



# AEROSPACE RECOMMENDED PRACTICE

## ARP 504B

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### IGNITION SYSTEM TESTING - METERING AND POWER SUPPLIES

1. PURPOSE  
∅ To provide a design standard for power supplies applicable to ignition system development testing.
2. SCOPE  
This procedure establishes the ignition system power supply design parameters for aeronautical engine ignition system testing.
3. FOR D.C. SYSTEM MEASUREMENTS
  - 3.1 Use meters with accuracy of 2% of full scale or  $\pm 1$  volt, whichever is less. Use lowest range meters for minimum error readings of mid-scale, or greater.
  - 3.2 Use power supplies having not more than 1 volt drop at the terminals when a 10 ampere load is applied. Use a capacitance across the power supply terminals large enough (2000 mfd plus) to ensure meeting ripple requirements of paragraph 3.3 and to provide a low impedance return part for the A.C. component that may be developed by the ignition exciters. The power supply shall be capable of being varied over the nominal supply voltage range that will be available to the system so as to allow checking of operation at the design limits of the system.
  - 3.3 Use power supplies having A.C. RMS ripple content no greater than 3% of average D.C. level, measured with 10 ampere load.
  - 3.4 Power supply circuit accessories such as filters, relays and long power leads should be considered part of the power supply and meet the above requirements.
  - 3.5 Locate meters for measuring input characteristics at the input terminal of the system.
  - 3.6 Use moving coil type D.C. ammeters, or automatic averaging electronic type, with  $\pm 2\%$  accuracy, for measuring average values of input current.  
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4. FOR A.C. SYSTEM MEASUREMENTS
  - 4.1 Use frequency meters with accuracy of  $\pm 1\%$  of full scale. Use lowest range meters for minimum error readings at mid-scale, or greater.
  - 4.2 Use electronic true RMS, dynamometer or iron vane type meters with  $\pm 2\%$  of full scale accuracy for measuring input current or voltage RMS values. Meters should be calibrated, or accuracy rated, up to the highest frequency to be measured. Digital type meters are not recommended due to the varying values over the charging and discharging cycle.  
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  - 4.3 Use power supplies having regulation capable of providing, at the extier terminal, input frequency and voltage in accordance with applicable ignition system specifications required when ignition load is applied.
5. FOR SELF-CONTAINED TYPE SYSTEM MEASUREMENTS
  - 5.1 An engine driven permanent magnet generator (PMG or alternator) provides self-contained A.C. power in this type system to make it self-sufficient (MIL-E-5007D, para. 3.74 and 3.7.5.2). The generator output frequency and voltage are proportional to engine RPM and are usually specified for ignition system measurements at 100% speed (RPM) and the minimum RPM at which ignition is required.  
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