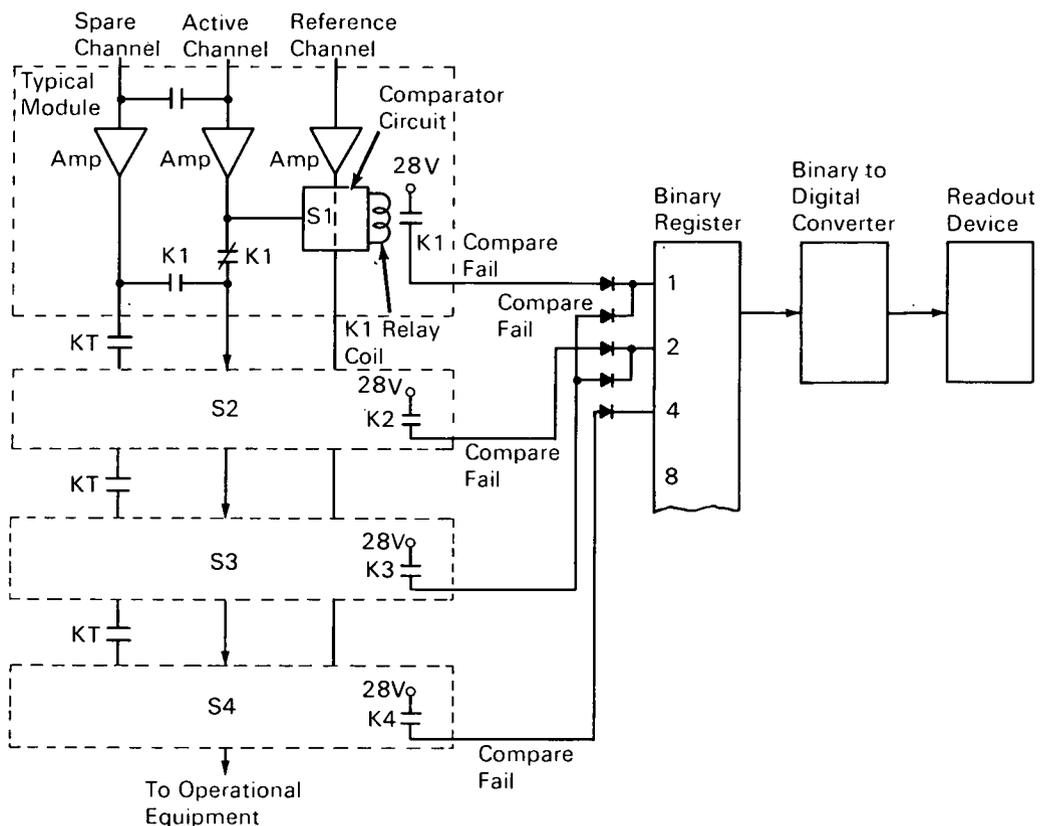


NASA TECH BRIEF



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Fault Detection Monitor Circuit Provides "Self-Heal Capability" in Electronic Modules: A Concept



A proposed self-checking technique detects and visually indicates defective solid state modules used in electronic test and checkout instrumentation. A modular reference channel (see fig.), comprised of an amplifier, comparator circuit and a relay, operates in parallel with the active analog channel. In normal operation, the active and reference channels in each module are combined in the comparator circuit.

If an active module exceeds a predetermined tolerance, a relay (or switching circuit) transfers a spare module to the active channel. A compare-fail signal from the faulty module is applied to a binary register when the module transfer takes place. The information in the binary register is converted to a digital format that identifies the faulty module and finally is displayed on a readout device such as a mechanical print-

(continued overleaf)

er or a cathode ray tube. The binary register has the capability of storage and clearing so that simultaneous module failures can be displayed.

The fault-detection monitor circuit has the following salient performance features: (1) a single display system provides immediate indication and location of a circuit failure; (2) a 10-bit register provides failure monitor and indication for 1023 comparator circuits; (3) the monitor circuit provides redundant operational signals to increase reliability; and (4) the automatic fault-isolation capability permits the electronic subsystems to be repaired by replacing the defective module.

Notes:

1. The monitor circuit can be applied in an isolation and identification technique for fault conditions in redundant electronic equipment and should be of particular interest to designers and manufacturers of computer equipment.
2. No additional documentation is available.

Patent status:

No patent action is contemplated by NASA.

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