AERONAUTICS

Private Satellites Coming

Satellites to be built by private industry are expected to be used to improve telephone, telegraph, radio and television services on a world-wide basis.

MAJOR EFFORT is being aimed at using satellites to improve telephone, telegraph, radio and television service on a world-wide basis.

Transoceanic television coverage of spectacular marriages or coronations could be flashed instantly from Europe to America. It would take only minutes to reach a member of the family, vacationing abroad, with a telegraphic message sent over a radio channel to and from a satellite. It has even been estimated that a phone call to any receiver in the world, via satellite, may cost as little as 25 cents.

The companies interested in satellites include International Telephone and Telegraph, American Telephone and Telegraph, Radio Corporation of America and General Electric Company. Many other companies are capable of either making or using communications satellites.

The talk now centers about "what kind of satellite" and "how do we get it up there."

Two kinds of satellites presently appear promising. First is the passive satellite, which the National Aeronautics and Space Administration hopes to launch next year. Second is the active satellite, a project of the Advanced Research Projects Agency in the Department of Defense. ARPA's "talking" satellite is scheduled for launching within a year. Contracts were awarded for it on July 17.

The passive satellite will be a 100-foot plastic balloon aluminized on both sides. It may be inflated by two drops of water which, under the vacuum pressure of space, will be capable of expanding the light, thin sphere to its full size. Inflation might also be accomplished with a small bottle of nitrogen. The passive satellite gets its name because it does nothing but bounce radio signals back to earth.

The active satellite will be more complex.

It will have electronic equipment aboard. Weaker radio signals can be sent up from the earth. They will be picked up, amplified by the electronic equipment and rebroadcast to earth upon command. It may last only two years but as operating experience is gained, life expectancy may go up to 20 years or more.

The two Government satellites should show quickly the relative merits of each type, and perhaps give direction to future commercial research effort.

Although industry experts say flatly that the radio equipment itself can be readily built and made to work properly with present knowledge, many problems remain to be solved. For instance, one company wonders whether radiations in space, such as are found in the Van Allen radiation belts around the earth, can shorten the lifetime of the equipment.

The big problem is "how to get the satellite up there." Dr. Henri G. Busignies, president of International Telephone & Telegraph Laboratories, said the estimated cost of missile-and-satellite is about $4,000,000. But "we considered that we could have four misfires before having one in operation. That multiplies the cost of $4,000,000 by five, making a total of $20,000,000 for the first attempt."

That is a large amount of money for a private company to invest. The emerging pattern, however, indicates that the Government will take the lead, with industry cooperating. Slowly industry will build upon its investment and ultimately play a big private role in space.

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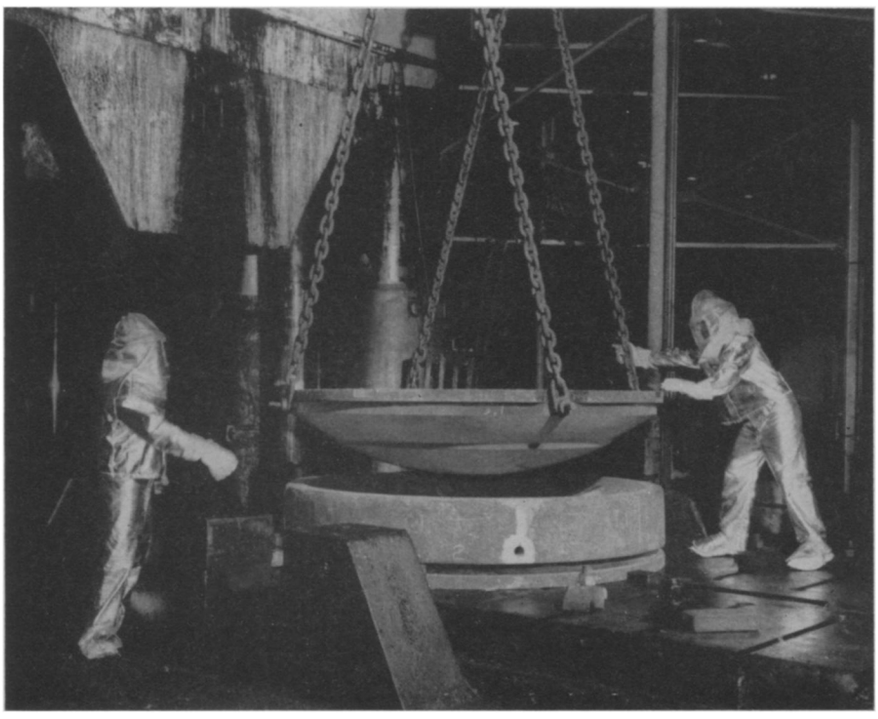

***BERYLLIUM SAUCER**—Workers in aluminized suits guide the top half of die set into the bottom half. When the 50,000-ton press squeezes a beryllium billet, contours of the dies transform the piece into a saucer-shaped disc.*

ASTRONAUTICS

Thin Metal Plate to Save Astronaut

THREE INCHES of beryllium will protect the first United States man in space from the "frying-pan" heat of his capsule as it plunges back to earth.

The giant, dish-shaped beryllium piece has been succesfully forged, the Brush Beryllium Company announced. The Cleveland firm, which supplied the record-sized beryllium billet, and Aluminum Company of America, which forged the billet into its rough form, made the joint announcement.

Brush Beryllium will finish the part soon to precision specifications.

To produce the plate, a 62-inch in diameter beryllium billet was hot-pressed. Following preliminary machining, the billet was encased in steel for the high temperature forging operation. In a special furnace, the billet was heated to approximately 2,000 degrees Fahrenheit. The glowing, steel-jacketed beryllium piece was then placed on a pre-heated die. At this stage a 50,000-ton press squeezed the billet into its saucer shape, three inches thick.

To be six feet in diameter, the beryllium dish is a key part for the space capsule that will carry the nation's first astronaut into space. Its lightness, strength, and heat-absorbing qualities made beryllium the choice for the capsule's "heat sink."

As the outside covering of the capsule's "floor," the beryllium plate is designed to store and safely dissipate the intense frictional heat of reentry. Without this, or some other heat-handling device, frictional heat might convert the capsule with its occupant to a fiery "shooting star" as it plunges back to earth.

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