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Microcomputer Fault-finding and Design

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Second Edition

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First edition 1991
Second edition 1995

Published by
MACMILLAN PRESS LTD
Houndmills, Basingstoke, Hampshire RG21 2XS
and London
Companies and representatives
throughout the world

ISBN 978-0-333-64166-8 ISBN 978-1-349-13808-1 (eBook)
DOI 10.1007/978-1-349-13808-1

A catalogue record for this book is available
from the British Library.

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Preface

Microcomputers vary from single-chip systems, such as pocket calculators, through to industrial controllers and multi-user office computers. This rapidly proliferating range of applications has brought with it a requirement for a greater understanding of this new electronic technology and for the acquisition of new skills by servicing personnel. This book is an attempt to describe the procedures and test equipment that can be applied when fault-finding on microprocessor-based equipment. There are few texts that attempt such a comprehensive coverage of this topic, and this book introduces some novel and innovative approaches to microcomputer fault detection.

Chapter 1 reviews the principles of microcomputer operation, while Chapters 2 to 8 describe items of test equipment and fault-finding procedures. The remaining chapters present a series of application studies of typical microcomputer systems which should help to give the reader an understanding of formal design procedures and servicing requirements. Appendixes describe the functions of all microprocessors and their supporting devices, while a Glossary explains the new technical vocabulary that is associated with the modern world of electronics and microcomputers.

In this second edition of the book, Chapter 14 has been added to describe input/output systems in more detail and to introduce advanced computer interfacing arrangements. Chapter 15 presents a review of the familiar IBM PC (Personal Computer) and all its compatible machines, together with descriptions of the architectural features which have been added during the evolution of the PC family. Examples on fault-finding (in Appendix D) have also been added to test the reader's understanding of this important theme within the book.

It is assumed that the reader has an understanding of binary numbers, basic digital electronic circuits and the use of standard electronic test equipment, for example the CRO (oscilloscope). The material presented supports the maintenance topics in BTEC and City and Guilds servicing courses. Additionally, practising service engineers and technicians should find the descriptions of great benefit. Even the computer hobbyist may be able to use the procedures to locate and eliminate faults causing total system failure or partial downgrading.

Acknowledgements

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