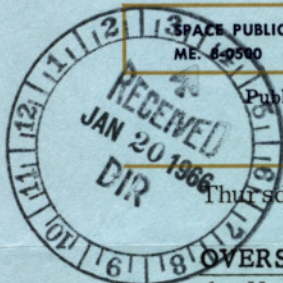
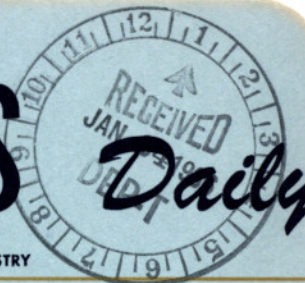


SPACE BUSINESS

FIRST DAILY MANAGEMENT NEWS SERVICE FOR THE MISSILE / SPACE INDUSTRY



SPACE PUBLICATIONS, INC.
ME. 8-9500 ME. 8-1577

WASHINGTON, D. C.
Cable: SPACE

NORMAN L. BAKER — Publisher & Editor
TWX: 202 — 965-0765 (SPACE - WASHINGTON)

Published five times a week by Space Publications, Inc., 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.
Permission for reproduction of this publication should be obtained from the editors.

Thursday, January 20, 1966

Vol. 24, No. 14

OVERSIGHT COMMITTEE GOES BEYOND AA.

The Oversight Subcommittee of the House Space Committee met in closed session yesterday in order to hear reports on a number of its investigations including: NASA's master planning, Automatic Data Processing (ADP), maintenance of facilities (roads and grounds, custodial services, security services, and the centers' construction execution programs), international programs, and NASA's administrative operations appropriations. The subcommittee, chaired by Rep. Olin E. Teague (D-Tex.), also discussed advanced planning for the national space program beyond **APOLLO** Applications. No final decisions were reached during the session.

EUROPA 1 FUTURE GROWING CLOUDY.

Some quarters of the European space industry are becoming concerned over the effect of the continuing problems the European Launcher Development Organization (ELDO) is having in its program to put its initial vehicle, **EUROPA 1**, into service. Comprised of the British **BLUE STREAK** first stage, the French **CORALIE** second stage, and a no-name German third stage, **EUROPA 1** (SPACE Daily, Oct. 5, 8 & 21) is well within its development career, and at least two more advanced versions of it are being seriously considered. Further trouble at this point could mean significantly fewer achievements during the remainder of this decade than ELDO has been projecting. **EUROPA 1** is intended to become operational in 1968, with other versions to enter service five to seven years later.

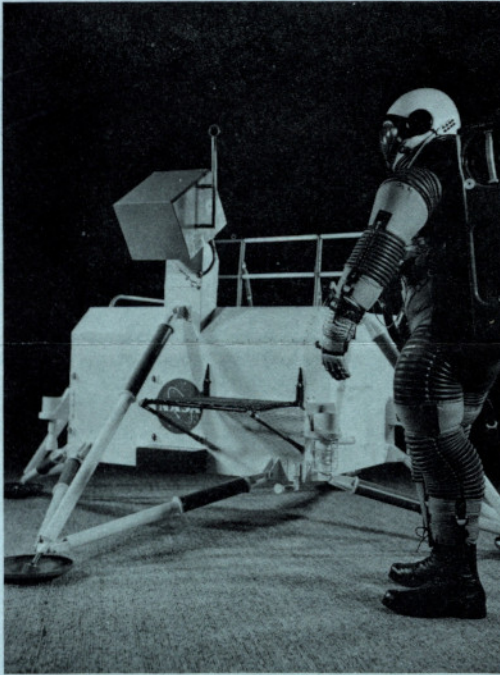
ISPO STRUGGLING TO BEGIN NEW APOLLO SHIP WORK.

The Navy's Instrumented Ships Project Office (ISPO), now richer by about \$20,500,000 from FY 1964 NASA construction funds, is racing to beat the clock in its move to fit the three **APOLLO** tracking ships with extra ground terminals to support ComSat's **BLUE BIRD** satellite system (SPACE Daily, Dec. 1). ISPO still intends to contract for those terminals this month as reported (SPACE Daily, Dec. 16), but securing the money has required a Congressional blessing, and internal negotiations with ship-converter General Dynamics have been slower than hoped.

It is already too late to install the terminals before the ships are delivered, but arrangements are expected whereby the ships can be returned after their sea trials to receive the additional hardware. The first such trials are set for the 29th or 30th of this month, with preliminary acceptance trials on the 14th and 15th of next month and formal delivery on February 28 as scheduled (SPACE Daily, Oct. 26) or possibly a week earlier if the trials prove fully successful.

NASA-Washington tried to reprogram \$22.5 million for the new requirements (SPACE Daily, Dec. 16).

BELL AA LUNAR HOPPER UNDER TEST



This is Bell Aerosystems' most recent mock-up of the **LUNAR HOPPER** it is developing for NASA-Marshall (SPACE Daily, July 6, '64) for possible use during **AA (APOLLO Applications)** missions on the lurnain. Marshall, now testing the model, has yet to give the go-ahead for production models, but the current Bell contract, which is an extension of the initial award (SPACE Daily, Apr. 9 and July 2), calls for submission of the final design report this summer, and the decision to enter procurement may be made this spring.

The Bell configuration (SPACE Daily, Sept. 29, '64, and July 23) can be modified to suit the mission. The version shown is designed to carry one astronaut and 300 pounds of equipment up to 7.5 miles from his lunar station--e.g. **MOLAB**--and back. Five 100-pound-thrust motors provide boost while small reaction-control motors provide steering. The overall vehicle (loaded) weighs 400 pounds. This mockup was fabricated

at Marshall.

NASA has been considering the **HOPPER** since early 1964 (SPACE Daily, May 14 & 15, '64). Three companies besides Bell submitted proposals (SPACE Daily, May 19, '64), and Bell was chosen for the preliminary design work under an approximately \$200,000 contract (SPACE Daily, July 6, '64). The extension was about \$490,000 (SPACE Daily, July 2). Some of the work left to do under that extension involves human factors and subsystems. The **HOPPER** has also been identified as the **LFV** (Lunar Flying Vehicle) and the **MFS** (Manned Flying System).

THE TWO PHASE PROGRAM FOR DEFINING THE AA PROGRAM

The proposals for the **LEM** and launch vehicle experiment payload integration (SPACE Daily, Jan. 17), due February 28, will call for consideration of a two phase **AA (APOLLO Applications)** program including operation of a Payload Integration Facility.

Basic constraints to the **AA** program are: 1) it must not interfere with the manned lunar landing basic objective of **APOLLO**; 2) it will have two phases, **APOLLO Alternate Missions (AAM)** and **APOLLO Follow-on Missions (AFM)**.

APOLLO Alternate Missions will be limited to 14 days in Earth-orbit, eight days in lunar orbit, and a three-day lurnain mission. The experiments for these Alternate Missions must be limited to those that can be supported with a minimum of mission modifications. **APOLLO Follow-on Missions** can include experiments requiring modifications made to support extended duration missions up to 45 days Earth-orbit, 28 days in lunar orbit and 14 days lurnain missions. The use of orbital rendezvous could extend total mission duration up to 135 days.

MORE

THE TWO PHASE PROGRAM FOR DEFINING THE AA PROGRAM -Contd.

Payload Integration Facility To Be Established

The proposals submitted by potential contractors must include details on the activation and operation of a Payload Integration Facility (PIF). AAM missions payload integration will be done either at the PIF or at Cape Kennedy, but integration of experiments for all AFM missions will be performed at PIF.

The experiment payload function will be divided into two main areas:

1) engineering, development and test; 2) modification and installation. The payload integration contractor will be required to perform: liaison functions, monitoring functions, interface control, develop requirements, develop specifications, receive experiments, adapt experiment modules, integrated checkout and test of experiment modules and deliver experiment modules to Cape Kennedy.

Each proposal submitted must include a suggested technical approach to: experiments, mission analysis, engineering, development and testing, manufacturing, assembly and checkout, facilities, and coordination. The experiment integration contractor will perform mission operational analysis and accomplish the engineering aspects of integrating the experiments into the experiment module. The contractor will also provide experiment support equipment, hardware definition and preliminary design, performance, design/test specifications, experiment interface specifications and develop the requirements, plans and program data for accomplishing payload integration.

The AA Experiments Program

The **AA** experiments to be integrated into the **LEM**, the **SATURN IB** and **V Instrument Unit (IU)**, and the **S-IVB** upper stage, will fall into three categories: Earth orbital mission experiments, lunar orbital mission experiments and lunar surface mission experiments. Lunar orbital and lunar mission experiments have not yet been well enough defined to allow a detailed description of those parts of the program.

The Earth orbital mission experiments however fall into three categories: Earth-oriented applications; support for space operations; and space science. Earth-oriented applications, with the objective of "better utilizing and controlling the Earth's resources and capabilities", is divided into: atmospheric science and technology (aeronomy, meteorology, air pollution control); earth sciences and resources (agriculture/forestry, geology/hydrology, oceanography/marine technology, and geography) (SPACE Daily, Jan. 7, 14); communications and navigation/traffic control.

Support for space operations, the second group of experiments, is divided into the following areas: biomedicine/behavior; advanced technology and supporting research; acquisition of design data; testing of research models; extravehicular engineering activities; operations techniques and advanced spacecraft subsystems. The third category is space science, including: astronomy/astrophysics; physical sciences; and bioscience.

\$190.4 MILLION DOD MISSILE SUPPLEMENTAL SUBMITTED

President Johnson has submitted a request to Congress for a fiscal 1966 DOD Vietnam supplemental appropriation of \$12.346 billion, which includes \$181.4 million for missiles. The missile breakdown among the services is: Army, \$64 million; Navy, \$26.2 million; Marine Corps, \$27.5 million; and Air Force, \$63.7 million. An additional \$9 million is budgeted for missile RDT&E.

SHAPE ORDERS SATCOM ANTENNA FROM BAC

The British Aircraft Corp.'s Systems Division E at Weybridge near London will supply to the SHAPE Technical Center in The Hague, Netherlands, a 30-foot satellite-tracking antenna, a Cassegrain subreflector, and a feed system. The antenna will have a 2500-pound counterweight. The overall system will be tested at Weybridge before being delivered to the Center in May.

FIFTH OV PROGRAM BEGUN/SECOND REVIVED

The Air Force Office of Aerospace Research now has a stable of five **OV** (Orbital Vehicle) satellite programs. It started out with three (SPACE Daily, Nov. 22), and now, with the appearance of the fifth, is hopeful of eventually including even more members. The second program, put into abeyance when the last **TITAN III-C** failed to orbit **OV2-3**, is now back in business as expected (SPACE Daily, Dec. 21 and Jan. 6) with the decision to buy **OV2-5** from **OV2** contractor Northrop and orbit it next year (see below).

OV5 presently has four TRW Systems octahedral payloads, the first two of which are tentatively set to be launched with **OV2-5** on a **TITAN III-C** in June of '67. **OV5-1**, designed for solar studies, will be put into a synchronous orbit, and **OV5-2** will assume a highly elliptical path whose apogee is approximately synchronous. They will probably be ejected into orbit laterally.

TUVE APPOINTED NAS HOME SECRETARY

Dr. Merle Tuve is the new home secretary of the National Academy of Sciences. He replaces the late Dr. Hugh Dryden of NASA. The home secretary oversees membership affairs for the Academy's National Research Council. Tuve's term will end June 30, 1967, thus filling out the time Dryden would have served. Tuve presently holds two other positions as well: chairman of the Council's Geophysics Research Board and director of Carnegie Institution's terrestrial magnetism department (Carnegie is in Washington, D.C.).

AF ASSIGNS MOL MAN AT DOUGLAS

Col. E. A. Kiessling, Air Force Systems Command assistant for management activities, has been assigned at Douglas' Space Systems Center as plant representative. He will have primary responsibility for efforts on the Manned Orbiting Laboratory (**MOL**) which Douglas is developing for the Air Force (SPACE Daily, August 26).

Kiessling, the Air Force notes, is highly regarded in research management in AFSC. He helped develop the "total package" plan of systems management and led efforts in establishing a new type of systems management survey to determine the effectiveness of contractor effort and AF program management. His new assignment comes at a time when the **MOL** program is slipping off original schedule. Delays in initiating the program, without being able to shorten vital component lead time, have pushed the program back one year until 1969 (yesterday's SPACE Daily).

AF CONTRACTS FOR 12-MAN COMMUNICATIONS SYSTEM

A contract to develop a helmet-borne system of two-way radios which would permit twelve or more astronauts to carry on six individual conversations at one time has been awarded by AFSC's Research and Technology Division to the aerospace division of the Westinghouse Defense and Space Center.

The self-contained transceiver units will allow astronauts to move about freely in the spacecraft without connecting wires. The system also contains an audio control center which would relay messages from astronauts outside of the spacecraft. The AF contract calls for the division to design and build the equipment for study.

OAO-A1 ARRIVES AT CAPE

The first flight model of the Orbiting Astronomical Observatory (OAO) has arrived at Cape Kennedy for pre-flight checkout before launch, presently scheduled for March 10. The 3900-pound satellite is being shipped from Grumman Aircraft, OAO prime contractor, to Cape Kennedy by truck. Placed into a circular, 500-mile, 32-degree inclination orbit by an **ATLAS AGENA** launch vehicle, the satellite will carry 983 pounds of scientific instruments including an X-ray telescope and a gamma ray telescope.

ATDA AND AGENA SHIPPED TO KENNEDY

Preparing for the **GEMINI VIII** rendezvous and docking flight, now tentatively scheduled for March 7, NASA has shipped both the **AGENA** target vehicle and an **ATDA** (Augmented Target Docking Adapter), a passive dummy which can be used for the docking exercise if the **AGENA** does not test out.

One of the two vehicles will be sent out to rendezvous with the **GEMINI** and provide a target for docking in a repeat of the **GEMINI AGENA VI** mission which ended with the explosion of the target vehicle in space (SPACE Daily, Nov. 9). By using off-the-shelf items NASA assembled the **ATDA** passive target (SPACE Daily, Dec. 14). The **AGENA** in addition to acting as a target for docking, will also have fuel and engines to allow the **GEMINI AGENA** vehicle to maneuver in space.

After the **AGENA** malfunction, modifications were made to the spacecraft engine and it is undergoing high altitude firing tests at Arnold Engineering at this time. Based on the results of these tests, NASA will decide whether or not to use the **AGENA** target vehicle or the **ATDA**.

S-IC-F SATURN STAGE ON WAY TO KENNEDY

A test **SATURN V** stage is scheduled to arrive at Cape Kennedy on Jan. 21. The **S-IC-F** (Facilities) version of the booster first stage, now enroute from NASA-Michoud Assembly Facility, will be mated with the **S-II-F** second stage, the **S-IVB-F** third stage, an instrument unit (**IU-F**) and a dummy **APOLLO** spacecraft. The Facilities stages are the same size and weight as a flight model booster and are used for propellant loading tests, "fit checks," and ground support equipment compatibility checks.

AFSC TO DOUBLE COST ANALYSIS CAPABILITY

The Air Force Systems Command at Andrews AFB, Md., is doubling its cost analysis capabilities in a major move to supply its decision-makers with more refined cost implications of possible decisions. The authorization for the AFSC cost analysis functions provides for a total increase of 149 persons, including 114 civilians.

Brig. Gen. W. E. Carter, Systems Command deputy chief of staff/comptroller, says that the command soon will begin recruiting for new positions. He adds, "This will improve the command's capability for recommending new systems, and for managing current systems, by supplying even more creditable cost estimates prior to decision. This doubling of the cost analysis capability will prove of great interest to industry and will help both contractors and military managers of proposed weapon systems."

AVCO RECEIVES \$6.3 MILLION TO OPERATE JOB CORPS CENTER

Avco has received a contract for \$6.3 million from the Office of Economic Opportunity to establish and operate the largest women's Job Corps training center in the country, at Poland Spring, Me. Earl H. Blaik, chairman of the company's executive committee, has been named chairman and chief executive officer of a new Avco subsidiary, Economic Systems Corp., which will operate the center. Other officers are: Dr. Charles J. Burton, vice president of the Defense and Industrial Products Group, is president; Harold V. Stewart is vice president, and Col. Sol E. Ernst is director of the center.

KIDDE TO ACQUIRE LEFEBURE ASSETS

Walter Kidde has agreed to acquire the assets of LeFebure Inc., a manufacturer of security equipment, for a stock transaction. The agreement is subject to approval by LeFebure shareholders. LeFebure stockholders will receive one share of a new Kidde preferred stock for each five shares of LeFebure common. The new stock will provide for an annual dividend of \$2.20 and will be convertible into two shares of Kidde common stock.

A LeFebure subsidiary, Craig Systems Corp., produces transportable communications and other electronic systems units for the military. LeFebure, with a 1965 sales volume of \$13,458,000 has plants in Cedar Rapids, Iowa, and Lawrence, Mass. The agreement calls for the company to operate under its present management group as an autonomous unit of Kidde.

AEL EARNINGS UP 37 PER CENT

American Electronic Laboratories had sales of \$12,470,666 for FY 1965, up 38 per cent from last year's \$9,042,273. Earnings rose 37 per cent from \$343,512 to \$471,714. Backlog at the close of the record year was more than \$13 million, up 50 per cent from \$8.7 million a year earlier.

Future Space Business**VERSATILE STERESCOPE WITH SCANNING STAND**

NASA-Houston is inviting firms to submit proposals for a versatile stereoscope with a scanning stand. The stereoscope will contain NMOM power POD and 10-power wide-field eye pieces. A relay lens system is to be furnished for a complete magnification range of from 3 X to 12.9 X.

Contact: NASA, Manned Spacecraft Center, Industry Assistance Office BG2, Houston, Tex. 77058, TWX No. 713-488-0454, Attn: H. T. Christman, Bldg. 1. Reference: RFP BG731-30-6-342P. Due date: Jan. 25.

AIR-BREATHING PROPULSION PERFORMANCE INVESTIGATION

The Air Force Systems Engineering Group is planning to fund a study to evolve the best practical methods for more accurately determining installed air-breathing propulsion performance in hypersonic vehicles through in-house computer programming. The main consideration is use of the aft portion of the vehicles as an exhaust gas expansion surface to improve performance with minimum penalty.

Contact: Directorate of R&D Procurement, Systems Engineering Group, RTD, Wright-Patterson Air Force Base, Ohio 45433, Attn: SEKMA. Reference: RFP 3384. Due date: Jan. 27.

OPTICAL/LASER RANGING DEVICES

The Naval Training Device Center is planning to fund a research and development program in the field of optical/laser ranging devices. The specific task will require the design and development of an experimental unit of a lightweight portable range estimator trainer which will be capable of determining ranges from a minimum of 100 meters to 2500 meters with an error not to exceed five per cent of maximum and .5 per cent at minimum range. The device will be used to train military personnel in rapid and accurate determination of range for light/heavy infantry weapons.

Contact: U. S. Naval Training Device Center, Port Washington, N. Y. 10050, Attn: Code 110. Due date: Jan. 23.

MANNED MISSIONS MAN/COMPUTER ROLE RESEARCH

NASA-Cambridge is preparing to fund a research program on the man/computer roles in the execution of navigation and guidance functions for future manned space missions.

Contact: NASA, Electronics Research Center, 575 Technology Square, Cambridge, Mass. 02139, Attn: Procurement Office. Reference: ERC/R&D 66-254. Due date: Jan. 29.

MORE

Future Space Business**OZONE MOLECULES VERTICAL DENSITY PROFILE/MOTION STUDY**

NASA-Cambridge is initiating a study program on a technique to determine the vertical density profile and motion of ozone molecules in the upper atmosphere.

Contact: NASA, Electronics Research Center, 575 Technology Square, Cambridge, Mass., Attn: Procurement Office. Reference: ERC/R&D 66-26.
Due date: Jan. 29.

DOD NEGOTIATIONS

Emerson Electric Co. --with Air Force Proving Ground Center for special purpose rocket munition.

United Aircraft Corp., Pratt and Whitney Div. --with Air Force Flight Test Center for further demonstration and test of a high energy advanced throttling concept for under sea level tests with fluorine hydrogen propellants.

General Dynamics, Convair --with Air Force Flight Test Center for design and manufacture of propellant vessels for tank storability program.

NASA NEGOTIATIONS

Analytical Mechanics Associates, Inc. --with Electronics Research Center for trajectory analysis support for future unmanned launch vehicles.

Thiokol Chemical Corp. --with Goddard for **APACHE** and **CAJUN** rocket motors.

AVCO Corp. --with Electronics Research Center for a study in applying modern functional analysis to trajectory optimization problems.

DOD CONTRACTS**Army**

Raytheon Co. --\$1 million for electron tubes for **HAWK** missile system transmitter.

Navy

Metal Disintegrating Co., Inc. Elizabeth, N.J. --\$19.2 million three-year contract to produce aluminum powder for use in the Mark 81 and 82 "SNAKEYE" bombs.

Air Force

Block Engineering, Inc. --\$45,000 for an investigation of interferometry analysis of enclosed habitable aerospace.