# SPACE BUSINESS Daily

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**HIBEX FOLLOW-ON IN THE WORKS.** The termination of the ten-test **HIBEX** (**HI**gh-**B**oost-**EX**periment) program (yesterday's SPACE Daily) is only a temporary halt to the ARPA high-acceleration booster project. While no firm follow-on programs have been decided on as of now, analysis is going on within ARPA to determine exactly which direction the follow-on will take. For example: Should work be concentrated on further refinements and improvements in the basic **HIBEX** booster (Boeing, prime, Hercules, propulsion subcontractor); or should emphasis be placed on developing an upper stage (**UPSTAGE**, being developed by Douglas) for the vehicle.

One thing is certain: ARPA is anxious to continue the program, which to date has pushed the state-of-the-art to its zenith. Exact scope of the work, however, may be limited by Secretary McNamara's budget. **HIBEX**, managed by the Army Missile Command, is part of ARPA's Project **DEFENDER** ballistic missile defense investigation program.

**KARTH TO STUDY VOYAGER "REORIENTATION"/AOSO.** Chairman Joseph E. Karth (D-Minn.) of the House Space Sciences and Applications Subcommittee, indicated yesterday that he had some doubt about the recent NASA decision to push **VOYAGER** back until 1973 and to substitute a reworked **MARINER** program (SPACE Daily, Dec. 23).

Karth told a Washington meeting of the National Space Club that he is not sure about NASA's plans for **VOYAGER**. He said he hoped that hearings of his subcommittee, which are tentatively scheduled for late February (SPACE Daily, Jan. 11), "may clear up doubts" about plans. On another point, the Congressman said he is "not favorable" to the NASA cancellation of the Advanced Orbiting Solar Observatory (**AOSO**), which was set on the 1969 NASA schedule (SPACE Daily, Dec. 16).

**Unmanned Space-Oceanography Recommended.** Karth, emphasizing the need for expanded efforts in the field of oceanography, told the Space Club that oceanography is becoming increasingly related to space. He noted the recent NASA/Naval Oceanographic Office agreement whereby the NOO will coordinate all investigations about possible applications of manned Earth orbital operations in the field of oceanography (SPACE Daily, Jan. 4, 7 & 10). He suggested that this program be expanded: "I intend to suggest that their (NOO) interest be expanded formally to include unmanned operations as well," Karth said.

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**Favors Space-Oceanography to Post-APOLLO Program.** The Congressman said that he did not think that post-**APOLLO** programs, such as manned expeditions to Mars or to the moons of Jupiter and Saturn, would gain "general acceptance" until "we have solved the continually worsening home planet problems of hunger and poverty." He said that much greater emphasis would be on areas such as oceanography, which have the ability to solve the problems here on Earth. (See SPACE Daily, Jan. 14 and Jan. 7 for NASA's envisioned program for direct application of space technology to needs on Earth.)

Karth added that he did not see any application of the Air Force Manned Orbiting Laboratory (**MOL**) to the space-oceanography program. "I hope we can get on with it (**MOL**), however," he said. The Navy has been studying for many months the use of the **MOL** for ocean surveillance and analysis with particular emphasis on fleet operations and anti-submarine warfare (SPACE Daily, May 5 & June 29, '64).

**MOL DELAYED ONE YEAR.** The year lost in the **MOL** program while Defense Secretary McNamara and the Administration pondered the necessity for its initiation has now come forward for its accounting. Under the original program the first manned flights would have come in 1968. This was the program approved by McNamara and the President. However, by the time they had approved it the 1968 date had lost its reality. Now, it is sometime in 1969 that the first manned flight is considered most acceptable.

This "extra" year is needed by the payload people, the organizations responsible for developing the vital sensors necessary for making the **MOL** an instrument of worth. Now, not needed is the original $340 million FY '67 budget which the Air Force packaged last fall (SPACE Daily, Sept. 22). That has been cut more than half, down to about $150 million. What with about $90 million in carryover FY '66 money, **MOL** will have about $240 million. There is still some more that may be available if needed. Under the original plan there would have been about $500 million available for starting off FY '67.

Administration officials, for the time being at least, are not talking **MOL** delays, budget reductions or phased-budget allocations in the same vein as the industry and Air Force. Instead, there is a clearly-defined attempt to infer, if not to declare, that if **MOL** does not get all or do all it was to have done in FY '67 it is because of that crisis partly responsible for the overall national space program's recession--the Vietnam War. One official, however, said McNamara was willing to have funded the **MOL** for what it would have been capable of doing in FY '67 without slacking on his responsibilities in Vietnam.

**PRESIDENT'S SPACE REPORT WILL PREFACE NASA BUDGET.** President Johnson, who neglected to mention the National Space Program in his State of the Union address (SPACE Daily, Jan. 14), will present his report on space to the Congress as a preface to the Administration's space budget, which will come into the open next week.

An editorial in the Worcester Sunday Telegram (serving the late Professor Goddard's home town) of Jan. 16, noting reports that the FY '67 space budget may drop to around

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$5 billion or below (SPACE Daily, Sept. 24 & Jan. 7), said: "That may explain why the President was silent on space (in his State of the Union message). State of the Union messages traditionally look for silver linings. Bad news usually is reserved for budget messages."

**FIRST AA EXPERIMENTS DEFINED.** The Systems Engineering Office of the Advanced Manned Missions Office has selected the first four experiments to be assigned to the **AA (APOLLO** Applications) program flights.

They are: **1)** experiment MSF-1, a lunar mapping photography experiment, to be placed in one segment of the Service Module in place of a pallet, presently scheduled for **SATURN V** flights 507, 511, 515, and 522; **2)** experiment S-27, an x-ray astronomy experiment scheduled to be flown in the **S-IVB** stage of the **SATURN IB** flight 211; **3)** experiment S-22, and **4)**, S-23, a low cosmic ray experiment and a high cosmic ray experiment, respectively, both of which are scheduled for **SATURN V** flights 511, 515, and 522.

Additional experiments for the **AA** program are currently undergoing definition, which is scheduled to be completed by June or July of this year. By that time most of the experiments for the first few **AA** flights will have to be firmly defined.

NASA-Marshall has issued RFPs for two or more parallel nine-month study contracts for defining the **AA** experiment integration for the **LEM**, **SATURN** Instrument Unit and the **S-IVB** transportation vehicles for the **SATURN IB / SATURN V** (SPACE Daily, Jan. 17).

Most of the **AA** experiments being investigated fall into four classifications: biological science; astronomy/solar physics; remote sensing (SPACE Daily, Jan. 7); and lunar exploration. Two fields which appear promising for a follow-on to the **AA** program are those of physical science and particles and fields investigations. Two allied fields which may have a number of experiments are the continuing studies in biomedicine and experiments to investigate the operational requirements of operations in space.

**COMSAT AWARDS SECOND SPACECOM STUDY CONTRACT.** The Centre Nationale D'Etudes Telecommunications has received a $60,000, six-month ComSat contract to study a medium-altitude, phased-orbit satellite system that would have 12 to 15 spacecraft in 12-hour, 30-degree orbits for five years of operation. The contract calls for an engineering analysis that involves such factors as system coverage, orbital stability, launch conditions, and type of communications. This is the second ComSat award for accumulation of "technical data on different aspects of satellite communications." The first was to the General Post Office in England (SPACE Daily, Dec. 13).

ComSat has long been considering a medium-altitude system for its operational global commercial network (SPACE Daily, Mar. 1, p. 5). After much deliberation (SPACE Daily, Apr. 28 and May 5), it finally decided to buy payloads that could be put at either medium or synchronous heights (SPACE Daily, May 24, p. 121). TRW will supply them (SPACE Daily, Dec. 16).

**TITAN III-C-4 DELAYED UNTIL SPRING.** As anticipated (SPACE Daily, Jan. 14), the next launch of a **TITAN III-C** will likely come in April (or possibly May) rather than the hoped-for mid March period (SPACE Daily, Jan. 5). The Air Force and the Defense Communications Agency (whose **IDCSP**--Initial Defense Communications Satellite Project--payloads will be aboard) met last week on the West Coast and are now meeting on the East Coast to finalize plans for the fourth **III-C** mission. Because the last two missions went awry (SPACE Daily, Oct. 19 & Nov. 3 and Dec. 22 & Jan. 10), extra pains are being taken to ready this one.

**D-1B LAUNCH SLIPS TO SUMMER.** The March launch date for **D-1B**, the second payload in France's second satellite series (SPACE Daily, Jan. 7), has been abandoned in favor of a summer date, probably June, to allow a less hurried schedule. Another reason for the change is the large time gap that would exist between **D-1B**'s launch and **D-1C**'s, which is set for late this year at the earliest (SPACE Daily, Jan. 7), if **D-1B** were to go in March. **D-1A** is due to lift off about February 11 (SPACE Daily, Jan. 7), although it might do so a few days sooner.

**REPUBLIC TO ANALYZE SCRAMJET DATA.** Air Force Systems Command anticipates the awarding of a contract to Fairchild-Hiller-Republic for a program to analyze wind tunnel data from tests of the **SCRAMJET** (Supersonic Combustion Ramjet) vehicle. The contract will result from an unsolicited proposal.

A Marquardt team including Lockheed-California and General Applied Science Labs will conduct a flight evaluation program for the **SCRAMJET** under a $5 million Air Force contract (SPACE Daily, Sept. 17). A **SCRAMJET** Technology Division has been established within the Aero Propulsion Lab at Wright-Patterson (SPACE Daily, June 3).

**FRANCE APPOINTS MISSILE/SPACE HEAD.** The Counseil des Ministres of the new French government (SPACE Daily, Jan. 11) has nominated General d'Armee Aerienne Fourquet as the Delegue Ministeriel a l'Armament to DMA which is responsible for the development of all French missiles and the space transportation systems such as the **DIAMANT** which recently launched the **A-1**. Fourquet will replace General Lavaud as head of DMA.

## HOUSE SPACE COMMITTEE CONSIDERS METRIC BILL

The House Committee on Science and Astronautics met yesterday to consider S.774, the bill calling for an investigation of the feasibility of the United States' switching to the metric system in some areas. Appearing on behalf of the bill was Dr. J. Herbert Hollomon, assistant secretary for science and technology of the Department of Commerce.

**Dr. Lester M. Field,** vice president of Hughes, has been appointed associate director of Hughes Research Laboratories.

## NAS RECOMMENDS POST-APOLLO SPACE PROGRAM (A Special Report) -Part III

(This is the third of a three part report on the National Academy of Sciences' recommendations for a national space program to follow **APOLLO**.)

### Optical Telescopic Research

As a relatively low-cost project within the overall planetary exploration effort, the Board proposes as "particularly important" a project with a "large, ground-based optical telescope."

The Board notes: "There are examples in recent years of programs of planetary observations that have not had the priority they should have been accorded if they had been considered in the light of their importance to an expensive national program. Priorities in astrophysical observatories are, quite rightly, awarded on the basis of overall contribution to astronomy. In order to introduce a different set of priorities it will be necessary for NASA to continue and probably expand its support of ground observatories in a few locations.

"The type of observation most needed at the present time for planning future missions is high spectral resolution spectrometry and high spatial resolution photometry on Jupiter, Mars, Venus, and Mercury. Long-term programs with maximum variation of parameters should be made."

The areas such programs should embrace are: 1) repeated thermal mapping of Venus, Mars, and Jupiter--"It cannot be overemphasized that such observations are potentially just as valuable and may even accomplish the same results as certain space probe observations, e.g. thermal mapping from orbiters. What telescopic observations lack in spatial resolution they make up in (a) accessibility. . .(b) repeatability, and (c) flexibility. . ."; 2) repeated quantitative observations of Venus terminator to augment thermal mapping--"We cannot responsibly ask for deep space probes to investigate planetary structure unless these observations have been developed to the maximum extent possible."; 3) repeated spatial and spectral resolution of Venusian carbon-dioxide bands--"We can hope for pressure, concentration, and temperature measurements as a function of time and related to changes in height and motions of clouds."; 4) repeated spectrographic study of Martian carbon-dioxide bands; 5) study of Martian terminator--"(It) has not been investigated properly. It could yield a surface pressure and some information on the meterology of dust clouds."; 6) study of Martian water vapor--"It is possible that a water-vapor feature on Mars could be used to trace water transfer; this is one of the prime questions of biological interest."; 7) study of Martian and Venusian glows--"The Venus and Mars dayglow, nightglow, and atmospheric fluorescence (ring effect) should be thoroughly investigated."

The Board does not think the status quo can meet these needs: "These and other telescopic programs vital to the planetary missions will, with present facilities, either not be performed at all or only in a perfunctory way. The expansion of facilities proposed by the (1964 NAS) Whitford report. . .may partly relieve this problem, but it is still dangerous to leave the demands of a large national program subject to the priorities of groups which are not directly involved. The two telescopes at present under construction with NASA funds are a more direct contribution, but the entire experiment contemplated at present may be insufficient for these reasons:

"a) The high spatial and spectral resolution discussed requires the largest telescopes available.

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**NAS RECOMMENDS POST-APOLLO SPACE PROGRAM (A Special Report)-Part III-**Contd.

Practical considerations suggest that attention should be focused upon a telescope similar to the 150-inch Kitt Peak (Tucson, Ariz.) instrument, since this is on the way to development. There are no plans to give planetary observations overriding priority for long periods on such an instrument.

"b) We are dealing with a meteorological type of geophysical problem. Variability is (its) essence. . . The programs discussed. . .have to be repeated on a routine basis. Such programs would never be contemplated by classical astronomers. . .but, from the point of view of NASA's expenditures, the costs are very low indeed. Thus the equipment asked for by the Whitford report will not be available for the time that we consider necessary.

"c) The Whitford committee had no information on the extent of the large scientific program planned by this study group.

"d) There are sound reasons for a longitudinal and southern hemisphere coverage in connection with the space program that may not be met by the instruments recommended per the Whitford report."

The Board declines to submit exact proposals to NASA for expansion in the optical telescope field. It does, however, make two general recommendations: 1) "NASA (should) give very high priority to the construction of ground-based telescopic equipment to the extent required to provide maximum support to the planetary flight program." and 2) "NASA and the Academy (should) make a joint study of the program that could be undertaken in planetary astronomy, with the aim of identifying the gap between existing and projected instruments and the needs of planetary exploration."

The Board adds and emphasizes this comment: "It should be pointed out that NASA is not being asked to support academic astronomy but to support its own interests. . . . . We know of examples where existing facilities have been insufficient and we know of detailed planning based on slipshod observations leading to avoidable situations in which poor science was backed by huge federal funds: we foresee more and more acute problems in the future."

## WILLIAMS PREDICTS $9.2 BILLION DEFICIT

Senator John J. Williams (R-Del.), ranking Republican on the Senate Finance Committee, has charged that President Johnson is concealing the true deficit in the FY 1967 national budget until after this year's elections. Williams claims that the true deficit would be $9.2 billion instead of the $1.8 billion figure predicted by the President in the State of the Union Message.

Williams estimates that Johnson's request that Congress put withholding of income taxes on a more "pay as you go basis," speed up collection of corporate taxes, and postpone the reduction of excise taxes on telephone calls and cars which went into effect the first of the year, would add about $1 billion in fiscal '66 corporate taxes and $3.2 billion in FY '67 and that the new withholding form would bring in about $400 million in the next fiscal year. Williams estimated also that collections from all these points--which he says are non-recurring--would add $2.6 billion to FY 1966's intake and $7.4 billion next year. Minting new coins with less silver is estimated to provide about $2.5 billion and the sale of goods from the National Stockpile has amounted to $330 million this year. In adding these figures to the President's predicted $1.8 billion deficit, the Delaware Republican comes up with a $9.2 billion deficit in the next fiscal year.

Future Space Business

## MULTICHANNEL INFORMATION VHF AMPLITUDE TRANSMITTER

The Naval Research Laboratory is requesting bids for a lightweight, compact satellite borne VHF amplitude modulated transmitter for telemetry use, which will be capable of handling multichannel information.

Contact: Supply Officer, U. S. Naval Research Laboratory, Washington, D. C. 20390. Reference: Synopsis No. 7. Due date: Jan. 31.

## ANTI-AIR WARFARE SYSTEMS INVESTIGATION

The Marine Corps is planning to fund analysis of data to develop air threats, determination of automated system capability by both analysis of engineering test data already obtained and analysis and monitoring of six months of Marine Corps operational tests to be conducted in Southern California.

Contact: Commandant of the Marine Corps, Washington, D. C. (CSG) 20380, Attn: D. E. Elmore Jr. (Code CSG-5), Telephone: (202) OX 4-1763. Due date: Jan. 28.

## PROPULSION SYSTEM STRUCTURAL METAL MATRIX COMPOSITES

The Air Force Systems Engineering Group is issuing RFPs for research and development to be conducted on the materials, processes, and evaluation of advanced filament reinforced metal matrix composites for selected propulsion system structural use.

Contact: Directorate of R&D Procurement, Systems Engineering Group (RTD), Wright-Patterson Air Force Base, Ohio 45433, Attn: SEKRB. Reference: RFP 6M26212R-B. Due date: Jan. 28.

## LABORATORY ELECTRODELESS THRUSTOR DEVELOPMENT

The Air Force is initiating research toward the eventual demonstration of an electrostatic thrustor which functions by simultaneously expelling positive and negative beams of charged, multimolecular particles produced by the electro hydrodynamic spraying process. The end result will be a laboratory electrodeless thrustor capable of achieving specific minimum goals.

Contact: Directorate of R&D Procurement, Systems Engineering Group, RTD, Wright-Patterson Air Force Base, Ohio 45433, Attn: SEKNY, Lt. Marie Dallas. Reference: RFP 27610. Due date: Jan. 23.

## DOD NEGOTIATIONS

North American Aviation, Rocketdyne Div.--with Air Force Flight Test Center for a theoretical and experimental program for the determination of the optimum length of end release for case bonded solid propellant rocket motors.

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## DOD NEGOTIATIONS

Douglas Aircraft Co.--with Air Force Space Systems Div. for modification of booster age for launch emplacement.

## NASA NEGOTIATIONS

General Dynamics/Convair--with Lewis for 18 **OAO-B** and **OAO-2** Shroud systems.

## DOD CONTRACTS

### Navy

Norris Thermador Corp.--$33.3 million multi-year (first year $6.8 million) fixed price contract for motor tubes for the 2.75 rocket.

Lockheed Missiles and Space Co.--$23.8 million cost-plus-fixed-fee contract for research and development in the Fleet Ballistic Missile System.

### Army

Martin-Marietta--$3.9 initial increment to a $41,093,332 contract for research and development of improved ground support equipment for the **PERSHING** weapons system.

General Precision, Inc., Kearfott Div.--$80,000 for development of a two-degree-of-freedom gyro with pneumatic pickoff.

Philco Corp.--$7.7 million for **SHILLELAGH** Ind engineer support.

Philco Corp.--$3.3 million for continuation and implementation of R&D services and hardware to adapt **SHILLELAGH** to the MBT.

Philco Corp.--$490,200 for the **SHILLELAGH** missile system.

Philco Corp.--$108,699 for technical publications for **SHILLELAGH** guided missile system.

AVCO Corp., Research and Advanced Dev. Div.--$71,220 for a study of methods to measure the effects of a contaminated atmosphere on the transmission of a high-energy laser beam.

AVCO Corp., Research and Advanced Dev. Div.--$160,750 for research and development effort for discrimination studies for the **NIKE-X** missile system.

## NASA CONTRACTS

### Marshall

Ridge Instruments Co.--$74,817 for pressure calibration systems.