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NORMAN L. BAKER — Publisher & Editor
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SURVEYOR MAY HEADLINE HEARINGS.

Rep. Joseph E. Karth's House Space Science and Applications Subcommittee is expected to attempt to "update" the story of the **SURVEYOR** development problems, which was the subject of the subcommittee report last fall (SPACE Daily, Oct. 28 & 29), during this spring's authorization hearings. The subcommittee is expected to give attention not only to the continuing slippage in the launch schedule (SPACE Daily, Feb. 9), but to the question of whether or not JPL has finally solved the difficult **SURVEYOR** management problems.

RELEASE OF AF NON-PROFIT REPORT INDEFINITE.

The evaluation of General Schriever's Air Force report on non-profit corporations (SPACE Daily, Sept. 13) is continuing to run beyond the expected termination date (SPACE Daily, Jan. 11) as reported (SPACE Daily, Jan. 31). The report has been reviewed by AF chief of staff General John McConnell and assistant AF secretary for R&D Dr. Alexander Flax as expected and is now being studied by AF secretary Harold Brown. The DOD will be advised as to the report's content but will not have to review it. No release date for the document has been set.

ARPA CLOSING OUT RVIP.

The Advanced Research Projects Agency's **RVIP** (Re-entry Vehicle Instrumentation Program) (See below), a part of Project **DEFENDER**, not the AF **ABRES** (Yesterday's SPACE Daily), will be ending this year. There are no funds in the ARPA budget for the program in fiscal 1967. The on-board instrumentation program, carried on **LORV** (Low Observable Re-entry Vehicle), was started by ARPA in 1962. The program is being managed by the Ballistic Systems Division to minimize duplication with the **ABRES** (Advanced Ballistic Re-Entry Systems) re-entry penetration aids development program (SPACE Daily, Dec. 20). GE and Avco are major **RVIP** contractors, with TRW, GCA, ERC and SRI also on the program.

AVCO WINS \$13 MILLION FOR LORV/RVIP.

The AFSC Ballistic Systems Division letter contract with Avco/RAD for Phase IA of the **LORV** (Low Observable Re-entry Vehicle) program and **RVIP** (Re-entry Vehicle Instrumentation Program) (yesterday's SPACE Daily) will total \$13 million. A \$2 million increment has already been awarded. Work under the contract will involve the study of "new-generation heat shield materials" and will bring the establishment of "design guidelines for environmental protection, dynamic motion, and subsystems." Also called for are flight tests at White Sands and Vandenberg with **ATHENA** and **ATLAS** vehicles.

SATURN INDUSTRIES ORGANIZED BY LTV. Ling-Temco-Vought will distribute to its shareholders an extra dividend consisting of 700,000 shares of common stock in Saturn Industries Inc., a newly organized diversified company with subsidiaries operating in the areas of electronics, aerospace subcontracting and marine services. The company, which is completely independent of LTV, represents a combination of Saturn Electronics Corp., L. T. Industries, and Harbor Boat Building Co., all formerly owned in whole or in part by LTV.

LTV plans to sell its remaining interest in the common stock of Saturn Industries to the Saturn management group, leaving LTV with an interest of 15,000 shares of nonconvertible \$5 series preferred stock redeemable at \$100 per share.

The dividend will be distributed in early April to stockholders of record March 10 on the basis of approximately 35 shares of Saturn for each 100 shares of LTV common.

GRUMMAN GETS AA LUNAR MISSION STUDY. NASA-Marshall will open negotiations shortly with Grumman for a study of lunar surface scientific mission simulation. The program will involve the use of astronauts with a cockpit mockup of a mobile lunar vehicle. Grumman will utilize vehicle concepts developed in its bidding for the NASA-Marshall **ALSS** (**APOLLO** Logistics Support System) study, which was eventually won by Bendix and Boeing (SPACE Daily, May 20, '64).

The **ALSS** study included two payloads, identified as **MOLAB** and a smaller **LSSM**. Grumman was awarded a sole-source contract by NASA-Houston shortly before the selection of the **ALSS** contractors to design a pre-**ALSS** system, more of the **LSSM** type (SPACE Daily, May 14, '64). Grumman, at that time, had developed an **LSSM**-type vehicle, known as the **LEM ROVER**. (See SPACE Daily, Sept. 9 & Oct. 1, '65, for report on current work by Boeing and Bendix on **LSSM**.)

LURAIN BEACON UNDER STUDY. The Ryan Aeronautical Company has just completed a study for NASA-Houston on the feasibility of a radar transponder which could be placed on the lurain for periods up to three years in order to act as a **LUNAR BEACON** for the manned lunar landing program.

The **BEACON** would be carried to the Moon by a **SURVEYOR** and would probably utilize a radionuclide-thermoelectric generator. Two frequencies could be used for the device including an S-band to communicate with the Earth and an X-band transmitter for communication with the orbiting or descending **LEM**. In addition to acting as a **LUNAR BEACON**, the transponder could also transmit data related to seismology, atmosphere composition and pressure, temperatures, micrometeoritic bombardment and radiation levels, i.e., a sort of lurain remote data package (SPACE Daily, June 11 & Aug. 5, '65) or lunar capsule (SPACE Daily, Dec. 3, '64 & Feb. 24, '65). The purpose of the transponder is similar to that of a lunar solar reflecting beacon under study by NASA-Houston (SPACE Daily, April 9).

SPP TESTS PLUME IN SUBORBITAL LAUNCH. An **ATLAS D** carried a Scientific Passenger Pod (**SPP**) into space yesterday from Vandenberg in a program supporting the Army **NIKE X** anti-missile program. **SPP** experiments included an ejectible capsule with sensors to measure the infrared characteristics of the **ATLAS'** exhaust plume.

LUNA X WILL BE AN ADVANCED SOFT-LANDER. The next LUNA(*) soft landers will be more advanced than the simpler semi-soft lander LUNA IX and are designed to study the mechanical and physical properties of the lurain, lunar rock composition and temperature fluctuations.

Soviet officials in Moscow have added a few more details of the mission, the design of the spacecraft and current analysis of the lurain. They have confirmed that the spherical payload is only about two feet in diameter in the configuration after impact (See SPACE Daily, Feb. 9, page 241), identifying this measurement as the distance of the TV camera above the lurain (See the drawing of the spacecraft on page 231, Feb. 8). Weight of the survivable capsule is 220 pounds, with the remainder of the total 3482 pounds concentrated in the retro-rocket, radar/radio and midcourse and attitude control lower section of the in-space configuration (illustrated in the drawing in SPACE Daily, Feb. 9, page 242), which is ejected prior to impact.

The payload was disinfected to avoid contamination of the lurain. The officials further explain that LUNA IX did not have solar batteries, claiming that only a three-day broadcast had been scheduled. This does not agree with the drawing of the spacecraft which shows one half of the payload sphere exposed by the opening of the clamshell shroud panels in what would be and appears to be an ideal location for solar cells, but which, with the Soviet announcement, means that the shroud was protection only for the antennas and TV lens which could have been protected in a much simpler fashion. Three sets of two-faceted mirrors were mounted on the field of vision of the camera (See SPACE Daily, Feb. 9) to reflect six narrow strips of the lurain. These strips gave pairs of stereoscopic photos with about a 20-inch base.

The lurain, Mstislav Keldysh, president of the Academy of Sciences, says is composed of "strong" pumice or slag-type of rock which holds water. The lurain in the vicinity of LUNA IX "was crushed by meteoritic bombardment, fused into hard rock through vacuum diffusion merger, cracked as a result of sharp changes in temperatures . . . crushed, fused and cracked again, resulting in a hard, porous, though unstable rock" surface. The surface is analyzed, according to Academician Alexander Vinogradov, to be a "hardened outpouring of basalt lava with cavities (the relics of gas bubbles in the lava) and rock splinter stones thrown over the lava surface after cooling by volcanic eruptions'and meteorite impact. In addition to a cosmic ray radiation of about 30 milliard a day, radiation from the Moon was found and is believed caused by the nuclear reaction of the cosmic rays in the top layers of the lurain.

RCA, developers of the RANGER cameras, many months ago analyzed that the craters seen on the lurain in the RANGER photos could only be produced in "material like coarse sand, gravel or cobblestone-size fragments . . . suggesting that an area of dune-like gravel banks, free of significant unmixed dust, would be found" (SPACE Daily, Jan. 15, 1965).

(* Yesterday the Soviets began referring to the first four Moon probes as LUNAs, rather than by their original designations of LUNIK. Up until this moment we had resisted the acceptance of LUNA as a designation because it was initiated with mission number five, i.e., admission that LUNA was a continuation of the LUNIK program, but with a new name. While remembering that the Soviets tried but failed to rename LUNIK II to MECHTA when it missed the Moon years ago, and abhorring the practice of disregarding history or of rewriting it, we find that if we persist in identifying the Soviet's Moon program by its original title we might instill further confusion and appear less than objective.)

THREE LAUNCH DATES SET FOR OV SATELLITES

The first attempt to orbit twin **OV** (Orbital Vehicle) Air Force satellites -- **OV1-4/-5** -- has been rescheduled for March 3 from February 23 due to continuing problems with one of the biological experiments that will be aboard -- the same one that prompted the postponement from January 20 to February 23 (SPACE Daily, Jan. 6). The original launch date, January 13 (SPACE Daily, Nov. 22), was abandoned when trouble developed with one of the propulsion modules that put the payloads in the proper orbital positions (SPACE Daily, Dec. 23). **OV1-4**'s orbit will be near-circular at about 480 nautical miles and **-5**'s will be circular at 550 n.m. (both 146 degrees).

The feasibility of putting two **OV1** packages up simultaneously was confirmed early last October when **OV1-2** and a dummy twin successfully went aloft (SPACE Daily, Oct. 6). The next launch after the impending one, of **-7** and **-8**, planned for July (SPACE Daily, Jan. 6), is now envisioned for the 13th of that month, although slippage is likely. The subsequent launch, of **-9/-10**, is expected in November (SPACE Daily, Jan. 6). **OV1-1** and **-3** rode faulty vehicles last year -- January and May respectively -- and never achieved orbit. **OV1-6**, originally intended only as a backup, is now set to go up in October with its cousin **OV4-1** on a **TITAN III-C** (SPACE Daily, Jan. 6).

OV3-1 Slated for Launch Apr. 7

The first satellite of the third **OV** family (there are five families), **OV3-1**, scheduled for an early April launch (SPACE Daily, Jan. 6), is fixed to lift off April 7 from Vandenberg on a **SCOUT** (as will the other five **OV3**s except for **-4** which will ride a **SCOUT** from Wallops in June). **OV3-5** will go in June (too), **-3** in September, **-2** in October, and **-6** in January of next year.

COMSAT ADOPTS "CATEGORY" SATELLITE TERMINOLOGY

In an apparent move to help ease the problem created by the Interim ComSat Committee's failure to name the ComSat satellites (SPACE Daily, Jan. 24), ComSat has devised a classification naming system whereby each satellite family constitutes a Category. The following list shows the various parallel terminologies presently in use and the general names SPACE Daily will continue to use until the Committee determines official labels:

<u>ComSat Category</u>	<u>General Name</u>	<u>Manufacturer's Number</u>
I	EARLY BIRD	HS-303
II	BLUE BIRD	HS-303A
III	Global Satellite	none
IV	Multipurpose Satellite	no manufacturer
none	Air Traffic Satellite	no manufacturer

ComSat also refers to the payloads as Intelsat 1, 2, 3, etc. (International Telecommunications Satellite), but this system is not official. The name comes from that of the multi-nation group for which the Committee is the representative agency and ComSat is systems manager: the International Telecommunications Satellite Consortium. The present membership is 48 countries.

Kenneth J. Stetten has been appointed technical director of the Optics Technology Center, a unit of General Precision-Librascope. Stetten previously was manager of applied physics at the Information Sciences Center of the Budd Corp. in McLean, Va.

NATO NUCLEAR PLANNING GROUP TO MEET NEXT WEEK

The Working Group for nuclear planning of NATO's Special Committee of Defense Ministers will hold its first meeting February 17 and 18 in Washington. The group, which was formed to study ways of improving and extending Allied participation in the planning for the use of nuclear forces in defense of NATO countries, probably will discuss the long-debated MLF (Multi-Lateral Force) plan for arming a NATO fleet with nuclear warheads. The group will submit its recommendations to the Special Committee of Defense Ministers, which in turn will report to NATO.

Secretary of Defense McNamara will serve as chairman of the meeting. Other Defense Ministers attending will be Kai-Uwe von Hassel, Germany; Giulio Andreotti, Italy; Ahmet Topaloglu, Turkey; and Denis Healey, United Kingdom. Manlio Brosio, Secretary General of NATO, also will attend the meeting.

SCOUT RE-ENTRY SUCCESSFUL

The fifth **SCOUT** re-entry test (SPACE Daily, Jan. 31) was successfully conducted from Wallops Island, Va., to arc a 210-pound payload 1100 miles downrange at a re-entry speed of 18,000 mph. With a peak altitude of 112 miles the fourth stage re-entry vehicle impacted 450 miles S. E. of Bermuda after information on the performance of the blunt shaped re-entry vehicle was radioed back to ground stations. A minor malfunction in the telemetry channel which was supposed to make a delayed transmission of data collected during the communications black-out deprived NASA scientists of some information, but the other telemetry link, the before-and-after black-out channel, provided all the necessary data. The launch was a test of low-density heat shield material.

WESTINGHOUSE DELIVERING ARC HEATER TO AF

Westinghouse is presently shipping a newly developed arc heater to the Air Force's Arnold Engineering Development Center in Tullahoma, Tenn., for use with a wind tunnel to simulate hypersonic re-entry conditions for missiles and spacecraft. The heater has been under development for two and a half years at the Westinghouse plant at Trafford, Pa., under an AF contract. It is a 20,000-kilowatt, three-phase, alternating-current unit that can create temperatures up to 13,000 degrees F (well over the Sun's surface temperature). It uses four doughnut-shaped electrodes and three revolving electric arcs in a cylinder 3.5 feet long and 1.5 feet in diameter. The arcs turn at 60,000 rpms.

VARIAN ASSOCIATES FILES STOCK PLAN

Varian Associates of Palo Alto, Calif., has filed a statement with the Securities and Exchange Commission seeking registration of 300,000 shares of common stock, to be offered in connection with its Employee Stock Purchase Plan.

John A. Wolfe and **Robert Naiman** have been named divisional vice presidents within Itek's Government Systems organization. Wolfe will act as vice president of the Systems Development Division, while Naiman will serve as vice president of the Engineering and Manufacturing Division.

CITIBANK PROCLAIMS GROWING INFLATION

New York City's First National City Bank (Citibank) says that although the nation's economy continues to show considerable forward momentum, with skilled labor in short supply, delivery times lengthening, order backlogs growing and with the prospect of a continuing deficit in the Federal budget, "the economy has increasingly assumed inflationary overtones." The bank predicts that with the increase in the discount rate as a move to support efforts to prevent domestic inflation and bolster the balance-of-payments program, Federal Reserve monetary policy will probably be influenced to a greater degree than before by the need to avoid inflation.

24 ATTEND NASA-MARSHALL COMPUTER SUPPORT BRIEFING

Representatives from 24 organizations attended a pre-proposal conference at NASA-Marshall Wednesday on the Center's proposed contract for technical support services for the Computation Laboratory. Types of services required include computer utilization, space or facilities utilization, management engineering, design and documentation of data systems, data systems engineering, data systems and computer equipment maintenance, fabrication and rework of data systems hardware, preparation of technical reports, computer operations, computer programming, computer techniques, mathematical analysis, and systems analysis design and documentation research and development (SPACE Daily, Feb. 3).

In addition to the present contractor, General Electric, the following firms attended: ITT; Honeywell; Ling-Temco-Vought, Computer Division; LTV Aerospace; Reynolds Electric; Brown Engineering; Booz-Allen; Burroughs; Litton Industries; Northrop; Systems Development Corp.; Gulton Industries; Telecomputing; Tracor Inc.; Wolf Research & Development; R. W. Beck & Associates; Consultants & Designers; C-E-I-R; Computing Scientific Corp.; Lear Siegler, Information Systems Division; Manpower Inc.; Mesa Scientific; and RCA. GE's contract, which is now valued at approximately \$14.9 million, expires in April.

CHANGES MADE IN BAC BOARD

W. Masterton, J. E. Armitage; and T. B. Pritchard have been named to the board of directors of British Aircraft Corp. (Operating) Ltd. Masterton will serve as deputy chairman, Armitage as commercial director, and Pritchard as financial director. Sir George Edwards is chairman of the new board, and Rt. Hon. Viscount Caldecote serves as managing director-guided weapons.

DOUGLAS DELIVERS TITAN III-C SHROUDS

Douglas has completed its work for Martin on three shrouds for use on **TITAN III-Cs**. The shrouds were modified for contamination protection under a \$1 million contract. The first shroud was employed on the December 21 **III-C** vehicle (**III-C-3**). The shrouds are designed to prevent fragmentation and contamination of payloads by equipment located near the payloads.

Dennis C. O'Mara, previously manager of the Manufacturing Division, has been appointed senior division manager-Operations for Aerojet-General's Downey, Calif., plant.

Future Space Business**SHOCK CRITERIA/MISSILE SITE EVALUATION**

The Ballistic Systems Division is funding a program of shock criteria and site evaluation for advanced missile facilities. The study will provide ground shock criteria based on geological and geophysical properties of hardened advanced missile sites and related nuclear ground shock effects. Study outputs will also include geological recommendations, soil standards, test plans, cost estimates and schedules for investigating future missile sites.

Contact: Headquarters, Ballistic Systems Division, Norton Air Force Base, Calif. 92409, Attn: BS RKC-2, R. E. Mueller. Reference: RFP 04-694-66-161. Due date: Feb. 20.

BIOSATELLITE SOLENOID VALVE DEVELOPMENT

NASA-Ames is requesting proposals for a special type of solenoid valves for use in the **BIOSATELLITE** project.

Contact: NASA, Ames Research Center, Moffett Field, Calif.
Reference: RFP A-11556HK. Due date: Mar. 11.

DOD NEGOTIATIONS

North American Aviation, Rocketdyne Div. --with Army Missile Command for booster motors used with the MQM-429 (**ROADRUNNER**) Type IV target guided missile.

General Precision, Inc., Kearfott Div. --with Army Missile Command for the repair of 84 hydraulic actuators for the **PERSHING** missile system.

Western Electric Co. --with Army Missile Command for additional research and development in re-entry physics and chemistry theory in connection with the **NIKE X** program.

Philco Corp., Aeronutronic Div. --Army Missile Command for FY '66 hardware procurement for the **CHAPARRAL** missile system.

Air Inflatable Products Co. --with Army Electronics Command to continue work in connection with satellite communications equipment.

Value Engineering Co. --with the Bureau of Naval Weapons to conduct a research program on air-launched missile propulsion systems.

General Technical Services, Inc. --with the Office of Naval Research for further research on the inertial guidance system.

Ball Brothers Research Corp. --with the Office of Naval Research for further research on the refurbishment and retesting of solar pointing controls and telemetry systems.

NASA CONTRACTS

Ames

North American Aviation, Space and Information Systems Div.--\$781,692 for bio-satellite project flight hardware packages for biosatellite experiments.

Honeywell, Systems Research Div.--\$466,048 for study of behavioral effects of ionizing radiation.

Cambridge

General Electric, Missile and Space Div.--\$99,300 for research to determine feasibility of achieving precision attitude control and stabilization.

Hughes Aircraft--\$48,794 for investigation of the potentialities of photochemical laser systems.

Goddard

Rutgers University--\$70,833 for determination for brightness, polarization, and ellipticity of the nozical light for the **OSO-G** experiment.

Ampex Corp.--\$500,411 for data tape recorder systems.

Ampex Corp.--\$25,095 for magnetic tape recorder/reproducer systems.

Headquarters

Douglas Aircraft--\$592,471 for development and demonstration of criteria for liquid fluorine feed system components.

TRW--\$97,760 for a study of an **Orbiting Radio Astronomical Observatory (ORAO)**.

Philco Corp.; Western Development Labs.--\$70,000 for research on fan-beam navigation satellite antenna and detection problems.

Bell Aerosystems--\$66,521 for synthesis for spacecraft structures study.

Exotech, Wash., D.C.--\$37,214 for preparation of revised handbook of space radiation effects on solar cell power.

Marshall

Cornell Aeronautical Lab.--\$89,577 for **SATURN V**-shroud and fin interference-free static aerodynamic investigation.

General Dynamics/Convair--\$19,384 for assessment of slosh coupling with space vehicle system study.