

Plan Hypersonic Craft

A hypersonic spacecraft traveling five times the speed of sound on its return to earth will be retrieved within a predetermined area

➤ A TEST MODEL of the first hypersonic spacecraft, designed to maneuver at five or more times the speed of sound while returning to earth, has progressed to the second phase of Air Force development.

Called the PRIME SV-5D lifting body, the vehicle gets its name because its mission consists of "Precision Recovery Including Maneuvering Entry."

The PRIME vehicle will be able to maneuver so that it can be retrieved at a point within a predetermined area known as its "footprint."

Shaped like a curving wedge with a rounded top, flat bottom and angled fins at the rear, PRIME is a wingless vehicle that derives its aerodynamic lift from the shape of its body.

The vehicle received by Goodyear Aerospace Corporation was built for pre-flight tests by the Martin Company, Baltimore. It is the same size and weight as four unmanned flight vehicles being built by Martin's Balti-

more Division for maneuvering re-entry tests from orbital altitude at hypersonic speed.

These vehicles will be launched on Atlas missiles from Vandenberg Air Force Base, Calif., and recovered near Kwajalein Island in the Pacific. During their return from space, their maneuverability and recovery system will be tested.

The PRIME vehicle will be controlled by a self-contained guidance system during the first stages of its return from space.

When the vehicle drops to an altitude of approximately 100,000 feet and has slowed to a speed three times that of sound, a top-shaped Ballute (balloon-parachute) four feet in diameter will be released. Goodyear Aerospace engineers reported that this will act as a drag to slow it further, and will also stabilize it during this stage of its descent.

Similar-type Goodyear Aerospace Ballutes have been used in the Gemini space program and on a supersonic sled. Constructed of a high-strength, heat-resistant fabric called Nomex, the Ballute can withstand temperatures up to 450 degrees F.

When PRIME has been slowed to half the speed of sound and descended to about 45,000 feet, a release device will detach the Ballute, and a 53-foot ultra-lightweight nylon parachute will open. At the same time a 15-foot cone extension covered with loops will emerge.

A military C-130 transport plane then will use boom-mounted hooks to engage the loops during the descent of the parachute and payload, and will reel the PRIME vehicle into its cargo compartment.

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frared. They are, in effect, color television pictures of the earth's temperature, snapped in wavelengths invisible to the human eye. The pictures are translated by ground stations into black and white photographs.

The temperature patterns calculated by comparing earth's heat changes at the different infrared wavelengths are the best available indications of global winds and, thereby, weather. The invisible color pictures are being used to measure, for the first time on a worldwide basis, the heat balance of earth everyday.

They show how much of the sun's radiation is being absorbed by the earth's surface and how much is reflected back into space. The difference between the two is the earth's albedo, or heat budget.

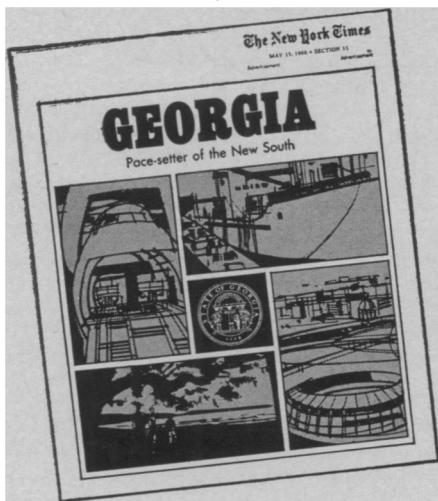
Scientists at the National Aeronautics and Space Administration's Goddard Space Flight Center, Greenbelt, Md., hope this heat balance study will give them clues as to how weather fronts and storms are born, grow and die. The sensor doing this is called the "Medium Resolution Infrared Radiometer."

The importance of Nimbus II measurements to future weather prediction was outlined to newsmen at NASA's research and control center.

A sudden drop in Nimbus II's power momentarily baffled scientists on May 20, until they remembered the drop coincided with a solar eclipse. Nimbus II depends upon solar cells for its power and the loss of current, almost 50%, was caused by the shadow of the moon cast on the satellite's path.

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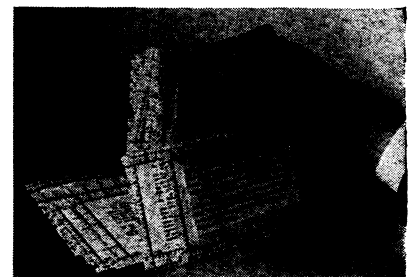
Weather Patterns Mapped Continuously

➤ NIMBUS II, the most sophisticated U.S. satellite flung into earth orbit, is successfully mapping the world's weather patterns everyday.

Its photographs of global weather can be received by more than 150 stations around the world, where scientists can then take a "quick look" at the cloud patterns for several hundred miles around.

For the future, however, the most important photographs being taken by Nimbus II are in four bands in the in-

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