

# SPACE BUSINESS



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## BOEING DEVELOPING AIRBORNE MINUTEMAN CONTROL.

Boeing, integrator for **MINUTEMAN** missile systems, is developing a control system for installation in a KC-135 aircraft as an alternate system to the missile's regular underground control center.

Preliminary design and prototype work is underway under an existing **MINUTEMAN** modernization contract, and the development contract will be awarded later for flight systems. Like the underground system, the airborne unit will require simultaneous operation by separate personnel.

## SOLAR CELLS FOR SOLAR MONITORING SATELLITE SOUGHT.

NASA-Ames will issue about January 20 a request for proposals for delivery of solar cells which could be used in a solar satellite monitoring mission.

Sufficient quantities of the cells will be obtained for a research and development investigation to prove the feasibility of operation in a near-solar flyby.

Designed for the 1966-67 period, the **SMS** would use the LTV **SCOUT** as an upper stage of the GD/C **ATLAS** as a transportation vehicle and use off-the-shelf hardware for adherence to the very tight launch and cost schedule (SPACE Daily, April 29).

NASA had been awaiting approval of plans (SPACE Daily, Aug. 6) for the development of a Solar Monitoring Satellite (**SMS**), which originated with an unsolicited proposal from General Electric, when the manager of the program died.

Dr. John C. Lindsay, identified as the father of the **OSO**, leader of the **SMS** program, died suddenly of a heart attack in September. After this passing of the Associate Chief of the Laboratory for Space Sciences the **SMS** program ceased to function.

## NASA ISSUES RFPS FOR GELLED STORABLE ENGINE.

Aerojet-General, Boeing-Aerospace, Lockheed M&S, Marquardt, NAA-Rocketdyne, Shell Development, Thiokol-Reaction, and United-UTC have received RFPS (RFP WO 66-1) with a due date of February 11 from the NASA-Western Operations Office (WOO) for a project to define and establish the systems aspects necessary for the employment of gelled space storable propellants in spacecraft engine systems.

## WIRE-REINFORCED SOLID PROPELLANT STUDY PLANNED.

The Navy is seeking the interest of non-solid propellant firms for a program to be established for an analytical investigation and stress analysis of wire-reinforced solid propellant grains for future Navy missile requirements.

The program will investigate continuous filament, rolled screen, and stacked laminate screen as a reinforcement medium. These designs will be evaluated and compared with conventional

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systems for their possible role in structurally-taxing Navy missions. The Navy's purchasing office in Los Angeles is compiling an interest list in preparation for issuance of request for proposals.

**FIBERGLASS 156 TEST PROGRAM PLANNED.** The Air Force Rocket Propulsion Laboratory at the Edwards Flight Test Center will issue requests for proposals to Aerojet-General, Hercules Powder, Lockheed, NAA-Rocketdyne, Thiokol, and United for a project to insulate, hydrotest, load, fire and hydroburst a fiberglass 156-inch diameter solid propellant motor case.

**NASA TRANSFERS FUNDS FOR AA-OCEANOGRAPHY.** The NASA has transferred \$900,000 to the Navy for funding the studies by the Naval Oceanographic Office of **APOLLO** Applications (**AA**) Oceanography missions (SPACE Daily, Jan. 4, 6 & 7). Specific applications and techniques to be explored were listed in the January 7 issue of SPACE Daily.

**RCA AWARDED SATURN COMPUTER SUPPORT.** A \$7,837,000 contract for a two-year logistics support of the **SATURN** ground computer has been awarded to the RCA Aerospace Systems division by NASA-Houston.

**CONTROL VALVE DISABLED TITAN TRANSTAGE.** The malfunction in the third **TITAN III-C**'s Transtage (SPACE Daily, Dec. 22) has been traced to an N-5 valve in the attitude control system. The valve leaked the fuel (or oxidizer) that was to have been burned to steady the stage prior to its third firing, the firing that would have circularized the stage's orbit at 18,200 nautical miles where its four satellites were supposed to be deployed (SPACE Daily, Nov. 5 and Dec. 10). Since the leakage precluded that burn of the ACS, the stage began to tumble slowly, and the guidance system was prevented from commanding the third firing. **III-C-3** was launched December 21. The fourth shot is set for mid March (SPACE Daily, Jan. 5).

**GD/C TO PROVIDE ABRES SAFETY SYSTEMS.** General Dynamics/Convair has won the competitive program for providing 35 **ABRES** (Advanced Ballistic Re-Entry Systems) Instrumentation Range Safety Systems (**AIRSS**). A \$1,622,299 contract has been awarded by Ballistic Systems Division. The **ABRES** test program is conducted over the Vandenberg to Kwajalein range with GD/C **ATLAS** transportation systems.

**NASA/TRW SIGN GEMINI/APOLLO ANALYSIS PACT.** NASA-Houston and TRW Systems have signed the \$7.5 million contract extension for the analysis of the **GEMINI** and **APOLLO** mission trajectories and the **APOLLO** spacecraft systems.



### LOCKHEED-WASHINGTON REORGANIZED

The election of William R. Wilson, currently director of Lockheed's Washington Operations, as vice president-public relations and his consequent move to corporate headquarters in Burbank, Calif. (SPACE Daily, Jan. 6), has initiated a major change in the structure of the Washington, D. C., office.

It has been decided that Wilson will not be replaced "in kind," but that his position will be divided into three parts with three men being promoted to the director level. A. D. Hight will become director of U.S. Government programs, R. G. McCune will become director of Foreign Programs, and E. M. Lightfoot will become administrative director. G. A. Busch and C. T. Bendorf will both remain at the director level--Busch as director of Planning and Bendorf as director of Government Relations. These five directors will all report directly to Vernon A. Johnson, corporate vice president-Eastern Region.

Other promotions include: P. J. Sullivan to become Washington manager-Aircraft Programs and W. P. Crenshaw to become Washington manager-Missiles, Space, Ocean Systems, Electronics Programs. Both Sullivan and Crenshaw will report to Hight.

### NAA-CALIFORNIA EXPANSION PLANNED

North American Aviation will expand facilities at its Los Angeles Division as part of its program to establish prime structural machining responsibility at Los Angeles for its California division. To implement the program, NAA is purchasing a wide range of heavy duty numerically controlled machine tools.

### HUGHES ESTABLISHES MISSILE SYSTEMS DIVISION

In a move designed to expand its effort in the missile field, Hughes has established a new missile systems division at Canoga Park, Calif. The new division will be staffed initially by 800 to 1000 employees of the company's aerospace group, with "hundreds more" expected later. The move from Culver City-El Segundo will be effected about April 1.

The new division, under the direction of Warren E. Mathews, associate director of R&D for the aerospace group, will have overall program responsibility for specific missile programs and will assist other systems divisions in designing and developing the missiles associated with major weapon system programs. Activities at Canoga Park will be confined to R&D, missile contract management, marketing and production of some experimental prototype hardware. Included in the responsibilities of the new division will be **TOW**, **PHOENIX**, **AIM-4D** and **FALCON**.

The new facilities, located in the Fallbrook Avenue research center, have been leased from TRW and will be made available to Bunker-Ramo.

W. J. Cecka Jr., previously plant manager of NAA-Rocketdyne's Neosho, Mo., facility, has been appointed to the new position of assistant general manager of the Solid Rocket division. O. I. Thorsen, formerly program manager for the H-1 engine, will succeed Cecka as plant manager at Neosho.



### CONGRESS GROUP ATTACKS SPACE/DEFENSE R&D

The Research and Technical Programs Subcommittee of the House Committee on Government Operations began hearings Friday seeking a better allocation of the \$16 billion annual research and development budget.

Chairman Henry S. Reuss (D-Wis.) charged that decisions on R&D expenditures are made in an unsystematic manner, not properly considering all the national goals. He pointed out that although \$3 billion has been allocated for developing a system to send a man to the Moon, nothing has been set aside for "research on how to develop entirely new systems of urban transportation that will transport people speedily, safely, economically, and without ruining our cities or polluting our atmosphere."

#### Reuss Wants APOLLO Deferred 5 Years

Reuss suggested that by advancing the APOLLO lunar landing target date from 1970 to 1975, approximately \$1.5 billion a year would be made available for R&D in such areas as housing, urban transportation, and pollution control.

He charged further that the view that advances in space/defense R&D produce as their by-products advances in civilian technology is "largely a myth." Instead, as defense needs have become more specialized, their translation to meet civilian needs has become less likely, and therefore, "Civilian technology in many fields will not be developed without federal research and development programs directed at these specific problems."

One solution to the problem of wisely allocating R&D dollars might be, according to Reuss, that the departments and agencies be requested to rank items in their research budgets on a priority basis. "Trade-offs could then be made among low-priority items, with a view to eliminating research projects with the lowest cost-benefit ratio."

#### Hornig Emphasizes Importance of Planning

Dr. Donald F. Hornig, director of the Office of Science & Technology, led off the list of witnesses by pointing out that "Because development is usually single-purpose in nature in support of particular objectives, it is not possible to trade off specific development items among different governmental objectives such as the military, space, and atomic energy programs." He said that the higher the level of decision on allocation, the greater the significance of political factors, and the less the significance of technical factors. "For these reasons, I do not believe that it is either wise or possible to approach this question by deciding what an appropriate fraction of the Federal Budget or the GNP would be for R&D, and then finding an appropriate way to divide that total among the various possible objectives. Rather, I believe we must address ourselves to a series of research and development programs each of which must be evaluated in terms of the goal it serves and then take into account whatever interrelationships there are between programs."

#### APOLLO Decision Not An R&D Allocation Decision

Hornig said that although most of the space program can be classified as R&D, the decision to go ahead with the space program and in particular the APOLLO lunar landing was not made "in the context of the allocation of research and development efforts, but rather in the broader context of our national goals. On the other hand, the smaller portion of the space R&D which relates to the exploration of outer space for practical applications is more susceptible of quantification in terms of **MORE**



## CONGRESS GROUP ATTACKS SPACE/DEFENSE R&amp;D-Contd.

benefits realizable through additional investment, as in the case of weather and communication satellites."

Can't Buy Progress In Non-Progressive Field

As for devoting more R&D funds to the areas of housing, transportation, and other domestic problems, Hornig pointed out that "What we lack in many of the civilian problem areas. . . is not a consensus on their importance. . . We cannot buy and create progress in a field which is not ready to progress." Questions which Hornig considers essential in the allocation of R&D include: "Can the developments be applied in practice; And is the society ready to assimilate these results."

Elmer B. Staats, deputy director of the Bureau of the Budget, told the members of the committee that "Uncertainty always hangs over any planning process, and it affects Federal budgeting materially. This year, for example, the developments in Vietnam have affected the budget decisions in every domestic program in the budget, and in very many instances have forced us to revise our plans and expectations."

He said that aggregate Federal expenditures for research and development in the 1966 administrative budget are about \$15.5 billion, which is roughly 15 per cent of the total expenditures. Of that total, research accounts for about a third, or \$5 billion, while development comes to \$9.5 billion. The remaining \$1 billion is for facilities. Of the \$5 billion for research, it has been estimated that basic research accounts for about \$2 billion.

Staats agreed that deferring the lunar landing from a 1970 to a 1975 target date might make available \$1.5 billion a year for R&D in civilian technology. "This would be one consequence; but there are other alternate consequences as well. Part or all of the same dollars might be claimed for education, for the war on poverty, for Appalachia, or for rivers and harbors. I am suggesting merely that we should keep our options flexible, and I am sure the Subcommittee would agree. In other words, given the variety of urgent national goals that we have as a Nation, the freeing-up of large fragments of the budget brings us back to where we started--to a problem in rationing based on judgments of relative needs and relative gains from a given order of expenditure."

Richard R. Nelson, an economist with the RAND Corporation, cautioned against putting too much emphasis on the techniques of cost analysis in ascertaining where R&D funds should or should not go: "The heart of any good cost-benefit analysis is deep understanding, not a particular set of techniques. I suspect the primary reason why policies in various areas are not particularly good is lack of understanding not absence of cost-benefit analysis."

**EARLY BIRD II AND III MAY NEVER FLY**

**EARLY BIRD II**, younger brother of ComSat's present operational satellite **EARLY BIRD I**, is in bonded storage at the Hughes plant in Los Angeles and may so remain if, as expected, **I** continues to operate satisfactorily, barring external disturbance, for at least the remainder of this decade. **III**, a prototype model that has been serving as a backup, seems likely to follow suit, since no need now exists for it either. Back in the summer, when **I**'s lifetime was considered short, **II** and **III** were being eyed for possible launch this year, although even then, Hughes was claiming a three-year career for **I** while ComSat was favoring 18 months (SPACE Daily, July 2 & 14).



### ADMINISTRATION CONSIDERING THREE TAX INCREASE PLANS

In order to meet increasing costs of the war in Vietnam and the Great Society program, the Administration has currently under study three different tax increase proposals which would affect corporate structures, Rep. Richard Roudebush (R-Ind.) says.

Under study are 1) A 10 percent personal income tax hike, increased corporate profit tax, and a freeze on excise taxes at 1966 levels, and a suspension of further cuts already voted. Money raised: \$7.5 billion. 2) A two percent increase in personal income rates, a two percent increase in corporate profit taxes, and a freeze on excise tax rates on autos and local phone service. Money raised: \$7 billion. 3) A two percent increase on the regular corporate tax, an excess profits tax similar to that of the Korean War, and a freeze of excise rates on auto and local phone service. Money raised: \$5 billion.

### DOD SCHEDULES PROCUREMENT BRIEFINGS

The Defense Department will offer procurement counseling and assistance at five Advanced Planning Briefings to be held in March/April. Special attention will be given to small business and labor surplus area concerns. The meetings are being held in cooperation with the National Security Industrial Association.

Briefings will be held as follows: March 3-4, Sheraton-Boston Hotel, Boston; March 9-10, Dinker Plaza Hotel, Atlanta; March 16-17, Sheraton-Jefferson Hotel, St. Louis; April 12-13, Fairmont Hotel, San Francisco; and April 27-28, Sheraton-Park Hotel, Washington.

### DOUGLAS MSSD TRANSFERS TO SPACE SYSTEMS CENTER

Headquarters of Douglas' Missile & Space Systems Division has moved from its old quarters at Santa Monica, Calif., to the company's Space Systems Center in Huntington Beach.

Approximately 750 executives and division staff personnel have moved into a new three-story, 180,000-square-foot building, which has been under construction since October (SPACE Daily, Oct. 29). Other personnel will follow throughout the month with the work force at the Space Systems Center being raised to nearly 6800 when the move is complete.

Heading the move of the MSSD vice presidents and directors of divisional operating, line and staff departments and members of their staffs was group vice president C. R. Able. It is planned that some 16,000 MSSD employees will remain at the Santa Monica area facilities, which will continue to provide the division's basic fabrication capability and will be the center of operations for the program management, design and development of the **THOR**, **DELTA**, **GENIE** and **ZEUS-NIKE X** programs. The development engineering staff also is at Santa Monica, as well as some 80 research laboratories.

Major MSSD programs at the Space Systems Center include the Manned Orbiting Laboratory (**MOL**) and the **SATURN S-IVB**.

**Lt. Col. Arthur Michelini (USAF, Ret.)** has been appointed to the new post of European regional manager for field operations by the Westrex Communications division of Litton Industries. Michelini will be stationed at Weisbaden, Germany.



### FIRST SURVEYOR LANDER RETRO ROCKET DELIVERED

Thiokol has delivered the 9000-pound thrust solid retro-rocket for the first **SURVEYOR** soft lunar landing mission to Cape Kennedy. The first attempt to land the troubled **SURVEYOR** (SPACE Daily, Oct. 28 & Dec. 20) on the Moon is, at present, scheduled for May or June (SPACE Daily, Nov. 24).

The 37-inch-diameter spherical rocket case, with a 52-inch submerged nozzle, is designed to be ignited at a height of about 60 miles above the lunar surface. At ignition **SURVEYOR** will be traveling at about 6000 miles per hour. After retro burnout, 25 miles out, the velocity should have been reduced to 340 miles per hour at which point the retro motor will be jettisoned and the radar altimeter and doppler velocity sensor system will control the liquid vernier rocket system to a touchdown.

### NEW DOUGLAS RESEARCH LAB OPENS TODAY

Douglas will begin today to operate its new \$2 million Advanced Research Laboratories at its Huntington Beach, Calif., Space Systems Center. To eventually be staffed by about 100 people, the Labs will focus on work in mathematical, environmental, material, and life sciences. Among the special facilities of the building are an optics tunnel, a glass blowing room, and crystal growing and finishing quarters. Dr. Lewis Larmore will oversee the Labs' operation.

### ARACON TO RUN NIMBUS II DATA CENTER

NASA has awarded ARACON Geophysics, a division of Allied Research Associates (Concord, Mass.), a \$600,000 contract to establish and operate a data utilization center at NASA-Goddard to handle the information provided by **NIMBUS II (B)**, which will be launched this spring. The center will catalogue the data and perform bookkeeping and evaluation tasks.

### BLUE BIRD I/II GO IN AUG./SEP.

ComSat's **APOLLO**-support synchronous satellite system (SPACE Daily, Aug. 2), comprised initially of two Hughes payloads (SPACE Daily, Aug. 16) called **BLUE BIRDS** (SPACE Daily, Nov. 1), will be implemented in August and September when **BLUE BIRD I** and **II** respectively are orbited--the former over the Atlantic and the latter over the Pacific. Improved **DELTA** vehicles will carry the 56-inch-diameter drums aloft from Cape Kennedy. They will have five-year lifetimes.

**BLUE BIRD I** will be delivered to the Cape in June and **II** in July, with their backups, **III** and **IV**, to arrive in August (SPACE Daily, Oct. 21). The **BLUE BIRD** contract was formally awarded in late November (SPACE Daily, Nov. 29).

### DAVENPORT TAKES OVER DOD POST

Roy K. Davenport, formerly Deputy Under Secretary of the Army for Personnel Management, has been appointed as Deputy Assistant Secretary of Defense (Manpower Planning and Research).



## NEW SATURN CONFIGURATIONS UNDER STUDY

NASA-Marshall recently contracted with its **SATURN** prime stage contractors for studies of 14 various configurations of its **SATURN IB** and **SATURN V** vehicles (SPACE Daily, Jan. 6). Plans for improving **IB** began to appear last spring (SPACE Daily, May 26 & June 14), while the program for uprating **V** came to the fore last summer (SPACE Daily, August 10 to 20). The new studies awarded by Marshall will also consider a vehicle between **IB** and **V** (SPACE Daily, August 20 and Sept. 10).

Eight variations of the **SATURN V** vehicle will be examined for Marshall. In all prospective configurations which include the **S-IC** stage, Boeing will be study systems integration contractor. In all other NAA will be contractor. The configurations to be studied: 1) Intermediate vehicle consisting of modified **S-II** and **S-IVB** stages powered by a new type liquid hydrogen-liquid oxygen engine and launched at existing **SATURN V** facilities from an elevated platform the same height as the missing **S-IC** stage; 2) Intermediate vehicle with two, three or four 120-inch-diameter solid motors strapped to the **S-II** stage; 3) Intermediate vehicle consisting of the **S-II** and **S-IVB** and from six to 12 **MINUTEMAN** first stage solid motors strapped to the **S-II**; 4) Vehicle consisting of a modified **S-IC** stage with a propellant capability of 4,555,000 pounds and a number of F-1 engines of 1,522,000 pounds thrust, with a **S-IVB** second stage, modified, if required; 5) Same basic **S-IC** (configuration 4) topped by standard **S-II**. (Desirability of removing engines for either or both stages will be investigated.); 6) A three-stage vehicle consisting of a modified **S-IC** using five F-1 engines uprated to 1.8 million pounds thrust, with **S-II** and **S-IVB** stages. (The upper stages would use a new hydrogen-oxygen engine.); 7) Basic **S-IC** configuration with additional propellant capacity with four 120-inch solids in a boost-assist mode (Modifications to **S-II** and **S-IVB** and to engines would be minimum, if necessary); and 8) Basic **SATURN V** three stage vehicle with **S-IC** modified for attachment of liquid rocket pods, each using two F-1 engines.

The six **SATURN IB** studies will consider: 1) The Zero Stage booster, consisting of four 120-inch solids strapped to the **S-IB** first stage (Second stage would be an **S-IVB**.); 2) **S-IB** booster with only four H-1 engines but with four 120-inch solids attached (Second stage would be an **S-IVB**.); 3) **S-IVB** with eight H-1 engines and two 120-inch solids attached (Second stage: **S-IVB**.); 4) **S-IB** stage with four **MINUTEMAN** solids attached; 5) **S-IB** stage with eight **MINUTEMAN** solids attached; and 6) A cluster of five 120-inch solids as booster. Chrysler will be prime contractor for the first five studies, with Douglas as support contractor. Douglas will conduct the sixth study. (See SPACE Daily, July 8.)

## NASA-MARSHALL CCC CONFERENCE: JAN. 11-12

NASA-Marshall is holding tomorrow and Wednesday its Cleaning and Contamination Control Conference. Fourteen technical papers will be presented, and John Condon, director of NASA-Washington's Office of Reliability and Quality Assurance, will be the guest speaker. Emphasis will be on **APOLLO** components.



### UPGRADING OF NATIONAL SCIENCE FOUNDATION URGED

A special congressional subcommittee has recommended a major overhaul of the National Science Foundation to increase its role in the nation's scientific development.

Rep. Emilio Q. Daddario (D-Conn.), chairman of the Subcommittee on Science, Research & Development, submitted the report to Chairman George P. Miller (D-Calif.) of the House Space Committee following more than a year of investigation and hearings.

#### Take-Over from OST and President's Advisory Group Urged

The primary goal of the report is aimed at strengthening the NSF and its mission, including an upgrading of the Foundation's director within the official Executive offices. Specifically the report recommends that NSF "should take the initiative and be held broadly responsible for the nation's science resources, disengaging the Office of Science and Technology and the President's Science Advisory Committee from their detailed oversight in this area."

The report urged that the NSF be made into a stronger policy-making body in regard to scientific and technological resources and their relationship to national goals. The report said the Foundation should serve as a "balance wheel" in developing adequate Federal support for science and technology, and that increased attention be given to the social sciences and engineering.

### AIAA AEROSPACE SCIENCE MEETING SCHEDULED

A Space Science Report, chaired by Homer E. Newell, NASA Associate Administrator for Space Sciences and Applications, will be one of the featured sessions at the AIAA Aerospace Sciences Meeting, January 24-26 at the Statler Hilton Hotel, New York City.

The AIAA meeting program will focus on fundamental research problems which will be met in the aeronautics and space fields during the next 10 years. Such subjects as lifting re-entry vehicles (shuttles) and ramjet and **SCRAMJET** applications will be considered.

NASA Deputy Administrator Robert Seamans will be the principal speaker at a special Honors Convocation. Honors to be presented include the Goddard Award, including a \$10,000 honorarium donated by United Aircraft. Other honors to be presented include the Sylvanus Albert Reed Award, Research award (\$2500 donated by Douglas) and the Space Science Award (\$1000 donated by Bell Aerosystems). A tribute to Dr. Hugh L. Dryden, late NASA Deputy Administrator, will be made by Gen. James Doolittle.

The technical program for the meeting will cover entry vehicle technology, plasmadynamics, electric propulsion, fluid mechanics, propellants and combustion, thermophysics, astrodynamics, fluid dynamics, education in the aerospace sciences, space and atmospheric physics, structures, and structural dynamics.

Benjamin Walker has been appointed a vice president of Space-General. He will continue as director of the company's work on the **APOLLO** Lunar Surface Experiments Package (**ALSEP**) (SPACE Daily, May 14 & Nov. 29).

D. Clark Murphy has been appointed product manager for data recognition equipment for Philco's Communications and Electronics Division.



### IMPROVEMENT PROGRAM SLATED FOR TITAN II & MINUTEMAN

The major responsibility for the Air Force IROS (Increased Reliability Operational Systems) program, designed to lower cost and increase tactical ability of its operational weapon systems, such as **TITAN II** and **MINUTEMAN**, has been assigned to the Air Force Logistics Command.

Using monthly reports, AFLC's logistics centers will compile failure data and mathematical models to isolate "weak links" in existing systems. The reports will cover each weapon system and will also contain reliability trends over a six-month period. They will include a detailed diagram showing the mean time between failure (MTBF) rate for each system and each subsystem having a low MTBF. Mathematical models are being developed on a prototype basis which will permit determination of an acceptable level of reliability for items within each system. Frank J. Ruther, AFLC Reliability Manager, will head report integration actions.

When components do not meet an acceptable level of reliability, the logistics centers will order changes in design, maintenance procedures or controls or in test equipment. In each case, cost effectiveness studies will be undertaken to determine feasibility of change. Factors involved: 1) cost of replacement; 2) cost of modification; 3) cost of substitute development program; 4) projected life of the system; 5) amount of cost reduction. "No modification program will be undertaken unless savings result to the Air Force or tactical capability is increased enough to insure performance of the mission." Of prime importance: personnel safety.

In the development and acquisition phases of new systems, the Air Force Systems Command will have responsibility for IROS. The command will establish component improvement programs to eliminate projected high failure-rate and man-hour consumer items. AFSC will also provide engineering support for operational systems upon request from AFLC and the operating commands.

Operating command, under the new system, are to develop a summary of the operational and maintenance concept changes necessary for each of their systems and will establish analytical models to pinpoint areas of low reliability. Working with AFLC and AFSC, they will determine the minimum acceptable reliability level and the desired reliability goal for each operational system. Priority of actions, based upon mission requirements and current availability of AF systems, will be recommended by operating commands.

### NASA PROMOTES FOUR TO ASSISTANT ADMINISTRATOR

Continuing the shifting of titles under the new management reorganization (SPACE Daily, Jan. 5), NASA has promoted four deputy associate administrators to the rank of assistant administrator. William B. Rieke (Industry Affairs), DeMarquis D. Wyatt (Programming), Admiral W. Fred Boone (Defense Affairs), and John D. Young (Administration) received the new titles. The organizational shift places these four new assistant administrators on the same level with the existing assistant administrators for Legislative Affairs (Richard L. Callaghan), International Affairs (Arnold W. Frutkin), Public Affairs (Julian W. Scheer), and Technology Utilization (Breene M. Kerr).



**Future Space Business****HYPERVELOCITY IMPACT RESEARCH PROGRAM**

NASA-Marshall is planning an experimental hypervelocity impact research program.

Contact: Purchasing Office, George C. Marshall Space Flight Center, NASA, Huntsville, Ala. 35812. Reference: RFQ DCN 1-6-28-00030. Due date: Feb. 2.

**METEOROLOGICAL SATELLITE IRLS SUBSYSTEM PLANNED**

NASA-Goddard is planning to issue a request for the design, development, fabrication and testing of one engineering model and three operational models of a 25 watt solid state transmitter to be used in the interrogation, recording and location subsystem (**IRLS**) for the GSFC Meteorological satellite program.

Contact: NASA-Goddard Space Flight Center, Procurement Div., Attn: Mr. Jon C. Swindle, Code 247. Reference: RFP 731-84778(210). Due date: Jan. 18.

**BALLISTIC MISSILE SUSPENSION SYSTEM STUDY**

Air Force Ballistic Systems Division is planning to conduct a study and sub-scale test program on a suspension system for a large ballistic missile to verify existing suspension system mathematical models and correlate component and system test data with these models.

Contact: Headquarters, Ballistic Systems Division, Norton Air Force Base, Calif. 92409. Attn: BSRKC-2. Reference: RFP 04-694-66-153. Due date: Jan. 17.

**HIGH G PARACHUTE RECOVERY SYSTEM**

Army, Picatinny Arsenal is issuing requests for proposals for the design and manufacture of a parachute recovery system for high "G" research test vehicle, consisting of parachutes, deployment release, controls and deployment bag.

Contact: Picatinny Arsenal, Picatinny, N. J. 07801. Reference: AMC (A)-28-017-66-273. Due date: Jan. 24.

**DOD NEGOTIATIONS**

Raytheon Co. --with Navy Purchasing Office to conduct a study to determine the blast effects on shipboard antennas.

Martin-Marietta, Denver Div. --with Air Force for fabrication of propellant vessels.

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**DOD NEGOTIATIONS-Contd.**

Honeywell, Inc.--with The Bureau of Naval Weapons to provide research, design and field engineering in connection with development of the **ASROC** and **ASROC/TERRIER** weapon systems.

Martin Co., Baltimore, Md.--with Air Force Special Weapons Center for a contract for feasibility study of control mechanism and coolant properties of turps.

Applied Technology, Inc.--with Rome Air Development Center for a study of elevation angle determination in wide aperture arrays.

Dynamic Science Corp.--with Air Force Flight Test Center for the effects of additives on the combustion of hydrazine.

**NASA NEGOTIATIONS**

Whittaker Corp.--with Langley for five dual potentiometer miniature attitudes reference systems.

Northrop Corp., Norair Div.--with Marshall for a study on aerodynamic properties of engine exhaust plumes.

Sylvania Electric Products, Inc.--with Marshall for modification of the optical superheterodyne receiver.

Motorola, Inc.--with Houston for the design, development and testing of **APOLLO** unified S-Band Transponder Laboratory test equipment.

**DOD CONTRACTS****Army**

Martin-Zachry Constructors, Honolulu, Hawaii--\$3.3 million for the construction of **NIKE-ZEUS**, **NIKE-XA** and press facilities at Marshall Islands.

North American Aviation, Inc., Columbus Div.--\$194,000 for airborne positioning and attitude data applications study.

General Electric Co.--\$98,899 for the continuation of a penetration aids study.

**Air Force**

Litton Systems, Inc.--\$150,686 for the continuation of research on electromagnetic plasma production and acceleration.

Analytic Services, Inc.--\$1.3 million for Project **ANSER (U)**.

Texas Instruments, Inc.--\$672,291 for ARPA Project **VELA** research.