

# SPACE BUSINESS *Daily*

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**FIRST MOLNIYA MOSCOW-PARIS TV TODAY.** The first official color telecast from Moscow to Paris by way of the **MOLNIYA** communications satellites, originally scheduled for late December (SPACE Daily, Oct. 26 & Nov. 23), has been scheduled for today. President Charles de Gaulle was informed last week that all was in readiness after all technical obstructions had been removed. The telecast from Moscow will be picked up at Pleumeur-Bodou, French Brittany.

**HURT ISSUES PLEA FOR 156.** The 156-inch solid motor development, jeopardized in the FY '67 budget preparation for DOD (SPACE Daily, Sept. 29 & Oct. 21), has recently been vigorously defended by Lockheed's Robert Hurt. After citing the great increase in payload capability and as great a reduction in cost, Hurt asks: "Must you always have a clearly defined requirement before you provide the equipment to handle it? Or would it not be wise to profit by the lessons of past history and provide now for the increasingly demanding space missions that are sure to come?"

Hurt explains that a **TITAN III** with 156-inch boosters will almost double the payload of a 120-**TITAN III**'s 23,000 pounds to 40,000 pounds (SPACE Daily, Feb. 4) while reducing the cost of payload pound from \$600 to \$400. Further, an **AGENA** upper stage would drop the cost to \$250 per pound and an all-solid 156-inch first stage would cut the cost to about \$200 per pound.

**ABELSON/WEAVER SOLIDIFY THEIR ANTI-SPACE LEADERSHIP.** Two of the nation's strongest opponents of a national space leadership drive have in the past few days solidified their ranking positions for the space historical archives. One of the most outspoken, Dr. Philip H. Abelson, once again charging that the decision for **APOLLO** was occasioned by a desire to shadow the Bay of Pigs failure, says the returns from our manned space program have been neither good nor lasting.

Aligning the nation's space efforts with the government expenditure of R&D funds "that do not help our competitive position or benefit society," Abelson believes the money would best be spent on chemistry. "The strongest nation," he explains, "will be the one that applies chemistry most effectively (which is) 10 to 100 times as important as space." Abelson is the editor of *Science*, the organ for the American Association for the Advancement of Science.

Shortly after Abelson's outburst against space, Dr. Warren Weaver, a former head of the AAAS, said the decision to spend the vast sums in a race with the Soviets to explore and exploit space is "just plain stupid." Interviewed by the U.S. News &

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World Report magazine, Weaver said the popular figure of \$30 billion for the **APOLLO** project could be used to raise teachers' salaries, endow colleges, educate scientists, construct medical schools, build and endow universities for developing countries, or finance three new Rockefeller foundations.

### NINE BID ON LIFTING SHUTTLE GUIDANCE/CONTROL STUDY

Nine firms--Autonetics, Bell Aerosystems, General Dynamics/Convair, GE, Honeywell, Kaman AviDyne, Lockheed-California, Martin, and Raytheon--have submitted proposals for NASA-Cambridge's program of trade-off studies to identify the opportunities and problems in guidance and control systems of the horizontal landing class of re-entry space vehicles in the terminal phase of Earth re-entry, from approximately 100,000 feet until touchdown, under adverse flight conditions. Sixteen firms were invited to bid on ERC/R&D 66-54 (SPACE Daily, Oct. 28).

### HUGHES TO BUILD ATS CLOUD CAMERA

The University of Wisconsin has awarded Hughes' Santa Barbara Research Center a \$180,000 contract to develop a cloud camera for use on an experiment on either the first (B) or fourth (C) flight of NASA's **ATS** (Applications Technology Satellite)(SPACE Daily, Nov. 18). With the satellite orbiting at a synchronous altitude, the camera will provide 2.2-nautical-mile resolution over a 100-degree area (50 degrees north latitude to 50 degrees south latitude). The camera will operate during the daylight only and will be aided by the satellite's spin stabilization.

### GEMINI VII LAUNCH ON DEC. 4 CONFIRMED

After three successful simulated flights with the **GEMINI VII** launch vehicle and spacecraft, NASA has confirmed the scheduled December 4 launch date for the first of the dual flights. A last minute power surge in the spacecraft guidance system was evaluated as not being a critical problem.

The launch should place the **GEMINI VII** spacecraft into orbit for a planned 14-day mission. **GEMINI VI** will be sent into orbit on December 13 for a rendezvous with **GEMINI VII**.

The flight plans for both missions remain almost the same as when they were planned for individual launches. The long duration **GEMINI** flight will allow a number of experiments to be performed, many of which have been attempted on previous missions. Those that will be repeated on **GEMINI VII** are: Cardiovascular Conditioning; In-Flight Exerciser; In-Flight Phonocardiogram; Bone Demineralization; Human Otolith Function; Proton-Electron Spectrometer; Tri-Axis Magnetometer; Celestial Radiometry and Space Object Radiometry; Simple Navigation; Synoptic Terrain Photography; Synoptic Weather Photography; and Visual Acuity and Astronaut Visibility (SPACE Daily, Nov. 29).

New experiments to be flown on the **GEMINI VII** mission are: Bioassays Body Fluids; Calcium Balance Study; In-Flight Sleep Analysis (by electroencephalograph); Optical Communication (voice communications by laser beam); Landmark Contrast Measurements; and Star Occultation Navigation.



## U.S. URGED TO STEP-UP INTERNATIONAL SPACE COOPERATION

An eight-man committee of space executives has called on the United States to take the lead in planning for international cooperation in space. The group, The Committee on Space of the National Citizens' Commission on International Cooperation, has recommended nine possible areas of international space cooperation at the White House Conference on International Cooperation (SPACE Daily, Nov. 12 & 24).

The Space Committee, chaired by Joseph V. Charyk, president of Com-Sat, paid tribute to growing space programs around the world, and asserted that the U.S. must be ready to enter into joint space ventures "of unusual technical interest" and enterprises that are "uniquely international in character."

### Nine Projects Recommended

Despite limitations in overseas state-of-the-art and funding, there are numerous future cooperative projects which can be foreseen, the committee said. These areas were recommended for further study:

1) New Launching Sites for Satellites. Of optimum interest is equatorial launching sites.

2) Multi-Purpose Navigation Satellite Systems. Studies are now underway to determine the value of such systems for marine and air navigation, traffic control, distress calls and assistance in rescue operations. If a positive conclusion is reached, the first step might be a joint navigation satellite experiment. For an operational system, if approved, the establishment of the space and supporting ground facilities could be carried out as a governmental rather than a commercial enterprise.

3) Experimental Data-Gathering Satellite System. The system would collect information from such sensing devices as buoys at sea, meteorological ground stations, and constant-altitude balloons. Plans for testing components and preparing experiments are already underway.

4) Synoptic Sounding Rocket Investigations. Interest here is in expanding sites and coordination of programs to study such things as high-atmosphere processes which can help explain the linkage between space phenomena and terrestrial weather.

5) Applications of Communications Satellites. For example: linkage of a company's facilities around the world by closed circuit TV; transmittal of business letters and documents; linkage of computer operations; improvement in aviation communications; linkage of television stations throughout the U.S.; transmittal of long range and emergency medical information; and direct broadcasting from space into the home receiver ("foreseeable during the decade of the 1970s). (See SPACE Daily, Nov. 12 & 29).

6) Mutual Assistance Between National and International Tracking and Data Acquisition Networks. Specifically: between the U.S. system and the systems under development by France and by the European Space Research Organization (ESRO).

7) Exploration of the Distant Planets. The principal contributions of others will be in the experiment and spacecraft systems areas, with the principal U.S. contribution seen in the booster and spacecraft support areas.

8) Remote Sensing. Initially, cooperating countries might provide test sites and correlative ground data in return for data derived from airborne and space flight sensing operations ("toward the end of this decade").

MORE



**U.S. URGED TO STEP-UP INTERNATIONAL SPACE COOPERATION-Contd.**

9) International Convention to Govern Human Activity on the Moon. The U.N. Committee on the Peaceful Uses of Outer Space could direct its Legal Subcommittee to draft a convention to serve as a guide for nationally-sponsored exploratory expeditions there. ("The Antarctica Treaty stands as a model providing the essential elements of such a convention: suspension of sovereignty claims, free access by all for scientific purposes, exclusion of military maneuvers and weaponry, and a verification procedure").

Members of the committee, in addition to Dr. Charyk, are Lloyd V. Berkner, Southwest Center for Advanced Studies; Karl Harr, Aerospace Industries Association; Robert Kay, Hughes Aircraft; W. Randolph Lovelace II, Lovelace Clinic; James S. McDonnell, McDonnell Aircraft; Hilliard Paige, General Electric; and Courtland D. Perkins, Princeton University.

**MANNED INTERNATIONAL COOPERATION OVERLOOKED (An Analysis).**

SPACE Daily believes the special Space Committee of the National Citizens' Commission of the White House Conference on International Cooperation has overlooked what might be one of the most promising and fruitful areas of international cooperation in space: a program to extend to the other countries an opportunity to participate physically in the manned spaceflight program.

This is the area where only the United States and Russia have the capabilities for perhaps many years to come. Yet, it is one area where most of the NATO countries at least are fully qualified to participate without "limitations in the state-of-the-art or lack of funding."

To all countries which have well qualified jet pilots, we could extend an invitation for submittal of a candidate for consideration for astronaut training within the United States. From this international astronaut pool, we could select one, when the time comes, for each (or most) of the AA (APOLLO Applications) program missions. Even France, who is the youngest member of the international space leadership, has no immediate plans for a manned space program.

**PHILCO SALES UP 16 PER CENT FOR FIRST TEN MONTHS**

Philco's sales for the first 10 months of 1965 were 16 per cent ahead of the total recorded for the same period in 1964, while government, international, and industrial sales were 15 per cent higher and the backlog in government contracts stood 15 per cent higher. Robert O. Fickes, president, says that "We anticipate that on the basis of current negotiations our government backlog by the end of 1965 will be up nearly 50 per cent over the total at the end of last year."

Government sales during the past 10 months included a \$30.2 million contract from the Air Force for an experimental program to extend missile re-entry technology.

**Najeeb E. Halaby**, former Administrator of the FAA and presently a senior vice president and a member of the board of directors of Pan American World Airways, has been elected to the board of trustees of the Aerospace Corporation.



### DOUGLAS MANRATING SPACE CHAMBER

The two-year-old vacuum chamber at Douglas' Huntington Beach (Calif.) plant is being modified to permit its use of manned experiments and tests under simulated space conditions. Thirty-nine feet in diameter, the chamber has been used to test spacecraft components, but, by this time next year, when it is expected to be man-rated, it will contain whole space systems for long-duration trials.

The modification consists essentially of the addition of two airlocks in tandem, with the second (the one next to the chamber) to be both a traffic corridor and a secondary test chamber. The locks will be formed by a ten-foot, stainless-steel cylinder and three four-by-seven-foot doors. The first (outer) lock will be eight feet long, and the second (inner) 13 feet. The work is being done by the Pittsburgh-Des Moines Steel Co. under a \$280,000 contract from the Douglas Missile & Space Systems Division.

When employed as a vacuum chamber, the inner lock will be able to accommodate up to 20,000 pounds of hardware and simulate space at up to 150 miles out. Mechanical pumps will evacuate it until the 40-mile level is reached, then a diffusion pump system will take over. It will have a 6.5-foot opening in its ceiling to allow the mounting of either a solar-simulator or a cover from which instruments and/or test equipment can be suspended.

### AEROJET TO BUILD NEW MARK 46 TORPEDO

The Navy has awarded a \$2 million supplemental agreement to Aerojet-General's \$62 million contract for development and production of a new version of the Mark 46 underwater missile (SPACE Daily, Nov. 1).

The new version, termed the Mod 1, will use a liquid fueled propulsion system instead of the solid propellant previously used. The Mod 1 will also use electric steering control rather than the hydraulic steering used on the Mod O Mark 46.

The changes will provide better performance, simplified maintenance and lower cost. A number of fleet-ready Mod O Mark 46s have been delivered to the Navy and are designed to be launched from aircraft, destroyers, piloted or drone helicopters or by ASROC antisubmarine rockets.

### MISSILE SITE SURVEY COMPLETED

Sylvania has completed a 3375-square-mile aerial survey of north central Montana, the area where 50 MINUTEMAN II ICBM silos and five command posts are being installed. Sylvania is under contract to the Air Force to install about 350 miles of hardened, underground communications cable to link the missile sites.

Jules I. Schwartz has been appointed director of technology at System Development Corp. Schwartz, previously head of the Technology Directorate's Programming Systems Staff, will be responsible for applied research and development in the information sciences.



### ECI/BENSON MERGER APPROVED

Stockholders of Electronic Communications and Benson Manufacturing Co., an ECI subsidiary in Kansas City, Mo., have approved a merger of the two companies, with Benson becoming an operating division of ECI (SPACE Daily, Oct. 28). ECI had owned more than 86 per cent of Benson's stock prior to the merger. Arrangements have been made for other Benson stockholders to receive 1/10 of one share of ECI stock for each of their Benson shares.

ECI management considers the merger as the final step in a two-part plan designed to increase efficiency and effectiveness through a combination of the operations of ECI subsidiaries with those of the parent company. The first step was completed by the transfer to ECI of the business of Standard Precision, a wholly-owned subsidiary located in Wichita, Kans.

### ITT ESTABLISHES DATA SERVICES DIVISION

ITT has formed a Data Services division at Paramus, N. J., which will offer data processing services to both commercial and government customers. The new division has branch operations in Nebraska, California, Virginia, and Washington, D. C.

The division, which will be headed by Robert A. Leonard, is planning a national computer services network and will offer subscriber data processing--high-speed data lines linking local customers directly to a centrally located large-scale computer system. ITT has been using this system for over a year in the metropolitan New York area and has plans for a West Coast regional subscriber data processing center for next year with centers planned for other points later.

### 68 PER CENT OF BOEING'S ORDERS TO SMALL BUSINESS

Boeing placed more than 68 per cent of its orders in support of government contracts with small businesses during the first six months of 1965. The 76,900 purchase orders placed with small firms totaled \$54.5 million, or one-third of the dollar value of all contracts issued during the period of government work.

Boeing, which recently passed the \$1 billion small business contracting mark, cooperates with the Small Business Administration's source referral program and the DOD/AIA voluntary Economic Assistance Program to build up its lists of qualified contractors in the small business category.

### MCDONNELL WORKERS RETURN

The 17,000 members of the International Association of Machinists returned to work at McDonnell Aircraft in St. Louis last Friday, which under their new contract becomes their ninth paid holiday. McDonnell called for large numbers of production workers to put in overtime to make up for the time lost during the six-day strike on work on two GEMINI capsules and some 50 Phantom jet fighters.

Edward J. Kuebert has been appointed value manager for Fairchild Space and Defense Systems. Kuebert was formerly manufacturing engineering manager.



### AERONUTRONIC ENGINEERING EMPLOYMENT UP 20 PER CENT

Philco's Aeronutronic Division has hired a total of 300 engineering personnel in the past 60 days, bringing total engineering employment up 20 per cent. Dr. Robert S. Carlson, director of engineering, says that the increase is part of the planned, orderly growth of the Division, and that hiring will continue at a moderate rate in the immediate future.

The new engineers, which bring Aeronutronic's total engineering complement up to 1550, were hired to support the Division's current contractual commitments. Aeronutronic presently has more than 85 prime contracts with NASA and the DOD including weapon systems; re-entry systems, including planetary landing capsules and penetration aids; reconnaissance and intelligence systems, and associated radar; and anti-weapon systems.

### SOLAR GETS SATURN V CONTRACT

Boeing, prime contractor for the **S-IC** first stage booster for the **SATURN V**, has awarded a \$1.4 million subcontract to Solar Division of International Harvester, for production of fuel pressurization ducts used to carry helium needed to pressurize the 199,000 gallon fuel tank.

### SPACE EFFECTS ON OPTICS STUDY RENEWED

NASA-Goddard has renewed a one-year \$50,000 study contract with Avco/RAD for an investigation of the contaminating effects of the space environment on optical materials similar to those used on the **TIROS** and **NIMBUS** weather satellites. The program will investigate changes in the infrared optical characteristics of semi-conductors.

### SYLVANIA PRODUCES ICBM SECURITY DEVICE

Sylvania Electric is producing the electronic security systems to protect 300 of the **MINUTEMAN ICBM** sites being installed throughout the US. The device creates a broad three-dimensional dome of radio signals around the missile silo. Any human intruding into the protected area creates a signal change which is detected by the device, analyzed and an alarm sounded within less than a second.

### SPACE EXERCISE DEVICE DEVELOPED

Lockheed Aircraft has developed a device weighing 15 pounds which can be used by astronauts on future long duration space missions to maintain physical condition. The device consists of a small metal cylinder through which a nylon line is pulled. Wooden handles or stirrups are attached to the ends of the line and the force required to pull the line through the cylinder can be varied from zero to 400 pounds by rotating the outer sleeve of the cylinder. The device can be used for either isometric or isotonic exercises.



### A-1A LAUNCH QUALIFIES DIAMANT FOR D-1A LAUNCH

Friday's successful launch of the first French satellite, **A-1A**, can be considered as a qualification demonstration of the **DIAMANT** launch vehicle for orbiting the **D-1A** satellite in January as planned (SPACE Daily, Oct. 8 and Nov. 9). So said General Pierre Soufflet to SPACE Daily soon after the **A-1A** flight had been verified as satisfactory. General Soufflet oversees missile and rocket operations for France's DMA (Delegation Ministerielle l'Armement).

The second **DIAMANT** was taken disassembled to the Hammaguir launch range in Algeria (where **A-1A** was launched) to back up its older brother (**A-1A**'s vehicle), and its second stage, **TOPAZE**, was used on **DIAMANT I** because I's **TOPAZE** was slightly damaged during its trip to Hammaguir from France. While **II**'s first stage, **EMERAUDE**, will remain at Hammaguir, its third stage, **RUBIS**, will be returned to France for mating with **D-1A** at the SEREB plant at Saint Medard en Jalles. SEREB builds the **DIAMANT** ("Diamond") for the DMA.

Four **DIAMANT**s have been built, and **II** was being considered for orbiting **A-1B** if **A-1A** failed (SPACE Daily, Nov. 9). **A-1A**'s success precludes the need for that shot, though, so the **D-1A** flight will be France's next space launch. **D-1A** is a 37-pound payload that will serve primarily to permit testing of satellite systems in orbit. For example, radiation effects on the craft will be studied.

### RITLAND RETIRES/RECEIVES MEDAL

Maj. Gen. O. J. Ritland, deputy commander for space of the Air Force Systems Command, has been awarded the NASA Exceptional Service Medal upon his retirement today from the Air Force. NASA Administrator James E. Webb commented that Ritland had led in the development of technology for manrating the **MERCURY-ATLAS** and **GEMINI-TITAN** launch vehicles, providing "an unprecedented example" of cooperation between the Air Force and NASA. Ritland has been one of the key AF officials behind **MOL** since its inception.

### MARSHALL TO PURCHASE 48 ROCKETDYNE J-2 ENGINES

NASA-Marshall has added an additional \$75.8 million to Rocketdyne's contract to supply 48 additional J-2 rocket engines to the Center, bringing the total value to approximately \$206 million. The amendment, which also converts the original cost-plus-fixed-fee contract to a cost-plus-incentive-award-fee arrangement, also calls for the company to provide various support services to Marshall. These include field engineering services, documentation, reports, ground test support equipment, spare parts and operational simulators. Marshall has ordered a total of 103 J-2 engines for use on the **SATURN IB** and **SATURN V**.

### FR-1 TO BE LAUNCHED DEC.

**FR-1**, the French satellite to be launched by an American vehicle (a **SCOUT**), will be orbited December 6 from Vandenberg. This date falls within the period recently set (SPACE Daily, Nov. 17).