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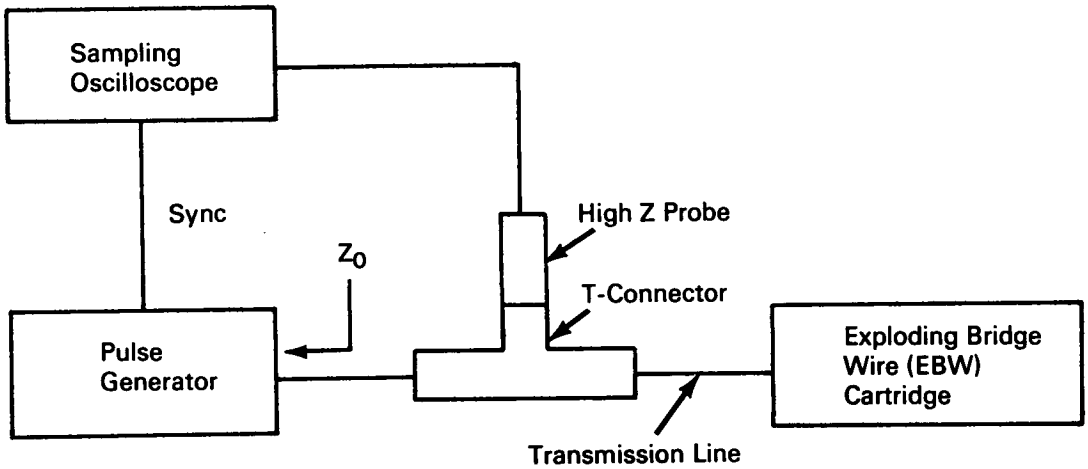
NASA TECH BRIEF

Pulse Technique Provides More Accurate Checkout of Exploding Bridge Wire Device



The problem:

To develop a more dependable method for checking the electrical integrity of an Exploding Bridge Wire (EBW) cartridge. In many exploding bridge wire ordnance devices there is a spark gap in series with the exploding bridge wire. The spark gap makes it difficult to check out the device. Presently there are two methods used to test EBW cartridges: an ac continuity check, and a dc spark-gap breakdown voltage and continuity checkout. Both of these test methods are attempts to validate the electrical integrity of the EBW cartridge, but both methods indicate only gross circuit parameters.

The solution:

Treat the EBW as a transmission line system and use pulse reflection techniques. Propagate a step voltage into the system and monitor the reflected voltage waves.

How it's done:

Pulse reflection testing employs a step generator and an oscilloscope in a manner that is similar to a radar system. A voltage step is propagated into the test setup and the reflected waves are monitored. The echo technique reveals both the position and the nature (resistive, inductive, or capacitive) of each discontinuity along the system. As shown, the pulse reflection measuring system consists of a fast rise time pulse generator to drive the EBW cartridge and transmission line and a fast rise time oscilloscope to display the reflections. No complicated directional couplers are needed to separate the incident and reflected waves.

(continued overleaf)

Note:

Inquiries concerning this invention should be directed to:

Technology Utilization Officer
Headquarters
National Aeronautics and Space Administration
Washington, D.C. 20546
Reference: B66-10561

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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(Hq-62)