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Approximate Approach

2.3.6.3 Appeal to the Valve Manufacturing Industry for More Truth on the Table
3 Noise in Components and Other General Noise Effects; 3.1... Introduction; 3.2...Signal-to-Noise (SN) Ratio Calculations; 3.3...The A-weighting Calculation Approach; 3.4...Output Referred SNs; 3.5...From Output to Input Referred SNs and Vice Versa; 3.6...Noise of Passive Components and Resistance Excess Noise; 3.6.1 Resistor Thermal Noise; 3.6.2 Resistor Excess Noise; 3.6.3 Special Case: Cathode Resistance Noise; 3.6.4 SN Worsening Factor and Figure; 3.7...Noise Model of a Triode Common Cathode Gain Stage (CCS)
3.8...Input Load Alternatives
3.8.1 Purely Resistive Input Load R_0 ; 3.8.2 Noise Voltage of a Preceding Gain Stage with Output Resistance R_0 less than 1 Ω ; 3.8.3 Noise Voltage of a Preceding Gain Stage with Output Resistance R_0 less than 1 Ω and Additional Output Resistor R_0 greater than 1 Ω ; 3.8.4 Noise Voltage of a Preceding Gain Stage with Output Resistance R_0 greater than 1 Ω and Additional Output Resistor R_0 greater than 1 Ω ; 3.8.5 Input Load with Resistor, Inductance, and Capacitance (MM cartridge case); 3.8.6 Input Shorted; 3.8.7 Sum of the Gain Stage Input Noise Voltage
3.9...The Noise Factor and Noise Figure of an Amplifier
3.10...General Remarks on the Mathcad Example Calculations; 3.10.1 Bias and Other Operational Values; 3.10.2 Values for Graphical Representations; 3.10.3 SN Calculation Approaches; Part II Operations with Singletons; 4 The Common Cathode Gain Stage (CCS); 4.1...Circuit Diagram; 4.2...The CCSu: Basic Formulae; 4.2.1 The Idle Gain $G_{0,u}$ (Output Un-loaded); 4.2.2 The Output Load Dependent Gain $G_u(R_L)$; 4.2.3 The Operating Gain $G_{ops,u}$ (Output Loaded); 4.2.4 The Input Resistance R_i , Input Capacitance $C_{i,u}$, and Input Impedance $Z_{i,u}(f)$
4.2.5 The Anode Output Resistance $R_{o,a,u}$ and Output Impedance $Z_{o,a,u}(f)$

Sommario/riassunto

The 34 chapters of the 2nd edition of How to Gain Gain give a detailed insight into a collection (54) of the most common gain producing, constant current generating possibilities, and electronic noise creation of triodes for audio pre-amplifier purposes. These chapters also offer complete sets of formulae to calculate gain, frequency and phase responses, and signal-to-noise ratios of certain building blocks built-up with this type of vacuum valve (tube). In all cases detailed derivations of the gain formulae are also presented. All what is needed are the data sheet valve characteristic figures of the triode's mutual conductance, the gain factor and the internal plate (anode) resistance. To calculate frequency and phase responses of gain stages the different data sheet based input and output capacitances have to be taken into account too. To calculate transfer functions and signal-to-noise ratios for any kind of triode driven gain stage, including all its bias setting, frequency, phase, and electronic noise influencing components, example Mathcad 11 worksheets as an essential simulation tool for each chapter allow easy follow-up and application of the respective formulae. Free download of all worksheets is guaranteed from the editor's web-site.