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J U L Y 1 9 6 9

July 1: Apollo 8 Astronaut Frank Borman and family flew from New York for nine-day tour of U.S.S.R. Institute for Soviet-American Relations in Moscow had extended invitation through Soviet Embassy in Washington, D.C. Itinerary included Moscow, Leningrad, Novosibirsk, and Crimea. (W Post, 7/1/69, A15; AP, W Star, 7/1/69, A4)

Preliminary investigation had revealed leak in small fuel line on Saturn V 1st stage (S-IC-II) No. 3 engine had caused June 26 fire, MSFC announced. Board had been convened to conduct further investigations and recommend preventive measures. Stage's No. 3 and No. 5 engines would be replaced; other three engines received minor damage and would be repaired in place. Accident would not affect launch preparations for Apollo 11 mission; inspection of Apollo 11 vehicle SA-506 had confirmed that its high-pressure fuel lines were in good condition. (MSFC Release 69-156)

North American Rockwell Corp. consolidated its Rocketdyne Div. and Atomics International Div. into new Power Systems Divs. headed by Jay D. Wethe, Vice President of Aerospace and Systems Group. (NAR Release N-14)

U.K. Defense Ministry said it had transferred its nuclear strike force from delta-wing bombers to Polaris submarines. Seven eventually would be brought into service. (Reuters, B Sun, 7/2/69, A2)

July 2: European Launcher Development Organization (ELDO) attempt to place Italian ELDO F-8 spacecraft into polar orbit from Woomera Rocket Range failed when West German 3rd stage of Europa booster malfunctioned. U.K. 1st stage and French 2nd stage performed satisfactorily. (SBD, 7/16/69, 14; AP, W Star, 7/3/69, A3)

Preliminary countdown demonstration test (CDDT) for July 16 Apollo 11 launch was successfully completed at KSC. Except for 3-hr 18-min hold during which technicians repaired leaky fuel valve, 5½-day test had run smoothly. (AP, B Sun, 7/3/69, A4)

Unofficial Communist sources said U.S.S.R. would launch unmanned Luna spacecraft July 10, which would attempt to scoop up lunar sample and return it to earth, Associated Press reported. Sources said launch would be third attempt to conduct successful mission; first had reportedly exploded on launch pad at Baikonur in early April, and second had exploded in flight June 14, when 2nd stage ignited. One source said Soviet space officials were "very disturbed over the success of the American Apollo program. Losing the moon race will be a terrible blow to them." (B Sun, 7/3/69, A1)

July 2: Cosmonauts Gherman S. Titov, Konstantin P. Feoktistov, and Georgy T. Beregovy were among Soviet officials who met Astronaut Frank Borman and family on arrival at Moscow's Sheremetyevo Airport at start of nine-day U.S.S.R. visit. Asked if Soviet cosmonaut might visit U.S., Borman said; "I'm sure that will be discussed. Cooperation in space activities is an important aspect of the space program." Bormans breakfasted in Moscow and returned to airport for flight to Leningrad. Schedule called for visit to Vzyozdni Gorodok--Star City--where cosmonauts lived and to space communications center in Crimea; nothing in program indicated visit to U.S.S.R. launching center at Baikonur in Kazakhstan. (AP, W Star, 7/2/69, A14)

Time-Life, Inc., would pay minimum of \$400,000 for exclusive book rights of lunar landing story to combine established by NASA astronauts in 1959, Don Kirkman said in Washington Daily News. Money would be split equally into 60 shares for 52 active astronauts and widows of eight deceased. (W News, 7/2/69, 7)

NASA announced award to Bendix Field Engineering Corp. of \$30 million, one-year, cost-plus-award-fee contract extension for operation and maintenance of major portion of Manned Space Flight Network. Extension was third exercised under option and brought total funding to \$139,215,832. (NASA Release 69-100)

July 3: Apollo 11 booster, spacecraft, and Astronauts Neil A. Armstrong, Michael Collins, and Edwin E. Aldrin, Jr., completed final countdown rehearsal test. Astronauts achieved simulated liftoff at 9:32 am EDT--exact time of scheduled July 16 launch. Final countdown for manned lunar landing mission would begin July 10. (AP, B Sun, 7/4/69, A10)

Apollo 11 astronauts would leave three items on lunar surface to commemorate landing, NASA announced. Silicon disc; 1½-in-dia, would carry statements by Presidents Eisenhower, Kennedy, Johnson, and Nixon; messages of goodwill from leaders of 73 countries; list of leaders of Congress and members of four Congressional committees responsible for NASA legislation; and names of NASA's top management, past and present. Statements, messages, and names had been etched on disc by process used to make microminiature electronic circuits. Each message had been reduced 200 times, to barely visible dot.

Three- by five-foot nylon American flag with tubing along top edge would be erected on eight-foot aluminum staff on airless moon. Two other U.S. flags and flags from 136 nations and 50 U.S. states would be carried to moon and returned to earth. Plaque on LM descent stage

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July 3 (continued)

would bear images of two hemispheres of earth and inscription, "Here men from the planet earth first set foot upon the moon July 1969, A.D. We came in peace for all mankind." It would bear names of Apollo 11 crew-- Astronauts Neil A. Armstrong, Edwin W. Aldrin, Jr., and Michael Collins-- and President Nixon. (NASA Releases 69-83E, 69-83F, 69-83H)

At Leningrad news conference during U.S.S.R. tour, Astronaut Frank Borman said he hoped U.S. and Soviet spacemen would fly together in joint mission by mid-1970s. (Reuters, W Post, 7/4/69, A3)

Editorial in Washington Post entitled "Our Man on the Moon" criticized White House decision to leave on moon plaque on Apollo 11 LM descent stage with signature of President Nixon: "The proposed plaque would state that 'we came in peace for all mankind.' That message, together with the names of the three brave men who made the voyage would seem to us to be enough." Editorial erroneously cited April 1968 article by NASA Historian Eugene M. Emme, "Historical Perspectives on Apollo," saying that nowhere did Mr. Nixon's name appear. Name did appear with reference to post-Sputnik statements in October 1957 and to promises of lunar landing by 1971 in 1960 election campaign. (W Post, 7/3/69, A14; Journ of Spacecraft and Rockets, 4/68, 369-81)

Apollo 11 might signal end to KSC area's economic boom, Wall Street Journal said. NASA had announced slack in Apollo launchings and cut in KSC employment from 23,500 to 18,500 persons. Brevard County (site of KSC) housing construction had fallen some 40%, from 3,438 units in 1967 to 2,080 in 1968, and was currently down another 40%. Amount of money drawn against checking account deposits in county rose only 1% in first five months of 1969, contrasting with 17% rise for all of Florida. (Prugh, WSJ, 7/3/69, 28)

Message from President Nixon was read at opening of summer session of 18-nation Disarmament Committee in Geneva; "...draft agreements have been submitted by the United States and by the Soviet Union to prevent an arms race on the seabeds. Although differences exist, it should not prove beyond our ability to find common ground so that a realistic agreement may be achieved that enhances the security of all countries.... Our goal should be to present a sound seabed arms control measure to the 24th General Assembly of the United Nations." (PD, 7/7/69, 929-30)

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July 3: At Paris press conference Sud-Aviation President Henri Ziegler denied reports that France was dropping Concorde supersonic transport project for economic reasons. Milan aerodynamic system developed for Mirage supersonic fighter-bomber was being tested on French prototype. It consisted of two small nose wings which shortened takeoff and landing runs and retracted in flight to reduce resistance. (NYT, 7/5/69, 28)

July 4: NASA officials ordered technicians to repaint Saturn V 3rd stage (S-IVB) after they discovered old coating had begun to peel. Thermal paint would help protect super-cold hydrogen fuels from sun's heat. Repainting of stage, scheduled to boost manned Apollo 11 spacecraft toward moon July 16, would not affect launch date. (AP, W Star, 7/5/69, A13)

At U.S. Embassy Independence Day Party in Moscow, Apollo 8 Astronaut Frank Borman signed autographs with Cosmonauts Gherman S. Titov, Georgy T. Beregovoy, and Konstantin P. Feoktistov. Among 1,000 persons attending reception given by U.S. Ambassador Jacob D. Beam were Vasily V. Kuznetsov, U.S.S.R. First Deputy Foreign Minister, and Mikhail P. Georgadze, Secretary of the Presidium of the Supreme Soviet. They were highest ranking Soviet officials to attend annual July 4 reception since 1964 attendance of Nikita S. Khrushchev as head of government and Communist Party. (Clarity, NYT, 7/5/69, 28; AP, B Sun, 7/5/69, A2)

Dr. Lee A. DuBridge, Presidential Science Adviser, addressed Independence Day celebration at Dearborn, Mich.: "For untold millions of years the human animal was chained to the earth. Sixty years ago he found a way of soaring into its atmosphere. Ten years ago he learned to break the chains of gravity and to soar out into space. This month the first man will set foot on another world. Later this month two spacecraft will reach Mars and send back new information about that Planet. Americans will have no reason to be ashamed of their nation on those days. Is it worth while? Is it worth while to lift the spirits of millions of human beings? If not, what else is worth while?"

Developing lunar landing technology was relatively easy. "The laws of nature which made it possible have been well known for a long time. The engineering skills required...were available and were brilliantly organized. Hundreds of thousands of Americans worked together to make this dream come true. They had faith and they had hope.

July 4 (continued)

"The problems of our cities and the other social problems which beset us are not all that easy. In this area human beings are not working together but are in conflict. We find that we do not yet know the cause of these troubles nor do we yet have the mechanisms for curing them. Hence we must study, we must experiment, we must try and we will often fail.... And we shall learn from our failures. (Text; CR, 7/29/69, E6415-7)

Analysis of lunar surface would provide key to earth's history by indicating whether moon's origin was catastrophic or noncatastrophic, Dr. H. Alfvén and Dr. G. Arrhenius of Univ. of California at San Diego said in Science. Radiometric dating of igneous lunar rocks might provide information on time of their solidification. If catastrophic alternative was correct, rocks should date to less than 4.5 eons, minimum age of moon, and predominant age should be approximately 0.7 eon, with major surface and subsurface features less than 0.7 eon. If noncatastrophic alternative proved correct, predominant age of lunar rocks should exceed 4 eons, at least, since it was likely moon predated earth. (Science, 7/4/69, 11-7)

Japanese freighter had been hit by wreckage of Soviet spacecraft, Japanese diplomats reported to five Western delegations on legal subcommittee of U.N. Committee on Outer Space meeting in Geneva. June 5 damage to Dai Chi Chinel while outside territorial waters and near Siberian coast had previously been attributed to unidentified object. It was believed to be first authenticated case of terrestrial damage caused by falling space objects. (Hamilton, NYT, 7/5/69, 28)

July 5: Apollo 11 Astronauts Neil A. Armstrong (commander), Edwin E. Aldrin, Jr. (LM pilot), and Michael Collins (CM pilot) held press conference at MSC. Astronauts were seated 50 ft from nearest newsmen and were partially enclosed in plastic booth as part of plan to limit crew's contacts during 21 days immediately preceding flight and prevent development of illness. Collins told press that from CM viewpoint, Apollo 11 should not be very different from previous manned Apollo missions. Only major differences would be inclusion of sleep period in his one-day solo flight around moon in CM and possibility of different CSM/LM rendezvous sequences since LM would be stationary on lunar surface. Collins said he did not feel "slightest bit frustrated" about going to moon without landing on it: "I'm going 99.9...percent of the way there, and that suits me

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July 5 (continued)
fine."

LM flight plan would pick up where Apollo 10 left off with phasing maneuver, Aldrin explained. There would be number of "firsts": "the ultimate test," actual touchdown; 1/6 g environment; new thermal conditions; two-man EVA on lunar surface; sleeping in LM on moon; star sighting technique with alignment telescope on lunar surface; and powered ascent from moon with seven-minute engine burn. One of important early activities after exiting from LM on moon would be determining best pace for moving about: "...there have been several different techniques employed in the partial zero gravity training. And, it looks like you can walk conventionally one foot after another. It also looks as though you can do a two-footed hop--Kangaroo style." In training in aircraft flown at 1/6 g, "a fairly rapid pace" appeared quite easy to perform. "It looks like we shouldn't have too much difficulty in moving at something like 6, 8, or 10 miles per hour."

In response to question on procedures during descent, Armstrong said crew would use "somewhat hybrid methods of manual and automatic. The predicted method at this point, although we have a great deal of flexibility and choice, based on the situation at the time, would be to maintain manual control of attitude and automatic control of throttle through the final descent from an altitude of somewhere between 500 and 1000 feet until such time as the automatic throttle rated descent was unsatisfactory, at which time we'll go full manual on the throttle...flying it in a manner like a normal VTOL machine would be flown."

Code names for CM and LM had been selected as "representative of the flight, the nation's hope," Armstrong revealed. LM would be called "Eagle" for U.S. national emblem, and CM would be called "Columbia" for U.S. symbol, statue on top of Capitol, and Jules Verne's fictional spacecraft, "Columbiad," which flew to moon 100 yrs ago. (Transcript; O'Toole, W Post, 7/6/69, A1)

- Bonny, pig-tailed monkey launched on board NASA's Biosatellite III June 29, was showing marked decrease in interest and efficiency. Although he was still in satisfactory physical condition, Bonny was becoming much less energetic and was consuming less food and water. (AP, W Star, 7/5/69, A3; W Post, 7/5/69, A6)
- Apollo 10 commander Thomas P. Stafford received Flying Tiger Pilot Trophy, presented every two years by Flying Tigers, group of World War II veterans. Trophy was presented during 27th reunion in Ojai, Calif. (AP, W Star, 7/7/69, A2)

July 5-6: In Moscow Apollo 8 Astronaut Frank Borman placed wreaths at tombs of Vladimir I. Lenin, founder of Soviet state; rocket designer Sergey Koroley; and Cosmonauts Yuri A. Gagarin and Vladimir M. Komarov. Later he placed wreath at tomb of Soviet Unknown Soldier.

Borman and family visited Star City, home of cosmonauts outside Moscow, where he presented color film of Apollo 8. Cosmonauts presented Borman with model of Vostok I, first manned spacecraft. Later Borman toured major space tracking station at Eupatoria near Yalta in Crimea. (AP, W Star, 7/5/69, A13; UPI, W Star, 7/7/69, A2)

July 6: NASA's Mariner VI (launched Feb. 24) and Mariner VII (launched March 27) were performing well and had traveled 41 million mi and 39 million mi from earth. Mariner VI, scheduled for July 31 flyby, was 9 million mi from Mars; Mariner VII, scheduled for Aug. 5 flyby, was 11 million mi from Mars. (NASA Release 69-102)

Dept. of Commerce announced it had successfully tracked free-drifting buoy in deep ocean with satellite telemetry in test off east Florida coast. Navigational data were relayed via satellite to GSFC for processing. Experiment proved ocean currents could be traced accurately and atmospheric and oceanographic data could be obtained from sensors on drifting buoy and transmitted with navigational information from remote regions of world. (ESSA Release 69-41)

In Washington Sunday Star, David Van Praagh discussed President Nixon's planned Asian tour, to follow mid-Pacific recovery of Apollo 11 crew. "Assuming the moon landing and takeoff are a success, Nixon will then find in Manila, Jakarta, Bangkok, New Delhi and LaHore--if he has time to look around in the day or two he'll spend in each place--that the problems of this planet's most populous continent present a striking contrast. They are not subject to quick, rational, scientific or dramatic solutions. Usually they can not even be tackled through modern communications. The vast majority of Indians and Pakistanis for example, can't read or write and do not own a tiny transistor radio or TV set to monitor the Pacific splashdown. They live in a rather backward age and most of them are hungry." (W Star, 7/6/69, D14)

July 7: U.S. News & World Report published interview with Dr. Thomas O. Paine, NASA Administrator. Apollo 11 lunar landing would be "culmination of America's satisfying everyone that it is indeed the leading technological nation that it thought it was before Sputnik blazed

July 7 (continued)

across the skies." U.S.S.R. would continue to put great stress on space and move ahead steadily. "...there's always the danger that we may feel we can relax now--having attained the lunar goal--and perhaps slack off. ...if we were not to start new programs now, I think the situation might well reverse and the Soviets might once again develop superior technological capabilities in space." Space technology could affect future defense posture. "...in the past, wherever man has flown farther and higher and faster, wherever he has developed new capability to observe from higher areas, to carry out operations in new media, this has had a major effect on the equations of international power. We're quite confident that this will probably be true again in space." Application of space to defense area was DOD's job. "We do not consider Apollo applications as any kind of substitute for MOL."

Journey of man to another solar system was "completely out of the realm of possibility" for next generation; "but in the more distant future, if it were ever possible...to control the energy of nuclear fusion and adapt it in some efficient way to the propulsion of spacecraft, it might be possible to think in terms of longer voyages to another star." Fundamental breakthrough would have to be made.

Chance that life existed in other solar systems seemed "absolutely 100 per cent." (US News, 7/7/69)

- . White House announced President Nixon had canceled plans to dine with Apollo 11 astronauts July 15, eve of launch. MSC Director of Research and Medical Operations, Dr. Charles A. Berry, had expressed concern that crew might catch earthly illness from President, which could complicate lunar landing mission. (AP, B Sun, 7/8/69)
- . Apollo 11 lunar samples would not be first moon material to reach earth and to undergo scientific examination, Los Angeles Times quoted Dr. Dean R. Chapman, Chief of ARC Thermo and Gas-Dynamics Div., as saying in interview. Tekites--molten pieces of lunar surface in form of chunks of black glass--had fallen to earth when meteorites struck moon with tremendous force. Most recent tektite shower had occurred 700,000 yrs ago. While tektites' origin was matter of scientific dispute, Dr. Chapman believed most commonly held theory--lunar origin. In working out shower's trajectory, he had determined tektites came from Tycho crater on moon's southern hemisphere. He believed Tycho to be 700,000 yrs old and that crusts of earth and of moon were intimately related. (Getze, LA Times, 7/7/69)

July 7: Newsweek's 42nd space age cover story since October 1957 contained comments from "opinion makers" on Apollo 11 mission.

Dr. Robert Jastrow, Director of NASA's Goddard Institute for Space Studies, said scientific basis for mission was to discover secret of earth's past through study of lunar rocks. Resolution of "cold moon" versus "hot moon" theory controversy--whether moon either was formed cold, or cooled off shortly after its birth, or was like earth molten or partly molten inside with volcanic surface--"may ride with Apollo 11."

Southern Christian Leadership Conference President, the Rev. Ralph D. Abernathy, said: "A society that can resolve to conquer space; to put man in a place where in ages past it was considered only God could reach; to appropriate vast billions; to systematically set about to discover the necessary scientific knowledge; that society deserves both acclaim and our contempt...acclaim for achievement and contempt for bizarre social values. For though it has the capacity to meet extraordinary challenges, it has failed to use its ability to rid itself of the scourges of racism, poverty and war, all of which were brutally scarring the nation even as it mobilized for the assault on the solar system."

Anthropologist Dr. Margaret Mead said: "This can be a first step, not into space alone, but into the disciplined and courageous use of enhanced human powers for man, enobled as he is today, as the first men step on the moon."

Philosopher Lewis Mumford said: "Space exploration...is strictly a military by-product; and without pressure from the Pentagon and the Kremlin it would never have found a place in any national budget." Best hope was "that this colossal perversion of energy, thought and other precious human resources may awaken a spontaneous collective reaction sufficient to bring us down to earth again. Any square mile of inhabited earth has more significance for man's future than all the planets in our solar system." (Newsweek, 6/7/69, 3, 60-1)

Original equipment of field-sequential color TV system which would be used by Apollo 11 to transmit pictures from moon [see April 5] was presented to Smithsonian Institution by inventor Dr. Peter C. Goldmark, President of CBS Laboratories. Apollo 11 would carry three-pound miniaturization of system in Westinghouse camera. (Schaden, W Star, 7/8/69, B1)

DOD announced award of \$356,713,045 fixed-price contract to McDonnell Douglas Corp. for F-4 Phantom II high-performance jet fighter aircraft for USN and USAF use. (DOD Release 568-69; AP, W Post, 7/8/69, A15)

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July 7-8: NASA terminated Biosatellite III mission to determine long-term effects of weightlessness on living organisms when Bonny, pig-tailed monkey on board, registered extremely low metabolic state and refused to drink water after receiving 10 emergency water commands. Spacecraft had been scheduled to remain in orbit 30 days after launch June 29, but monkey's condition--as indicated by steadily lowering body temperature, reduced heart rate, shallow breathing, substantial periods of sleep during day, and general sluggishness--had declined steadily for several days.

Spacecraft separated and parachute deployed successfully, but spacecraft reentered 100 mi downrange from expected point and recovery aircraft was unable to retrieve it in midair as planned. Capsule was recovered from Pacific off coast of Kauai at 7:36 pm EDT, minutes after splashdown, and flown to Hickam AFB, Hawaii, laboratories, where monkey was removed from capsule immediately and given intensive care. Without prior warning from changes in physiological parameters being recorded, Bonny died suddenly at 6:04 am EDT July 8.

Autopsy performed shortly after death suggested deterioration in health had been caused by heart failure brought about by weightlessness and lower-than-normal body temperature. Detailed analyses of data would be made during next six months and formal report would be issued after Jan. 1, 1970. Despite curtailed length of mission, experimenters expected significant results. (NASA Proj Off; ARC Astrogram, 7/17/69, 1)

July 8: Rep. John V. Tunney (D-Calif.) introduced H.J.R. 810, "designating the day which man lands on the moon, and the anniversary of that day each year thereafter as a national holiday to be known as 'Space Exploration Day.'" Resolution was referred to House Judiciary Committee. (CR, 7/8/69, H5725)

CBS Enterprises Inc. announced first agreement for regular satellite transmission of news stories had been reached with CBS Newsfilm subscribers in Australia and Japan. It would eventually lead to daily, instantaneous, intercontinental transmission of TV news by satellite, company said. (CBS Enterprises Release, 7/8/69)

July 9: Apollo 8 Astronaut Frank Borman met in Moscow with Mstislav V. Keldysh, President of Soviet Academy of Sciences, and spent 40 min with U.S.S.R. President Nikolay V. Podgorny in talk which Borman said was "encouraging and beneficial" in efforts to achieve U.S.-U.S.S.R. co-operation in space. (AP, W Post, 7/10/69, A23)

July 9: Apollo Program Management: Staff Study was submitted to House Committee on Science and Astronautics by Subcommittee on NASA Oversight. It identified key concepts contributing to successful evolution of NASA-industry management team and areas where additional studies would be useful in application of its expertise. Key factors included clear definition of primary objective, monitoring and auditing systems that allowed vertical and horizontal information flow, refinement in program control techniques using incentive contracts, correlation and definition of multiple-program interfaces by use of systems-oriented staff groups, real-time and flexible management reporting system, and balance between governmental, in-house capability and industrial capability. Study concluded that detailed analysis of applicability of Apollo management techniques and philosophies required "same critical analysis as was applied within the Apollo program." (Text)

- . Die proof of 1.05- by 1.80-in 10-cent air mail stamp commemorating "First Man on the Moon," attached to envelope, would be carried by Apollo 11 and canceled on moon by Astronauts Neil A. Armstrong and Edwin E. Aldrin, Jr., Postmaster General Winton M. Blount announced. On return to earth, die would be used to produce commemorative stamps for August issue. Hand-canceled "Moon Letter" would undergo 21-day decontamination period at LRL and be returned to Post Office Dept. for display in Washington, D.C., and later throughout U.S. and abroad. Stamp was designed by Paul Calle, modeled by Robert J. Jones, and engraved by Edward R. Felver and Albert Saavedra. It depicted astronaut stepping from spacecraft onto lunar surface. (PO Dept Releases 107, P-37; W Post, 7/10/69, A13)

Some observers on earth might be able to see moon-bound Apollo 11 on two occasions, NASA announced. At 2:44:18 GET, exhaust plumes from S-IVB firing in parking orbit over Gilbert Islands in South Pacific would be visible to naked eye for several minutes over large part of sky. For several hours after translunar injection burn, CSM/LM, S-IVB, and four spacecraft-lunar-module-adaptor (SLA) panels would be visible through telescope to observers in U.S., Mexico, Central and South America, and western Africa. (NASA Special Release)

- . As NASA prepared for Apollo 11 lunar landing, space contractors, engineers, and scientists cited thousands of "space technology transfers," down-to-earth rewards from space program, Wall Street Journal said. Side benefits of U.S. space program ranged from medical innovations and safer highways to new management techniques, commercial products, and industrial tools. They included liferaft with bucket keel to prevent capsizing in rough water and inner tube that inflated automatically to keep craft afloat when outer skin was punctured, computer system to track down fathers

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July 9 (continued)

behind in child support payments, inertial navigation systems that were standard equipment on new 360- to 400-passenger Boeing 747, and thermal mapper developed for satellites, being used to seek oil formations, diagnose cause of sinking airport runways, and find sources of water pollution. Other space age spinoffs were plastic resin marketed as commercial laminates, adhesives, and coatings; devices to monitor internal stress in dams during earth tremors; data-processing techniques to record train traffic and to match power-generating capacities to demand; electromagnetic hammer that smoothed and shaped metal without weakening it; and luminous devices for aircraft exit signs, map reading, and gun sites. Medicine was benefiting from miniaturized electronic devices in cardiac pacemakers; remote-handling and manipulation equipment that had improved prosthetic devices like artificial limbs; space-helmet-like hoods to measure oxygen consumption while patient exercised; computer to provide sharper x-ray photos; liquid-cooled suits to lower temperatures; "sequenced-pulsation pressure suit" for possible use in assisting circulation in heart patients; and small battery-powered devices to transmit physiological data from arms of as many as 64 patients to single nurse at monitor console. (Tanner, WSJ, 7/9/69)

- . MSFC announced it would exercise option in existing contract with Computer Sciences Corp. to allow continued computer support services through June 30, 1970, at cost of \$6,081,887. (MSFC Release 69-157)

July 10: U.S.S.R. launched Cosmos CCLXXXIX from Plesetsk into orbit with 324-km (201.3-mi) apogee, 208-km (129.2-mi) perigee, 89.6-min period, and 65.4° inclination. Satellite reentered July 15. (GSFC SSR, 7/15/69; SBD, 7/15/69, 5)

- . Apollo 11 countdown began at KSC at 8:00 pm EDT in preparation for launch at 9:32 am EDT July 16. (Apollo 11 Status Rpt)
- . Four-stage Pacemaker rocket launched from NASA Wallops Station carried 58-lb instrumented payload to 65,000-ft altitude and reentered atmosphere at 7,000 mph. Primary objective was to evaluate performance of carbon phenolic, synthetic resin, as ablative material. Secondary objective was to evaluate performance of low-density ablative materials--pyronne foam, polymer blend, and phenolic nylon--for possible use on manned lifting-body reentry vehicles. (WS Release 69-12; WS PIO)

July 10: American Academy of Achievement presented 1969 Gold Plate "Man of Achievement" Awards to Dr. William H. Pickering, JPL Director, and to Apollo 8 Astronauts William A. Anders and Frank Borman. (LA Her-Exam, 6/19/69; AFJ, 6/21/69, 30)

. Sen. Spessard L. Holland (D-Fla.), for himself and Sen. Edward J. Guernsey (R-Fla.), introduced S.J.R. 133 "to redesignate the area in the state of Florida known as Cape Kennedy as Cape Canaveral." Measure was referred to Senate Committee on Interior and Insular Affairs. (CR, 7/10/69, S7819)

, National Geographic Society cartographer and "backyard stargazer" David Moore was one of few amateur astronomers selected by NASA to help nearly 200 professionals who had volunteered to attempt sightings of Apollo 11 spacecraft, Washington Evening Star said. Through telescope in yard of his Wheaton, Md., home he would watch for "small brilliant flashes when rocket engines are turned on or 'burned' or...when waste water is ejected from the spacecraft." In ejection, water froze instantly and resultant ice crystals flared in sunlight. NASA had credited Moore with one of few sightings of earthbound Apollo 10. (Radcliffe, W Star, 7/10/69, D2)

. Apollo 11 and current nationwide water shortage were "two illustrations of man's efficiency in achieving the thrills of life and man's inefficiency in not achieving the necessities of life," Drew Pearson said in Washington Post. "At Cape Kennedy, the United States is about to launch the most carefully rehearsed, most expensive, most unnecessary project of this century by which man will reach a piece of drab, radioactive, lava-like real estate hitherto romantic because of distance--the moon. The launching will succeed because a vast amount of money and the best scientific brains in America over a period of seven years have been lavished on this moon shot. Meanwhile, up the Atlantic Coast, the Capital which voted the \$20 billion to reach the moon is desperately short of the second essential to man's life--water--all because of lack of planning, lack of foresight, and lack of money--the same ingredients which have put the moon shot on the verge of success." (W Post, 7/10/69, F11)

July 11: Apollo 11 Astronauts Neil A. Armstrong, Michael Collins, and Edwin E. Aldrin, Jr., underwent last major preflight medical examination at KSC and were cleared for July 16 launch. (Apollo Status Rpt; UPI, W Post, 7/12/69, A4)

July 11: At Cape Kennedy press conference, Apollo 8 Astronaut Frank Borman termed "totally ridiculous" cancellation of President Nixon's dinner with Apollo 11 crew on eve of launch to avoid contaminating crew with presidential germs. He had delivered invitation to dinner to White House and President Nixon had accepted when MSC Medical Director, Dr. Charles A. Berry, criticized dinner [see July 7].

Borman said his talks with U.S.S.R. officials during recent tour had left him convinced they planned lunar landing soon but, "from the people on the subways to their president, all I heard was that they are wishing success for Apollo 11." (Greider, W Post, 7/13/69, A4)

NAS published Plan for U.S. Participation in the Global Atmospheric Research Program. It recommended five-year effort including Pacific test of global weather observing system and large-scale atmospheric study in 1973, series of small regional studies beginning in 1969 or 1970, and experiments to improve numerical models of atmosphere for computer forecasting, with continued development of computer 100 times faster than currently available. Total effort would require 10 yrs, with plans for second portion to be based on information gained during first 5 yrs.

Report, prepared by NRC committee, said developments in computers and satellites had made it possible "to advance toward the goal of accurate two-week forecasts and, eventually, toward intelligent modification of the weather." Use of satellites such as Nimbus III, launched April 14, and expansion of other observing systems made it technically and economically possible to provide adequate global observations for long-range forecasts. Recommended test of global observing system would require 2 satellites with advanced instrumentation, nearly 1,000 balloons, and 135 instrumented buoys. Simultaneous cloud-cluster study would require 12 additional aircraft, several ground stations; and computer facility. Participating Government agencies would be responsible for determining program costs. (Text; NRC Release)

- . NASA and USAF announced cooperative flight test program using two USAF YF-12A aircraft and spares, ground equipment, maintenance personnel, and base support at Edwards AFB, Calif. NASA would budget for and fund \$10 million for program through FY 1974. About \$4 million had been made available by completion of X-15 and XB-70 flight programs. USAF purpose in two-part program was to provide USAF with additional data on aircraft's operational factors, procedures, limitations, and possible bomber penetration tactics. NASA would seek data on altitude-hold at supersonic speeds, boundary layer noise, heat transfer under high speed, airframe-propulsion system interactions, and other performance and handling characteristics. (DOD Release 581-69)

July 11: MSFC issued RFPs for design, development, test, and delivery of four flight models of manned lunar roving vehicle. Four-wheeled, 400-lb vehicle would be carried to moon on board LM in 1971, to transport astronauts, tools, lunar samples, and other equipment and experiments. (NASA Special Release)

- . Emperor Haile Selassie of Ethiopia toured MSC during five-day visit to U.S. (Reuters, W Post, 7/10/69, A23; Apollo Status Rpt; NASA PAO)

July 12: NASA program of returning man from lunar landing was based on conclusion there was no risk, Stanford Univ. geneticist Dr. Joshua Lederberg said in Washington Post. "We could not mount an effective quarantine against a real peril of global infection unless we were prepared to sacrifice the astronaut, which is unthinkable." Arguments for zero risk were "quite persuasive"--lack of atmosphere on moon, "an absolutely necessary condition for life to flourish," and fact that earth had experienced lunar material samples from secondary meteorites. Main purpose of quarantine was "to protect the samples from earthly contamination--not altogether successfully, in view of the exhalations from the landing rocket and from the astronauts' space suits. It was then reasonable to add on whatever additional precautions against back-contamination were possible without impeding the mission." Project had helped show lunar arrangements would be "quite inappropriate to a real risk, for example a sample return from Mars." For Mars program, "we must learn a great deal more by instrumented observations left there, before we can begin to design the precautions needed for samples, or men, returned to earth." (W Post, 7/12/69, A15)

- . "Poor People's Campaign" Director, the Rev. Hosea Williams of Southern Christian Leadership Conference, said "hungry" people from five southern states would demonstrate at Cape Kennedy July 15 on eve of Apollo 11 launch and would try to get "as close as possible" to launch site with mules and wagons. "We're not against things like the space shot, but there's been a miscalculation in priorities." (Reuters, W Post, 7/13/69, A5)

- . NASA said Soviet Ambassador Anatoly F. Dobrynin had rejected U.S. invitation to watch Apollo 11 launch. U.S.S.R. originally had accepted, but Soviet Embassy in Washington said Dobrynin would be out of country. (AP, W Star, 7/13/69, A9)

July 12: USN reported eight-ship Soviet Naval fleet was heading south 25 mi east-southeast of Miami, Fla., on course that could provide view of Apollo 11 launch. U.S. carrier aircraft and destroyer escort Gary shadowed squadron, officially enroute to Havana for July 26 commemoration of Cuban revolution. (Homan, W Post, 7/12/69, A1; AP, W Post, 7/13/69, A5)

July 13: U.S.S.R. launched Luna XV unmanned spacecraft from Baikonur into selenocentric orbit to conduct "further scientific studies of the moon and near lunar space," Tass announced. Spacecraft was expected to reach moon late July 16--scheduled date of launch of NASA's Apollo 11 manned lunar landing mission. There was speculation that Luna XV was Soviet attempt to land spacecraft on moon and return it to earth with sample of lunar soil before U.S. did. (W Post, 7/14/69, A1; SBD, 7/18/69, 22; B Sun, 7/14/69, A1; GSFC SSR, 7/15/69)

Washington Sunday Star published Associated Press interview with Dr. Charles A. Berry, MSC Director of Medical Research and Operations: While 4,514 hrs of weightlessness endured by U.S. astronauts in space had produced no serious medical problems, on moon "we will be placing men in an entirely new environment." After four days of weightlessness, they would step onto surface where gravity field was 1/6 that of earth.

At Mission Control Center in Houston, Dr. Berry would be watching Apollo 11 astronauts' heart rate, oxygen consumption, and temperature of water that cooled spacesuits. Preflight physicals had enabled doctors to draw metabolic profile of each astronaut, including work capacity on earth at various heart rates, oxygen consumption, and body heat generated. "We know the heat production level which the portable life support system can handle without being overburdened. If it reaches that point for five minutes, we will tell the astronauts to stop and rest." Because of spacesuits' bulk astronauts would start with simple tasks and work up to tougher ones. Excitement could affect ability to sleep in four-hour rest period planned before lunar walk. "We might have to make a real-time decision on whether to give them a sleeping pill or perhaps a stimulant."

Apollo had taught one "amazing medical fact--that the loss of red blood cell mass apparently is caused by a pure oxygen atmosphere. Results of using mixed nitrogen-and-oxygen atmosphere in spacecraft since January 1967 Apollo fire had indicated nitrogen apparently protected cells. (Benedict, AP, W Star, 7/13/69, A9)

July 13: From summer residence, Castel Gondolfo near Rome, Pope Paul VI asked Christians worldwide to pray for Apollo 11 astronauts and said mission showed man was a "giant." (AP, B Sun, 7/14/69, A5)

At White House religious service the Rev. Paul H. A. Noren of Mount Olivet Church in Minneapolis led 300 people in prayer. "We ask Thy divine protection for our space pioneers who will soon make footprints on the moon." (AP, NYT, 7/14/69, 23)

New York Times editorial: "This is the week of the moon. The countdown is on at Cape Kennedy and, if all goes well, a week from today a manned vehicle will for the first time alight on another celestial body. ...all mankind will share in the exhilaration of discovery. Ever since man evolved he has been exploring, extending his domain over all parts of his planet. Now that insatiable curiosity is bursting its terrestrial bounds to provide our first personal knowledge of the nearest neighbor in the cosmos. It is an inspiring adventure, a testimony not only to man's imagination in amassing knowledge of nature, but to his courage, his perseverance and his indomitable spirit." (NYT, 7/13/69)

In Washington Evening Star William Hines said: "...Space Administrator Thomas O. Paine was dead right when he acclaimed Project Apollo as 'a triumph of the squares.'" While word "square" was in disrepute, "you will find no umbrage taken by the clean-cut stars of this week's cosmic drama if you called them squares. They are, and probably proud of it. There was no fight from Neil Armstrong when Congress told him to plant an American flag on the surface of the moon.... The Apollo program is not only run by squares, but for squares, as well; its thrills and glories appeal to the vast majority of Americans who, at the bottom, are just as square as any Armstrong on Earth--Jack or Neil or any other." (W Star, 7/13/69, D2)

Wing of Lockheed C-5A static test specimen cracked during stress tests at point below aircraft's contract specifications but above its design limit. USAF later said cause of crack was overloading of wing area where spar attached to lower rear beam cap; it would not require extensive redesign. It was first major performance failure reported for C-5A. Contractor was planning modification and retesting of static specimen. (USAF Memo 8/18/69; W Post, 7/15/69, A2)

July 14: Apollo 11 Astronauts Neil A. Armstrong, Michael Collins, and Edwin E. Aldrin, Jr., appeared in nationally televised press conference. Interview with four newsmen was conducted over closed-circuit TV, with astronauts at KSC and press 15 mi away. TV cameramen allowed in auditorium with crew had undergone thorough medical examinations.

July 14 (continued)

Armstrong, mission commander, said that after decade of planning and hard work astronauts were "willing and ready to attempt to achieve our national goal. This is possible because very many Americans across the nation have dedicated themselves to quality craftsmanship and ingenuity."

In response to question on astronauts' attitudes toward mission, Armstrong said fear was not unknown, but added: "Fear is characteristic particularly of a knowledge that there may be something that you haven't thought of and feel that you might be unable to cope with. I think our training and all the work that goes into the preparation for a flight does everything it can towards erasing those kinds of possibilities and I would say that as a crew we...have no fear of launching out on this expedition." (Wilford, NYT, 7/15/69, 1, 20)

Chances of U.S.S.R.'s Luna XV successfully returning to earth with lunar sample were small because of complexity of operations required, NASA Associate Administrator for Manned Space Flight, Dr. George E. Mueller, told KSC Center Directors' Briefing. Landing, deploying equipment, collecting and storing samples, and then lifting off "are not simple things to do...and doing it remotely is more difficult than doing it with men in space. I don't think by any means impossible, but...the chances of being able to carry it out on the first mission are relatively low compared to the kind of probability that we would associate with our own landings."

If Luna XV were able to successfully retrieve lunar sample, feat would be "significant technological step and one that represents a considerable degree of prestige," he said, but "each country [U.S. and U.S.S.R.] will obtain its proper share of credit.... The first sample returned if it were possible to do so and the first man landing on the moon are significant events, each in their own right, and are to be treated as such." (Transcript)

IAF announced official endorsement of absolute world's records for Dec. 21-27, 1968, Apollo 8 mission's 10 lunar orbits: altitude, 234,672.5 mi; greatest mass lifted into earth orbit, 282,197 lbs; total time in space for an astronaut, James A. Lovell, Jr., 572 hrs 10 min 16 secs. Apollo 8 world class records: duration of lunar mission, 146 hrs 59 min 49 secs; duration in lunar orbit, 20 hrs 14 min 13.2 secs.

To obtain IAF certification of Apollo 11, crew would be given torn halves of four \$1 bills for comparison with other halves on return as proof same men returned as took off. NAA would submit claim for absolute world record for extravehicular activity (EVA) for successful Apollo 11 mission. (AP, NYT, 7/15/69, 20)

July 14: New York Post published results of Louis Harris poll which showed American people favored manned lunar landing by 51% to 41%. In February poll public opinion had been opposed by 49% to 39%. Harris attributed change to feeling "if we have gone this far, we ought to finish the job." He said 56% of 1,607 adults polled from June 16 to 22 were opposed to annual \$4-billion outlay for space program, while 37% favored it--little change from 55% for to 34% against in February. Reaction to Apollo 10 flight had been generally favorable. (NYT, 7/15/69, 20)

- . Expectation of one million tourists to witness Apollo 11 launch had led to extraordinary precautions at Cocoa Beach, Fla., Washington Post said. Tank truck would be stationed at City Hall to fuel police cars; airboats would stand by to rush casualties to hospital if ambulances could not penetrate automobile traffic; and officials were concerned with scores of aircraft circling overhead to glimpse spacecraft. (Grieder, W Post, 7/14/69, A1)
- . Washington Evening Star special supplement, "Voyage to the Moon," commented: "Hanging in the sky, attracting man's attention for untold generations, the moon has been the reputed home of gods and goddesses of all religions, primitive and modern. If all these deities lived there at any one time, the reasons for its battle-scarred appearance would be obvious. But assuming that none did... that pock-marked face still poses more questions than it answers." (W Star, 7/14/69)
- . Aerospace Systems Laboratory had been established at Princeton Univ. to investigate U.S. space program and other broad areas of applied research, including transportation systems, New York Times said. Project was assisted by NASA and other Federal agency grants. (NYT, 7/14/69, 23)
- . NASA announced availability of 16-in-dia globe of moon prepared by USAF Aeronautical Chart and Information Center from NASA photos made by Lunar Orbiter series. Lowell Observatory, Ariz.; prepared art work with exaggerated color tones showing lunar landscape bathed in morning sunlight and large Ring Plains, or explosive craters, on far side. One globe had been presented to President Nixon by Apollo 10 astronauts. (NASA Release 69-83G)
- . Harold W. Adams, Deputy to Vice President-Chief Engineer of Douglas Aircraft Co., received AIAA Aircraft Design Award of citation and \$500 honorarium at AIAA Aircraft Design and Operations Meeting in

July 14 (continued)

Los Angeles. Citation read: "In recognition of your outstanding contributions to the safety and economic practicality of commercial air transportation during the past 38 years by development of aircraft design principles for high reliability and ease of maintenance." Adams was specialist in electric and hydraulic systems. (AIAA Release, 7/9/69)

Oceanographer Jacques Piccard cast off in 48-ft research submarine from West Palm Beach, Fla., for rehearsal of 1,500-mi Gulf Stream Drift to study ocean depths. [See April 7]. If four-to-five-day trial run was successful, team would remain submerged for 30 days and drift to Boston. (UPI, W Star; 7/14/69, A10)

July 15: President Nixon sent telegram to Apollo 11 astronauts: "On the eve of your epic mission, I want you to know that my hopes and my prayers--and those of all Americans--go with you. Years of study and planning and experiment and hard work on the part of thousands have led to this unique moment in the story of mankind; it is now your moment and from the depths of your minds and hearts and spirits will come the triumph all men will share. I look forward to greeting you on your return. Until then, know that all that is best in the spirit of mankind will be with you during your mission and when you return to earth."

President also telephoned Apollo 11 astronauts: "...as you lift off to the moon, you lift the spirits of the American people as well as the world.... You carry with you a feeling of good will in this greatest adventure man has ever taken...." (PD, 7/21/69, 997)

First notables to arrive at Cape Kennedy on eve of Apollo 11 launch included former President and Mrs. Lyndon B. Johnson and Southern Christian Leadership Conference President, the Rev. Ralph D. Abernathy. Johnsons arrived in military aircraft assigned by President Nixon, to attend luncheon honoring James E. Webb, former NASA Administrator.

Abernathy led 25 poor southern families to protest Federal funding priorities. NASA Administrator, Dr. Thomas O. Paine, met group of 150 poor people outside KSC gate where Abernathy requested 40 VIP passes to launch, asked Dr. Paine to join fight against poverty, and urged NASA technology be converted to finding new ways to feed poor. Dr. Paine agreed to admit members of group to launch and pledged to do what he could to adapt space-developed food concentrates to aid undernourished. "It will be a lot harder to solve the problems of hunger and poverty than it is to send men to the moon." But, "if

July 15 (continued)

it were possible for us not to push that button tomorrow and solve the problems you are talking about, we would not push the button." He said space program and science could be used to help solve poverty problems. "I want you to hitch your wagon to our rocket and tell the people the NASA program is an example of what this country can do." The poor people said they would pray for Apollo 11 astronauts.

By evening 500,000 tourists had arrived in Brevard County, site of KSC, with total one million expected by early morning. Air traffic had quadrupled, with 10 local airfields handling over 1,200 small aircraft, and 200 private jets. Aircraft were to bring Vice President Spiro T. Agnew, over 200 Congressmen, 60 ambassadors, 19 governors, 40 mayors, and other public figures July 16. More than 1,000 police struggled to control road traffic, and hordes settled to sleep on beaches from which they could see illuminated spacecraft on launch pad. (Weinraub, NYT, 7/16/69, 22; Creider, W Post, 7/16/69)

Proximity of probable date of lunar landing to date of arrival of Mariner VI and VII cameras near Mars surface would provide U.S. TV viewers with "double space feature," NASA said. Gerald M. Truszynski, NASA Associate Administrator for Tracking and Data Acquisition, credited feat to advances in electronics through which streams of signals could be returned from moon and from Mars into tracking centers and switching points on earth, thence via comsats into TV networks throughout globe. Apollo 11 mission would include eight color telecasts from spacecraft. Lunar telecasts would be black and white since LM would lack power for color TV. Mars telecasts from Mariner VI would produce 50 photos; Mariner VII would deliver 91. Best resolution from closeup would be 900 ft; it had been 2 mi in 1965 Mariner IV photos and was 100 mi by best optical means from earth. (NASA Release 69-83I)

Europeans were "as excited as many Americans" about Apollo 11 launch, New York Times reported. But "only the sharpest observer of the Soviet news media could guess, as he went to bed tonight, that Americans will try to send men to the moon tomorrow," according to Baltimore Sun. Last mention of Apollo 11 in Soviet press had been July 9 meeting of President Nikolay V. Podgorny with Astronaut Frank Borman.

In U.K., BBC and commercial TV were planning extensive Apollo 11 coverage, some live via comsat. British newspapers were competing with special space supplements and guides. Exceptions to generally "adulatory" reportage was The Times of London article in which philosopher Lord Russell had said: "Men will not be content to land upon the moon and try to make it habitable. They will land simultaneously from Russia and the United States, each party, complete with H-bombs and each intent upon exterminating the other."

July 15 (continued)

American Embassy in Warsaw was packed every day with Poles viewing space films. Spain's Evening Daily Pueblo had sponsored contest to send 25 readers to Apollo 11 launch. In France 22-page space supplement issued by France-Soir had sold 1.5 million copies at \$1 each. Bild Zeitung in Germany had noted seven out of fifty-seven Apollo supervisors were of German origin. Austrian press had lionized Dr. Wernher von Braun during recent visit to Salzburg.

Volume of Western European newspaper space devoted to lunar landing mission rivaled that in U.S., New York Times said, and "the whole story of the moon effort is improving the 'prestige' of the United States.... But...respect voiced by individuals is often for America's technological power, not her humanity or civilization." (Lewis, NYT, 7/16/69, 20; B Sun, 7/16/69, A8, Mills, A9)

- . Across U.S. on eve of Apollo 11 launch, newspaper editorials commented on lunar landing mission:

Los Angeles Herald-Examiner: "It is with an almost breathless sense of awe that we await tomorrow's blast-off from Cape Kennedy--the launching of three space explorers on the most ambitious and fearsome adventure in all human history. Mere words cannot capture the immensity of the flight of Apollo 11. Quite literally, man will be attempting a final break of the chains which have bound him to this earth." (LA Her-Exam, 7/15/69)

Newport News, Va., Times-Herald: "Now, this triumph of human courage and knowledge stands poised on the threshold of accomplishment. For a few fleeting moments, the attention of the world will follow the Eagle as it ferries its two astronauts toward a destiny until now only dreamed of in our history. Then, most probably, our attention will filter back to the pressing problems on earth." (Times-Herald, 7/15/69)

Milwaukee Journal: "Apollo 11 is providing insight into the meaning of life and the imperatives of human society. It is forcing us to face the grim paradox of exploiting human reason and the marvels of machinery to soar into the majesty of space while the world becomes fragmented into selfish national sovereignties--some armed, some arming, with the hideous capacity to end life itself." (Milwaukee Journal, 7/15/69)

Denver Post: "The Soviet attempt to send an unmanned spaceship to the moon in advance of Apollo 11 is a bold bid to draw attention to Soviet space prowess. But even if it succeeds...in mechanically scooping up samples of the moon and returning to earth, the Soviet project will not overshadow the American mission. Instead, the Soviet flight will serve to underscore the expensive duplication of effort created by the space race. If the Russians and Americans had cooperated, rather than competed, the risks and the costs involved in landing a man on the moon would have been far less." (Denver Post, 7/15/69)

July 15 (continued)

Washington Evening Star: Soviet Luna XV seemed strangely timed. During their Moscow discussions on space cooperation, U.S.S.R. President Nikolay V. Podgorny had not given Astronaut Frank Borman, "slightest hint that the Kremlin was planning to send an unmanned spacecraft to the moon to coincide with the history-making Apollo 11 American mission." Was it really possible "to work together in space exploration with a country that seems to be playing tricks with ours at a moment when we are engaged in a historic effort to land men on the moon?" (W Star, 7/15/69, A12)

- . San Francisco Mayor Joseph Alioto urged San Franciscans to fly U.S. flag from Apollo 11 blastoff to splashdown and to sound every bell, siren, and whistle in city at splashdown. (AP, W Post, 7/17/69, A27)
- . NASA awarded General Electric Co.'s Aircraft Engine Group \$18.7-million, fixed-price contract with performance-award provision to construct and test two experimental quiet jet aircraft engines. To cut development costs, CF-6 and TF-39 engines developed for DC-10 and C-5A aircraft would be used as core of new engine. Engines would produce 4,900-lb thrust at cruise and 22,000-lb thrust for takeoff. Work was part of OART's Quiet Engine Research Program to develop turbofan engine with noise level 15-20 db below present engines. Contract would be managed by LeRC. (NASA Release 69-103)

July 16-24: Apollo 11 (AS-506) manned lunar landing mission flown by NASA achieved eight-year national goal set by President Kennedy May 25, 1961. On July 20, spacecraft's LM--Eagle--landed on lunar surface and first man stepped out onto moon. Two astronauts performed assigned tasks on lunar surface before reentering LM to lift off from moon, redock with CSM, and return safely to earth.

July 16-19: Mission began at 9:32 am EDT July 16, when spacecraft was launched from KSC Launch Complex 39, Pad A, by Saturn V booster. Liftoff was relayed live on TV to 33 countries on 6 continents, watched by estimated 25 million TV viewers in U.S., and heard on radio by millions of listeners. Launch events occurred as planned and spacecraft carried Astronauts Neil A. Armstrong (commander), Michael Collins (CM pilot), and Edwin E. Aldrin, Jr. (LM pilot), into circular parking orbit with 118.5-mi (190.7-km) altitude. After post-insertion checkout CSM separated from Saturn V 3rd stage (S-IVB)

July 16-19 (continued)

and LM, code-named Eagle. Crew successfully transposed CSM and docked with LM, ejected CSM/LM from S-IVB, and conducted first SPS burn. Successful propellant dump provided impulse to S-IVB for slingshot maneuver to earth-escape velocity. Translunar injection maneuver was so accurate that first midcourse correction was not required. Midcourse correction No. 2, at 26:45 GET, was so accurate that third and fourth maneuvers were not necessary.

Crew conducted two unscheduled color TV broadcasts--for 16 min beginning at 10:32 GET (taped for 11:26 GET transmission) and for 50 min beginning at 30:28 GET--and one scheduled 36-min transmission beginning at 33:59 GET. Broadcasts were very clear and showed earth, onboard computer keyboard, and crew. At 55:09 GET (4:40 pm EDT July 18) crew began 96-min color TV transmission with excellent picture resolution, coverage, and general quality. Viewers in North America, South America, Japan, and Western Europe saw live pictures of CSM and LM interiors, CSM exterior, and earth and watched crew removing probe and drogue, opening spacecraft tunnel hatch, preparing food, and house-keeping LM.

Apollo 11 passed into moon's sphere of influence at 61:40 GET, 214,546.8 mi (345,205.8 km) from earth, traveling at 2,990 fps relative to earth. Spacecraft entered lunar orbit with 194.3-mi (312.6-km) apolune and 70.5-mi (113.4-km) perilune at 75:56 GET (1:28 pm EDT July 19) after first SPS burn. During second lunar orbit, live color TV transmission showed spectacular views of lunar surface and approach path to Site 2. Armstrong pointed out lunar landmarks and described unexplained glow near crater Aristarchus which some scientists believed to be volcanic activity. Second SPS burn circularized orbit with 75.6-mi (121.6-km) apolune and 61.9-mi (99.6-km) perilune. Aldrin transferred to LM for two-hour housekeeping, voice and telemetry test, and oxygen-purge-system check.

July 20-21: Armstrong and Aldrin reentered LM at 95:20 GET and checked out all systems before firing SM reaction-control-system thrusters to separate CSM and LM on far side of moon. LM descent-propulsion-system engine propelled LM to within 9.8 mi (15.8 km) of lunar surface. Because LM-powered descent maneuver--initiated at perilune of descent orbit--was about 4.6 mi (7.4 km) downrange from planned position, landing point was also shifted downrange. During final approach phase, crew noted that landing point to which spacecraft was heading was in center of large, rugged crater with 5- to 10-ft-dia boulders. Consequently crew flew past crater to more suitable touchdown

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July 20-21 (continued)

point by controlling attitude manually and adjusting descent rate and horizontal velocity. Officials later attributed change in course to malfunction in onboard radar and subsequent critical overload of computer, which caused warning alarms and could have aborted mission.

LM landed on moon at 102:46 GET (4:18 pm EDT July 20) in Sea of Tranquility, 20,800 ft west and 4,000-5,000 ft south of center of planned landing ellipse. Landing-point coordinates were approximately 23.5°E and 0.64°N and site altitude was approximately 8,600 ft below moon's mean radius.

Armstrong reported: "Houston, Tranquility Base here--the Eagle has landed."

Mission Control replied: "Roger, Tranquility. We copy you on the ground. You got a bunch of guys about to turn blue. We are breathing again. Thanks a lot." Armstrong said landing area contained numerous boulders up to two feet in diameter, some apparently fractured by LM engine exhaust, and surface color varied from very light to dark gray. Crew immediately adapted to one-sixth (earth) gravity in LM and moved with ease. About two hours after landing astronauts requested and were granted permission to perform extravehicular activities (EVA) on moon's surface before sleep period--about 4½ hrs earlier than originally scheduled.

After postlanding checks, Armstrong opened LM hatch, descended LM ladder, and deployed modularized equipment stowage assembly (MESA) containing camera, which recorded his descent to lunar surface. Aldrin remained inside LM and recorded Armstrong's descent with 16-mm Maurer camera.

Armstrong took man's first step on moon at 109:24 GET (10:56 pm EDT July 20. Some 600 million viewers on earth--one-fifth of world population--watched live TV transmission and heard him describe feat as "one small step for a man--one giant leap for mankind."

Collins, orbiting moon alone in CSM, was unable to see landing and subsequent EVA because CSM was not equipped to receive TV transmission. Armstrong said moon had "stark beauty all its own" like desert in southwestern U.S. Lunar surface was "fine and powdery" and could be kicked up loosely. "It adheres like powdered charcoal...but I only go [sink] in a small fraction of an inch. I can see my footprint in the moon like fine grainy particles." Armstrong checked LM exterior and reported penetration of LM footpads into lunar surface was three to four inches and that strut collapse was minimal. Blast of descent engine had not formed crater in surface and about one foot of clearance remained between engine bell and lunar surface. He reported only problem was seeing his footing in darkness of LM shadow. He emplaced microdot containing messages from world leaders, collected contingency

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July 20-21 (continued)

sample of lunar soil near LM ladder, and reported that, although surface consisted of soft loose material, material six or eight inches under surface was very hard and cohesive. Rocks were very slippery, apparently because vesicles (pores) were filled with powdery surface material.

Armstrong photographed Aldrin's descent to lunar surface at 11:15 pm EDT and astronauts unveiled plaque mounted on strut behind ladder and read its inscription to their worldwide TV audience: "Here men from the planet earth first set foot on the moon July 1969, A.D. We came in peace for all mankind." Armstrong then removed TV camera from MESA, obtained panorama, and placed camera on tripod 40 ft from LM to view subsequent EVA. Aldrin experimented to assess man's mobility on moon by walking, running, leaping, and doing two-footed kangaroo hops between LM and camera. He indicated some difficulty in maintaining balance but said that his agility was better than expected and that he was able to move with great ease. Mass of backpack affected inertia and caused "slight tendency...to tip backwards. If I'm about to lose my balance in one direction, recovery is quite natural and easy. You've just got to be careful leaning in the direction you want to go in."

Aldrin deployed solar wind composition experiment in sunlight north of LM and joined Armstrong in erecting three- by five-foot American flag on eight-foot aluminum staff. Astronauts saluted flag and then talked by radiotelephone with President Nixon at White House in what President called "most historic telephone call ever made from the White House." President said: "Because of what you have done the heavens have become a part of man's world. As you talk to us from the Sea of Tranquility, it inspires us to redouble our efforts to bring peace and tranquility to earth. For one priceless moment in the whole history of man all the people on this earth are truly one--one in their pride in what you have done and one in our prayers that you will return safely to earth." Astronauts saluted President and expressed honor and privilege of representing U.S. and world on moon.

Continuing EVA, Armstrong collected bulk sample of assorted surface material and selected rock chunks, inspected LM, deployed passive seismic experiment package and laser ranging retro-reflector, and collected two core samples and 20 lbs of discretely selected material. Throughout EVA continuous black-and-white coverage of crew activity provided live documentation, with telemetered data and voice comments. Lunar surface photography included both still and sequence coverage using Hasselblad, Maurer data-acquisition, and Apollo lunar surface close-up cameras. Astronauts completed EVA, transferred film and samples to LM, reentered LM, and jettisoned equipment according to plan, closing hatch by 11:39 GET (1:11 am EDT July 21). Armstrong and Aldrin rested inside LM seven hours and checked out systems.

THE MALAY MAIL, SINGAPORE, JULY 21, 1969

The Malay Mail

That's one small step for a man but
one giant leap for mankind...

**First footsteps on
the moon**

ASTRONAUT AYM...
...first step on the moon!

Space
monday
baby
in Luna
Elin

**Nixon: This will
bring people
closer together**

LE JOUR, BEIRUT, LEBANON, JULY 21, 1969

AYN CE
HUNTO
LES CAVES DU ROY
MAINTIEN

LE JOUR

LA LUNE CONQUISE

TRYBUNA LUDU, WARSAW, POLAND, JULY 21, 1969

Trybuna Ludu

Po 103 godzinach lotu
**Człowiek wylądował
na Księżycu**

MIASTA I WSIE W OŚWIEŹNEJ SZCIE
25 rocznica odrodzenia

SIRI, LANKADIPA, LANKADIPA, PAKISTAN, JULY 21, 1969

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EL IMPARCIAL, HERMOSILLO, MEXICO, JULY 21, 1969

HOMBRE EN LA LUNA!

EL IMPARCIAL

**Eterno Sueño
Hecho Realidad**

**Abridos Repentinamente
Puertas del Siglo 21**

THE TIMES, LONDON, JULY 21, 1969

THE TIMES

Man takes first steps on the moon

BOZKURT, NICOSIA, CYPRUS (Turkish Language), JULY 21, 1969

Bozkurt

AY FETHEDİLDİ

Kartal'ın Ay'a yaptığı başarılı işi, televizyon
ekranlarında milyonlarca kişi tarafından izlendi

HANKOOK ILBO, SEOUL, KOREA, JULY 21, 1969

달에 인간이 내렸다!

着陸船

7/21/69

DIE BURGER

EERSTE TREE OP MAAN

Oppervlak 8009
Fyn Poeier,
Se Armstrong




The Natal Mercury

**Moonmen Zoom In
For The Big Walk
THEY'RE THERE!**


অনন্দ বাজার পত্রিকা

মানুষ চাঁদে পা রেখেছে
মানুষ চাঁদে

LA ESTRELLA DE PANAMA

EL HOMBRE EN LA LUNA

La Sensacional Caminata de los Astronautas Vista por el Mundo



The Montreal Star

**THE MOON
BELONGS TO MAN**

PAGES 4, 5 et 6 : Tout sur l'exploit

LE FIGARO

LES PREMIERS HOMMES SUR LA LUNE

LE LEM EST POSÉ À 21 H 30 DANS LA MER DE LA TRANQUILLITÉ

Le monde entier passionné a suivi minute par minute les manœuvres d'Armstrong et d'Aldrin

Aviation israélienne publie pendant plusieurs heures les positions exceptionnelles

‘อีเกิ้ล’ลงได้สวย!

หมุ่นห้วงอวกาศเพื่อคนเพราะเบียดเก่า
สาวเชยขึ้นได้ครอบงำตามจักรวาล

ไทยดิลิ

พรรค.สนับสนุนส่วนข้าราชการท้องถิ่น

BILD ZEITUNG, BERLIN, JULY 21, 1969

KURZENTRAKT-FOLYER
Kukident
Pflanzung, Juni 21. Juli 1969 - 13 Pf.

Die ersten Worte auf dem Mond: Der Adler ist gelandet!

Der Mond ist jetzt ein Ami

THE YOMIURI SHIMBUN, TOKYO, JAPAN, JULY 21, 1969

読売新聞
人間、初めて月を踏む

EL COMERCIO, QUITO, ECUADOR, JULY 21, 1969

LA PROEZA CULMINO!



AL-KAID, LEBVON, JULY 21, 1969

اسقاط الاطائرة اسرائيلية
القوات المصرية تكبد المدمرة هزازا حادثة
والاعتصاف معارك تجري على طول قناة السويس منذ حرب يونيو
اليوم: يمسي الانسان فوق القمر
في الثالثة والاربعين ساعة اليوم تمسك الطائرة وبنى رائدا الفضاء فوق سطح القمر

NEOI KAIROI, KYPRUS, JULY 21, 1969

Από εως 10.17 π.ε. εως 10.17 Κυριακή

ΑΝΘΡΩΠΟΙ ΕΙΣ ΤΗΝ ΣΕΛΗΝΗΝ
ΝΕΟΙ ΚΑΙΡΟΙ

LA VERDAD, CARACAS, VENEZUELA, JULY 21, 1969

¡Conquistada!
la verdad

ALGEMEEN DAGBLAD, ROTTERDAM, THE NETHERLANDS, JULY 21, 1969

Algemeen Dagblad

"De Eagle is geland" Reisduur: 102 uur. Uitstappen binnen 20 juli, 21.17 uur 15 min. en 10 sec. vijf uur na landing

MENS OP MAAN

Armstrong: Voetbalveld met stenen als spelers



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July 20-21 (continued)

At 124:22 GET (1:54 pm July 21) LM successfully lifted off moon, after 21 hrs 36 min on lunar surface. All lunar ascent and rendezvous maneuvers were nominal. Eagle reported to Mission Control: "Eagle is back in orbit, having left Tranquility Base, and leaving behind a replica from our Apollo 11 patch with an olive branch." LM docked with CSM at 128:03 GET. Crew transferred with samples and film to CSM, and LM ascent stage was jettisoned into lunar orbit. SM reaction-control-system separation maneuver placed CSM into orbit with 72.0 mi (115.9-km) apolune and 63.0-mi (101.4-km) perilune, where crew rested and prepared for return to earth.

July 22-24: Crew fired SPS engine at 135:24 GET (12:55 am EDT July 22), injecting CSM into transearth trajectory after 59 hrs 28 min (30 revolutions) in lunar orbit. Midcourse correction No. 5, at 150:30 GET, was so accurate that sixth and seventh corrections were not necessary. During 18-min color TV transmission, crew demonstrated weightlessness of food and water and showed scenes of moon and earth. Aldrin showed in-space preparation of ham sandwich and Collins showed viewers how to drink water from teaspoon and from water gun. Final, 12½-min broadcast at 177:32 GET sent message of appreciation from each astronaut to all who helped make Apollo 11 mission possible.

CM, code-named Columbia, separated from SM on schedule at 194:49 GET. Because of deteriorating weather in nominal landing area, splash-down point was moved 247.4 mi downrange, where weather was excellent. Parachute deployment and other reentry events occurred as planned.

Apollo 11 splashed down in mid-Pacific at 12:51 pm EDT July 24, 15 mi from recovery ship U.S.S. Hornet, 195 hrs 19 min after launch. Swimmers attached flotation collar and seven-man raft to spacecraft and helicopter dropped biological isolation garments, which were donned by astronauts inside CM and by one swimmer. Two other swimmers moved upwind of CM on another large raft. Postlanding ventilation was turned off and CM powered down, and astronauts climbed out and helped swimmer close hatch. Swimmer then decontaminated all garments, hatch area, flotation collar, and area around postlanding vent valves with Betadine disinfectant. Helicopter carried astronauts to recovery ship, where they entered 32-ft-long mobile quarantine facility (MQF) with recovery physician and technician. They were congratulated by President Nixon and NASA Administrator, Dr. Thomas O. Paine, who were on board ship. Crew, physician, and technician remained inside MQF until it was delivered to Lunar Receiving Laboratory (LRL) in Houston July 27.

CM was retrieved, placed in dolly on board recovery ship, moved to MQF, and mated to transfer tunnel. From inside MQF/CM containment envelope, MQF engineer removed lunar samples and equipment through decontamination lock and CM was sealed until delivery to LRL. Sample

1 9 6 9

July 22-24 (continued)

return containers, film, and other data were flown to Johnston Island and to Houston for transport to LRL.

Primary Apollo 11 mission objective--to perform manned landing on moon and return--and all detailed test objectives were achieved. All launch vehicle and spacecraft systems performed according to plan, with only minor, corrected discrepancies. Flight crew performance was outstanding; all three crew members remained in excellent health and their prevailing good spirits and proficiency were major factors in mission's success. Accomplishments included first manned lunar landing and return; first lunar surface EVA; first seismometer, laser reflector, and solar wind experiment deployed on moon; first lunar soil samples returned to earth; largest U.S. payload ever placed into lunar orbit (72,037.6 lbs at lunar orbit insertion); acquisition of numerous visual observations, photos, and TV transmissions of scientific and engineering significance; and first operational use of MQF and LRL.

Apollo 11 was eighth Apollo mission to date, fifth manned Apollo mission, and first manned lunar landing mission. Mission acquired major quantities of data for subsequent Apollo flights. First manned Apollo mission, Apollo 7 (Oct. 11-22, 1968), had verified operation of spacecraft for lunar-mission duration. First manned lunar orbital mission, Apollo 8 (Dec. 21-27, 1968), had proved capability of Apollo spacecraft and hardware to operate out to lunar distance and return through earth's atmosphere. Apollo 9 (March 3-13, 1969) had proved capability of LM to operate in space under manned conditions. Apollo 10 (May 18-26, 1969) had successfully operated complete Apollo spacecraft on lunar orbital mission and had provided major quantities of scientific and training materials for Apollo 11. Apollo program was directed by NASA Office of Manned Space Flight; MSC was responsible for Apollo spacecraft development, MSFC for Saturn V launch vehicle, and KSC for launch operations. Tracking and data acquisition was managed by GSFC under overall direction of NASA Office of Tracking and Data Acquisition. (NASA Proj Off; NASA Release 69-83K; NYT, 7/16-25/69; W Post, 7/16-25/69; W Star, 7/16-25/69; B Sun, 7/16-25/69; PD, 7/28/69, 1016)

July 16: U.S.S.R.'s Luna XV (launched July 13) entered lunar orbit at 3:00 pm Baikonur time (6:00 am EDT) with all systems functioning normally, Tass announced. Sir Bernard Lovell, Director of U.K.'s Jodrell Bank Experimental Station, said spacecraft was transmitting telemetry data but no photographic signals. (SED, 7/18/69, 22; AP, W Star, 7/17/69, A1)

July 16: In Cape Kennedy interview before Apollo 11 launch, Vice President Spiro T. Agnew said, "It is my individual feeling that we should articulate a simple, ambitious, optimistic goal of a manned flight to Mars by the end of this century. Whether we say it or not, someone's going to do it."

After liftoff, Vice President told NASA launching team, "...all the time I was out there I couldn't help thinking of you, the people in here and all over NASA who have done such a brilliant job in putting together the combined effort behind those three gentlemen who are off on this historic mission.... I bit the bullet for you today as far as Mars is concerned. But on the other hand...I may be a voice in the wilderness.

In Washington, D.C., Senate Majority leader Michael J. Mansfield (D-Mont.) told press, "I think we have a lot of problems here on earth that we must face up to and when we settle those we ought to consider future space ventures." Senate Majority Whip Edward M. Kennedy (D-Mass.) said, "The Apollo program is for landing a man on the moon and exploration and should take another one to two years. I think after that the space program ought to fit into our other national priorities." (Witkin, NYT, 7/17/69, 1; Transcript of Agnew statement to NASA launch crew; Unna, W Post, 7/17/69, A1)

- . At White House, President Nixon proclaimed July 21 National Day of Participation. "Apollo 11 is on its way to the moon.... Never before has man embarked on so epic an adventure.... As the astronauts go...we on earth will want, as one people, to be with them in spirit...and to support them with prayers that all will go well." All Executive departments and Government agencies would be closed and U.S. flag would be displayed on public buildings.

With many members at Cape Kennedy, Senate and House met briefly and conducted only routine business. Congressional Record was filled with comments on Apollo 11 and wishes for Godspeed to astronauts. (PD, 7/21/69, 997-8; CR, 7/16/69)

- . During CBS TV interview at Cape Kennedy following Apollo 11 launch, former President Lyndon B. Johnson said, "If our industrial people, these great managers of industry, the laboring people of the country, the government, the scientists, all with the help of the Congress, can get together and do a job like this there's just nothing we can't do." To world's ills, "we must apply some of the great talent that we've applied to space." There wasn't "a single thing that our country does, that our government does, that our people do, that has greater potential for peace than the space effort." (UPI, NYT, 7/17/69, 20)
- . Between 750,000 and 1 million persons crowded Brevard County, Fla., to witness launch of Apollo 11, including 5,000 dignitaries headed by Vice President Spiro T. Agnew and former President Lyndon B. Johnson.

July 16 (continued)

The Rev. Ralph D. Abernathy and 40 representatives of Poor People's Campaign watched launch from bleacher seats with 10,000 guests including families of Apollo program personnel, while other representatives marched outside KSC. Paris Match had brought 105 European businessmen. Some 3,100 press members were at special stand. As Apollo spacecraft lifted from launch pad there was some applause, but most spectators stared in silence until Saturn V rocket disappeared overhead. Afterwards many were caught in monumental traffic jams. Banana River, five miles south of Launch Complex 39, was clogged with several thousand boats registered from New England to Texas. (Greider, W Post, 7/17/69, A1; Weinraub, NYT, 7/17/69, 21, Lyons, NYT, 7/17/69, 21)

- . Apollo 11 launch brought mood of reflection across Nation, New York Times said. Dawn was breaking in western U.S. when blastoff occurred. Workers in San Francisco's open air fish markets stood in silence to hear radio report. In San Diego motorists crossing U.S.-Mexican border listened to countdown on car radios.

In mid-America, classes were postponed at Air Force Academy in Colorado Springs, Colo., while cadets watched launch on TV. Cowhands at northern Wyoming ranch, inaccessible to radio or TV, interrupted work to honor Apollo 11. Ranch owner Dr. Oakleigh Thorn II said, "We feel so close to the moon shot out here, because we're so close to the stars and sky."

In Biloxi, Miss., harbor fishermen paused on wharf to hear countdown. In Tennessee, tobacco farmers listened to transistor radios in fields.

Washington, D.C., school teacher said, "The astronauts didn't just go to the moon. All our minds went to the moon and intellectually man's horizons have jumped leaps and bounds beyond the historical situation they've always been confined to." (Fosburgh, NYT, 7/17/69, 1)

Worldwide audience focused on Apollo 11 launch:

At summer residence, Castel Gondolfo, Italy, Pope Paul VI asked for prayers for U.S. astronauts a few hours before launch of Apollo 11.

U.S.S.R. radio and TV gave factual accounts of Apollo 11 launch but maintained third day of silence on Luna XV. Major Soviet news program at 8:30 pm Moscow time showed tape of Apollo 11 liftoff taken from live comsat coverage. Public interest in Apollo 11 was high.

In U.K. TV viewers saw launch via transatlantic satellite. BBC scheduled live coverage through July 24 splashdown and would relay broadcasts to continent by cable. London newspapers frontpaged Apollo 11. Daily Express headline read, "Ho Hum--Anyone for the Moon

July 16 (continued)

"Today?" over report on relaxed astronauts.

Polish TV viewers saw launch via 45-min transmission directly from Cape Kennedy.

Hundreds of Germans and Americans crowded into Apollo 11 exhibit in Mannheim, Germany, department store.

Swedish TV viewers were advised by state broadcasting company not to turn off sets Sunday night--so they could be awakened for scheduled moon landing Monday.

Hippies in Iran held milk and honey party in Teheran restaurant to toast astronauts.

In Egypt, Moslem world's leading moon expert, Sheikh Ahmand Haredi said, "The Koran urges Moslems to look up from their earthly abode to what lies behind the moon and stars."

Japanese department stores featured models of Apollo command module.

In Greece, Aspis-Pronoia insurance company issued first outerspace life insurance policy, to cover Apollo 11 crew at \$10,000 each.

In Spain people called event most interesting since Columbus discovered America.

Israel's state radio broadcast in Hebrew from Cape Kennedy while Israelis stood around TV sets and portable radios in streets. U.S. Embassy in Tel Aviv and U.S. Consulate in Jerusalem opened Apollo 11 information offices.

Apollo 11 reaction was "generally tepid" in Lagos, Nigeria. Radio Nigeria reported launch seven minutes into its am newscast. Later it became number one newscast item.

Most of Latin America missed launch on TV because of failure of Intelsat-III F-2 June 29. Latin American newspapers and TV correspondents traveled to U.S. to cover launch and were reported to be outraged by absence of TV coverage in their countries. In Colombia, government asked TV manufacturers to put sets in all town squares. Bogota students would have July 21 off to watch lunar landing.

(NYT, 7/17/69, 21, 22; C Trib, 7/17/69)

- . Harry F. Guggenheim said in Washington Evening Star article that rocket expert Dr. Robert H. Goddard "was to the moon rocket what the Wright brothers were to the airplane." Guggenheim, administrator of Daniel Guggenheim Fund for the Promotion of Aeronautics during period it helped support Dr. Goddard's research, traced career of "Father of modern rocketry" from early experiments in 1908. Among Goddard's inventions were: first liquid-fuel rocket, first smokeless powder rocket, and first practical automatic steering device for rockets. It was no wonder American Rocket Society had conceded to Goddard, "the almost single-handed development of rocketry 'from a vague dream

July 16 (continued)

to one of the most significant branches of modern engineering.'" He had left "testimony to the power of one solitary individual to effect change and to transform the future." While Dr. Goddard had died without fame which had accrued to Wright brothers in their lifetime, "he died still believing that man would one day shatter the fetters of Earth's gravity and stride majestically into the vast reaches of space. I wish he were here now to share this moment. It belongs to him."
(AP, W Star, 7/16/69, A15)

- . As part of NASA and Washington National Gallery of Art program, Eye-witness to Space, group of artists attended Apollo 11 launch to paint facets of mission. Program originated in 1963 when artists were invited to cover Mercury 9 mission. Among those commissioned to record Apollo 11 were Peter Hurd, Robert Rauschenberg, Lamar Dodd, and James B. Wyeth. Since program started, 25 artists had produced more than 500 sketches and paintings. (Casey, W Post, 7/13/69, G1; Hicks, NYT, 7/15/69, 33; W Star, 7/17/69, A12)
- . Apollo 11 was producing noticeable effect on business and consumer products, Washington Post said. Snoopy the Astronaut dolls were selling out; sales of color TV sets had risen in some stores; and sales of "moon maps and globes, as well as toy rocket ships and lunar exploration vehicles had also lifted skyward." Two Washington, D.C., department stores were offering Japanese telescopes ranging from \$19.99 to \$1,000.00. One toy store manager said sales of space-related toys had jumped 70% or 80% in two months. Rockets propelled by solid-fuel inserts sold for \$1.50 to \$5.00 complete with recovery parachute. One Washington store had sold out supply of \$10 space suits. Demand for rental of color TV sets in Washington area had been "terrific" according to area dealer. (Cushing, W Post, 7/16/69, D11)
- . NAS announced formation of Universities Space Research Assn. (USRA) --national consortium of 48 universities--to foster cooperation among universities, other research organizations, and Government for advancement of space research [see Jan. 10]. It would acquire, plan, construct, and operate laboratories and other facilities for R&D and education in space science and technology and had submitted proposal to NASA for management of Lunar Science Institute in Houston, Tex. Existing contract between NASA and NAS would expire in autumn. Univ. of California at San Diego Vice Chancellor of Graduate Studies and Research, Dr. Frederick T. Wall, was Chairman of Board of Trustees. (NAS Release)

July 16: U.S. newspaper editorials hailed Apollo 11 launch.

Miami News: "All America, represented by three lonely men in space, is on its way to the moon. In fact, this is a people's effort, arousing the interest and participation of all the people of this country. This is evidenced by the more than one million persons on hand at Cape Kennedy ...for the start of the moon voyage and by the many millions who join in the adventure by television. Today's magnificent launch, and the elan stirred in our people by it, makes this one of America's most splendid hours." (Miami News, 7/16/69, A16)

Washington Evening Star: countdown which culminated in Apollo 11 liftoff, "regardless of NASA's official records," had begun, "when primitive man first looked up into the night sky to gaze at the moon, and to feel the first stirrings of wonder." (W Star, 7/16/69, A22)

Huntsville Times: Manhattan Project had climaxed with July 16, 1945, explosion of world's first successful atomic bomb. "Men, it seems, can only pray that the consequences of the quest of the planets may be better than those born in the irreversible explosion on a New Mexico desert 24 years ago." (Huntsville Times, 7/16/69)

Chicago Sun-Times: "Man has always looked upward to the stars, first in fear and awe, then in need to know. Today the first great step to the firmament will be taken. If it is successful man will stand on the threshold of outer space--and standing there will reach outward." (C Sun-Times, 7/16/69)

Svenska Dagbladet, Stockholm, Sweden welcomed Apollo 11 launch: "One of the greatest adventures of human history begins today.... Studies of the moon will to a great degree enrich our knowledge of both the earth and space. Among other things it will be possible to make comparisons which will propel science by leaps in various disciplines.... While we can predict much that may result from conquest of the moon, there will in all likelihood be many results which we cannot even imagine now. All great discoveries and bold undertakings have brought advances which no one could have foreseen from the outset."

Arbetet, Malmo, Sweden: "There is an irrational element in these feats of discovery which fortunately dominates the prosaic calculation of gains. Then one can regret that man's fantasy seems incapable of being fired for such a tremendous task as eliminating starvation from our earth, or for bringing peace to Biafra or for eliminating the U.S. Negro ghettos.... Three men will be lifted to world acclaim today on the crest of mankind's greatest ever coordinated effort...." (Am Embassy, Stockholm)

July 17: White House announced Apollo 11 crew on way to moon was carrying Soviet commemorative medals brought back to U.S. by Astronaut Frank Borman, who had received them from widows of Cosmonauts Yuri A. Gagarin and Vladimir M. Komarov during his Moscow visit. Apollo 11 also carried Apollo 204 crew patch and commemorative medals struck for families of Astronauts Virgil I. Grissom, Edward H. White, and Roger B. Chaffee before astronauts died in Jan. 27, 1967, fire.

President Nixon said, "The names of Gagarin and Komarov, of Grissom, White, and Chaffee, share the honors we pray will come to Armstrong, Aldrin, and Collins. In recognizing the dedication and sacrifice of brave men of different nations, we underscore an example we hope to set: that if men can reach the moon, men can reach agreement." (PD, 7/21/69, 999)

Aerospace industry was having its greatest week in history with Apollo 11 launch, said New York Times, but aerospace stocks remained in doldrums. Wall Street was "bearish about the industry and, from an investment standpoint, unenthusiastic about space." Security analysts interviewed agreed Apollo 11 would have little effect on long-depressed stocks, which commenced decline in 1968; many were selling near lows for year. Aerospace industry was chief beneficiary of space program funds, but largest portion of \$34 billion spent since 1960 had been allocated before "really spectacular shots" occurred. While Apollo program had been "tremendous boon to the aerospace industry and to the advancement of technology," it represented small part of total industry revenues and outlook was for further decline. (Hammer, NYT, 7/17/69, 63)

Apollo 11 launch continued to draw wide editorial comment in foreign and national press.

New York Times: "One could hardly watch the magnificent spectacle of the liftoff, let alone contemplate the feats of human ingenuity that made it possible, as well as the courage and skill of the flyers, without some reflection upon the meaning of this event.... The temptation is strong to fall back upon lyricism. The poetry of the thing has yet to find its expression in any of the earnest, proficient Americans who have ventured away from the Earth; yet, the stunning beauty of man's most marvelous creation, as it rose in its majesty toward the unknown, toward the future, could be matched only by the profound sense of having been present at an end to something and therefore necessarily at a beginning." (Wicker, NYT, 7/17/69)

Chicago Tribune: "The Apollo 11 blastoff was as beautiful a one as we've seen. It displayed every bit of the precision and the careful planning which we have come to expect from NASA." One of most "satisfying" things was that, "like our earlier launchings, it took place within

July 17 (continued)

the sight of anybody who wanted to go the Florida coast to watch it, and was broadcast live to countless millions more in every corner of the world. People will not fail to contrast this with the secrecy of Russia's unmanned Luna 15, which may reach the moon today on a mysterious mission of its own." (C Trib, 7/17/69)

Christian Science Monitor: "And although it is an American mooncraft, bearing American men...the venture is, in the best sense, a universal one. It is the result of American technology putting to use the knowledge, techniques and discoveries in which all nations and races have participated. ...all nations and peoples are taking part." (CSM, 1/17/69)

Seattle Times: "The space program has yielded immense new resources in...scientific and technological advances which...make the program worth while even beyond the explorations and discoveries--and national pride--offered by the ventures into outer space. It strikes us, therefore, that the time is at hand for these so-called by-products of the space program, which hold such promise for utilization in behalf of mankind, to be put to work for that purpose." (S Times, 7/17/69)

Bulgarian Telegraph Agency report carried in Bulgarian newspapers Rabotnichesko Delo, Narodna Mladezh, Trud, and Kooperativno Celo commented: "In the coming days all humanity will follow this flight with interest and tension. And surely there is no one on our old planet who will not ask himself this question: 'Will it succeed?'" (Am Embassy, Sofia)

July 18: In response to telephone inquiry by Astronaut Frank Borman, Mstislav V. Keldysh, President of Soviet Academy of Sciences, sent telegram guaranteeing that Luna XV, orbiting moon, would not interfere with Apollo 11 mission and assuring Borman that he would be notified of any changes in spacecraft's course. Under 1967 U.N. Outer space Treaty, U.S. and U.S.S.R. were bound to furnish each other this kind of data. (Wilford, NYT, 7/19/69, 1)

Apollo passive seismic experiment, part of extravehicular activity to be performed by Apollo 11 astronauts on moon, was described in Science as "the most exciting experiment in seismology." Dr. G. Latham and Dr. M. Ewing of Columbia Univ.'s Lamont-Doherty Geological Observatory, Dr. F. Press of MIT, and Dr. G. Sutton of Univ. of Hawaii explained objective was to detect naturally occurring seismic events on lunar surface through early Apollo scientific experiment package (EASEP) planted on moon. Package weighed 105 lbs and would transmit data to earth one year (or

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July 18 (continued)

maximum two years), during lunar days because its solar cell panels required illumination to provide power. Complete Apollo lunar surface experiments package (ALSEP), containing at least three additional experiments for measurements of solar wind and magnetic field, would be included on Apollo 12 for day and night operation.

In Apollo 11 experiment astronaut would remove instrument from LM to smoothest area within 6.6-9.8 ft (20-30 m) of LM, unfold solar panels adjust package level to within 5°, orient it in azimuth for maximum illumination of solar panels, and aim antenna toward earth. MSC would issue commands to uncage and level seismometers and select proper gain. Expected sources of lunar seismic activity included several hundred monthly moonquakes, thermal stresses produced by rapid temperature variations at surface; tidal stresses exerted by earth and sun; and meteoroid impacts. By end of Apollo program, scientists hoped to have achieved crude curves of travel time for body and surface waves and beginning of seismicity map of moon.

During post-Apollo period, seismologists wanted to achieve wider distribution of detectors to map seismically active belts in greater detail; study mechanisms of energy release; lower minimum detectable ground motion of individual seismometer; and improve performance of long-period seismometer systems at ultralong-period end of spectrum for recording surface waves from moonquakes, free oscillations of moon, and lunar tides. (Science, 7/18/69, 241-50)

White House confirmed President Nixon would talk with Apollo 11 astronauts over two-way TV hook-up as they first set foot on moon. Nixon and Astronauts Neil A. Armstrong and Edwin E. Aldrin, Jr., would be visible on split screen to earth TV viewers. President could watch on White House TV, but astronauts would have no view of him. President Nixon planned to spend evening of July 20 watching Apollo 11 progress on TV with former Astronaut Frank Borman, White House liaison with NASA. (Lyons, W Post, 7/19/69, A9)

Apollo 10 mission (May 18-26), first lunar orbital mission with complete Apollo spacecraft, was adjudged successful by NASA. Mission had achieved all objectives; systems had performed according to plan with only minor anomalies and crew had acquired major quantities of photographic training materials for subsequent Apollo missions. (NASA Proj Off)

Izvestia gave first U.S.S.R. report of President Nixon's July 17 announcement that medals of two dead Soviet cosmonauts would be placed on moon by Apollo 11 astronauts. Factual account of mission carried no comment. (W Post, 7/19/69, A10)

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July 18: Pride Inc. operations director Marion Barry called on black community to work during July 21 National Day of Participation declared by President Nixon in honor of Apollo 11 lunar landing. During Washington press conference he said, "Why should blacks rejoice when two white Americans land on the moon when white America's money and technology have not even reached" the inner city? "Why should blacks celebrate Monday...when President Nixon didn't feel that Dr. Martin Luther King's assassination deserved to be observed?" (Paka, W Post, 7/19/69, A9)

Richmond, Va., News Leader editorial approved Vice President Spiro T. Agnew's calling for flight to Mars by end of century [see July 16]: "One day, man will go beyond the planets, to other solar systems; right now...that is not within our technological reach. But Mars is, and so are the other planets. The moon is in earth's, and man's, own crib. Plans and commitments should be made--now--for man to take grown-up strides in the real world of space." (R News-Leader, 7/18/69)

After four years of "running at top speed," MSC had failed to turn Houston, Tex., into "science city," said Thomas G. Plate in Science. Houston area, as largest petrochemical industry area in U.S., was "going its own booming way" while 4,600 NASA people and 9,000 employees of 125 private firms working on NASA business in area helped to shape space age community at MSC. "The injection of \$140 million a year in NASA money and the impact on the life of the area of NASA workers--some 2500 of them R&D scientists and engineers--and of the 9000 employees of...high-technology firms serving MSC has so far had surprisingly little effect. But meanwhile the space community has developed its own special character with its own style of life and its own special goals." (Science, 7/18/69, 265-9)

ComSatCorp reported second quarter earnings of \$1,976,000 (20 cents per share); earnings had been \$1,506,000 (15 cents per share) in similar 1968 period. Earnings for first six months of 1969 totaled \$3,501,000 (35 cents per share) and \$3,405,000 (33 cents per share) in 1968. (ComSatCorp Release 69-43)

July 19: Montreal, Canada, Gazette commented on Apollo 11 mission: "Lyndon Johnson, more than any other man, is responsible for meeting the moon-shot deadline this week...." (Am Consul, Montreal)

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July 19: Pittsfield, Mass., Berkshire Eagle editorial said: "It subtracts nothing from the extraordinary human and technical achievement represented by Apollo 11 to say that the projected lunar landing is an occasion not only for awe and pride but also for a thoughtful reappraisal of our whole approach to the new frontier of space." (B Eagle, 7/19/69)

July 20: "We have entered a new era," Dr. Thomas O. Paine, NASA Administrator, told press in Houston following Apollo 11 lunar landing. "The significance of the trip is that mankind is going to establish places of abode outside of his planet earth."

In telephone call to White House, Dr. Paine had told President Nixon, "It is my honor on behalf of the entire NASA team to report to you that the Eagle has landed on the Sea of Tranquility and our astronauts are safe and looking forward to starting the exploration of the moon." Dr. Paine said President had spoken with "excitement and awe in his voice" and mood was that of "considerable tension relieved." NASA planned tentative six additional manned lunar missions over next few years. Dr. Paine praised U.S.S.R.'s cooperation in providing Luna XV information to Astronaut Frank Borman [see July 18]. He also said if Astronaut Neil A. Armstrong had not assumed manual control of LM to steer it from crater during lunar landing, "we might...have had considerable difficulty." (McGehan, B Sun, 7/21/69, A1)

CBS presented interview with former President Lyndon B. Johnson which had been taped July 5. President Johnson credited space program with sparking "revolution of the 60s" and said, "We can't discard space. We're just beginning." U.S. had enough money, "to do all the things we need to do" in space, education, and health. "What we must have is the determination to do it." He said his last act as president had been to send Apollo 8 photos of earth to 186 leaders of foreign governments. (W Post, 7/21/69, A7)

Astronaut Frank Borman repeated Apollo 8 reading from Genesis at White House service attended by President and family, Vice President, Cabinet members, Congressmen, and members of Joint Chiefs of Staff, and of diplomatic corps. During sermon, Dr. Paul S. Smith, President of Whittier College and member of Religious Society of Friends, said: "It was a philosopher...who, two thousand years ago, first recounted a voyage to the moon. Lucian called it The True History but confessed in the preface that he wrote 'of things which are not and never could have been.' It was a political satirist's precautionary disclaimer, because his real subject was the stupidity of human warfare. His lunar voyagers got caught up in internecine strife between the moonmen

July 20 (continued)

and the sunmen over the colonization of Venus! If there is something instructive in the thought, it may be the implication that after two millenia of philosophy men are still fighting over real estate and still dying in the name of philosophical abstractions, but that a voyage to the moon is just as feasible (though somewhat more expensive) as a trip to Timbuktu." (Wiegers, W Post, 7/21/69, B1; CR, 7/22/69, H6189-90)

Hours before lunar landing attempt by Apollo 11 Astronauts Neil A. Armstrong and Edwin E. Aldrin, Pope Paul VI said at Castel Gondolfo, Italy: "In the ecstasy of this prophetic day, a real triumph for means produced by man for the domination of the universe, we must not forget man's need to dominate himself. Admiration, enthusiasm and passion for instruments, for the products of man's hand, fascinate us, perhaps to the point of madness.... This is the danger: We must beware of this worship." (Schmick, B Sun, 7/21/69, A4)

- Tass announced that Luna XV was still functioning normally in lunar orbit with 109.4-km (68-mi) apolune, 16.1-km (10-mi) perilune, 1-hr 54-min period, and 127° inclination. Sir Bernard Lovell, Director of U.K.'s Jodrell Bank Experimental Station, said Luna XV had conducted two midcourse corrections and speculated that spacecraft was preparing either to land or to observe Apollo 11 landing. (AP, B Sun, 7/21/69, A1)

July 20-21: White House was flooded with congratulatory cables and telephone calls on Apollo 11 landing, from heads of state throughout world. Washington Post estimated half billion persons had watched lunar touchdown on worldwide TV, and NBC said 123 million in U.S. saw it, mostly in their own homes. But 35,000 baseball fans in New York had learned of landing's success when words "They're on the moon" flashed on scoreboard at Yankee Stadium. In New York's Harlem, many of 50,000 attending soul music festival booed lunar landing announcement. At massive "Moon In" at Central Park, enthusiastic crowd of young people watched landing on huge outdoor TV screen in steady downpour and bought "lunar dogs," "Apollo rock candy," and "moon picnic" boxes.

Composer and band leader Duke Ellington made singing debut with "Moon Maiden," song he wrote to celebrate Apollo 11 success, taped for ABC. New York Times sold out 950,000 copies of July 21 issue announcing lunar landing and announced it would reprint entire edition July 24 as souvenir. Special Florida Times-Union edition

July 20-21 (continued)

datelined "Moonday, July 21" sold out in Jackson within two hours. Estimated 8,000 Western Electric Co. employees left work or failed to show up in protest against being denied access to TV or radios on job during lunar landing. Des Moines, Iowa, TV stations received some complaints from viewers over absence of regular programs.

Crime rate fell in Los Angeles, while in Savannah, Ga., 17 prisoners sawed their way out of Chatham County prison branch while guards watched Apollo 11 on TV.

At MSC, Houston Welfare Rights Organization members demonstrated around display of LM, calling on U.S. to set new goal--elimination of poverty. (AP, B Sun, 7/22/69; W Post, 7/21/69; 7/22/69; Apollo 11 Mission Commentary, 7/21/69; NYT, 7/17/69, 7/27/69)

Millions around world hailed Apollo 11 landing:

Soviet Premier Alexsey Kosygin complimented U.S. on lunar landing and expressed interest in widening U.S.-U.S.S.R. space cooperation during July 21 Moscow discussion with former Vice President Hubert H. Humphrey, who was ending Soviet visit. Soviet TV did not carry live coverage of Apollo 11 lunar landing July 20; Tass announcement was read by newscaster and carried in two-paragraph item on Pravda's front page. Evening paper, Izvestia accorded story more space and featured photo of astronauts on moon. On TV, Cosmonaut Konstantin P. Feoktistov described landing as "major landmark" and said crew had coped "brilliantly" with mission. Georgy Petrov, Director of Soviet Institute for Cosmic Research, called Apollo 11 "outstanding achievement" but said more data per ruble could have been gathered by unmanned probes.

Statue dedicated to Apollo 11 astronauts was unveiled July 21 in sports stadium at Cracow, Poland.

In U.K., Queen Elizabeth watched lunar landing on TV, then cabled President Nixon "warmest congratulations." Prime Minister Harold Wilson expressed "heartfelt relief." At Jodrell Bank Experimental Station astronomers applauded and director, Sir Bernard Lovell, said that "the future has been revolutionized." David Threlfall collected \$24,000 on five-year-old bet that man would land on celestial body before 1971. Betting shop had given him thousand-to-one odds [see May 29].

In Wollongong, Australia, local judge heard cases while watching Apollo 11 lunar landing on portable TV set.

Czechoslovakia issued two postage stamps July 21 commemorating lunar landing, while record crowds at U.S. Embassy exhibition tapered off after exhausting supply of Apollo giveaway materials.

Five thousand Hungarians walked through American Embassy in Budapest July 21, picking up USIA pamphlet Man on the Moon.

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In Romania, bouquets were tossed through U.S. Embassy fence to foot of flagpole and several Romanians reported large numbers of Bulgarians were crossing border to watch live TV coverage of Apollo 11.

Cuban government decided not to jam Voice of America broadcast of Apollo 11 lunar landing, but in Algiers news was ignored except for announcement in government-controlled newspaper that "the man is on the moon." In Ghana, village chief listening to VOA broadcast feared astronauts might fall off moon if not careful.

In Bangkok, freedom for 622 pardoned prisoners was delayed because guards refused to leave TV sets showing Apollo 11.

Lunar landing stole top play in Israel and Egypt, from accounts of their fierce fighting at Suez Canal.

In Singapore, girl born half hour after lunar landing was named Luna. In Pakistan, boy baby was named Apollo.

Prime Minister, Mrs. Indira Gandhi, and Indian Parliament gave standing ovation to Apollo 11 astronauts at opening of day's business in New Delhi July 21.

In Japan, Emperor Hirohito called off customary daily stroll and interrupted lunch to watch Apollo 11 on TV.

Iroquois Indians in Brantford, Ontario, Canada, feared lunar landing might plunge earth into darkness and release monsters from earth's core. Their medicine man and chief, Joseph Logan, Jr., had said moon was sacred to his people and "we are not supposed to disturb her."

In Taipei, Formosa, Nationalist China Parliament member Hsieh Jen-chao invited Apollo 11 astronauts to attend Moon Festival honoring rabbit which Chinese legend said lived on moon and could provide eternal life.

Some devout Muslims in Somalia refused to believe Apollo 11 lunar landing was reality. Following radio, press, and word-of-mouth announcement, fist fights broke out July 21 in Mogadiscio streets between believers and disbelievers. Parents of baby boy born on lunar landing day broke with Muslim tradition and named child Armstrong Abdurahman Osman.

In Brussels workers in radio and TV studios suspended strike during transmission of Apollo 11 mission film.

In Brazil several thousand persons cheered as they witnessed televised lunar landing at Museum of Modern Art in Rio de Janeiro while church bells rang outside.

In Santiago de Chile people rushed out of restaurants to look at moon, forgetting it was midafternoon when they learned of lunar landing.

While rest of world focused on lunar landing, one quarter of world's population labored through sixth moon of Chinese lunar year unaware of event. Approximately 800 million people in Communist China had heard no news of lunar landing. Only deviation from "total blackout

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on space exploration" was July 17 story of Astronaut Frank Borman's visit to Moscow, reported by New China News Agency. (C Trib, 7/22/69; W Post, 7/21-22/69; W Star, 7/22/69; NYT, 7/22/69; B Sun, 7/21-22/69; Am Embassy, Prague, Bucharest, Brussels, Budapest, Mogadiscio)

Press editorials in U.S. and around world underscored Apollo 11's landing on moon and man's first steps on another planet.

St. Louis Post-Dispatch: "There is no doubt that the United States should continue to support a substantial spacefaring program. Anything else would be a denial of the scientific spirit of the century and the qualities that have made America what it is. But its scope should be measured by findings and probabilities--and one other factor. Future spacefaring ought to be a co-operative effort of all nations able to participate, with the benefits to be shared by all." (St. Louis P-D, 7/20/69)

Washington Sunday Star: "A creature that can stand where Armstrong and Aldrin stand tonight--that can, in the future, move among the spheres and literally explore new worlds...is unlikely to give up on the hard task of perfecting himself and his life in his natural environment on earth. The God who brought him thus far from a blob of squirming protoplasm...is unlikely...to let man blow it all now. Here...must be the answer to the national debate as to whether we go ahead in space, or whether we tend to our knitting at home. We are bound to do both.... The progressive expansion of the physical and spiritual domain of man inevitably will intensify our determination and ability, in concert with other nations, to build a home world where hunger, fear and violence no longer have a place." (W Star, 7/20/69, G1)

William Hines in Washington Sunday Star: "One cannot question the majesty of conception or magnitude of effort that made Apollo 11 possible." But one could ask, "Is this trip really necessary?" One saw in Apollo, "that fundamental failing called hubris, which got so many protagonists into hot water in the old Greek mythology. Hubris in English is usually taken to mean prideful arrogance; in ancient Greek the word meant simple insolence. The Apollo enthusiast rejects the concept of hubris; he says we go to the moon not because we are arrogant, but because we are driven, and thereby implicitly rejects the concept of free will and substitutes sappiness for sassiness. The majority asks, 'But if we didn't go, what?' and the minority responds, 'If we didn't go, so what?'" (W Star, 7/20/69, G2)

Humorist Art Buchwald in Washington Post: "Sometimes one gets the feeling that the right hand germs in the Government don't know what the left hand germs are doing. This was brought home to me...when I read about the millions of dollars that were being spent to see that the

July 20-21 (continued)

astronauts did not bring back a single germ from the moon. Unfortunately, across the page from that story was another that the Army was going ahead with open air testing of nerve gases and germ warfare." (W Post, 7/20/69, B6)

Los Angeles Herald-Examiner: "America's moon program has benefited all mankind. It has brought better color television, water purification at less cost, new paints and plastics, improved weather forecasting, medicine, respirators, walkers for the handicapped, laser surgery, world-wide communications, new transportation systems, earthquake prediction system and solar power.... The Mars goal should bring benefits to all mankind even greater than the tremendous contributions of the moon program." (LA Her-Exam, 7/20/69)

Baltimore Sun: "...it is still almost incredible that in the afternoon of a Sunday on earth two humans found themselves within a vehicle resting on the surface of the moon. Nothing could quite prepare one's mind for that, or for the subsequent moment of climax, the actual setting of a human foot on the substance of our barren satellite. One of the mysteries that had engaged the infinitely inquisitive mind of man is now made tangible. Others remain beyond our planet and upon it." (B Sun, 7/21/69, A16)

Chicago Daily News: "These have been moments to savor--moments in which uncounted millions have shared the immediacy of a turning point in history. This time there was no lapse of weeks or months, waiting for the event to be confirmed. We were all there, bound together by the miracle of communication that intertwined all the other miracles of technology that marked man's first step on a celestial body." (C Daily News, 7/21/69)

Milwaukee Journal: "Superlatives pale before the magnificence of the achievement. ...but how many years before the astounding performance of Armstrong and Aldrin will seem as primitive as the pioneering work of the Wright brothers?" (MJ, 7/21/69, 14)

Cleveland Plain Dealer: "Man's store of scientific knowledge will be vastly enriched by the landing on the moon. In no other single event in history has there been greater opportunity to unlock the mysteries of the universe." (Plain Dealer, 7/21/69)

London Daily Sketch: "America's moon triumph offers this old world's bickering and jealous people a parable of hope." (B Sun, 7/22/69, A1)

Montreal Star: "The deepest hope for a world starved for some form of symbolism, of an attempt at harmony in place of selfishness and narrow nationalism, came from the astronauts." CFOX Radio, Montreal, broadcast: "...Eliminate war? Yes! Eliminate poverty? Yes! But the exploration of space will help us, not impede us, in reaching these goals." (Am Consul, Montreal)

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Arbetet, Malmo, Sweden (principal organ of Social Democratic Party):
 "No Soviet politician has ever before used such conciliatory tones toward the U.S.A. as did Foreign Minister Gromyko recently in his speech before the Supreme Soviet.... This Russian position seems generally to be based on fears of a confrontation with China.... One of the side effects can be increased Russian interest in broader scientific cooperation in space research. Nothing else could be better designed for global cooperation, since nothing else gives us clearer testimony that we live in one world."
 (Am Embassy, Stockholm)

July 21: U.S.S.R.'s Luna XV (launched July 13) had landed on moon at 6:45 pm Moscow time (11:45 am EDT) and had ended its work, Tass announced. Spacecraft had "reached the moon's surface in the preset area" after 52 revolutions around moon and 86 communications sessions during which "the work of the new systems of the station was checked, the parameters of the trajectory of the movement were measured, and scientific research was conducted." Tass said Luna XV had demonstrated capability to land on various areas of lunar surface by changing selenocentric orbit and that mission had yielded important data on spacecraft systems.

Sir Bernard Lovell, Jodrell Bank Experimental Station Director, said signals from spacecraft had ended suddenly and estimated craft might have landed in Sea of Crises, about 500 mi from Sea of Tranquility. "If we don't get any more signals, we will assume it crashlanded. But we don't make that assumption at the moment." (Gwertzman, NYT, 7/22/69, 1, 29)

- . Univ. of Texas astronomers reported second unsuccessful attempt to bounce laser beam off reflector left on moon by Apollo 11 astronauts. McDonald Observatory Director, Dr. Harlan Smith, said he expected eventual success. (AP, B Sun, 7/22/69, A8)
- . Galabert International Astronautics Prize for 1969 was awarded in Paris to Apollo 11 astronauts. Award of \$4,000 was presented annually for notable contributions "to human progress for the advancement of all sciences and techniques associated with astronautics." (AP, B Sun, 7/22/69, A8)
- . HUD Secretary George W. Romney addressed International Platform Assn. in Washington, D.C.: "I do not propose that we now abandon our efforts to extend man's reach still further beyond our planet, any more than we abandoned our domestic goals while we were reaching for the moon. But I do believe the time has come for a revision--in

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July 21 (continued)

fact, a reversal--of our national priorities. I believe that in the decades ahead, the public interest and indeed our national survival require us to assign our housing and urban goals a high priority--at least comparable to the priority we gave our space program in the decade just ending." (HUD News; Hutchens, W Star, 7/22/69, A6)

South Korea dedicated its first super-highway, linking Seoul with Inchon. It was named Apollo in honor of U.S. moon landing. (AP, W Post, 7/23/69, C5)

July 22: U.S.S.R. launched two unmanned satellites. Cosmos CCXC, launched from Plesetsk, entered orbit with 323-km (200.7-mi) apogee, 192-km (119.3-mi) perigee, 89.6-min period, and 65.4° inclination and reentered July 29. Molniya I-12 comsat, launched from Baikonur, entered orbit with 39,526-km (24,560.3-mi) apogee, 496-km (308.2-mi) perigee, 711.0-min period, and 64.9° inclination. (GSFC SSR, 7/31/69; SBD, 7/28/69, 62; NYT, 7/23/69, 26)

Scientists at MSC, monitoring seismometers left on lunar surface by Apollo 11 astronauts, recorded five-minute tremor they said could have been internal activity--moonquake--or meteoroid strike on surface. Scientists expressed concern that seismometer was overheating, probably because of damage to protective cover from LM exhaust, and might not survive heat of lunar moon. (McGehan, B Sun, 7/23/69, A1; Cohn, W Post, 7/24/69, A15)

Scientists at Lick Observatory in California unsuccessfully tried for third consecutive night to bounce ruby laser beams off reflector left on lunar surface by Apollo 11 astronauts. They admitted difficulty in pinpointing reflector's exact location and speculated that it might have been knocked down by LM exhaust during ascent. (AP, W Star, 7/23/69, A7)

NASA announced revised plans for first orbital workshop, with 1972 launch using first two stages of Saturn V to launch workshop and Apollo Telescope Mount together. Workshop would be outfitted on ground and would arrive in 253-mi circular orbit equipped for immediate occupancy by astronauts and with ATM attached. Program objectives remained same as when NASA intended to use Saturn IB 2nd stage as 1971 workshop: to provide environment in which man could live and work for extended periods in space and to study man's physiological and psychological responses and capabilities in space.

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July 22 (continued)

ATM would permit man to operate high-resolution astronomical telescopes in space, free from earth's atmosphere.

Saturn V hardware from Apollo program was available for revised plan. (NASA Release 69-105; Simons, W Post, 7/22/69, A1)

- . President Nixon addressed 2,000 American Field Service students from 60 countries on White House lawn: "...in the year 2000 we will, on this earth, have visited new worlds where there will be a form of life. I know this will happen, and I want to tell you as I look forward and dream about that future...this is the kind of world I would like to see and the kind of exploration of that new world that I know all Americans want. I hope that when the next great venture into space takes place that it will be one in which Americans will be joined by representatives of other countries." (PD, 7/23/69, 1016-7)
- . U.K. radioastronomer Sir Bernard Lovell told press at U.K.'s Jodrell Bank Experimental Station that Apollo 11 and Luna XV increased hopes for U.S.-U.S.S.R. space cooperation because "this is the first time the United States has been demonstratively superior in a vital part of the space program. American approaches for collaboration may be received with sympathy in the Soviet Union as they can no longer regard themselves as masters." (AP, B Sun, 7/23/69, A4)
- . Wall Street Brokerage houses were watching effect of Apollo 11 success on stocks as market resumed trading after July 21 holiday. Some firms believed lunar landing would generate enthusiasm, although its impact would be restrained by uncertainties over surtax extension, House committee vote to cut oil depletion allowance (major tax benefit of petroleum industry) and apparent standoff at Vietnam peace conference. (UPI, W Star, 7/22/69, C7)
- . Washington Post said it found intellectuals "deeply divided" on implications of lunar landing. Univ. of California physicist Dr. Owen Chamberlain had said achievement showed "mankind can be in charge of his destiny.... We should now come back and put our emphasis on the surface of the globe" to achieve peace, lessen poverty, control overpopulation, and preserve our environment.

Univ. of California physicist Dr. Harold C. Urey said if some of space effort reliability rubbed off on industry, "spin-off" would be enormous and space program would pay for itself. Less than $\frac{1}{2}$ of 1% of GNP was spent on space and if lessened there was no guarantee it would be spent on necessary domestic programs.

July 22 (continued)

Harvard Univ. biochemist Dr. George Wald had said: "What should have been a great flight of the human spirit comes to us heavy with threat. Those almost miraculous guidance systems that so uncannily find their targets, will they one day be guiding missiles to find us?" Dr. Wald wondered if Apollo 11 had opened new horizons for his students. "I am afraid that they see in this an exercise of the old and well-entrenched, an exercise in great wealth and power, heavy with military and political overtones. I am afraid that they feel a little more trapped; a little more disillusioned, a little more desperate."

Most overseas intellectuals tended to concur with historian Prof. Arnold J. Toynbee's judgment, "If we are going to go on behaving on earth as we have behaved here so far, then a landing on the moon will have to be written off as just one more shocking misuse of mankind's slender surplus product."

But Oxford Univ.'s Prof. A. J. Ayer had said, "I doubt if Prof. Toynbee has any evidence that men are being prevented in any large numbers from turning their minds to meaningful pursuits by the part which they play, or the interest which they take, in the exploration of space.... I think that these spatial explorations...are intellectually stimulating, especially to young people."

Italian professor Michele Federico Sciaccia of Turin, Italy, felt "United States would offer proof of having achieved maturity if it were to stop exploration of space, except for [unmanned] ships intended to carry out essential scientific research." Mankind needed less technical achievement and more moral and religious strength. (W Post, 7/22/69, A14)

Australian Civil Aviation Minister Reginald Swartz said passengers on transpacific Qantas Airlines flight would see Apollo 11 reentry July 24 when command module would parallel their aircraft for four minutes during descent near Gilbert and Ellice Islands. (Reuters, W Post, 7/23/69, A12)

U.S. Patent Office issued patent No. 3,456,387 to Clyde A. Tolson, Associate Director of Federal Bureau of Investigation, for equipment to operate emergency windows and exits in aircraft and space vehicles. Without action of occupants, sensors would detect abnormal conditions and computer would weigh considerations before opening appropriate escape exits.

Patent No. 3,456,445 was issued to Curtiss-Wright Corp. for improved version of astronaut maneuvering unit, Cap Pistol, intended to propel man outside space vehicle by capsules spaced along tape strip and fired by engine in pistol fashion. Inventors were Joseph F. Loprete, Max Beniele, and Richard E. Biehl. (Pat Off PIO; Jones, NYT, 7/26/69, 31)

July 22: Goodyear Aerospace Corp. had invented USAF Pilot Airborne Recovery Device (PARAD) to keep ejecting jet fighter pilot aloft and out of range of enemy ground fire until his midair retrieval by rescue aircraft. Ballute (balloon-parachute) attached to main parachute had burner suspended below and fueled from propane tank on pilot's back. At 250°F hot air kept parachute above ground for 30 min. System could be operated automatically to carry pilot 6,000 ft or manually to 10,000-ft hovering altitude. (NYT, 7/22/69, 58)

- . National and international press continued comment on Apollo 11 lunar landing.

Philadelphia Inquirer: "Will this magnificent accomplishment serve as inspiration, urging Americans and all mankind on to a genuine 'giant leap' forward, not merely into the infinite reaches of space but into the infinite possibilities of achievement on earth where the space age has recorded many more failures than successes? Or will the inspiration be abandoned before the veiled censure of those who seem to suggest the solution of all human dilemmas lies in turning away from space to other priorities?" Cutbacks at hour of triumph would be only waste of investment in technology which could be help in solving earth problems. "This is no time to falter, our astronauts should come home to a world and nation determined to fulfill the prophecy in Commander Armstrong's words." (P Inq, 7/22/69)

Washington Post: It was foolish "to leap from this historic moment to eager expectations of the day when men will live and work in space, when colonies will be established, food raised and industrial products built on heavenly bodies other than the earth. These things will doubtless come in their own good time. But this is not the occasion on which to make a new national commitment in space that would keep NASA's program going at the frantic pace which fulfilled President Kennedy's great promise for the moon. Now is the occasion, rather, to establish a steady program of space development, one removed from the political debate over national priorities, which will ensure that we establish a firm base for future generations to build upon while creating at home...a kind of society which will allow them to use fully the new opportunities opened up by the three new American heroes and the tens of thousands of other people who made their flight possible." (W Post, 7/22/69, A24)

Handels Och Sjöfartstidning, Goteborg, Sweden: "This is a small step for a man, but a great one for humanity. Neil Armstrong's commentary when he stepped down onto the surface of the moon has every prospect of becoming one of those winged expressions which generations of school children will commit to memory.... Now should be the time to replace the extraordinarily costly space race with cooperation between the Soviet and the U.S.A." (Am Embassy, Stockholm)

July 22 (continued)

Stockholm Expressen: "The 'moonshot'...was imposing. But it also gives a horrible feeling to think that the U.S.A. can handle tremendous technical problems with such ease while it is considerably more difficult to cope with those of a complicated social, political and human nature."
(Am Embassy, Stockholm)

Canadian Montreal Star: "The scientific information which results from Apollo 11 is an extra dividend from an enterprise which has produced its own benefits for the human spirit and, perhaps, for human solidarity."
(Am Consul, Montreal)

July 23: USAF launched unidentified satellite from Vandenberg AFB into orbit with 532.5-mi (857-km) apogee, 488.4-mi (786-km) perigee, 101.3-min period, and 98.8° inclination. (GSFC SSR, 7/31/69)

NASA's HL-10 lifting-body vehicle, piloted by NASA test pilot William H. Dana, reached 68,000-ft altitude and mach 1.2 during 22nd flight west of Rosamond, Calif. Purpose was to obtain performance, stability, and control data.
(NASA Proj Off)

Scientists monitoring seismometer left on lunar surface by Apollo 11 astronauts told press at MSC five-minute event recorded July 22 was either meteoroid strike or moonquake similar to mild California earthquake recorded on East Coast. MIT geologist, Dr. Frank Press, said tremor would have magnitude of four or five according to Richter scale, on which major earthquake registered seven or eight. Seismic reading was strong indication that moon was layered with outer crust and inner mantle like earth and supported theories that moon was formed near or torn from earth. Layering, he said, "would imply that at one time there was enough heat so that the heavier rocks went to the interior and the lighter ones to the surface. (McGehan, B Sun, 7/24/69, A1; Lyons, NYT, 7/24/69, 1)

NASA announced selection of McDonnell Douglas Corp. and North American Rockwell Corp.'s Space Div. to conduct parallel \$2.9-million, 11-mo design and planning studies of 12-man earth orbital space station which could be developed by 1975 and have 10-yr lifetime. Companies would also include conceptual design of 50-man space base composed of specialized modules assembled in low earth orbit in late 1970s and early 1980s to serve as centralized scientific and technical facility in orbit.

Aerojet-General Corp., General Electric Co., and Hughes Aircraft Co. had been selected for final competitive negotiation of contract to

July 23 (continued)

develop advanced optical communications experiment. Companies would compete for one \$5-million contract to develop wideband laser communications system to be placed on board Applications Technology Satellite ATS-F, scheduled for launch in 1972, for communications between satellite and transportable ground station. (NASA Releases 69-108, 69-109)

Canadian Isis I International Satellite for Ionospheric Studies (launched Jan. 30) was adjudged successful by NASA. Nine of ten experiments were operational; ion mass spectrometer had been turned off after one week of operation, when it developed high-voltage problems, and since had been used only for short periods to collect engineering data. Low-frequency receiver experiment had been providing indirect ion data, thus compensating partially for IMS loss. Onboard tape recorder was providing excellent topside ionograms of Antarctic area and other previously inaccessible areas. (NASA Proj Off)

Full-color lunar photos from Apollo 11, including one of man first setting foot on moon, would be released by NASA to press and TV four days after splashdown, following two-day decontamination of film, NASA announced. Superintendent of Documents, GPO, was taking orders from public for photos to be filled in late August. Series of reproductions of paintings by American artists recording space program, "Eyewitness to Space," also would be released. (NASA Release 69-83J)

Successful Apollo 11 mission was expected to spur reservations on first lunar passenger flight, Washington Evening Star said. Before launch Pan American World Airways held 30,000 reservations and Trans World Airlines, 5,000. Pan Am spokesman said rush began after film "2001: a Space Odyssey" was first shown in 1968. In letters acknowledging reservations, Pan Am was saying, "Starting date of service is not yet known. Equipment and route will, probably, be subject to government approvals." TWA was saying, "We will be in contact with you again, as soon as technological advances develop to the point where we can project departure dates." (W Star, 7/23/69, A7)

In Pravda Soviet Academician, Prof. Leonid I. Sedov, said space research was developing in so many different directions that realization of future projects would require huge material expenditure and concentration of creative efforts of "countless highly qualified workers and specialists." He said, "Not one individual country can afford the practical implementation of all the technically feasible and worthwhile projects." While scientists had said unmanned spacecraft

July 23 (continued)

- could not always be substituted for manned vehicles, "flights by automatic stations have preceded and will continue to precede manned flights." Human feelings and observations, "especially when something turns up unexpectedly and unforeseen, cannot be completely replaced by automatic stations." But unmanned probes would continue as pathfinders because they were "cheaper, more simple and less dangerous vehicles for research." (Reuters, W Post, 7/24/69, A15)
- . U.S. delegate to U.N. William B. Buffum, responding to Soviet tribute to Apollo 11 astronauts by U.S.S.R. delegate Aleksey V. Zakharov, said before Security Council he hoped "fraternal spirit" demonstrated by astronauts and cosmonauts would lead to greater cooperation on earth also. (NYT, 7/25/69, 31)
- . In his fourth reference to Apollo 11 within week, Pope Paul VI said at summer palace, Castel Gondolfo, Italy: "Catholic faith, not only does not fear this powerful confrontation of its humble doctrine with the wonderful riches of modern scientific thought, but it desires it... because truth although diverse on various levels...is one and because such a confrontation is of mutual advantage to faith and to study in every field." (AP, W Post, 7/24/69, A15)
- . Rep. Louis Frey, Jr. (R-Fla.), introduced for himself and Rep. William Chappell (D-Fla.) H.J.R. 834 "to redesignate the area in the State of Florida known as Cape Kennedy as 'Cape Canaveral.'" Measure was referred to House Committee on Science and Astronautics. (CR, 7/23/69, H6238)
- . Czechoslovakian Communist Party Central Committee's weekly Tribuna said of Apollo 11 landing: "It would be premature today to try to attempt a detailed evaluation of the historical significance of this act. Surely its influence will be no smaller than that of Columbus' travels many centuries ago." (Am Embassy, Prague)
- . Space Business Daily editorial: "The space community must not be asked to stop, now that they have attained their first major goal in space, and to attempt to provide as effective a leadership in the social sciences and for the domestic programs, as they have provided in the physical sciences and technology. Rather, it is time for the social leaders of our country to reexamine their own program, to begin correcting their mistakes, and to forge a management structure from their fragmented family that will allow them to fully utilize the products of the space program." (SBD, 7/23/69, 36)

July 24: President Nixon welcomed returning Apollo 11 astronauts aboard U.S.S. Hornet: "I think I am the luckiest man in the world...not only because I have the honor to be President of the United States, but particularly because I have the privilege of speaking for so many in welcoming you back to earth." Washington had received messages from more than 100 foreign governments: "Emperors, Presidents, Prime Ministers, and Kings, have sent the most warm messages that we have ever received. They represent over 2 billion people on this earth, all of them who had the opportunity, through television, to see what you have done." Week of mission had been, "the greatest week in the history of the world since the Creation, because as a result of what happened in this week, the world is bigger, infinitely, and also, as I am going to find on this trip around the world...as a result of what you have done, the world has never been closer together before." (PD, 8/4/69, 1032-3)

At MSC news conference following Apollo 11 splashdown, Dr. George E. Mueller, NASA Associate Administrator for Manned Space Flight, said: "...we now stand at what is undoubtedly the greatest decision point in the history of this planet." Apollo 11 had proved "that man is no longer bound to the limits of the planet on which for so long he has lived. We will return to the moon first in November and then at regular intervals in the coming year. But these trips are only the first step.... Will we press forward to explore other planets or will we deny the opportunity to the future? To me, the choice is clear. We must take the next step.... This is the time for decision.... The knowledge possessed by men is sufficient, the resources are adequate for the task of carrying out this next step....

"In this moment of man's greatest achievement, it is timely for us to dedicate ourselves to the unfinished work so nobly begotten by three of us. To resolve that this nation, under God, will join with all men in the pursuit of the destiny of mankind will lead to the way to the planets."

In answer to questions, Dr. Mueller said next major step should be manned landing on Mars which would be possible "sometime after 1980."

L/G Samuel C. Phillips (USAF), Apollo Program Director, told press Apollo team was "strongest team that's ever been assembled in the history of man. It has the strength of technical and engineering confidence, scientific competence, and management competence that's unexcelled. It has the dedication that's necessary to be able to tackle an almost impossible job and bring it through" and an exciting future in lunar exploration.

Second manned lunar landing mission, Apollo 12, would be launched from KSC Nov. 14 toward touchdown on Site 7 in moon's Ocean of Storms. Primary objective would be to deploy Apollo lunar surface experiment package (ALSEP), explore and survey mare area, and return samples to earth. Secondary objective, if LM softlanded on target, would be to

July 24 (continued)

examine Surveyor III spacecraft (launched April 17, 1967), which was resting on moon near planned Apollo 12 touchdown point. Astronauts would have two periods for extravehicular activities (EVA), during which they would explore surface and conduct experiments for over three hours and walk farther away from spacecraft than had Apollo 11 crew. Maximum lunar stay time would be 28-32 hrs. Schedule called for planning to fly follow-on missions through Apollo 15 at four-month intervals and missions after that at five-month intervals. (Transcript)

USAF launched unidentified satellite from Vandenberg AFB by Thorad-Agena booster. Orbital parameters: apogee, 136.1 mi (219 km); perigee, 110.6 mi (178 km); period, 88.4 min; and inclination, 74.9°. Satellite reentered Aug. 23. (GSFC SSR, 7/31/69; 8/31/69; InteraviaAirLetter, 7/25/69, 5)

In nationwide reaction to safe return of Apollo 11 astronauts, New York Stock Exchange went wild though stocks continued to fall. Numbers on annunciator boards flapped in unison as message "New York Stock Exchange shares the world's joy at the safe return of Apollo from the moon--Astronauts Armstrong, Aldrin, and Collins--So proudly we hail you" appeared on tape and illuminated on screen. Along Fifth Avenue church bells rang. Hayden Planetarium suspended usual program to throw "splashdown party" with champagne and live color telecast of Apollo 11 recovery operations flashed on blackened dome.

San Franciscans exploded firecrackers and threw ticker tape from windows, and 10-story-high figure "11" was fashioned in lighted windows at MIT in Boston. Des Moines, Iowa, rang Liberty Bell reproduction for first time since its 1950 installation on State House grounds.

In Astronaut Neil A. Armstrong's home town, Wapakoneta, Ohio, highschool band marched playing moon songs. Montclair, N.J., theater marquee read, "Congratulations Buzz Aldrin--Montclair's Man on the Moon."

In Huntsville, Ala., MSFC Director, Dr. Wernher von Braun, was hoisted on shoulders of four local councilmen while thousands at MSFC site cheered and waved banners saying "Huntsville is Rocket City."

United Press International said city of Houston planned "Texas size" celebration for Apollo 11 astronauts Aug. 16, including ticker-tape parade and huge program in city's Astrodome coliseum. (Sloan, Weinraub, Hicks, Borders, UPI, NYT, 7/25/69, 67, 29, 69, 31, 30; B Sun, 7/25/69, 45)

July 24: Trans World Airlines filed first application with Civil Aeronautics Board for routes between earth and moon. Airline said it had received 1,200 reservations during final four days of Apollo 11 mission. (TWA Release)

Safe landing of Apollo 11 in Pacific made "splash applauded around the world," New York Times said. In U.S.S.R. TV viewers had live coverage for first time during mission as Moscow TV station hooked into Eastern Europe's Intervision network for live transmission of astronauts being deposited on carrier Hornet. Later station devoted first two-thirds of final newscast to Apollo 11 and announced that Soviet President Nikolay V. Podgorny had sent telegram to President Nixon offering "our congratulations and best wishes to the brave space pilots." Soviet Academy of Sciences president Mstislav V. Keldysh called voyage "a big contribution to space exploration and further progress of world science." Cosmonauts sent message to Apollo 11 crew: "We...closely followed your flight. We wholeheartedly congratulate you on the completion of your wonderful journey to the moon and safe return to earth."

In London Lloyds of London's Lutine Bell tolled twice for good news of splashdown of Apollo 11. Sir Bernard Lovell, Jodrell Bank Experimental Station Director, said, "The successful conclusion of this immense project marks the beginning of a new phase when man must concern himself with the greatest issues of peaceful coexistence in extraterrestrial space."

Thunderstorm in Paris drove many people off streets at time of splashdown. On Riviera, bells tolled for five minutes and ancient cannon boomed.

Mayor Pascal Rossini of Ajaccio, Corsica, sent invitation to astronauts to visit Corsica during 1969 bicentennial of Napoleon's birth.

In Warsaw crowd of 300 Poles broke into applause at U.S. Embassy.

Over Pacific on Qantas airliner flying under Apollo reentry point, crew and 80 passengers saw space capsule reenter. In Canberra Prime Minister John Gorton invited astronauts to visit Australia.

Pope Paul VI sent telegram to President Nixon with prayer "that this immense achievement may foster peace and prosperity and scientific and moral progress for all mankind."

Other congratulatory messages were sent by President Giuseppe Saragat of Italy, President Agha Mohammmand Yahya Khan of Pakistan, Prime Minister Eisaku Sato of Japan, President Chung Hee Park of South Korea, U.N. Secretary General U Thant, President Gustav Heinemann of West Germany, and Prime Minister John Gorton of Australia. (Collier, NYT, 7/25/69, 31; Mills, B Sun, 7/25/69, A6; AP, B Sun, 7/25/69, A6)

July 24: More TV coverage of Apollo 11 mission had been transmitted overseas via satellites to worldwide audience than of any previous event, ComSatCorp announced. More than 230 hrs of satellite time for 200 programs were transmitted during nine-day mission. Previous record was 225 hrs, set by Mexico Summer Olympic Games during 18-day period in October 1968. Broadcasters estimated that 500 million persons were able to watch Apollo 11's TV broadcasts in more than 40 countries on 5 continents. (ComSatCorp Release 69-46)

- . During stop at Hickam AFB, enroute to MSC from Apollo 11 splashdown, Apollo 8 Astronaut Frank Borman said it would be "helpful and hopeful" for U.S. and U.S.S.R. to cooperate in space missions. He saw "indications" during his tour of U.S.S.R. that Russians would be interested, but "talk is cheap" and U.S.S.R. "is still supplying 85 per cent of the munitions to North Vietnam." He said U.S. had gone "95 per cent of the way" towards promoting cooperation. It was up to U.S.S.R. to do the rest. (UPI, NYT, 7/26/69, 12)
- . USAF promoted Apollo 11 Astronaut Michael Collins to full colonel. In congratulatory message Gen. John P. McConnell, Air Force Chief of Staff, said Apollo 11 mission was "indeed a momentous achievement" and promotion was "token of appreciation for the part you played." (UPI, NYT, 7/25/69, 28)
- . NASA Office of Space Science and Applications announced establishment of Earth Resources Research Data Facility at MSC, containing documentation from NASA and user agency investigators in Earth Resources Survey Program over past three years. Information was available for examination in facility by all interested persons. (NASA Ann)
- . Rep. Louis Frey, Jr. (R-Fla.), introduced House Joint Resolution "providing for the establishment of the Astronauts Memorial Commission to construct and erect with funds a memorial in the John F. Kennedy Space Center...to honor and commemorate the men who serve as astronauts in the U.S. Space Program." Measure, co-sponsored by House Committee on Science and Astronautics, was referred to Committee on House Administration. (CR, 7/24/69, H6293; NASA LAR VIII/113)

July 25: NASA launch from ETR of Intelsat-III F-5 failed to reach planned synchronous orbit when 3rd stage of Delta booster malfunctioned. Satellite entered low earth orbit with 3,354.8-mi (5,399-km) apogee, 167.2-mi (269-km) perigee, 146.7-min period, and 30.3° inclination instead of elliptical orbit with 23,000-mi (37,007-km) apogee and

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- 175-mi (281.6-km) perigee. Mission, originally scheduled for launch in October 1969, had been rescheduled for July 17 to replace Intelsat-III F-2, which had stopped operating over Atlantic June 29. Launch had been delayed for various technical reasons. (NASA Release 69-119; SEB, 7/29/69, 65; GSFC SSR, 7/31/69)
- . Apollo 11 recovery physician, Dr. William R. Carpentier, reported from inside Mobile Quarantine Facility onboard U.S.S. Hornet that astronauts had completed preliminary medical examination and were "fine." Astronaut Neil A. Armstrong's slight ear infection had disappeared and all three astronauts were in excellent condition. (Wooten, NYT, 7/26/69, 1)
- . Two boxes of lunar samples from Apollo 11 arrived at Lunar Receiving Laboratory in Houston, where they would be examined and used in experiments. (Wilford, NYT, 7/26/69, 1)
- . Dr. Thomas O. Paine, NASA Administrator, told news conference aboard U.S.S. Hornet he expected U.S.S.R. to land men on moon within 18 mos. "My guess is it'll be much sooner than most people think." He thought U.S.S.R. had lost race "by keeping their program so secret." U.S. had encouraged suggestions from scientists throughout non-Communist world, while details of Soviet program were known only to "small elite." Apollo 11 success would eventually lead to closer cooperation with U.S.S.R. in space exploration. "I don't look for any early change in the attitude...but a steady interest on their part. I don't see joint efforts but cooperation from time to time." (UPI, NYT, 7/25/69, 30)
- . President Nixon arrived at Guam International Airport after flight from carrier Hornet. He said, "As I stand here and think of what happened today, the completion of that historic flight to the moon and the landing on the moon, I can say that I am sure all of us--all of the American citizens around the world--are proud today of what has happened...." (PD, 8/4/69, 1033)
- . Senate unanimously adopted S.R. 224, introduced by Sen. Michael J. Mansfield (D-Mont.) for himself and Sen. Everett M. Dirksen (R-Ill.), expressing gratitude on behalf of Senate and of all American people for "dedication, devotion, courage and effort of all associated with the Apollo program and with the Apollo 11 mission." (CR, 7/25/69, S8575)
- . In telephone interview, evangelist and presidential religious adviser Billy Graham took issue with July 24 statement of President Nixon in welcoming Apollo 11 astronauts back to earth. Graham told UPI, "...as

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a Christian, I would contend that there have been three much much greater days" than those of lunar landing and moon walk. They were first Christmas, day on which Christ died, and first Easter. While he did not wish to detract from "magnificent achievement," he felt "President was speaking extemporaneously. And I've found from years of speaking extemporaneously that in the excitement and emotion of a moment, you don't think through every statement you make." Associated Press later quoted Graham as saying, "I know that President Nixon agrees that the greatest single event in history was the coming of Christ"; he was sure President Nixon meant moon walk was probably man's greatest accomplishment. (W Post, 7/26/69, A10)

Plans for proposed \$1-million Neil A. Armstrong Aerospace Museum at Apollo 11 astronaut's birthplace, Wapakoneta, Ohio, called for completion in 1970, Ohio Historical Society Director Daniel R. Porter said. (UPI, W Post, 7/26/69, B7)

National and international press commented on successful completion of Apollo 11 mission:

Washington Post: "It has been eight days of triumph for America, eight days of triumph for mankind. Much more will undoubtedly follow as the secrets of space bow to the advances of science. But it is enough now--more than enough for an entire lifetime when you think about it--to have seen the first men walk on the moon and then, less than four days later, to welcome them back home safely." (W Post, 7/25/69)

New York Times: "For the first time in history, men have gone from this earth to another celestial body, landed there and returned home, even bringing back with them extraterrestrial matter. Not since the human race evolved has there been a comparable event, nor one so capable of lifting all mankind's horizons, dreams and aspirations. What was fantasy to preceding generations is now accomplished fact. The achievement will be remembered so long as civilization survives."

Of President Nixon's round the world tour, Times said: "The spectacular success of Apollo 11 has vastly increased good feeling toward the United States throughout the world. The President obviously wants to capitalize on it both for foreign and domestic political purposes." (NYT, 7/25/69, 46)

Cleveland, Ohio, Plain Dealer: Apollo 11 mission "closes out one aspect of the exploration program but opens wide the door of what can be an almost endless journey.... Although the Apollo program is not complete, the lure of Mars, 5 million miles away, grows in bold anticipation of the future. ...the race has only just begun." (Cleveland Plain Dealer, 7/25/69)

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Newport News, Va., Times Herald: "All of the money poured into the space program would appear justified if one of the side products was the kind of cooperation [with U.S.S.R.] now possible." (Newport News Times Herald, 7/25/69)

El Rai El Amn, Khartoum, Sudan: "America achieved a victory for the human mind by sending the first man from the earth to the moon.... But America, the great power that achieved this astonishing big success, must stop doing things that are far below these standards." (Am Embassy, Khartoum)

Somali News, Mogadiscio, Somali: "It is true that the responsibility for the Apollo-Eleven is entirely American, but the message left behind on the moon for posterity by the astronauts...acknowledges the universal aspect of such a feat. We think...of those courageous astronauts not... as Americans but as worthy representatives of the human race on whose total achievement they relied in carrying out their mighty and splendid mission." (Am Embassy, Mogadiscio)

Motion picture footage of Apollo 11 lunar landing mission would be released for sale to commercial producers after quarantine period, NASA announced. Two 600-ft rolls would be made available initially: one would include prelaunch, launch, and recovery operations; other would include all usable onboard footage. (NASA Release 69-83L)

July 26: Apollo 11 astronauts, enclosed in mobile quarantine facility (MQF), arrived at Pearl Harbor, Hawaii, where they were greeted by 12,000 cheering people and Mayor of Honolulu Frank F. Fasi. MQF was then transported to aircraft which could carry it to Lunar Receiving Laboratory in Houston. At LRL, scientists opened first of two boxes of lunar samples and made preliminary examinations of samples in one box. (Wooten, Wilford, NYT, 7/27/69, 47, 1)

At lunar landing celebration dinner in Huntsville, Ala., MSFC Director, Dr. Wernher von Braun, said: "We worked together and together we accomplished our part of the mission. The moon is now accessible. And someday, because of the beginning that we have made here, the planets and the stars may belong to mankind. This reach toward the heavens, toward the stars, can eventually loose the human race from the confines of this earth and maybe even this solar system and give it immortality in the immense and never-ending reaches of space." For first time, "life has left its planetary cradle and the ultimate destiny of mankind is no longer confined. When the Mayflower landed on American shores the pilgrims did not envision the nation that

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would eventually evolve. Neither can we truly say what will eventually spring from the footprints around Tranquility Base." (Text)

At state dinner in Manila, Philippine President Ferdinand E. Marcos exchanged toasts with President Nixon and commented on Apollo 11: "...we participate in the celebration of this achievement as man aspires for the stars, the stars outside of this world and the stars within himself and within his spirit. It is the hope of humanity, as it is the hope of the Philippines, that this vision and this genius, this courage and this ingenuity shall be utilized for the solution of man's problems." (PD, 8/4/69, 1036-7)

New York Times interview quoted JPL Director, Dr. William H. Pickering: "Now that Apollo has been accomplished, rather than set another ambitious goal we should have a period of consolidation," during which "the balance should be increased toward unmanned effort." There was talk of exploring universe, "but the solar system is only a small part and it's going to be a long time before we venture out. We are making a very local exploration." He believed solar system exploration would pay off in understanding of history and evolution of solar system and, possibly, discovery of life on another planet and in social benefits. "The trouble with the social world is that we cannot agree on goals. We talk of weather control...but control for whom? The farmer or the sportsman or the businessman?" (Reinhold, NYT, 7/27/69, 47)

Creation of U.N. Space Institute was urged by Columbia Univ. law professor Richard N. Gardner in New York Times. It would be "center for the cooperative planning of space exploration in which all U.N. members would be invited to take part." U.S. and U.S.S.R. could divide responsibilities for instrumented landings on different planets. There should be "United Nations Space Station" in outer space manned by astronauts from all U.N. nations and trained at U.N. Space Institute. It would gather information about solar system and universe and be used for practical earth applications. (NYT, 7/26/69, 24)

July 27: Lamont Geological Observatory scientist Dr. Gary Latham said in Houston his team had detected 14 "unusual seismic events" from seismometers left on moon by Apollo 11 astronauts. They believed walls of lunar craters had been falling in as different parts became hotter than others during highest lunar temperatures and felt they might be observing "initial stages of the process by which fresh new craters are transformed to old." (W Post, 7/28/69, A6)

July 27: President Nixon toured Jakarta Fair during Indonesian visit. He offered to send Indonesian President Suharto and other world chiefs of state "a piece of the moon as a souvenir." In evening at state dinner in Jakarta, President Suharto said: "I underline Mr. Armstrong's momentous enunciation, when he, as the first human being, put his feet on the moon, declaring: 'These are small human steps which form a great leap to mankind.' This leap has occurred in the outer space, a very expansive space full of mysteries, but it has not taken place in this world of ours, which seems to be contracting and is relatively simpler.... It is the task of all nations in this world to realize peace and unity." (NYT, 7/28/69, 18, PD, 8/4/69, 1043-6)

- . Apollo 11 flight was public relations man's and reporter's dream, James Clayton said in Washington Post. NASA had kept "very little, if anything" from hundreds of U.S. and foreign press. More than 3,500 sets of press credentials had been issued at MSC and Cape Kennedy. Most went to Americans, but 55 foreign countries were represented, including Czechoslovakia, Yugoslavia, and Romania. There were 111 newsmen representing Japan among 800 foreign newsmen, several of whom had been waiting in Houston since Apollo 10 flight May 18-26. Voice of America joined in transmitting news abroad. At peak, Apollo 11 story was going out in 22 languages to every world area except some Communist countries. "Even those had the radio beams directed at them." (W Post, 7/27/69, B6)
- . Psychological, technical, and political factors had combined to enable U.S. to win lunar landing race over U.S.S.R., said Harry Schwartz in New York Times. Moscow had shown overconfidence in underrating American capabilities, ignored lunar rendezvous technique adopted by U.S., and purged Nikita S. Khrushchev, who had been "enamored of space exploits and the propaganda they gave him." New Soviet leaders had changed priorities to concentrate on domestic problems. Since U.S. lunar landing, however, "two very different reactions are visible in the Soviet Union." Scientists, engineers, and many ordinary people were overcome with admiration. Ideologists and Soviet propaganda managers were deeply unhappy, "and their regret that it was not Soviet cosmonauts who went to the moon is scarcely hidden." (NYT, 7/27/69)
- . Washington Sunday Star editorial said: "Apollo 11 has cast a harsh light on life on earth, showing man's failures in sharp contrast to his breathtaking technical achievements. It is a vision that should...be exploited as an incentive to get the vitally needed jobs done on earth." But, the U.S. could not withdraw from space.

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"The complete Apollo program...should be funded. Beyond that, serious consideration should be given to the establishment of permanent manned stations on the moon so that we may truly explore and perhaps exploit the new world that we have already conquered. The manned orbiting station that NASA has proposed should be provided to test the ability of men to live and work for long period in weightlessness. And far more emphasis should be placed...on unmanned probes of the planets." Minimum requirement should be enough momentum in program to prevent it from falling apart through disuse. Every effort should be made "to enlist the cooperation, the technical help, and the financial support of any nation that is willing to contribute to the adventure that must, finally, be seen as the collective achievement of all mankind." (W Star, 7/27/69, E1)

- . In Washington Sunday Star William Hines said: "Considering how very little he had to do with the whole enterprise, it is remarkable how much political mileage President Nixon got out of the flight of Apollo 11. The plaque, the phone call and the trip to greet the returning heroes all were benefits Nixon inherited rather than earned." Official NASA space age history This New Ocean, published by GPO in 1966, mentioned Nixon only once in 648 pages "and there hardly as an aggressive champion of manned space flight." Book said Nixon, as Vice President and as presidential candidate running against John F. Kennedy, had defended Eisenhower Administration's attitude toward space which ruled out manned flights to moon in foreseeable future. "The new President's belated enthusiasm blurs memories of the olden days," Hines said. "But 'This New Ocean' remains, proving perhaps that all government-sponsored history books should be armed to self-distrust whenever a change of administration occurs." (W Star, 7/27/69, E4)

July 28: JPL engineers sent signals to Mariner VI to turn on TV camera and scientific experiments that would measure Mars surface and air temperatures. Spacecraft (launched Feb. 24) began tracking Mars and would begin taking first of 33 far-encounter pictures 771,500 mi from Mars early July 29. Full-disc photos would be received at JPL July 29. (AP, B Sun, 7/29/69, A5)

- . Geologists at Lunar Receiving Laboratory held press conference on Apollo 11 samples and expressed surprise at discovery of tiny glass-like crystals in lunar dust. Analyses had revealed samples were crystalline, igneous, fragmented, scoriaceous, and vesicular. They

July 28 (continued)

confirmed theory based on Surveyor V data that lunar material contained titanium and indicated presence of number of minerals. Columbia Univ. scientist Dr. Paul Gast said, "The most exciting discovery to date has been that of the glass. There is something going on on the moon far different than on the earth." He said scientists speculated impact of meteoroids on moon had vaporized lunar material and caused it to rain back on surface in small drops which formed tiny yellow, brown, and clear pieces of glass few tenths of millimeter in diameter. (Lyons, NYT, 7/29/69, 1; Sehlstedt, B Sun, 7/29/69, A1)

- . U.S. applied to Astronautic Committee of International Aeronautical Federation for six world records based on Apollo 11 achievements: duration of stay on lunar surface outside spacecraft, Astronaut Neil A. Armstrong, 2 hrs 21 min 15 secs; duration in lunar orbit, Astronaut Michael Collins, 59 hrs 27 min 55 secs; duration of stay on lunar surface, Astronauts Armstrong and Edwin E. Aldrin, Jr., 21 hrs 36 min 16 secs; duration of stay on lunar surface inside spacecraft, Aldrin, 19 hrs 45 min 52 secs; greatest mass landed on moon, Armstrong and Aldrin, 7,211 kg (15,897 lbs); greatest mass lifted into lunar orbit from lunar surface, Armstrong and Aldrin, 2,648 kg (5,837 lbs). Records would not be acknowledged officially until NASA presented confirming data and Federation officials approved. (NYT, 7/29/69, 16)
- . At state banquet in Bangkok, Thai King Bhumibol Adulyadej toasted President Nixon: "Last week's breathtaking achievement of Apollo 11 and its brave American crew cannot be measured solely in scientific terms, for it also indicates man's ability to look beyond his earth-bound problems and to set his sights on new horizons in quest of wider knowledge and deeper understanding of himself and his environment." (PD, 8/4/69, 1049-50)
- . Gloom and embarrassment over Apollo 11 success and crash of Luna XV on moon had caused controversy among Soviet leaders, including Communist Party Secretary Leonid I. Brezhnev and President Nikolay V. Podgorny, at July 21-23 meeting of Eastern European leaders in Warsaw, New York Times said. Reports of enthusiastic public response to Apollo feat across Eastern Europe had been interpreted as sign of lingering and latent sympathy for U.S. It was strongest in technologically advanced East Germany and Czechoslovakia, but had been noted as well in Poland, Hungary, and Romania. (Hofmann, NYT, 6/28/69, 7)

July 28: U.K.'s Royal Geographical Society awarded special gold medal-- its first for space exploration--to Astronaut Neil A. Armstrong for leading Apollo 11 mission. Other gold medalists included Capt. Roald Amundsen, first to reach South Pole; Adm. Robert E. Peary, first to reach North Pole; Sir Edmund Hillary, conqueror of Mt. Everest; and Sir John Hunt, leader of Everest expedition. (AP, W Star, 7/28/69, A5)

- . Senate Committee on Banking and Currency favorably reported, with amendments, S.J.R. 140, providing for striking of medals honoring U.S. astronauts who had flown in outer space. (CR, 7/28/69, D681)
- . MSFC announced resignation of M/G Edmund F. O'Connor (USAF), Director of Industrial Operations, effective July 31. Gen. O'Connor, on loan to NASA from USAF for past five years, would become Vice Commander of Air Force Aeronautical Systems Div. He would be succeeded by Lee B. James, Saturn V Manager, MSFC. (MSFC Release 69-166)
- . USAF released Air Force Review of the C-5A Program. Total cost of 120 Lockheed C-5A aircraft had increased from \$3.369 billion at 1965 contract award to current total \$5.125 billion, overrun of \$1.756 billion. At DOD press conference Air Force Secretary Robert C. Seamans, Jr., criticized "ambiguities and deficiencies" in original contract and hinted remaining 39 aircraft in 120-plane package might not be purchased unless revisions were made in contract. (Text; Phillips, W Post, 7/29/69, A1)
- . Il Mattino del Lunedì, Asmara, Ethiopia: "...today we not only admire, but exult. Because this 'almost superhuman' exploit has been accomplished by a society which is free and pluralistic, by a society which has no close and oppressive traditions, by a society which has founded its political and constitutional structure not on a totalitarian ideology but on the democratic philosophy of the Declaration of Independence. It has been accomplished by a nation, the American nation, whose characteristic...is the fusion of the spirit of precision and discipline...with the spirit of freedom.... This is the reason why we today exult. Because we know that the conquest of Apollo-11 is in the service of man and not to oppress him." (Am Consul, Asmara)
- . Norrlandska Social-Demokraten, Boden, Sweden, editorial commented that Russian press was surprisingly generous with praise of men behind Apollo 11 and American space research in general during mission, but now press seemed to fear landing might have increased respect for U.S. around the world. "It is surely disturbing for Pravda and the

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July 28 (continued)

Russian Party leaders that the American conquest of the moon...witnessed by the greater part of the Communist world, crushed the myth of the Communist system's superiority." (Am Embassy, Stockholm)

- . Within 76 hrs after Apollo 11 splashdown, Bantam Books and New York Times published We Reach the Moon, 416-page paperback account of U.S. space program from 1961 through Apollo 11's success. Early publication was effected by nearly $2\frac{1}{2}$ yrs of planning. Book went to press immediately after July 24 splashdown while aerospace reporter John Noble Wilford was completing text. Final copy was telexed to Chicago printer July 25. First printing comprised 375,000 copies. Hard cover edition would be published by W. W. Norton & Co. in September. (NYT, 7/29/69, 16)

July 29: First pictures of Mars taken by NASA's Mariner VI, launched Feb. 24 to fly by Mars equator, were received at JPL. Full-disc photos, taken between 771,500 and 450,000 mi from Mars, were flashed on screen every five minutes. Although pictures were not as clear as expected, they showed Mars as dull, gray, egg-shaped body with crack in surface and bright spot--southern polar cap--with ragged edge. Better pictures were expected as spacecraft traveled closer to Mars. (AP, B Sun, 7/30/69, A1; Lannan, W Star, 7/30/69, A3)

- . JPL radar readings which showed 8.3-mi altitude variation in Mars' north equatorial zone and included corrected figures for Mars' ephemeris, or orbital path, were expected to ensure accuracy of TV cameras aboard Mariners VI and VII, NASA said. Experimenters hoped to obtain photos identifying objects 900 ft across at close approach and pictures were expected to be 500 times better than those taken to date by earth-based telescope cameras. Readings were obtained at NASA's Goldstone Tracking Station in California by team directed by Dr. Richard Goldstein during planet's closest approach to earth (Mars had been within 45 million mi of earth June 9). They would be of great interest to astronomers because they showed that areas which appeared light to telescopes might be either high or low in elevation. Optically dark areas appeared to be of medium elevation to radar-scanners. (NASA Release 69-111; JPL Release 530)

July 29: NASA released first photos taken by Apollo 11 astronauts on and near lunar surface, including four color stills and 16-mm film of LM descent. Film opened as LM swung low and curved slightly over area pocked with craters and rocks and showed dust being scattered by exhaust as LM touched down safely. It then showed Astronaut Neil A. Armstrong as he descended ladder to surface, took first step on moon, and deployed initial equipment.

Still photos showed closeup of brownish surface sprinkled with footprints, silhouettes of LM and U.S. flag, Armstrong inside LM, and earth with Europe, Africa, and Asia visible. (Witkin, NYT, 7/30/69, 1; Cohn, W Post, 7/30/69, A1, A3)

- . LRL scientists continued examining lunar samples and preparing them for experiments on living organisms. Experiments, scheduled to begin July 29, would be delayed one day to repair cracked glove which permitted scientists outside vacuum box to handle objects inside and to allow more time for grinding samples to uniform size. (AP, NYT, 7/30/69, 19)
- . NASA Wallops Station announced award of 40-mo, \$936,311 contract to Rice Univ. to investigate relationship between field-aligned currents and auroral particle fluxes and document and summarize findings and conclusions. Rice would construct and test suitable flight and ground instrumentation for three Nike-Tomahawk sounding rocket payloads; prepare and preflight-test payloads; and acquire, record, reduce, analyze, and publish resulting magnetic and auroral particle data. (WS Release 69-14)
- . FCC, at White House request, decided to delay for 60 days decision on establishment of domestic comsat system to enable Nixon Administration to study issues and make recommendations. (Aug, W Star, 7/29/69)
- . Rep. William G. Bray (R-Ind.) introduced H.J.R. 844, providing for distribution of Apollo 11 lunar samples to Governors of 50 states. (CR, 7/29/69, H6486)
- . New York weathermen were being deluged with calls blaming 10 days of rain and overcast weather in northeastern U.S. on Apollo 11, Associated Press said. WCBS radio news meteorologist Dr. Robert Harris had said, "We've had an abundance of calls from all sorts of people who are absolutely certain, through their Bible studies, that the Lord has taken the sun away from us." (AP, B Sun, 7/30/69, A6)

July 29: National Assn. of Government Employees president Kenneth T. Lyons told House Interstate and Foreign Commerce Committee landing on moon would soon be safer than landing at most U.S. airports. "Do we have to have NASA take over from the FAA in order to get a little sense into our airport and aircraft traffic management jumble?" (Bentley, B Sun, 7/29/69, A5)

July 30-31: NASA's Mariner VI, launched Feb. 24 on Mars equatorial flyby mission, approached Mars and completed 17 pictures of planet taken at about 111,400-mi altitude, which showed ragged edges of polar cap, W-shaped cloud, and seas, deserts, and craters seen by Mariner IV in 1965.

As spacecraft neared and swung around Mars it took 24 close-up pictures from about 2,000 mi at closest point. Pictures were so sharply defined and detailed that they were shown live on TV instead of being refined and released later in photographic prints as originally planned. Pictures--enhanced by computers at JPL to clear out static, highlight images, adjust contrast and brightness, and exaggerate features--were spectacular. They showed that Mars was heavily cratered and looked very much like moon. One photo showed 11-mi-dia crater closely resembling moon's Copernicus crater and diagonal ditch resembling lunar rille. During closest approach onboard TV cameras took 12 high-resolution and 12 medium-resolution pictures, stored some on board for later playback, and transmitted some immediately to ground stations for conversion to images at JPL. Three of four onboard experiments--TV to take pictures, UV spectrometer to identify and measure gases in upper atmosphere, and infrared radiometer to measure planet's temperature--functioned satisfactorily. Only anomaly was failure in cooling of one channel on infrared spectrometer, designed to identify gases in lower Martian atmosphere, which prevented proper acquisition of data.

JPL controllers temporarily lost contact with Mariner VII, enroute to Mars, at 6:00 pm EDT July 30. Engineers speculated that spacecraft had been thrown out of alignment when struck by tiny micrometeoroid traveling at 40 mps and had locked on planet Jupiter or another bright object. Contact with Mariner VII was regained seven hours later by switching from one antenna to another and proper attitude was restored by rolling spacecraft around until it locked on star Canopus. Although some of data being transmitted appeared to be abnormal, flyby mission was still expected to succeed.

Mariner VI would continue taking pictures and play back recorded near-encounter data during final phase of mission. Data would be compared with data from Mariner VII (launched March 27), which would

July 30-31 (continued)

fly past Mars polar region Aug. 4. (NASA Release 69-26A; Sullivan, NYT, 8/1/69, 1; Auerbach, W Post, 8/1/69, A1; Lannan, W Star, 7/31/69, A5)

July 30: On arrival in Saigon, Republic of Vietnam, President Nixon said:

"I am happy that the moon landing, which in its universality signifies a symbolic drawing together of all mankind, has provided an occasion for me to meet with President Thieu in the capital of his country."

Later, after discussions with President Nixon, President Nguyen Van Thieu said, "The Vietnamese people fully concur in the message of peace which the three brave American astronauts deposited on the moon for all mankind." (PD, 8/4/69, 1051-4)

- . During Apollo 11 celebration, credit should be given to former NASA Administrator James E. Webb, "whose organizational skill, vision and drive played a major part in its success," MIT Provost, Dr. Jerome B. Wiesner, and MIT physicist Jerrold Zacharias said in letter to New York Times. "There never was any question regarding the technical feasibility of a manned lunar landing. The real question was whether or not we could organize and manage so large and complex a program on the time schedule laid down by President Kennedy." Webb had organized, defended, and managed program, "and as the world celebrates this great technical and human achievement we should also honor the man who directed its accomplishment." (NYT, 8/5/69, 32)
- . LRL scientists began injecting pulverized lunar samples into sterile white mice in attempt to discover germs or chemicals hazardous to human beings. Mice, born by Caesarean section and raised in sterile environment so that they would be extremely sensitive to infection, would also have samples mixed in their food and air. (UPI, W Star, 7/31/69, A5; AP, B Sun, 7/30/69, A1)
- . World Health Organization Director General, Dr. M. G. Candau, and Dr. Karel Raska, Director of WHO's Communicable Disease Div., said in Houston that Soviet scientists had "initiated" plans for lunar receiving laboratory. Soviet delegates to international conferences had discussed subject but no details were available. WHO officials were in Houston to observe LRL at U.S. Government invitation. (W Post, 7/31/69, A3)

July 30: After two-hour inspection of Tu-144 at Moscow's Sheremetyevo International Airport, Pan American World Airways president Najeeb E. Halaby said Soviet supersonic transport had left group of U.S. aviation experts "very, very impressed." U.S.S.R. apparently had progressed further in testing than U.K. or France with Concorde, and Tu-144 had reached 900 mph, breaking sound barrier several times. Concorde hoped to reach mach 1 in six months and U.S. SST was at least five years behind. Aeroflot planned to put Tu-144 in service by 1973. Pan Am would review all information available before deciding whether to order aircraft as hedge against competition. Halaby liked Tu-144's design and advanced instrumentation and was impressed with amount of titanium used in construction. Russians had told him aircraft's noise level was low in landings and takeoffs. (NYT, 7/31/69, 58)

Senate passed S.J.R. 140, providing for striking of medals honoring American astronauts who had flown in outer space. (CR, 7/30/69, S8786)

Subcommittee on Science, Research, and Development of House Committee on Science and Astronautics published Science, Technology, and Public Policy During the Ninetieth Congress. Report covered 1967-1968, giving details behind 94 public laws passed which authorized, funded, or otherwise affected R&D in U.S. and 45 additional bills on which Congress took legislative action. It included major reviews of U.S. policy for science and technology by Organization for Economic Cooperation and Development and by NSF for United Nations Educational, Scientific, and Cultural Organization. Both reviews showed pluralistic nature of U.S. public policy for science, built up by laws, executive orders, and other expressions of policy as they occurred. (Text)

July 31: USAF launched unidentified satellite from Vandenberg AFB into orbit with 333.1-mi (536-km) apogee, 288.9-mi (465-km) perigee, 94.6-min period, and 75.0° inclination. (GSFC SSR, 7/31/69; UPI, NYT, 8/1/69, 8)

. At state dinner in New Delhi, India, Acting President Mohammad Hidayatullah exchanged toasts with President Nixon and congratulated him: "The epic flight to the moon and back by three of your countrymen has amazed the world and marks a new stage in science and technology. On behalf of the Government and people of India, and myself, I congratulate you, and through you, the people of your country on this historic occasion.... We are glad to know that you are sharing the knowledge you have gained with the rest of the world." (PD, 8/4/69, 1056-9)

July 31: Sequence of five color photos of Apollo 11 Astronauts Neil A. Armstrong and Edwin E. Aldrin, Jr., performing extravehicular activities on lunar surface were released by NASA. Vivid sequence showed Aldrin descending ladder to surface, walking near LM, posing near U.S. flag, deploying seismometer, and walking with Armstrong's reflection visible in his visor. NASA also released two-part 16-mm film which showed moon fading away as LM ascended and LM's rendezvous with CSM in lunar orbit. It also showed Astronaut Michael Collins shaving inside CSM. (W Post, 8/1/69, A7; Witkin, NYT, 8/1/69, 16)

Hans H. Maus, Director of Executive Staff at MSFC, and Dr. George N. Constan, Director of Michoud Assembly Facility, retired after combined total of 51 yrs Government service. Maus, expert in rocket development and production engineering, had received USA's Exceptional Civilian Service Award and number of citations for development of manufacturing methods, process automation, assembly, and tooling concept development. Dr. Constan had served with USA at Milan, Joliet, and Redstone Arsenals before his appointment to Michoud in 1961. (MSFC Release 69-167)

. Soviet Academician, Dr. Anatoly A. Blagonravov, conceded that competition with U.S.S.R. might have been major factor in U.S. determination to reach moon and said that in space there was no way to really declare a winner, Space Business Daily reported. "I don't preclude the idea that such a boosted preparation of the Apollo project was in some measure the result of competition with us. Basically a healthy competition is no obstacle to success.... Science is boundless in its development and it cannot be compared to a horse race--there is no finishing line. The interests of science are bound to win anyway...." U.S.S.R. would continue research in "several major scientific areas," make "extensive use of automatic devices for exploring outer space," and pay "due attention" to moon and to both manned and unmanned missions. Cosmos, Zond, and Proton spacecraft would continue to be used for research and Soyuz spacecraft would be converted into "modules of orbital space laboratories designed for research in lengthy flight." (SED, 7/31/69, 79)

. Man's knowledge of Venus, Mars, and moon had been enormously enhanced by unmanned Mariner missions, New York Times editorial said. They were relatively inexpensive and did not risk human lives. "Nevertheless, American political leadership has been so obsessed with sending a man to the moon that unmanned probes of the planets became the stepchildren of the national space program. There were times when even the continued existence of the Jet Propulsion Laboratory--the

July 31 (continued)

center for these unmanned flights--seemed in doubt. Now, in the new phase of American space exploration begun in the wake of Apollo 11's historic achievement, the major cost-benefit advantages of Mariner type unmanned flights need to be more fully appreciated by Washington policy makers, and even more intensively exploited than in the past, even as the manned exploration of the moon continues." (NYT, 7/31/69, 32)

During July: MOL cancellation "should at most be a 'postponement,'" Dr. Edward C. Welsh, formerly NASC Executive Secretary, said in Air Force/Space Digest. "Contrary to assertions made by people who should know better, the MOL was not planned as a weapon system and would not have been a threat to any other nation." MOL observations would be "as peaceful as those obtained on the NASA Gemini and Apollo flight. Men on board the spacecraft can be justified by the contributions men make in matters of choice of observations, maintenance, and communication with earth." MOL would not duplicate NASA's Apollo Applications program. "To try to combine the Air Force and NASA manned programs would waste much of the investments already made, would delay both programs, would increase the total cost over the long run, and would violate the sound administrative principle of having the experts do what they have been trained to do. Failure to get a maximum return from this national-security system would seem to be woefully shortsighted and wasteful." (AF/SD, 7/69, 60-1)

- . American Embassy science attache in New Delhi reported completion of India-U.S. project to erect 48-in telescope at Hyderabad. Project was started in 1955 and completed just before U.S. lunar landing. (O'Neill, W Post, 8/31/69, D5)

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