

# Technology Notes

## PATTERN RECOGNITION

### **Electronic Pigeon's Eye Developed**

An electronic model of a pigeon's eye, capable of seeing in the same way the bird does, has been developed by Douglas Aircraft Co., Newport Beach, Calif.

The pigeon is able, by its eye alone and not its brain, to recognize objects passing across its visual field. Its retinal nerve cells can filter out of the visual field only that information needed by the brain, while ignoring other details. The Douglas model can recognize direction, velocity, shape and size of certain patterns by means of a similar data reduction and filtering process.

Set to detect directional motion, for example, the device responds only to a spot or edge of light moving in a specific direction. Its signal, an audible beep, ceases immediately if the movement stops or changes direction. In addition, the electronic model has one refinement not included in the real thing. It can be set to respond only to bug-shaped objects while ignoring spots, stars and other configurations.

The Douglas eye consists of an array of 145 light-sensitive photocells coupled to 50 circuit boards full of electronically simulated nerve cells. In laboratory tests, the model has successfully duplicated the functions of the six classes of ganglion detectors reported to be present in the pigeon's eye.

One use for such a technique could be in radar, which could be equipped to register movement in only one direction, such as that of incoming planes or missiles, while ignoring outbound vehicles. Another application might be in data processing systems, in which the device could enable the computer to automatically eliminate all data not pertinent to solving the problem at hand.

## ATOMIC POWER

### **Nuclear Plants on the Rise**

There are now 14 nuclear power plants operating in the United States producing 1,881,200 kilowatts of electricity, according to the Atomic Energy Commission.

In addition, 13 more are being built and another 32 are planned to be in operation by 1974, which will bring the power total to more than 32 million kilowatts. Still in the planning stages, with no reactor suppliers selected yet, are 11 more, representing still an additional 9.4 million kilowatts (SN: 12/31/66).

## PHOTOMETRICS

### **Computer Sharpens X-rays**

A computer technique developed to improve photographs from spacecraft such as Ranger, Surveyor and Mariner now promises to enhance medical X-rays.

Best results so far have been obtained with pictures of the retina and with X-rays of the chest and skull. Used on skull X-rays, the process sharpened the outlines of blood vessels, as well as details of the cell structure of the mastoid bone behind the ear.

The process uses a television scanner to break down each picture into thousands of tiny spots. Each spot is

ranked on a brightness scale running from 0 (white) to 63 (black), and is stored in a computer. The computer is programmed to adjust the values of nearby spots to heighten contrast. As it plays back the processed spots, they are reconverted into pictures.

The technique was developed at the University of California's Jet Propulsion Laboratory, Pasadena, from which all of the U.S. lunar and interplanetary photo missions have been controlled.

## AVIATION

### **Fuel Jelly Runs Jet Engine**

Conventional JP4 jet fuel, emulsified into a gelatinlike consistency that is reportedly safer in case of fuel tank rupture and less susceptible to fire in case of accidental spillage, has completed an eight-hour test run in a commercial jet engine.

The fuel resembles petroleum jelly and has essentially the same burning qualities as liquid fuel once it is pumped into the engine. The test was run by Pratt and Whitney Aircraft, East Hartford, Conn., using a turbo-jet engine throttled up and down to simulate a flight from New York to Salt Lake City and back.

Engineers reported that the fuel readily became liquid as it passed through the engine's high-speed pump, offering no problems except in the fuel-flow gauges, which were designed for liquid fuel and had to be replaced with a weight-operated system.

The Federal Aviation Agency has been studying thickened fuels for about two years, as has the Army, which is concerned about low-flying combat aircraft whose fuel tanks have been ignited by gunfire from the ground.

## TEXTILES

### **Linen Combined With Synthetics**

A process enabling natural linen fibers to be combined with synthetic fibers, as well as with wool and cotton, has been developed in Ireland.

Developed by Kirkpatrick Brothers, Ballyclare, the process results in a fiber called Linron, which has been experimentally combined in a variety of coarse and fine weaves with such materials as acrylics, polyesters and flame-proof fibers. The process reportedly retains all the natural properties of linen, while enabling quality-control standards comparable with those for synthetics.

## SPACE POLICY

### **Satellite Uses Studied**

The National Aeronautics and Space Administration has asked the National Academy of Sciences to spend this summer and next evaluating the practical uses of satellites.

The stakes are high, because as the expenses of Apollo dwindle, NASA will put more money into applications, and competition is heavy among Federal agencies.

Some 70 scientists and engineers will compose the study group, with individual panels covering weather, oceanography, natural resources, communications, navigation, traffic control and broadcasting.