

# SPACE BUSINESS *Daily*

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## SOVIETS OFFER TO LAUNCH FRENCH "IMP" SATELLITE.

A CNES

(French Space Agency) official has confirmed for SPACE Daily that the Soviets offered during the recent space cooperation talks late last month, to launch a French satellite with a Soviet rocket (SPACE Daily, Oct. 26). CNES proposed that the Soviets launch an **IMP**-type payload into a 125,000-mile apogee orbit. The Soviets apparently countered with an offer to launch such a satellite into a 25,000-mile apogee orbit. The CNES official says the proposal and counter-proposal "happened at the scientists' level" during the recent talks which also discussed future cooperation in space communications.

Currently, the level of discussion of the French-Soviet space cooperation plans are at the Yvon Bourges, State Secretary for Scientific Research and Nuclear Problems, and Mstislav Keldysh level of development (SPACE Daily, Nov. 4). It is believed that the French would have to deliver their satellite to Soviet scientists and would not be permitted to observe the launch of their payload. It is expected that the satellite selected, if the agreement is reached, will be similar to the ESRO (European Space Research Organization) satellites, **TD-1**, **TD-2** and **HEOS** (High Eccentricity Orbit Satellites), projects scheduled for launching by the United States with **DELTA** vehicles.

## DIRECT FM BROADCAST SATELLITE TECHNOLOGY "IN HAND."

Officials

say the technology for the Direct FM Broadcast Satellite for which NASA is expected to request proposals in the near future (SPACE Daily, Nov. 15 & 8) is already "in hand" with the pacing factors being NASA's degree of aggressiveness and booster availability. The problems of developing FCC regulations and working out the new principles are not expected to be too difficult to surmount.

The **FMB** might utilize an antenna of 100 feet in diameter or larger from its synchronous platform. Seen as useful for network, educational and computer communications applications, the solar-powered space package's major problem will be effective radiated power, a factor dependent on the RF power output of the satellite transmitter and the gain of the satellite antenna.

## NAVY WILL ORDER 100 TALOS PER YEAR.

The Naval Ordnance is seeking

procurement contractors for the anticipated delivery of about 100 **TALOS** surface-to-air missile boosters per year. Competition is being sought for what is expected to be a multi-year program. The procurement may be a part of the Navy's program of "Get Well" research to improve the intercept capability of the weapon which while

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installed aboard seven ships is not ear-marked for further deployment until its accuracy is improved. Allegany Ballistics Laboratory produces the TALOS Mk 11 booster.

**FR-1 ASSUMES OLD LAUNCH DATE.** Despite the French proposal to launch its **FR-1** satellite this week and despite recent indications the launch may at least come this month (SPACE Daily, Nov. 10), the original launch period of mid-December now seems more probable. CNES, the French space agency, has just released an **FR-1** press kit, but it does not name a liftoff date, and SPACE Daily is told by French officials that the CNES program director for **FR-1** will fly to this country December 6, possibly to make final arrangements for a preChristmas shot.

**FR-1** was scheduled to be flown to Los Angeles yesterday and then trucked to Vandenberg for mounting on its **SCOUT** vehicle. The prelaunch checkout should begin today or tomorrow. The satellite will carry two experiments to study radio propagation and electron density respectively.

**LLRV TO BE MODIFIED TO LEM CONFIGURATION.** NASA-Edwards will award a contract to Bell Aerosystems for modification of the **LLRV** (Lunar Landing Research Vehicle) to simulate the **LEM** interior and control configuration. Bell originally delivered two **LLRVs** to NASA, one in an unassembled condition. Both vehicles already have the capability to simulate the power and stabilization mode of the **LEM** under lunar conditions. Now that the **LEM** configuration is frozen, NASA is investigating ways to make the second **LLRV** more similar to the **LEM**. The possibilities include changing the **LLRV** from a one-man to a two-man vehicle.

**DUAL NOZZLE STUDIED FOR NAVY MISSILES.** Rocketdyne-McGregor (Solid Rocket division) has been studying and will receive a contract from the Bureau of Naval Weapons for a research program to determine the development feasibility of dual nozzle and its application to the current family of advanced Navy solid propellant missiles under development.

**HONEYWELL TO STUDY NEW ASROC WARHEADS.** The Naval Ordnance Test Station will enter into negotiations with Honeywell of West Covina, California, for an evaluation study of advanced warheads for the **ASROC** anti-submarine rocket missile. Honeywell is prime contractor for this weapon which is currently designed for a General Electric Mk 44 homing torpedo with a nuclear warhead.

**AIR FORCE BLUE ROCK.** The Air Force Electronics Systems Division will issue a contract to Technical Operations, Inc. for the maintenance, inspection and testing of the Blue Rock instrumentation. In other Blue Rock programs the Army Missile Command recently issued a contract to Emerson Electric for design changes in the rocket vehicle being designed as a part of Operation **BLUE ROCK** (SPACE Daily, Oct. 21, '64) and the Bureau of Naval Weapons issued a contract to Lockheed for the modification of the Mk 2 re-entry vehicle for the **BLUE ROCK** Operation (SPACE Daily, Sept. 15, '64). The Air Force ESD is presently engaged in the determination phase of a Sea Launched Ballistic Missile Detection System (SLBMDS).



#### FOURTH STINGS TEST IS SUCCESSFUL

The fourth test of the **STINGS** (STellar INertial Guidance System) aboard a **POLARIS A-1** missile was performed "perfectly" late last Friday afternoon from Cape Kennedy. The missile left Complex 29A at 5:28 PM EST and arced the system some 230 miles to an ocean impact southeast of the Cape. The system first acquired the North Star, as it did during the three previous shots, and then repositioned itself and acquired another star as it was programmed to do.

**STINGS** is built by General Precision for the Air Force's **STAFF** program (STellar Acquisition Feasibility Flights), and this was the last feasibility-demonstration flight. The system was originally intended for the **MMRBM** (Mobile Mid-Range Ballistic Missile) but has now been considered for use with the **POSEIDON** and other future fleet ballistic missiles (SPACE Daily, Jan. 25 and Mar. 4). **POLARIS**-producer Lockheed is associate contractor with GP for **STAFF**.

#### SYLVANIA BUILDS MOBILE SPACECOM TERMINAL

Sylvania has fabricated a lightweight, mobile ground station for deployment in front-line battlefield positions to feed communications satellites. The 4000-pound terminal has a collapsible 12 foot dish antenna, is erectable in less than an hour, and can handle two-way voice or teletype transmissions. It can be transported by helicopter and towed to the set-up site by truck. It was fabricated under a company-funded R&D program.

#### ITT TERMINAL TO AID LIVE TV OF GEMINI RECOVERIES

If the TV networks decide to provide live television coverage of the **GTA-6** and **GT-7** recovery operations (SPACE Daily, Nov. 1 & 12), the mobile ground station on the recovery carrier will again be ITT's as it was for the aborted **GTA-6** (SPACE Daily, Oct. 11). Western Union was hopeful of supplying the terminal for the ship-to-satellite-to-shore TV transmissions, as it was for the first **GTA-6** (SPACE Daily, Sept. 24), but the terminal it would use, made by Page Communications, is not expected to be ready in time even if CBS, the pool TV agency, did decide to work with WU on the coverage.

The ITT terminal is still on the USS Wasp, the recovery carrier, having been left there since the unrealized **GTA-6**. The Wasp is in port at Boston being prepared to go to sea on the 30th of this month to deploy for the upcoming **GEMINI** flights. The terminal was checked out at sea under conditions similar to those it will soon meet (SPACE Daily, Nov. 1).

#### LOCKHEED TESTS NEW PULSE MOTOR PROPELLENT

Lockheed has begun preliminary testing on a new wafered pulse solid propellant motor utilizing an aluminized Nitroplastisol propellant. Based on the AF-sponsored research leading towards a **SRAM**-type air launched missile, the new pulse motor will have a new initial velocity, a higher burning rate, and a restartable versatility which could be used for a **SRAM** follow-on missile, a maneuverable tactical missile, or a possible surface launched anti-missile missile.



### NASA-LEWIS TO BRIEF PETROLEUM INDUSTRY

NASA-Lewis has scheduled a two-day "Conference on Selected Technology for the Petroleum Industry" December 8 and 9 in Cleveland. The conference, which is the first such meeting planned by NASA to acquaint a specific non-aerospace industry with knowledge gained from space research and development, is planned as part of NASA's Technology Utilization Program whose objective is to transfer to the general economy the scientific and technical results of the space program.

Lewis scientists and engineers will survey subjects of special interest to the industry such as heat transfer and combustion; storage and handling of liquids and gases; magnetics and superconductivity; physics and chemistry of surfaces; fluid system stability; hydrodynamics of liquid surfaces; pump technology; and bearings, seals and lubricants.

### LITTON FILES STOCK PLANS

Litton Industries has filed a registration statement with the Securities and Exchange Commission seeking registration of 75,000 shares of common stock, to be offered pursuant to its Employees Stock Purchase Plan. The company also filed a registration statement covering 30,000 options to purchase a like number of common shares (and the underlying stock), to be offered under the Foundation of the Litton Industries Plan.

### GENERAL INSTRUMENT FILES DEBENTURE OFFERING

General Instrument Corp. of Newark, N. J., has filed a registration statement with the Securities and Exchange Commission seeking registration of \$12 million of convertible subordinated debentures. The debentures, which will come due in 1985, will be offered for public sale with the interest rate, public offering price and underwriting terms to be supplied by amendment.

Debenture sale proceeds will be used to repay all of the company's presently outstanding 5 1/4 per cent loans payable to banks, and the balance will be added to working capital. The company, which manufactures electronic components and end products for space, defense, industrial and commercial markets, has outstanding 2,657,523 common shares, of which management officials own 15.7 per cent.

### GT&E FORECASTS '65 EARNINGS OF \$165 MILLION

General Telephone & Electronics, whose divisions include Sylvania Electric Products and Lenkurt Electric, expects to have total assets of more than \$3.8 billion by the end of the year. Company officials predict that sales for the year should exceed \$2 billion with earnings of approximately \$165 million. GT&E's space and defense business totaled approximately \$242 million last year, including a wide range of highly advanced projects in communications, electronics and related fields.

John C. Mooney Jr. has been named general manager of Curtiss-Wright's Electronics Division. Mooney, who has served as vice president of operations at the division since July, succeeds Shirley D. Brinsfield who is now a corporate vice president.



### DOD INVESTIGATING C-5A CONTRACT INFORMATION LEAK

The Department of Defense is conducting an inquiry into the possibility of premature release of the award of its contract for the C-5A jet transport to Lockheed-Georgia. The confirmation of the investigation came in a letter from Deputy Defense Secretary Cyrus R. Vance to Rep. Bob Dole (R-Kans.), who had asked for inquiries from both DOD and the Securities and Exchange Commission (SPACE Daily, Oct. 19 & Nov. 4).

In his request for an investigation into the matter, Dole pointed out that approximately \$32 million worth of stock in the three companies under consideration for the contract was traded on the New York Stock Exchange in advance of the official announcement and that the volume and pattern of trading showed that information as to who would get the contract "was unquestionably in the hands of certain insiders well ahead of its release to the general public."

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### SYLVANIA AWARDS ALTAIR RADAR CONTRACT

Sylvania Electric has awarded a \$900,000 contract to Energy Systems for design and manufacture of a high power radar transmitter for use in Project **ALTAIR** (ARPA Long-Range Tracking and Instrumentation Radar) as part of the Project **PRESS** investigations of how to distinguish an ICBM warhead from other objects entering the atmosphere. The system will be used on Roi-Namur Island in Kwajalein Atoll, site of the **NIKE-X** experiments.

Sylvania was awarded a \$16 million radar contract for Project **ALTAIR** in May (SPACE Daily, May 17) by DOD's ARPA (Advanced Projects Agency). The project will be monitored by the Army Missile Command (SPACE Daily, July 2). Sylvania is responsible for design, construction and installation of the radar facility.

### SYLVANIA RECEIVES MINUTEMAN CONTRACT

Sylvania Electric has received a \$1 million extension to provide for 50 more **MINUTEMAN II** missiles under their prime contract to install an underground cable communications system for the **MINUTEMAN II** installations in north central Montana. This contract extension brings the total missile sites under the contract to 200.

### MINUTEMAN GUIDANCE SYSTEM SETS NEW RECORD

A **MINUTEMAN I** guidance and flight control system, built by North American's Autometrics Division, has operated continuously without error for more than 21,000 hours at Malmstrom AFB, Mont. The N10Q guidance system, which was installed in its silo more than two years ago, has more than 20,000 electronic parts, including resistors, diodes and capacitors.

George A. Earle Jr. has been appointed to the newly created position of manager, product sales for RCA's Aerospace Systems Division. Earle was previously marketing manager, applied research techniques for the corporation's Applied Research Division.

J. Knight Goodman has been named to the newly created position of corporate director of public relations and advertising for Aeronca Manufacturing Corp.



### BOEING ADDS ENGINEERING EMPLOYMENT POLICIES

Boeing-Seattle has initiated the following new engineering employment practices policies: 1) To encourage engineers to take state engineering registration examinations, after-hour refresher courses have been initiated. Boeing will reimburse employees for one-half their tuition expenses upon completion of the program; 2) To add status and prestige to those who have passed the registration examination, the initials P. E. (Professional Engineer) will be placed on identification badges, and the employees will be permitted to use the designation on company documents; and 3) Boeing will encourage engineers to participate in continuing education programs conducted by the University of Washington by reimbursing one-half the tuition expenses incurred by engineers enrolled in approved technical courses.

These new practices follow closely Boeing's stepped-up engineer recruitment program, which has been geared to hire more than 2500 additional engineers before the end of 1966 (SPACE Daily, Oct. 25).

### 17 INVITED FOR ION IMPLANTATION TECHNIQUES STUDY

NASA-Cambridge has invited 17 firms to submit proposals for its R&D program (ERC/R&D 66-60) for the development of ion implantation techniques for microelectronics. The implantation techniques will cover junctions, resistors and interconnections on high temperature material substrates such as silicon carbide by the use of ion beams and will be used in the fabrication of semiconductor integrated and thin film circuit technologies.

The following were on the Center's original invitation list: Advanced Kinetics (Costa Mesa, Calif.), Autonetics, Boeing Aerospace, CBS Laboratories (Stamford, Conn.), Cornell Aeronautical Laboratory, Electro-Optical Systems, Fundamental Methods Associates (New York City), General Dynamics/Convair, General Precision Librascope, Hughes Research Laboratories, Ilikon Corp. (Natick, Mass.), Ion Physics Corp. (Burlington, Mass.), Litton Applied Science Division, Sprague Electric Co. (North Adams, Mass.), Texas Instruments, Varo Inc. (Garland, Tex.), and Westinghouse. Due date is December 6.

### US-ARGENTINE SPACE AGREEMENT EXTENDED

The present agreement on space cooperation between NASA and the Argentine Comision Nacional de Investigaciones Espaciales (CNIE) has been extended to provide for a series of four **NIKE-APACHE** sounding rocket launches from Chamical, Argentina. NASA will provide the equipment and facilities for construction of the payloads and a **NIKE-APACHE** launcher on loan. CNIE will provide the personnel who will fabricate the payload at NASA-Goddard, and procure the rockets and operate the launch range. CNIE will also be responsible for the reduction and analysis of the data. The sounding rockets will measure electron density and temperature and ion density in the atmospheric phenomenon known as sporadic E.

L. H. (Luke) Sample, formerly Washington representative for AVCO, has been named vice president and Washington representative for the firm's Lycoming Division.



### DOD NEGOTIATIONS

Aerojet-General Corp.--with Bureau of Naval Weapons to conduct a research program in the area of mechanical properties and structural integrity of solid propellants.

Thiokol Chemical Corp., Reaction Motors Division--with Bureau of Naval Weapons to conduct a supporting research program directed toward evolving an optimum positive expulsion technique for advanced thixotropic slurry packageable propellants.

American Cynamid Co., Central Research Laboratories, Stamford, Conn.--with Bureau of Naval Weapons to conduct a research program on the synthesis, characterization and evaluation of oxidizers and binder containing the difluoramino-group for use on rocket propellants.

Philco Corp., Western Development Laboratories--with Air Force Satellite Control Facility for special support activities for satellite control facility.

Hughes Aircraft Co., Grounds Systems Group--with Army Electronics Command to continue research work in the field of satellite communications.

Perkin-Elmer Corp., Electro-Optical Division--with Army Missile Command for installation and operation of Project **GLOW** equipment.

### NASA NEGOTIATIONS

GCA Corp., GCA Technology Division--with Washington for investigation of performance of Langmuir probes in the ionosphere.

Varian Associates, Beverly, Mass.--with Washington for research leading to the development of an atomic hydrogen maser for space vehicle application.

### DOD CONTRACTS

#### Navy

The Western Co., Research Division, Dallas, Tex.--\$195,000 for development and fabrication of an aviation fuel gelling device for **FIREEYE**.

#### Air Force

The Mitre Corp., Bedford, Mass.--\$8.2 million for general systems engineering, technical direction, engineering support in the area of electromagnetic communications and control.

Cornell University--\$30,000 for experimental study of the coherence in Q switched ruby laser emission and in output radiation arising from non-linear, stimulated optical phenomena.

The Trustees of Emmanuel College, Boston, Mass.--\$90,000 for research directed toward study of cosmic and trapped radiation.