Valve Studio – Guitar Pentode Pre-Amp – Part 1

Review Project Goal
  RCA RS-175A Record Player Guitar Amp Mod
  Blencowe, Designing Preamps for Guitar and Bass

Biasing
  Plate Characteristic
  Transfer Characteristic

Distortion
  Dynamic Characteristic
  Harmonic
  Intermodulation

Analog Discovery 2
  Test circuit
    THD
    IMD

Performance
  Measurement by equipment
  Analysis by ear

Valve Studio – Guitar Pentode Pre-Amp – Part 1a – Biasing – Intermodulation Distortion

Discussion
  Traditional Biasing
    Transfer Characteristic
      6AU6 Pentode – GE - https://frank.pocnet.net/sheets/093/6/6AU6A.pdf

  Distortion
    Harmonic Distortion
      https://en.wikipedia.org/wiki/Total_harmonic_distortion
    Intermodulation Distortion
      https://en.wikipedia.org/wiki/Intermodulation

  Operating Point
    K=0.56, RDH3 Dynamic Characteristic, Chapter 34, p272
                RDH4 Resistance-Capacitance Coupled Pentode, Section 3/12.3, p496
                        The optimum value of K, Section 3/12.3, p504
                        Maximum voltage output and distortion, Section 3/12.3ix, p510

  Dynamic Characteristic
    The Choice of Operating Conditions for Resistance-Capacitance-Coupled Pentodes
      Radiotronics July 1948, Langford-Smith
        https://frank.pocnet.net/other/AWV_Radiotronics/Radiotronics_1948/1948_07_AWV_Radiotronics_132.pdf

    Dynamic Characteristics of Pentodes
      Communications July 1946, Haefner
        http://www.americanradiohistory.com/Communications_Master_Page.htm

  Measurement
    Cohen 3-4 Ratio A method of measuring distortion products

Valve Studio – Guitar Pentode Pre-Amp – Part 1b – AD2 – Distortion

Experiment
  Harmonic Distortion
    AOUT1 custom function
  Intermodulation
    AOUT1 custom function

    Use AD2 python API
    Calculate IMD - done
      http://www.testips.com/imd.php
      https://github.com/awesomebytes/libermate
      imd.py

Future Plans
  Build AD2 test fixture to re-create curves of Langford-Smith Radiotronics 132
    Need to measure IMD, show AD2 addon

  Measure results
    Equipment
    Ear

  Have fun!