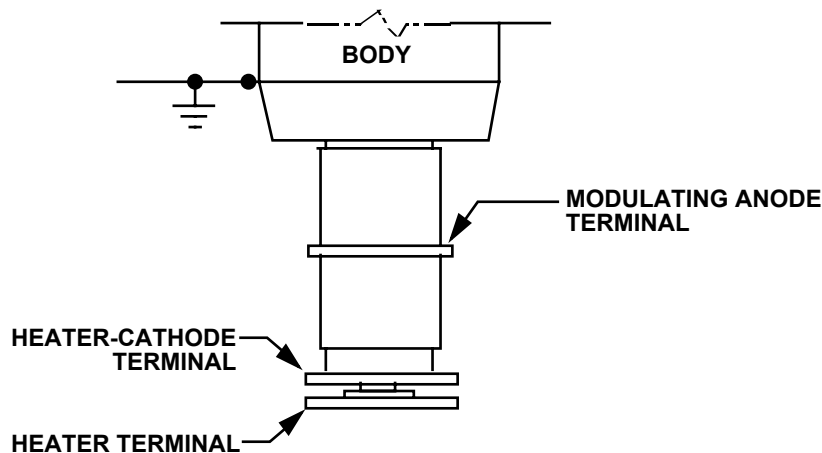


Some klystron users have expressed concern that klystrons operating for extended periods are susceptible to high-voltage breakdown faults when they are moved from visual to aural service or are pulsed when previous operation has been continuous. In both of these cases, the difference of potential between elements is increased over values used in normal visual operation. In some cases, this elevated difference in potential can lead to internal arcing between the electron-gun elements due to long-term buildup of electrical leakage in these areas. This is a normal aging process in klystrons, and it can be slowed by reduction of the filament voltage and reduced or cleaned up by high-voltage reconditioning. It has been found useful to clear any residual leakage from between the various elements prior to pulsing an older klystron or when moving an existing visual klystron to aural operation.

The klystron electron-gun leakage can be checked and, in many cases, the gun elements reconditioned by applying a high dc potential between these elements. This processing is termed "hipotting." The equipment required for this operation is a current-limited (5 ma max.), continuously variable dc supply with a range of 0–30 kV (hipotter).

1. The heater must be off during the reconditioning and the cathode allowed to cool completely (1–2 hours).
2. Connect the negative high-voltage output of the hipotter to the heater-cathode terminal and the positive ground lead to the modulating anode (mod-anode). Gradually increase the voltage output, noting the leakage current.

If high levels of current are noted, reduce the voltage and allow it to stand at the 1–2 ma level until the leakage current reduces (burns off). Continue to raise hipotter output until the voltage applied is equal to the normal operating value for the klystron being checked. The typical leakage level is 200–400 μ A.



3. The mod-anode-to-body ground leakage should be checked and reduced, if necessary, in the same fashion. The negative high-voltage output is now connected to the mod-anode terminal, and the positive ground lead is connected to the klystron body.

The leakage level indicated above is only typical, and tubes should still operate normally above this value but may be more susceptible to internal arcing.