Cf

EXECUTIVE (6)

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503
IT 47-26
OS

January 20, 1967

FOR Marie Fehmer

FROM Joe Califano

RE: January 18 Luncheon-meeting with the President, Cardinal Francis Spellman, Billy Graham, and Califano

The President asked Dr. Graham and Cardinal Spellman for their views on Viet Nam as a result of their trips there. Each of them reported to the President, both stressing the incredibly high morale of the troops.

Ambassador Goldberg discussed the timing of the Outer Space Treaty signing.

Nothing else sent to
Central Files as of 3-3-67
LB.

EXECUTIVE

DS.
FB11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

January 20, 1967

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities.

1. Launches.

a. The United States successfully launched 8 military communications satellites into near synchronous orbit January 18 with a Titan IIIC booster from Cape Kennedy. All of the satellites are operating satisfactorily. This makes 15 such satellites to provide a unique and vital military communications circuit with overseas military commands.

b. The Soviet Union launched Cosmos 138 into a low altitude orbit January 19. The satellite is of the type usually recovered after about 8 days in orbit.

2. Intelsat II. The communications satellite launched January 11 for the ComSatCorp and the international consortium was successfully placed into a synchronous orbit over the Pacific January 14. It will be moved to a position on the equatorial plane near the international date line where it will start commercial operation on or about January 27. The satellite is scheduled to relay telephone, television, and teletype signals. Another Intelsat satellite is to be launched into orbit over the Atlantic February 15.

3. Flood Warnings. The communications capacity of the synchronous Applications Technology Satellite will be used experimentally for the speedy relay to the U.S. Weather Bureau in Washington of river and rainfall information from five stations west of the Mississippi.

4. Storm Detection Capability. In order to increase U.S. ability to obtain weather information in the equatorial Pacific, cloud cover pictures from the Applications Technology Satellite will be correlated with locally obtained readings from three Pacific Islands -- Christmas, Fanning, and Palmyra.

5. Weather Satellites.

a. Even though one transmitter aboard the ESSA III weather satellite has failed, the remaining transmitter has been successful in relaying all of the data from both camera systems and infrared sensors. The Nimbus and ESSA I satellites are also in the global weather satellite system and are in good operating condition. ESSA II has the automatic picture transmission device and is used for local weather picture readout only. Weather satellites Tiros VII through X are partially operable and could be used in case of the further deterioration of ESSA III. ESSA IV isscheduled for launch January 25.

b. Three tropical storms were photographed in the Indian Ocean by ESSA III January 11-17, and storm warnings were sent to the threatened countries, including India and Ceylon, Australia, South Africa, Mauritius, and Malagasy.

6. Long Distance Repair. Explorer XXXIII, a scientific measuring satellite, was repaired last week by radio signals from earth 253,000 miles away. Noting that the power voltage was down from normal, NASA engineers suspected an electrical short. A power surge was created by turning the transmitter off which then burned out the short. The spacecraft is now operating normally again.

7. Lunar Orbiter III. The U.S.'s third picture-taking satellite of the moon is scheduled for launch February 13.

8. Nuclear Aircraft Study. NASA engineers and others are again examining the potential of a nuclear engine for commercial aircraft, noting that future airplanes are expected to be sufficiently large to handle the weight of shielding and other features of the engine.

9. SPACE PAYLOAD SUCCESS BOX SCORE
(January 20)

	U.S.		USSR	
	1966	1967	1966	1967
Earth Orbit	2	9	1	1
Escape	0	0	0	0

E. C. Welsh

January 20, 1967
10:15 A.M.

EXECUTIVE
OS
FG11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

January 13, 1967

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities

1. INTELSAT 2. The second INTELSAT 2 communications satellite was successfully launched from Cape Kennedy January 11. An attempt will be made January 14 to place the satellite into synchronous orbit above the equator over the Pacific. Launched by NASA for the Communications Satellite Corporation and the international consortium, the 192-pound satellite is a replacement for an INTELSAT satellite launched October 26 which failed to achieve synchronous orbit. The satellite is scheduled to relay telephone, television, and teletype signals for the Far East as well as for the Apollo program.

2. Congress

a. The House Science and Astronautics Committee is planning a one day seminar February 1 for new Congressmen to acquaint them with NASA's part of the space program. Top NASA officials will participate.

b. The earliest tentative date for NASA Authorization hearings before the House Committee is the week of February 20.

c. The Senate Aeronautical and Space Sciences Committee hearings (January 25-February 7) on the status and trends of aeronautical research will include the following witnesses: NASA Administrator, President of the Aerospace Industries Association, Secretary of Transportation, President of the Air Transport Association, Director of Defense Research and Engineering, and the Executive Secretary of the National Aeronautics and Space Council.

d. The House Science and Astronautics Committee on February 8 is sponsoring an exhibit of man in space for the Congress and the public, to include an astronaut, and the equipment he uses in space.

3. Pending Launches

a. Eight military communications satellites are scheduled for launch by a single Titan IIIC January 18.

b. Launch of the ESSA IV weather satellite is scheduled for January 25.

c. Launch of Lunar Orbiter III is scheduled for February 3.

4. Artificial Heart Valve. NASA specialists have joined with medical researchers at Cleveland's St. Vincent Charity Hospital to aid in the development of an artificial heart valve control mechanism in the expectation that heart valve surgery will become a near-routine operation.

5. Surveyor I. The U. S. first soft landed lunar spacecraft, which has been on the lunar surface since June 2, 1966, was reactivated for 12 hours on January 6 to make some measurements to help refine data regarding the moon's distance from the earth and its orbital motion.

6. Space Payload Success Box Score
(January 13)

	U. S.		U. S. S. R.	
	1966	1967	1966	1967
Earth Orbit	0	1	1	0
Escape	0	0	0	0

E. C. Welsh

Friday, January 13
Time: 10:15 a. m.

15m

Jno

(3)

EXECUTIVE
OS
PR15-5
FG726
FG 11-9

(Preface for the Report, "The Post-Apollo Space Program," to be published by President's Science Advisory Committee)

January 11, 1967

In the brief span of less than ten years, the United States Space Program has advanced from small and hesitant beginnings into a large and vital national effort. Today, its achievements provide daily testimony of our country's leadership in space capabilities, in their applications to peaceful practical purposes, and to the advancement of scientific understanding of the world in which we live.

But space is a hostile medium both for man and his instruments and therefore long periods of study, planning and hard work are required before major space undertakings can be successfully executed and their benefits fully harvested. For this reason, my Science Advisory Committee during the last year has been examining the many faceted problem of what the United States might do in space in the early years following our Apollo Program. They have examined the potentialities and the value of new space programs and recommended a course for the future.

We will give careful consideration to these recommendations. Because the opportunities in space are great but the costs are high, our space planning deserves the thoughtful consideration of all Americans. I am therefore releasing this report for publication so that the excellent work of this Committee will be available to all as we chart a course into the future.

LBJ;DFH;eac

1-President's File
2-3 WH Central Files
4-Dr. Hornig, R. 200, EOB

LYNDON B. JOHNSON

Orig to Dr Hornig

MEMORANDUM

THE WHITE HOUSE

WASHINGTON

Wednesday, January 11, 1967
4:45 PM

MEMORANDUM FOR

THE PRESIDENT

As you directed, we are planning the public release of the report, "The Post-Apollo Space Program," by your Science Advisory Committee, in the near future.

I recommend that you sign the attached statement for use as a preface to the report.

Donald Hornig

Donald F. Hornig

Attachment

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

EXECUTIVE
OS
FG11-4

January 6, 1967

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities

1. Satellite Communications

a. An Intelsat II synchronous communications satellite is scheduled for launch January 11 by NASA for the Communications Satellite Corporation and the international consortium. The satellite is scheduled to be placed over the Pacific to provide communication links with the Far East as well as for the Apollo program. A second similar satellite is scheduled for launching later in the year to improve communications between the United States and Western Europe.

b. In a move to strengthen our national defense communications, eight satellites are scheduled for launch by a Titan IIIC on January 18.

2. NASA Astronauts. Over 400 scientists, medical doctors, and engineers have already applied to the National Academy of Sciences for selection for NASA astronaut training. About 46 percent of those applying are from universities, 21 percent from industry, and 13 percent from government or government-supported laboratories. The rest are from hospital staffs or are self-employed.

3. Saturn Test. The giant Saturn V launch vehicle's second stage (S-II) completed its second full duration static test firing December 30 at the Mississippi Test Facility. It is hoped that analysis of the test will provide the basis for flight worthiness certification.

4. SST. The winning contractors for the airframe and engine designs of the U. S. commercial Supersonic Transport were announced December 31 by the FAA. The contractors will continue to study and refine their design proposals in anticipation of decisions regarding the construction and testing of a prototype.

5. Luna 13. The second Soviet spacecraft to be soft-landed on the moon ceased transmitting December 30. Besides taking TV-type panoramic pictures, the spacecraft was equipped with a soil-probing device to test the load-bearing strength of the lunar surface. The findings gave additional support to our conclusion that the surface was sufficiently strong to hold a spacecraft the weight of the Apollo LEM.

6. Weather

a. The weather pictures taken by the synchronous Applications Technology Satellite from a 23,000 mile altitude have been of excellent quality. During the first two weeks of this year the weather services of Australia, Canada, New Zealand, and French possessions in the South Pacific are participating in weather facsimile transmission experiments using the ATS which achieves a 4-5 hour time saving over conventional data transmission.

b. Weather satellite ESSA IV containing two Automatic Picture Transmission cameras is scheduled for launch during the last week of January from the Western Test Range, using a Delta launch vehicle.

c. U. S. weather satellites photographed Typhoon Pamela in the western Pacific December 23-29, and warnings were sent to threatened areas.

7. U. S.-ESRO Agreement. The U. S. has signed an agreement with the European Space Research Organization (ESRO) under which NASA will launch the organization's scientific satellites beginning in late 1968. NASA will provide the launch vehicles, services, and facilities on a reimbursable basis.

8. Manned Launch. The first Apollo manned flight is scheduled for the first quarter of 1967, probably late in February. The trip is to be of 14-day duration and the launch by an Advanced Saturn I vehicle.

E. C. Welsh

Friday, January 6
Time: 11:15 a. m.

6. Weather

a. The weather pictures taken by the synchronous applications technology satellite (ATS) are, and will have been of excellent quality. During the first two years of this, our the weather services of Australia, Canada, New Zealand, and French possessions in the South Pacific are participating in weather facsimile transmission experiments using the ATS which achieves a 4-5 hour time saving over conventional data transmission.

b. Weather satellite [illegible] contributing two Automatic Picture Transmission cameras is scheduled for launch during the last week of January from the Western Test Range, using a Delta launch vehicle.

c. U. S. weather satellite photographs Typhoon Carmela in the Western Pacific Ocean for [illegible], and warnings were sent to threatened areas.

7. [illegible] - NASA Agreement. The U. S. has signed an agreement with the European Space Research Organization (ESRO) under which NASA will launch the Oxynoxphere scientific satellite beginning in late [illegible]. NASA will provide the launch vehicle, services, and facilities on a reimbursable basis.

8. Launch Range. The first Apollo manned flight is scheduled for the first quarter of [illegible], probably late in February. The trip is to be of 14-day duration and the launch by an Saturn I vehicle.

E. C. Welsh

Friday, January 6
Time: 11:15 a.m.

OUT

16—76223-1 GPO

IDENTIFICATION OF FILE MATERIAL File Designation Date Description	CHARGED TO	DATE CHARGED
All fm. Several Places Sarah Lee Thompson Davis	9 M. Davis	2-10-67
EXEC. Memo for Mr. Rostow from – OS Benjamin Read re Outer Space Treaty To State 1-3-67 Sgd + Dated 12-31-66/12-23-66	Mr. Ratchford	2/14/67

OFFICIAL USE ONLY

EXECUTIVE (6)
ND20
AT2
OS
FI4/FG202
FG202

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

January 2, 1967

NR 1/3/67

Dear Marvin:

In response to your request of December 31, I am enclosing the Presidential briefing material on the ROVER Program and the budget issues of concern to Senator Anderson, Clinton

If I can provide you with any further information, kindly let me know.

Cordially,

Glenn

Chairman

Honorable W. Marvin Watson
Special Assistant to the President
The White House

Enclosures:
As stated

P.S. This may be useful to the President even though the meeting won't be held on Tuesday.

OFFICIAL USE ONLY

BROUGHT FORWARD

EXECUTIVE

OS 12/31/66

Previously filed Date

NAME Six Full Powers Signed

ORGANIZATION

EXECUTIVE

OS 2/7/67

New File Symbol Date

FINAL ACTION Outer Space Treaty to Senate

JMT/pd

EXECUTIVE
OS
SP (2)
FG260

THE WHITE HOUSE
WASHINGTON

Dec. 30, 1966

MEMO TO MR. CATER

Attached is a carbon copy of the NASA segment for the Year-end Roundup with the addition I spoke to you about.

Bob Hardesty

NASA

Confirmation and confidence are the two key words describing America's space program during 1966.

It was a year of great activity. NASA attempted 28 major missions involving 33 launch vehicles. Of these, 21 missions and 31 launches were successful.

It was also a year of landmark achievements. These achievements included:

-- Completion of the 12-mission Gemini Project, giving the United States a total of 1, 993 hours and 41 minutes in manned space flight.

-- A soft landing on the moon.

-- Historic new photographs of the lunar surface and of the earth from the vacinity of the moon.

-- A new speed record of 4,223 miles per hour, set by the X-15 piloted research plane.

The success of the Gemini two-man program confirmed our

design concepts, our manufacturing techniques, and our launch techniques. It also confirmed that man can withstand the rigors and hostile environment of space. He can rendezous and dock with other space craft. He can maneuver his space craft. And he can function outside of his space craft.

From these achievements, the United States gained further confidence in its ability to place astronauts on the moon and return them safely to earth before this decade is over.

The successful flight of Suvryor I and II lunar orbiters bolstered this confidence. They gave us valuable new information about the surface of the moon. And they tested-out many of the concepts that will be used in the Apollo program.

We now know that the moon is within our reach in this decade.

That is the lesson of 1966. Now, as we enter into a new phase of our efforts, we have cause for both pride and hope.

BB/

EXECUTIVE

OS
FG 11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

December 30, 1966

MEMORANDUM FOR THE PRESIDENT

Subject: U. S. Space Highlights for 1966

1. Manned Space Flight

The U. S. manned space flight program achieved its most significant successes during 1966, including the final five manned Gemini missions and the first three Apollo unmanned missions. Additionally, broad based and proficient development and production activities provided the groundwork for the upcoming Apollo manned flights, pointing toward the Lunar mission planned for the 1968-69 time period. Over a twenty-month period, 10 Gemini two-man missions were successfully carried out, in which 1940 man-hours of flight experience were gained. Also of significance were the 12 hours of space exposure and activity outside the spacecraft. The five missions during 1966 demonstrated that rendezvous and docking by separately launched spacecraft can be accomplished with ease, that man can perform useful work in space -- both inside and outside his spacecraft. A new manned altitude record of 851 miles was set, and it was demonstrated that two spacecraft could be tethered together in a station-keeping arrangement. The unmanned Apollo flights tested the operation of the three-man lunar spacecraft and the efficacy of its heat shield under reentry conditions. Progress was also made in the development of the Defense Department's Manned Orbiting Laboratory.

2. Scientific Spacecraft

Important progress was made with a variety of unmanned scientific spacecraft. Surveyor I landed gently on the moon and then returned over 11,000 pictures of its surroundings. Lunar Orbiters I and II obtained hundreds of useful pictures of potential landing areas for the Apollo Lunar Excursion Module. Pioneer 7 made a successful flight to measure radiation and particles in the interplanetary medium between the orbit of earth and an orbit 12 million miles further out. The nation's first Biosatellite was launched on a three-day flight to investigate the effects of weightlessness, radiation and other stresses of the space environment on various forms of life, and an Orbiting Geophysical Laboratory was launched into earth orbit.

3. International Activities

Stimulated by the initiative of the President of the United States, the United Nations reached agreement on a "Treaty on Principles Governing the Activities of States in the Exploration and the Use of Outer Space, including the Moon and Other Celestial Bodies." The treaty forbids the placing of weapons of mass destruction in outer space or on celestial bodies, and bars claims of sovereignty and national appropriation. The U. S. continued the practice of assistance to other nations in their efforts to contribute to space progress. Through the end of the year 71 countries had participated cooperatively with the United States in space research. This included the launch of six satellites for four countries, and nine other satellites under agreement for future launch. Also, nineteen countries had entered into agreements for cooperative sounding rocket programs, and 31 countries had automatic picture transmission (APT) facilities to obtain cloud cover pictures directly from satellites overhead.

4. Applications Satellites

More communications satellites were orbited in conjunction with the Communications Satellite Corporation and the international consortium INTELSAT, joining together more distant parts of the world for live transmission of television and other forms of communication. Four new weather satellites joined the U. S. weather satellite system, which warns the world of impending weather dangers. A Pageos satellite was orbited to give mapmakers more precise measurements of distances. The U. S. nuclear explosion detection satellite system (VELA) was expanded.

5. Developments in Propulsion and Spacecraft Power

The United States made significant progress in its program to develop large boosters. Development flights of the Titan IIIC were continued with the use for the first time of new and improved upper stages. The advanced Saturn I was used with complete success, and the giant 7,500,000 pound thrust Saturn V is being readied for its first test early next year. The Atlas-Centaur test program was successfully completed, and tests of the nation's first nuclear-rocket "breadboard" engine (one which contains flight-type components but in a non-flight arrangement) demonstrated high performance and stability over a wide range of operating conditions. A single ion engine was endurance tested for over 8,000 hours, leading to the decision to prepare a second flight

in the Space Electric Rocket Test (SERT) program. The nation continued to improve its spacecraft power sources, and more durable and powerful batteries, solar cells, and fuel cells were developed. Preparations were made for the Phoebus 1-B nuclear power reactor tests, and a space thermoelectric generator fueled with curium 242 was successfully tested for 90 days under simulated lunar conditions.

6. Aeronautics

Research and development of improved V/STOL aircraft, helicopters, and large commercial transports continued. Of major importance was the completion of the principal studies and decisions needed to develop the United States commercial supersonic transport by the early 1970's.

7. Launch Record

The U.S. successfully placed into earth orbit 95 spacecraft as compared with 46 by the USSR. These current totals compared with 94 last year for the U.S. and 66 for the USSR -- a slight statistical increase for us and a substantial statistical decrease for the Soviets. However, the USSR did put more weight into orbit. In addition, each country had five successful escape missions for lunar and planetary exploration during the year.

Of the total of 100 spacecraft successfully launched into space during 1966, 70 were Defense payloads and 30 were NASA payloads.

Payload Success Box Score
(December 30)

	USA			USSR		
	1965	1966	1957-66	1965	1966	1957-66
Earth Orbit	94	95	437	66	46	197
Escape	3	5	18	7	5	20
Totals	97	100	455	73	51	217

E. C. Welsh

Friday, December 30
Time: 2:15 P.M.

EXECUTIVE
OS
FD11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

December 30, 1966

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities

1. Launch. A Department of Defense satellite was successfully launched by a Thor-Agena launch vehicle from the Western Test Range December 29.

2. Luna 13. The Soviet Union has released some pictures of the lunar terrain taken by Luna 13, the second Soviet spacecraft to be soft-landed on the moon. The spacecraft is also reported to be collecting data about the hardness and density of the lunar surface. Soviet indication that the spacecraft would probably not operate beyond January 1 suggests that they are still powering their lunar spacecraft with batteries rather than solar cells, in contrast with the U. S.

3. Saturn Test. The most recent test of the third stage of the Saturn V was stopped after a few seconds of burning because of an incorrect signal given by the test equipment. Inspection revealed that the stage had performed well through the no-hold countdown and ignition. Another test is expected soon.

4. Tracking Station. NASA is preparing to shut down on schedule the U. S. tracking station in Nigeria December 31. It is no longer required for our space program.

5. Soviet Chart. The Soviet Union has announced that its scientists have made a detailed chart of the earth's magnetic field, using data obtained from its Cosmos satellites.

6. Snow Cover. The Weather Bureau has received a research report on the practicality of using satellites to measure snow melt based on the reflectivity from one or more inches of snow cover. This technique promises improvement in predicting the timing and accuracy of water run-off, aiding agriculture in judging the amount of water that will be needed for irrigation, and increasing the accuracy of flood warnings.

7. European Space. The three major European space organizations have been holding ministerial meetings this month, suggesting the possible fusion of these organizations into a single international space

agency. For the first time, members of the European Launcher Development Organization (ELDO), the European Space Research Organization (ESRO), and the European Conference for Telecommunications Satellites (CETS) held joint meetings.

8. Storms. U. S. weather satellites observed one typhoon and one tropical storm in the Pacific and Indian Ocean areas, December 25-27. Warnings were sent to threatened areas.

9. Space Payload Success Box Score
(December 30)

	U. S.		USSR	
	1965	1966	1965	1966
Earth Orbit	94	95	66	46
Escape	3	5	7	5

E. C. Welsh

Friday, December 30
Time: 10:15 a. m.

File Memo:
December 30, 1966
JMT

EXECUTIVE
SC
OS
PU 1/FG 260
FG 260

The following (assumed to be from NASA, per Mrs. Territo's attached note) are filed X On the Shelf. # 6

Notebook containing a sequence of pictures showing weather changes.

Book, containing Lunar Orbiter photographs, entitled "Photographs of the Moon."

Book entitled "An Administrative History of NASA."

Boxed set of Volumes as listed below on the NASA memo.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Office of the Administrator

Significant Achievements in the Space Sciences

Volumes	Cost
Space Astronomy	45
Space Bioscience	55
Space Communications & Navigation	45
Satellite Geodesy	70
Ionosphere & Radio Physics	45
Satellite Meteorology	60
Particles & Fields	50
Planetary Atmospheres	45
Planetology	45
Solar Physics	50
	5.10

Available from Superintendent of Documents individually but not as a boxed set. It was decided not to box them because the volumes were released individually at different times and to keep costs down. A few sets were boxed only for display purposes.

BB/

EXECUTIVE
OS
FG 11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

December 23, 1966
10:45 A.M.

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities.

1. Launches.

a. Luna 13, launched by the Soviet Union December 21, is expected to reach the vicinity of the moon December 25th. Its announced mission is further scientific study of the moon's environment.

b. The Soviet Union launched Cosmos 136 December 19 and Cosmos 137 December 21. Both were placed into orbits about the earth.

c. The Japanese attempt to launch a satellite December 19 ended in failure when the fourth stage of the launch vehicle did not ignite.

d. The Defense Department launched by Atlas booster an experimental maneuverable lifting re-entry vehicle, the SV-5D. It successfully re-entered the atmosphere December 21 but it was not recovered due to the failure of a radio beacon.

e. NASA air-dropped from a B-52 at 45,000 ft. altitude a wingless piloted lifting body which landed safely a few minutes later.

2. Treaty. The Treaty on outer space, initiated by President Johnson, was unanimously approved December 17 by the United Nations General Assembly. Ratification by individual nations is expected soon.

3. Communication Satellite Launches.

a. The Communications Satellite Corporation plans to have NASA launch a synchronous commercial communications satellite over the Pacific on January 11.

b. The next series of 8 Defense communications satellites is scheduled for launch by a Titan IIIC launch vehicle January 18.

4. Soviet Proposal. A Soviet Deputy Minister for Communications stated that the USSR is ready to cooperate in the development of space communications based on the USSR Molniya communications satellite system with any other country interested. He criticized INTELSAT, initiated by the U.S. and currently supported by 55 nations.

5. BioSatellite. Retro-rockets failed to fire December 17 and the NASA-orbited capsule of biological experiments did not return to earth as planned. Consequently, the only results of the experiments were those obtained by telemetry. The second BioSatellite is scheduled for launch during the first quarter of 1967.

6. Antarctic Experiment. Several of NASA's space experts are scheduled to visit Antarctica in January to examine conditions which are thought to represent somewhat similar hostile environment as that to be encountered on the moon.

7. Apollo. The difficulties encountered in the Environmental Control Unit of the Apollo spacecraft have been remedied. If no other problems are encountered, the first manned Apollo mission to be launched by an Advanced Saturn I will meet its present schedule in the first quarter of 1967.

8. Saturn. Engine failure in a Saturn V static test occurred December 22 at the Mississippi Test Facility.

9. Aerospace Industry Growth. Sales by U.S. companies involved in aeronautics and space work for 1966 are estimated at $23.8 billion (15.1% above 1965) and are predicted to rise another 6.1% in 1967, according to the Aerospace Industries Association. These are both new peaks of activity. Profits after taxes are also estimated at new highs. Employment in the industry totals 1,349,000, an increase of 11% over a year ago.

10. Weather Satellites. U.S. weather satellites spotted four tropical storms in the Indian Ocean area and one east of the Philippines last week, and warnings were sent to threatened areas.

11. Cloud Charts. The National Environmental Satellite Center is now distributing daily a composite global analysis utilizing all weather satellite information together with data gained from ground stations and observers.

12. SPACE PAYLOAD SUCCESS BOX SCORE
(December 23)

	U.S.		USSR	
	1965	1966	1965	1966
Earth Orbit	93	94	64	46
Escape	3	5	7	5

E. C. Welsh

JMT/BW

I want to call him and thank him for that letter and tell him it is the nicest Christmas present I could have.

LBJ/mf
12-22-66
4:00p

L F

EXECUTIVE
OS
FO9
CO31
CO303

(5)

(1)

THE REPRESENTATIVE
OF THE
UNITED STATES OF AMERICA
TO THE
UNITED NATIONS

December 20, 1966

IT 47-26

The President
The White House

Dear Mr. President:

I thank you very much for your letter of congratulations on the completion of the outer space treaty.

You have been more than kind and generous in referring to my efforts in helping to bring about agreement on the text of this treaty.

It is only appropriate, however, for me to point out and for history to acknowledge that the treaty would not have been negotiated had you not taken the initiative on May 7 of this year to authorize me to initiate consultations for the treaty in the appropriate United Nations body. Moreover, without your full support throughout the negotiations, this important step towards peace could not have been achieved.

I share your hope that the series of peace-building agreements will continue to grow. In 1959 the Antarctic treaty was negotiated. In 1963 the Limited Test Ban treaty was signed, and now we have this treaty. I know nothing would make you happier than if a treaty against the proliferation of nuclear weapons would soon be added as the fourth compact on this historic list.

It is a source of great personal pride and satisfaction that I can be of assistance to you in reducing the dangers of international conflict and in promoting the prospects of international cooperation for the common interests of mankind.

Dorothy joins me in this expression of thanks and appreciation to you for your warm words.

Respectfully,

Arthur J. Goldberg

Arthur J. Goldberg

Nothing else sent to
Central Files as of 1-7-67
Bill

JMT

EXECUTIVE (4)
OS
FO9
CO303
IT47-26

THE WHITE HOUSE

WASHINGTON

December 16, 1966

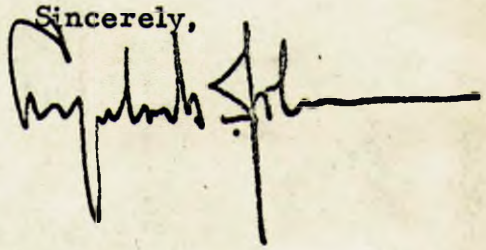
Dear Arthur:

You and I share a passion for peace. I am writing to tell you how tremendously pleased I am that through your labors in pursuit of a treaty on outer space with the Russians we have moved another step forward. My hope is that the space agreement may in time open a path to further progress in the area of non-proliferation and other aspects of disarmament.

I know very well how many endless hours you have devoted to the space treaty, despite your full engagement in the work of the United States Mission and of the General Assembly Session. Perhaps Dorothy will forgive me if I say that, hard as it may have been for her, the sacrifice of time and energy you have made on this account has been fully justified in the national interest.

Once again, as I have so often done in the past, I want to congratulate you personally on the outstanding result you have just achieved. It adds lustre to your place in contemporary American history.

Sincerely,



The Honorable Arthur J. Goldberg
Permanent Representative of the
United States to the United Nations
New York, New York 10017

Dispatched 12/16/66 – Outside Rept.

THE REPRESENTATIVE
OF THE
UNITED STATES OF AMERICA
TO THE
UNITED NATIONS

OFFICIAL BUSINESS

Rec'd 12-21-66 3pm

DEC 21 1966

Rec'd 12-22-66 11:00a

The President
The White House

VIA POUCH
UNCLASSIFIED

PLEASE FORWARD TO THE RANCH

"REGISTERED # 38

THE WHITE HOUSE

DEC 21 11 36 AM '66

RECEIVED

2236

THE WHITE HOUSE
WASHINGTON

Thurs., Dec. 15, 1966
12:15 p.m.

MR. PRESIDENT:

Joe Sisco, the reigning expert, tells me it would be good for morale, etc., if you were to send Arthur Goldberg a letter like the attached.

Walt R.

Type it up for signature_____

No_____

The Honorable
Arthur J. Goldberg
Permanent Representative of the
United States to the United Nations
New York, New York 10017

Dear Arthur:

You and I share a passion for peace. I am writing to tell you how tremendously pleased I am that through your labors in pursuit of a treaty on outer space with the Russians we have moved another step forward. My hope is that the space agreement may in time open a path to further progress in the area of non-proliferation and other aspects of disarmament.

I know very well how many endless hours you have devoted to the space treaty, despite your full engagement in the work of the United States Mission and of the General Assembly Session. Perhaps Dorothy will forgive me if I say that, hard as it may have been for her, the sacrifice of time and energy you have made on this account has been fully justified in the national interest.

Once again, as I have so often done in the past, I want to congratulate you personally on the outstanding result you have just achieved. It adds lustre to your place in contemporary American history.

Sincerely,

Lyndon B. Johnson

Name	Date
Mr. Ratchford	2-14-67

EXECUTIVE

OS
FG11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

Recd 12-16-66 2:30P

December 16, 1966

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities

1. Launches

a. Two Department of Defense satellites containing radiation experiments were launched into orbit from pods on the side of an Atlas-D ICBM launched December 12 from the Western Test Range.

b. The Soviet Union launched Cosmos 135 into orbit December 12. They reported it to be a satellite carrying scientific measuring experiments.

H

c. NASA successfully launched the first of a series of biosatellites December 14 from Cape Kennedy, by a thrust augmented Delta launch vehicle. It will be recovered near the Hawaiian Islands after three days in orbit. The satellite carries a collection of 13 biological experiments on organisms including pepper plants, wheat seedlings, frog eggs, amoeba, beetles, and other insects.

d. The Department of Defense successfully launched a military satellite with a Titan III launch vehicle December 14 from the Western Test Range.

2. Surveyor Program. Three of the eleven remaining Surveyor spacecraft to be soft-landed on the moon have been eliminated from the program at a saving of about $100 million. The saving was made possible because of the large amount of lunar information obtained from the Ranger project, two Lunar Orbiters, and the two Surveyors already launched. Surveyor planners estimate that if five of the remaining satellites are successful, all of the needed data will be obtained.

3. ATS. The U. S.'s first Applications Technology Satellite continued to record new firsts as it photographed the earth and its cloud cover from 22,300 miles altitude. In one test, photographs were taken every 20 minutes over a 17-hour period, giving the scientists the ability of viewing changes in cloud structures over wide areas of the earth. The ATS also scored a new first by permitting ground voice communication between the Goddard Center and aircraft widely dispersed around the world.

4. Intelsat. A second attempt to place into synchronous orbit a commercial communications satellite over the Pacific is scheduled for January 11.

5. Communications Regulation

a. The FCC has approved the ComSat Corp. request to construct an earth station in Puerto Rico, but at the same time approved the international carriers' request to construct a high capacity submarine cable for the Caribbean area. A composite rate structure lower than cable service alone but higher than satellite service alone is expected to be established.

b. The FCC has dismissed as premature, but without prejudice, a request by Western Union Telegraph to construct, operate, and use its own satellite facilities for transmission of teletype and data services within the U. S.

c. The ATT has filed to have a domestic communications system, including TV, with the satellites owned by the ComSat Corp. and the ground stations by other common carriers.

6. Speed Record. The X-15 unofficially established a new speed record last month. Refined data now indicate the aircraft flew at 4233 mph or in excess of Mach 6.

7. Lunar Orbiter. Photographs from Lunar Orbiter II have supplied what experts call "photographic proof" that the moon has had a long and complicated history of volcanic activity. The satellite, now finished with its picture-taking mission, has had its orbit around the moon changed so that it is in a better position to report regarding the moon's shape and gravity field.

8. Weather Satellites. U. S. satellites located two storms in the Indian Ocean December 7-11 and satellite advisories were sent to affected areas.

9. Space Payload Success Box Score
(December 16)

	U. S.		U. S. S. R.	
	1965	1966	1965	1966
Earth Orbit	88	94	62	43
Escape	2	5	7	4

Friday, Dec. 16
Time: 10:45 a. m.

E. C. Welsh

EXECUTIVE

OS
FG11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

December 9, 1966
11:30 A.M.

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities.

1. Space Treaty. The United States, Soviet Union, and other leading nations have agreed on the text of a United Nations Treaty governing the exploration of the moon and other celestial bodies which resulted from President Johnson's initiative. Acceptance by the U.N. General Assembly is anticipated at this session, and the President announced he will submit it to the Senate for advice and consent early next year.

2. Launches.

a. The first of a series of Applications Technology Satellites was launched December 6 and successfully placed into synchronous orbit December 7. The satellite's experiments include: microwave transmission of color TV; UHF voice communication between ground stations and aircraft via satellite; and cloud cover pictures from synchronous altitude. By December 18th, it will have been jockeyed into place south of Hawaii.

b. The Soviet Union launched Cosmos 134 December 3 into a low altitude orbit from which recovery is usually accomplished in 8 days.

c. The United States orbited a defense payload December 5 from the Western Test Range using an Atlas Agena launch vehicle.

3. Lunar Orbiter. After having completed 97% of its photographic mission, Lunar Orbiter II failed to respond to readout commands December 7. Efforts continue to retrieve the few remaining pictures. The photographs obtained by this satellite represent a major milestone in the manned lunar landing program.

4. Pending Launches.

a. The first Biosatellite is scheduled for launch by NASA December 14. It contains many experiments selected to determine the effects of the space environment on various life processes in its planned 3 days in orbit.

b. Japan now plans to orbit its first satellite December 19.

5. British Satellites. The United States has agreed to launch two British military communications satellites into synchronous orbit in 1968. They are compatible with and could be used by the U.S. military system.

6. Expedition. U.S. astronauts and geologists carried out a three-day field expedition to the Pinacate Hills area in Mexico last week. The area has a terrain similar to that of the moon.

7. FCC-ComSat Ruling. FCC has modified its previous decision which authorized the Communications Satellite Corporation to build, own, and operate on an interim basis, the first three communications satellite ground stations. A new ruling provides that for the next three years, the ComSat Corporation will own 50% of each station, the remainder to be divided among the carriers based on their use.

8. ESRO Satellites. The intergovernmental European Conference on Satellite Communications (CETS) has ordered the European Space Research Organization (ESRO) to draw up specifications by May 1967 for a series of experimental European telecommunication satellites. The satellites would be suitable for television, weather, and aeronautical purposes.

9. Public Opinion Poll. According to the latest six-city Trendex survey, 86% of the respondents favored continuing the space program at the current or an increased level; of these 20% favored speeding it up.

10. SPACE PAYLOAD SUCCESS BOX SCORE
(December 9)

	U.S.		USSR	
	1965	1966	1965	1966
Earth Orbit	86	90	61	42
Escape	2	5	7	4

R. W. Hale
for E. C. Welsh

EXECUTIVE

OS
FG 11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

December 2, 1966

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities

1. Launch. The Soviet Union launched Cosmos 133 into a low earth orbit on November 28.

2. Lunar Orbiter. Striking photographs of the moon have been obtained from Lunar Orbiter II's high and medium resolution cameras. Taken from an altitude of 28.5 miles above the lunar surface, the pictures reveal vivid details of the lunar scape which will be very useful in selecting an Apollo landing area.

3. Saturn V. Preliminary analysis of a full thrust static test of the Saturn V lunar landing launch vehicle's second stage December 1 indicates that problems previously detected in this stage have been corrected, eliminating a major roadblock in the path of the first launch test of the complete giant booster.

4. Mariner IV. The spacecraft which was launched into solar orbit November 28, 1964 and which took the first pictures of Mars on July 14, 1965, is still functioning after two years of operation through two billion miles of interplanetary space. The spacecraft continues to transmit data on solar storms and other physical phenomena.

5. Applications Technology Satellite. NASA's first ATS is scheduled for launch into a synchronous orbit on December 6. The satellite's experiments include: a high resolution meteorological camera, a 1000 voice channel microwave communications link (or two color TV channels), and a very high frequency communications link to carry facsimile picture transmissions, as well as constant voice communication between ground terminals and aircraft.

6. Public Support. A leading national poll reports this week that 69% of the public support the Apollo program.

7. Intelsat II. The Intelsat II continues to score new communications firsts. The satellite will be used as part of the regular communications network between Hawaii and the continental U. S. On November 25 it carried the first live television program exchanged between Australia and Great Britain.

8. Japanese Launch. Japan plans to launch its first satellite into earth orbit toward the end of this month.

9. Meteorological Satellite. The ESSA II weather satellite has been tipped 15 degrees on its side to minimize excessive solar heating and thereby extend its life. Because of the difficulty in analyzing the resulting oblique range pictures at APT readout stations throughout the world, APT users have been advised to rely on the APT system of the Nimbus II weather satellite until the ESSA IV weather satellite is launched in January.

10. AIAA Symposium. Leaders in the field of space planning met this week in Boston. The Manned Orbital Mission Panel which included the Chairman of the House Space Committee was chaired by the Executive Secretary of the Space Council. In a later session on advanced systems, a member of the Council staff discussed space rescue.

11. Space Payload Success Box Score
(December 2, 1966)

	U. S.		USSR	
	1965	1966	1965	1966
Earth Orbit	84	88	60	41
Escape	2	5	6	4

R. W. Hale
for E. C. Welsh

Friday, December 2
Time: 11:15 a. m.

EXECUTIVE

OS

FG 11-4

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

November 25, 1966

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities

1. Launches. The Soviet Union launched Cosmos 132 into orbit November 19. The satellite is of the type usually recovered after about eight days in orbit.

2. Lunar Orbiter II. The U. S.'s second lunar orbiting camera satellite started its picture taking operation on November 18. Both high and medium resolution photographs have been of excellent quality. The pictures, taken from about 30 miles above the lunar surface, show unique shadows of geological objects of unknown nature and origin. Altogether, the spacecraft camera will have taken 422 pictures when the final shot of possible lunar landing sites is finished today.

3. Communications Satellites. The Intelsat II satellite which failed October 30th to go into its scheduled synchronous circular orbit is nevertheless making itself useful. From its elliptical orbit it transmitted color TV of athletic events to Hawaii, and will be used for limited periods to transmit telephone messages to the 50th state.

4. Applications Satellite. NASA will launch the first of the applications Technology Satellites on December 6 into a synchronous orbit positioning it over the Pacific. The satellite's mission is to transmit color TV between the U. S., Japan, and Australia; to relay very high frequency voice transmissions to aircraft in flight; to provide cloud cover photographs from synchronous altitude; and to act as a transmission link for weather data from Suitland, Maryland, to stations in the U. S., Japan, and Australia.

5. Gemini XII. Astronauts Lovell and Aldrin and other Gemini officials were given NASA awards by the President, after having participated in a press conference in which their experiences in Gemini XII were delineated to the public.

6. Congress.

a. The Senate Aeronautical and Space Sciences Committee will hold hearings on the status of the nation's aeronautical research January 25-31.

b. The House Science and Astronautics Committee will hold its annual meeting on science and technology January 24-26. The panel's theme will be "Government, Science, and International Policy", with Secretary Rusk

as the keynote speaker. A number of foreign scientists will be present.

7. Soviet Rocket Tests. The Soviet Union announced it is testing rockets which are scheduled to impact in the mid-Pacific from November 20 to December 30.

8. Science Attaches. The Vice President met with State Department officials including fourteen science attaches, who were back in the U. S. for briefings. He stressed international cooperation in space and oceanography and urged support of improved world-wide information about our technical accomplishments.

9. X-15. A new world speed record was set by the X-15 rocketplane as it flashed over Edwards Air Force Base on November 18 at a speed of 4159 miles per hour, 6.1 times the speed of sound. The nine-minute flight was at an altitude of 98,000 feet.

10. Weather Satellites. Typhoon Nancy was tracked in the Western Pacific by U. S. weather satellites, and warnings were issued to the Philippines before it struck the Islands November 20.

11. U. S. Payload Success Box Score
(November 25)

	U. S.		U. S. S. R.	
	1965	1966	1965	1966
Earth Orbit	82	88	58	40
Escape	2	5	6	4

E. C. Welsh

Friday, November 25
Time: 10:30 A. M.

EXECUTIVE
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FG 11-4

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EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

November 17, 1966

MEMORANDUM FOR THE PRESIDENT

Subject: Space Activities

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1. Launches

a. The twelfth and last Gemini was successfully placed into orbit ninety minutes after the launch of the Agena target vehicle, November 11. The four-day mission included 5 hours and 38 minutes of extravehicular activity, which was accomplished with much less strain and much more success than on previous flights. Rendezvous with the Agena target vehicle was achieved as planned, and three dockings as well as tethered station keeping were accomplished. Photographs were taken of the November 12 eclipse of the sun. The spacecraft, with its pilots safely on board, splashed down November 15 within about three miles of the recovery ship.

b. The Soviet Union launched Cosmos 131 into orbit November 12. The satellite is of the type normally recovered after about 8 days in orbit.

2. Lunar Orbiter II. The U. S.'s second picture taking spacecraft to orbit the moon is now in an elliptical orbit around the moon, which brings its low sweep to within 31.3 miles of the lunar surface. The schedule calls for it to begin its photography mission November 18.

3. Foreign Observers. Members of the UN Outer Space Committee visited Cape Kennedy to witness the Gemini XII launch, November 11. Some 35 representatives of the 28 countries on the Committee were present, including representatives from Poland and Rumania in the Soviet bloc. The Soviet member was invited, but declined.

4. Apollo-Saturn. Schedule adjustments in the manned Apollo flights have been made by NASA. The first manned Apollo flight, previously scheduled for this December and now scheduled for early in 1967, is to be followed by an unmanned flight of the Apollo lunar module. Then a dual launch will be attempted which will call for rendezvous and the movement of astronauts from the main craft to the lunar module, which will have been launched separately. The astronauts will return to the command-service craft before coming back to earth.

As for the Saturn V rocket, developmental difficulties have arisen and the first two flight tests have been moved to somewhat later dates. However, there has not yet been any change in the schedule of subsequent Saturn V flights.

5. Fuel Cell. The 30-pound Air Force fuel cell put into orbit November 3 by an Air Force Titan III-C launch vehicle is operating successfully. Turned off and on by ground commands, the fuel cell has been producing between 75 and 100 watts of power within a range of between 22 and 30 volts.

6. European Space Activities

a. The European Committee for Space Telecommunications is considering a proposal that the European Space Research Organization (ESRO) undertake development of an experimental communications satellite.

b. The ESRO tracking station under construction near Fairbanks, Alaska, is expected to be operational early in 1967.

7. Weather Satellite. Two tropical storms, one of cyclone intensity, were photographed in the Indian Ocean by ESSA III November 8-13. Warnings were issued before Ceylon and India were struck.

8. International Cooperation

a. A number of foreign countries have been invited to cooperate in a U. S. experiment designed to test the feasibility of transmitting meteorological data from point to point via the NASA synchronous satellite scheduled for launch next month. The USSR, Australia, Canada, France, Japan, and New Zealand would receive U. S. Weather Satellite transmissions at their APT stations within range of the satellite which would be stationed over the equator at 155° W.

b. On November 10, a German-built scientific payload was launched from Fort Churchill, Canada, on a Nike-Apache sounding rocket furnished by NASA under a cooperative agreement.

9. Soviet Explosions. Within a six-week period the Soviets launched two spacecraft which shattered into many parts after launching. The first of these occurred September 17, and the second on November 2.

10. Space Payload Success Box Score
(November 17)

	U. S.		U.S.S.R.	
	1965	1966	1965	1966
Earth Orbit	81	88	57	39
Escape	2	5	6	4

E. C. Welsh

Thursday, Nov. 17
Time: 5:00 P. M.

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

EXECUTIVE SECRETARY

November 17, 1966

COPY

EXECUTIVE
OS
OS 4
FG 11-4

MEMORANDUM FOR THE VICE PRESIDENT

Subject: The Gemini Program

The Gemini program has been an impressive success from the first flight on April 8, 1964 through the twelfth flight which ended November 14, 1966. The first two flights (April 8, 1964 and January 19, 1965) were unmanned flights while the first manned Gemini flight took place March 23, 1965.

It should not be overlooked that the Mercury program which preceded Gemini was a success in its own right and contributed materially to the experience necessary to have made the Gemini program turn out so well.

The current estimate of the total cost of the Gemini program is $1,295 million, which is $59 million less than was estimated for the Gemini program in 1964. It is believed that improved management and incentive contracts have helped keep the costs below the 1964 estimate. Incidentally, McDonnell's fee for its Gemini spacecraft contribution averaged 8.9% of their costs; Martin's fee for the Titan launch vehicle averaged 10% of their total cost.

The pilots' total man hours flown in the Gemini amounted to 1,940. If we add the 54 hours of the Mercury program, it would make the total flight time equal 1,994 hours. This is about a 4 to 1 ratio compared with the 507 man flight hours of the Soviets.

The Gemini program recorded a number of "firsts." Included in these innovations are rendezvousing of two spacecraft (9 times) and docking of two spacecraft (9 times). An impressive record of extravehicular activity characterized the Gemini program, with a total of 11 hours and 31 minutes of such space exposure and activity. This can be compared with the 20 minutes of Soviet EVA. It might also be noted that the Soviets have yet to engage in space rendezvous or docking.

E. C. Welsh

Original &
Nothing else sent to
Central Files as of 12/3/66
L.G.

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EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL AERONAUTICS AND SPACE COUNCIL
WASHINGTON 20502

November 16, 1966

EXECUTIVE SECRETARY

MEMORANDUM FOR THE VICE PRESIDENT

Subject: Mercury and Gemini Manned Space Flight Record

	U. S.	U. S. S. R.
Number of flights	16 (2 suborbital)	8
Number of pilots	26 (7 flown twice)	11
Number of revolutions	639 (all spacecraft)	274
Number of revolutions	1244 (all pilots)	320
Number of man hours	1994 (all pilots)	507
Number of flight hours	1024 (all spacecraft)	433
Longest flight hours	330 (December 1965)	119 (June 1963)
Longest flight revolutions	206 (December 1965)	76 (June 1963)
Space rendezvous	9	0
Spacecraft docking	9	0
Extravehicular activity	5 (11 hrs. 31 min.)	1 (20 min.)

E. C. Welsh