



# **THE THEORY AND SERVICING OF AM, FM, AND FM STEREO RECEIVERS**

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**and**

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With warm affection and appreciation,  
this book is dedicated—

To my parents,  
*C. A. and Opha Green*  
of Butler, Tennessee.

—Clarence R. Green

To my grandparents,  
*John and Lizzie Martin*  
of Kenbridge, Virginia.

—Robert M. Bourque

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# PREFACE

A person studying electronics with the intention of becoming an electronics service technician must necessarily begin with the fundamental concepts of electronics, but soon the transition must be made from fundamental concepts to functional systems such as radio receivers. Further, the novice technician must become familiar not only with the normal operation of functional systems, but must also consider the effect upon the system of a wide variety of malfunctions.

This book is intended to assist in the transition from fundamental concepts to the servicing and troubleshooting of AM, FM, and FM-stereo receivers. Therefore, the three main objectives of this text are (1) to describe the operation of AM, FM, and FM-stereo receivers; (2) to present the principles and procedures of electronic troubleshooting; and (3) to illustrate the application of the troubleshooting procedures to AM, FM, and FM-stereo receivers.

While addressed to AM, FM, and FM-stereo receivers, this text presents many techniques and procedures that are directly applicable to other systems, such as CB transceivers, audio systems, commercial communications receivers, many sections of a TV receiver, and so forth. Indeed, a major portion of the circuits (or variations) described in this text are widely used in other electronics systems.

It is assumed that the reader has a general knowledge of the fundamentals of electronics, including vacuum-tube and solid-state devices. No prior knowledge of electronic troubleshooting is assumed. No mathematics beyond simple algebra is required since circuit operation is described primarily in nonmathematical terms. While formulas are given for calculating many things, no attempt has been made to provide derivations, since they are available in standard engineering texts.

Even though this text is intended for the student of electronics servicing, it is anticipated that the beginning student in electronics technology or electronics engineering will find it very helpful in developing an intuitive understanding of AM, FM, and FM-stereo receivers.

We are indebted to Howard W. Sams & Co., Inc. for granting permission to include in this text the many schematic diagrams that are taken from actual service data published by Howard W. Sams & Co., Inc. Also, to Zenith Radio Corporation and to the many organizations which supplied invaluable technical information, we express our sincere gratitude.

For typing the major portion of the manuscript and the many supporting materials, we gratefully acknowledge Rosemary Hudson, who took charge of the manuscript and assisted greatly in bringing it to its final form. Also, we are indebted to Dixie H. Bourque for typing several early chapters and to Sandra Clary for typing and assisting with the initial proposal.

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C. R. Green acknowledges with great affection the contributions to this work made, perhaps unknowingly, by his two sons, Francis Weston and Seth Douglas Green, in that time with their father was frequently sacrificed so that work on the manuscript might go on.

Finally, but most importantly and with superlatives intended, we express our heartfelt gratitude to our wives, Susan B. Green and Dixie H. Bourque, for tolerating our commitment to this project, for accepting increased domestic responsibilities, and for consistently providing much-needed moral support and encouragement.

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