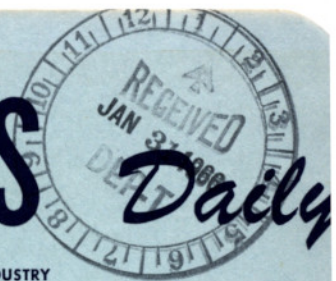


SPACE BUSINESS



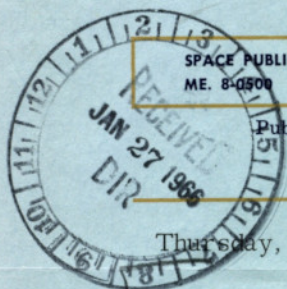
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NATIONAL SPACE PROGRAM TOTAL BUDGET AT \$40.7 BILLION. Since 1955, the year of the first official approval of a national space effort and the year this effort became a fiscal responsibility, the United States has budgeted (through FY '67) \$40.667 billion for space exploration and exploitation. Expenditures for that period will total \$37.1 billion, including the DOD, AEC, NSF and Commerce. (See detailed breakdown on page 173). *add*

ALSEP EXPERIMENTS SELECTED.

Seven geophysical instruments have been selected by NASA for inclusion in the **ALSEP** (APOLLO Lunar Surface Experiments Package) which will be carried in the initial APOLLO manned lunar landing flights to be activated and left on the lunar surface (SPACE Daily, May 14 & June 11). The experiments will be included in three **ALSEP** flight models, plus one backup model, and will be designed to operate and transmit data back to Earth for six months to one year. The number of experiments to be carried in each package has still not been determined but the **ALSEP** will be designed in modular form so that experiments will be interchangeable.

ALSEP at present is being designed with competing \$500,000, six-month, fixed price contracts by Bendix Systems, Space-General Corp., and TRW Systems (SPACE Daily, Aug. 5). The design contracts will be completed in February at which time one of the firms will be selected to develop the **ALSEP** hardware and integrate the experiment payload.

General Electric was recently selected to develop **ALSEP's** **SNAP 27** 50-watt isotope power source (SPACE Daily, Oct. 15), the implementation of which has caused an amount of mission planning indecision (SPACE Daily, Nov. 29). The Sandia Laboratory has in the last few days (SPACE Daily, Jan. 25) been assigned the technical direction for the AEC's **SNAP** program, including the **ALSEP SNAP 27**.

NASA's Geophysics Subcommittee of the MSF Experiments Board says that the **ALSEP** would be able to carry out "every basic observation in geophysics." A Passive Lunar Seismic Experiment will measure lunar tremors to determine the structure of the crust and core. A Lunar Tri-Axis Magnetometer will measure the internal magnetic field and the interaction of the solar wind with external magnetic field. A Medium Energy Solar Wind Experiment will measure the velocity and direction of protons, electrons and alpha particles and the interaction of these particles with the lunar surface. A Suprathermal Ion Detector is designed to sample ions in a range of energies to determine how strongly the ionosphere is affected by the solar wind. Lunar Heat Flow Measurements will measure the outflow of heat from the interior to indicate the distribution of radioactive elements and the extent of volcanism.

MORE

A Low Energy Solar Wind Experiment will study solar wind particles in the low energy ranges. An Active Lunar Seismic Experiment will gather information on the physical properties of the lunar surface to a depth of about 500 feet in the near vicinity of the **ALSEP**. This latter experiment will be activated by the astronaut after which he will hit the lunar surface with a thumping device as he walks out to 1000 feet from the **LEM**. A small mortar device will also be used to fire small projectiles to land on the surface so that the resulting tremors can be studied.

NASA PONDERES SUNBLAZE/SUNSHINE FOR SMS. Scientists within NASA have recently been considering the implementation of design and development studies of the **SUNBLAZER** as a Solar Monitoring Satellite (**SMS**). **SUNBLAZER**, referred to as "a poor man's **PIONEER**," would be an unguided payload employing the Sun's gravitational attraction for describing its arcing trajectory around and behind the Sun. The basic components of the mission system would include the acceleration rocket, a simple solar cell power supply, a radio transmitter, and a solar sail to keep the payload oriented toward the Sun. By analysis of the payload's modulated radio signal as it passed behind the Sun, data on the nature of the Sun's corona and atmosphere could be gained.

Also competing for NASA attention and possible approval for further development is the General Electric concept for the **SMS**, known as **SUNSHINE** (*SPACE Daily*, April 29) that would study the Sun from the Earth's orbit using simple, off-the-shelf hardware.

ISPO SIGNS AGREEMENT WITH GD FOR APOLLO SHIP WORK. As expected (*SPACE Daily*, Dec. 1 & 16 and Jan. 20), ISPO, the Navy's Instrumented Ships Project Office, has finalized its plans to outfit three **APOLLO** tracking ships with ground stations to support ComSat's **BLUE BIRD** satellite system. The \$20,500,000 re-programmed from NASA funds (*SPACE Daily*, Jan. 20) has been affixed to a "supplemental agreement" between ISPO and General Dynamics, the ship conversion contractor (*SPACE Daily*, Sept. 10, '64, and Mar. 15 & 16).

General Dynamics has been negotiating with General Electric and Reeves Instrument for the stations' antenna systems, and one will be selected early next month. The first of the three vessels, the Vanguard, will be returned to port late next January for a three-month installation and checkout of the station, but the Redstone and Mercury will receive their stations before being delivered.

The Vanguard, launched in September (*SPACE Daily*, Sept. 14) and equipped during the fall (*SPACE Daily*, Oct. 26), is leaving GD's Quincy, Mass., shipyard this Saturday for her initial ocean tests (*SPACE Daily*, Jan. 20) and will be delivered to the Navy on February 28 as scheduled (*SPACE Daily*, Oct. 26) after preliminary acceptance trials at mid month (*SPACE Daily*, Jan. 20). Putting the stations on the Redstone and Mercury will take an extra month on the original schedule, which means the former will be delivered in June and the latter in September (*SPACE Daily*, Sept. 14).

Now that the ISPO-GD pact is secure, two facts have been acknowledged: 1) The original conversion plans called for the stations, and 2) ISPO never intended to procure the stations competitively. Initial indications were that the appearance last summer of the ComSat satellite system (*SPACE Daily*, Aug. 2) introduced a new hardware requirement for the ships, but the DOD and NASA had anticipated the system all along but declined to reveal it.

COMSAT ANDOVER PURCHASE CONFIRMED/IMPROVEMENTS SLATED. As reported (SPACE Daily, Dec. 6) negotiations will end soon between ComSat and AT&T over the former's purchase of the latter's ground station at Andover, Me. ComSat president Dr. Joseph Charyk told the Senate Space Committee yesterday that an agreement will be reached "in the very near future." He added that once the sale has been made, ComSat will make \$1.7 million of improvements to the station and will locate about 40 ComSat personnel there to replace the AT&T people now employed. (Similar complements, he said, will man the Corporation's other two stations, Brewster and Paumalu.) ComSat presently rents Andover from AT&T. Purchase of the site has been under negotiation since last summer (SPACE Daily, July 14).

O'CONNELL CONFIRMS SOVIET COMSAT SYSTEM

White House assistant James O'Connell, a retired Lieutenant General, told the Senate Space Committee yesterday that the Soviets are apparently moving toward a communications satellite system as was indicated last fall when Soviet and French officials met to discuss such a system (SPACE Daily, Oct. 26 and Nov. 4).

"Recent communications satellites orbited by the Soviet Union make it increasingly clear that the Soviets are viewing with some favor the possibility of establishing their own communications satellite system," said O'Connell.

"Such a system, if created, might be exploited to provide both point-to-point international communications service and perhaps broadcast service. Broadcast service may be particularly attractive in those instances where it is in the interest of the Soviet Union to consider mass distribution media."

BROWN/MCCONNELL BACK BOMBER/MISSILE MIX

Air Force Secretary Harold Brown and AF Chief of Staff John P. McConnell have backed the bomber-missile "mix" before Congress as "providing long-range, all-weather capability useful at any level of conflict to support our national military objectives."

Secretary Brown indicated that, as yet, no decision had been made on whether or not to proceed on the Advanced Manned Strategic Aircraft (AMSA) to follow the FB-111. But McConnell stated that "we will want to replace the B-52 G and H force in the 1975 period with some equivalent capability." McConnell also described the change that has taken place in the "mix" over recent years: in 1961 the Air Force had a total of 1495 bombers and 28 missiles; by June of 1966, they will have 680 bombers and 934 missiles.

OSTRANDER JOINS BELL AEROSYSTEMS

Maj. Gen. Don R. Ostrander (USAF-Ret.), one of the Air Force's top space managers, has joined Bell Aerosystems as vice president-planning. He succeeds Dr. Richard M. Hurst, who was elevated to the new post of executive vice president January 1.

For three years prior to his retirement, General Ostrander served as commander of the AF Office of Aerospace Research. Previously he had been vice commander of the AF Ballistic Systems Division; director of launch vehicles for NASA; deputy director of the Advanced Research Projects Agency; assistant for guided missiles to the Secretary-General of NATO; deputy commander for resources of the Air Research and Development Command; commander of Holloman ADC, and deputy commander of the White Sands Proving Ground.

DOD SMALL BUSINESS PRIMES UP/SUBCONTRACTS DOWN

John M. Malloy, deputy assistant secretary of defense (procurement) told the Senate Subcommittee on Government Procurement of the Select Committee on Small Business that small business firms received \$5.305 billion in DOD prime contract awards during FY '65, an increase of \$463 million over the amount received last year. Although small business primes were up, prime contract awards to all United States business firms during the year amounted to \$26.113 billion, which was \$808 million less than awarded in FY '64.

Missile Decline Contributes to Subcontract Fall-Off

Small business concerns' share of the defense subcontract dollar amounted to \$3.534 billion during the fiscal year, compared to \$3.629 billion in fiscal year 1964. Malloy partially attributed this fall-off to the decline in missile procurement, where small business firms have better subcontracting opportunities. Reports from the 600 prime contractors, participating in the DOD small business subcontracting program, indicate that approximately 50 per cent of their total receipts for defense work is subcontracted and, of this amount, 40 per cent is subcontracted to small business firms.

Malloy told the subcommittee that all elements of the Military realize that it is important that there be no lessening of total small business awards and that emphasis be placed on the small business set-aside program to assure that it remains at a high level. In this connection, the DOD sponsored a workshop, which was held in Philadelphia last fall. Its purpose was to discuss with small business specialists their responsibilities in the new set-aside procedures and their responsibility for the surveillance and monitoring of prime contractors' small business subcontracting program.

Small Business Gets 12% of Air Force Primes

Robert H. Charles, assistant secretary of the Air Force (installations and logistics), told the subcommittee that in FY '65, Air Force prime contract awards to small business concerns increased by \$116 million over 1964's \$939 million to reach 12 per cent of the total contracts awarded. Set-aside awards in FY '65 were \$274 million, which was also an all-time-high. Set-aside awards to small business were \$232 million in 1964 and \$231 million in 1963.

The first four months of FY '66 showed small business had already received \$374 million in prime contracts, compared to \$317 million for the first four months of FY '65. Set-aside awards for the first quarter were \$59.4 million, compared to last year's \$54.8 million for the same period.

Malloy pointed out that the "total package concept," as embodied in Lockheed's C-5A contract, "will be of real interest to small business in the area of subcontracting... (It is) reasonable to conclude that small business stands to be afforded the opportunity to bid on more of the requirements associated with the performance of the contract than would normally have existed under previous techniques used in the procurement of weapon systems." Contracts, such as the C-5A, which are made in a competitive environment and are fixed-price incentive contracts, provide an environment in which it is to the prime contractor's interest that the services and supplies required be obtained from the most competitive sources, thereby affording small business more opportunities to bid on this type of work.

V. Reed Manning has been appointed associate head of MITRE's Communications Planning and Research Department. Manning previously served as a project engineer/-executive assistant for Collins Radio in Paris, London, and Dallas.

US SUPPORTS INTERNATIONAL SPACE CONFERENCE

Arnold Frutkin, NASA assistant administrator for international affairs and United States representative to the Working Group of the UN Committee on the Peaceful Uses of Outer Space, has supported the proposal for an international conference in 1967. This conference will commemorate the first decade of space exploration, which would be designed to further the international cooperation in space and to promote the practical benefits of man's exploration of space (SPACE Daily, Jan. 21).

Frutkin called for a specialized conference between political representatives of governments rather than another international scientific and technical exchange. He has proposed four topics for the conference: 1) An appraisal of the contribution which can be made by scientific research in space to practical applications and to international cooperation; 2) the opportunities for participation in space exploration, covering the means for beginning or expanding useful space research and the opportunities for useful cooperative projects; 3) the applications and economic implications of space research which would include direct and indirect technological gains and the benefits to be extracted from programs in communications, meteorology, navigation, and advanced geophysical, agricultural, maritime, and other surveys; and 4) the final topic would be the impact of space exploration on education including the effect of space research on curricula at all levels and the training of scientists and engineers.

BISPLINGHOFF ELECTED AIAA PRESIDENT

Raymond L. Bisplinghoff, special assistant to the administrator of NASA, has been elected 1966 president of the American Institute of Aeronautics and Astronautics. Bisplinghoff succeeds Richard E. Horner, vice president and general manager of Northrop-Norair.

Elected to the board of directors were: Seymour Bogdonoff, Robert Porter Paterson, Professor in Aeronautical Engineering at Princeton University, and Edward W. Price, head, Aerothermochemistry Group, U.S. Naval Ordnance Test Station, serving as directors-technical. Rene Miller, H. N. Slater Professor, Flight Transportation in the Department of Aeronautics and Astronautics, MIT; Harrison Storms, president, North American S&ISD; and Ronald Smelt, vice president and chief scientist, Lockheed, were elected directors-at-large.

SNAP-10A UNIT COMPLETES 1 YEAR OPERATION

A ground test model of the ill-fated **SNAP-10A** reactor which failed after only 43 days in space (SPACE Daily, May 24), has completed one year of generating electricity continuously without external control.

The FS-3 model of the **SNAP-10A** was started up January 22, 1965, by remote control, reached full power and has produced 3.5 million watt hours of electricity since that time. The causes of the unscheduled shut-down of the **SNAPSHOT SNAP-10A** reactor were never firmly determined (SPACE Daily, May 25).

The AEC is not requesting funding for the **SNAP-10A** in FY '67. The program was funded for \$3.4 million in FY '66 (See yesterday's SPACE Daily, page 155).

MCDONNELL SIX-MONTH EARNINGS UP 24 PER CENT

McDonnell's sales for the first six months of FY 1966 were \$466,614,916, down slightly from the \$468,653,831 recorded for the same period in 1965. Although sales were down, earnings rose 24 per cent from \$13,462,113 to \$16,776,497 and backlog increased from \$948,128,893 to \$1,088,861,769. This figure excludes orders not yet funded and orders being negotiated as continuations of authorized programs, which on December 31, amounted to approximately \$700 million.

Acquisition of 80 per cent of the stock of Conductron Corp. (Ann Arbor, Mich.) has been completed, and it is expected that the new subsidiary will benefit materially from the additional personnel and facilities of McDonnell's Electronic Equipment Division and Tridea Electronics Co., a wholly-owned subsidiary, which have been transferred to Conductron (SPACE Daily, Nov. 10).

ROHR FILES STOCK PLANS

Rohr Corp. of Chula Vista, Calif., has filed a statement with the Securities and Exchange Commission seeking registration of \$2,773,599 of employee contributions in its savings plan for employees covered by collective bargaining agreements, savings plan for hourly employees not covered by collective bargaining agreements, and savings plan for salaried employees, together with debentures and common stock which may be acquired in connection with the plans.

PHILCO TO OPERATE NORAD CENTER

Philco's Communications and Electronics Division has been selected to operate and maintain the NORAD Combat Operations Center in the Cheyenne Mountains. The center is the focal point of United States defense against attack against the Continent.

Under the \$286,000 AF contract, Philco will be responsible for three real-time data processing systems, two off-line data processing systems, a space manual inputs processing system, a closed circuit TV net, display systems and input/output equipment.

LUCAS NAMED DIRECTOR OF MARSHALL LABORATORY

Dr. William R. Lucas, formerly head of materials research and engineering for NASA-Marshall, has been appointed director of the Propulsion and Vehicle Engineering Laboratory. The P&VE Lab conducts R&D and technical management in the field of rocket structures, mechanics, propulsion and materials. It is also responsible for design, development and testing of structural and propulsion systems, temperature and pressure control systems and other rocket elements.

Vincent J. Mattamira and Walter Worth Jr. have been elected assistant treasurer and assistant secretary, respectively, of General Applied Science Laboratories. Mattamira was also named manager of financial accounting, and Worth was also appointed manager of cost and information controls.

Dr. Clyde Williams, president of Clyde Williams and Co. (Columbus, Ohio), has been elected chairman of the board and a director of Aerospace Controls Corp. (Los Angeles).

Future Space Business**AF SEEKS SOLID-PROPELLANT NOZZLES COATING IMPROVEMENT**

The Air Force Flight Test Center is preparing to fund a research and development program leading to the improvement of pyrolytic graphite coatings for solid-propellant rocket nozzles. This is an applied research program consisting of design analysis studies, deposition improvement and an evaluation of the coating's usefulness with various solid propellants and restartable motor applications. Theoretical calculations will be complemented by motor firings to demonstrate the material's performance.

Contact: Air Force Flight Test Center, Directorate of Procurement, Edwards Air Force Base, Calif., Attn: FTMKB. Reference: PR 3059660. Due date: Feb. 5.

NASA WANTS SPACE-BORNE VOICE-CONTROLLED COMPUTERS

NASA-Cambridge is planning to fund a study program of applied research aimed at developing voice-controlled computing devices to facilitate an astronaut's utilization of space-borne computer capabilities. The system is to be designed to respond to one speaker using the English language and will be capable of expansion to a large command and data insertion vocabulary.

Contact: NASA, Electronics Research Center, 575 Technology Square, Cambridge, Mass. 02139, Attn: Procurement Office. Reference: ERC/R&D 66-225. Due date: Feb. 5.

ALASKA DATA ACQUISITION FACILITY CONSTRUCTION/EXPANSION

NASA-Goddard has issued invitations for bid for the construction and expansion of the Alaska Data Acquisition Facility in Fairbanks.

Contact: NASA, Goddard Space Flight Center, Glendale Rd., Greenbelt, Md., Attn: Walter R. Mitchel, Code 249.3. Reference: IFB S-73708/731. Due date: Feb. 21.

BIPROPELLANT ENGINE VALVES SUBCONTRACTING

Moog Servo Controls is preparing to issue subcontracts for its NASA-Houston contract to provide bipropellant rocket engine valves.

Contact: Moog Servo Controls Inc., East Aurora, N.Y.

DOD NEGOTIATIONS

Aerogjet-General Corp.--with Air Force Systems Engineering Group for research to obtain information concerning the toxic hazards of new missile propellants concurrently with their production and testing.

NATIONAL SPACE PROGRAM HISTORICAL BUDGET SUMMARY
(In millions of dollars)

	NASA							Total Space
	<u>Total</u>	<u>Space only 1/</u>	<u>Dept. of Defense</u>	<u>AEC</u>	<u>Dept. of Commerce</u>	<u>NSF</u>		
<u>NEW AUTHORITY</u>								
<u>Historical</u>								
1955	56.9	56.9	3.0	---	---	---	---	59.9
1956	72.7	72.7	30.3	7.0	---	7.3	---	117.3
1957	78.2	78.2	71.0	21.3	---	8.4	---	178.9
1958	117.3	117.3	205.6	21.3	---	3.3	---	347.5
1959	305.4	235.4	489.5	34.3	---	---	---	759.2
1960	523.6	461.5	560.9	43.3	---	.1	---	1,065.8
1961	964.0	926.0	813.9	67.7	---	.6	---	1,808.2
1962	1,824.9	1,796.8	1,298.2	147.8	50.7	1.3	---	3,294.8
1963	3,673.0	3,626.0	1,549.9	213.9	43.2	1.5	---	5,434.5
1964	5,099.7	5,046.3	1,599.3	210.0	2.8	3.0	---	6,861.4
1965	5,249.7	5,167.6	1,579.4	228.6	12.2	3.2	---	6,991.0
<u>1967 Budget</u>								
1966	5,174.9	5,087.9	1,693.5	195.6	27.3	3.6	---	7,007.9
1967	<u>5,012.0</u>	<u>4,908.3</u>	<u>1,620.7</u>	<u>173.5</u>	<u>35.8</u>	<u>2.9</u>	---	<u>6,741.2</u>
Total through 1967	28,152.3	<u>27,580.9</u>	<u>11,515.2</u>	<u>1,364.3</u>	<u>172.0</u>	<u>35.2</u>	---	<u>40,667.6</u>
<u>EXPENDITURES</u>								
<u>Historical</u>								
1955	73.8	73.8	1.5	---	---	---	---	75.3
1956	71.1	71.1	16.5	6.3	---	6.2	---	100.1
1957	76.1	76.1	47.5	19.2	---	7.3	---	150.1
1958	89.2	89.2	135.5	20.2	---	4.0	---	248.9
1959	145.6	58.8	341.0	32.6	---	1.5	---	433.9
1960	401.0	329.2	518.1	41.1	---	---	---	888.4
1961	744.3	693.6	710.0	64.3	---	---	---	1,467.9
1962	1,257.0	1,225.9	1,028.8	130.0	1.0	.9	---	2,386.6
1963	2,552.3	2,516.8	1,367.5	181.0	12.2	1.1	---	4,078.6
1964	4,171.0	4,131.3	1,563.5	220.1	12.3	2.6	---	5,929.8
1965	5,092.9	5,035.0	1,591.8	232.2	24.1	3.0	---	6,886.1
<u>1967 Budget</u>								
1966	5,600.0	5,521.0	1,640.0	201.0	19.2	3.5	---	7,384.7
1967	<u>5,300.0</u>	<u>5,211.0</u>	<u>1,650.0</u>	<u>173.7</u>	<u>27.0</u>	<u>2.8</u>	---	<u>7,064.5</u>
Total through 1967	25,574.3	25,032.8	10,611.7	1,321.7	95.8	32.9	---	37,094.9

^{1/}Excludes amounts for aircraft technology in 1959 and succeeding years. Amounts for NASA-NACA aircraft and space activities not separately identifiable prior to 1959.