Adage
Graphics
Terminal

Adage Graphics Terminal

The Adage Graphics Terminal was developed to meet a growing need for on-line graphical communication between the user and the computer facility. The usual practice of outputing computer results in numerical form via printer or typewriter 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. Finally, complete control by the operator to manipulate and modify displayed images can be important in the conduct of heuristic studies like computer-aided design, certain types of signal processing, and modelling.

Computer graphics makes possible close interaction between the user and his processing equipment and in this way is proving to be of substantial benefit in a wide range of disciplines. In chemical research new compounds are studied "visually"; molecular structures are generated by the computer under parametric control of the investigator. A new automobile body design is drawn on the CRT, and then turned around to be looked at from all sides. In exploring for oil, geologists gain fresh meanings from seismic signals by manipulating three-dimensional displays of processed measurements. Computer-generated simulations of spacecraft flights with full six degrees of motion are useful in engineering design and for pilot training.

The Adage Graphics Terminal is a comprehensive, general-purpose CRT display system. It is equipped with its own internal computer — the Adage Ambilog 200. Complete systems software is available for communication with the remote central processor, for local image control, and for console input/output. Hybrid processing techniques exclusive with Adage produce dynamic displays of three-dimensional objects which can be translated, rotated, and scaled continuously by the operator in a way not possible with other, conventional techniques. Even complex images are presented without flicker on a large screen, high intensity CRT, which comes equipped with light-pen input.

Because scope refreshing and image manipulation are done right at the terminal, loading of the central computer is held to a minimum. For the same reasons, a low-cost, voice-grade communications link, like a Data-Phone line, is entirely adequate.

System Highlights

- Dynamic three-dimensional CRT displays
- Three-dimensional windowing
- Perspective generation
- Intensity-modulated depth cueing
- Powerful, 30-bit word length internal processor
- Human-engineered operator's console with joy stick or bowling ball control
- Analog tablet input
- Photographic hard-copy output
- Comprehensive systems software for local image control, graphic I/O, and communication with central computer
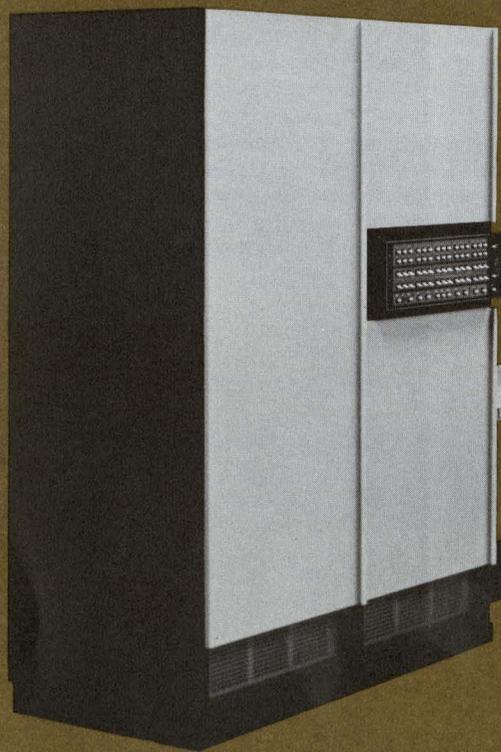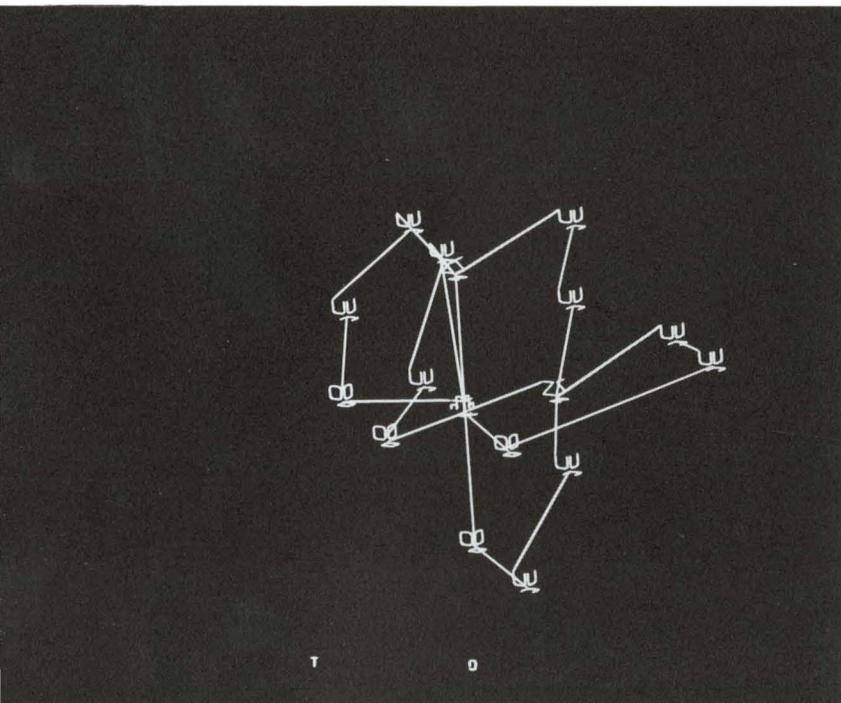
Representation of a molecular structure

System
Concept

As the complexity of CRT displays increases, and as the amount of user manipulation of the picture increases, the generation of graphical presentations requires greater and greater information processing power. It is more and more the case that the central computer cannot provide this on-line processing capability (or that communication lines cannot meet the high throughput requirements associated with these applications). The graphics input/output terminal itself must include the necessary display processing capabilities.

Each Adage Graphics Terminal contains an Ambilog 200 DPR processor (described in other Adage literature), a coordinate transformation hybrid array, a vector generator, and an operator's console. The array, which is loaded from and controlled by the DPR, is made up of combined analog-digital processing elements operating in parallel. It accomplishes spatial point transformations with efficiency and at speeds that are unmatched by conventional all-digital techniques. In one standard version of the Terminal, additional computing power is obtained with hardware decoding of macro image-processing instructions. The scope-driving vector generator produces lines of uniform intensity regardless of length.

Light-pen control of on-line signal analysis
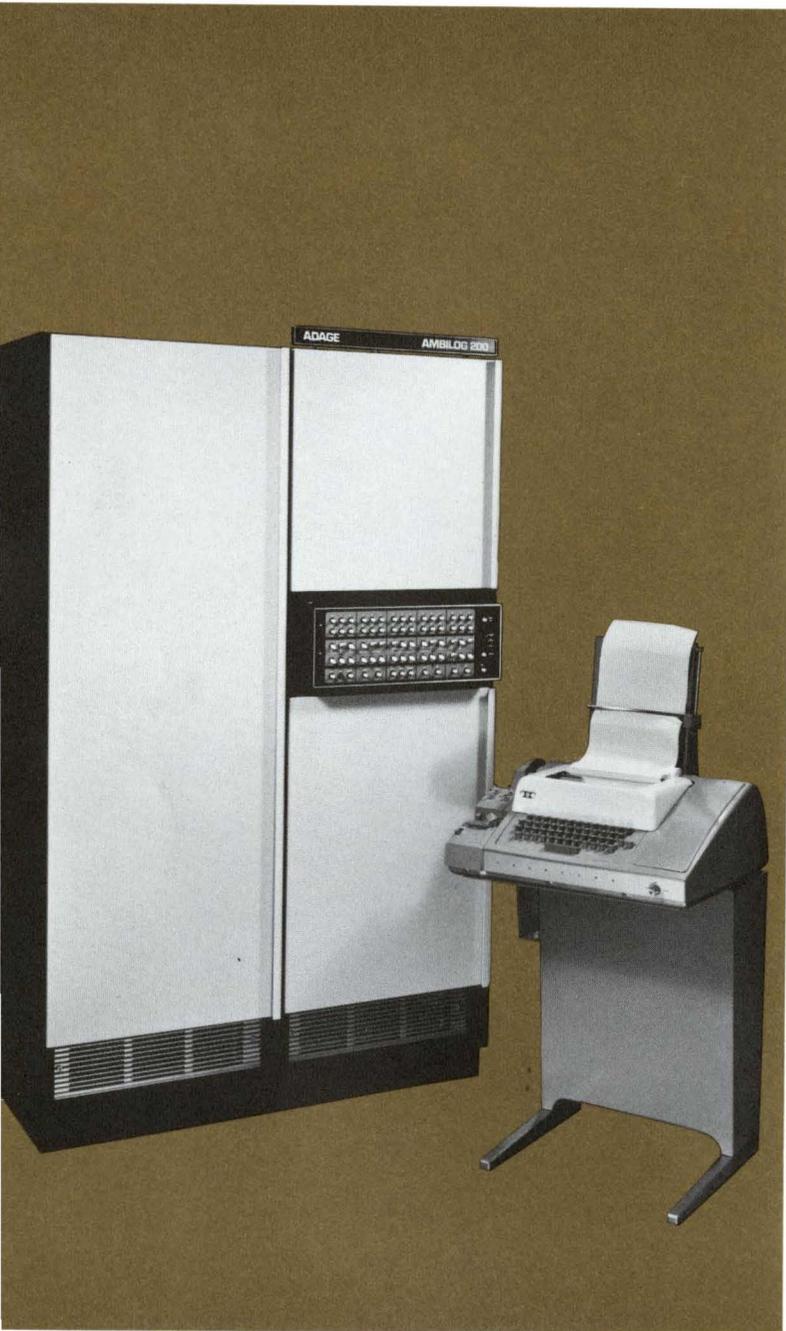
Ambilog 200 DPR Processor, 30-bit
word length computer used in every
Adage Graphics Terminal

The operator's console contains a high speed, high accuracy CRT and a variety of functional controls. The scope display area measures 12 x 12 inches. Pictures are bright and clear, with resolution better than 100 lines per inch. Modular design allows flexible, individually-tailored arrangements of console components.

The extraordinary processing capability and advanced scope-driving techniques of the Adage Graphics Terminal make possible flicker-free displays containing 5000 one-half-inch lines or 1000 ten-inch lines with full six-degrees-of-freedom motion and frame-to-frame dynamic changes.

Finally, since all of the picture-producing transformations are performed in the Terminal itself, communication with the central computer need involve only changes in the image description and the parameters of the viewing transformation. In most cases, data transmission between the central computer and the graphics terminal can be handled by a low-capacity communications link, such as a Data-Phone.
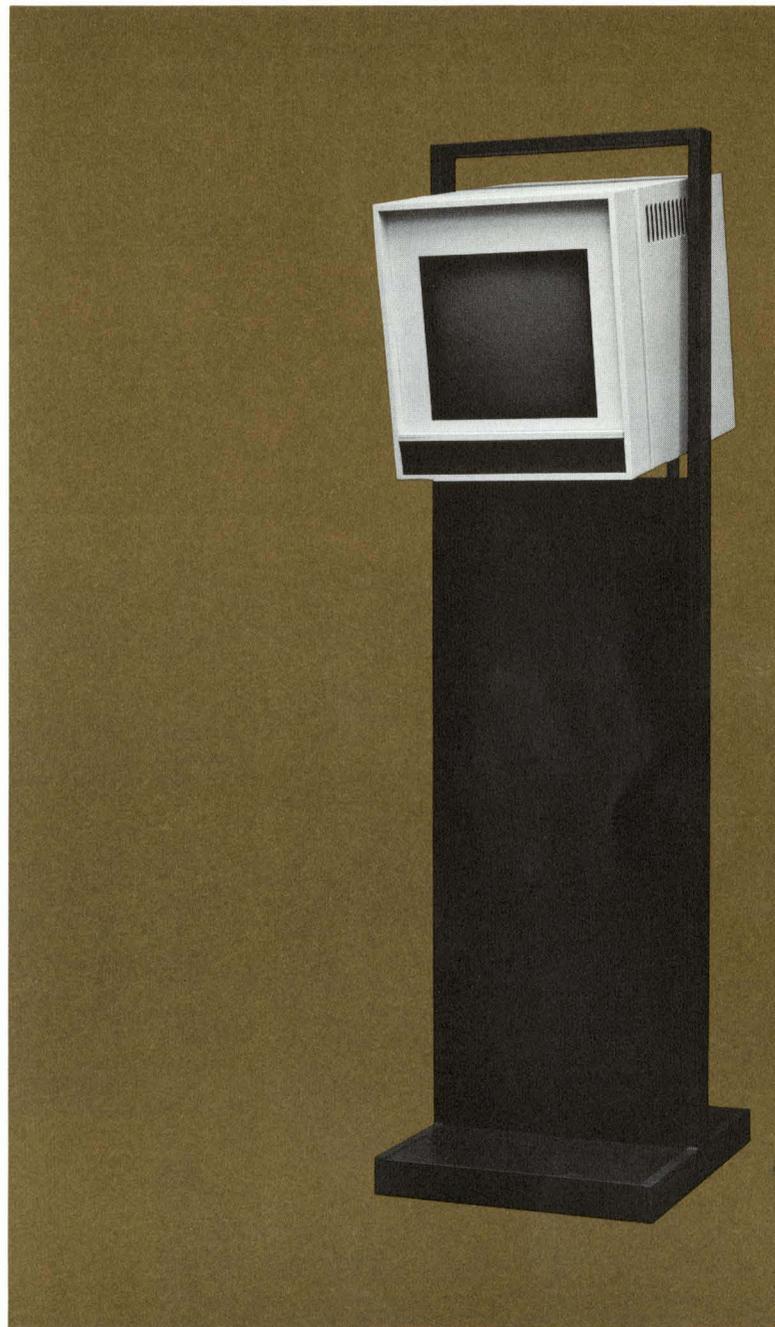
Auxiliary scope, high-mount version

Standard
Options

Options available with any configuration include:

- All standard options and I/O peripherals of Ambi-log 200, e.g., tape or disk storage, card reader input, line printer output
- Data-Phone interface or high-speed data channel to central computer
- Joy-stick or bowling-ball control
- Analog tablet input
- Photographic hard-copy output
- Multiple scopes auxiliary to the main display
- Character generator

These options are available in models AGT/30 and AGT/50 only:

- Automatic windowing in three dimensions
- Automatic perspective generation

Software

The Adage Graphics Terminal makes full use of the extensive systems software for the Ambilog 200, plus a number of systems programs designed especially for graphical operations.

A monitor and operating system places the hardware and software capabilities of the Adage Graphics Terminal under finger-tip control by the operator. The resident monitor handles memory allocation, interrupt servicing, and all other aspects of loading and linking programs and image descriptions obtained either from local mass storage or from the central computer. With its foreground/background operating mode, the resident monitor permits the simultaneous operation of the graphics terminal under control of the central digital computer, and the inputing from the local Teletype unit (included in each terminal) of parameters and control information.

The graphics interpretive language executive performs the task of producing pictures from image descriptions. It recognizes image-control elements which govern sequencing, looping, nesting, and conditional operations. To this end, it executes both graphics sub-programs (sub-image descriptions) and machine-language subroutines, references to which are included in image descriptions.

The graphics interpretive language includes pseudo instructions for creating, designating, combining, dissecting, freezing, filing and retrieving images. Each of these operations is accomplished by an appropriate combination of special-purpose hardware and interpretive subroutines. The hardware/software balance for each varies with the hardware extension of a particular terminal. The software delivered with each terminal includes a basic set of image processing operator routines, sufficient for normal operation of the terminal.

Adage
INC.
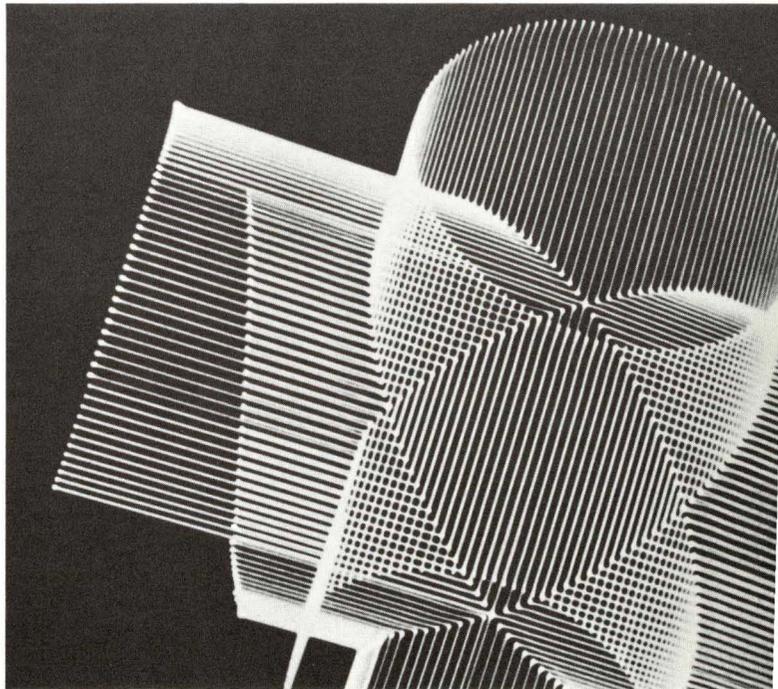
1079 Commonwealth Avenue
Boston, Massachusetts   02215
(617) 783-1100

CORPORATE OFFICES

1079 Commonwealth Avenue
Boston, Massachusetts   02215
(617) 783-1100

MANUFACTURING PLANTS

1079 Commonwealth Avenue
Boston, Massachusetts   02215
(617) 783-1100

1145 East Ash Avenue
Fullerton, California   92631
(714) 879-8193

SALES OFFICES

Northern

1079 Commonwealth Avenue
Boston, Massachusetts   02215
(617) 783-1100

17500 Northland Park Court
Southfield, Michigan   48075
(313) 358-3393

Southern

818 Roeder Road
Silver Spring, Maryland   20910
(301) 589-1221

Braniff Airways Building
Exchange Park
Dallas, Texas   75235
(214) 358-3161

Western

3518 West Cahuenga Boulevard
Los Angeles, California   90028
(213) 466-7691

680 Beach Street
San Francisco, California   94109
(415) 771-3577