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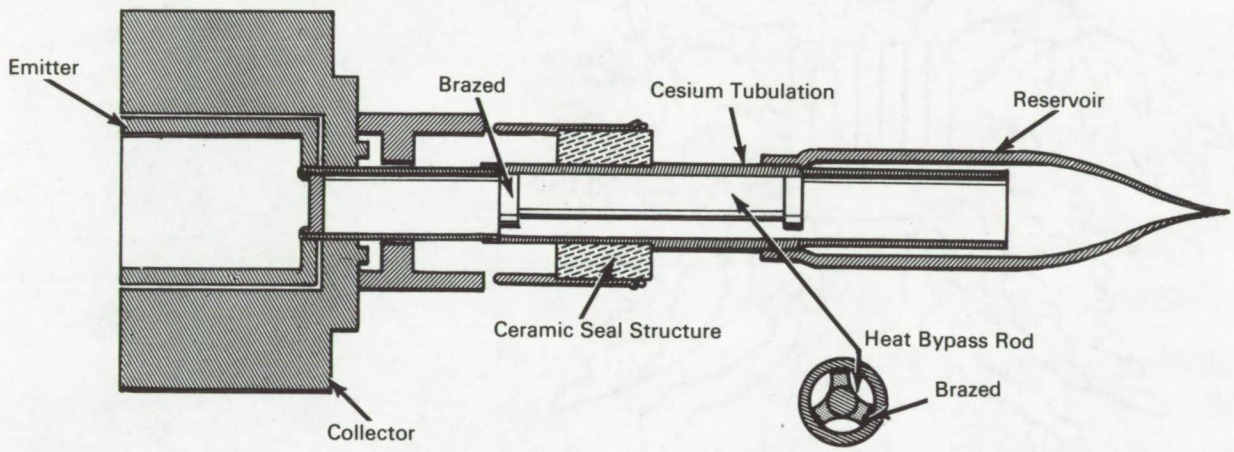
NASA TECH BRIEF

Bypass Rod Transfers Heat Developed in Thermionic Diode



The problem:

In operating thermionic diodes a cesium reservoir that acts as a heat sink should be maintained at an optimum temperature below that of the emitter–collector assembly. To maintain this differential, thermal barriers are placed between the two areas. It is necessary to pass large quantities of heat to the cesium reservoir without passing through a ceramic seal structure that is incapable of sustaining large temperature gradients.

The solution:

A cesium tube that joins the emitter–collector area and cesium reservoir is fitted with a copper bypass rod held in place by a standoff bracket at each end. This bypass rod transfers heat developed in the emitter–collector area to the cesium reservoir without going through the ceramic seal structure that surrounds the outside surface of the cesium tube.

How it's done:

The copper bypass rod is mounted within the cesium tube by means of a three pronged bracket at either end of the rod. Each prong is lightly brazed to the inside of the tube to minimize the amount of heat transferred to the tube and subsequently to the ceramic seal.

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
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Reference: B66-10303

Patent status:

No patent action is contemplated by NASA.

Source: Lazaros J. Lazaridis
of Thermo Electron Engineering Corporation
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