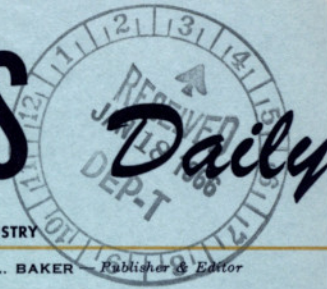


SPACE BUSINESS



FIRST DAILY MANAGEMENT NEWS SERVICE FOR THE MISSILE / SPACE INDUSTRY

SPACE PUBLICATIONS

WASHINGTON, D. C.

NORMAN L. BAKER *Publisher & Editor*

TWX: 202 - 965-0765 (SPACE - WASHINGTON)

Published five times a week by Space Publications at 1341 G St., N.W., Washington, D. C. 20005

Subscription rates: \$175.00 for one year, \$110.00 for six months, \$20.00 for one month.

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Thursday, January 13, 1966 ©

Vol. 24, No. 9

SENATE SPACE COMMITTEE SCHEDULES HEARINGS. The Senate Space Committee has scheduled hearings on the communications satellite program, January 25-26, and on authorizations for NASA, February 28 and March 1-5.

The tentative schedule calls for the director of the Defense Communications Agency, Lt. Gen. Alfred D. Starbird, or his next-in-command to lead off the witnesses for the communications satellite program hearings. Other probable witnesses are: ComSat president Dr. Joseph Charyk, James McCormack, ComSat chairman of the board and chief executive officer, Dr. Homer E. Newell of NASA, James D. O'Connell, assistant director/director of telecommunications management in the Office of Emergency Planning and the State Department's C. Hoyt Price, director of the Office of Telecommunications.

NASA Administrator James E. Webb, Deputy Administrator Robert C. Seamans, and associate administrators George E. Mueller, Homer E. Newell, Edmond C. Buckley and Mac C. Adams will probably head NASA's list of witnesses for the hearings on the space agency's FY '67 budget.

The committee has also scheduled a round of hearings for sometime in April on the nation's goals in aeronautics research and development over the next 10 to 15 years. Similar hearings were held last year.

NASA EUROPEAN COOPERATION TRIP SEEN SOON. Reports reaching SPACE Daily in Europe say "an important NASA team" would arrive in Europe on January 28, with its first destination West Germany. While such a trip could be expected to be no more than a follow-on of US/German talks in Washington for possible acceleration of US/European space cooperation in the future, intelligence portrays it as the start of a US-European cooperation at the top level.

The NASA in Europe confesses to know nothing of the plans for such a trip while NASA-Washington, admitting that they "can't rule out the possibility," say plans have not been made at this time. NASA emphasizes that any such trip to include James Webb during this month does not appear likely. However, Webb, unless he is called as a witness before the Senate Space Committee for communications satellite hearings beginning January 26 (See above) will not be needed for NASA budget hearings before February 15 (SPACE Daily, Jan. 11). NASA does reaffirm that Webb is supposed to leave for the space cooperation meetings "early this year as outlined by the President."

ELDO LEADERS TO MEET TO PLOT FUTURE.

ELDO (European Launcher Development Organization) scientific and/or space research ministers are considering a possible major planning meeting in the second half of 1966 to review the future of the European space launcher program. The theme of the agenda will be the search for a decision on how far and how fast should the ELDO move after **EUROPA-1**. First, they will tackle the problem of how far can ELDO go technically while ELDO wants to know how far the governments of the organizations can and are willing to go financially. There may be some difficulty in firming an early exact date for convening the body. Earlier, a large ELDO meeting had been planned for this spring.

PAN AM TESTING BENDIX SATCOM SYSTEM.

Pan American Airlines, its eye on the not-too-distant day when ComSat's air traffic satellite (yesterday's SPACE Daily) will be in place over the Atlantic to help control commercial flights, is conducting a series of inflight tests of the Bendix Radio transceiving system that could be used to communicate with the satellite. The flights are regular Pan Am trips between San Francisco and Honolulu, and four tests have already been completed (January 4, 6, 8 and 11). The next test is today, and more are set for Saturday and the coming week. Ground stations have been set up in each city, and broadcasts are made directly with the aircraft via a troposcatter link (no satellites involved) from San Francisco.

The Bendix system includes a modified RTA-41 VHF AM transceiver, a modified FM modem unit, a preamplifier, an amplifier that jumps a standard 25-watt aircraft signal to 500 watts, and a Boeing antenna. Bendix has already fabricated some preliminary production models of this system and is prepared to enter full-scale production once the airlines are ready to convert their planes for satellite communications.

One major problem for air-to-space transmissions has been the aircraft antenna. Boeing and Douglas have been seeking solutions in anticipation of the need of supplying satcom antennas with the planes they build for the airlines. In fact, Pan Am has already issued to those two companies such a specification, and TransWorld Airlines has run a series of antenna tests. Also under development now are antennas that can be retrofitted on planes presently in service. Bendix and Dorne/Margolin (Westbury, N.Y.) are the developers.

Similar Tests Run Last Winter.

The feasibility of using a satellite to relay aircraft communications was established last fall and winter when Pan Am, Bendix, and Boeing used Hughes' **SYNCOM III** to experiment with antenna configurations and a Bendix receiver. All the flights, save one, were San Francisco/Honolulu (**SYNCOM III** was, and is, over the International Dateline), and all used a Boeing 720B plane, plus Boeing antennas.

The first two flights--September 21 and 22, 1964--demonstrated the inability of conventional antennas to work satisfactorily with the receiver. The third flight--November 22--affirmed the ground-to-satellite-to-aircraft concept when teletype transmissions from a NASA facility at Camp Roberts, Calif., were received successfully aboard the plane as it headed toward Honolulu. The fourth, fifth, sixth, and seventh flights--January 27, 28, 29 and 31, 1965--verified the overall operation of the plane/satellite/terminal system.

FRENCH TEST FLUORINE ROCKETS. Tests are underway by French scientists at the LBRA (Laboratoire de Recherches Balistiques et Aerodynamiques) of Vernon on liquid fluorine rocket engines. The tests, being conducted by ONERA (Office National d'Etudes et de Recherches Aerospatiales) and SEPR (Societe pour l'Etudes et la Propulsion par Reaction), are seeking to demonstrate two different systems. SEPR is developing a 220-pound thrust engine while ONERA is working on a 2200-pound thrust system. A new test stand has been built in Vernon for these advanced propulsion tests.

NEW ESRO TRACKING STATION UNDER CONSTRUCTION. A new tracking station for the ESRO (European Space Research Organization) ESRANGE network is under construction at Redu, Haute Hesse, Belgium. It is expected to be operational by the end of the year. A world-wide tracking and telemetry network is being established by the French CNES under an agreement with ESRO. The French stations, identified as Diane and Iris, are designed for low-latitude operation while the ESRANGE stations will operate the upper latitudes.

BELGIAN FIRM DEVELOPING ESRO PAYLOADS. The Space Division of the Belgian SABCA Societe Anonyme Belge de Constructions Aeronautiques) is developing new sounding rocket payloads for the European Space Research Organization (ESRO). The company recently delivered to ESRO a new payload for the British **SKYLARK**. Current payloads under development include meteorological data gathering equipment.

BELGIUM'S ACEC BIDS FOR ESRO/US SPACE WORK. ACEC Company (Ateliers de Constructions Electriques de Charleroi) of Belgium currently holds no development contracts in the space business but it has formed a Space division, established a separate company with General Dynamics, and has just completed and put into service a clean room for satellite assembly. At the present time ACEC is bidding actively for prime work while it performs subcontract assemblies for most of the electronics for the French drone **CT-20** produced by Nord Aviation (SPACE Daily, Nov. 19 & Jan. 12). ACEC will be assigned the fabrication work for the General Dynamics/ACEC company, known as ETCA, which at the present time is contracted only for studies.

NAA TO DEMONSTRATE MANEUVERING ENGINE. The Air Force Rocket Propulsion Laboratory plans to negotiate with NAA-Rocketdyne for a continuation of the program to demonstrate a rocket engine system which can be utilized for space maneuvering systems. The Air Force was allocated \$7 million for the development of space maneuvering rockets which could be used for rendezvous and docking (SPACE Daily, March 3).

GOODYEAR'S BALLUTE APPLICATIONS STUDY TO BE EXTENDED. The Air Force Special Weapons Center anticipates a continuation of the sole-source contract with Goodyear Aerospace for the development of applications of the Ballute technique for slowing and stabilizing re-entry bodies (SPACE Daily, July 7), with applications for space shuttles, penetration aids and ballistic re-entry programs being explored.

F-4 CORALIE DELIVERED TO WOOMERA

The dummy model of the **CORALIE** second stage that will be used on the fourth test flight of the European Launcher Development Organization's **EUROPA-1** vehicle (SPACE Daily, Oct. 8 & 21 and Dec. 10 & 17) has been delivered to the Woomera, Australia, launch range as scheduled (SPACE Daily, Dec. 10), and the dummy third stage is set to be flown to Woomera January 24 as indicated (SPACE Daily, Dec. 10). The test, F-4, is expected in late March (SPACE Daily, Dec. 10), but early April is still a possibility as it was (SPACE Daily, Oct. 21). The **BLUE STREAK** first stage left England before Christmas for Woomera (SPACE Daily, Dec. 10) and should arrive there on its barge soon. **CORALIE**, made by Nord Aviation, is undergoing static tests at the French company's Vernon plant (SPACE Daily, Dec. 17). The third stage is German-built.

ELECTRON-BOMBARDMENT ION THRUSTOR SYSTEMS TEST PROGRAM

NASA-Lewis has invited 15 firms to submit proposals for an experimental and analytical testing program of electron-bombardment Kaufman-type ion thruster systems which use mercury as a propellant.

The following companies are on the Center's solicitation list: Aerojet-General-Cleveland, GE-Cleveland, Westinghouse-Cleveland, Douglas-Cleveland, General Dynamics-Cleveland, RCA-Camden, Hughes-Malibu, Texas Nuclear-Austin, Battelle-Northwest-Richland (Wash.), TRW-Cleveland, North American-Cleveland, Electro-Optical-Pasadena, Bell Aerosystems, Ion Physics-Burlington, TRW Systems Group, and Arnold Engineering Development Center (Tenn.). Proposals are due at the Center by January 21.

REDSTONE READIED FOR DEFENDER

A November 30 test of a seven-year-old **REDSTONE** missile modified for the Advanced Research Project Agency's Project **DEFENDER** has been termed a complete success by Chrysler after studying the launch reports.

Some 24 of the Army-stockpiled **REDSTONEs** have been ordered by ARPA for use in re-entry measurements. The boosters are being used in a cooperative program with the Navy on the West Coast, and in a cooperative program with Australia and the United Kingdom at Woomera, Australia.

The **REDSTONE** fired last November from the West Coast has been in the Army's combat-ready stockpile for the past five years. It was one of the first **REDSTONEs** reactivated by Chrysler last June for Project **DEFENDER**. The launch was the first for a **REDSTONE** since November 1963, when Army troops conducted the final in a series of 25 training flights at White Sands. Other programs utilizing existing **REDSTONEs** for new missions "are under active consideration," Chrysler said.

Arthur T. Bourgault has been elected president of Haveg Industries, a wholly owned subsidiary of Hercules Powder. Bourgault, formerly vice president and general manager of the Taunton Division, succeeds **Dr. John H. Lux**, who has resigned to accept the presidency of Ametek, Inc., of New York City.

ITT TO PROVIDE NIMBUS B CAMERA

A new daytime weather camera for the **NIMBUS B** is being developed by ITT Industrial Laboratories under a \$600,000 contract from NASA-Goddard. The seven-pound camera will have a transmission range of 1500 miles from satellite to ground stations and a picture area of 1620 square miles. The camera is 4.5 by 5.5 by 15.5 inches and has a power requirement of 8.5 watts. ITT was awarded another contract by NASA-Goddard last month to develop a daytime, continuous scanning meteorological camera for the **ATS** spacecraft (SPACE Daily, December 16).

DOUGLAS BEGINS NUCLEAR RESEARCH LABORATORY

Ground will be broken today for the new \$1.75 million nuclear research laboratory being built in Richland, Wash., by Douglas Aircraft (SPACE Daily, Jan. 12).

The new facility--the Donald W. Douglas Laboratories--will support space programs of the Douglas Missile & Space Systems Division's Space Systems Center, Huntington Beach, Calif. Laboratory research, under the overall direction of Dr. W. E. Matheson, will be concentrated on projects such as nuclear electric power systems and advanced high-thrust nuclear propulsion work. Application will be to nuclear rockets for manned interplanetary missions of the future, and to power plants for manned orbiting space stations, several of which Douglas has studied and defined, particularly in its role as prime contractor for the Air Force **MOL** (SPACE Daily, August 26). About 100 persons will be employed at the laboratories by the end of the first year's operation, Douglas said, with future growth in employment and scope of activity anticipated.

First shovelful of dirt from the site will be sent to Vandenberg AFB to be sent into space on a Douglas-built space booster.

S-IVB EXPECTED AT ARNOLD FRIDAY

A Douglas S-IVB third stage of the **SATURN V** is expected to arrive at the Air Force Arnold Engineering Development Center Friday to begin a series of tests in the high altitude simulation rocket test cell. The cell has an underground exhaust chamber 250 feet deep by 100 feet in diameter. It is one of two high altitude test cells of Arnold's Large Rocket Facility.

The Air Force reports that there "have been some difficulties" in loading the S-IVB from barge to truck at Pittsburgh, some 40 miles from the Test Center. Delivery is still expected this week, however.

R. A. Denzor, assistant director of international marketing for Douglas, has been named director of international operations. He will be responsible for providing coordination of Douglas international programs including development of new overseas markets and negotiation of foreign license agreements.

Robert B. Abbey has joined the staff of Atlantic Research to represent the company's Propulsion and Chemical Systems Division in the Los Angeles area. Abbey was previously field-sales engineer for marketing for Talley Industries.

RCA TO ACQUIRE FORMER RAYTHEON PROPERTY

RCA will acquire the former Raytheon Building in Lewiston, Me., for use in production of its semiconductor devices. The company will spend \$4.1 million of its 1966 \$195 million expansion budget to purchase and equip the building.

WESTINGHOUSE UPGRADES SILICON SOLAR PANELS

Westinghouse's semiconductor division at Youngwood, Pa., has been awarded a \$249,995 contract by the Air Force Aero Propulsion Lab at Wright-Patterson AFB to further develop the division's recently evolved method of producing silicon strips for solar panels. The company claims the half-inch strips offer less weight, more reliability, and far more power for panels using them. The strips are produced in ribbons up to 18 feet long.

S-IVB-4 ARRIVING/S-IVB-2 LEAVING SACRAMENTO

The upper stage for the second **SATURN IB** vehicle has been tested at the Douglas Sacramento test site and is due to leave for Cape Kennedy Saturday by barge. Enroute to Sacramento is the fourth S-IVB second stage, which will replace S-IVB-3 in the test stand. S-IVB-2 has been at Sacramento since early fall (SPACE Daily, Oct. 5, p. 168). S-IVB-3 arrived there about a month later (SPACE Daily, Nov. 2). And S-IVB-4 has been in assembly at Douglas' Huntington Beach plant until recently (SPACE Daily, Oct. 5, p. 168).

ASTRONOMY SPECTROGRAPH TO RIDE AEROBEE 150

Perkin-Elmer will soon complete its work on an ultraviolet astronomical spectrograph that will be launched on an **AEROBEE 150** sounding rocket to gather photographic data on starlight in the region of 1200 to 3000 angstroms. The work is being done under a \$99,000 contract from the Kitt Peak National Observatory at Tucson, Ariz., and is expected to end next month. The spectrograph will be gyrostabilized, will make observations for up to five minutes, and will be recovered by parachute.

APOLLO ABORT VI SET FOR JANUARY 18

The **APOLLO** Abort-VI (SPACE Daily, Dec. 3, 7, & 17) originally scheduled for Dec. 18 will be held on January 18 at White Sands Missile Range (SPACE Daily, Dec. 20).

SIX INVITED TO BID ON RESISTORS DEPOSITION PROCESS

Six companies--Aerojet-General, General Precision Librascope, IBM Federal Systems, MHD Research, Melpar, and Sprague Electric--have been invited to submit proposals for NASA-Cambridge's study of cold-substrate deposition of thin-film passive elements. Interested firms have until January 25 to submit bids on RFP R&D 66-158.

Future Space Business**RANGER PHOTOGRAPHS PROCESSING CONTRACT**

The Rocky Mountain Area of the U. S. Geological Survey is inviting interested firms to submit bids for the work of processing **RANGER** lunar photographs for removal of television scan discretization by optical spatial filtering. The contract will extend through June 1966.

Contact: U. S. Geological Survey, Rocky Mountain Area, Building 25, Federal Center, Denver 25, Colo., Attn: Service and Supply Officer. Reference: IFB 66-31. Due date: Jan. 26.

SPACE APPLICATIONS POTTING/ENCAPSULATING COMPOUNDS

NASA-Marshall is preparing to fund the development of improved potting and encapsulating compounds for space applications.

Contact: Purchasing Office, Marshall Space Flight Center, Huntsville, Ala. 35812, Attn: PR-ES, C. H. Brown, Telephone: 842-3204. Reference: RFQ DCN 1-6-54-01107. Due date: Feb. 9.

BASE FLOW/SEPARATION STUDIED

NASA-Marshall is issuing RFQs for base flow and separation studies.

Contact: Purchasing Office, Marshall Space Flight Center, Huntsville, Ala. 35812, Attn: PR-ES, C. H. Brown, Telephone: 842-3204. Reference: RFQ DCN 1-6-75-00096. Due date: Feb. 9.

DC PROTOTYPE GUIDANCE CONTROL UNITS

The Army Missile Command is inviting companies to submit proposals for the fabrication and assembly of DC prototype guidance and control units including associated test equipment to support an exploratory development program under the direction of the R&D Directorate's Advance Systems Lab.

The proposed contract calls for the practical application of investigative findings and theories of a scientific and technical nature and requires the making and furnishing of such quantities and kinds of equipment as are necessary for experiment development and test.

Contact: U. S. Army Missile Command, Redstone Arsenal, Ala. AMSMI-IZD. Reference: RFQ AMSMI-IZ(D) 66-71. Due date: Feb. 14.

NASA NEGOTIATIONS

Data Control Systems--with Houston for data processing submodules.

North American Space and Information Systems--with Houston for test cell nitrogen system, clean room modifications, plating area enclosure, and additional telemetry room power.

DOD CONTRACTS

Army

Raytheon Co. -- \$2.1 million modification to an existing contract for work on the design and development of the **HAWK** Anti-tactical Ballistic Missile System.

Navy

Goodyear Aerospace Corp. -- \$18.5 million fixed-price contract for **SUBROC** missiles and related equipment.

Air Force

Lockheed Aircraft Corp. -- \$2 million and \$3.5 million to two existing contracts for satellite control facility work.

NASA CONTRACTS

Lewis

Astrodata, Inc. -- \$73,934 for addition of increased data system capabilities.

Doan Electric Co., Cleveland, Ohio -- \$815,000 for instrumentation data acquisition and controls systems for the space propulsion facility.

USAF Space Systems Command -- \$50,000 for **DSV-21/THORAD** capability.

USAF Space Systems Command -- \$1.5 million for **AGENA** launch services at ETR.

USAF Space Systems Command -- \$1.5 million incremental funding for eight **AGENA** vehicles.

USAF Space Systems Command -- \$321,000 incremental funding for two **LV-2A** vehicles and launch services for **PAGEOS A & B**.

USAF Space Systems Command -- \$310,000 incremental funding for **THOR/TAT** hardware and/or travel services.

USAF Space Systems Command -- \$2.4 million incremental funding for **ATLAS** booster hardware and launch service.

Lockheed Aircraft Corp., Missiles and Space -- \$25,139 for incorporation of **ISIS-X** mission spare parts.

Lockheed Aircraft Corp., Missiles and Space -- \$789,856 for incorporation of change orders.

AVCO Corp. -- \$627,347 for the design, development, fabrication, test and delivery of electrothermal engine systems.