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PLANS FOR SOLAR/JUPITER PROBES LACKING (An Analysis). A gathering of space officials are viewing with a degree of chagrin the apparent hypocrisy of President Johnson's offer to share in an all-out international effort a program to explore the Sun and Jupiter (See yesterday's SPACE Daily.). Not only does the United States not have such a program to offer, it does not have even a realistic plan to carry out such an endeavor within the next decade. Most significant is the knowledge that it is within the areas of space exploration proposed by the President that the Administration is making its heaviest gouges of monies requested for FY '67.

Officials intimately concerned with the particular area of interest discussed by the President profess to know of no serious proposals for implementation of either a major solar "probe" or Jupiter "probe." An Administration official explains, however, that the President, presented with a variety of possibilities, "may decide on one of them and that makes it serious right there." Without countering the President's authority in this area, other officials explain that "serious" programs require decisions and funding and they are not familiar with either for FY '67. Rather it is further explained, the decisions which are being made remove the funding rather than making it available.

(Continued on following page)

SPACE PUBLICATIONS OPENS NEW OFFICES. Space Publications will enter 1966 in new, expanded editorial offices and facilities in Washington, D. C., as a part of its continual growth plan to perpetuate and improve its news service to the space leadership community. The new location at 1341 G Street, N.W., will serve as the headquarters of the organization's national and international editorial team. SPACE BUSINESS Daily, in order to facilitate and accelerate the move of its editorial offices, will not be published next week, resuming publication with the issue of Monday, January 3. However, editors and staff members will be available to provide a special information service during this brief interval.

1965 has been another record year for SPACE BUSINESS Daily, and its universal recognition for the timeliest, most exclusive and in-depth coverage and reporting has again been further solidified and bolstered by a space leadership community that is second to no other leadership community in the nation or the world.

Space Publications and SPACE BUSINESS Daily extend the wishes for a most pleasant holiday season and the best for the new year--the 11th year of the Space Age and the 9th year since **SPUTNIK**.

The **AOSO** (Advanced Orbiting Solar Observatory) is one of two choice points of contention involved in the present discussion. A Solar probe, as it is generally defined, would be a mission where a spacecraft, launched perhaps by an **ATLAS AGENA**-Kick Stage, would be sent into an orbit within three-tenths of one Astronomical Unit (AU) of the Sun. Interested officials emphasize that such a mission could not be performed until the late 70s at the earliest if funding and decisions were forthcoming by FY '68. In other words, it is not a program that "is high on the space agenda."

A member of the Space Science Board of the National Academy of Sciences told SPACE Daily that: "I think, given a choice, astronomers would vote very strongly in favor of the **AOSO** over a Solar probe, if they had to make a choice over two roughly equally expensive programs."

The Administration official counters that the term "solar probe" was "used loosely by the President," declaring there is no reason why the **AOSO** cannot be considered a solar probe. Further, he explains, that just because it has been cancelled there is no reason why "you could not get help from somebody else on it." NASA officials, not briefed on the Johnson plan and therefore not attuned to the mechanics for keeping something dead alive, are studying the implications of the cancellation of the program, determining whether some of the **AOSO** experiments will have to be placed on **OSO**s and future or Extended **PIONEERS**, or whether the latter two should be extended.

When discussing a program for a Jupiter "probe" the outlook is almost as dismal. **VOYAGER**, a program originally conceived as a search for life on Mars, later extended to Venus exploration possibilities and still later spoken of as a possible Jupiter probe vehicle by NASA's space science head, Dr. Homer Newell, does not stand a good chance of getting a healthy start in FY '67. This program, which one Congressman (Rep. Vivian) months ago proposed as an international or UN cooperative program, will feel the smart of a cut of its request for a Vietnam contribution (See below). Certainly no effort is being made to groom it for earliest possible utilization as an international space cooperation vehicle.

While NASA program officials have not been made aware of any major proposals for solar/Jupiter probes the NASA International Affairs office staffed and originated the plan for working with European countries on joint spacecraft without proposing a specific solar or Jupiter probe. Other members of the Commission, to be headed by James E. Webb, have not been selected. When it will leave for Europe is not certain and how early next year it will leave is dependent upon avoidance of conflicts with Congressional budget hearings. It is certain that ESRO (European Space Research Organization) will be a primary point of arrival.

VOYAGER POSTPONED/NEW MARINER APPROVED. The NASA, suffering from a deep cut of the budget axe, has moved **VOYAGER** two years farther into the future, with the first launch now scheduled for 1973. To fill the very wide gap, at a time when the Soviet Union is accelerating its interplanetary efforts, a reworked and a new **MARINER** program has been approved for implementation.

Even these plans anticipate an Administration approval of budget plans for the program which call for the first procurement of hardware for the **VOYAGER** program, i.e., this new program is predicated on a plan that may receive only partial approval as a funded undertaking.

MORE

Under the new plan the **VOYAGER** '71 program for orbiting two spacecraft around Mars with a **SATURN V** would be moved to and combined with the **VOYAGER** '73 mission where two spacecraft would orbit Mars and inject two life detection capsules to the surface of the planet.

Ironically, 1973 has been determined by NASA scientists to be the worst possible time for the search for life on the planet of Mars (SPACE Daily, Oct. 18). These scientists stressed that if we pass up the 1969 and 1971 opportunities for life search the next opportune time will not come until 1984.

Stressing the need to "obtain the greatest possible return from the funds available for FY '66 and those anticipated for FY '67," NASA explains that it is slipping three **MARINER** flights into the seven-year interval. The first, to arc toward Venus in a fly-by mission in mid-1967, would be the **MARINER IV** back-up, modified for the mission. Two years later the much sought Mars '69 mission (SPACE Daily, Feb. 12 & May 10) would be fulfilled with two new "somewhat heavier" **MARINER**s to be developed. These, too, would probably be fly-by missions.

So it is that the demands of Vietnam have made their second large slice into the NASA space budget for next year. This time NASA has been forced to move back drastically from interplanetary plans, cutting its **VOYAGER** requests in half (SPACE Daily, Dec. 13 & 21) and deferring hardware development for up to two years. NASA may move into phased procurement of the landing capsule late in 1966 or early 1967 by issuing RFPs for preliminary design contracts. The **MARINER** '67 and '69 missions will be managed by JPL.

NASA COMPUTER PROCUREMENT POLICY OUTLINED

The NASA-Industry Conference on Present and Future Computer Procurement Policies attended by 14 major automatic data processing (ADP) manufacturers (See page 306) was an effort to alleviate the growing concern over expanding ADP inventory and increasing dollar expenditures for computers throughout the government. NASA outlined two pending requests for proposals for computer equipment: an RFP from NASA-Langley for an integrated computing facility and an RFP from NASA-Marshall for computation equipment (hardware and software) that will make up the "third generation" computer system to replace existing systems.

NASA also outlined a three-point plan to improve the NASA-industry exchange of information: annual industry briefings to inform computer firms of long-range plans, needed improvements, and projected procurements; providing opportunities for individual manufacturers to conduct annual briefings for NASA ADP personnel; pre-specification briefings whenever NASA plans large or unusual ADP procurements to be held prior to issuing RFPs. The first industry briefing under the new program will be held next May. NASA emphasized that future ADP procurements will be for computing systems rather than just hardware.

NASA AWARDS SOLID RESEARCH CONTRACT

NASA's JPL has awarded a $67,135 research grant to the University of Utah for a one-year study to better understand the interaction of gases in the combustion zone of solid rocket motors by using recently developed fast scanning spectroscopic instruments.

COMSAT TO BREAK GROUND AT PAUMALU MONDAY

Ground will be broken next Monday at the site of ComSat's incipient ground station near Paumalu, Hawaii, with ceremonies beginning at 11 AM Hawaiian time. On hand will be Governor John Burns, Senators Hiram Fong (R) and Daniel Inouye (D), Representative Patsy Mink (D), and ComSat Chairman James McCormack.

The 248-acre site is on the northern side of Oahu Island, the far side from Honolulu. J.P. Finan General Contractor of Honolulu was chosen early this month to prepare the site and build the quarters (SPACE Daily, Dec. 2). ComSat initiated plans for Paumalu in the middle of last summer (SPACE Daily, July 14), soon after starting the effort to establish its other new station near Brewster, Wash., (SPACE Daily, July 9). Ground was broken at Brewster November 16 (SPACE Daily, Nov. 15). Hardware procurement for the stations is about over, now that the RFP for the multiplex equipment is due (SPACE Daily, Dec. 6).

ROCKET RESEARCH STOCK OFFERING COMPLETED

A public offering of 475,000 shares ($5,106,205) of Rocket Research common has been completed by Dempsey-Tegeler and Co. Rocket Research, which specializes in control rockets, gas generators, high-energy rocket propellants, and explosives, will use the proceeds to acquire additional laboratory and manufacturing facilities and for working capital.

OV1-4/-5 LAUNCH RESCHEDULED FOR JAN. 20

The fourth and fifth **OV1** satellites, the first dual **OV1** payload (SPACE Daily, Aug. 6), are now set for launch on the 20th of next month rather than the 13th as originally planned (SPACE Daily, Nov. 22). **OV1** is the first of the three Orbital Vehicle programs being conducted by the Air Force Office of Aerospace Research. The feasibility of the dual-payload concept was confirmed by the successful launch of **OV1-3** and its dummy twin on October 5 (SPACE Daily, Oct. 6). Like that shot, the upcoming one will involve a scientific pod on the side of the **ATLAS** vehicle in addition to the satellites. The postponement is due in part to problems with the payload's propulsion module.

SPACE CRAFT FILES FOR SECONDARY OFFERING

Space Craft Inc. of Huntsville, Ala., has filed a statement with the Securities and Exchange Commission seeking registration of options to purchase 21,000 shares of common stock and the underlying shares. In a past public offering of the company's stock, Goodbody & Co. acquired from one of the selling shareholders options to purchase common shares as follows: 10,000 shares at $12.50 per share and 11,000 shares at $13.50 per share. Space Craft's prospectus states that these options may be exercised by Goodbody and in turn may be offered for public sale at the market price current at the time of sale ($20 per share maximum).

NASA HOLDS COMPUTER CONFERENCE

NASA has conducted a one-day industry briefing with 14 major computer manufacturers in order to outline present and future computer procurement policies. NASA Administrator James E. Webb, Deputy Administrator Dr. Robert C. Seamans Jr., representatives of NASA-Goddard, NASA-Langley, NASA-Marshall, and each of the headquarters offices met with representatives from Control Data Corp., Burroughs, Computer Control Co., Digital Equipment Co., General Electric, Honeywell, IBM, National Cash Register, Philco , RCA, Raytheon, Schlumberger Ltd., Scientific Data Systems, and Sperry Rand.

PHILCO TO EXPAND MICROELECTRONICS OPERATION

An expansion program, which will cost approximately $2 million, is being started at the Microelectronics Operation of Philco's Lansdale Division. Michael W. Newell, general manager of the division and vice president of Philco, says that the capital funding will enable the operation to triple its sales and production capacity and double its market penetration by the end of next year.

The program includes funds for basic silicon integrated circuit manufacturing equipment, including wafer fabrication, assembly and test equipment; package and mask fabrication equipment; engineering processing and test equipment; quality control equipment; and related expenses, including furniture and rearrangement of facilities. During 1966, 350 persons are expected to be added to the operation's payroll, increasing its total employment to more than 800. By the end of the year, Microelectronics will have completely occupied a modern 74,000-square-foot semiconductor processing building, and occupied another 10,000 square feet in another building at the Lansdale facility.

The current $2 million program brings Lansdale's total investment in microelectronics to more than $12 million in three years, including substantial independent research and development costs.

NASA-CAMBRIDGE MICROELECTRONIC CIRCUIT MODULE R&D

NASA-Cambridge is requesting bids for the development of a digital circuit module capable of operating from -60 degrees C to 300 degrees C at a basic clock rate of 100 megacycles.

The Center has invited the following firms to submit proposals: Fairchild Semiconductor; GE; General Instruments Corp., Microelectronics Division; Melpar; Motorola; RCA; Texas Instruments; Westinghouse; and Collins Radio. Due date for R&D 66-121 is January 13.

MARSHALL TEST FIRINGS OF S-IC-T END

A run of 15 static firings at NASA-Marshall of the **S-IC-T**, the Tooling test version of the **SATURN V** first stage (SPACE Daily, Oct. 13 and Dec. 16), ended last Thursday. The nonflight stage will now be refurbished for later tests.

The first three firings involved only one of the **S-IC**'s five **F-1** engines and were only partially successful since the burntime was too short. The other 13 firings involved all engines and were generally successful. The tests began last spring.

SSD TO CONTRACT FOR VELA TRACKING STUDY

The Air Force Space Systems Division, executive manager of the Nuclear Detection Satellite program (NDS) (VELA) for the Advanced Research Projects Agency, is going to industry for a system analysis of nuclear detection satellite systems.

The new program will involve orbital mechanics, tracking systems, space and ground-based communications, data processing and alpha-numeric displays.

Written requests for RFP must be submitted by January 1. (Contact: Headquarters, Space Systems Division, Los Angeles Air Force Station, Air Force Unit Post Office, Los Angeles, Calif. 90045. Attn: Thomas Schaus, SSKB.) Documentation verifying capability, background and experience in conducting system analysis of satellite systems must be submitted along with request for RFP. A facility clearance of secret and restricted data, Atomic Energy Act of 1954 are required. For further information, contact: SSD, Attn: Ann Liringis, SSUNK, Phone 643-3530.

An operational NDS system would consist of three satellites in one orbital plane with three more in a plane 90 degrees from the first. Three pairs of nuclear detection satellites (Project VELA) have been launched (October 17, 1963; July 17, 1964; and July 20, 1965). The satellites orbited this year are advanced versions of the first four VELAs, which are classified as R&D configurations.

TRW Systems Group, prime contractor for the nuclear detection satellite, is under contract to SSD to build two sets of an advanced NDS which "are considerably larger and sophisticated" than earlier versions. The redesigned spacecraft will use the TITAN III-C booster. (ATLAS-AGENA has been used to date.)

In 1964 (SPACE Daily, Dec. 1, '64), TRW was awarded a $9 million AF contract to develop within two years a Space Ground Link Subsystem (SGLS). The system, envisioned as part of the AF Satellite Control Facility, Sunnyvale, Calif., was designed as "an all-purpose subsystem," including a space-borne integrated package of telemetry, tracking and command equipment, and ground station and support equipment.

The original communications subsystems for VELA were designed to receive ground command signals at distances up to 75,000 nautical miles and to transmit Atomic Energy Commission nuclear detection payload data and spacecraft performance data back to the ground stations.

BRITISH TECHNOLOGIST TO ADDRESS SPACE COMMITTEE

Sir Charles P. Snow, British Parliamentary Secretary to the Ministry of Technology, will participate in the House Space Committee's annual conference with the members of its 1966 Panel on Science and Technology on January 25 and 26.

The Panel, composed of some fifteen recognized American scientists, was set up to advise the Committee as part of its overall surveillance of scientific activities in the government. The Committee, in addition to calling on individual members with regard to particular problems, meets annually with the entire Panel to discuss a major topic of the day. Sir Charles--scientist, government administrator, novelist and politician--will deliver a paper on the general theme of the Panel, "Government, Science and Public Policy."

Vice President Hubert H. Humphrey, Chairman of the National Aeronautics and Space Council, has been invited by Committee Chairman George P. Miller to open the three-day conference.

AEROSPACE INDUSTRY SALES

(As Compiled By Aerospace Industries Association)

1960 - 1965

(Millions of Dollars)

To	1960 $	1961 $	1961 % Chg.	1962 $	1962 % Chg.	1963 $	1963 % Chg.	1964 $	1964 % Chg.	1965 E $	1965 E % Chg.
TOTAL	17,326	17,997	3.9	19,162	6.5	20,120	5.0	20,716	2.9	20,893	0.9
DOD	13,196	13,871	5.1	14,331	3.3	14,191	- 1.0	13,241	- 6.7	11,793a/	-10.9
NASA	363	630	73.6	1,334	111.7	2,614	96.0	3,550	35.8	4,349b/	22.5
Commercial Aerospace Sales	2,208	1,876	-15.0	1,772	- 5.5	1,485	-16.2	2,042	37.5	2,843c/	39.2
Non-Aerospace	1,559	1,620	3.9	1,725	6.5	1,830	6.1	1,883	2.9	1,908c/	1.3

E- Estimated

a/ Estimated on the basis of expenditures for the first nine months of 1965. Adjustment made for increased expenditures as the result of hostilities in Vietnam.

b/ Estimated on the basis of reported expenditures for the first ten months of 1965.

c/ Estimated on straight line basis from data for first six months of 1965.

NASA RESEARCH AND DEVELOPMENT

NET OBLIGATIONS BY TYPE
(Millions of Dollars)

Calendar Year	Research and Development	Per Cent Change
1959	$ 284.2	-
1960	362.5	27.6
1961	909.6	150.9
1962	1,817.6	99.8
1963	3,144.0	73.0
1964	4,746.0	51.0
1965 (E)	4,591.0	- 3.3

(E) Data estimated on the basis of average obligations for first 10 months of 1965.

MUELLER/NEWELL TO CHAIR AEROSPACE/ELECTRONIC CONFERENCE

NASA Associate Administrators George E. Mueller (Manned Space Flight) and Homer E. Newell (Space Sciences & Applications) will chair featured panels at the 1966 IEEE/AIAA Winter Convention on Aerospace and Electronic Systems.

The conference, the first major symposium of the new IEEE Group on Aerospace and Electronic Systems, will be held February 2-4 at the International Hotel, Los Angeles. The event is a continuation of the Winter Convention on Military Electronics which has been held annually for the last seven years.

Mueller is chairman of a session on **APOLLO/SATURN** Ground Support Equipment, while Newell will head a hearing on Scientific Exploration of the Planets. Other sessions will deal with Deep Space Communications, World Weather Watch Systems, Laser Technology, Communications Satellites, and Tactical Avionics and Missiles. Classified sessions of the symposium are sponsored by the Air Force Systems Command.

GEMINI SCIENTIFIC VALUE QUESTIONED

The question of the actual science value of the United States manned space flight program--as compared to unmanned space experiments--has been raised by a Kings College educator. Said Dr. F. A. E. Piriani: "The American space program...is a bolster to national pride and contributes but trivially to science...It is difficult to think of any scientific purpose which cannot be served more quickly and cheaply with unmanned vehicles." As for **GEMINI**, he said the program "demonstrated remarkable technological dexterity but its scientific significance is completely negligible."

CONTRACT SEMINARS SCHEDULED BY NDEI

Three incentive contracting meetings have been scheduled by the National Defense Education Institute, Boston, next month. The program will consider such questions as contracts structure, strengths and weaknesses of current incentive approaches, and problems encountered after contract award.

The schedule: New York, January 10-14; Los Angeles, January 17-21; and Boston, January 24-28. The program will consist of three separate phases (separate registration): 1) Briefing--the opening one-day seminar covering background and forms of incentives; fundamentals of cost, schedule and performance incentives; introduction to multiple incentives. 2) Structuring Seminar--a two-day advanced session covering multiple-incentives; effectiveness and value concepts; the trade-off matrix; and a structuring workshop. 3) Administration Seminar--a two-day session in the management of incentive contracts covering structuring and negotiation of subcontracts; and management of changes to the contract.

NDEI is an affiliate of the National Security Industrial Association and Harbridge House, Inc., a management consultant, education and research firm, which, among other projects, has prepared official manuals in the contracts field for both the Defense Department and NASA.

LTV MICHOUD COMPUTER SUPPORT CONTRACT

LTV Range Systems Division, named by NASA to provide computer support services for the Michoud Assembly Facility (yesterday's SPACE Daily), will employ some 200 personnel on the project. A few of the employees will be from the Dallas-based LTV unit with the majority being hired at the New Orleans site.

The contract calls for operation and maintenance of some 20 digital and analog computers, a data transmission system, a data reduction system and related electronic equipment. These services also will support the Mississippi Test Facility.

Final negotiations between LTV and NASA, which follow competitive proposals and bidding, will deal with a one-year period with provisions for three one-year renewals. The cost-plus-award-fee contract is expected to approximate $1.5 million for the first year.

KAMAN'S GUIDANCE-TURBULENCE STUDY

Kaman AviDyne's study of guidance system concepts on the structural load imposed by atmospheric turbulence will use **ATLAS** and **MINUTEMAN** ICBMs and a **TITAN**/winged payload (SPACE Daily, December 21). Data from the "theoretical study," however, is not limited to the named systems, and could have application to other booster programs.

Dr. Robert S. Voris, previously director of development for the Explosive and Chemical Propulsion Department, has been appointed technical director of Hercules' MHD Research. Replacing Voris as director of development is **Richard Winer**, currently manager of rocket engineering for the Chemical Propulsion Division.

Future Space Business

ROCKET ENGINE CHAMBER INSULATION MATERIALS STUDY

NASA-Western Operations is soliciting proposals from the following firms to carry out a project to investigate spacecraft rocket engine chamber insulation materials: Atomics International, Avco/RAD, Battelle Memorial Institute, The Boeing Co., GE Co., Hi-Temp Corp., Lockheed MSC, Marquardt Corp., Rocketdyne, Southern Research Institute, Union Carbide Research Institute, and Arthur D. Little Co. (20 Acorn Park, Cambridge, Mass.).

Contact: NASA, Western Operations Office, Santa Monica, Calif. Due date: Dec. 31.

HYPERSONIC TURBULENT BOUNDARY LAYERS STUDY

NASA-Langley has issued RFPs for spacecraft required by the Center's Reentry F, turbulent heating experiment. This experiment is a continuation of the program to investigate hypersonic turbulent boundary layers.

The following firms have been invited to participate: Atlantic Research Corp., Avco Corp. (Research and Development Div.),The Boeing Co., Chrysler Corp., Defense Group, Douglas Aircraft Co., Inc., Fairchild Hiller Corp. (Republic Aviation Div.),GE Co., Goodyear Aerospace Corp., Grumman Aircraft Engineering Corp., Honeywell, Inc., LTV Aerospace Corp., Lockheed Aircraft Corp., McDonnell Aircraft Corp., Martin Co., North American Aviation, Inc., Northrop Corp., Philco Corp., RCA, Spacecraft Inc., Space-General Corp., United Aircraft Corp., and TRW Inc.

Contact: NASA Procurement Office, Langley Research Center, Langley Station, Hampton, Va. Reference RFP L-6345. Due date: Jan. 25.

TEN CENTIMETER BASE LINE SPECTROMETER STUDY

NASA-Goddard is requesting proposals for the investigation and feasibility determination of a ten centimeter base line time-of-flight mass spectrometer suitable for spacecraft use.

Contact: NASA, Goddard Space Flight Center, Greenbelt, Md. Attn: Code 246, Malcolm Stephens.

RAPID WIRE LIQUID PROPELLANT SMALL CALIBER WEAPON

The Aberdeen Proving Ground is requesting proposals for the design and theoretical study of the dynamic behavior of a laboratory system to simulate liquid pumping and metering and projectile functioning in a rapid fire liquid propellant small caliber weapon.

Contact: Procurement Division, Building 4603, Aberdeen Proving Ground, Md. Reference: RFQ-RD-APG-135-66. Due date: Jan. 19.

MARTIAN ENVIRONMENTAL CHAMBER PRESSURE CONTROL SYSTEM

NASA-Ames has issued IFPs for the fabrication, installation, and test of a pressure control system for the Martian environmental chamber. The system is used to regulate the flow of noncorrosive gases into vessels for simulating atmosphere conditions from 7-to-760-ton absolute pressure.

Contact: NASA, Ames Research Center, Moffett Field, Calif. Reference: IFB A-11395(TT)-74. Due date Jan. 9.

NONPROPULSION DUAL RAIL SLED

Air Force Missile Development Center is preparing to fund a non-propulsion carrying general purpose variable payload dual rail sled.

Contact: Air Force Missile Development Center, Procurement Directorate. Attn: MDMKN-5. Due date: Dec. 31.

AMC DESIGN/DRAFTING/DOCUMENTATION SUPPORT

The Army Missile Command is issuing RFPs for services to provide an estimated 12,000 manhours for design, drafting and documentation support to the Army Inertial Guidance & Control Laboratory, Research and Development Directorate, Redstone Arsenal, Ala.

Contact: Army Missile Command, Procurement and Production Dir., Systems Contracts Division A, Negotiation Branch 1. Attn: AMSMI-IWA. Due date: Jan. 3.

APOLLO PROTOTYPE GLOVE SYSTEM

NASA-Houston is issuing RFPs to design, develop, fabricate, and test a prototype glove system which will permit easy manipulation of apparatus and samples in a 10-6 torr, sterile vacuum environment with a pressure of 3.7 PSIA across the gloves. The gloves will be incorporated in the vacuum chambers of the lunar sample receiving laboratory, and will constitute the principal manipulative device for opening the returned **APOLLO** lunar sample containers. Interstitially pumped glove, based on available pressure suit designs, is recommended.

Contact: NASA Manned Spacecraft Center, General Research Procurement Branch, Texas 77058. Attn: Jack H. Goldstein, BG721 (38). Reference: BG721-38-6-313P. Due date: Jan. 20.

NASA NEGOTIATIONS

Grumman Aircraft--with Houston for four additional Lunar Excursion Modules.

ITT Industrial Laboratories--with Goddard for the design, development, fabrication and integration support for a flight model image dissector camera system and the associated ground support equipment to be used on the **ATS** satellite.