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SIGGRAPH '84

Welcome to SIGGRAPH '84!

As the SIGGRAPH conferences enter their second decade with this 11th annual event, we have again broadened our sphere: Not only does the conference reflect the growing role of computer graphics in our society but this year more than ever before we are an international conference—welcoming attendees and participants from the USA, Canada, France, Japan, China, Australia—indeed all parts of the globe—as course speakers, panel and paper participants and exhibitors.

The conference provides many unique opportunities: innovators present their latest research results; manufacturers display their newest equipment; artists present their best works in a variety of computer graphics media—film, video, slides.

This year's course selection offers new topics as well as specialized applications of contemporary issues. One offering—Medical and Biological Applications of Computer Graphics—is accredited with the American Medical Association.

The technical program reflects tremendous interest in the synthesis of complex images. Among the panel sessions is an in-depth retrospective of the computer graphics field and a forum on international trade and technology exchange.

This year, the design arts show brings SIGGRAPH and the art world together. The show is curated by three leading members of the art community and focuses on visual communication, architecture and industrial design.

The film and video shows again feature the best of computer graphics in these and other media.

With pleasure, we welcome you to Minneapolis—one of the midwest's fastest growing cities and indeed a world leader in spawning high technology corporations.

The Twin Cities—Minneapolis and St. Paul—provide many entertainment options during your SIGGRAPH stay. The Guthrie Theater and the Walker Art Center combine world class repertorie theater with contemporary art. The Minneapolis Institute of Art offers the cities' largest collection and is located adjacent to the Minneapolis College of Art and Design, which is

currently housing the SIGGRAPH '84 design arts show. Orchestra Hall, just a few blocks from the Minneapolis Auditorium has a full summer concerts schedule. The Minnesota Zoo sports a beautiful aviary and houses many animals in large natural settings. Zoo visitors can observe from walking paths or monorails. A walking tour through downtown Minneapolis should include the Crystal Court in the center of the IDS Building, the Nicollet Mall, and the hanging building: The Federal Reserve. The Twin Cities and the State of Minnesota are noted for their beautiful lakes and parks. During SIGGRAPH '84, Minneapolis celebrates its summer festival— Aquatennial. Schedules for the many Aquatennial events are available in the registration area.

In the several years since Minneapolis was selected as the '84 conference site, the conference has grown fourfold. Hence bringing SIGGRAPH '84 to Minneapolis has taken great efforts from the conference committee, the many volunteers and even cooperation from both Minneapolis and St. Paul and state of Minnesota officials. Some of the participants are named in this program, but we want to extend our sincerest thanks and appreciation to all those who worked countless hours to bring you this special event.

Enjoy the conference!

SIGGRAPH '84 co-chairs
Richard M. Mueller
Richard A. Weinberg

SIGGRAPH: The organization

SIGGRAPH is the Association for Computing Machinery's Special Interest Group on Computer Graphics. Its 11,000 plus members include engineers, architects and planners, artists, animators and filmmakers, software and hardware developers and manufacturers, scientists, mathematicians and many other professionals leading the fields of computer graphics theory, design, implementation and interactive techniques.

In the United States, local SIGGRAPH groups are active in Austin, Chicago, Cleveland, Philadelphia, Los Angeles, Minneapolis/St. Paul, New England, New York, Princeton, Raleigh, Oakland, Syracuse and Washington, D.C. In addition, SIGGRAPH chapters also are active in France, Australia and Vancouver and Toronto, Canada. ACM SIGGRAPH membership includes subscriptions to *Computer Graphics,* SIGGRAPH's quarterly publication, and to *SIGGRAFFITI,* a quarterly newsletter. Membership dues are $18 for ACM members and associate members, $10 for ACM student members and $45 for non-ACM members.

Membership application requests should be addressed to:
Association for Computing Machinery
11 West 42nd Street
New York, New York 10036 USA
(212) 869-7440

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courses

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Santa Fe State University

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Workshop, MIT

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Diane Shamash
Minneapolis College of
Art and Design

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National Film Board of
Canada

Nelson Max
Lawrence Livermore
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Graphics

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Peter Spreenberg
Institute of Design, IIT

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Hideki Yamamoto
Miranda Moss
Joanne Biron
Sherice Bowers
Sean Cleary
Beth Garland
Aimee Hucek
Barbara Schubring
Robert Valentine
Alan Wilfahrt

Omnimax film
Edward Garrick
Productions, Inc.
Edward Garrick

	7 am	8	9	10	11	12	1 p	2	3	4	5	6	7	8	9	10	11

Sunday
July 22
- Registration
- Design arts show

Monday
July 23
- Registration
- Courses — Lunch — Courses
- Design arts show
- Course reception

Tuesday
July 24
- Registration
- Courses — Lunch — Courses
- Equipment exhibition
- Design arts show
- Electronic theater, part I

Wednesday
July 25
- Registration
- Opening session
- Technical program — Lunch — Technical program
- Equipment exhibition
- Design arts show
- Electronic theater, part II

Thursday
July 26
- Registration
- Technical program — Lunch — Technical program
- Equipment exhibition
- Design arts show
- Technical program reception

Friday
July 27
- Registration
- Technical program — Lunch — Technical program
- Design arts show

Birds-of-a-feather sessions
Birds-of-a-feather meetings will be held Wednesday
and Thursday in rooms 204C and 204D in the
Minneapolis Auditorium and Convention Hall.
SIGGRAPH '84 attendees are welcome to use these
rooms for informal small group discussions. A sign-up
board is located on the registration kiosk in the
registration area of the Minneapolis Auditorium and
Convention Hall.

A Birds-of-a-feather session to gather suggestions on
future areas of standardization for ANSI X3H3 is being
held Thursday at 10 a.m. in room 204D of the
Minneapolis Auditorium and Convention Hall.

Design arts show
The SIGGRAPH '84 design arts show features more
than 35 major architectural, industrial and visual
communications design projects that have made
significant use of computers. The projects show how
computer graphics plays an expanding role in pro-
ducing complex, creative and aesthetic images
quickly and accurately. The curated exhibit is open
Sunday through Saturday from 9 a.m. to 5 p.m. at the
Minneapolis College of Art and Design.

Following its SIGGRAPH '84 premiere, the design arts
show travels to major installations in North America,
Europe and Japan.

A color slide set, poster and four-color catalog
detailing the design arts show are available at the
conference materials desk in the registration area.

Electronic theater
Always a SIGGRAPH conference highlight, this year's
evening film and video presentations have been
expanded and renamed. The electronic theater is an
international showcase featuring the finest examples
of scientific, commercial and artistic computer motion
graphics and multi-media performances. Different
programs are offered each evening in the arena of the
Minneapolis Auditorium and Convention Hall beginning
at 8 p.m. Tuesday and 8:30 p.m. Wednesday.

Exhibition opening ceremony
All SIGGRAPH '84 attendees are invited to attend the
brief opening ceremonies for the equipment exhibition
at 10 a.m. Tuesday outside of the exhibition hall.

Omnimax film

SIGGRAPH '84 premieres the first totally computer-generated Omnimax film Sunday through Friday at the Science Museum in St. Paul. Experience computer graphics as never before. Dynamic sequences in the world's largest film format, projected on an eight-story high dome, surround the viewers.

Check the signs in the registration area for the schedule of Omnimax showings and transportation information.

An inside look at the creation of the totally computer-generated Omnimax film is presented in a special catalog available at the conference materials desk in the registration area. Reviewing the work of the film's contributors, the SIGGRAPH '84 Omnimax film catalog probes intothe latest state-of-the-art graphics generation and reviews individual artists' contributions to the film.

SIGGRAPH executive committee meeting

The SIGGRAPH executive committee meets Thursday from 5:30 p.m.-8 p.m. in the Center Forum Ballroom of the Holiday Inn. All ACM SIGGRAPH members are invited to attend.

Social functions

Course registrants are invited to the SIGGRAPH '84 course reception at 7 p.m. on Monday in the Crystal Court of the Minneapolis IDS Center. Renew industry acquaintances and mingle with new colleagues while enjoying a wide variety of tantalizing hors d'oeuvres. Two complimentary drinks for soft drinks, beer and wine are included. A cash bar also is available. All SIGGRAPH '84 course attendees are welcome at this special event.

A reception is scheduled for technical program registrants at 8 p.m. Thursday evening in the architecturally unique Hennepin County Government Center. Continuing last year's tradition, this SIGGRAPH '84 event showcases complimentary desserts in an ice cream social setting. Two complimentary drinks for soft drinks, beer, wine and coffee are included. A cash bar also is available.

Special effects showcase

Demo reels by production companies and facilities, and system manufacturers are shown in the

Computer Pictures special effects showcase. Computer graphics and computer animation are the main focus of the demo reels being shown.

Representatives from commercial production houses and equipment manufacturers interested in showing demo reels must reserve viewing time. The special effects showcase is open Wednesday through Friday from 9 a.m. to 5 p.m. in room 202 A/B of the Minneapolis Auditorium and Convention Hall.

The complete special effects showcase schedule is listed in *Computer Pictures'* special SIGGRAPH '84 section available at the publication's booth in the exhibit hall.

User groups

The following user groups are planning meetings during SIGGRAPH '84. For details about the groups, contact the people indicated below after the conference. Check the kiosk in the registration area of the Minneapolis Auditorium and Convention Hall for updated user group information and announcements of additional group meetings.

Tuesday, July 24
Computer Graphics in Education
3:30 p.m.-5:30 p.m.
Holiday Inn Downtown
Hall of Avenues Room 4
Albert Bork (714) 856-6945

AGUS (Adage Graphic Users Society)
3:30 p.m.-8 p.m.
Amfac Hotel Rooms 1 & 2
Elaine Cheever (617) 667-7070

Wednesday, July 25
LEXUS
7:30 a.m.-1 p.m.
Amfac Hotel Rooms 5 & 6
Joyce Anderson (617) 663-8550

Megatek Users Group (MUG)
11:30 a.m.-3 p.m.
Minneapolis Auditorium and
Convention Hall Room 204B
Gerry MacDonald (619) 455-5590

Computers in the Arts
Noon-2 p.m.
Minneapolis Auditorium and
Convention Hall Room 204A
Dick Moberg (215) 923-3299

Evans & Sutherland Users Group
1 p.m.-5 p.m.
Minneapolis Auditorium and
Convention Hall Room 203A/B
Neil Jon Harrington (801) 582-5847

UGCS—Graphics Compatibility System Users Group
4 p.m.-6 p.m.
Holiday Inn Downtown
Hall of Avenues Room 4
Debbie Campbell (505) 846-2462

VIM Applications & Graphics Products Committee
6 p.m.-8 p.m.
Minneapolis Auditorium and
Convention Hall Room 201A
Peggy Brehm (602) 231-7503

Gould DeAnza User Group
6:00 p.m.-Midnight
Holiday Inn Downtown
Hall of Avenues Room 3
Jim Weil (408) 263-7155

Thursday, July 26
SIGGRAPH Local Groups
2 p.m.-3 p.m.
Minneapolis Auditorium and
Convention Hall 204B
William Goodin (213) 825-5010

MOVIE.BYU
5:30 p.m.-7 p.m.
Minneapolis Auditorium and
Convention Hall Room 201A/B
Hank Christiansen (801) 378-6325

Friday, July 27
Superset Users Group
9 a.m.-5 p.m.
Minneapolis Auditorium and
Convention Hall Room 201
Wendy Warnecke (619) 452-8665

Courses

		Monday July 23	Tuesday July 24	Course site
General courses				
1	Introduction to Computer Graphics			Auditorium
2	Color Perception			Amfac
3	Introduction to Raster Graphics			Amfac
4	Psychology of User-Computer Interfaces			Leamington
5	How to Design User-Computer Interfaces			Leamington
6	Device-Independent Computer Graphics Using the Standard GKS			Auditorium
7	Entrepreneurship—Starting and Growing a Computer Graphics Business			Auditorium
Visual synthesis				
8	Introduction to Computer Animation			Auditorium
9	Advanced Computer Graphics Animation			Holiday
10	Introduction to TV, Video, Film, Printing			College
11	State-of-the-Art in Image Synthesis			Hyatt
12	Advanced Image Synthesis			Hyatt
13	Technologies of Highly Interactive Computer Graphics			Holiday
14	Bitmap Graphics			Amfac
15	The Mathematics of Computer Graphics			Library
CAD/CAM/CAE				
16	Graphics Applications in Robotics			Holiday
17	CAD Systems			Holiday
18	Introduction to Solid Modeling			Leamington
19	Advanced Topics in Solid Modeling			Leamington
20	Freeform Curves and Surfaces I			Auditorium
21	Freeform Curves and Surfaces II			Auditorium
22	VLSI and Computer Graphics			College
Graphics applications				
23	Interdisciplinary Issues in Computer Art and Design			Cricket
24	Medical and Biological Applications of Computer Graphics			Holiday
25	Office Automation with a Graphical Accent			Amfac
26	Distributed Graphic Systems: Workstations, Microcomputers and Mainframes			Holiday
27	Building Scientific and Engineering Graphics Applications			Auditorium

Key

Amfac	Amfac Hotel
Cricket	Cricket Theater
Library	Heritage Hall, Minneapolis Public Library
Holiday	Holiday Inn
Leamington	Hotel Leamington
Hyatt	Hyatt Regency
Auditorium	Minneapolis Auditorium and Convention Hall
College	Minneapolis College of Art and Design

Course information

SIGGRAPH '84 courses are held Monday and Tuesday at eight different locations: Amfac Hotel, Cricket Theatre, Heritage Hall-Minneapolis Public Library, Holiday Inn Downtown, Hotel Leamington, Hyatt Regency Minneapolis, Minneapolis Auditorium and Convention Hall and Minneapolis College of Art and Design. Courses begin at 8:30 a.m. on Monday and Tuesday and conclude at 5 p.m. on both days. Shuttle buses running at regular intervals connect the conference hotels to course locations and the Minneapolis Auditorium and Convention Hall.

Luncheons are served each course day near the course locations. Luncheon ticket(s) are included in registration packets. Refreshments are served during the morning and afternoon breaks in areas adjacent to the course locations.

Registration for one or more courses admits attendees to the exhibition, design arts show, electronic theater and Monday evening course reception.

Course notes, the design arts show catalog, Omnimax film catalog and electronic theater catalog are included in the course registration. Additional course notes can be purchased in the registration area of the Minneapolis Auditorium and Convention Hall.

1
Introduction to Computer Graphics
Auditorium—Room 204 C/D

Chair
Marceli Wein, National Research Council of Canada

Lecturers
Kellogg S. Booth, University of Waterloo,
Waterloo, Ontario
Daniel E. Field, University of Waterloo,
Waterloo, Ontario
David R. Forsey, University of Waterloo,
Waterloo, Ontario
Marceli Wein, National Research Council of Canada,
Ottawa, Ontario

Topics: Part 1 of a two-day course
Overview of computer graphics/Booth
Graphics software pipeline/Forsey
Raster graphics hardware/Wein
Viewing and geometric transformations/Forsey
Calligraphic hardware/Wein
Hard copy devices/Wein
Interactive techniques/Wein
Dynamics/Field

2
Color Perception
Amfac—Ballrooms 1 & 2

Chair
William B. Cowan, National Research Council of
Canada

Lecturers
William B. Cowan, National Research Council of
Canada, Ottawa, Ontario
Colin Ware, University of Waterloo, Waterloo, Ontario

Topics:
The colored environment
• Introduction/Cowan
• Looking at the environment/Ware
Classical colorimetry
• Physiology of the eye/Cowan
• Color matching/Cowan
• CIE colorimetry/Ware
Color coding in the visual system
• Physiology of the retina and LGN/Cowan

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- Color coding, temporal and spatial properties of color/Cowan
- Color differences/Ware
- Color order systems/Cowan

Higher level uses of color
- Physiology of the cortex/Cowan
- Color appearance/Ware
- Color and attention/Cowan

3
Introduction to Raster Graphics
Amfac—Ballroom 3

Chair
Donald P. Greenberg, Cornell University

Lecturers
Ted Crane, Cornell University, Ithaca, New York
John Dill, Cornell University, Ithaca, New York
Donald P. Greenberg, Cornell University, Ithaca, New York
Gary Meyer, Cornell University, Ithaca, New York
Channing Verbeck, Cornell University, Ithaca, New York

Topics
Introduction/Greenberg
Raster concepts and performance/Meyer
Display architecture/Crane
Low level graphics software/Dill
Color and color spaces/Meyer, Greenberg
Raster algorithms/Greenberg, Verbeck
Illumination models/Greenberg, Verbeck
Image enhancements, anti-aliasing/Verbeck
Applications/Dill
Conclusion/Greenberg

5
How to Design User-Computer Interfaces
Leamington—Iowa/Wisconsin

Chair
James D. Foley, George Washington University

Lecturers
James D. Foley, George Washington University, Washington, D.C.
John L. Sibert, George Washington University, Washington, D.C.

Monday courses

Topics
Introduction / Foley
Methodology for designing user interfaces / Foley
Guidelines for designing user interfaces / Sibert
Interaction tasks, techniques and devices / Foley
Visual presentation of information / Foley
Case study in design: window managers / Foley

6
Device-Independent Computer Graphics Using the Standard: GKS
Auditorium—Room 202

Chairs
Peter R. Bono, Ship Analytics, Inc.
David H. Straayer, Tektronix, Inc.

Lecturers
Peter R. Bono, Ship Analytics, Inc., North Stonington, Connecticut
David H. Straayer, Tektronix, Inc., Wilsonville, Oregon

Topics: Part 1 of a two-day course
Introduction / Straayer
Introduction to concepts of device independence / Bono
Overview of graphics standards / Bono
Other standards relating to computer graphics / Bono
Overview of GKS: What GKS is / Bono, What GKS can do / Bono, Concepts: primitives, attributes, etc. / Bono
Wrap-up, administrivia / Straayer

7
Entrepreneurship—Starting and Growing a Computer Graphics Business
Auditorium—Room 203

Chair
Gary Smaby, Piper, Jaffray, and Hopwood Incorporated

Lecturers
Michael Bochert, L. F. Rothchild, Unterberg, Towbin, Bloomington, Minnesota
Leonard Brandt, Norwest Venture Capital, Minneapolis, Minnesota
Gerald Bratter, Bratter Financial, Minneapolis, Minnesota
Daniel Garms, CAD/CAM Specialists, Schaumburg, Illinois
Hunt Greene, Piper, Jaffray and Hopwood, Incorporated, Minneapolis, Minnesota

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Brian Job, Via Video, Santa Clara, California
Thomas King, Frederickson & Byron, Minneapolis, Minnesota
Neil Kleinman, International Data Corporation, Santa Monica, California
Sallie Lilienthal, First Bank of Minneapolis, Minneapolis, Minnesota
Alan Paller, AUI Data Graphics, Washington, D.C.
Peter Preuss, ISSCO, San Diego, California
Gary Smaby, Piper, Jaffray and Hopwood, Incorporated, Minneapolis, Minnesota
James Teter, Management Graphics, Minneapolis, Minnesota

Topics
Getting started
- Assembling founder's team
- Legal options for organization
- Importance of market research

Early stages
- Constructing the business plan
- Preparing financial projections
- Early stage financing

Financing growth
- Leveraged buy-out, entrepreneurial alternatives
- Role of venture capital
- Planning for second stage and public financing

Life in the fishbowl—an entrepreneurial perspective:
- A panel of entrepreneurs

8
Introduction to Computer Animation
Auditorium—Room 204 A/B

Chair
Frederic I. Parke, New York Institute of Technology

Lecturers
Carter Burwell, New York Institute of Technology, Old Westbury, New York
Patrick Hanrahan, New York Institute of Technology, Old Westbury, New York
Richard Lundin, New York Institute of Technology, Old Westbury, New York
Duane Palyka, New York Institute of Technology, Old Westbury, New York
Frederic I. Parke, New York Institute of Technology, Old Westbury, New York
Alvy Ray Smith, Lucasfilm Ltd., San Rafael, California

Lance Williams, New York Institute of Technology, Old Westbury, New York
David Zeltzer, Ohio State University, Columbus, Ohio

Topics: Part 1 of a two-day course
Introduction/Parke
Introduction to computer-assisted animation/Palyka
Background painting/Palyka
2-dimensional animation/Williams
2-dimensional case study/Palyka
A tool set for 3-dimensional animation/Zeltzer
3-dimensional commercial animation/Burwell
3-dimensional shape representation/Hanrahan
3-dimensional modeling/Burwell
Questions and answers/all

11
State-of-the-Art in Image Synthesis
Hyatt—Nicolett

Chair
Rodney Stock, Lucasfilm Ltd.

Lecturers
Geoffrey Gardner, Grumman Aerospace, Bethpage, New York
Thomas Porter, Lucasfilm Ltd., San Rafael, California
William Reeves, Lucasfilm Ltd., San Rafael, California
Alvy Ray Smith, Lucasfilm Ltd., San Rafael, California
Rodney Stock, Lucasfilm Ltd., San Rafael, California

Topics
Introduction/Stock
Real time computer simulation of complex scenes/Gardner
Image composition/Porter
Image composition hardware/Stock
Motion blur/Porter
Graftals/Smith
Stochastic modeling with particle systems/Reeves

13
Technologies of Highly Interactive Computer Graphics
Holiday—Loring Ballroom

Chair
Jan R. Hendricks, Kriya Systems, Inc.

Lecturers
David Eccles, Evans & Sutherland Computer Corporation, Salt Lake City, Utah

Patricia Harrison, Real Time Design, Chicago, Illinois
Jan R. Hendricks, Kriya Systems, Inc., Chicago, Illinois
Eugene Jarvis, Vid Kidz, Chicago, Illinois
Larry Leske, systems graphics consultant, Chicago, Illinois
Ann Marion, Atari, Sunnyvale, California

Topics

Software to hardware: the evolution of highly
interactive graphic systems/Leske
Software structures and languages for interactive
graphic design/Harrison
CT5A—real time visual simulation/Eccles
Use of interactive graphics in education and
learning/Marion
Graphic and game design/Hendricks
Gensim—a proposal for a general purpose, highly
interactive total simulation environment/Jarvis

15
The Mathematics of Computer Graphics

Library—Heritage Hall

Chair

Alan H. Barr, California Institute of Technology
James T. Kajiya, California Institute of Technology

Lecturers

Alan H. Barr, California Institute of Technology,
Pasadena, California
Brian A. Barsky, University of California, Berkeley,
California
James F. Blinn, Jet Propulsion Laboratory, Pasadena,
California
Tom Duff, Lucasfilm Ltd., San Rafael, California
Leo Guibas, Xerox Palo Alto Research Center, Palo
Alto, California
James T. Kajiya, California Institute of Technology,
Pasadena, California
Benoit B. Mandelbrot, IBM T.J. Watson Research
Center, Yorktown Heights, New York

Topics: Part 1 of a two-day course

Introduction/Kajiya and Barr
Homogeneous coordinates/Blinn
Computational geometry/Guibas
Mathematical controversies in computer
graphics/Barr
Computer-aided geometric designs/Barsky
Numerical analysis/Duff

16
Graphics Applications in Robotics
Holiday—North Forum Ballroom

Chair
Karl Kempf, McDonnell Douglas Corporation

Lecturers
Stephen Derby, Rensselaer Polytechnic Institute, Troy, New York
Ranga Jayaraman, IBM T.J. Watson Research Center, Yorktown Heights, New York
Karl Kempf, McDonnell Douglas Corporation, St. Louis, Missouri
Mary Pickett, GM Research Laboratories, Warren, Michigan
Myron Souris, McDonnell Douglas Automation Company, St. Louis, Missouri

Topics
Introduction/Kempf
Modeling objects and tasks/Pickett
Layout of robotic work cells/Souris
Robot and sensor programming using graphics:
- Overview/Pickett
- Off-line robot programming/Kempf
- Off-line sensor programming/Souris
- Off-line to on-line program transfer/Derby
Simulation of robotic applications/Jayaraman
Robot design/Derby
Panel discussion with questions and answers/all

18
Introduction to Solid Modeling
Leamington—Illinois/Minnesota

Chair
George Allen, McAuto

Lecturers
George Allen, McAuto, Cypress, California
Val Hawks, The Ben Franklin Technical Center, Bethlehem, Pennsylvania
Bill Licea-Kane, Digital Equipment Corporation, Maynard, Massachusetts
Jim Miller, Control Data Corporation, Arden Hills, Minnesota

Topics
Introductory overview/Allen
- Introduction and rationale

- Schemes for representing solid objects
- Construction and editing techniques
- Possible applications of solid modeling

Analysis of solid models/Miller
- Analytical tools
- Applications algorithms
- Sculptured surfaces in solid modelers

Industrial use of solid modeling systems/Hawks and Licea-Kane
- Motivations for industrial use
- Evaluating systems
- Target applications
- Discoveries and experiences
- Needed improvements

20
Freeform Curves and Surfaces I
Auditorium—Room 201

Chair
Richard F. Riesenfeld, University of Utah

Lecturers
Elaine Cohen, University of Utah, Salt Lake City, Utah
William J. Gordon, Drexel University, Philadelphia, Pennsylvania
Richard F. Riesenfeld, University of Utah, Salt Lake City, Utah
Lee Seitelman, Pratt & Whitney Aircraft, Hartford, Connecticut
Spencer Thomas, University of Utah, Salt Lake City, Utah

Topics
Introduction to computer-aided geometric design/Riesenfeld
Computing freeform curves and surfaces/Cohen
Coons and other surfacing techniques/Gordon
Set operations in geometric modeling/Thomas
Engineering use and applications of freeform surfaces/Seitelman

22
VLSI and Computer Graphics
College—Theater

Chair
Henry Fuchs, University of North Carolina at Chapel Hill

Lecturers
James Clark, Silicon Graphics, Inc., Mountain View, California, and Stanford University, Stanford, California
Henry Fuchs, University of North Carolina, Chapel Hill, North Carolina
John Ousterhout, University of California, Berkeley, California
Robert Schumacker Evans & Sutherland Computer Corporation, Salt Lake City, Utah
Neil Weste, Bell Laboratories, Holmdel, New Jersey

Topics
Introduction/Fuchs
Graphical techniques in IC layout/Ousterhout
Graphically aided symbolic IC design techniques/ West
Evolution of IC technology in flight simulators/ Schumacker
VLSI for high-performance graphics workstations/ Clark
Enhanced memories for raster graphics/Fuchs

23
Interdisciplinary Issues in Computer Art and Design
Cricket Theater

Chairs
Frank Dietrich, West Coast University
Vibeke Sorensen, Art Center College of Design

Lecturers
James F. Blinn, Jet Propulsion Laboratory, Pasadena, California
Frank Dietrich, West Coast University, Los Angeles, California
Scott Kim, Stanford University, Stanford, California
Vibeke Sorensen, Art Center College of Design, Pasadena, California
Joan Truckenbrod, School of the Art Institute of Chicago, Chicago, Illinois
Patrick Whitney, Institute of Design, Illinois Institute of Technology, Chicago, Illinois

Topics: Part 1 of a two-day course
Introduction to tutorial, short history of computer art/Dietrich, Sorensen, special guest:
William Schwartz
From calligraphy to digital typography/Kim
Color—on the screen, on paper, on textile/Truckenbrod

Monday courses

Introduction to 3-dimensional computer graphics/Blinn
Computers in visual communications and product design education/Whitney, special guest: Charles L. Owen
SIGGRAPH '84 design arts show curatorial committee: Del Coates, Muriel Cooper, William Mitchell, Patrick Whitney
Visual music/Sorensen
Creative strategies in design/all

24
Medical and Biological Applications of Computer Graphics
Holiday—Center/South Forum Ballrooms

Chair
Steven S. Saliterman, M.D.

Lecturers
Lowell Harris, Ph.D., Mayo Clinic, Rochester, Minnesota
Martin E. Kernberg, M.D., Stanford University, Stanford, California
Steven S. Saliterman, M.D., Minneapolis, Minnesota
Robert A. Sternberg, Arctan Graphic Arts, Inc., Rochester, New York
Michael W. Vannier, M.D., Mallinckrodt Institute of Radiology, St. Louis, Missouri

Topics
Welcome/Saliterman
Role of computer graphics and imaging in medicine and the biological sciences/Saliterman
Use of computer graphics with tomographic imaging in biomedicine/Harris
Clinical applications of computer graphics/Vannier
New approaches to medical illustration/Sternberg
Mathematical modeling and computer graphics in biomedical applications/Kernberg
Open forum/all

Accreditation
The International Medical Education Corporation (IMEC) certifies that this course meets the criteria for 6 credit hours Category 1 of the Physicians Recognition Award of the American Medical Association. IMEC is accredited by the Accreditation Council for Continuing Medical Education for Physicians.

1
Introduction to Computer Graphics
Auditorium—Room 204 C/D

Chair
Marceli Wein, National Research Council of Canada

Lecturers
William B. Cowan, National Research Council of Canada, Ottawa, Ontario
Daniel E. Field, University of Waterloo, Waterloo, Ontario
David R. Forsey, University of Waterloo, Waterloo, Ontario
Marceli Wein, National Research Council of Canada, Ottawa, Ontario

Topics: Part 2 of a two-day course
Color/Cowan
Graphics input/Wein
Modeling primitives/Field
Modeling data structures/Field
Graphics standards and packages/Wein
Rendering techniques/Field
Wrapup/all

4
Psychology of User-Computer Interfaces
Leamington—Iowa/Wisconsin

Chairs
Jack D. Grimes, ITT Advanced Technology Center
H. Rudy Ramsey, ITT Advanced Technology Center

Lecturers
Michael E. Atwood, ITT Advanced Technology Center, Shelton, Connecticut
Jack D. Grimes, ITT Advanced Technology Center, Stratford, Connecticut

Topics
Introduction/Grimes
Brief history of human factors/Atwood
Psychology of the user/Grimes
User requirements analysis/Atwood
Functional design/Atwood
Dialogue examples/Grimes
Dialogue design/Atwood
Workstation design/Grimes
Questions and answers/Atwood, Grimes

6
Device-Independent Computer Graphics Using the Standard: GKS
Auditorium—Room 202

Chairs
Peter R. Bono, Ship Analytics, Inc.
David H. Straayer, Tektronix, Inc.

Lecturers
Peter R. Bono, Ship Analytics, Inc., North Stonington, Connecticut
David H. Straayer, Tektronix, Inc., Wilsonville, Oregon

Topics: Part 2 of a two-day course
Introduction and administrivia / Straayer
Use of output and attributes / Straayer
Detailed example 1: a simple graphing program / Straayer
Use of segmentation and input / Straayer
Detailed example 2: a "tiny editor" in GKS / Straayer
Metafiles / Straayer
Miscellaneous topics: conversion, implementation / Bono, Straayer
Questions and answers, student interaction / Bono, Straayer
Wrap-up, course evaluation, etc. / Straayer

8
Introduction to Computer Animation
Auditorium—Room 204 A / B

Chair
Frederic I. Parke, New York Institute of Technology

Lecturers
Carter Burwell, New York Institute of Technology, Old Westbury, New York
Patrick Hanrahan, New York Institute of Technology, Old Westbury, New York
Richard Lundin, New York Institute of Technology, Old Westbury, New York
Duane Palyka, New York Institute of Technology, Old Westbury, New York
Frederic I. Parke, New York Institute of Technology, Old Westbury, New York
Alvy Ray Smith, Lucasfilm Ltd., San Rafael, California
Lance Williams, New York Institute of Technology, Old Westbury, New York
David Zeltzer, Ohio State University, Columbus, Ohio

Topics: Part 2 of a two-day course
Review and overview/Parke
Sampling, filtering, anti-aliasing/Smith
Special effects animation/Williams
Review of splines and transformations/Smith
Interactive animation systems/Hanrahan
Goal directed motion/Zeltzer
Motion simulation/Lundin
3-dimensional case studies:
- Parameterized faces/Parke
- Robot animation/Lundin
- Special effects animation/Burwell
Questions and answers/all

9
Advanced Computer Graphics Animation
Holiday—Loring Ballroom

Chair
Judson Rosebush, Digital Effects Inc.

Lecturers
Ed Catmull, Lucasfilm Ltd., San Rafael, California
C. Robert Hoffmann, Digital Effects Inc., New York, New York
Bill Kovacs, Robert Abel and Associates, Hollywood, California
Gene Miller MAGI, Elmsford, New York
Judson Rosebush, Digital Effects Inc., New York, New York
Mark Vickers, Atari, Sunnyvale, California

Topics
Introduction/Rosebush
Computer animation combined with real world production/Kovacs
- Digitizing and registration
- Previewing camera and lens systems
- Line up techniques
- Compositing techniques
Modeling action in computer animation/Vickers
- Object representation
- Interaction considerations
- Action techniques: simulation, inbetweening, procedurals
- Animation languages
Lighting and coloring digital scene simulation/Hoffmann, Miller
- Visible surface determination and orientation
- Reflectance: surface properties

- Lights and lighting
- Implementation properties

Temporal anti-aliasing/Catmull
- Concept of aliasing
- Spatial aliasing
- Temporal aliasing
- Solutions in traditional and computer graphic media

10
Introduction to TV, Video, Film, Printing
College—Theater

Chair
Stephen R. Levine, Electronic Graphics Associates

Lecturers
John Blunden, Lawrence Livermore National Laboratory, Livermore, California
Bruce Eric Brown, The Quail Group, Orem, Utah
Stephen R. Levine, Electronic Graphics Associates, Watertown, Massachusetts
John McCann, Polaroid Corporation, Cambridge, Massachusetts
Bernice Rogowitz, IBM T.J. Watson Research Center, Yorktown Heights, New York

Topics
Introduction/Levine
The technology of video/Levine
The technology of film/Blunden
Human vision/Rogowitz
Introduction to printing as applied to computer graphics/Brown
Techniques for calculating color sensations/McCann

12
Advanced Image Synthesis
Hyatt—Nicollet

Chair
Frank Crow, Xerox Palo Alto Research Center

Lecturers
James F. Blinn, Jet Propulsion Laboratory, Pasadena, California
Frank Crow, Xerox Palo Alto Research Center, Palo Alto, California
Ken Perlin, MAGI, Elmsford, New York

Turner Whitted, University of North Carolina, Chapel Hill, North Carolina

Topics
Introduction/Crow
Anti-aliasing/Crow
Geometric calculations: polygons and fractals/ Crow
Parametric surfaces/Whitted
Implicit and quadric surfaces/Blinn
Intensity calculations: light reflection and texture mapping/Blinn
Environment modeling and ray tracing/Whitted
A unified reflectance and texturing model/Perlin
Systems issues/all

14
Bitmap Graphics
Amfac—Ballrooms 1 & 2

Chair
Rob Pike, Bell Laboratories

Lecturers
Leo Guibas, Xerox Palo Alto Research Center, Palo Alto, California
Dan Ingalls, Xerox Palo Alto Research Center, Palo Alto, California
Rob Pike, Bell Laboratories, Murray Hill, New Jersey

Topics
Introduction and overview/Pike
Raster graphics/Guibas
Definitions and data types/Guibas
Algorithms and applications/Guibas, Ingalls
Software and hardware/Pike
Implementation/Pike
Building systems using bitblt/Ingalls
Dynamic effects/Ingalls
Alternate techniques/Guibas
Recap/Pike

15
The Mathematics of Computer Graphics
Library — Heritage Hall

Chairs
Alan H. Barr, California Institute of Technology
James T. Kajiya, California Institute of Technology

Lecturers

Alan H. Barr, California Institute of Technology, Pasadena, California

Brian A. Barsky, University of California, Berkeley, California

James F. Blinn, Jet Propulsion Laboratory, Pasadena, California

Tom Duff, Lucasfilm Ltd., San Rafael, California

Leo Guibas, Xerox Palo Alto Research Center, Palo Alto, California

James T. Kajiya, California Institute of Technology, Pasadena, California

Benoit B. Mandelbrot, IBM T.J. Watson Research Center, Yorktown Heights, New York

Topics: Part 2 of a two-day course

Introduction/Kajiya and Barr
Fractal mathematics/Mandelbrot
Transform theory/Kajiya
Deformations in solid modeling/Barr
Differential and algebraic geometry/Kajiya
Newtonian dynamics and animation/Barr

17
CAD Systems

Holiday—North Forum Ballroom

Chair

Bertram Herzog, Unicad, Inc.

Lecturers

Stuart Caren, GRAFTEK, Boulder, Colorado

Larry Gozzard, Computervision Corporation, Bedford, Massachusetts

Patrick Hanratty, MCS, Irvine, California

Bertram Herzog, Unicad, Inc., Boulder, Colorado

Charlotte Hudgin, Bausch & Lomb, Austin, Texas

John Leasia, CADLINC, Incorporated, Elk Grove Village, Illinois

John Rockwell, McAuto, Cypress, California

Leif Rosqvist, Calma Company, Santa Clara, California

John Sommer, IBM Corp., Minneapolis, Minnesota

George Steinke, INTERGRAF Corporation, Huntsville, Alabama

Robert Thomas, Control Data Corporation, Minneapolis, Minnesota

Keith Trickett, Gerber Systems Technology Inc., South Windsor, Connecticut

Gary Westlind, Auto-trol Corporation, Denver, Colorado

Other CAD/CAM/CAE exhibitors/vendors

Topic
Functional description of CAD systems

19
Advanced Topics in Solid Modeling
Leamington—Illinois/Minnesota

Chairs
Aristides Requicha, University of Rochester
Herbert Voelcker, University of Rochester

Lecturers
Gershon Kedem, University of Rochester, Rochester, New York
Martti Mantyla, Technical University of Helsinki and Stanford University, Stanford, California
Ramon Sarraga, General Motors Research Labs, Warren, Michigan
Mark Shephard, Rensselaer Polytechnic Institute, Troy, New York

Topics
Euler operations/Mantyla
Curve & surface intersections/Sarraga
Finite-element mesh generation/Shephard
CSG-oriented VLSI hardware/Kedem

21
Freeform Curves and Surfaces II
Auditorium—Room 201

Chairs
John C. Beatty, University of Waterloo
Richard F. Riesenfeld, University of Utah

Lecturers
Brian A. Barsky, University of California, Berkeley, California
Richard H. Bartels, University of Waterloo, Waterloo, Ontario
John C. Beatty, University of Waterloo, Waterloo, Ontario
A. Robin Forrest, University of East Anglia, United Kingdom
Ronald Goldman, Control Data Corporation, Minneapolis, Minnesota

Topics
Introduction and shaping B-splines/Beatty

Uniformly and continuously shaped
beta-splines/Barsky
B-splines and discretely shaped
beta-splines/Bartels
Probability and geometry/Goldman
Solid modeling with surfaces/Forrest

23
Interdisciplinary Issues in Computer Art and Design
Cricket Theater

Chairs
Frank Dietrich, West Coast University
Vibeke Sorensen, Art Center College of Design

Lecturers
Frank Dietrich, West Coast University, Los Angeles, California
Art Durinski, Omnibus Computer Graphics, Los Angeles, California
David Em, independent artist, Sierra Madre, California
Yoichiro Kawaguchi, Nippon Electronics College, Tokyo, Japan
Robin King, Sheridan College, Oakville, Ontario, Canada
Monique Nahas, Universite Paris, France
Barbara Nessim, Pratt Institute, New York, New York
Duane Palyka, New York Institute of Technology, Old Westbury, New York

Topics: Part 2 of a two-day course
Education for graphic designers and artists/King
Painting with pigment, painting with light; illuminating a concept/Nessim
Imaging by harmonic numbers/Dietrich
Computer/art—de-polarization and unification/Palyka
Visual communications in 4-dimensions/Durinski
1984: the state of the art and the state of the artist in computer graphics/Em
Computer art experiments of the last 10 years/Nahas
Simulating nature and fantasy/Kawaguchi
Future directions of computer art and design/all

25
Office Automation with a Graphical Accent
Amfac—Ballroom 3

Chair
Amy D. Wohl, Advanced Office Concepts Corporation

Lecturers

Howard L. Morgan, Advanced Office Concepts
Corporation, Bala Cynwyd, Pennsylvania
Alan Paller, AUI Data Graphics, Washington, D.C.
Amy D. Wohl, Advanced Office Concepts
Corporation, Bala Cynwyd, Pennsylvania

Topics

An overview of office automation/Wohl
The use of graphics in the office/Paller
Trends in office automation graphics/Morgan
Ask the experts: a panel discussion on graphics in the
office—now and in the future/all

26
Distributed Graphic Systems: Workstations, Microcomputers and Mainframes
Holiday—Center/South Forum Ballrooms

Chair

Robert M. Dunn, R.M. Dunn & Associates, Inc.

Lecturers

Charles Bittman, Penta Systems, Inc., Baltimore,
Maryland
Marc Brown, Brown University, Providence, Rhode
Island
John T. Crawford, The Hartford Insurance Group,
Hartford, Connecticut
Robert M. Dunn, R.M. Dunn & Associates, Inc.,
New Haven, Connecticut
Griffith Hamlin, Unicad Inc., Boulder, Colorado
Alan Paller, AUI Data Graphics, Washington, D.C.
John Peterson, John Deere Company, Moline, Illinois
David Shuey, McDonnell Douglas Automation,
St. Louis, Missouri

Topics

Overview of principles for distributed graphics
systems/Dunn
Workstation characteristics and implications for
standards and application software/Hamlin
Data distribution strategies in the distributed graphic
systems/Shuey
Distributed business graphics systems/Paller
Case study—work in distributed graphics systems for
software development in commercial data
processing/Crawford
Case study—distributed graphics systems used in
computer science education/Brown

Case study—distributed graphics systems in printing and publication/Bittman
Case study—applications in mechanical design and manufacturing/Peterson

27
Building Scientific and Engineering Graphics Applications
Auditorium—Room 203

Chair
David J. Kasik, Boeing Computer Services

Lecturers
David J. Kasik, Boeing Computer Services, Seattle, Washington
Rik Littlefield, Battelle-Northwest Laboratories, Richland, Washington
Jim Thomas, Battelle-Northwest Laboratories, Richland, Washington
Kevin Weiler, General Electric Company, Schenectady, New York

Topics
Introduction/Kasik
An architecture for graphics applications development/Kasik
- Derivation of logical components in the architecture
- Description of functionality for each component
- Description of resulting applications built within architecture

Understanding graphics technology and directions in an application context/Weiler
- Graphics display pipeline
- Structure of graphics display systems software and hardware
- Future directions of graphics systems architecture

Building specialized, limited audience applications/Littlefield
- Analysis of a complete graphics application
- Derivation of software engineering principles within application

Applying computer graphics in genetic engineering/Thomas
An application-oriented guide to the exhibits/Kasik

Technical
Program

Technical program information

Concurrent refereed paper and panel sessions of the SIGGRAPH '84 technical program are held Wednesday through Friday. Thirty papers detail the latest computer graphics research findings in 10 sessions. Eleven panel discussions explore current topics and issues in the computer graphics field.

A special panel session during this year's conference presents an in-depth look at the past as well as the future of computer graphics. "A Retrospective: Six Perennial Issues in Computer Graphics" features seven computer graphics pioneers detailing topics common to most computer graphics systems or applications: displays, transformations, rendering, interaction, geometric modeling and animation.

The special retrospective is scheduled for Wednesday at 3:15 p.m. To allow all SIGGRAPH '84 technical program attendees the opportunity to view this unique program, the panel is housed in the arena of the Minneapolis Auditorium and Convention Hall. No papers are presented during this panel session.

All technical papers are presented in the Minneapolis Auditorium and Convention Hall arena. Panel sessions (except the retrospective panel mentioned above) are held in the Nicollet and Greenway ballrooms of the Hyatt Regency.

Refreshments are served during morning and afternoon breaks in areas adjacent to the sessions.

Each technical program registrant receives one copy of the SIGGRAPH '84 proceedings, the design arts show catalog, Omnimax film catalog and electronic theater catalog. Admission to the exhibition, design arts show, electronic theaters and Thursday evening technical program reception also is included in technical program registration.

9:00-10:30   **Opening session**
SIGGRAPH '84 welcome
Richard M. Mueller
Richard A. Weinberg

Aquatennial welcome

SIGGRAPH report
Thomas A. DeFanti

1984 SIGGRAPH award
Jon Meads

Computer Graphics Achievement
Award
James H. Clark

Modeling I
Chair
Dick Gordon, University of Manitoba

Plants, Fractals and Formal Languages
Alvy Ray Smith, Lucasfilm Ltd.

Simulation of Natural Scenes Using
Textured Quadric Surfaces
Geoffrey Y. Gardner, Grumman
Aerospace Corporation

Global and Local Deformations of
Solid Primitives
Alan H. Barr, Raster Technologies,
Inc.

Panel: Computer-Integrated Manufacturing in Japan
Recent progress in Japanese CIM
includes the integration of computer
graphics, data base management
systems, local area networks, robotics
and software engineering technology.
This panel discusses advanced CAD/
CAM/CAT (computer-aided testing)
and FMS (flexible manufacturing sys-
tems) available in Japan. Panel mem-
bers from representative CIM-related
companies in Japan describe both
current capabilities and future trends.
Several typical application examples
also are presented to illustrate the
effects of the newest CIM technology.

Chair
Tosiyasu L. Kunii, The University of
Tokyo

Panelists
Hajime Inaba, GM Fanuc Robotics
Co., Ltd.
Takaaki Kubo, Hitachi, Ltd.
Kazuo Nakagawa, Mitsui Engineering
& Shipbuilding Co., Ltd.
Naomasa Nakajima, The University
of Tokyo
Ikuo Nishioka, Sharp Company, Ltd.

1:30-3:00   **Modeling II**
Chair
Thomas W. Sederberg, Brigham
Young University

Interpolating Splines with Local Tension,
Continuity, and Bias Control
Doris H.U. Kochanek, National Film
Board of Canada
Richard H. Bartels, University of
Waterloo

Efficient Octree Conversion by
Connectivity Labeling
Markku Tamminen, Helsinki
University of Technology
Hanan Samet, University of Maryland

Automatic Synthesis of Graphical
Object Descriptions
Mark Friedell, Harvard University

1:30-3:00   **Panel: Computing in the Fast Lane:
Super-systems for Computer Graphics**
This panel discusses the very high
end of the computational spectrum as
applied to computer graphics. Con-
trasts are drawn between the largest
scale systems used for generating
images: the supercomputers, the flight
simulators and the special purpose
graphics systems. Each of these
systems is capable of computing in
excess of 100 million arithmetic
operations per second. The panel
discusses contrasting architectural
features, programming, price/perfor-
mance, complexity, utility, philosophy,
numerical accuracy, speed require-
ments and evolutionary trends.

Chair
Richard A. Weinberg, Fifth
Generation Graphics, Inc.

Panelists
Michael Cosman, Evans and
Sutherland Computer Corporation
Joseph M. Cychosz, Control Data
Corporation
Gary Demos, Digital Productions
Kouichi Omura, Osaka University
Rodney Stock, Lucasfilm Ltd.

3:15-5:45 **Panel: A Retrospective: Six Perennial Issues in Computer Graphics**

It is time to see where we've come from as well as to know where we're going. Six topics occur in most computer graphics systems or applications: displays, transformations, rendering, interaction, geometric modeling and animation. Pioneers and significant contributors in each of these areas provide a retrospective on each topic as well as project what the future might hold. This panel is co-sponsored by The Computer Museum, Boston, Massachusetts, and Graphics Pioneers and is presented in the arena.

Chair
Robert M. Dunn, R.M. Dunn & Associates, Inc.

Panelists
Edwin Catmull, Lucasfilm Ltd.
David Evans, Evans & Sutherland Computer Corporation
James Foley, George Washington University
Robin Forrest, University of East Anglia
Alan C. Kay, Apple Computer Inc.
Carl Machover, Machover Associates Corporation
Robert Sproull, Sutherland, Sproull & Associates

Panel contributors
Gwenn Bell, The Computer Museum
Oliver Strimple, The Computer Museum
Sonya Ellingson, Institute for Media Arts

This panel is held in the arena of the Minneapolis Auditorium and Convention Hall.

9:00-10:30 **Hardware**
Chair
Ian Hirschsohn, Superset, Inc.

A Parallel Processor System for
Three-dimensional Color Graphics
Haruo Niimi, Kyoto University
Yoshirou Imai, Takuma Radio
Technical College
Masayoshi Murakami, Nippon
Denshi Kagaku Co., Ltd.
Shinji Tomita, Hiroshi Hagiwara,
Kyoto University

Chap-A SIMD Graphics Processor
Adam Levinthal, Thomas Porter,
Lucasfilm Ltd.

A Hardware Stochastic Interpolator for
Raster Displays
Timothy S. Piper, CAE Electronics
Ltd.
Alain Fournier, University of Toronto

9:00-10:30 **Panel: International Technology Transfer**
For the past two and one-half decades,
USA suppliers have generally domi-
nated the computer graphics market-
place, providing an estimated 90 per-
cent of computer graphics shipments
worldwide. In the past few years, how-
ever, a number of non-USA sources
have begun to develop products
which not only have captured a
growing percentage of their domestic
markets, but also have begun to be
competitive worldwide. USA com-
panies have increasingly turned to
non-USA sources for licenses and
products. This panel brings together
executives from European, Asian and
South African companies to discuss
the growing exchange of computer
graphics technology among USA and
non-USA suppliers.

Chair
Carl Machover, Machover Associates
Corporation

Panelists
John Watts, GMW Computers Ltd.
Richard Guedj, Thomson-CSF
Tsuneo Ikedo, Seillac
Carl Machover, Machover Associates
Corporation
J.G. Scott, Ferranti Cetec Graphics
Ltd.
David Skok, Skok Systems

10:45-12:15 **Visible Surface Algorithms**
Chair
Bruce Brown, The Quail Group

Invisibility Coherence for Faster
Scan-line Hidden Surface Algorithms
Gary A. Crocker, General Electric
Company

The A-buffer, An Antialiased Hidden
Surface Method
Loren Carpenter, Lucasfilm Ltd.

An Analytic Visible Surface Algorithm
for Independent Pixel Processing
Edwin Catmull, Lucasfilm Ltd.

10:45-12:15 **Panel: International Market Opportunities**
The panel provides information on the
many opportunities available to com-
panies to expand sales profitably by
entering foreign markets. Methods
for entering foreign markets, benefits
and potential pitfalls are discussed;
the panel is of benefit to both the
inexperienced and experienced
exporter. Topics addressed include
foreign distributor agreements, licen-
sing (both hardware and software)
and direct investment abroad such as
joint ventures.

Chair
Philip G. Husby, Peat Marwick
Mitchell & Company

Panelists
Edward J. Hayward, Oppenheimer,
Wolff, Foster, Shepard & Donnelly
Scott B. Hill, Arthur Young &
Company
Philip G. Husby, Peat Marwick
Mitchell & Company
Ronald E. Kramer, U.S. Department
of Commerce
Michael Prichard, Dorsey & Whitney
Ruan Xue-yu, Shanghai Jiao-tong
University

2:00-3:30	**Ray Tracing I**

Chair
Gary Rogers, Superset, Inc.

Beam Tracing Polygonal Objects
Paul S. Heckbert, Pat Hanrahan,
New York Institute of Technology

Ray Tracing with Cones
John Amanatides, University of
Toronto

Distributed Ray Tracing
**Robert L. Cook, Thomas Porter,
Loren Carpenter,** Lucasfilm Ltd.

2:00-3:30   **Panel: Trends in Semiconductor Hardware for Graphics Systems**
During the next 5-10 years, text and graphics systems will tend to merge because of the demand for a more productive man/machine interface, falling memory costs and the availability of higher performance VLSI controllers. This panel discusses video controllers, memory components and their architectures, graphic systems configurations and the evolution of enhanced system performance versus reduced system cost.

Chair
Henry Fuchs, University of North Carolina

Panelists
John Atwood, Silicon Compilers
Robert Bruce, Metheus Corporation
James H. Clark, Silicon Graphics, Inc.
Karl Guttag, Texas Instruments
Henry Fuchs, University of North Carolina
Edmund Sun, Weitek Corporation

3:45-5:15

Ray Tracing II
Chair
Edwin Catmull, Lucasfilm Ltd.

An Adaptive Subdivision Algorithm
and Parallel Architecture for Realistic
Image Synthesis
Mark Dippe, John Swensen,
University of California, Berkeley

Ray Tracing of Steiner Patches
Thomas W. Sederberg, Brigham
Young University
David C. Anderson, Purdue
University

Ray Tracing Volume Densities
James T. Kajiya, Brian P. Von Herzen,
California Institute of Technology

3:45-6:00

Panel: Microcomputer Graphics
Ranging from consumer computers
for entertainment and education to
personal workstations for productivity
and presentation, microprocessor
hardware spans the entire spectrum of
applications. This panel explores the
issues and trends involved in the
rapidly growing field of personal,
"human scale" computing. In addition
to examining the latest and most
popular hardware offerings, the panel
explores the unique aspects of mass
market software and its ramifications
for the future of computer graphics
and the human-computer dialog.

Chair
Howard Pearlmutter, Knoware
Institute of Technology

Panelists
Bill Atkinson, Apple Computer Inc.
Susan Kare, Apple Computer Inc.
Scott Kim, Stanford University
R. J. Mical, Amiga Computer
Nancy Mohler, Atari Computer Inc.
Charles Moore, Novix
Gabrielle Savage, Tom Snyder
Productions

| 8:30-10:00 | **Interactive Systems**
Chair
John Brewer, Louisiana State University

A System for Algorithm Animation
Marc H. Brown, Robert Sedgewick, Brown University

Priority Windows: A Device Independent, Vector Oriented Approach
Richard J. Littlefield, Battelle, Pacific Northwest Laboratories

Manipulating Simulated Objects with Real-world Gestures Using a Force and Position Sensitive Screen
Margaret R. Minsky, Atari Cambridge Research |
| 8:30-10:00 | **Panel: Computer Graphics in Commercial and Broadcast Production**
This panel includes speakers from many of the leading computer animation companies involved in commercial and broadcast production. The panelists discuss how well and to what degree state-of-the-art computer graphics techniques are being used in commercial production. The techniques discussed include rendering, modeling and motion direction.

Chair
Carl Rosendahl, Pacific Data Images

Panelists
Charles Csuri, Cranston/Csuri Productions
Larry Elin, MAGI
Lance Williams, New York Institute of Technology |

10:15-11:45   **Shading and Texturing**
Chair
Maureen Stone, Xerox Palo Alto
Research Center

Summed-area Tables for Texture
Mapping
Franklin C. Crow, Xerox Palo Alto
Research Center

Modeling the Interaction of Light
Between Diffuse Surfaces
**Cindy M. Goral, Kenneth E.
Torrance, Donald P. Greenberg,
Bennett Battaile,** Cornell University

Shade Trees
Robert L. Cook, Lucasfilm Ltd.

10:15—11:45   **Panel: Role and Reality of Graphics
Standards**
Graphics standards are supposed to
do for graphics what the ANSI
standard did for FORTRAN. But will
they? This panel looks at the several
standards vying for acceptance and at
the requirements of its intended
benefactors—the buying public. The
panel examines the problems of imple-
menting a single standard faced both
by hardware manufacturers and
software vendors and considers the
value of standards certification.

Chair
James R. Warner, Precision Visuals

Panelists
J. Encarnacao, TH—Darmstadt—FB
Informatik
Fred Langhorst, Digital Research,
Inc.
Mark Skall, National Bureau of
Standards
James R. Warner, Precision Visuals

1:15-2:45

Algorithms for Painting and Matting

Chair
Larry McCleary, Naval Oceans
Systems Center

A Family of New Algorithms for Soft
Filling
Kenneth P. Fishkin, Brian A. Barsky,
University of California, Berkeley

Texture Synthesis for Digital Painting
John-Peter Lewis, Massachusetts
Institute of Technology

Compositing Digital Images
Thomas Porter, Tom Duff,
Lucasfilm Ltd.

1:15-2:45

Panel: The Storage, Retrieval and Display of Integrated Graphics and Text

This panel discusses methodologies,
techniques and applications for the
storage and retrieval of integrated
graphics and text. Current areas of
interest include engineering drawings,
CAD, publishing, graphics and data-
bases, business graphics, cartography
and typography. This topic is at the
leading edge of current developments
and impacts a wide variety of disci-
plines. Current trends in research and
development and cost effective
practical applications are examined.

Chair
R.A. Earnshaw, University of Leeds

Panelists
Peter Brown, University of Kent
William R. McMunn, Gerber Systems
Technology
William Newman, consultant
S. Pollitt, Huddersfield Polytechnic

3:00-4:30   **Graphics Standards**
Chair
Jose Encarnacao, FG Graphisch-Interaktive Systeme

A Programmer's Interface to Graphics Dynamics
Joshua U. Turner, IBM Corporation

GKS for Imaging
Cliff Stoll, Johns Hopkins University

NOVA*GKS, A Distributed Implementation of the Graphical Kernel System
Clinton N. Waggoner, Charles Tucker, Christopher J. Nelson, Nova Graphics International Corporation

3:00-4:30   **Panel: Computer Graphics Research in Japanese Universities**
There is considerable research activity related to computer graphics within the Japanese academic community. However, little is known about it outside of Japan because of the language barrier. This panel surveys the work of several leading Japanese researchers who briefly describe the history of computer graphics at their institutions, report on their current areas of research and discuss their views on the role of universities in the further development of computer graphics.

Chair
Laurin Herr, Pacific Interface

Panelists
Eihachiro Nakamae, Hiroshima University
Makoto Nagao, Kyoto University
Norio Okino, Hokkaido University

Voluntary translator
Betsy Schneider

Exhibition

Exhibition information
Exhibition hours:

Tuesday, July 24	10 a.m.-6 p.m.
Wednesday, July 25	10 a.m.-6 p.m.
Thursday, July 26	10 a.m.-3:30 p.m.

210* internationally recognized industry suppliers display the most technologically advanced computer graphics equipment and supplies at the SIGGRAPH '84 exhibition. With more than 75,000 square feet of exhibition space in the Minneapolis Auditorium and Convention Hall, attendees can view the latest products in well over 45 categories.

*Exhibitors added to the roster after June 7 are included in the addendum to the program.

Adage, Inc.
Booth 818

One Fortune Drive
Billerica, Massachusetts 01821
(617) 667-7070
Derek Warren
Director of Corporate Communications

User Group Contact: Keith L. McVicar
Programmer Analyst CAD/M-Sikorsky Aircraft
(203) 386-4000

Adage designs, manufactures, markets and services
high-performance, interactive computer graphics
workstations. Our expanding family of color raster and
vector refresh workstations is used for a variety of
demanding graphics applications, including computer
aided design and manufacturing (CAD/CAM), simula-
tion, animation seismic analysis, solids modeling and
image processing. Adage customers are served by
over 200 sales and service representatives in 61
locations throughout North America and Europe and
by a network of distributors around the world. The
executive offices and principal facilities of Adage, Inc.
are located in Billerica, Massachusetts.

Addison-Wesley Publishing Company
Booth 111

Jacob Way
Reading, Massachusetts 01867
(617) 944-3700
October Graham
Product Manager

Exhibit will include a broad variety of computer and
graphics-related books and references, including the
best-selling *Fundamentals of Interactive Computer
Graphics* by Foley and Van Dam, as well as up-to-
the-minute books on artificial intelligence, smalltalk-
80, the UNIX System and other operating systems,
Ada, Pascal, algorithms, Logo, assembly language,
VLSI, and more.

Advanced Color Technology, Inc.
Booth 328

21 Alpha Road
Chelmsford, Massachusetts 01824
(617) 256-1222
Chuck Stires
Marketing Manager

Advanced Color Technology, Inc. will demonstrate
several ACT II™ low cost, desk top, color graphics
printers for transparency and paper. End Users
include business, process control, CAD/CAE,
mapping and imaging processing. Over 40 color
computers and terminals are interfaced to the ACT II
by serial, parallel and video links. These include
Aydin, Chromatics, DEC, Hewlett Packard, IBM,
Lundy, Megatek, Sanders, Tektronix, Vectrix, and many
others. Brilliant images are printed on transparency or
paper from a pallet of 125 color shades in 90 seconds.
The ACT II combines high resolutions and high
reliability with ease of use.

Advanced Electronics Design, Inc. (AED)
Booth 728

440 Potrero Avenue
Sunnyvale, California 94086
(408) 733-3555
(800) 538-1730 (outside California)
Robin Ratajczak
Manager, Marketing Communications

Advanced Electronics Design, Inc. (AED),
manufacturers of COLORWARE™, will display their
full product line of color graphics terminals and
recently announced color graphic desk-side work-
stations. These ergonomically designed products
provide high-resolution and price/performance for a
broad variety of graphics applications.
Demonstrations of VLSI, 2-D drafting, imaging,
graphics arts and business graphics will be on exhibit.

Advanced Technology Center, Inc.
Booth 353

5179 Overland Avenue
Culver City, California 90230
(213) 836-5852
Frank Braunlich
Marketing Manager

ATC specializes in machine and device independent graphics and image processing software for systems ranging from the IBM-PC to large mainframes. Operating system environments include CPM, MS-DOS, UNIX, VERSA-DOS and VMS. ATC is currently the only firm offering products which meet the SIGGRAPH CORE, GKS and VDI Standards to end-users and OEM's. These products include the metafile and retained segment capabilities. ATC will also introduce their new product GRAFIT for business and engineering presentation graphics.

Altek Corp.
Booth 602

2150 Industrial Parkway
Silver Spring, Maryland 20904
(301) 622-3906
Sherri Margolies
Marketing Communications Manager

User Group Contact: Lowell Nerenberg
Sales Manager
(301) 622-3906

Altek Corp., world leader in high resolution, high accuracy graphic digitizers, will be featuring three of their newest products designed to increase user productivity and accuracy. The AC40 Controller: a low priced, intelligent controller that can be enhanced to provide scaling, translation and rotation, line length and area calculations. The APACHE™ Intelligent Controller: it scans the line being digitized like a TV camera and then corrects the line to its exact center. The Super Disk II® controller: a complete user-programmable digitizer system. Altek DATATAB® tables are available in three accuracies: +/-.010", +/-.005", +/-.003". Sizes range from 12"x12" to 42"x130". Top surfaces are available back lit, non-back lit, rear projected or translucent.

AMF Logic Sciences, Inc.
Booth 1126

10535 Rockley Road, Suite 103
Houston, Texas 77099
(713) 879-0536
Peter Ferrer
Director of Marketing

High performance graphics processing and raster display systems. Hardware and software interfaces are available for a number of host resident graphics packages including: APPLICON, VERSAPLOT 7, and CALCOMP.

On-line and off-line configurations are available and each is supported by an HSR-11B High Speed Raster Processor and several options, including:

- Video Controller Sub-System
- Front-end Graphics Processor
- Down-loadable user defined, rotatable character fonts
- Disc Storage
- Mag-Tape Sub-System

Color or Monochrome output images may be displayed on 1 or 2 CRTs and up to four different Electrostatic and/or Laser plotters. Each system has been designed to improve thru-put at reduced cost.

Amtron Corporation
Booth 127

2260 De La Cruz Blvd.
Santa Clara, California 95050
(408) 748-8500
Barry Turner
Vice President, Marketing

Amtron exhibits high performance raster CRT displays for a wide variety of applications in industry, CAD/CAM, industrial process control, government and medicine. These displays feature a wide range of horizontal and vertical scan frequencies.

Anderson Publishing Company
Booth 1210

4525 E. Industrial St., Suite 4L
Simi Valley, California 93063
(805) 581-1184
B.J. Anderson
Co-Publisher/Editor

Anderson Publishing Company serving industry worldwide with news and information. *The Anderson Report* newsletter on computer graphics features information on new products, trends, software and major vendor companies. *CADD Quarterly/Research Notes*, a series of quarterly reports on CAD, CAM, CAE with updates (Research Notes).

DARATECH manuals:
Vol. 1 CAD/CAM, CAE: The Contemporary Technology
Vol. 2 CAD/CAM, CAE: Evaluating Today's Systems
Vol. 3 CAD/CAM, CAE: Survey, Review and Buyers'
Guide
The Graphics Standards Handbook—takes the
confusion out of the graphics standards issues.

Ann Arbor Terminals, Inc.
Booth 129

6175 Jackson Road
Ann Arbor, Michigan 48103
(313) 663-8000
Gary DeLuca
Marketing Director

Ann Arbor Terminals will introduce an entire family of
ANSI standard CRT terminals packaged in a new
ergonomic enclosure and supplied with a low profile
serial keyboard. Ann Arbor will be exhibiting a new
model of the Ambassador complete with high resolu-
tion graphics, Tektronic 4010/4014 compatibility
vector graphics with 11 line types, and 16 patterns of
polygon draw and fill. Other Ann Arbor terminals to be
displayed will be the Genie, the Genie+Plus, and the
Guru. All Ann Arbor terminals are standard with a 15
inch screen, detachable keyboard, programmable
function keys, and full diagnostics.

Antics Enterprises
Booth 2013

256 Mott St. (reps for GPSA)
New York City, New York 10012
Claudio Castillo
President

User Group Contact: Tony Pritchett
Programer-Animator
32 Winchester Road
London NW3
London 5861329

Antics Enterprises provides turn-key systems for high-
quality animation of all kinds. The Antics software was
written by A. Kitching of GPSA over a period of
thirteen years. During the last two years there have
been four installations in Japan done by Nippon
Univac. This year there have been two installations in

Europe. Antics is the only animation machine programmed by an animator that can be used by people of all ages. It is also the most versatile and cost-efficient system on the market today. The Antics software is constantly being updated. Different hardware configurations for a variety of users are available.

Apollo Computer Inc.
Booth 238

330 Billerica Road
Chelmsford, Massachusetts 01824
(617) 256-6600
Bill Warner
Product Marketing Manager

Apollo will be showing its full range of compatible, high-performance workstations, including the recently announced DN550, which combines a 68010 with a dedicated bit-slice graphics processor in a compact, under-desk enclosure. Apollo's high performance color DN660 and B&W DN460 both have a full 32-bit bit-slice processor, and offer dedicated performance in the range of a VAX/780, for under $40K. Apollo will also be demonstrating a new graphics software tool called Graphics Metafile Resource (GMR). Aimed at boosting graphics performance while making it easier for the application programmer to create interactive graphics applications, GMR combines the concepts employed by the emerging PHIGS standard with an editable graphics file storage mechanism called a Graphics Metafile.

Applied Digital Data Systems Inc.
Booth 1609

100 Marcus Blvd.
Hauppauge, New York 11788
(516) 231-5400
Joe Maronna
Director, Marketing

User Group Contact: Ron Kain
Manager, National Sales

ADDS will display the XK1, XK19 and 5A Series of high resolution monochrome and medium resolution color computer graphics terminals. The Series is Motorola 68,000-based. ADDS XK1 is a 1024 x 1024 resolution monochrome graphics terminal with 15-

inch diagonal monitor, the ADDS XK19, with larger 19-inch diagonal monitor and the ADDS X5A, a 512 x 512 resolution terminal with a 14-inch monitor, 16 displayable colors and a color look-up table containing 4,096 different colors.

Artronics, Inc.
Booth 1212

300 Corporate Court, PO Box 408
South Plainfield, New Jersey 07080
(201) 756-6868
Hugh Smyser
V.P. Marketing

Artron™ PC-2000 Studio Computers are powerful, turn-key systems for graphic designers, slide, and video producers. Artronics offers combinations of hardware and software for all kinds of media; including full-color ink jet prints, multi-image 35mm slides and full-color 8 x 10 overheads, videotape, and flat color art. The Paint software enables you to create images with a palette of 256 colors and a possible 16.7 million colors attainable. The Automatic Data Illustrator™ software produces quality high-resolution graphics; including charts, graphs, type, and other graphic figures. The full-color Image Grabber™ converts artwork from any source into a form which is compatible with the computer.

Association for Computing Machinery
Booth 1201

11 West 42nd Street
New York, New York, 10036
(212) 869-7440
Roberta Bukar
Conference Coordinator

As the educational and scientific society of the information processing community, ACM attracts and serves the finest practitioners and theoreticians throughout the world, the leading edge of computer technology—gathering at conferences and chapter meetings, publishing and reading the most probing technical literature, sharing ideas and information, promoting the common good of computing professionals. It is a volunteer organization whose composition and activities have always reflected the changing nature and needs of people engaged in computing arts and sciences.

Association for Women in Computing, Twin Cities Chapter
Booth 1108

c/o Sara Graffunder
3828 Pillsbury Ave. S.
Minneapolis, Minnesota 55409
(612) 681-3267

User Group Contact: Sara K. Graffunder
Member, Twin Cities Chapter

The Association for Women in Computing has as
goals to promote communication among women in
computing, to further the professional development
and advancement of women in computing, and to
promote the education of women of all ages in
computing. In addition to the national organization,
there are local chapters around the U.S. The Twin
Cities Chapter is sponsoring this booth.

Auscom, Inc.
Booth 1104

2007 Kramer Lane
Austin, Texas 78758
(512) 836-8080
Linda Lewis
National Sales Manager

Auscom provides a reliable and proven method of
attaching graphics systems directly to an IBM (or Plug
Compatible) Channel. The Model 8911A Program-
mable Channel interface, a compact and rack-
mountable device, attaches directly to any channel
type and emulates a standard IBM control unit.
Multiple high-speed parallel and/or serial ports are
available on the downline side. Device-driver software
is available for the majority of graphics devices and
Auscom can provide new drivers as needed. Also
being exhibited is Auscom's new Model 800 Single
Board Channel Interface aimed towards the OEM that
wants a channel attach integrated into his product.

AutoCAD
Booth 1625

150 Shoreline Highway Bldg. B
Mill Valley, California 94941
(415) 332-2344
Mauri Laitinnen
Technical Manager

User Group Contact: Lionel Johnston
Self-appointed editor of the Cadalyst

AutoCAD is a full function computer-aided design system which features the capabilities of an extensive mini-computer-based CAD system. AutoCAD is a general purpose system suitable for a wide variety of drafting applications. AutoCAD currently runs on most microcomputers and supports approximately 40 I/O devices.

AVL
Booth 1615

500 Hillside Avenue
Atlantic Highlands, New Jersey 07716
(201) 291-4400
Randy Klein
VP, Marketing

User Group Contact: J. Michael LaRue
Manager, Exhibits and Training

AVL will exhibit fully integrated stand alone desktop color graphics Presentation Computer systems for the creation of high resolution presentation business graphics applications. Outputs include high resolution (4000 line) 35mm slides, and 4 x 5 and 8 x 10 film formats. AVL Presentation Computers also allow you to create, control and present dazzling images on their color monitors, or project via RGB and NTSC video standards. Graphics are created utilizing a mouse or puck and digitizing tablet, and keyboard. Four software packages are included: AVL Artgraphics, Textgraphics, Chartgraphics, and Showgraphics (video presentaion software). Animation effects achieved through 3 buffer switching, color changing, and scrolling.

AV Video Magazine
Booth 2122

25550 Hawthorne Boulevard, Suite 314
Torrance, California 90505
(213) 373-9993
Joy McGrath
Publisher

AV Video magazine published by Montage Publishing, Inc., features stories on computer graphics, slide/multi-image, video, audio and microcomputers.

Barco Industries, Inc.
Booth 1705

2818-G Interstate 85-South
Charlotte, North Carolina 28208
(704) 392-9371
Emmy Verheecke
Marketing Manager

User Group Contact: Johan Deschacht
Product Support Manager

Barco Industries, Inc. will show, for the first time, their new CDCT 6000 color display: 1280 x 1024 pixels/60 Hz non-interlaced, a horizontal freq. ranging from 45-75 kHz in 4 adjustable steps, vertical freq. of 35-120 Hz, min. bandwidth of 120 MHz. The state-of-the-art in color display technology. Barco Industries, Inc. will also show their full line of high resolution, high performance color raster scan graphics displays: 14", 20" and 26". CDCT 5000—series: up to 37.5 kHz horizontal freq., up to 50 MHz bandwidth. CD-range: up to 24.8 kHz horizontal freq., up to 20 MHz bandwidth.

Benson, Inc.
Booth 806

2690 Orchard Park Way, P.O. Box 32059
San Jose, California 95152-2059
(408) 945-1000
Robert L. Hines
Manager, Marketing Communications

Benson will exhibit its expanding line of plotters, controllers, vector-to-raster converters, and media for computer graphics hardcopy applications.

Charles Beseler Company
Booth 1800

8 Fernwood Road
Florham Park, New Jersey 07932
(201) 822-1000
Carl Laufer
Product Manager

Beseler #4500 Video Film Recorder is an easy-to-use camera system for producing 35mm color slides, instant prints and 4 x 5" or 8 x 10" films—including overhead transparency materials—from graphics and

text generated by personal computers and computer graphics workstations. The Video Film Recorder's advanced digital technology produces the most accurate color rendition and maximum tonal range from both analog and TTL computer systems.

Robert Bosch Corp., Video Equipment Division
Booth 1400

P.O. Box 31816
Salt Lake City, Utah 84131
(801) 972-8000
Al Jensen
Manager, Advertising

Robert Bosch Corporation, Video Equipment Division, with headquarters, manufacturing and engineering facilities located in Salt Lake City, Utah, is a division of Robert Bosch Corporation, Chicago, Illinois. The corporation is the North American arm of the world-wide Robert Bosch Company of Stuttgart, West Germany. The Video Equipment Division was established to develop, manufacture, market and service professional video equipment in North America and in the international marketplace.

With the new Salt Lake City, Utah manufacturing facility and in conjunction with Bosch of Europe, the Video Equipment Division provides the most comprehensive range of products and services available for the professional video broadcast market. Products available include Film Scanners, Video Tape Recorders, Video Cameras, Editing Systems, Video Graphic Systems, Routing Systems, Video Processors, Terminal Equipment, Production Switchers and Video Monitors. Bosch is also involved in the consumer/home video market and world-wide telecommunications.

Business Computing Magazine
Booth 1225

119 Russell Street
Littleton, Massachusetts 01460
(617) 486-9501
Gene Pritchard
Publisher

Business Computing serves the business and professional user of the IBM PC and compatible computers. Devoted exclusively to business applications, problems and solutions, regular monthly

coverage includes: news articles, new product information, hardware and software reviews and special features, among other pertinent topics.

Cahners Publishing Co.
Booth 145

221 Columbus Ave.
Boston, Massachusetts 02116
(617) 536-7780
Corie Rand
Promotion Assistant

EDN—First in readership among engineering managers and electronic design engineers.
Electronic Business—For the management team in electronics, computers, and systems companies.

Cahners Publishing Company
Booth 502

221 Columbus Ave.
Boston, Massachusetts 02116
(617) 536-7780
Wendy Whittemore
Promotion Coordinator

Mini-Micro Systems—edited for value-added OEMs, value-added resellers and value-added users who are responsible for integrating mini-micro computer products and software into configured systems.
Business Computer Systems—devoted entirely to the buyer of business computer systems in business applications. Controlled circulation is identified by type of computer in current use at their business location.
PC Products—new controlled circulation product review and evaluation magazine for business users and retailers of IBM PC and PC-compatible computers. Editorial focus is strictly products—hardware and software—product announcements, product reviews and product evaluations.

CalComp
Booth 528

2411 W. LaPalma Avenue
Anaheim, California 90630
(714) 821-2281
Marietta Schoenherz
Trade Show Coordinator

CalComp has the broadest array of computer graphics hardware available in the industry: turnkey systems, graphics displays, vector and raster plotters, and digitizers. Support is provided through technicians and systems analysis worldwide.

CELCO (Constantine Engineering Labs Co.)
Booth 734

70 Constantine Drive
Mahwah, New Jersey 07430
(201) 327-1123
Peter Constantine
Sales Engineer

Three flexible CELCO Color Film Recording Systems interface with many Graphic Arts workstations including Artronics, Autographix, Executive Presentation Systems, Florida Computer Graphics, Hewlett-Packard HP2700, MAGI, Management Graphics and Via Video. Compatible with ISSCO and UNIRAS device-independent graphic software packages and the following mainframes: DEC LSI-11, PDP-11 and VAX, Perkin-Elmer and IBM. CELCO CFR4000 series features 7500 resolvable pixels over useful diameter and variable or fixed formats from 16mm to 8″ x 10″. Lowest cost CFR4000-A features 4200 resolvable pixels and fixed format. All three machines feature 20 seconds recording speed on 35mm format independent of slide complexity.

Chromatics, Inc.
Booth 2001

2558 Mountain Industrial Blvd.
Tucker, Georgia 30084
(404) 493-7000
Peggy Grimm
Trade Show Coordinator

Chromatics features key members of its OEM rack-mount CX family of color graphic display systems that provide a range of resolutions and performance for a wide variety of CAD/CAM and mapping applications. Each family member fully supports the Graphical Kernel System (GKS) and all fit in identical packaging allowing the OEM customer or sophisticated end-user to choose price/performance and compatability desired. Leading the family is the Chromatics CX 1500 color graphic display system with a resolution of 1536 x 1152 at 60Hz non-interlaced.

Cohu Inc., Electronics Division
Booth 1901

5725 Kearny Villa Rd., P.O. Box 85623
San Diego, California 92138
(617) 277-6700
Loren Whitley
OEM Products Manager

Professional, High Resolution CCTV Cameras for
Graphics Imaging, Processing and Medical
Applications.

Computer-Aided Engineering
Booth 1140

Penton Plaza 111 Chester Avenue
Cleveland, Ohio 44114
(216) 696-7000
William T. Tucker
Publishing Director

Computer-Aided Engineering is a technical journal
which features editorial and advertising directed to the
professionals who specify and buy computer-based
equipment for design and manufacturing applications.

Computer Arts Inc.
Booth 2028

608 2nd Ave. So.
Minneapolis, Minnesota 55402
(612) 332-2411
Terry Hickey
Marketing Coordinator

Minneapolis based producer of computer art.
Specializes in bridging the gap between conventional
art and computer art. The computer artists on staff
work with the latest computer design stations to
accomplish new and innovative designs. Advertising
Agencies, Art Studios, Audio Visual companies and
corporate communications people are encouraged to
work directly with staff artists on their current projects.

Products include: *Print design* for brochures, annual
reports, magazine covers, package design and
posters. *Overhead visuals* such as slides and
transparencies. Graphic designers and producers
should inquire about computer art seminars.

Computer Decisions
Booth 844

10 Mulholland Drive
Hasbrouck Heights, New Jersey 07604
(201) 393-6000
Don Huber
Vice President/Publisher

Computer Decisions is the magazine for MIS/DP management and information resource-involved management at large corporations and other large user organizations. *Computer Decisions* offers in-depth management features and applications coverage for MIS/DP company management making decisions to expand their information resources to improve productivity and profit.

Computer Design Magazine
Booth 1225

119 Russell Street
Littleton, Massachusetts 01460
(617) 486-9501
Bob Billhimer
Marketing Director

Computer Design Magazine serves senior engineers and engineering managers who design and develop both computer and microprocessor based systems. Editorial features analyze the trends in technology re: hardware (including computer systems, CPU's, peripherals and components) and related software, the techniques for development, programming, packaging and testing that will significantly impact the design of future computer systems in the industry.

Computer Graphics News
Booth 1236

1515 Broadway
New York, New York 10036
(212) 730-1050
Herbert L. Burklund
Marketing Manager

Chris Weathersbee
Editor
(212) 586-2920

CGN will publish daily editions for SIGGRAPH '84, and will distribute copies of these and its regular editions. *CGN* provides timely independent coverage of hard news in the graphics and image-processing fields— articles on the hardware and software tools and techniques used by computer graphics professionals in their work.

Computer Graphics World
Booth 1225

1714 Stockton St.
San Francisco, California 94133
(415) 398-7151
Diane Fuller
Marketing Services Mgr.

Computer Graphics World is the only monthly trade magazine devoted exclusively to computer graphics. Editorial content features extensive coverage of computer graphics applications and comprehensive news coverage of new developments throughout the industry. Additional regular features include interviews with key newsmakers, hardware and software reviews and evaluations, and surveys of computer graphics users. Special issues focus on topics such as international developments, rapidly developing areas of application such as management information systems and CAD/CAM, and highlights from the major trade shows and conferences.

Computer Pictures Magazine
Booth 943

330 West 42nd Street
New York, New York 10036
(212) 947-0020
Dean Ross Eaker, Publisher
Tom Tolnay, Editor

Computer Pictures Magazine was developed to bridge the gap between the executive and the engineer. Too often, these movers in our industry speak different languages, and that's where we come in. *Computer Pictures* is designed to keep you informed, aware and fully knowledgeable about the significant software and hardware developments in the computer graphics field. *Computer Pictures* ranges across the full spectrum of Business, Broadcast, and Entertainment, covering creative applications and supported by sound business sense.

Computer Pictures is a magazine dedicated to the imaginative interfacing of reader and writer.

The Conference Book Service, Inc.
Booth 1818

80 South Early Street
Alexandria, Virginia 22304
(703) 823-6966
Roseann Doyle
Exhibit Coordinator

A browsing library of professional books and journals of interest to specialists in computer graphics.

Conrac Division/Conrac Corporation
Booth 918

600 N. Rimsdale Avenue
Covina, California 91722
(818) 966-3511
Robert Hofer
Manager, Marketing Communications

User Group Contact: Rich Owoc
Product Marketing Manager

Conrac designs and manufactures a broad line of raster scan display monitors for the computer graphic OEM market:
A variety of TTL color monitors, 9", 13" and 19" CRT sizes, 8 colors, selection of resolution and line rates; Model 2600 Series of high performance monochrome monitors, available in 9", 15" and 19" CRT sizes; 65 kHz, 1000 line non-interfaced color monitor, Model 7311; Model 7211 general purpose 1080 x 809 resolution color monitor; Model 7111 medium resolution color monitor; Model SNA, 23" monochrome CRT for large area viewing; Model 2400 high resolution monochrome, 19" CRT, 40 mHz video bandwidth, switch selectable line rates.

Control Data Corporation
Booth 928 & 1028

8100 34th Avenue South
Minneapolis, Minnesota 55440
(612) 853-6367
Alan M. Christman
General Manager, CIM Marketing

The high performance ICEM Ergonomic Workstation
expands the Integrated Computer-aided Engineering
and Manufacturing solution with high precision state
of the art graphics and processing power. The ICEM
solution includes tools to improve productivity in such
areas as hydraulics, facilities planning, kinematics
synthesis and analysis, schematics and PC board
routing, design/drafting and finite element modeling.
All this coupled with engineering data control storage
and retrieval, training and consulting at your site make
ICEM an extremely powerful CIM (Computer
Integrated Manufacturing) solution.

Control Systems
Booth 2130

2855 Anthony Lane
Minneapolis, Minnesota 55418
(612) 789-2421
Robert Beale
President

User Group Contact: Robert Beale
President

Artist High Resolution Graphic Display Systems for
the IBM Personal Computer. High Resolution Graphic
Art Workstations simultaneously capable of 12 BIT
graphic art, genlock and keying on video disk and
running standard IBM software, such as LOTUS 123.
Resolution up to 1024 x 1024 x 12 BITS. For 4096
simultaneous colors, end user graphic art software,
video disk genlock and keying, broadcast quality
RS170A output. LOTUS 123 and Flight Simulator are
transformed to fill the high resolution screen and
achieve a high character font.

CPT Corporation
Booth 2031

8100 Mitchell Road, P.O. Box 295
Minneapolis, Minnesota 55440
(612) 937-8000
Jeff Falkingham
Product Publicity Specialist

CPT Corporation is a leading supplier of high-quality,
high-performance office automation systems. The
company provides sales and service in more than
600 locations in 65 countries. Its products include the

CPT Phoenix™ system—an advanced professional workstation that integrates high-resolution graphics with word processing and data processing.

Cray Research, Inc.
Booth 912

1440 Northland Drive
Mendota Heights, Minnesota 55120
(612) 681-3248 or (612) 452-6650
John E. Aldag
Manager, General Applications Support & Development

Cray Research, Inc. designs, manufactures, markets and supports large-scale, high-performance computers used by industry and government for engineering and research. Nearly 70 CRAY super-computers installed worldwide are used for such diverse applications as weather forecasting, structural analysis, nuclear safety, basic research, oil reservoir modeling, seismic processing, image processing and computer graphics.

CSP, Inc.
Booth 1811

40 Linnell Circle
Billerica, Massachusetts 01821
(617) 272-6020
Dennis Coraccio
Manager, Sales Support

CSP, Inc., is a leading manufacturer of programmable floating-point array processors which enhance a minicomputer's ability to do high-speed arithmetic. Its 32-bit product line is directed at signal processing problems which include seismic research, sonar/radar, vibration, simulation, and imaging systems. Its 64-bit product line is directed at scientific computation and computer-aided engineering. Its Mini MAP product is specifically configured for OEMs of seismic, imaging, and CAD/CAM systems.

Cubicomp Corporation
Booth 351

3165 Adeline Street
Berkeley, California 94703
(415) 540-5733

Carol Rainin
Marketing Manager

Cubicomp manufactures the CS-5 Solid Modeling
System, a hardware/software subsystem which runs
on the IBM Personal Computer. The CS-5 allows
operators to easily create and manipulate three-
dimensional models. System resolution is 512 x 512
by 16 bits per pixel. 4096 colors can be displayed
simultaneously from a palette of 16.8 million.
Sophisticated, menu-driven software includes such
features as anti-aliasing, smooth shading, rotation,
translation, and zoom capabilities.

C.W. Communications, Inc.
Booth 1209

375 Cochituate Road
Framingham, Massachusetts 01701
(617) 879-0700
Donald E. Fagan
V.P. Sales/Marketing

Computerworld, the newsweekly for the computer
community will distribute copies of its most recent
issue. Other publications of the C.W. Communications,
Inc. family are *Computerworld on Communications,
Computerworld Office Automation* and *Computerworld
Buyer's Guide.*

Daikin Industries Limited
Booth 1228

1754 Technology Drive, Suite 116
San Jose, California 95110
(408) 280-6004
Katsutomo Kishimoto
General Manager, Engineering

Daikin Industries designs and manufactures high
performance, intelligent color graphic displays.
The new COMTEC DS-300 series incorporates many
advanced functions at the display level to support
various CAE applications. Very high speed display
processing is accomplished by using six functionally
separate processor structures. For example, hidden
surface removal and detailed image shading is done
locally to enable fast, realistic displays using 3-D solid
models and surface models.

Datacopy Corporation
Booth 222

1215 Terra Bella Avenue
Mountain View, California 94043
(415) 965-7900
Susan G. Seubert
Trade Show and Media Manager

See Datacopy's Word Image Processing System™ (WIPS™) operating with the IBM PC XT Personal Computer. WIPS™ integrates images: photographs, line drawings, small three-dimensional objects, into text or data bases prepared with popular micro-computer software programs. WIPS™ consists of the new Model 680 Graphic Scanner, Model 110 Image Processing Interface, and WIPS™ software. The Graphic Scanner contains an electronic digitizing mechanism and optimized illumination source that provides resolution up to 1728 by 2846 8-bit picture elements with 256 shades of grey for each PEL. Q-Bus and Multibus interfaces are now available for the Model 680 and Model 610 Electronic Digitizing Camera. Also see the Model 90, Integrated Imaging System based on the Model 610 EDC and photo-graphic copy stand providing flexibility and image capture.

Datacube, Inc.
Booth 1148

4 Dearborn Road
Peabody, Massachusetts 01960
(617) 535-6644
Stanley M. Karandanis
President

Datacube manufactures real time video image processing and graphic products for the Multibus, Q-bus, Unibus and IBM PC.

We are demonstrating our robust 123 family which features the HIGHEST resolution available in a computer controlled video acquisition system plus a real time pipelined signal processor that allows images to be processed and transferred at the rate of 14 megapixels per second. We also are showing our new line of IBM PC video acquisition and display modules; our VG-150 ultra high resolution, intelligent graphics board; plus our fully integrated turnkey workstations. Stop by and let us show you how we can be your

one-stop supplier for your image processing and graphics needs. We have the hardware, software and expertise you are looking for.

Dataplotting Services Inc.
Booth 1422

225 Duncan Mill Road
Don Mills, Ontario M3B 3K9
(416) 441-4163 or Toll Free 1(800) 268-7878
Brian Diamond
National Sales Manager

The D-PICT software family is a powerful, integrated graphics system, featuring several modules to produce dozens of graph types, colors, patterns, line widths and lettering styles. D-PICT/B is an easy-to-use business graphics system. D-PICT/AUTOGRAPH features over 200 pre-designed bar, line, pie and word charts so you can produce high quality graphics simply using your data. D-PICT/LAYOUT quickly creates word charts, forms and diagrams. D-PICT/MESH displays data in 3D. D-PICT/CONTOUR creates high quality contour maps. D-PICT/META combines graphic elements in a single display. D-PICT/VGL provides over 300 graphics subroutines, enabling a programmer to create sophisticated graphic applications.

Dataram Corporation
Booth 952

Princeton Rd.
Cranbury, New Jersey 08512
(609) 799-0071
Pete Yeatman
Marketing Manager

Q Bus Graphics Controller. The GC20 provides 1024 x 1024 images at a vector draw speed of 1.2 million pixels/sec. 16 colors out of a 4096 palette. Emulates 4010, 4014, 4065, VT-100, VT-125, and VT-240, REGIS and PLOT 10 supported.

Dataram will also be displaying its popular mini-computer systems, add-in memory, peripheral sub-systems and controllers and Bulk Memory Systems.

Decision Images, Inc.
Booth 2020

228 Alexander Road
Princeton, New Jersey 08540
(609) 683-0234
Bob Mills
President

User Group Contact: Robert C. Lauer
Director, Software Development

Decision Images provides low-cost desktop graphics/
image processing workstations, featuring 1024 x 1024
resolution with 4096 simultaneous colors. Based on
the IBM PC/XT for low cost, maintainability, and
upgradability. Linkage of the APL programming
language with a library of imaging graphics service
routines in C and Assembler provides the comfort of a
turnkey system, with the flexibility of a language
environment designed with interactivity in mind. Low
cost upgrade to XT/370 personal mainframe, tape
drives, and large disk storage options available.
Applications include satellite image enhancement,
geographic information systems, medical imaging,
graphics and imaging research and graphic arts.

DIC Americas, Inc.
Booth 2035

2100 North Central Road
Fort Lee, New Jersey 07024
(201) 592-5100
Hironobu Yujobo
Vice President Marketing

Showing for the first time in the Western Hemisphere:
4Dbox Visual Fusion Computer, Design & Color
Simulation System Forth Language used in this
system gives excellent performance and simple
operation, as many as 256 colors can be freely
selected out of a possible 16 million. The range of
possible application include Design area, Animation,
Cross-section diagrams etc.

DICOMED Corporation
Booth 706

9700 Newton Avenue South
Minneapolis, Minnesota 55431
(612) 887-7946

Laura Winter
Marketing Communications Manager

User Group Contact: Laura Winter
Marketing Communications Manager

DICOMED will be featuring the IMAGINATOR™, a
unique design console with the FLEXICHART™
feature and the FLEXSCAN™ option. DICOMED's D38
Design Station and PRESENTER™ will be displayed
as well as DICOMED's Film Recorder, the heart of the
DICOMED system.

Digigraphic Systems Corporation
Booth 2000

10273 Yellow Circle Drive
Minnetonka, Minnesota 55343
(612) 935-9111
Gary J. Paradise
Vice President,
Corporate Communications & Marketing

The EXCEL Series from Digigraphic Systems
Corporation is a business graphics system that
incorporates large screen, "electronic" presentation
and audio graphic teleconferencing. The EXCEL
system is also completely hardware and software
compatible with the IBM-PC/XT microcomputer.
Applications: training, financial analysis, sales
presentations, operational reviews and investor
meetings. Uses: Presentation graphics, business
information graphics and personal decision graphics.

Digital Engineering
Booth 838

630 Bercut Drive
Sacramento, California 95814
(916) 447-7600
Terry Hostek
Marketing Manager

New *HiScan Graphics™* terminals, manufactured and
marketed by Digital Engineering, make use of custom
VLSI architecture which allows the devices to draw
complex graphs at 1,000,000 pixels per second. Avail-
able in two models, *4210 HiScan* provides 800-by-600
non-interlaced resolution in monochrome, while *4205
HiScan* provides 800-by-300 non-interlaced resolu-

tion in color. Both HiScan Graphics terminals provide DEC VT220 text terminal compatibility and Tektronix 4010/4014 graphics terminal compatibility. They are also compatible with Tektronix 4105, 4027, or DEC ReGIS. DE also markets a line of low-cost graphics enhancements, called *Retro-Graphics®*, for upgrading DEC, TeleVideo, Lear Siegler, and Datamedia terminals into full-featured graphics terminals.

Digital Equipment Corporation
Booth 538

146 Main Street
Maynard, Massachusetts 01754
(617) 480-4491
John DiNapoli

Digital's many roads to graphics solutions will be displayed at this year's symposium:

The VT240/1, designed as a business or data reduction graphics terminal, optimized for the office environment.

The VAXstation 100 is Digital's workstation terminal for the technical professional using VAX/VMS, providing menus that allow quick and easy access to screen services.

IVIS is Digital's newest inroad to advanced computer technology, combining the power of a Professional 350, 16-bit minicomputer with the clarity of a laserdisc image.

DECtouch also takes full advantage of the Professional 350, allowing users to "talk" to the computer without words, control commands or a keyboard.

Digital will also display their super microcomputer products, the Micro/PDP-11 and the recently announced Microvax 1. Both are based on the popular Q-Bus software.

Dotronix, Inc.
Booth 1208

160 First Street S.E.
New Brighton, Minnesota 55112
(612) 633-1742
Richard Lemke
Director of Marketing

Dubner Computer Systems
Booth 1701

158 Linwood Plaza
Fort Lee, New Jersey 07024
(201) 592-6500
Keith Thomson
Software Engineer

User Group Contact: Emily Dubner
Animator/Instructor

Dubner Computer will be exhibiting an upgraded
version of the CBG-2 Video Graphics Generator. The
CBG-2 is a multi-purpose computer graphics and
animation system, combining a character generator, a
"paint" system, and a 3-D solid modeling system.
Animation sequences are recorded frame by frame
on a high-speed disk, and played back in real time at
speeds up to 60 fields/second. New features for this
year include hardware anti-aliasing, and texture
mapping software.

Dunn Instruments
Booth 718

544 Second Street
San Francisco, California 94107
(415) 957-1600
Peter McBride
VP Sales & Marketing

User Group Contact: Lyn Cameron
Director, Marketing

Dunn Instruments will demonstrate the full line of
color graphics cameras which output crisp high
resolution color film from most RGB graphics terminal
systems. Film formats include 35mm, SX-70, 4 x 5,
8 x 10, 16mm and 35mm cine, Kodamatic. Dunn
Instruments will exhibit the Model 631, ProColor and
new MicroColor cameras.

DYNAIR Electronics, Inc.
Booth 302

5275 Market St.
San Diego, California 92114
(619) 263-7711
Thomas R. Meyer
Product Manager

DYNAIR Electronics, Inc., a San Diego-based manufacturer of high resolution RGB graphics switching and distribution equipment, will present a solid-state modular 1000 line RGB graphics switching system. Modular units which switch five (5) RGB signals to a single display, up to 1000 RGB signals to 1000 displays will be shown.

Eastman Kodak Company
Booth 1525

343 State Street, Dept. 620
Rochester, New York 14650
(716) 724-4689
F.X. Millor
Coordinator, Sales Development

The following equipment will be shown or demonstrated:

- New KODAK INSTAGRAPHIC CRT Print Imager that enables users to make instant color prints or conventional slides from 9-, 12-, 13- and 19-inch screens.
- KODAK EKTAGRAPHIC III Slide Projectors
- KODAK EKTAGRAPHIC CT1000 16 mm Projector
- KODAK EKTAGRAPHIC AudioViewer/Projector, Model 260AF
- EASTMAN Video Tape—½-, ¾- and 1-inch formats

EIKONIX Corp.
Booth 244

23 Crosby Drive
Bedford, Massachusetts 01730
(617) 275-5070
Stephen J. Emery
Marketing Manager

User Group Contact: Brenda Boomhower
Marketing Coordinator

EIKONIX Corp. is a manufacturer of high resolution image digitizing cameras and systems. Camera/Systems exhibit flexibility, speed and utility for both production and laboratory environments. Applications include Electrophoresis, Gel Scanning, Mapping, X-Rays, Well Logs, Computer Animation, Fonts & Logos, Textile design, B/W prints, Artwork enhancement, electronic text generation, micrographics, general image enhancement and processing. EIKONIX Corp.

introduces their 850 Series CCD Type digital camera. The 850 Series offers the highest possible resolution with a 4096 Solid State CCD array. The CCD array may be retrofitted to the standard Model 78/99 Camera head. Special OEM configurations are available.

Elector USA Inc.
Booth 751

5128 Calle del Sol
Santa Clara, California 95050
(408) 727-1506
Guido Govaert
Sales Manager, Computer Products

Gigatek CCD color raster scan displays. 40 KHz scan, 50 MHz bandwidth, 9, 12, 13 and 19 inch. Variable scan rates.

Saber ST 310/64 very high resolution color raster scan display. 64 KHz scan, 10 MHz bandwidth, 19" 1280 x 1064 Hz refresh. Very high performance. Barco Electronic DCD/PCD/PAD medium resolution raster scan color displays; also composite video, dedicated to particular application areas. Barcodata high performance, high resolution raster scan color graphics projector; variable scan rates; also composite video.

Electrohome Limited
Booth 1602

809 Wellington Street North
Kitchener, Ontario, Canada N2G 4J6
(519) 744-7111
Tom Sutherland
Product Manager

Electrohome will exhibit color and monochrome large screen projection systems for computer/data and graphics applications. The ECP 1000 is a single lens color unit that projects high resolution data and graphics from color terminals, video cassette recorders or video cameras. The single lens system means fast, easy set-up and perfect convergence at all times. The monochrome EDP-57 is designed for large screen, high resolution video displays of alphanumeric and graphic information from computer generated signals. Both systems will interface with most color and mono-

chrome terminals on the market today and project images on curved or flat screens, front or rear projection.

Electronic News
Booth 1112

7 East 12th Street
New York, New York 10003
(212) 741-6722
Zachary J. Dicker
VP/Publisher

Electronic News is edited for professionals in the electronics and computer industries. Its news columns report the technical and business events of the preceding week in the electronics and computer markets—government, industrial, commercial, military, aerospace and consumer. Editorial content covers electronic components, computers and peripheral equipment, instrumentation, communications and data networking, materials and production, electronic distribution and finance. Special features include: Coming Events, Patterns in Pricing, Major Contracts, Data Topics, Government Closeups, and Off-The-Shelf (distribution).

Electronic Systems Products
Booth 1315

One Tico Road
Titusville, Florida 32780
(305) 269-6680
Peg Whitmore
Manager, Marketing Communications

ESP designs, fabricates, manufactures and markets professional high-performance, large-screen video projectors that serve a wide range of customers. Its two main products are the Aquastar IIIC and the Aquaray-RGB. The Aquastar is compatible with most high resolution computers, has a modular quick change tube assembly, interchangeable electronic assemblies, and a 500 lumen light output. Aquaray-RGB is compatible with most medium resolution computers, has self-diagnostic capability, an exclusive micocomputer control, and a 400 lumen light output. Representative applications for both units include teleconferencing, computer display, management presentations, education and training, entertainment and trade shows.

Elographics, Inc.
Booth 149

105 Randolph Rd.
Oak Ridge, Tennessee 37830
(615) 482-4100
Bob Highfill/Mike Higginbotham
Marketing Mgr./Sales Engineer

The Elographics TIX (Touch Information Exchange)
Screen lets you interact with a computer system
simply by touching the display screen. The TIX is a
thin, transparent, rigid glass panel that form fits the
front of the display. Militarized versions are available
that withstand harsh and extreme environments.

The E232 Cursor Control Pad is designed for com-
puter terminal cursor motioning and control. The pad's
controller outputs high resolution coordinates of the
position of the operator's finger on the pad. It is an
excellent man/machine interface where ease of oper-
ation, limited space, or high reliability are required.

Engineering Automation Systems, Inc.
Booth 828

936 Silas Deane Highway
Wethersfield, Connecticut 06109
(203) 237-3637
Dina Wenger
Marketing Communications Specialist

EAS offers a low-cost, total solution for PCB
engineering: the EAS/700 Series System for PCB
design, and the EAS/300 Personal Engineering
Workstation for sophisticated, desk-top design
capture. Featuring complete integration, the EAS
systems communicate either through an
ETHERNET™ (EAS/LAN) or RS-232 interface. The
recently introduced EAS/300, based on the IBM-PC,
features proprietary software as well as licensed
software such as PC-CAPS™ (for design capture
using hierarchical design methodology) and PC-
LOGS™ (for on-line, interactive logic simulation).

Down-loading net-list data to an EAS/700 for PCB
layout, the EAS/300 also receives back-annotation
data from the EAS/700. This integration ensures
design and documentation integrity, and top
productivity.

Equitable Life Leasing Corporation
Booth 1809

10251 Vista Sorrento Parkway
San Diego, California 92121
(619) 458-4400
Roderic L. Eaton
Senior Vice President

Leasing services for a wide variety of technological
and service related equipment, including CAD/CAM
equipment, computers and computer peripherals.
Products offered: Operating leases, tax-priced leases,
and national vendor programs available.

Eutectic Electronics, Inc.
Booth 1308

8608 Jersey Court
Raleigh, North Carolina 27612
(919) 782-3000
David M. Smith
Vice President

Eutectic Electronics introduces the VDPIII, a low cost
dynamic refreshed Vector Display Processor. The
VDPIII reproduces any 3-Dimensional line structure
on a CRT. The image can then be manipulated to
examine the 3-D features, and mathematical or
statistical computations can be made regarding the
nature of the image at any viewing angle. The VDPIII
receives commands and data from a host computer
and the user can manipulate the image smoothly and
in real time with a joy stick, data tablet, or other
interactive device. FORTRAN software is included.

Fibronics International, Inc.
Booth 1502

325 Stevens Street
Hyannis, Massachusetts 02601
(617) 778-0700
Linda Lowell
Marketing & Communications

Fibronics will display products providing a high
resolution graphic link between Computervision
CPU's and Computervision workstations (also IBM).
Fibronics' main feature is to extend the transmission

distance of color, high resolution graphic display and full duplex data update from 30 meters to 3 kilometers via fiberoptic cable with full immunity to RGI/EMI, sparks, lightning, etc. Each color (RGB) is converted from coaxial into fiberoptic and reconverted into coaxial on the other extremity. Data update is full duplex carried by multiplexing several 26 pin connectors allowing printer, digitizer, keyboard, and light pen to be connected at the workstation.

Floating Point Systems, Inc.
Booth 1134

3601 S.W. Murray Boulevard
Beaverton, Oregon 97223
(503) 641-3151
Gayle Furlow
Marketing Communications Promotions
Coordinator

Floating Point Systems, Inc., based in Beaverton, Oregon, is a leading manufacturer of special-purpose computers called array processors. FPS was incorporated in 1970, and today, has more than 30 sales offices in North America, Europe, Asia, and Africa.

The FPS-5000 Series Products, consisting of six basic product groups, will be featured at SIGGRAPH '84. These products are offered in a base configuration which includes 256K words of data memory, 12.5K words of table memory, a general-purpose control processor, and a single floating-point coprocessor.

These new high-performance array processors address the needs of the image and signal processing communities.

Florida Computer Graphics, Inc.
Booth 938

1000 Sand Pond Road
Lake Mary, Florida 32746
(305) 321-3000
Jo Hunnicutt
Manager, Marketing Support

User Group Contact: David L. Heys
Manager, Contracts and Administration

FCG is announcing the Beacon 850; a 32 bit Unix™ micro mainframe based on the NSC 32032 with multiple color graphic workstations and networking.

The new system has 2-8 MB's of ECC RAM with 16 MB virtual memory, bit-slice graphics, GKS display list and 30 CAD. Additional products: High Resolution slide system, Color Image Capture System, Beacon 440 DesignPlus, Beacon 420 Illustrator and the Beacon 415 Decision Support System. Hardware and software, integrated and ready to use.

FutureNet Corporation
Booth 1424

21018 Osborne Street
Canoga Park, California 91304
(818) 700-0691
Terry A. Zimmerman
Vice President, Marketing

User Group Contact: Mike Basson
Senior Applications Engineer

FutureNet's DASH-1 converts an IBM PC/XT into a schematic designer, capable of producing top quality schematics for PC boards or semi-custom devices. DASH-1 automatically generates Net Lists, List of Materials and Design Check Reports. A logic and fault simulator package capable of handling designs of up to 10,000 gates locally is also available.

In addition, interfaces to larger CAD Systems are now also on-line. Classic examples are *TEGAS, SCICARDS, REDAC* and *Computervision.* Direct connection to DEC, IBM and other computers is a snap.

Both add-on packages to fit your IBM PC or XT and complete turn-key systems are available.

W.W. Gaertner Research, Inc.
Booth 1511

205 Saddle Hill Rd.
Stamford, Connecticut 06903
(203) 866-3200
William M. Hawkins
Manager, Graphics Systems Development

W.W. Gaertner Research, Inc. is displaying the INRAD II Real-Time Graphics Development system. The INRAD System is part of a new generation of high performance graphics engines providing the end-user with a powerful tool for creating real-time (30 Hz or 60 Hz) 3D high-resolution graphics. INRAD features real-

time hidden surface removal, multiple channel output and a modular system architecture for efficient system upgrade. Designed primarily to operate as a standalone system, the INRAD II is available in both laboratory and ruggedized airborne versions. Current installations include advanced avionics graphics, moving map and real-time radar applications.

General Electric Company
Booth 138

Projection Display Products Operation,
Electronics Park 6-205
Syracuse, New York 13221
(315) 456-2974
Charles P. Venus
Manager Domestic Sales

General Electric Talaria Large Screen Video projector for use in training and education, management information, entertainment, command, control and simulation. The unique light valve projector will be on display at the booth and in seminars. Models PJ5055, PJ5155 and the new PJ4500 will be shown at the conference.

Genisco Computers Corporation
Booth 851

3545 Cadillac Ave.
Costa Mesa, California 92626
(714) 556-4916
Daniel Jones
Director of Product Marketing

Genisco manufactures high performance interactive graphics and imaging terminals and systems for use in CAD/CAM, real-time operations in military command and control, and telecommunications, as well as satellite and medical imaging.

GIXI Inc.
Booth 2108

5591 West 78th Street
Edina, Minnesota 55435
(612) 944-5353
Ronald Johnson
Purchasing

RADIANCE 2000: 8-color 2048 x 2048 graphic display, Tektronix compatible (2048 x 1568 displayed on a 20″ screen).

RADIANCE 320: 256 simultaneous colors, 640 x 488, Tektronix compatible, 20″ screen. Many features, functions, peripherals available.

GKS:ANSI graphic Fortran 77 package with many I/O computer interfaces and device drivers.

GIXI's products are high resolution color graphics displays for CAD/CAM, image processing and imagery Graphic software.

Gordon Publications, Inc.
Booth 1206

Box 1952
Dover, New Jersey 07801
(201) 361-9060
Ronald Hill
Publisher, Gordon Show Dailies

Gordon Publications will be publishing and distributing the *GRAPHICS SHOW DAILY* at SIGGRAPH and will be displaying *Computer Products* magazine and their new publication, *Scientific Computing and Automation* that debuts in September.

Gould Inc., Imaging & Graphics Division
Booth 228

1870 Lundy Avenue
San Jose, California 95131
(408) 263-7155
Mike Battaglia
National Sales Manager

User Group Contact: Jim Weil
Applications Engineer

Gould Inc., Imaging and Graphics Division, formerly DeAnza Systems, will show the Real-Time Digital Disk accepting live RS-170 inputs, then outputting the sequences at 512^2 or 1024^2 with a variety of readback formats.

We will also show LIPS and LIPS Plus software for remote sensing on the IP8500, 1024^2 Image Processing Software, and FD5000 LIPS for low budget image processing.

Additional new hardware will include our Auxiliary Graphics Processor and may include our Hardware Warper.

Graphic Controls Corporation
Booth 137

189 Van Rensselaer St., P.O. Box 1271
Buffalo, New York 14240
(716) 853-7500
Paul Klas
Product Marketing Manager

Graphic Controls offers the computer graphics industry the most complete line of plotter supplies products.
Available are: Dielectric media and toners for electrostatic plotters and printers, ink-writing media, pens, points, inks, adapters and accessories used in a variety of plotter applications including CAD/CAM and Work Station Graphics.
Strict quality assurance coupled with the most rigidly designed production equipment have contributed toward Graphic Controls worldwide reputation as an industry leader in Plotter Supplies.

GraphOn Corporation
Booth 800

1901 S. Bascom Ave., Fifth Floor, Tower One
Campbell, California 95008
(408) 371-8500
Mason Killebrew
Director, Marketing and Sales

GraphOn will exhibit the GO-100 and GO-140 terminals. The GO-100 provides all of the functions of the DEC VT100 including advanced video and printer options. The GO-140 combines the VT100 personality with the graphics functions of the Tektronix 4010 series. In addition to selectable alphanumerics enhancements, the GO-140 offers numerous graphics extensions. The GO-100 and GO-140 are plug-compatible with the terminals they emulate. Selectable enhancements allow the user to maximize terminal functionality while ensuring complete compatibility with existing system hardware and software.

Grinnell Systems Corporation, a Gulton Co.
Booth 310

6410 Via Del Oro Drive
San Jose, California 95119
(408) 629-9191
Jim Hixson, Harley Hallett, & Leila Robinson
Product Marketing Managers & Marketing
Administrator

New products are featured for both the GMR 270 and
Model 2800 Product lines. A Quad Density Memory
Card for the GMR 270 Family is shown in a compact
new configuration; the GMR 275E. In addition to IPEX
Image Processing Software, the GMR 275E demon-
strates a newly developed software driver for PVI's
DI-3000 SIGGRAPH Core Graphics package.

The newly released Model 2800-32 runs its own imple-
mentation of Grinnell's Image Processing EXtension
(IPEX) software for the Unix and VMS operating
environments.

A low-cost eight color thermal hardcopy printer from
Gulton Industries, Inc., Graphic Instruments Division,
is also on display.

GTCO Corporation
Booth 113

1055 First Street
Rockville, Maryland 20850
(301) 279-9550
George Helser
Director of Marketing

GTCO is the leading manufacturer of electromagnetic
digitizing tablets.

The DIGI-PAD family of digitizing tablets is available in
sizes 11″ x 11″ up to 42″ x 60″. Highly flexible, the
DIGI-PAD has many user selectable features, includ-
ing four operating modes and three standard output
formats. Resolution and repeatability is .001″. Input
devices include a solid state stylus (available with a
tilt sensing option), a pressure sensing stylus, and
one, four, five and sixteen button cursors with a glass
cross-hair reticle.

The Micro DIGI-PAD family of digitizing tablets, in
sizes 6″ x 6″ and 12″ x 12″ is a low-cost, low power
digitizing tablet for common tracing, menuing and
cursor-positioning applications.

Harris Corporation, Computer Systems Division
Booth 1403

2101 West Cypress Creek Road
Ft. Lauderdale, Florida 33309
(305) 974-1700
Alfred Sharpe
Exhibits Manager

The HARRIS 800 high performance super-mini-computer, design workstations, graphic display terminals and CAD/CAM applications software will be exhibited. Operating at 1.6 MIPS, the HARRIS 800 handles a wide range of engineering and high technology applications, providing both virtual memory flexibility and real-time performance.

Harris will demonstrate PATRAN-G, ANVIL 4000 and several other software packages, all running simul-taneously on the HARRIS 800 super-minicomputer. This shows the capability to take users from design concept through drafting and analysis to final drawings on one super-minicomputer with advanced graphics terminals and graphics software.

Hitachi America, Ltd.
Booth 1012

59 Route 17 South
Allendale, New Jersey 07401
(201) 825-8000
Dave Sapper
National Sales Manager

Our HM-4619 is a high resolution RGB color monitor featuring 1280 x 1024 pixel resolution at 60 Hz non-interlace conditions. The HM-3719 features 1024 x 1024 pixel resolution in a compact, modular package with flexible, OEM design. Hitachi RGB monitors are used where high performance color presentations are required such as CAD/CAM/CAE, process control and general computer graphics applications.

Hitachi Denshi America, Ltd.
Booth 1232

175 Crossways Park West
Woodbury, New York 11797
(516) 921-7200
Tommy Yamashita
Visual Products Division Manager

User Group Contact: Madeleine Lanza
Advertising Manager

The following Computer Graphic Monitors will be on display:
12" Color Display (RGB TTL) 24 KHz (fH)
14" Color Display (RGB TTL) 24 KHz (fH)
14" Color Display (RGB TTL) 31 KHz (fH)
Also on display: HD 4800 FP and HD 9600 New High Speed Modems and HM-9671A Card Modem.

Houston Instrument
Booth 1006

8500 Cameron Road
Austin, Texas 78753
(512) 835-0900
Jim Raska
Product Manager

Houston Instrument will display plotters and digitizers which are compatible with over 175 graphics software packages for micro, mini, and mainframe computers. Applications include business, engineering, architecture and mechanical drafting. The new DMP-51 C&D size plotter features a speed of 22 ips, 4G and .001" resolution. HI will also display these plotters: C&D size DMP-41; E-size CPS-19; eight-pen DMP-29 and compact DMP-40 for up to 11" x 17" graphics; and the 11" x 11" Hipad digitizer and the large Series 7000 digitizer.

IBIS Systems, Inc.
Booth 1319

5775 Lindero Canyon Road
Westlake Village, California 91362
(818) 706-2505
Harvey Raider
Vice President, Sales

IBIS Systems will display an IBIS Model 1400, large capacity (1.40 Gigabyte), high-speed (12 Mps) thin film media disk drive applicable for imaging on graphic systems. Also on display will be a cut-away model of the head disk assembly as used in the Model 1400.

ID Systems Corporation
Booth 332

4089 Leap Road
Hilliard, Ohio 43026
(614) 876-1595
Dan Lavon
Customer Sales Representative

ID Systems Corporation is the innovator in the color graphics terminal industry. Our ID-100 and the new ID-200 graphics terminals serve both business and engineering. Our terminals are IBM, Tektronix 4010, 4014, and 4027 compatible while also being fully DEC VT-100 compatible. We are supported by many software packages such as ISSCO and SAS. ID Systems also offer interfaces for the ID-100 and the ID-200 lines, including screen dump hardcopy, lightpen, digitizer, mouse, trackball. The new ID-200 also offers a 14″ or 19″ monitor along with split imaging capabilities. The resolution is 1280 x 480. ID Systems Corporation; The Graphics Innovator.

IEEE Computer Society
Booth 1500

10662 Los Vaqueros Circle
Los Alamitos, California 90720
(714) 821-8380
Janet Endrijonas
Advertising Manager

The IEEE Computer Society will display technical books and magazines. Membership information will also be available.

IGC Inc.
Booth 1723

400 Oser Avenue
Hauppauge, New York 11788
(516) 231-0006
Todd Martin
National Sales Manager

IGC Inc. will be demonstrating IBM PC based 3-D graphics displayed on a 1280 x 1024 bit mapped image. True shaded 3-D images will also be displayed with the images manipulated locally. IGC will also demonstrate a new interface which permits an IBM

PC to transmit high speed bi-directional data and emulate the DEC VAX DR11W.

Ikegami Electronics (U.S.A.) Inc.
Booth 1022

37 Brook Avenue
Maywood, New Jersey 07607
(201) 368-9171
Craig H. Sloss
Sales Administration and Mktg. Services Manager

User Group Contact: Frank Heyer
Manager Sales and Engineering
(213) 534-0050

Ikegami will be demonstrating a full line of raster-scan CRT display monitors for the OEM computer industry.

For over 37 years, Ikegami has been an innovative leader in the broadcast video industry. By applying its years of broadcast video experience to designing and manufacturing high quality graphics and alpha-numeric display monitors, Ikegami has quickly risen to the top as a leading supplier to quality conscious OEM's.

Both medium and high resolution color and mono-chrome models will be shown.

IMAGEN Corporation
Booth 1925

2660 Marine Way
Mountain View, California 94043
(415) 960-0714
Mary Basile
Marketing Communications Manager

IMAGEN Corporation manufactures non-impact page printing systems delivering the ability to merge text and graphics, support various text composition systems, provide font flexibility, and support various mechanical emulations such as line printer, daisy wheel and Tektronix 4014. In addition, Imagen printer systems include a powerful proprietary graphics primitive language, imPRESS, which provides for the creation of graphic primitives, forms overlay, and other applications support. Imagen currently markets the 5/480, a 480 dpi 5 page per minute laser printer, the 8/300, an 8 page per minute, 300 dpi laser printer,

and a 60/240, a 60 page per minute, 240 dpi ion deposition printer, all providing the functionality listed above, but meeting applications calling for varying print speeds and resolutions.

Imaging Technology Incorporated
Booth 1245

600 West Cummings Park, Suite 5500
Woburn, Massachusetts 01801
(617) 938-8444 X-202
Robert Rudolph
Marketing Communications Coordinator

Imaging Technology Incorporated represents innovation in board level image processing products for OEM systems integrators. The company has developed a series of image processing modules that are plug-compatible with the most popular bus architectures in use today. These compatible boards team up to integrate a complete real-time video processing or high resolution graphics system. This system is capable of retrieving images that are stored in the frame buffers for analysis or enhancements. Typical applications utilizing image processing are Factory Inspection Systems, Medical Imaging, Teleconferencing, Microscopy, Infrared Thermography, Astronomy, Security, Motion Analysis, Graphic Design, Low Light Image Analysis and many more. For more information or a demonstration, visit our booth #1245 during SIGGRAPH.

Inflight Services, Inc.
Booth 432

485 Madison Avenue
New York, New York 10022
(212) 751-1800
Frank J. Genovese
Director of Sales

ImagiTex, Inc.
Booth 1415

77 Northeastern Boulevard
Nashua, New Hampshire 03062
(603) 889-6600
John G. Felahi
Product Marketing Manager

User Group Contact: Robert M. Hanselman
Manager, Marketing Support

ImagiTex, Inc. will be demonstrating the ImagiTizer
Series of products, including the continuous tone
imagery and line art scanner with black & white and
color digitization capabilities, the image processor,
and the image processing workstation. Live demon-
strations will show the ImagiTizer subsystems doing
the image capture, enhancement and processing.

Imtec Equipment Inc.
Booth 2019

1083 Thomas Busch Memorial Highway
Pennsauken, New Jersey 08110
(800) 257-7460 (In New Jersey, (609) 663-3212)
Ronald T. Chucola
Mktg. Support Manager

At Booth 2019, Imtec will show the Imtec Microfilm
Laser Plotter MLP-1, which converts digitized data
from magnetic tapes off CAD Systems into high-
resolution 35mm microfilm aperture cards.

Imtec will also show the Imtec 2000 Microfilm Reader/
Printer with a screen size of 18 x 24 inches. The
Imtec 2001 Engineering Reader will also be on
display.

Infinite Graphics Incorporated
Booth 400

4611 East Lake Street
Minneapolis, Minnesota 55406
(612) 721-6283
Roger Rusche
Vice President Sales and Marketing

Infinite Graphics Incorporated is a turnkey supplier of
Desktop CAD/CAM Systems. The "IGI Desktop 2100"
is an IBM PC XT based system with high resolution
graphics and 2D CAD/CAM software capabilities. The
system offers multiple application capabilities in sche-
matics/printed circuit design and artwork generation,
mechanical design and drafting, facilities and space
planning with relational data base reporting. Full
featured CAD/CAM is available on your desk.

INMOS Corporation
Booth 1241

P.O. Box 16000
Colorado Springs, Colorado 80935
(303) 630-4493
O. Fred Jones
Applications Manager-Memory Products

User Group Contact: Brad Hartman
Marketing Manager-Microprocessor Products

INMOS is a leading supplier of high performance
NMOS and CMOS semiconductors for your graphics
applications, featuring:
IMS2620 and IMS2630 64K NMOS DRAMS
IMS1423 and IMS1600 16K and 64 CMOS SRAMS
and 4Q'84
IMS2800 256K CMOS DRAM
IMST424 Concurrent Microprocessor plus our other
outstanding VLSI Products

International Imaging Systems
Booth 218

1500 Buckeye Drive
Milpitas, California 95035
(408) 262-4444
Dave Racionzer
Applications Engineering Manager

International Imaging Systems(I2S) is the recognized
leading supplier of add-on, turnkey, and OEM digital
image processing systems for remote sensing,
medical, and industrial machine vision applications.
This year, I2S will be demonstrating the latest release
of System 575 Applications Software Modules on the
high-performance, UNIX-based, dual 68000 Image
Processing Workstation. In addition, up-to-date
information will be available on the System 600
distributed image processing environment incorporat-
ing seismic visualization, gravity magnetics, and
mapping software modules. Information will also be
available on the ODIN family of Machine Vision
processors and the latest additions to our range of
medical OEM Image Processors.

Intecolor Division, Intelligent Systems Corporation
Booth 306

225 Technology Park
Norcross, Georgia 30092
(404) 449-5961
Tully Johnstone
Manager of Telemarketing

Intecolor will display its 2427 color graphics work-station that includes an ink-jet printer. The 2427 is a preview graphics device that emulates Tektronix 4010-4014 and is compatible with the Tektronix 4027 and the VT52 and VT100. Also, the VHR-19 (1024H x 1024V resolution) terminal for preview graphics is Tektronix 4014 compatible and offers 8 colors out of a possible 4096. The E8001 Series of color graphics terminals also will be displayed. This is the terminal that has captured more than half of the process control market.

Interactive Machines, Inc.
Booth 1116

733 Lakefield Rd.
Westlake Village, California 91361-2694
(818) 707-1880
Kenneth E. Dozier
President

User Group Contact:
George Paul Semerau
Executive Vice President

4K x 4K x 256K color raster. Random graphics. Color coded stereo. Real-time, backfacing cul.

Intran Corporation
Booth 1419

7429 Bush Lake Road
Edina, Minnesota 55344
(612) 835-9903
Lynda Miyata Gray
Marketing Support Manager

Intran Corporation will be exhibiting the MetaForm™ electronic pre-press workstation, a front-end tool dedicated to the interactive and visual management of the common page. Powerful software programs

allow the user to visually create and interactively edit forms, graphics and fonts on a high-resolution screen. Applications include the generation of technical documentation manuals and business forms for in-plant, insurance, financial, tax, business forms, commercial printing and service bureau sites, to name a few. MetaForm supports Xerox 9700/8700 laser printers and select digital phototypesetters (Lasercomp, VideoComp 570, Compugraphic 8600, APS-5). Also on display will be ECRM's Autokon 8200 digitizer and the QMS Lasergraphix 1200 proofer/printer.

ISSCO
Booth 406

10505 Sorrento Valley Road
San Diego, California 92121
(619) 452-0170
Jeff Anderson
Director of Marketing

User Group Contact: Louise Courtier
Users Group Liaison

ISSCO is the world's leading independent supplier of data representation graphics software used on mainframe and minicomputers for business, scientific and engineering applications. ISSCO's products are: TELL-A-GRAF, an English language command system for nonprogrammers to develop business graphics; CUECHART, a prompting system used with TELL-A-GRAF that allows computer novices to start producing charts immediately; THE DATA CONNECTION, accesses all computer-stored data and converts it automatically into graphical format; TELLAPLAN, project management and reporting application software for all levels of users; and DISSPLA, a high-powered library of FORTRAN subroutines for use by computer programmers.

Ithaca Intersystems Inc.
Booth 441

1650 Hanshaw Road
Ithaca, New York 14850
(607) 273-2500
Jan N. Potts
Marketing Communications Manager

Ithaca will display two advanced color graphics terminals, GRAPHOS II and GRAPHOS III. They feature Shiftable Cell™ Architecture and 16 independently managed screen windows. The windows have individual color tables and are central to device independent information. They also allow simultaneous emulation of DEC VT-100 and Tektronix 4010 terminals. Both terminals communicate through RS-232 connector with any host computer and attach to a variety of monitors. An MC68000 processor in the terminal runs subroutines in a command set supplied in firmware. The two terminals differ in memory, speed and number of colors. Process control, UNIX environment, mapping, etc.

James River Graphics, Inc.
Booth 1522

28 Gaylord Street
South Hadley, Massachusetts 01075
(413) 536-7800
Kenneth W. Courtenay
Marketing Manager

JVC
Booth 2007

41 Slater Drive
Elmwood Park, New Jersey 07407
(213) 537-6020
York Takahashi
Manager, CRT Display Division

CRT monitors including high resolution monitors.

King Concepts Corporation
Booth 2001B

5190 West 76th Street
Minneapolis, Minnesota 55435
Dan Lucariello
Sales Manager

Kloss Video Corporation
Booth 2113

145 Sidney Street
Cambridge, Massachusetts 02139
(617) 547-6363
Steven P. Jackson
Professional Products

The VideoBeam 2000 professional high resolution RGB projection monitor will be demonstrated. It is designed specifically for high resolution large screen video display of computer generated color graphic and alphanumeric images. The VideoBeam 2000 also displays composite video (tape, discs, color camera, off air or cable signal) with outstanding color and superb image clarity. The VideoBeam 2000 displays either 6½ or 10 foot images and may be used as a portable desktop or ceiling mount projector. Kloss Video Corporation manufactures the most extensive line of projection televisions today at its plant in Cambridge, Massachusetts.

KMW Systems Corporation
Booth 906

8307 Highway 71 West
Austin, Texas 78735
(512) 288-1453
Jean Richards
Director Marketing Administration

KMW will feature its VP10, 20, 30 Series of Vector Processors, controllers designed to eliminate host computer overhead associated with the vector-raster conversion task. The VP10 is the latest single board technology for connecting the low cost raster hard copy devices to a mainframe computer. The VP20 is most usable in a seismic plotting application. The VP30, KMW's most sophisticated Vector Processor, is for use with large wide-bed electrostatic plotters. These products accept random (or sectored) vectors, symbols and other graphic information from a host mainframe computer, translate the data at computer speed and drive the various output devices at rated speed, independent of the hard copy device manufacturer. Host input formats include KMWPLT, Calcomp 906, 907, 960 and 925 emulation.

KURTA Corporation
Booth 1605

4610 S. 35th St.
Phoenix, Arizona 85040
(602) 276-5533
Steven V. Stine
Vice President, Marketing

User Group Contact: Janet Rice
Marketing

KURTA Corporation is exhibiting their DIMENSION SERIES of graphic tablets and digitizers. They range in sizes from 8.5" x 11" to 42" x 60".

KURTA SERIES ONE, with an 8.5 x 11" and 12 x 12" size, has a resolution of 200 ppi. These features along with its ergonomic styling make it most suitable to low cost computer and CAD workstations.

KURTA SERIES TWO has a 12 x 17" active area and resolutions of 200, 400 and 1000 ppi. The ergonomic styling and accuracy makes it ideal for workstation applications.

KURTA SERIES THREE features sizes to 42" x 60" with resolution of 1000 ppi and dual microprocessors.

Lang Systems, Inc.
Booth 107

1010 O'Brien Drive
Menlo Park, California 94025
(415) 328-5555
Tim R. Shelton
Sales Manager Graphics Products

VideoSlide35 offers a quick and low cost way to generate 35mm slides and Polaroid SX-70 prints of images from color terminals such as the IBM 3279 or with personal computer systems such as IBM PC and Apple II and Apple III. The product accepts video inputs, including RGB RS-170, NTSC, TTL RGB and others. VideoSlide35 connects to video output or in parallel with the monitor used by the operator. Controls for the table top unit consist of an on-off switch, three thumb-wheel switches for color balance and exposure time control. Additional software is not required for operaion. VideoSlide 35 accepts conventional 35mm film or Polaroid's Polachrome™ instant process slide film.

Lexidata Corporation
Booth 518

755 Middlesex Turnpike
Billerica, Massachusetts 01865
(617) 663-8550
Jack Huisman
Product Marketing Manager

User Group Contact: Joyce Anderson
Marketing Communications Specialist

Lexidata manufactures high performance raster display products used in CAD/CAM, medical, defense and graphic arts applications. Featured at SIGGRAPH '84 are LEX 90, SOLIDVIEW, IMAGEVIEW and the Series 2000 graphics terminals.

Lundy Electronics & Systems, Inc.
Booth 1815

One Robert Lane
Glen Head, New York 11545
(516) 671-9000
Joseph Mittleman
Director, Corporate Communications

Machine Design
Booth 1140

Penton Plaza
1111 Chester Avenue
Cleveland, Ohio 44114
(216) 696-7000
William T. Tucker
Publishing Director

Machine Design is a technical journal which features editorial and advertising directed to the professionals who specify and buy computer-based equipment for design and manufacturing applications.

Management Graphics, Inc.
Booth 132

1401 East 79th Street
Bloomington, Minnesota 55420
(612) 854-1220
Frank Schneider
Vice-President Operations

User Group Contact: Donna Roberts
User Group Coordinator

Management Graphics, Inc. is a manufacturer of computer slide making systems. These systems can produce 20-60 speaker support slides per hour and are suitable for slide production houses, graphics design studios, corporate A/V departments and medical communication professionals.

TTS/Plus System—total system for fast, in-house production capacity of up to 60 slides an hour. It

performs three functions at one time, responsive to user commands with fast video screen updates.

QM-1 QUICKCHART Concentrator—Add to a TTS or TTS/Plus System and accommodate up to six QUICKCHART users at one time. It handles many administrative functions and includes a library of QUICKCHART formats, invoice printer, and console printer.

MASSCOMP
Booth 1144

One Technology Park
Westford, Massachusetts 01886
(617) 692-6200
Catherine Pfister
Trade Show Administrator

MC-500 and WorkStation-500 both support a Real-Time virtual memory UNIX-based operating system. Both products are designed as 32-bit VLSI CPU's with 4Kb data/address cache and up to 6 Megabytes of ECC memory. An array processor and a high performance floating point processor can optionally be configured for single and double precision engineering computations. The MC-500 additionally features a Data Acquisition and Control processor which enables analog acquisition (12 bit) at a million samples per second. A highly flexible performance architecture offloads the CPU, and performs graphics functions, Ethernet protocol work, each in a separate microprocessor.

Masterbyte Computers (USA) Inc.
Booth 2012

117A East 71st Street
New York, New York 10021
(212) 570-0770
Martin Green
President

Masterbyte Computers was started on April 5, 1983 in London, England. The aim of the organization as set down at that time was to further the industrial and engineering applications of microcomputers. Masterbyte Computers (USA) Inc., a companion company was setup on December 11, 1983. Its aims are specifically geared toward the development of micro-

based graphics and CAD systems. Our products exhibited at SIGGRAPH '84 represent some efforts of both organizations during the past six months.

Matrix Instruments, Inc.
Booth 618

One Ramland Road
Orangeburg, New York 10962
(914) 365-0190 ext. 383
Arthur Shufelt, V.P. Color Graphics Marketing

User Group Contact: Mary Drummond
Marketing Support Manager

Digital and analog color graphic film recording equipment for making high resolution (up to 4096 pixels) 35mm slides, 8 x 10 transparencies or prints, or 4 x 5 prints from your mainframe or mini computer.

Matrox Electronic Systems Ltd.
Booth 300

5800 Andover Avenue
Montreal, Quebec, Canada H4T 1H4
Gerry Sullivan
Marketing Manager

Matrox Electronic Systems Ltd. is a major manufacturer of board level color graphics display controllers. Featured at the Matrox exhibit is the new SX-900 graphics display controller. The SX-900 is a single, multibus-compatible board which is capable of generating graphic displays of up to 540 x 480 at 60Hz non interlaced, with up to 8 bits/pixel (256 simultaneously displayable colors). Matrox also manufactures and will be exhibiting a 1024 x 1024 intelligent color graphics terminal (GXT-1000A).

McDonnell Douglas Corporation
Booth 441

P.O. Box 560
Colchester, Vermont 05446
(802) 655-3159
Jack Scully
Vice President Marketing

Polhemus Navigation Sciences, a division of McDonnell Douglas Electronics Company will

demonstrate 3SPACE Digitizer, a three dimensional
digitizer that is a true six degree-of-freedom measure-
ment machine. Especially designed for ease of use,
the unit has numerous uses including building three
dimensional data bases, animating images, and per-
forming volume analysis. Configured as a peripheral
add-on, the product is targeted at OEM firms capable
of integrating it into larger systems for CAD and
graphic workstation applications.

MCI/Quantel
Booth 846

3290 West Bayshore Road
Palo Alto, California 94303
(415) 856-6226
George A. Grasso
President

MCI/Quantel manufactures and markets a wide
range of digital video products for broadcast use and
for scientific/industrial applications. Broadcast prod-
ucts on exhibition include: the Paint Box, a digital
graphics/paint/character generation/animation
system; and the DLS 6000 series digital library system
for storage and replay video still pictures.

Measurement Systems Inc.
Booth 600

121 Water Street
Norwalk, Connecticut 06854
(203) 838-5561
Donald W. Fisher
Marketing Manager

Measurement Systems is a manufacturer of manual
controls that interface human operators to machines.
Joysticks, stiff sticks, trackballs and mouse controls
are offered with a variety of interfaces such as analog,
TTL level pulse or coded digital including RS232C,
RS422 or parallel binary.

Media Horizons, Inc.
Booth 2017

475 Park Avenue South
New York, New York 10016
(212) 725-2300
Aaron Lafer
Vice President, Advertising & Sales

Media Horizons, Inc., will have on display our latest issues of *Audio-Visual Communications, Government Data Systems, Computer Graphics Today, Industrial Photography, Videography, Marketing Communications, Biomedical Communications* and *Law Enforcement Technology.*

Megatek Corporation
Booth 606

9605 Scranton Road
San Diego, California 92121
(619) 455-5590
Hiram French
Vice President, Marketing

Megatek will exhibit its entire line of Whizzard computer graphics systems and terminals and will also be introducing a new graphics system at the show.

Megatek Corporation
Booth 1018

9605 Scranton Road
San Diego, California 92121
(619)455-5590
Rick Kreysar
Product Marketing Manager

User Group Contact: Tim Scott
TEMPLATE Specialist

TEMPLATE is a comprehensive three dimensional graphics subroutine library. TEMPLATE is computer independent supporting most 32 bit and larger computer and device intelligent which allows any 2D or 3D, batch or interactive application to be written. TEMPLATE features 3D software display list and segmentation, support of interactive input devices, metafile capabilities and workstation model and post processor application. Written in Fortran, TEMPLATE is applicable to any applications within the engineering scientific marketplace.

MegaVision
Booth 1223

P.O. Box 60158
Santa Barbara, California 93160
(805) 964-1400

Kenneth W. Boydston
Systems Engineer

User Group Contact: Richard Colvin
Senior Engineer

MegaVision is a new image processing company formed in 1983 and committed to advancing the state of image processing art while increasing the scope of image processing applications through dramatic improvements in the cost/performance ratio.

MegaVision has chosen the SIGGRAPH '84 conference to formally introduce and demonstrate the 1024 XM digital image processor. The 1024 XM is a true thousand line processor with computational power and speed several times that of standard five hundred line image processing systems. Significant architectural and technological improvements give the 1024 XM great flexibility and an unprecedented cost/performance ratio.

Mercury Computer Systems, Inc.
Booth 1822

600 Suffolk Street
Lowell, Massachusetts 01854
(617) 458-3100
John Montelione
Vice President, Marketing

Mercury Computer Systems, Inc. is a manufacturer of array processors for microcomputers with applications in image, graphic, signal and scientific processing, This year Mercury introduced the first two products of its ZIP 3200 Series Array Processors, the ZIP 3216 and the ZIP 3232, which feature an innovative dual processor architecture executing 30 million instructions/computations per second and a software development environment which allows users to write, debug, and time ZIP programs on computers ranging from the IBM-PC to DEC's VAX computer, without ZIP hardware. An extensive library of algorithms for image, vision, and graphic processing, callable via high level language commands is available.

Metheus Corporation

Booth 212

P.O. Box 1049
Hillsboro, Oregon 97123
(503) 640-8000
Gary Romans, Marketing Manager
Bob Behrens, Marcom Manager
Jim Buchanan, Communications Director

Metheus offers three high-performance graphics controllers: Omega 500 has 1280 x 1024 x 8 resolution at 60 Hz non-interlaced; drawing rates of 1.5 million pixels/sec for vectors, 30 million for filled rectangles; 256 colors from 16.7 million palette. Omega 400 amd Omega 300 feature 1024 x 768 resolution at 33 Hz; drawing rates of 1 million pixels/sec for vectors, 16-million for polygon fill; and 16 colors (Omega 300) or 16 or 256 colors (Omega 400) from 16.7 million palette. Metheus' engineering workstations division provides UNIX™ based 32-bit computer with high-performance color graphics, plus complete software tools for a range of electronic CAD applications.

Micro Control Systems, Inc.

Booth 451

27 Hartford Tpke.
Vernon, Connecticut 06066
(203) 647-0220
Jeff Hall
Marketing Representative

The Midwest introduction of the PERCEPTOR, a high performance RS 232 compatible 3-dimensional Graphics Digitizer and Data Acquisition Device. We will also be demonstrating our full 2 and 3 dimensional microprocessor-based CAD graphics system for the mechanical design, architectural, medical and instrumentation markets. Existing applications include mechanical design, molecular modeling, architectural drawings, 3-D modeling, 3-D digitizing and measurement. MCS 3-Dimensional space Graphics Tablet and the new Perceptor provide interactive 3-Dimensional digitizing capabilities. Software for IBM, Apple, and many look alikes.

CADKEY—MCS new software package provides advanced construction techniques, hidden line removal, and significantly enhanced 3-D capabilities.

Minnesota Trade Office/
Department of Energy & Economic Development
Booth 1234

90 West Plato Blvd.
St. Paul, Minnesota 55107
(612) 297-4650
Lars Nelson
Trade Representative

The Minnesota Trade Office and the Minnesota
Department of Energy and Economic Development
will demonstrate the advantages and benefits of
locating manufacturing, research or distribution com-
panies in Minnesota, the host for SIGGRAPH '84.
Minnesota is a leading technology center. Many
industry leaders and technological schools of higher
learning find Minnesota a stimulating, productive
environment. The Minnesota Trade Office/
Department of Energy and Economic Development
will explain why.

Minolta Corp.
Booth 1905

101 Williams Dr.
Ramsey, New Jersey 07446
(201) 825-4000
John T. McCasland
Sales Manager

TV Color Analyzer II to adjust white balance in
CRT/Monitor.

Modgraph, Inc.
Booth 945

1393 Main Street
Waltham, Massachusetts 02154
(617) 890-5764
Henry R. Kunicki, Jr.
Vice President, Marketing

Modgraph's GX-1000 Graphics Terminal with 1024 x
780 display and 132 column alpha display. The
monochromatic graphics terminal is fully 4014 and
VT100 compatible. Also shown is the DG-2000 series
display generator with both 1280 x 1024, 60 Hz and
512 x 512 displays. The DG-2000 is available in both
commercial and full MIL-E-16400 versions.

Moniterm Corporation
Booth 1805

7160 Shady Oak Road
Eden Prairie, Minnesota 55344
(612) 941-8383
Nancy Cornish
Sales Coordinator

Moniterm will exhibit the VR-Series high resolution CRT monitors, full page interlaced displays for word processing and office automation. Also available from Moniterm are 64-88 KHz monitors which generate a 1024 x 1024 non-interlaced display for CAD/CAM and computer-aided graphics. All monitors are available with 12'', 15'', or 19'' screens in either the "portrait" or "landscape" configuration. A variety of Phosphors are available.

Morgan-Grampian Publishing Co.
Booth 1237

1050 Commonwealth Ave.
Boston, Massachusetts 02215
(617) 232-5470
Deb Goldstein
Exhibits Coordinator

Digital Design is the fastest growing publication for systems designers, engineers and engineering managers in the OEM. Companies in the OEM include primary computer manufacturers; systems houses; component and peripheral manufacturers; manufacturers incorporating computer devices into their products; and large volume end users.

Electronic Imaging is the magazine with 100% engineers, scientists, and designers and their technical managers who are involved in the development, design and production of electronic imaging components, equipment and systems. It reaches imaging engineers and managers in the following segments of the electronic industry: medical, military, computer instrumentation, consumer, industrial, aerospace, automated office and communications.

Mosaic Technologies, Inc.
Booth 1405

47 Manning Road
Billerica, Massachusetts 01821
(617) 667-2383

R.L. Gimbel
Manager of Market Programs

The Mosaic workstation family is based upon the 32 bit National Semiconductor 32032 microprocessor with demand paging and a floating point co-processor. A dedicated graphics processor provides high performance graphics support, with a range of black and white and color monitors available. Local storage options include up to four 85mb Winchester disks and a 45mb streamer tape. Multibus™ and Ethernet™ interfaces are supported. Software available includes Mosaix (Unix 4.1 with extensions), C, Fortran 77, Pascal, Core graphics, file transfer and virtual terminal support. Presentation graphics support includes a window manager, menu facility and screen manager.

Motorola Semiconductor
Booth 1300

725 South Madison Drive
Tempe, Arizona 85281
(512) 928-6348
Pat Svtak
Applications Engineer

Advanced VLSI integrated circuit technology related to computer display/graphics, and text generation.

Multiwire Advanced Manufacturing Group—
Multiwire/New York
Booth 1907

Multiwire Advanced Manufacturing Group
10 Andrews Road
Hicksville, New York 11801
(516) 938-2000
Debra L. Ekback
Administrative Asst., Marketing/Advertising Dept.
ext. 83

Multiwire/New York
31 Sea Cliff Ave.
Glen Cove, New York 11542
(516) 448-1427

High density discrete wired circuit boards for prototype and production. Meets IPC DW 425. Advanced manufacturing services for surface mountable devices and projects requiring engineering intervention.

National Computer Graphics Association
Booth 2104

8401 Arlington Blvd.
Fairfax, Virginia 22031
(703) 698-9600
Pam Wellman
Exhibits Coordinator

New GEA
Booth 1305

335 Oser Avenue
Hauppauge, New York 11787
(516) 434-8400
Nick Hughes
Director of Marketing

New GEA will be exhibiting the JRC NWX230 and
NWX235. New GEA's CAD and CAE VAX based work-
station featuring JRC graphics processors will be
introduced. New products from JRC to be released
are the NWX237 very powerful and high performance
graphics processor and the IPS stand alone graphics
workstation.

New Media Graphics Corporation
Booth 1423

279 Cambridge Street
Burlington, Massachusetts 01803
(617) 272-8844
Arthur J. Franke
Vice President—Sales

New Media Graphics manufactures a line of com-
puter graphics display peripherals that create and
merge graphics with video pictures coming from
videodisc, videotape or TV camera. The combined
pictures are output in either RGB or NTSC. These
products are compatible with any standard computer
via RS232C or parallel interface. Graphics input
devices available include lightpen, graphics tablet,
touch screen, and joystick.

Nicolet Computer Graphics Division
Booth 428

777 Arnold Drive
Martinez, California 94553
(415) 372-7568

Ralph Manildi
Marketing Services Manager

Nicolet Computer Graphics Division designs, manufactures and markets a complete line of pen plotters. Widths of 11, 24, 34 and 54 inches in continuous feed media and cut sheet capability for most models. IEEE-488 and RS-232 interfaces enable ZETA plotters to be connected to all major mainframes, minicomputers. An SNA/SDLC interface is provided in three models for direct connection to IBM mainframes. Nicolet is the leader in high throughput fine resolution plotters that produce presentation quality output on paper, vellum, mylar and clear film. A wide range of models will be actively demonstrated at this exhibit.

Northern Micrographics, Inc.
Booth 1312

2004 Kramer Street, P.O. Box 1653
La Crosse, Wisconsin 54601
(612) 426-0312
Bert Frawley
Vice President Graphic COM Sales

Northern Micrographics, Inc., offers a broad spectrum of graphics computer output microfilm services to users of computer drafting, mapping and image processing equipment. We can produce roll microfilm, aperture cards, diazo duplicate cards, and microfiche from your vector, raster or print-image data. We can also generate, in volume, hard copies from the data on bond, vellum or mylar in sizes from 8½" x 11" up to 24" x 36". Other services include source document microfilming and high volume duplication of micro-images on silver and diazo film.

Nova Graphics International Corp.
Booth 1505

1015 Bee Cave Woods
Austin, Texas 78746
(512) 327-9300
Fred Buss
Chairman of the Board

User Group Contact: Harold Blair
President

NOVA*GKS is the industry's first commercially-developed implementation of the Graphical Kernel System (GKS), the new ISO/ANSI standard. Both the mainframe/host and microcomputer versions of NOVA*GKS feature a unique, multilayer, distributed architecture, making both versions hardware tuneable and application tuneable. The GKS design also makes it possible to include only those levels of the GKS functionality required to support a particular application. Available in FORTRAN and C bindings, NOVA*GKS gives programmers a common graphics model and standard syntax to speed programming and increase productivity.

Number Nine Computer Corporation
Booth 1100

691 Concord Avenue
Cambridge, Massachusetts 02138
(617) 492-0999
Will Frentz
Vice President Marketing

User Group Contact: Stan Bialek
Vice President Research and Engineering

Number Nine presents the REVOLUTION series of advanced graphic boards for IBM-PC/XT featuring Dual-Ported Display Buffer and up to 80MHz band-width capabilities. Demonstrating 256 on-screen colors from 16.8M palette with NTSC encoding and RS-170 Genlock. Also exhibiting Color Graphic Systems for the Corvus Concept Workstation and Apple II+/e personal computers. All boards are supported by a comprehensive set of graphic development tools. Our broad line of programming languages and 4XXX emulation provides the ideal foundation for presentation, simulation, CAD, process control, data analysis and videotext applications development.

Numelec
Booth 2106

1 Place de la Gare La Verriere
78320 Le Mesnil Saint Denis, France
(3) 062-43-20
Guy Sereys
Marketing Manager

Designed, manufactured and maintained by Numelec, the PERICOLOR 2000 is a comprehensive and inter-active stand-alone system for digital image process-ing and analysis. Image data may come from a host computer through the high speed by-directional interface, or may be acquired by the PERICOLOR 2000 as a stand alone system. The unique concep-tion of operator-machine dialogue is one key feature which is very attractive and allows scientists, engineers and technicians to use the PERICOLOR 2000 without difficulty and specific training. PERICOLOR 2000 displays on the TV screen the functions directory, called "MENU". From it, any of the available functions are easily selected by depressing one key on the keyboard. PERICOLOR 2000: up to 8 images 512 x 512 x 8 bits. PERICOLOR 2000 is a software oriented system. Complete comprehensive software package is provided with the system. For user with programming experience, they may write their own programs for the PERICOLOR 2000 in PLM 86 or FORTRAN calling up all available subroutines from standard software package as well as using the interactive microcode assembler.

Numonics Corporation
Booth 100

418 Pierce Street
Lansdale, Pennsylvania 19446-2498
(215) 362-2766
Rolland H. Henderson
Marketing Manager

User Group Contact: Morris B. Bowles
Eastern Regional Sales Manager

Numonics manufactures a complete line of free-cursor and restrained cursor digitizers for the OEM and the end user. The Model 2200 is a low-cost, compact electromagnetic tablet with user-specifica-tion of output data in absolute measurement or number of user-defined minimum increments. It also includes firmware for self-diagnostics, matrix menuing and host override of switch settable functions. The Model 2300 is a competitively priced digitizer/tablet for large-volume users and single-unit users with their own graphics software. The 5400 Series is a competi-tively priced microprocessor-based plotter with ASCII control commands embossed roller design for low-inertia paper transport and the ability to produce

exceptionally high line quality. The 6400 Series Flat-Bed plotters for business and professional graphics at highest speeds.

OCLI
Booth 624

2789 Northpoint Parkway
Santa Rosa, California 95407-7397
(707) 525-7436
Bill Grenawalt
Product/Sales Manager

User Group Contact: Mark Parish
Product Manager

Anti-glare glass panels and filters that virtually eliminate glare from the face of visual displays while maintaining high character resolution.

Omnicomp Graphics Corporation
Booth 1130

7670 Woodway, Ste. 248
Houston, Texas 77063
(713) 780-1231
Anthony Masraff
President

OMNI 1000 GDC, a high performance, BUS indepen-dent, single board Graphics Display Controller. Display resolution is 1024 x 1024 x 8 planes, thus allowing simultaneous display for 256 colors from a palette of 4096. On board processors are the Intel 8086, 8087, 8089 and 7220 Graphics Processor. Memory is made up of 1024 KB Display Video RAM, 256 KB of List and Image Processing RAM, and 64 KB of EPROM for program storage. Firmware is GKS compatible. Controller currently interfaces to Q-Bus, Multibus, and IBM PC and compatibles.

Oxberry
Booth 2001 A

180 Broad Street
(201) 935-3000
Carlstadt, New Jersey 07072
James Aneshansby
Director of Marketing

Panasonic Industrial Company, Computer Components Division
Booth 103 & 1310

One Panasonic Way
Secaucus, New Jersey 07094
(201) 392-4077
Margaret Lopez
Sales Correspondent

User Group Contact: Bruce Jeniec
Product Manager

The Computer Components Division will be proudly displaying ultra high resolution cathode ray tubes in 13", 15" and 19" sizes with dot pitches ranging from 0.21 mm to 0.25 mm all having in-line guns.

The 15" and 19" tubes have been designed for CAD/CAM applications. Also included will be a large screen delta gun high resolution tube.

Panasonic Industrial Company, Computer Products Division
Booth 802

One Panasonic Way
Secaucus, New Jersey 07094
(312) 680-7794
Tom Reina
Manager, Optical Disc Department

User Group Contact: Lou Skriba
Laser Data Technology, Customer Representative

The Optical Disc Department of the Computer Products Division of Panasonic Industrial Company introduces unique high capacity, low cost, removable media recording equipment. Ideal for real time frame storage applications, such as: computer animation, medical image storage and analysis, aerial reconnaissance photo interpretation, time lapse and microscopy. Analog, digital, color, B & W options are available and will be demonstrated. Five different models, employing laser technology to a capacity limit of 24,000 frames are also available. All have ½ sec. frame access time (max) and host control via RS232C (9600 BAUD).

Parallax Graphics
Booth 1715

1095 E. Duane Ave. Suite #215
Sunnyvale, California 94086
(408) 720-1600
Elizabeth Ketcham
Marketing Services Manager

Parallax Graphics, Inc. offers OEM, and system integrators. Two series of high speed color graphics controllers—the 600 Series and the 1000 Series provides popular micro computer systems with a wide range of graphics capabilities. These controllers draw complex images from 12 million to 88 million pixels/second utilizing proprietary processor technology developed by Parallax Graphics.

Peritek Corporation
Booth 1216

5550 Redwood Road
Oakland, California 94619
(415) 531-6500
Thomas H. Birchell
President

Peritek board and accessory products to be displayed include a full line of color and monochrome raster graphics display interfaces and fast, mapped-memory alphanumeric controllers, Winchester disk interfaces, high-speed multiprocessor links, and other items related to high-performance display applications. Also available for viewing is the new Perigraf™ series of small, desk-side systems for graphics development and custom graphics OEM application. Peritek products are well-suited for applications such as CAD/CAM, robotics and vision systems, high resolution workstations, data acquisition and process control.

PERQ Systems Corp.
Booth 112

2600 Liberty Ave., P.O. Box 2600
Pittsburgh, Pennsylvania 15230
(412) 355-0900
Carol Geyer
Marketing Communications Specialist

User Group Contact: Carol Geyer
Marketing Communications Specialist

128

PERQ Systems manufactures LINQ—a distributed computing network that joins PERQ high performance graphics workstations together into a non-proprietary, Ethernet-based local area network. LINQ supports Accent, a truly transparent, message-based operating system designed in conjunction with Carnegie-Mellon University. LINQ also incorporates the latest addition to the PERQ family of graphics workstations—PERQ AI, a low-cost, single-user system for artificial intelligence. PERQ Systems' products are being used in fields such as electronic publishing, architecture, CAD/CAM, and AI.

Photographic Sciences Corporation
Booth 1314

770 Basket Road
Webster, New York 14580
(716) 265-1600
Donna L. Keller
Product Manager

Photographic Sciences will exhibit DATACAM™, a new innovative color graphics recording camera. DATACAM™ allows you to instantly produce hardcopy 3" x 4" prints or 35mm slides directly from your CRT, thus meeting the fast-rising demand for photographic records of images from CRT monitors for reference and presentation.

DATACAM™ is extremely easy to use. All you have to do is place DATACAM™ on the computer's monitor screen, press a button to shoot and within minutes you have the finished print or slide.

DATACAM™ comes in two monitor sizes, 12"/13" and 19"/21" to fit almost every available screen size.

Photonics Spectra
Booth 1402

Berkshire Common, P.O. Box 1146
Pittsfield, Massachuetts 01202
(413) 499-0514
George S. Cominsky
Director of Sales

User Group Contact: Robert S. Clark
Executive Editor

Publisher of *Photonics Spectra Magazine,* the monthly
journal of optics, electro-optics, laser and fiber optic
technology. Also publisher of *The Optical Industry &
Systems Purchasing Directory,* an annual, two-book
reference and buyers' guide for optics, electro-optics,
lasers and fiber optics, and Photonics Direct Inquiry
Postcards.

Picture Element Limited
Booth 1507

635 Waverly Street
Palo Alto, California 94301
(415) 322-2141
Michael K. Stauffer
Director of Marketing

User Group Contact: Michael K. Stauffer
Director of Marketing

PEL manufactures the Video Sequence Processor
(VSP)™, a stand-alone "image processing system."
The VSP is based upon a 68000 microprocessor
running the UNIX operating system. The VSP has a
unique capability of recording and playing back up to
8 minutes of digital image sequences in real time.
Software includes computer graphics and image
processing functions which can be used either as
libraries linked to user programs or interactively via
the PEL menu system. PELCALC, a new, interactive
image processing software package, is also available
for the VSP. It permits the user to compute simple,
calculator-like expressions within entire images as
variables.

Polaroid Corporation
Booth 206

575 Technology Square-2Z
Cambridge, Massachusetts 02139
(617) 577-3017
Michael O'Brien
Marketing Manager

User Group Contact: Michael O'Brien
Marketing Manager

Polaroid is a worldwide supplier of instant imaging
systems for high quality photographic hardcopy, in
formats from 35mm to 8 x 10 inches, in color or black-

and-white, as slides, prints or overhead transparencies, from video, computer and CRT sources. The company is demonstrating the versatility of its inexpensive Palette computer image recorder, using popular presentation graphics packages to produce enhanced-resolution 35mm instant color slides and reference prints of images from IBM-PC, Apple II and Digital's Rainbow microcomputers. The exhibit also includes demonstrations of Polaroid's VideoPrinter Model 8, a display-driven digital color film recorder for 8 x 10 inch hardcopy.

Precision Visuals, Inc.
Booth 318

6260 Lookout Road
Boulder, Colorado 80301
(303) 530-9000
Brenda Honeyman
Marketing Services Coordinator

Precision Visuals machine- and device-independent graphics software tools provide programmers with a rich set of graphics subroutine libraries supporting all applications, ranging from scientific/engineering to business graphics. This versatile software runs on most popular minis, mainframes, and UNIX-based systems, with support for over 70 graphics devices.

DI-3000® —A robust subroutine package that anchors other Precision Visuals products.

CONTOURING—A specialized package for rendering detailed 2D and 3D contour maps.

METAFILE SYSTEM—A "picture library" with extensive capabilities for storing and manipulating graphics.

DI-TEXTPRO—Publication quality fonts.

GRAFMAKER™—A business graphics tools system.

GRAFMASTER—A "user-friendly" interactive package for simple and sophisticated presentation graphics.

PrintaColor Corporation
Booth 1817

6040 Northbelt Drive
Norcross, Georgia 30071
(404) 448-2675
Philip Frick
Vice President, Marketing

Since PrintaColor's introduction of the first desktop color ink-jet printer in 1980, we have advanced ink-jet color technology to a high level of refinement, sophistication and reliability. The PrintaColor TC1040 has a unique color palette and a powerful vocabulary you can count on. Our color ink-jet system prints up to 120 dots per inch, delivering crisp and clear type fonts, graphics and images on a variety of media. Push button console, flexible media handler and snap-in disposable cartridges make operation as easy as 1-2-3. And the TC1040's fast-full image-seeking and bi-directional capabilities will print on 8½" x 11" paper in just 1½ minutes.

Printronix, Inc.
Booth 551

17500 Cartwright Road
Irvine, California 92713
(714) 863-1900
Ted E. Lorber
Product Marketing Manager

The Printronix 4160 Graphic System provides high resolution output particularly well suited for CAD/CAM and CAE applications. Consisting of a Printronix 4160 GraphicPrinter and PI-80 Interface Controller, the 4160 Graphic System emulates Versatec electrostatic plotters—models V-80, 1200A and 3200A. Small dot size of 0.010 inch and substantial dot overlap produce fine, smooth curves. Graphics and alphanumerics can be intermixed. Also, the system plots on plain paper without chemicals.

PRIVAC, Incorporated
Booth 151

3711 South George Mason Drive
Falls Church, Virginia 22041
(703) 671-3900
George Wheelock
Vice President Marketing

Real time graphics processor with unprecedented performance to price ratio. The PRIVAC CT-1000 features a 1K x 1K resolution with 4 to 32 bit planes, a 16 million color palette and on-board display list storage up to 8 megabytes.

A custom microcoded processor and a 68000 allow drawing speeds up to 400 million pixels/second, real

time 3D coordinate transforms at the rate of 800,000/ second and hardware implemented 2D and 3D graphics primitives. CT-1000 can 3D transform, clip and draw in perspective shaded triangles with 20 pixel length sides at a rate of 100,000 triangles/second.

QMS (Quality Micro Systems)
Booth 128

P.O. Box 81250
Mobile, Alabama 36689
(205) 633-4300
Gary W. Covan
Distribution Sales Manager

User Group Contact: Donald L. Parker
V.P. of Research and Development

QMS will show its line of intelligent non-impact printers for graphics and text processing applications. The Lasergrafix™ line of printers includes the Lasergrafix 1200, 800, and 2400. These printers have speeds from 8 ppm to 24 ppm, resolution of 300 DPI, and a unique controller with full bit-map page memory for mixing text and graphics.

Ramtek Corporation
Booth 418

2211 Lawson Lane
Santa Clara, California 95050
(408) 988-2211
Robert S. Varga
Director of Marketing Services

The 2020 series is a new generation of compatible graphics terminals that address CAD/CAM applications, from advanced design of complex solid models to engineering analysis and drafting. Designed to offer the high performance of a closely-coupled 3-D graphics workstation and the flexibility of device independence, the 2020 also features the most advanced technology available today, including the highest resolution 60 Hz non-interlaced color display, The system architecture is based on parallel pipelined processing, with up to five dedicated processors to handle display lists, geometry operations, vector-to-raster conversion, peripherals, and host communications.

The 9000 series of display generators also offers high performance and resolution, and feature local instruc-

tions for processing both graphics and image data types. This makes them particularly suitable in applications which require graphics overlays to an image background.

Raster Technologies, Inc.
Booth 738

9 Executive Park Drive
North Billerica, Massachusetts 01862
(617) 667-8900
Richard Fichera
Director of Marketing

Raster Technologies is exhibiting its Model One family of graphics systems, featuring the Model One/80 ultra-high performance shading and 3-D display list graphics system, and the Model One/10 low-cost, high performance integrated graphics terminal. The Model One/80 offers 1280 x 1024 pixel resolution with up to 24 bit planes at 60 Hz refresh rate. The Model One/10 offers 640 x 480 resolution, with up to 10 bit planes. The Model One family of graphics systems includes a complete graphics command set, local debugger, and host-based FORTRAN Library.

Recognition Concepts, Inc.
Booth 346

924 Incline Way, P.O. Box 8510
Incline Village, Nevada 89450
(702) 831-0473
John Sample
Marketing Manager

Recognition Concepts, Inc. manufactures a family of image processing systems featuring image memory capacity to 16 mbytes, image processing via pipeline or pixel operations, and a complete line of image digitizers which support video or non-video standard input such as CCD area or line scan arrays. The Trapix 5500 may be configured as a turnkey system featuring RTIPS (Real Time Image Processing Software) for stand alone image acquisition, enhancement, and analysis.

Ridge Computers
Booth 744

2451 Mission College Blvd.
Santa Clara, California 95054
(408) 986-8500
Carol Byram
Manager/Marketing Communications

The Ridge 32 product family is a line of full 32-bit,
high performance superminicomputers. All have a
Reduced Instruction Set Computer (RISC) archi-
tecture and a UNIX System V/Berkeley 4.2-based
Ridge Operating System (ROS). ROS is specifically
designed for scientific, engineering and graphics
applications and supports C, Pascal, Fortran 77,
Mainsail and assembler languages.
(UNIX is a trademark of Bell Laboratories, Mainsail is
a trademark of Xidak, Inc.)

Saber Technology Corporation
Booth 946

2381 Bering Drive
San Jose, California 95131
(408) 945-9600
Barbara Davidson
Marketing Administrator

Saber Technology is displaying its product line of
state-of-the-art graphics and image products.
Products include the next generation workstation,
SaberStation, based on the National Semiconductor
NS32032 with an ultra high resolution 2 megapixel
display. In addition, Saber will show a 1280 x 1024
ST310/64 color display, a 1664 x 1248 ST125/78
monochrome display, and the fully programmable
video pattern generator. All Saber products are
designed for and marketed to OEM manufacturers in
the CAE, CAD, CAM, CASE, general graphics and
image processing markets.

Schoeller Technical Papers, Inc.
Booth 1322

Centerville Road, P.O. Box 250
Pulaski, New York 13142
(315) 298-5133
Richard W. Hess
Market Research Analyst

Arlon F. King
Color Hard Copy Task Force Manager

Schoeller will display its family of CompuColor™ high intensity ink jet papers. Designed exclusively for ink jet printing, these papers are available in a variety of coating formulations, each providing a specific amount of dot spread. The ability to control dot spread results in bright, clear, high-resolution images for virtually any ink jet printer, regardless of dot-per-inch resolution. A unique chemical additive system to CompuColor™ baryta coatings causes rapid fixing of commercial aqueous inks, minimal bleeding, water-fast images, and frequently improved image density.

Scientific Calculations, Inc.
Booth 1038

7635 Main Street
Fishers, New York 14453
(716) 385-6790
Gus Taft
Manager, Marketing Communications

User Group Contact: Gus Taft
Manager, Marketing Communications

Scientific Calculations . . . Vendor of Turnkey CAD/CAM Systems will demonstrate: 1. The SCICARDS System; an auto-interactive, CAD System for the design of printed circuit boards, with output that is directly usable by automated manufacturing equipment. 2. The SCHEMACTIVE Program; A comprehensive, flexible and interactive program for the finished schematic logic diagrams for the circuitry contained in a PCB. 3. SC Design Station: A 68000 based multi-processor stand-alone, office environment design station will be used to demo SC's software.

Scriptel Corporation
Booth 1719

3660 Parkway Lane
Hilliard, Ohio 43026
(614) 876-8636
Nicholas G. Venetis
Vice-President/Marketing

Scriptel Corporation manufactures and markets high-performance graphics tablets for computer-aided

design applications, business graphics, and personal computers. Scriptel's patented Graphics Tablets utilize a new digitizing method, known as Resistive Decoding Technology (RDT™), which offers improved performance and reliability compared to conventional wire-grid electromagnetic digitizers. In addition, this new technology can be utilized to produce optically transparent digitizers which are exceptionally thin so that a new generation of display/digitizer applications have now become feasible. Scriptel Corporation will be featuring its opaque and transparent digitizers.

Secapa Informatique
Booth 2116

Parc d'affaires regional
69570 Dardilly France 69570
(7) 835.71.45
Pierre Bessolo
Président Directeur Général

Color Graphics Terminal, very high resolution of 1024 x 780 d. Points: "1096"
Monochrome Graphics Terminal, very high resolution of 1024 x 1024 d. Points: "1020"
Monochrome Graphics Terminal, high resolution of 640 x 480 d. Points: "770B"
Color Graphics Terminal, high resolution of 640 x 480 d. Points: "550B"

Seiko Instruments USA, Inc.
Booth 438

1623 Buckeye Drive
Milpitas, California 95035
(408) 943-9100
Cheryl Landman
Manager-Marketing Communications

Seiko Instruments will exhibit the D-SCAN Series graphics devices featuring color graphics terminals and color hard copiers. The D-SCAN GR1100 series and 2400 series graphic display terminals feature 14-19" terminals with up to 1024 x 1280 resolution; desktop models with VT100 emulation and 2-D transformation.

The CH-5201 copier produces high resolution (150 dot/inch) crisp color copies with the ease of conventional office copiers. Blending the concepts of color printing and thermal image transfer technology

the CH-5201 produces hard copy on paper or polyester film.

Seillac Corporation
Booth 1709

1000 E. Dominguez St.
Carson, California 90746
(213) 575-0714
David L. Peltz
Vice President, Marketing & Sales

Seillac 7, a state-of-the-art, high-resolution (1400 x 1024), ultra-high speed (up to 400,000 vec/sec) 3D and 2D Color Display for CAD/CAM, Image Processing, and other highly demanding applications. It can display up to 16.7 million colors simultaneously, and performs many complex graphic functions (translation, rotation, scaling, clipping, fill, perspective, etc.) and interactive functions (position, dragging and picking, etc.) all via built-in hardware.

Extensive use of Seillac's custom VLSI provides the highest possible capability and speed yet at a very attractive price.

SIGGRAPH '85 and SIGGRAPH Local Groups
Booth 1224

Conference Services Office
111 East Wacker Drive
Chicago, Ilinois 60601
(312) 644-6610

Conference Co-chairs
Pat Cole
Robert L. Heilman

Local Groups Coordinator
William R. Goodin
Department of Engineering
UCLA Extension
10995 Le Conte Avenue
Los Angeles, California 90024
(213) 825-5010

SIGGRAPH '85, the Twelfth Annual Conference on Computer Graphics and Interactive Techniques, meets July 22-26, 1985 in San Francisco, California, adjacent to Silicon Valley.

SIGGRAPH '85 is sponsored by the Association for Computing Machinery's Special Interest Group on Computer Graphics in cooperation with the IEEE Technical Committee on Computer Graphics, and Eurographics.

In the call for participation at the end of this program, we invite your contribution to making the 1985 conference another success. Posters, buttons, and call for participation flyers will be distributed at the booth.

Local groups of SIGGRAPH currently exist in seventeen cities including groups in the United States, Canada, France, and Australia. Visit the booth and learn how you can become a member of an existing SIGGRAPH group or begin a new group in your area.

Silicon Graphics, Inc.
Booth 628

630 Clyde Court
Mt. View, California 94043
(415) 960-1980
Randy Nickel
Marketing Manager

Silicon Graphics manufactures and supports powerful computing systems designed for applications requiring real-time 2D and 3D graphics. The IRIS (Integrated Raster Imaging System) integrates the Geometry Engine™, a custom VLSI graphics processor designed by Silicon Graphics, with a powerful general-purpose computer, the UNIX operating system, and Ethernet to provide the ideal solution for complex engineering and scientific applications.

SlideTek, Inc.
Booth 2006

3304 Geary Blvd., Ste. 500
San Francisco, California 94118
(415) 221-4164
Noemi Bolvary
Business Manager

The SLIDETEK™ computer graphics slide production system incorporates the natural interface for graphic artists. The features and speed exceed the highest cost/performance standards in the computer graphics industry.

The system offers sophisticated software for text entry and editing, chart creation, illustration and special effects. All image creation and manipulation is displayed in real-time. The extended graphics memory can hold a vast amount of work-in-progress images and design tools simultaneously. Crisp high-resolution output is produced right on your premises. The ARTSTATION I™ supports smooth curved drawing and video camera input. The FILMSTATION I™ records images in 3800 x 2500 pixel resolution.

Sogitec
Booth 2100

26 Rue de Vanves
Boulogne, France 92100
011.33.1. 609.95.25.
Xavier Combette
Simulation Marketing Manager

User Group Contact: Claude Mechoulam
Image Generation Department Manager

Computer Generated Image Generator: The experience of Sogitec in the field of Electronics and Simulation enabled the firm to develop a highly advanced computer-generated-image technology. Sogitec has now at its disposal a computer center specializing in the production of three-dimensional computer-generated films or commercials and offering first-rate realizations both from the technical and creative points of view.

Spatial Data Systems
Booth 718

420 Fairview Avenue
Goleta, California 93116
(805) 967-2383
Rick Mandrell
General Manager

Spatial Data Systems will demonstrate the EyeCom III digital image processing system. EyeCom III is a real time processor which features options such as disk storage, video digitizers, hardcopy cameras, and an extensive library of image processing routines.

Spring Systems
Booth 1923

21 West Circle
Concord, Massachusetts 01742
(617) 369-3263
John T. Fitch
Representative

The low-priced COMP-U-DRAFT, a CAD system for electrical, mechanical, architectural and other engineering drafting. Features include multi-color display and plotter output, mouse-controlled cursor, keyboard call-up of rectangles and ellipses, user-generated symbol library, rotation, zooming, and automatic dimensioning. Compact microcomputer (NCR or IBM) and hard disk permit rapid generation and storage of hundreds of drawings and their variants. Plotters up to A0. Options include English, German, French and Dutch language versions, digitizer tablet, and CP/M-86 or MS-DOS word processing and other software packages.

SPSS Inc.
Booth 342

444 N. Michigan Avenue
Chicago, Illinois 60611
(312) 329-2400
Susan Phelan
Sales Manager

User Group Contact: Gail Newman—ISSUE (International SPSS Software Users Exchange) Executive Director

SPSS Inc. offers end users complete information analysis and reporting systems for data management and graphic displays: SPSS-X, the Information Analysis System; SPSS Graphics for color rendering of analysis results, including maps, bar and pie charts, and line graphs; SPSS/PC for the IBM PC/XT; SPSS/PRO software for the DEC PRO 350; SCSS Conversational System; IDA Interactive System; SPSS Data Analysis System and its PDP-11 version, SPSS-11.

Stereographics Corporation
Booth 1401

P.O. Box 2309
San Rafael, California 94912
(415) 459-4500

Jim Schreiber
Director of Corporate Communications

The new StereoDimensional™ brand three-dimensional computer graphics display system from Stereographics Corporation is the first flickerless, high-resolution computer imaging technology offering authentic stereoscopic capability. With this unique system, true two-eyed depth perception can be enhanced by the usual monocular "3-D" simulation cues such as shading and rotation. Providing a general solution to the problems of stereoscopic CRT display, the StereoDimensional computer graphics system can be used wherever a three-dimensional image is wanted, in all CAD/CAM/CAE and similar applications.

Strobe, Inc.
Booth 2021

897-5A Independence Avenue
Mountain View, California 94043
(415) 969-5130
Elizabeth D. Holthofer
Advertising & Marketing Services Manager

User Group Contact: Fred Osowick, Customer Service Manager

Strobe manufactures and markets a family of graphics plotters, proprietary software and supplies. The Strobe graphics system products are easy to use, can be interfaced to a variety of PC's, and are compatible with most major business application graphics software packages. The user can quickly and easily produce color graphic overhead transparencies or hardcopy graphics directly from data stored in his PC Plotter supplies such as pens, paper and overhead transparency film are provided as a part of Strobe's product line.

Summagraphics Corporation
Booth 106

777 State Street Extension
Fairfield, Connecticut 06430
(203) 384-1344
Kathy Dunn
Marketing Communications Manager

User Group Contact: Dave Pruner
Product Manager

MM Series: MM Series digitizers are designed for use with today's lower-cost terminals, graphics work-stations and personal computers. MM's can perform all cursor steering, menu picking and graphics digitizing tasks with the added flexibility of a built-in mouse. The product line features two ergonomically-designed tablets. SummaMouse: SummaMouse combines solid state optics with state-of-the-art micro-processor technology to deliver the most reliable, user-responsive digital mouse on the market. The ease of use, speed of interaction and low cost make SummaMouse the ideal cursor steering device for menu selection, graphics and text editing. Microgrid: Microgrid Series is a new family of high-resolution, high-accuracy digitizers that combines the latest technology with innovative design to offer significant improvements in accuracy, appearance, compatibility, versatility, reliability and price.

Sun Microsystems, Inc.
Booth 1222

2550 Garcia Avenue
Mountain View, California 94043
(415) 960-1300
Connie Humphries
Technical Support Specialist

User Group Contact: Marleen Martin
Marketing Programs Manager

Sun Microsystems is displaying members of its Sun-2 family of SunStations—high-performance multi-purpose workstations designed for the technical professional to enhance productivity. Each SunStation offers 68010 virtual memory processor, 1-4 MB main memory, high-resolution 19-inch bit-mapped display, an optical mouse and Sun UNIX 4.2 bsd enhanced with support for graphics and networking. The SunStations can be networked together via Ethernet to form a distributed computing environment, sharing peripherals like mass storage, printers, etc.

The SunStations currently are used in a wide variety of applications including CAD/CAM/CAE, typesetting and documentation preparation, software develop-ment, animation, a range of scientific and research applications and artificial intelligence.

Superset, Inc.
Booth 810

11035 Roselle Street
San Diego, California 92121
(619) 452-8665
Jerry Donaldson
Director of Marketing

Graphic Workstation based on PGM-2 48 bit
Processor for stand-alone and host application. New
features include: SMD disk interface (up to 4 SMD
disks), 2 high speed DMA ports, printer port, stream
tape interface, Function Processor capability 5 MITS.
Applications include: Business graphics, Graphic
design, 3-D modeling, Video/Animation, Electrical
CAD, Cartography.

Video/Animation Workstation: Animate business
graphics and 3-D models. Features include: 7 light
sources, shadows, transparent output can be slides,
NTSC video (mix with external video signal) and
definable resolution up to 4096 x 4096 x 24 bit for
low and high resolution cameras.

Symbolics, Inc.—Graphics Division
Booth 118

1401 Westwood Boulevard
West Los Angeles, California 90024
(213) 478-0681
Gary T. Sechrist
Manager, Product Management

Symbolics introduces ZetaGraphics, an advanced
color graphics system based on the Symbolics 3670
computer, for use in broadcast, scientific, and indus-
trial applications. Hardware options include: 8 and 24
bit per pixel displays with programmable resolution up
to 1280 x 1024; an RGB frame grabber for video input;
'genlock' option to generate broadcast quality video;
floating point accelerator; VTR animation interface.
Fully integrated Lisp-based software options include:
Fortran and Pascal; ZetaPaint, to create original
images, and touch-up, mix, and modify existing
image; 3-D database, object definition, rendering and
dynamics software for the production of 3-D stills and
animated sequences.

Systems Research Laboratories, Inc.
Booth 141

2800 Indian Ripple Road
Dayton, Ohio 45440
(513) 426-6000
Ron D. Taulton
Director, Marketing

User Group Contact: Jacqueline Townsend
Marketing, VTS

SRL Model 2106 Color Display (1280 x 1024) with 100 MHz video bandwidth and multiple line/frame rates (selectable by internal switches) to meet today's high resolution graphic needs.

SRL Model 2110 Color Display (1280 x 1024) with 64 kHz horizontal frequency (adjustable to 16 ranges), 100 MHz video bandwidth, 1000 line presentation and factory convergence that require no further adjustment, to provide consistent brightness and flicker free images with fine tuned convergence.

Applications include: Computer graphics, CAD/CAM/CIM, training and simulation, and C^3I.

Talaris Systems Inc.
Booth 2011

7840 Herschel Avenue
La Jolla, California 92037
(619) 454-3363
Sonny J. Burkett
V. President Sales/Marketing

Talaris Systems Inc. is a software firm which has developed a total solution in electronic printing utilizing the Xerox XP-12 engine, the QMS Quic Rip controller, and D.V.I. post-processing tools for formatters such as TeX 80, TeX, and TROFF, NROFF and, soon to be released, DITROFF. QDRIVE facilitates text and graphics integration with simple short commands either internal or external to the files and the plotting library interfaces with most graphics software through Calcomp and Versaplot Fortran 77 calling routines. Using Metafont, Talaris has over 300 fonts which can be downline loaded, 70 of which can be obtained in Prom.

Technology & Business Communications, Inc.
Booth 1908

730 Boston Post Road, Suite 25
Sudbury, Massachusetts 01776
(617) 443-4671
Bonnie Kameny
Exhibit Manager

Specialists in computer graphics publishing and
marketing services, computer graphics postcard
action deck and list rentals.
1) The S. Klein Directory of Computer Graphics
   Suppliers: Hardware, Software, Systems and
   Services. Third Edition (1984-'85). 225 pp. 500+
   listings. Company products and demographics.
   Computer generated cross reference index.
2) "Marketing Computer Graphics in Europe:
   Analyses, Strategies, Forecasts." 230 page
   industry study. Includes country-by-country market
   forecasts; also how to set up, operate, and
   compete in Europe.
3) Economics of CAD. . .Solving the Puzzle. A 32
   page primer on how to evaluate the cost-
   effectiveness of computer-aided design systems.

Tektronix, Inc.
Booth 506

P.O. Box 500
Beaverton, Oregon 97077
(503) 642-8716
Ralph Show
Senior Exhibits Manager

Tektronix will be exhibiting its full family of 4100 and
4110 series computer display terminals, ranging from
the low-cost 4105 with DEC VT100 compatible
alphanumerics and color graphics to the high perfor-
mance 4115B high resolution color raster display with
patented auto-convergence feature. Also on display
will be Tektronix' family of ink jet color copiers offering
highly reliable color hardcopy with a range of
price/performance alternatives. Tektronix PLOT 10
graphics utility software—TCS, IGL and the new
international standard GKS—and PLOT 10 Computer-
Aided Drafting software will also be featured.

Telex Communications, Inc.
Booth 2121

9600 Aldrich Avenue South
Minneapolis, Minnesota 55420
(800) 828-6107 In MN: (612) 887-5531
Daniel M. Paulnock
General Manager, Visual Master System

User Group Contact: Daniel M. Paulnock
General Manager, Visual Master System

Visual Master Computer-Based Graphics Production
System, Caramate Slide Projectors, Insta Load XL
16mm Motion Picture Projectors, 35mm Filmstrip
Projectors.

Texas Instruments Incorporated
Booth 1309

P.O. Box 1443, M/S 6418
Houston, Texas 77001
(713) 879-2373
Alec Cameron
Manager, S/C Merchandising

High-performance, dual-port video RAMs and high-
performance graphics processors will be featured at
TI Semiconductor booth.

Tigre S.A.
Booth 2124

2 Centre Administratif des Sept Mares
Elancourt, France 78310
(3) 062 29 12 Telex: 696469F
Guy Ragot
President

Tigre 3000 system is a new generation of interactive
information processing systems for:
—signal processing
—image processing
—graphic processing 2D or 3D
High resolution: 1344 pixels x 1024 lines
High throughput: 9.6 giga bits per second
Optimization of Memory Space (International Patent).

Time Arts Inc.
Booth 1204

3436 Mendocino Ave.
Santa Rosa, California 95401
(707) 576-7286
Stephen C. Oaks
Director of Sales

Lumena™ and EASEL Art and Illustration Software
are professional computer graphics packages.
Software is available for IBM PC, TI, Zenith, and
Mindset computers and a variety of frame buffers with
16 to 4,096 displayable colors. Complete low cost
turnkey systems are marketed to the professional,
commercial, educational, and fine arts industries.
Time Arts will be introducing new frame buffer
versions of its software and new menus for fonts
and animation.

Trilog, Incorporated
Booth 714

17391 Murphy Avenue
Irvine, California 92714
(714) 863-3033
Al Rocheleau
Product Marketing Support Manager

Trilog is exhibiting the Colorplot-II full color hard copy
printing system. Capable of printing at 300 lines per
minute, the TIP-302 uses three passes (yellow, red
and blue) to achieve 256 possible colors. Through the
use of Trilog's proprietary two bank system, the TIP-
302 also features Non-Stop-Printing™. Letter quality
printing and two sizes of compressed printing round
out the features available to the user in the print
mode. For plotting, variable densities are offered; from
60 x 75 dots per inch to 100 x 100 dots per inch.

T&W Systems, Inc.
Booth 1917

7372 Prince Drive, Suite #106
Huntington Beach, California 92647
(714) 847-9960
Robert Murphy
Director of Marketing

Manufacturer of VERSACAD, low cost computer aided
drafting system for IBM PC and Hewlett Packard 200

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series computers. Full range of features, including: symbol libraries, layering rubber banding, scaling, zooming, spline curves, ellipses, single key stroke entry.

UNIRAS, Inc.
Booth 144

Executive Place III, 50 Mall Road, Suite 212
Burlington, Massachusetts 01803
(617) 272-7260
Sean Gallagher
Vice President

UNIRAS, Inc. is a software company specializing in color graphics software. Interactive applications include business charting and mapping, and grid/contour mapping. Fortran libraries contain fundamental graphics from 2D primitives to solids and ANSI-GKS. Today with low cost devices, the scope of applications has expanded significantly. Now UNIRAS offers "device intelligent" software. Device intelligence means that UNIRAS software discerns what the display device (terminal or hardcopy) is capable of, and takes full advantage of those graphics functions supported by the hardware. Any graphics primitives not available in a particular device are supported in UNIRAS software.

Universal Data Systems
Booth 2112

5000 Bradford Drive
Huntsville, Alabama 35805
(205) 837-8100
Tom Scott
Sales Manager

Universal Data Systems, of the Information Systems Group of Motorola, Inc., will show a full line of low, medium, and high speed modems. As a complement to this line, recently announced new equipment on display will include the EC100 Error Controller and the 9600A/B, the industry's first 9600 bps dial-up modems.

Universal Technical Graphics
Booth 1219

5462 Research Dr.
Huntington Beach, California 92649
(714) 895-4811

Universal Technical Graphics/Graphic Resources Corp. demonstrates an array of vector and raster plotters and digitizers with an emphasis on cost-effective, refurbished equipment. Graphic Resources features plotting media, pens, inks and accessories developed and manufactured for use on all pen and electrostatic plotters.

Vectrix Corporation
Booth 1046

2606 Branchwood Drive
Greensboro, North Carolina 27408
(919) 288-0520
Larry E. Addison,
Director of Engineering

Elizabeth Stotler-Ferrill
Assistant Director of Marketing

Vectrix Corporation manufactures high resolution, low cost graphics systems. Products include the VX128A and the VX384A processors, which interface to virtually any host computer; and the new Midas Color Card, a 2-board set which fits directly into the IBM-XT or PC to create a professional quality color graphics work-station. The Midas offers resolution of 672 x 480 and a basic color palette of 4,096 with 512 concurrently viewable colors. It features hardware zoom, pan and scroll, light pen support, and an MS-DOS 2.0 driver.

Versatec, A Xerox Company
Booth 638

2710 Walsh Avenue
Santa Clara, California 95051
(408) 988-2800
Annette Stansky
Advertising Manager

Stop by the Versatec booth to see high resolution electrostatic plotters producing, fast, 400 point per inch drawings. Large (42 inch width) full color electrostatic output will also be demonstrated on the world's first electrostatic color plotter. See high quality 11 inch output or talk to one of the many specialists on hand to help you solve your output requirements.

Visual Intelligence Corp.
Booth 1242

Amherst Fields Research Park,
160 Old Farm Road
Amherst, Massachusetts 01002
(413) 253-3482
Cheryl McDermott
Director, Marketing Communications

Visual Intelligence features DataViews* graphics software system. DataViews allows users to quickly compose screens of animated displays for monitoring variables in real-time. Applications include instrumentation, process control, CAE, simulation, CIM, science, and business and finance. The DataViews system includes over 30 display formats ranging from line graphs, bar and pie charts to dials and gauges, 2-D surface plots, and vector fields. Users interact with the system through menus and graphical objects, with no programming required. DataViews is modular in design allowing easy integration by OEMs and system integrators. Written in machine and device independent C code, DataViews can be run on virtually any modern machine from 68000 supermicros on up.

(*DataViews is a trademark of Visual Intelligence.)

Western Graphtec, Inc.
Booth 900

12 Chrysler St.
Irvine, California 92714
(714) 770-6010
Annette Comeau
Manager, Advertising and Promotion

Western Graphtec will display its series of intelligent plotters. The plotters are available in flat bed and flat bed with roll attachment. They are offered in 6 and 10 pen models. Also displayed will be the WX 4731 Plotwriter, which is a 4-pen drum plotter. The MP1000 Business Graphics, 6 pen plotter will also be shown.

Westward Technology Inc.
Booth 338

90 Montvale Ave.
Stoneham, Massachusetts 02180
(617) 438-6623
John Roberts
Sales Development Manager

User Group Contact: John Roberts
Sales Development Manager

Westward will be showing their new graphics work-station products at SIGGRAPH '84: a 20" high resolution color display and a 19" ultra-high resolution monochrome display along with their existing range of graphics displays. Westward is the largest manufacturer of graphics terminals in Europe, and base their success on a unique combination of ergonomic styling, competitive prices, and high quality screen display.

Xtar Electronics, Inc.
Booth 2120

2262 Landmeier Rd.
Elk Grove, Illinois 60007
(312) 364-4111
Terrence J. Coleman
Vice President, Engineering

Xtar will exhibit its new GMP Graphics Micro-processor chip set. The GMP is specifically designed to draw and fill in polygons at a rate sufficient to support real-time graphics applications. The chip set will support various screen resolution and pixel depths. Polygon fill rates in excess of 160 million pixel/second (at 1024 x 1024 resolution) are possible. The chip set communicates via a display list to any 16 or 32 bit microprocessor. The GMP includes a programmable 2D clipper and display list RAM refresh circuit.

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238	Apollo Computer
1212	Artronics, Inc.
1615	AVL
1800	Charles Beseler Company
928 & 1028	Control Data Corp.
2130	Control Systems
351	Cubicomp Corporation
222	Datacopy Corporation
1148	Datacube, Inc.
952	Dataram Corporation
2020	Decision Images
838	Digital Engineering
538	Digital Equipment Corporation
1308	Eutectic Electronics, Inc.
938	Florida Computer Graphics, Inc.
1424	FutureNet Corporation
851	Genisco Computer Corporation
800	GraphOn Corporation
332	ID Systems Corporation
1415	ImagiTex, Inc.
400	Infinite Graphics Incorporated
441	Ithaca Intersystems Inc.

306	Intecolor Corporation
518	Lexidata Corporation
2012	Masterbyte Computers (USA) Inc.
300	Matrox Electronic Systems Ltd.
606 & 1018	Megatek Corporation
451	Micro Control Systems, Inc.
1405	Mosaic Technologies, Inc.
1300	Motorola Semiconductor
1100	Number Nine Computer Corporation
1715	Parallax Graphics
1216	Peritek Corporation
112	PERQ Systems
151	PRIVAC, Inc.
128	QMS (Quality Micro Systems)
738	Raster Technologies, Inc.
2116	Secapa Informatique
438	Seiko Instruments USA, Inc.
1923	Spring Systems
2021	Strobe, Inc.
1222	Sun Microsystems, Inc.
506	Tektronix, Inc.
2121	Telex Communications, Inc.
1204	Time Arts Inc.
1046	Vectrix Corporation
900	Western Graphtec, Inc.
338	Westward Technology Inc.
2120	Xtar Electronics, Inc.

Booth	**Manufacturing Systems**
928 & 1028	Control Data Corp.
2000	Digigraphic Systems Corp.
1245	Imaging Technology Inc.
1300	Motorola Semiconductor

Booth	**Mechanical Design Systems**
818	Adage, Inc.
238	Apollo Computer
928 & 1028	Control Data Corp.
351	Cubicomp Corporation
851	Genisco Computer Corporation
400	Infinite Graphics Incorporated
1144	MASSCOMP
451	Micro Control Systems, Inc.
1130	Omnicomp Graphics Corporation
151	PRIVAC, Inc.
744	Ridge Computers
946	Saber Technology Corporation
2116	Secapa Informatique
1814	Seillac Corporation
1923	Spring Systems

1222	Sun Microsystems, Inc.
1917	T&W Systems, Inc.
900	Western Graphtec, Inc.

Booth	**Monitors**
127	Amtron Corporation
1400	Robert Bosch Corp., Video Equipment Division
918	Conrac Division/Conrac Corporation
222	Datacopy Corporation
751	Elector USA Inc.
1602	Electrohome Limited
2108	GIXI Inc.
228	Gould Inc., Imaging & Graphics Division
1012	Hitachi America, Ltd.
1232	Hitachi Denshi America, Ltd.
332	ID Systems Corporation
1022	Ikegami Electronics (USA), Inc.
1116	Interactive Machines, Inc.
2007	JVC
2113	Kloss Video Corporation
1805	Moniterm Corporation
103 & 1310	Panasonic Computer Components Division
1216	Peritek Corporation
946	Saber Technology Corporation
2112	Secapa Informatique
1222	Sun Microsystems, Inc.
141	Systems Research Laboratories, Inc.

Booth	**Non-glare Coating/Materials**
127	Amtron Corporation
624	OCLI
206	Polaroid Corporation
1222	Sun Microsystems, Inc.

Booth	**Numerical Control (NC, CNC, DNC)**
238	Apollo Computer
928 & 1028	Control Data Corp.
1300	Motorola Semiconductor

Booth	**Piping Systems**
928 & 1028	Control Data Corp.
441	McDonnell Douglas Corporation
946	Saber Technology Corporation

Booth	**Plotters**
328	Advanced Color Technology, Inc.
806	Benson, Inc.
528	CalComp

2031	CPT Corporation
310	Grinnell Systems Corporation, a Gulton Co.
1006	Houston Instrument
2019	Imtec Equipment Inc.
428	Nicolet Computer Graphics Division
100	Numonics Corporation
551	Printronix, Inc.
128	QMS (Quality Micro Systems)
1814	Seillac Corporation
2021	Strobe, Inc.
1917	T&W Systems, Inc.
714	Trilog, Incorporated
1219	Universal Technical Graphics
638	Versatec, A Xerox Co.
900	Western Graphtec, Inc.

Booth	**Printers**
328	Advanced Color Technology, Inc.
1609	Applied Digital Data Systems Inc.
1212	Artronics, Inc.
1925	Imagen Corporation
2019	Imtec Equipment Inc.
1300	Motorola Semiconductor
551	Printronix, Inc.
128	QMS (Quality Micro Systems)
2116	Secapa Informatique
118	Symbolics, Inc., Graphics Division
2011	Talaris Systems Inc.
714	Trilog, Incorporated

Booth	**Projectors**
1800	Charles Beseler Company
1525	Eastman Kodak Company
751	Elector USA Inc.
1602	Electrohome Limited
1315	Electronic Systems Products
138	General Electric Company
2113	Kloss Video Corporation
141	Systems Research Laboratories, Inc.
2121	Telex Communications, Inc.
638	Versatec, A Xerox Co.

Booth	**Publications**
111	Addison-Wesley Publishing Company
1210	Anderson Publishing Company
2122	AV Video Magazine
1225	Business Computing Magazine
145 & 502	Cahners Publishing Company
1140	Computer-Aided Engineering

Booth	
844	Computer Decisions
1225	Computer Design Magazine
1236	Computer Graphics News
1225	Computer Graphics World
943	Computer Pictures Magazine
1209	CW Communications, Inc.
1112	Electronic News
1500	IEEE Computer Society
1140	Machine Design
1237	Morgan-Grampian Publishing Co.
1402	Photonics Spectra
1908	Technology & Business Communications, Inc.

Booth	Quantizer/Line Scan Cameras
1223	MegaVision
346	Recognition Concepts, Inc.

Booth	Robotics
1148	Datacube, Inc.
1116	Interactive Machines, Inc.
218	International Imaging Systems
1300	Motorola Semiconductor
1216	Peritek Corporation

Booth	Software
818	Adage, Inc.
111	Addison-Wesley Publishing Company
353	Advanced Technology Center, Inc.
2013	Antics Enterprises
1400	Robert Bosch Corp., Video Equipment Division
928 & 1028	Control Data Corp.
351	Cubicomp Corporation
222	Datacopy Corporation
1148	Datacube, Inc.
1422	Dataplotting Services
2020	Decision Images
1424	FutureNet Corporation
1151	W.W. Gaertner Research, Inc.
2108	GIXI Inc.
310	Grinnell Systems Corporation, a Gulton Co.
1403	Harris Computer Systems
1419	Intran Corporation
406	ISSCO
606 & 1018	Megatek Corporation
451	Micro Control Systems, Inc.
1405	Mosaic Technologies, Inc.
1216	Peritek Corporation

222	Datacopy Corporation
1148	Datacube, Inc.
2020	Decision Images
244	EIKONIX Corp.
938	Florida Computer Graphics, Inc.
1424	FutureNet Corporation
310	Grinnell Systems Corporation, a Gulton Co.
400	Infinite Graphics Incorporated
218	International Imaging Systems
1419	Intran Corporation
441	McDonnell Douglas Corporation
451	Micro Control Systems, Inc.
1507	Picture Element Limited
346	Recognition Concepts, Inc.
1038	Scientific Calculations, Inc.
1222	Sun Microsystems, Inc.
141	Systems Research Laboratories, Inc.
1917	T&W Systems, Inc.
2121	Telex Communication, Inc.
1204	Time Arts Inc.
900	Western Graphtec, Inc.

Booth	**Turn Key Systems-Software**
353	Advanced Technology Center, Inc.
1126	AMF Logic Sciences, Inc.
2013	Antics Enterprises
1212	Artronics, Inc.
1615	AVL
351	Cubicomp Corporation
1148	Datacube, Inc.
2020	Decision Images
1424	FutureNet Corporation
310	Grinnell Systems Corporation, a Gulton Co.
400	Infinite Graphics Incorporated
218	International Imaging Systems
1419	Intran Corporation
451	Micro Control Systems, Inc.
1507	Picture Element Limited
346	Recognition Concepts, Inc.
1038	Scientific Calculations, Inc.
342	SPSS Inc.
1222	Sun Microsystems, Inc.
141	Systems Research Laboratories, Inc.
1917	T&W Systems, Inc.
2121	Telex Communications, Inc.
1204	Time Arts Inc.
900	Western Graphtec, Inc.

1901	Cohu Inc., Electronics Division High resolution, variable scan rate cameras, video monitors
2028	Computer Arts Inc. Computer art producer
1818	Conference Book Service Book display
2130	Control Systems Video genlock and keying graphic art software
912	Cray Research, Inc. Computers
1811	CSP Inc. Array processors
302	DYNAIR Electronics, Inc. RGB routing switchers
751	Elector USA Inc. 64 KHz test pattern generator
1315	Electronic Systems Products Large screen projectors
149	Elographics, Inc. Transparent touch screens
1809	Equitable Life Leasing Corporation Leasing services
1502	Fribronics International Inc. CAD/CAM communication systems
1134	Floating Point Systems, Inc. Special-purpose computers called array processors, used in image and signal processing applications.
938	Florida Computer Graphics, Inc. GKS compatible graphic systems
138	General Electric Company Video projectors
137	Graphic Controls Corporation Plotter supplies
1319	IBIS Systems, Inc. High speed memory systems, high performance read/write disk subsystems
1500	IEEE Computer Society Professional society

Site
Locations

Minneapolis

St. Paul

179

Minneapolis Auditorium and Convention Hall

ACM SIGGRAPH '84

Street level

Registration

3rd Avenue South

- Information and assistance
- Message center
- United Parcel Service
- Housing assistance
- Transportation information
- Airline information
- Conference materials
- Tour information

Minneapolis Auditorium and Convention Hall

ACM SIGGRAPH '84

15th Street

751 · 851 · 952 · 1151

744 · 846 · 945 · 946 · 1046 · 1148

844 · 943 · 1144

638 · 738 · 838 · 938 · 1038 · 1140

628 · 734 · 1134

728 · 828 · 928 · 1028 · 1130

624 · 1126

618 · 718 · 818 · 918 · 1018 · 1022 · 1116

714 · 810 · 912 · 1012 · 1112

606 · 706 · 806 · 906 · 1006 · 1108

600 Aisle · **700 Aisle** · **800 Aisle** · **900 Aisle** · **1000 Aisle** · **1100 Aisle** · 1104 · **First Aid**

602 · 800 · 802 · 900 · 1100

1225 · 1237 · 1241 · 1245 · 1255

Main entrance

Escalators

Stevens Avenue

To
Exhibition Hall

North ➡

Arena
(Electronic theater)

Street level

Convention Hall

Exhibition Hall
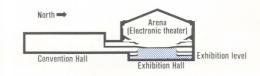
Exhibition level

Minneapolis Auditorium and Convention Hall

ACM SIGGRAPH '84

Floor plan with booth numbers:

2019, 2021, 2031, 2035

2020, 2028, 1625, 1723, 1822, 1925

1615, 1719, 1818, 1817, 1923

1715, 1815, 1916, 1917

1609, 1709, 1811, 1916

1605, 1705, 1809, 1908, 1907

1805, 1905

1600 Aisle   **1700 Aisle**   **1800 Aisle**   **1900 Aisle**

1602, 1701, 1800

2121, 2129, 1901

2120, 2122, 2124, 2130

North ➡

Arena
(Electronic theater)

Convention Hall

Exhibition level

Exhibition Hall
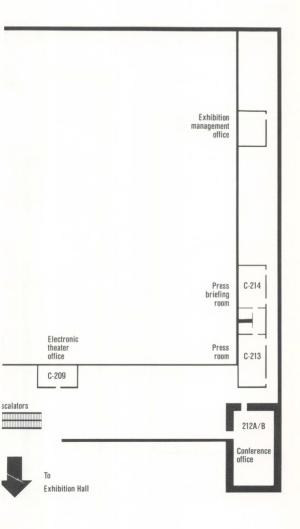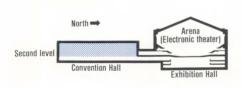
Minneapolis Auditorium and Convention Hall
ACM SIGGRAPH '84

Second level

201 B A

202 B A

203 B A

Attendee screening room—A/V headquarters

204A

204B

204C

204D

205A/B

A/V Headquarters

Speaker's slide prep. room

C-206

Speaker's slide prep. room

C-207

Speaker's film/vid prep. room

C-208

Exhibition management office

Press briefing room

C-214

Electronic theater office

Press room

C-213

C-209

escalators

212A/B

Conference office

To
Exhibition Hall

North ➡

Arena
(Electronic theater)

Second level

Convention Hall
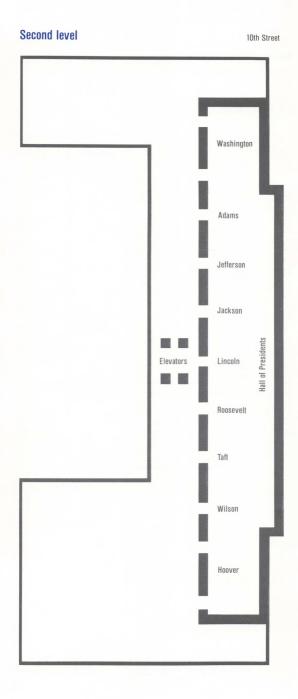
Exhibition Hall
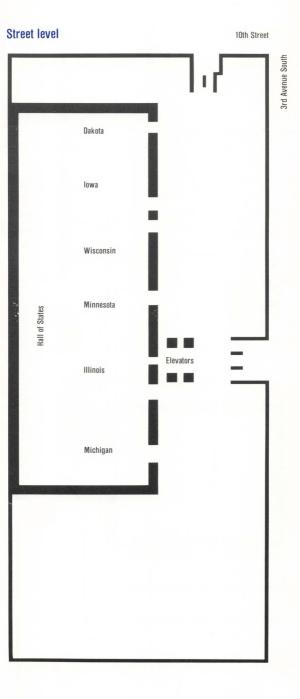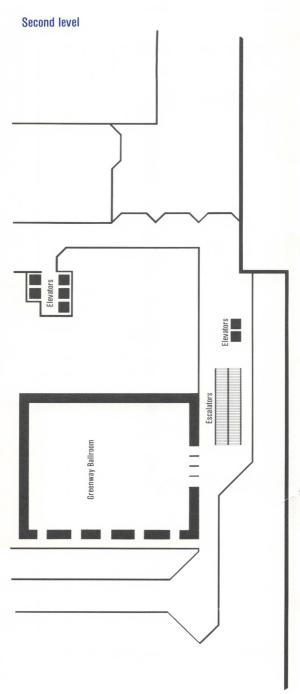
Hotel Leamington
3rd Avenue South & 10th Street

Second level

10th Street

Washington

Adams

Jefferson

Jackson

Elevators

Lincoln

Hall of Presidents

Roosevelt

Taft

Wilson

Hoover

Street level

10th Street

3rd Avenue South

Hall of States

Dakota

Iowa

Wisconsin

Minnesota

Illinois

Michigan

Elevators

Hyatt Regency
Nicollet Mall & Grant Street

Second level

Elevators

Elevators

Escalators

Greenway Ballroom
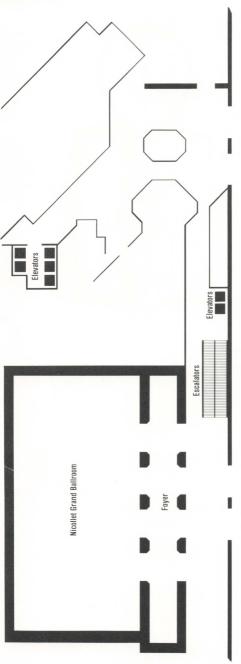
Grant Street

Hyatt Regency
Nicollet Mall & Grant Street

Street level

Nicollet Mall

Elevators

Elevators

Escalators

Nicollet Grand Ballroom

Foyer
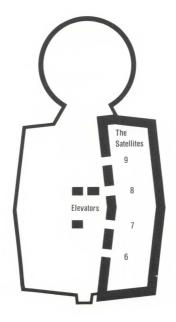
Grant Street
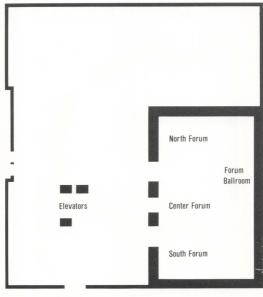
Holiday Inn Downtown
Nicollet Mall & 13th Street

14th floor

The
Satellites

9

8

Elevators

7

6
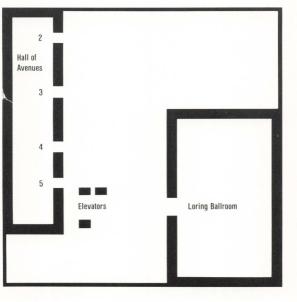
Holiday Inn Downtown
Nicollet Mall & 13th Street

Street level

North Forum

Forum
Ballroom

Elevators

Center Forum

South Forum

Grant Street

Lower level

2

Hall of
Avenues

3

4

5

Elevators

Loring Ballroom
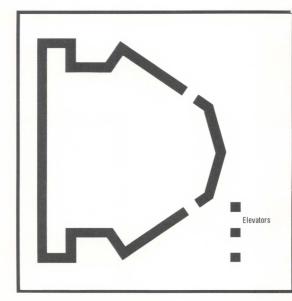
Cricket Theater
Hennepin Center for The Arts
Hennepin Avenue & 6th Street

8th floor

Elevators

6th Stree

Street level

Library proper

Heritage Hall

Planetarium
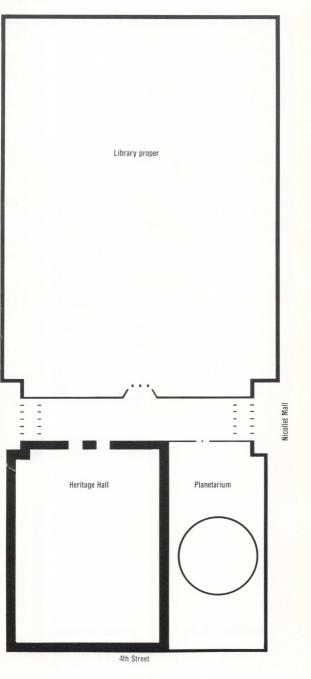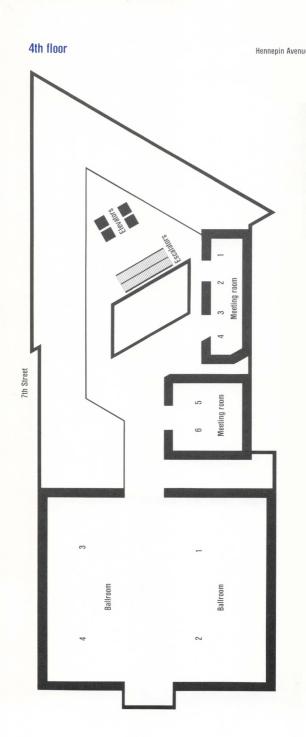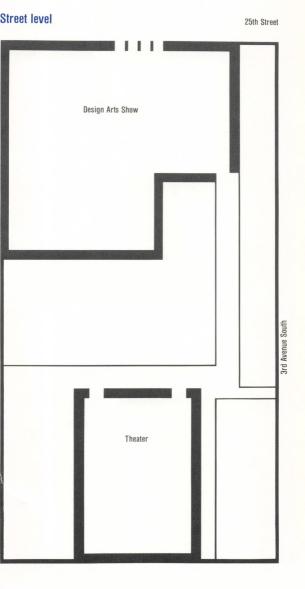
Nicollet Mall

4th Street

Amfac Hotel
7th Street & Hennepin Avneue

4th floor

Hennepin Avenue

7th Street

Elevators

Escalators

Meeting room

1

2

3

4

Meeting room

5

6

Ballroom

3

4

Ballroom

1

2

194
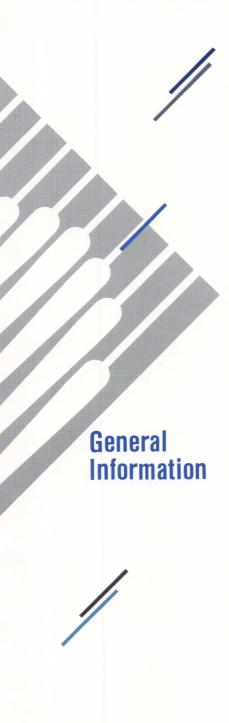
Minneapolis College of Art and Design
3rd Avenue South & 25th Street

Street level

Design Arts Show

Theater

3rd Avenue South

General
Information

Aquatennial

Each year, Minneapolis/St. Paul celebrates its summer season with the Aquatennial. Portions of this year's event, themed "Futuristic Fantasies," take place during SIGGRAPH '84. Conference attendees are invited to enjoy and participate in numerous activities throughout the area, including the Aquatennial torchlight parade and a 10 kilometer race.

For information on the Aquatennial and extended SIGGRAPH '84 hotel rates, contact Nancy Johnson, Minneapolis Aquatennial Association, Commodore Court, 702 Wayzata Boulevard, Minneapolis; (612) 377-4621.

A/V service

A/V headquarters

A/V headquarters—Minneapolis Auditorium and Convention Hall Room 205A/B—provides general A/V assistance, including 35mm slide trays, blank slides and reservations for the attendee screening room. A/V heaquarters is open Sunday 9 a.m.- 10 p.m.; Monday-Thursday, 7:30 a.m.-7 p.m.; Friday 7:30 a.m.-6 p.m. The telephone number is (612) 874-1312.

Speaker film/video prep room (Minneapolis Auditorium and Convention Hall Room 208)
A film/video prep room is available for reviewing 16mm films and ¾-inch U-Matic NTSC videotapes. Limited ¾-inch videotape dubbing is facilitated. The room is open Sunday 9 a.m.-10 p.m.; Monday-Thursday 7:30 a.m.-7 p.m.; Friday 7:30 a.m.-6 p.m.

Speaker film/video prep room (Hyatt Regency Loring room)
Another film/video prep room is provided specifically for speakers in panel sessions and courses near the Hyatt Regency to review 16mm films and ¾-inch U-Matic NTSC videotapes. The room is open Sunday 9 a.m.-10 p.m.; Monday-Thursday 7:30 a.m.-7 p.m.; Friday 7:30 a.m.-6 p.m. The telephone number is (612) 339-0485

Speaker slide prep rooms (Minneapolis Auditorium and Convention Hall Rooms 206 and 207)
Slide prep rooms are provided for speakers to review 35mm slides. Slide viewer/sorters and projectors are available Sunday 9 a.m.-10 p.m.; Monday-Thursday 7:30 a.m.-7 p.m.; Friday 7:30 a.m.-6 p.m.

Speaker slide prep room (Hyatt Regency Grant room)
Another slide prep room is provided specifically for speakers in panel sessions and courses near the Hyatt Regency to review 35mm slides. Slide viewer/sorters and projectors are available Sunday 9 a.m.-10 p.m.; Monday-Thursday 7:30 a.m.-7 p.m.; Friday 7:30 a.m.-6 p.m. Slide trays and blank slides may be picked up in the Hyatt Regency Loring room.

Electronic theater office
The electronic theater office—Minneapolis Auditorium and Convention Hall Room 209—is open Sunday 1 p.m.-9 p.m. for delivery of final show materials as per previous arrangements with the electronic theater committee. Films and videotapes may be picked up Thursday 11:30 a.m.-5:30 p.m. and Friday 9 a.m.-5:30 p.m. The telephone number is (612) 870-9391.

Attendee screening room
Room 203 in the Minneapolis Auditorium and Convention Hall is available for informal slide, film and videotape viewing. 35mm slides, 16mm films and ¾-inch U-Matic NTSC videotapes are supported. The room is open Thursday 7:30 a.m.-7 p.m. and Friday 7:30 a.m.-6 p.m. Contact A/V headquarters for first-come, first-serve reservations.

Conference support
Images at SIGGRAPH '84 are clearer than ever before through General Electric light valve video projectors, Electronic Systems Products, Inc. Aquastar IIIC video projectors, Telex 35mm slide projectors and Singer 16mm film projectors.

Child care
Most SIGGRAPH '84 hotels offer child care services. For information on what type of child care services your hotel offers, contact the guest services department.

Conference materials
SIGGRAPH '84 course notes, proceedings, slide sets, T-shirts, tie pins, stick pins and poster sets are available for purchase at the conference. Additionally, registrants may buy SIGGRAPH video reviews, 1983 Japanese exhibition of computer graphics art show catalogs and merchandise from previous SIGGRAPH conferences.

Coupons are purchased at the registration desk and exchanged for conference materials at the conference materials desk. Both desks are located in the registration area of the Minneapolis Auditorium and Convention Hall. The desks are open beginning at 1 p.m. on Sunday and thereafter during registration hours.

Conference office
SIGGRAPH '84 staff members are available in room 212A/B of the Minneapolis Auditorium and Convention Hall to assist registrants with any special needs or questions throughout the conference.

Conference sponsorship
SIGGRAPH '84 is sponsored by the Association for Computing Machinery's Special Interest Group on Computer Graphics in cooperation with the IEEE Technical Committee on Computer Graphics, Eurographics, the Minneapolis College of Art and Design, the University of Minnesota, the Science Museum of Minnesota and the Institute for Media Arts.

Dress
Casual dress is acceptable at all SIGGRAPH '84 conference functions. Casual dress also is acceptable at many Minneapolis/St. Paul dining establishents; however, jackets and ties may be required in some locations. The SIGGRAPH '84 conference committee recommends that guests check dress code requirements when restaurant reservations are made.

First aid
Paramedics are on duty Sunday through Friday during the following hours: Sunday 8 a.m.-11 p.m.; Monday 8 a.m.-8 p.m.; Tuesday 8 a.m.-10 p.m.; Wednesday 8 a.m.-10:30 p.m.; Thursday 8 a.m.-9 p.m.; Friday 8 a.m.-5 p.m.

The first aid room is located in Lobby B at the Stevens Avenue entrance of the Minneapolis Auditorium and Convention Hall. The telephone number is (612) 874-0961.

Foodservice
The Minneapolis Auditorium and Convention Hall concession stand is open Monday through Friday from 8 a.m.-5 p.m. The stand is located near the registration area in the auditorium.

General information

The cafeteria, located on the mezzanine level of the Minneapolis Auditorium and Convention Hall, is open during the exhibition hours: Tuesday 10 a.m.-6 p.m.; Wednesday 10 a.m.-6 p.m.; Thursday 10 a.m.-3:30 p.m.

Hotels

Amfac Hotel
30 South Seventh Street
Minneapolis
(612) 349-4000

Concord Motel
71 South Eleventh Street
Minneapolis
(612) 332-1481

Fair Oaks Motor Hotel
2335 Third Avenue South
Minneapolis
(612) 871-2000

Guest House Motel
704 Fourth Avenue South
Minneapolis
(612) 370-1444

Holiday Inn Downtown
1313 Nicollet Mall
Minneapolis
(612) 332-0371

Hotel Leamington
1014 Third Avenue South
Minneapolis
(612) 370-1100

Hyatt Regency
Minneapolis
1300 Nicollet Mall
Minneapolis
(612) 370-1234

Leamington Motor Inn
400 South Tenth Street
Minneapolis,
(612) 332-4500

Marquette Hotel
Marquette Ave. at IDS Center
Minneapolis
(612) 332-2351

Minneapolis Plaza Hotel
315 Nicollet Mall
Minneapolis
(612) 332-4000

Normandy Inn
Minneapolis
405 South Eighth Street
Minneapolis
(612) 370-1400

The Northstar Hotel
618 Second Avenue
South
Minneapolis
(612) 338-2288

Radisson Plaza St. Paul
411 Minnesota Street
St. Paul
(612) 291-8800

Radisson St. Paul Hotel
11 East Kellogg Blvd.
St. Paul
(612) 292-1900

Regency Plaza
41 North Tenth Street
Minneapolis
(612) 339-9311

St. Paul Granada Royale
175 East Tenth Street
St. Paul
(612) 224-5400

The St. Paul
350 Market Street
St. Paul
(612) 292-9292

Housing assistance

A representative from the Minneapolis Convention and Visitors Commission is available at the housing desk in the registration area of the Minneapolis Auditorium and Convention Hall on Sunday from 1 p.m.-8 p.m. and Monday and Tuesday from 9 a.m.-5 p.m. to assist SIGGRAPH '84 registrants in making hotel accommodations in Minneapolis and St. Paul.

SIGGRAPH '84 registrants needing housing assistance Wednesday, Thursday and Friday can contact the Minneapolis Convention and Visitors Commission between 9 a.m. and 5 p.m. at (612) 348-4313.

Information and assistance center

The conference information and assistance center is located in the registration area of the Minneapolis Auditorium and Convention Hall. Personnel handle questions beginning at 1 p.m. on Sunday and thereafter during registration hours.

Luggage check area

A luggage check area is located in Lobby B at the Stevens Avenue entrance of the Minneapolis Auditorium and Convention Hall for the convenience of SIGGRAPH '84 attendees. This area opens at 1 p.m. on Sunday and is open thereafter during registration hours.

Message center

A message center for SIGGRAPH '84 attendees is located in the registration area of the Minneapolis Auditorium and Convention Hall. The message center telephone number is (612) 874-7715.

Message center personnel also accept personal messages from one conference participant to another. The message center is open beginning at 1 p.m. on Sunday and thereafter during registration hours.

Omnimax film credits

Executive production by ACM SIGGRAPH in cooperation with The Science Museum of Minnesota.

Produced and directed by Edward Garrick, Edward Garrick Productions, Inc.

Film recording and co-production by Cal Kirchhof and DICOMED Corporation.

Sponsored by Control Data Corporation, Cray Research, Inc. and DICOMED Corporation.

For the Association for Computing Machinery, Special Interest Group on Computer Graphics—Richard M. Mueller and Richard A. Weinberg.

For the Science Museum of Minnesota—Joel Orlen and Mike Day.

Distribution by The Science Museum of Minnesota

Filmed in Imax.

Contributors
Constellation Sequence
by Vibeke Sorensen, Art Center College of Design— Caltech Computer Graphics Group
Software by James F. Blinn

Colorfalls
by James A. Squires
Software Assistance by Jerry Reed, Richard Moszkowski, Ian Macleod.
Computer equipment furnished by Chromatics Inc.

Digital Harmony Sketches at UCLA
by John Whitney, Bernard Servoulle, Dahna Butnik, Diane Feingold, Philip Cizewski, Philippe Daniel, Francois Antier.
Principal programmer-Bernard Servolle, Advisor- James A. Squires, Filming Assistance- Ian Macleod.
Computer equipment furnished by Chromatics Inc.

Nighttrain
by Bill Charlesworth, Rich Crawford, Joe Cychosz, Dave Plunkett, Steve Van Frank, Purdue University CADLAB.
Acknowledgements—Michael J. Bailey, Purdue University CADLAB; Purdue University Computing Center; John R. Jackson, Control Data Corporation.

Urban Dive, Egg, SIGGRAPH logo
by Peter Jurgensen.
Thanks to Skidmore, Owings & Merrill.

Anthroman Leaves Town
Producer-Steve Legensky, Director-Dan Stipe, Image Generation Software-Charles Lamb.

Fly-in—Steve Legensky, Database and Animation-John Butler.
The City—Modeling and Animation-George Tsakas, Stan Cohen, Tod Rogers, Dan Stipe.
The Gilder—Modeling and Animation-Rick Fitzpatrick, Dan Hiepler.
Anthropometric Software, Roland Johnson.
Intelligent Light at Austin Electronics.

ADAM's Leap
by Arthur J. Olson, Ph.D., Research Institute of Scripps Clinic, Copyright 1984.

Desert Planet Simulation
Geometric Productions, Berkeley California.
Director-Charles E. Henderson, Senior Programmer/Mathematician-Agnis Kaugers.
This sequence was generated on a CRAY computer.
Sinai Satellite Data provided by Earth Satellite Corporation, Starfield Data provided by Lucasfilm Ltd.
Special thanks to: John Aldag, Cray Research, Inc.; Bill Samayoa, Cray Research, Inc.; Max Miller, Earth Satellite Corporation; Kawana Estep, Earth Satellite Corporation; Loren Carpenter, Lucasfilm Ltd; Art Paradis, Dynamic Graphics Inc.

Space Station Sequence
by California Institute of Technology—Jim Kajiya, Tim Kay, John Platt, Brian Von Herzen. Art Center College of Design—John Beidenharn, Tom Brown, Chuck Esrock, Susan Gipson, Ted Owens, Rebecca Wilmot.
Thanks to: Al Barr, Caltech; Jeff Goldsmith, Caltech; Bob Schaff, Caltech; John Aldag, Cray Research, Inc.; Cray Research Inc.
This sequence was generated on a CRAY computer.

Saturn Fly
by Jeffrey Goldsmith, James T. Kajiya, Timothy L. Kay, Brian Von Herzen, James F. Blinn.
Thanks to: JPL Computer Graphics Laboratory, John Aldag and Cray Research, Inc., Bob Williams and the University of Minnesota Computer Center.
This sequence was generated on a CRAY computer.

Rollercoaster
by Digital Effects Inc.—C. Robert Hoffmann, Donald Leich, Judson Rosebush.

Square Root of Seven and The Third Day
by Bruce J. Lindbloom, DICOMED Corporation.

The Final Frontier
by Al Barr, California Institute of Technology Computer Graphics Group; Gray Lorig, Rensselaer Polytechnic Institute Center for Interactive Computer Graphics. Special thanks to: John Aldag, Cray Research, Inc. This sequence was generated on a CRAY computer.

Cloud Sequence
by Nelson Max, Lawrence Livermore National Laboratory.

Inside a Quark (Vine Labyrinth)
Design, modeling and animation by Ned Greene. Software—Jules Bloomenthal, Paul Heckbert, Ned Greene, Lance Williams.
Produced at New York Institute of Technology Computer Graphics Lab.
Special thanks to: Alexander Schure, chancellor, New York Institute of Technology.

Raster Egg Animation
Animation by Paul Heckbert. Egg Model by Ron Resch, Robert McDermott. Rendering software by Paul Heckbert.
Produced at New York Institute of Technology Computer Graphics Lab.

Revenge of the Ant
Animation and ant modeling by Dick Lundin. Background modeling by Paul Xander Jr. Anthill modeling by Lance Williams.
Produced at New York Institute of Technology Computer Graphics Lab.

Trip Through Molecule of Superoxide Dismutase
by Michael E. Pique, James S. Lipscomb, Anne C. Andersen, University of North Carolina at Chapel Hill. Molecular data by David Richardson, Jane Richardson, John A. Tainer, Elizabeth D. Getzoff, Kenneth Thomas, Karl Beem, Byron Rubin, Duke University.
Electric field by Elizabeth D. Getzoff, John A. Tainer. Scripps Clinic and Peter A. Kollman, Paul K. Weiner, University of California, San Francisco.
Dot surface by Mike Connolly, Scripps Clinic. Mathematical advice by Thomas A. Hern, Bowling Green State University and University of North Carolina at Chapel Hill, Nelson Max, Lawrence Livermore National Laboratory.

Computing by the Computer Science Department,
Microelectronic Systems Lab, University of North
Carolina at Chapel Hill and Research Triangle
Institute, Research Triangle Park, North Carolina.
Additional funding by the National Institute of Health
Grant RR-00898, principal investigator, Frederick P.
Brooks Jr.

Press briefing
A briefing for media representatives is scheduled on
Tuesday at 8:30 a.m. in room 214C of the Minneapolis
Auditorium and Convention Hall. Following a short
review of this year's conference highlights, early
admittance to the exhibition floor is granted to mem-
bers of the press.

Press room
Rooms 213C and 214C in the Minneapolis Auditorium
and Convention Hall are the base for press activities
during SIGGRAPH '84. Media guests register in the
SIGGRAPH '84 press room. Press kit displays, tele-
phones, typewriters, conference course notes and
proceedings are available in the room. Additionally,
set-up for individual interviews with scheduled
SIGGRAPH '84 spokespersons and other persons is
provided. The press room is open Sunday 3 p.m. to
8 p.m., Monday-Thursday 8 a.m. to 6 p.m. and Friday
8 a.m. to Noon.

Before proceeding to the press room, media repre-
sentatives must stop at the security desk in the
registration area of the Minneapolis Auditorium and
Convention Hall for clearance. Press badges are
issued in the press room.

Registration
SIGGRAPH '84 course registrants may pick up
conference materials in the registration area of the
Minneapolis Auditorium and Convention Hall prior to
the date of their first scheduled course.

Attendees for courses at the Amfac, Cricket Theatre,
Heritage Hall and the Minneapolis College of Art and
Design, who are unable to claim credentials prior to
the first day of their course, must register at the
course location. Conference materials for advance
registrants to the Monday courses, if not claimed at

the Minneapolis Auditorium and Convention Hall by Sunday evening are moved to the course location and are available for pickup beginning Monday at 7 a.m. Materials not claimed at the end of the day are returned to the registration area in the Minneapolis Auditorium and Convention Hall.

Likewise, credentials for advance registrants to the Tuesday courses are held in the registration area of the Minneapolis Auditorium and Convention Hall until 8 a.m. Monday. Conference materials are then moved to the course location for pickup beginning at 7 a.m. Tuesday.

For courses scheduled at the Hyatt Regency, Holiday Inn, Hotel Leamington and Minneapolis Auditorium and Convention Hall, conference materials remain available for pickup in the registration area of the Minneapolis Auditorium and Convention Hall.

All on-site registrations are handled in the registration area of the Minneapolis Auditorium and Convention Hall during regular registration hours.

Registration hours are:

Sunday, July 22	1 p.m.-11 p.m.
Monday, July 23	7 a.m.-8 p.m.
Tuesday, July 24	7 a.m.-8 p.m.
Wednesday, July 25	8 a.m.-8 p.m.
Thursday, July 26	8 a.m.-6 p.m.
Friday, July 27	8 a.m.-6 p.m.

All press registrants must stop by the security desk in the registration area for clearance to the press room. Press badges are distributed in the press room, 213C and 214C, in the Minneapolis Auditorium and Convention Hall.

Slide sets
Three slide sets have been created to capture the visual essence of SIGGRAPH '84. The technical set depicts new research and applications of computer graphics from many disciplines. The industry set continues a new feature from last year's conference, a visual proceedings of the SIGGRAPH '84 exhibition of computer graphics hardware, software, applications and services. The design arts show set features selected examples centered around this year's design arts show theme: computer-supported design—architectural, industrial and visual communication.

All slide sets are available at the conference materials desk in the registration area of the Minneapolis Auditorium and Convention Hall.

Special services
Airline information
Republic Airlines is available in the registration area of the Minneapolis Auditorium and Convention Hall to reconfirm and change reservations for all airlines. The Republic desk also will issue tickets.

Currency exchange
International visitors may exchange their currency for United States dollars at a special desk in the Hyatt Regency. An exchange facility also is located in the Minneapolis/St. Paul International Airport, and several local banks handle international money exchanges.

Shipping Desk
A United Parcel Service shipping desk is available near the conference materials desk in the registration area of the Minneapolis Auditorium and Convention Hall. Shipping costs are posted.

Telephones
A/V headquarters
Minneapolis Auditorium and Convention Hall Room 205A/B
(612) 874-1312

Conference management office
Minneapolis Auditorium and Convention Hall Room 212A/B
(612) 874-0577

Electronic theater office
Minneapolis Auditorium and Convention Hall Room 209
(612) 870-9391

Emergencies (ambulance, fire, police)
911 or dial 0 for a switchboard operator in your hotel

Exhibition management office
Minneapolis Auditorium and Convention Hall Lobby C, Third Avenue entrance
(612) 871-8860

First aid
Minneapolis Auditorium and Convention Hall
Lobby B, Stevens Avenue entrance
(612) 874-0961

Housing assistance
Minneapolis Auditorium and Convention Hall
registration area
(612) 874-0307

Information and assistance center
Minneapolis Auditorium and Convention Hall
registration area
(612) 874-7412

Message center
Minneapolis Auditorium and Convention Hall
registration area
(612) 874-7715

Minneapolis College of Art and Design
((612) 870-3285

Minneapolis Convention and Visitors Commission
(612) 348-4313

Press room
Minneapolis Auditorium and Convention Hall
Rooms 213C and 214C
(612) 874-7632

Registration area
Minneapolis Auditorium and Convention Hall
Plaza Room
(612) 874-8494

Speaker film/video prep room
Hyatt Regency Loring Room
(612) 339-0485

Tours
Informational materials outlining things to see and do
in the Minneapolis/ St. Paul area are available at the
information and assistance center in the registration
area of the Minneapolis Auditorium and Convention
Hall.

Transportation
Public transportation in Minneapolis/ St.Paul, including
taxis, is scarce. To assist your transportation efforts,
the SIGGRAPH '84 conference committee strongly
suggests you take advantage of the following offerings.

Future
Conferences

SIGGRAPH '85
San Francisco, California
July 22-26, 1985

Co-chairs
Pat Cole, Atari Computer Animation
Robert L. Heilman, Gould Computer Systems Division

Technical program
Brian A. Barsky, University of California, Berkeley

Courses
Mike Bailey, Purdue University

Forum
Bertram Herzog, Unicad, Inc.

Art show
Louise R. Etra, independent

Film and video show
Robert L. Cook, Lucasfilm Ltd.

Exhibits
Pete Harris, Jupiter Systems, Inc.

Treasurer
Elaine L. Sonderegger, independent

Aural / Visual environments
Phil Morton, Video Research Consultants

Graphic design
Richard Winn Taylor II, LIGHT FX

Major due dates
All deadlines will be strictly observed. This allows a fair selection process and time for production of printed materials.

Technical papers	January 16, 1985
Course proposals	November 30, 1984
Forum proposals	January 16, 1985
Art and installations	March 15, 1985
Film and video	April 17, 1985
Slides	as available

Technical program
The technical program forms the nucleus of the annual SIGGRAPH conference and is noted to be the

...eader for the presentation of new research results in the field of computer graphics. Previously unpublished papers in all areas of computer graphics and interactive techniques are solicited for formal review for the technical program. Appropriate topics include, but are not limited to, image generation, geometric modeling, CAD/CAM, algorithms, animation, interactive techniques and hardware. Accepted papers will be presented during three days of technical sessions at the conference and published in the conference proceedings, a special issue of *Computer Graphics.* Previous SIGGRAPH conference proceedings have become standard references in the field.

A submission should be a scholarly article containing original research results. The acceptance or rejection decision is based on the paper as submitted, which should therefore be refined and complete. It should include an abstract of 100 to 300 words, a discussion of how the reported results relate to other work, citations to the relevant literature, background material or references thereto, as well as details of the new work. Authors are encouraged to consult the *Communications of the ACM* publications standards (published in July 1982). It is strongly recommended that papers not exceed 20 double-spaced typewritten pages.

Five copies of each submitted paper should be received by the technical program chair by January 16, 1985. This is an absolute deadline. The reviewing process will commence on this date; papers not in the technical program office at that time will not be reviewed. Acceptance notification will be at the end of March 1985 and final, camera-ready papers will be due in mid-May 1985.

Technical program chair
Brian A. Barsky
SIGGRAPH '85 Technical Program Office
Berkeley Computer Graphics Laboratory
Computer Science Division
University of California
Berkeley, California 94720 USA

Contact Lindy Foster at (415) 642-7290
Telex: 9103667114 UC BERK BERK

Technical program committee
Russell J. Athay*, Evans and Sutherland Computer Corporation

Norman I. Badler, University of Pennsylvania
John C. Beatty, University of Waterloo
R. Daniel Bergeron, University of New Hampshire
Edwin E. Catmull, Lucasfilm Ltd.
Franklin C. Crow, Xerox PARC
Nick England, Adage, Inc.
David C. Evans*,Evans and Sutherland Comptuer Corporation
James D. Foley, George Washington University
A.R. Forrest, University of East Anglia
Alain Fournier, University of Toronto
Henry Fuchs, University of North Carolina at Chapel Hill
James T. Kajiya, California Institute of Technology
Jefferey M. Lane, Vulcan Software
James C. Michener, CERN
Richard F. Riesenfeld, University of Utah
Marceli Wein, National Research Council of Canada

*SIGGRAPH '86 technical program co-chair

Courses
A wide variety of one and two-day courses will be presented at the conference. Introductory to advanced topics will feature many of the leaders in the field. All courses will be chosen based on proposals submitted for formal review.

Forum
The conference forum will provide unique opportunities to explore topics of special interest in parallel with the formally refereed papers. A forum session may take the structure of a panel, poster session, debate, or other appropriate format. Areas of interest include works in progress, industry issues, trends in the field of computer graphics, and applications. Proposals for new and creative forum sessions are invited.

Art show
Envisioned as a festival of the arts at the conference and extending into the rich, cultural environment of the San Francisco community, the SIGGRAPH '85 art show will be formally juried and will travel to museums around the world. Artists using computers may contribute works, including hardcopy, stills, film, video, sculpture, installations, performance and framebuffer images.

Film and video show
Two different evening presentations will show computer animation at its finest. Pieces will range from

older works of historical interest to the latest in state-of-the-art computer graphics. Contributions from research, industry, advertising and the arts are invited on either videotape or film. A jury will screen the entries, basing its selection on creativity and technical excellence.

Slides

In addition to slides submitted for the art show selection, slides may be contributed for general use in promoting, documenting and celebrating the conference. Possible uses of slides include covers, posters and advertisements.

For a package of detailed information regarding contributions to the technical program and **all** of the above, **please contact:**

SIGGRAPH '85
Conference Services Office
Smith, Bucklin and Associates, Inc.
111 East Wacker Drive
Chicago, Illinois 60601
(312) 644-6610

For information about the large conference exhibition to display the latest in computer graphics hardware, software and services, **please contact:**

SIGGRAPH '85
Exhibition Management Office
Robert T. Kenworthy, Inc.
866 United Nations Plaza
New York, New York 10017
(212) 752-0911

Future conferences

Future Conferences
SIGGRAPH '86
August 18-22, 1986
Dallas, Texas USA
Co-chairs
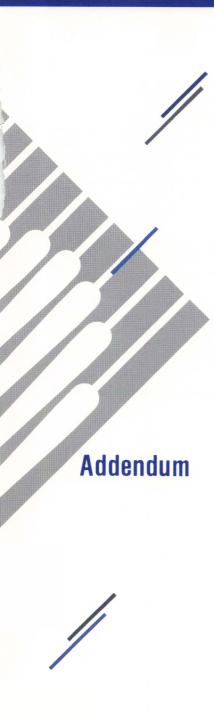Raymond L. Elliott (505) 667-7356
Ellen Gore (619) 452-0170

SIGGRAPH '87
July 27-31, 1987
Anaheim, California USA

SIGGRAPH '88
July 25-29, 1988
Atlanta, Georgia USA

Addendum

Local events—art

The "Honeywell Corporate Gallery Invitational: The Artist and the Computer 1984"—A computer graphic art exhibit is open to Siggraph attendees. This exhibit will be displayed at the Honeywell Corporate Gallery, three blocks east of the Minneapolis College of Art and Design (which houses the SIGGRAPH '84 Desig Arts Show) between 26th and 28th streets on Fifth Avenue South.

The Honeywell exhibit contains 40 computer graphics generated artworks in print format as well as selected 3-dimensional artworks which incorporate computer graphics techniques.

The Honeywell Corporate Gallery is open from 9 a.m. to 5 p.m. weekdays. No admission is required for the show but you may be required to show Siggraph credentials. For group tours contact Mark Feyereisen at Honeywell, 870-6271.

Additional Omnimax film contributors
Caltech
Al Barr

ISSCO
Craig Hairston

Exhibition additions

Changes in exhibitor locations and exhibitors added to the roster between June 7 and July 9 are as follows:

Exhibitor relocations

Control Systems
Booth 1255
(original location: Booth 2130)

New GEA Corporation
Booth 828
(original location: Booth 1305)

Additional exhibitors

AT&T Teletype Corp.
Booth 1246

5555 West Touhy
Skokie, Illinois 60077
(800) 323-1229

Frederiksen & Shu Laboratories Inc.
Booth 1214

531 West Gulf Road
Arlington Heights, Illinois 60005
(312) 956-0710
David Shu
President

IEV, Corporation
Booth 2107

254 West 400 South
Suite 280
Salt Lake City, Utah 84101
(801) 531-0757
Nelson N. Woodbury
President

kms Advanced Products Inc.
Booth 2101

3941 Research Park Drive
Ann Arbor, Michigan 48106
(313) 769-1100
Craig Rubenstein
Marketing Director

Pixel Computer Inc.
Booth 1901

260 Fordham Road
Wilmington, Massachusetts 01887
(617) 657-8720
Colleen Kurlansky
Manager, Corporate Communications

Quintar Corporation
Booth 1305A

2525 Maricopa Street
Torrance, California 90503
(213) 320-5700
Molly S. Morgan
Director of Marketing & Sales

Texas Memory Systems, Inc.
Booth 1305

9888 Bissonnet, Suite 470
Houston, Texas 77036
(713) 771-8200
Holly Frost
President

Video Images
Booth 2130

12200 West Adler Lane
Milwaukee, Wisconsin 53214
(414) 475-0111
Russ DeGrave
Sales Representative

9916 West 74th Street
Eden Prairie, Minnesota 55344
(612) 941-9267
George Stanfield
Sales Representative

VLSI Design
Booth 2021

111 East Shore Road
Manhasset, New York 11030
(516) 365-4600
Ken Kaplan
Association Publisher

The Eleventh Annual Conference on Computer Graphics and Interactive Techniques

Sponsored by the Association for Computing Machinery's Special Interest Group on Computer Graphics in cooperation with the IEEE Technical Committee on Computer Graphics, Eurographics, the Minneapolis College of Art and Design, the University of Minnesota, the Science Museum of Minnesota and the Institute for Media Arts.

acm　Φ　EG