

AIR FORCE ROCKET ENGINE SUMMARY

5,000,000 POUNDS THRUST STUDY
1,500,000 POUNDS THRUST

FEASIBILITY & DESIGN
STUDIES COMPLETED

NAVAHO

300,000 to 400,000 POUNDS THRUST

ATLAS BOOSTER

TITAN BOOSTER

NAVAHO

THOR, JUPITER, PIONEER & JUNO BOOSTER

HI ENERGY

TITAN SUSTAINER

ATLAS SUSTAINER

HUSTLER

RASCAL

SENTRY

ARPA

UPPER STAGE

EARLY THOR & JUPITER

BOMARC

F84 & F86

NAVAHO

REDSTONE & EXPLORER

B-47

XF-91

56,000 POUNDS THRUST

60,000 POUNDS THRUST

FIRST TURBINE-FED ENGINE

ATO

AZO

X-1

X-2

1942

44

46

48

1950

52

54

56

58

1960

9

04692398

7-17-66

31 May 1991

THRUST

12

FDAT item for inclusion - Feb 1960
in C.I.S. A. Possibilities in Congressional hearing
1 Dec 1959

STATUS OF ADVANCED RECONNAISSANCE SYSTEM

1. PROBLEM. What is the status of the Advanced Reconnaissance System?

2. POSITION. The W-117L has been separated into three separate programs: SMCS, HEAS and DISCOVERER. The SMCS program is being developed to provide SAC with a satellite reconnaissance system by both photo and direct techniques. HEAS is being designed to provide SMCS with an advanced sensitive satellite warning system for the detection, at the earliest time possible, of enemy SMCS. DISCOVERER will provide the previous two systems with engineering information necessary to insure the reliability required. In addition, DISCOVERER specimens will be tested for the purpose of determining data for SMCS's future role in space. On 10 September 1959 the Secretary of Defense directed the Air Force to be responsible for operation of the SMCS and HEAS systems. By direction of the Deputy Secretary of Defense SMCS, HEAS and DISCOVERER were referred to the Air Force effective 17 November 1959. The Advanced Research Projects Agency had been changed with the responsibility for development of these programs since February 1958. Development, SMCS and DISCOVERER plans are being prepared for submission to the Department of Defense for approval by 15 January 1960.

3. REQUIREMENTS. During the past year the SMCS program has undergone major modifications. In December 1959 the program was restructured by AFSA to include the following:

- a. Consolidation of the 4" SMCS SMCS system.
- b. Acquisition of the 35" SMCS SMCS system.
- c. Integration of the capability to recover both a new mapping and charting system and a new high resolution photo reconnaissance system.

In May of 1959 the Air Force was directed to cancel the mapping and charting development effort which had been initiated. In June 1959 the Air Force was directed, because of AFSA cost limitations, to consider replacing the high resolution reconnaissance recovery system. By direction of the Deputy Secretary of Defense of 17 November 1959 the Air Force was directed to again restructure the SMCS program to provide capability of the recovery system. The development plan reflecting the latest changes to the program is to be reviewed by Air Force Headquarters on or about 15 December 1959. The presently approved development plan dated 20 January 1959 includes an Advanced Satellite program. The initial SMCS-based SMCS satellite which will have components of both the SMCS and SMCS systems as required is scheduled for firing from the Pacific Missile Range in June 1960.

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The MIDAS system has been approved in principle but is undergoing a thorough analysis to be certain that the total reliability is sufficient to guarantee the economical feasibility of this instrument warning system. In accordance with this spirit and by direction of the Deputy Secretary of Defense a development plan is being prepared for this system which will be submitted to Air Force Headquarters for review about 15 December 1959. The initial launch of the MIDAS satellite will be accomplished in February 1960 from the Atlantic Missile Range. Two months later another firing will be made from the same location. After this, test operations will be shifted to the Pacific Missile Range to accomplish Polar orbital tests. It is hoped that after the first two launches from the AMR some degree of confidence in system reliability will have been shown which will permit this program to be developed concurrently with the operational buy program. As of now, there exists no approval of the operational program.

The first firing in the DISCOVERER program was conducted from Vandenberg Air Force Base in February 1959. Since then a total of eight DISCOVERER satellites have been launched from there. In general a high degree of success has been achieved and our general knowledge regarding launching and control of satellites has been vastly improved. Factors inherent within the program have prevented the Air Force from achieving the final result: the recovery of the satellite capsule from orbit in the general area of Hawaii. Since the last firing, 20 November 1959, the test program has been stopped until a thorough analysis of all components and subsystems of the satellite and their location has been made to insure a higher probability of successful recovery.

4. ~~DISCOVERER PROGRAM AIR FORCE HEADQUARTERS.~~
Discontinued.
5. ~~DISCOVERER.~~ Major D. S. Floyd, Office, Director of Advanced Technology, AFSA.
6. ~~DISCOVERER AND THE OTHER LAUNCHES.~~ Brigadier General E. A. Dunbar, Director of Advanced Technology.
7. ~~DISCOVERER PROGRAM TO GET THE OTHER INFORMATION.~~ Major D. S. Floyd, Office, Director of Advanced Technology.

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SECRETARY OF DEFENSE

Immediate Air Force Administration Program

1. Closely related to the Air Force TMSM program are the development projects to provide an emergency TMSM, and the Advanced Reconnaissance System (Recoverable Photographic Capsule) W-117L. There are four additional projects, all of which use TMSM as a booster, which the Air Force desires to initiate immediately. Eleven TMSM boosters, which are part of our present IRLM development program, can be used for these projects from Calendar 1960 and on.

Four projects are:

1. Television Satellite. A small television satellite is to be launched in a satellite to provide global coverage for military, commercial and scientific purposes. The satellite is combined with the TMSM engine to boost the satellite to orbit. This combination would be virtually identical to that required for the Recoverable Photographic Capsule W-117L already underway. First flight of this satellite is planned for September 1960.

2. Recoverable Satellite. This system could carry a variety of systems all aspects of recovery by decelerating the satellite to orbit. This would be combined with a TMSM second stage to boost the satellite to orbit. First flight can be made in 1960.

3. Scientific Satellite. The use of TMSM and the TMSM engine will enable the Air Force to launch a three-stage scientific satellite by October 1960.

4. Data Relay. As previously recommended, the Air Force has issued a program under the name, TMSM-1, which is a data relay system. This system will be completed by October 1960. It will be the scientific data that will be obtained from such a system. The United States would have a major international interest in this system. It would be useful to the

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3. Regarding items 2a and d above, the Air Force can undertake their accomplishment or participate in such projects as may be deemed appropriate.

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ADVANCED RESEARCH AGENCY

28 MAY 1954

THE AIR FORCE

THE AIR FORCE

the early planning
but both political and
the technical possibilities
by several months, and
might have of the

of such acceleration
it should be assumed
it will be in addition

the program is complete
including planning to
to suggest a program

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AFSA ORDER SUMMARY (NUMERICAL) (continued)

<u>AFSA ORDER NUMBER</u>	<u>DATE</u>	<u>AFSC PROJECT OFFICE</u>	<u>ASSIGNED TO</u>	<u>AMOUNT \$</u>	<u>FOR</u>
24-59-1	30 Oct 58	RBR	WADC (Bow Chan)	\$ 2,094,000	Solid Propellants Research ↓ Meteorological Applications of Satellite Data
24-59-2	11 Dec 58		CNR (VarTomas; Stanford Resch Inst; Aerojet-2; U of Calif; Mat Res Corp)		
24-59-3	14 Jan 59		CNR (US Bur of Mines)		
26-59	29 Sep 58	RBR	CRC	1,151,000	
27-59	27 Sep 58	RDE	RADC (Columbia U)	1,328,500	ORDIR (224A)
29-59	30 Sep 58	RDE	RADC (Bendix)	2,144,297	ESAR (224A)
30-59	9 Oct 58	RDE	CRC-WADC (RCA)	3,435,000	Optical Missile Test Range Instrumentation (224A)
31-59	9 Oct 58	RDE	CRC (Stanford Resch Inst.)	570,000	Ship ACANIA (224A)
37-59	6 Nov 58	RDE	EqAADC (Convair)	1,374,500	R&D Systems Studies (224A)
38-59	5 Nov 58	AFEMD	AFEMD (Lockheed)	750,000	Subsystem "G" (224A)
41-59	17 Nov 58	AFEMD	AFEMD	9,827,000	Pt. Arguello Launch Complex
42-59	26 Nov 58	RDE	CRC	0	Geophysics Work for 224A
46-59	15 Dec 58	RDE	RADC (Convair)	(Est 1,445,000)	
48-59	16 Dec 58	AFEMD	AFEMD	200,000	Radars Discrimination Program (224A)
50-59	19 Dec 58	RDE	CRC	(Est 550,000) additional	
54-59	20 Jan 59	AFEMD	AFEMD	0	DISCOVERER-THOR
56-59	19 Jan 59	RBR	RADC (Lincoln Labs)	299,000	Space Track Interim System
58-59	22 Jan 59	RDE	WADC	(Est 1,000,000 addit'l)	
				1,000,000	Communications Satellite
				0	Advanced Radar Techniques
				(Est 500,000)	
				0	Precision IR Tracking Unit
				(Est 1,500,000)	

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AREA ORDER SUMMARY (BY AREA PROGRAM AREA)

MISSILE DEFENSE

6-58-1	\$ 460,000	Studies on Satellite Interceptor
6-58-5	955,000	Molecular Interactions(224A)
6-58-6	500,000	Decoy Discrimination(224A)
6-58-7	660,000	Precision IR (Optical) Tracking (224A)
27-59	1,328,500	ORDIR (224A)
29-59	2,144,297	ESAR(224A)
30-59	3,435,000	Optical Missile Test
31-59	570,000	Ship ACANIA(224A)
37-59	1,374,500	BMD System Studies (224A)
38-59	750,000	Subsystem "G" (224A)
42-59	1,445,000	Geophysics Work for 224A
46-59	750,000	Radar Discrimination Program(224A)
58-59	1,500,000	Precision IR Tracking Unit
TOTAL	\$ 15,872,297	

PROPELLANT CHEMISTRY

24-59	\$ 2,094,000	Solid Propellants
6-58-8	380,000	Three Advanced Propulsion Studies
TOTAL	\$ 2,474,000	

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AREA ORIGIN SUMMARY (BY ARPA PROGRAM AREA)

MILITARY SPACE TECHNOLOGY

Lunar Probes (2-58)	7,600,000	(Transferred to NASA)
SENTRY (9-58)	148,200,000	
Facilities (41-59)	9,827,000	Pt. Arguello Launch Complex
DISCOVERER (48-59)	(Undefined portion) Financial Breakout being prepared of SENTRY \$)	
Boosters (17-59)	5,090,000	10 THOR - 2 ATLAS
Cloud Cover Satellite		Navy Payload
Navigation Satellite		Navy Payload $\frac{1}{2}$
Others to be defined		
Communications Satellite (54-59)	1,000,000	Army Payload
Tracking & Data Reduction		
Interim Space Surveillance Center (50-59)	299,000	
Multi-Satellite Data Reduction Study (6-58, Task No. 9)	197,992	
SCORE (18-59)	699,000	
Research Studies and Exploratory Investigations		
Lincoln Lab-Re-Entry Physics (13-59)	4,516,000	
Advanced Radar Techniques (56-59)	500,000	
Nuclear Bomb Propelled Vehicle (6-58-3)	999,750	
Meteorological Application of Satellite Data (26-59)	1,151,000	
Nuclear & Hi-Altitude Effects (other than those applying to AICEM) Studies		
ARGUS (4-58)	2,565,126	
Study on Effect of Space Weapons on Electronic Systems (6-58-2)	578,542	
Quick Key - Information Center for Hi-Alt Effects (11-59)	144,000	
HEF Upper Stage (19-59)	16,000,000	

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NASA ORDER SUMMARY (NUMERICAL)

<u>NASA ORDER NUMBER</u>	<u>DATE</u>	<u>AEDC PROJECT OFFICE</u>	<u>ASSIGNED TO</u>	<u>AMOUNT</u>	<u>FOR</u>
HS-2	9 Oct 58	AFEND	AFEND	1,997,000	Continues AFMA 2-58
HS-5	23 Oct 58	AFEND	AFEND	8,958,000	Venus Probes
HS-6	23 Oct 58	AFEND	AFEND	7,120,000	Earth Satellites
HS-13	4 Nov 58	RDR	WABC (Rocketdyne)	426,000	Rocketdyne Engine Contract
HS-24	25 Nov 58	AFEND	AFEND	1,000,000	Atlas Booster
HS-36	9 Dec 58	AFEND	AFEND	6,000,000	9 Atlas Boosters

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ARPA ORDER SUMMARY (MEMORIAL)

<u>ARPA ORDER NUMBER</u>	<u>DATE</u>	<u>ARDC PROJECT OFFICE</u>	<u>ASSIGNED TO</u>	<u>AMOUNT</u>	<u>FOR</u>
2-58	27 Mar 58	AFBMD	AFBMD	\$ 7,600,000	Lunar Probes
4-58 (Indirect)	28 Apr 58	RDR	AFBWC(Lincoln Labs)	2,565,126	ARGUS
6-58-1	16 Jan 58	RDEZ	HqARDC(RCA-Convair)	460,000	Studies on Satellite Interceptor
6-58-2	19 Jun 58	RDR	CRC(G.E.)	578,542	Study on Effect of Space Weapons on Electronic Sys
6-58-3	25 Jun 58	RDR	AFBWC(Gen Atomics)	999,750	Study Nuclear Bomb- Propelled Vehicle
6-58-5	4 Nov 58	RDEZ	AFBWC	0	Molecular Interactions (224A)
6-58-6	10 Dec 58	RDEZ	AFBWC	(Est 955,000)	Decoy Discrimination (224A)
6-58-7	9 Jan 59	RDEZ	HqARDC(Lockheed)	(Est 500,000)	Precision IR(Optical) Tracking (224A)
6-58-8	21 Jan 59	RDR	OSR(Aerojet) (BNI) (Giannini)	(Est 60,000 600,000 addt'l)	Three Advanced Propul- sion Studies
6-58-9	27 Jan 59	RDEZ	OSR (Rand)	380,000	Multi-Satellite Data Processing Study
9-58	30 Jun 58	AFBMD	AFBMD(Lockheed & others)	(Est 0 197,992)	SENVRY
11-59	4 Aug 58	RDR	OSR (Rand)	148,200,000	Information Center for Hi-Alt Effects
13-59	13 Aug 58	RDR	CRC(Lincoln Labs)	144,000	Lincoln Lab Re-entry Physics
17-59	4 Sep 58	AFBMD	AFBMD	4,516,000	10 THOR - 2 ATLAS Vehicles
18-59	27 Aug 58	AFBMD	AFBMD	5,090,000	SCORE
19-59	29 Aug 58	RDEZ	HqARDC(Pratt-W;Convair)	699,000	REF Upper Stage
				16,000,000	

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COPY

February 14, 1958

MEMORANDUM FOR THE SECRETARY OF DEFENSE

SUBJECT: THOR and WS-117L Program

1. Closely related to Air Force THOR and WS-117L programs are five projects, all of which, I believe, should be undertaken promptly by the Air Force. THOR boosters can be made available for these projects from 1958 authorized production without adversely affecting the IRBM program.

2. The projects are as follows:

a. THOR ICBM - An existing project to test advance ICBM nose cones is based on using THOR and a VANGUARD second stage. This combination will also provide a two-stage missile carrying a 300 lb. warhead with a range of over 5,000 miles. This missile could be provided for inventory relatively cheaply and at a cost of about \$20 million more than the cost of a THOR squadron. No firm recommendation as to program on the THOR ICBM is made at this time, but it is believed operational missiles could be secured at a very early date to supplement ICBM capability, if desired.

b. Television Satellite. A small television transmitter can be installed in a satellite to provide global weather for military, commercial and scientific purposes. The THOR would be combined with the HUSTLER engine to boost the satellite to orbit. I am advised the first flight of this system can be made in September 1958.

c. Recoverable Satellite. This system could carry a variety of payloads all capable of recovery by decelerating devices. The THOR would be combined with a VANGUARD second stage to boost the satellite to orbit. Present indications are that the first flight can be made in July 1958.

d. Scientific Satellite. The use of THOR and the HUSTLER engine would enable the Air Force to launch a 300 lb. scientific satellite by October 1958.

e. Moon Impact. As previously recommended, the Air Force can launch a moon rocket using the THOR, VANGUARD 2 and VANGUARD 3 with an appropriate payload by October 1958. In addition to the scientific data that can be obtained from such a flight, the United States could make a major international psychological gain by beating the Russians to the Moon. I urge that this Air Force approach be utilized.

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C O P Y

Memo for Secy of Defense, Subj: INOE and WS-117L Program(U)

3. Regarding items 2d and e above, the Air Force can undertake their accomplishment or participate in such projects as may be deemed appropriate. I believe the dates used above should be regarded as targets and are necessarily subject to adjustment as programs proceed.

(Signed) JAMES H. DOUGLAS
Secretary of the Air Force

APPROVED (Within Air Force Resources for 1958):

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D. C.

FEB 27 1958

MEMORANDUM FOR VICE CHIEF OF STAFF

SUBJECT: (Unclassified) Accelerated Air Force Space Program

1. Per your request, this memorandum is submitted as actions the Air Force is taking and can take to accelerate our space program within our own means.

2. We understand that you are specifically interested in the present status and anything else that could be done (within Air Force approval authority) to accelerate the following three projects:

a. Moon Shoot - Work being done on the Thor-boosted 5,500-mile re-entry test vehicle is applicable in part to the Moon Shoot project. That project is progressing at a satisfactory rate. However, an actual Moon Shoot cannot be done without letting contracts to industry, and OSD approval must first be obtained. There is nothing more within Air Force authority we can do to accelerate this program.

b. Manned Satellite - In this general category are included such projects as the X-15B, AVCO, Martin and Convair Proposals, DYNA-SOAR, etc. Whichever ones we choose involve the letting of contracts with industry. We can go no further without OSD approval.

c. Recoverable Photo Capsule - This program is the first operational device of WS-117L. It is progressing as rapidly as possible, and we anticipate that first flight can be made in October 1958. No additional funds in FY 1958 are needed.

3. There are other projects associated with space flight that the Air Force is presently conducting that might be of interest to you. A summary of these activities follows:

a. The One Million Pound Thrust Engine - This project was started in 1955. The feasibility studies and preliminary design work was completed and advanced design competition was initiated in 1957. Proposals from five contractors are being evaluated and will be completed in early March. Approximately two months will elapse before a contract is written. The funds needed to continue this program at the rate desired are \$3.55 million in 1958 and an additional \$8 million in 1959. OSD approval has not been obtained; however, Mr. Horner has stated that such approval was not necessary (Published OSD Directives indicate it is).

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DEPARTMENT OF JUSTICE
Office of the Inspector General
UNITED STATES OF AMERICA

SOURCES RECEIVED

Facilitating

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20 January 1960

MEMORANDUM FOR THE OFFICE OF THE CHIEF SIGNAL OFFICER, SIG
ATTN: Research and Development Division

FOR DIRECTOR, ARPA, GND

SUBJECT: Revised Communications Satellite Development Plan

1. In accordance with memorandum of 21 December 1958 from Advanced Research Projects Agency, relative to the Communications Satellite Joint Development Plan, the program revisions requested in paragraphs 2 and 1c are submitted herewith. Data requested in paragraph 2 was received on 23 December 1958.

2. Because of the complexities involved in evaluating such factors as cost, jamming, reliability, survival effects, etc., we are not able at this time to completely answer all aspects of the problem requested in the referenced memorandum. This investigation, however, is continuing and answers will be forthcoming as early as possible.

3. With respect to the possible use of the 117L vehicle as a booster stage in the 1960 and 1961 launches, it appears that this is technically feasible and that the best cost estimates presently available indicate a negligible effect on overall program costs. There are, however, other factors influencing the selection of the stage which also bear upon the problem. For example, the AJ10-104 is a pressurized, rather than simplified design utilizing the Rocket Able-1 engine, hydraulic systems and plumbing which has been improved as a result of many flights and which was designed for the type of application envisaged here. It has a lesser number of parts, which tends toward an inherently greater reliability. It would also appear that within this time period the experience level will be higher with AJ10 stages than with 117L stages. It is also likely that modifications would have to be made to standard production versions to (1) remove unneeded equipment,

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~~AFDAR: [unclear]~~ Subj: Revised Communications Satellite Dev Plan
20 Jan 60

and (2) to create the necessary interfaces between stage and payload. Therefore, with performance factors considered approximately equal we would at this time tend to favor the use of the AJ10-104 stage as a more conservative choice. This is not to say however that the choice is final and investigations will continue.

4. Inclosure #1 to this memorandum describes the environmental data necessary to insure the success of the 1968 Communications Satellite Program. This environmental data is also highly desirable for improved prediction of the operating life of the 1968 satellite.

FOR THE CHIEF OF STAFF:

- 1 Incls
- 1-(H) Comm Sat Prog Study
- 2-(H) Inclosures to Comm Sat Dev Plan (3 cpy)

H. A. BOURNEY
Brigadier General, USAF
Director of Advanced Technology
DCM/Development

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AFDAT/Dr. Bowen/dca/70833

20 January 1960

MEMORANDUM FOR MR. BOWEN, SAEND

SUBJECT: Chronology of USAF Requests for Space Missions

For your verbal request, transmitted herewith is a chronology of all documents of which we have knowledge which have been transmitted outside the Air Force and which pertain to space programs.

In addition, where appropriate, a few replies have been included.

For the sake of completeness certain appropriate directives which have originated outside the Air Force and which have been received by the Air Force are included.

1 Incl
As shown abv

13/
E. A. BOWEN
Brigadier General, USAF
Director of Advanced Technology
DCL/Development

Gen Boushey's "Signature" file

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**CHRONOLOGY OF DOCUMENTS PERTINENT TO USAF REQUESTS
FOR SPACE MISSIONS AND SUPPORT OF SPACE PROGRAMS**

1. 29Oct57 The Air Force briefed the Secretary of Defense on the Advanced Reconnaissance System of 117L. Mr. McElroy expressed some reservations, and asked if the Air Force could accelerate the work provided OSD made additional funds available.
2. 12Nov57 Memo, Mr. Richard E. Horner, SAF(R&D) to Mr. McElroy supplying the requisite data on ARES 117L. Mr. Horner stated that with small additional funds allocation in FY 1958, and \$20,000,000 in FY 1959, the Air Force could have ARES 117L in orbit in June 1958, instead of June 1959 as currently scheduled. At same time Mr. Horner suggested immediate work on a recoverable satellite using a THOR as booster, a Lockheed F102 as satellite, and two rockets to push the payload out of orbit and back to earth. Requested authorization to launch THOR-boostered satellite in March 1958.
3. 12Nov57 Memo, Secretary Douglas to Secretary McElroy, asking OSD for formal assignment to the Air Force of responsibility for development and operation of all military satellites.
4. 24Jan58 Memo, Mr. Horner to Mr. William Haladay, Director of Guided Missiles, OSD, stating that six space missions -- Reconnaissance, Weapons Delivery, Space Research and Experiment, Manned Space Flight, Data Transmission, and Countermeasures -- were considered by USAF to be essential to national position and prestige, and recommending approval of the following aeronautical programs:

<u>Program</u>	<u>Title</u>	<u>Sub-Projects</u>	<u>Missions</u>
I. 000	Ballistic Test	A. BRATS	Space research and experiment Reconnaissance
		B. Aerial Survey	
H. 407	Manned Eye	L. X-15	Space research and manned flight Manned space flight and experiment
		M. Adv Res a/c	
III. #64	Dyna Soar	L. Manned Capsule Test	Manned space flight
		M. Conceptual Test	Manned space flight
		N. Boost Glide Tactical	Weapon delivery

<u>Program</u>	<u>Title</u>	<u>Sub-Projects</u>	<u>Missions</u>
		G. Boost Glide Interceptor	Countermeasures
		F. Satellite Interceptor	Countermeasures
		Q. Global Reconnaissance	Reconnaissance
		R. Global Bomber	Weapon delivery
IV, 117	Satellite Sys	L. (a) ARS (b) Recoverable Data	Reconnaissance Reconnaissance
		M. 24 Hour Reconnaissance Sys	Reconnaissance
		O. Global Surveill.	Reconnaissance, Space research and experiment
		P. Manned Strategic Station	Weapon delivery and reconnaissance
		Q. Strategic Communication Sta.	Data transmission
V. 400	Lunar Base System	B. Manned Variable Trajectory Test Vehicle	Manned Space Flight, space research and experiment
		E. Nuclear Rocket Test	Space research and experiment
		F. Ion Propulsion Test	Space research and experiment
		G. Lunar Transport	Manned space flight, space research and experiment
		H. Manned Lunar Base	Weapon delivery, reconnaissance

8. 117066 Memo, Secretary of the Air Force to Secretary of Defense requesting OSD approval of USAF Memo of 12 Nov, and a directive to Air Force to continue the 1171 Project under the overall direction of the contemplated Advanced Research Projects Agency (ARPA).

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(For information only: 7 February 1966 the Secretary of Defense established by a Department of Defense Directive the Advanced Research Project Agency (ARPA), Mr. Ray Johnson, Director, to direct such research and development being performed within the Department of Defense as the Secretary might desire.)

7. 14Feb66 Reply: OSD approved the ~~SPURRY~~ ^{14 Feb} Memo of ~~OSD~~ ~~66~~, but the programs would have to be met within the Air Force resources for 1966.
6. 14Feb66 The Secretary of the Air Force requested OSD to approve plan for USAF to initiate five specific astronautic projects:
1. THOR-ICBM to test advanced ICBM nose cones.
 2. TV satellite THOR and Huetler engine to boost satellite to orbit with first flight scheduled for September 1966.
 3. Recoverable satellite by deceleration, using THOR and VANGUARD.
 4. Scientific satellite of 300 pounds, using THOR and HETTLER.
 5. Moon impact using THOR and VANGUARD as 2 and 3, by October 1966.
8. 21Feb 66 SAF(R&D) memo to OSD describing some aspects of ARS and asking that USAF be made Executive Agent.
9. 21Feb66 Memo, Malcolm Mackenzie, Under Secretary of the Air Force, to Mr. Holaday requesting authorization for USAF to proceed with ablation type nose cone.
10. 21Feb66 Memo, SAF(R&D) to Secretary of Defense requesting OSD approval of WE-117L.
11. 21Feb66 Memo, Horner to OSD requesting approval of WE-117L plans to place a series of unmanned satellites in orbit around the earth to transmit information to ground stations. On 24 Feb OSD informed ARPA that WE-117L program was approved in principle. (Memo, OSD to Secretary of the Air Force, subj: WE-117L Program, 24 Feb 1966)

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12. 24Feb66 Memo, Chairman OSD-NSC to Executive Secretaries of the Army, Navy and Air Force NSC's, adding three new programs to those of highest national priority as previously established by NSC:
1. Anti-missile defense weapon system including active defense and other related early warning for defense of U.S. proper.
 2. Other satellite programs determined by OSD to be of political, scientific or psychological value.
 3. ICBM satellite VANGUARD and JUPITER-C programs.
13. 28Feb66 Reply: Memo, Ray Johnson to the Secretary of the Air Force replying to USAF memos of 12 Nov 1965 and 14 Feb 1966. Mr. Johnson had discussed USAF proposals with the Director of Guided Missiles, the Special Assistant to the President for Science and Technology, and the Director of Central Intelligence. They wanted to avoid duplication, etc. Mr. Johnson approved acceleration of ATLAS 117L on highest priority; test firings of THOR booster as cheaper than ATLAS; development of THOR booster with suitable second stage vehicle for experimental flights with laboratory animals.
14. 28Feb66 Memo, USAF(R&D) to Hainday, with 7 incls, explaining USAF astronomical development program.
15. 4Mar66 Memo, Secretary of the Air Force to the Secretary of Defense, presenting a program for defense against ICBM.
16. 10Mar66 Memo, Secretary of the Air Force to Johnson re approval of ARPA project to put into space and recover a manned vehicle.
17. 19Mar66 Memo, Mr. MacIntyre to ARPA explaining the increased cost of the USAF Man-in-Space Program.
18. 18Apr66 Memo USAF(R&D) to ARPA concerning the identification of USAF R&D programs for Astronautics.
19. 28Apr66 Memo, USAF to ARPA, Status Report on WE-117L.

20. 27May58 Memo, SAF(R&D) to ARPA on Astronautics Instrumentation Plans.

21. 28May58 Memo, ARPA to SAF(R&D) expressing desire to factor early placement of payloads in space, and hoping for earlier ATLAS-launched WS-117L than was scheduled. Requested information on possibility of improving launch dates by several months.

22. 2Jun58 Memo, SAF(R&D) to ARPA concerning use of NAVARO boosters.

23. 11Jul58 Memo, AFEMD to ARPA, Participation of University of Chicago in Lunar Probe Program.

(For information only: On 29 July the President signed HR 12075 establishing NASA. On 29 July General White issued GO No. 44 establishing AFDAT as of 15 July, and assigning to the Directorate the following projects:

- | | |
|------------------------|-------------------------------|
| Sentry (LIVL) | Strategic Lunar Systems |
| Man-in-Space | Satellite Tracking |
| BYNA SOAR | Ballistic Missile Test System |
| Lunar Probes | Other programs to be assigned |
| Satellite Interceptors | from time to time |

24. 18Sep58 Memo, USAF to ARPA presenting an Air Force statement on the military uses of space.

25. 18Sep58 Memo, approved by C/S for Director, ARPA from SAF requesting approval and financial support of a program for a recoverable capsule. ARPA rejected the request on 24 Sept 1958.

26. 18Sep58 Memo, AFEMD to ARPA proposing instrumented payload configuration for 3rd Lunar Probe vehicle flight.

27. 28Sep58 Memo, approved by the Vice Chief of Staff for ARPA from AFDAT, forwarding copies of Abbreviated Development Plan for Strategic Communications Station System as requested 5 Sept 1958.

- 22. 22Sep68 Memo, ARDC to ARPA proposing Bio sciences and Microtechnology Research and Development Effort.
- 23. 22Sep68 Memo, approved by Vice Chief of Staff for ARPA from SAFP(R&D) urging early initiation, on an equal basis with LITL reconnaissance satellite, of Strategic Communications System.
- 24. 30Oct68 Memo, Secretary of the Air Force to Mr. Glusman, Administrator of NASA, seeking return of the 1,000,000 pound (increased to the 1,500,000 pound) thrust liquid rocket development because of USAF capability to do the work quickly.
- 25. 14Oct68 Memo, approved by the Vice Chief of Staff, for ARPA from Deputy for Operations, USAF (D&O) stating USAF satellite and space surveillance requirements, as asked by ARPA. Memo stressed need to devise a satellite detection, tracking, and position prediction system for use by NORAD.
- 26. 20Oct68 Proposed memo, approved by C/S for the Secretary of Defense from the Secretary of the Air Force, listing thirteen military uses of space, and requesting USAF be given responsibility for at least five vital missions. Secretary Douglas returned the memo as "overshaken by events."
- 27. 21Oct68 USAF/NASA agreement signed covering USAF participation in the development and use of Solid Rocket Test Vehicle 000A.
- 28. 18Nov68 Memo, SAFP(R&D) to Director ARPA setting forth Air Force statement of Military Uses of Space, and stating that the documented Air Force Requirements for Space Systems are covered in the General Operational Requirements 80 and 100.
- 29. 21Nov68 Memo, approved by the Vice Chief of Staff for ARPA from SAFP(R&D) explaining urgent SAC requirements for instant-aneous, long range ground/air communications, and urging ARPA to give this requirement the top priority of the communications satellite program.
- 30. 24Nov68 ARDC memo requesting NASA assistance on ARPA directed program.

37. 28Nov68 Memo, Asst Vice Chief of Staff to SAJ(R&D) informing Mr. Houser of USAF plans, including programmed funds, schedule milestones, and program objectives, and asking his concurrence.
38. 18Dec68 Proposed memo, approved by Asst Vice Chief of Staff for ARPA from the Secretary of the Air Force asking delay in Missile Defense Alarm Satellite (MDAS) Development Plan until the Air Staff could complete its study of developing an ICBM Attack Alarm System (currently a sub-system of LTVL). On 17 Dec SAJ(R&D) returned the draft as overruled by events.
39. 4Dec68 Memo, approved by the Asst Vice Chief of Staff for the Secretary of Defense from the Secretary of the Air Force, asking Mr. McNamara to obtain Bureau of the Budget release of \$10,000,000 of FY 69 funds being withheld by DOD, as well as another \$14,000,000 programmed by USAF in support of DTRA SOAR.
40. 18Dec68 Memo of Understanding by the Chief of Staff covering NASA participation in the DTRA SOAR program. The NASA Administrator had already signed the agreement on 14 Nov 68.
41. 9Dec68 Memo, approved by the Asst Vice Chief of Staff for SAJ(R&D) from LtGen R. C. Wilson, DOD/D, urging Mr. Houser to discuss with Mr. Johnson USAF objections to the Communications Satellite Program as being directed by ARPA.
42. 18Dec68 Ltr, Commander NORAD to Director ARPA on SCRM Defense System.
43. 28Dec68 Memo, ARDC to ARPA on Development of Life Support Equipment Components.