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July 1: Eighth anniversary of NASA's largest Center, Marshall Space Flight Center. MSFC started business July 1, 1960, with 4,400 employees working in facilities valued at estimated \$100 million. On eighth anniversary MSFC had 6,500 employees. Plant value was estimated at \$400 million, with real property values accounting for \$140 million and capital equipment for remaining \$260 million. Achievements during first eight years included development and successful flight of Saturn I, Saturn IB, and Saturn V launch vehicles. (MSFC Release 68-143)

. McDonnell Douglas Corp. received \$9,666,800 NASA contract for 10 additional Improved (Long-Tank) Delta launch vehicles for use in variety of launches, including TOS-E for ESSA in August, INTELSAT III for ComSatCorp in September, IDSCP/A for DOD in May 1969, HEOS (Highly Eccentric Orbiting Satellite) for ESRO in late 1968, and ISIS-A (International Satellite for Ionospheric Studies) in late 1968. North American Rockwell Corp. was awarded \$6,968,038 contract extension for material, facilities, manpower, and equipment for XB-70 flight operations, and General Electric Co. was awarded \$1,957,323 extension for maintenance of XB-70 engines. Both extensions covered July 1, 1968, through June 30, 1969. (NASA Release 68-116; FRC Release 19-68)

. At signing in Washington, D.C., of nuclear nonproliferation treaty, President Johnson said: "The conclusion of this treaty encourages the hope that other steps may be taken toward a peaceful world. And...I have described this treaty as the most important international agreement since the beginning of the nuclear age.... After long seasons of patient and painstaking negotiation, we have concluded just within the past five years, the limited test ban treaty, the outer space treaty, the treaty creating a nuclear-free zone in Latin America. And the march of mankind is toward the summit and not the chasm".

Agreement had also been reached between U.S. and U.S.S.R., President Johnson announced, "to enter in the nearest future into discussions on the limitation and the reduction of both offensive strategic nuclear weapons delivery systems and systems of defense against ballistic missiles."

At Moscow signing of treaty, Soviet Premier Alexey N. Kosygin called agreement a "major success for the cause of peace." He disclosed contents of U.S.S.R. memorandum to all nations proposing a nine-point disarmament and arms control program and called on 18-nation Geneva disarmament conference to take up proposal. (PD, 6/8/68; Sherman, W Star, 7/1/68, A1; UPI, 7/1/68; Grose, NYT, 7/2/68, 1, 2)

. Sudden affirmative response by U.S.S.R. to President Johnson's long-standing offer for discussion of limiting missiles may have substantial meaning, said William S. White in Washington Post. "If

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July 1 (continued)

this should turn out to be the case it would be ironic, indeed. It would mean that only after renouncing his office had the President been able to convince the Russians...that this country was honestly prepared to make accommodations with Moscow, so long as they were realistic and enforceable accommodations to reduce a possibility of nuclear holocaust that still hangs over the world and will so hang whatever may or may not happen in the Vietnams." (W Post, 7/1/68, A21)

- . Resignation of Dr. Mac C. Adams, NASA Associate Administrator for Advanced Research and Technology, announced May 21, became effective. He rejoined Avco Corp., where he had worked from 1955 to 1965, as Corporate Vice President and Deputy Group Executive of Government Products and Services Group. (NYT, 7/2/68, 63)
- . NASA appointed M/G Daniel F. Callahan (USAF, Ret.), Manager of Florida Missile Operations for Chrysler Corp., to position of Deputy Director of Administration, Kennedy Space Center, vacated in October 1967 by Frederic Miller, who had become Director of Installation Support. (KSC Release KSC-331-68)
- . New subdivision of Air Force Systems Command, Air Force Human Resources Laboratory (AFHRL), became operational at Brooks AFB, Tex., as focal point for USAF R&D effort to satisfy technology needs in human resources education, training, and management. It would also provide technical and management assistance in support of studies, analyses, development planning activities, acquisition, test evaluation, modification, or operation of aerospace systems and related equipment. (AFSC Release 93.68)
- . Commenting on C-5 maiden flight, New York Times editorial noted: "Of the many technological advances required for yesterday's aviation breakthrough, the most important was the quantum leap in jet propulsion capabilities represented by the C-5's motors. The enormous size of the new plane forced extraordinary use of light metals...to keep down weight. It also posed unprecedented manufacturing problems whose brilliantly successful solution was proved by yesterday's pathbreaking flight.
"But will the airports of this country--and the world, for that matter--be capable of meeting the challenges...?" By 1978, "it may be commonplace for a few enormous planes landing minutes apart to deposit 5,000 or 10,000 passengers on the ground almost simultaneously.... Now is none too soon to begin planning for handling such masses of people.... The vast size of the giant new planes ahead is dwarfed only by the enormity of the unprecedented problems they pose." (NYT, 7/1/68, 30)

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July 2: USAF had attributed March 3 reports of unidentified flying objects over eastern U.S., including 70 eyewitness accounts, to reentry of booster rocket or other launching components of Zond IV spacecraft launched by U.S.S.R. March 2 on apparently unsuccessful mission. Despite March flurry, there had been a sharp decline in UFO reports; they were reaching USAF at $\frac{1}{4}$ the monthly rate of 1967. As of previous weekend, 156 UFO reports had been received since Jan. 1, 1968; 21 were attributed to astronomical objects, 19 to aircraft, 10 to balloons, 8 to satellites, and 22 to other known causes. There were 35 cases pending and 41 as yet unidentified. (Sullivan, NYT, 7/2/68, 1)

- . West Germany's major aerospace companies--Messerschmidt-Bölkow, Vereinigte Flugtechnische Werke of Bremen, Hamberger Flugzeugbau, and Dornier--formed subsidiary to coordinate all long-range aircraft and space projects. They met under auspices of West German Government which had been urging greater concentration of the nation's aerospace capacity. Experts termed the new organization nucleus of eventual merger of the four companies to increase West German competition in world markets. (Shabecoff, NYT, 7/3/68, 12)
- . NASA awarded contracts valued at \$579,000 to Lockheed Missiles and Space Co. and \$568,313 to Northrop Systems Laboratories to build and test nonflight demonstration models for Orbiting Primate Experiment, as continuation of preliminary conceptual design studies made during 1967. Research had been begun to gain better understanding of physiological changes anticipated in long manned flights. To assess effects of weightlessness on relatively high order mammal, NASA was studying experiment which might place two unrestrained rhesus monkeys in orbit and return them for detailed examination after extended period to isolate weightlessness as a variable while maintaining all other factors near normality. Post-flight examinations could reveal changes resulting from absence of gravity. Orbiting Primate Experiment was part of NASA's Human Factors Systems program to provide technology required to support man in space during extended periods. (NASA Release 68-119)
- . Univ. of Virginia announced it would use \$100,000 NASA grant to finance construction of 40-in astrometric telescope at its observatory south of Charlottesville, Va. Additional funding would come from estate of Leander McCormick, who provided funds for its 26-in telescope built in 1882. (AP, W Star, 7/3/68, A20)
- . U.S. patent No. 3,390,492 was issued to General Electric Co. engineer Edwin T. Myskowski for glass deep-submergence module in titanium alloy frame usable as laboratory or living quarters on ocean floor in anchored

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July 2 (continued)

or mobile form. Patent No. 3,390,853 was issued to North American Rockwell Corp. mechanical engineer Raymond P. Wykes for inflatable drag balloon (ballute) which was released behind reentry vehicle or lifting-body vehicle at end of a cable which pulled spacecraft's wings out from its body on reentry and slowed it down for landing. (Patent Off PIO; Jones, NYT, 7/6/68, 25)

- . N. Whitney Matthews, Chief of GSFC's Spacecraft Technology Div., died in Alexandria, Va., at age 52. Pioneer in space research, he had been with NASA 10 yr and had helped see Goddard through planning stages. He had worked with Projects Vanguard, Ariel, and Echo and with number of Explorer programs. He had specialized in electronic and solid-state instrumentation and control circuitry. (W Post, 7/5/68, B8)
- . In editorial critical of National Academy of Sciences June 25 report on sonic boom, Washington Evening Star said: "There comes a time when the convenience of the few and the profit of the even fewer simply have to be made secondary to the sanity of the many. That time is arriving in the sonic boom business. There is no imaginable excuse for unleashing the boom against defenseless citizens." (W Star, 7/2/68, 3)

July 3: President Johnson signed H.R. 15856, NASA FY 1969 Authorization Act, which had been designated P.L. 90-373 [see June 18]. (NASA LAR VII/71)

- . Washington Post editorial commented on complaints of scientists about deceleration of Federal funding for R&D. Since Federal expenditures had risen every year, there would not be "much lay sympathy for scientists who complain they are not getting their annual increase of 15 per cent.... Rather than crying 'crisis'...scientists ought to accept an ongoing obligation to help public officials devise better ways of deciding how to support the level of science that the national welfare requires." (W Post, 7/3/68)
- . Did it matter in 1968, asked New York Times editorial, that Italian astronomer Galileo after three centuries might be cleared of heresy by a commission authorized by the Pope? "His astronomical theories and discoveries have long since been accepted; in a real sense, it is the spirit of scientific inquiry that will be 'retried' by the Vatican Tribunal."
"...it still matters in 1968 that the intellectuals, the scientists and the students be granted full freedom of inquiry and

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July 3 (continued)

participation in modern life and government. That is the meaning of Galileo, the individual and heretic, for today." (NYT, 6/3/68)

- . Aluminum Co. of America and Ocean Science and Engineering, Inc., would invest more than \$5 million in Alcoa Seaprobe project calling for construction of ship permitting search, science, and salvage work at depths to 6,000 ft and able to hoist to surface loads weighing up to 200 tons. Planned for launch by May 1970, vessel would search the ocean floor by lowering streamlined sensor, carrying side-looking sonar, at end of long semirigid pipe. (W Star, 7/3/68, A2)
- . French government announced imminent start of new atomic test series in the Pacific amid indications France would attempt her first explosion of hydrogen bomb in late summer or early autumn. Bulletin warned ships to avoid, until further notice, danger zone around Mururoa Atoll, about 750 mi southeast of Tahiti. (NYT, 7/4/68, 1)
- . Jet Propulsion Laboratory announced appointment of Dr. Robert V. Meghreblian, Manager of JPL Space Sciences Div., to newly-established post of Deputy Assistant Laboratory Director for Technical Divisions. Dr. Donald P. Burcham, Deputy Manager of Space Sciences Div., would succeed him. (JPL Release)
- . French Armed Forces Ministry announced successful testing of two new long-range ballistic missiles during preparation for Pacific nuclear test series expected to include French hydrogen bomb. First missile, sea-to-ground, two-stage, remote-controlled rocket, would be used on France's first nuclear submarine, which would enter service in early 1970. (Reuters, NYT, 7/5/68, 13; W Post, 7/5/68, A27)

July 4-8: NASA launched 417-1b Explorer XXXVIII, Radio Astronomy Explorer (RAE-A), from WTR by three-stage Thrust-Augmented Delta booster in first of two missions to measure frequency, intensity, and source direction of radio signals from solar, galactic, and extragalactic sources. Spacecraft entered elliptical transfer orbit, where it was spin-stabilized with 3,656.1-mi (5,884-km) apogee, 397.7-mi (640-km) perigee, 157-min period, and 59.4° inclination. Apogee motor was fired July 7, placing Explorer XXXVIII into planned near-circular orbit with 3,652.3-mi (5,881-km) apogee, 3,641.2-mi (5,860-km) perigee, 224.4-min period, and 59.2° inclination. On July 8, yo-yo despin mechanism reduced spin rate from 93 rpm to 2.8 rpm. As primary objective spacecraft would measure intensity and direction of radio signals from cosmic sources

July 4-8 (continued)

in 0.5- to 10-mhz range, not normally observable from earth. Secondary objectives were to place spacecraft into circular orbit of about 3,728-mi (6,000-km) altitude and to obtain useful data during first 30 days in orbit, for detailed study of dynamic spectra and decay rates of sporadic radio bursts. Spacecraft was expected to provide first low-frequency radio map of Milky Way and additional data on low-frequency signals from Jupiter and sun.

Explorer XXXVIII was equipped with unique antenna system consisting of two antennas made of four $\frac{1}{2}$ -in-dia booms which could be deployed up to 750 ft each, to form X-shaped array. Configuration was to be gravity-gradient stabilized [see July 22]. Spacecraft was also equipped with damper boom, dipole antenna, and TV cameras to monitor spacecraft performance and determine source of radio signals monitored with upper array. Radio Astronomy Explorer project was managed by Goddard Space Flight Center under direction of NASA Office of Space Science and Applications. GSFC constructed, designed, and tested spacecraft and provided scientific instrumentation. (NASA Proj Off; NASA Release 68-109K; Schmeck, NYT, 6/29/68, 8; AP, W Star, 7/5/68; AP, NYT, 7/5/68, 26; W Post, 7/8/68, A6; 7/9/68, A7)

July 5: U.S.S.R. successfully launched Cosmos CCXXX from central launch site at Kapustin Yar. Orbital parameters: apogee, 544 km (338 mi); perigee, 283 km (175.8 mi); period, 92.8 min; and inclination, 48.4°. (UPI, NYT, 7/6/68; SED, 7/10/68, 26; GSFC SSR, 7/15/68)

- . AEC's High Energy Physics Advisory Panel report in Science decried recent cutbacks in funds for high-energy physics--"one of main fronts of science"--and recommended budget increase to avert decline in U.S. effort and construction of giant bubble chamber at Brookhaven Laboratory and electron-positron storage ring at Stanford Linear Accelerator (SLAC). Work on 200-bev accelerator at Weston, Ill., should continue "at highest priority," report stressed, and provision should be made to finance joint research with U.S.S.R. using present most powerful accelerator in world at Serpukhov, near Moscow.

Lack of approval of bubble chamber and SLAC storage ring in 1968 and 1969 budgets meant "for the first time in the history of this field, U.S. physicists will be unable to make use of some of the most modern means of research." Further, there was "clear and present danger" that U.S. would lose its leadership in this fundamental field, "an ominous step" toward situation of 1930s, "when most of the major discoveries in fundamental science were made in Europe." (Science, 7/5/68, 11-19; Sullivan, NYT, 7/7/68, 17)

July 5: JPL scientist Dr. Robert Nathan, who had devised method using computers to improve spacecraft photos of moon and Mars, planned to link computers with electron microscopes to photograph a single atom. Within six months much of connection work should be done, he said, and "with luck, we could be taking pictures of atoms in a year or so." (Dighton, Glendale News-Press, 7/5/68, 1)

- . NASA awarded 16-mo, \$178,844 cost-plus-fixed-fee contract to Lockheed Missiles & Space Co. for computer software required to operate NASA/RECON remote-console information retrieval system. Consoles would be installed at field centers and NASA Hq. and linked to central computer at NASA Scientific and Technical Information Facility in College Park, Md. They would provide real-time access to NASA's worldwide collection of scientific and technical documents on aerospace. Users would need no special skill. (NASA Release 68-118)
- . FCC ruled that rates charged television networks for overseas service via satellite were not excessive and that companies providing service--AT&T, RCA Communications, Inc., ITT World Communications, Inc., and Western Union International--were no longer required to place payments for services in deferred credit fund. (AP, NYT, 7/7/68, 10)
- . Danish government announced it had banned U.S. rocket flights to probe sunspot effects at high altitudes over Greenland during 1968 because of popular apprehension which followed January crash of nuclear-armed USAF B-52 aircraft near Thule AFB. Disappointed scientists noted 1968 was peak in 11-yr sunspot cycle; 1969 would offer hardly enough sunspots for study. (C Trib, 7/6/68, 5)
- . Sonic booms from USAF test flights were threatening prehistoric Indian cliff dwellings and natural rock formations in Arizona. Log kept at Canyon de Chelly National Monument at request of National Park Service had recorded 16 booms in April 1967, 19 in April 1968, and 20 in May 1968. Booms dropped to 9 in June 1968. Natural Environment Panel, participating in Interagency Aircraft Noise Abatement Program under DOT, planned to place data recorders at four national parks, Yellowstone, Yosemite, Bryce, and Mesa Verde, to extract information on which to base plea for "adjustment" from USAF. (Blumenthal, NYT, 7/5/68, 11)
- . Indication by West German Chancellor Kurt G. Kiesinger that his government would seek U.S. guarantee against U.S.S.R. nuclear aggression before accepting nonproliferation treaty was confirmed by U.S. officials. They said West German request was based partly on fear NATO might

July 5 (continued)

expire before 25-yr treaty, leaving Bonn exposed, and partly on West Germany's lack of confidence in U.N. Security Council efficacy in emergency. (Shabecoff, NYT, 7/6/68, 1, 3)

July 5-12:

High quality weather data was moved from Suitland, Md., by wire to NASA's Mojave, Calif., relay station from whence it was beamed, for first time, to stations in the Netherlands and West Germany via NASA's ATS III Applications Technology Satellite. Transmissions, including cloud maps, charts, and photo-mosaics, were received "in good form," according to Environmental Science Services Administration. WEFAX (Weather Facsimile Experiment) project was part of World Weather Watch program to develop economical worldwide weather data distribution system. Further experiments scheduled for September included relay via ATS III of weather data to more than 150 Automatic Picture Transmission (APT) stations in 30 countries. (ESSA Release ES 68-43, UPI, NYT, 7/19/68, 35; W Star, 7/24/68, A14)

July 6:

Ninth Molniya I comsat, Molniya I-9, was launched by U.S.S.R. to "ensure the operation of the long-range system of...communication" and TV transmission to far northern and far eastern U.S.S.R., according to Tass. Orbital parameters: apogee, 39,307 km (24,422.3 mi); perigee, 882 km (548 mi); period, 11 hr 54 min; and inclination, 65°. Equipment, including instruments for transmission, command, and satellite operation, was functioning normally. (AP, NYT, 7/9/68, 6; SBD, 7/10/68, 26; GSFC SSR, 7/31/68)

- . Japanese astronomer Minori Honda of Kurashiki Astronomical Observatory, Okayama, discovered new comet south of Capella in Auriga constellation. Tokyo Astronomical Observatory said July 14 discovery had been confirmed by three American observatories. Comet was named Honda Comet No. 6. (AP, C Trib, 7/15/68)
- . DOD released April 24 testimony before Senate Committee on Armed Services' Preparedness Investigating Subcommittee. Dr. John S. Foster, Jr., Director of Defense Research and Engineering, had said F-111A wings had broken off during Jan. 23 ground test--under load greater than expected in flight but less than stipulated 50%-overload safety margin--before introduction into Vietnam combat, where aircraft had operated under protective restrictions.

On previous day, Joint Chiefs of Staff Chairman Gen. Earl G. Wheeler (USA), when asked if he had become apprehensive about U.S. survival

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July 6 (continued)

capacity if trends of some U.S. policies continued, had replied affirmatively: "...I submit...they do not necessarily have to continue...[because] these trends are not irreversible." Gen. Wheeler and other Joint Chiefs had been anxious to proceed with new ICBM development and deployment of F-12 force plus full missile interception system, none of which had been included in FY 1969 DOD budget.

General Dynamics President Frank W. Davis later termed type of ground testing which reportedly broke wings off USAF F-111A "normal." Tests, he indicated, were made to determine stress limitations. "We've had no failures...at stress simulation to be expected in combat." (Transcript; Kelly, W Star, 7/7/68, A3; AP, W Post, 7/7/68, A22; 7/8/68, A15; Corddry, B Sun, 7/7/68, 1)

- . Washington Evening Star editorial praised USAF C-5 Galaxy jet aircraft and its "impressive" civilian potential: "According to Tom [T.R.] May, Lockheed's president, all the experimental evidence indicates there are virtually no engineering limitations to building strikingly larger C-5s than those scheduled," but its commercial use would cause passenger and baggage congestion. "If the Galaxy is to become a commercial plane, then, at the most, only a third of its space should be for passengers; the rest should be for cargo.... Although [May is] confident that bigger and bigger C-5s can be made, he doubts that the world is ready for them. We doubt it, too." (W Star, 7/6/68)

July 7: Melbourne, Fla., engineer Duane Brown had applied for patent on Survey Satellite (SURSAT), system of four low-cost satellites which would enable surveyors to plot boundaries, route highways, make maps, and monitor earth's crust to accuracies of a few inches. System included regional center for processing survey data and portable receiving and recording units for field use and could be operational by mid-1970s, Brown said. (UPI, W Star, 7/7/68, A7)

- . Successful test-firing of Phoebus 2A, world's most powerful reactor, June 26 might have been catalyst needed to bring DOD into partnership with NASA and AEC in development of nuclear energy for space propulsion, Frank Macomber wrote in San Diego Union. Not only was USAF becoming interested in military applications for nuclear engine, so were scientists and engineers representing aerospace industry. Phoebus firing would be followed in fall by first test of smaller NERVA XE-1 nuclear engine. Both were vital phases of NASA-AEC Rover program. (SD Union, 7/7/68, 12)

July 7: Sun Shipbuilding and Dry Dock Co. announced plans for new Guppy, 4,000-lb, low-cost, undersea research vehicle to be tethered to surface ship by electric cable and capable of carrying two men to 2,000-ft depth for up to 48 hr. Spherical glass fiber and steel vehicle would be economical enough for capital investment rather than leasing arrangement. First vehicle would be completed in March 1969. (NYT, 7/8/68, 66)

- . France began 1968 nuclear test series with detonation of conventional atomic warhead over Mururoa Atoll in the Pacific. Device was fired to test complex measuring instruments installed for tests scheduled to culminate in explosion of France's first hydrogen bomb. (UPI, NYT, 7/7/68, 7; W Post, 7/8/68, A12)

July 8: Dr. Robert C. Seamans, Jr., Special Consultant to NASA Administrator, had been elected to board of trustees of Aerospace Corp. (Aerospace Release; SBD, 7/8/68, 10)

- . Approximately 36 Soviet Air Force flights involving more than 85 bombers had been identified off the northern coasts of North America during first half of 1968, six times the scale of operations reported during last half of 1967, according to Charles W. Corddry in Baltimore Sun. In all these expeditions, sources reported, Soviet aircraft had cruised over international waters giving no evidence of hostile intent. DOD reportedly considered flights routine. (B Sun, 6/9/68, 1)
- . In joint communique, Dr. Donald F. Hornig, Special Assistant to the President for Science and Technology, and Alexandru Birlandeanu, member of Romanian Politburo touring U.S. scientific institutions, announced agreement whereby Romania would broaden scientific and technological ties with U.S., including exchange of scientists and possible collaboration in atomic energy field. Romania had asked U.S. for technical and financial aid toward construction of its first nuclear power plant by 1973. (Grose, NYT, 7/9/68, 1)
- . New York Times editorial on June 21 emergency meeting of scientists to protest cuts in Federal support for basic research: "...deep slashes in basic research funds are likely to be extremely costly in the years ahead. The fundamental lesson of the history of science is that basic research is the indispensable seed bed for all future technology, the ultimate source of the new wealth and of the improved capacity to save lives that future technology could bring.... Those in Congress and the Executive Branch who

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July 8 (continued)

are now applying the axe to Government spending would be wise to proceed as gently as possible in this small area that is so essential for the nation's future." (NYT, 7/8/68, 36)

- . NASA Associate Administrator for Manned Space Flight Dr. George E. Mueller addressed joint meeting of American Institute of Aeronautics and Astronautics (AIAA) and Canadian Aeronautics and Space Institute (CASI) in Montreal: Systems engineering concept applied to management "was pioneered and developed in aerospace programs and is being increasingly applied as a powerful tool in the management of other major enterprises." In NASA most extensive application was in Apollo program. Factors unique to manned space flight had contributed to management approach, including "sheer size of Apollo program, larger in...lead time, money, organization and technological development than any previous program." Special feature was high reliability and safety required. And space program had been executed under scrutiny of press, public, Congress, and scientific community.

Weight and volume budgeting were critical. High cost of flight-testing space vehicles made maximum ground testing necessary, as well as all-up (concurrent rather than sequential) flight testing. Vehicle was as complete as practicable for each flight, to obtain maximum information from minimum number of flights and provide earliest possible system readiness. Open-ended mission concept was used to accomplish as many flight objectives per vehicle as consistent with safety and mission success. Review of status throughout mission determined length of mission. Redundant, or alternate, means of operation reduced ability of single failure to endanger crew or mission. Prime design consideration in all manned space flights was safety. (Text; UPI, H Chron, 7/10/68)

- . NASA board investigating fatal accident at North American Rockwell Corp.'s, Downey, Calif., plant Oct. 5, 1967, had found that laboratory employees had ignored important safety procedures. "Most probable cause" of explosion which had killed two workmen and injured 11 was, "frictional or impact force created while barium-Freon TF slurry was being transferred from a laboratory container to a shipping container." Although NAR had issued safety instruction requiring barium--used in NASA sounding rocket experiments--be handled only under dry argon atmosphere, it had been washed and sieved in open air. Board recommended full recognition of chemical hazards of combining metals and chemicals such as Freon TF and upgrading of precautions, manuals, and procedures. NAR had altered procedures, would process barium only under remote control. (NASA Release 68-122; AP, NYT, 7/9/68, 27)

July 8: Inauguration of direct air service between New York and Moscow had been set for "on or after July 15" by letters between U.S. Moscow Embassy and U.S.S.R. Foreign Ministry. Soviet airline Aeroflot announced Il-62 jet aircraft service would start from Moscow July 15. U.S. carrier Pan American World Airways expected to start Boeing 707 service from New York same date. Bilateral air agreement of Nov. 4, 1966, had stipulated once-weekly return flights over 4,700-mi route. May 6, 1968, agreement added intermediate stop at Montreal, Copenhagen, Stockholm, or London, with carriers having option to change intermediate point at six-month intervals. Fares had been set at \$1,109 first class return, \$730 economy return, with \$429 economy one way during peak summer season. (CAB Docket 6489; State Dept Release 94; AP, NYT, 7/9/68, 65; Ward, B Sun, 7/9/68, 1; AP, W Post, 7/9/68, A15)

July 8-9: Two major solar flares were detected within 25-hr interval by U.S. Space Disturbance Forecast Center scientists in Boulder, Colo. First had interfered with short-wave transmissions worldwide, according to ESSA Chief of Forecast Services, Robert Doeker; second had seemed weaker although no firm reports on disruptions had been received. Scientists were watching for effect of cloud of electrons spawned by first solar flare, biggest and brightest since 1966. (AP, LA Her-Exam, 7/10/68; AP, NYT, 7/10/68, 17)

July 9: British physicist Samuel Tolansky, appointed a special investigator for Apollo program, had predicted discovery of industrial diamonds among 40 lb of matter Apollo spacecraft would bring back from moon. Theory was based on supposition that lunar craters had been caused by meteor impact or volcanic eruptions producing shock waves. "You can create diamonds by passing a shock wave through carbon," he said. "And there has to be carbon on the moon." (NANA, Pasadena Independent, 7/9/68)

- . Lockheed Missiles & Space Co. scientists were studying use of small charcoal beds to remove contaminants in space capsules where pollution hazards had been found to be "more serious than those for the man on the street." Studies had isolated 150 contaminants, most of which could be extremely toxic. (WSJ, 7/9/68, 23)
- . President Johnson transmitted "Treaty on the Non-Proliferation of Nuclear Weapons" to Senate for ratification and urgently recommended that Senate "move swiftly" to enhance U.S. and world security. "The treaty," he said, "does more than just prohibit the spread of nuclear weapons. It would also promote the further development of nuclear energy for peaceful

July 9 (continued)

- purposes under safeguards." Treaty had been passed by U.N. General Assembly June 12 and opened for signature July 1. (PD, 7/15/68, 1090-2)
- . With Senate Foreign Relations Committee scheduled to open hearings on nuclear nonproliferation treaty July 10, none of the seven "threshold nations," nonnuclear as yet but capable of producing atomic weapons, had signed, said Washington Post's Chalmers M. Roberts. West Germany was hedging. There had been "vague talk" of additional U.S. guarantee although President Johnson, at German request, had repeated U.S. commitment to honor its obligations under existing NATO alliance; Japan was waiting outcome of its July 7 elections; India had said in April it would not sign; Israel was expected to sign now that its enemies, Egypt, Syria, and Iraq had signed; Sweden's signing would be delayed by summer holidays until August; and Switzerland would seek more information. It was believed she would prefer to see West Germany and Italy sign first; Canadian signature was expected shortly. Thus far 62 nations had signed treaty, including 3 of 5 nuclear powers, U.S., U.K., and U.S.S.R.; Communist China and France would not sign. Italy, Belgium, the Netherlands, and Luxembourg had issued statement saying they would sign soon. Spain and South Africa had yet to sign; Pakistan had been key organizer of conference of nonnuclear nations to open in Geneva Aug. 29 to consider treaty's implications. Brazil opposed to treaty on grounds it would impede its peaceful use of nuclear explosives and Argentina would not sign without Brazil. Treaty would become effective with signature of three nuclear powers and ratification by 40 other nations. (Roberts, W Post, 7/9/68, 1)
 - . Fixed-wing SST design aerodynamically similar to one unsuccessfully submitted to USAF by Boeing in 1957 XB-70 competition but featuring more titanium, new flight control system, and more powerful turbo-jets was presented to customer airlines at FAA SST program briefing. Model was undergoing wind-tunnel tests to determine its ability to exceed mach 1 without perceptible sonic boom. (Hoffman, W Post, 7/9/68, 1)

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July 10: NASA issued Apollo Status Summary: Saturn IB launch vehicle was undergoing propulsion subsystem checks at Launch Complex 34. Apollo 7 spacecraft was being prepared for unmanned altitude chamber tests at 210,000 ft for 15 hr. If successful, manned tests might be scheduled to begin July 15 with Astronauts Walter M. Schirra, Jr., Donn F. Eisele, and R. Walter Cunningham in command module. In Apollo/Saturn 503 program, combined systems tests would continue through mid-July on Lunar Module 3.

On July 8 and 9, nine astronauts had taken part in life support training for aircraft pilots at Perrin AFB, Tex. They were second astronaut group to attend the USAF course. Vibration testing of entire Apollo spacecraft stack assembled in launch configuration was continuing at MSC. Doctors and engineers from MSC would participate in Third Annual Meeting of Assn. for the Advancement of Medical Instrumentation at Houston, July 16-17. In Apollo spacecraft loading tests, drogue parachutes would be tested within several days at Naval Air Facility, Calif., with 13,000-lb test vehicle dropped from aircraft at 46,000-ft altitude, subjecting parachutes to "ultimate loads" in reefed condition before they opened fully. Drop, a repeat of previous test which failed, was to complete verification test series which had begun in 1967. Last of seven boilerplate verification tests of modified earth landing system had been successfully completed July 3. Only one of two drogue parachutes and two of three main parachutes had been deployed to simulate a "worst case" of high-altitude abort condition. (Text)

- . Cosmos CCXXXI was launched from Baikonur Cosmodrome by U.S.S.R. into orbit with 391-km (243-mi) apogee, 206-km (128-mi) perigee, 89.6-min period, and 64.9° inclination. Equipment functioned normally and spacecraft reentered July 18. (UPI, W Star, 7/11/68, A5; UPI, NYT, 7/12/68, 7; SBD, 7/12/68, 41; GSFC SSR, 7/15/68, 7/31/68)
- . Soviet Stalin Prize physicist Prof. Andrey D. Sakharov, contributor to development of U.S.S.R. hydrogen bomb, had issued plea for full intellectual freedom, U.S.-U.S.S.R. cooperation, and worldwide rejection of "demagogic myths," in unpublished essay entitled

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July 10 (continued)

"Thoughts About Progress, Peaceful Coexistence and Intellectual Freedom," which was circulating in Moscow. Expressing fear that world was on the brink of disaster, he urged worldwide implementation of scientific method and freedom of thought in politics, economic planning and management, education, arts, and military affairs and denounced Soviet censorship. "The salvation of mankind requires intellectual freedom--freedom to obtain and distribute information, freedom for unprejudiced and unfearing debate, and freedom from intimidation by officialdom. Such freedom of thought is the only guarantee against an infection of mankind by mass myths which...can be transformed into bloody dictatorship. Intellectual freedom is the only guarantee of a scientific-democratic approach to politics, economic development and culture." (Anderson, NYT, 7/11/68, 1)

- . DOD formally ordered work stoppage on F-111B (USN version) development work being conducted by General Dynamics Corp. Action followed Congressional cuts of \$460 million in program. (General Dynamics PIO; SBD, 7/11/68, 30)
- . Chrysler Corp. engineers and technicians static-fired Saturn IB booster in 35-sec run at East Test Area, MSFC. Booster was scheduled for full-duration, 2 $\frac{1}{2}$ -min run July 25. (Marshall Star, 7/17/68, 1)
- . Sen. Eugene J. McCarthy (D-Minn.), candidate for Democratic nomination for President, in position paper urged that U.S. delay deployment of Sentinel ABM system and Poseidon and Minuteman III missiles to facilitate agreement with U.S.S.R. on defensive and offensive armament limitation. Delay would not jeopardize U.S. security, he said, since neither Chinese nuclear threat nor Soviet ABM development is "moving ahead perceptibly." Paper was prepared by Harvard Univ. chemistry professor Dr. George B. Kistiakowsky and MIT Provost Dr. Jerome B. Wiesner. (Text; Kenworthy, NYT, 7/11/68, 25; CR, 7/11/68, S8439-42)

July 10-12: Hearings were held by Senate Foreign Relations Committee and Senate members of Joint Committee on Atomic Energy on U.S. ratification of nuclear nonproliferation treaty. Secretary of State Dean Rusk affirmed treaty would bind U.S. to no more atomic defense action than already set forth in existing treaties and by membership in U.N. Security Council.

Gen. Earl G. Wheeler, Chairman, Joint Chiefs of Staff, and Deputy Secretary of Defense Paul H. Nitze in joint testimony said U.S. would give up nothing under terms of treaty but would benefit from major

July 10-12 (continued)

step to reduce tensions. They assured Committee that U.S. planned no special agreement with West Germany to guarantee its protection against nuclear invasion. (AP, NYT, 7/11/68, 16; Roberts W Post, 7/11/68, All; UPI, NYT, 7/12/68, 4; Sherman, W Star, 7/12/68, A5)

July 11: USAF successfully launched OV I-15 and OV I-16 research satellites pickaback from Vandenberg AFB by Atlas-F booster. OV I-15 entered orbit with 1,074.4-mi (1,729-km) apogee, 93.8-mi (151-km) perigee, 103.8-min period, and 89.8° inclination. OV I-16 nicknamed "Cannonball," was 600-lb, 23-in-dia Low Altitude Density Satellite (LOADS) launched to measure atmospheric density between 90- and 110-mi altitudes for 25-30 days. Densest satellite U.S. had orbited, OV I-16 had 162-lb-per-cu-ft density, which enabled it to orbit closer to earth than any previous spacecraft. Orbital parameters: apogee, 315.6 mi (508 km); perigee, 88.2 mi (142 km); period, 91 min; and inclination, 89.7°. OV I-16 reentered Aug. 22. (O'Toole, W Post, 7/12/68, A21; SBD, 7/15/68, 44; GSFC SSR, 7/15/68, 8/31/68)

- . DOD directive that General Dynamics Corp. halt development of USN F-111B aircraft because of weight problem would not affect USAF's F-111A program or Hughes Aircraft Co. development of Phoenix air-to-air missile, which presumably would be installed in replacement aircraft, Wall Street Journal reported. Of 17 F-111B prototypes planned, 8 had been produced and 6 delivered (one of which had crashed). General Dynamics was uncertain how many of remaining nine would be completed. USN had originally requested 30 aircraft. (WSJ, 7/11/68, 29)
- . Secretary of Defense Clark M. Clifford announced USN would proceed with construction of one of two advanced nuclear submarines advocated by V/A Hyman G. Rickover to combat Soviet submarine threat. Authorization was for "super high-speed" version; "quiet" electric-powered craft was still under consideration though its development had been stopped in May. Congressional committees had supported Adm. Rickover and urged development of both types. (Dale, NYT, 7/12/68, 1; Kelly, W Star, 7/12/68, A5)

July 12: Last USN flying boat, SP-5B Martin Marlin, was formally retired from active service and turned over to Smithsonian Institution at ceremony at U.S. Naval Air Station, Patuxent, Md. Aircraft would be placed in proposed National Armed Forces Museum. (CR, 7/18/68, E6671)

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July 12: Dr. Stephen B. Sweeney, governmental administration professor at Univ. of Pennsylvania's Wharton School and Executive Director Emeritus of Univ.'s Fels Institute of Local and State Government, and Dr. Harold Asher, manager of General Electric Co.'s TEMPO section and former Deputy Assistant Secretary of Defense, had been sworn in as consultants to NASA Administrator James E. Webb. Dr. Sweeney would specialize in university affairs, public administration, and application of science and technology to urban problems. Dr. Asher would review and analyze NASA's systems for resource management. (NASA Release 68-124; AP, 7/15/68, A19)

July 13: USAF C-5 Galaxy jet aircraft, flown by Lockheed-Georgia Co. test pilot Walter E. Hensleigh, completed successful 2-hr 44-min second flight with takeoff weight of 520,000-lb--believed to be 10 tons heavier than any previous aircraft takeoff weight. During ascent to 1,000 ft, crew cut each of four GE TF39 engines individually and restarted them in air. Auxiliary units also underwent cut-restart checks. (AP, W Star, 7/14/68, 14)

- . FB-111A, bomber version of F-111, successfully completed 30-min maiden flight from Carswell AFB, Tex., reaching 20,000-ft altitude and up to 660 mph, DOD announced. Equipped with advanced avionics, including onboard computers enabling pilots to alter missions in flight automatically, FB-111A's design incorporated basic fuselage of USAF F-111A tactical fighter recently grounded after three crashes in Southeast Asia. (DOD Release 652-68; AP, W Star, 7/14/68, A2; AP, W Post, 7/14/68, A5)
- . Team of NASA and Max Planck Institute scientists completed 28-day tour of Argentina, Chile, Netherlands Antilles, Peru, and Venezuela, where they had explored potential sites for optical observation of high-altitude ionized cloud experiment proposed as cooperative project of German Ministry for Scientific Research and NASA. Release of barium vapor at 12,000- to 20,000-ft altitudes by Scout rocket launched from NASA Wallops Station was being considered. Barium cloud would be visible from large area of Western Hemisphere. (NASA Release 68-121)

July 14: U.S. and U.S.S.R. had exchanged private messages which raised hope initial talks on limiting nuclear missiles would begin in few weeks, according to Geneva sources quoted by Washington Post's Murrey Marder. Possible obstacle was Warsaw meeting of U.S.S.R. and Eastern European officials over Czechoslovakian advance toward liberalization. U.S.-U.S.S.R. accord on nuclear missile production

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July 14 (continued)

presumably would interact on Soviet strength in Eastern Europe weakening it as East-West tension subsided. Soviet Foreign Minister Andrey A. Gromyko and Premier Alexey N. Kosygin, in recent speeches, had implied that secure Soviet version of status quo in Eastern Europe was a critical prerequisite for further reduction of international tension. (W Post, 7/15/68, A1)

- . George Alexander reviewed in Washington Post Erik Bergaust's Murder on Pad 34, story of Jan. 27, 1967, Apollo fire. Book was "characterized by sloppy errors of omission and commission, innuendo and pointlessness," Alexander said. "It was good fortune, nothing else, that the various mechanical flaws and human faults that occurred in the...Mercury and Gemini programs did not coincide...as they did inside Apollo-one. Foresight tries to prevent such coincidence, but... not all possible coincidence can be foreseen.... Accidents...will happen. And the searching investigation conducted by the National Aeronautics and Space Administration into Apollo-one could find no evidence that the fatal fire was anything but an accident." (Book World, W Post, 7/14/68, 4-5)

July 15: President Johnson formally asked Senate to ratify space rescue treaty endorsed by U.N. General Assembly Dec. 19, 1967, and signed by 43 nations April 22, terming it "another step toward stable peace on this threatened earth." Astronaut assistance and return agreement looked "beyond the old divisions of history and ideology to recognize the challenge of common peril and the benefits of common action.... Our laws and treaties must always keep pace with our science. But the value of this Agreement goes beyond the protection it offers to those who venture into space." It also "helps protect the peace of this planet.... Surely two nations who aspire to the stars can realize the common danger and act in the common interest here on earth." (Text; W Post, 7/16/68, A9; Ap, W Star, 7/16/68, A8; Nordlinger, B Sun, 7/16/68, 1)

- . Harvard College Observatory scientists Dr. George R. Huguenin and Dr. J. H. Taylor became first U.S. scientists to identify a new pulsar when they discovered HP 1506 in northern sky near Little Dipper. Pulsar, similar to four pulsars discovered in 1967 by U.K. scientists, had pulse rate of one every 0.7397 sec, each lasting 0.020 sec. Pulse rate of other four pulsars ranged from 0.25 to 1.4 sec, with each pulse lasting 0.020 sec. Harvard scientists used National Radio Astronomy Observatory antenna at Green Bank, W. Va. (Sullivan, NYT, 7/19/68, 20)

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July 15: NASA Administrator James E. Webb discussing implications of FY 1969 budget reductions at American Astronautical Society Symposium in Denver, Colo., said he did not find public support for space program declining. Rather, "many people who in the years following 1961 ascribed to the space program a separate, special, top priority status are now realizing, as the national leadership in the space program has understood all along, that the space program must be regarded as only one of a number of essential activities of high priority to which the country must devote substantial resources.... The investments made in NASA may well add greatly to the value of investments we will have to make in these other fields."

NASA was "very much in business, and it will stay in business. We are accepting the challenge of the time and will continue a hard-hitting, technically sound program aimed at the most important objectives of the future." But he described cutbacks as well as elements of strength. "We are doing all we can to avoid terminating completely such important activities as the unmanned planetary exploratory program, but it is not likely that we will be able to proceed with the Titan/Mars 1973 missions." Saturn I Workshop would be delayed and, "for a number of years to come, missions to use the manned space flight capabilities developed in the Apollo program will be very limited." Reductions to a budget already "sharply reduced will have many very serious effects on the U.S. position in aeronautics and space. They are only the most recent in a series of cutbacks and, in effect, constitute something like final ratification of a decision...that the United States will not, at this time, take the steps necessary to continue the advances of the recent years."

Outlining NASA's program, Webb said two flyby missions to Mars in 1969 were largely paid for. "Even at our reduced levels, I believe we can follow the 1969 missions with two orbiter missions in 1971, but will probably have to postpone for another year the start of work on the two Titan-launched orbiter and lander missions which we had hoped to fly in 1973." The 1969 missions "were initiated three or more years ago. We are approaching the end of our approved flight programs. The number of new projects started each year has sharply dwindled since 1966 and we will soon see years go by when we will have very few flights. We may see a gap of 2 years in our manned flight program after the landing on the moon, and a second gap, equally long, after the Saturn I Workshop.

"Perhaps the most fundamental decisions ahead lie in the field of large launch vehicles. Can we gap the production of Saturn V or will we have to terminate it?" Question required reexamination of uses of Titan III and of possible development of new, less costly launch vehicles.

"Especially important" in this period was continuation of broad program of advanced research for future national needs, including broad university program. (Text)

July 15 (continued)

Sen. Gordon Allott (R-Colo.) at AAS meeting said space program had created new yardstick of economics because of the expenditure of vast sums for new knowledge and experimentation. He said the country should be careful not to confuse the economics of the market place with those of space. (CR, 7/18/68, S8901; NASA LAR VII/84a; Denver Post, 7/15/68)

Martin Marietta Corp. planetary scientist Allan R. Barger, who was doing theoretical work on balloon-borne Venus probe, told AAS meeting U.S.S.R. data released after Oct. 18, 1967, Venus probe was incorrect. Soviet report had set planet's surface temperature at about 520°F and surface pressure at about 18 times that on earth. Barger said his conclusions, based on analysis of Soviet report and on data gathered by NASA's Mariner V space probe as it flew by Venus' upper atmosphere, set planet's surface temperature at about 890°F and pressure at 100 or more times that on earth. (Denver Post, 7/15/68)

- . USAF's Arnold Engineering Development Center was conducting research with 5 million-w arc heater to determine temperature and pressure limitations of ablative materials used to prevent military reentry vehicles from burning up on encountering earth's atmosphere. Military reentry vehicles had to withstand conditions similar to high-speed reentry of interplanetary vehicles on return to earth, far more severe than those to be met by lunar astronauts. Data had been produced for civilian and military agencies. (AFSC Release 117.68)
- . Food, land, and raw material shortages might compel man to establish mining operations on other planets and to grow food in space stations, according to Dr. K. A. Ehricke, North American Rockwell Corp. scientist. He said farms growing food in chemicals could be established in earth-orbiting stations fertilized by chemicals produced on Mars and other planets. (AP, NYT, 7/15/68, 6)
- . France exploded nuclear device at Mururoa Atoll in the Pacific. Test was second in 1968 series believed designed to perfect trigger for hydrogen bomb France planned to explode in 1968. First test in series (July 7) had been protested by many countries concerned over increasing contamination of atmosphere. (Reuters, NYT, 7/16/68, 7; UPI, W Star, 7/16/68)
- . Boyd C. Myers, II, NASA Deputy Associate Administrator for Operations, Office of Advanced Research and Technology, became NASA Deputy Assistant Administrator for Administration. (NASA Release 68-125; AP, NYT, 7/16/68, 7)

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July 15-16: Commercial air service between U.S. and U.S.S.R. was inaugurated with Moscow departure July 15 of Ilyushin-62 aircraft belonging to Soviet flag carrier Aeroflot. Aircraft, carrying 97 Soviet officials and commercial passengers, landed at Kennedy International Airport in New York July 16, after 13-hr 17-min flight via Montreal (including 1 hr 35 min circling New York area because of air traffic). U.S. flag carrier, Pan American World Airways, flew two Boeing 707 aircraft from New York to Moscow's Sheremetyevo Airport via Copenhagen July 16. First carried U.S. officials and press; second carried revenue passengers. (W Star, 7/15/68, All; 7/16/68, A7; Witkin, NYT, 7/16/68, 1; Anderson, NYT, 7/17/68, 28)

July 16: U.S.S.R. successfully launched Cosmos CCXXXII into orbit with 355-km (220.6-mi) apogee, 200-km (124.3-mi) perigee, 89.4-min period, and 65.3° inclination. Spacecraft reentered July 24. (UPI, NYT, 7/17/68, 30; GSFC SSR, 7/31/68)

- . Maj. William J. Knight (USAF) piloted X-15 No. 1 to 218,500-ft altitude and 3,409 mph (mach 4.74) in flight from Edwards AFB. Objective of flight, exposure and satisfactory retraction of WTR experiment, was not accomplished because abnormally low hydraulic pressure and severe vibrations prevented aircraft's reaching required altitude. (X-15 Proj Off)
- . NASA Associate Administrator for Advanced Research and Technology James M. Beggs dedicated new \$3.5-million Flight Control Research Facility at Langley Research Center. Facility, connected to LaRC's data analysis and computation center, would be used for guidance and control research in support of manned flight.
During ceremony, Center's Digital Computer Complex Group received LaRC Group Achievement Award for "outstanding performance and dedicated efforts in combining unique concepts in computer organization and operating systems" contributing to "one of the most outstanding research computer installations in the United States." (Langley Researcher, 7/26/68, 1, 4)
- . MSC officials announced resignation of Astronaut John S. Bull (I/Cdr., USN), third astronaut to leave space program because of medical problem. Dr. Charles A. Berry, MSC Chief of Medical Programs, told news conference Astronaut Bull had rare respiratory disease for which there was no known cure and no medical name. It was characterized by chronic sinus difficulties, lung obstruction, and sensitivity to aspirin (UPI, W Post, 7/17/68, All)

July 16: Global warning system operational since January was providing airline pilots with as much as two months notice of reentry of spacecraft debris, which had been averaging one reentry a day. Chances of damage by fragment to aircraft, while small, would increase with operation of SSTs at 70,000- and 80,000-ft altitudes. System, outgrowth of Volunteer Flight Officer Network formed in 1963, included more than 38,000 flight crews attached to 117 airlines, which received reentry data from NORAD computers via United Air Lines communications facilities at Denver, Colo. (Sullivan, NYT, 7/17/68, 27)

- . President Johnson informed Geneva disarmament conference that agreement was expected "shortly" on time and place of U.S.-U.S.S.R. talks to limit nuclear missile production. In message read to opening of new session of conference, President said if progress could be made on limiting strategic delivery systems, U.S. "would be prepared to consider reduction of existing systems." (Text; W Post, 7/17/68, A15; NYT, 7/17/68, 1)

July 17: Investigation of Nov. 15, 1967 X-15 accident by NASA board indicated that pilot, Maj. Michael J. Adams (USAF) who died in crash, had suffered disorientation and operated controls improperly. Mistaking roll indicator for heading indicator, he had increased heading error, causing aircraft to spin uncontrollably at mach 5 and 230,000-ft altitude and then to go into severe pitch oscillation and disintegrate at altitude above 60,000 ft. Board requested that Government report on MH-96 control system experience and recommended use of telemetry for directional readings by NASA X-15 ground control center, careful checkout of experiments and equipment for next X-15 flight, inclusion in pilot physical examination of special tests for tendency toward vertigo, and development of additional methods to maintain proper heading under ballistic flight conditions. (FRC Release 20-68; NASA Release 68-126)

- . James C. Elms, Director of NASA Electronics Research Center, discussed "The NASA Biomedical Program in Perspective" before Third Annual Meeting of Assn. for the Advancement of Medical Instrumentation in Houston. "Despite the rapid advance of biomedical techniques since World War II, the main thrust of the activities was directed toward studying sick individuals in a normal environment. The manned space program has provided the opportunity for intensive controlled study of a select group of normal and healthy individuals in an abnormal and stressful environment. By so doing, we have achieved a better definition of the range of normality of the healthy organism which, in turn, is useful in the study and understanding of disease."

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July 17 (continued)

Interaction of space and medicine had led to many medical applications of aerospace hardware. Application of electron probe microanalyzer--used for chemical analyses of microelectronic circuits--to study of red blood cells had led to unexpected clues in study of blood cancer. System to monitor heart rate, respiration, and galvanic skin response was being considered for use in measuring efficiency of dental anesthetics on children and in training teachers for retarded children. Accomplishments of bioelectronics research in interdisciplinary electronics environment included remote measuring technique for eye-pointing direction, meaningful measurement of aerosol concentration and size distribution, and automatic tracking system to identify thresholds of mental alertness. (Text)

- . Univ. of California physicist Dr. Edward Teller, at hearing on nuclear nonproliferation treaty before Senate Foreign Relations Committee, urged Congress to preserve option of giving nonnuclear allies control over "purely defensive" nuclear weapons systems. He was referring, he said, to system that could be exploded only over a nation's territory, one involving "time-lock" of monthly inspection by donor nation, and one which would be proof against tampering or analysis designed to develop it into offensive system.

In afternoon Arthur Larson, head of Educational Committee To Halt Atomic Weapons Spread, testified he agreed with Sen. John O. Pastore (D-R.I) that proper time to press for revision was when theoretical system became reality. (Maffre, W Post, 7/18/68, A4; Sherman, W Star, 7/18/68, A12)

- . U.K., West Germany, Italy, and the Netherlands signed agreement to cooperate in \$4.8-million project to develop and produce advanced combat aircraft for their air forces. Aircraft, scheduled to enter service in 1975, would replace U.S. Lockheed F-104 Starfighter currently being used. Orders for new aircraft were expected to reach 1,000. (Reuters, B Sun, 7/18/68, 2)

July 18: Cosmos CCXXXIII was launched from Plesetsk Cosmodrome by U.S.S.R. into orbit with 1,505-km (935.2-mi) apogee, 199-km (123.6-mi) perigee, 101.9-min period, and 81.9° inclination. Equipment was functioning normally. (SBD, 7/22/68, 32; GSFC SSR, 7/31/68)

- . Senate passed unanimously H.R. 17023, FY 1969 Independent Offices and HUD appropriations bill, including \$4.008 billion for NASA. Total for NASA agreed with House-passed total, but Senate adopted

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July 18 (continued)

- committee amendments increasing funds for construction of facilities by \$12.95 million and decreasing R&D funds by same amount. As passed by Senate, bill provided \$3.37 billion for R&D, \$34.75 million for construction of facilities, and \$603.17 million for administrative operations. Senate requested conference with House on amendments. (NASA LAR VII/76; CR, S8910-38; SBD, 7/19/68, 71)
- . House Appropriations Committee cut \$550.5 million from DOD FY 1969 appropriations, including \$85 million from USAF Manned Orbiting Laboratory (MOL) program. (CR, 7/18/68; SBD, 7/19/68, 71)
 - . Defense Communications Agency had declared operational eight satellites added to Defense Satellite Communications System (DSCS) by successful June 13 launch from ETR, final launch of Initial Defense Communications Satellite (IDSCP) Project. Total of 24 satellites were in normal use, orbiting eastward in 21,000-mi-altitude synchronous orbit. They would remain in use until 1971. (DOD Release 668-68)
 - . NASA had completed tests to find solution to "longitudinal oscillations" of Saturn V booster which had occurred during April 4 Apollo 6 mission. Tests revealed that natural frequency of vehicle structure and propulsion system frequency had coincided, multiplying amplitude of oscillations. Problem would be corrected by using accumulators, small gas reservoirs, in 1st-stage liquid-oxygen prevalues to change propulsion system frequency. Minor modifications necessary to allow helium injection into prevalues were being made on 1st stages of third and sixth Saturn Vs. (NASA Release 68-128; MSFC Release 68-158)
 - . Ryan Vertifan, jet V/STOL aircraft designated XV-5B by NASA, was undergoing flight tests before delivery to Ames Research Center for use in aeronautical research programs. Aircraft's counter-rotating fans submerged in wings and driven by jet exhaust, provided lift for vertical takeoff, hovering, and vertical landing. XV-5B was improved version of Ryan Aeronautical Co. research aircraft built for USA; modifications and renovations, after damage from October 1966 emergency landing at Edwards AFB, were made under \$1-million NASA contract. (ARC Astrogram, 7/18/68, 1)
 - . With U.S. and U.S.S.R. ready to discuss possible mutual restriction on production of strategic missiles, research and testing of advanced spectrometer designed to police agreement had been delayed because of congressional cuts in DOD funds for Arms Control and Disarmament

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July 18 (continued)

- Agency program. Device, which analyzed missile characteristics from their exhaust trails at launch sites, had been developed at cost of \$574,000 after 1964 proposal by U.S. for missile agreement with U.S.S.R. Device could be manned by international inspectors positioned one mile from launch site or read by remote control through transmission cable already developed for additional \$200,000. Field testing under simulated U.S.S.R. conditions had been postponed one year until summer 1969. (Oberdorfer, W Post, 7/18/68, G4)
- . The Security of Japan and Prospects for 1970, study produced for Japanese Defense Agency by Security Research Council, said Japan had the technical and economic resources to produce uranium and plutonium bombs and ICBM producing capability similar to that of France. Japanese policy to date had banned construction and importation of nuclear weapons. (W Post, 7/18/68, A3)
 - . Dr. Ernest Harry Vestine, expert on geomagnetism who joined The RAND Corp. in 1957 after 20 years with Carnegie Institution, died in Santa Monica, Calif., of heart attack at age 62. He had been one of originators of 1957-58 International Geophysical Year and had served as consultant to DOD, NASA, and Dept. of Commerce. He had been one of leaders of 1933 International Polar Year expedition, which established observatory to measure earth's magnetic field. (W Post, 7/19/68, B6)

July 19: NASA test pilots Donald L. Mallick and Fitzhugh Fulton flew XB-70A to 42,000-ft altitude and mach 1.62 in flight from Edwards AFB. Purpose of flight was to evaluate performance of variety of speeds, check exciter vane function, determine ground effects during low approach, and evaluate pilot proficiency during touch-and-go landing. (XB-70 Proj Off)

- . Astronauts James A. McDivitt, David R. Scott, and Russell L. Schweickart successfully completed checkout of Apollo spacecraft cabin flight equipment provisions under simulated mission conditions at North American Rockwell Corp.'s Downey, Calif., facility. (NAR Skywriter, 7/26/68, 1)
- . Hydrogen-filled 600-ft-dia plastic balloon bearing card dated May 7, 1968, and words "National Center of Space Studies, Landes, France, Balloon Launching Center" landed in cornfield near Portsmouth, Ohio. It was believed to have been responsible for flurry of unidentified flying object reports from south central Ohio previous night. (AP, NYT, 7/20/68, 27)

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July 20: Senate by vote of 67 to 3 passed H.R. 17903, FY 1969 public works and atomic energy appropriations bill, which included \$36 million for NERVA and total of \$68 million for space propulsion systems. Senate also passed H.R. 13781, authorizing \$15 million for sea-grant colleges and ocean exploration in FY 1969 and another \$15 million in FY 1970. (NASA IAR VII/77; CR, S9047, S9069-87)

July 21: USN had awarded five \$1-million contracts for study of F-111B replacement to Grumman Aircraft Engineering Corp., LTV Aerospace Corp., General Dynamics Corp., North American Rockwell Corp., and McDonnell Douglas Aircraft Corp. Substitute for F-111B, designated VFX-1, would have vertical sweep wings and same jet engine. USN had also awarded \$143.5-million contract to Newport News (Va.) Ship Building Co. for two nuclear-powered guided-missile frigates, which would bring to five USN's total atomic-powered escort vessels. (W Post, 7/21/68, H1)

July 22: Partial extension of Explorer XXXVIII's antennas, delayed because of unexpected spacecraft oscillations and ground computer failure, was successfully conducted by NASA after series of complex maneuvers which permitted successful gravity-gradient capture and three-axis stabilization. Antenna array's four booms would be held at planned 455-ft length for at least two weeks while data was collected and then, if spacecraft performed satisfactorily, antennas would be extended to full 750-ft length. Damper boom was deployed, experiments were turned on, and all spacecraft support systems were functioning normally. Dipole antenna was deployed July 23 and satellite was declared fully operational. Spacecraft had been launched July 4. (NASA Proj Off; NASA Releases 68-123, 68-132; W Post, 7/18/68, D21)

- . Explorer XXXV (IMP-E), sixth spacecraft in Interplanetary Explorer series, completed one year of operation in lunar orbit. Seven of eight onboard experiments and all spacecraft systems were 100% operational. Eighth experiment had 5% degradation in performance. Since July 19, 1967, launch, satellite had shown that positive ions from solar wind crashed directly into lunar surface and had verified existence of solar wind void directly behind moon, enabling scientists to deduce information on moon's electrical conductivity and internal temperature. (NASA Proj Off)
- . Despite sharp budget cuts NASA was not contemplating layoff of Civil Service Commission personnel, columnist Jerry Kluttz reported in

July 22 (continued)

Washington Post. As Government agencies searched for ways to meet cuts ordered by Congress, NASA appeared to be only major agency with no problem of excess employees. But because of "big money problems," NASA hoped to save dollars by abolishing half of its currently vacant positions, possibly making some "selective" layoffs at MSFC and GSFC, and continuing major cutbacks in contractor personnel. NASA would reprogram its activities and transfer funds to finance CSC positions. (W Post, 7/22/68, A20)

- . In Project Cold Flare, joint NASA-FAA-USAF program to assess radiological effects of solar activity on future SST passengers and crews, radiation-measuring flights were being flown from Eielson AFB, Alaska, near North Pole, where solar and galactic charged particles were normally concentrated, to gather data on radiological phenomena during solar flares. (NYT, 7/22/68, 61)
- . Michael Getler in American Aviation saw SST program "eminently worthy of criticism" but, more important, "eminently worthy of success." Thus far it had come to "full circle: from basic design to advanced concept back to even more basic design." These events, he said, should be regarded objectively, with an eye toward learning lessons applicable to future large-scale Government-industry-commercial undertakings involving advanced technology. "The SST also should teach us a lesson about aviation technology, one which reminds us that aerodynamics is still the name of the game. There was great concern about the engine and materials problems in the SST, but those two areas have come along very well and the culprit is proving to be basic aerodynamics." (Am Av, 7/22/68, 60)

July 22-23: Arthritic growth on spine of Astronaut Michael Collins (Maj., USAF), scheduled to pilot command module on third manned Apollo mission early in 1969, had led to his being grounded. USAF surgeons successfully removed bone spur from near base of his neck but speculated convalescence might take up to four months. MSC officials declined conjecture on his future flight status. Collins was member of third group of astronauts selected in 1963 and had piloted two-man Gemini mission July 18-21, 1966, during which he had performed two space walks. (AP, W Star, 7/23/68, A4; W Post, 7/23/68, A5; 7/24/68)

July 23: Senate passed H.R. 18188, Dept. of Transportation appropriations bill by vote of 82 to 2 after approving addition of \$153 million for Federal Aviation Administration to hire 3,627 air traffic controllers to relieve congestion at nation's busiest airports. (CR, S9226-47; AP, W Star, 7/24/68, A21)

- . Guidance and control equipment used during Gemini XI reentry Sept. 15, 1966, was being flight-tested at NASA Wallops Station to set up system performance requirements for automated landing for V/STOL aircraft. Tests were part of long-range NASA research program to develop all-weather aviation electronics systems for V/STOL aircraft. (ERC Release 68-12; WS Release 68-14; Marshall Star, 8/14/68, 2)

July 23-24: NASA launched series of 11 sounding rockets from NASA Wallops Station between 8:19 pm July 23 and 5:55 pm July 24 to gather upper atmosphere data for weather research. Carried on six Nike-Apache and five Nike-Cajun sounding rockets, experiments included: two Univ. of Colorado experiments to obtain vertical profile of nitric acid density, with two spheres to measure daily density change; four payloads instrumented by GCA Corp. and Univ. of Illinois to measure electron and ion density and solar radiation in ionosphere; three joint GSFC-Univ. of Michigan grenade launches to obtain temperature, pressure, and wind data; and two Univ. of Michigan payloads to measure ambient air density by tracking two small spheres as they fell from different altitudes. Experiments were expected to yield new information about interrelationship of ionosphere and neutral atmosphere between 30- and 70-mi altitudes. (NASA Release 68-134; WS Release 68-15)

July 24: ComSatCorp reported \$3.3 million net income (33 cents per share) for first half of 1968, of which \$1.5 million (15 cents per share) was in second quarter. Earnings for first half of 1967 were \$2 million (21 cents per share) and for second quarter of 1967, \$859,000 (9 cents per share). (ComSatCorp Release 68-35)

- . IBM physicists Dr. Peter P. Sorokin and J. P. Lankard had designed and built pulsed laser which produced 100,000-w bursts of light lasting 2.5 millionths of a second and varying in color according to commercial liquid dye used. It could be built in home workshop with materials worth \$25 to \$50. By changing type of dye used, thereby selecting new molecule, light of new frequency was produced,

July 24 (continued)

enabling scientists to investigate energetic properties of molecules and atoms. Dr. Sorokin had said he considered laser's selectivity more important, scientifically, than its cheapness and simplicity of construction. (Stevens, NYT, 7/26/68, 55)

- . Joint Committee on Atomic Energy said no valid reason had been offered for DOD's May 28 halt in spending for quiet electric drive submarine and urged that all restraints on its design and construction be removed. Recommendation accompanied release of June 21 testimony in which V/A Hyman G. Rickover strongly supported submarine and criticized DOD for delaying its development [see July 11]. (Transcript; AP, NYT, 7/28/68, 54)

July 25: NASA was entering competitive negotiations with Informatics Inc., and Leasco Systems and Research Corp. for one-year, \$4-million contract with two one-year options for operation of its Scientific and Technical Information Facility at College Park, Md. (NASA Release 68-133)

July 26: NASA Aerobee 150 MI sounding rocket launched from WSMR carried Columbia Radiation Laboratory experiment to 88.3-mi (142-km) altitude to examine x-ray polarization of Sco XR-1 in 10- to 25-kev region with x-ray polarimeter. Rocket and instruments performed satisfactorily. Experiment worked as expected, but some counter or electronic failure, or both, occurred during early part of flight. (NASA Rpt SRL)

- . USAF-sponsored unidentified flying object (UFO) investigation by Univ. of Colorado concluded April 30 had become "mired in controversy" said Science. Its Director, Dr. Edward U. Condon, had refused to discuss situation and critics were saying project was "biased and less than diligent investigation." Chief targets for criticism were Dr. Condon and project coordinator Robert J. Low, while "most substantial" critics were James E. MacDonald, Univ. of Arizona senior physicist, and Northwestern Univ. astronomer Dr. J. Allen Hynek, USAF's chief UFO consultant, who feared Dr. Condon would recommend against further serious UFO study. Dr. Condon's supporters had noted criticism was based on newspaper quotes, on his delight in humorous UFO anecdotes, statements from project members who had been fired, and memo written by a subordinate before project began. They did not find evidence convincing, Science said. (Boffey, Science, 7/26/68, 339-42)

July 26: USAF Cambridge Research Laboratories scientists John W. Salisbury and Graham R. Hunt reported in Science they had found hypothesis of particle size control of albedo incompatible with hypothesis of abundant limonite on Mars. Their observations indicated that proposal that polarimetric, spectrometric, color, and albedo measurements of light and dark areas on Mars proved limonite was major soil constituent was irreconcilable with proposal that variations in size of particle could be responsible for albedo difference between light and dark areas. They showed relative albedo was reversed from blue to red for limonite samples with different-sized particles. Observations of Mars revealed no blue-red albedo reversal between areas. Although evidence was insufficient for choice between hypotheses, they believed Mars soil was most likely, for geological reasons, to be composed of silicates stained or coated with ferric oxides. (Science, 7/26/68, 365-6)

- . First transatlantic aircraft crossing had been made by USN NC-4 flying boat in May 1919, Univ. of North Carolina professor Joseph L. Morrison, biographer of Secretary of the Navy Josephus Daniels, said in letter to the editor of Time. He pointed out six-man crew under Cdr. Albert Cushing Read (USN) had crossed between Newfoundland and Lisbon via Azores one month before Britons John Alcock and A. W. Brown made nonstop Newfoundland-Ireland crossing in Vickers Vimy bomber which July 12 Time had called first crossing. (Time, 7/26/68, 8)

July 27: Aerobee 150 MI sounding rocket launched by NASA from WSMR carried MIT payload to 84.1-mi (135.3-km) altitude to obtain data on celestial locations and energy spectra of discrete x-ray sources in three regions and to search for weak, undiscovered x-ray sources using proportional counters. Rocket and instruments performed satisfactorily. (NASA Rpt SRL)

- . Sen. Clinton P. Anderson (D-N.Mex.), Chairman of Senate Aeronautical and Space Science Committee, inserted into Congressional Record his report "Legislative History of Space Nuclear Propulsion for Fiscal Year 1969" which confirmed "the continued vigorous support of the Congress for this space research and development activity" and that "appropriate agencies should proceed with the development of the NERVA-1 nuclear rocket engine." Final Congressional action on AEC and NASA FY 1969 authorizations strongly supported nuclear propulsion development. NASA authorization had been \$55 million for Nuclear Rockets Program. Joint Committee on Atomic Energy had recommended \$69 million for AEC Nuclear Space Propulsion Systems and strongly recommended program proceed. AEC had requested \$72 million for Project Rover, including \$49 million for development of NERVA I

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July 27 (continued)

rocket engine. Final action of both Senate and House Appropriations Committees on Independent Offices bill and AEC appropriations bill had supported space nuclear propulsion and NERVA rocket engine development, restoring funds cut by House earlier. It was clear, said Sen. Anderson, "that the view of the Congress is that the Nuclear Rockets Program for fiscal year 1969 is one of the most important and highest priority programs in NASA and should move forward as planned...." The amount finally appropriated for NASA R&D for FY 1969 would not be less than \$3.3703 billion, including \$55 million for the Nuclear Rockets Program. "The conference committee on the AEC appropriations...agreed to \$53 million on the AEC's program in Reactor Development--Space propulsion Systems, a figure more than halfway between the House lower figure [\$31 million] and the Senate higher figure [\$68 million]." (CR, 7/27/68, S9582-4; NASA LAR VII/81)

- . U.S. was completing secret arms-control studies in preparation for talks with U.S.S.R. on curbing nuclear missile race, Seymore Topping reported in New York Times. Optimism on both sides was generated by acceptance of need to avoid competitive scramble for ABM systems which might cost each government \$40 billion in resources needed for domestic programs and foreign aid. Agreement would require some method of mutual onsite inspection, possibly through existing systems of satellites over each others territory. (NYT, 7/27/68, 1)
- . Army Electronics Command had produced new battery-operated nuclear clock which would gain or lose only one second every 3,000 yr. It would be used by USA, NASA, USAF, and USN primarily in aviation-electronic systems and had potential use in U.S., U.K., Canadian, and Australian digital communications systems. (AP, NYT, 7/28/68, 30)

July 28: JPL astronomers Dr. Richard M. Goldstein and Dr. Shalhav Zohar had located and mapped three rugged sectors on northwest face of Venus using Goldstone Tracking Station's 210-ft antenna. Beta, most clearly defined, appeared roughly circular with 150-mi dia and 17,000-sq-mi area. Two other irregular features almost as large had appeared on radar map which covered triangular area of estimated 160,000 sq mi, equal to area of northeastern U.S. Dr. Goldstein inclined to theory that prominences were mountains, but he had not yet been able to measure their heights. "We know these features are permanent," he said, "because they have appeared on all our tests" for past six years. (JPL Release BB-483)

- . German scientist Dr. Otto Hahn, who had won 1944 Nobel Prize for chemistry for his 1938 discovery of nuclear fission, died at Goettingen, Germany,

July 28 (continued)

of heart failure at age 89. He had been consistent opponent of use of atomic weapons, urging scientists to concentrate on peaceful uses of nuclear energy. (UPI, W Post, 7/29/68, B4)

July 28-August 3: Australian astronomers using Mills Cross antenna array at Univ. of Sydney had detected first two pulsars to be found in southern sky. They brought to nine total pulsars discovered to date. Their pulse rate of once every 0.56 and 1.96 sec, respectively, was similar to all others, which ranged between 0.25 and 2 sec. Cornell Univ. astronomer, Dr. Yervent Terzian, had observed that two-second pulse rate made it appear unlikely that pulsating neutron stars could account for the signals. Calculations indicated that, if they were quivering, or "ringing" like a bell, it should be at much shorter intervals than those observed. Pulse rates were more compatible, he said, with proposal that they emanated from white dwarfs, "cinders" of stars that had consumed their nuclear fuel but were larger and less dense than neutron stars. (Sullivan, NYT, 8/8/68, 30)

July 29: Aviation Week reported that anticipated \$100-million cut in FY 1969 funding could halt contractors' work on USAF Manned Orbiting Laboratory (MOL) in September, with slippage of flight schedule into 1972. Boeing Co. was working on new launch vehicle at NASA's Michoud Assembly Facility under Project Scrimp. Booster would be vehicle 75 ft in dia and 80 ft high and use TRW engine based on Boeing lunar module ascent engine experience, with 2-million-lb operational thrust--although USAF had not decided to abandon Titan III-M as launch vehicle. (Av Wk, 7/29/68)

- . House passed H.R. 18785, military construction appropriations bill for FY 1969, which included \$263.3 million for Sentinel ABM facilities. It had rejected by vote of 106 to 37 a motion to delete missile funds. (CR, H7710-35; Crowther, B Sun, 7/20/68, A5; AP, NYT, 7/30/68, 62)
- . Aviation Week reported that DOD concern over advanced U.S.S.R. tactical fighters [see June 10]--particularly new Soviet mach 2.8 MiG-23 (Foxbat)--might result in approval of long-delayed USAF and USN projects including USN VFX-1 and follow-on VXF-2 interceptors for fleet defense, USAF FX air superiority fighter, and USAF/Lockheed F-12 interceptor. USAF originally had wanted next-generation continental defense interceptor force composed entirely of F-12s but would accept mixed force of F-12s and modified Convair F-106 interceptors designated F-106X. Faster, longer-range F-12 would be used to intercept enemy bombers well

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July 29 (continued)

beyond U.S. shores; F-106Xs would be used to intercept and divert bombers which survived F-12 screen. (Av Wk, 7/29/68)

- . Panel of scientists testified before House Committee on Science and Astronautics symposium on unidentified flying objects (UFOs) in unanimous support of further, more detailed UFO research. Northwestern Univ. astronomer Dr. J. Allen Hynek said U.S. should seek U.N. cooperation in setting up "international clearing house" for scientifically-respectable UFO reports because there was almost a total lack of quantitative data about the phenomenon. Cornell Univ. exobiologist Dr. Carl Sagan told Committee it was not inconceivable that there were other planets with civilizations and technologies more advanced than earth's, but he cautioned against a widespread UFO investigation program which would require "some harder evidence than is now present," thus being expensive.

Computer Science Corp. mathematician and celestial mechanics specialist, Dr. Robert L. Baker, Jr., revealed space-based sensor system operated from Colorado Springs Air Defense Command Hq. had received several anomalous UFO alarms that had not been explained by natural phenomena, equipment interference or malfunction, or man-made space objects. Dr. James A. Harder, Univ. of California at Berkley engineer, suggested that power which permitted UFOs to undertake their reportedly incredible maneuverings might depend on a theoretically possible "second gravitational field" interacting with electrical field in a manner corresponding to reaction between conventional electrical motors and generators.

Panel, which Dr. Sagan said was "plagued by a shortage of those who disbelieve" in UFO phenomena, also included Univ. of Illinois sociologist, Dr. Robert L. Hall, and Univ. of Arizona meteorologist, Dr. James E. McDonald. (Transcript; Lyons, NYT, 7/30/68, 10; Lannan, W Star, 7/30/68, A3)

- . DOD announced one-year appointment of Dr. John C. Fisher, Manager of Programs and Systems, General Electric Research and Development Center, as USAF Chief Scientist, effective Aug. 1. He would succeed Dr. Robert H. Cannon, Jr., who would return to Stanford Univ. as professor of aeronautics and astronautics. (DOD Release 702-68)
- . NASA had extended, for \$29,130,524, one-year contract with Trans World Airlines, Inc., for installation support services at KSC, bringing total of cost-plus-award-fee contract to \$101,017,194. (KSC Release KSC-364-68)

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July 30: U.S.S.R. launched Cosmos CCXXXIV from Baikonur Cosmodrome into orbit with 295-km (183.3-mi) apogee, 208-km (129.2-mi) perigee, 89.5-min period, and 51.8° inclination. Equipment was functioning normally. Satellite reportedly softlanded in its home territory Aug. 5. (GSFC SSR, 7/31/68; 8/15/68; SBD, 7/31/68, 129; AP, NYT, 7/31/68, 3; 8/7/68)

- . NASA announced addition of \$35,048,000 to contract with General Electric Co. for continuation of design, fabrication, and testing of four remaining Biosatellite spacecraft, associated experiment hardware, and aerospace ground equipment--bringing total value of contract to \$136,662,157. (NASA Release 68-136)
- . Cone-shaped instrumented payload of French Veronique rocket released at 114-mi altitude fell into Atlantic 164 mi off French Guiana and was swept away by currents, French National Space Center announced. (Reuters, W Post, 7/31/68, A14)
- . NASA announced that Bernhardt L. Dorman had resigned as Assistant Administrator for Industry Affairs to return to Aerojet General Corp. He would be succeeded Aug. 5 by Philip N. Whittaker, Vice President of IBM Federal Systems Div. (NASA Release 68-137)
- . USAF Space and Missile Systems Organization issued Lockheed Aircraft Corp. \$2-million initial increment to \$4,131,785 cost-plus-fixed-fee contract for reentry vehicle technology and observables program. (DOD Release 706-68)

July 31: NASA issued Apollo Status Summary: Apollo 7 prime crew, Astronauts Walter M. Schirra, Jr., Donn F. Eisele, and R. Walter Cunningham, successfully completed nine-hour test in spacecraft in KSC altitude chamber July 26 at 226,000-ft simulated altitude, with cabin pressurized first with 60% oxygen and 40% nitrogen, then with 100% oxygen at 5 psi, normal orbital atmosphere. Astronauts Thomas P. Stafford, John W. Young, and Eugene A. Cernan had completed successful manned altitude test in KSC chamber July 29 with cabin pressurized with 60/40 mixture at start and oxygen to replenish atmosphere during test. Saturn IB launch vehicle stages were mated at Complex 34 with sequence malfunction tests scheduled for Aug. 1. Propellant utilization system modifications had been completed on 2nd stage.

In Apollo/Saturn 503 program, Lunar Module 3 ascent and descent stages were being modified to correct radar lock-on problem in

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July 31 (continued)

rendezvous radar subsystem. Saturn V launch vehicle 1st and 2nd stages were mated, with pogo suppressor modification kits on 1st stage being verified. Third stage propulsion subsystem checks were in progress. Engine leak checks would be conducted on stage during week. In Apollo/Saturn 504 program, launch vehicle 2nd stage was undergoing augmented spark igniter propellant feed line modifications. Six-minute captive firing of fifth Saturn V 2nd stage, postponed because of difficulties with liquid hydrogen vent valve, had been rescheduled for Aug. 1 at Mississippi Test Facility. Twelfth Saturn IB booster stage was scheduled to leave MSFC for Michoud Assembly Facility Aug. 6 for post-static checks and storage.

In South Atlantic Anomaly Probe, computer analysis had confirmed radiation levels presented no hazard to low-altitude manned Apollo orbital flights. (Text)

- . Nike-Tomahawk sounding rocket launched from NASA Wallops Station carried Univ. of Maryland and Johns Hopkins Univ. experiments to 186-mi (300-km) altitude to investigate role of electrons in producing day airglow. Rocket and instrumentation--which included five-wavelength filter-wheel photometer with special sunshade, 3- to 800-ev electron spectrometer, and electron retarding-potential analyzer--performed satisfactorily. Data correlating ionospheric electron density distribution with day airglow emissions in ionosphere were obtained. (NASA Rpt SRL)
- . NASA announced award of \$31,270,300 contract to General Electric Co. for continuance of general support services at Mississippi Test Facility through September 1969, bringing total value of basic contract to \$190,810,713. (MSFC Release 68-170)
- . Dr. Henry J. Reid, former Director and Senior Staff Associate at NASA Langley Research Center died in Gloucester, Va., after heart attack at age 72. He had become LaRC Director in 1926 and retired in June 1961, after 34 yr continuous service. (AP, W Post, 8/1/68, B10)

During July: Ralph Kinney Bennett in Data scored U.S. complacency in year which might "see some of the greatest Soviet space spectacles of the decade." In U.S., he said, early glamour of space race had faded and NASA projects were neither as ambitious nor as well-funded as they once were. In contrast, he noted, U.S.S.R. showed signs of "a new spurt of activity, new technical accomplishments above our

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During July (continued)

planet, an accelerated assault on the moon and dark rumblings of advanced military uses of the threshold of space. The time for a Soviet resurgence could hardly be better.

"...Soviets are badly in need of a great techno-propaganda feat to reassert their influence on world public opinion.... Soviet hold on European satellite nations had shown evidence of advanced erosion. Their position in relation to the rest of the communist world is no longer clearly defined." Soviets were spending estimated \$9 billion a year on space and half that sum went toward military applications of space technology. "There is an American attitude...of waiting until you get burnt before you shed complacency. When Sputnik I burnt us, we came back with a vengeance. Now complacency has set in again. Perhaps we will feel the fire from the Soviets in space before this year is out and react accordingly. But in space technology...it's a tough way to play the ball game." (Data, 7/68)

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