

## **VI. Amplifier-Related Experiments:**

1. **Resistor Properties:**
  - Audio AC properties of real resistors (carbon molded, carbon film, metal film, etc) with DC voltages across them, vs. frequency.
2. **Blocking Capacitor Properties:**
  - Audio AC complex impedance/tonal properties of real capacitors (oil-impregnated paper caps, oil-filled, polypropylene, polyester, mylar film, ceramic, silver mica caps) with DC voltages across them vs. frequency.
  - Use PC-based LabWindows/CVI DAQ – Capacitance.prj program.
  - Use Digital ‘Scope in X-Y (Lissajous) mode, measure D-E hysteresis losses and phase shift vs. frequency. X-fer scope data to PC for analysis.
3. **Electrolytic Capacitor Properties:**
  - Charging Current/ESR vs. Time for Fixed DC Voltage.
  - Reforming of Electrolyte Layer vs. Shelf Time. Affects overall sound of amp?
4. **Vacuum Diodes (Rectifier Tubes) & Thermionic Emission:**
  - PC-based LabWindows/CVI DAQ – RectPar1.Prj
  - Electronics Work Bench/SPICE Simulations & Comparisons
5. **Triode Tube Parameters:**
  - PC-based LabWindows/CVI DAQ – TrioPar5.Prj
  - Electronics Work Bench/SPICE Simulations & Comparisons
6. **Power Tube Parameters:**
  - PC-based LabWindows/CVI DAQ – PowerPar1.Prj
  - Electronics Work Bench/SPICE Simulations & Comparisons
7. **Triode Voltage Amplifier:**
  - PC-based LabWindows/CVI DAQ – TrioAmp1.Prj
  - Electronics Work Bench/SPICE Simulations & Comparisons
8. **Power Transformers, Amplifier Power Supplies:**
  - Various Classic Power Transformer Module(s).
  - Use a variac to vary AC line voltage to amp, record sounds from amp using digital recorder as function of variac’s AC line voltage and analyze using MatLab Wav\_Analysis software.
9. **Rectifier Tubes:**
  - Measure Transient Response & “Voicing” of S-E Class A & P-P Class A/Class AB Amps to Different Rectifier Tubes & Solid-State Rectifiers - e.g. 5Y3, 5V4, 5U4, 5AR4/GZ-34 vs. SS Rect.