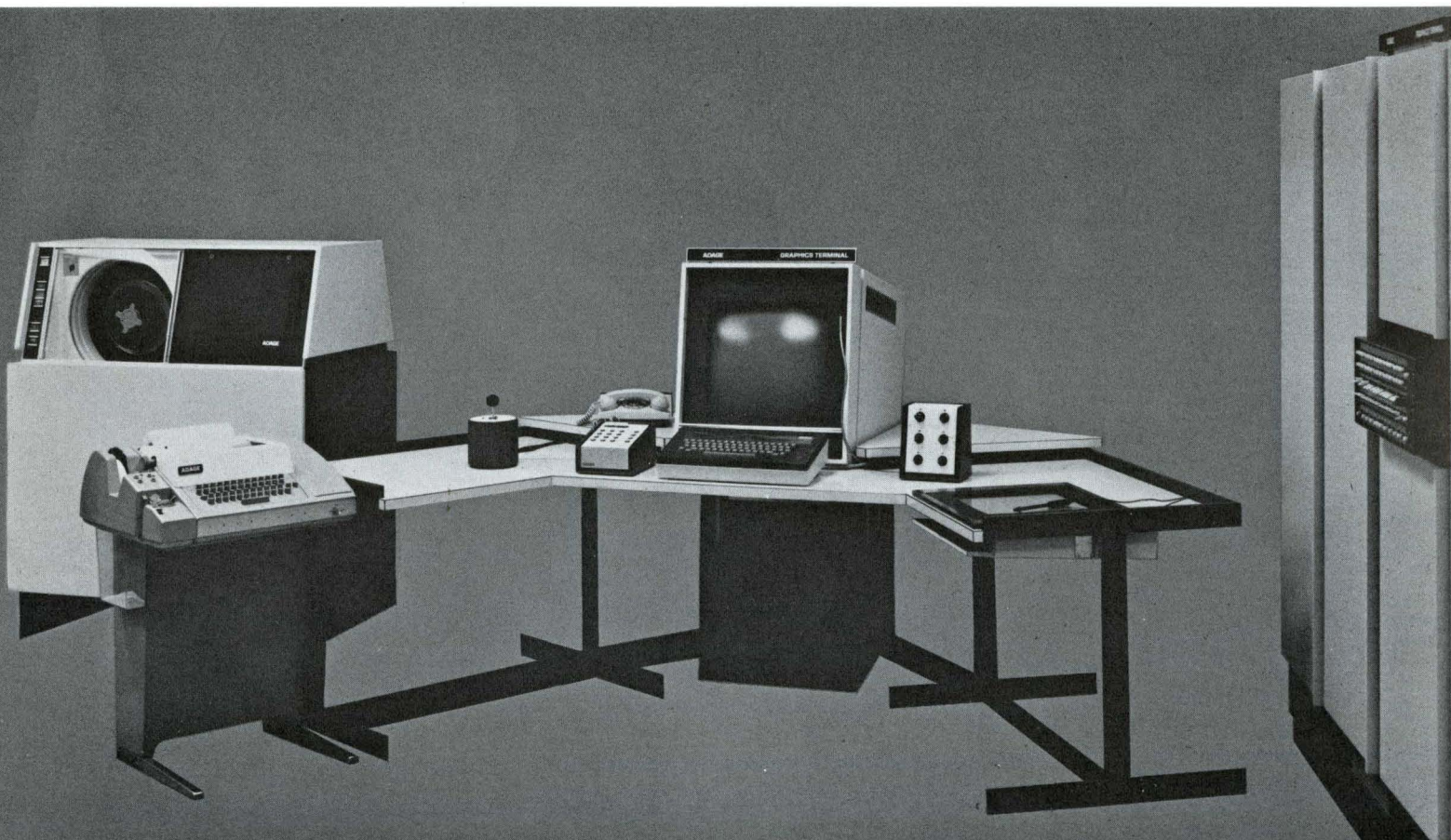
central computer. As a result, even complex images can be displayed dynamically with arbitrary changes in scale factor and position between successive frames.

Finally, the **operator facilities** include a console, the precision CRT, operator's controls, and graphics I/O elements.

The three models, AGT/10, AGT/30 and AGT/50, offer the graphics user a range of performance and cost.

The AGT/10 is designed for efficient handling of two-dimensional displays which can contain as many as 4000 to 5000 line segments. Images can be continuously expanded or reduced or moved about on the screen.

The AGT/30 and AGT/50 are configured to optimize their use in applications involving dynamic display of three-dimensional images, i.e., such images can be rotated, translated, and scaled with picture changes made from frame to frame. A three-dimensional windowing operator is available with these models for sectioning and spacial analysis. The AGT/50 incorporates extended image-processing hardware for handling very complex pictures containing up to 8000 line segments.



standard models

	Digital Processor	Display Generation Hardware	Operator Facilities
AGT/10	DPR digital computer 4K core memory	2-D coordinate transformation matrix vector generator	console ASR 33 teletype CRT with lightpen function switches
AGT/30	DPR digital computer 8K core memory	3-D coordinate transformation matrix vector generator with intensity modulation	console ASR 33 teletype CRT with lightpen function switches
AGT/50	DPR digital computer 16K core memory	3-D coordinate transformation matrix vector generator with intensity modulation extended image processor	console ASR 33 teletype CRT with lightpen function switches
Standard Options	core memory expansion to 8, 16, or 32K magnetic tape disk storage line printer card reader dataphone interface parallel computer interface	vector generator with programmed intensity control (standard with AGT/30 and AGT/50) windowing operator (available with AGT/30 and AGT/50 only) character generator raster segment generator	data tablet joystick variable control dials console keyboard up to 3 auxiliary CRT's hard copy recorder trackball

The subsystems listed for each model, grouped by function, define the basic configuration. Standard options are also shown and are available with all models except where noted. Models are upward compatible and can be expanded or converted in the field with a minimum of downtime.

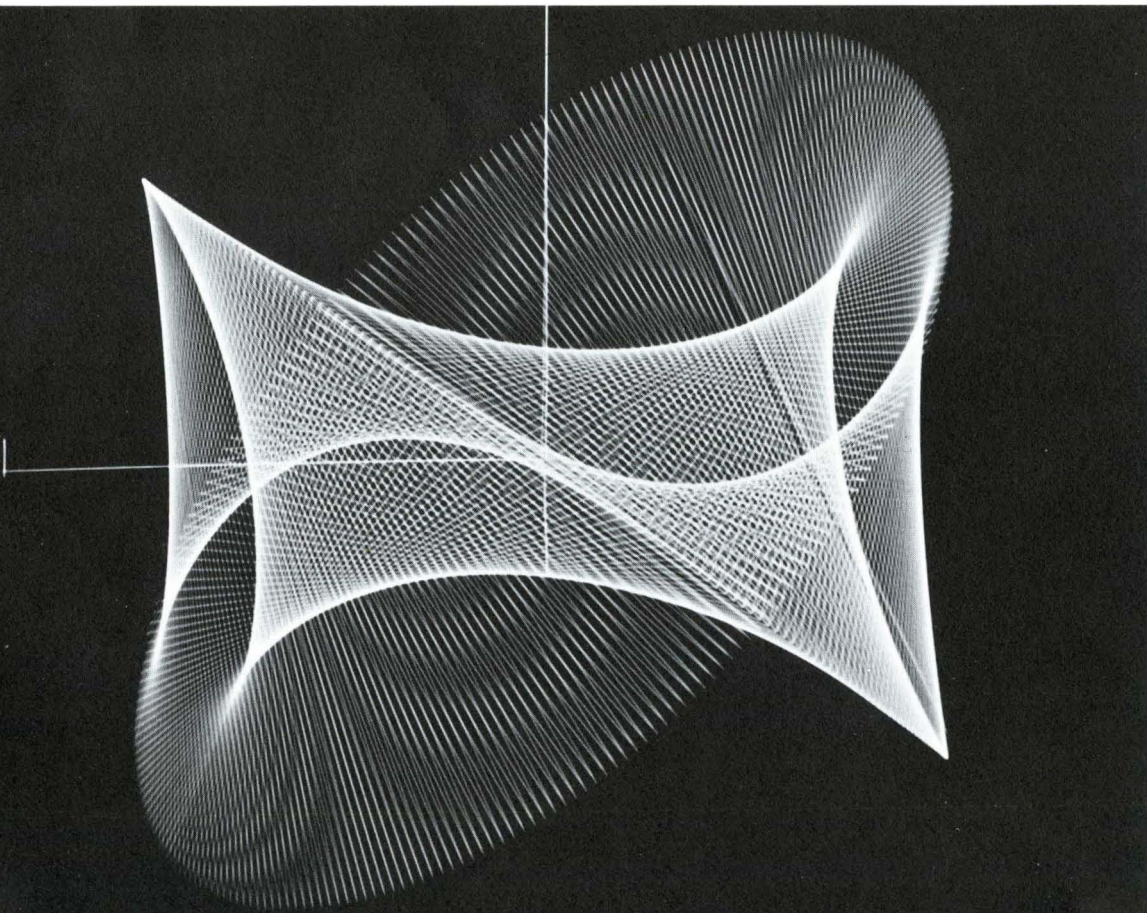
system software

The Adage Graphics Terminal is supported by comprehensive software tailored to the particular requirements of interactive graphics. The software system, called AMOS, includes a monitor, a self-extending macro assembler, a graphics-oriented FORTRAN compiler, a text editor, and graphics operators.

The AMOS monitor places the hardware and software capabilities of the Adage Graphics Terminal under fingertip control. It handles control statement processing, memory allocation, and all aspects of loading and linking of programs and image descriptions which are filed in the system library. The AMOS monitor includes foreground/background capability in which monitor control functions occur in the foreground and applications programs are processed in the background.

The assembler and FORTRAN compiler together with text editing and filing facilities make feasible operation of an AGT as a stand-alone facility.

Graphics operators are provided to facilitate implementation of interactive graphics. These operators are programs contained in the AMOS library and are used for image filing, retrieving and formatting.



standard software

Resident Monitor

AMRM. Processes control statements for loading and executing of all programs in the AMOS library.

Program Preparation Aids

AFORT. Compiles FORTRAN source language programs.
ADEPT. Assembles in object code from machine-oriented source languages.
EDIT. Provides for entry and modification of source language programs.

Graphics Operators

Routines for displaying, constructing, manipulating, and storing images.

General Library Subroutines

AFDSP. Subroutines for interfacing FORTRAN programs with graphics operators.
Subroutines for interfacing communications systems.
Subroutines for digital I/O peripherals.
Subroutines for graphics I/O devices.
Subroutines for commonly-used mathematical functions.

Graphics Applications Programs

Interactive-display user programs.

Utility and Service Routines

Debugging aids and file maintenance facilities.
Tests and diagnostic aids for system maintenance.

Minimum hardware configuration to support standard software: magnetic tape or disk and 8K core memory.



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