

SPACE BUSINESS



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AA SPACE-GEOLOGY/HYDROLOGY FEASIBILITY SOUGHT.

The first contract to be awarded under the new cooperative agreement between NASA and the Department of the Interior's Geological Survey to the University of Michigan (yesterday's SPACE Daily) calls for feasibility studies of a lunar satellite-borne device that will produce images of the lunar surface in the infrared and ultraviolet radiation regions as well as in the visible light regions.

The instrument, known as a spectral radiometric imaging system, will permit scientists to identify elements on the lunar surface and produce a compositional and structural map. It will also provide a good picture of lunar geography. The University of Michigan's Infrared and Optical Sensor Laboratory (Willow Run Laboratories), which is conducting the study, said such instrument surveys are necessary because astronauts on the Moon will be able to explore "only a small part of the lunar surface in our lifetime." The new study is based on previous work by the Laboratory in developing similar devices for studies of the Earth's geography and vegetation from satellites.

Funding for the NASA/Geological Survey cooperative program will come from NASA, at least for the immediate future. However, certain aspects of the geology/hydrology studies--some of these concerned with Earth as opposed to the Moon and the planets--have been, and will be, funded by the Survey. Many of the AA experiments under study were proposed to NASA by the Geological Survey.

"We expect that a geological laboratory in space with its unique and sophisticated new instruments would greatly expand our knowledge of the Earth and our understanding of its formation and geologic history," William A. Fischer, the Survey's project supervisor explains. "This knowledge is essential in the discovery and development of sufficient quantities of water, fuel, and other mineral resources needed to sustain the world's burgeoning population."

The Survey emphasized that a satellite survey of areas of Africa and South America as well as other untapped areas, could lead to discovery of "billions of dollars" in mineral resources--a program even further improved by utilization of a man in space.

COMSAT PLANNING AIR TRAFFIC SATELLITE FOR 1967.

Plans are well underway within ComSat to orbit in August of next year a small communications satellite to aid control of commercial aircraft traffic over the Atlantic Ocean. **MORE**

The craft will be positioned at 30 degrees West longitude in a synchronous path and will have two voice channels with 200 watts of effective radiated power per channel. Two new ground terminals will be established to support it--one on each side of the Atlantic--and transAtlantic aircraft will be fitted with sending and receiving equipment such as the FAA is interested in (SPACE Daily, Jan. 4).

The satellite will probably be operated under a contract or agreement with the FAA. Since it will be owned by the international consortium for which ComSat is agent and manager, ComSat is presenting the satellite proposal to the consortium today. Preliminary discussions have been conducted with the FAA and various organizations within the air transportation industry, and the consensus is that such a satellite is of immediate and intense importance. Certain technical problems have yet to be solved, and the FCC will have to authorize the entire program, but optimism has been expressed from diverse quarters that the satellite can be successfully orbited and operated.

This payload may be considered a forerunner to the big multipurpose satellite ComSat is planning to launch around 1970 to serve television networks, airlines, and ships (SPACE Daily, June 1 and Jan. 3: there described as a "national" satellite). Although primarily envisioned for TV service, that satellite could be designed with substantial air and sea service capacity if the 1967 payload proves itself. ComSat's **EARLY BIRD** satellite has already been used to demonstrate the feasibility of using a spacecraft to relay aircraft communications (SPACE Daily, Oct. 25).

RIVERS ORDERS ARMED SERVICES SUBCOMMITTEE HEARINGS

Rep. L. Mendel Rivers (D-S.C.), chairman of the House Armed Services Committee, has ordered investigations of Secretary of Defense McNamara's decisions to: phase out part of the strategic bomber force in favor of missiles, close down or downgrade 149 military bases, and delay starts on previously authorized military construction projects because of the rising costs of the war in Vietnam. Another group is preparing to hold hearings on military research and development.

Rep. F. Edward Hebert (D-La.) chairs the subcommittee which will look into the bomber phase-out; O. C. Fisher (D-Tex.) heads the group on military base closings; and Rep. Philip J. Philbin's (D-Mass.) subcommittee will look into the cut-back on military construction. Rep. Melvin Price (D-Ill.) chairs the military R&D group.

Rivers gave instructions to the subcommittee chairmen to begin hearings "immediately" and to report to the full committee before posture hearings begin sometime next month. Price told SPACE Daily that his group will begin hearings as soon as the Defense Department witnesses are prepared to discuss the fiscal 1967 budget, which will be around January 25 (the legal deadline for submission of the budget to Congress) or shortly thereafter. Hebert has scheduled hearings on the B-52, the F-111, and AMSA (Advanced Manned Strategic Aircraft) beginning January 24.

Rivers said, regarding the phase-out of B-52 and B-58 bombers, that "The testimony of the Secretary of Defense last February, and the action of the Secretary of Defense last November, are at such complete variance that the Committee must be fully informed on our plans for our future capability in manned bombers."

AIA COUNCIL DIVISION CHAIRMEN NAMED

Division chairmen have been named for the Aerospace Industries Association's Aerospace Technical Council, which is the association's top-level advisory group on technical matters, for the coming year.

G. C. Martin, vice president-engineering, Boeing, will head the Technical Management Division. His vice chairman will be M. C. Haddon, group vice president of Lockheed. S. Kleinhans, corporate director-research and engineering, Douglas, and W. C. Jamouneau, chief engineer, Piper Aircraft Corp., will serve as chairman and vice chairman of the Airworthiness Requirements Division. Heading the Technical Specifications Division will be Erle Martin, vice-president-research and development, United Aircraft. Vice chairman is C. C. Ross, vice president-engineering, Aerojet-General. The Engineering Validation Division will be chaired by G. F. Metcalf, vice president-research and engineering, Martin, with J. H. Gerteis, chief engineer, Cessna Aircraft Co., serving as vice chairman.

Herman E. Shipley, executive secretary of the Technical Management Division, has been appointed assistant director of the Council. Shipley, employed by the AIA since last February, will continue to serve in his old capacity in addition to his new duties.

DOUGLAS SATURN MANAGEMENT REORGANIZATION

The following promotions have been made within Douglas' **SATURN** launch vehicle organization: J. L. Bromberg, who had headed **SATURN** activities as vice president-director of the Space Systems Center, was named vice president-assistant general manager of the Missile & Space Systems Division for **SATURN/APOLLO** programs; T. D. Smith, previously director-**SATURN/APOLLO** programs, will serve as deputy to Bromberg with responsibility for **SATURN/APOLLO** program activities; and W. L. Duval, who has been director of the Sacramento Test Center, has been named a senior director. Duval will continue to be responsible for **SATURN/APOLLO** activities at Sacramento, as well as directing efforts of other Douglas programs at the test facility.

LTV DOUBLES CASH DIVIDEND

Ling-Temco-Vought has doubled the cash dividend on its common stock to one dollar a year per share, declaring a 25 cent per share dividend for the first quarter of 1966. The new dividend policy was adopted at a meeting of the company's executive committee, which was authorized by the board of directors to change dividend policy and declare the first quarterly dividend.

The committee also declared the fourth annual dividend on the company's Series A preferred stock of \$1.35 per share. Both dividends are payable March 24 to stockholders of record on March 1.

James J. Ling, chairman of the board and chief executive officer, said in part that "Anticipated earnings from existing business, coupled with the earnings increase which will result from the acquisition of the Okonite Company (SPACE Daily, Jan. 11 & Oct. 19), justify the cash dividend increase..."

NASA TRACKING NET PASSES CONGRESS INSPECTION

Representative Ken Hechler (D-W. Va.), chairman of the House Space Subcommittee on Advanced Research and Technology, has returned from a month-long inspection tour of NASA's foreign tracking stations and reports that he is "well pleased" by the relations between Americans and foreign nationals. The trip also indicated, he reports, that NASA is doing "an unusually good job" adapting and modifying the tracking stations in preparation for the **APOLLO** program.

Hechler, accompanied by Rep. J. Edward Rousch (D-Ind.) and staff assistant James E. Wilson, visited both the Manned Spaceflight Network and the Deep Space Net stations in Madrid; South Africa; Carnarvon, Woomera, and Canberra, Australia; and Hawaii.

During the tour the group participated in the dedication, by Australian Prime Minister Robert G. Menzies, of the Mills-Cross radio astronomy telescope at Canberra. The new telescope, which employs two-mile arms, was built by Australia with the help of a \$900,000 grant by the National Science Foundation.

DIAC RECEIVES SIX NEW MEMBERS

Cyrus Vance, deputy secretary of defense and chairman of the Defense Industry Advisory Council, has appointed six new members to the DIAC to fill two vacancies and replace four retirees. The new members are Fred Borch, president of General Electric; Kermit Gordon, vice president of Brookings Institute; Daniel Haughton, president of Lockheed; Donald Holden, president of Newport News Shipbuilding & Dry Dock; Roger Lewis, president of General Dynamics; and Noel McLean, board chairman of EDO Corp. The retiring members are Elton Carter, consultant; Charles Hastings, president of Hastings-Raydist; James McCormack, board chairman of ComSat; and Edward Warren, president of Cities Service.

UCLA'S LIN TO RECEIVE AIAA RESEARCH AWARD

Professor Chao-Chi Lin of UCLA will be honored at the upcoming AIAA Aerospace Sciences Meeting in New York (SPACE Daily, Jan. 10) with the 1966 AIAA Research Award for his "basic research in the electric and electromagnetic properties of ionized gases, and for significant contributions to re-entry physics." Much of the work he is being cited for was done when he was employed by Avco-Everett, which developed the **GEMINI** and **APOLLO** heat shields. The Award includes a \$2500 donation from Douglas Aircraft. Lin teaches engineering physics.

Maj. William A. Cole has been named acting project manager of the **SERGEANT** weapon system at the Army Missile Command. Cole replaces Col. J. Mort Loomis, Jr., who has retired.

Phil L. Beatty, assistant director of industrial relations for Boeing's Wichita, Kans., Branch, has been named the company's corporate director of labor relations. Beatty replaces James D. Esary Jr., who has retired.

NASA/AF DETAIL SST RADIATION STUDY

The study of radiation at the altitude of the proposed SuperSonic Transport (SST) to be conducted by NASA and the Air Force for the FAA (SPACE Daily, Dec. 17) is now planned to run for two years with flights of an experiment package to be made approximately 12 times per month.

The experiment package will be built by Solid State Radiations, Inc. of Santa Monica for the FAA. The packages will be carried 12 times a month, on a space-available basis, by RB-57F aircraft of the 58th Weather Reconnaissance Squadron from Kirtland AFB, New Mexico.

The Air Force Weapons Laboratory will make the biophysical measurements from the experiment package while NASA will gather the physical or background readings.

The two-year period of the project will include the forthcoming cycle of increasing solar activity to determine if there are any significant biological effects from natural radiation and to better define the environment to be encountered by supersonic travelers. The flights will be made above 40,000 feet.

ARPA INTERESTED IN ILLIAC COMPUTER

The DOD's Advanced Research Projects Agency has joined AEC in funding a new computer-known as ILLIAC III--being designed and constructed at the University of Illinois. The computer, which will be able to perform up to 1024 logical operations at once, is being built to test the parallel design concept for automatic recognition of similar patterns in a series of pictures or images.

AEC has funded the project since fiscal 1961 at a total cost of about \$2 million. FY '66 funding is \$620,700. ARPA is adding \$620,000 in FY '66 monies to fund a word core memory, a disk back up store and a closed circuit television communication system for the project. Project director for ILLIAC III is Professor Bruce H. McCormick.

BIDDERS IN ON ERC RFPS

The following firms have submitted proposals to NASA-Cambridge procurement requests:

Time standards for interplanetary flight navigation (ERC/R&D 66-113)--Hydro Space Systems Corp., Pickard & Burns Electronics, and Varian Associates.

Large computer use in solving problems of calculus and algebra (ERC R&D 66-117)--Allen-Babcock Computing, C-E-I-R, Computer Research Corp., GE, IBM, Lockheed Missiles & Space, and United Aircraft Corporate Systems Center (SPACE Daily, Dec. 8).

Investigation of refractory dielectrics for integrated circuits (ERC/R&D 66-120)--General Precision-Librascope, GT&E Labs, Hughes-Microelectronics, IBM, Litton Systems-Guidance & Control Systems, McDonnell-Electronics, Microwave Associates, Motorola-Semiconductor Products, United Aircraft-Norden, Raytheon-Research and Sperry Rand Research Center (SPACE Daily, Dec. 14).

NATO/NORD CT-20 DRONE PACT FINALIZED

The NATO contract with Nord Aviation for CT-20 target drones (SPACE Daily, Nov. 19) for deployment on Crete Island has been formalized at \$20 million for 450 drones. The award, which Greece negotiated for NATO, calls for Nord and Sodeteg Engineering to organize and equip the drone base, with the initial flights to take place by about the middle of next year. The base has been named NAMFI (NATO Missile Firing Installation).

The CT-20 is 17 feet, 8 inches long, 2 feet, 2 inches in diameter, and 11 feet, 10 inches from wingtip to wingtip. Normally launched from a 33-foot ramp, it weighs 1480 pounds at takeoff and has a ground-level thrust of 1060 pounds. Its effective ceiling is 50,000 feet; its endurance at 33,000 feet is one hour (speed: Mach .85); and its recovery is by parachute.

HALVORSON TO CONSTRUCT DOUGLAS RICHLAND LABS

Douglas has awarded a contract valued at approximately \$1.75 million to H. Halvorson Inc. of Spokane, Wash., for construction of the Donald W. Douglas Laboratories in Richland, Wash. Construction will begin immediately with completion due in approximately 10 months. The labs, which will be operated by the Missile & Space Systems Division, will employ around 100 persons at the end of the first year of operation.

WESTON NAMES FLORIDA SALES REPRESENTATIVE

Weston Instruments of Newark, N.J., has assigned Reynolds & Associates (Eau Gallie, Fla.) to represent the WESTON product line throughout Florida. The product line consists of panel meters, laboratory test instruments and standards, portable meters, photocells, techometers, relays, thermometers, potentiometers, and servo components and sub assemblies.

AIAA TO HONOR FRANCIS JOHNSON

Francis Johnson, director of the Southwest Graduate Research Center's Earth and Planetary Sciences Lab and the man who discovered the hydrogen layer in the Earth's atmosphere, will be presented the 1966 Space Science Award of the American Institute of Aeronautics and Astronautics at its Honor Convocation January 25 in New York City. A \$1000 honorarium from Bell Aerosystems will accompany the award, which will cite Johnson for "contributions to knowledge of the solar constant ultraviolet spectrum, atmospheric structure and dynamics, the geocorona, and the existence and nature of atmospheric gravity waves." He is presently serving on several NASA and NAS committees.

President Johnson will appoint James Stemble Duesenberry as a member of the Council of Economic Advisers. Duesenberry, a full professor at Harvard, will succeed Otto Eckstein, who will return to his duties at Harvard about February 1.

Future Space Business**INFRARED SPECTROMETER DESIGN**

NASA-Marshall is planning the research, design and development of a far infrared spectrometer.

Contact: Purchasing Office, George C. Marshall Space Flight Center, Huntsville, Ala. 35812. Reference: RFQ 1-6-28-00031. Due date: Feb. 7.

CRYOGENIC THERMOMETER STUDY

NASA-Marshall is initiating for the study, design, development, and fabrication of a prototype digital cryogenic thermometer.

Contact: Purchasing Office, George C. Marshall Space Flight Center, Huntsville, Ala. 35812. Reference: RFQ 1-6-80-00222. Due date: Feb. 7.

SATURN MANUFACTURING TECHNOLOGY/WELDING

NASA-Marshall is planning **SATURN** manufacturing technology for welding methods and techniques.

Contact: Purchasing Office, George C. Marshall Space Flight Center, Huntsville, Ala. 35812. Reference: RFQ 1-6-30-32619. Due date: Feb. 7.

DOD NEGOTIATIONS

Thiokol Chemical Corp., Huntsville Div. --with Army Missile Command for a research program for development of functionally terminated high energy prepolymer.

Lockheed Missile and Space Co. --with Air Force Space Systems Division for modification of the RF data link system.

Bell Aerosystems Co., Div. of Bell Aerospace Corp. --with SSVAK, Space Systems Div. for a contract for engines for the **AGENA** vehicles.

AVCO Corp., Research and Development Div. --with Army Electronics Command for the continuation of research investigations entitled "optical sources."

Boeing Co., Seattle, Wash. --with Army Electronics Command for the further investigation of electromagnetic shielding.

NASA NEGOTIATIONS

Wheeler Laboratories, Inc. --with Electronics Research Center, Cambridge for microscopic optical waveguide and optical component research.

DOD CONTRACTS

Army

Syracuse University Research Institute--\$27,351 for a one year study of the stability of spherical shells subject to time dependent loads.

General Electric Co.--\$29,400 for performance of additional effort for the design, fabrication and checkout of an extended dynamic range orthicon television system, Project **GLOW**.

Air Force

North American Aviation, Inc.--\$13.8 million for components of the improved **MINUTEMAN** guidance system.

Hughes Aircraft Co.--\$1.2 million for work on an air-to-surface missile guidance program.

Raytheon Co.--\$1.2 million increment to a previously awarded contract for work on a rocket research program.

North American Aviation, Inc., Autonetics Div.--\$29,709 for research on thin film optical transmission line.

Arinc Research Corp., Annapolis Science Center--\$30,053 for system reliability prediction by function.

Lockheed Propulsion Co.--\$139,203 for kinetics of decomposition of solid oxidizers.

Westinghouse Electric Corp.--\$44,939 for ion migration in thin films.

Litton Systems, Applied Sciences Div.--\$50,000 for research and investigation of depth of penetration of bombarding ions into the sputtered surface.

Space General Corp.--\$64,416 for **NIKE-IROQUOIS (NIRO)** rocket hardware.

North American Aviation, Inc., Rocketdyne Div.--\$76,761 for spare parts of a specialized technical nature for the **ATLAS** propulsion subsystem in support of the **ABRES/NIKE ZEUS** program.

NASA CONTRACTS

Lewis

General Electric Co.--\$44,700 for a program of aerodynamics' design of part-span shrouds for advanced compressor concepts.

Hughes Aircraft Co., Hughes Research Labs.--\$49,949 for the measurement of the charge exchange cross-section of Mercury.