

Second
Edition

AERIAL MAPPING

Methods and Applications

*Edgar Falkner
Dennis Morgan*



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Preface

This book provides up-to-date information to help a variety of users; in particular, professionals and managers. The topics of photogrammetry, remote sensing, geographic information systems (GIS), global positioning systems (GPS), surveying, and other mapping sciences allow readers to develop a greater understanding, and help them harness the capabilities of technology.

Building upon principles described in the first edition of *Aerial Mapping: Methods and Applications*, the second edition captures current methods and describes their workings in language that is easy to understand. The growth in the mapping sciences over the last decade is breathtaking, and it is incumbent upon us to make use of the myriad advances. These technologies provide for more accurate and precise applications, and can often be conducted at lower relative cost than solutions provided by earlier technological approaches. With the details supplied here and your experience and skills, good things will happen.

John G. Lyon, Ph.D.
Henderson, NV

Foreword

Like its predecessor (*Aerial Mapping: Methods and Applications* which was written by Edgar Falkner and published by Lewis Publishers in 1995), this text was conceived to aid professional middle managers who may need to understand the rudiments of aerial photography, remote sensing, and photogrammetric mapping to get their job done. This may include, but not necessarily be limited to, the fields of agronomy, engineering, hydrology, surveying, geography, architecture, geographic information systems, soil science, forestry, wetlands, game biology, geology, natural resources, environmental science, public and private utilities, facilities management, or others.

The content of this text is deliberately semi-technical. It, in conjunction with the previous reference book, is intended as an introduction to practical mapping production. Parts of the original book have been included, but other sections have been upgraded in keeping with the dynamics of the technology.

Managers should supplement this knowledge with their own high level expertise. It should be realized that, as an elementary guide, the processes discussed are presented in a limited scientific context.

Until fairly recently photogrammetry was juxtaposed with such disciplines as geographic information systems, remote sensing, and image analysis. Now these fields all tend to merge. This is due, in great part, to advances in hardware and software for electronic data manipulation. In the current technological scenario many disciplines can share information. The reader must be aware that, parallel with the rapid advancement in electronic data processors, all of the technologies discussed herein are dynamic. What is vogue today could very well be obsolete tomorrow.

The original reference book essentially concentrated on photogrammetry, but this edition introduces the reader to other techniques that are available to aid in accomplishing a mission. Once exposed to basic procedures, the user can apply this knowledge to conditions that are germane to a specific project locale.

Edgar Falkner
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The Authors



Dennis Morgan (right) has been a Civil Engineer and Certified Photogrammetrist with the U.S. Army Corps of Engineers since 1974. He earned a B.S. in Engineering Technology from Northern Arizona University in 1973. His professional background includes design, management, and monitoring of production of photogrammetric mapping data sets for a wide variety of engineering and Geographic Information Systems applications. His work has included aerial photography and planimetric, topographic, and orthophoto mapping for many civil and military engineering and environmental projects. Morgan is a member of the American Society of Photogrammetry and Remote Sensing (ASPRS). Published articles in various trade and professional journals include *POB*, Oct.-Nov. 1993, Vol. 19, No. 1, *The Military Engineer*, June-July Vol. 89, No. 585, and *GPS World*, Feb. 1996. He was a contributing author to *GIS DATA Conversion Strategies — Techniques — Management*, edited by Pat Hohl, Onward Press, 1998.

Edgar Falkner left high school during his senior year to serve a tour of duty with the Marine Corps during World War II. Upon discharge, he earned a B.S. in Forestry from Michigan College of Mining and Technology in 1953. For 7 years he held federal forest management (California) and state wildland inventory (Alaska) positions, and over a period of 34 years he worked in private and public aerial mapping situations, including 10 years as vice president and partner in a private sector firm and 5 years as a technical mapping consultant with the U.S. Corps of Engineers. He has frequently functioned as a lecturer for technical workshops, seminars, and adult education courses. He is the author of *Aerial Mapping: Methods and Applications*, published by Lewis Press in 1995. Falkner was a contributor to *GIS DATA Conversion Strategies — Techniques — Management*, edited by Pat Hohl, Onward Press, 1998, and is the author of several articles published in technical journals.

Acknowledgment

Within this book the reader will observe courtesy notes accompanying a number of illustrations, giving credit for contributions by several mapping and remote sensing organizations. In the past Ed and Dennis have worked on projects with representatives of these establishments as well as many of their contemporaries. During the course of these dealings the authors have found a common vein of helpfulness and cooperation at all times, and much of the information in this book has been gleaned from these people's free sharing of technical knowledge and professional experience. They deserve our thanks.

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