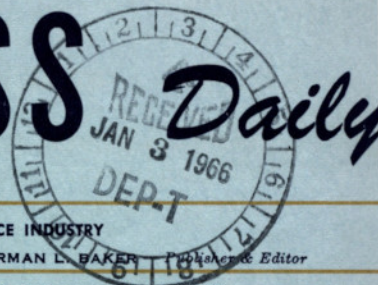


SPACE BUSINESS



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NEW VOYAGER PHASE IA REPORTS DUE SHORTLY. Boeing, GE and TRW are expected to submit their Phase IA (extended) reports on the reoriented **VOYAGER** early in January (SPACE Daily, Oct. 20). NASA was to request approximately \$150 million in the FY '67 budget (SPACE Daily, Dec. 13) to fund the Phase IB systems design effort. NASA may be granted no more than half this amount in order to hold the overall NASA request to the new lower annual level (SPACE Daily, Sept. 24 & Dec. 13). The Phase IB effort will probably be initiated around April or May with the selection of one contractor from the three Phase IA contractors.

ARMY ISSUES SCRAMJET STUDY. The Army Missile Command, entering the supersonic ramjet development area, has issued a sole-source procurement contract with General Applied Science Laboratories of Long Island for a 12-month research study of the Supersonic Combustion **RAMJET (SCRAMJET)** development program. The Air Force has been testing the **SCRAMJET** principle for possible future **SPACE PLANE** applications (SPACE Daily, Nov. 13, '64). Marquardt is currently evaluating the propulsion system for the Air Force, assisted by Lockheed-California and General Applied Science Labs (SPACE Daily, Sept. 17).

AIR FORCE TO ISSUE MARTIN PRIME SUPPORT CONTRACT. The Air Force Space Systems Division plans to open negotiations with Martin-Baltimore for a program of photographic support of the **PRIME SV-5D** space shuttle development program. The **SV-5D** is a scale-model, unmanned development flight model for SSD's program conceived to lead eventually to a manned lifting body space shuttle concept presently identified as **SV-5P** (SPACE Daily, Sept. 20). Martin recently named its major subcontractors on the **PRIME** program and delivered the first of six boilerplate models. The flight models are scheduled to begin tests over the Pacific from the Western Test Range late next year. Launch will be by **ATLAS**.

AIR FORCE NEGOTIATING WITH NORTHROP FOR OV2-5. As indicated (SPACE Daily, Nov. 22), the Air Force has initiated procurement of a fourth **OV2** satellite now that a ride has been secured for it in 1967. Set tentatively for launch in the first half of the year by a **TITAN III-C**, **OV2-5** is now being negotiated for by the AF Office of Aerospace Research with Northrop, builder of the previous three **OV2**s, the last of which, **OV2-3**, is aboard the **III-C** that is supposed to go aloft today (SPACE Daily, Nov. 4 & 18). **OV2-1** was on the ill-fated last **III-C** (SPACE Daily, Oct. 18 & 19 and Nov. 3); **OV2-2** was cancelled (SPACE Daily, Aug. 6); and **OV2-4** was never developed (SPACE Daily, Nov. 22).

The Leader in Missile/Space Reporting

DE GAULLE'S MISSILES PROVIDE SPACE DIVIDEND

As a dividend from the military MSBS and SSBS ballistic missile development programs, France is on the verge of developing boosters with a much larger capacity than the three-stage **DIAMANT** rocket which recently placed France's first satellite in orbit. (See SPACE Daily, November 30, December 1 & 6.)

Though plans have not been completely firmed, several projects have been on the drawing boards and could be developed "without any major technical problems," SPACE Daily-France has learned. These projects include:

1) A **DIAMANT**. A first step to improve the current three-stage **DIAMANT** would be to replace the **EMERAUDE** first stage--liquid fueled--with a solid-propellant P-10 stage (ten tons of solid propellant). -- First tests of P-10 were conducted in absolute secrecy at Hammaguir in late October and early November. The P-10, shorter than the **EMERAUDE**, is believed to be the SSBS second stage. Its thrust is 47 tons. A slightly larger version (11.2 tons of solid propellant) would have 59 tons thrust. An even larger P-16 (35,000 pounds of solid propellant) is envisioned, as are smaller strap-ons. Plans are also being studied for up-rating the **DIAMANT**'s **RUBIS** third stage. The **DIAMANT** would have up to a 770-pound orbital capacity.

2) The **REGENT**. Initial studies of this booster--whose ultimate goal might be to place the first Frenchman into space--concerned use of the P-30 (30 tons of solid propellant) first stage, a P-4 second stage and a P-1 (**DIAMANT**) third stage. Another project had P-30 as first stage and a derivative of **CORALIE (EUROPA-1)** second stage) as second stage. Such **REGENT**s could orbit 1000 pounds at 310 miles. Most recently, however, the most favored configuration for **REGENT** would be a P-40 booster (40 tons of solid propellant), with a thrust of "around 175,000 pounds," with an H-4 (four tons of liquid-hydrogen-propellant). Also being considered is a P-16, P-10 and P-4 combination, which would fit between **DIAMANT** and **REGENT**. It is a direct derivative of SSBS.

3) The **ORION**. This rocket would utilize clusters of P-30s as the first stage, or clusters of H-30s (utilizing six engines used for H-7). One project studied would utilize three P-30s as booster and one H-7 as upper stage and would orbit about 5 tons or accelerate one and a half tons on an escape trajectory.

KAMAN STUDY TO AID AERO-ICBM/SHUTTLE

A research study of vehicle-guidance-wind-interaction effects on the structural design of two ICBMs and a booster/winged payload combination will be carried out by Kaman AviDyne for the Air Force Flight Dynamics Laboratory. The study, to be completed by June, is designed to provide guidelines and criteria as to the severity of structural loads for each vehicle-guidance concept combination under varying wind characteristics.

Flight simulation analysis will be performed at the Air Force Research and Technology Division digital computer facility, Dayton, Ohio. Vehicles will be tested through a series of wind soundings from a number of locations with different wind characteristics. Gust interaction effects due to atmospheric turbulence will be investigated using a flexible body simulation for each vehicle. Mission concepts, vehicle performance and control system stability criteria will be established by AviDyne. Work is funded at \$47,100.

HUGHES DEVELOPING FIRE SYSTEM FOR ARMY SAMS

Hughes-Ground Systems Group is developing the AN/TSQ-51 Fire Distribution System for the Army Missile Command to reduce operation and maintenance costs of surface-to-air missile defenses by up to 75 per cent. Installed in three trailer vans, the system will be used with the radars for missiles like **HAWK** and **NIKE HERCULES**. About ten men are needed to run the system.

APOLLO ASTRONAUTS WILL EAT HOT AND COLD MEALS

NASA-Houston physiologist Dr. Paul La Chance foresees **APOLLO** astronauts consuming foods reconstituted by hot water and drinking both hot and cold liquids. Speaking from aboard the **GEMINI** recovery carrier, the USS Wasp, he said items like lobster and ice cream will be dehydrated, dried, and frozen for reconstitution by either hot or cold water.

MARSHALL SHOWING SATURN I TEST MODEL

NASA-Marshall is displaying the dynamic test version of the **SATURN I** launch vehicle as part of the vehicle and missile collection standing in front of its Space Orientation Center. The model was used for a variety of ground tests to help perfect the flight models. The last **SATURN I** left Cape Kennedy on the last day of July to set a 10-for-10 mission record (SPACE Daily, Aug. 2).

AF HELIUM TEST SUBJECTS HONORED

The four Strategic Air Command officers who spent 70 days in an Air Force test chamber to help study a helium-oxygen atmosphere for astronauts (SPACE Daily, Oct. 5 and Dec. 14) have been awarded Commendation Medals for "distinguishing themselves" during the test period, September 6 to yesterday, which included pre- and post-test duty. The test began in the afternoon of October 4 and ran until the morning of December 13, during which time the men experienced a simulated space mission of about 56 days (Oct. 13-Dec. 7).

The four are Captain Roger Gaal, 27, of San Francisco; Lieutenant Richard Sessler, 28, of Syracuse; Captain Lawrence Smulczenski, 29, of West Mifflin, Pa.; and Captain Robert Till, 27, of Bangor.

L. Wayne Mullane, a group vice president of Aerojet-General, has been elected chairman of the board of Aerojet Delft, which is jointly owned by Aerojet-General and N. V. Optische Industrie "de Oude Delft" of Holland. The company was founded in 1962 to combine Aerojet's defense and space technology with Old Delft's pre-eminence in the fields of optics and image intensification techniques.

Wesley A. Sauer has joined CMC, a San Fernando, Calif., manufacturer of electronic counting, measuring and timing instrumentation, as a senior member of the technical staff.

MCCALL TO HEAD MARSHALL AA OFFICE

NASA-Marshall has created a new Experiments and Applications Office to handle the NASA-Marshall responsibilities under the AA center organization (SPACE Daily, Dec. 20). Dr. Jerry C. McCall, presently Deputy Director of the Research and Development Operations, will serve as manager of the new office with Stan Reinartz as his deputy. The appointment of program directors for NASA-Houston and NASA-Kennedy has not yet been decided.

ELPAC ACQUIRES DOUBLE-E PRODUCTS/ELECTS NEW OFFICERS

Robert L. Burr, formerly executive vice president of Technical Measurement Corp. (North Haven, Conn.), has been elected chairman of the board and chief executive officer of Elpac Inc. (Westminster, Calif.) and has acquired majority control of the electronics manufacturing company. Also newly elected as members of the board were Bertram K. Massing, assistant secretary and general counsel, and Dale F. Rodesch, assistant to the president. Re-elected as directors were Donald S. Evans, secretary-treasurer, and Donald G. Felton.

As a first step in the company's planned program of growth and diversification within the electronics industry, Elpac has established a new Systems Division. Also revealed by the board was the acquisition of Double-E Products, a manufacturer of passive filters presently located in El Segundo, Calif.

NSIA ITEM CONTROL PROGRAM: JAN. 13

The National Security Industrial Association will conduct a briefing on DOD Item Entry Control at the Biltmore Hotel in Los Angeles on January 13. Speakers will include Paul Riley, deputy assistant defense secretary for material requirements; Brig. Gen. William Hamrick, Defense Supply Agency executive director for technical and logistics services; Capt. V. C. Bertelsen, director of the DOD IEC office; and R. D. Donnell, chairman of the NSIA spares provisioning panel.

BENDIX AWARDED PERSHING GUIDANCE CONTRACT

Army Missile Command has awarded a \$10 million contract to Bendix Eclipse-Pioneer Division for production of guidance and control components for the **PERSHING**. Work will be carried out at the company's Teterboro, N. J., plant.

SYLVANIA AWARDED MINUTEMAN SECURITY SYSTEM CONTRACT

Initial funding of \$3 million for production of components for electronic security systems which guard **MINUTEMAN** sites has been awarded Sylvania Electric Products by the Air Force. The components will refine existing operational systems.

Dr. Donald A. Dooley, formerly with United Aircraft's corporate office, has been elected a vice president of Aerospace Corp. and appointed general manager of the System Planning Division.

AVCO/RAD TO STUDY PENETRATION AIDS FOR BSD

The Air Force Ballistic Systems Division has contracted with Avco/RAD for a study to determine the feasibility of using radar reflectors to enhance the penetration of ICBMs. The program will include theoretical analysis, design and flight test verification. A. D. Sapowith of the Advanced Pen Aids Program Project Office will be in charge of research. Contract is for \$504,254.

Avco/RAD is negotiating with BSD on another penetration aids contract, this one for Phase IA of the **ABRES** (Advanced Ballistic RE-entry Systems) integrated flight test program (yesterday's SPACE Daily). GE is negotiating with BSD for Phase IB of the **ABRES** program.

PLANNING RESEARCH OPENS NEW YORK OFFICE

Planning Research Corp. of Los Angeles has opened a branch office in Rome, N. Y., to support the firm's present contracts with the Rome Air Development Center and to develop business in the area. The Rome office will be headed by J. P. Marshall, senior associate.

THE LOG OF GEMINI VII/VI

December 18, 1965--8:28 AM EST: **GEMINI VII** retro-rockets fired as the spacecraft ends its 206th orbit.

9:06 AM--**GEMINI VII** splashes down in the Atlantic--13 days, 18 hours and 36 minutes after liftoff from Cape Kennedy on December 4.

9:25 AM--Astronauts Borman and Lovell are picked up by helicopter and flown to the pickup ship, the carrier Wasp.

PIONEER VI FUCTIONING PROPERLY

All six experiments aboard the TRW **PIONEER VI** are operating as scheduled, telemetry data from the spacecraft shows. Launched December 16 from Cape Kennedy, **PIONEER VI** will make its closest approach to the Sun--75.7 million miles--after 155 days of flight. This will be the closest any spacecraft has come to the Sun.

The six experiments aboard the **PIONEER** are designed to return data on the solar wind stream, the Sun's magnetic field, the region between the solar atmosphere and interstellar space, the physics of the Sun, and the interactions of high-energy charged particles and magnetic fields (SPACE Daily, December 13).

James O. Lawson, formerly manager of quality control, has been appointed manager of the newly created Engineering Laboratory of Sylvania Electric Products' Parts Division. Lawson will supervise the division's expanded research and development program.

George T. Ryan, previously assistant division manager for Raytheon's Industrial Components Division, has been named controller for the Components Division.

ECI ACQUIRES SCOTT ELECTRONICS

S. W. Bishop, president of Electronic Communications, and Peter L. Scott, president of Scott Electronics, have signed documents finalizing an agreement whereby Scott became a subsidiary of ECI (SPACE Daily, Dec. 6). The new ECI subsidiary will continue to operate as a separate corporation with no change in management or policies.

ARC RECEIVES ACCIDENT INSURANCE REFUND

Atlantic Research has received an insurance refund of \$108,380 from H. L. Rust and Aetna Life and Casualty for its low employee accident rate during 1964. The check, which was presented as a luncheon honoring the company's employee safety program, compared with refunds of \$74,000 for 1963 and \$23,000 for 1962.

Dr. Arthur W. Sloan, chief executive officer, noted that the reduction in injuries and the saving of lives are the paramount considerations in ARC's safety program, "but that the reduction of costs as reflected in the refunds is also important in that it directly improves the company's ability to compete for new business as a defense contractor."

NASA ORDERS TRACKING STATION GENERATIONS

NASA will procure over a half million dollars in gas turbine power generators for use in APOLLO tracking stations from the Solar Company.

NAA AWARDS MINUTEMAN II COMPONENTS CONTRACT

A \$250,000 follow-on contract for gas bearings and disc memory units for the MINUTEMAN II has been awarded to Speedring Corp., Warren, Mich., by NAA-Autonetics.

COSMONAUT POPOVICH APPLAUDS BORMAN/LOVELL

Describing the GEMINI VII mission as "a considerable achievement," Soviet cosmonaut Pavel Popovich says that, although "a two-week stay in space was never doubted by scientists who had already done significant tests on longer flights of Soviet and American cosmonauts," astronauts Frank Borman and James Lovell "are strong, courageous people able to remain self-controlled under unexpected circumstances." Commenting on the GEMINI VII and VI rendezvous, he says "With all my heart I congratulate the four cosmonauts" but adds that VOSTOK III and IV came within about 3.5 miles of each other.

Dr. Allen J. Vander Weyden, formerly deputy assistant general manager for reactors for the AEC, has been named senior director-research of Douglas Missile & Space Systems.

DOD NEGOTIATIONS

Army

Radio Corporation of America, Burlington, Mass.--with Army Electronics Command for a four month feasibility study leading to development of criteria for the design and fabrication of an automatic test system applicable to project **FLATTOP**.

Air Force

IIT Research Institute, Chicago, Ill.--with Air Force Systems Command for studies, testing, integrated planning and liaison with associate contractors in connection with **MINUTEMAN** hardness testing.

Hughes Aircraft Co., Ground Systems Group, and Westinghouse Electric Corp.--with Electronic Systems Division for continuation of contract definition phase study efforts for definition and specification of lightweight 3-D radar set.

Goodyear Aerospace Corp.--with Systems Engineering Group for design definition and experimental evaluation of a rigid mechanically-folded solar energy collector.

Aerojet-General Corp, Solid Rocket Plant--with Air Force Systems Command for sixteen all ordnance destruct systems for the **MINUTEMAN** Wing VI missile..

General Motors Corp., AC Electronics Div.--with Air Force Systems Command for the fabrication and refurbishment of signal conditioners, engineering data and reports to support the **TITAN II** guidance program.

NASA CONTRACTS

Lewis

U. S. Department of Commerce, Bureau of Standards--\$50,000 for continued technical support and services for the **CENTAUR** program.

Hughes Aircraft Co., Research Laboratories--\$41,651 to develop and demonstrate a method to deflect the beam from an ion thruster.

Lockheed Aircraft Corp., Missiles & Space--\$2 million for **LUNAR ORBITER** mission.

The Boeing Co.--\$160,342 for a study of weldments and pressure vessels made of Hy 150 steel plate.

Westinghouse Electric Corp., Aerospace--\$81,940 for design, documentation, fabrication and delivery of ion engine power conditioners.

General Electric Co., Specialty Control--\$49,942 for engine power conditioners.

MORE

NASA CONTRACTS - Contd.

Lewis

Canadian Commercial, Ottawa, Canada--\$99,510 for meteoroid impact bumper interactions.

Edwards

IBM Corp., Bethesda, Md.--\$99,754 for biodata processing study and program formulation.

Marshall

Mason-Rust Co.--\$13,131,252 for an extension to the basic cost-plus-award-fee contract for continued support services at NASA-Michoud.

Kennedy

Trans World Airlines--\$1,133,978 for an addition to the \$23,667,857 contract for general management and support services for the Center.

Western Operations

Space General Corp.--\$492,000 for modifications to **DELTA** second stage propellant loading system equipment.

Douglas Aircraft Co., Inc.--\$67,700 for development of a system for prestressing brittle material.

Cambridge

General Precision, Inc., Aerospace Group--\$29,940 for gas bearing materials research study.

Headquarters

TRW Systems--for feasibility study of new **OGO** orbits and a spin stabilized mode.

DOD CONTRACTS

Army

Raytheon--\$1,155,530 fixed-price contract for selected items for ground support equipment for the **HAWK**.