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

PHOTOGRAHAMETRY SESSIONS

Introduction ................................... 2
High Speed, Large Format Flatbed Photocomposition System .... 4
P.F. Grosso

Digital Terrain Services at Chicago Aerial Survey .......... 14
Jerry W. Robinson
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
Chrisopher 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

ix
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

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