

SPACE

Soviet H-Bomb Tests

► HIGH ALTITUDE H-bomb explosions are expected to have top priority in the new Soviet series of nuclear weapons tests begun on Aug. 5, SCIENCE SERVICE learned.

Soviet military leaders are anxious to find out whether a high H-bomb blast can destroy a nearby missile carrying an atomic warhead. This is a capability the Russians fear the United States already has under development. An H-bomb may be a much stronger defense mechanism than the Soviet anti-missile device that Premier Khrushchev boasted could "hit a fly in space."

Indications are that the anti-missile effects of the radiant energy and blast waves from a nuclear bomb exploded in space do not require a direct hit. The neutrons and X-rays released from an H-bomb exploded in the high-altitude path of an oncoming missile, according to experts, would melt the plutonium in the missile's nuclear warhead, causing premature explosion. The atomic particles also would wreck the electronic guidance system. High-altitude atomic explosions also can black out communications.

Two high-altitude explosions—one from the anti-missile and one from an approaching missile—would double the aurora, causing short wave blackout and other geophysical effects.

Previous atomic shots in space by the United States as well as those planned to complete the current series are believed to have advanced U.S. scientific knowledge and understanding and technical ability in the use of nuclear weapons beyond that possessed by the Russians.

The United States announced plans for her high-altitude explosion four days in advance so that scientists all over the world could study its effects. Present plans are to broadcast future U.S. atomic space shots by radio.

No such advance notice has ever been received nor is it expected now from the Russians. Sweden has asked the Soviet Union to give advance notice, particularly on giant atmospheric bomb tests planned by the Russians.

Such super-megaton explosions, according to experts in Washington, D.C., are largely politically motivated, "a face-saving" effort to show the rest of the world that anything the U.S. can do, the Russians can do bigger and better.

The desire to be the last to test before coming to a nuclear test-ban agreement also is a major factor in the Soviet decision to test again. In fact, there is very little chance that the Russians will agree to any nuclear test ban treaty until they have tested again.

If, following this new series of tests, the Soviets agree to a reasonably monitored and inspected test ban, the United States probably will let the Russians have the last word on atomic test explosions.

The general view in the Administration is that a treaty, even one that would limit a worldwide detection network to as few as 20 stations and provide for inspection on site only if a recognizably suspicious event occurred, is far preferable to the possible technical gains and greater risk of war from continued testing.

• Science News Letter, 82:101 August 18, 1962

TECHNOLOGY

TV Goes Underground To Assist Oil Men

► A NEW TELEVISION system can be lowered thousands of feet into oil wells to assist oil men in their operations.

The oil men will be able to observe first hand the rock layers drilled and spot any possible trouble.

It will be the first time since oil well drilling began more than 100 years ago that men will not have to work "blind" in downhole operations.

The TV system has a cylindrical-shaped TV camera, fluorescent lights to illuminate the borehole and a unit that permits the camera 360-degree scanning. A TV monitor screen on the surface is used for continuous viewing. The image on the screen can be recorded instantaneously with a Polaroid camera.

The system was devised by Shell Development Company's exploration and production research division in Houston, Texas.

Currently the downhole television system can be operated to a maximum depth of 5,000 feet and at a maximum pressure of 5,000 square inches. Continuous operation is possible at 120 degrees Fahrenheit.

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TV SATELLITE—Mock-up of the communications satellite that will establish uninterrupted television programming.

SPACE

New Satellite for 24-Hour TV Hookup

► THE NEXT generation of communication satellites that will provide continuous 24-hour a day television programming is in the making by Hughes Aircraft Company under a government space contract.

Only one of the new spacecraft will be needed to link the four continents of North America, Europe, South America and Africa into a vast communications network operating around the clock, Dr. Allen E. Puckett, Hughes vice president and head of the company's aerospace group, said.

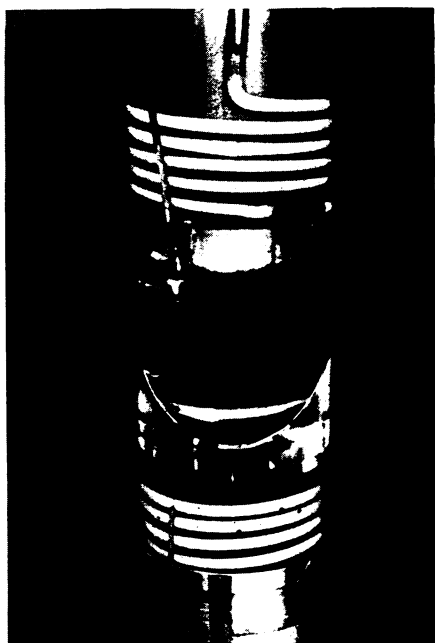
The satellite, a high altitude advanced Syncom type, will "stand still" in the sky instead of orbiting the earth, Dr. Puckett explained. He said the spacecraft would be "parked" high over the Atlantic Ocean and that any ground station in its view could communicate with any other ground station in the network without interruption via TV, telephone or telegraph.

"Such a stationary, or synchronous, satellite is an entirely different concept from the low altitude systems," the official said. "Three Syncom type satellites could blanket the earth, whereas 40 to 50 low altitude satellites would be required."

Synchronous satellites are launched to an altitude of 22,300 miles where their speed just matches the earth's rate of rotation so that they turn with the earth and thus appear to hang motionless overhead.

Work on the advanced Syncom at Hughes is being done under a contract with the Goddard Space Flight Center of the National Aeronautics and Space Administration.

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MIRROR VIEW TV—The lens of the camera can be seen in the mirror of the downhole television system. Neon fluorescent lights illuminate the bore hole.