Previously Published Works
UC Santa Barbara

A University of California author or department has made this article openly available. Thanks to the Academic Senate's Open Access Policy, a great many UC-authored scholarly publications will now be freely available on this site.
Let us know how this access is important for you. We want to hear your story!
http://escholarship.org/reader_feedback.html

Title:
Where No Flag Has Gone Before: Political and Technical Aspects of Placing a Flag on the Moon

Author:
Platoff, Anne M., UC Santa Barbara

Publication Date:
August , 1993

Series:
UC Santa Barbara Previously Published Works

Permalink:
http://escholarship.org/uc/item/93t5x9dq

Preferred Citation:
Platoff, Anne M. "Where No Flag Has Gone Before: Political and Technical Aspects of Placing a Flag on the Moon." NASA CR-188251. Houston: NASA Johnson Space Center, 1992.

Published Web Location:
http://www.jsc.nasa.gov/history/flag/flag.htm

Keywords:
flag, international relations, space law, Apollo 11, lunar surface, Apollo 11 flight, Apollo flights, lunar landing, lunar flag assembly, flagpoles, flag on the Moon

Abstract:
The flag on the Moon represents an important event in vexillological history. This paper examines the political and technical aspects of placing a flag on the Moon, focusing on the first Moon landing. During their historic extravehicular activity, the Apollo 11 crew planted the flag of the United States on the lunar surface. This flag-raising was strictly a symbolic activity, as the United Nations Treaty on Outer Space precluded any territorial claim. Nevertheless, there were domestic and international debates over the appropriateness of the event. Congress amended the agency's appropriations bill to prevent the National Aeronautics and Space Administration (NASA) from placing flags of other nations, or those of international associations, on the Moon during missions funded solely by the United States. Like any activity in space exploration, the Apollo flag-raising also provided NASA engineers with an interesting technical challenge. They designed a flagpole with a horizontal bar allowing the flag to "fly" without the benefit of wind to overcome the effects


eScholarship
University of California

eScholarship provides open access, scholarly publishing services to the University of California and delivers a dynamic research platform to scholars worldwide.

of the Moon's lack of an atmosphere. Other factors considered in the design were weight, heat resistance, and ease of assembly by astronauts whose space suits restricted their range of movement and ability to grasp items. As NASA plans a return to the Moon and an expedition to Mars, we will likely see flags continue to go "where no flag has gone before."

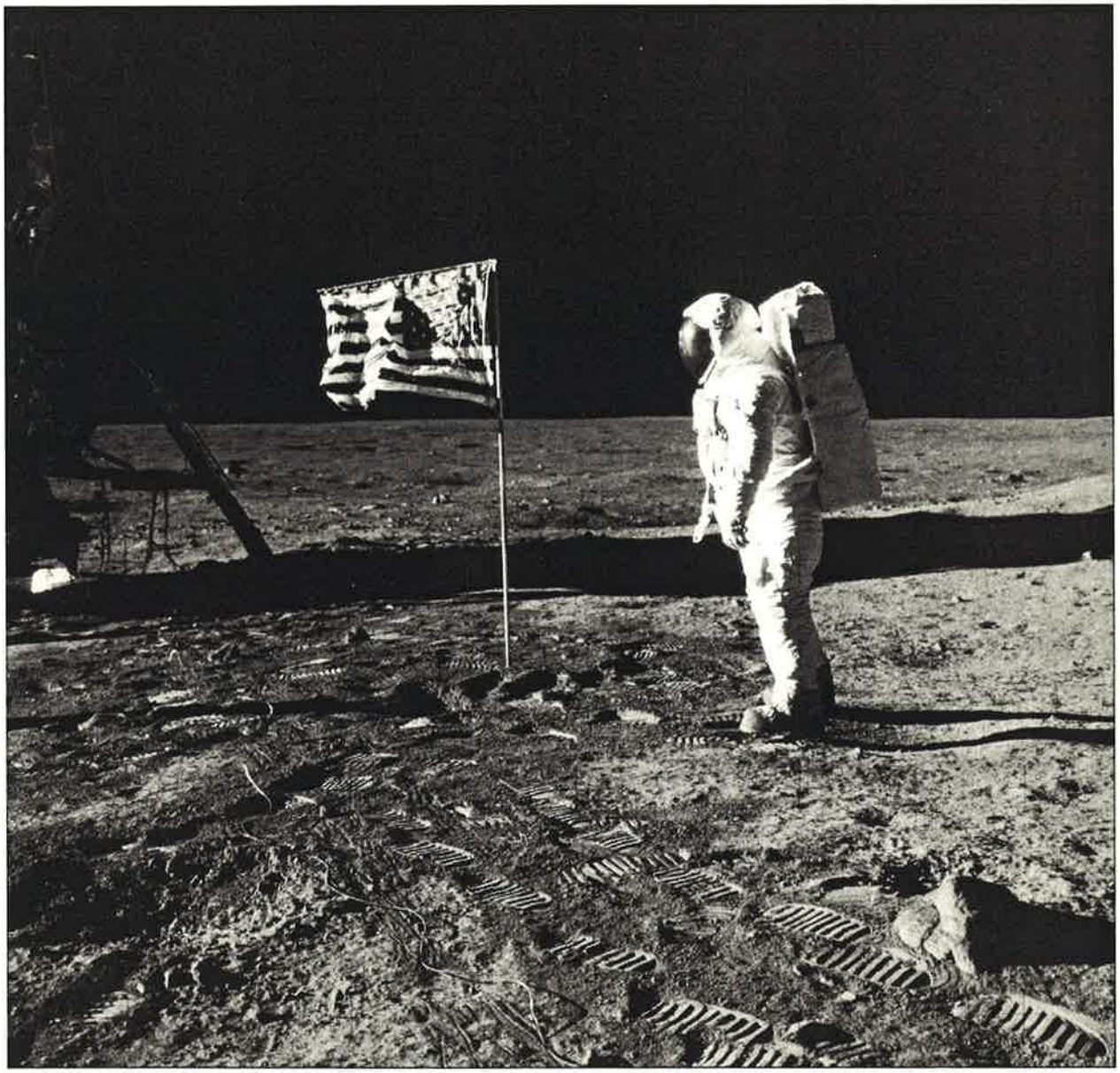
Copyright Information:

eScholarship
University of California

eScholarship provides open access, scholarly publishing services to the University of California and delivers a dynamic research platform to scholars worldwide.

NASA Contractor Report 188251

Where No Flag Has Gone Before: Political and Technical Aspects of Placing a Flag on the Moon



Apollo 11 astronaut stands beside U.S. flag on the Moon

August 1993

NASA Contractor Report 188251

Where No Flag Has Gone Before: Political and Technical Aspects of Placing a Flag on the Moon

Anne M. Platoff
Hernandez Engineering Inc.
Houston, Texas

Awarded the Driver Award for the Best Paper
Presented to the 26th Meeting of the North American Vexillological Association, October 11, 1992
San Antonio, Texas

Prepared for
Lyndon B. Johnson Space Center
under contract NAS9-18263

National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas

August 1993

Abstract

The flag on the Moon represents an important event in vexillological history. This paper examines the political and technical aspects of placing a flag on the Moon, focusing on the first Moon landing. During their historic extravehicular activity, the Apollo 11 crew planted the flag of the United States on the lunar surface. This flag-raising was strictly a symbolic activity, as the United Nations Treaty on Outer Space precluded any territorial claim. Nevertheless, there were domestic and international debates over the appropriateness of the event. Congress amended the agency's appropriations bill to prevent the National Aeronautics and Space Administration (NASA) from placing flags of other nations, or those of international associations, on the Moon during missions funded solely by the United States. Like any activity in space exploration, the Apollo flag-raising also provided NASA engineers with an interesting technical challenge. They designed a flagpole with a horizontal bar allowing the flag to "fly" without the benefit of wind to overcome the effects of the Moon's lack of an atmosphere. Other factors considered in the design were weight, heat resistance, and ease of assembly by astronauts whose space suits restricted their range of movement and ability to grasp items. As NASA plans a return to the Moon and an expedition to Mars, we will likely see flags continue to go "where no flag has gone before."

Introduction

President John F. Kennedy, in his historic speech of September 1962, expressed his vision of space exploration for an audience assembled in the stadium of Rice University. Earlier that year he had challenged the United States to go to the Moon within the decade. The space race was well underway and Kennedy, in foreseeing the role his country was to play in space exploration, also alluded to a role for flags. "We mean to lead [the exploration of space], for the eyes of the world now look into space, to the moon and to the planets beyond, and we have vowed that we shall not see it governed by a hostile flag of conquest, but by a banner of freedom and peace."[1] Thirty years later, as we prepare to return to the Moon and continue on to Mars, it is time to reconsider the political and technical aspects of placing a flag on the lunar surface.

Political Aspects

Domestic Considerations

The political aspects of the first lunar flag-raising were twofold—both domestic and international. NASA relies upon Congress for its funding and therefore has always been very cognizant of the need for good public relations. Astronauts were considered national heroes, and the flag of the United States has been a common symbol used in all aspects of the manned space program. NASA's spacecraft and launch vehicles have always been decorated with flags. Edward H. White II became the first American astronaut to "walk in space" on 4 June 1965 (fig. 1), and his

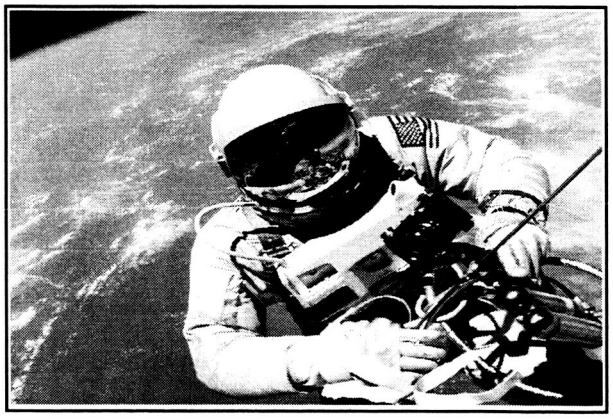


Fig. 1. Edward H. White II displays the U. S. flag on his space suit during his historic spacewalk, or extravehicular activity (NASA photograph S65-30431).

space suit was one of the first to be adorned with a flag patch.[2] Following this tradition, flags have been used on the suits of astronauts from many countries. Use of flags in the space program created controversy, however, only when it became apparent that a flag would be planted on the Moon.

International Considerations

Prior to the Apollo 11 Moon landing, the United Nations (U.N.) adopted the Treaty on Principles Governing the Activities of States

in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies of 27 January 1967 (commonly known as the Outer Space Treaty). Article II of the treaty clearly states that "outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of occupation, or by any other means."[3] The United States, signatory to the treaty, could not claim the Moon. Therefore, raising a flag on the lunar surface would merely be a symbolic gesture—an expression of triumph similar to the planting of a flag on Mount Everest or at the North and South Poles. The legal status of the Moon clearly would not be affected by the presence of a U.S. flag on the surface, but NASA was aware of the international controversy that might occur as a result.[4]

In January of 1969, President Richard M. Nixon's inaugural address stressed the international flavor of the Apollo program. "As we explore the reaches of space, let us go to the new worlds together—not as new worlds to be conquered, but as a new adventure to be shared." NASA officials noted the tone of the speech, and there was some discussion within the agency that a U.N. flag could be used for the flight.[5] This was one of the possibilities considered by the Committee on Symbolic Activities for the First Lunar Landing, which was appointed by Thomas O. Paine, NASA Acting Administrator, on February 25 of that year. The committee was instructed to select symbolic activities that would not jeopardize crew safety or interfere with mission objectives; that would "signalize the first lunar landing as an historic forward step of all mankind that has been accomplished by the United States" and that would not give the impression that the United States was "taking possession of the moon" in violation of the Outer Space Treaty. The committee considered several options including the possibilities of leaving a United States flag or an adaptation of the solar wind experiment in the form of a flag, leaving a set of miniature flags of all nations, and leaving a commemorative marker on the surface.[6]

The committee's report recommended using only the flag of the United States during the lunar extravehicular activity (EVA). In addition, the committee suggested that a plaque bearing an inscription ("Here men from the planet Earth first set foot upon the moon July 1969, A.D. We came in peace for all mankind.") be mounted on the lunar module to emphasize that the purpose of the mission was one of exploration and not conquest. The original plaque design featured a U. S. flag, but the graphic was changed to pictures of the eastern and western hemispheres of the Earth to symbolize the crew's point of origin. It was decided that, in addition to the large flag, 4 x 6 inch flags of the 50 states, the District of Columbia, the U. S. territories, and flags for all member countries of the U.N. and several other nations, would be carried in the lunar module and returned for presentation to governors and heads of state after the flight.[7]

Technical Aspects

Design and Engineering Constraints

Work on the lunar flag assembly began about three months prior to the Apollo 11 mission. Robert Gilruth, Director of the Manned Spacecraft Center (MSC)[8] and a member of the Committee on Symbolic Activities, asked Jack Kinzler, Chief of Technical Services Division at MSC, for ideas regarding the EVA. Kinzler suggested that a full-size U.S. flag could be deployed using a specially designed flagpole. He drew up a preliminary sketch (fig. 2) and the idea was presented to

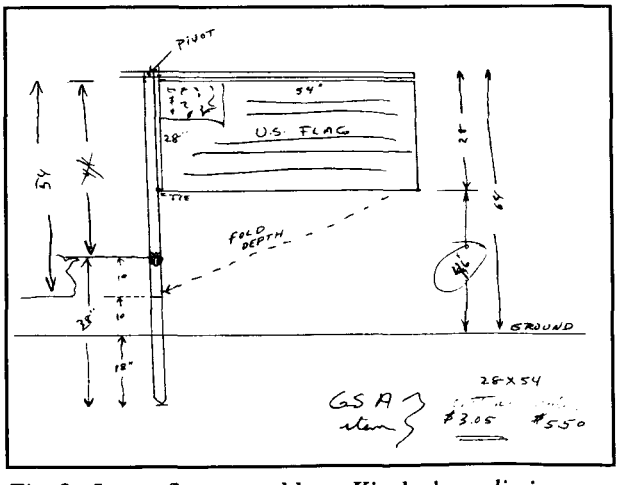


Fig. 2. Lunar flag assembly — Kinzler's preliminary sketch.

the committee. Working with Deputy Division Chief Dave McCraw, he worked out the details of the lunar flag assembly over several days. The design was based on a number of engineering constraints. For example, to compensate for the lack of an atmosphere on the lunar surface, the flag assembly included a horizontal crossbar to give the illusion of a flag flying in the breeze.[9]

Two other major constraints were the weight of the assembly and the stowage space required. The team designed the entire assembly to be as lightweight as possible—when completed it weighed only 9 pounds and 7 ounces. They reduced the size of the package by developing a two-part telescoping pole apparatus with a telescoping crossbar. It was also necessary to design a flagpole that could be easily assembled and deployed by astronauts wearing space suits. Space suits used for the lunar surface EVA were pressurized to approximately 3.7 pounds per square inch and, as a result, the amount of force that the astronauts could apply with their gloved hands was limited and their range of movement was restricted (fig. 3).

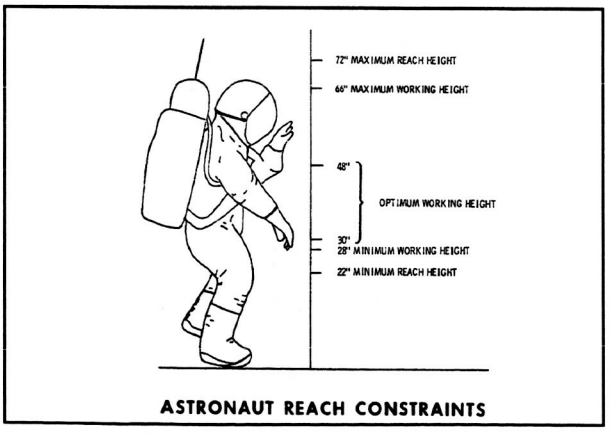


Fig. 3. Astronaut reach constraints (NASA press release 69-83K, p. 122).

A 3 x 5 foot nylon flag, obtained through the government supply catalog[10], was altered by sewing a hem along the top. The crossbar, hinged to the pole, went through this hem, and a loop sewn around the bottom of the flag secured it to the pole. An astronaut would unfurl the flag by extending the telescoping crossbar and by raising it first to a position just above 90 degrees. He then lowered it to a position perpendicular to the pole where a catch prevented the hinge from moving. The upper portion then slipped into the base portion of the flagpole, which had been driven into the ground using a lunar geological hammer. A red ring was painted around the base of the assembly 18 inches from the bottom to aid the astronauts in judging the distance that the pole had penetrated the surface.[11]

Finally, it was necessary to protect the flag during the descent portion of the lunar landing. To make the flag easily accessible during the EVA, it was mounted on the left-hand side of the ladder on the Lunar Module (LM) (fig. 4). This also reduced the amount of



Fig.4. Dave McCraw, NASA Manned Spacecraft Center Technical Services Deputy Division Chief, demonstrates the removal of the flag shroud from the Lunar Module ladder. He holds the "pip" pin in his right hand (NASA photograph S69-38755).

equipment that had to be carried inside the already crowded vehicle. It was estimated, however, that the LM ladder would be heated to 250°F by the descent engines as they fired during the descent staging phase of the landing. The ladder would experience temperatures up to 2,000°F during the 13 seconds of the touchdown phase. Tests run on the flag determined that it would withstand temperatures of only up to 300°F. These conditions made it necessary to design a protective shroud for the flag assembly. The shroud design (fig. 5) was the work of the

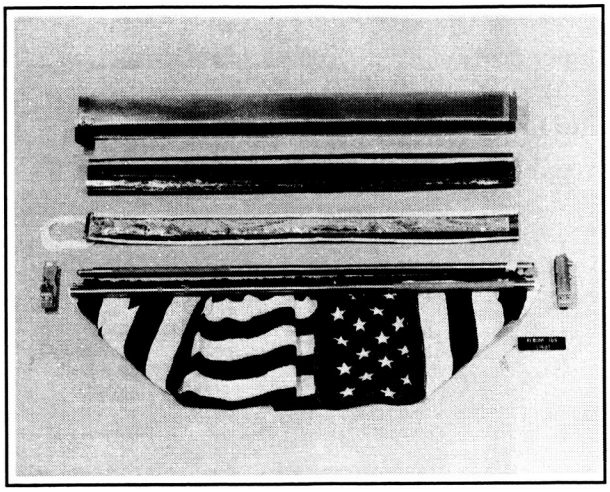


Fig.5. Flag assembly and shroud (NASA photograph S69-38748).

MSC Structures and Mechanics Division. It consisted of a stainless steel outer case separated from an aluminum layer by Thermoflex insulation. Several layers of thermal blanketing material were placed between the shroud and the flag assembly, limiting the temperature experienced by the flag to 180°F.[12]

Construction and Testing

All of the work on the flag assembly and on the flag shroud was performed in the workshops at the MSC. Alterations to the flag were done in the fabrics shop, the sheet metals shop constructed the flagpole, and another shop anodized the flagpole—electrolytically coating the aluminum to give it a gold color and a stiff protective surface. Tubing used in the construction of the pole was about an inch in diameter with a wall approximately 1/32 of an inch thick. The telescoping feature of the pole was created by using different sizes of tubing that slid neatly into each other. A capped bottom allowed the upper portion of the pole to slide easily into the lower portion. The base of the lower section was designed with a hardened steel point to make it easier to drive into the lunar soil.

Cost of materials was relatively low—the flag was purchased for $5.50 and the tubing cost approximately $75. The cost of the shroud has been estimated at several hundred dollars due to the materials involved. Construction of the prototypes was achieved in several days, and after a week the team had made a few backup assemblies, and some to be used for crew training purposes. Demonstration tests were performed where the flag assembly was folded, packed, unpacked, erected and deployed to ensure that it would operate properly. Kinzler flew to Kennedy Space Center (KSC) in Florida to participate in a mockup review of the lunar flag assembly on 25 June 1969. The astronauts were included in several of these tests as part of their EVA training so that they would be familiar with deployment procedures.[13]

Preflight Preparation

Packing of the flag assembly followed a written 12-step procedure which required up to 5 people to ensure that it was tightly packed. Wooden blocks and plastic ties were used by the team to keep the packed flag together as they progressed through the steps. These packing aids were removed when the flag was placed into the thermal package. After the flag was rolled into the thermal package, a thermal rip strip made with Velcro was used to close the package. The strip had a pull-tab at the top to make it easier for the astronauts to open the package once they were on the lunar surface. This thermal package was then installed into the metal shroud following a 4-step procedure. A small block of Thermaflex insulation was placed around the bottom and top ends of the pole to protect the flag ends from hot brackets. The flag packing for the Apollo 11 flight was performed in Jack Kinzler's office and was approved by the Chief of Quality Assurance who was present during the procedure. Once the flag thermal package was properly stowed inside the shroud, it was taken to the launch site at KSC to be mounted on the ladder of the LM.[14]

Because the final decision to fly the flag and attach the plaque was made so close to the launch date, a Lear jet was chartered to fly Kinzler, George Low (Manager of the Apollo Spacecraft Program), Low's secretary, the flag assembly, and the commemorative plaque to KSC before the launch. The flag and plaque were installed on the LM of Apollo 11 at 4:00 in the morning as the spacecraft sat atop its

Saturn V rocket ready for launch. Kinzler had written an 11-step procedure for mounting the assembly on the ladder and personally supervised the installation.

Proper installation was vital if the astronauts were to be able to deploy the flag on the lunar surface. An astronaut first released the shroud "pip" pin by squeezing it and then pulling it out, and then released the main flag assembly "pip" pin. A spring tension against the flag poles was released when the pins were pulled allowing easy removal of the shroud. The astronaut then pulled the Velcro strip off the insulation package and discarded the wrapping materials.

Deployment and Performance

The first U.S. flag on the Moon was deployed by Neil Armstrong and Edwin "Buzz" Aldrin during their historic EVA on 20 July 1969 (at 4 days, 14 hours and 9 minutes mission-elapsed time). The flag was seen worldwide on live television (fig. 6). At their technical

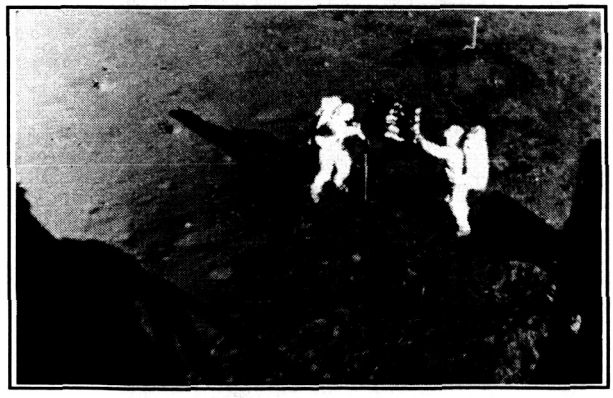


Fig. 6. Neil Armstrong and Buzz Aldrin deploy the first United States flag on the moon (NASA photograph S69-40308).

crew debriefing, Armstrong and Aldrin reported few problems with the deployment. They had trouble extending the horizontal telescoping rod and could not pull it all the way out. This gave the flag a bit of a "ripple effect," and later crews intentionally left the rod partially retracted. The Apollo 11 astronauts also noted that they could drive the lower portion of the pole only about 6 to 9 inches into the surface. It is uncertain if the flag remained standing or was blown over by the engine blast when the ascent module took off.

The only design change made as the result of performance on the lunar surface was in the catching mechanism of the horizontal crossbar's hinge. The Apollo 12 crew could not get the catch to latch properly and, as a result, the flag drooped slightly. Later models of the flag assembly had a double-action latch that would work even if the horizontal bar was not raised above a 90 degree angle.[15]

Reactions to the Flag Deployment

Even though the event took only 10 minutes of the 2 1/2 hour EVA, for many people around the world the flag-raising was one of the most memorable parts of the Apollo 11 lunar landing. There were no formal protests from other nations that the flag-raising constituted an illegal attempt to claim the Moon. Buzz Aldrin, in an article written for *Life* magazine, stated that as he looked at the flag he sensed an "almost mystical unification of all people in the world at that moment." A few published articles expressed regret that NASA had chosen not to plant a U.N. flag, either in addition to or alongside that of the United States.

Prior to the mission, several members of Congress relayed letters from their constituents to NASA which recommended (or in some cases opposed) the use of specific flags. Flags mentioned in these letters included the U.S. flag, the U.N. flag, and the Christian flag.[16] The congressional debate heated up in the House of Representatives as the body considered NASA's appropriations bill for fiscal year 1970. On 10 June, NASA formally notified members of Congress that a decision had been made to raise the U.S. flag on the lunar surface. The House approved the appropriations bill on that same day after amending it to include a flag provision. This measure did not actually affect the Apollo 11 mission, but did make it clear to NASA where many members of Congress stood on the flag issue.

A House and Senate conference committee agreed on the final version of the bill on 4 November 1969 which included a provision that "the flag of the United States, and no other flag, shall be implanted or otherwise

placed on the surface of the moon, or on the surface of any planet, by members of the crew of any spacecraft ... as part of any mission ... the funds for which are provided entirely by the Government of the United States." The amendment, in deference to the Outer Space Treaty, concluded with the statement "this act is intended as a symbolic gesture of national pride in achievement and is not to be construed as a declaration of national appropriation by claim of sovereignty."[17]

Although the amendment was passed and became law, technically NASA was not required to deploy a U.S. flag on each of the following Apollo missions. Spencer M. Beresford, NASA's General Counsel, noted in a report to the Associate Deputy Administrator that "the managers on the part of the House further clarified the intent of the provision during the conference by stipulating that this section should not be construed to mean that the American flag must necessarily be implanted or otherwise placed on the surface of the moon or the surface of any planet on each and every landing subsequent to an initial landing." Regardless of this interpretation, the Apollo flights could have been considered exempt since, as pointed out by a member of the House of Representatives, several international partners had contributed to portions of the Apollo Program.[18] This is also likely to be the case if and when NASA sends astronauts back to the Moon or on to Mars.

The Future

President George Bush, speaking on the steps of the National Air and Space Museum on the 20th anniversary of the Apollo 11 Moon landing, proposed that lunar/Mars exploration should be the nation's long-term objective in space exploration. "The Apollo astronauts left more than flags and footprints on the Moon. They also left some unfinished business. For, even 20 years ago, we recognized that America's ultimate goal was not simply to go there and go back—but to go there and go on."[19]

Although Bush did not include the concept of international cooperation in his vision of the space exploration initiative, there are many who recognize that the political climate has changed since the days of Apollo. Space exploration and space projects have become internationalized, and missions on the scale of a lunar base or a Mars mission will probably require international funding to make them feasible. It will be interesting to see which flags join that of the United States on the lunar surface and which will be the first flags on Mars (fig. 7). One thing is clear—as humans explore the solar system we will likely see flags continue to go "where no flag has gone before."



Fig. 7. "Return to Utopia," by Pat Rawlings, shows the arrival of humans at the Viking 2 landing site. Flags will most likely accompany humans as they explore the planets (NASA photograph S91-52337).

Notes

[1]John F. Kennedy. "Remarks of the President: Rice University Stadium, Houston, Texas." NASA News Release, 12 September 1962. On file at the NASA Johnson Space Center (JSC) History Office.

[2]White's crewmate, James A. McDivitt, also wore a flag on his suit. The astronauts purchased the flags themselves, but following their flight NASA made the flag patch a regular feature on the space suits. Dick Lattimer, *All We Did Was Fly to the Moon*

(Gainesville, FL: Whispering Eagle Press, 1983), p. 23; "Stars & Stripes Flew High on Gemini 4," *Dispatch: a Newsletter for Members of the Space Patch Collectors Club*, Vol. 1 No. 8 (June 1986), p.1; Buzz Aldrin, *Men From Earth* (New York: Bantam Books, 1989), p. 129; corroborated by Robert Spann, 1964-66 Project Engineer for the Gemini Support Office of the Space Suit Office at the Manned Spacecraft Center (MSC), personal communication, 10 September 1992.

[3]"Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies of 27 January 1967," in *Space Law: Views of the Future: A Compilation of Articles by a New Generation of Space Law Scholars*, edited by Tanja L. Zwaan (Deventer, The Netherlands: Kluwer Law and Taxation Publishers, 1988), pp. 149-154.

[4]Adrian Bueckling, "Flaggen Auf Dem Mond," *Zeitschrift f¸r Luftrecht und Weltraumrechtsfragen* 19 (1 January 1970), pp. 19-24.

[5]Richard Nixon, "Inaugural Address, January 20, 1969," in *Public Papers of the Presidents of the United States: Richard Nixon — Containing the Public Messages, Speeches, and Statements of the President 1969* (Washington, D.C.: USGPO, 1971); George M. Low, memo to Director of JSC, 23 January 1969, on file at the JSC History Office.

[6]T. O. Paine, NASA Acting Administrator, memo to Associate and Assistant Administrators and Center Directors, 25 February 1969, on file at the NASA Headquarters (HQ) History Office; George M. Low, memo to Director of JSC, 23 January 1969, on file at the JSC History Office; Willis H. Shapley, NASA Associate Deputy Administrator and Chairman of the Committee on Symbolic Activities, memos to Dr. Mueller of the Apollo Program Office, 19 April 1969 and 2 July 1969, and memo to the Administrator of NASA, n.d., on file at the NASA HQ History Office; Leonard Jaffe, Director for Space Science and Applications Programs, memo to the Associate Administrator for Space Science and Applications, 13 March 1969, on file at the NASA HQ History Office.

[7]Jack Kinzler, MSC Chief of Technical Services (retired), interview with the author, 30 August 1992. Following the presentation of 4x6 inch flags to several heads of state, it was discovered that some of the national flags flown were obsolete. Dr. Whitney Smith of the Flag Research Center was contacted by NASA and asked to check the remaining flags for accuracy. Whitney Smith, personal communication, 29 April 1992.

[8]In 1973 the Manned Spacecraft Center was renamed the Lyndon B. Johnson Space Center and is commonly referred to as JSC.

[9]Kinzler, interview, 30 August 1992.

[10]It is uncertain who manufactured the flag that was deployed by the Apollo 11 crew. According to a NASA Press Release of 3 July 1969, "the Stars and Stripes to be deployed on the Moon was purchased along with several others made by different manufacturers at stores in the area around the Manned Spacecraft Center near Houston. In order to attach the flag properly to its aluminum staff it was necessary to remove the binding and labels. For this reason the name of the manufacturer cannot be determined." (NASA Press Release 69-83E, 3 July 1969, on file at the JSC History Office) In his book, *All We Did Was Fly to the Moon,* (Gainesville, FL: Whispering Eagle Press, 1988), p. 121, Dick Lattimer states that the flags that went to the Moon were made by Annin & Co. Randy Beard, Sr., of Annin contacted the Public Affairs Office at NASA Headquarters regarding the flag shortly after the Moon landing. His company had supplied many flags to NASA throughout the manned space flight program. Beard was told that three secretaries had been sent out to buy 3x5 foot nylon flags during their lunch hours. After they had returned, it was discovered that all of them had purchased their flags at Sears. Annin was the official flag supplier for Sears at the time so this story seemed to confirm that the flag had been made by Annin. Beard was informed that NASA would not confirm the manufacturer of the flag because

they didn't "want another Tang" — in other words, the agency did not want another advertising campaign based upon the fact that a commercial product had been used by the astronauts. (Randy Beard, Sr., Annin & Co., personal communication, 24 August 1992 and 10 September 1992.) Jack Kinzler was unable to verify that the flags were purchased at local stores or that the labels were removed. His notes indicate that the flags were purchased from the Government Stock Catalog for $5.50. (Kinzler, interview, 30 August 1992.)

[11]Kinzler, interview, 30 August 1992.

[12]Kinzler, interview; T. Moser, "Insulation Configuration," drawing and data from the personal files of Jack Kinzler.

[13]Kinzler, interview; JSC Technical Services Division, "Weekly Activities Report—June 23-27, 1967," on file at the JSC History Office.

[14]Kinzler, interview; "Flag Folding Procedure" and "Flag Installation in Shroud (Procedure)" from the personal files of Jack Kinzler; Kinzler, personal communication, 9 September 1992.

[15]Kinzler, interview; JSC Technical Services Division, "Weekly Activities Report — July 7-11, 1969," on file at the JSC History Office; Kinzler, "Mounting Flag Assembly on Ladder (Procedure)," from the personal files of Jack Kinzler. Also these materials on file at the JSC History Office: "Apollo 11 GOSS NET (Ground Operational Support System Network) Transcripts," Tape 71/10, p. 390; NASA JSC Mission Operations Branch Flight Crew Support Division, *Apollo 11 Technical Crew Debriefing (U)*, Vol. I, 31 July 1969, pp. 10-43 to 10-45; NASA JSC, Apollo News Center, "Apollo 11 Postflight-Crew Press Conference," 12 August 1969. Buzz Aldrin noted that "just beneath the powdery surface, the subsoil was very dense. We succeeded in pushing the flagpole in only a couple of inches. It didn't look very sturdy." (Buzz Aldrin, *Men From Earth*, p. 242.) No film footage of either the Apollo 11 or Apollo 12 liftoff from the lunar surface is available, so it could not be determined if those flags remained standing. The Apollo 14 Mission Film (JSC-563) clearly shows that the flag from that mission remained standing after liftoff.

[16]Edwin E. Aldrin, Jr., "Lunar Dust Smelled Just Like Gunpowder," *Life* 67 #8 (22 August 1969), p. 26; Bueckling; Eugene Brooks, "Legal Aspects of the Lunar Landing," in *International Astronautical Federation, Colloquium on the Law of Outer Space, 12th, Mar del Plata, Argentina, October 5-10, 1969, Proceedings*, pp. 160-161. Also these materials on file at the NASA HQ History Office: Fanny Ventadour, "U.S. Flag On Moon Improper: Reader," letter to the editor, *Orlando Sentinel*, Thursday Morning, 17 July 1969; Donald C. Drake, "Flag on Moon Offers an Example for Man," *Philadelphia Inquirer*, Sunday, 10 August 1969; Robert F. Allnutt, NASA Assistant Administrator for Legislative Affairs, letters to: Representative Clark MacGregor (28 January 1969), Senator J. W. Fulbright (11 February 1969), Representative William Scott (13 May 1969), Senator Wallace F. Bennett (1 July 1969), Representative Richard L. Ottinger (2 July 1969), Senator Margaret Chase Smith (22 July 1969); T. O. Paine, NASA Acting Administrator, letter to Lee A. DuBridge, Science Advisor to the President, 30 January 1969. Also, these materials on file at the JSC History Office: "It's All Ours — And Everyone Else's," *Iberian Daily Sun* (22 July 1969), p. 35; "—In Peace for All Mankind," *Philadelphia Inquirer* (date unknown); "...So Proudly We Hailed," The Seattle Times (21 July 1969); "Let's All Cheer," *Huntsville News* (18 July 1969).

[17]"'Plans' for Apollo to Land U.N. Flag Questioned," *Space Daily*, 31 March 1969, p. 145; Robert F. Allnutt, NASA Assistant Administrator for Legislative Affairs, letters to Representatives Robert H. Michel and Richard L Roudebush, both dated 8 April 1969; T. O. Paine, NASA Administrator, letter to Senator Birch Bayh, 18 April 1969; "Mathias Asks Flags for Next Apollo," *Washington Post*, 28 May 1969; "Rarick Calls for Placing of U.S. Flag on the Moon," *Space*

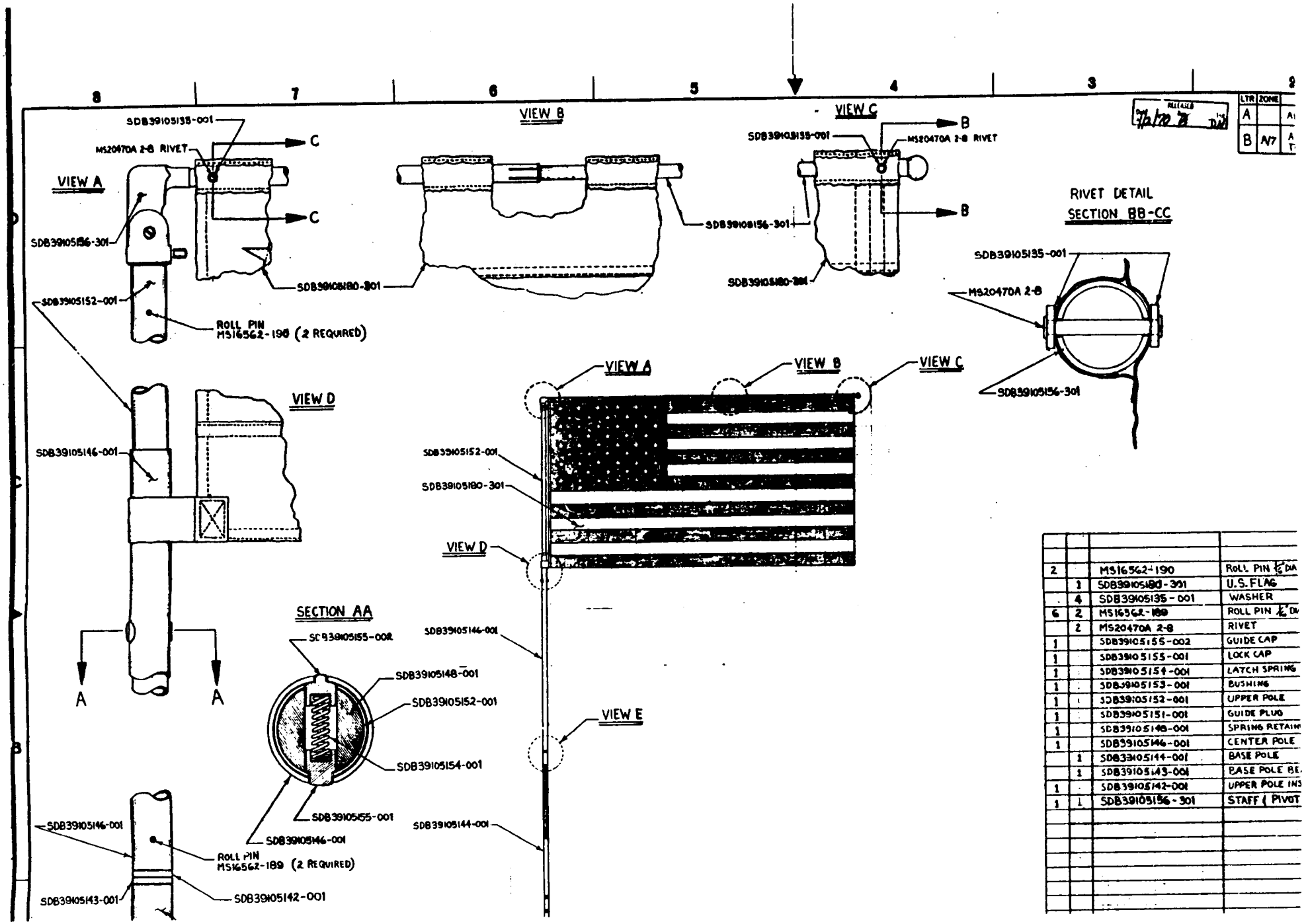
Daily, 29 May 1969, p. 132; "'Put an American Flag on the Moon' - Bennett," *Space Daily*, 3 June 1969, p. 148; Congressman Joe L. Evins, "American Flag to be Placed on Moon by Apollo 11 Astronauts," *Congressional Record*, 16 June 1969, E4908; Congressman Symington, "The Implantation of a Flag on the Moon," *Congressional Record*, 16 June 1969, H4828; "Moon Exploration: 2 Flags to be Hoisted," *Washington Star*, 11 June 1969; William Hines, "Big Congressional Flap Over Flag," *Washington Star*, 29 June 1969; Congressman James G. Fulton, "Apollo 11 Flags," *Congressional Record*, 15 July 1969, E5931; "Conferees Agree on Space Budget and Flag Rule," *The Evening Bulletin*, Philadelphia, 5 November 1969 — all on file at the NASA HQ History Office. Also, "Implantation of the United States Flag on the Moon or Planets," P.L. 91-119, 18 November 1969, Section 8 (83 Stat., 202), in *National Aeronautics and Space Act of 1958, as Amended, and Related Legislation*, committee print for the Committee on Science and Technology—U.S. House of Representatives, October 1983.

[18]Spencer M. Beresford, NASA General Counsel, opinion for the Associate Deputy Administrator, 5 December 1969, on file at the JSC History Office; Symington, "The Implantation of a Flag on the Moon." Symington notes four examples of international cooperation in the Apollo program: 1) tracking stations around the world which, for the most part, were provided rent-free by the host governments, 2) the solar wind experiment which was developed by Swiss scientists who were funded by the Swiss government, 3) a team of 150 scientists selected to examine lunar samples included 36 members from 8 other countries who would participate at the expense of their respective countries, and 4) rocket monitor sounding probes which were conducted by a Brazilian space agency team for the Apollo program.

[19]George Bush, "Remarks by the President at 20th Anniversary of Apollo Moon Landing; The Steps of the Air and Space Museum, Washington, D.C." The White House, Office of the Press Secretary, 20 July 1989.

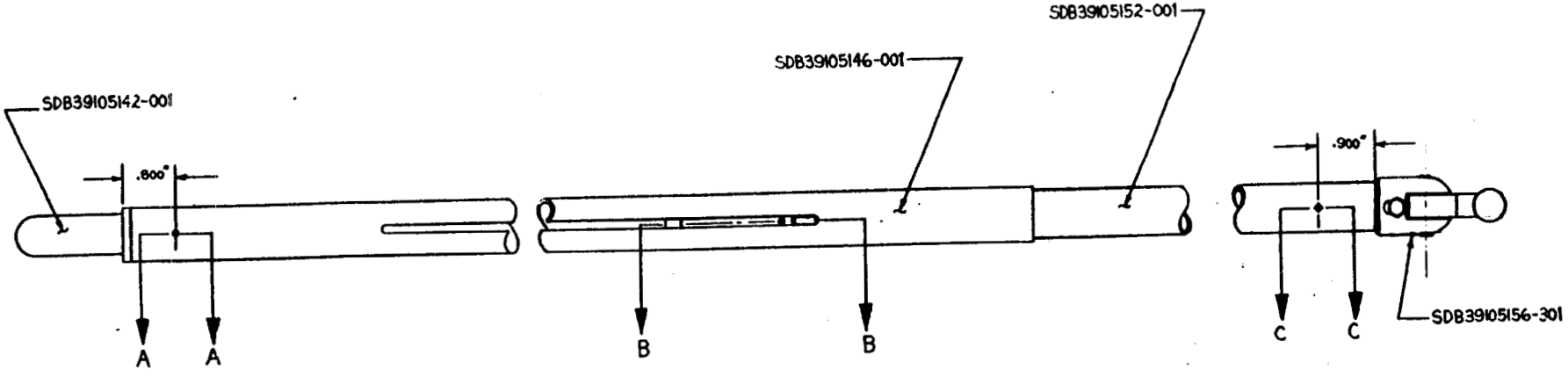
APPENDIX

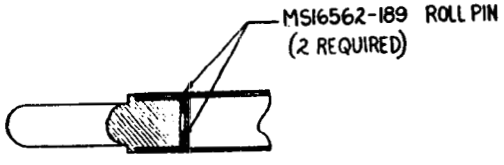
Original NASA Engineering Drawings of Flag Assembly



2		MS16562-190	ROLL PIN ⅛ DIA
	1	SDB39105180-301	U.S. FLAG
	4	SDB39105135-001	WASHER
6	2	MS16562-189	ROLL PIN ⅛ DI
	2	MS20470A 2-8	RIVET
1		SDB39105155-002	GUIDE CAP
1		SDB39105155-001	LOCK CAP
1		SDB39105154-001	LATCH SPRING
1		SDB39105153-001	BUSHING
1		SDB39105152-001	UPPER POLE
1		SDB39105151-001	GUIDE PLUG
1		SDB39105148-001	SPRING RETAIN
1		SDB39105146-001	CENTER POLE
	1	SDB39105144-001	BASE POLE
	1	SDB39105143-001	BASE POLE BE
1		SDB39105142-001	UPPER POLE INS
1	1	SDB39105156-301	STAFF (PIVOT

LTR	ZONE	
A		A
B	N7	A



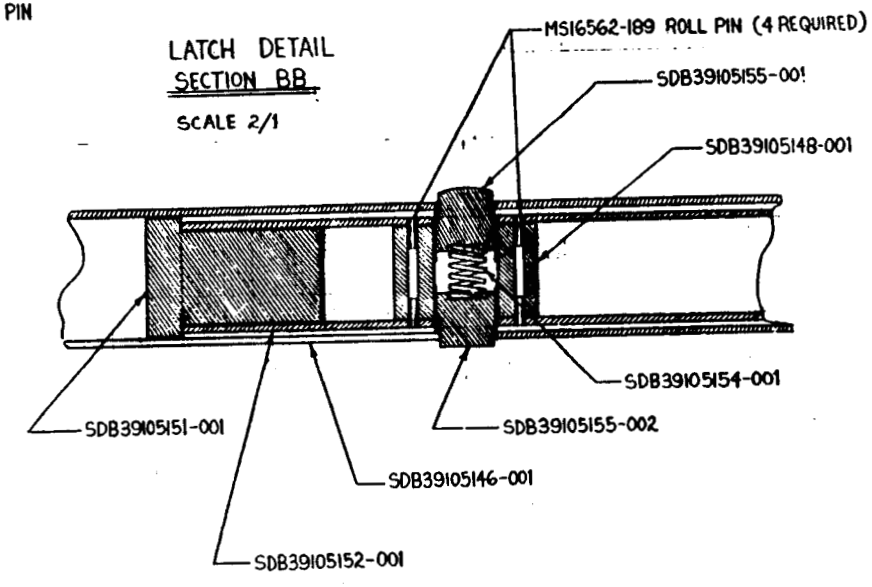


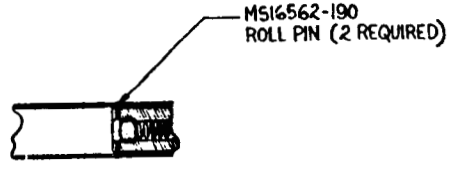
SECTION AA

SCALE 1/1

LATCH DETAIL
SECTION BB

SCALE 2/1





SECTION CC

SCALE 1/1

REDUCED

PART NUMBER	DESCRIPTION	
DIMENSIONAL TOLERANCE UNLESS NOTED OTHERWISE .X ± .10 .XX ± .02 .XXX ± .005 ANGULAR =	SIGNATURES DR	DATE 1/70
SURFACE FINISH IN MICROINCHES RMS UNLESS NOTED OTHERWISE ✓	CHK	1-20-70
SDB39105177	APP AUTH	1-19-70

NATIONAL AERO
MANNED SPACE

FLAG A
PROJEC

CODE IDENT NO. 21356 | SIZE D

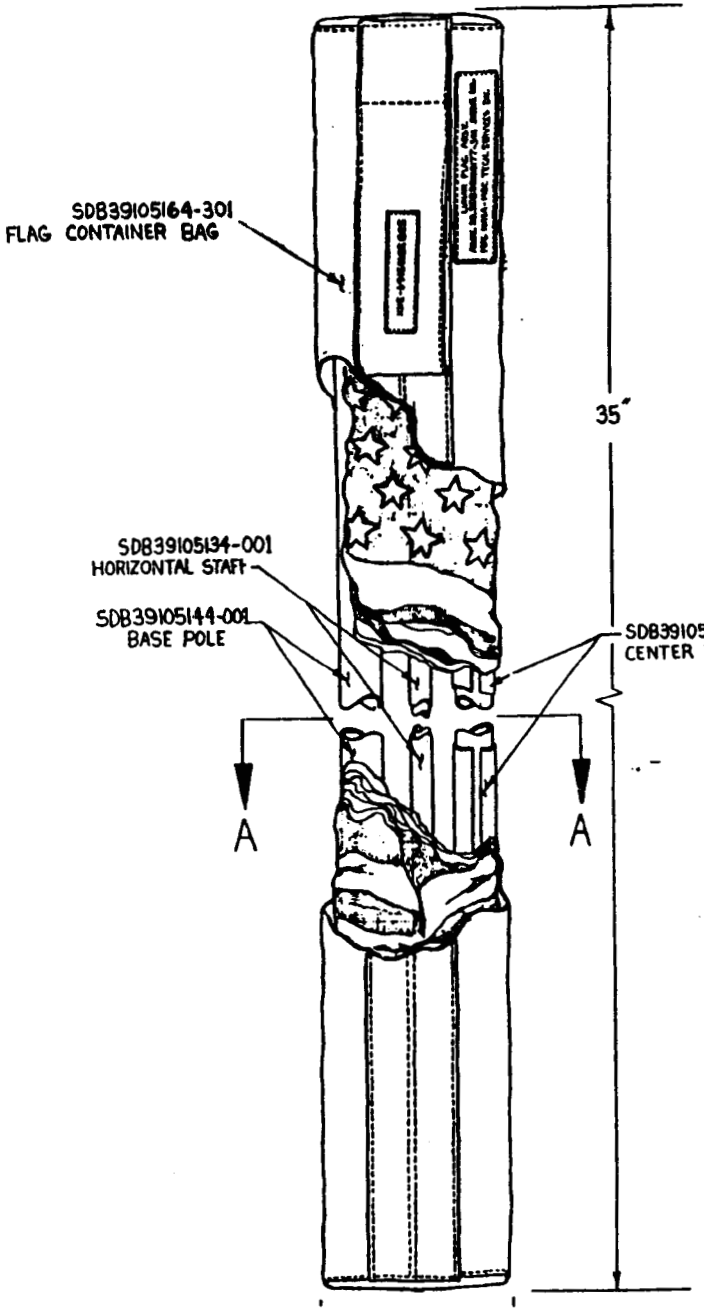
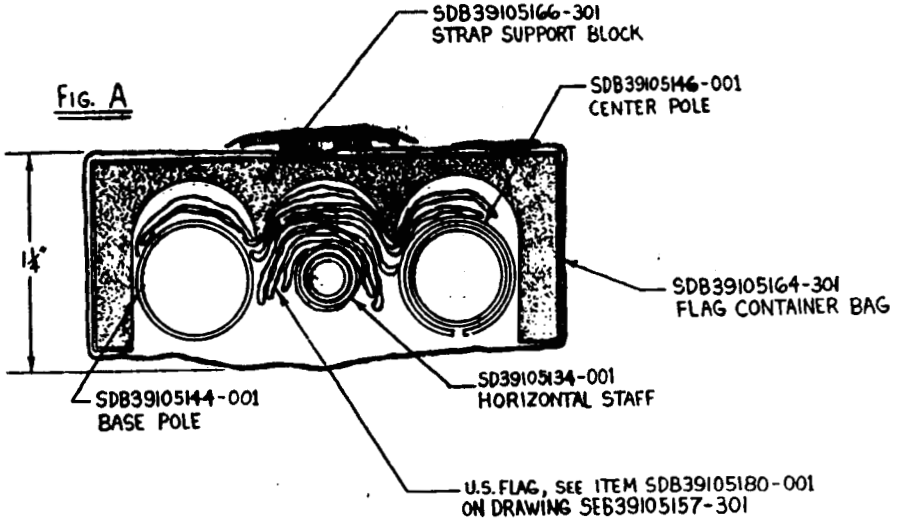
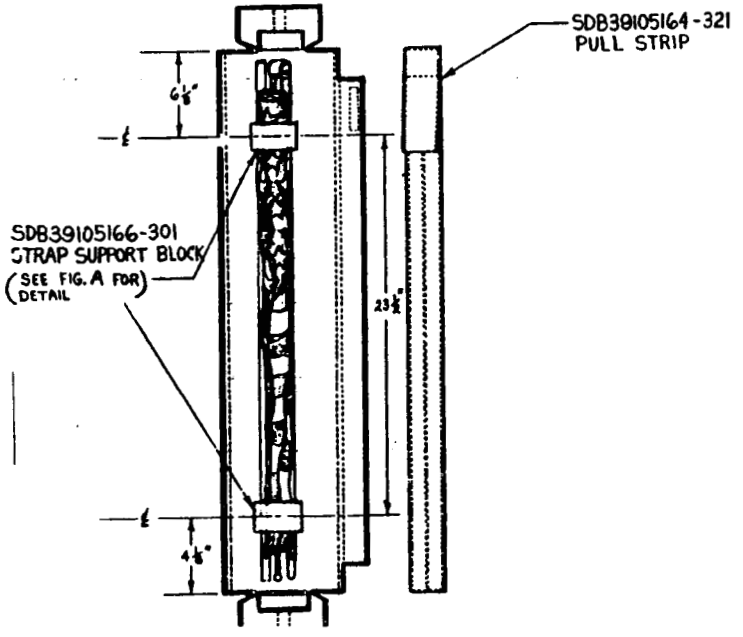


FIG. A





1	SDB39105164-301	FLAG CONTAINER BAG
2	SDB39105166-301	STRAP SUPPORT BLOCK
1	SEB39105157-301	FLAG ASSY.
	-301	
301	PART NUMBER	DESCRIPTION

DIMENSIONAL TOLERANCE UNLESS NOTED OTHERWISE
.X ± .10
.XX ± .02
.XXX ± .005
ANGULAR ±

SIGNATURES	DATE
DR W.A. Sorrento	11-69
CHD	1-70
CH	

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	August 1993	Contractor Report

4. TITLE AND SUBTITLE
Where No Flag Has Gone Before: Political and Technical Aspects of Placing a Flag on the Moon

5. FUNDING NUMBERS

6. AUTHOR(S)
Anne M. Platoff, Hernandez Engineering Inc.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
National Aeronautics and Space Administration
Johnson Space Center
Houston, TX 77058

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
National Aeronautics and Space Administration
Washington, D.C. 20546-001

10. SPONSORING / MONITORING AGENCY REPORT NUMBER
NASA-CR-188251

11. SUPPLEMENTARY NOTES
This work was performed under contract number NAS9-18263.

12a. DISTRIBUTION / AVAILABILITY STATEMENT
Unclassified/Unlimited Publicly Available
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4600 Subject Category 84

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

The flag on the Moon represents an important event in vexillological history. This paper examines the political and technical aspects of placing a flag on the Moon, focusing on the first Moon landing. During their historic extravehicular activity, the Apollo 11 crew planted the flag of the United States on the lunar surface. This flag-raising was strictly a symbolic activity, as the United Nations Treaty on Outer Space precluded any territorial claim. Nevertheless, there were domestic and international debates over the appropriateness of the event. Congress amended the agency's appropriations bill to prevent the National Aeronautics and Space Administration (NASA) from placing flags of other nations, or those of international associations, on the Moon during missions funded solely by the United States. Like any activity in space exploration, the Apollo flag-raising also provided NASA engineers with an interesting technical challenge. They designed a flagpole with a horizontal bar allowing the flag to "fly" without the benefit of wind to overcome the effects of the Moon's lack of an atmosphere. Other factors considered in the design were weight, heat resistance, and ease of assembly by astronauts whose space suits restricted their range of movement and ability to grasp items. As NASA plans a return to the Moon and an expedition to Mars, we will likely see flags continue to go "where no flag has gone before."

14. SUBJECT TERMS
Flag, International Relations, Space Law, Apollo 11, Lunar Surface, Apollo 11 Flight, Apollo Flights, Lunar Landing, Politics, Sovereignty

15. NUMBER OF PAGES
14

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL



National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas