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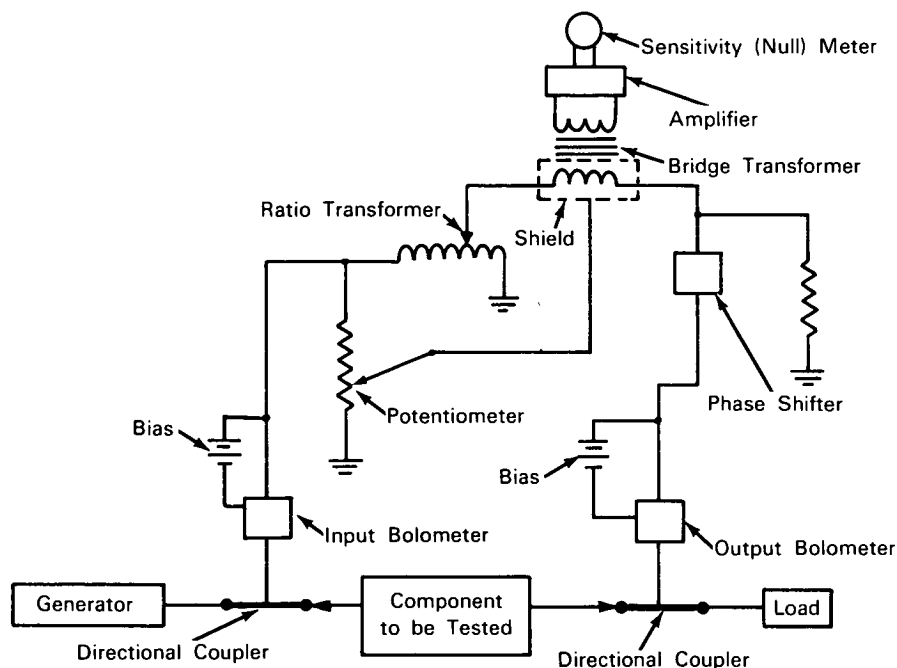
Brief 64-10080

# NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the NASA space program.

## Improved Insertion-Loss Tester



**The problem:** Accurate measurement of the insertion loss of rf components while avoiding the effects of amplifier drift.

**The solution:** Balancing currents across a bridge transformer with shorted probes and then with the component to be tested in the circuit. Adjustments are made to obtain a null on a sensitivity meter in each case and the difference in adjustment is interpreted to give the component's insertion loss.

**How it's done:** The rf output of the input bolometer is applied to the ratio transformer that is tapped to the primary of a bridge transformer. The secondary of the bridge transformer drives an amplifier

connected to a null meter. The output of the bridge transformer primary is fed to an output bolometer through a phase shifter. To test the insertion loss of a component, the directional couplers are connected (shorted) and the tap on the ratio transformer adjusted to obtain a null on the meter. The tap position for meter null is recorded. The couplers are now disconnected and, with the test component inserted, the tap on the ratio transformer is again adjusted to obtain a null on the meter. Once an almost complete balance is obtained, the phase shifter is adjusted until an actual null is obtained. This tap position for meter null is recorded. The difference between the two recorded tap positions is converted by

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a table or chart to give the rf insertion loss of the component tested.

To prevent transients from affecting bridge transformer current, an electrostatic shield is placed around the transformer primary and maintained at the potential of the primary by means of the potentiometer.

**Note:**

For further information about this invention inquiries may be directed to:

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Source: C. J. Finnie and D. Schuster  
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