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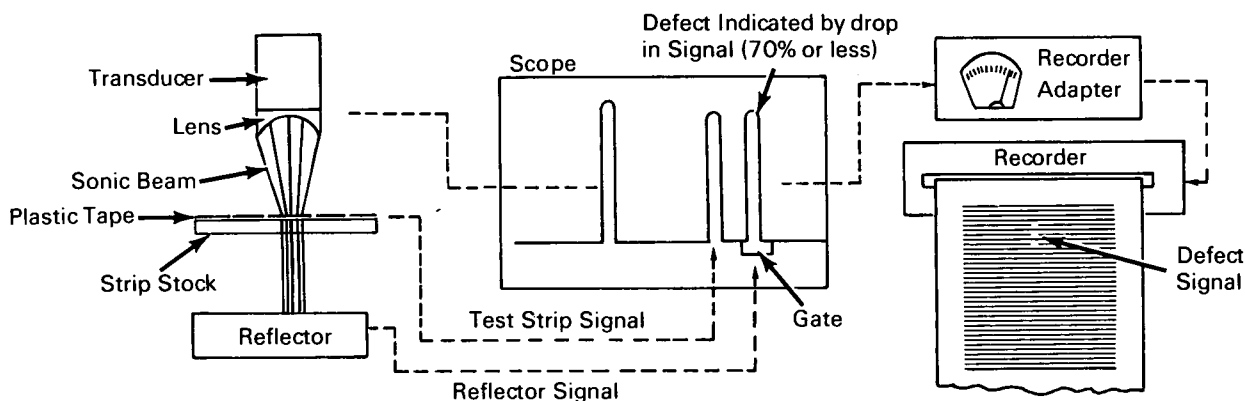


# AEC-NASA TECH BRIEF



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## Calibrating Ultrasonic Test Equipment for Checking Thin Metal Strip Stock



### The problem:

It was desired to detect minute laminar-type discontinuities in thin metal strip stock. To ensure valid data from conventional ultrasonic test devices, a positive calibration technique was required that would not damage or destroy the strip stock.

### The solution:

Patterns of plastic tape are preselected to include minutely calculated discontinuities and the tape is applied to the strip stock to intercept the incident sonic beam.

### How it's done:

A transducer, the tape-treated strip stock, and reflector are immersed in a water bath (not shown) and a pulsed sonic beam is focused to strike the plastic tape atop the thin metal strip stock, pass through the tape and strip stock and impinge on the reflector. At each interface between water and solid material, energy is lost from the incident sonic beam by reflection that is a function of acoustic impedance mismatch at that point. The signal output from the

reflector is of principal interest. The gate in the scope is set on the reflector signal and receiver gain is adjusted to provide a 100% amplitude response in the recorder. The recorder adapter is adjusted to provide continuous current to the recorder unless signal amplitude drops below a preselected level. With no discontinuities in the test sample, a dark line appears on the readout. Discontinuities are shown as breaks in the readout lines.

### Notes:

1. This technique permits calibration to a sensitivity that senses laminar defects down to 0.0022 square inch in 0.012-inch strip stock.
2. Prior to this innovation, the only methods available for creating simulated discontinuities involved the use of chemical or electrode induced erosion. Both methods were time consuming, difficult to apply, and resulted in destruction of the strip stock.

(continued overleaf)

3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
AEC-NASA Space Nuclear Propulsion  
Office  
U.S. Atomic Energy Commission  
Washington, D.C. 20545  
Reference: B67-10127

**Patent status:**

No patent action is contemplated by AEC or NASA.

Source: R. M. Peterson  
of Aerojet-General Corporation  
under contract to  
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