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Brief 70-10118

NASA TECH BRIEF

Acoustic Vibration Test Detects Intermittent Electrical Discontinuities

A nondestructive test method has been developed for detecting intermittent discontinuities (faulty crimps on electrical connections, cold solder joints, loose pin contacts, etc.) in electronic cable harnesses and circuitry. The circuitry under test is ultrasonically vibrated, and the resultant noise signal due to any intermittent discontinuity in the test circuitry is observed on an oscilloscope. This test method employs readily available commercial equipment and is particularly advantageous for detecting faulty electrical connections in inaccessible or hidden portions of electronic harness assemblies and connectors.

Acoustic power is applied across an air gap to the electronic harness assembly (or other circuitry) under test. This power is generated by a 250-watt loudspeaker horn positioned at a distance of 2 inches from the test circuit terminal board. The speaker is continuously driven through a 17-kHz audio oscillator and an amplifier. Noise levels developed in the test specimen are measured across a shielded 100-kilohm wirewound resistor and read on an oscilloscope. A direct current of 60 microamperes (maximum) is supplied from a 6-volt battery to leads clipped to terminal points on the test specimen.

A permanent record of the test signal traces can be made by using a logic plug-in unit to print frame numbers and a frequency plug-in unit with a response to 50 kHz.

Note:

Requests for further information may be directed to:
Technology Utilization Officer
Manned Spacecraft Center, Code BM7
Houston, Texas 77058
Reference: TSP70-10118

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

Source: D. E. Roberts and S. M. Grieve of
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