

# Technology Notes

## ELECTRONICS

### First Germanium Integrated Circuits

Integrated circuits made of germanium instead of silicon have been reported, apparently for the first time, by a team of researchers at International Business Machines Corp.

Even though the experimental devices are about three times as large as the smallest silicon circuits, they reportedly offer faster overall switching speed, despite their early stage of development.

The advantage of germanium is that it has inherently greater mobility than silicon, which means that electrons move through it faster when a current is applied. At present, virtually the entire integrated circuit industry uses silicon, largely because the techniques for making many devices on a wafer require protection of selected areas of the wafer by some sort of easily formed impervious layer. In silicon, this protection is provided by silicon oxide. The easily formed oxides of germanium, however, are unstable. By vacuum-depositing certain materials, however, the IBM engineers were able to provide a stable coating.

Practical application of the germanium integrated circuits may be several years in the future, but already scientists are working with an even more advanced material, gallium arsenide, which poses its own set of problems.

## METROLOGY

### Metric Bill to Move Soon

Legislation calling for a study of conversion of the United States to the metric system of measurement will be approved soon by the House Science Committee—perhaps this month, according to Chairman George P. Miller (D-Calif.). His committee passed the bill last session, as did the full Senate, but the measure died in the House Rules Committee (SN:1/28; p. 87).

## REACTOR ENGINEERING

### Nuclear Power Longevity Record

The nuclear power plant supplying 1,000 kilowatts of electricity to a mountain-top radar station near Sundance, Wyo., has set a new U.S. record for uninterrupted nuclear electric power generation.

On the morning of Feb. 13, the PM-1 plant surpassed the 3,758-hour mark set by the Yankee plant in Massachusetts in 1964. A close runner-up is a 1,500-kw naval installation at McMurdo Sound, Antarctica.

The PM-1 is powering a station that is part of the Air Force's SAGE (Semi-Automatic Ground Environment) radar defense system. Before it began operation in February 1962, the unit required 16 flights of an Air Force C-130 transport to get it into place.

# Space Notes

## LUNAR EXPLORATION

### Orbiter Makes It Three-for-three

On Feb. 15, Lunar Orbiter spacecraft settled down to the task of photographing potential Apollo landing sites on the moon.

Many of Orbiter's targets will be those already photographed before by Orbiters 1 and 2, and one of those has already been described by the space agency as the "most likely" choice for a manned landing. The schedule called for the spacecraft to take 64 pictures of three primary sites on the right side of the moon, and a total of 312 pictures. Picture-taking altitude for Orbiter 3 is about 28 miles.

On the same day, France launched its fifth satellite, its second in as many weeks after a year of abstinence. The crown-shaped satellite was to become part of an earth-measuring network using laser beams.

## SPACE BIOLOGY

### First Biosatellite 'Crew' Lost

A last-ditch effort to save the frog eggs, wheat seeds, fruit flies and other life forms aboard the first Biosatellite as it fell to earth failed as the space probe went down over Australia with all hands.

Launched Dec. 14 and scheduled to come down three days later, the satellite was prevented from descending

by a faulty retrorocket that failed to provide the necessary nudge. By measuring the decay of its orbit, the National Aeronautics and Space Administration calculated that it would splash down late in the evening of Feb. 14.

Unfortunately, despite all the tracking equipment, communications networks (links were in Maryland, the District of Columbia, California and in stations around the world) and rescue planes on ready alert, Biosatellite A simply disappeared after crossing Grand Turk Island tracking station in the Bahamas. The next station, in Australia, never picked it up.

## ASTRONOMY

### Earth Telescope for Space Safety

A 328-foot telescope designed principally to enable advance warnings of solar proton showers, which could be dangerous to men and equipment in space, is being built on schedule on—and in—a New Mexico mountain.

More than half of the instrument's length will be below ground when it is completed early in 1968 at the Air Force's Sacramento Peak Observatory near Sunspot, N.M. The Air Force is anxious to complete the telescope on time, since 1968 is expected to be a year of high solar activity. In addition, the USAF Manned Orbiting Laboratory, planned for about then, will keep its crew in space for longer than any previous space flight, 30 days, and would be a particularly needful beneficiary.