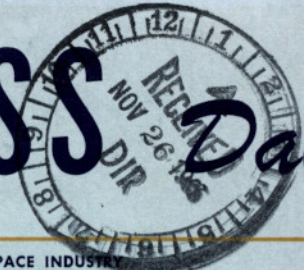


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NASA REQUESTS \$12-\$14 MILLION FOR 260/\$4 MILLION FOR SNAP-8.

NASA submitted within its first proposed budget estimates to the Bureau of the Budget a request for \$12 to \$14 million for the 260-inch-diameter, large solid rocket motor program and about \$4 million for the **SNAP-8** program. Both of these programs, as well as the M-1 large liquid engine program, were cancelled by NASA last year but restored by the Congress (SPACE Daily, June 14). The final NASA authorization bill provided \$8 million for the **SNAP-8** program and \$13.7 million for the chemical propulsion program (M-1 and 260) over and above the funds requested by NASA for FY 1966.

The FY 1967 budget proposals, including provisions for the 260 and **SNAP-8** are now being considered by BOB. The BOB "apportionment" of FY '66 funds for these two programs hasn't even been requested by NASA as yet. However, prospects for the 260 appear dim at this time. Since the budget request for this year is running in the near vicinity of last year's, the programs cancelled by NASA last year will obviously be the first to be cut by NASA when BOB rejects its first proposals, even at the risk of Congressional ire. Prospects for the **SNAP-8** look only slightly better due to a possible NASA interest in the overall technology of the program even without a defined mission.

SURVEYOR STRETCHED TO MAY.

The first flight of a lunar soft-landing **SURVEYOR**, a schedule which has in the last three months been stretched 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), has now been moved by JPL to May. It does not appear a possibility that the three or four flights that Oran Nicks had hoped for in 1966 will materialize. One official has already said that June is a better date than May.

SCRAMJET INTEGRATION PROGRAM PLANNED.

The Air Force Flight Dynamics Laboratory is drawing up the study program plans for an eventual contracted investigation of the integration problems of a supersonic/hypersonic ramjet, such as the **SCRAMJET**, and its exhaust nozzle complexities to the airframe of possible future vehicles. **SCRAMJET**, envisioned by the Air Force as the possible propulsion system for the **SPACE PLANE** concepts (SPACE Daily, April 28), is under flight evaluation by Marquardt, Lockheed-California and General Applied Science Laboratories (SPACE Daily, Sept. 17).

LIVE TV OF GEMINI VII/VI RECOVERIES CONFIRMED. In a meeting with ABC and NBC late Monday afternoon, CBS secured the formal consensus to go ahead with its plans to provide, for multilateral distribution, live television coverage of the recovery operations of the sixth and seventh GEMINI missions--thus confirming its expectation last week (SPACE Daily, Nov. 17) that such a consensus would come. Since ITT's mobile ground station will be used aboard the recovery carrier to send the TV signals to ComSat's EARLY BIRD satellite for relay to the continent (SPACE Daily, Nov. 16), both ITT and ComSat, as well as CBS, will now file with the FCC for permission to provide the coverage.

The splashdown of the GEMINI VI spacecraft is scheduled for December 15, and for GEMINI VII the following 18th. One of the CBS cameras on the carrier (the USS Wasp) will have an 80-inch lens to cover the splashdowns if either or both occur within, roughly, ten miles of the ship. The three TV networks began discussions of the coverage at the outset of this month (SPACE Daily, Nov. 1) and held off finalizing their decision until now in order to examine the costs involved in the coverage (SPACE Daily, Nov. 12).

FCC TO DEFER DECISION ON ABC SATELLITE. A week from today, on December 1, the FCC will rule that ABC's request for the right to own and operate a communications satellite (SPACE Daily, Sept. 22) is deficient in its supporting documentation and must be augmented with further clarification before the Commission can act on the application. The ruling will also create a period for interested parties to submit comments and countercomments on the request. Thus, the FCC is taking an interim step, rather than the final step originally expected (SPACE Daily, Oct. 29), and will not now likely give or deny this year the authority ABC is seeking. This deferment does leave the door open, however, for the affirmative decision the Commission is anticipated making to foster competition with ComSat (SPACE Daily, Nov. 12).

COMSAT "USER" DEBATE EXTENDED AGAIN. An industrial request to the FCC for an extension of the time in which to reply to comments on the question of "authorized users" of ComSat's satellite services has received a favorable ruling from the Commission, and the due date for such replies is now December 31. The Commission opened discussion of the question early last summer (SPACE Daily, June 21), setting the deadline for comments as October 1 and for replies as November 1. ComSat later sought and got an extension of those dates (a month extra for each period) (SPACE Daily, Oct. 14), making the reply deadline a week from today.

COSMOS 96 UP FROM TYURATAM. The 96th COSMOS was launched yesterday from the southern Baykonur complex at Tyuratam into a 51:54 degree, 140/192-mile orbit into a possible surveillance mission. This is the third 51-degree COSMOS this year. Both the first, COSMOS 67, and the second, COSMOS 77, were returned with their payloads 8 days after launches in May and August. This would indicate that COSMOS 96 is scheduled to be brought down about December 1 and would mark the last such mission for 1965 if the program follows the pattern set down for the first year of operation when three were launched and recovered in 1964.

AIA ELECTION OF OFFICERS

The following officers for the coming year were elected at the fall meeting of the board of governors of the Aerospace Industries Association: J. S. Parker, vice president and group executive, Aerospace and Defense Group of GE, elected chairman of the board, and Courtlandt S. Gross, chairman of the board of Lockheed, elected vice chairman. Karl G. Harr Jr. was reelected president, as were V. J. Adduci, as vice president, and Samuel L. Wright, as secretary-treasurer. Parker succeeds J. L. Atwood.

The following, as well as Parker, Gross, Atwood and Harr, will serve as members of the board of governors for 1966: William E. Zisch, president, Aerojet-General; James R. Kerr, president, Avco; Frank E. Hedrick, executive vice president, Beech Aircraft; A. P. Fontaine, chairman of the board, Bendix; William M. Allen, president, Boeing; Dwane L. Wallace, president, Cessna Aircraft; Harry H. Wetzell, president, Garrett; Roger W. Lewis, president, General Dynamics; H. H. Dice, vice president and general manager, General Motors, Allison Division; J. W. Murray, chairman of the board, General Precision; and Loren A. Murphy, president Goodyear.

Also elected were E. Clinton Towl, president, Grumman; J. D. Hayes, general manager, Explosives & Chemical Propulsion Department, Hercules Powder; Roy E. Wendahl, executive vice president, Hughes; David B. Nicholson, president, Kollsman Instrument; William B. Bergen, president, Martin; David S. Lewis, president, McDonnell; James L. Murray, president, Aviation Division, Rockwell-Standard; Carl L. Sadler, vice president, Aviation & Defense Products, Sundstrand; J. W. Crosby, president, Thiokol; H. A. Shepard, president, TRW; and H. M. Horner, chairman of the board, United Aircraft.

IAM AND MCDONNELL REACH "TENTATIVE AGREEMENT"

McDonnell Aircraft and its striking IAM (International Association of Machinists) workers have reached "tentative agreement" on the key issue in the five-day-old dispute, although negotiations with federal mediators in Washington continued. The major obstacle to renewing the contract was the issue of job specifications, which the union considered too loosely drawn.

The 200 McDonnell workers at Cape Kennedy returned to work today on check-out procedures for the GEMINI VII/VI mission as a result of a local agreement reached Monday to return to work in order to avoid holding up the dual space launch (See yesterday's SPACE Daily). NASA indicated that the return of the Cape Kennedy workers will allow it to adhere to its December 4 launch date for the GEMINI mission.

CONVAIR TO TEST ROCKET FUEL TANKS

The Rocket Propulsion Lab at Edwards AFB has awarded General Dynamics/Convair a \$55,000 contract to fabricate and test 12 rocket propellant tanks for at least two years to determine the anticorrosion characteristics of four metals. Three tanks will be made of aluminum alloy 6061-T6, three of aluminum alloy 2014-T6, three of titanium alloy 5AL2.5 SN, and three of stainless steel AM 350 SCT.

Each tank will be 18 inches in diameter and 18 inches high and will contain nitrogen tetroxide or chlorine trifluoride. They will be stored at Edwards at 85 per cent humidity and 85 degrees F temperature.

NEW CALIFORNIA SPACE FIRM ESTABLISHED

A newly formed engineering and manufacturing firm--42 Corporation--has been established by a California group headed by J. W. White, founder and president of the company. The new firm, which has moved into temporary headquarters in San Diego, develops and markets equipment, products and systems for the military and prime contractors primarily in space and electronics industries.

The founder group began in August and has thus far resulted in the acquisition of 14 existing companies with projected sales exceeding \$10 million. White predicts that the 42 Corporation, with six new acquisitions being negotiated, will have sales running at an annual rate of \$15 million with pre-tax earnings of approximately \$2 million.

The acquired firms will remain at their present locations for the time being, but will be relocated as quickly as possible to a new \$20 million, 400-acre industrial-park site now under development in northern San Diego County.

GLENN/BISPLINGHOFF NAMED GODDARD LIBRARY CHAIRMEN

Col. John H. Glenn Jr., presently serving as an advisor to NASA and a member of the board of directors of Royal Crown, has been named an honorary chairman of the Robert Hutchings Goddard Library Program at Clark University. In another Library appointment, Dr. Raymond L. Bisplinghoff, special assistant to NASA Administrator Webb and a member of the board of directors of the AIAA, has been named chairman of the Program's Professional Societies Division.

Dr. Wernher von Braun, director of NASA-Marshall and chairman of the Program's International Sponsors Committee, has added the following to his advisory group: C. Waller Barrett, president of the American Antiquarian Society (Worcester, Mass.); Arthur A. Collins, president of Collins Radio; and Senator Leverett Saltonstall (R-Mass.).

WYLE LABS TESTING LEM OXYGEN SYSTEM

Wyle Labs of El Segundo (Calif.) is pressure testing the Lunar Excursion Module's oxygen system in a new explosion chamber that can handle test-subject pressures up to 10,000 psi. The 285-square-foot chamber is made of concrete and has a special removeable roof that can baffle explosions while passing the resulting gases. Wyle is also currently testing the S-II, SATURN V's second stage (SPACE Daily, Nov. 5).

LINK TO BUILD F-111A TRAINER

General Precision's Link Group has been awarded a \$4 million contract by General Dynamics for the design and construction of an F-111A flight and mission simulator for training Air Force pilots. The simulator will use a Link GP-4 computer and will be delivered to Cannon AFB in New Mexico in early '67. The F-111A is the AF version of the supersonic, variable-sweep-wing fighter aircraft GD is developing for the AF Tactical Air Command.

TOP 100 DOD CONTRACTORS--FY 1965

The top 100 Department of Defense contractors for fiscal year 1965 accounted for 68.9 per cent of the total contracted to firms during the year by the DOD. This was a 4.5 per cent drop from last year's 73.4 per cent and was the lowest percentage for the 100 top companies since FY '57 when the figure was 68.4 per cent.

The percentage decline was attributed to a \$1.6 billion decrease in missile and aircraft contracts which are generally awarded to large companies. As a result of this decline, the percentage of primes awarded to small businesses increased from 18 per cent to 20.3 per cent.

The FY '65 list contains 17 companies which did not appear on last year's top 100 roster. Most of these firms appear between the 76th and 100th positions; however, two of the new companies--Todd Shipyards and Ogden Corp.--attained a rank within the first 50.

Space-Oriented Firms Down Slightly

Over half of the firms represented are engaged in space, electronics and aircraft work. There were 21 aircraft, 18 space-missile (six fewer than last year), and 16 electronics firms. The remaining 45 companies fell into other categories.

Lockheed/General Dynamics Contract Awards Top \$1 Billion

Two companies--Lockheed and General Dynamics--received prime contract awards of more than \$1 billion each during the year, compared to four companies last year and five firms the year before.

Lockheed leads the list for the fourth consecutive year with \$1,715,000,000 or 7.1 per cent of the total. Besides aircraft contracts, Lockheed is prime contractor for the Navy's **POLARIS** and **POSEIDON** programs.

General Dynamics received awards amounting to \$1,178,600,000 which represented 4.9 per cent of the total. The company, which moved up from fifth to second place, has space contracts including either the development or production of **ATLAS**, **MAULER**, **REDEYE**, **TARTAR** and **TERRIER** missiles and boosters for the space program.

McDonnell with \$855,800,000 and GE with \$824,300,000 occupied the third and fourth positions on the list. McDonnell remained in third place for the second year, but GE moved from the sixth to the fourth slot.

FY 1965 GCA EARNINGS UP 14 PER CENT

GCA Corp. had sales of \$10,498,846 for FY 1965, compared to 1964's \$9,995,888. Earnings rose 14 per cent from \$394,343 to \$448,089. These figures do not include the sales and earnings for Precision Scientific Co., which was acquired last month. With Precision Scientific's sales of \$7,082,547 and earnings of \$519,038, GCA's sales would have been \$17,581,393, with an overall profit of \$925,327.

Dr. Earl W. Lindveit, formerly associated with the American Council on Education, has joined the staff of Battelle Memorial Institute as senior scientist in its recently inaugurated Science Policy Program. Lindveit will direct a series of studies on the impact of science on society.

ARPA PLANNING FOURTH JOINT RESEARCH UNIT

The DOD's Advanced Research Projects Agency (ARPA) is planning to establish next year the fourth of the industry-university research teams that comprise its "coupling program" to accelerate and improve the interaction of research and application personnel (particularly graduate students and industry researchers respectively). However, unlike the three extant teams, the new one will embody "a completely different approach" to the coupling concept--so different, in fact, that the industrial RFP will not be issued along conventional lines.

The nature of the research the fourth team will do will be disclosed next month after DOD officials firm their decision on it late this month. The company and university will be chosen early next year, with the announcement of the winners to come about March 1.

The current teams consist of an industrial firm as the prime contractor and an academic institution as the subcontractor. The work of each team is intended to be continuous, so the contracts are awarded under "longevity funding" in multi-year blocks as large as the budget will allow. The three groups were established last spring and are now fully active.

Martin is researching explosive forming processes with the University of Denver under a \$1 million, three-year award; Monsanto Research is investigating polymer composites with Washington University at St. Louis under a \$2 million, two-year award; and Union Carbide is studying carbon composites with Case Institute (and Bell Aerospace) at Cleveland under a \$2.7 million, three-year award.

489L COMMUNICATIONS LINK ESTABLISHED

Work is largely complete on the Air Force's communications link between Thule AFB in Greenland and Hall Beach in northeastern Canada. Managed and installed by Philco for the AFSC Electronic Systems Division, the link is an FM tropospheric scatter system that has a 100,000-watt transmitting capability and that uses four, 120-foot, square, parabolic antennae (two at each end).

The system is part of the Northern Area Communications System (ESD's 489L program) and is known as the Thule-Fox link because the terminal at Hall Beach is on the site of the Fox Main Military Station (Hall Beach is on the Melville Peninsula north of Hudson Bay). It was developed and implemented in about two years, an accomplishment the Air Force calls "a milestone in modern engineering," given the unusually long distance involved (587 miles), the high power and antenna requirements, and the climatic conditions.

The antennae were supplied by Blaw-Knox, the radio subsystems by DCA's Radio Engineering Labs, and the multiplex equipment by Lenkurt. The project was done as part of the effort to update the Northern Area System.

Dr. Raymond M. Warner Jr., previously director of engineering at Motorola Semiconductor Products Division, has joined Texas Instruments Semiconductor-Components Division. Warner will head a program for the Research and Development Laboratories.

NASA AWARDS \$1.3 MILLION IN GRANTS

NASA has awarded \$1,313,407 in new and supplementary grants and contracts to 19 universities, colleges and private research institutions.

University of Houston--\$14,739 for petrographic analysis of a meteorite impact crater; Syracuse University--\$42,720 for studies of gas radiation and transport properties at high temperatures; Massachusetts General Hospital--\$19,740 for a study of solid chemical radiation dosimeters; MIT--\$38,735 for study of the resistivity of microorganisms to thermal inactivation by dry heat; Brandeis University--\$28,675 for theoretical studies in radiative transfer in planetary atmospheres and rarified gases, and in related topics of astrophysical interest; University of Rochester--\$25,599 for study of gaseous lasers for optical communications in space; Penn State--\$152,960 for study of the structure and function of living cells; University of Maryland--\$70,000 for a study of primary cosmic ray electrons, utilizing balloon-borne experiments; University of Illinois--\$225,000 for experimental analysis of the micro-neuroanatomy of the central nervous system and \$40,000 for investigation of basic processes occurring in gaseous plasmas in various states.

Mayo Foundation--\$14,676 for studies of the effects of acceleration on cardiovascular and respiratory dynamics; Ohio State University--\$45,000 for theoretical and experimental investigations of spacecraft antenna problems and \$75,000 for research on receiver techniques and detectors for use at millimeter wave lengths; University of Michigan--\$36,000 for studies of nonlinear interaction phenomena in the ionosphere; RAND Corp.--\$199,144 for research on charged particles and fields in space; CalTech--\$130,000 for investigations of rarefied gas flow; University of California at Berkeley--\$79,000 for interdisciplinary space-oriented research in the physical, biological, engineering and special sciences; University of Southampton (England)--\$59,500 for investigation into helicopter rotor noise; and McMaster University (Canada)--\$26,919 for a study of attention and psychological time.

DOD NEGOTIATIONS

General Precision Laboratory--with Army Missile Command for two-degree of freedom gas bearing gyro with pneumatic output.

Cutler-Hammer--with Air Force Systems Engineering Group for an exploratory development effort to establish the feasibility of a scanning monolithic ferrite lens incorporated into a radome.

Philco Corp., Aeronutronic Division--with Army Missile Command for continued development of **CHAPARRAL** missile system.

Martin-Orlando--with Air Force Systems Engineering Group for research to examine the feasibility of nuclear pumped solid state lasers.

The Boeing Co.--with Air Force Ballistic Systems Division for the force modernization assembly and checkout of **MINUTEMAN** weapons systems at Malmstrom Air Force Base, Mont.

MORE

DOD NEGOTIATIONS - Contd.

General Electric Co., Re-Entry Systems Department, Missile and Space Division--with Army Missile Command for ARPA test operation, data reduction and data analysis for Project **GLOW**.

DOD CONTRACTS**Army**

Philco Corp., Aeronutronic Division--\$1.2 million modification to an existing contract for industrial engineering services for the **SHILLELAGH** missile.

Avco Corp.--\$2 million modification to an existing contract for a research program under (an ARPA program) Project **DEFENDER**.

General Dynamics/Pomona--\$8.1 million for FY 1966 engineering services for the **RED-EYE** missile system.

Navy

Columbia University--\$1.8 million for additional research under Project **ARMETIS**--an exploratory development effort to determine the feasibility of using a very high-powered sonar transducer and high-grain receivers, together with advanced data processing equipment for locating submarines in large ocean areas.

General Precision Librascope--\$8.8 million for major components for the fire control system for **SUBROC**.

Air Force

North American Aviation--\$2.5 million for overhaul and repair of components for the **HOUND DOG** missile.

General Electric Co.--\$1.2 million increment to a contract for development and test of space vehicles.

Physics International Co., San Leandro, Calif.--\$1.5 million for development of an advanced flash x-ray system.

Atlantic Research Corp.--\$3 million for high altitude weather sounding rockets.

The Boeing Co.--\$20.2 million initial increment to an \$89.9 million contract for assembly, installation and checkout of **MINUTEMAN** missiles for the Grand Forks Air Force Base, N.D., complex.

Thiokol Chemical Corp., Huntsville Division--\$91,973 for investigation of the mechanism of solid propellant burn rate.

Minnesota Mining and Manufacturing Co.--\$146,244 for development of a high density binder for solid propellants.