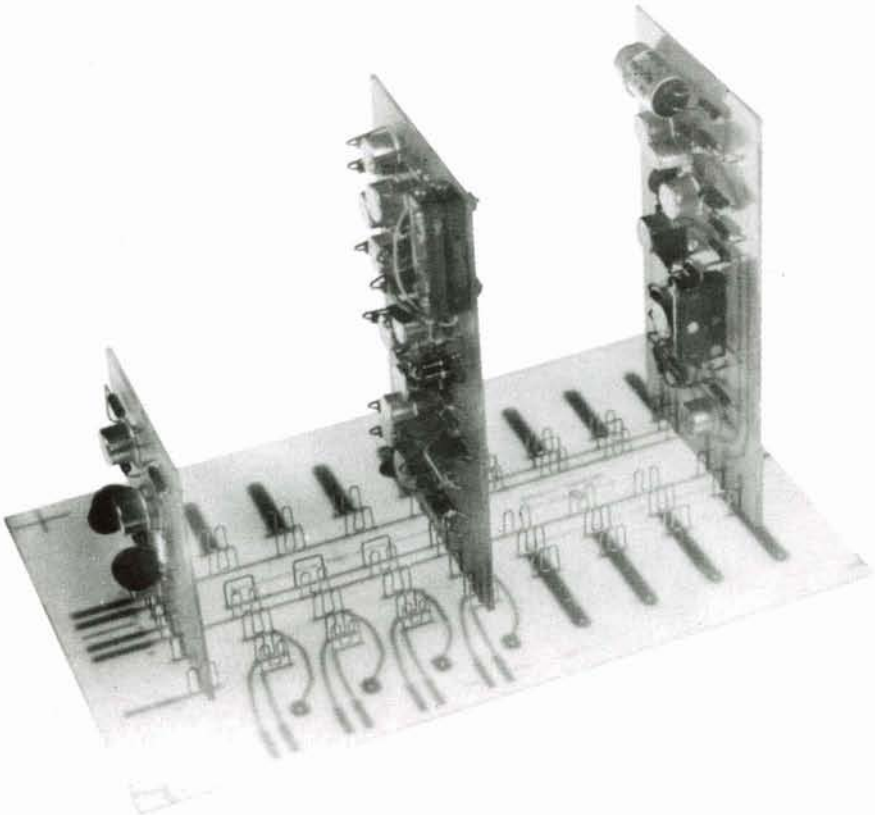
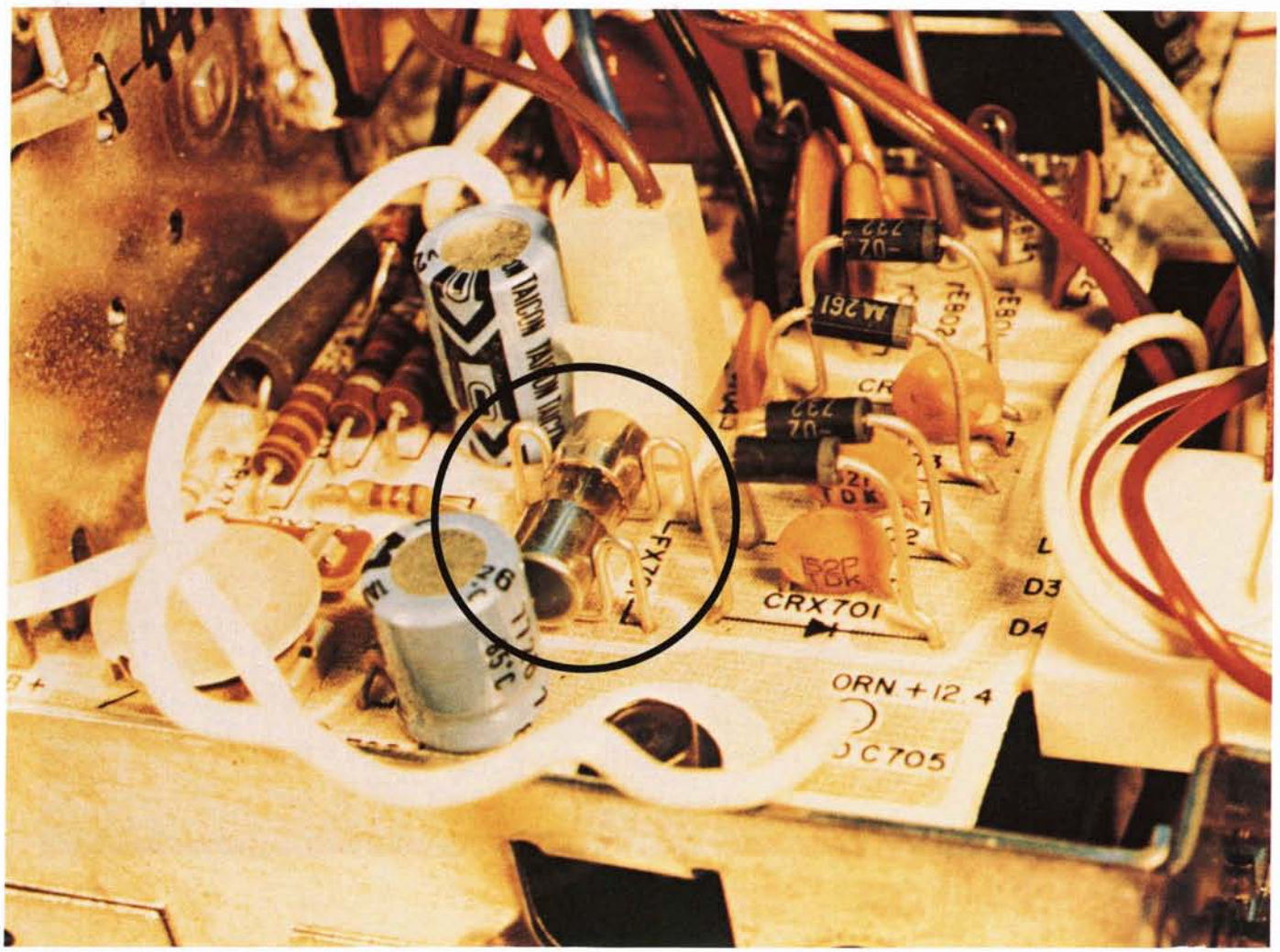


Circuit Connectors

The U-shaped wire devices in the upper photo are Digi-Klips®; aids to compact packaging of electrical and electronic devices. They serve as connectors linking the circuitry of one circuit board with another in multi-board systems. Digi-Klips were originally developed for Goddard Space Flight Center to meet a need for lightweight, reliable connectors to replace hand-wired connections formerly used in spacecraft. They are made of beryllium copper wire, noted for its excellent conductivity and its springlike properties, which assure solid electrical contact over a long period of time.

Used on a number of satellites, Digi-Klips were developed for NASA by Components Corporation, Denville, New Jersey. The company is now producing the connectors for a vari-



ety of commercial applications, such as household appliances, telephone systems, computers, aircraft and automotive equipment. Offshoots of the original Digi-Klips are the company's Fuse Clips, which are used on all black and white Zenith television sets. The lower photo shows a display of Zenith TVs in the showroom of The Zamoiski Company, Baltimore area distributors. At lower left is a view of the circuitry of one Zenith model, with typical Fuse Clips circled.

®Registered trademark. Components Corporation

Rotation Measurement

In aircraft turbine engine research, certain investigations require extremely precise measurement of the position of a rotating part, such as the rotor, a disc-like part of the engine's compressor which revolves around a shaft at extremely high speeds. For example, in studies of airflow velocity within a compressor, researchers need to know—for data correlation—the instantaneous position of a given spot on the rotor each time a velocity measurement is made. Earlier methods of measuring rotor shaft angle required a physical connection to the shaft, which limited the velocity of the rotating object.

Seeking better instrumentation, NASA's Lewis Research Center developed an Electronic Shaft Angle Encoder which measures the angular position of a rotating shaft in about one microsecond; the device picks up an electrical pulse generated by the rotating machinery, computer processes the information and presents a coded reading on a display window. The fact that it does not require physical connection allows use of the device with the highest-speed machinery in existence; thus it is possible to obtain accurate measurements of very high speed rotations that cannot be accomplished by other means. The Lewis-developed device is being produced by Real Time Systems Inc., Mount Vernon, New York, as the Model 371 Shaft Angle Encoder shown above. The encoder has commercial application in monitoring the performance of industrial turbines as an aid to preventive maintenance or problem diagnosis.