# NASA TECH BRIEF
## *John F. Kennedy Space Center*

NASA

## Signal Conditioner Test Set

**The problem:**

To check signal conditioners it is often necessary to remove them from the overall system; in some cases, they must be shipped to a laboratory for testing and study.

**The solution:**

A compact, light-weight, solid-state test set can be used to check signal conditioning modules while they are installed in the system.

**How it's done:**

The test set, which operates from 115 Vac or 28 Vdc, indicates whether the signal conditioner is performing according to specification. In the case of the specific conditioner for which the set was designed, it indicates the condition of a specific capacitor that is subject to malfunction.

A schematic of the test set is shown in the illustration. The set consists of an astable multivibrator with a 13.33% duty cycle which approximates the signal input
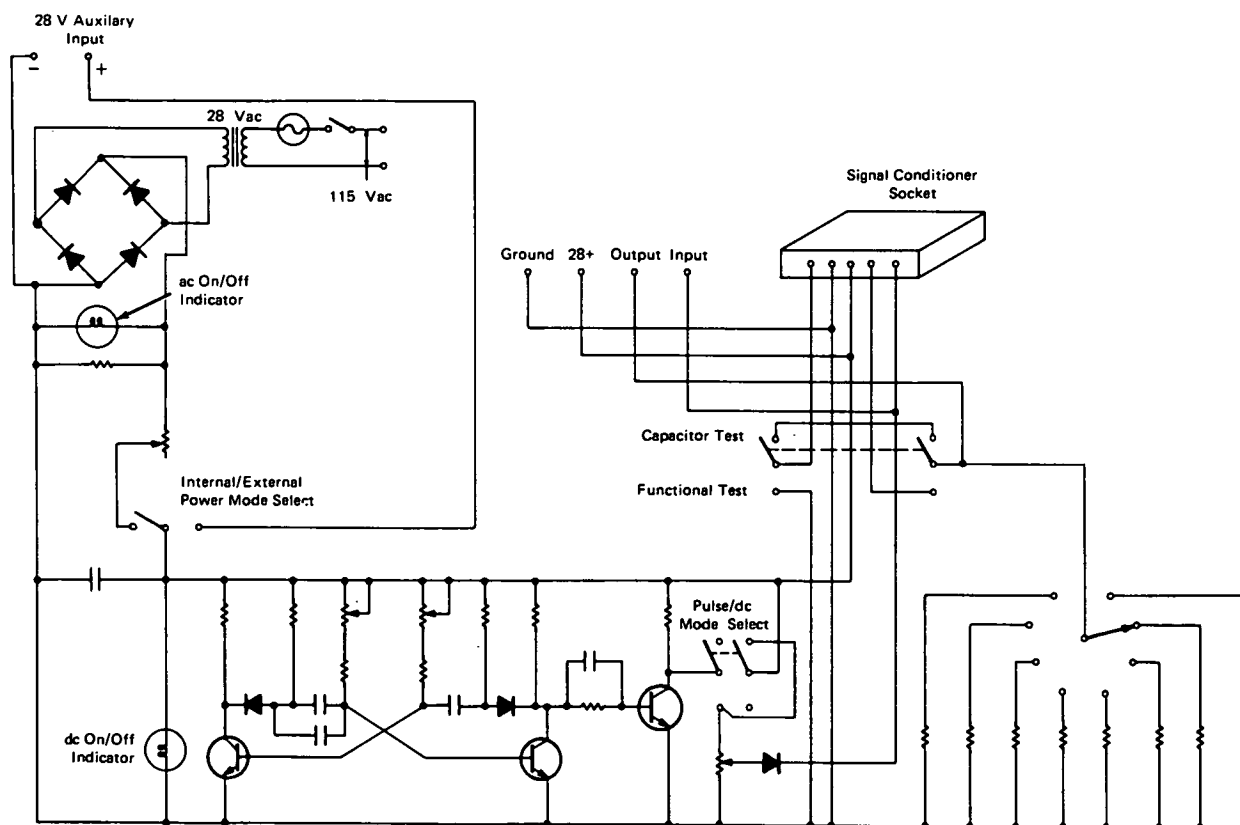


Test Set Schematic

to the conditioners in the system. The multivibrator oscillator has an "off" voltage of about 27 volts and an "on" voltage of one volt. Any intermediate voltage is also possible. The output consists of a variable amplitude waveform with logic levels compatible with standard conditioning equipment. Several known loads are available through a multiposition switch on the set. The oscillator output goes to a driver stage which feeds the signal conditioner under test.

There are several other controls and adjustments. A selector switch determines ac or dc power; although in either case 28 Vdc is available at external jacks. One fine control adjusts the period of oscillation, another the duty cycle, and another adjusts the amplitude of the waveform as seen by the signal conditioner. The oscillator signal, a straight dc voltage, or no voltage at all may be fed to the signal conditioner by means of a selector switch. In addition to these controls, there is a multipositional load switch which allows the user to approximate the actual load as closely as possible.

Although this test set was designed for a specific conditioner, it may be used with any conditioner with compatible logic levels by means of external jacks provided to feed an input signal, a load for the conditioners, and power if needed. In any case, before using the set it may be necessary to adjust the frequency or duty cycle if they are critical.

Another feature of this test set is that it may be used to cycle the ground computer, if it is suspected of malfunctioning, rather than to use the signal condi-

tioners. In this case, it may bypass the signal conditioner and provide a direct signal for the computer. Alternately, the test set feeds signals to the conditioners and from there to the ground computer.

Notes:
1. The only peripheral equipment needed is an oscilloscope.
2. Requests for further information may be directed to:
   Technology Utilization Officer
   Kennedy Space Center
   Code AD-PAT
   Kennedy Space Center, Florida 32899
   Reference: B73-10189

Patent status:
This invention is owned by NASA and a patent application has been filed. Inquiries concerning non-exclusive or exclusive license for its commercial use should be addressed to:
   Patent Counsel
   Kennedy Space Center
   Code AD-PAT
   Kennedy Space Center, Florida 32899

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