

ROCKETS AND MISSILES

Rocket Research Lost Year

Rulings by the Bureau of the Budget and orders by high defense officials are said to have caused at least one year's delay in the nation's atomic missile research program.

► AMERICA'S basic research program to develop nuclear-powered engines for intercontinental ballistic missiles (ICBM) or space rockets was retarded a full year by a personal order of former Secretary of Defense Charles Wilson and an "unrealistic ruling" by the Bureau of the Budget, the joint Congressional Committee on Atomic Energy was told in secret testimony just released.

The Atomic Energy Commission first had been urged by the Defense Department to proceed "promptly" on research toward a nuclear rocket. Then Secretary Wilson suggested to former AEC Chairman Lewis Strauss that the research be conducted on a "moderate scale" without a target date for tests, the heavily censored transcript of hearings begun Jan. 22, 1958, reveals.

Col. Jack Armstrong, deputy chief of the AEC Aircraft Reactors Branch, and Sen. Clinton P. Anderson (D-N. M.), chairman of the special subcommittee on outer space propulsion, agreed the Administration decisions lost us at least a year of vitally needed work, especially in basic research.

Sen. Anderson told SCIENCE SERVICE the decisions, which resulted in transferring nuclear rocket research from two laboratories to just one laboratory and which "locked up" \$9,000,000 in Congressionally appropriated funds, probably has delayed the U. S. effort more than a year.

"Those decisions may have delayed us two years or more," he said, "because progress in basic research, when it comes, often snowballs. The result sometimes is a breakthrough, as in the case of the hydrogen bomb.

"I think favoritism by the aircraft industry for chemical fuels instead of nuclear power may have influenced the decision to cut back the nuclear propulsion basic research effort."

He said, during the hearing, that it was "obvious" the AEC had been forced to reduce its nuclear rocket program even before a Department of Defense committee of experts had time to make a report, and it appeared that Secretary Wilson had made up his own mind also before seeing the report.

The experts reported "the potential military value of a nuclear reactor . . . to an advanced ICBM are such as to warrant a prompt effort (by the AEC) to demonstrate the technical feasibility of such a reactor."

Sen. Anderson, who was reading from the full report, said that when Mr. Wilson sent the report on to Adm. Strauss, Mr. Wilson specifically requested that the AEC continue its work on a "moderate scale," and suggested that the committee of experts had erred in its judgment concerning proposed test dates.

The subcommittee chairman recalled that Congress had approved an additional \$9,000,000 for the AEC program, but that the Bureau of the Budget, acting on Administration economy orders, would not allow AEC to touch the money.

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AERONAUTICS

Reveal 2,000-Mph Planes And Rocket Test Studies

See Front Cover

► HEAVY TRANSPORT planes, as well as bombers, will be flying over intercontinental distances at 2,000 miles per hour, three times the speed of sound (Mach No. 3), in a few years as a result of research data revealed by the National Advisory Committee for Aeronautics at the triennial inspection of the Ames Aeronautical Laboratory, Moffett Field, Calif.

While the most intensive push is directed toward missiles for the conquest of space, supersonic flight for atmospheric aircraft is being so successfully explored that



SOUNDING ROCKET—This two-stage Nike-Cajun sounding rocket was fired by the National Advisory Committee for Aeronautics in a successful twilight test of the ejection and automatic inflation mechanism of a 12-foot aluminum foil satellite. The deflated satellite is carried in the aft area of the nose section of the missile. After burnout, the rockets separate in sequence.

new horizons will be reached. The first application will be to the Air Force's new chemical bomber, the North American B-70.

The world's first, full-scale five-stage rocket has been fired for test purposes off the Virginia coast over the Atlantic, exceeding Mach No. 16, or 10,516 miles per hour, and reaching an altitude of several hundred miles.

For firing models of missiles at 16,000 miles per hour, a new huge light-gas-gun, 200 feet long, is in operation at the laboratory, firing into a pressurized range 500 feet long.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the Laboratory's atmosphere entry simulator. It combines a specially shaped supersonic nozzle with a high speed gun to duplicate the flight of a missile and the atmosphere's changing density. At left is a storage tank for high pressure air. The high speed gun for model launching is not visible. Technicians are adjusting two of the 48 shadow-graph stations which make accurate picture and time records of a model flight.

When a gun-launched model flies at full re-entry speed into the simulator nozzle, it experiences in a few thousandths of a second the stress of actual re-entry.

There is also a new shock tunnel with air flowing at 12,500 degrees Fahrenheit for studying heating at hypersonic velocities. This is important in flight into space and the return to earth of vehicles from space.

Ions, which are atoms stripped of electrons, are being created in beams to determine what effects these particles, created when objects re-enter the atmosphere, will have on material from which space craft are constructed.

Ions are also being investigated as a means of propulsion in outer space, possibly in connection with atomic engines at the Lewis Flight Propulsion Laboratory, Cleveland, Ohio. NACA is developing a nuclear reactor to eject a gas at high temperature for propelling a rocket, and in another, to generate electricity to force all ionized particles rearward.

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TECHNOLOGY

Squeeze Tubes Feed Spacemen in Flight

► SOME 3,000 aluminum squeeze tubes are being filled with liquid and semi-liquid foods in the final test stages of a project designed to keep spacemen well-fed.

When they are filled, the tubes will be turned over to the U. S. Air Force for pilot tests at "extremely high altitudes," the American Can Company has announced.

Main advantages of the proposed method for feeding pilots dressed in space suits are that the tubes are unaffected by pressure differences inside and outside the helmet, and that the lightweight tubes—each weighs nine grams or about one-third of an ounce—can withstand the food sterilization process.

Flavored milks, fruit juices, chicken, beef and ham will be included in the pilots' test menu.

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