Miscellany

US–USSR Exchange Program

Meeting in Washington last November, US Atomic Energy Commission chairman John A. McCone and the head of the Administration for Utilization of Atomic Energy in the Soviet Union, Vasily S. Yemelyanov, outlined plans for the early exchange of Soviet and US scientists as a first step towards the possible establishment of cooperative programs in some areas of research on the peaceful uses of atomic energy. This projected atomic reciprocity is included in the cultural and technical exchange program of the US and the USSR, which was recently extended for two years by the signing of an agreement in Moscow by US Ambassador Lewellyn Thompson and Georgi A. Zhukov, chairman of the State Committee for Cultural Relations with Foreign Countries. The two nations have also agreed to work out arrangements for more efficient and effective exchange of the results of research, and Prof. Yemelyanov is reported to have suggested the desirability of considering the joint construction and operation of large accelerators. All details of the cooperative program are to be coordinated with the work of the International Atomic Energy Agency in Vienna.

The cultural and technical exchange agreement also calls for further exchange of scholars, students, and teachers of Russian and English. In addition, there will be cooperation by American and Soviet public health agencies and medical research institutions in attacking the problems of cancer, heart disease, and polio. Both governments have agreed to facilitate publication in their own journals of the other's important research, and it has been suggested that twenty ranking American and Soviet medical research specialists be exchanged. The number of technical delegations to study manufacturing and construction industries and techniques has been increased from two to eight.

Another hopeful indication of future international cooperation in science and technology is the recent signing by nine nations, including both the US and the USSR, of a new charter for the Committee on Space Research. The Committee, which is concerned with encouraging international cooperation in rocket and satellite research, was organized under the auspices of the International Council of Scientific Unions, first met in London in 1958, and is open to all national academies of science actively taking part in space studies. The Committee is scheduled to hold another session this month in France on the occasion of the First International Space Science Symposium in Nice.

Facilities

Still on schedule, or perhaps somewhat ahead of schedule, the multibillion-volt proton synchrotron at the CERN Laboratory in Geneva went into operation for the first time on November 24, and did so in a thoroughly impressive manner by attaining a very close approximation of its estimated 25-Bev design energy. News of the successful trial reached the Thanksgiving Meeting of the American Physical Society in Cleveland that same week, the announcement being made by the Society's vice president, Victor F. Weisskopf of the Massachusetts Institute of Technology, who reported that the CERN group had managed to produce a 24-Bev proton beam with a pulse of 10 billion protons every three seconds. Construction work on what is now the world's largest accelerator has been in progress for the past five years, and the target period for trial operations was long ago established as being late 1959 or early 1960.

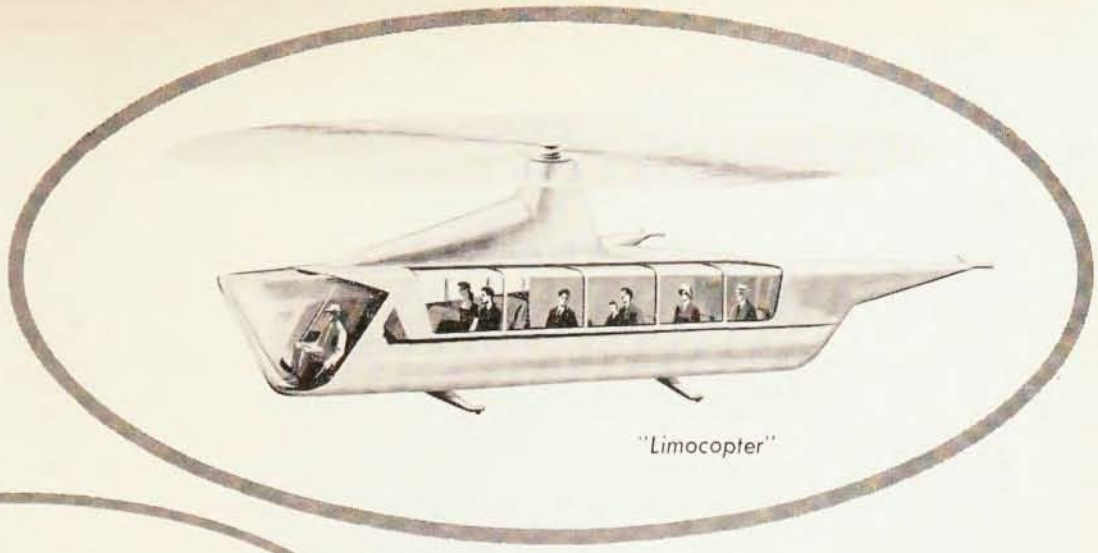
Oak Ridge National Laboratory has commenced work on a new building to house its proposed 76-inch cyclotron, designed to accommodate experiments with a variety of particles over a broad range of energies up to about 100 Mev. The "relativistic isochronous" cyclotron, as it is called, belongs to a new class, identified by an azimuthally varying magnetic field, and is expected to be one of the most versatile medium-energy accelerators in existence. It will be ORNL's third cyclotron. The others are an 86-inch, 23-Mev proton accelerator and a 63-inch cyclotron which accelerates nitrogen ions to 27 Mev.

Also at Oak Ridge, as a part of ORNL's current expansion program, a new plant for reprocessing fuel elements from a variety of power reactors will be constructed this year. The building will house two cells lined with stainless steel and shielded by six feet of concrete. It will be serviced by an underwater fuel element storage canal capable of handling core components as long as 14 feet and weighing up to 1000 pounds.

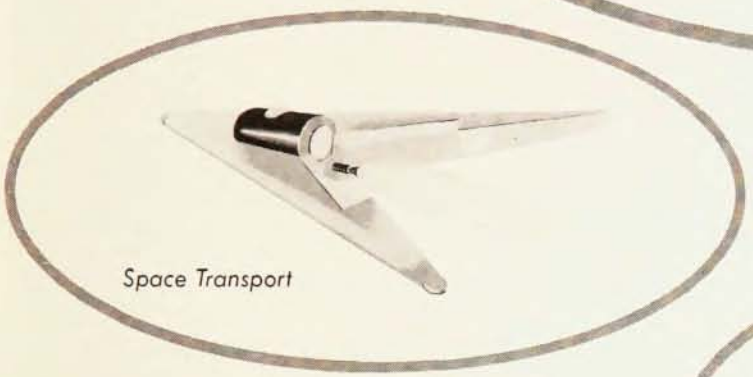
Concentrating on solid-state physics, especially in fields of micro-miniaturization, ferromagnetics, and photoconductors, an Applied Research Department has been established by Librascope, Inc., Glendale, California. The department, under the direction of Wayne Blackburn, will complement the firm's existing Advanced Research Group, which is concerned with the development of computer memory techniques for data processors and computing systems.

Space Sciences

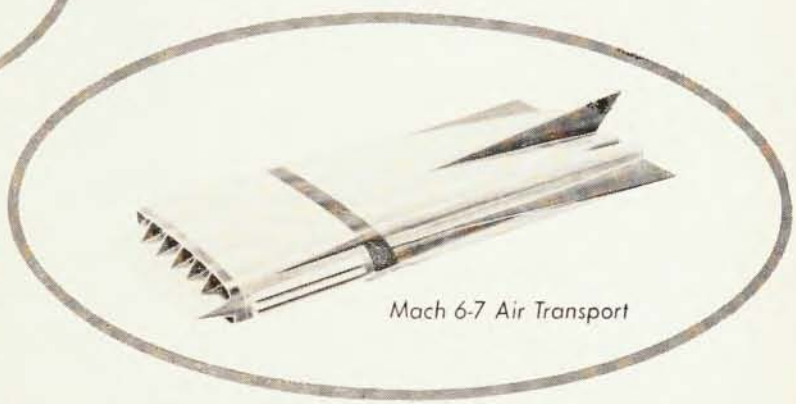
The first of three experimental satellites which the National Aeronautics and Space Administration plans to launch under its "Project Echo" is scheduled to be sent aloft this spring and placed in a 1000-mile-high orbit that will make it visible in all countries between 50° north and 50° south latitude. Designed to serve as



"Limocopter"



Space Transport



Mach 6-7 Air Transport

NEW FLIGHT FRONTIERS AND SPACE MISSIONS

Bold plans revealed in Lockheed's program of total flight technology

Air/Space travel, whether the vehicle is manned or unmanned, poses vast problems. To expand the total technology of flight, Lockheed's California Division proposes bold new concepts for both military and commercial vehicles. In line with this, the Company has assumed major responsibility for Research and Development on future space vehicles. This responsibility extends from development of advanced components to major complex systems.

Advanced projects to spring from this broad base of Air/Space travel include: Limousine-Helicopters designed for shuttle service between large cities and suburbs, or to transit terminals; Mach 6-7 Air Transports able to take off and land vertically; Space Transports capable of transporting, to an orbit of more than 1000 miles, a pilot and 1000 pounds of payload, or three passengers equipped to work in space; advanced Infrared Systems studies as an advanced detection method; and Solar Radiation studies.

This markedly expanded program into the total concept of flight creates urgent need for personnel with high-level skills. The concept ranges from subsonic to hypersonic speeds; from atmospheric to outer space vehicles.

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LOCKHEED / CALIFORNIA DIVISION

a radio-wave reflector for long-range communication experiments, the Echo satellite is a 150-pound aluminum-coated plastic balloon which is to be inflated in space to a sphere 100 feet in diameter. Transmitting and receiving facilities are being readied by the Jet Propulsion Laboratory at its Goldstone Tracking Station in California and by the Bell Telephone Laboratories at Holmdel, N. J. Other scientific groups in the US and abroad may also be expected to take advantage of the satellite's presence, particularly since NASA has indicated that international participation in the Echo experimental program will be welcome.

Research on intercontinental communications by means of a satellite relaying system will be the concern of International Telephone and Telegraph Corporation's new center in Nutley, N. J. ITT has predicted the eventual use of three repeater satellites, 120 degrees apart and orbiting at 22 300 miles in the equatorial plane, to provide world-wide telephone, television, and teleprinter coverage with ground stations at such widely separated points as Athens, Tokyo, and Houston.

The University of Cincinnati's new Institute of Space Sciences has been awarded a 3-year, $178 000 grant by the National Aeronautics and Space Administration for research in celestial mechanics. Paul Herget, the Institute's director, is also director of the International Astronomical Union's Minor Planet Center at the University's observatory. The Institute has access to the Observatory facilities and the University's Computing Center, which has an IBM 650 electronic computer. Its research program will include studies of earth-satellite orbits, lunar satellites, solar parallax, and minor planets.

National Research Corporation's newly completed 45-cubic-foot space test chamber at Cambridge, Mass., designed to simulate space conditions at altitudes "in excess of 400 miles", has attained pressures as low as 8×10^{-10} mm of mercury, according to a recent announcement by the firm. The stainless steel system can be modified to introduce thermal radiation, emissivity, and various mechanical tests under ultrahigh vacuum, making possible realistic tests of large satellite and space vehicle components.

For the Advisory Panel to its Atmospheric Sciences Program, the National Science Foundation has named six men distinguished in meteorology and related fields. They are Thomas F. Malone, director of research, Travelers Insurance Co.; Walter H. Munk, professor of geophysics, University of California at La Jolla; Walter Orr Roberts, director of the High Altitude Laboratory, University of Colorado; Verner E. Suomi, professor of meteorology, University of Wisconsin; Arthur H. Waynick, director of the Ionosphere Research Laboratory, Pennsylvania State University; and E. J. Workman, president of the New Mexico Institute of Mining and Technology.

Eighteen fellowships for graduate work in space flight, rockets, jet propulsion, and flight structures will

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"NEW DIMENSIONS / in electronics and data processing systems"

be awarded this spring by the Daniel and Florence Guggenheim Foundation. They will be granted for study at the Guggenheim Jet Propulsion Center at Princeton University, the California Institute of Technology, and the Guggenheim Institute of Flight Structures at Columbia University and each will provide tuition and a stipend ranging from $1500 to $2000. Applications must be filed with the university selected by March 1.

Documentation

A proposal that action be taken to make electron diffraction data more generally available has been advanced by a group of some 20 scientists who met at the Mellon Institute last November to consider the need for better access to such information. The group, under the leadership of Victor Hicks of the Allen-Bradley Corporation, has suggested that the ultimate goal should be to prepare compilations of electron diffraction data in a form similar to the x-ray diffraction card file of the American Society for Testing Materials. William Fink, vice chairman of the Joint Committee on Chemical Analysis by Powder Diffraction Methods (a joint project of the ASTM, the American Crystallographic Association, and the British Institute of Physics), has been designated to represent the group at the meeting of the International Union of Crystallography to be held next August in Cambridge, England, and to present the problem to the international organizations involved. To determine the extent of interest in the proposed program, individual comment has been invited. Those having views on the subject should write (before July 1) to Karl E. Beu, chairman of the Powder Diffraction Subcommittee of the American Crystallographic Association, Goodyear Atomic Corporation, P. O. Box 628, Portsmouth, Ohio.

A bibliography entitled *Aerodynamic Phenomena in Stellar Atmospheres* has been prepared under the editorship of Richard N. Thomas, consultant in astrophysics to the director of the Boulder Laboratories of the National Bureau of Standards. Published as NBS Technical Note No. 30, it was compiled for use in preparation of the forthcoming symposium on cosmical gas dynamics to be held during August in Varenna, Italy, under the joint sponsorship of the International Astronomical Union and the International Union of Theoretical and Applied Mechanics. Copies of the bibliography, PB 151389, may be obtained for $1.25 from the Office of Technical Services, Washington 25, D. C.

To provide additional space for the increasing number of papers on the physics and chemistry of glass, the British Society of Glass Technology is now publishing its *Journal* in two bimonthly parts. Section A, *Glass Technology*, is to contain reports of applied science in the glass industry, while Section B, *Physics and Chemistry of Glasses*, will carry reports of original experimental and theoretical work. Each will also include abstracts, letters, and book reviews. Those wishing to submit papers or obtain subscription information should