ENGINEERING

"Super-Transistor" Made

The "spacistor," the same size as the tiny transistor, may replace many electronic devices because of its speed, adaptability and ability to withstand high temperatures.

➤ A DISCOVERY in electronics called the "spacistor" may well revolutionize present electronics devices and techniques much like transistors did vacuum tubes five years ago, when they ushered in the "era of miniaturization" in electronics components.

The development of the device has been announced in a paper presented before a joint meeting in Boulder, Colo., of the Institute of Radio Engineers and the American Institute of Electrical Engineers.

The "spacistors," as they are called, are no larger than the tiny transistors. One type, pictured alongside an ordinary pin, can be seen to be only about "four pin-heads long and one pin-head wide."

Like vacuum tubes and transistors, the purpose of the device is to boost the power of weak electric signals, that is, to "amplify" them. The spacistor has several advantages over present electronic amplifiers:

The spacistor is not dependent on specific or special-quality semi-conductor materials, as transistors depend on high-purity silicon and germanium. Spacistors can draw upon any semi-conductor material with suitable properties, depending on the future use of the device.

The spacistors can successfully amplify electric "signals" vibrating up to ten billion times a second, 40 times the vibration frequency limit of ordinary transistors, and 10 times that of vacuum tubes.

Spacistors will operate reliably at temperatures of around 930 degrees Fahrenheit. Transistors do not operate above about 400 degrees Fahrenheit.

Spacistors retain many transistor advantages. They are very small, operate on a fraction of the power needed to use vacuum tubes, do not need hot filaments or a "warm-up time," and resist shock.

The spacistors handle electrons the same way transistors do but faster. A transistor lets electrons "filter" very rapidly through its body. In slow motion it would be comparable to an ink drop diffusing from the top to the bottom of a glass of water. In the spacistor, however, a powerful electric field is set up across the body. Electrons "fed in" on the negative side of the field are caught up and hustled rapidly across the body. The increase in speed allows the amplification of higher frequencies than do the "slower" transistors.

The spacistor was developed after two years of research by Drs. Hermann Statz and Robert Pucel and Conrad Lanza of Raytheon Manufacturing Company, Waltham, Mass.

Among present electronic equipment expected to benefit from the discovery are the electronic devices in guided missiles and rockets, radar, communications equipment and television sets. Dr. Statz cautioned, however, that it may take three to five years more of research and development work on the spacistors before they become commercially available.

Science News Letter, July 27, 1957

METEOROLOGY

"Rainmakers" Fail on Plains

➤ THE PRESIDENT'S Advisory Committee on Weather Control has summarized its findings to date on the controversial question of "rainmaking."

The Committee reported to President Eisenhower that a statistical evaluation of cloud seeding projects on the West Coast, taken as a group, showed there has been an "average increase in precipitation during the seeded storms." The odds that this result is due to natural causes and not to the seeding are estimated to be extremely small. (See SNL, May 4, p. 275.)

The average increase falls somewhere between five percent and 22%, the committee found.

These results, however, apply only to mountainous regions. Evaluations of cloud seeding operations in the relatively flat lands of the Midwest and East failed to show any indications of effects from cloud seeding. Variations in rainfall amounts in the Midwest and East are too large for any effects of cloud seeding to be detected by presently known statistical methods.

One current program, known as the Santa Barbara Project, promises to yield the kind of information on "rainmaking" that many scientists have long believed essential. Instead of seeding every suitable storm cloud, those into which the silver iodide particles are thrown will be selected on a random basis. Thus, approximately half will be seeded, the other half used as a control for comparison.

With sufficient data, this system eliminates the difficulty of determining how much rain would have fallen if there had been no seeding.

In the letter covering transmittal of the reports to President Eisenhower, the Advisory Committee's chairman, Capt. Howard T. Orville, USN (Ret.), recommended that its records and functions be turned over to the National Science Foundation. A bill to enable the foundation to carry on a long-range program of basic and applied research in weather modification may be considered by the Senate before adjournment. (See SNL, May 25, p. 335.)

Capt. Orville is technical consultant for the Friez Instrument Division, Bendix Aviation Corporation of Baltimore, Md.

Science News Letter, July 27, 1957

FOREST PATHOLOGY

Oak Flowers May Aid In Spread of Oak Disease

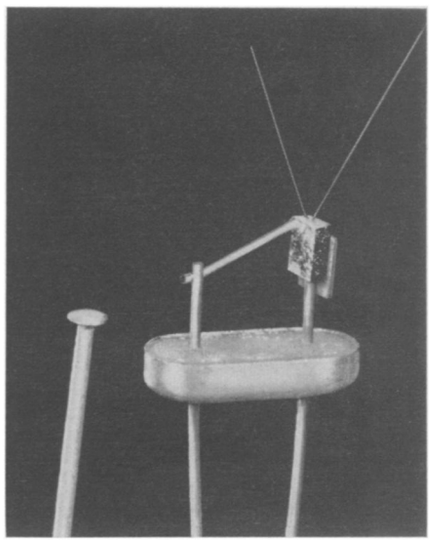
➤ INSECTS that feed on oak tree blossoms may be spreading the oak wilt disease, a fungus disease that is destroying many of the nation's oak trees.

Scientists of the U. S. Department of Agriculture and the Missouri Agricultural Experiment Station inoculated a group of flowering oak trees with the disease-causing fungus by placing a drop of fungi spores on the flowers' stigmas and then pricking the stigmas through the drop.

Trees that had not been inoculated but which still showed symptoms of the oak wilt disease were later examined to see if the disease could have been transmitted through roots. No evidence for this was found, the scientists reported.

The results of their study indicate that oak wilt infections can occur through injured flowers and that contaminated insects may be guilty of spreading the disease.

Science News Letter, July 27, 1957



SPACISTOR PORTRAIT—An experimental assembly of the spacistor, developed by Raytheon Manufacturing Co., Waltham, Mass., is shown alongside a straight pin. The spacistor has four leads: base, the slanted crossbar; collector, the wire directly under the semiconductor block at the right; injector, the whisker-sized wire on top left; and modulator, the whisker-sized wire on top right. The device is attached to a boat-shaped transistor mount.