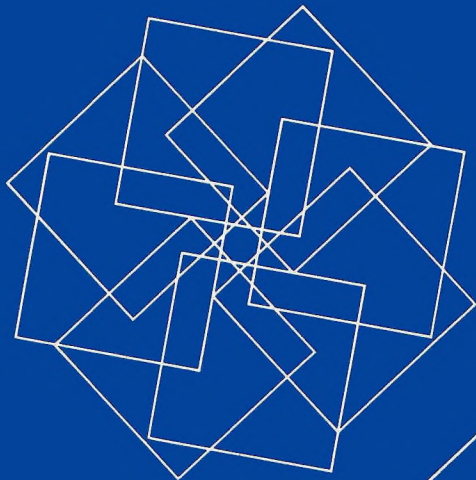


SIGGRAPH'80 Program

acm



The Seventh Annual Conference
on Computer Graphics and Interactive Techniques
July 14-18, 1980, Seattle, Washington

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Introduction

This Final Program, in conjunction with the Exposition Guide, contains information necessary for participation in the SIGGRAPH '80 Conference.

The organization of the material was derived by subject matter or activity category. Specifically, the following sections are contained in this booklet.

- I Recognition of people that created SIGGRAPH '80.**
- II Technical Program.**
- III Tutorials**
- IV Exposition**
- V Other Events and Meetings**
- VI General Information**
 - 1. On-site Registration**
 - 2. Transportation**
 - 3. Headquarters**
 - 4. Information Center**
 - 5. Message Center**
 - 6. Phone numbers**
 - 7. Hotels**
 - 8. Industrial Tours**
- VII Maps, Personal Calendar.**

For the latest information or for questions not answered here, please contact the Information Center at either the Olympic Hotel, Williamsburg Room, or the Seattle Center Coliseum foyer.

SIGGRAPH – The Organization

SIGGRAPH is the Special Interest Group on Computer Graphics of the Association for Computing Machinery (ACM). The 6000+ individuals that belong to the group share an interest in the topics of Man-Machine Interaction, Graphical Representation of Data, Data Structures, Data Base Searching and Retrieval, Computer Aided Design, Graphic Control Systems, Network Design, Computer Art, Computer Animation, Graphic Software and Graphic Hardware. Local Chapters have been formed in Washington, D.C., Los Angeles and Syracuse. Annual membership dues include a subscription to "Computer Graphics" the group newsletter, and are \$8.00 for ACM members, \$4.00 for ACM Student Members or \$18.00 for Non-ACM Members. Make checks payable to ACM, Inc., P.O. Box 12105, Church Street Station, New York, N.Y. 10249 and include name, mailing address, and a signature identifying the ACM Number or a request for non-ACM membership under provisions of ACM Constitution By-Law 7, Section 3.

Present ACM-SIGGRAPH officers are:

James E. George, Chairman
Norman Badler, Vice-Chairman
Tom DeFanti, Secretary
Sara Bly, Treasurer
Bary W. Pollack, Editor-in-Chief
Robert A. Ellis, Director
Lansing Hatfield, Director
Elaine Sonderegger, Director
Richard L. Phillips, Past Chairman

Messages

From The General Chairmen

Production of a conference is like the construction of a gigantic jigsaw puzzle. If one selects the pieces (technical program, tutorials, exposition), locates and orients them (budgets, local arrangements) and is lucky to find enough pieces to see the picture (a great committee) the form begins taking shape. Eventually one develops "contingency" plans against the overturning of the table (foreseen and unforeseen disasters) and solicits advice (coordination) in the hope that control can be established. Publicity is telling the world how great things are going to be and being reminded of the errors made by others. Certainly one can get some satisfaction from putting together the final pieces (putting some personal touches to the result). However, the results of SIGGRAPH '80 will be longer lasting than the construction of a puzzle... contacts made and knowledge gained will have an impact on each participant, while the proceedings and programs will provide a permanent record of what happened in Seattle this third week in July. Everyone hopes you find what you expected, because it was created to satisfy you, the attendee, but if not, you will have the opportunity to build your own puzzle. Next year's conference organizers, we are certain, would appreciate any constructive criticism of our efforts.

We would like to thank those who created prior SIGGRAPH conferences for the lessons learned and our co-workers for the support that made SIGGRAPH '80 possible. We also extend our good wishes to future organizers of SIGGRAPH conferences. And last, but not least, we would like to thank our management at the Boeing Co. for permitting us to spend the time necessary to manage the organization of this conference.

Harvey Z. Kriloff
Robert A. Ellis
General Co-Chairman

From The Technical Program Chairman

The SIGGRAPH '80 Technical Program is a blend of both application and theoretical presentations. Particular emphasis has been placed on the applications and educational aspects providing the broadest learning experience for those attending SIGGRAPH '80. The papers and panels selected have been subjected to a strict reviewing process with only the highest quality being accepted. The Technical Program Committee hopes you will find SIGGRAPH '80 to be an informative graphic conference. We would appreciate your feedback so that next year's SIGGRAPH Conference will be even better.

James J. Thomas
Technical Program Chairman

From The Tutorial Chairmen

The SIGGRAPH '80 Tutorials play an important role in this conference as they have in past SIGGRAPH conferences. They offer newcomers the opportunity to learn about the fundamentals of Computer Graphics, practitioners the continuing education in the latest graphics techniques, and established members of our field the opportunity to be brought up to date on the most recent developments in Computer Graphics.

The Tutorials are a result of the response from our attendees in previous years. Thus, we bring you five tutorials from last year: *Introduction to Computer Graphics*, *Introduction to Raster Graphics*, *Advanced Raster Graphics*, *Computer Aided Design*, and *Animation Graphics*. We also bring you three new tutorials. Two of these reflect the expansion of Computer Graphics and its relationship with other disciplines such as Psychology and Graphic Design: *User Interfaces to Graphics Systems* and *Graphic Design and Information Graphics*. The third new tutorial is covering an area that has not previously had the attention it deserves; graphics capabilities of personal computers are discussed in *Low Cost Computer Graphics*.

We hope you like this year's selection of tutorials. We also hope to hear from you regarding improvements to existing as well as suggestions for new tutorials so that SIGGRAPH can continue to keep you informed of current developments in Computer Graphics.

Ingrid Carlbom
Lee B. Metrick
Tutorial Co-Chairmen

From The Exposition Chairman

SIGGRAPH '80 proudly welcomes you to our fifth equipment and software exposition. This year's show is the largest ever devoted to computer graphics. The dynamic growth pattern is directly coupled to the impact of graphics on industry and the dedication of SIGGRAPH organizing committees and the vendor community.

The SIGGRAPH '80 Exposition typifies the emergence of computer graphics as a useful and usable tool for the 1980's.

WELCOME!

David J. Kasik
Exposition Chairman

I Recognition of people that created SIGGRAPH '80

SIGGRAPH '80 Committee

General Co-Chairmen

Robert A. Ellis
Harvey Z. Kriloff

Boeing Computer Services Company
Boeing Computer Services Company

Technical Program

James J. Thomas

Battelle Northwest Laboratories

Tutorials

Ingrid Carlbom
Cathy Eastman
Lee Metrick
Tim Stevenson

Pennsylvania State University
Tektronix, Inc.
Tektronix, Inc.
Tektronix, Inc.

Exposition

David J. Kasik
Lawrence E. Gaylord

Boeing Computer Services Company
Boeing Commercial Airplane Company

User Groups

Guenther C. Schrack

University of British Columbia

Audio Visual

L. Richard Speer
Loren C. Carpenter

University of Washington
Boeing Computer Services Company

Local Arrangements

Johannes C. Sveinsson
Joan D. Weddle
John R. Sopka
Philip Katz
Yves de Saint Giles
Gil Drynan

Boeing Commercial Airplane Company
Boeing Commercial Airplane Company
Digital Equipment Company
Weyerhaeuser Company
Boeing Computer Services Company
Boeing Aerospace Company

Film Show

Charles Csuri

Ohio State University

Preliminary Program

Jean E. Schweitzer
Gary J. Herron

Boeing Computer Services Company
Boeing Computer Services Company

Final Program

Eva K. Peoples
Janice M. Hayden

Boeing Commercial Airplane Company
Boeing Commercial Airplane Company

Conference Coordinator

Curtis M. Geertgens Weyerhaeuser Company

Commercial Program

Donald E. Hankins Boeing Computer Service Company
Ware Washam Control Data Corporation
Larry Trickey Boeing Computer Services, Richland

Organizer, President's Forum

Neil L. Johnson Vector General, Inc.

Publicity

Jerry Schneider University of Washington
Paul A. Lewis University of Washington and
Boeing Computer Services Company

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Wesley D. Banning Boeing Computer Services Company

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Mailing

Joel Ware Boeing Computer Services Company
Margery A. Ellis Virginia Mason Hospital
Stanford N. Payzer Boeing Commercial Airplane Company

Proceedings Cover

Steven Wells Tektronix, Inc.

Student Assistants Coordinator

Steven Tamimoto University of Washington

Security

H.D. Barnhart Boeing Computer Services Company

SIGGRAPH '80 Committee

Program Committee

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Tony Lucido	Texas A&M University
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Ken Anderson	Anderson Publishing Co.
Kellogg Booth	University of Waterloo
John Dill	General Motors Corp.
James Foley	George Washington University
Henry Fuchs	University of North Carolina
Bary W. Pollack	University of British Columbia

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Prof. John Beatty	University of Waterloo
Dr. James F. Blinn	Jet Propulsion Lab
Dr. Kellogg S. Booth	University of Waterloo
Dr. Edwin Catmull	LucasFilm
Prof. James Clark	Stanford University
Prof. Franklin Crow	Ohio State University
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Maureen Gordon	The Foxboro Company
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Hannah L. Kemper	Digital Graphic Systems, Inc.
Philip Kennicott	General Electric Company
Dr. Stephen R. Levine	Electronic Graphics Associates
Mark LeVoy	Cornell University
Frank Lillehagen	Central Institute for Industrial Research (Norway)
Aaron Marcus	Lawrence Berkeley Laboratory
Susan Marcus	Meta-Graphics
Dr. Franklin Moses	U.S. Army Research Institute
Prof. Richard L. Phillips	University of Michigan
Gay Reineck	Reineck and Reineck
Jack Reineck	Reineck and Reineck
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Alvy Ray Smith	LucasFilm
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Victor Wallace	University of Kansas
Tony Lucido	Texas A&M University
Fanya Montalvo	Lawrence Berkeley Lab
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Kellogg Booth	University of Waterloo
John Dill	General Motors Corp.
James Foley	George Washington University
Henry Fuchs	University of North Carolina
David J. Kasik	Boeing Computer Services Company

II Technical Program:

All Technical Sessions are held at the Seattle Center

Opening Session	9:00am Exhibition Hall
Session A	Exhibition Hall
Session B	Snoqualmie Room (North Court)

There are no set breaks; people are free to come and go as they please, with proper consideration for speaker and audience. Luncheons are not provided by the conference. Regarding eating and dining in the vicinity of the Center and Seattle in general, please read the Restaurant section in this program. Of particular note, a number of quick service restaurants are located in the Food Circus at Seattle Center House.

Registration for the Technical Sessions entitles you to the Vendor Exhibit and Vendor Forum free of charge. Both events take place in the Coliseum, Seattle Center.

Extra Copies of Proceedings of the Conference, containing all papers presented in the Technical Sessions, are available for purchase starting Wednesday, July 16th at noon. Details at Information Centers.

Note: "Concurrent Session" means two sessions are being held simultaneously in different locations.

Technical Program

Wednesday, July 16, 1980 — Exhibition Hall

- 9:00 **Conference Chairmen's Welcome:** H. Kriloff, R. Ellis
- 9:20 **State of SIGGRAPH:** J. George, SIGGRAPH Chairman
- 9:30 **Technical Program:** J. Thomas, Technical Program Chairman
- 9:40-11:30 **Special Session**
Showing What You Know —
Effective Information Presentation Techniques for
Computer Graphics
-

Chairman: A. Marcus, Lawrence Berkeley Laboratory

Graphic design will be increasingly important to user-oriented computer graphic systems in the 1980's. The panel presentations will feature recognized graphic designers presenting case studies of innovative, informational graphics (charts, diagrams, maps, and so forth) and critiquing existing computer graphics from the graphic designer's point of view toward visual communication.

Participants:

M. Kurlansky, Pentagram Design
S. Marcus, Meta-Graphics Design Studio
J. Reineck, Reineck & Reineck Design Studio
G. Reineck, Reineck & Reineck Design Studio

11:30-1:00 **Lunch**

1:00 **Sessions A & B**

1:00-2:00 **Session A** (Concurrent Session) — Exhibition Hall
Algorithms

Chairman: K. Booth, University of Waterloo

The Theory, Design, Implementation, and Evaluation of a Three-Dimensional Surface Detection Algorithm
E. Artzy, G. Frieder, and G. Herman, State University of New York at Buffalo

Polygon Comparison Using a Graph Representation
K. Weiler, Carnegie-Mellon University

Creating Polyhedral Stellations
K. McKeown and N. Badler, University of Pennsylvania

2:15-3:45 **Session A** (Concurrent Session) — Exhibition Hall
Graphic Hardware Systems

Chairman: H. Fuchs, University of North Carolina at Chapel Hill

Acoustic Radar Graphic Input Device
P. deBruyne, Institut fur Hochfrequenztechnik

Movie-Maps: An Application of the Optical Videodisc to Computer Graphics
A. Lippman, Massachusetts Institute of Technology

High-Performance Raster Graphics for Microcomputer Systems
A. Bechtolsheim and F. Baskett, Stanford University

Simulation and Expected Performance Analysis of Multiple Processor Z-Buffer Systems
F. Parke, Case Institute of Technology

4:00-5:30 **Session A—Panel—Exhibition Hall**
Trends in High Performance Graphic Systems

Chairman: H. Fuchs, University of North Carolina at Chapel Hill

Panelists will discuss the techniques and impacts of new VLSI-oriented designs on affordable high-performance graphics systems.

Panelists:

D. Cohen, University of Southern California

B. Sproull, Carnegie-Mellon University

J. Clark, Stanford University

F. Parke, Case Institute of Technology

1:00-2:00 **Session B (Concurrent Session)—Snoqualmie Room**
Geographic and Data Base Systems

Chairman: L. Addison, Terak

Atlas Supplement to the 1972 County and City Data Book
L. Tedrow and E. Hoerauf, Western Washington University

A Prototype Spatial Data Management System
C. Herot, R. Carling, M. Friedell, and D. Kramlich,
Computer Corporation of America

ATLAS: A Geographic Database System — Data Structure
and Language Design for Geographic Information
T. Tsurutani, Y. Kasahara, and M. Naniwada, Nippon
Electric Company, Ltd.

2:15-4:15 **Session B—Panel (Concurrent Session)—Snoqualmie Room**
Computer Graphics Moves Into the Business World

Chairman: C. Machover, Machover Associates

Panelists will discuss new motivating forces in business graphics including hardware, software, systems, and user attitudes.

Panelists:

S. Taylor IBM

A. Schmidt, Harvard University

P. Birkhahn, American Can Company

J. Hament, Insurance Company of North America

J. Quann, NASA

Technical Program

Thursday, July 17, 1980

8:30 **Session A**

8:30-9:50 **Session A—Exhibition Hall**
Graphic Software & Languages

Chairman: R. Puk, Megatek Corporation

Integrating Solid Image Capability into a General Purpose
Calligraphic Graphics Package

G. Laib, R. Puk, and G. Stowell, Megatek Corporation

QUADRIL: A Computer Language for the Description of
Quadric-Surface Bodies

J. Levin, Boeing Computer Services

PICTUREBALM: A LISP-Based Graphics Language
System with Flexible Syntax and Hierarchical Data
Structure

G. Goates, M. Griss, and G. Herron, University of Utah

A Structure from Manipulation for Text-Graphic Objects

F. Lakin, Stanford Artificial Intelligence Laboratory

10:00 **Sessions A & B**

10:00-12:00 **Session A (Concurrent Session)—Exhibition Hall**
Surfaces

Chairman: B. Pollack, University of British Columbia

Stochastic Modeling in Computer Graphics

A. Fournier and D. Fussell, University of Texas at Dallas

Computer Rendering of Fractal Curves and Surfaces

L. Carpenter, Boeing Computer Services

A 3-Dimensional Representation for Fast Rendering of
Complex Scenes

S. Rubin and T. Whitted, Bell Laboratories

A Linear Time Exact Hidden Surface Algorithm

W. Franklin, Rensselaer Polytechnic Institute

On Visible Surface Generation by a Priori Tree Structures

H. Fuchs, University of North Carolina at Chapel Hill; and

Z. Kedem and B. Naylor, University of Texas

10:00-12:00 **Session B (Concurrent Session)—Snoqualmie Room**
Applications and Systems

Chairman: R. Ewald, Los Alamos Scientific Laboratory

Stereographic Displays of Atmospheric Model Data

M. desJardins and A. Hasler, NASA/Goddard Space
Flight Center

Application of Graphical Interaction to the Analysis of Radio
Astronomy Data

J. Torson, National Radio Astronomy Observatory

Color Graphics for Remote Teaching

W. Hankley and V. Wallentine, Kansas State University

Procedure Models for Generating Three-Dimensional
Terrain

R. Marshall, R. Wilson, and W. Carlson, Ohio State
University

Dynamic Scan-Converted Images with a Frame Buffer
Display Device

J. Jackson, Bell Laboratories

1:30 Sessions A & B

**1:30-3:30 Session A — Panel (Concurrent Session) Exhibition Hall
Computer Graphics in Television**

Chairman: R. Shoup, Aurora Imaging Systems

Panelists will discuss and illustrate use and techniques of computer graphics within the television industry.

Panelists:

T. Klimek, Computer Creations

L. Evans, AMPEX

P. Black, XIPHIAS Group

H. Bley, ABC Sports

D. Weise, KTVU Television Oakland

**3:40-5:30 Session A—Exhibition Hall
Animation**

Chairman: L. Metrick, Tektronix

Optical Printing in Computer Animation

N. Max and J. Blunden, Lawrence Livermore Laboratory

Adaptation of Scan and Slit-Scan Techniques to Computer Animation

F. Parke, Case Institute of Technology

Real Time Animation Playback on a Frame Store Display System

B. Ackland and N. Weste, Bell Laboratories

Special Problems in Human Movement Simulation

N. Badler and J. O'Rourke, University of Pennsylvania;
and B. Kaufman, Burroughs Corporation

The Integration of Subjective and Objective Data in the Animation of Human Movement

T. Calvert, J. Chapman, and A. Patla, Simon Fraser University

**1:30-2:30 Session B (Concurrent Session)—Snoqualmie Room
CAD/CAM**

Chairman: J. Dill, General Motors Research Laboratory

Graphic Analysis and Planning of Electrical Distribution Systems

G. Fuehring, Scott and Scott Consultants

B-Spline Surfaces for Ship Hull Design

D. Rogers and S. Satterfield, United States Naval Academy

Interactive Computer Graphics at Ford Motor Company

F. Bliss, Ford Motor Company

**2:45-4:45 Session B—Panel (Concurrent Session)—Snoqualmie Room
The User's View of CAD/CAM**

Chairman: Ken Anderson, Anderson Publications

The panelists will describe their views and experiences with establishing CAD/CAM systems, specifically addressing productivity.

Panelists:

M. Thompson, General Motors

D.H.W. Harris, Boeing

R. Wilson, Intel

B. Crowley, Structural Dynamics Research Corporation

C. Boyd, Boyd, Broach and Foster

M. Wozny, Rensselaer Polytechnic Institute

Technical Program

Friday, July 18, 1980

8:30-10:00 Session A—Exhibition Hall
Graphic Standards

Chairman: P. Bono, Naval Underwater Systems Center

The Workstation Concept of GKS and the Resulting Conceptual Differences to the GSPC Core System
J. Encarnacao (TH Darmstadt); G. Enderle; E.G. Schlechtendahl (KfK, Karlsruhe); K. Kansy and P. Wi kirchen (GMD, St. Augustin); G. Nees (Siemens AG, UbE, Erlangen); J. Weiss

BUMPS: A Program for Animating Projections
R. Gurwitz, R. Thorne, and A. van Dam, Brown University; and I. Carlbom, Pennsylvania State University

Natural and Efficient Viewing Parameters
J. Michener, Intermetrics, Inc.; and I. Carlbom, Pennsylvania State University

10:00 Sessions A & B

10:00-11:30 Session A—Panel (Concurrent Session)—Exhibition Hall
Graphics Standards Status Report

Chairman: P. Bono, Naval Underwater Systems Center

Status of International Standards Organization Committee
ISO TC97/SC5/WG2
P. ten Hagen, Mathematical Center, Amsterdam

Status of American National Standards Institute Committee
X3H3
Chairman: J. Chin, Tymshare, Inc.

Other Panelists:
J. Encarnacao, (TH Darmstadt)
J. Michener, Intermetrics, Inc.

10:00-11:30 Session B (Concurrent Session)—Snoqualmie Room
Human Factors

Chairman: V. Wallace, University of Kansas

Computer-Assisted Chart Making from the Graphic Designer's Perspective
A. Marcus, Lawrence Berkeley Laboratory

Perceptual Color Spaces for Computer Graphics
G. Meyer and D. Greenberg, Cornell University

"Put-That-There": Voice and Gesture at the Graphics Interface
R. Bolt, Massachusetts Institute of Technology

Prototyping and Simulation Tools for User/Computer Dialogue Design
P. Hanau and D. Lenorovitz, Martin Marietta Aerospace

1:00-3:30 **Session A—Exhibition Hall**
Raster Techniques

Chairman: F. Montalvo, Lawrence Berkeley Laboratory

3-D Transformations of Images in Scanline Order
E. Catmull, Lucasfilm and A. Smith, Jet Propulsion
Laboratory

Continuous Anti-Aliased Rotation and Zoom of Raster
Images

C. Weiman, General Electric Company

Synthetic Texturing Using Digital Filters

E. Feibush, M. Levoy, and R. Cook, Cornell University

The Display of Characters using Gray Level Sample Arrays

J. Warnock, Xerox Palo Alto Research Center

Human Vision, Anti-Aliasing, and the Cheap 4000 Line
Display

W. Leler, Texas Instruments

Techniques for Interactive Raster Graphics

P. Baudelaire and M. Stone, Xerox Palo Alto Research
Center

Filling Regions in Binary Raster Images: A Graph-Theoretic
Approach

U. Shani, University of Rochester

III Tutorials

Tutorials are held at two different locations: The Seattle Center and the Olympic Hotel. Please read the schedule carefully for time and place of the Tutorial for which you are registered. Please note that, because seating space is limited, attending more than one tutorial is discouraged — badges are coded to control entry. Registration for a Tutorial entitles you to the Vendor Exposition and Vendor Forum free of charge. Note that on Tue., July 15, the tutorials start at 8:30 and have a two hour lunch break (11:30-1:30) in order to permit attendance at the exposition which is open from 12:00-6:00 on that day.

Seattle Center:

There will be one break morning and afternoon. Weather permitting, refreshments will be set up outside the Northwest meeting rooms. In case of liquid sunshine, go to the lobby area between Rainier and Olympic rooms. A buffet luncheon is served in the Exhibition Hall during the days of the tutorials.

Olympic Hotel:

Morning and afternoon refreshments will be available in the Grand Ballroom. The buffet luncheon will also be served in the Grand Ballroom with tables and chairs available for seating.

All Tutorial Notes, along with the conference proceedings, are available for purchase starting Wednesday July 16th at noon. Details at Information Centers.

Introduction to Computer Graphics Tutorial

John Beatty, Chairman

Monday, July 14 Olympic Hotel, Georgian Room

- 9:00** Introduction: Outline of Tutorial/Beatty
- 9:15** Software I: Introduction to Software/Beatty
- 10:45** Break
- 11:00** Hardware I: Line Drawing and Point Plotting Systems/
Booth
- 12:00** Lunch
- 1:30** Hardware II: Raster Graphics Systems/Booth
- 3:15** Break
- 3:30** Software II: Advanced Software/Beatty

Tuesday, July 15 Olympic Hotel, Georgian Room

- 8:30** Graphics Input Hardware and Interaction Techniques/Wein
- 10:00** Break
- 10:15** Graphics Input Hardware, Continued/Wein
- 11:30** Lunch
- 1:30** Color and Color Perception; Animation and Painting
Systems/Beatty
- 2:45** Break
- 3:00** Graphics Packages/Beatty
- 4:30** Overview of Conference/Booth

Introduction to Raster Graphics Tutorial

Frank Crow, James Clark & Turner Whitted, Chairmen

Monday, July 14 Seattle Center, North Court, Nisqually Room

- 9:00** General Introduction/Crow
- 9:30** Frame Buffer Systems/Fuchs
- 10:30** Break
- 10:45** More Frame Buffer Systems/Fuchs
- 11:15** Other Graphic Output Devices/Levine
- 12:00** Lunch
- 1:30** Aspects of Color/Smith
- 2:15** Interactive Raster Graphics/Shoup
- 3:00** Break
- 3:15** Basic Raster Algorithms (Scan Conversion, etc.)/Crow

Tuesday, July 15 Seattle Center, North Court: Nisqually Room

- 8:30** Business Applications/George
- 9:15** Page Makeup Systems
- 10:00** Break
- 10:15** Applications in VLSI/Clark
- 11:30** Lunch
- 1:30** Introduction to 3D Raster Graphics/Whitted
- 3:00** Break
- 3:15** Applications Overview (Slide Show)/Levine

Advanced (3D) Raster Graphics Tutorial

Franklin Crow, James Clark and Turner Whitted, Chairmen

Monday, July 14 Seattle Center, North Court: Snoqualmie Room

- 9:00 General Introduction/Whitted
- 9:30 Color Theory/Smith
- 10:30 Break
- 10:45 Output to Film and Video/Catmull
- 12:00 Lunch
- 1:30 Hidden-Surface Algorithms for Polygonal Surfaces/Fuchs
- 3:00 Break
- 3:15 Algorithms for Curved Surfaces/Whitted

Tuesday, July 15 Seattle Center, North Court: Snoqualmie Room

- 8:30 Applications of Depth Buffers/Williams
- 9:15 Shape Data Development/Crow
- 10:00 Break
- 10:15 Shading and Lighting Techniques/Blinn
- 11:30 Lunch
- 1:30 More Shading and Lighting/Blinn
- 2:00 High-Performance and VLSI/Clark
- 3:00 Break
- 3:15 Films Illustrative the Above/Staff

User Interfaces to Graphics Systems Tutorial

Prof. James Foley and Dr. Jack D. Grimes, Chairmen

Monday, July 14 (Psychology Day) Seattle Center, North Court: Rainier Room

- 9:00 Introduction/Foley & Grimes
- 9:30 Applied Cognitive Psychology and the Information Processing Model/Grimes
- 10:45 Break
- 11:00 Psychology of Visual Perception/Moses
- 12:00 Lunch
- 1:30 Perception of Flicker in CRT Displays/Grimes
- 2:00 Organization of the Visual World and Display Formatting Approaches/Moses
- 3:00 Break
- 3:15 Application of Color Displays to Process Control/Gordon
- 4:15 Interactivity and The Perception of Time/Grimes
- 4:45 Why Do Computers Make Me Nervous?/Grimes

Tuesday, July 15 (How-To-Do-It Day) Seattle Center, North Court: Rainier Room

- 9:00 User Interface Design Methodology: Part 1/Foley
- 10:30 Break
- 10:45 User Interface Design Methodology: Part 2/Foley
- 11:30 Interaction Devices and Techniques: Part 1/Wallace
- 12:00 Lunch
- 1:30 Interaction Devices and Techniques: Part 2/Wallace
- 3:00 Break
- 3:15 A Case Study in the Design of a Text Editor/Tesler
- 4:45 Closing Comments/Foley & Grimes

Low Cost Computer Graphics Tutorial

Richard L. Phillips, Chairman

Monday, July 14 Olympic Hotel, Spanish Ballroom

- 9:00** Computer Graphics Overview/Phillips
- 10:30** Break
- 10:45** Stand-Alone Graphics—Single Board System/Hertzfeld
- 12:00** Lunch
- 1:30** Low Cost Hard Copy/George
- 3:00** Break
- 3:15** Interactive Graphics/Phillips

Tuesday, July 15 Olympic Hotel, Spanish Ballroom

- 8:30** Stand-Alone Graphics—S100 System/Kemper/Reynolds
- 10:00** Break
- 10:15** Low Cost Graphical Input/Phillips
- 11:30** Lunch
- 1:30** Demonstrations & Hands-On Experience/Phillips
- 3:00** Break
- 3:15** Panel: The Outlook for Low Cost Computer Graphics/Staff

Computer Aided Design Tutorial

Michael Wozny, Chairman

Monday, July 14 Seattle Center, North Court: Orcas-Lopez-Blakely Rooms

- 9:00** Overview of CAD/Wozny
- 10:30** Break
- 10:45** IGES/Kennicott
- 12:00** Lunch
- 1:30** A Tutorial Introduction to Geometric Modeling:
Part I/Voelcker
- 3:00** Break
- 3:15** A Tutorial Introduction to Geometric Modeling:
Part II/Requicha

Tuesday, July 15 Seattle Center, North Court: Orcas-Lopez-Blakely Rooms

- 8:30** Sculptured Surfaces/Hinds
- 10:00** Break
- 10:15** Real Intelligence in CAD Work Stations/Lillehagen
- 11:30** Lunch
- 1:30** Geometric Data Management/Dube, Warkentine
- 3:00** Break
- 3:15** Research Contributions and New Directions in Computer Aided Geometric Design/Risenfeld

Graphic Design and Information Graphics Tutorial

Aaron Marcus, Chairman

Monday, July 14 Seattle Center, North Court: Fidalgo-Shaw Rooms

- 9:00 Introductory Lecture: Basic Terminology/A&S Marcus
- 9:45 Begin working individually on Project 1/A&S Marcus
- 10:30 Break
- 10:45 Continue working on Project 1/A&S Marcus
- 11:15 Group review and critique of Project 1/A&S Marcus
- 12:00 Lunch
- 1:30 Lecture: Typography and Composition/A&S Marcus
- 2:15 Begin working individually on Project 2/A&S Marcus
- 3:00 Break
- 3:15 Continue working on Project 2/A&S Marcus
- 4:15 Group review and critique of Project 2/A&S Marcus

Tuesday, July 15 Seattle Center, North Court: Fidalgo-Shaw Rooms

- 8:30 Lecture: Statistical Charting and Diagramming/J&G Reineck, A&S Marcus
- 9:15 Begin individual work on Project 3/J&G Reineck, A&S Marcus
- 10:00 Break
- 10:15 Continue work on Project 3/J&G Reineck, A&S Marcus
- 10:45 Group review and critique of Project 3/J&G Reineck, A&S Marcus
- 11:30 Lunch
- 1:30 Lecture: Diagramming and Mapping/J&G Reineck, A&S Marcus
- 2:15 Begin working individually on Project 4/J&G Reineck, A&S Marcus
- 3:00 Break
- 3:15 Continue working on Project 4/J&G Reineck, A&S Marcus
- 4:15 Group review and critique of Project 4/J&G Reineck, A&S Marcus

Animation Graphics Tutorial

Ed Catmull, Chairman

Monday, July 14 Seattle Center, North Court: Olympic Room

- 9:00 Computer Animation Overview/Catmull
- 9:45 The Use of Frame Buffers in Animation and Painting Programs/Smith
- 10:45 Break
- 11:00 Scan and Paint for Traditional Animation/LeVoy
- 12:00 Lunch
- 1:30 Inbetweening with Computers/Catmull
- 2:30 The GRASS Line Drawing Animation System/DeFanti
- 3:30 Break
- 3:45 Color/Smith
- 4:15 3D Animation/Williams

Tuesday, July 15 Seattle Center, North Court: Olympic Room

- 8:30 ZGRASS Raster Animation System; Video Animation Overview/DeFanti
- 9:30 Mapping and Texture for 3D Surfaces/Williams
- 10:00 Break
- 10:15 The Texas Animation System/Smith
- 10:45 Merging Images in a Commercial Animation Environment/LeVoy
- 11:30 Lunch
- 1:30 Equipment for Computer Animation/Catmull
- 2:15 Aliasing and Image Quality/Williams
- 3:00 Break
- 3:15 Panel: The Future in Computer Animation/Staff
- 4:00 Film and Video Show/Staff

IV Exposition

Seattle Center Coliseum

Tuesday, July 15 12 Noon—6:00 P.M.

Wednesday, July 16 10:00 A.M.—6:00 P.M.

Thursday, July 17 10:00 A.M.—6:00 P.M.

The annual SIGGRAPH Conference and Exposition is unique in the computer field. The excellence of the exhibitor community and their willingness to display the latest developments enhance the attraction of the conference as a whole. A conference attendee can compare products and services that will meet his requirements with state-of-the-art technology in one place.

SIGGRAPH takes pride in the balance achieved between the exposition and technical portions of the conference. This year guarantees to be the largest exposition yet held at a SIGGRAPH Conference. Further information is provided in the separate exposition guide.

Exposition Marks Its Fifth Year

This is the fifth year that the SIGGRAPH Conference has included an Equipment and Services Exposition supported by the graphics industry vendors. Starting with the 10 vendors added late in the planning for SIGGRAPH '76 in Philadelphia, and growing to 37 vendors at SIGGRAPH '77 in San Jose and 45 vendors at SIGGRAPH '78 in Atlanta, we were forced out of hotel facilities by the 79 exhibitors who were part of SIGGRAPH '79 in Chicago. At the five year mark we may pass the 100 exhibitor mark (certainly we will have over 90 vendors) here in Seattle. We thank each exhibitor who has participated, but we think it bears particular mention that three exhibitors have "shown their wares" at all five SIGGRAPH Expositions. Those exhibitors are:

Control Data Corporation
Summagraphics Corporation
Tektronix Incorporated.

The list of four year exhibitors includes over 20 names. In an industry noted for the large number of new companies it's nice to acknowledge those pioneers who prepared the way.

Exposition Opening Ceremony

Tuesday, July 15, 1980

Seattle Center Coliseum 12:00 P.M. (Noon)

A short ceremony will mark the opening of the largest computer graphics exposition ever held under one roof. The guest list is still being finalized, but we expect some notables to be present. Come join the crowd and see it happen—everyone is invited.

Exhibitors

	Booth No.		Booth No.
ACM— Association for Computing Machinery	403	DeAnza Systems, Inc.	221
ABW Corp.	706	Design Aids, Inc.	635
Adage Inc.	432	Dicomed Corp.	214
Advanced Electronics Design	208	Digital Effects, Inc.	326
The Anderson Publishing Co.	316	Digital Engineering, Inc.	802
Apple Computer Inc.	531	Digital Equipment Corp.	519
Applicon, Inc.	436	Dunn Instruments, Inc.	110
Applied Dynamics	519	Dynair Electronics, Inc.	614
International	216		
Aydin Controls	511	E & O Systems, Ltd.	231B
		Eigen Video	728
		Electrohome Limited	803
		Evans & Sutherland	734
Bell Northern Research	620	GTCO Corp.	328
Benson-Varian, Inc.	527	General Electric Company	213
Benwill Publishing Corp.	722	Genisco Computer	645
Boeing Computer Services Company	405	Gerber Systems Technology	226
		Graphic Constructions, Inc.	324
Cahners Publishing Co.	539	Grinnell Systems Corp.	732
California Computer Products, Inc.	340	The Harvard Newsletter on Computer Graphics	429
CEC Div./Bell & Howell	642	Hewlett-Packard	418 & 420
Celco	231C	Houston Instrument	312
Child Incorporated	525		
Chromatics, Inc.	711	IBM Corporation	413
Colorado Video	203	IEEE Computer Society	529
Computer Graphics Magazine	615	Ikonas Graphics Systems	204
Computervision Corp.	626	Image Resource Corp.	337
Comtal Corp.	637	Imlac Corporation	505
Conference Book Service	727		
Control Data Corporation	533		
Cromemco, Inc.	607		

	Booth No.		Booth No.
Information Devices Corp.	438	Ramtek Corporation	616 & 632
Integrated Software Systems Corp.	212	STSC, Inc.	326
Intelligent Systems Corp.	426	Sanders Associates, Inc.	228
KMW Systems Corp.	605	Science Accessories Corporation	517
Lexidata Corporation	220	Science Applications, Inc.	634
Logic Sciences, Inc.	209	Selamar Corporation	318
M & S Computing, Inc.	508	Soltec Corp.	427
Magnavox Display Systems	523	Spatial Data Systems	600
Matrix Instruments, Inc.	521	Stanford Technology Corp.	424
Megatek Corporation	440 & 540	Summagraphics Corporation	107
Moxon Electronics	427	Superset, Inc.	322
Nicolet Zeta Corporation	200	Synercom Technology Inc.	640
Numonics Corporation	422	Talos Systems, Inc.	304
Dave Nutting Assoc. Div. of Bally	314	Technical Marketing	215
Optical Business Machines, Inc.	621	Tektronix, Inc.	334
Perkin-Elmer	724	Terak Corporation	631
Phoenix Computer Systems, Inc.	702	3M—Minnesota Mining & Manufacturing	719
Polaroid Corp.	800	Three Rivers Computer Corp.	231A
Precision Visuals, Inc.	537	Trilog Inc.	229
Printronic, Inc.	317	Vector Automation	320
		Vector General	536
		Versatec	306
		Xerox Printing Systems Division	210

Vendor Forum

The SIGGRAPH '80 Vendor Forum is being held in the mezzanine of the Seattle Center Coliseum, the same building that contains the exhibits. Sessions will be held July 16 and 17, between 10:00am and 5:00pm. The Vendor Forum consists of 30 minute sessions in which participating vendors are given an opportunity to present information on new and existing products and services. The final schedule for these sessions will be available at the Information Center and at the entrance to the exhibit area. The preliminary list of participants includes:

- Adage, Inc.
- Bell Northern Research
- Benson-Varian, Inc.
- Boeing Computer Services Company
- Child Inc.
- DeAnza Systems, Inc.
- DICOMED Corporation
- The Harvard University Newsletter
- Ikonas Graphics System
- Image Resource Corporation
- Integrated Software Systems Corporation (ISSCO)
- Lexidata Corporation
- Megatek Corporation
- Nicolet Zeta Corporation
- Precision Visuals, Inc.
- Sanders Associates, Inc.
- Selanar Corporation
- Superset, Inc.
- Tektronix, Inc.
- Three Rivers Computer Corp.
- Trilog, Inc.
- Vector General

Proceedings Cover Design Contest

The first computer generated art competition for a SIGGRAPH conference must definitely be judged a success. We hope that future conferences will make this a regular event.

Entries for the Proceedings cover contest were received from:

Michael A. Nicol
5249 Woodcock Way
Dayton, Ohio 45424

Donald F. Fussell
University of Texas at Dallas
Box 688
Richardson, Texas 75080

Wayne E. Carlson
Computer Graphics Research Group
Ohio State University
Columbus, Ohio 43212

Bob Armstrong
288 Vine Ave.
Highland Park, Illinois 60035

Buz Davis
Georgia State University
University Plaza
Atlanta, Georgia 30303

Copper Giloth
UICC/Dept. of INFE
Electronic Visualization Lab
Box 4348
Chicago, Illinois 60680

Joan Wyzkoski
Department of Math
Bradley University
Peoria, Illinois 61625

AHJ Christensen
Computer Science Division
National Research Institute
for Mathematical Sciences
P.O. Box 395
Pretoria, 0001 South Africa

Darcy Gerbarg
12 East 12th St. 11th floor
New York, NY 10003

Loren Carpenter M/S 73-02
Boeing Computer Services
P.O. Box 24346
Seattle, Washington 98124

The Judges were:

David Turrill
1066 East Blaine
Seattle, Washington 98102

Rick Eiber
University of Washington
School of Art DM-10
Seattle, Washington 98195

Bary W. Pollack,
University of British Columbia
Department of Computer Science
2075 Wesbrook Mall
Vancouver, B.C. Canada U6T 1W5

The winners are:

Color Division
Monochrome Division

Loren Carpenter
AHJ Christensen

All entries will be on display during the Conference in the Coliseum.

Conference at a Glance

7 AM 8 9 10 11 12 1 PM 2 3 4 5 6 7 8 9 10 11 12



ACM—SIGGRAPH '81

Call for Papers

Eighth Annual Conference on Computer Graphics and Interactive Techniques August 3-7 1981 Dallas, Texas.

ACM SIGGRAPH '81, the eighth Annual Conference on Computer Graphics and Interactive Techniques will be held August 3-7, 1981 at the Convention Center, Dallas, Texas. The conference will consist of a blend of paper and panel discussions with major emphasis on human-machine communication and applications demonstrating

Sponsored by the Association for Computing Machinery Special Interest Group on Computer Graphics

state-of-the-art techniques. Both hardware and software topics are encouraged. An emphasis will be placed on industrial (foreign and local), government, and other innovative end-user applications. SIGGRAPH Tutorials and the Pattern Recognition and Image Processing (PRIP) Conference will simultaneously precede the conference.

Due Dates

300 Word Abstract
First Draft with Figures
Author Notification
Final Copy

November 10, 1980
December 8, 1980
March 16, 1981
May 4, 1981

A mix of both innovative research applications and system management topics will be chosen.

Suggested topics for paper and panel sessions include:

Research and Development

Low Cost Graphic Displays
Graphics Input Devices
Graphics Algorithms
Input Techniques
Surface Representation

Video/Color Hardware
Distributed Graphics
Programming Languages
Viewing Transformations
Human Interactions

Innovative Applications

Information Presentation
Architecture/Engineering
Cartography
Manufacturing/Design
Education/Training
Medical Sciences

Animation/Dynamics
Natural/Social Sciences
Management/Finance
Art/Entertainment
Database Management
Process Control

System Management

Cost Trade-Offs
Managing Development
Data Proliferation
User Training
Selecting Equipment

Obtaining Productivity
Controlling Expenses
Establishing Standards
Developing Utilization

Publications

Papers accepted will be published in Computer Graphics. Selected papers will be submitted for publication in the Communications of the ACM. Authors wishing their papers to be considered for submission must so state on the paper when it is submitted. Only those papers so designated will be considered by

CACM. Panel proposals should include topic abstract, panel moderator, and suggested panelists. All submissions should conform to CACM publications standards in form and six copies should be submitted to the conference Technical Program Chairman.

Technical Program Chairman

Henry Fuchs
Computer Science Dept.
Univ. of North Carolina
New West Hall 035A
Chapel Hill, NC 27514
(919) 966-4650

General Conference Information

ACM-SIGGRAPH '81
Dr. Doug Green
Dept. of Electrical Engineering
Texas A&M University
College Station, TX 77843
(713) 845-7441

Social Events

Please wear SIGGRAPH '80 badges for admittance to all social events.

Tutorial Reception

(Tutorial registrants only)

Monday July 14th
Grand Ballroom
Olympic Hotel
7:00 PM

Welcome to the Conference Reception & GSPC wake

Tuesday July 15th
Grand Ballroom and
Spanish Ballroom
Olympic Hotel
7:00 PM

It should be a grand evening for all.

Starting at 8:00 PM, we will gather to mourn the passing, commemorate and rejoice in the accomplishments of ACM/SIGGRAPH's Graphics Standards Planning Committee (b. 1974-d. 1979). This is the first annual SIGGRAPH Conference since the GSPC completed its work. The undersigned mourners invite their GSPC co-workers and all graphics colleagues to join them to give GSPC a right and proper burial during SIGGRAPH '80. There will be a telling of tales—true, false, wishful or mythical—about the CORE and the people who wrote it. Join us to shed a tear and toast the future.

Robert M. Dunn
Robert L. Heilman
Bertram Herzog

Organizing Mourners

Conference Dinner

Thursday, July 17
Evening

You will be treated to an authentic Pacific Northwest Salmon Bake—an unforgettable experience for most visitors. Specific information for this SIGGRAPH '80 potlatch is enclosed with the ticket you receive at registration.

Special Events During the Conference

IMAX Show

Wednesday, July 16— Afternoon
IMAX Theater, Pacific Science Center
Seattle Center
Limited Seating

A special showing of the much acclaimed film TO FLY, coordinated by Dr. Nelson Max, has been arranged for SIGGRAPH '80 participants and their guests. This film will be shown in conjunction with computer animated films—all in IMAX format—It is a unique visual experience. Cost \$2.50 per person. Time schedule for the two shows will be 4:30pm and 6:30pm

Presidents Forum

Wednesday, July 16
Georgian Room
Olympic Hotel
9:00 P.M.

The Presidents and General Managers of a number of computer graphics companies will engage in a dialogue among themselves and with the user community. They will each address two of the three topic questions in short 3-5 minute presentations, and then open the topics to comments and pertinent questions from the floor. Come prepared to learn from a panel of experienced leaders in the graphics industry.

Topic Questions

1. Will there be a recession in the computer graphics industry and if so what segments will be impacted?
2. Will raster graphics replace calligraphic displays?
3. What features or services is the user community requesting that the industry is not supplying? and why not?

Participants

Moderator

Neil L. Johnson

Manager Advanced Systems,
Vector General, Inc.

Calligraphic:

John R. McPherson

President, Vector General, Inc.

Raster:

Charles E. McEwan

President, Ramtek, Inc.

Pen Plotters:

Howard "Gene" Brewer

Vice President & GM,
Graphics Products Division,
California Computer Products
(CalComp) Inc.

Electrostatic:

Ren Zaphiropoulos

President, Versatec, A Xerox
Company

Turnkey Systems:

Jim Meadlock

President, M&S Computing

DVST and Systems:

Howard W. Mikesell

GM, Information Display
Division, Tektronix, Inc.

User's Group Meetings

A number of Users Groups meet traditionally during the days of the SIGGRAPH tutorials and conference. Time and place scheduled for these meetings will be posted at the Conference Information Centers.

DI-3000 Users
Evans & Sutherland Users' Group
GCS Users' Group
Ikonas Graphic Systems Users' Group
ISSCO Users' Group
M & S Computing
Sanders Graphic Seven Users' Group
Vegus (Vector General)
VIM (Control Data Graphics Users)

SIGGRAPH Executive Committee Business Meeting

Thursday, July 17
9:00 am-noon
Seattle Center, Convention Center: Room H

All attendees are invited to observe/participate in this important meeting of the SIGGRAPH Organization. Of particular interest to SIGGRAPH members is the presentation, by the SIGGRAPH Editor-in-Chief, of publication options which will permit SIGGRAPH to maintain and expand its current level of publications without drastic increase in membership fees in the face of soaring publication costs. Comments from the audience will be solicited.

Other Meetings

Wednesday, July 14, 1980
Colonial Room, Olympic Hotel

Local ACM Chapter Meeting
8:00 P.M.

The Puget Sound Chapter of the ACM invites participants at SIGGRAPH '80 to attend their July meeting that will coincide with the conference. The speaker will be Col. Robert Tuft of the United States Air Force, Defense Communications Engineering Center and a lecturer on structured programming in COBOL at Northern Virginia Community College who will discuss "Structured Programming Problems in a COBOL Environment." The talk will focus on both technical and people problems and will include a recitation of a number of structured programming "horror" stories. Col. Tuft is an ACM National Lecturer, and if you're tired of computer graphics, here's an alternative.

Future SIGGRAPH Meetings

The following sites and dates have been selected for future SIGGRAPH annual conferences:

Dallas, Texas	August 3-7, 1981
Boston, Massachusetts	July 26-30, 1982
Detroit, Michigan	July 25-29, 1983

Future sites are now being considered for 1984 and 1985, so if you have any good ideas—particularly if you want to help with the organization—contact a member of the ACM/SIGGRAPH Executive Committee.

Film Show

Wednesday July 16
Grand Ballroom
Olympic Hotel
8:00 P.M.

Two hours of the finest new computer animation plus selected classics will be presented Wednesday evening. Subjects include cartoon animation, science films, engineering simulation and pure visual art. Both 16 and 35 mm projector and Light Valve video projectors will be used.

VI General Information

Conference Headquarters Hotels

Olympic Hotel
4th & Seneca
Seattle, WA 98111
Phone: (206) 682-7700

Park Hilton Hotel
6th & Seneca
Seattle, WA 98101
Phone: (206) 464-1980

Message Centers

A central location where messages can be left for other conference participants.

Seattle Center:

Hours: 7:30am-6:00pm
Monday through Friday

Phone: (206) 345-2633

Messages will be posted on a message board located in the Coliseum foyer.

Olympic Hotel:

Williamsburg Room
Hours: same as on-site registration

Phone: (206) 682-7700
ask for Williamsburg Room

Messages will be posted in the Williamsburg Room. Messages can also be transmitted via the specific hotel message operator. Please see hotel listing in this program for phone numbers and addresses.

Information Centers:

Location where up-to-date information can be obtained.

Seattle Center:

Coliseum Foyer (Northeast Area)
Hours: 7:30 am-6:00 pm;
Monday-Friday

Olympic Hotel

Location: Williamsburg Room
Hours: 4:00 pm-9:00 pm; Sunday
7:30 am-6:00 pm; Monday-Friday

Pre Registration

Packets can be picked up only at the following locations:

Olympic Hotel, Spanish Lounge	Sunday	4:00pm-9:00pm
Olympic Hotel, Spanish Lounge	Monday	7:30am-6:00pm
Olympic Hotel, Spanish Lounge	Tuesday	7:30am-9:00pm
Seattle Center Coliseum	Wednesday	7:30am-6:00pm
Seattle Center Coliseum	Thursday	7:30am-6:00pm
Seattle Center Coliseum	Friday	7:30am-noon

On-site Registration

There are two sites for on-site registration:

Olympic Hotel— Spanish Lounge
Sunday 4:00pm-9:00pm
Monday 7:30am-6:00pm
Tuesday 7:30am-9:00pm

Seattle Center— Coliseum NE foyer
Monday 7:30am-6:00pm
Tuesday 7:30am-6:00pm
Wednesday 7:30am-6:00pm
Thursday 7:30am-6:00pm
Friday 7:30am-noon

General Information

Press Room

You can obtain the use of a press room by contacting the information center.

Transportation

A shuttle bus provides free transportation to the Seattle Center between the hours 7:00am to 11:00pm.

Boarding Points: America West
Town Motor Hotel
(7th Avenue Side)
Olympic Hotel
(University Street
Side)

Return Pick up points: North of the North Court Room area—near Republican St. and 2nd Street.

The bus runs occur 15-30 minutes apart depending on demand. Your SIGGRAPH '80 badge permits you to board.

An additional boarding point from 7pm to 11 pm is the Mayflower Hotel.

Monorail

A *highly recommended* mode of transportation is Seattle's unique monorail, first used at the Worlds Fair in 1962. To accommodate this conference, the monorail starts at 7:30am and will run at approxi-

mately 15 minute intervals until midnight. One way fare is 25¢. Again check the downtown Seattle map in this program for terminal location. The time schedule reverts back to 10:00am to midnight on the weekend.

Metro

Seattle's public transportation system, provides excellent service. The cost is 50¢ for one zone fare. On 3rd Avenue board busses going north on line 1, 2, 3, 4, or 13. On 4th Avenue board busses going north on line 19, 24, or 33, getting off each time at the Seattle Center.

Downtown Seattle has a FREE BUS ZONE, which pertains to any Metro Bus within the following zone: area bounded on the north by Battery Street, on the east by 6th Avenue, on the south by the King Dome and on the west by the Water front. Thus, a Metro Bus can be used in this zone to take you to the SIGGRAPH Shuttle Bus route, if you do not wish to walk.

Airport Transportation

The Hustle Bus departs from the Olympic Hotel and the Washington Plaza Hotel. Call 682-5950 for schedule. Cost \$3.60. *Metro* also provides transportation to the airport for 75¢. Traveling south on 2nd avenue take bus # 174.

ACM-SIGGRAPH '81

Tony Lucido, next year's conference chairman, will be at the conference. He or a representative will generally be available through the Information Center at the Seattle Center.

Meeting Rooms

You can obtain the use of a meeting room by contacting the Information Center.

Industrial Tours

Arrangements are being made for tours to graphics application sites in the Seattle area. Those interested, please check as soon as possible in the Information

Centers:
Williamsburg Room, Olympic Hotel on Sunday and Monday
Seattle Center Coliseum on Tuesday and Wednesday

Childcare

Due to lack of interest, childcare service is not offered during the conference. Please check for references for individual childcare with the Conference Information Centers or at the registration desk of your hotel.

Sightseeing

Information (Brochures) on Seattle area sight seeing is available in the Information Centers. Possibilities include tours of the St. Michelle Winery, Pioneer Square, Seattle and its historic sights, the North Cascade Wilderness area, a shopping/sightseeing tour of Victoria B.C. & its Butchart Gardens, perhaps a weekend of white-water rafting.

Important Phone Numbers

The SIGGRAPH '80 conference supplies these numbers as a service to our attendees. Listing does not imply endorsement of these services.

Dentist — 24 hour answering service	624-4912
Doctor — 24 hour answering service	622-6900, 364-9100
Pharmacy — G.O. Guy — 3rd & Union Monday to Saturday 9:30am to 6:30pm	622-4842
Emergencies, Ambulance, Fire, Police	911
Language Bank International Center	622-4250 682-6986
Metro Transit System	447-1978
Poison Control Center	634-5252
Post Office 3rd & Union Street	442-1978
SIGGRAPH Seattle Center Message Center	345-2633
Airport Hustlebus	682-5950
Kiana Lodge	682-2370
Tillicum Village	329-5700
Seattle Center Public Information (Not Siggraph)	625-4234
State Patrol Emergencies only	455-7700
Tourist Information Seattle/King County Convention & Visitors Bureau, 1815 7th Ave.	447-7273
Weather Report	662-1111
Washington State Ferries	464-6400

Hotels

The following is a list of SIGGRAPH '80 downtown Seattle hotels:

American West 6th Avenue
Motor Hotel
2000—6th Avenue
Seattle, WA 98121
682-8300

American West Towne Motor Hotel
2205—7th Avenue
Seattle, WA 98121
622-3434

Camlin Hotel
1619 9th Avenue
Seattle, WA 98109
682-0100

Century House Motor Hotel
2224 8th Avenue
Seattle, WA 98121
624-6820

Cosmopolitan Motel
2106 5th Avenue
Seattle, WA 98121
682-8833

Downtown Travelodge
2213 8th Avenue
Seattle, WA 98105
624-6300

Executive Inn
200 Taylor North
Seattle, WA 98109
628-9444

Hotel Seattle
315 Seneca
Seattle, WA 98101
623-5110

Imperial 400 Hotel
325 Aurora Avenue N.
Seattle, WA 98109
623-5673

Kennedy Hotel
1100 5th Avenue
Seattle, WA 98101
623-6175

Loyal Inn of Seattle
2301 8th Avenue
Seattle, WA 98121
682-0200

Mayflower Park Hotel
4th & Olive
Seattle, WA 98101
623-8700

Olympic Hotel
4th & Seneca
Seattle, WA 98101
682-7700

Pacific Plaza Hotel
400 Spring St.
Seattle, WA 98104
623-3900

Park Hilton
6th & Seneca
Seattle, WA 98111
464-1980

Regency Motor Inn
2200 5th Avenue
Seattle, WA 98121
682-9785

Roosevelt Hotel
7th & Pine
Seattle, WA 98101
624-1400

Seattle Hilton Hotel
6th & University
Seattle, WA 98101
624-0500

Space Needle Travelodge
200—6th Avenue North
Seattle, WA 98109
623-2600

Tropics Motor Hotel
225 Aurora Ave. North
Seattle, WA 98109
624-6789

Vance Motor Hotel
7th & Stewart
Seattle, WA 98101
623-2700

Windsor Hotel
1405 6th Avenue
Seattle, WA 98101
623-5230

YMCA
909 4th Ave.
Seattle, WA 98104
447-4511

Restaurants

A listing of quality restaurants suggested and tried by Diane Rice, Les Jeter, and/or Janice Hayden, Seattle residents.

The list is compiled to represent a variety of cuisines located in three neighborhoods in close proximity to the activities of SIGGRAPH '80.

Price Range: Expensive=EXP Moderate=MOD Inexpensive=INEXP

Location—Seattle Center Vicinity

Bloch's Restaurant INEXP
301 Queen Anne N. Sun.-Thurs. 10:00am-midnight
282-3434 Fri.-Sat. 10:00-2:00am
Decent cafeteria-style deli.

CaféLoc (Vietnamese) INEXP
407 Broad Sun. closed
682-7663 Mon.-Sat. 11am-3pm lunch
5pm-8pm dinner

A treat for those who have never tried Vietnamese cuisine. Reservations suggested.

The French Invention
(French) MOD
352 Roy Street Sun. closed
283-6850 Mon.-Wed. 11:30am-10:00pm
Thurs-Sat. 11:30am-midnight
Comfortably restored home serving variety of excellent dinners and crepes. Reservations recommended.

Jake O'Shaugnessey's MOD
(American)
100 Mercer Street Sun. 5:00pm-10:00pm
285-1898 Mon.-Fri. 5:00pm-11:00pm
Sat. 4:30pm-11:00pm
Fine dining, the largest collection of spirits in the United States, and the best Irish Coffee in the city. No reservations accepted.

LaTastevin (French) EXP
501 Queen Ann Avenue N. Sun. closed
283-0991 Mon.-Thurs. 5:00pm-10:30pm
dinner
Tues.-Fri. 11:30am-2:30pm lunch
Fri.-Sat. 5:00pm-11:00pm dinner
Tasteful French restaurant within walking distance. Reservations suggested.

Lebanon (Lebanese) MOD
112 5th N. Sun.-closed
624-6662 Mon.-Sat. 11:00am-3:00pm lunch
5:30pm-11:00pm
dinner
Nearby Lebanese restaurant offering bellydancing over lunch. Reservations needed on weekends.

Pablo's Especial (Mexican) MOD
14 Roy Street Sun.-Thurs. 5:00pm-10:00pm
284-7770 Fri.-Sat. 5:00pm-11:00pm
Cantina 2:30pm-closing
Winner of 3 international restaurant awards. Live entertainment Wednesday through Saturday. Reservations needed for 6 or more.

Location—Downtown

Atlas Cafe (Cantonese)

424 Maynard Ave. S.
623-0913

MOD

Sun. 4:00pm-9:00pm
Monday Closed
Tues.-Sat. 4:00pm-11:00pm

Good Cantonese food, excellent duck, fresh fish listed on blackboard.

Copacabana (Bolivian)

Triangle Bldg. Pike Place Market
622-6359

MOD

Sun. closed
Mon.-Fri. 11:00am-9:00pm
Sat. 11:00am-5:30pm

Bolivian restaurant in the midst of the bustling market district. Reservations requested.

Brasserie Pittsbourg (French)

602 1st
623-4167

MOD

Sun. closed
Mon.-Thurs. 5:30-10:30
Fri.-Sat. 5:30-11:30

Excellent classic French cookery in the Pioneer Square Historical District.

F.X. McRory's (American)

King & Occidental
623-2424

MOD

Sun. 5:00-10:00pm
Mon.-Sat. 5:00-11:00pm

Steak, chop, and Oyster house by the Kingdome. No reservations accepted.

Kallenka Cafe (Russian)

1933 1st Avenue
624-1278

INEXP.

Modest Russian Cafe close to market district. Serves good Borscht and pastries.

Labuznik (Czechoslovakian)

1924 1st Avenue
682-1624

EXP.

Sun.-Mon. closed
Tues.-Thurs. 5:30pm-10:00pm
Fri.-Sat. 5:30pm-11:00pm

Good—Reservations recommended.

LeGrande Bouffe (French)

2600 1st Avenue
624-2831

EXP.

Sun. closed
Mon.-Fri. 11:00am-2:30pm lunch
Mon.-Thurs. 4:30pm-10:00pm
dinner
Fri.-Sat. 4:30pm-11:00pm dinner

French gourmet center featuring live music Fridays and Saturdays. Reservations suggested weekends.

Mangia/Bevi (Italian)

119 Pine
624-3337

MOD

Sun. closed
Mon.-Fri. 11:30am-2:30pm lunch
Mon.-Thurs. 5:30pm-10:00pm
dinner
Fri.-Sat. 5:30pm-11:45pm dinner

Straightforward, elegant Italian cuisine with different menu daily. Reservations requested.

Restaurants

Mikado (Japanese) EXP
514 S. Jackson Sun. closed
622-5206 Mon.-Sat. 5:30pm-10:00pm
This is the place for seafood! Reservations recommended.

**Rosellini's Other Place
(Continental)** EXP
319 Union Street Sun. closed
623-7340 Mon.-Fri. 11:00am-10:30pm
Sat. 5:00pm-10:30pm
Cream-of-the-crop dining, out of reach for those on a tight budget.
Reservations advisable.

Sun-Ya (Chinese) INEXP.
605 7th Ave. S.
623-1670
Large dim sum (Chinese tea pastries) selection. Crowds at lunch include
Tai Chi masters. Reservations advisable.

Location—Broadway Strip

Andy's Cafe (American) INEXP.
214 Broadway East
322-9896
Clean, cheap, unexotic eating.

**Boondocks, Sundeckers &
Greenthumbs (American)** MOD
611 Broadway East Sun. 9:00am-2:00am
323-7272 Mon.-Thurs. 11:00am-3:00am
Fri. 11:00am-4:00am
Sat. 9:00am-4:00am

Large selection and late hours.

Charlie's Restaurant (American) MOD
217 Broadway E. Sun. 10:30am-1:00am
323-2535 Mon.-Sat. 11:30am-3:00am
Good dining in comfortable surroundings. Reservations requested.

DeVille's on Broadway (French) MOD
1823 Broadway Sun.-Sat. 11:30am-3:00pm lunch
325-5392 Sun.-Thurs. 5:00pm-midnight
dinner
Fri.-Sat. 5:00pm-2:00am dinner
Simple, delicious French fare. Reservations suggested.

FUNKY Broadway East (BBQ) INEXP
916 East John
323-8659
Pleasant, down-to-earth atmosphere. Select your own 'hotness'. Good tater
pie and homemade ice cream.

**Henry's Off Broadway
(American)** EXP.
1705 East Olive Way Sun.-Sat. 11:30am-2:30pm lunch
329-8063 Sun. 5:00pm-10:00pm dinner
Mon.-Thurs. 5:30pm-10:30pm
Fri.-Sat. 5:30pm-11:30pm

Dressy, elegant dining. Their French Onion Soup is getting a name around
town.

Seattle Area Points of Interest

Downtown Scene

The *Freeway Park* over I-5 is one block east of the Olympic. The *Pike Street Market* is most colorful, a bona fide farmer's market with stalls. Its gawkers and jolly crowds create a really people-to-people atmosphere. Across from the Olympic Hotel is the new *Rainier Square* surrounded by exclusive shops. A block south of the Olympic on 4th Avenue is our new modern library; across the street from it is the monolithic Seattle First National Bank building, the tallest in town. In front of the bank is a gigantic bronze sculpture by Henry Moore. Across on Madison from the library is the Bank of California building.

Pioneer Square

A delightful area of old buildings restored and enlivened with shops, restaurants, and various diversions, here is where the *Underground Tour* begins. The underground tour is an earthy, comic presentation of Seattle history bringing Seattle's early pioneers to life. The tour costs \$2.00 for adults, \$1.25 for senior citizens. For more information on the tour call 682-4646.

Many national historic landmarks call Pioneer Square home. Just south of this area is the new domed stadium—The Kingdome.

Take Metro Busses 1, 7, 14, (avoid express), going south on 3rd Ave. Magic Carpet area (free fare). To return, catch 1, 7, 14 going north on 5th Avenue.

Waterfront

Previously destined for extinction, the waterfront has come alive with shops, services, eating establishments, a waterfront park, and a new Aquarium (open daily from 10:00am to 9:00pm), located at pier 59. The Princess Victoria and Flying Princess (Boeing hydrofoil) leave daily for Victoria, British Columbia from Pier 69. Pier 70 with its many shops shows what can be done with an old warehouse. The Washington State Ferry Terminal is at Pier 52.

Take Metro "waterfront" bus (route 99) going north from 4th avenue and Seneca.

Seattle Center

Take some breaks from SIGGRAPH Business to tour the Seattle Center. Site of the 1962 Worlds Fair, the center is home of the landmark Space Needle with its 360 degree panoramic view. The Pacific Science Center offers interesting space and science exhibits. Also to be seen are the beautiful Opera House, charming Playhouse, Food Circus, Seattle Art Museum's Modern Art Pavilion, International Bazaar, and the Northwest Craft Center. Take advantage of the 25¢ monorail to get there from downtown. North of the center across Mercer Street is the interesting Hansen Bakery. Take Metro's Monorail or SIGGRAPH shuttles.

Discovery Park

In the Magnolia District in Seattle. Although considered a park, this large area would classify more as a preserve. Miles of trails bring you through woods, grasslands and beach. A favorite spot for hikers and picknickers. Take Metro #33 bus going north on 4th Ave.

Seattle Area Points of Interest

University District

Explore the many shops along University Way. The beautiful University of Washington campus has the largest single campus enrollment on the West Coast. An authentic coffee house—Last Exit on Brooklyn Avenue—is a haven for chess and Go enthusiasts. Theatres in the U-district offer international films for the film buff. Two nationally recognized museums are located here; the Burke Museum of Natural History (on campus), and the Henry Gallery. South of Union Bay is the U.W. Arboretum.

Metro busses 71, 72, 73 (avoid express) North on 3rd Avenue and Union (post office).

Woodland Park Zoo & Green Lake (Jogger's Paradise)

Just south up the hill from Green Lake and northwest of the U-district on old highway 99 (Aurora Blvd.), the zoo offers an excellent assortment of animals from around the world, high-lighted by its outstanding monkey house, known for its success in breeding gorillas, and has an excellent children's zoo. Lower Woodland Park offers paths and trails up and down hills. Greenlake offers a 2.8 mile running path around this beautiful lake. Bicycling is also available through bike rentals and roller skating is possible from rental locations by the northeast end of the lake.

Metro Busses, 5 Phinney—catch by door of Pennys (2nd and Pike).

International District

International District is having a revival of its own. Some of its highlights include new restaurants, unique oriental shops, a museum two mini-parks, and historical walking tours. Restaurants are in the vicinity of Maynard and Jackson streets.

Metro busses—catch 1, 7, 14 (avoid express) southbound on 3rd Avenue. Get out at Jackson to avoid paying bus fare.

Chateau St. Michelle

A winery styled after a French country estate and is one of Washington State's most popular attractions. Frequent tours followed by sampling of wines in a tasting room.

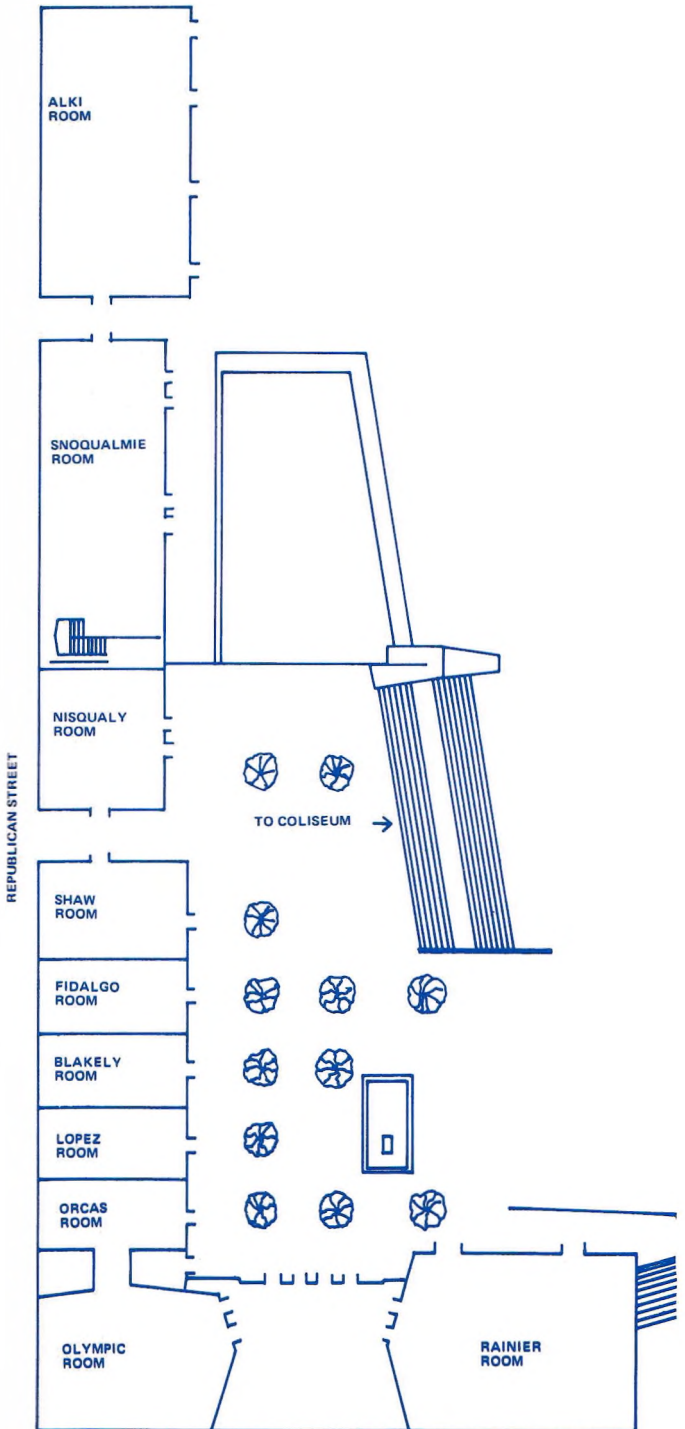
For more information and directions call: Chateau St. Michelle
Woodinville, WA 485-9721

Volunteer Park

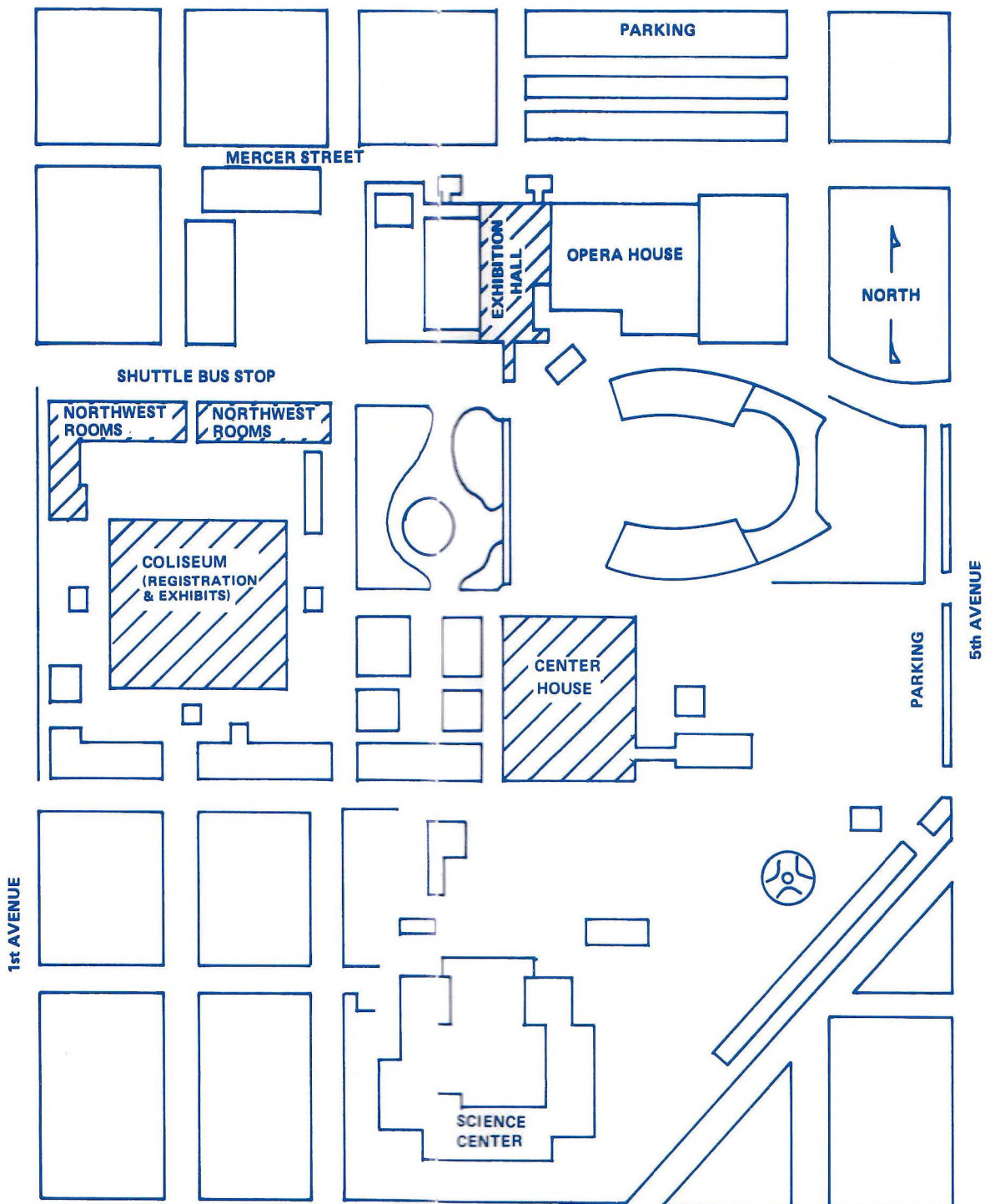
One of Seattle's largest parks, this park boasts a Conservatory, the Seattle Art Museum (known for its Asian collection), and a water tower from which you can get a good view of Lake Washington, the University district, and the surrounding area. Outdoor concerts are frequent here in the summer, and joggers and volley ball players abound.

Metro bus-take 10 North on 3rd.

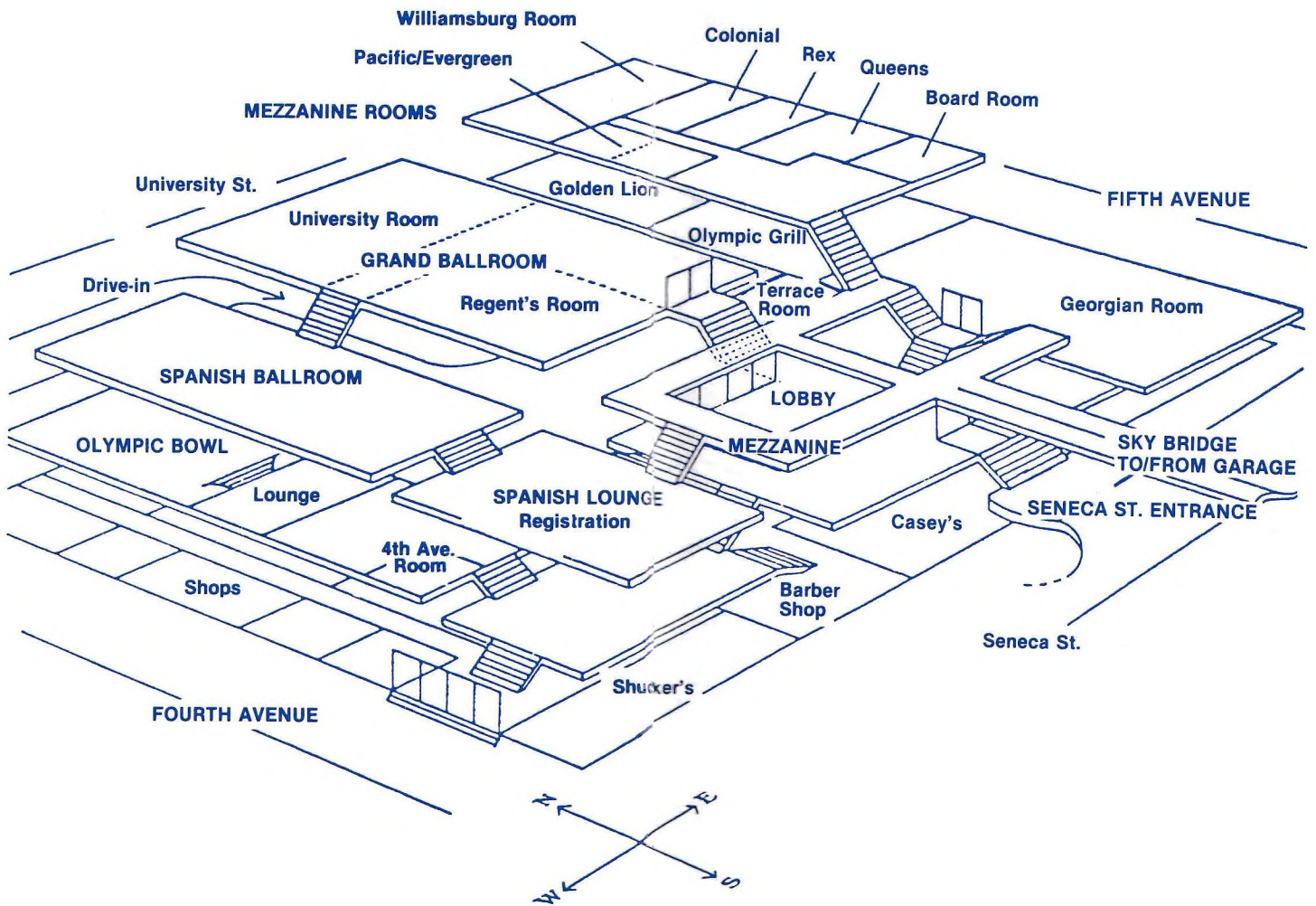
Maps North Court Rooms



Seattle Center



Olympic Hotel Floor Plan



Downtown Seattle



Your Personal SIGGRAPH '80 Calendar

Monday July 14

Time	Activity	Location

Tuesday July 15

Wednesday July 16

Thursday July 17

Time	Activity	Location

Friday July 18

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