About the cover: "bugs in the computer"

The phrase "bugs in the computer" has taken on a slightly different meaning at the Los Alamos National Laboratory in New Mexico, where image designer Melvin L. Prueitt and producer Charles R. Barnett have recently completed a film entitled "Chrysalis." Four images from their film—caterpillar, chrysalis, unfolding butterfly, and adult butterfly—are shown on our cover's display screens. The stylized images were produced on an Information International FR-80, a computer-output-to-microfilm system that draws vectors on a white phosphor CRT. Color is then applied through the use of primary color filters.

"I designed these images by fitting together triangles and quadrilaterals that were represented in the computer as coordinates of vectors," says Prueitt. "The computer causes lines to be drawn between the points, and the points are then moved slightly, according to a prescription that involves the coordinates of the other points of that polygon. Lines are drawn between the points again, and the process is repeated."

32-bit CAD/CAM system has two displays

Auto-trol Technology has announced the release of its GS-32 engineering and manufacturing system, an integrated 32-bit system that includes a 1M-byte memory, 9" alphanumeric display, and 19" raster display. According to Auto-trol, products can be completely designed and analyzed on the system, and the resulting data can be accessed by manufacturing personnel for use in designing machinery, tooling, and assemblies; and in developing flat patterns, nesting layouts, and numerical control parts programs.

The system is based on the VAX family of processors. Customers can either purchase a VAX as part of a GS-32 system or Auto-trol's software and workstations can be interfaced with an installed VAX.

Prices for the system start at $70,000.

Reader Service Number 10

Option gives personal computer a 640 x 240 pixel display

Radio Shack's Graphics Option (26-4104) has been designed for the TRS-80 Model II. With the package, a TRS-80 Model II can be used to create tables, charts, graphs, illustrations, maps, and geometric patterns. The Graphics Option organizes the Model II's CRT into a 640 x 240-pixel display.

For $499 (plus installation, required) users receive hardware, a manual, and an 8-inch diskette that contains both Graphics Basic and an assembly language graphics subroutine library. Graphics Basic adds eleven commands that simplify the programming of lines, circles, arcs, and ellipses. Additionally, the eleven commands help to fill in selected screen areas; rotate; animate; and store and retrieve screen graphics.

Reader Service Number 11

Business graphics package runs on CP/M

BMC's Grafit is a color graphics generation program for the company's if800 microcomputers. With this graphics package, users can design graphic presentations, generate graphs of several varieties, draw diagrams and pictures, generate overlays, and save them on disk for future use or modification.

The package runs under BMC's version of the CP/M operating system. It carries a list price of $695, but Grafit is supplied at no additional cost to purchasers of the BMC if800.

Reader Service Number 12

Screen Director, a graphics software package from Business & Professional Software, lets Apple II and Apple III computers emulate Carousel slide projectors. It is used with another BPS package called Apple Business Graphics and lets the user move from image to image with a Kodak hand-held remote slide-projector controller that plugs into the Apple's "game" slot while the audience sees the presentation on video monitors. The package is priced at $150 for the Apple II and $250 for the Apple III. Shown here on an Apple III is a "slide" with stacked bars and a trend line.

Reader Service Number 13
Civil engineering CAD station uses modular software

A computer-aided design system that automates the entire civil design process has been made available by United Information Services. According to the company, combining hardware with a fully integrated site and civil engineering software application significantly reduces the time required to create plans.

The major hardware components of the system include a Data General S-140 CPU, a CalComp plotter, two Megatek Whizzard 7250 graphics workstations; the software application consists of more than 30 modules, each of which addresses a specific civil site design task.

Interacting with C/D II, an engineer can design intricate site plans, view the intermediate results, save a copy, and route the finished drawing to a mechanical plotter for drafting. Data resulting from one module is automatically reformatted so that an engineer can use it when interacting with subsequent modules, and the success of modules guides an engineer through total creation of a site plan, the company states.

Civil/Designer II can be purchased or rented directly from UIS. Rental terms can be arranged for periods as short as three months. The price of a standard configuration, with twin workstations, is approximately $270,000.

Reader Service Number 14

Slide option enhances graphics software

The Rapidata Division of National Data Corporation has added to its interactive Graphics service an option for producing 35mm slides. Made possible through an agreement with Intercart, the option permits Intercart's Lexidata hardware for slide production to be utilized with Rapidata's Graphics software.

According to Rapidata, users will continue to develop their plots, charts, and graphs at terminals or plotters in their own offices using Graphics' array of formats and design options; then, by issuing a SLIDE command, they will have a high-resolution 35mm slide of any plot, chart, or graph delivered to them by Rapidata within four working days.

Costs for slides produced in this manner are based on Rapidata's standard computer resource usage costs for development, plus an additional $23 per slide for the actual slide production.

Reader Service Number 15

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CIRCULATION: IEEE Computer Graphics and Applications (ISSN 0073-112X) is published monthly by the IEEE Computer Society, 10862 Los Vaqueros Circle, Los Alamitos, CA 90720. (714) 821-8380. Annual subscription: $12.00 in addition to any IEEE group or society dues. Single-copy prices: members $6.00, nonmembers $10.00. This journal is convertible in microfiche form.

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BPA membership applied for October 1981
Statistical graphics package available for IBM systems

Statistical Graphics Corporation has introduced Statgraphics, an interactive statistical graphics system in APL. Designed for use on IBM 370, 303x, 3081, and 4300 series machines, the system consists of over 200 user-documented APL functions organized into 24 chapters. These functions can be used individually, integrated into other user-written functions, or executed under the control of full-screen menus. System features include the use of screen fields for data input and option selection, direct access to graphics primitives, use of screen panels and PF keys to control execution and generate graphics, and a split-screen feature that allows the construction of up to nine plots on a single screen.

According to the company, the Statgraphics system is oriented toward engineering and management applications, with a number of capabilities in the areas of statistical modeling, quality assurance, experimental design, and time series analysis. While users do not need any previous experience in programming, the company states, the functional design of the system gives experienced analysts access to the full power of APL at all times.

Industry licenses for the package cost $12,000 for the first year and $8000 per year thereafter. For universities the costs are $8000 and $6000, respectively.

Reader Service Number 18

Image processing workstations run with Unix

A family of DEC-based image processing workstations that use the Unix operating system has been introduced by Grinnell Systems and International Data Services.

 Called Grids, the workstations give users a choice of Grinnell image processing hardware configurations and one of four stand-alone DEC computer systems. Also included are a terminal, disk storage, and software for both image processing and the operating system.

A typical configuration is the Grids 23/1. It combines a Grinnell GMR 274 image processing and display system with the Unixcisor computer system from IDS. The GMR 274 has three 8-bit image memory banks, 512 x 512 resolution, four graphics overlays, two zoom and pan controls, a real-time pipeline processor with 16-bit ALU, a 6-bit video digitizer, and an image histogram generator.

The Unixcisor system includes a DEC LSI 11/23, 256K bytes of RAM, parallel and serial interfaces, VT100 terminal, 30M bytes of Winchester disk storage, 1M byte of floppy storage, and a binary license for the System III Unix operating system from Western Electric.

In addition to Grids 23, Grinnell and IDS supply the Grids 44, which incorporates the PDP 11/44 and a GMR 270 series image processing display system. For large computational or multiworkstation requirements, the Grids 750 and 780 systems are also available; these use DEC's VAX superminis and can have either the Unix or VAX/VMS operating systems and can support one or more Grinnell image processing display systems.

Prices for Grids start at $43,500.

Reader Service Number 17

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Reader Service Number 4
Designed for PCB master artwork generation, the Gerber Model 4135 PCB photoplotter uses laser interferometers and enables users to draw traces as fine as one mil, with two-tenths of a mil accuracy. The unit features a 32" × 40" active plotting area, and users can batch four 16" × 20" film masks and plot unattended via plot queueing software. The Model 4135, which sells for $250,000, consists of Gerber’s Model 4100 minicomputer controller with video display terminal, floppy disk drive for program loading, and plotting software. System software includes linear and circular interpolation, automatic acceleration, input data buffering, look-ahead processing, and automatic offset.

Anvil-4000 leasing packages are now available

Manufacturing and Consulting Services has announced that three packages of Anvil-4000L systems are now available through leasing agreements.

First, a basic geometry and drafting package, the Anvil-4000L-950, can be leased for a monthly fee of $2400, which includes system maintenance. The list price on this system is $46,000.

The second package, the Anvil-4000L-951, adds extended geometry and analysis to the basic geometry and drafting package. It can be leased for a monthly charge of $3850. The list selling price of this package is $81,000.

The third package, the Anvil-4000L-990, offers all of the features of Anvil-4000L-951 but adds numerical control to the package. Monthly lease and maintenance charges are $3975, compared to a total list price of $95,000.

MCS offers a 15 percent discount on the maintenance charges if payment is made one year in advance. Lease terms include installation charges plus the last month’s lease payment upon execution of the contract and prior to actual installation. Payments are due in advance each month, and the minimum lease term is one year.

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Graphics display family aims at OEM market

CalComp's Vistagraphic 4000 raster scan displays come packaged either for use as stand-alone graphic computers or as intelligent terminals in a distributed graphics-processing network.

The 19" black-and-white and color displays are designed for the CAD/CAM, process control, mapping, engineering analysis, simulation and training, and command and control markets, according to the company.

The 4000 family includes three compatible series—the 4200, with 640 x 512 resolution at 60-Hz refresh rates; the 4300, with 1024 x 768 resolution at 45-Hz refresh rates; and the 4400, with 1024 x 1024 resolution at 45-Hz (monochrome) and 30-Hz (color) refresh rates. All three series can display up to 256 colors simultaneously from 4096 possible colors.

All of the models use dual MC68000 16-bit microprocessors; one is used as a system processor, and the other is used as a graphics processor to control the high-resolution raster memory. In this case, the graphics processor controls the raster frame buffers and performs raster conversion of vectors, circles, and filled areas. Double-buffered pixel memory architecture provides dynamic update capability with no blanked screen, no flash, and no "hole-filling" chores.

The 4000s accept graphics primitives including lines, circles, irregular polygons, and text, all of which are described in the coordinate system and stored in the system processor's RAM memory. The resulting data base is segmented under user control to permit incremental updates. In addition, the system offers local zoom and pan capability and user control of pixel memory plane access.

Standard hardware configurations include the system processor with 32K bytes of EPROM and 128K bytes of RAM for program storage; and the graphics processor with 4K bytes of RAM and 16K bytes of EPROM. Options for the system processor include additional RAM to a maximum of 4M bytes, diskette storage with two drives, and hard disk storage with two 32M-byte Winchester drives.

Software support for the graphics computer configuration includes the company's Vista-dos, which includes a text editor, stand-alone debugger, Macro assembler, language compilers, and a math library. Other host computer software includes CalComp's Fortran support package, which is a collection of approximately 75 graphic subroutines.

The 4000 family is software-compatible with existing Vistagraphic 3000 (raster) and 1000 (vector) displays.

Prices for the Vistagraphic 4000 family range from $11,000 to $40,000, with OEM discounts available.

Census tract boundaries are digitized for computer mapping

Geographic Data Technology has announced the release of its Tract-80 census files. The files are available in several different formats and are compatible with most computer mapping programs. Tract-80 enables users to map 1980 census information, or other data aggregated to census tracts, by providing 1980 census tract boundary coordinate values for all 323 Standard Metropolitan Statistical Areas (SMSAs) defined in 1981 by the Office of Management and Budget.

A Tract-80 license costs $5.50 per tract and is available by SMSA.

Reader Service Number 22
Aydin Controls has announced the availability of a three-dimensional graphics instruction set for the 5216 display computer. Using the 3-D Instruction Set, users can create, edit, display, and store graphic objects in the hierarchical, three-dimensional data base. The 3-D system is user programmable with Forth or 8086 assembly language. The package has 64 fundamental instructions that fall into three categories: graphic commands for a world coordinate system; data-base management that is based on a tree-structured hierarchy; and interactive commands that provide user programming and picking functions. The 3-D Instruction Set enables users to scale, rotate, translate, window, create perspective drawings, display basic primitives (surface, prisms, spheres, vectors, and text), detect (pick) logical entities, and support hue intensity saturation color schemes (RGB or specified pixel value also available). As an add-on, the package sells for $6000.

Reader Service Number 23

Laser printer merges text and graphics

With its recently added graphics capabilities, the Hewlett-Packard 2680 laser printer can be tied into HP 3000 business computer systems and eliminate the need for typesetting, paste-up, vendor printing, and collating, according to the company. The HP 3000 is used to design graphics, combine them with text, and merge them into a complete document, which is then printed under the computer's command on the laser printer at up to 45 pages per minute.

The production of graphics is made possible through the use of graphics option hardware and graphics software packages. With this software, users can produce illustrations such as graphs, organization charts, flow charts, or schematics, which then can be merged with text and printed all at once on the laser printer.

The text portion of documents is produced using the company's TDP/3000 text and document processing software. Text is entered into the system, edited, and formatted with TDP/3000.

The graphics package for the HP 2680 laser printer is expected to be priced in the US from $19,250 to $34,450, depending on options. Graphics capabilities are available both for HP 2680 laser printers and HP 2685 print stations and may be retrofitted to existing systems. The US price of the HP 2680 is $92,000; current delivery estimates are 8 weeks. The stand-alone HP 2685 print station is priced at $160,000.

Reader Service Number 24

Video display terminal will feature oval enclosure

An ergonomically designed video display terminal being developed by TeleVideo will be available late this year.

According to TeleVideo, the radically changed profile of the model 970 is the result of a new design that maximizes reliability and performance.

The unit will feature an oval-shaped enclosure with 14" CRT screen and a detachable keyboard. The 970 will also feature a logic board and power supply that are placed on the side of the enclosure, rather than inside. The vented air flow through the vertically mounted electronics reduces temperature and results in more reliable product performance, the company states.

Prices for the terminal are expected to start around $1500.

Reader Service Number 25

User-oriented drawing system offers format flexibility

Used in conjunction with the Hewlett-Packard 9845 desktop computer and 9111A graphics tablet, the Udraw software package, from Sparacino Associates, enables users to draw, edit, store, and retrieve graphs, charts, and sketches, including associated text.

The Udraw system is menu-driven, with the HP 9111A graphics tablet being used for menu selection and most drawing inputs. A major feature of the system, according to the company, is the format flexibility and control available to the user. A "trace" mode can be used to capture, edit, plot, and store existing hard-copy drawings that may not have been prepared using the Udraw system. Regression analyses of selected drawing inputs can be performed and the resultant functions plotted automatically.

The Udraw software package consists of a user instruction manual, program tape cartridge, and special function key overlay and is available for $1000.

Reader Service Number 26

Module allows on-line inspection of drawings

The Preview Routine from Tektronix is an addition to the company's Plot 10 Interactive Graphics Library that allows a user to preview plots generated by application programs developed using CalcComp's fundamental graphics software.

The module offers on-line inspection of drawings prior to plotting and is compatible with the Tektronix Plot 10 Terminal Control System.

Preview Routine is priced at $1000.

Reader Service Number 27

Package links CAD/CAM system to phototypesetting

Computervision's CV/APS software converts illustrations and supporting text created and edited on the Cads 4 Designer CAD/CAM system into a form that can be electronically reproduced by the Autologic APS-5 family of phototypesetters.

In addition, with CV/APS, Atex system users can electronically merge illustrations generated on a Computervision system with text pages made up by the Atex system. According to the company, this eliminates the paste-up and camera work normally associated with technical page makeup. Text and illustrations are electronically typeset using the Autologic graphics fonts. No wet ink plots are required. Illustration callouts and other illustration text can be printed using the typesetter text fonts, with no cutting and pasting.

CV/APS is priced at $17,000.

Reader Service Number 28
Single-board graphic interface produces 16-color display

Graphic Strategies' Versagraphic module, a single-board color graphic interface to Motorola's 16/32-bit MC68000 microcomputer, produces a 16-color, 512×512- or 1024×1024-element raster scan display. The module is plug-compatible with Motorola's Versabus, Versados, and RMS68K operating systems as well as with a number of industry-standard color video monitors, camera systems, and large-screen projectors.

To accomplish the single printed-circuit board design of the interface, Graphic Strategies has utilized current VLSI and memory technologies, including the NEC 7220 GDC and 64K RAM. Other features include high-speed vector, circle and arc generation, line and area texturing, flicker-free refresh, zoom in integer steps from one to 16, arbitrary cursor shapes with selectable grid lock, and 2-D transformations such as translation, rotation, and scaling.

Support software includes a high-level graphic language interpreter and a graphic editor that allows operators to create, edit, store, and recall skeleton and finished images.

Prices for the Versagraphic module start at $2600 for the 512×512-element version and $4700 for the 1024×1024-element version. Quantity and evaluation unit discounts are available.

Image processing system accepts infrared, sonar data

Intellclpticl, a desktop image processing system from MCI/Quantel, is capable of picture capture, enhancement, and analysis, together with annotation, storage, and retrieval.

The company claims that the system is designed for applications ranging from electron microscope image enhancement and analysis to on-line monitoring of production lines.

Intellclpticl accepts normal TV raster-type signals. With an optional slow-scan input feature, it can also accept line scan data from infrared and sonar sources.

Features of the system include key-selectable functions for single-keystroke operation, a dual mode CRT for terminal and video display, noise reduction for image enhancement, integral picture storage and retrieval, optional Winchester disk bulk picture storage, and an interactive "novice" mode with automatic prompting for inexperienced or casual operators.

The system, which uses standard DEC computing hardware, comes with a documented Fortran software package.

For users who wish to develop their own programs, an Intellclpticl program development system is available with dual floppy disks.

The standard Intellclpticl is priced at $35,000 and includes software and full documentation. Delivery is 30 days ARO.

The Pro-Cam color camera system from LogE /Dunn Instruments is designed for high throughput 35mm slide production, according to the manufacturer. It produces color hard copies taken directly from computer generated, computer-enhanced, and direct transmission video images. Featuring a Forox SD-H camera for pin-registered accuracy, the system also has an RS-232 communications interface. The Pro-Cam offers a 35mm×100 feet (35mm×30.5 meters) film capacity and sells for $24,000.

Superior Interactive Design 3-D Graphics Workstation

An expanded second edition covers raster graphics, interactive graphics, and visible surface algorithms. This tutorial serves as an introductory course in computer graphics, updated and reflecting all areas of advancement. Includes 45 reprints, 17 of which are new and amply illustrated in full color. 570 pp.

Order #425

Tutorial: COMPUTER GRAPHICS

by John C. Beatty and Kellogg S. Booth
2nd Edition, April, 1982

Members—$25.00
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CPS-1/G can produce a color-scaled grid mosaic to assist geologists in interpreting surface features such as highs, lows, and slope information. It also helps detect artificial anomalies introduced by mathematical algorithms or data errors.

The user can identify regions containing contour anomalies by enclosing them in a polygon. A regional grid editing algorithm then reevaluates grid nodes within the polygon to produce a new surface based upon surface trends outside the polygon and any control points added within the polygon by the user. The user can see the results of regional grid editing immediately by means of real-time contouring of the edited grid.

Application brief: contour map package uses Core-based tools

First developed in the late 1960's to format aeromagnetic data for a geological exploration company, Radian Corporation's CPS-1 is a batch-oriented contour mapping system widely adopted by geophysics-related industries. Radian is now using a set of Core-based graphics tools to achieve device and machine independence in a new interactive enhancement, called CPS-1/G. The tool package, DI-3000 from Precision Visuals, has sped software development and reduced program maintenance.

Because of its ability to describe a third-dimensional z value as a set of two-dimensional contours on an x,y Cartesian grid, oil companies have found the CPS-1 system useful for analyzing geological structures. In addition, the National Oceanic and Atmospheric Administration has used it for nautical mapping, and Radian itself has applied it to environmental modeling, using the z value to show concentrations of air pollution over a two-dimensional landscape.

In the spring of 1981, Radian embarked upon the development of CPS-1/G. "Recent hardware advances were permitting a geologist to sit at a computer station and create survey-type maps in an interactive environment," recalls Mike Haecker, Radian's manager of applications software development. The company felt it was imperative to offer the same interactive benefits in its contouring package. Coded in Fortran, phase one of CPS-1/G was released last April with the second of three phases due later this year.

Haecker explains that the new package helps the geologist identify and correct certain types of data errors before they are used to generate a map. "For example," he says, "data may be inaccurate due to a transcription error in the field or at the terminal. Instrumentation is not always precise and may introduce a bias. There is also a whole class of errors associated with parameter selection." The cost of these errors can be great. In a unitization study, for example, where several companies are allocating oil reserves, a misplaced contour can throw volume estimates off by several million dollars.

The interactive graphics package minimizes this risk by displaying the data, scaled by color for clarity, rather than sending it blindly to the plotter via magnetic tape. The geologist can then add, delete, or modify information as necessary. The system also permits the user to change the grid, amending control points to produce more accurate contours.

Although Radian is an OEM for Chromatics terminals, Haecker explains that most of its CPS-1/G customers acquire the software to run on whatever terminals they already have.

"One of the main reasons for going with DI-3000 is the ongoing need to maintain device and machine independence," he says. "We have some customers running the package on storage tube devices, such as the Tektronix 4014, and others who have ventured into the color raster world with such terminals as Ramtek, Megatek, and Chromatics."

Radian has also sought independence at the machine level. "Our evaluation of DI-3000 indicated that Precision Visuals isolated the machine-dependent elements into separate, identifiable modules. As a result, we were easily able to modify it to run on our Univac machine even though the architecture is considerably different from the VAX hardware that DI-3000 was developed on."

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