

## SPACE

# Nimbus Satellite for 1962

► THE FIRST Nimbus weather satellite, second project in a long-range series to improve weather forecasting, is scheduled to be launched during 1962.

It will be heavier and carry better and more equipment than does the currently circling Tiros III weather satellite.

The 650-pound Nimbus space vehicle will differ from Tiros in two aspects, the National Aeronautics and Space Administration reported. It will be oriented so that its television cameras will look down at the earth at all times, and it will be launched into a polar orbit. This orbit permits the cameras to photograph the entire globe once every 24 hours.

A Thor-Agena B rocket will launch the first Nimbus from the Pacific Missile Range into a circular orbit about 600 miles above the earth. The weather satellite will contain as many as six TV cameras to photograph the clouds covering the earth. The cameras are improved versions of those flown in the Tiros satellites.

Nimbus will also carry equipment for a number of infrared radiation measurements similar but superior to those in Tiros III.

These experiments are designed to measure the amount of energy lost by the earth from the top of the atmosphere.

Two large paddles of solar cells will convert the sun's energy into electrical power to operate the satellite's instrumentation and supply power to storage batteries for continued operation during periods of darkness.

Cloud cover pictures and other data stored in the satellite will be played back by command from the data-acquisition site at Fairbanks, Alaska. All information obtained from Nimbus will be analyzed by meteorologists of the U.S. Weather Bureau and the Department of Defense.

Foreign scientists will also be invited to participate in the meteorological aspects of the program. Some 40 of them from 27 nations were in Washington attending an International Meteorological Workshop sponsored by NASA and the Weather Bureau.

Aims of the workshop were to present results of the U.S. weather satellite program so that weather services of other nations could acquire a working knowledge of satellite data.

• Science News Letter, 80:366 December 2, 1961

## TECHNOLOGY

# Electronic Coin Tossing

► AN ELECTRONIC method of tossing coins that determines "heads" or "tails" 200,000 times a second has been devised at the U.S. Navy Electronics Laboratory, San Diego, Calif.

The new machine is not a gambling device but is being used to develop automatic signal detection methods for future Navy radar. It promises to have application in civilian communication systems and quality control.

In the device, electrical circuits play the part of coins. These electrical circuits rest in either one of two states—these two states represent the heads and tails of the coin. Electronic noise generators are used to randomly change the circuit states or "toss the coin."

The heads and tails outcomes are brought out as electrical impulses. Further electronic manipulation of these impulses enables the scientist to duplicate different random processes quite rapidly.

The electronic coin tosser has been evaluated on the basis of many millions of tosses. Excellent agreement has been obtained with the theory of how an ideal coin should behave.

A higher speed machine, operating at a rate of 2,000,000 tosses per second, is currently being planned.

The electronic coin tossing method was devised by R. E. Simmons and G. M. Dillard of the laboratory's technical analysis branch. James W. Caspers, branch head, explained the relation of the new machine to coin matching or tossing:

Almost everyone is familiar with the simple game of matching coins. There have been many popular theories, most of them wrong, regarding the behavior of tossed coins. Few have appreciated or have even heard of the application of coin tossing to areas far removed from games.

Many highly technical and scientific problems can be solved through the method of tossing coins. These problems may require an enormous number of tosses, often running into the millions. Few persons would undertake such a task.

The analytical power of coin tossing and similar random processes has encouraged many scientists and mathematicians to search for less grueling methods of "tossing the coin." Modern electronic computers have been used frequently to synthesize the tossing of coins and other random processes.

Computational rules have been used to provide long lists of pseudorandom numbers having random-like characteristics.

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## AEROMEDICINE

## Space Fringe Benefits Are Aids to Health

► FRINGE BENEFITS from space are helping to improve man's health on earth.

These by-products of space research are advancing medical knowledge, Maj. Gen. Richard L. Bohannon, U.S. Air Force Deputy Surgeon General, told a meeting of

Federal Hospital Administrators in Washington, D.C.

"It includes the better understanding we have acquired of certain neurological functions and of the dynamics of the blood from studies of weightlessness," he said, "although weightlessness as a possible barrier to manned space flight continues to worry us."

Cosmonaut Titov's experience of space-sickness has prompted United States space medical research on the effects of changes of blood circulation to the brain resulting from prolonged accelerative forces.

"If these effects are disabling and cannot be overcome by training, then a mechanism to produce artificial gravity must be provided," he said. "There is no substitute for the observations of man in space. The human mind is still far superior to any electromechanical device; for the mind is a versatile, sensitive sensor, capable of thought and judgment."

Research aimed at getting man into space already has paid off on earth and gives promise of more benefits in the future.

Currently the Air Force is studying an irradiation drug to be taken by astronauts who might travel through the Van Allen radiation belts. Radiation is a peril to man in space just as on earth, the General pointed out. An effective irradiation drug may prove of even greater use in civil defense than in space.

Medical aids have resulted from research aimed at space vehicles as well as man in space. These include hydrazine, a drug developed from a missile propellant, used in the treatment of blood disorders; a hand gun-like device for accurate measurement of static electricity in missiles, which may prove invaluable in the operating room; miniaturized valves used in surgery; and remote physiological measuring devices that may revolutionize patient observation and care in the hospital and at home.

Individuals kept at tasks for 72-hour runs in the space cabin simulators at the USAF School of Aerospace Medicine at Brooks Air Force Base reported such bizarre phenomena as seeing washer women hang up clothes across the space chamber, the instrument panel melt, and gaping holes open up in the floor, necessitating feeling of the floor to ascertain its presence.

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## AERONAUTICS

## TV on Bomber Remedies Pilots' Blind Spots

► CLOSED-CIRCUIT television systems are now being used aboard the U. S. Air Force's big B52G bombers to put an end to blind spots in the pilots' range of vision.

A TV camera in the tail section scans approach areas not normally visible to the pilot, including the rear, sides, top and underside. The pilot sees these areas on a monitor in the plane's control section.

The airborne TV equipment is manufactured by Boeing Airplane Company and was developed in cooperation with Foto-Video Electronics, Cedar Grove, N. J.

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