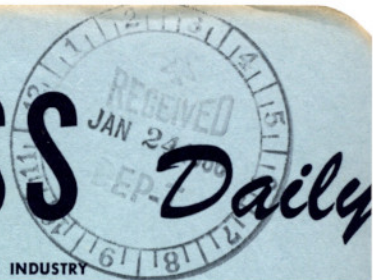


SPACE BUSINESS



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AA TO REPLACE AOSO.

The objectives of the ill-fated Advanced Orbiting Solar Observatory (AOSO), cancelled recently by NASA (SPACE Daily, Dec. 16) due to "budgetary considerations", are set to be attempted as major experiments aboard manned AA (APOLLO Applications) flights.

AA program officials say the manned space station experiments will be able to collect much of the same type of data as the AOSO but would not be able to accomplish one objective of the unmanned satellite -- maintaining continuous monitoring of solar phenomena. This problem could be remedied by including the solar monitoring experiments aboard a LEM Laboratory Module which could be left in space to continue unmanned remote observations of the Sun.

AOSO, to have been developed by Fairchild-Republic, was intended to be launched in 1969 to augment the OSO observations during the period of maximum solar activity. It was designed to study the Sun's fine structure, localized rapid solar fluctuations, and the Sun's radiation and its significance from a position free of atmospheric interference. To accomplish these objectives AOSO would have required the capability of target acquisition and holding within five arc seconds, the use of high resolution telescopes and spectographs, a broad search capability, an accurate and quick reaction pointing ability, and a high resolution and high data rate instrumentation.

WEBB EUROPEAN TRIP DELAYED.

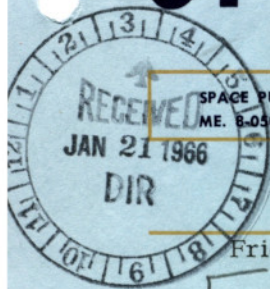
NASA Administrator James E. Webb's proposed trip to western Europe to discuss the "joint exploration of space" as announced by President Johnson (SPACE Daily, Dec. 22), is tentatively scheduled for late March or early April. Although the President had said that Webb would be sent "early in the year", NASA budget problems have occupied Webb's time throughout January and he will be busy during most of February preparing for and engaged with Congressional hearings.

The possibility of sending an advance team of NASA officials to hold preliminary talks is being discussed (SPACE Daily, Jan. 13). The possible itinerary for such an advance party or for Webb's trip has not been decided as yet.

SOVIETS HINT OF MAJOR MANNED MISSION.

Soviet reports refer to preparations for a new major manned space flight which will represent an outstanding expansion of manned experimentation. Space stations, carrying from three to eight men, will be orbited for missions of about 30 days. This indicates that the new PROTON booster will probably be employed to carry out the mission.

The Leader in Missile/Space Reporting



FRENCH COMSAT INTEREST EXPANDING. France, one of the original 11 countries to join ComSat on August 20, 1964, is beginning to show interest in a communications satellite of its own. Years ago CFTH (Compagnie Frangaise Thompson Houston) proposed to the French government that a satellite similar to **SYNCOM** be developed (name: **TELECOM**). Now, a handful of French companies are teaming with American firms to prepare for technical exchanges in the event the government intensifies its interest, a possibility underpinned by the intended FY '66 funding in the French budget of a communications satellite.

Among those teams are CFTH/Hughes, MATRA/TRW Systems, and NORD/-Philco. The erstwhile funded satellite may have been the 330-pound **D-5** payload that France has been considering for launch in the 1970s on a **REGENT** or **ELDO**-class vehicle. CNES, the French space agency, has been hard put financially and may have dropped plans to further study and develop **D-5** during FY '67. France has been operating a ground station at Pleumeur-Bodou in Brittany since July of 1962. It is one of the major stations that support ComSat's **EARLY BIRD**.

UN CONSIDERS INTERNATIONAL SPACE CONFERENCE. A Working Group of the United Nations Committee on the Peaceful Uses of Outer Space is presently considering a proposal to hold an international conference in 1967 on the possible cooperative applications of space exploration. The Soviet Union has supported the proposal and the United States will support the conference but wants it to be more than a recital of space accomplishments.

The United States' position calls for a conference which will investigate how space exploration can benefit mankind. Our delegates will suggest four topics for consideration by the conference: the opportunities for participation in space exploration; the economic implications of space exploration; the impact of space exploration on education; and the UN role in each of these areas.

NASA-EDWARDS SPACE SHUTTLE EXTENSION DELAYED. The planned extension of the NASA-Edwards manned space shuttle concept feasibility study (SPACE Daily, Jan. 11) has been delayed. The studies, which were to have been completed in December, were undergoing negotiation with the two contractors in order to extend them until the end of January but this action has not yet been completed. McDonnell and Northrop Norair are performing the study.

DOUGLAS BACKLOG PASSES \$2 BILLION MARK. Douglas had sales of \$766,790,535 for FY '65, compared with 1964's \$650,127,609. Earnings rose correspondingly from \$13,694,988 to \$14,598,313. The company's backlog jumped from \$935,861,000 as of November 30, 1964, to \$2,041,739,000 a year later. Of the year-end backlog, \$1,378,156,000, or about 67 per cent, was commercial and \$663,583,000, or about 33 per cent, was government work.

Capt. Dante R. Marzetta (USN, Ret.), a former executive officer of the Industrial College of the Armed Forces, has been named administrative services manager of Johns Hopkins' Applied Physics Laboratory.

EUROPA 1 FUTURE GROWING CLOUDY -- II. The mounting dissatisfaction with the progress of ELDO's **EUROPA 1** launch vehicle (yesterday's *SPACE Daily*) is rooted in both technical and administrative problems. The third stage, a nameless German system, is more complex than the other two stages (as an ELDO official told *SPACE Daily*, Dec. 17, bottom p. 271), so small modifications in those two mean larger changes in the upper one. Also, the choice of the third stage's two vernier engines proved difficult, and serious problems arose during tests of the stage.

Another headache is whether the planned switch in the middle of the flight test program from aluminum boilerplate frames to titanium ones will prove successful. Aluminum frames .01 inches thick are to be used for the upcoming second block of tests (F-4, F-5, F-6.1, and F-6.2), which will use dummy upper stages for the first two, and live second and no third stages for the last two (*SPACE Daily*, Dec. 17). For the third block (F-7, -8, -9, and -10) (all stages live), titanium frames .004 inches thick are to be used, which will bring structural changes and, thus, problems.

Bureaucratic Indecision/Inefficiency. Administratively, the obstacle seems to be the usual bureaucratic indecision and inefficiency. Coordinating the overall development effort and making technically sound decisions when they need to be made are apparently not being done both within and outside of ELDO (European Launcher Development Organization).

The fate of **EUROPA 1** will affect the lives of its younger but more advanced brothers, the other vehicles ELDO hopes to develop around the basic **EUROPA 1** configuration as the United States has developed its **TITAN** and **SATURN** vehicle lines (*SPACE Daily*, Dec. 1 & 3). **EUROPA 1** is designated the ELDO A configuration, and under consideration are designs A2 (called AS), B1, B2, and C. The Bs continue to be the favored, however, and the talk is now that B1 could be operational by 1973 and B2 by '75. **EUROPA 1** is supposed to become operational in '68. It can orbit 2200 pounds (*SPACE Daily*, Dec. 17) while B1 can put up 3970 pounds and B2 7050 pounds (low orbits in all three cases).

Third CORALIE Test "Fully Successful". **EUROPA 1**'s second stage, **CORALIE**, made by Nord Aviation and LRBA (Laboratoire de Recherches Balistiques et Aerodynamiques), is presently undergoing static tests at LRBA's Vernon (Eure, France) facility. The first test, in late October, was successful. The second, in mid December (*SPACE Daily*, Dec. 17) was partly successful. And the third, held earlier this month, has just been declared a complete success (the tests are largely secret). This one, like the first and unlike the last, did not involve the stage's thrust vector control system. The burn lasted 100 seconds (full-duration). The fourth test is set for late this month.

The **CORALIE** for the next flight test, F-4 (Fire-4), of **EUROPA 1** was delivered to the Woomera (Australia) launch range last week (*SPACE Daily*, Jan. 13). F-4 will occur in late March or early April (*SPACE Daily*, Dec. 10). It will be a suborbital shot. Sentiment within the European space industry is somewhat pessimistic over the vehicle's performance during the F tests yet to be conducted. The development problems seem severe.

DOUGLAS STUDY DEFINES MORL POWER SUBSYSTEM. A plutonium-238 fueled isotope Brayton cycle system appears to be the best system for providing power to a second-generation space station (**MORL**) Douglas Missile & Space Systems Division has reported to NASA-Langley. Douglas was picked for the 10-month study 16 months ago (SPACE Daily, Sept. 16 '64). Garrett's AiResearch (SPACE Daily, May 6) and NAA Atomic International assisted in the study.

The Brayton System concept was studied as if it were integrated into the NASA **MORL** (Manned Orbiting Research Laboratory). The **MORL**, a second-generation, 6-9 man laboratory, was selected as the basis for isotope power plant design and evaluation because it is "the most detailed Earth orbital concept available." Douglas said the potential development scheduled for the power system "closely parallels that projected for the **MORL**"--the early 1970's.

The Brayton System would deliver 11 kilowatts of electrical power at a 25 per cent overall system efficiency. The system consists of two redundant power conversion systems using plutonium fuel blocks to provide isotope energy by radiation to a surrounding heat exchanger. The system would be designed to operate without resupply or replacement of the fuel blocks for a full mission duration of five years. Provisions would be made for periodic replacement of the power conversion packages which contain all of the rotating machinery. Douglas concludes that the Brayton System could be used on support missions ranging from those visualized for the **APOLLO** Applications (**AA**) program to early lunar exploration and basing missions (**AES/LESA**).

Douglas, prime contractor on the envisioned **MORL** (SPACE Daily, Dec. 3 '63), is investigating several subsystems of the space station for Langley. Resistojet and radioisotope rocket engine concepts have been selected for study for use on **MORL** (SPACE Daily, Nov. 15). Marquardt and TRW Systems are subcontractors.

ROCKET-EXHAUST CONTAMINATION STUDY RECOMMENDED. An up-rated emphasis on studies to investigate unintentional alteration of the atmosphere by man has been recommended by a weather panel of the National Academy of Sciences after a two-year study of the present scientific status of weather and climate modification. One such alteration listed as a critical subject for study: rocket-exhaust contamination of the higher atmosphere. In the overall area of weather and climate modification, the panel recommended an increase in the level of Federal research support from the current \$5 million to at least \$30 million a year by 1970.

FIRST APOLLO CREW SELECTED. NASA has chosen the first three-man **APOLLO** crew for the first manned **SATURN IB** flight planned for late this year. Announcement of the crew is being held up until the first unmanned flight test of the **SATURN IB**, presently scheduled for the middle of February.

HUGHES CONTINUES AEROSPACE GROUP REORGANIZATION

In its latest move to improve its space/defense position, Hughes has made three key appointments within its aerospace group to reflect its expansion in both program development and facilities. William F. Eicher, a corporate vice president and previously manager of the aeronautical systems division, has been named to the new position of vice president-operations. Dr. Leonard Gross was named to succeed Eicher and Meade A. Livesay was appointed associate manager of the aeronautical systems division. Gross formerly was associate manager and Livesay assistant manager of the same division.

In upgrading the research and development division of the aerospace group, Hughes recently named Edwin H. Meier as a corporate vice president and Dr. Malcolm R. Currie as associate manager of the research and development division (SPACE Daily, Jan. 18). Meier will also continue in his old position of manager of the division.

In addition to changes within the aerospace group division, Hughes recently established a new missile systems division at Canoga Park, Calif. (SPACE Daily, Jan. 10). The division, under the direction of Warren E. Mathews, formerly associate manager of the research and development division, will have overall program responsibility for specific missile programs and will assist other systems divisions in designing and developing the missiles associated with major weapon system programs. Activities at the new division will be confined to R&D missile contract management, marketing and production of some experimental prototype hardware. Included in its responsibilities will be **TOW**, **PHEONIX**, **AIM-4D** and **FALCON**.

BELL INITIATES PROJECT TOTAL

Bell Aerosystems has launched its new Project TOTAL (Team Offensive to Achieve Leadership) which will coordinate the existing company programs for employee suggestion, zero defects, performance improvement, and value engineering.

RUSSIAN SEES COMPETITION AS KEY TO PRODUCTIVITY

The United States' space business and other scientific areas are more productive than comparable Soviet areas because of their industry/competition background, a Soviet scientist said yesterday.

Peter Kapitsa, director of the Institute for Experimental Physics, pointed out that the total number of American and Soviet scientists "differs little," but U. S. scientists produce about one-third of the world's science, while the Soviet Union produces about one-sixth. "Thus, we are the second country in the world, but we produce only half as much as the United States. The productivity of labor among our scientists is lower than among the Americans," Kapitsa said. He added that the solution may be to transfer less productive theoretical scientists to industry, where they might do more effective work.

Col. S. P. Steffes, previously with the Directorate of Data Automation in the Pentagon, has been appointed chief of the Air Force Electronic Systems Division's Electronic Data Processing Equipment Office. Steffes replaces Col. Edward McCloy who has retired.

AMU STARTS TESTS AT NASA-HOUSTON

First test of the Air Force astronaut maneuvering unit (AMU) at NASA-Houston's environmental test chamber last Friday was termed successful, though some difficulties did occur. In the test last week, Maj. Edward Givens, AF AMU project officer, was taken to a simulated altitude of more than 200,000 feet. The AMU was integrated with the NASA ELSS (Extravehicular Life Support System) chest pack (SPACE Daily, Nov. 29) and the GEMINI space suit.

"In the tests the AMU performed successfully under vacuum conditions to be found in spaceflight. . . Some minor problems occurred with suit connections which will be studied further before the next test in the series," a spokesman said.

The AMU is scheduled to be flown as one of a series of Department of Defense experiments on GEMINI IX and XII missions (SPACE Daily, Nov. 9, 12 & 23). Astronaut Charles Bassett, GEMINI IX's pilot, is scheduled to make first space test of the system.

AMU, built by LTV Aerospace, will equip an astronaut with a complete propulsion system for space excursions, an automatic stabilization system to hold him at desired altitude, a two-way communications system linking him to his craft, plus oxygen, pressure and temperature systems to provide a comfortable environment in space. The AMU back pack is propelled and controlled in attitude by 12 hydrogen peroxide-powered reaction jets located in corners of the back. The astronaut maneuvers the pack by operating controls located on two side arm supports.

In the GEMINI test flights the AMU will be carried in the spacecraft's equipment adaptor section outside the crew compartment in the aft portion of the spacecraft. The astronaut, using the NASA ELSS with umbilical, will retrieve the pack from its stowed position in the adapter section and put it on. The umbilical will remain attached. At present there is no approved operational plan to perform untethered flight as part of the GEMINI program. The extravehicular experiment is scheduled to last about 50 minutes, though the AMU is capable of operating for longer periods.

APOLLO ABORT VI SUCCESSFUL

The sixth APOLLO abort test, the first to use an actual APOLLO spacecraft instead of a mockup, was successful yesterday in the final proof of the ability of the launch escape system to rescue the spacecraft from an abort at medium altitude. The launch at White Sands had been scrubbed several times because of electrical malfunctions or weather conditions (SPACE Daily, Dec. 17). A telemetry failure during yesterday's launch marred the test but uprange ground observations confirmed its success.

Leo W. Killen has been named vice president of North American Autonetics' Strike Avionic Systems division. At the same time, Peter A. Kreider was appointed Strike Avionic Systems executive director. Killen formerly was assistant to the president and acting SAS division director, and Kreider was SAS assistant division director.

Future Space Business**POWDERED SPACE FOOD R&D**

The Aerospace Medical Division of the AFSC is planning to initiate the development of a powdered food ration for extended space flights.

Contact: Aerospace Medical Division (AFSC), Attn: AMSKR-1, P. O. Box 35448, Brooks Air Force Base, Tex. 78235. Reference: RFP 41-609-66-133. Due date: Jan. 30.

INFRARED SENSING SYSTEMS FOR USE ON THE LURAIN

NASA-Marshall is requesting proposals for the development of infrared sensing systems for spacecraft studies of localized areas on the lunar surface.

Contact: Purchasing Office, Marshall Space Flight Center, Huntsville, Ala. 35812. Reference: RFQ 1-6-40-6667. Due date: Feb. 28.

LURAIN MODEL BELT FABRICATION

NASA-Marshall is funding the design, development, and fabrication of a detachable continuous belt to be used as a three-dimensional simulated lunar surface model in conjunction with a Link SMK23 visual simulator.

Contact: Purchasing Office, Marshall Space Flight Center, Huntsville, Ala. Reference: RFQ 2-6-22-0001. Due date: Feb. 1.

LIQUID PROPELLANT NON-DESTRUCT TESTING

The Air Force Flight Test Center is planning an investigation to develop a technique for non-destruct testing of liquid propellant missiles. This is an applied research program to investigate the feasibility of a technique for non-destruct testing of liquid propellants in missile tankage. A study to determine the types and rate of propellant degradation under environmental operational conditions will be conducted and a method to convert this data to a meaningful factor will be established to determine the ability of the propellants in the missile tankage to provide the required performance.

Contact: Air Force Flight Test Center, Directorate of Procurement, Edwards Air Force Base, Calif., Attn: FTMKB. Reference: PR 8172603. Due date: Jan. 29.

STABILITY/CONTROL DIGITAL COMPUTER PROGRAM

The Air Force Systems Engineering Group is requesting proposals for the establishment of a digital computer program for estimating the aerodynamic stability and control characteristics of any complete vehicle operating through a large range of hypersonic mach numbers and angles of attack. The approach is not to develop such programs, but examine computer programs being currently developed by industry and select for procurement those programs which can be most

MORE

STABILITY/CONTROL DIGITAL COMPUTER PROGRAM

economically modified to meet the objective.

Contact: Directorate of R&D Procurement, Systems Engineering Group, RTD, Wright-Patterson Air Force Base, Ohio, 45433, Attn: SEKMA. Reference: PR 3393. Due date: Jan. 30.

DOD NEGOTIATIONS

Westinghouse Electric Corp.--with U.S. Naval Ordnance Laboratory for the development and test of a propulsion system for an underwater weapon.

Aerojet-General Corp.--with Air Force Ballistic Systems Division to support the **ATHENA** program.

NASA NEGOTIATIONS

Ling-Temco-Vought, Inc.--with Houston for programs to study related solar activity.

Vitro Labs.--with Houston for the design, development and fabrication of an engineering model of a conical fluid transpiration arc which will be used as a radiation source for the solar simulation modules in NASA-Marshall's space environment simulation laboratory.

North American Space and Information Systems Div.--with Houston for equipment modifications on a vibration system.

Avco Corp.--with Goddard for a resistojet thruster system for flight simulation testing in the **ATS** (Applications Technology Satellite) program.

National Engineering Science Co.--with Langley to perform a study related to statistics of laser noise.

EWEN-Knight Corp., East Natick, Mass.--with Cambridge for an experimental study of techniques for discrimination against atmospheric effects.

Honeywell -- with Marshall for research study of a large flexible launch booster control.

NASA CONTRACTS**Goddard**

TRW Systems Group--\$637,500 to fabricate detection of plasma waves in the magnetosphere experiments and associated equipment for the Orbiting Geophysical Observatory program.

Interstate General Contractors, Chicago, Ill.--\$58,471 for the construction of **ATS** operation building.