ROCKETS AND MISSILES

Chart Space "Weather"

Information radioed back from Explorer VI is providing scientists with their first charts of the "winds" and "weather" of outer space.

See Front Cover

THE "WEATHER" of space is now being charted for the first time by scientists using information radioed back to earth from satellites.

Before rocket probes and satellites were sent spinning into space around earth, many scientists thought that changes in the earth's outer atmosphere, if any, occurred slowly.

Now they are finding that there are "winds" and streams of nuclear particles in nearby space, undergoing sudden and violent changes. Gradually the meteorology of space in earth's vicinity is being charted, but one difficulty is that different pictures are obtained depending on what instruments are used to view the radiation.

Latest findings from Explorer VI, the paddlewheel satellite launched Aug. 7, indicate that the radiation belts near earth are not as sharply divided as once thought. They are now thought more likely to be one large radiation area, with varying zones of intensity for the different kinds of radiation.

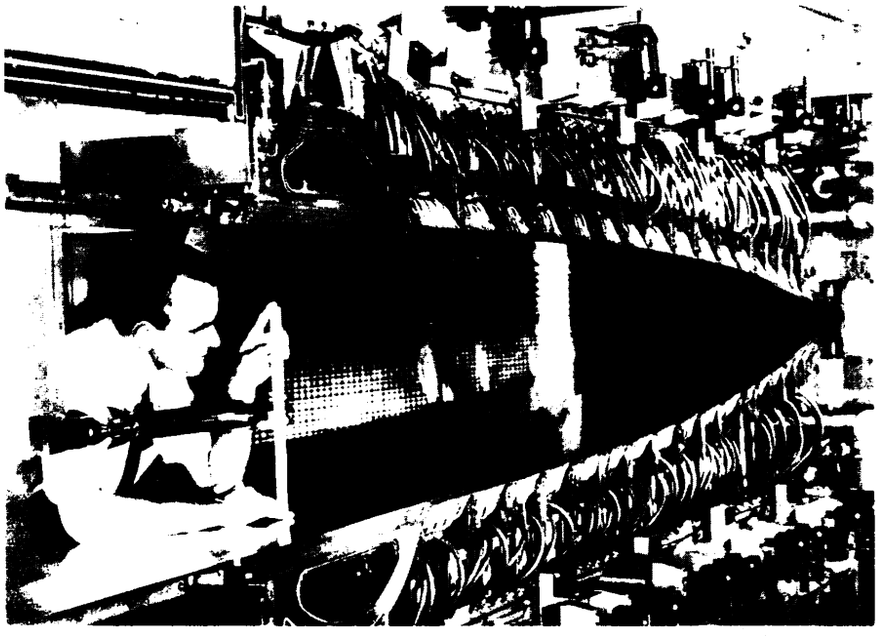
Most of the radiation, which could prove hazardous to manned space travel, can be eliminated by shielding with relatively thin layers of such materials as aluminum and lead.

At a National Aeronautics and Space Administration news conference, Dr. John A. Simpson of the University of Chicago reported that information from Explorer VI showed the presence of a thin band of highly energetic protons some 300 miles thick at the lower edge of earth's radiation zone. Manned space vehicles would probably travel through this region at such high speeds, however, that it would not constitute a barrier to interplanetary explorations.

Scientists from the Space Technology Laboratories of Inglewood, Calif., reported instruments on Explorer VI had transmitted the first crude image of the earth's cloud cover. The television-like picture covers a broad area of the central Pacific, and indicates in very rough fashion earth's clear and cloud-covered areas. At the time the photograph was transmitted, which took some 40 minutes on Aug. 14, the satellite was about 17,000 miles above the earth's surface, crossing Mexico. The area photographed was thus more than 20,000 miles from the satellite.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows a sunlighted area of the Central Pacific ocean and its cloud cover, in the section at the right. The lined areas in the section at the left represent a cloud-cover map, prepared from meteorology charts, which have been superimposed on a globe to show the lighted area which the Explorer VI television scanner saw.

Science News Letter, October 10, 1959



HYPERSONIC WIND TUNNEL—An upstream view of the nozzle of the California Institute of Technology Jet Propulsion Laboratory's new $3,500,000 hypersonic wind tunnel shows Roger Barnett positioning a model missile in the 21-by-21-inch test section. The two tapering stainless steel plates, which can be seen at the top and bottom of the nozzle, are flexible and can be contoured to test forms by a system of 16 hydraulic jacks.

AERONAUTICS

NASA Asks Radio Hams Not to Endanger Tests

U. S. RADIO AMATEURS were urged "not to experiment" with radio signals that, when broadcast, might trigger a rocket misfire or satellite payload-ejection equipment.

A "spurious signal" has been cited as cause for the unsuccessful testing of a developmental capsule at Wallops Island, Va. NASA said the spurious signal which spoiled the launching definitely came from its own launch equipment in this case, but that a radio ham might accidentally start the launching. Even though NASA believes the chance of this happening is remote, further to safeguard its experiments NASA releases no information on the radio frequencies used, the type of coding or the time of launching.

Science News Letter, October 10, 1959

RADIO

New Short-Wave Radio Has Dual Transmission

A SHORT-WAVE radio transmitter has been developed that can simultaneously broadcast two or more independent transmissions on different wavelengths.

The one-kilowatt Marconi Wireless Telegraph Company's transmitter, Chelmsford, England, may be particularly useful in ground-to-air communications because it enables service on one frequency to be put on a second frequency before being discontinued on the first frequency, the Company said. (Changes in short-wave frequencies often are made as radio conditions fluctuate.)

The secret of the transmitter is a device known as a distributed amplifier. Unlike conventional types, this amplifier dispenses with tuning controls. The design is such that even if a tube fails, the transmitter is unlikely to go "off the air." Instead there would be only a slight reduction in output.

The unit overcomes what has always been a major drawback with conventional transmitters: the complex stage-by-stage retuning of the high-frequency amplifier whenever it is desired to change frequency. The distributed amplifier provides wideband amplification over the whole high-frequency band, thereby obviating operational tuning in the transmitter's high-frequency amplifier stages. At the same time it permits the simultaneous radiation of two or more independent transmissions.

Although the distributed amplifier is used as a low-level voltage amplifying device, for instance, in oscilloscopes, this is believed to be its first successful use for this service.

The engineers mainly credited for the development are B. M. Sosin and V. O. Stokes.

Science News Letter, October 10, 1959