SPACE BUSINESS Daily

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SURVEYOR MAY SLIP AGAIN. The first flight of a lunar soft-lander **SURVEYOR** faces its fifth slippage in five months. Now, a program official confirms, the flight may move from late May to "early June." When the May flight schedule was originally established, one official hinted that it might not be possible to hold to that date (SPACE Daily, Nov. 24). **SURVEYOR**, most recently, slipped due to technical difficulties from October (SPACE Daily, Sept. 24) to late in the year (SPACE Daily, Oct. 5) to February (SPACE Daily, Oct. 11) to March (SPACE Daily, Nov. 4) and then to May (SPACE Daily, Nov. 24).

The first flight model of **SURVEYOR** will be delivered by Hughes to the General Dynamics/ Convair plant later this month for mating with the flight shroud. Current plans call for delivery to Cape Kennedy between April 1 and April 15.

FIRST APOLLO IS POSSIBLE CIRCUMLUNAR FLIGHT. The official explanation to NASA's current plans for a possible manned circumlunar flight of **APOLLO** prior to a manned lunar landing, a plan which the Soviet Union is furthering (SPACE Daily, Feb.7), is that: "The first manned lunar flight which finds itself in the vicinity of the Moon will decide whether or not to land or simply circumnavigate the Moon," i.e., the "official" announcement of the plan will be made after the decision to do so.

In the meantime, NASA-Houston plans to negotiate with North American for a contract to define a plan to integrate the **APOLLO** Mapping/Survey (AMS) system, originally scheduled for a mission of **AA** (**APOLLO** Applications) to locate post-initial **APOLLO** landing sites, into the **APOLLO** program (See yesterday's SPACE Daily). NAA has been under contract for several months for the definition of the **AA** AMS system.

SOVIET CIRCUMLUNAR FLIGHT SEEN BY '67 AT LATEST. The Soviet Union "will put a man around the Moon without landing...later on this year or certainly next year," Jodrell Bank director Sir Bernard Lovell said yesterday. (SPACE Daily reported the day before (page 220) that "we can confidently surmise that the manned circumlunar flight by the Soviets is early on the agenda, perhaps in 1967 or early 1968," with early 1969 carried forward as the latest date for the manned landing.)

FRANCO-SOVIET SPACE AGREEMENT EXPECTED THIS SUMMER. While plans are in the works for a third meeting of French and Soviet scientists on April 1 to discuss

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a cooperative communications satellite program (SPACE Daily, Feb. 7), talks at the government level concerning increased space cooperation are continuing. French President Charles de Gaulle will go to Moscow in late June to finalize plans. Any major space cooperative agreement between the two countries will be announced at that time.

PRE-WEBB NASA TRIP TO EUROPE CONFIRMED. The NASA team expected to go to Europe late last month (SPACE Daily, Jan. 13) to prepare for the Presidentially announced trip of James Webb (SPACE Daily, Dec. 22) is now set to depart this weekend for a ten-day tour of four European capitals. Dr. George Mueller, associate administrator for manned space flight; Dr. Homer Newell, associate administrator for space science and applications; Arnold Frutkin, assistant administrator for international affairs; and Dr. John Townsend, deputy director of NASA-Goddard, will rendezvous in Bonn, West Germany, Monday morning for several days of talks there before traveling on to London, Paris, and Rome (not necessarily in that order). Once this team reports back to Webb, his journey later this winter will be arranged. He will take at least four men with him.

LOVELL ASKS U.S./SOVIET SPACE COOPERATION. Sir Bernard Lovell, director of England's Jodrell Bank radio observatory, says the United States and the Soviet Union should join together in a program to put a man on the Moon. Lovell said it "is the depth of human stupidity" for the two countries to fail to cooperate in space exploration. "I want to emphasize the absolute stupidity of the way in which this (manned lunar landing) is being done in a spirit of competition instead of cooperation between the Russians and the Americans."

AA/MOL TO BE DISCUSSED IN OPEN HEARINGS. The House Space Committee, which is ending its three-day series of closed discussions of the MOL and AA (APOLLO Applications) program today (SPACE Daily, Feb. 4), is expected to devote still more time to these subjects in its open budget hearings, scheduled for the middle of next month. The DOD's MOL program, which comes under the consideration of the House Armed Services Committee, principally is of interest to the Space Committee for its possible relationship to NASA's post-APOLLO plans.

ROCKET RESEARCH NAMED TO AIMP-E TEAM. Rocket Research has been selected by NASA-Goddard to build the attitude thruster system for the AIMP-E lunar-orbiting satellite. The company has been awarded a $99,481 contract to provide four subliming solid control rockets having a thrust of one-hundreth of a pound. Function of the rockets, which will have a working life of one year, will be to control the spin axis of the satellite with respect to the Moon.

The AIMP-E (lunar-Anchored Interplanetary Monitoring Platform) is one of two satellites in the IMP program which will be orbited around the Moon, designed to study the properties of interplanetary magnetic fields, solar plasma flux, dust distribution, solar and galactic cosmic rays and the gravitational field of the Moon. The AIMP will be placed in orbit as a satellite of the Moon, completing a circuit every 29.5 days. Launch of AIMP-D, the first lunar-anchored IMP, is scheduled for July, with AIMP-E set for the third quarter of this year. The AIMP, built by Goddard, will weigh about 203 pounds with apogee kick motor.

DODGE TO BE DELIVERED IN FALL. The Advanced Physics Lab, prime contractor to the Bureau of Naval Weapons for **DODGE** (the DOD Gravity Experiment satellite) (SPACE Daily, Dec. 2 & 3), will deliver the satellite this fall. The gravity-gradient-stabilized payload will ride a **TITAN III-C** next January (SPACE Daily, Dec. 2) to test that stabilization technique for possible application for later DOD communications satellites. BuWeps is the **DODGE** contracting agency for the DOD's Research and Engineering office. The forerunner to **DODGE** is **GGTS** (Gravity Gradient Test Satellite), the General Electric payload that will ride the upcoming **TITAN III-C** and the one after that (SPACE Daily, Jan. 14).

COMSAT EYEING VIRGINIA/GEORGIA FOR GROUND STATION. ComSat's prospective southeastern ground station (SPACE Daily, Feb. 4) may be located in Virginia or Georgia if present plans pan out. Sites near the mountains in those two states are now being considered. The Corporation expects to seek this month FCC authority to establish the station. Procurement for the hardware will probably be sought competitively rather than being conducted with the present contractors for the incipient stations near Brewster, Wash., and Paumalu, Hawaii.

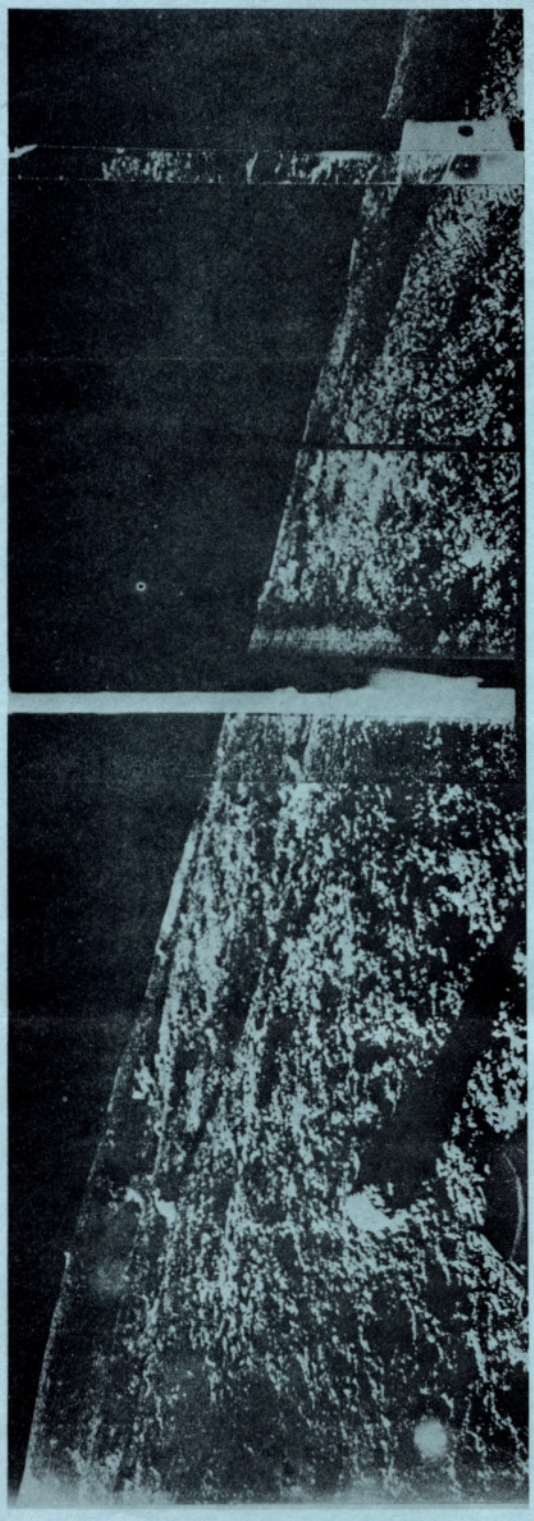
BLUE BIRD STILL PROVOKING COMSAT IRE. **"BLUE BIRD,"** the tentative name (SPACE Daily, Nov. 1) for ComSat's **APOLLO**-support satellite, continues to irritate ComSat administrators and the Interim ComSat Committee as it did last fall (SPACE Daily, Nov. 19). The Committee--which has not even approved **EARLY BIRD**'s name, much less **BLUE BIRD**'s (SPACE Daily, Jan. 24)--is presumably maintaining its objection that **BLUE BIRD** has been prematurely coined without the Committee's endorsement and that the satellite should go unnamed until an official label can be determined and promulgated. Possibly another objection is that the name originated within ComSat rather than the Committee. Neither the Committee nor ComSat has devised an alternative name, however, so a variety of titles has appeared, including the Hughes in-house number, 303A (SPACE Daily, Dec. 20).

NASA-CNES EOLE (FR-2) TALKS STILL ON. Although expected to end last month (SPACE Daily, Jan. 4), the Franco-American negotiations over **EOLE**, the French weather satellite, are still being conducted and are now anticipated to conclude in about a month in a Memorandum of Understanding whereby a **SCOUT** will orbit the payload from Vandenberg in late 1968. The talks have been underway since the fall (SPACE Daily, Oct. 4), and a '68 **SCOUT** launch from the East or West Coast has been the plan discussed (SPACE Daily, Nov. 2). Because it will be the second U.S.-orbited French package, **EOLE** will be designated **FR-2**.

EOS To Supply EOLE Solar Arrays. The Service d'Aeronomie, a government agency, has contracted with Electro-Optical Systems for 20 solar arrays for the **EOLE**s. Each array will have 140 cells mounted on a thin plastic board. Delivery will be made this July to the **EOLE** Project facility at Noumea, the capital of New Caledonia, France's southwest Pacific island.

Joseph F. Poplosky has been promoted to the newly created position of assistant director-International Sales and Services for Raytheon. Poplosky was formerly international sales manager for electronic systems.

THE LURAIN FROM LUNIK IX (A Special Report)



The lurain as recorded by **LUNIK IX** and transcribed by Soviet scientists is projected in this panoramic view which represents two photos joined in an overlay. These photos relayed to SPACE Daily by Novosti are in proper scale and are justification for Anatoli Blagonravov's charge that Jodrell failed to transcribe the photo record properly (See yesterday's SPACE Daily.). The Soviet photos are expanded 2.5 times in the horizontal axis and reduce the distance of the camera from the lurain from the 6-10 feet estimated by Jodrell to somewhat less than three feet elevation (The Jodrell facsimile of the left photo, published in SPACE Daily yesterday, is reproduced on the following page for comparison purposes.).

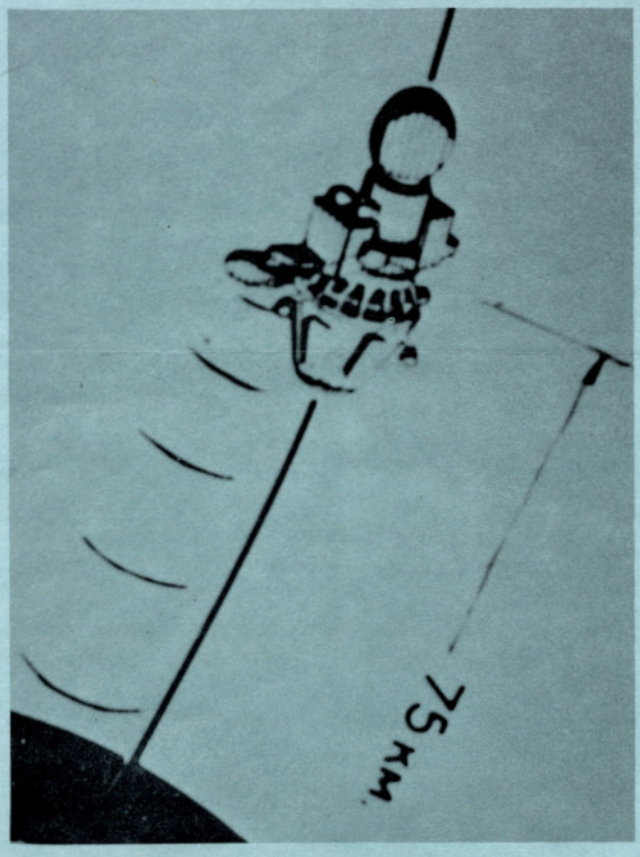
The **LUNIK IX** lurain impact area, at 7 degrees, 8 minutes north latitude, and 64 degrees, 22 minutes west longitude, seen in the two photos showing the southeast area of **LUNIK IX**'s panoramic field of view is located in the eastern outskirts of the Ocean of Storms. The Sun, on this 4th of February, was about 7 degrees above the lunar horizon. **LUNIK IX** settled into the lurain tilted a few degrees to one side resulting in some of the pictures showing mostly space above the lurain as the camera made its 360-degree sweep.

Distance from the spacecraft to the horizon is about one mile. The distance between the two points of the clam-shell shroud seen in the left (lower) photo is 1.56 inches (4 cm) while the rock directly in front of the shroud is 5.85 inches (15 cm) in diameter and is approximately 6.5 feet distance from the shroud. Other rocks can be seen in the distance and large depressions or rounded craters with a back-drop of hills in the top center of the left photo and to the right of the right photo.

The vertical white column in the right photo is one of the four TV/radio antennas which sprang into upright position when the four clam-shell panels of the shroud were opened exposing the TV camera and the solar cells arrayed around the top half of the payload sphere (See drawing in yesterday's SPACE Daily.). The upright device on the right side of the right photo is a prism mirror used for orientation purposes, reflecting other views of the lurain.

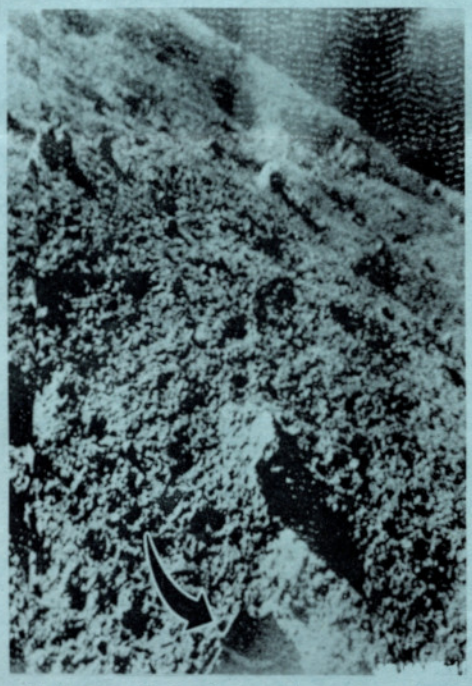
MORE

THE LURAIN FROM LUNIK IX (A Special Report)-Contd



The drawing of the spacecraft illustrates **LUNIK IX**'s configuration as it reached the point of orientation of the "braking device" axis according to the lunar vertical and just before the switching on of the retro-rocket at a command from the radio altitude meter. The retro-rocket is located in the cone-shaped device on the lower end of the spacecraft, firing through the open end after the four attitude control rockets on the upper portion of this cone have completed the alignment. The radar antenna for determining retro-sequence is located on middle left and is aimed toward the lurain. The spherical payload can be seen on the mid-section and nestled into it. It is connected to the radar/radio equipment and instrumentation and mid-course correction apparatus section which is ejected along with the retro system just prior to landing.

UNDERGROUND LUNIK INTERCEPT

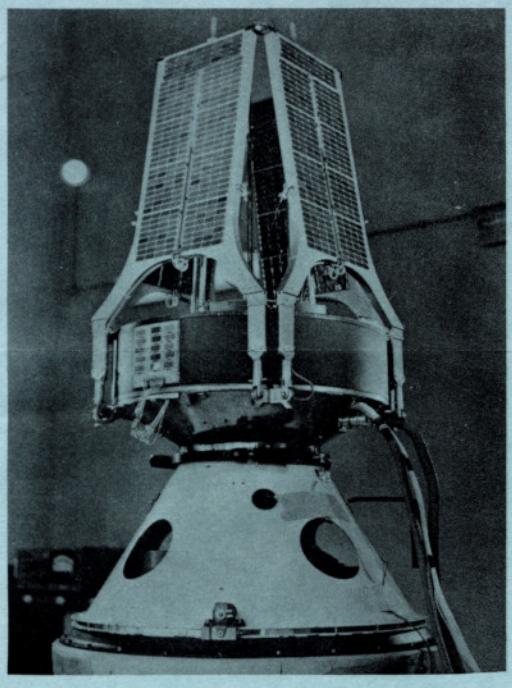


Dr. Edward C. Welsh of the National Space Council has implied that the United States utilized other than its NASA capabilities to receive **LUNIK IX** data direct, i.e., that our DOD space net or other obscure site(s) of the classic black box nature received what could have been pictures but apparently was not.

Welsh told SPACE Daily that "we have obtained some information regarding the **(LUNIK IX)** pictures from our own sources. Such data are currently under study and evaluation." Welsh declined to say where the information was obtained from, and if the "information" consisted of photos. He said he felt the American people ought to know that we have this capability.

The Air Force large radio-telescope installation at Sagamore (AF Cambridge Research Laboratory) did not pick up **LUNIK IX**'s transmission. Reason: "Whenever the **(LUNIK IX)** got out of sight of the Russian observatories, the Russians shut the transmitters down, and the result was that we could not pick up the signals." There are NASA facilities which may have been close enough for interception at Woomera, Australia; Johannesburg, South Africa; and Madrid, Spain; but NASA has again stated that it did not pick up the lunar photos (SPACE Daily, Feb. 7).

SECOND FRENCH SATELLITE SCHEDULED FOR LAUNCH TOMORROW



The **D-1A**, France's second satellite, is scheduled for launch tomorrow from the Hammaguir range in Algeria. The launch date has been confirmed by CNES, the the French space agency, though other French government sources say the date is the 11th. SPACE Daily-France will cover the launch from Hammaguir in any event.

D-1A, shown in these SPACE Daily-France photos atop its **DIAMANT** booster (above), and being checked out by a technician (below), is the first French technical research satellite. France's first satellite, the **A-1A** launched from Hammaguir last year (SPACE Daily, Dec. 1 & 6), is termed as a technology satellite, i.e. to check out satellite equipment. In addition to satellite technology, the **D-1A** is designed to gather information in the field of geodesy and to gain data on the problems of communicating with satellites.

The satellite weighs 47.84 pounds and is cylindrical in shape, with a diameter of 19.7 inches and a height of 7.87 inches. The satellite has four solar panels (rectangular, 16.5 inches long and 8.27 inches wide), four upper antenna (29.53 inches high) used for telemetry, and an upper axial antenna (7.87 inches long).

In orbit, total height and diameter of the satellite are 50 inches and 45.27 inches, respectively.

A three-stage **DIAMANT** (No. 2) booster will be the launch vehicle. The satellite will be launched at an inclination of 34 degrees and is designed to reach a perigee of 319 miles and an apogee of 1675 miles.

The satellite, built by the French space industry, is under the direction of the Satellites Division of CNES. J. P. Guinard is **D-1A** program manager, with J. M. De Lamare responsible for the scientific mission.

SA-201 TEST LAUNCH SCHEDULED TODAY. A "wet-mock" practice count-down, ending in a simulated launch at 3 PM today, was started again late yesterday with the **SA-201 SATURN IB** vehicle. The test count-down was initiated on Monday but was scrubbed three hours and twenty minutes before the simulated lift-off due to leaks in the ground lines for the liquid hydrogen fuel for the **S-IVB** upper stage. The count-down was then picked up again yesterday. NASA indicated that the "hold" would not delay the scheduled launch of the **SA-201** on February 22.

Future Space Business

ACTIVE PENETRATION AIDS CONCEPTS TO BE STUDIED

The Army Missile Command is planning to fund a feasibility study of active penetration aids.

Contact: Negotiation Branch 4, Systems Contracts Division A, Procurement Operations, Procurement and Production Directorate, U. S. Army Missile Command, Redstone Arsenal, Ala., Attn: Charles Rodenhauser, Contract Negotiator, AMSMI-IWD, Telephone: 876-7558. Reference: RFQ IWD-66-3. Due date: Feb. 18.

SOLID LIQUID MIXTURES HIGH PRESSURE PUMPS

The Naval Ordnance Test Station is interested in ascertaining the state-of-the-art and determining potential sources for high pressure pumps for solid liquid mixtures. The mixture characteristics are 17 per cent by weight of solids and 83 per cent by weight of liquids. The most commonly made mixture is in gel form with abrasive solids evenly dispersed throughout with solids ranging from three to 25 microns particle size with seven microns average.

Contact: U. S. Naval Ordnance Test Station, 3202 E. Foothill Blvd., Pasadena, Calif. 91107, Attn: Code P25631-HE. Due Date: Feb. 18.

DIGITAL ATTITUDE CONTROL LOGIC SYSTEMS

NASA-Lewis is funding the design, fabrication, test and delivery of attitude control logic systems. All systems are intended for ground testing of attitude control systems and shall be identical to each other. Each system will consist of storage electronic and logic components assembled in such a manner as to solve specific equations enabling the control logic system to maintain the angular attitude of the simulated spacecraft within a specified angular deadband such that a minimum of propellant usage and a minimum number of thrustor firings would result in the presence of varying internal and external disturbing torques.

Contact: Lewis Research Center, 21000 Brookpark Rd., Cleveland, Ohio 44135. Reference: RFP 202865. Due date: Feb. 14.

DOD NEGOTIATIONS

Hydronautics, Inc. -- with The Bureau of Naval Weapons to perform research studies to describe an analytically stable control system for **LASS-I**.

Philco Corp., Western Development Labs. -- with the Air Force Special Weapons Center for the fabrication of digital subsystem and space modules for solid space radiation monitoring system.

NASA NEGOTIATIONS

Lockheed Missile and Space Co. -- with Marshall for a contract on **SATURN IB** debris risk hazard analysis.

TRW Systems, Inc. -- with Marshall for mission oriented advanced nuclear system parameters.

Bendix Corp. -- with Goddard to design, develop and test two reaction wheel scanners.

Lockheed Missile and Space Co. -- with Marshall for a study of modular nuclear vehicles, technology problems, and safety systems.

Aerojet-General Corp. -- with Marshall for a "FOGO" analysis of the **SATURN** propulsion systems.

Pratt & Whitney Div., United Aircraft Corp. -- with Marshall for a survey of the suppression of combustion oscillations with mechanical damping devices.

TRW Systems Group, TRW, Inc. -- with Goddard for research and development to provide two Orbiting Geophysical Observatories.

Space Guidance Center, IBM -- with Langley for the development of a scanistor fiber optic micrometeroid detector.

DOD CONTRACTS

Navy

Kaman Aircraft Corp., Kaman Nuclear Div. -- $162,152 for **POLARIS/POSEIDON** facilities.

Raytheon Co., Space and Information Systems Div. -- $400,000 for Phase II effort on **POSEIDON** guidance system CDP.

Raytheon Co., Space and Information Systems Div. -- $170,000 for **POSEIDON** guidance PDP effort.

Hughes Aircraft Co. -- $199,200 for research and development on a missile-borne semi-active radar guidance.

McDonnell Aircraft Corp. -- $46,561 for conceptual flutter analyses of technical applications to guided missile configurations.

Korad Corp. -- $105,000 for research and development on a coherent infrared ranging and seeker system for missile-borne applications.