SPACE BUSINESS Daily

FIRST DAILY MANAGEMENT NEWS SERVICE FOR THE MISSILE / SPACE INDUSTRY

SPACE PUBLICATIONS, INC. ME. 8-0500 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.

Friday, February 4, 1966 Vol. 24, No. 24

LUNIK IX SOFT LANDS ON THE MOON. The Soviet Union moved an outstanding stride forward yesterday when **LUNIK IX**, its sixth attempt to soft land a spacecraft on the lurain, successfully completed its mission. Our own soft lander, the **SURVEYOR** is at least four to five months away from its first "engineering test model" attempt in what was originally considered a vital mission for the **APOLLO** lunar landing program. Radio communications with Soviet stations were initiated after the lurain landing of **LUNIK IX**.

The Soviets let only one optimum launch window pass since the last attempt, providing a demonstration of an impressive back-up capability in spacecraft availability and launch preparation and countdown. At least this spacecraft was not buried in any deep lunar dust which may or may not cover the lurain. The Soviets could, or should be able to, provide data on the lurain which might prove of extreme priority in the **APOLLO** program, but so will it be vital to their own lunar landing program. And, if we can admit to a lunar landing race, it might not be to the Soviets advantage to release that data until it is too late to be of any positive aid to us or until our own **SURVEYOR** has completed a successful mission.

LUNIK IX landed on the lurain at 1:45 PM EST in the Ocean of Storms. The Soviets said that the spacecraft "has a reliable communication link with the Earth," and for those who still doubt or have downgraded the importance of the Soviets efforts, it was pointed out that this soft landing is a "major step forward in the manned lunar mission race."

PROPELLANTS UNDER STUDY FOR AIR-AUGMENTED ROCKETS. Air Force Flight Test Center at Edwards is initiating a program to develop fuel-rich (Monex) propellants for air-augmented rocket application. Martin has been the leader in the air-augmentation rocket area (SPACE Daily, Nov. 10 '64 & July 13 '65), and is building and testing several full-scale missile models for its RENE (Rocket Engine Nozzle Ejector) concept (SPACE Daily, Oct. 4). UTC is providing 100 solid rocket motors for Martin's program on air-augmentation (SPACE Daily, Nov. 2). Thiokol recently entered the field with a $2 million, two-year AF contract to design, develop and test air-augmented, solid fueled propulsion systems (SPACE Daily, Nov. 5).

The new AF applied research program will call for developing the propellants through determination of secondary combustion characteristics and tailoring of mechanical and ballistic properties to meet air-augmented rocket system requirements. The program will culminate with a series of connected pipe tests using the best propellant formulations for air-augmented applications. Fuels to be studied are monopropellants.

HOUSE HEARINGS RESCHEDULED. The House Space Committee has revamped its schedule for the month of February. The Committee will hold executive hearings, February 7-9 on the Air Force **MOL** project and NASA's **AA** (**APOLLO** Applications) plan. The full committee hearings on the NASA authorization bill, originally scheduled for February 15, have been postponed, probably until the middle of March. The change was due to Chairman George P. Miller's (D-Calif.) decision to leave for Australia in order to represent the U. S. at the dedication of the Orraral Valley Tracking Station on February 21.

Because of the shuffle in full committee hearings, subcommittee hearings will probably be held first. Congressman Joseph E. Karth (D-Minn.), chairman of the Space Sciences and Applications Subcommittee, will hold hearings on the budget request starting probably on February 17. Rep. Olin E. Teague (D-Tex.), chairman of the Manned Space Flight Subcommittee is leaving during this period to consult with the Philippine Government concerning the Commission on Joint Problems between the two countries. Representative Emilio Q. Daddario (D-Conn.), senior Democrat on the subcommittee will be asked to hold Manned Space Flight hearings if possible.

The Manned Space Flight Subcommittee will leave next week for a three-day tour of NASA-Edwards, North American Aviation company facilities, the Douglas plant and the Jet Propulsion Laboratory.

NATIONAL SPACE CLUB TO BEGIN GODDARD MEMORIAL LECTURE. The National Space Club is planning to initiate an annual Goddard Lecture March 15 to honor its namesake and the outstanding space leader chosen to give it. The Space Club's Goddard Lecture Selection Committee--Dr. George E. Mueller, NASA associate administrator-Manned Space Flight, chairman; Norman L. Baker, president and publisher, Space Publications Inc.; D. Brainerd Holmes, senior vice president, Raytheon; and George P. Miller, chairman, House Committee on Science and Astronautics--are in the process of selecting this year's lecturer.

COMSAT TO BUILD U.S. GROUND STATION NEXT YEAR. According to ComSat vice president for operations George Sampson, the Corporation has determined that a ground station in the southeastern United States will be needed next year. He also says ComSat is studying sites for additional stations. The southeastern terminal will help relieve the load on the existing Andover, Me., station and will enable East Coast communications traffic to be routed more efficiently.

ESSA I LAUNCHED. **ESSA I** (**TIROS XI**, **TOSS I**), the first Environmental Survey Satellite, was launched successfully by NASA yesterday into a 432.9/522.6-mile, 81.1-degree orbit with a period of 100.2 minutes. The satellite is the first of the **TIROS** Operational Satellite System (**TOSS**) and contains an APT (Automatic Picture Transmission) camera system which transmits a picture of the local cloud cover directly to relatively inexpensive ground receiving units all over the world. The **ESSA I** will pass over the same ground point at the same local time each day.

NAS RECOMMENDS SPACE-ASTRONOMY PROGRAM-III. Additional sections of Part II of the Woods Hole report, prepared by working groups of the Space Science Board of the National Academy of Sciences, deal with x-ray and gamma-ray astronomy. For such space studies balloons, rockets, satellites, and lunar bases are recommended. As for rockets, small relatively inexpensive satellites of the **EXPLORER** class, often designed to carry out a single experiment, will continue to have a major role. Experiments carried aloft while attached to the instrument unit of a **SATURN** rocket offer advantages intermediate between those of rockets and **EXPLORER**-type satellites. **APOLLO** Applications **(AA)** vehicles offer additional advantages.

X-Ray and Gamma-Ray Astronomy: Every ingredient exists in this field to guarantee its development in a manner that may soon lead to results comparable in importance to those of radio astronomy (yesterday's SPACE Daily). Advances will bring a large number of weaker galactic sources within range and permit the observation of strong extragalactic sources. (See Soviet proposal in yesterday's SPACE Daily.) The following recommendations were made:

1) A substantial increase in balloon flights should be authorized. At least 40 balloon flights per year will be needed. Greater support should be given to balloon programs (as well as **EXPLORER**-class satellites) for observations in the energy range 0.1 to 30 MeV.

2) Two new types of balloons should be developed: One capable of lifting 250 pounds of scientific payload to altitudes of 145,000 feet; the other capable of 2000 pounds to 130,000 feet. National Center for Atmospheric Research (NCAR) should direct the program. Total cost for three years: $2 million. NCAR personnel should be increased.

3) Funds should be provided to develop a prototype controllable star-guided orientation system, with an accuracy better than 1 min of arc.

4) A twofold increase in rocket flights--from the present 6 to 12 a year--is required for x-ray astronomy.

5) Weight-lifting capacity greater than **AEROBEE** is needed. One possibility: Use of **SERGEANT** and **NIKE HERCULES**. It is important these vehicles be made available to the scientific user. **APOLLO** and **AA** vehicles would be very useful.

6) Pointing accuracies must be improved. An accuracy of 15 sec of arc to 1 min of arc is required, with small drift rates.

7) X-ray experiments should replace other more conventional experiments which have been accepted for the Orbiting Astronomical Observatory **(OAO)**. In fact, the first unassigned **OAO** should be set-aside for x-ray observation, supplemented, if possible by lower priority gamma-ray observations.

8) X-ray experiments should be included in **OAO** pickaback plans. Optical focusing devices with focal lengths comparable to length of **OAO** should be considered.

9) Experiments utilizing focusing x-ray optics should be flown on pointed rockets and satellites currently available or being developed.

MORE

10) Plans should be begun for orbiting x-ray telescope with focal lengths of 30 to 100 feet. Unfolding of an extensible system in space may be possible.

11) A NASA research center should initiate a strong program in the technology of soft x-rays.

12) Continued support should be given to development of detection devices using actively shielded collimators or Compton scatter telescopes.

13) Space flight assignments should be given only to proven instruments which offer clear improvement in background reduction, energy resolution or angular definition. One instrument that is needed: Devices with large collection factors which provide angular resolution of better than 1 degree.

14) Support should be provided for continued study of solar x-ray and gamma-ray spectra during both quiet and active phases of the solar cycle.

15) Experiments should be undertaken in balloons to search for point sources and to define the design requirements for satellites.

16) Measurements of the diffuse radiation flux should be attempted in the immediate future with small **EXPLORER**-type satellites.

17) One of the forthcoming **SATURN** vehicles should be scheduled to study spectral composition and directional structure of the diffuse flux and to measure weak fluxes from and spectra of discrete sources.

18) Support should be given for the design and construction of a prototype universal supernova monitor. Serious consideration should be given for the inclusion of this monitoring device on many future spacecraft.

The Role of Man: There are certain observations where man will be helpful. However, the scientific mission will take up a great part of man's role. Because of the great expense only experiments that are clearly excellent should be expected for **GEMINI** and **APOLLO** extended systems: a) Large area (110 square meter) x-ray detectors equipped with mechanical collimators. This could be assembled in orbit; b) Focusing x-ray telescopes; c) Spark chambers and Cerenkov counters. These do not need to be assembled in space, but manned repair may be warranted; d) Small detectors for the nuclear gamma-ray region could be assembled, coarsely oriented and occasionally calibrated by an astronaut; e) An x-ray astronomy observatory on the lurain.

(This report to be concluded tomorrow.)

U.S./ EUROPEAN "TECHNOLOGY GAP" SEEN

President Johnson's science adviser, Donald I. Hornig, has reported to the President that Europeans believe that there is "a technology gap" between Europe and the United States. Hornig, who recently completed a two week visit to Europe, reported he found a desire in some nations there that the U.S. "develop programs to transfer some of our new technology to Europe." Hornig said it was "obvious that Europe has to take steps itself" to close any technological gap.

WEST LEADS NATION IN ELECTRONICS SALES

According to a survey conducted by the Western Electronic Manufacturers Association (WEMA), 1966 electronics sales for the western part of the United States should reach $4.74 billion--nearly 26 per cent of the nation's expected electronics output of $18.25 billion. This corresponds favorably to 1965's $4.3 billion share.

WEMA president Wendell B. Sell says that this could mean 20,000 new jobs this year added to the present total of 267,300, compared to 243,100 a year ago. Sell explains that employment dropped in 1963 and 1964 when sales reached a temporary plateau. He says that "new technology and rapidly expanding use of electronics in consumer and industrial applications are the major forces behind the present industry expansion" rather than the war in Vietnam.

Leading the West's growth at the present time are Arizona and the Los Angeles and San Francisco Bay areas of California. Arizona's employment jumped from 18,600 to 27,000 last year with sales rising from $325 million to $425 million--a 30 per cent increase resulting almost entirely from non-military business. Sales for 1966 are expected to top $500 million, making the state the third largest electronics region in the West.

The Los Angeles area continued to provide over half of the total electronic sales and employment in the West during 1965. The area's employment and sales are expected to continue to expand at the same rate as the national average reaching $2.45 billion in sales this year.

COLOR OUT FOR ABC GEMINI RECOVERY COVERAGE

The technical problems of deploying color equipment on the **GEMINI** recovery carrier have proved too serious to permit solution in time to cover the **GT-8** splashdown and recovery in color as ABC, the downrange pool TV agency, had hoped to do (SPACE Daily, Jan. 24). Nonetheless negotiations with ITT (SPACE Daily, Jan. 28) are continuing for supply of the shipboard ground station that CBS used for **GT-6** and **-7** (SPACE Daily, Dec. 6). ABC expects to finalize arrangements with ITT late next week at the earliest. The USS Wasp, the recovery carrier, is now on a Caribbean trip and will return to its Boston port late this month for preparation for the eighth **GEMINI** mission.

ATLAS E MISSILE COMPLEX EQUIPMENT REMOVAL

The Air Force is requesting non-personal services for removal of equipment from **ATLAS E** missile complexes 2, 6, 7 and 9, located within a radius of approximately 40 miles from Forbes Air Force Base, Kans. Forbes' **ATLAS E** complexes were ordered displaced by Secretary of Defense McNamara in late 1964 (SPACE Daily, Nov. 20, '64) along with other **ATLAS E** squadrons and **ATLAS F** and **TITAN I** missile squadrons.

Major items of equipment to be removed include three underground 28,000-gallon liquid oxygen storage tanks, high-pressure helium and nitrogen storage vessels, and eight diesel engines and generators with associated equipment. No salvage is involved for the items, which will be delivered to the Air Base after removal. Firms have until February 12 to submit bids to the Procurement Division at Forbes.

GENERAL DYNAMICS EARNINGS UP ON LOWER SALES

General Dynamics had sales of $1,472,785,201 for 1965, down from 1964's $1,579,862-316. Although sales were down, earnings rose 15 per cent from $42,611,105 to $49,-268,929.

GENISCO EARNINGS UP 37 PER CENT

Genisco Technology Corp., a Compton, Calif.-based electronic components supplier, had sales of $10,990,955 for FY 1965, up from 1964's $8,126,357 while earnings rose 37 per cent from $305,299 to $419,918. Due to the increase in sales, a consolidation of the various operating elements of the organization was accelerated. Five of the company's ten facilities have been eliminated, enabling the remainder to operate at new levels which have made possible a 35 per cent increase in shipments during the year just ended.

ECI EARNINGS UP

Electronic Communications Inc (St. Petersburg, Fla.) had sales of $7,135,372 for the first quarter of its current fiscal year, compared with the $4,770,161 reported for the same period last year. Earnings for the period rose from $28,532 (three cents per share) to $155,647 (21 cents per share). In spite of the increase in sales, the company's backlog reached a new high of $43,650,000 at the end of the quarter. This compared with $22,500,000 a year ago.

C-E-I-R'S FIRST-QUARTER EARNINGS UP 23 PER CENT

C-E-I-R had sales of $6,203,000 for the first quarter of its current fiscal year, up from the $4,752,000 reported for the same period last year. Earnings for the period rose 23 per cent from $223,000 to $275,000.

DATA PRODUCTS EARNINGS UP

Data Products of Culver City, Calif., had sales of $3,058,232 for the third quarter of the fiscal year, up from last year's $1,856,811. Earnings rose from $10,554 to $255,760. The period, which had a closing backlog of $4,002,339, compared to the previous year's $2,913,071, was the best in the company's history.

LEAR SIEGLER-INSTRUMENT HAS RECORD BUSINESS MONTH

Lear Siegler's Instrument Division recorded its highest monthly total of new business in the company's history--$15,126,000--during December. The total exceeded by more than a million dollars the Division's former record of $14,098,400 set in September 1963. Contributing to the record was a $2,150,000 contract for Aerospace Ground Equipment (AGE).

DIGITAL TIME CODE GENERATOR SYSTEM

NASA-Edwards is requesting proposals for a digital time code generator system, consisting of 10 airborne digital time code generators, two portable synchronization units, and 10 Nixie display driving units and manuals.

Contact: NASA, Flight Research Center, P. O. Box 273, Edwards, Calif. 93523. Reference: RFP 6-288. Due date: March 9.

SAGE SITE ACTIVATION SERVICES

The Air Force Systems Command has a requirement for the site activation services in connection with a back-up interceptor control to the Semi-Automatic Ground Environment (**SAGE**). Activation of 19 operational sites and system engineering support to a nonoperational Category II test facility are involved.

Contact: Deputy for Communications Systems, Electronic Systems Division, Air Force Systems Command, L. G. Hanscom Field, Bedford, Mass., Attn: Directorate of Procurement and Production, Attn: F. E. Obey, Contracting Officer. Due date: Feb. 11.

AIRBORNE INSTRUMENTATION SIGNAL CONDITIONING SYSTEM

The Air Force Systems Engineering Group is initiating a research and development program for an airborne instrumentation signal conditioning system. This program will call for delivery of prototype circuitry of modular construction.

Contact: Directorate of R&D Procurement, Systems Engineering Group, RTD, Wright-Patterson Air Force Base, Ohio, Attn: SEKNA, Thomas E. Bahan, Buyer. Reference: RFP 6D-7346. Due date: Feb. 12.

DOD NEGOTIATIONS

Boeing Co. -- with Air Force Ballistic Systems Division for the design, development, test hardware, documentation, test vehicle installation, test and manufacture of kits for operational aircraft for the airborne launch control center.

Lockheed Missiles and Space Co. -- with the Bureau of Naval Weapons to provide engineering services in support of the United Kingdom **POLARIS** program.

Autonetics, Div. of North American Aviation, Inc. -- with the Bureau of Naval Weapons for engineering services in support of **POLARIS** navigation training facilities.

Western Union Telegraph Co. -- with Air Force Electronic Systems Division for systems engineering services for FY '66 Autodin overseas program.

Nortronics Div., Northrop Corp. -- with U.S. Navy Ships Parts Control Center for **POLARIS** test equipment repair parts.

Lockheed Missiles and Space Co. -- with the Bureau of Naval Weapons for A3P **POLARIS** missiles.

MORE

DOD NEGOTIATIONS-Contd.

Avco-Everett Research Laboratory -- with Arnold Engineering Development Center to perform research studies and the development of a twenty megawatt magnetohydrodynamic accelerator-generator channel.

General Atronics Corp. -- with Air Force Systems Engineering Group for an airborne phased array antenna signal processing techniques.

The Cleveland Pneumatic Tool Co., Cleveland, Ohio -- with the Navy Bureau of Ships for modified adapters for **TERRIER** missiles and boosters and adapters for the **TARTAR** missile.

NASA NEGOTIATIONS

RCA, Camden, N. J. -- with Marshall for continuation of work that has been performed under contract NAS8-11272 for a study on properties of high field superconductors at elevated temperatures.

Dynatronics, Inc., Orlando, Fla. -- with Edwards for the modification of an existing PCM ground station.

Electro-Mechanical Research, Inc. -- with Kennedy for telemetry frequency calibrator systems.

RCA -- with Houston for a **TOSS** spacecraft system study of the APT (Automatic Picture Taking) system on-board gridding.

DOD CONTRACTS

Air Force

Sperry Rand Corp., Ford Instrument Co. -- $72,359 for a study of weapons effectiveness assessment concepts.

Shock Hydrodynamics, Sherman Oaks, Calif. -- $64,915 for the feasibility of a study for lethality and vulnerability test facility.

Columbia University -- $3.9 million for project **DEFENDER** studies.

Giannini Controls Corp., Astromechanics Research Div. -- $78,462 for the continuation of research on pressurized, inflatible, and filament-wound structures.

Navy

Bird Engineering Research Associates, Inc. -- $191,387 for engineering, scientific, analytical, and technical services, facilities, and material to the anti-radiation missile development program.