

# Appendices

## APPENDIX 2-1

### **Proposed Air Force Astronautics Program, 24 January 1958\***

- I. 609, *Ballistic Test and Related Systems*
  1. BRATS, Space Research and Experiments
  2. Aerial Survey and Target Locating System (Recon)
- II. 447, *Manned Hypersonic Research System*
  3. X-15, Space Research and Experiment
  4. Advanced Hypersonic Research Aircraft  
(Manned Space Flight, Space R&D)
- III. 464, *Dyna-Soar*
  5. Manned Capsule Test (Manned Space Flight)
  6. Conceptual Test (Manned Space Flight)
  7. Boost Glide Tactical (Weapon Delivery)
  8. Boost Glide Interceptor (Countermeasure)
  9. Satellite Interceptor (Countermeasure)
  10. Global Reconnaissance
  11. Global Bomber (Weapon Delivery)
- IV. *WS-117L Satellite System*
  12. Advanced Reconnaissance Satellite
  13. Recoverable Data (Photo Capsule) (Recon)
  14. 24-hour Reconnaissance System
  15. Manned Strategic Station (Weapon Development and Recon)
  16. Strategic Communications Station (Data Transmission)
- V. 499, *Lunar Base System*
  17. Manned Variable Trajectory and Test Vehicle (Recon and Experiment)
  18. Nuclear Rocket Test (Space Recon and Experiment)
  19. Ion Propulsion Test (Space Recon and Experiment)
  20. Lunar Transport (Manned Space Flight, Recon and Experiment)
  21. Manned Lunar Base (Weapon Development and Recon)

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\* Source: Lee Bowen, *The Threshold of Space: The Air Force in the National Space Program, 1945–1959* (Washington, D.C.: USAF Historical Division Liaison Office, September 1960), p. 23.

APPENDIX 2-2

**Projects Transferred to ARPA and Redistributed to the Services\***

*Projects Transferred to ARPA:*

1. Argus (nuclear explosion in exosphere)	4 April 1958
2. Satellite and Outer Space Programs including Vanguard	1 May 1958
3. High Performance Solid Propellants	7 June 1958
4. Minitrack Doppler Fence	20 June 1958
5. Army and Air Force Ballistic Missile Defense Projects	20 June 1958
6. Studies of the Effects of Space Weapons Employment on Military Electronic Systems	20 June 1958
7. Nuclear Bomb-Propelled Space Vehicle	20 June 1958
8. WS-117L	30 June 1958

*Projects Redistributed by ARPA:*

1. Sounding Rockets and Ground Instrumentation for Argus	AFSWC/AFCRC
2. Weapon System to Control Hostile Satellites	ARDC
3. Nuclear Bomb-Propelled Space Vehicle	ARDC
4. Effects of Space Weapons on Military Electronic Systems	ARDC
5. WS-117L	ARDC
6. Lunar Probes	AFBMD
7. High Energy Propellants and Liquid hydrogen-Liquid Oxygen Propellants	ARDC
8. Reentry Studies	ARDC
9. Project Score	ARDC
10. 1,500,000-pound booster	AOMC
11. Meteorological Satellite	AOMC
12. Inflatable Sphere	AOMC

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\* Source: Lee Bowen, *The Threshold of Space: The Air Force in the National Space Program, 1945-1959* (Washington, D.C.: USAF Historical Division Liaison Office, September 1960), pp. 26-27.

APPENDIX 2-3

**ARPA Programs Transferred to NASA \***

*Program III:*

1. Man in Space
2. Special Engines
3. Special Components for Space Systems
4. Project Argus
5. Satellite Tracking and Monitoring Systems
6. Satellite Communications Relay, Meteorological Reporting, Navigational Aid Systems

*Program IV:*

1. ABMA/JPL Program for Four Scientific Space Vehicles to be Launched in 1958
2. AFBMD Program for Three Lunar Probes
3. NOTS Program, a one-frame television with a mechanical scanner to get “a first look at the other side of the moon”
4. Follow-on Program, vaguely defined as “more of the same”

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\* Source: Lee Bowen, *The Threshold of Space: The Air Force in the National Space Program, 1945–1959* (Washington, D.C.: USAF Historical Division Liaison Office, September 1960), p. 29.

APPENDIX 2-4

**Major Military Uses of Space Identified by the Air Force,  
Spring 1959\*\***

1. Military Reconnaissance Satellites Utilizing Optical, Infra-red and Electromagnetic Instrumentation\*
2. Satellites for Weather Observation\*
3. Military Communications Satellites\*
4. Satellites for Electronic Counter-measures\*
5. Satellites as Aids for Navigation\*
6. Manned Maintenance and Resupply Outer Space Vehicles\*
7. Manned Defensive Outer Space Vehicles\*  
Bombardment Satellites\*
8. Manned Lunar Station\*
9. Satellite Defense System
10. Manned Detection, Warning and Reconnaissance Space Vehicle
11. Manned Bombardment Space Vehicle or Space Base
12. Target Drone Satellite

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\*indicates those missions listed in NSC 5814/1, "Preliminary U.S. Policy on Outer Space," 18 August 1958.

\*\*Source: Memorandum, AFDAT, subj: Background Information on Current Air Force Position in Space, n.d. [March 1959].

APPENDIX 2-5

**Military Space Program Plan, November 1958\***

Functions	Projects
Navigation	Transit satellite system; assigned to the Navy on 9 May 1960
Meteorology	TIROS television (RCA) satellite system assigned to NASA; military system proposed, but held to studies while negotiations for a single civil-military system were underway with NASA and the Department of Commerce (Weather Bureau)
Communication	Courier Active (repeater) strategic and tactical communications satellite system; assigned to the Army on 15 September 1960
Missile Detection and Space Defense	Infrared radiometers that detect focused heat sources (Missile Detection and Alarm-MIDAS)  Satellite inspector  ROBO/Dyna-Soar (X-20)  Radar tracking of earth satellites  Optical tracking of satellites (from IGY Baker-Nunn system)  Distant Early Warning (DEW) radar net and, by the early 1960s, the Ballistic Missile Early Warning System (BMEWS) radar net
Observation of the Earth	Other automated satellites

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\* Source: R. Cargill Hall, "The Origins of U.S. Space Policy: Eisenhower, Open Skies, and Freedom of Space," *Colloquy* (December 1993): 23.

## APPENDIX 3-1

**DoD Space and Related Programs, Fiscal Years 1961–1962\***

Program	FY 61	FY 62 (proposed)
Samos, MIDAS, Discoverer	\$461.2	\$541.2
Transit	21.6	22.4
Notus (later Advent)	42.0	72.0
Saint	6.1	26.0
Spacetrack and Spasur	11.6	38.3
Blue Scout	5.6	15.0
Westford	3.6	4.3
X-15	14.9	7.0
Dyna-Soar	58.0	106.5
Component development, applied research, other	127.1	169.7
Large solid booster		62.0
Titan launch vehicle		15.0
<b>Total</b>	<b>\$751.7</b>	<b>\$1,079.4</b>

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\* Source: U.S. House, Committee on Government Operations, *Government Operations in Space (Analysis of Civil-Military Roles and Relationships)*, House Report No. 445, 89th Congress, 1st Session, 4 June 1965, p. 65.

APPENDIX 3-2

**U.S. Government Space Activities, Fiscal Years 1969–1984\***

Historical Budget Summary—Budget Authority (in millions of dollars)

Fiscal Year	NASA		Defense		Energy	Commerce	Interior	Agriculture	NSF	Total Space
	% Total		% Total							
	Space <sup>a</sup>	Space	Space	Space						
1959	260.9	33.2	489.5	62.3	34.3					784.7
1960	461.5	43.3	560.9	52.6	43.5			0.1		1065.8
1961	926.0	51.2	813.9	45.0	67.7			0.6		1808.2
1962	1796.8	54.5	1298.2	39.4	147.8	50.7		1.3		3294.5
1963	3626.0	66.7	1549.9	28.5	213.9	43.2		1.5		5434.5
1964	5016.3	73.4	1599.3	23.4	210.0	2.8		3.0		6831.4
1965	5137.6	73.8	1573.9	22.6	228.6	12.2		3.2		6955.5
1966	5064.5	72.6	1688.8	24.2	186.8	26.5		3.2		6969.8
1967	4830.2	71.9	1663.6	24.7	183.6	29.3		2.8		6709.5
1968	4430.0	67.7	1921.8	30.3	145.1	28.1	0.2	0.5	3.2	6528.9
1969	3822.0	63.9	2013.0	33.6	118.0	20.0	0.2	0.7	1.9	5975.8
1970	3547.0	66.4	1678.4	31.4	102.8	8.0	1.1	0.8	2.4	5340.5
1971	3101.3	65.4	1512.5	31.8	94.8	27.4	1.9	0.8	2.4	4740.9
1972	3071.0	67.1	1407.0	30.7	55.2	31.3	5.8	1.6	2.8	4574.7
1973	3093.2	64.1	1623.0	33.6	54.2	39.7	10.3	1.9	2.6	4824.9
1974	2758.5	59.4	1766.0	38.0	41.7	60.2	9.0	3.1	1.8	4640.3
1975	2915.3	59.3	1892.4	38.5	29.6	64.4	8.3	2.3	2.0	4914.3
1976	3225.4	60.6	1983.3	37.2	23.3	71.5	10.4	3.6	2.4	5319.9
T.Q. <sup>b</sup>	849.2	63.3	460.4	34.3	4.6	22.2	2.6	0.9	0.6	1340.5
1977	3440.2	57.5	2411.9	40.3	21.7	90.8	9.5	6.3	2.4	5982.8
1978	3622.9	55.6	2728.8	43.2	34.4	102.8	9.7	7.7	2.4	6508.7
1979	4030.4	54.3	3211.3	43.2	58.6	98.4	9.9	8.2	2.4	7419.2
1980	4680.4	53.8	3848.4	44.2	59.6	92.6	11.7	13.7	2.4	8688.8
1981	4992.4	50.0	4827.7	48.0	40.5	87.0	12.3	15.5	2.4	9977.8
1982	5527.6	44.0	6678.7	54.0	60.6	144.5	12.1	15.2	2.0	12440.7
1983	6327.9	41.0	8490.9	54.0	38.9	177.8	4.6	20.4		15588.5
1984 (est)	6590.4	38.0	10590.3	61.0	34.1	234.8	4.7	23.0		17477.3

Notes: a. Excludes amounts for air transportation; b. T.Q.=Transitional Quarter

\* Source: *Aeronautics and Space Report of the President: 1982 Activities* (Washington, D.C.: NASA, 1983), p. 96, with updated figures from OMB and DoD, included in Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945–1984* (Ithica: Cornell University Press, 1985), p. 255.

## APPENDIX 3-3

## Funding of U.S. Defense Department Space Programs by Mission, Fiscal Years 1961–

Mission <sup>a</sup>	FY 1961 <sup>f</sup>	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
<b>Manned Space Flight</b>	58.0	100.0	131.8	89.7	47.0	151.4	237.1	431.0	515.0	121.8		
<b>Communications</b>	55.2	104.6	35.4	80.2	25.7	61.1	58.6	60.6	62.0	126.8	84.6	54.0
<b>Navigation</b>	23.6	22.0	42.1	27.9	27.6	15.5	22.0	24.7	11.5	5.1	7.4	6.0
<b>Early Warning</b>	122.5	180.8	102.4	61.5	50.4	58.6	45.6	68.0	(159.0) <sup>h</sup>	(211.8)	(266.5)	(228.0)
<b>Weather</b>												
<b>Geodesy</b>									12.1	8.6	5.8	5.0
<b>Space Defense<sup>b</sup></b>	8.2	33.0	40.9	66.9	39.1	8.0	16.6	15.4	16.5	9.8	3.9	3.0
<b>Vehicle and Engine Develop.</b>	3.7	68.3	286.1	389.8	274.4	190.0	98.9	72.5	72.3	74.6	46.0	36.0
<b>Space Ground Support<sup>c</sup></b>	57.8	102.6	167.7	171.9	235.1	240.1	316.9	260.2	183.9	169.3	150.5	152.0
<b>Research and Development<sup>d</sup></b>	74.2	155.7	174.3	157.9	167.1	156.9	131.1	124.1	79.9	82.6	84.6	118.0
<b>General Support<sup>e</sup></b>	420.7	531.2	569.2	553.5	713.0	807.2	732.8	864.5	900.9	868.0	863.0	800.0
<b>Total</b>	813.9	1298.2	1549.9	1599.3	1579.4 <sup>e</sup>	1688.8	1663.6	1921.8	2013.1	1678.4	1512.3	1400.0

\* Source: Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945–1984* (Ithaca, NY: Cornell University Press, 1985), pp. 256–257.

APPENDIX 3-3 (cont.)

Mission <sup>a</sup>	1974	1975	1976	1976(TQ) <sup>j</sup>	1977	1978	1979	1980	1981	1982	1983	1984
<b>Communications</b>	275.3	361.5	361.4	57.29	720.9	574.2	458.6	506.2	687.4	986.1	1329.6	1414.1
<b>Navigation</b>	38.1	47.6	104.8	23.1	104.9	93.8	117.7	185.6	167.0	431.2	295.4	494.4
<b>Early Warning</b>	103.7	136.5	88.7	16.0	87.9	150.0	214.3	207.3	267.3	565.7	707.2	714.7
<b>Weather</b>	24.5	29.1	54.7	8.1	67.9	78.7	61.2	67.9	86.5	109.7	232.4	191.1
<b>Geodesy</b>	6.6	7.7	46.3	2.2	7.7	7.3	8.5	10.3	11.6	28.1	60.8	51.4
<b>Space Defense<sup>b</sup></b>	(3.5) <sup>i</sup>	(3.2)										
<b>Vehicle and Engine Develop.</b>	26.0	36.8	54.7	18.5	106.3	289.6	509.6	661.0	758.5	842.3	1072.5	1211.1
<b>Space Ground Support<sup>c</sup></b>	189.9	91.9	111.7	24.9	123.6	173.7	210.9	242.3	337.8	472.0	614.4	804.8
<b>Research and Development<sup>d</sup></b>	133.8	137.1	159.3	50.1	209.5	296.0	434.0	427.7	573.7	759.6	848.7	1004.1
<b>General Support<sup>e</sup></b>	968.1	1044.2	1047.9	260.3	981.2	1065.5	1196.5	1196.5	1540.1	2586.7	3329.3	4604.1
<b>Total</b>	1766.0	1892.4	1983.3	460.4	2411.1	2728.8	3211.3	3211.3	3848.4	6681.1	8490.9	10514.1

Notes:

a. The missions listed exclude satellite reconnaissance due to the March 1962 DoD Directive that ended all official reference to reconnaissance activities. However, totals for FY 1959 and FY 1960 include satellite reconnaissance projects it is likely that subsequent funding for this activity has been hidden in the above totals. Funding for satellite intelligence gathering activities is excluded from this table. These figures are not publicly available. The mission elements have also varied in subsequent years and are reflected in the table.

b. Space Defense includes such projects as SAINT, Program 505, 437.

c. Defined as including range support, instrumentation, satellite detection, tracking and control.

d. Defined as including basic and applied research and component development.

e. Defined as including laboratory and research center in house programs, development support organizations, general operational support, and space related construction not otherwise charged to specific space projects.

f. Figures for FY 1961 are the first available using this mission break down.

g. This total is different from Appendix 3-4 where the amount is given as \$1573.9.

h. For FY 1969-72 there are no separate figures for the Early Warning Mission. However the entry 'miscellaneous' which is in parenthesis includes Early Warning.

i. Space Defense funding for FY 1974 and FY 1975 is added in parenthesis but it is excluded from subsequent listings for these years.

j. TQ=Transitional Quarter.

## APPENDIX 3-4

**U.S. Space Activities: Historical Budget Summary\***

Historical Summary and 1970 Recommendations January 1969—New Obligation Authority (in millions of dollars)

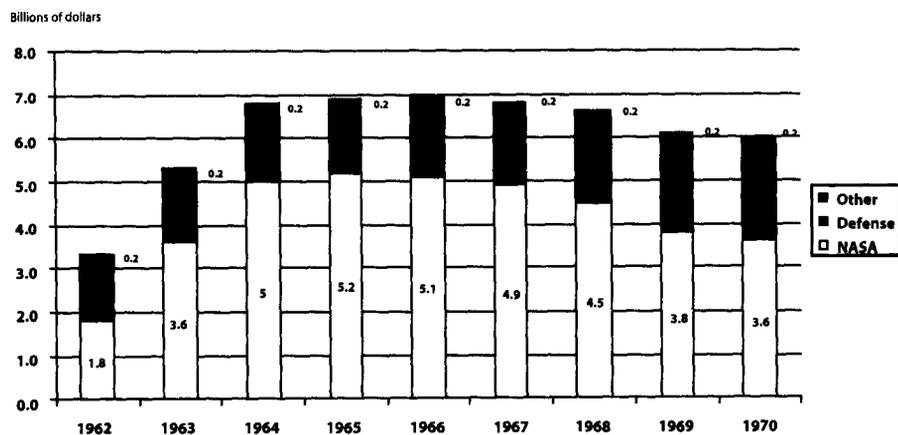
	NASA		DoD	AEC	Commerce	Interior	Agriculture	NSF
	Total	Space <sup>1</sup>						
<b>1955</b>	56.9	56.9	3.0					
<b>1956</b>	72.7	72.7	30.3	7.0				7.3
<b>1957</b>	78.2	78.2	71.0	21.3				8.4
<b>1958</b>	117.3	117.3	205.6	21.3				3.3
<b>1959</b>	305.4	235.4	489.5	34.3				
<b>1960</b>	523.6	461.5	560.9	43.3				0.1
<b>1961</b>	964.0	926.0	813.9	67.7				0.6
<b>1962</b>	1824.9	1,796.8	1,298.2	147.8	50.7			1.3
<b>1963</b>	3673.0	3,626.0	1,549.9	213.9	43.2			1.5
<b>1964</b>	5099.7	5,046.3	1,599.3	210.0	2.8			3.0
<b>1965</b>	5249.7	5,167.6	1,573.9	228.6	12.2			3.2
<b>1966</b>	5174.9	5,094.5	1,688.8	186.8	26.5	4.1		3.2
<b>1967</b>	4967.6	4,862.2	1,663.6	183.6	29.3	3.0		2.8
<b>1968</b>	4588.8	4,452.5	1,921.8	145.1	28.1	2.0	0.5	3.2
<b>1970 budget:</b>								
<b>1969</b>	3994.9	3,844.8	2,082.5	117.2	20.2	2.2	0.7	3.3
<b>1970</b>	3760.5	3,599.0	2,218.7	105.5	9.7	6.0	3.6	3.7

<sup>1</sup> Excludes amounts for aircraft technology in 1959 and succeeding years. Amounts for NASA-NACA aircraft and space activities separately identifiable prior to 1959.

Note: Details may not add to totals because of rounding.

\* Source: Report to Congress, *U.S. Aeronautics and Space Activities 1968*, p. 110.

APPENDIX 3-4 (cont.)  
**U.S. Space Budget: New Obligation Authority\***



\* Source: Report to Congress, *U.S. Aeronautics and Space Activities 1968*, p. 110.

APPENDIX 6-1

**Strategic Air Command to Space Command Transfers,  
15 November 1982–1 May 1983\***

Project, Sensor, Unit, Site:

Overseas Ground Station (OGS) Availability Improvements DSP-1 Upgrade Sensor Evolutionary Development	15 November 1982
BMEWS Missile Impact Predictor BMEWS Radar Upgrades	1 December 1982
Large Processing Station Upgrade Operational Support Module DSP Peripheral Upgrade	31 January 1983
PAVE PAWS Expansion Tactical Warning Sensor Tech Support Center ARPA Maui Optical Station (AMOS) Compensated Imaging Ground-based Electro-optical Deep Space Surveillance (GEODSS) System, Sites 4 and 5	1 February 1983
Mobile Ground System Improved Radar Calibration System C-Band Upgrades Space Based Surveillance System Retrograde Sensors Pacific Barrier (PACBAR) III radar	1 March 1983
Diyarbakir Extended Range Modification Peterson AFB	1 April 1983
Detachment 1, 20th Missile Warning Squadron (FSS-7) 20th Missile Warning Squadron (FPS-85) Perimeter Acquisition Radar Characterization System COBRA DANE FPS-79, Pirinclik, Turkey PAVE PAWS Defense Support Program (DSP) Simplified Processing Station	1 May 1983

**APPENDIX 6-1 (cont.)**

Ballistic Missile Early Warning System (BMEWS)  
Defense Meteorological Satellite Program (DMSP)  
GEODSS Sites 1, 2, and 3  
Maui Optical Tracking and Identification Facility (MOTIF)  
Western Space and Missile Center Sensor Support  
Eastern Space and Missile Center Sensor Support  
Baker-Nunn cameras  
ARPA Lincoln C-Band Observables Radar (ALCOR)  
SACLOG  
4614th Contracting Squadron  
BMEWS Radome Replacement  
4602d Computer Services Squadron and Detachment 1  
FPS-85 System Programming Agency  
Operating Location BE, 3900th Computer Services Squadron  
Activities of Lincoln Laboratories  
PACBAR I radar  
PACBAR II radar  
Signal Analysis System Acquisition  
Large Processing Station Facility Upgrade  
Thule AB, Greenland  
Sondrestrom AB, Greenland  
Clear AFS, Alaska

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\* Source: History, Space Command ADCOM, January–December 1983, pp. 3-4.

## APPENDIX 6-2

**USAF Space Plan Tasking Summary, November 1984\***

1a	Space Weapons Plan	HQ USAF/XOS	October 1985
2a	ALMV Summary Plan	SPACECOM/XPSD	Done
3a	SDI Operational Requirements	SPACECOM/XPSD	January 1985
3b	SDI Strategic Implications	HQ USAF/XOS	January 1985
4a	Space Systems Architecture Study	SPACECOM/XPSS	January 1985
5a	Force Structure Operational Concepts	SPACECOM/XPSS	+
5b	Force Structure Support	SPACECOM/LGXP	June 1985
5c	Satellite Replacement	SPACECOM/XPSS	June 1985
6a	Space Transportation Master Plan	SAF/ALS	March 1985
7a	Satellite Autonomy Plan	Space Division/XRP	January 1985
7b	Satellite Control Network Documentation	Space Division/XRP	January 1985
7c	Space Station R&D Requirements	Space Division/XRP	June 1985
7d	Space Station Operational Requirements	SPACECOM/XPSF	February 1985
8a	Staffing Decisions	HQ USAF/MPMP	Done
8b	Training	HQ USAF/MPPTS	Done
8c	Education Assessment	HQ USAF/MPPE	May 1985
8d	Career Development and Retention	HQ USAF/MPPTS	May 1985
9a	Military Crews in Space	SPACECOM/XPSF	March 1985
10a	Military Use of Commercial Systems	SPACECOM/KRQS	March 1985
10b	Commercial Systems Survivability	SPACECOM/KRQS	March 1984
11a	Logistics Support	AFLC/XXRXO	May 1985
11b	Depot Support	AFLC/XXRXO	May 1985
11c	Logistics Integration	AFLC/XXRXO	May 1985
12a	New Actions	HQ USAF/XOS	May 1985
13a	Air Force Manual 2-XX	SPACECOM/XPXX	February 1985
13b	Basic Doctrine	HQ USAF/XOXIS	May 1985
14a	Radio Frequency Interference	SPACECOM/DOCE	June 1985
14b	Space Debris	Space Division/XRP	June 1985
15a	Planning Gap	HQ USAF/XOS	January 1985

+ Upon publication of Air Force Regulation 55-24

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\* Source: Space Command/XPXX to HQ USAF/XOS *et al*, subj: 15-16 Nov 84 Space Plan Meeting Minutes, 19 December 1984, attachment 3.