Address by

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before the

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Mr. Catledge, Mr. Akers, Ladies and Gentlemen:

I am very happy to have the opportunity to discuss NASA's program at this annual meeting of the American Society of Newspaper Editors. You have all heard and read the many discussions of the Soviet Union and the U. S. approaches to space exploration. The debate has been intensified by the successful orbiting of a Soviet astronaut last week. Our goals are bold, imaginative and broadly based and we are providing and will continue to provide this country with a valuable return on its investment. During the next half hour I will discuss with you some of our accomplishments to date and will attempt to define our principal objectives.

First, let me describe briefly the organization commonly called NASA, the National Aeronautics and Space Administration. At its birth two and one-half years ago, NASA absorbed the National Advisory Committee for Aeronautics, the forty-three year old aeronautical research agency which had already participated in space research. To the 8,000 NACA scientists, engineers, and technical and administrative personnel utilizing five field centers, other excellent groups were added to form the new agency. Among these were the staff members of the Naval Research Laboratory Vanguard group who joined NASA in November 1958, and the Jet Propulsion Laboratory, operated by the California Institute of Technology, in December 1958. On July 1 of last year, more than 5,000 people of the Development Operations Division, Army Ballistic Missile Agency, Huntsville, Alabama, were added. Today, our total employee strength--excluding the Jet Propulsion Laboratory,--is more than 16,000.

We now have an all-around space research and development capacity. In this regard, may I emphasize that despite NASA's necessary growth during the last two years, we are determined that universities and industry shall get an ever-increasing share of NASA budget dollars. Contract participation currently amounts to more than 75 percent of those dollars. We feel that the NASA staff should be kept at the level required to plan the space exploration program and to organize, contract for and over-see its implementation, and to conduct sufficient in-house effort to maintain the calibre of our scientific and technical personnel.

As stipulated in the Space Act of 1958, NASA is required "to develop and operate space vehicles for a variety of purposes." These purposes can be roughly divided into three categories: unmanned scientific exploration, manned space flight, and satellite application for meteorological and communication systems. Obviously, time does not permit a detailed discussion of the various aspects of our satellite program but let me give you several of the highlights.

Unmanned Scientific Exploration

We have launched 38 satellites and probes and have additional satellites under development. The purposes of the scientific satellites range from investigating the earth's atmosphere, the ionosphere, the energetic particles and fields about the earth, to investigating the sun and the galaxies. These satellites have been specially tailored to each particular mission or series of missions.

Among our most successful experiments to date have been the Pioneer series of space probes. Pioneer V, for example -- launched into solar orbit on March 11 of last year -- was tracked into space to a distance of 22.5 million miles, still the greatest distance any man-made object has been tracked. Pioneer V sent back scientific data on conditions in space until communication contact was lost on June 26, 1960. This space probe gave us new and valuable information about cosmic rays, the earth's magnetic field, solar "storms," and evidence of the existence of a large "ring current" circulating around the earth at altitudes of from about 30,000 miles to 60,000 miles.

Launch vehicles, such as the Agena and the Centaur, will soon be available, with greatly improved load-carrying capability. Detailed plans have been made and work will soon begin on an Orbiting Geophysical Observatory, based on the use of the Agena. This observatory will be one of our first standardized satellites, with a stock-model structure, basic power supply, attitude control, telemetry, and command system. Its modular compartments are capable of carrying 50 different geophysical experiments on any one mission. For this reason, it is often referred to as the "streetcar" satellite. The observatory will be about six feet long by three feet square. The two solar paddles used to collect energy from the sun will be about six feet square. The satellite will weigh 1,000 pounds and will include 150 pounds of scientific experiments.

NASA also has well-advanced plans for exploring the moon. The first slide shows the trajectory of a lunar spacecraft -- known as Ranger -- which has been designed to carry an instrument package built ruggedly enough to survive a crash landing on the moon. Then its instruments will record and radio back to earth data on the make-up of the lunar surface. We will begin flights of Ranger this year, using the Atlas-Agena launch vehicle.

Following Ranger will come Surveyor, a spacecraft that will be able to make a so-called "soft landing" on the moon sometime in 1963. 800. More delicate scientific instruments than those in Ranger can thus be employed. This next slide shows a mock-up of the Surveyor spacecraft.

Also under way is a spacecraft that will fly close to Venus and Mars, and later perhaps other, more distant planets. This spacecraft, shown in the next slide, is called Mariner. Mariner will carry 800 - 2500 instruments to measure planetary atmosphere, surface temperatures, rotation rates, magnetic fields, and surrounding radiation regions. The Mariner series will be launched by our Centaur vehicle.
Summer of 1962

The lunar and planetary explorations are not only for scientific investigations but also to initiate the technological developments that will lead to eventual manned flights throughout our solar system.

SLIDES

Lunar and Planetary

Ranger B Flight Sequences

Surveyor Spacecraft

Mariner Spacecraft

(continued)

1600 mi

Manned Space Flight

Tracking and Communications Network

Flight Trajectory Project Mercury

Mercury Capsule

Redstone Ballistic Flights

Saturn Vehicle at Launch Pad

1.5 million pound thrust engine

Nova

Nuclear Rocket Engine KIWI-A Reactor

Manned Space Flight

~~S-I~~
C-1 19,000
C-2 45,000

Applications at Hand

One of the most promising applications of satellites appears to be in the communications field. Capacities of international teleradio and cable systems are severely burdened today and will be exceeded by the demands of tomorrow. At present, television cannot be transmitted directly more than two or three hundred miles. However, the usable radio spectrum of frequencies above 20 megacycles (whose range is limited to line-of-sight) offers almost unlimited bandwidth space. Ground-based microwave relay links and coaxial cables are employed to overcome the range limitation, but for overseas communications they are impracticable, unreliable, or prohibitively expensive. Such prototypes as NASA's Project Echo, the satellite many of you have seen passing overhead, have demonstrated conclusively that satellites can be used as communications relays or reflectors to extend line-of-sight transmissions to inter-continental ranges. Satellites can provide tremendous bandwidth capacity to meet the fast-growing need for teleradio communications. Their use will also permit rapid, voluminous transmission of scientific data to the electronic computers that are playing more and more significant roles in the workings of government, science, and industry.

NASA is developing meteorological satellites to provide worldwide observation of atmospheric elements--the data which meteorologists must have to understand atmospheric processes and to predict the weather. Tiros I, launched April 1, 1960, was the first step toward an operational meteorological satellite system. The highly successful 270 pound first Tiros satellite, orbiting at altitudes averaging 450 miles, transmitted 22,952 television pictures of the earth's cloud patterns. This gave meteorologists unprecedented opportunity to relate the earth's cloud cover to weather observation from the ground, Tiros II was launched November 23, 1960, and is providing useful television pictures as well as infrared heat measurements of the earth.

The U. S. Weather Bureau and cooperating meteorological groups within the Department of Defense will be analyzing TIROS data for months to come. Already this data has made important contributions to meteorological research. For example, TIROS transmitted pictures of cyclonic storms whose spiral bands were more than 1,000 miles in diameter. The frequency and extent of highly organized cloud systems associated with these vortices were not fully realized before TIROS. Other pictures indicated the presence of jet streams, regions of moist and dry air, thunderstorms, fronts, and many other meteorological phenomena.

It is clear that use of satellites of the TIROS type can greatly increase the accuracy of weather forecasting, particularly since they can report information from areas such as those over the oceans where it is difficult to obtain data by orthodox means.

OTHER BENEFITS

It goes without saying that space exploration holds genuine significance for the security and well-being of the United States. In addition, the space effort is benefiting the entire economy. Needs of the space program spread across the whole industrial spectrum--electronics, metals, fuels, ceramics, machinery, plastics, instruments, textiles, cryogenics, and many other areas.

A graphic example of participation in the space program can be seen from the development of the X-15. This experimental rocket craft, designed to fly to the fringes of the earth's atmosphere, is the product of the efforts of some 400 different firms and contractors. At least 5,000 companies or research organizations are engaged in the space industry. More than 3,200 different space-related products have been required and are being produced. Industry supporting our space program will be providing technical developments leading to many new products.

RECAPITULATION AND CONCLUSION

In conclusion, we are continuing our ~~exciting~~ important scientific exploration of the atmosphere, the moon, the planets, the solar system, and the stars. This program provides the base for ~~both~~ specific applications as well as for manned exploration of space. It seems certain that the next decade will see general use of weather and communication satellites. Here virtually assured are early, practical, and extremely beneficial uses of space technology. ~~Man's first flight in space has been achieved by the Soviet Union.~~ NASA's Project Mercury will ~~soon~~ provide us with further ~~information on man's capability to perform~~ in a space environment. It must be remembered that man's entry into space is not a stunt, to be accomplished once, then discontinued. Rather, the program must broaden with new vehicle and propulsion technology, providing increasingly greater maneuverability and longer times of flight until man himself can explore the moon and planets. As Dr. Hugh L. Dryden, Deputy Administrator of the NASA, stated in the Penrose Memorial Lecture on April 21, 1960, "Man himself is the most versatile observer of all and will take part in the exploration. We may be confident that in time, space travel will be commonplace, although we are unable to forecast the details of future spacecraft or the timetable of their development."

Finally let me say that The task of exploring space is one which will stretch the muscles and brains of men and women for years to come, providing a continuing long term stimulant to our society. It will test to the utmost our powers to enlist the cooperation not only of teams of scientists and engineers but of every other element of our society. The magnitude of the task challenges the resources and cooperative will of all nations. We must use our insight and vision to guide our present-day decisions so that we can prepare our successors for the unfolding developments in the Age of Space Exploration.

SLIDES used by Dr. Seamans in speech before American Society of Newspaper Editors, Washington, D. C., April 20, 1961

Lunar and Planetary

Ranger B. Flight Sequences -------------------	#61-4
Surveyor Spacecraft -------------------------	61-5
Mariner Spacecraft ---------------------------	61-7

Manned Space Flight

Tracking and Communications Network, Project Mercury -------------------------------	61-67
Flight Trajectory Project Mercury -------------	61-66
Project Mercury Ballistic Capsule -------------	2832
Redstone Ballistic Flights, Project Mercury----	61-64
Saturn Vehicle at Launch Pad -----------------	61-186
1.5 Million Pound Thrust Engine ---------------	61-171
Nova --	60-126
KIWI-A Reactor --------------------------------	61-150
Manned Space Flight --------------------------	61-46