

## SPACE

# Space Research Effects

► **OUT OF THIS WORLD**, being a four-billion-dollar industry, has consequences closer to everyday living than landing on the moon. The space program rising out of the Russian double threat—bomb-carrying missiles and the prestige rivalry—is now being exploited for its benefits to medicine, cities, manufacturing and many other facets of our living.

There is much brain-searching and hurrying to discover the by-products of getting vehicles and men in space, launched toward moon and planets. At least four conferences, one large and the other three small and exclusive, are running programs this spring. Chicago is the scene of the Third Conference on the Peaceful Uses of Space, climaxing Midwest Space Month. A conference hideaway in Oakland, Calif., Dunsmuir House, was the scene of an exclusive gathering of big names in March, and Arden House's American Assembly is running two smaller meetings in Colorado and Minnesota.

Perhaps the greatest boon to life on earth instead of in space will be more concise and neater mechanisms for communication, resulting in better radio and TV. Satellites will bounce intelligence around the globe.

Medicine will convert space health into better instruments and hints of new treatments. The space suits of astronauts have been adapted to a device to aid bedridden victims of strokes.

Because in airless outer space human beings carry their own atmospheres and keep them clean, there may be tricks to use in countering smog and air pollution in the space environments created.

The human factors and reactions that are ferreted out by test and trial in fitting men to a space existence can be applied to work in factories and learning in schools.

Vast changes in industry and living conditions will be caused by the space effort. How they will affect all of us is a continuing problem.

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## COMMUNICATIONS

# Satellite for Radio Hams

► **RADIO AMATEURS**, who usually can talk back and forth on their two-meter band only as far as their line of sight goes, soon will be chatting with fellow hams living 1,000 miles away.

Oscar III, the hams' version of the Telstar satellite, will be launched late this year or early next, its makers say.

Oscar III was designed, financed and built by the same group of California hams who produced Oscar I and II. The first two Oscars orbited the globe, saying "Hi" over and over to hams who tuned them in.

As did its predecessors, Oscar III will rise from Vandenberg Air Force Base, Calif., riding "piggyback" aboard an Air Force rocket.

Oscar III—the name stands for "orbital satellite carrying amateur radio"—will be like a little radio mirror high in the sky.

When a ham at any spot on earth catches Oscar III's low-power beacon signal on his two-way radio, he can start talking—for two minutes.

He is instructed then to listen for about another two minutes for a response from some other ham far beyond his horizon. If the response comes, the two can start talking to each other at will until Oscar slips back out of range.

A mock-up of Oscar III is being tested in Los Altos, Calif., where it is perched on a pole in a ham's back yard.

Solar cells will charge the satellite's internal batteries. Oscar's lifetime will depend upon its exact orbit, which in turn will depend upon the type of rocket the Air Force will use. The Air Force is not discussing such matters.

Once Oscar III is launched, its path will

be broadcast worldwide to radio amateurs by the headquarters station of the American Radio Relay League, West Hartford, Conn.

Communication among amateurs and the Oscar control headquarters will be conducted by single-sideband telephony and radio-teletype.

Radio transmissions from Oscar III can be controlled from Oscar headquarters near Sunnyvale, Calif., by a coded signal that will turn it off and on upon command.

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# Explorer 17 Will Probe Upper Atmosphere

► **SECRETS** of the earth's upper atmosphere will be further probed when Explorer 17, the first stainless steel satellite, is launched soon by the National Aeronautics and Space Administration.

The satellite will study the composition, density, pressure and temperature of the atmosphere at heights from 155 to 460 miles.

The satellite weighs 400 pounds, of which 320 pounds are composed of instruments. The steel shell is thinner than a paper match cover, yet strong enough to hold a full earth atmosphere without rupturing in the vacuum of outer space.

The shell must also be non-magnetic and nearly leakproof.

A string of 67 high-energy power packs will supply power for all measuring and transmitting devices, including communications, track and telemetering.

Explorer 17 will be inclined 58 degrees to the equator.

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# Gemini Windows Almost Eye-Shaped

► **GEMINI ASTRONAUTS** will look through specially-coated glass windows shaped almost like eyes. Each window will consist of three parallel, flat panels of high temperature and high strength glasses, separated by space to inhibit heat transfer.

First test set of Gemini window panels has been shipped from Corning Glass Works, Corning, N. Y., to the McDonnell Aircraft Corporation, St. Louis, Mo., builder of the two-man spacecraft for the National Aeronautics and Space Administration's Manned Spacecraft Center.

The two windows on each vehicle will be identical. Their peculiar shape is formed by a top and a bottom arc joining at one end and a short straight line enclosing the other end, conforming to structures of the vehicle and the field of vision required by the spacecraft's two astronauts.

The outer panel of each window will be a thermal shield, Corning said, made of a 96% silica glass. The inner panel will be an aluminosilicate glass, especially strengthened to protect the integrity of the astronaut enclosure. The middle panel will also be a 96% silica glass. It will provide a fail-safe factor by fulfilling both thermal and mechanical functions.

A special coating on the panels will reduce reflections from inside and outside light sources to a minimum. Unless compensated, reflections are a usual outcome of multi-panel composite windows.

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NASA

**STAINLESS STEEL SATELLITE**—The new satellite is shown undergoing vibration testing at Goddard Space Flight Center, Greenbelt, Md., to make sure it will withstand the punishing shock of rocket launch.