

TABLE OF CONTENTS
VOLUME II

Foreword	iii
Preface	v
Photogrammetry Sessions	1
Image Processing Session	50
Digital Terrain Models Sessions	93
Urban Mapping Sessions	139
Exploration and Utility Systems Session	195
Data Bases, Small Systems Sessions	234
Data Bases, Large Systems Sessions	254
Interactive Cartography, Small Systems Sessions	353
Interactive Cartography, Large Systems Sessions	387
Appendixes	424

PHOTOGRAMMETRY SESSIONS

Introduction	2
High Speed, Large Format Flatbed Photocomposition System P.F. Grosso	4
Digital Terrain Services at Chicago Aerial Survey Jerry W. Robinson	14

The Use of Computer Generated Maps in Interpreting Urban Forestry Data	24
William O. Lucoff	
An Analytical Photogrammetric Solution to a Civil Engineering Problem	30
William R. Detwiler	
Practical Experience in Integrating Conventional Photogrammetric Compilation and Digital Mapping Techniques	35
John K. Powell, Glenn L. Osick, and Thomas C. Miller	
Large Format Laser Scanner/Plotter System	42
J.E. Turek and D.J. Walker	
IMAGE PROCESSING SESSION	
Introduction	51
Cartographic Considerations for the Integration of LANDSAT Digital Imagery with Existing Spatial Data	52
Richard L. McKinney	
The Interactive Image System for the METEOSAT Project	61
L. Fusco, G.W. Kerr, R. Powell, and H. Rupp	
Image Processing and Navigation for the METEOSAT Project	69
M. Jones and K.G. Lenhart	
Practical Applications for Digital Cartographic Data Bases in Tactical Surveillance and Strike Systems	77
Frederick C. Budelman and Toini L. Figgins	
A Data Structure for a Raster Map Data Base	85
Roger L.T. Cederberg	

DIGITAL TERRAIN MODELS SESSIONS

Introduction 94

The Triangulated Irregular Network 96
Thomas K. Peucker, Robert J. Fowler,
James J. Little, and David M. Mark

Triangulation-Based Terrain Modelling -
Where Are We Now? 104
Christopher M. Gold

Interactive Graphics Editing for IPIN 112
Gerald M. Elphingstone

A Unified System for Terrain Analysis
and Mapping from DEM and DTM 124
Stanley H. Collins and
George C. Moon

The Digital Terrain Model as a Data
Base for Hydrological and
Geomorphological Analyses 132
Richard J. Heil

URBAN MAPPING SESSIONS

Introduction 140 ,

Mapping Services in Fairfax
County, Virginia 143
John C. Lay

Urban Mapping Applications: Census
Tracts to Ownership Parcels 148
Ronald Domsch

Examples of Automated Cartography
in Presenting Land Use and Land
Cover Maps and Data 156
James R. Wray

Interactive Computer Mapping
Applications to Criminal Justice
Planning in Three Virginia Cities 158
Leonard J. Simutis and
Todd A. Scott

Interactive Computer Mapping	165
Thomas K. Peucker and Andrew Clement	
Alternatives to the Population Pyramid for Mapping Age-Sex Characteristics of Metropolitan Census Tracts	172
Richard Lycan	
Computer Mapping of Cancer Mortality by Census Tract: Columbus, Ohio 1956-1974	180
Eugenia E. Calle	
Urban Uses of Geo-Based Data: Getting the Technician Out of the Way	188
Joel N. Orr	

EXPLORATION AND UTILITY SYSTEMS SESSION

Introduction	196
Automated Mapping and Facilities Management	197
Henry A. Emery	
CADAE: Computer Aided Design and Engineering	205
Donald R. Johnston	
'Landform' Land Analysis and Display for Mining	213
Richard O. Mahan	
Engineering Applications of Digital Terrain Mapping	219
Douglas M. Isbell and William H. Young	
Topological Models for Architectural and Engineering Projects	223
James Corbett	

DATA BASES, SMALL SYSTEMS SESSIONS

Introduction 235

Coordinate Free Cartography 236
Marvin S. White Jr. and
Patricia E. Griffin

The Data Structure of BASIS 246
Paul M. Wilson and
Donald A. Olmstead

DATA BASES, LARGE SYSTEMS SESSIONS ,

Introduction 256

Computer-Assisted Environmental Data
Handling: Issues and Implications 259
Kenneth E. Gordon

National Ocean Survey - Automated
Information System 267
Ray E. Moses and
James L. Passauer

GEOMEODEL - Integrated Data Structures
for Representing Geographic Entities 275
Jay R. Baker

ECOBASE OF BRITAIN: Status Report on
a Digital Data Base of Britain 283
David P. Bickmore and
Graham J. Witty

A Data Structure for a Spatial
Information System 291
Robert M. Haralick and
Linda G. Shapiro

WHIRLPOOL: A Geometric Processor
for Polygon Coverage Data 304
James Dougenik

A Formal Model of a Cartographic Information Base	312
Timothy L. Nyerges	
Extraction of Polygonal Information from Gridded Data	320
Scott Morehouse and Geoffrey Dutton	
Land Resource Information Systems: Spatial and Attribute Resolution Issues . . .	328
Kenneth J. Dueker	
RIDS - Current Technology in Resource Management	337
Roger T. Pelletier	
The Development of a National Small Scale Digital Cartographic Data Base	345
Malcolm J. Stephens, Michael A. Domaratz, and Warren E. Schmidt	
 INTERACTIVE CARTOGRAPHY, SMALL SYSTEMS SESSIONS	
Introduction	354
Recent Advances in GIS Processing Techniques Using Color Graphics and Minicomputer Technology	356
Charles H. Alvord III and Stephen L. Morgan	
The Cartographic Potential of Low-Cost Color Computer Graphics Systems	364
James R. Carter	
GIMMAP: A (Mini)Computer-Assisted Cartography System	372
Charles G. Ross	
Moving Interactive Thematic Mapping From Mainframe to Mini: Some Design Possibilities and Development Experience . . .	379
Albert Yen, Harvard Holmes, and Peter Wood	

INTERACTIVE CARTOGRAPHY, LARGE SYSTEMS SESSIONS

Introduction 388

Automated Production of a Large
Scale Thematic Atlas 390
James B. Campbell

Multiple System Interactive Map
Compilation with Distributive
Computer Network 397
M. Mosaad Allam

Energy Analysis by Means of Computer
Generated Interactive Graphics 405
Mark Henriquez

Electron Beam Recorders for
Automated Cartography 413
P.F. Grosso and
A.A. Tarnowski

APPENDIXES

AUTO-CARTO IV Staff and Committees 425

AUTO-CARTO IV Participants 428

Author Index - Volume II 475