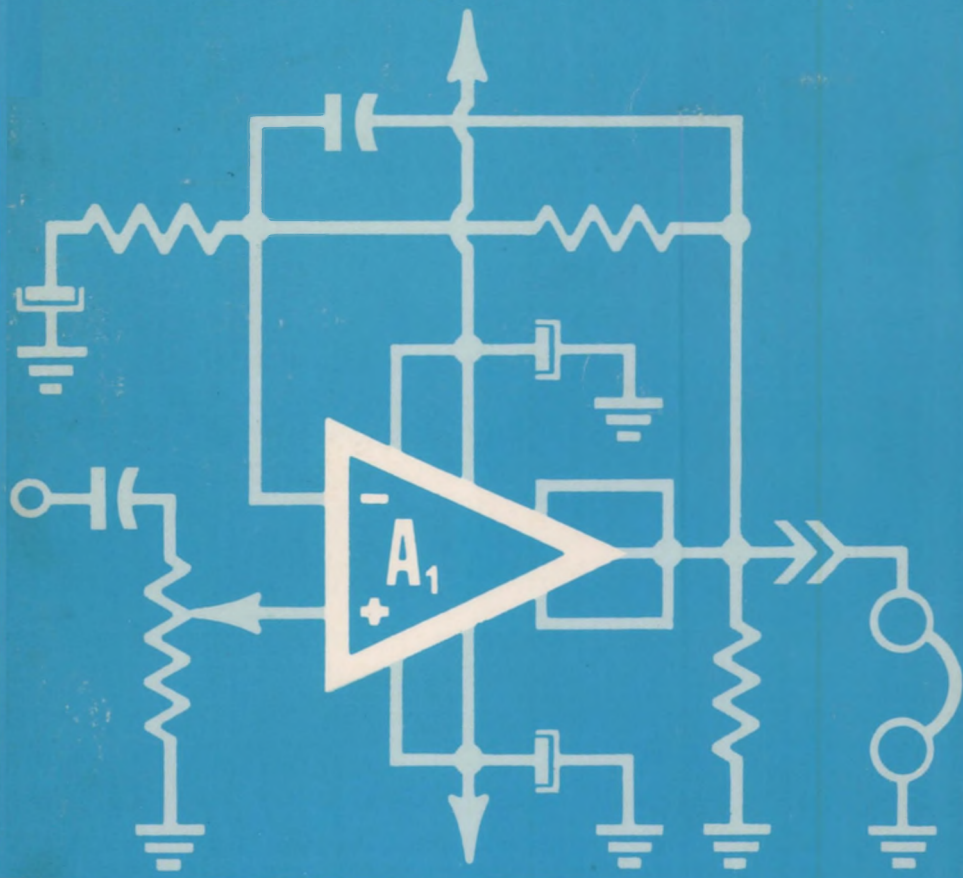


Audio IC OP-AMP Applications

by Walter G. Jung



*To all Audio IC Op-Amp
Application readers, please
to enjoy this Ebook edition!
Walt Jung
February 2015*

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Applications

by

Walter G. Jung

Extracted from

IC OP-AMP COOKBOOK

by **Walter G. Jung**



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Preface

Although there are a multitude of IC op-amp types available to the circuit designer, the incorporation of these devices into audio circuits has been relatively slow to develop in comparison to their incorporation into other types of circuits. The reasons for this are partly device-based and partly due to incomplete treatment in technical literature of the problems that beset the audio designer when he attempts to utilize op amps in his circuits.

The advantages to be gained from using IC op amps in audio circuits include: small size, low power consumption, excellent and reliable performance at low cost, and a minimum of associated components. These rewards, however, cannot be successfully attained without an understanding of the technical barriers to performance and an intimate knowledge of basic op-amp theory, as well as the characteristics of the various devices available. When these factors are mastered, IC op amps can be effectively applied to audio use in a wide variety of circuit applications.

This book describes methods for realizing the full potential of IC op amps for audio use, and also discusses the various pitfalls that may be encountered. It is assumed that the reader is already familiar with basic op-amp theory; therefore, the organization and style of the book are directed toward both the theory and practical applications of audio circuits.

The first chapter identifies and briefly reviews the op-amp types *under consideration* and also discusses general operating procedures and precautions to be observed in applying the devices. The next two chapters deal with particular IC op-amp parameters important in audio applications, and with the basic op-amp configurations as they are applied to audio use. The remaining three chapters are devoted to detailed descriptions of a wide variety of practical circuits for audio use incorporating IC op amps.

The author is indebted to a number of individuals whose efforts contributed to this book in some form. For critical reviews, I am indebted to the following: Bob Dobkin of National Semiconductor, who reviewed the entire manuscript in a thorough manner and offered many helpful suggestions; Don Kesner of Motorola Semi-

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Thanks also to my wife Anne, who tirelessly typed the entire manuscript, and to research assistants Jeannie and Mark.

WALTER G. JUNG

To Jeannie

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Audio IC Op-Amp Applications

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The application of the IC op amp to the field of audio signal processing has been somewhat slow in developing. One reason for this has been insufficient treatment in technical books and papers of the problems the audio designer encounters when he attempts to incorporate IC op amps in his circuits. This book examines the various pitfalls in detail and discusses methods for realizing the full potential of the op amp in a wide variety of audio circuits.

The book is organized into six chapters: Chapter 1 introduces and briefly discusses the IC types under consideration, and also covers general operating procedures and precautions to be observed in using the various devices. Chapter 2 discusses IC op-amp parameters that are important in audio applications, while Chapter 3 deals with the basic op-amp configurations as they are applied to audio use.

Chapter 4 covers a variety of practical audio amplifier circuits in which specific IC types are used. These circuits include: standard voltage amplifiers with optimized frequency and gain performance; power amplifiers; and microphone, phono, and tape preamplifiers. Equalized amplifiers and active filters are dealt with in Chapter 5, while Chapter 6 discusses a miscellaneous assortment of special-purpose audio circuits, such as mixing amplifiers, load-matching circuits, linear-feedback gain-controlled stages, sine-wave oscillators, function generators, etc.

Most of the material for this book was extracted from the author's *IC Op-Amp Cookbook*, another SAMS publication. Readers already familiar with basic op-amp theory will find this book a valuable addition to their technical libraries.

ABOUT THE AUTHOR



Walter G. Jung is a design engineer/technical writer specializing in the field of linear-circuit design, in particular, applications involving IC operational amplifiers. Currently, he is the solid-state editor for *Broadcast Engineering* magazine.

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