

## SPACE

# U.S. Cooperates in Space

► WHILE RUSSIA began talks with the United States on cooperation in space, this country was already cooperating with more than 50 countries.

These countries participate with the U.S. in weather programs, rocket probes for studying and solving the mysteries of the upper atmosphere and in tracking manned space flights and scientific satellites.

In the program of ground-based meteorology in support of satellite activity, which will ultimately result in better local weather forecasting, 28 countries cooperate with the U.S. This program also provides more widespread international weather coverage, important in getting a complete picture of weather patterns of the whole earth.

In the great venture of sending a man into space, the U.S. has shared all its information with the rest of the world, and seven stations around the globe cooperated by tracking Astronaut John H. Glenn Jr. on his three-orbit flight around the earth. The participants in the Mercury tracking program are Australia, Canton Island, Mexico, Nigeria, Spain, the United Kingdom and Zanzibar.

Unmanned satellites are tracked with Minitrack stations by seven countries, including Chile, Ecuador, Peru and South Africa. Deep space tracking is done by Australia and South Africa, and optical tracking involves nine countries spanning the entire earth from India to Argentina, across the Atlantic to South Africa, Spain and the Netherlands.

The U.S. also sponsors an exchange program under which scientists and technicians come here for research, training and visits to scientific institutions from as many as 42 countries. This is the only space-linked program in which Russia now cooperates with the U.S.

Some of the countries, such as the United Kingdom (Britain) and Australia, participate in 10 of the 15 activities within the U.S. international space program. Britain's participation includes ground-based meteorology, communications, Minitrack, Mercury, Moonwatch, and collection of data and cooperation on the launching of the first British satellite S-51, scheduled to go aloft this spring.

This satellite will be launched with a U.S. Delta rocket using a Thor booster. All the experiments were designed by British scientists at University College and Imperial College, London, and Birmingham University.

These experiments will enable the satellite to measure electron temperature and density at an elevation between 230 and 625 miles as it circles the earth. The satellite is also designed to study ions, or charged particles, radiation from the sun, and cosmic rays, to obtain additional information about the surface of the sun and space medium between the sun and earth.

The National Aeronautics and Space Administration's Goddard Space Flight Center is responsible for the launch vehicle,

spacecraft, structure, power supply and telemetry equipment. The project is under joint management of NASA and the Office of the British Minister for Science. Data from the satellite will be gathered by both Britain and the U.S.

A second British satellite, S-52, is scheduled for launch in 1963. It will be designed to measure radio noise from the Milky Way galaxy, in which the solar system is located. It will also study the ozone (a form of oxygen) high in the earth's atmosphere and measure the number and sizes of micrometeors. This satellite is planned to go more than 1,100 miles into space.

Only one other country, Canada, has plans at this time for launching a satellite in cooperation with the U.S. This topside

## TECHNOLOGY

## Gold-Covered Fabric For Space Age Research

► A FABRIC covered with 24-carat gold has been developed to protect personnel handling space age rocket fuels. The "Armalon" laminated fabric, produced by the Du Pont Company, Wilmington, Del., is said to have the most effective combination of heat reflectivity and chemical inertness yet developed.

The fabric will protect its wearer from flash temperatures as high as 3,000 degrees Fahrenheit, or temperatures up to 1,000 degrees for from 30 seconds to one minute and 500 degrees for extended periods.

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PROTECTIVE GOLD-COATED SUIT

sounder satellite called S-27, or Alouette, is scheduled for launch during 1962. It is expected to rotate around the earth over the poles and find how many electrons are present at different times of the day in the same zones at distances from about 185 to 625 miles from earth. New information about auroras and the earth's magnetic field may result from these studies.

The experiments and the spacecraft of S-27 are being developed by the Canadian Defence Research Telecommunications Establishment (DRTE). The launch vehicle will be a Thor-Agena B from NASA's Marshall Space Flight Center.

The NASA cooperative sounding rocket program sent rockets up to study the upper atmosphere in cooperation with Australia, Italy and Sweden during 1961. These studies may lead to better weather prediction, give new information on cosmic rays and test how radio waves travel through the atmosphere. New sounding rocket firings are planned this year in cooperation with Japan, New Zealand, Norway-Denmark, Pakistan and Sweden, and cooperative efforts are planned with Argentina, Canada and France.

The first experiments in transatlantic communications, including television, will also be conducted this year as a result of agreements between the U.S. and Britain, France and West Germany.

Under this agreement, the European nations will provide ground stations for experiments with such U.S. communications satellites as the Relay and Telstar.

In the future, the Tiros weather satellite program will continue with about 30 members of the World Meteorological Organization now participating. Information from the cloud pictures taken by the Tiros is expected to advance long range forecasts so important for planting and harvesting.

A European Space Research Organization has discussed plans with NASA scientists for sending a moon satellite and smaller earth satellites into orbit. Such launching may be made with a rocket using Britain's Blue Streak as a booster, France's Veronique as a second stage and a still undeveloped third stage.

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## GENERAL SCIENCE

## Army Offers Summer Jobs To Top Young Scientists

► THREE YOUNG FINALISTS at the National Science Fair-International, to be held at the Seattle World's Fair May 2-5, are in for a pleasant surprise.

The U.S. Army Chemical Corps will award three salaried summer jobs to outstanding senior high school finalists in the fields of biology, chemistry and mathematics-physics.

The winners will be eligible to return to the jobs each summer with higher pay if their college grades and work performance are satisfactory. Three alternates will also be selected.

The National Science Fair-International is administered by SCIENCE SERVICE, Washington, D. C.

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