

INTER-UNIVERSITY ELECTRONICS SERIES, VOL. 5

DISPLAY SYSTEMS ENGINEERING

EDITED BY

H. R. Luxenberg

*Consultant in Information
Systems
Lux Associates*

Rudolph L. Kuehn

Douglas Aircraft Company

M c G R A W - H I L L B O O K C O M P A N Y



New York San Francisco Toronto London Sydney

DISPLAY SYSTEMS ENGINEERING

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39143

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**DISPLAY
SYSTEMS
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INTER-UNIVERSITY ELECTRONICS SERIES

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To Lucille, Jean, and Others Who Have Helped

SERIES PURPOSE

The explosive rate at which knowledge in electronics has expanded in recent years has produced the need for unified state-of-the-art presentations that give authoritative pictures of individual fields of electronics.

The Inter-University Electronics Series is designed to meet this need by providing volumes that deal with particular areas of electronics where up-to-date reference material is either inadequate or is not conveniently organized. Each volume covers an individual area, or a series of related areas. Emphasis is upon providing timely and comprehensive coverage that stresses general principles, and integrates the newer developments into the over-all picture. Each volume is edited by an authority in the field and is written by several coauthors, who are active participants in research or in educational programs dealing with the subject matter involved.

The volumes are written with a viewpoint and at a level that makes them suitable for reference use by research and development engineers and scientists in industry and by workers in governmental and university laboratories. They are also suitable for use as textbooks in specialized courses at graduate levels. The complete series of volumes will provide a reference library that should serve a wide spectrum of electronic engineers and scientists.

The organization and planning of the series is being carried out with the aid of a Steering Committee, which operates with the counsel of an Advisory Committee. The Steering Committee concerns itself with the

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scope of the individual volumes and aids in the selection of editors for the different volumes. Each editor is in turn responsible for selecting his coauthors and deciding upon the detailed scope and content of his particular volume. Over-all management of the Series is in the hands of the Consulting Editor.

Frederick Emmons Terman

PREFACE

During the past decade a new interdisciplinary field—information display systems—has arisen. The increasingly complex man-machine interactions of modern computer-based information systems have given a forced impetus to integrating previously unrelated pools of knowledge. In all such processes, some cross fertilization takes place resulting in an expansion of new concepts and techniques.

The preparation of a book such as this inevitably raises the problems of what material to include, and at what level. We have based our approach upon our experiences in the development of modern display systems as well as the presentation of many tutorial courses in the field. *Display Systems Engineering* is a background book which may be read by the practicing scientist or engineer seeking an introduction to display systems, or by the worker already skilled in one or more of the allied disciplines.

The first six chapters comprise much of the essential theoretical foundation of display systems. Some of the selected topics may be familiar to a greater or lesser extent to those readers who are proficient in the representative fields. We hope that the specialist will not be perturbed by the inclusion of “self-evident” knowledge in his own domain in the interest of the compilation that this volume represents.

Chapters 7 through 11 are concerned with technological reductions to practice. We have deliberately minimized, however, including descriptions of specific systems and mechanizations as these are always subject

to obsolescence. In the belief that a grasp of applicable fundamentals is to be desired, we have chosen this approach. The references to be found at each chapter's end will allow the reader to research in depth those topics of particular interest to him.

It seems especially appropriate for an interdisciplinary subject to utilize, to the extent possible, the international system of units adopted by the Eleventh Conference on Weights and Measures in 1960. This coherent system of units, the *Système International d'Unités* (designated SI in all languages) was accepted as the preferred system by representatives of 36 participating countries, including the United States. In the interest of clarity and to ease the transition, certain portions of this book retain British-American units, particularly in those chapters dealing more with application than theory.

H. R. Luxenberg
Rudolph L. Kuehn

**DISPLAY
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