# SPACE BUSINESS Daily

FIRST DAILY MANAGEMENT NEWS SERVICE FOR THE MISSILE / SPACE INDUSTRY

SPACE PUBLICATIONS WASHINGTON, D. C. NORMAN L. BAKER — *Publisher & Editor*

Published five times a week by Space Publications at 1426 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.


Friday, November 5, 1965 Vol. 23, No. 5

**NEW ATM TO BE DEVELOPED FOR AAFSS.** The Army is expected to soon move into development of the anti-tank missile which will be employed aboard the compound helicopter which has been contracted for development by Lockheed. The helicopter is the first major step in the development of its AAFSS (Advanced Aerial Fire Support System) which will be composed of the helicopter, avionics systems, weapons guidance system, and the weapons system.

The missile will be roughly in the class of the now-in-service **SS-11**, the Nord Aviation solid propellant 63-pound weapon with a range of 3800 yards and velocities over 400 mph. A major problem will be the guidance system since most of the present missile systems are wire-guided and require line-of-sight control from point of fire until impact. The advances in guidance are expected to be in hand by the time the AAFSS is operational in 1970.

A dual Army/Air Force anti-tank missile development program is not only a possibility but has been under investigation for several weeks (SPACE Daily, July 21). The Army with its dual version **MAW** and the Air Force with its **HORNET** (SPACE Daily, March 16, '64) have been moving out into development of separate developments when it believed that a single weapon could be devised.

**NO DOCKING OR MANNED TETHER ON GEMINI VII/VI.** NASA has ruled that docking and extravehicular activity during the **GEMINI VII** and **VI** rendezvous mission are out due to a lack of time for providing the necessary equipment. Preparations for launching **GEMINI VII** are on schedule with the December 8 launch date still considered possible but still not the official date.

**THIOKOL TO DESIGN AIR-AUGMENTED ROCKETS.** A two-year, $2 million Air Force contract has been awarded Thiokol-Huntsville for the design, development, and testing of air-augmented, solid-fueled propulsion systems. The award was made by the Rocket Propulsion Lab at Edwards AFB, which is presently supervising Martin-Denver's work on air-augmented rockets (SPACE Daily, Oct. 4). United Technology is supplying the solids for Martin (SPACE Daily, Nov. 2).

**COSMOS 95 LAUNCHED FROM TYURATAM.** A new **COSMOS**, the 95th and a general research and operations satellite, was launched yesterday from the Tyuratam or southernmost facility of the Baykonur-Karsakpay space complex.

## FRENCH VESTA ROCKET FINALLY LAUNCHED

Over two years late, France's two-stage, liquid-fueled sounding rocket **VESTA** has been twice launched from the Hammaguir, Algeria, range in tests that were qualified successes. The first test came at 6:32 AM Hammaguir time last October 15 when the rocket began what became a 118-mile ascent, and the second launch was made at 4:30 PM local time October 25 with only a 67-mile zenith being reached due to trouble with the rocket's guide cables. Both rockets carried 1212-pound payloads.

Originally called **SUPER VERONIQUE** because it is the successor to the **VERONIQUE** sounding rocket, **VESTA** was supposed to see its first test in June of 1963, but technical and financial problems prevented the schedule from being realized. The October flights returned good AJAZ and APX telemetry and, despite the cable trouble, went "as programmed." They were conducted by the Centre Interarmees d'Essais d'Engins Speciaux (CIEES).

**VESTA** was developed for **CNES** (Centre National d'Etudes Spatiales) by the Laboratoire de Recherches Balistiques et Aerodynamiques at Vernon under the control of the Delegation Ministerielle pour l'Armement. At launch, it weighs 12,125 pounds, of which 9400 is nitric acid and terebenthine fuel. Liftoff thrust is 33,000 pounds. Peak altitude is 140 miles with a 1.1-ton payload, or 300 miles with a 440-pound payload. Initial acceleration is 1.66 gs, and acceleration at burnout (56.4 seconds later) is up to 12.55 gs.

The French are expected to use **VESTA** for biological experiments with animals.

## NEW NASA PHASED PLANNING GOES INTO EFFECT

NASA has adopted a new phased project planning policy which will be used for all major research and development projects requiring "significant agency resources." Each phase of the new policy must be specifically approved by NASA top level staff only after management review of the preceding phase. The four steps of the policy are: Phase A--advanced studies; Phase B--project definition; Phase C--design; and Phase D--development/operations.

## NASA STARTS SPACE EDUCATION PROGRAM

NASA-Cambridge has awarded a $20,000 grant as a pilot study to the Massachusetts Department of Education to provide for the development of teacning aids and textual material for the teaching of space science to elementary and grade school children throughout the state. The grant, the first of its kind to be awarded, will undertake a curriculum resource study in response to the constantly increasing need on the part of school systems for updated educational materials.

## GEOS A SLIPS AGAIN TO TOMORROW

**GEOS A**, originally scheduled to be launched Nov. 2 and later postponed to today due to an electric circuit break (SPACE Daily, Nov. 2), has been rescheduled again to tomorrow, Saturday, Nov. 6, with the possibility that the delay may continue until next week.

## FAIRCHILD HILLER SALES/EARNINGS UP

Fairchild Hiller had sales of $60,913,000 for the first nine months of 1965, compared with last year's $57,163,000. Earnings for the period rose four per cent from $1,982,000 to $2,064,000.

President Edward G. Uhl said that sales and earnings for the period do not include operations of Republic Aviation, which was acquired by Fairchild this fall (SPACE Daily, Sept. 30, Oct. 1 & 4). He did say, however, that the company's year-end statement will include the new division's sales and earnings for the October-December period.

Uhl noted that the integration of Republic into Fairchild is now complete and that the company's planned program of growth is proceeding on schedule. "We anticipate a further upswing in 4th quarter sales and earnings as well as during next year when sales should exceed $200 million."

## CHICAGO AERIAL INDUSTRIES EARNINGS UP 20 PER CENT

Chicago Aerial Industries' sales for the first nine months of 1965 were $10,007,655, up from last year's $9,623,722. Earnings rose 20 per cent from $421,832 to $506,821. Backlog of unfilled orders also showed an increase--from $9,035,099 to $10,223,985.

President Marlan E. Bourns said that the company is expected to show the highest year-end sales and earnings in its history, based on business which has already come in.

## ITEK SALES UP FOR FIRST NINE MONTHS

Itek Corp. had sales of $41,722,000 for the first nine months of 1965, compared to last year's $34,192,000. Earnings dropped 28 per cent from $1,066,000 to $831,000, while backlog increased from $38 million to $42 million.

The drop in earnings was attributed to two factors: first, major expenditures on the company's photo-optical memory development program were charged against income. Second, during the third quarter last year incentive profits on the full year's work were recorded on certain contracts in which performance had proved that they were earned.

## AIR FORCE GETS FIRST DECOMPRESSION CHAMBER

The Air Force's first compression chamber for treatment of decompression sickness is now operational at Brooks AFB's School of Aerospace Medicine. It is being used both for actual treatment and for training in its use. Five feet in diameter and 12 feet long, it has an outer lock of 68 cubic feet and an inner compartment of 145 cubic feet. Seven more like it will be installed at other AF bases.

TITAN III-C-3 will carry OV2-3 (15 experiments), LES III and IV, and OSCAR IV into a 90-n.m. parking orbit, then go to an 18,300-n.m. IDSCP-type synchronous orbit. Pad 41 at the Cape will be used. Launch date: Dec. 2 (yesterday's SPACE Daily).

## COLLINS TO EXPAND DALLAS FACILITY

Collins Radio has started initial site preparation for a $9 million construction program at its Dallas (Richardson), Tex., location. The capital acquisition program, which is based on anticipated expansion in sales volume, together with a growing need to modernize and consolidate present operations, is an integral part of the company's long-range planning for growth and profit improvement. Approximately 225,000 square feet of manufacturing and 110,000 square feet of administrative facilities are scheduled for occupancy in December 1966.

## SPACERAYS REGISTERS STOCK OFFERING

Spacerays Inc. of New York has filed a registration statement with the Securities and Exchange Commission seeking registration of 150,000 shares of common stock, to be offered for public sale. The public offering price ($6 per share maximum) and underwriting terms will be supplied by amendment.

The company, which was formed in 1962 to undertake research and development services and to manufacture products in the fields of optics and electro-optics, has also agreed to sell to George G. Hynson Jr. and Thomas W. Lewis, officers of the underwriting agent T. W. Lewis & Co., at 10 cents each, four-year warrants to purchase an aggregate of 20,000 common shares. Net proceeds of the stock sale will be used for corporate purposes, including the acquisition of additional equipment, improvements to its newly rented plant and laboratory, expansion of its technical and marketing staff, and the development of additional products.

## WYLE TO TEST S-II FOR SHAKE AND SOUND

Wyle Labs of El Segundo, Calif., is making vibration and acoustic tests of sections of North American's **S-II** stage, the **SATURN V** second stage. The three sections are being subjected to the jarring and noise the **S-II** will be expected to tolerate during the **V**'s launch. Wyle's $3.5 million contract from NAA calls for work at El Segundo, Norco (Calif.), and Huntsville. To fulfill the test requirements at the latter site, Wyle will add a 7200-square-foot, 50-foot-tall section to its test facility. The tests will be completed in 1967.

New appointments at Philco-Aeronutronic include: **Perry A. Luth,** formerly Newport Plant manager, named manager, U.S. Army Missile Plant; **Phillips Eastman Jr.**, formerly manager of administration, Aeronutronic Applied Research Laboratories, succeeding Luth; **Robert L. Ball**, formerly manager of the marketing support department, Marketing, succeeding Eastman; and **James R. Franks,** formerly manager of engineering support, Engineering, replacing Ball.

**Jerry E. Goldress** has been appointed corporate director of reliability and quality assurance of Fairchild Hiller. Goldress was previously manager of quality for Raytheon.

## NASA AWARDS 12 NEW GRANTS

NASA has awarded 12 new grants and contracts or extensions to nine universities, colleges and private research institutions which total $530,974:

University of Louisville, $34,064 for performance measurements of intellectual functioning; Oregon State University, $48,592 for physiological ecology of cryophillic algae; University of Illinois, $76,800 for theoretical and experimental studies of ionospheric electron control and irregularities, and $42,300 for physiological responses of central vestibular pathways and diffuse ascending systems to vestibular stimulation; University of Chicago, $53,210 for meteorological interpretation of satellite radiation data; University of Minnesota, $10,000 for the study of heat transfer through connective layers; University of Maryland, $58,877 for the study of the behavior of organisms under conditions of space flight, and $14,720 for the study of protein hydration; University of Pittsburgh, $14,201 for new formulas for collision amplitudes and related quantities; Stevens Institute of Technology, $29,-024 for an investigation of flame spreading over the surface of ignited solid propellants; Graduate Research Center of the Southwest, $130,000 to develop and evaluate techniques and instrumentation for the measurement of cosmic radiation anisotropics, and $19,186 for processing and interpretation of data for PIONEERs A and B.

## NSIA KEYNOTER CALLS FOR GOVERNMENT/INDUSTRY PARTNERSHIP

Dr. Henri Busignies, noted electronic scientist and senior vice president of ITT, speaking before the National Security Industrial Association's R&D Symposium (yesterday's SPACE Daily), declared that both government and industry "must act as partners in the greatest undertakings the world has yet seen." If they do, Busignies, chairman of the newly authorized NSIA R&D Advisory Committee, contended that American industry will be able to help government to attain the various national goals. In research and development, however, a "condition necessary to this partnership" is that industry must be able to make a reasonable profit on its undertakings and inventions made under government contract should remain the property of the original inventors.

## NASA-MARSHALL CELEBRATES NASA ANNIVERSARY

The seventh anniversary of the founding of NASA will be celebrated by NASA-Marshall with the presentation of a number of awards. Included among the awards will be the presentation of 20-year service pins to 10 members of the original von Braun team who began service at Ft. Bliss, Texas,in 1945.

## BOMROC: NAVY MARK 7 REPLACEMENT

The Naval Ordnance Test Station at China Lake, Calif., is developing BOMROC (Bombardment Rocket) to replace the Mark 7 rocket. BOMROC's new solid motor will give it twice the range of Mark 7 and better accuracy. Set to become operational in 1967, it will be launched from assault ships toward shore targets. Both Mark 7 and BOMARC missile technologies are being drawn upon for BOMROC's development.

Future Space Business

## ATHENA PROGRAM FACILITIES

Bids are being requested for construction of facilities for the **ATHENA** program. The work will consist of the erection of two prefabricated metal buildings at White Sands Missile Range, N.M.

Contact: Purchasing and Contracting Division, White Sands Missile Range, N.M. (STEWS-WS-PF-88002), Telephone: (915) 678-1735. Reference: IFB (1) AMC(R)-29-040-65-548. Due date: Nov. 12.

## AIRBORNE INFRARED DECOY EVALUATION SYSTEM

The Air Proving Ground Center has invited eight companies to submit technical proposals for an airborne infrared decoy evaluation system.

The following firms have been invited to bid: McDonnell, GE, Aerojet-General, Raytheon, Melpar, Perkin-Elmer, Douglas, and Hughes.

Contact: Air Proving Ground Center (PGMKK), Eglin Air Force Base, Fla. Reference: RFTP PGVE 65-120. Due date: Nov. 12.

## MULTIPLE RESTART APPLICATION MOTOR INSULATION

The Air Force's Flight Test Center is preparing to fund an investigation and evaluation of motor insulation for multiple restart application. This program is to investigate the properties and behavior of elastomeric insulation during transient (heating and cooling) and steady state heating conditions and the influence of these properties of the material's performance. This program is to develop a technique for predicting insulation performance for any stop-start duty cycle and to investigate possible bonding problems caused by thermal cycling and long heat soak periods.

Contact: Air Force Flight Test Center, Directorate of Procurement (FTMKR-5), Edwards Air Force Base, Calif. 93523, Attn: L. W. Rucker, Telephone: 258-2111, extension 29431. Reference: PR 3059655. Due date: Nov. 14.

## LUNAR GRAVITY SIMULATOR STUDY

NASA-Marshall is funding a preliminary design study of a lunar gravity simulator.

Contact: NASA, Marshall Space Flight Center, Huntsville, Ala., Attn: PR-ES/R. W. Chatworthy, Telephone: 842-3272. Reference: RFQ 1-5-21-00032. Due date: Nov. 26.

## SPACE RFP LOG

This is a reference of the government requests for proposals which are coming due. For further information see SPACE Daily issues as noted.

Advanced satellite tracking instrumentation study, RFQ AMC(T)-44-009-66-G161-B, Army Engineer Research and Development Labs, due Nov. 10 (SPACE Daily--Nov. 2).

## DOD NEGOTIATIONS

Research Analysis Corp., McLean, Va.--with Army Defense Supply Service to conduct a study to develop improvements for translating the Department of Defense five-year program into time-phased impacts on industries.

Optics Technology, Palo Alto, Calif.--with Air Force Systems Engineering Group for research on infrared reconnaissance and sensor techniques.

Sylvania Electric Products--with Air Force Systems Engineering Group for research in the field of laser technology.

Thiokol Chemical Corp.--with Air Force for **LANCE** rocket motor, Model TX77-2 with pyrogen igniter.

## DOD CONTRACTS

### Army

General Electric Co.--$99,939 for addition research and development study on radar degradation.

Honeywell, Military Products Group--$178,188 for research and development work for 12 months relating to laser inflight obstacle detection device, exploratory development model (feasibility), instruction book and technical reports.

### Navy

Sylvania Electric Products, Sylvania Electronic Systems--$34,410 for a research study of global sea surveillance.

### Air Force

Defense Research Corp., Santa Barbara, Calif.--$69,800 for research on explosive instabilities in condensed phase monopropellants.

Dow Chemical Co.--$194,554 for investigation and compilation of the thermodynamic properties of rocket exhaust products.

Aerojet-General Corp., Sacramento Plant--$362,275 for study and demonstration of advanced thrust chamber cooling concepts.

Rocket Power Inc., Division of Maremont Corp.--$134,996 for a study of thermodynamic properties of rocket exhaust products.

## NASA CONTRACTS

### Lewis

Lockheed Missiles and Space Co.--$25,000 for **ISIS-X** mission spare parts.

## LISTING OF MAJOR SPACE "FIRSTS" ACHIEVED BY THE U.S. AND THE U.S.S.R.

| | UNITED STATES | | | UNION OF SOVIET SOCIALIST REPUBLICS | | |
|---|---|---|---|---|---|---|
| | Event | Satellite | Launch Date | Event | Satellite | Launch Date |
| **SCIENCE** | Discovery of Van Allen Radiation Belt | Explorer I | 2/1/58 | First orbiting geophysical laboratory | Sputnik III | 5/15/58 |
| | Discovery that the Earth is "pear shaped" | Vanguard I | 3/17/58 | First photos of the moon's far side | Luna III | 9/12/59 |
| | First orbiting solar observatory | OSO I | 3/7/62 | First comprehensive cosmic ray space station | Proton I | 7/16/65 |
| | First successful probe of Venus | Mariner II | 8/27/62 | | | |
| | First geodetic satellite | Anna IB | 10/31/62 | | | |
| | First close-up pictures of the lunar surface | Ranger VII | 7/28/64 | | | |
| | First satellite to communicate over 100 million miles | Mariner IV | 11/28/64 | | | |
| | First space pictures of Mars | Mariner IV | 11/28/64 | | | |
| | First comprehensive micrometeroid satellite | Pegasus I | 2/16/65 | | | |
| **APPLICATIONS** | First active communications satellite | Score | 12/18/58 | | | |
| | First TV pictures from space | Explorer VI | 8/7/59 | | | |
| | First weather satellite | Tiros I | 4/1/60 | | | |
| | First navigation satellite | Transit IB | 4/13/60 | | | |
| | First missile detection satellite | Midas II | 5/24/60 | | | |
| | First passive communications satellite | Echo I | 8/12/60 | | | |
| | First nuclear explosion detection satellite | Vela Hotel | 10/17/63 | | | |
| **BIOASTRONAUTICS AND MANNED SPACE FLIGHT** | First manned orbital maneuver | Gemini III | 3/23/65 | First biosatellite | Sputnik II | 11/3/57 |
| | First propulsion by "Space Gun" outside orbiting spacecraft | Gemini IV | 6/3/65 | First animals orbited and recovered | Sputnik-Cosmic II | 8/19/60 |
| | | | | First human orbited and recovered | Vostok I | 4/12/61 |
| | | | | First close co-orbit rendezvous of two manned ships | Vostok III & IV | 8/13/62 |
| | | | | First multi-manned ship in orbit | Voskhod I | 10/12/64 |
| | | | | First man to leave capsule in space | Voskhod II | 3/18/65 |
| **SPACE FLIGHT AND PROPULSION** | First orbiting of two spacecraft by same launch vehicle | Transit IIA & Greb I | 6/22/60 | First satellite | Sputnik I | 10/4/57 |
| | First recovered payload | Discoverer XIII | 8/11/60 | First escape payload | Luna I | 1/2/57 |
| | First air snatch recovery of payload | Discoverer XIV | 8/19/62 | First lunar impact | Luna II | 9/12/59 |
| | First synchronous satellite | Syncom II | 7/26/62 | First orbital launch platform | Sputnik V | 2/12/61 |
| | First to place two satellites in different orbits | Vela Hotel I & II | 10/17/63 | First flight-by Venus | Venus I | 2/12/61 |
| | First hydrogen-fueled rocket to orbit satellite | Centaur II | 11/27/63 | First flight-by Mars | Mars I | 11/1/62 |
| | First sub-orbital test of an ion engine | SERT I | 7/20/64 | First ion engine test in orbit | Voskhod I | 10/12/64 |
| | | | | First plasma rocket tested in orbit | Zond II | 11/30/64 |
| **AUXILIARY POWER SYSTEMS** | First solar cells operating on spacecraft | Vanguard I | 3/17/58 | | | |
| | First spacecraft with isotope nuclear power | Transit IVA | 6/29/61 | | | |
| | First spacecraft powered exclusively by nuclear energy | Transit V | 9/28/63 | | | |
| | First nuclear reactor in orbit | Snapshot I | 4/3/65 | | | |
| | First space use of fuel cell | Gemini V | 8/21/65 | | | |

NOVEMBER 1, 1965
NATIONAL AERONAUTICS AND SPACE COUNCIL STAFF