



The Anderson Report

EDITED EXCLUSIVELY FOR THE COMPUTER GRAPHICS INDUSTRY

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APPLICON FIRST TO OFFER SOLIDS MODELING

Applicon, Burlington, MA is the first turnkey vendor to offer solids modeling as a standard product. The demos Applicon ran at the NCGA Conference in Baltimore were real show stoppers. Here's how it works...a designer creates a 3D wire frame part on a standard Applicon AGS system. The completed model is transferred to an off-line VAX 11/750 or 780 where the wire frame description is converted to a solid. After the completion of this operation (which may take a few minutes), it is easy to distinguish surfaces and intersections. The sectioning feature allows the designer to slice-away or cross section a part to reveal inner components. Mass properties such as area, weight, volume, moment of inertia and center of gravity are automatically calculated. With these operations completed, the designer can define which views should be converted to drawings and the solid model is transformed back to a wire frame model. The AGS system plots the drawings and illustrations. It is also possible to plot the solids model directly on Applicon's 22 x 34 inch color ink jet plotter.

This is a fantastic system and the way of the future for mechanical designers. The Applicon implementation overcomes the difficult user interface by starting with a wire frame model and letting the VAX create the solids model using 14 basic primitive shapes. Applicon has trademarked the name "Solids Modeling" for this product; it sells for \$50k and first deliveries are scheduled for Dec. 1981.

A BREAKTHROUGH IN 3D DISPLAY TECHNOLOGY

Bolt, Beranek and Newman, Inc., Cambridge, MA announce a totally new approach to display dynamic 3D images. The SpaceGraph 3D represents a technical advance that will have far reaching implications in many applications. Until SpaceGraph 3D, images were displayed by computing the algorithms for orthographic or perspective projection onto a 2D surface. SpaceGraph projects a CRT image onto a vibrating mirror and organizes the data in the "Z" axis, thereby displaying the back of an image during the rear most deflection of the mirror. The resulting image is true 3D...you can actually see through the image. By changing the viewing angle you can see around parts of the image which block the view of distant vectors or characters.

The technology is straight forward; the mirror is deflected at 30 FPS by a hi-fi speaker assembly and tuned mechanically to eliminate the 30 Hz tone. Vectors are represented by pixels (points), ordered in the "Z" axis and output to an electrostatically deflected CRT. Toughest part is the speed demanded of the display generation hardware to create enough pixels to represent complex images.

This technology will be commercially available later this year. BBN has licensed the SpaceGraph to Genisco Computer, Costa Mesa, CA. The folks at Genisco are working feverishly to have the first production model ready for introduction at SIGGRAPH in August. Price will be about \$100k. Genisco already has orders for four systems from oil companies who plan to use SpaceGraph for seismic analysis. Our congratulations to Larry Sher, inventor of SpaceGraph, and BBN for funding this important contribution to the computer graphics industry. For more info, call Lilly Monde at Genisco, (714) 556-4916.

NCGA IS HUGE SUCCESS

The second annual National Computer Graphics Assoc. Conference and Exhibition held in Baltimore, MD, June 14-19 was a blazing success. 7800 folks showed up

to attend the sessions and view the exhibits of 103 computer graphics vendors. The grand total, including vendors, was over 8,700. We conducted a survey of over 1,000 attendees during the show...here are the results: 35% were not presently using computer graphics, 27% use CAD/CAM, 17% Business Graphics, 5% Mapping, and the rest represent Command and Control, R & D, Imaging, Data Analysis, CAI, and Technical Publications. Kudos to Caby Smith and the entire staff of NCGA for a great job.

EVANS & SUTHERLAND INTRODUCE NEW SYSTEM

Evans & Sutherland, Sale Lake City, UT announces a 3D stroke refresh display system that is the fastest on the market. The PS300 can refresh 95,000 vectors at 30 FPS versus about 30,000 for stroke technology presently available. This blinding vector speed is important in multistation configurations where vector capacity is shared between four workstations. In addition to special processors used to support display arithmetic, The PS300 has a 68,000 microprocessor with 256k bytes of memory expandable to four megabytes. Control devices include: data tablet, control dials, function switches and A/N keyboard. Each dial or function switch has LED's to display an alphanumeric message telling what function the software has assigned that switch or dial. Interface to the system is via RS 232 or 449 communication connection. Display processors support rotation, translation, scaling, clipping, and depth cueing for dynamic isometric or perspective image representation. The PS300 is the first product of a new family for E & S and is not software compatible with the PICTURE SYSTEM II. Prices begin at \$69k; deliveries are scheduled for Sept. '81. Call (801) 582-5847 for info.

NEW INK JET PLOTTER

Advanced Color Technology, Chelmsford, MA introduces an ink jet plotter that supports seven solid colors and 125 color shades with a resolution of 140 x 85 dots per inch. Plot speed is 90 seconds for an 8-1/2 x 11 inch copy. Plotting width is 12.5 inches wide on a continuous paper format. Advanced Color Technology is a new company, founded in November, 1980 to develop color ink jet products for the computer graphics market. ACT plans to start shipping the ACT-1 plotter in Nov., 1981. Price is about \$9,000. For info call (617) 256-1222.

ARCHITECTURAL MARKET FOR COMPUTER GRAPHICS GROWING

The market in computer graphics systems for architects is beginning to take off according to all indications at the SYSTEMS 81 Conference in Los Angeles recently. Over 1,800 architects and engineers attended this show sponsored by The Paper Plane newsletter. This is over a 50% increase from last year and the prevailing mood suggests this is only the beginning of real growth in this market segment. The needs of architects are special; over 85% of architectural firms employ ten people or less. They are not accustomed to large capital investment but are being forced to modernize due to high personnel costs and limited availability of talent...sound familiar??? In our view, the vendors with the best shot at this market are the low cost turnkey guys who can supply customer support and a good lease/purchase financing plan. For information on SYSTEMS 82, call (203) 666-9487.

GOULD PLANS TO BUY DeANZA

Gould, Inc., Rolling Meadows, IL has agreed in principle to acquire DeAnza Systems, Inc., San Jose, CA. The value of this acquisition will be between \$22 - \$26M. DeAnza is one of the technical leaders in image processing systems with an estimated FY '81 revenue of \$10M. Gould apparently thinks DeAnza will fit nicely with the SEL computer group in terms of product synergy.

Special SIGGRAPH '81 Preview

INDEX OF PRODUCT CATEGORIES

Companies are listed in alphabetical order within each category, followed by the Sales/Marketing contact, Product Description, and Booth Number. SIGGRAPH '81 is scheduled for August 3-7 in Dallas. For registration information call 312-644-6610

HARDCOPY DEVICES & DIGITIZERS - - PAGE 3 & 4	TURNKEY SYSTEMS - - - - PAGE 6 & 7
STROKE REFRESH DISPLAYS - - - - PAGE 4	SOFTWARE - - - - - PAGE 7
RASTER REFRESH - - - - - PAGE 5 & 6	OTHER - - - - - PAGE 7

HARDCOPY DEVICES AND DIGITIZERS

- APPLICON, INC (Robert Patnaude)...to demo large format (22 x 34 inch) ink jet plotter that supports seven solid colors and 15,000 shades. BOOTH 940
- ADVANCED COLOR TECHNOLOGY, INC. (Robert Manning)...premiering the ACT-1 ink jet plotter for 11 inch wide format. New company - new product - MUST SEE. BOOTH 920
- ANALOG TECHNOLOGY CORP. (Jim Lawrence)...featuring a low cost hardcopy that is plug compatible with Tektronix terminals. BOOTH 931
- BENSON, INC. (Al Salottolo)...to demo Model 9444 ES plotter using Duraplot translucent plotting materials. BOOTH 341
- CALIFORNIA COMPUTER PRODUCTS INC. (Gene Brewer)...showing the Model 953 vector to raster converter and the Model 1060, 54 inch pen plotter. Also a full range of free cursor digitizers and Sanders stroke refresh display. BOOTH 407
- CEC DIVISION/BELL & HOWELL (Bill Griffith)...to demo the Model 912 grayscale printer that supports 16 levels of grayscale on electro-sensitive paper at 200 lines per inch. BOOTH 912
- DATA TECHNOLOGY, INC. (Donald Skenderian)...premier introduction of the Laser Track Digitizer. This is a semi-automatic digitizer reported to increase productivity 3:1. A MUST SEE. BOOTH 134
- DICOMED CORP. (Don Stickse)...will demo the D148S/D38 SLIDESYSTEM, stressing the function of film output for both CAD/CAM and business graphics systems. BOOTH 841
- DUNN INSTRUMENTS INC. (Mason Killebrew)...to show the Model 631 color camera, featuring instant 8 x 10 overhead transparencies. BOOTH 915
- GTCO CORP. (George Helser)...featuring the DEMI-PAD 5 low cost (\$735) one mil data tablet and a low cost digitizing system. BOOTH 909
- HEWLETT PACKARD (Bill Sharp)...showing the 7580-A 36 inch plotter...NEAT PRODUCT. Also flatbed plotters, plus the 9845C graphics display. BOOTH 525
- HITACHI AMERICA LTD. (Roy Akeobshi)...to introduce the Model HDG-1216 digitizer. First showing of Hitachi's digitizer lines. CHECK IT OUT! BOOTH 124
- HOUSTON INSTRUMENT (Rod Schaffner)...to display a 6 pen option for the low cost HILOT plotter. Will also demo a totally new digitizer line. BOOTH 650 & 808
- IMAGE RESOURCE CORP. (Morgan Walker)...to feature the VIDEOPRINT color computer graphics camera with remote control via RS 232 port. BOOTH 550
- MACDONALD DETTWILER & ASSOCIATES LTD. (Dan Murray)...VERY FIRST SHOWING of the FIRE 240, a high speed digital film recorder. BOOTH 731

Special SIGGRAPH '81 Preview

HARDCOPY DEVICES AND DIGITIZERS...cont'd.

- MATRIX INSTRUMENTS, INC. (Arthur Shufelt)...featuring a color computer graphic camera, using a new CRT monitor for high resolution instant hardcopy. BOOTH 933
- NICOLET ZETA (Gary Hasenfus)...will demo the Model 3620/C63 off line plotter workstation and the Model 1453 4 pen desktop plotter, BOOTH 834
- NUMONICS CORP. (Eric Doerrer)...to show the Model 2300 and 2400. Stressing custom programming for OEM users, BOOTH 229
- OPTRONICS (Alan Barrett)...featuring the OASIS system series of image processing digital film scanners, BOOTH 651
- PRINTACOLOR CORP. (Ray Keithley)...demoing the GP 1024 high resolution ink jet color printer. Color output from this printer has a resolution of 512 or 1024 pixels per line, BOOTH 830
- SELANAR CORP. (Patrick Greenwell)...introducing a printed circuit board for the DEC LA-120 printer to give graphics output capability. BOOTH 213
- SCIENCE ACCESSORIES CORP. (H.A. Cleveland)...to feature low cost 18 x 24 inch data tablet - price under \$1k. SAC will also demo 3D digitizing capability, BOOTH 904
- SPATIAL DATA SYSTEMS INC. (M. S. Schlosser)...will introduce the EyeCom III video digitizing systems. A brand new product for digitizing video images capable of software control of new digitizing operations 30 times per second. BOOTH 800
- VERSATEC, INC. (Stan Edmonson)...demoing the Random Element Processor that takes un-ordered vector data and performs ordering and rasterizing. Will also display the full complement of Versatec's electrostatic printer/plotters, BOOTH 614
- WATANABE INSTRUMENTS CORP. (Jack Campbell)...introducing a 6 pen option for the Model WX4671 pen plotter. BOOTH 152
- XYNETICS, INC. (Richard Stanton)...will display the high speed linear motor product line. This is the fastest pen plotter in the business. BOOTH 900

STROKE REFRESH DISPLAYS

- ADAGE, INC. (Fred Shirk)...to display the 4100 series 2D & 3D graphics systems. BOOTH 725
- EVANS & SUTHERLAND (Vel Casler)...the second public showing of the brand new PS300 system. The PS300 is the first of a new family of high performance display systems from E&S. YOU GOTTA TAKE A LOOK! BOOTH 925
- IMLAC CORP. (David Luther)...will exhibit the SERIES II independent graphics terminal. This system is one of the lowest cost stroke refresh displays available. BOOTH 305
- INTERACTIVE MACHINES INC. (George Semerau)...this new company will demo the IMI 500.. a system with some real neat architecture. BE SURE TO SEE IT. BOOTH 558
- LUNDY ELECTRONICS & SYSTEMS, INC. (Ray Maloney)...to introduce a new workstation, the ULTRAGRAF, along with a graphics software package for the DEC RSX 11M operating system, BOOTH 760
- MEGATEK CORP. (Peter Shaw)...will focus on the WHIZZARD 7295 which combines stroke and high resolution color raster in one system. Also on display will be the 6200 series of color systems. CHECK OUT the highly dynamic color images this system can support. BOOTH 607
- VECTOR AUTOMATION (Phillip Adams)...will demo the new 3D transformation option for the GRAPHICUS 80. VA has implemented the CORE standard software in the firmware of the GRAPHICUS 80. BOOTH 234

Special SIGGRAPH '81 Preview

STROKE REFRESH DISPLAYS...cont'd

VECTOR GENERAL, INC. (Cliff Gaw)...to introduce the VG 33000 system just announced.
Also see the new VG 8250 IBM plug compatible display system. BOOTH 707

RASTER REFRESH

- ADVANCED ELECTRONICS DESIGN, INC. (J. D. Kennedy)...to show the AED 512 intelligent color graphics workstation. BOOTH 717
- APPLIED DYNAMICS INTERNATIONAL (Hal Clearwaters)...showing new features for the LIGHT 50 series of color display systems. AD to emphasize their OEM versions of this equipment. BOOTH 851
- AYDIN CONTROLS (Raymond Slane)...to demo AYGRAF - 3D, a 3 dimensional software package for the Aydin color raster display systems. BOOTH 715
- COLORGRAPHIC COMMUNICATIONS CORP. (Ezra Mintz)...a new company with a new product - the MVI-7 color graphics terminal. BE SURE AND TAKE A LOOK, BOOTH 347
- CHROMATICS, INC. (Lowell Coulson)...will introduce the INSIGHT business graphics software and will demo the Model CGC 7900 series of color computer graphics equipment. BOOTH 919
- COMTAL CORP. (Harvey Raider)...to feature the VISION ONE/10 low cost image processing system. Also showing GRAPHS new software package. BOOTH 325
- CROMEMCO, INC. (Ed McGreehan)...showing Fontmaster, new software to allow users to design their own character fonts. BOOTH 540
- DATAcube (Stanley Karandanis)...demoing a high resolution video acquisition system for high speed image processing. BOOTH 918
- DEANZA SYSTEMS, INC. (Chuck Nordby)...will show the Model IP 8500 multi user image processing system and the VISACOM/23 stand alone image analysis system. BOOTH 200
- DIGITAL EQUIPMENT CORP. (Bill Koteff)...introducing the 11C03 Graphics Interface for VAX systems. BOOTH 425
- E & O SYSTEMS, LTD. (Barry Turner)...to display the full line of BARCO color monitor systems. BOOTH 205
- FIRST COMPUTER CORP. (C. D. Berteau)...will demo the FIRSTAR stand alone turkey image processing system. BOOTH 905
- GENERAL ELECTRIC CO. (J. P. Gunderson)...showing the PJ5150 large screen TV display. BOOTH 151
- GENISCO COMPUTERS CORP. (Bob Chartrand)...introduction of SPACEGRAPH. This is the neatest thing we've seen in a long time. (See article Page 1). DON'T MISS THIS - even if you have no application for it. Genisco will introduce the G6000 high speed raster system. BOOTH 441
- IKONAS GRAPHICS SYSTEMS INC. (Mary Whitton)...to feature the MA1024/D 3D transformation module for their high speed raster system. This module can transform a 3D point in less than three microseconds. Great for 3D surface generation. BOOTH 127
- INTEGRATED TERMINALS (Glen Alcorn)...introducing the ITI 801 12 inch color graphics terminal and also displaying a graphics thermal printer. BOOTH 109
- INTERNATIONAL IMAGING SYSTEMS (Michael Strozza)...announcing a virtual refresh memory option for the Model 70 image processing system. This system is based upon a Winchester disk with a virtual memory capacity up to 112 megabytes. Also featuring new applications software for fast rotate and zoom. BOOTH 335

Special SIGGRAPH '81 Preview

RASTER REFRESH...cont'd

- LEXIDATA CORP. (Chris Robert)...will demo EGOS (extended graphics operating system) Also displaying the XV7 high resolution non-interlaced color and black & white system first introduced last month. BOOTH 815
- LOGIC SCIENCES, INC. (Roger Fuller)...to feature the REMGRAPH II, a remote graphic workstation with disk storage. BOOTH 400
- MATROX ELECTRONIC SYSTEMS LTD. (Ed Dwyer)...demoing the RGB-GRAPH high resolution color video display card which includes hardware vector generation. BOOTH 233
- OMEGA DATA PERIPHERALS INC. (Tim Farris)...will feature a full page display terminal of 66 lines x 160 characters on a 17 inch CRT. NEW COMPANY - NEW PRODUCT BOOTH 911
- PERITEK CORP. (Thomas Birchell)...color and monochrome modules that are Q-Bus compatible. BOOTH 248
- PHOENIX COMPUTER SYSTEMS INC. (Elliott Bouillion)...introducing the Raster 640, a high resolution eight color display system. BOOTH 250
- RAMTEK CORP. (Toney Glinskas)...to introduce the Model 9450 - a low cost version of the popular 9400 system. Also see the new 6211 color graphic terminal and the 4100 color graphic printer. BOOTH 825
- RASTER TECHNOLOGIES, INC. (Louis Doctor)...featuring the RTI Model I display controller with 512 x 512 resolution and up to 24 bits per pixel. BOOTH 231
- TEKTRONIX (Kevin Van Hoomissen)...on display will be the new 4100 series. 4114 is the color storage tube and the 4112 is the raster refresh version. Also showing the 4611 electrostatic hardcopy. BOOTH 625
- TERAK (Daniel Clark)...showing the Model 8600 Color Graphics system featuring dual 16 bit processors. CHECK OUT THIS ONE! BOOTH 934
- THREE RIVERS CORP. (Frank Williams)...featuring the PERQ system. Check out the combined word processing and graphics capability of PERQ. BOOTH 205
- VICOM SYSTEMS, INC. (R. P. LaJeunesse)...will have a digital image processing system featuring high speed processing methods for image manipulation in real time. BOOTH 451

TURNKEY SYSTEMS

- AM BRUNING (David Kohn)...will demo EASYDRAF II general purpose computer aided drafting system. Be sure to see this new entry in the CAD/CAM business. BOOTH 419
- COMPUTER PICTURES CORP. (Phil Cooper)...showing their turnkey business graphics system focused for financial planning and business simulation. BOOTH 118
- ENGINEERING SYSTEMS INC. (Mike Clotiaux)...demoing the Design Graphics I & II. These systems are based on the LSI 11/03 and 11/23 respectively. Applications software supports general purpose drafting. BOOTH 111
- INTERGRAPH (Rick Lussier)...featuring the entry level PD11/23 system with two workstations. Priced at \$180k. Intergraph continues to pick up steam as a major contender in the high end turnkey systems. A MUST SEE. BOOTH 315
- NICOLET CAD (Phil Monego)...first showing of the new System 60, CAD system for PC design, monochrome version of Color System 80. BOOTH 834
- SUMMAGRAPHICS CORP. (Alyce Branum)...the first showing of the two station Datagrid II system with color raster workstations. BOOTH 507

Special SIGGRAPH '81 Preview

TURNKEY SYSTEMS...cont'd

SYNERCOM TECHNOLOGY, INC. (Irv Levine)...will demo new applications software for steel fabrication oriented to builders using steel format construction. BOOTH 805

SOFTWARE

APPLE COMPUTER CORP. (Jerry Bowers)...featuring Apple II business graphics. This is a command oriented business tool for new users. BOOTH 241

BELL-NORTHERN RESEARCH (Tony Toplak)...a new 3D option for their Virtual Machine Software (VGM) and a new advanced business graphics package. BOOTH 908

COMSHARE, INC. (Donald Vuchetich)...showing EXECUCHART, a business graphics system for time share users. BOOTH 331

DESIGN AIDS, INC. (Nancy Savinelli)...demoing Drafting System I on the VAX 11/780 interfaces to the SCI-CARDS automatic placement and routing system. BOOTH 802

ISSCO GRAPHICS (Mel Gafner)...to feature the powerful DISSPLA Version 9 and TELL-A-GRAF Version 4. ISSCO's software is device independent designed for a wide range of data representation. BOOTH 951

PRECISION VISUALS, INC. (James Warner)...to show GRAFMAKER, a color 2D line graph, bar chart, and pie chart system. BOOTH 460

SCIENCE APPLICATIONS, INC. (Madeleine Sparks)...will feature a wide range of software including IGPS, a 3D system for IBM 370/Adage 4370 graphics system, SAIGRAPH, a software system based on the CORE software system, and a mini computer based business graphics system. BOOTH 632

OTHER

ABW CORP. (Ruth McCormick)...displaying a new Apple Graphic Interface for use with TEKSIM, a module that makes Apple Computers PLOT 10 compatible. BOOTH 249

AUSCOM, INC. (David Huss)...will show IBM Selector Channel Interface that supports up to 256 remote graphic systems. BOOTH 916

JOYCE LOEBL DIV. VICKERS INSTRUMENTS INC. (John Morrissey)...to demo MAGISCAN 2 - a TV based interactive image analysis system. BOOTH 110

KMW SYSTEMS CORP. (Fred Klingensmith)...introducing the VP20, a vector processor for electrostatic plotters and the 3270T communication front end for graphic CRT's. BOOTH 831

POLOROID CORP. (Morris Samit)...will formally introduce the Type 891 Color Graphic Overhead Transparency Film, This is an important product for business graphics. BE SURE TO TAKE A LOOK. BOOTH 619

SUPERSET, INC. (Ian Hirschsohn)...showing the PGM Virtual Memory Computer with power-full data representation. (Programmers love this machine). BOOTH 926

SYSTEMS ENGINEERING LABORATORIES (Mike Resnecow)...introducing the concept of tools to support the graphics needs of its customers. They will be using the Template software system developed by Megatek. Looks like SEL is getting serious about graphics. BOOTH 751

NEW PRODUCTS

Ramtek, Santa Clara, CA introduces the Model 6211 desktop color display system loaded with features for an introductory price of \$5,995. The RM-6211 is a bit map system with a resolution of 640 x 480 on a 13" CRT supporting 16 colors. The user may specify eight colors and use the other memory plane for alphanumeric overlays or a blink function. The RM-6211 is compatible with PLOT 10 software and emulates the functions of the DEC VT-100 terminal. For information call (408) 988-2211.

Lexidata, Billerica, MA continues to push the state-of-the-art in raster refresh display technology. Just introduced is the System 3400 XV7, which features 880 x 704 resolution and eight colors refreshed at 60 Hz non-interlaced. The full range of 3400 features are supported. Call (617) 663-8550 for info.

SOFTWARE NEWS AND SERVICES

IBM, White Plains, NY, signs a licensing agreement with Bell Northern Research of Canada for a circuit board design system. This software operates on the 4331 and larger systems with the 3277 and a Graphics Attachment. The three major modules in the Circuit Board Design System include facilities for logic diagram creation, auto routing, parts placement, and gate assignments, plus a data base management system. For information, contact the Electronic CAD/CAM Design Dept-83V, 1133 Westchester Ave., White Plains, NY 10604.

Color Terminals International, Inc., Troy, MI announces a new system to generate color 35mm slides. The heart of this system is software that runs on several time share services and a color graphic workstation supplied by Color Terminals International. The software is organized to make it easy for non-computer types to create charts and graphs. Data created at the workstation is automatically transferred to one of four processing centers in the U.S., where a high resolution color slide is created. The slide is processed and returned to the customer within 48 hours. For more information, call (313) 528-2787.

PEOPLE AND PLACES

E & S names three new VP's - Gary Meridith, Robert Schumacker, & Gary Watkins. Structural Dynamics forms new subsidiary, CAE International and names Joe Frazier Pres. Ed Dyer is new Dir. of Marketing for Grinnell Systems, Advanced Electronics Design names Robert Deisher Mktg. Mgr. for Europe and Middle East and Hank Park Internat'l Mktg. Mgr. for the Pacific Basic. Richard Sager appointed VP-Engineering at Image Resource. Clare Moulton is promoted to Dir. of Mktg. Comm. at Adage.

THE ANDERSON REPORT WINNERS!

It was great to see you at our booth at NCGA and thanks for signing up for our free drawing. The winners are:

- FIRST PRIZE Brief case: Carlos Monserrate of the US Nuclear Reg. Commission, Washington, D.C.
- SECOND PRIZE 3 Volume set of CAD/CAM Daratech Manuals: Roland Henderson, U.S. Navy, Washington, D.C.
- THIRD PRIZE Two year Sub.-The Anderson Report: Stanley Kovy, Smithsonian Institution, Washington, D.C.
- FOURTH PRIZE One year Sub.-The Anderson Report: Donald Vincent, Society of Mfg. Engineers, Dearborn, MI.

FREE PASSES TO SIGGRAPH '81 EXHIBITS, available to AR subscribers..while they last. Call Betty Luckie (805) 581-1184. HOT TIP...A Complete Guide to Computer Graphics... information coming soon...