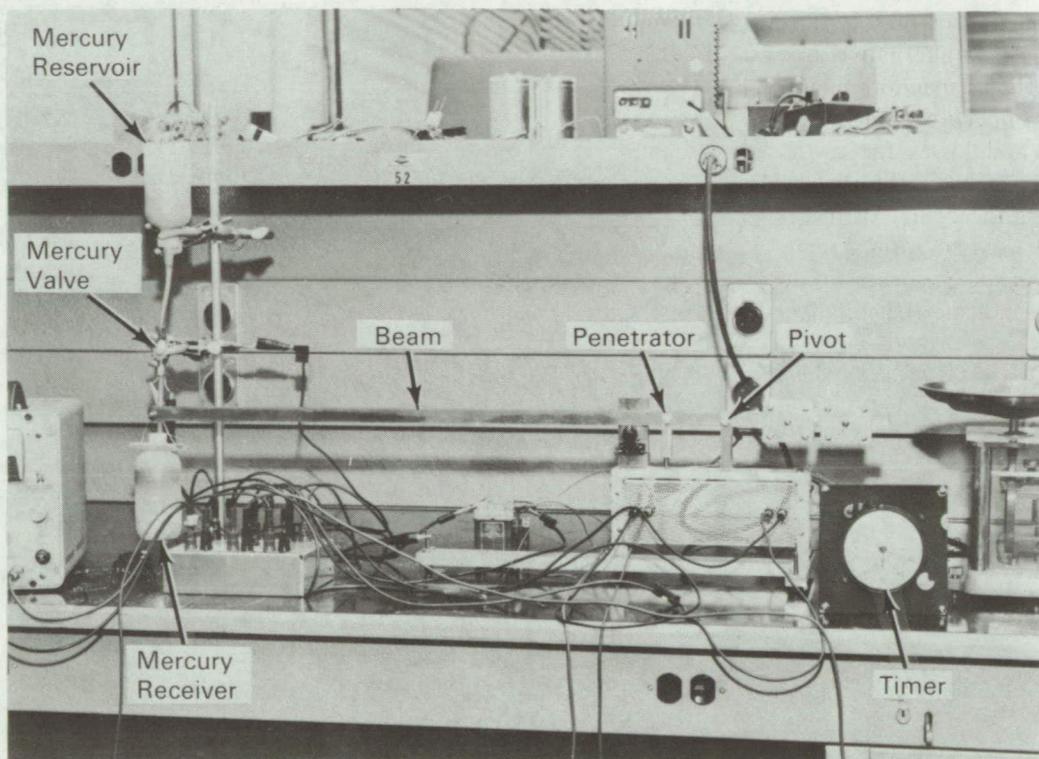


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Cut-Through Tester Accurately Measures Insulation Failure Rates



The problem:

To accurately measure the rate of failure of various wire and cable insulating materials both as to time and the amount of applied pressure. Previous methods depended on operator reaction time and relatively crude weight (force) application.

The solution:

A cut-through tester in which the time to cut-through is measured electronically and the force

(weight) acting on the penetrator can be applied through a near infinite range.

How it's done:

As illustrated, the cut-through tester consists of the following bench mounted components: a counter-weighted beam that mounts the penetrator; a timer to record time to cut-through; a mercury reservoir that connects by valved tubing to a mercury receiver riding on the outboard end of the beam; and associated electronics.

(continued overleaf)

In operating the tester, the sample under test is placed beneath the penetrator and the valve in the mercury line between reservoir and receiver is opened. As the mercury flows into the receiver the beam is caused to pivot and bring the penetrator into contact with the insulation under test. This starts the timer, which runs until cut-through, at which time the associated electronic circuitry shuts off the timer and closes the mercury valve simultaneously. The weight of mercury in the receiver related to the elapsed time on the timer are used to determine the wear resistance to sharp objects of the specific insulation tested.

Notes:

1. The loading rate (weight vs time) may be precisely adjusted by means of a restricting orifice in the mercury line valve.

2. All components of the system are commercially available.
3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10354

Patent status:

No patent action is contemplated by NASA.

Source: Edmund U. Baker
of Douglas Aircraft Company
under contract to
Marshall Space Flight Center
(MFS-12506)