Audio Power Amplifier Design

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Audio Power Amplifier Design ***2023-08-15***

COLBY HOOD

Valve and Transistor Audio Amplifiers Elsevier
This is a rigorous tutorial on radio frequency and microwave power amplifier design, teaching the circuit design techniques that form the microelectronic backbones of modern wireless communications systems. Suitable for self-study, corporate training, or Senior/Graduate classroom use, the book combines analytical calculations and computer-aided design techniques to arm electronic engineers with every possible method to improve their designs and shorten their design time cycles.
Design Reference Audio Amateur Publications
Building Valve Amplifiers is a unique hands-on guide for anyone working with tube audio equipment--as an electronics hobbyist, audiophile or audio engineer. This 2nd Edition builds on the success of the first with technology and technique revisions throughout and, significantly, a major new self-build project, worked through step-by-step, which puts into practice the principles and techniques introduced throughout the book. Particular attention has been paid to answering questions commonly asked by newcomers to the world of the valve, whether audio enthusiasts tackling their first build or more experienced amplifier designers seeking to learn about the design principles and trade-offs of "glass audio." Safety considerations are always to the fore, and the practical side of this book is reinforced by numerous clear illustrations throughout. The only hands-on approach to building valve and tube amps--classic and modern--with a minimum of theory Design, construction, fault-finding, and testing are all illustrated by step-by-step examples, enabling readers to clearly understand the content and succeed in their own projects Includes a complete self-build amplifier project, putting into practice the key techniques introduced throughout the book
A Complete Design Workflow Elsevier
Advanced Design Techniques for RF Power Amplifiers provides a deep analysis of theoretical aspects, modelling, and design strategies of RF high-efficiency power amplifiers. The book can be used as a guide by scientists and engineers dealing with the subject and as a text book for graduate and postgraduate students. Although primarily intended for skilled readers, it provides an excellent quick start for beginners.
The Audiophile's Project Sourcebook: 120 High-Performance Audio Electronics Projects Newnes
Amplification is central to many branches of electronics; describes amplifier types, how they work, their properties, advantages and disadvantages, and applications.
Self on Audio Taylor & Francis
This much-anticipated volume builds on the author's best selling and classic work, RF Power Amplifiers for Wireless Communications (Artech House, 1999), offering experienced engineers a more in-depth understanding of the theory and design of RF power amplifiers. An invaluable reference tool for RF, digital and system level designers, the book includes discussions on the most critical topics for professionals in the field, including envelope power management schemes and linearization.
Design and Analysis Techniques for Frequencies from Audio to RF Springer Science & Business Media
The use of active crossovers is increasing. They are used by almost every sound reinforcement system, and by almost every recording studio monitoring set-up. There is also a big usage of active crossovers in car audio, with the emphasis on routing the bass to enormous low-frequency loudspeakers. Active crossovers are used to a small but rapidly growing extent in domestic hifi, and I argue that their widespread introduction may be the next big step in this field. The Design of Active Crossovers has now been updated and extended for the Second Edition, taking in developments in loudspeaker technology and crossover design. Many more pre-designed filters are included so that crossover development can be faster and more certain, and the result will have a high performance. The Second Edition continues the tradition of the first in avoiding complicated algebra and complex numbers, with the mathematics reduced to the bare minimum; there is nothing more complicated to grapple with than a square root. New features of the Second Edition include: ● More on loudspeaker configurations and their crossover requirements: MTM Mid-Tweeter-Mid configurations (The d'Appolito arrangement) Line arrays (J arrays) for sound reinforcement Frequency tapering Band zoning Power tapering Constant-Beamwidth Transducer (CBT) loudspeaker arrays ● More on specific sound-reinforcement issues like the loss of high frequencies due to the absorption of sound in air and how it varies. ● Lowpass filters now have their own separate chapter. Much more on third, fourth, fifth, and sixth-order lowpass filters. Many more examples are given with component values ready-calculated ● Highpass filters now have their own separate chapter, complementary to the chapter on lowpass filters. Much more on third, fourth, fifth, and sixth-order highpass filters. Many more examples are given with component values ready-calculated ● A new chapter dealing with filters other than the famous Sallen & Key type. New filter types are introduced such as the third-order multiple feedback filter. There is new information on controlling the Q and gain of state-variable filters. ● More on the performance of crossover filters, covering noise, distortion, and the internal overload problems of filters. ● The chapter on bandpass and notch filters is much extended, with in-depth coverage of the Bainter filter, which can produce beautifully deep notches without precision components or adjustment. ● Much more information on the best ways to combine standard components to get very accurate non-standard values. Not only can you get a very accurate nominal value, but also the effective tolerance of the combination can be significantly better than that of the individual components used. There is no need to keep huge numbers of resistor and capacitor values in stock. ● More on low-noise high-performance balanced line inputs for active crossovers, including versions that give extraordinarily high common-mode rejection. (noise rejection) ● Two new appendices giving extensive lists of crossover patents, and crossover-based articles in journals. This book is packed full of valuable information, with virtually every page revealing nuggets of specialized knowledge never before published. Essential points of theory bearing on practical performance are lucidly and thoroughly explained, with the mathematics kept to an essential minimum. Douglas' background in design for manufacture ensures he keeps a very close eye on the cost of things.
High-speed Clock and Data Recovery, High-performance Amplifiers, Power Management McGraw Hill Professional
Master the art of audio power amplifier design This comprehensive book on audio power amplifier design will appeal to members of the professional audio engineering community as well as the hobbyist. Designing Audio Power Amplifiers begins with power amplifier design basics that a novice can understand and moves all the way through to in-depth design techniques for the very sophisticated audiophile and professional audio power amplifier designer. This is the single best source of knowledge for anyone who wants to design an audio power amplifier, whether for fun or profit. Develop and hone your audio design skills with in-depth coverage of these and other topics: Basics of audio power amplifier design MOSFET power amplifiers and error correction Static and dynamic crossover distortion demystified Understanding negative feedback and the controversy surrounding it Advanced negative feedback compensation techniques Sophisticated DC servo design Audio measurements and instrumentation Overlooked sources of distortion SPICE simulation for audio amplifiers, including a tutorial SPICE transistor modeling, including the EKV model for power MOSFETs Thermal design and the use of ThermalTrak transistors Four chapters devoted to class D amplifiers Supplemental material available at www.cordellaudio.com includes: * Ready-to-run amplifier simulations * Key transistor models * Other bonus materials Make Great Stuff! TAB, an imprint of McGraw-Hill Professional, is a leading publisher of DIY technology books for makers, hackers, and electronics hobbyists.
The Collected Audio Design Articles of Douglas Self Taylor & Francis
This book is the essential reference for audio power amplifier designers and engineers. Author Douglas Self covers all the issues of distortion and linearity, power supplies, protection, reliability and layout. He also tackles unusual forms of compensation and unexpected sources of distortion such as capacitors and fuses. This much expanded and updated Fifth Edition includes four NEW chapters, one of them dedicated to the XD crossover-displacement principle, invented by the author, and used by Cambridge Audio. The book has a wealth of new material on four-stage amplifier architectures, current-mirrors, power transistors with internal sensing diodes, amplifier bridging, subtle distortion mechanisms, input stage common-mode distortion, double input stages, amplifier stability, output stages with gain, transformers and hum fields, inrush current suppression, DC servo design, thermal protection, the subtleties of cooling fan control, advanced line input stages, ultra-low-noise design, high and low-pass filtering, testing and safety, infra-red control, signal activation, 12V trigger, level indication and much more. There is significantly expanded material on professional power amplifiers as used in sound reinforcement and PA applications. This book is a must-have for audio power amplifier professionals and audiophiles, amateur constructors and anyone with intellectual curiosity about the struggle towards technical excellence. *Provides everything you want to know in one volume, offering an essential guide to design principals and practice *Includes numerous graphs and an easy to read layout to illustrate points and aid complete understanding. *Includes the author's own amplifier designs for readers to build upon and adapt
Practical Audio Amplifier Circuit Projects Routledge
Electronics for Vinyl is the most comprehensive book ever produced on the electronic circuitry is in full swing, and a clear and comprehensive account of the electronics you need is very timely. Vinyl reproduction presents some unique technical challenges; the signal levels from moving-magnet cartridges are low, and those from moving-coil cartridges lower still, so a good deal of high-quality low-noise amplification is required. Some of the features of Electronics for Vinyl include: ● integrating phono amplifiers into a complete preamplifier; ● differing phono amplifier technologies; covering active, passive, and semi-passive RIAA equalisation and transconductance RIAA stages; ● the tricky business of getting really accurate RIAA equalisation without spending a fortune on expensive components, such as switched-gain MM/MC RIAA amplifiers that retain great accuracy at all gains, the effects of finite open-loop gain, cartridge-preamplifier interaction, and so on; ● noise and distortion in phono amplifiers, covering BJTs, FETs, and opamps as input devices, hybrid phono amplifiers, noise in balanced MM inputs, noise weighting, and cartridge load synthesis for ultimately low noise; ● archival and non-standard equalisation for 78s etc.; ● building phono amplifiers with discrete transistors; ● subsonic filtering, covering all-pole filters, elliptical filters, and suppression of subsonics by low-frequency crossfeed, including the unique Devinyliser concept; ● ultrasonic and scratch filtering, including a variety of variable-slope scratch filters; ● line output technology, including zero-impedance outputs, on level indication for optimal setup, and on specialised power supplies; and ● description of six practical projects which range from the simple to the highly sophisticated, but all give exceptional performance. Electronics for Vinyl brings the welcome news that there is simply no need to spend huge sums of money to get performance that is within a hair’s breadth of the best theoretically obtainable. But you do need some specialised knowledge, and here it is.
Small- Signal Audio Design Focal Press
This book is essential reading principally for designers of linear audio frequency power amplifiers and more generally students and amateur enthusiasts of audio frequency electronics. A first-principles analytical approach is here preferred because it engenders an intuitive appreciation of the workings of linear audio frequency power amplifiers, and it provides the engineer and researcher with a sound foundation for further work in the field. Among other matters, the author cogently and succinctly Evaluates the merits and demerits of two pole Miller minor negative

feedback loop frequency compensation (TPMC) and localised two pole Miller minor negative feedback loop frequency compensation (LTPMC) and develops clear, systematic means by which these frequency compensation networks may be optimised. Tenders two novel feedforward-compensated push-pull folded cascode transimpedance stage (TIS) designs in which slew asymmetry is banished. Renders two novel feedforward-compensated push-pull transimpedance stage (TIS) designs based on the complementary emitter-coupled transistor pair of Sziklai et al. Assesses the value of Burwen's Inductive Frequency Compensation (IFC) in context. Presents six idiosyncratic audio frequency power amplifier designs compensated with optimised LTPMC networks and incorporating non-invasive anti-saturation measures. Examines monolithic/discrete composite linear audio frequency power amplifiers and their frequency compensation. Describes how Safe Operating Area (SOA) protection networks may be correctly and accurately designed so that they remain inert when the amplifier does not require protection. Gives an account of error feedback correction and presents three novel error feedback correction circuits. Discusses output-stage-inclusive single pole Miller minor negative feedback loop frequency compensation (OSI-SPMC). The author gives all credit to Almighty God, the fount of all knowledge and without whom nothing is possible, through His son, Jesus Christ. Finally, the author hopes devoutly that adopters of this book will derive as much pleasure from reading it as he did from writing it.

Highly Linear Integrated Wideband Amplifiers Newnes

Introduction to RF Power Amplifier Design and Simulation fills a gap in the existing literature by providing step-by-step guidance for the design of radio frequency (RF) power amplifiers, from analytical formulation to simulation, implementation, and measurement. Featuring numerous illustrations and examples of real-world engineering applications, this book: Gives an overview of intermodulation and elaborates on the difference between linear and nonlinear amplifiers Describes the high-frequency model and transient characteristics of metal–oxide–semiconductor field-effect transistors Details active device modeling techniques for transistors and parasitic extraction methods for active devices Explores network and scattering parameters, resonators, matching networks, and tools such as the Smith chart Covers power-sensing devices including four-port directional couplers and new types of reflectometers Presents RF filter designs for power amplifiers as well as application examples of special filter types Demonstrates the use of computer-aided design (CAD) tools, implementing systematic design techniques Blending theory with practice, Introduction to RF Power Amplifier Design and Simulation supplies engineers, researchers, and RF/microwave engineering students with a valuable resource for the creation of efficient, better-performing, low-profile, high-power RF amplifiers.

An Analytical Approach to Linear Audio Frequency Power Amplifier Design McGraw Hill Professional

This comprehensive book on audio power amplifier design will appeal to members of the professional audio engineering community as well as the student and enthusiast. Designing Audio Power Amplifiersbegins with power amplifier design basics that a novice can understand and moves all the way through to in-depth design techniques for very sophisticated audiophiles and professional audio power amplifiers. This book is the single best source of knowledge for anyone who wishes to design audio power amplifiers. It also provides a detailed introduction to nearly all aspects of analog circuit design, making it an effective educational text. Develop and hone your audio amplifier design skills with in-depth coverage of these and other topics: Basic and advanced audio power amplifier design Low-noise amplifier design Static and dynamic crossover distortion demystified Understanding negative feedback and the controversy surrounding it Advanced NFB compensation techniques, including TPC and TMC Sophisticated DC servo design MOSFET power amplifiers and error correction Audio measurements and instrumentation Overlooked sources of distortion SPICE simulation for audio amplifiers, including a tutorial on LTspice SPICE transistor modeling, including the VDMOS model for power MOSFETs Thermal design and the use of ThermalTrak(tm) transistors Four chapters on class D amplifiers, including measurement techniques Professional power amplifiers Switch-mode power supplies (SMPS). design Static and dynamic crossover distortion demystified Understanding negative feedback and the controversy surrounding it Advanced NFB compensation techniques, including TPC and TMC Sophisticated DC servo design MOSFET power amplifiers and error correction Audio measurements and instrumentation Overlooked sources of distortion SPICE simulation for audio amplifiers, including a tutorial on LTspice SPICE transistor modeling, including the VDMOS model for power MOSFETs Thermal design and the use of ThermalTrak(tm) transistors Four chapters on class D amplifiers, including measurement techniques Professional power amplifiers Switch-mode power supplies (SMPS).

RF and Microwave Power Amplifier Design Kendall Hunt Publishing Company

Analog Circuit Design contains the contribution of 18 tutorials of the 17th workshop on Advances in Analog Circuit Design. Each part discusses a specific to-date topic on new and valuable design ideas in the area of analog circuit design. Each part is presented by six experts in that field and state of the art information is shared and overviewed. This book is number 17 in this successful series of Analog Circuit Design.

High Power Audio Amplifier Construction World Scientific Publishing Company

Morgan Jones' Valve Amplifiers has been widely recognised as the most complete guide to valve amplifier design, modification, analysis, construction and maintenance written for over 30 years. As such it is unique in presenting the essentials of 'hollow-state' electronics and valve amp design for engineers and enthusiasts in the familiar context of current best practice in electronic design, using only currently available components. The author's straightforward approach, using as little maths as possible, and lots of design knowhow, makes this book ideal for those with a limited knowledge of the field as well as being the standard reference text for experts in valve audio and a wider audience of audio engineers facing design challenges involving valves. Design principles and construction techniques are provided so readers can devise and build from scratch designs that actually work. Morgan Jones takes the reader through each step in the process of design, starting with a brief review of electronic fundamentals relevant to valve amplifiers, simple stages, compound stages, linking stages together, and finally, complete designs. Practical aspects, including safety, are addressed throughout. The third edition includes a new chapter on distortion and many further new and expanded sections throughout the book, including: comparison of bias methods, constant current sinks, upper valve choice, buffering and distortion, shunt regulated push-pull (SRPP) amplifier, use of oscilloscopes and spectrum analysers, valve cooling and heatsinks, US envelope nomenclature and suffixes, heater voltage versus applied current, moving coil transformer source and load terminations. * The practical guide to analysis, modification, design, construction and maintenance of valve amplifiers * The fully up-to-date approach to valve electronics * Essential reading for audio designers and music and electronics enthusiasts alike

RF Power Amplifiers Artech House

This book is essential for audio power amplifier designers and engineers for one simple reason...it enables you as a professional to develop reliable, high-performance circuits. The Author Douglas Self covers the major issues of distortion and linearity, power supplies, overload, DC-protection and reactive loading. He also tackles unusual forms of compensation and distortion produced by capacitors and fuses. This completely updated fifth edition includes four NEW chapters including one on The XD Principle, invented by the author, and used by Cambridge Audio. Crosstalk, power amplifier input systems, and microcontrollers in amplifiers are also now discussed in this fifth edition, making this book a must-have for audio power amplifier professionals and audiophiles.

Advanced Design Techniques for RF Power Amplifiers CRC Press

Design and build awesome audio amps. Amateur and professional audiophiles alike can now design and construct superior quality amplifiers at a fraction of comparable retail prices with step-by-step instruction from the High-Power audio Amplifier Construction Manual. Randy Slone, professional audio writer and electronics supply marketer, delivers the nuts-and-bolts know-how you need to optimize performance for any audio system--from home entertainment to musical instrument to sound stage. Build a few simple projects or delve into the physics of audio amplifier operation and design. This easy to understand guide walks you through: Building the optimum audio power supply; Audio amplifier power supplies and construction: Amplifier and loudspeaker protection methods; Stability, distortion, and performance; Audio amplifier cookbook designs; Construction techniques; Diagnostic equipment and testing procedures; Output stage configurations, classes, and device types; Crossover distortion physics; Mirror-image input stage topologies.

Fundamentals and Applications Audio Power Amplifier Design

Practical Audio Amplifier Circuit Projects builds on the introduction to electronic circuits provided in Singmin's innovative and successful first book, Beginning Electronics Through Projects. Both books draw on the author's many years of experience as electronics professional and as hobbyist. As a result, his project descriptions are lively, practical, and very clear. With this new volume, the reader can build relatively simple systems and achieve useable results quickly. The projects included here allow a hobbyist to build amplifier circuits, test them, and then put them into a system. Progress through a graduated series of learning activities culminates in unique devices that are nevertheless easy to build. Learn the basic building blocks of audio amplifier circuit design and then apply your knowledge to your own audio inventions. Targets the intermediate to advanced reader with challenging projects that teach important circuit theories and principles Provides a ready source of audio circuits to professional audio engineers Includes an electric guitar pacer project that lets you "jam" with your favorite band!

RF Power Amplifiers for Wireless Communications Elsevier

Audio Power Amplifier DesignFocal Press

Audio Power Amplifier Design Elsevier

THE AUDIOPHILE’S PROJECT SOURCEBOOK Build audio projects that produce great sound for far less than they cost in the store, with audio hobbyists’ favorite writer Randy Slone. In The Audiophile’s Project Sourcebook, Slone gives you— • Clear, illustrated schematics and instructions for high-quality, high-power electronic audio components that you can build at home • Carefully constructed designs for virtually all standard high-end audio projects, backed by an author who answers his email • 8 power-amp designs that suit virtually any need • Instructions for making your own inexpensive testing equipment • Comprehensible explanations of the electronics at work in the projects you want to construct, spiced with humor and insight into the electronics hobbyist’s process • Complete parts lists "The Audiophile's Project Sourcebook" is devoid of the hype, superstition, myths, and expensive fanaticism often associated with 'high-end' audio systems. It provides straightforward help in building and understanding top quality audio electronic projects that are based on solid science and produce fantastic sound! THE PROJECTS YOU WANT, FOR LESS Balanced input driver/receiver circuits Signal conditioning techniques Voltage amplifiers Preamps for home and stage Tone controls Passive and active filters Parametric filters Graphic equalizers Bi-amping and tri-amping filters Headphone amplifiers Power amplifiers Speaker protection systems Clip detection circuits Power supplies Delay circuits Level indicators Homemade test equipment

Newnes Circuits Manual Series John Wiley & Sons

The audio amplifier is at the heart of audio design. Its performance determines largely the performance of any audio system. John Linsley Hood is widely regarded as the finest audio designer around, and pioneered design in the post-valve era. His mastery of audio technology extends from valves to the latest techniques. This is John Linsley Hood's greatest work yet, describing the milestones that have marked the development of audio amplifiers since the earliest days to the latest systems. Including classic amps with valves at their heart and exciting new designs using the latest components, this book is the complete world guide to audio amp design. John Linsley Hood is responsible for numerous amplifier designs that have led the way to better sound, and has also kept up a commentary on developments in audio in magazines such as The Gramophone, Electronics in Action and Electronics and Wireless World. He is also the author of The Art of Linear Electronics and Audio Electronics published by Newnes. Complete world guide to audio amp design written by world famous author Covers classic amps to new designs using latest components Includes the best of valves as well as best of transistors