

1. Record Nr.	UNISA996495163003316
Autore	Dailey Denton J.
Titolo	Electronics for guitarists // Denton J. Dailey
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	9783031107580 9783031107573
Edizione	[Third edition.]
Descrizione fisica	1 online resource (507 pages)
Disciplina	787.8709969
Soggetti	Electric guitar Amplifiers (Electronics)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Intro -- Preface -- Who This Book Is Written For -- Analog Rules! -- About the Math -- Building the Circuits -- Vacuum Tubes -- The Third Edition -- Safety -- Disclaimer -- Acknowledgments -- Contact Information -- Internet Links and Descriptions Used in Text -- Contents -- List of Figures -- Chapter 1: Power Supplies -- Introduction -- A Simple Power Supply Circuit -- The Transformer -- The Rectifier -- Analysis of the Rectifier -- The Frequency Domain -- The Filter -- Ripple Voltage -- Filter Analysis: The Frequency Domain -- Response Curves, Decades, and Octaves -- Power Indicators -- Neon Lamps -- Light-Emitting Diodes -- LED Current Limiting Resistor Calculation -- Incandescent Lamps -- A Basic Regulated Power Supply -- The 78xx Voltage Regulator -- Dropout Voltage -- Power Dissipation -- Bipolar Power Supplies -- Using Batteries for Bipolar Power -- A Typical Bipolar Power Supply -- A Regulated Bipolar Power Supply -- Two-Diode, Full-Wave Rectifier -- Basic Vacuum Tube Diode Power Supplies -- Vacuum Tube Diodes -- Reverse Bias -- Forward Bias -- The 5AR4, 5U4-GB, and 5Y3-GT Diodes -- Typical Vacuum Tube Diode Power Supplies -- The LC, Pi Filter -- RC Pi Filter -- Supply Voltage Distribution -- Final Comments -- Summary of Equations -- Chapter 2: Pickups and Volume and Tone Controls -- Introduction -- Single-Coil Magnetic Pickups -- Humbucker Pickups -- Peak and

Average Output Voltages -- More Magnetic Pickup Analysis -- Inductance -- A Pickup Winding Example -- Winding Resistance -- Winding Capacitance -- Approximate Circuit Model for a Magnetic Pickup -- Piezoelectric Pickups -- Piezoelectric Pickup Analysis -- Example of Calculation: Input Resistance and Corner Frequency -- Guitar Volume and Tone Control Circuits -- Potentiometers -- Potentiometer Taper -- The Transfer Function -- Rheostats -- Basic Guitar Tone Control Operation.

Damping -- Multiple Pickups -- Pickup Phasing -- Amplifier Tone Control Circuits -- A Basic Tone Control Circuit -- Improved Single-Pot Tone Control -- Baxandall Tone Control -- Other Tone Control Circuits

-- Final Comments -- Summary of Equations -- Chapter 3: Small-Signal and Low-Power Amplifiers -- Introduction -- Gain -- Decibels -- Other Amplifier Parameters -- Distortion -- Input Resistance -- Output Resistance -- Bandwidth -- Slew Rate -- Amplifier

Classifications and Biasing -- Bipolar Junction Transistors -- The Active Region -- Saturation -- Cutoff -- Biasing -- Class A -- Class B -- Class AB -- The Load Line -- Clipping -- DC and AC Load Lines -- Class A Power Dissipation Characteristics -- The Common Emitter Configuration -- The Emitter Follower (Common Collector)

Configuration -- The Common Base Configuration -- Field Effect Transistors -- Bipolar Transistor Specifications -- Basic BJT Amplifier Operation -- Voltage Divider Biased CE Amplifier -- DC Q-Point Analysis Equations for Fig. 3.13 -- Beta Independence -- AC Analysis Equations for Fig. 3.13 -- Common Emitter Amplifier Analysis Example -- DC Q-Point Analysis -- AC Analysis -- Experimental Results --

Some Practical Testing and Measurement Tips -- Amplifying a Guitar Signal -- Frequency Response -- Negative Feedback -- Local and Global Feedback -- A JFET Common Source, Class A Amplifier -- JFET Parameters -- JFET Amplifier Overview -- JFET Centered Q-Point -- BJT vs. JFET -- Piezoelectric Pickup Preamplifier -- Phone Jack Power Switching -- Increasing Voltage Gain -- A JFET-BJT Multiple-Stage Amplifier -- Some Useful Modifications -- A Closer Look at Transconductance -- BJT, JFET, and MOSFET Transconductance Equations -- A MOSFET Common Source Amplifier -- Theoretical Analysis -- Experimental Results -- Operational Amplifiers -- Basic Noninverting and Inverting Op Amp Equations.

Noninverting and Inverting Amplifier Analysis -- Power Bandwidth -- Single-Polarity Supply Operation -- Noninverting Amplifier -- The Two Golden Rules of Op Amp Analysis -- Inverting Amplifier -- Parasitic Oscillation -- Inside the Op Amp -- Operational Transconductance Amplifiers -- An OTA Analysis Example -- The OTA as a Voltage-Controlled Amplifier -- Current Difference Amplifiers -- Your Turn -- Miscellaneous Useful Circuits -- An Audio Test Oscillator -- A Closer Look at the Oscillator Output Signal -- The Rail Splitter -- High-Power Rail Splitter -- Use with Pedal Boards and Daisy Chain Power Cords -- Charge Pumps -- Charge Pump vs. Rail Splitter -- Class A, Collector Feedback, Germanium Transistor Amplifier -- DC Analysis -- AC Analysis -- Experimental Results -- Practical Use of the Amplifier -- An Alternate JFET Input Version -- Mixing Magnetic and Piezo Pickups -- Final Comments -- Summary of Equations -- Chapter 4: Solid-State Power Amplifiers -- Introduction -- The Basic Push-Pull Stage -- Class AB: Eliminating Crossover Distortion -- Output Power Determination -- Bipolar Power Supply Operation -- Power Transistors -- Composite Transistors -- Darlington Transistors -- Sziklai Transistors -- A Complete Power Amplifier -- Output Stage Analysis -- Transistor Thermal Analysis -- Parallel-Connected Power Transistors -- Thermal Runaway -- Push-Pull Stage with Parallel Transistors -- Adding a Tone

Control -- Amplifier Stability Issues -- Ground Reference -- Star Grounding -- Motorboating -- Decoupling Capacitors -- The Zobel Network -- MOSFET Output Stages -- The VBE Multiplier -- The Rail Splitter Revisited -- Enclosing Base-Emitter Junction in the Feedback Loop -- Converting the Rail Splitter to an Amplifier -- Slew Rate-Induced Crossover Distortion -- Final Comments -- Summary of Equations -- Chapter 5: Effects Circuits -- Introduction.

Signals and Spectra -- Time, Period, Frequency, and Pitch -- Sinusoids in the Time Domain -- Waveform Shape, Symmetry, and Harmonic Relationships -- Transfer Function Symmetry and Harmonic Distortion -- An Odd Symmetry Example -- An Even Symmetry Example -- An Example of Neither Even Nor Odd Symmetry -- Intermodulation Distortion -- Influence of Amplifier Design on Distortion -- Effects of Negative Feedback -- Single-Ended vs. Push-Pull -- Effects of Device Transfer Characteristics on Distortion -- BJTs -- FETs -- Triodes -- Effect Bypassing -- Overdrive Circuits -- Single-Stage Transistor Overdrives -- Simple BJT Overdrive -- Sziklai Overdrive Circuit -- Darlington Overdrive Circuit -- Multiple-Stage Overdrive Circuits -- JFET/BJT Overdrive -- MOSFET/PNP Germanium Overdrive -- An Op Amp Overdrive Circuit -- Distortion Circuits -- Fuzz vs. Distortion -- Diode Clippers -- Asymmetrical Clipper with Power Indicator -- Adjustable Op Amp Distortion Circuit -- Logarithmic Amplifiers -- Log Amp Output Equation Derivation -- Log Amp Distortion Circuit -- Phase Shifters -- The All-Pass Filter -- Optocouplers -- An Experimental Phase Shifter Circuit -- Flangers -- Flanging vs. Phase-Shifting -- Bucket-Brigade Devices -- Clock and LFO Generation -- A BBD-Based Flanger -- Sampling Frequency and Aliasing -- Anti-aliasing and Reconstruction Filters -- Oversampling -- Chorus Effect -- Envelope Followers -- Signal Envelope -- Precision Rectifier Circuits -- Precision Half-Wave Rectifiers -- Precision Full-Wave Rectifier -- An Experimental Envelope Follower -- String Frequency-to-Pulse Converter -- Compression, Sustain, and Dynamic Range -- Voltage-Controlled Amplifiers -- Experimental OTA-Based Compressor -- Experimental LDR-Based Compression/Sustain -- Tremolo -- Reverberation -- Delay Time -- Decay Time -- Reverb Springs -- A Digital Reverb.

Modulation and Pitch Shifting -- Amplitude Modulation -- Balanced (Ring) Modulation -- An Experimental Ring Modulator -- Frequency Doubling -- A Deeper Dive -- Analog Multipliers -- Vocoder -- Wah-Wah Circuits -- IGMF Bandpass Filter -- An IGMF Design Example -- Varying f_0 of the IGMF -- Experimental IGMF Wah-Wah Circuits -- Eliminating Switching Pop -- A Gyrator-Based Wah-Wah Circuit -- Envelope-Controlled Filter (Auto-Wah) -- Noise Gates -- A Little Deeper Look at the LM358 -- Sampling, Quantization, DACs, and ADCs -- The R-2R Ladder -- DAC Operation -- Effect on an Audio Signal -- Final Comments -- Summary of Equations -- Chapter 6: Low-Power Vacuum Tube Amplifiers -- Introduction -- Commonly Used Vacuum Tubes -- Parts Sources and Availability -- Vacuum Tube Parameters and Data Sheets -- Absolute Maximum Ratings -- Other Data Sheet Parameters -- Tube Pin Numbering -- General Amplifier Design Principles -- Cathode Feedback Biasing -- Fixed Biasing -- Class A, Resistance-Coupled, Common Cathode Amps -- 12AU7 Low-Power Amp Design Example -- Alternative Determination of Cathode Resistance R_K -- DC and AC Load Lines -- Amplifier AC Performance -- Output Voltage Compliance -- Experimental Test Results -- Q-Point Location and Distortion -- 6AN8 Triode, Low-Power Amp Design Example -- Amplifier AC Performance -- The AC Load Line -- Output Voltage Compliance -- 12AX7 Low-Power Amp Design Example --

Amplifier AC Performance -- The AC Load Line -- Output Voltage Compliance -- Experimental Results -- 12AT7 Low-Power Amp Design Example -- Amplifier AC Performance -- Output Voltage Compliance -- Pentodes -- Screen Grid (G2) -- Suppressor Grid (G3) -- 6AN8 Pentode, Low-Power Amp Design Example -- Amplifier AC Performance -- Output Voltage Compliance -- Cathode Followers and Phase Splitters -- Cathodyne Phase Splitter Design -- Cathode Resistor Determination.
AC Characteristics.
