



# Chronological History Fiscal Year 1978 Budget Submission

Prepared by:  
Associate Administrator/  
Comptroller  
Budget Operations Division  
Code BTF-3            Ext. 58466

October 19, 1978

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FISCAL YEAR 1978

LEGISLATIVE REFERENCE										
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Langley Research Center.....	6	---	---	---						
Lewis Research Center.....	6	---	---	---						
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Various Locations.....	7	---	---	---						
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# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY1978 Budget Submission  
(In thousands of dollars)

I T E M	A U T H O R I Z A T I O N						A P P R O P R I A T I O N					
	NASA Budget Submission	House Comm. H.R. 4088 Rep. 95-67 3/10/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-380 6/2/77	Senate Comm. H.R. 7554 Rep. 95-280 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd. 7/12/77 Rep. 95-495	Final Cong. Action House 7/19/77 Senate 9/23/77 P.L. 95-119 Appd. 10/4/77	Difference From Budget Submission	Difference From Authorization
<b>TOTAL APPROPRIATIONS:</b>												
Research and Development	3,026,000 <sup>a/</sup>	3,047,500	3,030,000	3,041,500	+15,500	2,943,600	3,013,000	3,013,000	c/	3,013,000	-13,000	-28,500
Construction of Facilities.....	161,800	158,340	161,800	160,940	-860	160,940	160,940	160,940	160,940	160,940	-860	---
Research and Program Management												
Basic Submission.....	(846,989)	(847,989)	(846,989)	(846,989)	(---)	(844,000)	(841,989)	(844,000)	(844,000)	(844,000)	(-2,989)	(-2,989)
Supplemental Approp....	(46,200)	(45,761)	(45,761)	(45,761)	(-439)	(45,761)	(45,761)	(45,761)	(45,761)	(45,761)	(-439)	(-439)
Total, R&PM.....	893,189	893,750	892,750	892,750	-439	889,761	887,750	889,761	889,761	889,761	-3,428	-3,428
<b>GRAND TOTAL.....</b>	<b>4,080,989</b>	<b>4,099,590</b>	<b>4,084,550</b>	<b>4,095,190</b>	<b>+14,201</b>	<b>3,994,301</b>	<b>4,061,690</b>	<b>4,063,701</b>	<b>c/</b>	<b>4,063,701</b>	<b>-17,288</b>	<b>-31,928</b>
<b>R&amp;D Appropriation:</b>												
OSF.....	1,753,500	1,749,500	1,756,500	1,756,500	+3,000	1,694,800	1,753,500	1,753,500	1,753,500	1,753,500	---	-3,000
OSS.....	415,700	423,700	409,700	414,700	-1,000	390,000	409,700	409,700	c/	404,700	-11,000	-10,000
OA.....	233,800	238,800	239,800	239,800	+6,000	233,800	233,800	233,800	233,800	233,800	---	-6,000
OAST.....	328,700	338,200	328,700	333,700	+5,000	328,700	323,700	323,700	323,700	325,700	-3,000	-8,000
OE.....	4,500	9,500	4,500	7,500	+3,000	9,500	4,500	4,500	7,500	7,500	+3,000	---
OTDA.....	281,700	278,700	281,700	280,200	-1,500	278,700	279,700	279,700	279,700	279,700	-2,000	-500
OTU.....	8,100	9,100	9,100	9,100	+1,000	8,100	8,100	8,100	8,100	8,100	---	-1,000
TOTAL, R&D.....	3,026,000	3,047,500	3,030,000	3,041,500	+15,000	2,943,600	3,013,000	3,013,000	c/	3,013,000	-13,000	-28,500
<b>CoF Appropriation:</b>												
OSF.....	72,150	68,690	72,150	71,290	-860	71,290	71,290	71,290	71,290	71,290	-860	---
OA.....	3,100	3,100	3,100	3,100	---	3,100	3,100	3,100	3,100	3,100	---	---
OAST.....	37,980	37,980	37,980	37,980	---	37,980	37,980	37,980	37,980	37,980	---	---
OTDA.....	1,750	1,750	1,750	1,750	---	1,750	1,750	1,750	1,750	1,750	---	---
Center Operations.....	10,190	10,190	10,190	10,190	---	10,190	10,190	10,190	10,190	10,190	---	---
Comptroller.....	36,630	36,630	36,630	36,630	---	36,630	36,630	36,630	36,630	36,630	---	---
TOTAL, CoF.....	161,800	158,340	161,800	160,940	-860	160,940	160,940	160,940	160,940	160,940	-860	---
<b>R&amp;PM Appropriation:</b>												
Basic Submission.....	846,989	847,989	846,989	846,989	---	844,000	841,989	844,000	844,000	844,000	-2,989	-2,989
Supplemental Approp....	46,200	45,761	45,761	45,761	-439	45,761	45,761	45,761	45,761	45,761	-439	-439
TOTAL, R&PM.....	893,189	893,750	892,750	892,750	-439	889,761	887,750	889,761	889,761	889,761	-3,428	-3,428
<b>TOTAL, NASA.....</b>	<b>4,080,989</b>	<b>4,099,590</b>	<b>4,084,550</b>	<b>4,095,190</b>	<b>+14,201</b>	<b>3,994,301</b>	<b>4,061,690</b>	<b>4,063,701</b>	<b>c/</b>	<b>4,063,701</b>	<b>-17,288</b>	<b>-31,928</b>

CPO 699-526

<sup>a/</sup> Includes President's budget amendment of 15 million submitted to Congress 2/22/77. (Mars follow-on mission definition increased 10 million; Landsat-D increased 5 million for initial funding of backup spacecraft.)

<sup>b/</sup> Subcommittee recommended 846,989,000, the amount requested in the budget.

<sup>c/</sup> Reported in Disagreement. Managers on the part of the House to offer motion to appropriate 2,995,300,000 for R&D instead of 3,013,000,000 proposed by the Senate, reflecting agreement with conference adjustments except JOP which is reported in disagreement.

Prepared by:  
Associate Administrator/  
NASA Comptroller  
Office of Budget Operations  
Code BTF Ext. 58466

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY1978 Budget Submission  
(In thousands of dollars)

Subfunction Code

ITEM	AUTHORIZATION					APPROPRIATION						
	NASA Budget Submission	House Comm. H.R. 4088 Rep. 95-67 3/10/77 Appd. 3/17/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77 Appd. 5/13/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-380 6/2/77 Appd. 6/15/77	Senate Comm. H.R. 7554 Rep. 95-280 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd 7/12/77 Rep. 95-495	Final Cong. Action House 7/19/77 Senate 9/23/77 P.L. 95-119 Appd. 10/4/77	Difference From Budget Submission	Difference From Authorization
<b>RESEARCH AND DEVELOPMENT</b>	3,026,000	3,047,500	3,030,000	3,041,500	+15,500	2,943,600	3,013,000	3,013,000	d/	3,013,000	-13,000	-28,500
253 Space Shuttle.....	1,349,200	1,349,200	1,354,200	1,354,200	+5,000	1,292,500	1,349,200	1,349,200	1,349,200	1,349,200	---	-5,000
253 Space Flight Operations. Expendable Launch	267,800	270,800	265,800	267,800	---	272,800	267,800	267,800	267,800	267,800	---	---
253 Vehicles.....	136,500	129,500	136,500	134,500	-2,000	129,500	136,500	136,500	136,500	136,500	---	+2,000
254 Physics and Astronomy...	224,200	229,200	226,200	228,200	+4,000	224,200	226,200	226,200	224,200	224,200	---	-4,000
254 Lunar and Planetary.....	158,200 <sup>a/</sup>	161,200	150,200	153,200	-5,000	132,500	150,200	150,200	d/	147,200	-11,000	-6,000
254 Life Sciences.....	33,300	33,300	33,300	33,300	---	33,300	33,300	33,300	33,300	33,300	---	---
254 Space Applications.....	233,800 <sup>b/</sup>	211,900	239,800	239,800	+6,000	233,800	233,800	233,800	233,800	233,800	---	-6,000
254 Earth Resources Opera- tional Systems.....	---	26,900 <sup>c/</sup>	---	---	---	---	---	---	---	---	---	---
405 Aeronautical Research and Technology.....	231,000	236,500	231,000	234,000	+3,000	231,000	226,000	226,000	228,000	228,000	-3,000	-6,000
254 Space Research and Technology.....	97,700	101,700	97,700	99,700	+2,000	97,700	97,700	97,700	97,700	97,700	---	-2,000
254 Energy Technology Applications.....	4,500	9,500	4,500	7,500	+3,000	9,500	4,500	4,500	7,500	7,500	+3,000	---
255 Tracking and Data Acq...	281,700	278,700	281,700	280,200	-1,500	278,700	279,700	279,700	279,700	279,700	-2,000	-500
255 Technology Utilization..	8,100	9,100	9,100	9,100	+1,000	8,100	8,100	8,100	8,100	8,100	---	-1,000
<b>CONSTRUCTION OF FACILITIES</b>	161,800	158,340	161,800	160,940	-860	160,940	160,940	160,940	160,940	160,940	-860	---
Dryden Flight Research Center.....	420	420	420	420	---	420	420	420	420	420	---	---
Goddard Space Flight Center	3,100	3,100	3,100	3,100	---	3,100	3,100	3,100	3,100	3,100	---	---
Jet Propulsion Laboratory.	2,830	2,830	2,830	2,830	---	2,830	2,830	2,830	2,830	2,830	---	---
Johnson Space Center.....	2,540	2,540	2,540	2,540	---	2,540	2,540	2,540	2,540	2,540	---	---
Kennedy Space Center.....	2,130	2,130	2,130	2,130	---	2,130	2,130	2,130	2,130	2,130	---	---
Langley Research Center...	1,770	1,770	1,770	1,770	---	1,770	1,770	1,770	1,770	1,770	---	---
Lewis Research Center.....	860	860	860	860	---	860	860	860	860	860	---	---
National Space Technology Laboratories.....	620	620	620	620	---	620	620	620	620	620	---	---
Large Aeronautical Facility	37,000	37,000	37,000	37,000	---	37,000	37,000	37,000	37,000	37,000	---	---
Various Locations.....	1,750	1,750	1,750	1,750	---	1,750	1,750	1,750	1,750	1,750	---	---
Space Shuttle Facilities..	65,740	62,280	65,740	64,880	-860	64,880	64,880	64,880	64,880	64,880	-860	---
Space Shuttle Payload Facilities.....	6,410	6,410	6,410	6,410	---	6,410	6,410	6,410	6,410	6,410	---	---
Rehabilitation and Mod...	18,900	18,900	18,900	18,900	---	18,900	18,900	18,900	18,900	18,900	---	---
Minor Construction.....	5,950	5,950	5,950	5,950	---	5,950	5,950	5,950	5,950	5,950	---	---
Facility Planning and Design.....	11,780	11,780	11,780	11,780	---	11,780	11,780	11,780	11,780	11,780	---	---
<b>RESEARCH AND PROGRAM MANAGEMENT</b>	893,189	893,750	892,750	892,750	-439	889,761	887,750	889,761	889,761	889,761	-439	-439
Basic Submission.....	846,989	847,989	846,989	846,989	---	844,000	841,989	844,000	844,000	844,000	-2,989	-2,989
Supplemental.....	46,200	45,761	45,761	45,761	-439	45,761	45,761	45,761	45,761	45,761	-439	-439
<b>TOTAL.....</b>	<b>4,080,989</b>	<b>4,099,590</b>	<b>4,084,550</b>	<b>4,095,190</b>	<b>+14,201</b>	<b>3,994,301</b>	<b>4,061,690</b>	<b>4,063,701</b>	<b>d/</b>	<b>4,063,701</b>	<b>-17,288</b>	<b>-31,928</b>

a/ Includes budget amendment of 10 million for Mars follow-on definition, increasing project total to 15 million.

b/ Includes budget amendment of 5 million for Landsat-D backup spacecraft, increasing project total to 26.9 million.

c/ Transfer of Landsat-D from Space Application's program.

d/ Reported in disagreement. See footnote c/ page 1.

Prepared by:  
Associate Administrator/  
NASA Comptroller  
Office of Budget Operations  
Code BTF Ext. 58466

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1978 Budget Submission  
(In thousands of dollars)

Subfunction Code	ITEM	AUTHORIZATION					APPROPRIATION						
		NASA Budget Submission	House Comm. H.R. 4088 Rep. 95-67 Appd. 3/17/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77 Appd. 5/13/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-380 6/2/77 Appd. 6/15/77	Senate Comm. H.R. 7554 Rep. 95-280 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd. 7/21/77 Rep. 95-495	Final Cong. Action House 7/19/77 Senate 9/23/77 P.L. 95-119	Difference From Budget Submission	Difference From Authorization
	RESEARCH AND DEVELOPMENT APPROPRIATION:	3,026,000	3,047,500	3,030,000	3,041,500	+15,500	2,943,600	3,013,000	3,013,000	d/	Appd. 10/4/77 3,013,000	-13,000	-28,500
	OFFICE OF SPACE FLIGHT....	1,753,500	1,749,500	1,756,500	1,756,500	+3,000	1,694,800	1,753,500	1,753,500	1,753,500	1,753,500	---	-3,000
253	Space Shuttle Program....	(1,349,200)	(1,349,200)	(1,354,200)	(1,354,200)	(+5,000)	(1,292,500)	(1,349,200)	(1,349,200)	(1,349,200)	(1,349,200)	(---)	(-5,000)
	Orbiter.....	690,500	690,500	695,500	695,500	+5,000	633,800	690,500	690,500	690,500	690,500	---	-5,000
	Main Engine.....	219,900	219,900	219,900	219,900	---	219,900	219,900	219,900	219,900	219,900	---	---
	Solid Rocket Booster.....	83,600	83,600	83,600	83,600	---	83,600	83,600	83,600	83,600	83,600	---	---
	External tank.....	80,000	80,000	80,000	80,000	---	80,000	80,000	80,000	80,000	80,000	---	---
	Launch and Landing.....	133,500	133,500	133,500	133,500	---	133,500	133,500	133,500	133,500	133,500	---	---
	Production.....	141,700	141,700	141,700	141,700	---	141,700	141,700	141,700	141,700	141,700	---	---
253	Space Flight Operations Program.....	(267,800)	(270,800)	(265,800)	(267,800)	(---)	(272,800)	(267,800)	(267,800)	(267,800)	(267,800)	(---)	(---)
	Space Transportation System Operations Capability Development, Test and Development, Test and Mission Operations....	63,000	61,000 <sup>a</sup>	*	61,000	-2,000	63,000	63,000	63,000	63,000	63,000	---	---
	Advanced Programs.....	173,000	173,000	*	173,000	---	173,000	173,000	173,000	173,000	173,000	---	---
	Space Transportation System Operations.....	10,000	15,000 <sup>b</sup>	*	12,000	+2,000	15,000	10,000	10,000	10,000	10,000	---	---
	Planning and Program Integration.....	17,800	17,800	*	17,800	---	17,800	17,800	17,800	17,800	17,800	---	---
	4,000	4,000	*	4,000	---	4,000	4,000	4,000	4,000	4,000	4,000	---	---
253	Expendable Launch Vehicles Program.....	(136,500)	(129,500) <sup>c</sup>	(136,500)	(134,500)	(-2,000)	(129,500)	(136,500)	(136,500)	(136,500)	(136,500)	(---)	(+2,000)
	Scout.....	16,000	*	16,000	*	*	*	16,000	16,000	16,000	16,000	---	*
	Centaur.....	55,900	*	55,900	*	*	*	55,900	55,900	55,900	55,900	---	*
	Delta.....	55,300	*	55,300	*	*	*	55,300	55,300	55,300	55,300	---	*
	Atlas-F.....	9,300	*	9,300	*	*	*	9,300	9,300	9,300	9,300	---	*
254	OFFICE OF SPACE SCIENCE...	415,700	423,700	409,700	414,700	-1,000	390,000	409,700	409,700	d/	404,700	9,000	-10,000
	Physics and Astronomy Program.....	(224,200)	(229,200)	(226,200)	(228,200)	(+4,000)	(224,200)	(226,200)	(226,200)	(226,200)	(224,200)	(---)	(-4,000)
	High energy astronomy observatories.....	22,450	22,450	*	22,450	---	22,450	22,450	22,450	22,450	22,450	---	---
	Solar maximum mission...	30,600	30,600	*	30,600	---	30,600	30,600	30,600	30,600	30,600	---	---
	Space telescope.....	36,000	36,000	*	36,000	---	36,000	36,000	36,000	36,000	36,000	---	---
	Shuttle/spacelab science payload development.....	28,900	28,900	*	28,900	---	28,900	28,900	28,900	28,900	28,900	---	---
	Orbiting explorers.....	35,000	35,000	*	35,000	---	35,000	35,000	35,000	35,000	35,000	---	---
	Orbiting solar observatories.....	1,270	1,270	*	1,270	---	1,270	1,270	1,270	1,270	1,270	---	---
	Orbiting astronomical observatories.....	1,980	1,980	*	1,980	---	1,980	1,980	1,980	1,980	1,980	---	---
	Suborbital programs.....	26,000	26,000	*	26,000	---	26,000	26,000	26,000	26,000	26,000	---	---
	Supporting activities...	42,000	47,000	*	46,000	+4,000	42,000	44,000	44,000	44,000	42,000	---	---

\*Undistributed

a/ STS upper stages decreased by 2 million.

b/ Space industrialization studies increased by 5 million.

c/ Supporting activities decreased by 7 million.

d/ See footnote c/ page 1.

Prepared by:  
Associate Administrator/  
NASA Comptroller  
Office of Budget Operations  
Code BTF Ext. 58466

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1978 Budget Submission  
(In thousands of dollars)

Subfunction Code

ITEM	AUTHORIZATION					APPROPRIATION						
	NASA Budget Submission	House Comm. H.R. 4088 Rep. 95-67 3/10/77 Appd. 3/17/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77 Appd. 5/13/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-380 6/2/77 Appd. 6/15/77	Senate Comm. H.R. 7554 Rep. 95-280 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd. 7/21/77 Rep. 95-495	Final Cong. Action House 7/19/77 Senate 9/23/77 P.L. 95-119	Difference From Budget Submission	Difference From Authorizator
254 Lunar and Planetary										Appd. 10/4/77		
Exploration Program.....	(158,200)	(161,200)	(150,200)	(153,200)	(-5,000)	(132,500)	(150,200)	(150,200)	e/	(147,200)	(-11,000)	(-6,000)
Viking.....	20,000	20,000	20,000	20,000	---	20,000	20,000	20,000	---	20,000	---	---
Pioneer Venus.....	19,000	19,000	19,000	19,000	---	19,000	19,000	19,000	---	19,000	---	---
Mariner Jupiter/Saturn 1977.....	14,300	14,300	14,300	14,300	---	14,300	14,300	14,300	---	14,300	---	---
Jupiter Orbiter/Probe...	20,700	20,700	20,700	20,700	---	---	20,700	20,700	---	17,700	-3,000	-3,000
Pioneer 6-11.....	3,600	3,600	3,600	3,600	---	3,600	3,600	3,600	---	3,600	---	---
Helios.....	700	700	700	700	---	700	700	700	---	700	---	---
Planetary Flight Support.....	25,000	25,000	25,000	25,000	---	25,000	25,000	25,000	---	25,000	---	---
Supporting Activities...	54,900 <sup>a/</sup>	50,900 <sup>c/</sup>	46,900	49,900	-5,000	49,900	46,900	46,900	---	46,900	-8,000	-3,000
Lunar Polar Orbiter.....	---	7,000	---	---	---	---	---	---	---	---	---	---
254 Life Sciences Program.....	(33,300)	(33,300)	(33,300)	(33,300)	(---	(33,300)	(33,300)	(33,300)	(33,300)	(33,300)	(---	(---
Common Operating Research Equipment....	8,000	8,000	8,000	8,000	---	8,000	8,000	8,000	8,000	8,000	---	---
Vestibular Function Research.....	1,500	1,500	1,500	1,500	---	1,500	1,500	1,500	1,500	1,500	---	---
Integrated Life Sciences Shuttle Spacelab Experiments..	1,000	1,000	1,000	1,000	---	1,000	1,000	1,000	1,000	1,000	---	---
Supporting Activities...	22,800	22,800	22,800	22,800	---	22,800	22,800	22,800	22,800	22,800	---	---
OFFICE OF SPACE APPLICATIONS.....	233,800	238,800	239,800	239,800	+6,000	233,800	233,800	233,800	233,800	233,800	---	-6,000
254 Space Applications Program.....	(233,800)	(211,900)	(239,800)	(239,800)	(+6,000)	(233,800)	(233,800)	(233,800)	(233,800)	(233,800)	(---	(-6,000)
Earth Resources Detection and Monitoring.....	97,000 <sup>b/</sup>	70,100 <sup>d/</sup>	99,000	99,000	(+2,000)	97,000	97,000	97,000	97,000	97,000	---	-2,000
Earth Dynamics Monitoring and Forecasting.....	7,900	7,900	*	*	*	7,900	7,900	7,900	7,900	7,900	---	*
Ocean Condition Monitoring and Forecasting.....	19,200	19,200	*	*	*	19,200	19,200	19,200	19,200	19,200	---	*
Environmental Quality Monitoring.....	27,500	27,500	*	*	*	27,500	27,500	27,500	27,500	27,500	---	*
Weather and Climate Observation and Forecasting.....	30,700	35,700	*	*	*	30,700	30,700	30,700	30,700	30,700	---	*
Materials Processing in Space.....	15,500	15,500	*	*	*	15,500	15,500	15,500	15,500	15,500	---	*
Space Communications....	22,800	22,800	*	*	*	22,800	22,800	22,800	22,800	22,800	---	*
Applications Explorer Mission.....	13,200	13,200	*	*	*	13,200	13,200	13,200	13,200	13,200	---	*
Earth Resources Operational Systems...	(---	(26,900)	(---	(---	(---	(---	(---	(---	(---	(---	(---	(---

\*Undistributed

- a/ Includes budget amendment of 10 million for Mars follow-on definition, increasing project total to 15 million.
- b/ Includes budget amendment of 5 million for Landsat-D backup spacecraft, increasing project total to 26.9 million.
- c/ Increased 1 million to augment supporting research and technology; Mars follow-on definition decreased by 5 million.
- d/ Landsat-D established as a separate program in Earth Resources Operational Systems Program.
- e/ Reported in disagreement. See Footnote c/ page 1.

Prepared by:  
Associate Administrator/  
NASA Comptroller  
Office of Budget Operations  
Code BTF Ext. 58466

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1978 Budget Submission  
(In thousands of dollars)

Subfunction Code

Subfunction Code	ITEM	AUTHORIZATION					APPROPRIATION						
		NASA Budget Submission	House Comm. H.R. 4088 Rep. 95-67 3/10/77 Appd. 3/17/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77 Appd. 5/13/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-360 6/2/77 Appd. 6/15/77	Senate Comm. H.R. 7554 Rep. 95-260 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd. 7/12/77 Rep. 95-495	Final Cong. Action House 7/19/77 Senate 9/23/77 P.L. 95-119	Difference from Budget Submission	Difference From Authorization
	<b>OFFICE OF AERONAUTICS AND SPACE TECHNOLOGY....</b>	328,700	338,200	328,700	333,700	+5,000	328,700	323,700	323,700	325,700	325,700	-3,000	-8,000
405	Aeronautical Research and Technology Program.....	(231,000)	(236,500)	(231,000)	(234,000)	(+3,000)	(231,000)	(226,000)	(226,000)	(228,000)	(228,000)	(-3,000)	(-6,000)
	Research and Technology Base.....	97,550	100,550 <sup>a/</sup>	97,550	*	*	97,550	*	*	*	*	*	*
	Systems Studies.....	3,000	3,000	3,000	*	*	3,000	*	*	*	*	*	*
	Systems Technology Programs.....	72,200	74,700 <sup>b/</sup>	72,200	*	*	72,200	*	*	*	*	*	*
	Experimental Programs...	58,250	58,250	58,250	*	*	58,250	*	*	*	*	*	*
254	Space Research and Technology Program.....	(97,700)	(101,700)	(97,700)	(99,700)	(+2,000)	(97,700)	(97,700)	(97,700)	(97,700)	(97,700)	(---	(-2,000)
	Research and Technology Base.....	65,900	69,900	65,900	67,900	+2,000	65,900	65,900	65,900	65,900	65,900	---	-2,000
	Systems Studies.....	2,000	2,000	2,000	2,000	---	2,000	2,000	2,000	2,000	2,000	---	---
	Systems Technology Programs.....	5,800	5,800	5,800	5,800	---	5,800	5,800	5,800	5,800	5,800	---	---
	Experimental Programs...	15,000	15,000	15,000	15,000	---	15,000	15,000	15,000	15,000	15,000	---	---
	Low Cost Systems Program.....	9,000	9,000	9,000	9,000	---	9,000	9,000	9,000	9,000	9,000	---	---
254	<b>ENERGY TECHNOLOGY APPLICATIONS.....</b>	4,500	9,500	4,500	7,500	+3,000	9,500	4,500	4,500	7,500	7,500	+3,000	---
	<b>OFFICE OF TRACKING AND DATA ACQUISITION.....</b>	281,700	278,700	281,700	280,200	-1,500	278,700	279,700	279,700	279,700	279,700	-2,000	-1,000
255	Tracking and Data Acquisition Program.....	(281,700)	(278,700)	(281,700)	(280,200)	(-1,500)	(278,700)	(279,700)	(279,700)	(279,700)	(279,700)	(-2,000)	(-1,000)
	Operations.....	229,900	*	229,900	*	*	*	*	*	*	*	*	*
	Systems Implementation...	42,500	*	42,500	*	*	*	*	*	*	*	*	*
	Advanced Systems.....	9,300	*	9,300	*	*	*	*	*	*	*	*	*
	<b>OFFICE OF INDUSTRY AFFAIRS AND TECHNOLOGY UTILIZATION.....</b>	8,100	9,100	9,100	9,100	+1,000	8,100	8,100	8,100	8,100	8,100	---	-1,000
255	Technology Utilization Program.....	(8,100)	(9,100)	(9,100)	(9,100)	(+1,000)	(8,100)	(8,100)	(8,100)	(8,100)	(8,100)	(---	(-1,000)
	Industrial Applications.	3,445	*	*	*	*	3,445	3,445	3,445	3,445	3,445	---	*
	Technology Applications.	3,640	*	*	*	*	3,640	3,640	3,640	3,640	3,640	---	*
	Program Control and Evaluation.....	1,015	*	*	*	*	1,015	1,015	1,015	1,015	1,015	---	*

\*Undistributed

a/ 3.0 million added to accelerate materials research.

b/ 2.5 million added for agricultural aircraft systems technology.

Prepared by:  
Associate Administrator/  
NASA Comptroller  
Office of Budget Operations  
Code BTf Ext. 58466

# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1978 Budget Submission  
(In thousands of dollars)

Subfunction Code	ITEM	AUTHORIZATION					APPROPRIATION						
		NASA Budget Submission	House Comm. H.R. 4088 Rep. 95-67 3/10/77 Appd. 3/17/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77 Appd. 5/13/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-380 6/2/77 Appd. 6/15/77	Senate Comm. H.R. 7554 Rep. 95-280 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd 7/12/77 Rep. 95-495	Final Cong. Action House 7/19/77 Senate 9/23/77 P.L. 95-119	Difference From Budget Submission	Difference From Authorization
	CONSTRUCTION OF FACILITIES APPROPRIATION:	161,800	158,340	161,800	160,940	-860	160,940	160,940	160,940	160,940	160,940	-860	---
405	<u>DRYDEN FLIGHT RESEARCH CENTER</u> .....	(420)	(420)	(420)	(420)	(---	(420)	(420)	(420)	(420)	(420)	(---	(---
	A-Construction of Central Hydraulic System.....	420	420	420	420	---	420	420	420	420	420	---	---
254	<u>GODDARD SPACE FLIGHT CENTER</u> .....	(3,100)	(3,100)	(3,100)	(3,100)	(---	(3,100)	(3,100)	(3,100)	(3,100)	(3,100)	(---	(---
	E-Construction of Additional Technical Processing Facilities.	3,100	3,100	3,100	3,100	---	3,100	3,100	3,100	3,100	3,100	---	---
255	<u>JET PROPULSION LABORATORY</u> .....	(2,830)	(2,830)	(2,830)	(2,830)	(---	(2,830)	(2,830)	(2,830)	(2,830)	(2,830)	(---	(---
	A-Modifications to Various Buildings for Seismic Protection....	2,830	2,830	2,830	2,830	---	2,830	2,830	2,830	2,830	2,830	---	---
255	<u>JOHNSON SPACE CENTER</u> .....	(2,540)	(2,540)	(2,540)	(2,540)	(---	(2,540)	(2,540)	(2,540)	(2,540)	(2,540)	(---	(---
	A-Modification of Chillers in Central Heating and Cooling Plant.....	2,540	2,540	2,540	2,540	---	2,540	2,540	2,540	2,540	2,540	---	---
255	<u>KENNEDY SPACE CENTER</u> .....	(2,130)	(2,130)	(2,130)	(2,130)	(---	(2,130)	(2,130)	(2,130)	(2,130)	(2,130)	(---	(---
	A-Modifications for Utility Control System.....	2,130	2,130	2,130	2,130	---	2,130	2,130	2,130	2,130	2,130	---	---
255	<u>LANGLEY RESEARCH CENTER</u> .....	(1,770)	(1,770)	(1,770)	(1,770)	(---	(1,770)	(1,770)	(1,770)	(1,770)	(1,770)	(---	(---
405	A-Rehabilitation of Main Heating Plant.....	790	790	790	790	---	790	790	790	790	790	---	---
	R-Rehabilitation of Unitary Plan Wind Tunnel.....	980	980	980	980	---	980	980	980	980	980	---	---
255	<u>LEWIS RESEARCH CENTER</u> .....	(860)	(860)	(860)	(860)	(---	(860)	(860)	(860)	(860)	(860)	(---	(---
	A-Modification of Central Chilled Water System.....	860	860	860	860	---	860	860	860	860	860	---	---
255	<u>NATIONAL SPACE TECHNOLOGY LABORATORIES</u> .....	(620)	(620)	(620)	(620)	(---	(620)	(620)	(620)	(620)	(620)	(---	(---
	A-Modifications for Utility Control System	620	620	620	620	---	620	620	620	620	620	---	---

GPO 899-529

A - Center Operations Project  
 B - NASA Comptroller Project  
 E - Applications Report  
 M - Space Flight Project  
 R - Aeronautics and Space Technology Project  
 T - Tracking and Data Acquisition Project

Prepared by:  
 Associate Administrator/  
 NASA Comptroller  
 Office of Budget Operations  
 Code BTF Ext. 58466

# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1978 Budget Submission  
(In thousands of dollars)

Subfunction Code	I T E M	A U T H O R I Z A T I O N					A P P R O P R I A T I O N						
		NASA Budget Submission	House Comm. H.R. 4088 Rep. 95-67 3/10/77 Appd. 3/17/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77 Appd. 5/13/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-380 6/2/77 Appd. 6/15/77	Senate Comm. H.R. 7554 Rep. 95-280 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd 7/12/77 Rep. 95-495	Final Cong. Action House 11/19/77 Senate 9/23/77 P.L. 95-119 Appd. 10/4/77	Difference From Budget Submission	Difference From Authorization
	<b>LARGE AERONAUTICAL FACILITY.....</b>	(37,000)	(37,000)	(37,000)	(37,000)	(---	(37,700)	(37,000)	(37,000)	(37,000)	(37,000)	(---	(---
405	R-Construction of National Transonic Facility (LaRC).....	23,500	23,500	23,500	23,500	---	23,500	23,500	23,500	23,500	23,500	---	---
405	R-Modification of 40 by 80-Foot Subsonic Wind Tunnel (ARC).....	13,500	13,500	13,500	13,500	---	13,500	13,500	13,500	13,500	13,500	---	---
	<b>VARIOUS LOCATIONS.....</b>	(1,750)	(1,750)	(1,750)	(1,750)	(---	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(---	(---
255	T-Rehabilitation and Modification of 64-Meter Antenna Components.....	1,750	1,750	1,750	1,750	---	1,750	1,750	1,750	1,750	1,750	---	---
	<b>SPACE SHUTTLE FACILITIES AT VARIOUS LOCATIONS AS FOLLOWS:</b>	(65,740)	(61,280)	(65,740)	(64,880)	(-860)	(64,880)	(64,880)	(64,880)	(64,880)	(64,880)	(-860)	(---
253	M-Modifications to Launch Complex 39 (KSC).....	40,700	40,700	40,700	40,700	---	40,700	40,700	40,700	40,700	40,700	---	---
253	M-Modifications for Solid Rocket Booster Processing Facilities (KSC).....	1,730	1,730	1,730	1,730	---	1,730	1,730	1,730	1,730	1,730	---	---
253	M-Rehabilitation for Barge Channels (KSC).	2,090	2,090	2,090	2,090	---	2,090	2,090	2,090	2,090	2,090	---	---
253	M-Modifications for Crew Training Facilities (JSC).....	860	---	860	---	-860	---	---	---	---	---	-860	---
253	M-Modification of Manufacturing, and Final Assembly Facilities for External Tanks (MAF).	18,610	16,010	18,610	18,610	---	18,610	18,610	18,610	18,610	18,610	---	---
253	M-Rehabilitation and Modification of Shuttle Facilities at Various Locations....	1,750	1,750	1,750	1,750	---	1,750	1,750	1,750	1,750	1,750	---	---
	<b>SPACE SHUTTLE PAYLOAD FACILITIES AT VARIOUS LOCATIONS AS FOLLOWS:</b>	(6,410)	(6,410)	(6,410)	(6,410)	(---	(6,410)	(6,410)	(6,410)	(6,410)	(6,410)	(---	(---
254	M-Modifications and Addition for Shuttle Payload Vertical Processing (KSC).....	6,410	6,410	6,410	6,410	---	6,410	6,410	6,410	6,410	6,410	---	---

GPO 899-529

A - Center Operations Project  
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 Associate Administrator/  
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# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1978 Budget Submission  
(In thousands of dollars)

Subfunction Code

ITEM	AUTHORIZATION					APPROPRIATION						
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255 B-REHABILITATION AND MODIFICATION OF FACILITIES AT VARIOUS LOCATIONS.....	(18,900)	(18,900)	(18,900)	(18,900)	(---	(18,900)	(18,900)	(18,900)	(18,900)	(18,900)	(---	(---
255 B-MINOR CONSTRUCTION OF NEW FACILITIES AND ADDITIONS TO EXISTING FACILITIES AT VARIOUS LOCATIONS.....	(5,950)	(5,950)	(5,950)	(5,950)	(---	(5,950)	(5,950)	(5,950)	(5,950)	(5,950)	(---	(---
255 B-FACILITY PLANNING AND DESIGN.....	(11,780)	(11,780)	(11,780)	(11,780)	(---	(11,780)	(11,780)	(11,780)	(11,780)	(11,780)	(---	(---

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## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1978 Budget Submission  
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I T E M	A U T H O R I Z A T I O N							A P P R O P R I A T I O N				
	NASA Budget submission	House Comm. H.R. 4088 Rep. 95-67 3/10/77	Senate Comm. H.R. 4088 Rep. 95-120 5/4/77	Conf. Comm. Appd. 6/21/77 Rep. 95-281 P.L. 95-76 7/30/77	Difference From Budget Submission	House Comm. H.R. 7554 Rep. 95-380 6/2/77	Senate Comm. H.R. 7554 Rep. 95-280 6/21/77	Senate Approved 6/24/77	Conf. Comm. Appd. 7/12/77 Rep. 95-495	Final Cong. Action House 7/19/77 Senate 9/23/77 F.L. 95-115	Difference From Budget Submission	Difference From Authorization
		Appd. 3/17/77	Appd. 3/13/77			Appd. 6/15/77				Appd. 10/4/77		
RESEARCH AND PROGRAM MANAGEMENT APPROPRIATION												
Basic Submission.....	(846,989)	(847,989)	(846,989)	(846,989)	(---)	(844,000)	(841,989)	(844,000)	(844,000)	(844,000)	(-2,989)	(-2,989)
BY INSTALLATION:												
Johnson Space Center....	139,581	*	139,581	139,581	---	*	*	*	*	*	*	*
Kennedy Space Center....	110,141	*	110,141	110,141	---	*	*	*	*	*	*	*
Marshall Space Flight Center.....	134,693	*	134,693	134,693	---	*	*	*	*	*	*	*
National Space Tech- nology Laboratories...	1,942	*	1,942	1,942	---	*	*	*	*	*	*	*
Goddard Space Flight Center.....	116,133	*	116,133	116,133	---	*	*	*	*	*	*	*
Wallops Flight Center...	14,226	*	14,226	14,226	---	*	*	*	*	*	*	*
Ames Research Center....	53,706	*	53,706	53,706	---	*	*	*	*	*	*	*
Dryden Flight Research Center.....	17,034	*	17,034	17,034	---	*	*	*	*	*	*	*
Langley Research Center.	95,411	*	95,411	95,411	---	*	*	*	*	*	*	*
Lewis Research Center...	88,706	*	88,706	88,706	---	*	*	*	*	*	*	*
NASA Headquarters.....	75,416	*	75,416	75,416	---	*	*	*	*	*	*	*
BY FUNCTION:												
Personnel.....	649,104	649,104 <sup>a/</sup>	649,104	649,104	---	*	*	*	*	*	*	*
Travel.....	17,846	18,846 <sup>a/</sup>	17,846	17,846	---	*	*	*	*	*	*	*
Facilities Services....	91,650	91,650	91,650	91,650	---	*	*	*	*	*	*	*
Technical Services.....	38,356	38,356	38,356	38,356	---	*	*	*	*	*	*	*
Administrative Support..	50,033	50,033	50,033	50,033	---	*	*	*	*	*	*	*
SUPPLEMENTAL.....	(46,200)	(45,761)	(45,761)	(45,761)	(-439)	(45,761)	(45,761)	(45,761)	(45,761)	(45,761)	(-439)	(-439)
TOTAL, R&PM.....	893,189	893,750	892,750	892,750	-439	889,761	887,750	889,761	889,761	889,761	-3,428	-3,428

\*Undistributed

a/ Travel increased by 1 million.

Prepared by:  
Associate Administrator/  
NASA Comptroller  
Office of Budget Operations  
Code BTF Ext. 58466

AUTHORIZING APPROPRIATIONS TO THE NATIONAL  
AERONAUTICS AND SPACE ADMINISTRATION

MARCH 10, 1977.—Committed to the Committee of the Whole House on the  
State of the Union and ordered to be printed

Mr. TEAGUE, from the Committee on Science and Technology,  
submitted the following

REPORT

[Including cost estimate and comparison of the Congressional Budget Office]

[To accompany H.R. 4088]

The Committee on Science and Technology, to whom was referred the bill (H.R. 4088) to authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill do pass.

PURPOSE OF THE BILL

The purpose of the bill is to authorize appropriations to the National Aeronautics and Space Administration for fiscal year 1978 as follows:

Programs	Authorization fiscal year 1978	
Research and development.....	\$3,047,500,000	
Construction of facilities.....	158,340,000	
Research and program management...	847,989,000	
<b>Total</b> .....	<b>4,053,829,000</b>	

COMMITTEE ACTIONS

RESEARCH AND DEVELOPMENT

SPACE SHUTTLE

NASA requested \$1,349,200,000 for Space Shuttle for Fiscal Year 1978. Your Committee reviewed the progress of the Space Shuttle program and found it to be within cost and on schedule. Therefore, the Committee recommends no increase in the Fiscal Year 1978 request for Space Shuttle. However, the Committee observes that a highly complex program with a demanding schedule such as the Shuttle could effectively use increased funding for both the design, development, test and evaluation phase and initial Shuttle Orbiter production phase of the program while remaining within the NASA total cost commitments. So that such authority might be available, your Committee has added a new Section 7 to the bill authorizing an increase not to exceed \$95,000,000 for Space Shuttle in Fiscal Year 1977 bringing the total authorized to \$1,383,100,000 for Fiscal Year 1977 in the event that additional appropriated funds become available.

SPACE FLIGHT OPERATIONS

NASA requested \$267,800,000 for Space Flight Operations in Fiscal Year 1978. Within this line item your Committee increased Advanced Programs \$5,000,000 and reduces Space Transportation System Upper Stages \$2,000,000 resulting in a total recommended authorization of \$270,800,000 for Space Flight Operations for Fiscal Year 1978. NASA requested in submissions to Office of Management and Budget, a budget containing studies programs for space industrialization. All funds for this effort were deleted from the Fiscal Year 1978 budget requests. It has been the position of the Committee that all reasonable steps should be taken to gain the full potential of practical space application at the earliest possible time. Studies are required to demonstrate the need for and value of space industrialization in order to address the long-range goals and objectives of the U.S. civilian space program. Continuation of these studies in Fiscal Year 1978 will provide definitive cost estimates to guide in the determination as to proceeding in subsequent years with industrialization of space.

Recent events indicate that private interest can develop upper stages without government funded development. Therefore, the Committee reduced Space Transportation System Operations Capability Development by \$2,000,000 in recognition that economy can be realized.

#### EXPENDABLE LAUNCH VEHICLES

NASA requested \$136,500,000 for the Expendable Launch Vehicle Program in fiscal year 1978. Within this line item the Committee decreased supporting activities by \$7,000,000. The Committee notes that NASA has made efforts toward consolidating all launch activities in the Office of Space Flight and because of the maturity of the program the Committee recognizes the ability to achieve greater economies in this area. Therefore, the Committee recommends that a total of \$129,500,000 be authorized for the Expendable Launch Vehicles Program in fiscal year 1978.

#### PHYSICS AND ASTRONOMY

NASA requested \$224,200,000 for Physics and Astronomy programs in Fiscal Year 1978. Within this line item the Committee increased Supporting Research and Technology programs by \$5,000,000 resulting in a total recommended authorization of \$229,200,000 for Physics and Astronomy for fiscal year 1978. The Committee reviewed the fiscal year 1978 request of \$16,800,000 for Supporting Research and Technology and compared the funding history of this line item with previous years. The Supporting Research and Technology budget has been almost constant for a number of years, resulting in a decline of the technology base in the university community and a net decrease in the amount of research that can be accomplished. The efforts supported by these funds enhance the scientific and technological return from flight projects and help assure the continued viability of future research in physics and astronomy. Therefore, the Committee recommends a total authorization of \$21,800,000 for Supporting Research and Technology for fiscal year 1978, an increase of \$5,000,000 to the NASA request to be used for augmenting the supporting research and technology base in the university community.

#### LUNAR AND PLANETARY EXPLORATION

NASA requested \$158,200,000 for Lunar and Planetary Exploration in fiscal year 1978. Within this line item the Committee increased Supporting Research and Technology programs by \$1,000,000, added \$7,000,000 for initiation of development of the Lunar Polar Orbiter and reduced the Mars Follow-on Mission Definition by \$5,000,000 resulting in a total recommended authorization of \$161,200,000 for Lunar and Planetary Exploration in fiscal year 78.

*Supporting Research and Technology.*—NASA requested \$13,000,000 for Lunar and Planetary Supporting Research and Technology programs in fiscal year 1978. The Committee recommends an increase of \$1,000,000 to augment the planned level of activities and to offset the effects of inflation for a total authorization of \$14,000,000.

*Lunar Polar Orbiter.*—NASA requested funds for the Lunar Polar Orbiter from the Office of Management and Budget. These funds were deleted from the NASA budget submission to Congress. The investigation of any solar-system object can be divided into three categories: reconnaissance, exploration, and intensive study. It is apparent that the reconnaissance mode of study of the inner solar system is com-

pleted and that the general technology for a new generation of exploration studies exist. The most attractive way to learn about the moon and moonlike planets at this stage in exploration is by a sequence of missions in which a geochemical/geophysical polar orbiter is placed around each body. For the moon, geochemical and geophysical orbital mapping are needed to develop a global view, integrated with the sample data. Therefore, the Committee recommends an addition of \$7,000,000 to initiate development of the Lunar Polar Orbiter mission to study lunar composition, gravity, magnetism, heat flow, and imagery. The Committee further notes that the design of the Lunar Polar Orbiter spacecraft and experiments should accommodate future missions to the moonlike planets.

*Mars Follow-on Mission Definition.*—NASA requested \$15,000,000 for definition studies of a Mars Follow on Mission. The Committee fully supports a logical and productive next step to the highly successful Viking mission but believes that the definition of this mission can be accomplished with less funding. Therefore, the Committee recommends a decrease of \$5,000,000 resulting in an authorization of \$10,000,000 for Mars Follow-on Definition studies.

#### SPACE APPLICATIONS

NASA requested \$233,800,000 for Space Applications in fiscal year 1978. Within this line item the Committee transferred \$26,900,000 for the LANDSAT-D program to a new line item entitled Earth Resources Operational Systems and increased weather and climate observation and forecasting by \$5,000,000 resulting in a total recommended authorization for fiscal year 1978 of \$211,900,000 for Space Applications.

Funds for weather and climate observation and forecasting declined from fiscal year 1976 to fiscal year 1977. A further reduction was proposed for fiscal year 1978. Coupled with the effects of inflation this decline was assessed by the Committee as having an unfavorable effect on maintenance of an adequate weather and climate research and development effort. Therefore, the increase of \$5,000,000 was provided to maintain a reasonably constant level in program effort for fiscal year 1978.

#### EARTH RESOURCES OPERATIONAL SYSTEMS

The Committee has added a new line item entitled Earth Resources Operational Systems to the fiscal year 1978 NASA authorization bill and has transferred to the line item the funding requested under Space Applications for LANDSAT D. LANDSAT-D has been proposed as a new initiative to advance the technology and techniques for earth resources remote sensing by utilizing the capabilities of the second generation experimental multispectral scanner, the Thematic Mapper currently under development. The project will also test a total end-to-end data acquisition, processing, dissemination, and analysis system by bringing the data to the users in a timely fashion (five to seven days) on a routine basis.

The Committee believes that the outstanding success of LANDSAT 1 and 2, the expected results of LANDSAT-C, and the goals of this

project justify moving forward to an operational remote sensing system to assure various users timely and accurate land use data, crop forecasting and better management of our nation's resources.

The insertion of this new line item should not be interpreted as an inhibition to continuing research and development activity for the improvement of this nation's remote sensing technology and capability as embodied in such programs as Thematic Mapper, Heat Capacity Mapping Mission and other application and demonstration activity. Therefore, the Committee recommends \$26,900,000 for Earth Resources Operational Systems for fiscal year 1978.

#### AERONAUTICAL RESEARCH AND TECHNOLOGY

NASA requested \$231,000,000 for Aeronautical Research and Technology. The Committee is pleased to note that this amount represents real growth of approximately 15 percent for fiscal year 1978, the first real growth since fiscal year 1973.

The Committee has repeatedly maintained, doing so most recently in its report, "The Future of Aviation," that investments in aeronautical R. & D. must be increased. This is based on the need for such investments to preserve U.S. preeminence in aviation, the benefits of which can be measured in millions of jobs for Americans and in large contributions to our balance of payments. Accordingly, the Committee increased the requested amount by \$3,000,000 to accelerate the extremely promising materials work in superplastic forming and diffusion bonding and to reverse the recent downward trend in independent university research.

An additional \$2,500,000 was added to establish a line item for agricultural aircraft systems technology under the Systems Technology Program for a total authorization of \$236,500,000.

#### SPACE RESEARCH AND TECHNOLOGY

NASA requested \$97,700,000 for Space Research and Technology programs in fiscal year 1978. Within this line item the Committee increased the Research and Technology Base \$4,000,000 to offset inflation and to augment advanced propulsion technology resulting in a total recommended authorization of \$101,700,000 for Space Research and Technology programs.

NASA requested \$65,900,000 for Research and Technology Base activities in fiscal year 1978. The Committee increased this amount \$4,000,000 for the total authorization of \$69,900,000 for Research and Technology Base programs including \$2,000,000 for advanced propulsion technology. The increase for advanced propulsion concepts is based on a belief that a major advance in propulsion is necessary to augment chemical propulsion capability to realize a number of longer term space program opportunities. The \$2,000,000 for advanced propulsion technology should be directed toward an expanded program of fundamental research and exploratory development in new propulsion concepts including gaseous nuclear engines, nuclear electric propulsion, atomic and metallic hydrogen, and laser propulsion and excluding "solar sailing" concepts.

#### ENERGY TECHNOLOGY APPLICATIONS

NASA requested \$4,500,000 for Energy Technology Applications activities in fiscal year 1978. Within the line item, the Committee increased Energy Systems/Satellite Solar Power Systems by \$5,000,000 resulting in a total recommended authorization of \$9,500,000 for Energy Technology Applications in fiscal year 1978. NASA requested \$1,000,000 for Energy Systems/Satellite Solar Power System studies in fiscal year 1978. The Committee increased this amount \$5,000,000 for a total authorization of \$6,000,000 to significantly broaden the system definition effort and to initiate a comprehensive environmental impact and benefit analysis. The Committee carefully reviewed the merits of this program and believes that solar satellite system concepts offer an exciting and challenging possibility for meeting future energy needs.

#### TRACKING AND DATA ACQUISITION

The Committee decreased the Tracking and Data Acquisition Program budget request of \$281,700,000 for fiscal year 1978 by \$3,000,000 as a result of a thorough review of anticipated workload of the total tracking systems.

The Committee commends the Office of Tracking and Data Acquisition for their continued excellent performance while recognizing their ability to achieve greater economies in this area. Therefore, the Committee recommends that a total of \$278,700,000 be authorized for the fiscal year 1978 for the Tracking and Data Acquisition Program.

#### TECHNOLOGY UTILIZATION

NASA requested \$8,100,000 for fiscal year 1978 for activities in Technology Utilization area which is identical to the fiscal year 1977 request. The Committee observes that this is a relatively small investment to guarantee a high return on the research and development dollars invested in the NASA mainline programs. Consequently, the Committee increased by \$1,000,000 the Technology Utilization Program to offset the effect of inflation and provide latitude to continue to strengthen the program. Therefore, the Committee recommends \$9,100,000 for Technology Utilization for fiscal year 1978. To assure that the technology utilization effort is evaluated, the Committee requests that within the increase of \$1,000,000 NASA conduct a cost-benefits analysis of the program and report the results of that effort to the Committee not later than December 31, 1977.

#### CONSTRUCTION OF FACILITIES

NASA requested \$161,800,000 for Construction of Facilities in fiscal year 1978. The Committee deleted \$860,000 for the construction of Crew Training Facilities at Johnson Space Center and \$2,600,000 for the construction of a chemical waste treatment facility at Michoud Manufacturing Facility. Therefore the Committee recommends a total authorization of \$158,340,000 for Construction of Facilities Programs.

#### JOHNSON SPACE CENTER

NASA submitted a request of \$860,000 for construction of Crew Training Facilities, principally a water immersion tank, to be constructed at the Johnson Space Center to support the Shuttle Program. The Committee recognizes the need for proper crew training in a weightless environment. However, NASA has not substantiated this facility on the basis of an eight year life cycle cost. Facilities already exist at the Marshall Space Flight Center and the Committee is concerned about the added cost incurred in operating two facilities. Since the cost of operation and maintenance outweigh the cost of initial construction and since existing facilities exist the Committee recommends that \$860,000 be deleted and no line item for this facility be included in the bill.

#### MICHOUD MANUFACTURING FACILITY

NASA requested \$18,610,000 for modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility. Within this line item NASA has requested \$2,600,000 for the construction of a Chemical Waste Treatment Facility. The Committee strongly supports facilities which contribute to maintaining a clean and healthy environment. The waste products emanating from the manufacture of the external tank for the Shuttle Program are highly toxic. Presently, NASA uses deep injection well waste disposal which has proved to be satisfactory. The proposed chemical waste treatment facility is to improve waste disposal and conserve water. The Committee notes that the proposed chemical waste treatment facility has not been designed and while a preliminary engineering report has been prepared, that report mentions the need for bench scale experiments to support design. The Committee believes that the complexity of the facility requires the satisfactory completion of bench scale experiments and completion of final design in order to better evaluate the performance risks and total costs before start of construction. The Committee therefore recommends that \$2,600,000 for chemical waste treatment facilities be deferred bringing the total recommended for modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility to \$16,010,000 for fiscal year 1978.

#### RESEARCH AND PROGRAM MANAGEMENT

NASA requested \$846,989,000 for the civil service staff needed to perform in-house research and to manage the R&D programs, and other institutional elements such as utilities, travel, maintenance, operation of facilities, technical and administrative support in fiscal year 1978.

The Committee notes with approval the effort that NASA made in holding estimated Research and Program Management costs at essentially the fiscal year 1977 level (except for federal pay increases). This was achieved despite substantial increases in labor and utility rates, and in the costs of travel.

The Committee finds that in the majority of cases the economy measures instituted by NASA have been absorbed without significant impact to the research and development mission. The exception is travel. This budget category has been increasingly constrained in recent years to the point where the amount requested for fiscal year 1978 is inadequate, especially in the area of professional travel. The Committee believes that the climate for innovation, and therefore the future viability of NASA as a research institution, will be diminished by further reductions in travel. Accordingly, the Committee, to restore travel approximately to the fiscal year 1977 level, added \$1,000,000 to the amount for Research and Program Management, for a total authorization of \$847,989,000 for fiscal year 1978.

#### LANGUAGE AMENDMENTS

##### *Section 1(h)*

The Committee acted to rescind \$6,500,000 which represents that part of the authorization included in Section 1(b)(4) of the fiscal year 1976 NASA Authorization Act, for which appropriations have not been made. That section authorized \$12,500,000 as the first increment of funding for the 40 x 80 foot Subsonic Tunnel at Ames Research Center.

##### *Section 1(i)*

The Committee acted to rescind \$6,000,000 which represents that part of the authorization included in Section 1(b)(14)(B) of the fiscal year 1977 NASA Authorization Act, for which appropriations have not been made. That section authorized \$18,855,000 for modifications to launch complex 39, John F. Kennedy Space Center.

##### *Section 7*

A new Section 7 is included to provide an increase in authorization in fiscal year 1977 of \$95,000,000 for augmentation of the Research, Development, Test and Evaluation program and acceleration of the Orbiter production for the Space Shuttle Program.

## COMMITTEE VIEWS

### SHUTTLE AND SPACELAB PAYLOADS

The Committee is encouraged by NASA's expanded efforts in planning Space Shuttle utilization as indicated by increased funding requests for Shuttle and Spacelab payload development within the various program offices. Experimental instrumentation and orbital facilities developed as payloads to meet specific program office objectives can provide opportunities for equipment commonality which transcend these program offices. Coordination is necessary to minimize the number of multi-mission and payload support equipment being developed to provide integration for a broad range in science, technology and application payloads. It is the view of the Committee that NASA should strengthen its coordinative effort to assure that the various program offices are fully effective in bringing together common payload requirements whenever they exist.

### ORBITING EXPLORERS

The Committee notes that NASA has again reprogrammed funds from the Orbiting Explorer program to cover unexpected funding requirements for other programs. The Committee believes that the goals and objectives of the Orbiting Explorer program are sufficiently important to require the funds requested and encourages NASA to utilize these funds as requested.

### SEASAT PROGRAM FOLLOW-ON

The Committee was encouraged in its September hearings by NASA's activity with the SEASAT user community and looked forward to receiving NASA's long range program plan in the fiscal year 1978 Authorization request. Since such a plan has not been presented, the Committee requests that NASA provide to the Committee at the earliest practicable date a follow-on plan for SEASAT.

### SPACE PROCESSING

The Committee notes with approval the continuing projected growth of the space processing technology program and NASA's effort in identifying potential applications of this important new technology.

The Committee commends the National Aeronautics and Space Administration for recognizing materials processing in space as a forward looking activity which will help bring benefits to a broad segment of the entire public and urges increased efforts in ground based and rocket-borne research activity prior to the availability of the Space Shuttle.

### AERONAUTICAL TEST FACILITIES

The Committee is gratified to note that three urgently needed new national aeronautical test facilities all received funding in fiscal year 1977. They are: (1) the Aeropropulsion Systems Test Facility (ASTF) at the Air Force Arnold Engineering Development Center, Tennessee; (2) the National Transonic Facility at NASA's Langley Research Center, Va.; and (3) modernization of the 80 x 80-foot Subsonic Tunnel at NASA's Ames Research Center, Calif.

In view of the need to maintain U.S. civil and military leadership in aeronautics and the vital contribution of modern test facilities to that maintenance, the Committee wishes to stress the overriding need for NASA and the Air Force to complete the construction quickly so that aircraft now in development may receive adequate testing before being committed to production.

### TECHNOLOGY FOR ADVANCED SUPERSONIC TRANSPORTS

The Committee, in its report, "The Future of Aviation," recommended that it is in the national interest for the United States to build an economically acceptable, economically viable advanced supersonic transport.

The Committee is concerned because a research and technology base is not being developed in the United States that is adequate to permit development of an American AST in the foreseeable future. Since such a development will require more than 10 years even after a 4- or 5-year intensive technology effort, now is the time for careful long range planning if the United States is to gain a pre-eminence in this field.

The Aeronic Branch of the Army Program Office, as extensively planned in response to congressional requests and now being implemented by NASA, is a most effective way to develop and to integrate the research and technology base necessary to make possible a new generation of fuel efficient subsonic transport aircraft in the 1980s. A similar effort is needed for the development of supersonic transport (AST). Accordingly, the Committee requests that the Administrator of NASA prepare an overall program plan with the goal of achieving technology readiness for such an aircraft by the early 1980s.

The plan should describe the efforts needed in each of the major technology disciplines, the associated costs and the significant milestones.

In addition, an analysis of the broader economic and policy questions should be prepared in conjunction with the program plan.

Among the important factors to be addressed are:

- (1) Economic analysis covering investment/return aspects of development implementation.
- (2) Societal benefits of supersonic transportation, including trade and communications.
- (3) Societal, including environmental impacts from the operation of a fleet of supersonic transports.
- (4) Approaches for development financing.

(5) Extent of Federal government participation in the development and alternatives for organizational arrangements.

Furthermore, the Committee expects that NASA will develop these plans in full coordination with DOT, DOD, EPA, other appropriate government and non-government agencies with the aviation industry and with State and local governments in whose area such aircraft will likely be operated. It is essential that adequate comprehensive planning be conducted in advance to insure that the AST will be both operationally and environmentally acceptable at airports where it is intended to be operated.

The results of the outlined study should be available for Committee consideration during the fiscal year 1979 Authorization hearings in September 1977.

#### HEALTH OF THE AERONAUTICAL RESEARCH AND TECHNOLOGY BASE

The R&T Base is the reservoir of basic knowledge that exists at any particular time to sustain the growth of new technological products. As new technology is directed away to be applied in new products, the R&T Base is depleted. It must therefore be replenished periodically to feed the next crop of aviation advances.

The Committee finds that because of an overemphasis on immediate results there has been a trough in recent years. We have been living off the R&T Base that was built up in the 1950's, and which is now severely depleted. It is therefore time to refill the reservoir with long-range research ideas so that the current worldwide American leadership in aeronautics can be maintained. Of particular concern is a worsening climate for innovation at NASA caused by the recent decline in the number of "in-house" researchers, especially young researchers, devoted to aeronautical R&T. The Committee recognizes that there is a variety of possible means available to correct this trend ranging from reallocating civil service positions within NASA, to innovative concepts employing the use of NASA "fellows" in industry and at the universities. Accordingly the Committee requests the Administrator of NASA to examine the benefits and tradeoffs of these and other possible concepts and to report his findings not later than September 1977.

#### SHORT TAKE-OFF AND LANDING TECHNOLOGY

The Committee has examined the issues, raised recently, concerning the pace and scope of NASA's program in STOL technology. Department of Transportation planners, manufacturers and the airlines all agree that the time when large STOL aircraft will be needed and are economically feasible is at least several years away.

NASA has been totally responsive to these projections in structuring their STOL program, which is being conducted at a relatively low level. The Committee believes, furthermore, that, because of the military as well as the potential civil implications, it is entirely proper for NASA to be involved in this area of flight research.

#### ENERGY RESEARCH AND DEVELOPMENT

The Committee observes that in the continuing energy crisis all potential energy sources should be thoroughly evaluated to determine their value to the Nation. The Committee further observes that solar satellite power represents one of the potentially promising sources of energy and that NASA expertise and facilities need to be used to the fullest extent possible to assure that this technology is evaluated. Therefore, the Committee urges that the President and responsible energy authorities within the executive branch encourage the use of NASA expertise and facilities by:

(a) allocating sufficient funds to the National Aeronautics and Space Administration for verification of the technology essential to solar satellite power demonstration, and

(b) reviewing the existing National Aeronautics and Space Administration facilities and equipments complement to assure that these National assets are employed in solution of our energy problem.

#### ENERGY TECHNOLOGY IDENTIFICATION AND VERIFICATION

The Committee believes that the identification and verification of energy research ideas is one of the most important tasks of the Committee. The Committee believes that the most basic, but often neglected, step in the process is to identify and define the energy research ideas that exist, and then to evaluate the capabilities of the existing research facilities to support these ideas. In support of the Energy Research and Development Administration (ERDA). However, the Committee believes that it is essential to expand this activity and encourage the identification of energy research ideas.

#### TRACKING AND DATA ACQUISITION PROGRAM

The Committee finds that the amount of activity the Office of Tracking and Data Acquisition supports in its high coverage of both earth orbit and deep space satellite programs is exemplary. However, it appears that the opportunity exists to reduce data acquisition in some areas and, therefore, NASA should consider carefully reducing data acquisition on a selected basis. The Committee observes such a plan is not only prudent but also necessary if NASA is to maintain its high standard of service both in quality and quantity of scientific and engineering satellite data in the fore-seeable future.

#### CONSTRUCTION OF FACILITIES

##### Launch Complex 39

The Committee supports NASA's planning for a second launch pad at the Kennedy Space Center for the Space Shuttle Program. The first pad, presently under construction, will have an optimum launch capability of 35 missions annually. However, unforeseen delays during launch operations and adverse weather conditions could easily reduce this capability. The second pad is necessary to assure the capability to launch 40 missions annually.

The Committee notes that approximately half of the 40 missions are independent of the need for the payload change-out room being constructed at the first pad. For this reason, the Committee requests NASA to review the design for the second pad and if feasible, to substitute a less costly service platform at the second pad. The Committee further requests that NASA inform the Committee of their findings before starting construction of the second pad.

**REHABILITATION AND MODIFICATION OF FACILITIES**

The Committee noted its concern in the authorization report accompanying H.R. 12453 that there was an increasing number of Rehabilitation and Modification projects included in the annual request which appeared to be incrementally funded, or phased over two or more years. Further, it was the Committee's understanding that major Rehabilitation and Modification costing in excess of \$500,000 would be programmed as discrete line items. The Committee in this regard remains unchanged, and NASA is once again urged to abide by the original intent in further requests for annual authorization. Specifically, projects such as rehabilitation and modification of the electrical distribution system at the Langley Research Center should be defined in its entirety as a discrete line item so that the Committee may weigh its responsibility in embarking upon a project of significant magnitude.

**NASA INSTITUTIONAL COSTS**

The Committee recognizes that it is incorrect to equate the Research and Program Management budget with overhead or with the institution function. For example, compensation for research and development personnel and utility costs for NASA facilities can not be correctly considered overhead, although they are included in the Research and Program Management line item. Conversely, program support costs, which are funded by the Development, Test and Mission Operations line and by a non-line-item category of funds called Institutional Management System, might be classified as institutional. Since this situation exists, and to have the greatest possible visibility of all institutional costs, it is requested that NASA recommend to the Committee prior to the consideration of the fiscal year 1979 budget submission to Congress, possible improvements in cost reporting to achieve this goal.

**SUPPORT SERVICE CONTRACTORS**

The Committee commends the recent effort by NASA to establish consistent definitions and accounting for support service contractors. The results will allow "headcount" controls to be applied uniformly at all field centers. However, the Committee is concerned about the potential effect of such controls on the centers' ability to manage their research and development responsibilities effectively. In an environment of rapidly changing requirements, some flexibility to move funds between manpower and programs is needed. Therefore, the Committee

requests that NASA examine current policies in this area, including the need for manpower ceilings; and report such findings to the Committee not later than September, 1977.

**OFFICE OF PUBLIC AFFAIRS**

The Committee takes note of the recent action by the Motion Picture Academy of Arts and Sciences in nominating a NASA produced documentary film entitled "The Universe" as one of the four finalist in its upcoming Academy Awards presentation.

The Committee takes this opportunity to congratulate the Office of Public Affairs for this nomination and urges NASA to continue its pursuit of excellence to actively inform the public on NASA programs.

**EXPLANATION OF THE BILL**

**RESEARCH AND DEVELOPMENT**

**SUMMARY**

Programs	Authorization fiscal year 1978	Page No.
1. Space Shuttle	\$1,349,200,000	23
2. Space flight operations	270,800,000	33
3. Expendable launch vehicles	129,500,000	44
4. Physics and astronomy	229,200,000	46
5. Lunar and planetary exploration	161,200,000	57
6. Life science	33,300,000	69
7. Space applications	211,900,000	71
8. Earth resources operational systems	26,900,000	108
9. Aeronautical research and technology	236,500,000	109
10. Space research and technology	101,700,000	130
11. Energy technology applications	9,500,000	142
12. Tracking and data acquisition	278,700,000	143
13. Technology utilization	9,100,000	154
<b>Total</b>	<b>3,047,500,000</b>	

## CONSTRUCTION OF FACILITIES

## SUMMARY

Projects	Authorization	Page No.
1. Construction of central hydraulic system, Hugh L. Dryden Flight Center.....	\$420, 000	158
2. Construction of additional technical processing facilities, Goddard Space Flight Center.....	3, 100, 000	158
3. Modifications to various buildings for seismic protection, Jet Propulsion Laboratory.....	2, 830, 000	159
4. Modification of chillers in central heating and cooling plant, Lyndon B. Johnson Space Center.....	2, 540, 000	159
5. Modification for utility control system, John F. Kennedy Space Center.....	2, 130, 000	160
6. Rehabilitation of main heating plant, Langley Research Center.....	790, 000	160
7. Rehabilitation of unitary plan wind tunnel, Langley Research Center.....	980, 000	161
8. Modification of chilled water system, Lewis Research Center.....	860, 000	161
9. Modifications for utility control system, National Space Technology Laboratories.....	620, 000	161
10. Large aeronautical facilities, various locations:		
(A) Construction of national transonic facility, Langley Research Center.....	23, 500, 000	162
(B) Modification of 40 by 80 foot subsonic wind tunnel, Ames Research Center.....	13, 500, 000	162
11. Rehabilitation and modification of 64 meter components, Goldstone, California; Canberra, Australia; and Madrid, Spain.....	1, 750, 000	164

## CONSTRUCTION OF FACILITIES—Continued

## SUMMARY—Continued

Project	Authorization	Page No.
12. Space Shuttle Facilities at various locations as follows:		
(A) Modifications to launch complex 39, John F. Kennedy Space Center.....	40, 700, 000	164
(B) Modifications for solid rocket booster processing facilities, John F. Kennedy Space Center.....	1, 730, 000	166
(C) Rehabilitation of barge channels, John F. Kennedy Space Center.....	2, 090, 000	166
(D) Modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly facilities.....	16, 010, 000	167
(E) Rehabilitation and modification of shuttle facilities at various locations.....	1, 750, 000	167
13. Modifications and addition for shuttle payload vertical processing, John F. Kennedy Space Center.....	6, 410, 000	171
14. Rehabilitation and modification of facilities at locations, not in excess of \$500,000 per project.....	18, 900, 000	172
15. Minor construction of new facilities and additions to existing facilities at various locations, not in excess of \$250,000 per project.....	5, 950, 000	175
16. Facility planning and design not otherwise provided for.....	11, 780, 000	177
(A) Master planning.....	240, 000	177
(B) Sustaining engineering support.....	1, 255, 000	177
(C) Preliminary engineering reports and related special engineering support.....	1, 655, 000	179
(D) Final design.....	2, 950, 000	179
(E) Other requirements.....	5, 680, 000	180
Total.....	158, 340, 000	

## RESEARCH AND PROGRAM MANAGEMENT

The Research and Program Management appropriation provides for: (1) the civil service staff needed to perform in-house research, technology, and test activities; and to plan, manage, and support the Research and Development programs; and (2) the other elements of operational capability of the laboratories and facilities such as utilities; logistics support including travel and transportation, maintenance, and operation of facilities; and technical and administrative support. Over three-fourths of this appropriation is required to cover salaries and related costs of civil service employees. The balance, consisting of travel, facilities services, technical services, and administrative support of all NASA installations, provides the support and related goods and services which make possible the efficient accomplishment of NASA's approved missions.

SUMMARY OF OBLIGATIONS BY FUNCTION  
(In thousands of dollars)

	1976 actual	Transition quarter actual	1977		1978 budget estimate
			Budget estimate	Current estimate	
Personnel and related costs.....	608,789	156,855	615,630	616,028	616,804
Travel.....	17,312	4,772	17,143	17,704	17,846
Facilities services.....	83,768	28,325	98,005	92,342	91,630
Technical services.....	36,392	14,184	36,976	37,752	38,256
Administrative support.....	46,051	16,033	46,301	49,174	50,833
Subtotal.....	792,312	220,169	814,055	813,000	814,789
October 1976 pay raise.....				31,777	32,200
Total.....	792,312	220,169	814,055	844,777	846,989
Increase for travel.....					1,000
Total.....	792,312	220,169	814,055	844,777	847,989

SUMMARY OF OBLIGATIONS BY INSTALLATION  
(In thousands of dollars)

	1976 actual	Transition quarter actual	1977		1978 budget estimate
			Budget estimate	Current estimate	
Johnson Space Center.....	128,817	37,470	134,254	139,743	139,581
Kennedy Space Center.....	99,794	28,610	103,624	107,027	110,141
Marshall Space Flight Center.....	132,799	35,709	133,165	138,557	134,693
National Space Technology Laboratories.....	1,752	444	1,833	1,917	1,942
Goddard Space Flight Center.....	108,580	28,626	109,176	115,872	116,133
Wallops Flight Center.....	13,081	3,985	13,554	13,999	14,229
Ames Research Center.....	50,964	13,285	50,518	53,673	53,706
Dryden Flight Research Center.....	14,512	5,319	15,832	17,267	17,034
Langley Research Center.....	93,169	24,187	91,691	95,414	95,411
Lewis Research Center.....	80,677	22,214	85,739	87,538	88,706
Headquarters.....	68,167	20,320	74,569	73,870	75,416
Total.....	792,312	220,169	814,055	844,777	846,989
Addition for travel.....					1,000
Total.....	792,312	220,169	814,055	844,777	847,989

## SECTIONAL ANALYSIS

**A BILL** To authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes

### Section 1

Subsections (a), (b), and (c) would authorize to be appropriated to the National Aeronautics and Space Administration funds, in the total amount of \$4,053,829,000, as follows: (a) for "Research and development," a total of 13 program line items aggregating the sum of \$3,047,500,000; (b) for "Construction of facilities," a total of 16 line items aggregating the sum of \$158,340,000; and (c) for "Research and program management," \$847,989,000. Subsection (c) would also authorize to be appropriated such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

Subsection 1(d) would authorize the use of appropriations for "Research and development" without regard to the provisions of subsection 1(g) for: (1) items of a capital nature (other than the acquisition of land) required at locations other than NASA installations for the performance of research and development contracts; and (2) grants to nonprofit institutions of higher education, or to nonprofit organizations whose primary purpose is the conduct of scientific research, for purchase or construction of additional research facilities. Title to such facilities shall be vested in the United States unless the Administrator determines that the national program of aeronautical and space activities will best be served by vesting title in any such grantee institution or organization. Moreover, each such grant shall be made under such conditions as the Administrator shall find necessary to insure that the United States will receive benefit therefrom adequate to justify the making of that grant.

In either case no funds may be used for the construction of a facility in accordance with this subsection, the estimated cost of which, including collateral equipment, exceeds \$250,000, unless the Administrator notifies the Speaker of the House, the President of the Senate and the specified committees of the Congress of the nature, location, and estimated cost of such facility.

Subsection 1(e) would provide that, when so specified in an appropriation Act, (1) any amount appropriated for "Research and development" or for "Construction of facilities" may remain available without fiscal year limitation, and (2) contracts for maintenance and operation of facilities, and support services may be entered into under the "Research and program management" appropriation for periods not in excess of twelve months beginning at any time during the fiscal year.

Subsection 1(f) would authorize the use of not to exceed \$35,000 of the "Research and program management" appropriation for scien-

tific consultations or extraordinary expenses, including representation and official entertainment expenses, upon the authority of the Administrator, whose determination shall be final and conclusive.

*Subsection 1(g)* would provide that of the funds appropriated for "Research and development" and "Research and program management," not in excess of \$25,000 per project (including collateral equipment) may be used for construction of new, or additions to existing facilities, and not in excess of \$50,000 per project (including collateral equipment) may be used for rehabilitation or modification of existing facilities; however, of the funds appropriated for "Research and development," not in excess of \$250,000 per project (including collateral equipment) may be used for construction of new facilities or additions to, or rehabilitation or modification of, existing facilities required for unforeseen programmatic needs.

*Subsection 1(h)* would rescind \$6,500,000 which represents that part of the authorization included in Section 1(b)(4) of the National Aeronautics and Space Administration Authorization Act, 1976, for which appropriations have not been made.

*Subsection 1(i)* would rescind \$6,000,000 which represents that part of the authorization included in Section 1(b)(14)(B) of the National Aeronautics and Space Administration Authorization Act, 1977, for which appropriations have not been made.

#### *Section 2*

Section 2 would authorize upward variations of the sums authorized for the "Construction of facilities" line items (other than facility planning and design) of 10 per centum at the discretion of the Administrator or his designee, or 25 per centum following a report by the Administrator or his designee to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate on the circumstances of such action, for the purpose of meeting unusual cost variations. However, the total cost of all work authorized under these line items may not exceed the total sum authorized for "Construction of facilities" under subsection 1(b), paragraphs (1) through (15).

#### *Section 3*

Section 3 would provide that not more than one-half of 1 per centum of the funds appropriated for "Research and development" may be transferred to the "Construction of facilities" appropriation and, when so transferred, together with \$10,000,000 of the funds appropriated for "Construction of facilities," shall be available for the construction of facilities and land acquisition at any location if the Administrator determines (1) that such action is necessary because of changes in the space program or new scientific or engineering developments, and (2) that deferral of such action until the next authorization Act is enacted would be inconsistent with the interest of the Nation in aeronautical and space activities. However, no such funds may be obligated until 30 days have passed after the Administrator or his designee has transmitted to the Speaker of the House, the President of the Senate and

the specified committees of Congress a written report containing a description of the project, its cost, and the reason why such project is necessary in the national interest, or each such committee before the expiration of such 30-day period has notified the Administrator that no objection to the proposed action will be made.

#### *Section 4*

Section 4 would provide that, notwithstanding any other provision of this Act—

(1) no amount appropriated pursuant to this Act may be used for any program deleted by the Congress from requests as originally made to either the House Committee on Science and Technology or the Senate Committee on Commerce, Science, and Transportation;

(2) no amount appropriated pursuant to this Act may be used for any program in excess of the amount actually authorized for that particular program by subsections 1(a) and 1(c); and,

(3) no amount appropriated pursuant to this Act may be used for any program which has not been presented to or requested of either such committee,

unless (A) a period of 30 days has passed after the receipt by the Speaker of the House, the President of the Senate and each such committee of notice given by the Administrator or his designee containing a full and complete statement of the action proposed to be taken and the facts and circumstances relied upon in support of such proposed action, or (B) each such committee before the expiration of such period has transmitted to the Administrator written notice to the effect that such committee has no objection to the proposed action.

#### *Section 5*

Section 5 would express the sense of the Congress that it is in the national interest that consideration be given to geographical distribution of Federal research funds whenever feasible and that the National Aeronautics and Space Administration should explore ways and means of distributing its research and development funds whenever feasible.

#### *Section 6*

Section 6 would authorize the National Aeronautics and Space Administration, when so provided in an appropriation Act, to enter into and maintain a contract (or contracts) for tracking and data relay satellite services. The Government would incur no costs under such contract prior to the furnishing of such services except that the contract could provide for the payment for contingent liability of the Government which may accrue in the event the Government should decide for its convenience to terminate the contract before the expiration of the contract period. Such tracking and data relay satellite services would be furnished to the Administration in accordance with applicable authorization and appropriation Acts. It is envisaged that facilities may be required to be provided under such a contract in order to provide such services. The bill would authorize the construction

of such facilities on Government-owned land if there is included in the contract a provision under which the United States may, in accordance with terms and conditions agreed upon in the contract, acquire title to the facilities upon contract termination. In January of each year the Administrator would be required to report to the Committee on Science and Technology and the Committee on Appropriations of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate the projected aggregate contingent liability, through the next fiscal year, of the Government under termination provisions of any contract authorized under this section. This section would become permanent law in that it is specified that the authority of the National Aeronautics and Space Administration to enter into and maintain the contract (or contracts) authorized in this section shall remain in effect unless repealed by legislation hereafter enacted by the Congress.

*Section 7*

Section 7 would authorize to be appropriated to the National Aeronautics and Space Administration for fiscal year 1977 \$95,000,000 for the Space Shuttle. The funds thus authorized would increase the Space Shuttle line item for fiscal year 1977 (Public Law 94-307) from \$1,288,100,000 to \$1,383,100,000.

*Section 8*

Section 8 would provide that the Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1978".

**COST AND BUDGET DATA**

The bill will authorize appropriations for Fiscal Year 1978 in the amount of \$4,053,829,000. In accordance with the requirements of section 252(b) of the Legislative Reorganization Act of 1970, the Committee's estimate for the next five years of the NASA budget request is as follows:

Fiscal year	
1978	4,053,829,000
1979	4,190,100,000
1980	3,977,000,000
1981	3,526,900,000
1982	3,147,500,000

These estimates do not include provisions for any new program or program augmentations that may be recommended, nor do they include any provisions for administrative adjustments that may be required.

**EFFECT OF LEGISLATION ON INFLATION**

In accordance with Rule XI, Clause 2(1)(4) of the Rules of the House of Representatives this legislation is assessed to have no adverse inflationary effect on prices and costs in the operation of the national economy. NASA expenditures are labor intensive with approximately 85 percent of spending directly for jobs and the remainder for materials. There is now underemployment and unused plant capacity in the aerospace industry, therefore, these expenditures will not be inflationary.

The long run economic effect of NASA expenditures is to increase productivity, both through direct application of aeronautical and space technology (as demonstrated by communications satellites, improved aircraft and other innovations) and indirectly through the development and dissemination of advanced technology which is then applied in many other sectors of the economy.

Studies by the Midwest Research Institute and by Chase Econometrics, Inc. have shown the average rate of return for NASA high technology expenditures to be in the range of 32 to 36 percent per year or a return of \$7 for every \$1 of NASA expenditure over a period of years.

**CONGRESSIONAL BUDGET ACT INFORMATION**

No information pursuant to section 308(a) of the Congressional Budget Act of 1974 has been provided to the committee by the Congressional Budget Office. Under a separate section of this report, a five-year current programs cost estimate is provided in response to the requirement of section 308(a). No funds for State or local financial assistance are included in H.R. 4088.

**ESTIMATE AND COMPARISON, CONGRESSIONAL  
BUDGET OFFICE**

Pursuant to clause (2)(1)(3)(C) of rule XI of the Rules of the House of Representatives the report of the Congressional Budget Office is included.

**CONGRESSIONAL BUDGET OFFICE COST ESTIMATE**

1. Bill No.: H.R. 4088.
2. Bill title: National Aeronautics and Space Administration Authorization Act, 1978.
3. Bill status: As reported by the House Committee on Science and Technology.
4. Purpose of bill: This bill would authorize appropriations to NASA for research and development, construction of facilities and for research and program management for FY 1978. It also raises the FY 1977 authorization for the Space Shuttle by \$95 million, and provides certain guidelines for the allocation and disbursement of the FY 1978 funds.
5. Cost estimate: Federal costs would be incurred as a result of the re-authorization of the various NASA programs. The estimated costs of these activities are shown below.

	COSTS					
	[In thousands of dollars]					
	Fiscal year—					
	1977	1978	1979	1980	1981	1982
Authorization level.....	95,000	4,053,829				
Estimated cost:						
Increase for Space Shuttle.....	67,260	23,940	2,850	950		
Research and development.....		1,823,038	964,959	122,407	37,097	
Construction of facilities.....		23,854	54,394	53,492	19,664	6,885
Research and program management.....		795,414	46,791	6,784		
<b>Total.....</b>	<b>67,260</b>	<b>2,706,286</b>	<b>1,067,984</b>	<b>183,633</b>	<b>56,761</b>	<b>6,885</b>

6. Basis of estimate: Outlays were calculated by applying the historical disbursement rates for NASA programs to the authorization levels in the bill. In the case of the FY 1977 authorization increase for the Space Shuttle, the appropriate spendout rate was applied to the increment of \$95 million.
7. Estimate comparison: None.
8. Previous CBO estimate: None.

**OVERSIGHT FINDINGS AND RECOMMENDATIONS,  
COMMITTEE ON GOVERNMENT OPERATIONS**

No findings or recommendations on oversight activity pursuant to clause 2(b)(2), rule X, and clause 2(1)(3)(D), rule XI, of the Rules of the House of Representatives have been submitted by the Committee on Government Operations for inclusion in this report.

**COMMITTEE RECOMMENDATION**

A quorum being present, the Committee unanimously approved the bill by voice vote of those present.

**NASA RECOMMENDATION**

This is a National Aeronautics and Space Administration legislation item approved with the exceptions noted in this report by the Office of Management and Budget, as indicated by the following letters:

NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION,  
*Washington, D.C., January 17, 1977.*

Hon. THOMAS P. O'NEILL, Jr.,  
*Speaker of the House of Representatives,*  
*Washington, D.C.*

DEAR MR. SPEAKER: Submitted herewith is a draft of a bill, "To authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes," together with the sectional analysis thereof. It is submitted to the Speaker of the House of Representatives pursuant to Rule XL of the House.

Section 4 of the Act of June 15, 1959, 73 Stat. 75 (42 U.S.C. 2460), provides that no appropriation may be made to the National Aeronautics and Space Administration unless previously authorized by legislation. It is a purpose of the enclosed bill to provide such requisite authorization in the amounts and for the purposes recommended by the President in the Budget of the United States Government for fiscal year 1978. For that fiscal year, the bill would authorize appropriations totaling \$4,019,789,000 to be made to the National Aeronautics and Space Administration as follows:

(1) for "Research and development" amounts totaling \$3,011,000,000;

(2) for "Construction of facilities" amounts totaling \$161,800,000; and

(3) for "Research and program management," \$846,989,000.

In addition, the bill would authorize appropriations totaling \$4,388,800,000, to be available October 1, 1978, i.e., in fiscal year 1979.

The enclosed draft bill follows generally the format of the National Aeronautics and Space Administration Authorization Act, 1977 (Public Law 94-307). However, the bill differs in substance from the prior Act in several respects.

First, subsections 1(a), 1(b), and 1(c), which would provide the authorization to appropriate for the three NASA appropriations, differ in the dollar amounts and/or the line items for which authorization to appropriate is requested.

Second, section 6 of the draft bill authorizing NASA to enter into and to maintain a contract for tracking and data relay satellite services differs from that included in the prior Act, in that the new section 6 would provide permanent authority which would remain in effect unless repealed by legislation hereafter enacted by the Congress. Under the temporary authority of the prior Act, NASA has entered into the contract which would be authorized by section 6 of the draft bill, and a copy of the terms and conditions of that contract has been provided to the Committee on Science and Technology.

Third, section 7 of Public Law 94-307, which amended section 5316 of title 5, United States Code, and is, therefore, permanent law, has been omitted.

Fourth, section 8 of the prior Act, which amended section 6 of the National Aeronautics and Space Administration Authorization Act, 1968, and is, therefore, permanent law, has been omitted.

Fifth, as noted above, in addition to providing authorization of appropriations in the amounts recommended by the President in his Budget for fiscal year 1978, the bill also would provide authorization for appropriations to be available in fiscal year 1979. It is specified that all of the limitations and other provisions of the bill applicable to amounts appropriated pursuant to section 1 shall apply in the same manner to amounts appropriated pursuant to section 7.

Finally, the last section of the draft bill, section 8, has been changed to provide that the bill, upon enactment, may be cited as the "National Aeronautics and Space Administration Authorization Act, 1978," rather than "1977."

Where required by section 102(2)(C) of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4332(2)(C)), and the implementing regulations of the Council on Environmental Quality, environmental impact statements covering NASA installations and the programs to be funded pursuant to the bill have been furnished to the Committee on Science and Technology.

The National Aeronautics and Space Administration recommends that the enclosed draft bill be enacted. On January 14, 1977, the Office of Management and Budget advised that there is no objection to the submission of this draft bill to the Congress and its enactment would be in accord with the program of the President.

Sincerely,

JAMES C. FLETCHER,  
*Administrator.*

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,  
*Washington, D.C., February 22, 1977.*

HON. THOMAS P. O'NEILL, JR.,  
*Speaker of the House of Representatives,*  
*Washington, D.C.*

DEAR MR. SPEAKER: Submitted herewith is a draft of a bill, "To authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes," together with a sectional analysis thereof. It is submitted to the Speaker of the House of Representatives pursuant to Rule XL of the House.

On January 17, 1977, I addressed a letter to you which transmitted a similar bill to the House of Representatives and recommended its enactment. That bill was recommended to provide the requisite authorization of appropriations for the National Aeronautics and Space Administration (NASA) in the amounts and for the purposes recommended by President Ford in the Budget of the United States Government for fiscal year 1978. The bill was introduced as H.R. 2221 on January 19, 1977.

Following a review of the budget estimates of NASA for fiscal year 1978, the new Administration is recommending an increase in the "Research and development" appropriation of \$15 million, bringing the total recommended to \$3,026,000,000. The enclosed draft bill incorporates this recommended change. Specifically, paragraph (5) of subsection 1(a) of the enclosed bill, which specifies the amount for "Lunar and planetary exploration," has been increased from \$148,200,000 to \$158,200,000 and paragraph (7) of that subsection, which specifies the amount for "Space applications," is changed from \$228,800,000 to \$233,800,000. Also, with respect to the authorization of appropriations for fiscal year 1979 contained in section 7, the enclosed bill does not include the specific dollar amounts set forth in the draft bill submitted on January 17, 1977.

In addition, references to the Senate Committee on Aeronautical and Space Sciences in the bill transmitted on January 17, 1977, have been changed to the Senate Committee on Commerce, Science, and Transportation, consistent with Senate Resolution No. 4 effective February 11, 1977.

Other than the changes specified above, the enclosed bill is identical in all respects to that transmitted on January 17, 1977, and my discussion of and comments on the previous bill apply in the same manner to the enclosed bill.

The National Aeronautics and Space Administration recommends that the enclosed bill be enacted. The Office of Management and Budget has advised that such enactment would be in accord with the program of the President.

Sincerely,

JAMES C. FLETCHER,  
*Administrator.*

# Calendar No. 99

# Calendar No. 99

95TH CONGRESS  
1st Session

SENATE

{ REPORT  
No. 95-120

95TH CONGRESS }  
1st Session

SENATE

{ REPORT  
No. 95-120

## NASA AUTHORIZATION FOR FISCAL YEAR 1978

### REPORT

OF THE

### COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ON

H.R. 4088

AN ACT TO AUTHORIZE APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FOR RESEARCH AND DEVELOPMENT, CONSTRUCTION OF FACILITIES, AND RESEARCH AND PROGRAM MANAGEMENT, AND FOR OTHER PURPOSES



MAY 4 (legislative day, APRIL 28), 1977.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1977

## AUTHORIZING APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MAY 4 (legislative day, APRIL 28), 1977.—Ordered to be printed

Mr. MAGNUSON, from the Committee on Commerce, Science, and Transportation, submitted the following

### REPORT

[To accompany H.R. 4088]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (H.R. 4088) to authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes, having considered the same, reports favorably thereon, with an amendment striking out all after the enacting clause and inserting the committee amendment, and recommends that the bill be passed.

(1)

CONGRESSIONAL ADJUSTMENTS TO NASA REQUEST  
FOR FISCAL YEAR 1978—SUMMARY

Fiscal year 1978	Budget request	House action	Senate committee action
Research and development:			
Space Shuttle.....	\$1,349,200,000	\$1,349,200,000	\$1,354,200,000
Space flight operations.....	267,800,000	270,800,000	265,800,000
Expendable launch vehicles.....	136,500,000	129,500,000	136,500,000
Physics and astronomy.....	224,200,000	229,200,000	225,200,000
Lunar and planetary exploration.....	158,200,000	161,200,000	150,200,000
Life sciences.....	33,300,000	33,300,000	33,300,000
Space applications.....	233,800,000	211,900,000	239,800,000
Earth resources operational systems.....	0	26,900,000	0
Aeronautical research and technology.....	231,000,000	236,500,000	231,000,000
Space research and technology.....	97,700,000	101,700,000	97,700,000
Energy technology applications.....	4,500,000	9,500,000	4,500,000
Tracking and data acquisition.....	281,700,000	278,700,000	281,700,000
Technology utilization.....	8,100,000	9,100,000	9,100,000
Total.....	3,026,000,000	3,047,500,000	3,030,000,000
Construction of facilities.....	161,800,000	158,340,000	161,800,000
Research and program management.....	846,989,000	847,989,000	846,989,000
Grand total.....	4,034,789,000	4,053,829,000	4,038,789,000

<sup>1</sup> Includes Carter amendments to original fiscal year 1978 budget request.

#### PURPOSE OF THE BILL

The purpose of this bill is to authorize appropriations to the National Aeronautics and Space Administration totaling \$4,038,789,000 for fiscal year 1978 as follows:

Fiscal year 1978	Budget request	House action	Senate committee action
Research and development.....	\$3,026,000,000	\$3,047,500,000	3,030,000,000
Construction of facilities.....	161,800,000	158,340,000	161,800,000
Research and program management.....	846,989,000	847,989,000	846,989,000

#### LEGISLATIVE HISTORY

The budget request for fiscal year 1978 for the National Aeronautics and Space Administration was introduced in the House under H.R. 2221 and in the Senate as S. 365. The subsequent amendments of President Carter to the fiscal year 1978 budget request were incorporated in a new authorization bill in the House as H.R. 4088. In view of the minimum changes reflected in the Carter budget amendment, no further legislation was introduced in the Senate.

After holding hearings and marking up H.R. 4088, the House Committee on Science and Technology reported H.R. 4088 with an amendment striking all after the enacting clause and inserting the committee amendment. The bill was passed by the House, after the adoption of two floor amendments, and subsequently referred to this committee.

The committee held hearings on S. 365 during February and March 1977. During its consideration of the bill, the committee determined that amendments were required.

The committee reported out H.R. 4088 with an amendment striking all after the enacting clause and inserting the committee amendment.

#### SUMMARY

The NASA budget request for fiscal year 1978 was for a total of \$4,019,789,000, of which \$3,011,000,000 was for "Research and development," \$161,800,000 was for "Construction of facilities," and \$846,989,000 was for "Research and program management." President Carter subsequently submitted a budget amendment increasing "Research and development" by \$15 million to a new total of \$3,026,000,000, and the total request to \$4,034,789,000. No amendments were made to the other two appropriations categories.

The House approved an authorization total of \$4,053,829,000, of which \$3,047,500,000 was for "Research and development," \$158,340,000 was for "Construction of facilities," and \$847,989,000 was for "Research and program management." The House bill is \$19,040,000 above the request.

The committee is recommending an authorization of \$4,038,789,000, an amount \$4 million above the NASA request and \$15,040,000 below the amount in the House approved bill. Of the total amount, the committee recommends \$3,030,000,000 for "Research and development," which is \$4 million above the NASA request, and \$17,500,000 below the House approved amount for this appropriations category; recommends \$161,800,000 for the "Construction of facilities," which is identical with the NASA request, and \$3,460,000 above the House amount; and recommends \$846,989,000 for "Research and program management," which is identical to the NASA request and \$1 million below the amount approved by the House.

This authorization recommendation is approximately \$343 million above the amount recommended for NASA programs in the prior fiscal year reflecting a slight increase in total program authorization after allowing for the effects of inflation in the intervening period. The NASA authorization, as it has in recent years, represents less than 1 percent of the total of new budget authority recommended in the fiscal year 1978 federal budget.

It was the committee's view in evaluating the NASA budget request for fiscal year 1978 that it was important to sustain a relatively constant level of funding for NASA activities in order to support ongoing programs approved in prior years, and to maintain through NASA a significant share of the national research and technology base—a base that is essential to advancing scientific and technical knowledge, to increasing national productivity, and to being able to respond to current and emerging national needs. Consequently, this bill will support research and development undertakings currently underway and within the constraints of a relatively constant level of expenditure, will support five significant new starts. These new projects are: (1) acquisition of a national fleet of five Space Shuttle orbiters, including the refurbishment of the two orbiters in the development program, to support NASA, Department of Defense, other government agencies, commercial/industrial and international users space launch needs be-

gining in 1980; (2) initiation of the development of the Shuttle launched Space Telescope for research in astronomy, the highest priority project of the scientific community; (3) Landsat-D, a third generation Earth resources survey spacecraft to carry an advanced scanning instrument, the thematic mapper, approved for development in fiscal year 1977; (4) initiation of a search and rescue satellite system as a cooperative project with the Government of Canada; and, (5) initiation of a Jupiter orbiter probe mission to continue exploration of the solar system with the launch scheduled for 1981. Each of the foregoing is a multiyear project, yet, as has been indicated, they are so programed that they can be supported, together with other NASA responsibilities, without major budget impacts in subsequent years.

With respect to ongoing activities, the bill provides funding for continued development of the Space Shuttle, the principal element of a reusable space transportation system designed to significantly reduce the cost of space operations and thereby provide a new capability to explore and to utilize space in support of national needs. Testimony presented to the committee states that this program is on schedule and within costs. This bill supports within the Aeronautical Research and Technology line item which underwrites NASA's statutory responsibility to conduct aeronautical research, the second funding increment of a fuel efficient aircraft technology development program designed to provide the technology, by 1985, to decrease the fuel consumption of commercial jet transports by 50 percent. This research initiative has the objective of assuring the continued competitiveness of U.S.-built aircraft in the world marketplace. In addition to these more significant undertakings identified, the bill will provide funds for many other projects such as the completion of Mariner Jupiter/Saturn, Pioneer Venus, Tiros N, and Seasat, for essential supporting activities such as launch and tracking and data acquisition services, and for a multiplicity of research and technology development tasks in space and aeronautics designed to advance the state-of-the-art, to carry out approved initiatives, and to maintain a balanced program that will provide the Nation with a base for undertaking new initiatives that it may desire to accomplish in the future.

The "Construction of facilities" authorization recommendation, about \$40 million above the previous fiscal year, is influenced by the need for Shuttle facilities, particularly launch related facilities at the Kennedy Space Center and external tank manufacturing facilities at the Michoud Assembly Facility. The Shuttle facilities program is on schedule and within the cost estimate established in 1972. This bill will also support the second increment of funding for two aeronautical research facilities, namely, construction of the new transonic research facility at the Langley Research Center and the upgrading and expansion of the 40' x 80' subsonic wind tunnel at the Ames Research Center. Both of these facilities are an integral part of a joint NASA/DOD large aeronautical research facilities program designed to provide an adequate research capability to maintain the Nation's leadership in aeronautics in the years ahead.

The committee's recommended authorization for the "Research and program management" appropriation reflects an essentially stable budget posture except for the impact of the federal employees annual pay increases. The fiscal year 1978 personnel level of 23,737 to be supported by this bill is 79 positions below that authorized in the previous fiscal year. It does, however, represent a slowing in the very significant annual reductions in the NASA workforce experienced in recent years. With about 75 percent of this appropriations category devoted to salaries and with a very high percentage of the NASA personnel complement reflecting the technical skills forming a significant part of NASA's in-house research and development capability, the committee is concerned about further decreases in the onboard NASA strength. The NASA roles and mission study, a comprehensive review of the several NASA field installations undertaken in 1975 to clarify and redefine functional assignments with the objective of increasing organizational efficiency and effectiveness, is in its second year of implementation and will be continued during fiscal year 1978. Against this background it is the committee's view that the "Research and program management" budget is tightly constrained and, therefore, should be supported at the request level.

The committee considered several language amendments as discussed in the report under "Legislative Changes". The most significant amendment, included as section 7 of the bill, amends the amount authorized for the Space Shuttle in the fiscal year 1977 NASA Authorization Act (Public Law 94-307), increasing the program amount by \$95 million from \$1,288,100,000 to \$1,383,100,000. This action authorizes the funds included in the "Economic Stimulus Appropriations Act, 1977", H.R. 4876, and would advance to fiscal year 1977 the start of production on the national fleet of five orbiters thereby permitting the most efficient transition from design, development, test and evaluation activities to production through the retention of Shuttle skilled personnel now on board rather than incurring layoffs and subsequent rehiring which otherwise would be required.

The Subcommittee on Science, Technology, and Space held hearings on this bill on February 25, March 1, 3, 7, 9, 17, and 18, 1977. During the course of the hearings, the subcommittee received testimony from NASA, the Department of Defense, and the Energy Research and Development Administration, and from the scientific community and witnesses representing the general public. Also, statements for the record were received from other agencies conducting space and space-related programs and having significant interfaces with NASA in its research development activities. These are the Department of Agriculture, the U.S. Geological Survey of the Department of the Interior, the National Oceanic and Atmospheric Administration of the Department of Commerce, and the National Science Foundation.

The Subcommittee on Science, Technology, and Space met on April 5, 1977, to mark up the bill and prepare its recommendations to the full committee. The Committee on Commerce, Science, and Transportation met on April 26, 1977, and ordered the bill reported.

## RESEARCH AND DEVELOPMENT

## SUMMARY

Fiscal year 1978	Budget request <sup>1</sup>	House action	Senate committee action
<b>Research and development:</b>			
Space Shuttle.....	\$1,349,200,000	\$1,349,200,000	\$1,354,200,000
Space flight operations.....	267,800,000	270,800,000	265,800,000
Expendable launch vehicles.....	136,500,000	129,500,000	136,500,000
Physics and astronomy.....	224,200,000	229,200,000	226,200,000
Lunar and planetary exploration.....	158,200,000	161,200,000	150,200,000
Life sciences.....	33,300,000	33,300,000	33,300,000
Space applications.....	233,800,000	211,900,000	239,800,000
Earth resources operational systems.....	0	26,900,000	0
Aeronautical research and technology.....	231,000,000	236,500,000	231,000,000
Space research and technology.....	97,700,000	101,700,000	97,700,000
Energy technology applications.....	4,500,000	9,500,000	4,500,000
Tracking and data acquisition.....	281,700,000	278,700,000	281,700,000
Technology utilization.....	8,100,000	9,100,000	9,100,000
<b>Total.....</b>	<b>3,026,000,000</b>	<b>3,047,500,000</b>	<b>3,030,000,000</b>

<sup>1</sup> Includes Carter amendments to original fiscal year 1978 budget request.

## SPACE SHUTTLE PROGRAM, \$1,354,200,000

## COMMITTEE COMMENT

Recognizing that additional funding for the Space Shuttle program for fiscal year 1977 would not only provide additional employment in the aerospace industry but would also permit the retention of trained personnel and a more efficient approach to orbiter fleet production, the committee adopted in section 7 of the bill, an amendment to the fiscal year 1977 authorization act (Public Law 94-307) increasing the amount for the Space Shuttle program by \$95 million. The implementing appropriation for this authorization is contained in H.R. 4876, the "Economic Stimulus Appropriations Act, 1977". These funds are to be applied primarily to orbiter production and to a lesser extent to Shuttle design, development, test and evaluation (D.D.T. & E.) activities if necessary to assure program success. The latter application will advance funding for selected D.D.T. & E. activities but will not increase the total cost estimate for the Shuttle D.D.T. & E. program. The House included a similar provision in its bill.

This availability of added funds in, and the consequent advancement of the initiation of orbiter production to fiscal year 1977, necessitates adjustments of the currently planned orbiter production schedule for fiscal year 1978. To provide for these adjustments and to assure adequate funding for a most efficient production program the committee is recommending an additional \$5 million for the Space Shuttle program for fiscal year 1978 for a total program authorization of \$1,354,200,000.

## SPACE FLIGHT OPERATIONS PROGRAM, \$265,800,000

## COMMITTEE COMMENT

While the committee appreciates fully the need to actively pursue the development of payloads for the Space Shuttle/Spacelab, particularly those believed to offer beneficial or unique extensions, of

manufacturing and processing operations on Earth, the testimony reflects that the fiscal year 1978 budget contains \$90 million for payload development. This amount does not include major Shuttle payloads such as the Space Telescope or the Jupiter Orbiter Probe project. Accordingly, the committee believes that adequate resources are provided for these activities including such small amounts as may be necessary for studies in the area of space industrialization.

The committee agrees with the NASA initiative in arranging with private industry for the development and delivery of upper stages to extend the capabilities of the Space Shuttle. Recognizing the status of this activity, the committee agrees with the House reduction of \$2 million expecting that economies can be realized in the program subcategory space transportation system operations capability development.

The committee recommends \$265,800,000 for the space flight operations program.

## EXPENDABLE LAUNCH VEHICLES PROGRAM, \$136,500,000

## COMMITTEE COMMENT

While the committee recognizes the Space Shuttle is the prime launch system beginning in the early 1980's, it notes the number of launches requiring expendable systems until the Shuttle is fully operational. The committee further notes the increasing number of reimbursable launches annually and the additional responsibility placed upon NASA to continue the launch success record that it experienced until the Delta failure on April 20, 1977. This record is in no small part due to the sustaining engineering and other supporting services that have over the years contributed gradual improvements in hardware and operations that have brought the expendable systems to a very reliable performance status. In view of the foregoing, and with the payload representing the most significant investment in any launch package, the committee believes this program should be supported at the request level of \$136,500,000. Accordingly, it does not concur with the House reduction of \$7 million in the expendable launch vehicles program.

## PHYSICS AND ASTRONOMY PROGRAM, \$226,200,000

## COMMITTEE COMMENT

In its report on the NASA fiscal year 1977 authorization bill, the former Committee on Aeronautical and Space Sciences requested that NASA assign the initiation of the Space Telescope project the highest priority in its fiscal year 1978 budget submission. Accordingly, the committee recommends the approval of this project. In so doing, the committee notes that this new start represents a major program commitment, which, combined with the fact that there is a \$58 million increase in the physics and astronomy program, persuaded the committee that adequate resources are being applied to this program with one exception.

The exception is the responsibility given NASA by the Congress to conduct an upper atmospheric research, technology, and monitoring program directed to understanding the physics and chemistry of the upper atmosphere. The Congress assigned this responsibility in response to an identified national need—that of understanding the effects of various human activities on stratospheric ozone. Although ozone is a minor constituent of the stratosphere, its existence there is of the utmost importance to life on Earth. Consequently, the committee believes NASA should pursue aggressively its responsibilities with respect to the upper atmosphere; and, \$13.6 million is recommended for the upper atmospheric research program, \$2 million above the request. Accordingly, the committee recommends the physics and astronomy program be funded at \$226.2 million, \$2 million above the request.

As indicated above, it is the committee's view that the physics and astronomy program is reasonably well provided with the resources necessary for a balanced program and, therefore, it did not concur with the \$5 million added by the House.

#### LUNAR AND PLANETARY EXPLORATION PROGRAM, \$150,200,000

##### COMMITTEE COMMENT

The committee recommends \$150,200,000 for the lunar and planetary exploration program; this is \$8 million below the request. In making this recommendation the committee disagrees with the House addition of \$7 million to initiate the Lunar Polar Orbiter project and with the \$1 million add-on to supporting research and technology, but agrees with the House in reducing the request for the Mars follow-on studies.

The House reduced the Mars follow-on studies by \$5 million. The committee recommends a reduction of \$8 million, leaving \$7 million for such studies which the committee believes is entirely sufficient to determine the follow-on strategy for the exploration of the planet Mars.

The committee disagreed with the House on Lunar Polar Orbiter for two reasons: (1) the lunar and planetary exploration program has one major new start for fiscal year 1978—the Jupiter Orbiter with Probe mission whose total cost is estimated to be \$275-\$295 million; and (2) the funding requirement for the Lunar Polar Orbiter for the year following its initiation would be about \$50 million. This combined with the funding for the Jupiter Orbiter with Probe mission would require a substantial increase in the resources for the lunar and planetary exploration program. Moreover, the Lunar Polar Orbiter mission is not launch-window dependent as are the planetary launches and can be initiated in the next fiscal year.

Inasmuch as the total resources being recommended for supporting activities under this program will be increased by \$4.9 million above the budget plan for fiscal year 1977, the committee disagreed with the House addition of \$1 million for supporting research and technology.

#### SPACE APPLICATIONS PROGRAM, \$239,800,000

##### COMMITTEE COMMENT

*Landsat.*—The committee notes with satisfaction the inclusion in the NASA request of funding to initiate a Landsat-D Earth resources satellite project, including a backup spacecraft, to fly the advanced sensor now under development, the thematic mapper. The committee views this undertaking as a significant step to advance remote sensing technology thereby increasing the value of the data acquired, and to assure the continuity of data to users beyond Landsat-C scheduled for launch early in 1978. However, the thematic mapper on the Landsat-D, while significantly enhancing the resolution of the data acquired and extending the coverage, will involve a larger, more complex instrument with the associated development risk. This fact, combined with the rapidly growing, worldwide user community that is increasingly dependent on continuous data to support its activities, dictates a need to take reasonable action to assure data continuity until reliable operation of the thematic mapper is assured. Accordingly, the committee added \$2 million to the space applications program to provide for the addition of a proven multispectral scanner to the first Landsat-D spacecraft to satisfy this need. The total cost of this addition is estimated to be about \$28 million, funded over 3 years.

Inasmuch as the committee has before it and plans action this session on S. 657, "Earth Resources and Environmental Information System Act of 1977" which addresses the same subject, no action was taken on the new line item, "Earth resources operational systems," established by the House during its consideration of H.R. 4088.

*Weather and climate.*—The committee appreciates fully the need to devote adequate resources to weather and climate research to increase our basic knowledge and the ability to improve forecasting particularly in the area of severe storms. With respect to the latter, testimony for the past 2 years reflects the difficulty encountered in acquiring the fundamental understanding of the relationship between what can be observed and a prediction capability that is required to develop systems to improve severe storm forecasting. It is clear that further experimental work is necessary and the committee requests that NASA, in conjunction with NOAA, pursue this matter aggressively because of the importance of this weather forecasting capability. With the completion of the development of advanced spacecraft systems such as Nimbus and Tiros N, more resources are now available for application to research and new technology advancements. Accordingly, the committee is not persuaded that additional funding for this program at this time will produce a commensurate benefit and, consequently, it did not concur with the House addition of \$5 million for this activity.

*Space communications and environmental quality.*—The committee added \$4 million to the space applications program to support two new initiatives when it appears that NASA capabilities may be able to make a most worthwhile contribution. First, \$2 million was added to the subprogram space communications to define and develop, taking into account the interests of NOAA, the Maritime Administration and the Coast Guard, a satellite-based system for conducting surveillance of the 200-mile limit. This activity would be directed to assisting in the implementation of the recently assigned responsibility to these agencies for monitoring ship activity in coastal waters. Second the subprogram environmental quality was increased by \$2 million to support the investigation of the potential for utilizing satellite systems to detect and monitor oil spills in U.S. waters.

The committee is recommending a total of \$239,800,000 for the space applications program, \$6 million above the request.

#### TECHNOLOGY UTILIZATION PROGRAM, \$9,100,000

#### COMMITTEE COMMENT

The committee requests that NASA consider methods by which it can better assure that American industry is the primary beneficiary of NASA and other Government-sponsored technological advancements. This includes a broadening, by NASA, of its activities to encompass the new technology of other Government entities and the integration of that technology into more comprehensive programs for dissemination and applications assistance not only by NASA but also by other scientific and technical agencies of the Federal Government.

The committee believes also that NASA should develop better methods for protecting devices and processes which it invents or develops to restrict, where appropriate, their uncontrolled adoption by foreign industry, as well as to increase the return to the U.S. Treasury from those public or private entities who most benefit from these innovations.

To accomplish the foregoing, the committee added \$1 million to the technology utilization program intending that NASA use as much of the addition as is necessary to develop expanded, innovative and flexible dissemination techniques and systems while providing for patenting, licensing, or otherwise protecting NASA technology advancements nationally and internationally for the purposes indicated above. In carrying out this mandate NASA should consult with other Federal agencies, including the Department of Commerce, in order to benefit from their experience in technology transfer.

## CONSTRUCTION OF FACILITIES

<i>Items</i>	<i>Summary</i>	<i>Amount</i>
1. Construction of central hydraulic system, Hugh L. Dryden Flight Research Center.....		\$420,000
2. Construction of additional technical processing facilities, Goddard Space Flight Center.....		3,100,000
3. Modifications to various buildings for seismic protection, Jet Propulsion Laboratory.....		2,830,000
4. Modification of chillers in central heating and cooling plant, Lyndon B. Johnson Space Center.....		2,540,000
5. Modifications for utility control system, John F. Kennedy Space Center.....		2,130,000
6. Rehabilitation of main heating plant, Langley Research Center.....		790,000
7. Rehabilitation of unitary plan wind tunnel, Langley Research Center.....		980,000
8. Modification of central chilled water system, Lewis Research Center.....		860,000
9. Modifications for utility control system, National Space Technology Laboratories.....		620,000
10. Large aeronautical facility: Construction of national transonic facility, Langley Research Center.....		23,500,000
11. Large aeronautical facility: Modification of 40- by 80-foot subsonic wind tunnel, Ames Research Center.....		13,500,000
12. Rehabilitation and modifications of 91-meter antenna components, various locations.....		1,750,000
13. Space Shuttle facilities at various locations as follows:		
(a) Modifications to launch complex 39, John F. Kennedy Space Center.....		40,700,000
(b) Modifications for solid rocket booster processing facilities, John F. Kennedy Space Center.....		1,730,000
(c) Rehabilitation of barge channels, John F. Kennedy Space Center.....		2,090,000
(d) Modifications for crew training facilities, Lyndon B. Johnson Space Center.....		860,000
(e) Modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility.....		18,610,000
(f) Rehabilitation and modification of Shuttle facilities at various locations.....		1,750,000
14. Space Shuttle payload facility: Modifications and addition for Shuttle payload vertical processing, John F. Kennedy Space Center.....		6,410,000
15. Rehabilitation and modification of facilities at various locations, not in excess of \$500,000 per project.....		18,900,000
16. Minor construction of new facilities and additions to existing facilities at various locations, not in excess of \$250,000 per project.....		5,950,000
17. Facility planning and design not otherwise provided for.....		11,780,000
<b>Total</b> .....		<b>161,800,000</b>

(d) *Modifications for crew training facilities, Lyndon B. Johnson Space Center, \$360,000.—*

COMMITTEE COMMENT

This project was deferred from fiscal year 1977 for further study of the appropriate location for astronaut crew training activities. That study has been completed and concludes that a relocation of these activities from the Johnson Space Center is too costly and very impractical. The committee has reexamined the construction and operating costs of this proposed facility with these costs associated with adapting and utilizing the existing neutral buoyancy facility at the Marshall Space Flight Center for this training requirement. Since the Marshall approach would result in a net additional cost to NASA of \$3.3 million over the first 8-year period, the committee recommends proceeding with this facility project. Accordingly, the committee does not agree with the action of the House in deleting this facility from the bill.

(e) *Modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility, \$18,610,000.—*

COMMITTEE COMMENT

It is the committee's view that any NASA manufacturing operation must have a reliable, effective, and environmentally acceptable chemical waste disposal system. NASA should be a leader in this area. The record shows that such a system not only does not exist at the Michoud Assembly Facility, but also that the existing system is clearly inadequate to support scheduled production operations. In fact, the committee was advised that it was necessary to shut down the present deep well disposal system on March 31, 1977, for 4 days. Rehabilitation of existing well disposal systems has proven to be expensive and ineffective as a permanent solution. The committee is not aware of any fundamental problem that should preclude proceeding promptly with the final design of, contracting for, and construction of the chemical waste disposal facility as presented by NASA; therefore, it is recommending the authorization of this facility as a part of the larger project to provide facilities for external tank manufacturing and assembly.

RESEARCH AND PROGRAM MANAGEMENT

Summary

Fiscal year 1976	Budget request	House action	Senate committee action
Personnel and related costs .....	\$649,104,000	\$649,104,000	\$649,104,000
Travel .....	17,846,000	18,846,000	17,846,000
Facilities services .....	91,650,000	91,650,000	91,650,000
Technical services .....	38,356,000	38,356,000	38,356,000
Administrative support .....	50,033,000	50,033,000	50,033,000
Total .....	846,989,000	847,989,000	846,989,000

The "Research and program management" appropriation includes funding for research in Government laboratories, management of programs, and other activities of the National Aeronautics and Space Administration. Principally, it is intended to (1) provide the civil service staff to conduct in-house research, and to plan, manage, and support the research and development programs, and (2) provide other elements of operational capability to the laboratories and facilities such as logistics support (travel and transportation, maintenance, and operation of facilities), and technical and administrative support.

Approximately three-fourths of this authorization recommendation for fiscal year 1978, or \$649,104,000, is required to pay the salaries and related personnel costs of NASA employees during the fiscal year. This amount will support 23,737 permanent positions, of which approximately 65 percent will be occupied by scientific, engineering, and supporting technician personnel. Programmatically, 19,942 employees will be assigned to space and 3,795 employees to aeronautical research activities. The staffing plan for fiscal year 1978 represents a reduction of 79 positions below the 23,816 positions authorized for the previous fiscal year, and reflects the continuing implementation of the recommendations of an agency wide study of the roles and missions of the several NASA research installations. The study, completed late in calendar year 1975, examined the responsibilities and projected workloads in the approaching shuttle era, and it was designed to clarify the roles of the NASA installations, to eliminate any unnecessary duplication of research activities, and to maximize the utilization of personnel and facilities. While the total NASA employment continues to decline from the agency high of about 33,900 in 1966, the annual funding continues to increase due to the periodic Federal employee pay increases. For example, the October 1976 pay increase raised the current estimate for fiscal year 1977 by \$31,777,000 and impacts the fiscal year 1978 request by an additional \$32,200,000. The total personnel cost estimate for fiscal year 1978 in this bill is \$1,300,000 above that for fiscal year 1977.

## COST ESTIMATES

The remaining funding in this appropriations category is, for convenience, grouped into the functional budget categories of travel, facilities services, technical services, and administrative support for which a total of \$197,885,000 is recommended. After net adjustments, this amount is about \$1 million above the fiscal year 1977 budget plan primarily due to rising utility rates and wage increases for support contractor personnel at the several installations. NASA has underway an aggressive energy conservation and reduction program, with initial results reflected in energy cost reductions from estimates presented last year. However, continuing wage increases for support contractor personnel and increases in utility rates essentially offset savings originating from energy usage reductions.

## COMMITTEE COMMENT

The committee believes NASA should continue to aggressively pursue the implementation of its roles and missions study to assure the most effective utilization of its manpower and facilities to carry out its responsibilities. In so doing it should take full cognizance of the committee view on staffing expressed in conjunction with its comments on the aeronautical research and technology program. In view of these requests, personnel reductions experienced by the agency in recent years and the relative stability achieved in cost categories other than personnel, the committee is recommending adoption of the fiscal year 1978 budget request for the research and program management appropriations category.

Testimony reflects adoption of teleconferencing techniques by the agency and the committee recommends that this communications approach be exploited fully as a substitute for personnel travel. This, combined with the fact the official travel is an area requiring continuous management control, persuades the committee that the travel budget, as presented, is adequate. Accordingly, the committee did not concur with the \$1 million increase in travel funds made by the House.

The NASA request for new budget authority for fiscal year 1978 was \$4,034,789,000. This bill, H.R. 4088, as recommended by the committee, authorizes appropriations to the National Aeronautics and Space Administration in the amount of \$4,038,789,000 for that fiscal period. This amount is \$4 million above the budget request.

In accordance with the requirements of section 252(a) of the Legislative Reorganization Act of 1970, the estimates for the next 5 years of NASA budget authority are as follows:

(In millions of dollars)

Fiscal year	NASA estimate	Committee estimate
1978	4,035	4,039
1979	4,105	4,117
1980	3,913	3,926
1981	3,492	3,499
1982	3,125	3,129

The above estimates are future funding requirements for the continuation or completion of the NASA programs (including the development of the Space Shuttle) provided for in this bill. These estimates do not provide for the impact of inflation, do not include a provision for administrative adjustments that may be required, and do not provide for the initiation of any new programs. Further, these estimates are not an estimate of what the NASA budget will be in future years. As existing programs and projects are phased out new programs and projects may be requested. The Congress will have an opportunity to exercise its judgment on these new programs and projects when authority and funds are requested to proceed with them. The committee does expect, however, that the budgets for the fiscal years through 1982 will approximate \$4.1 billion, in current year dollars, as new initiatives are proposed from studies currently underway and as developments demonstrate the need for and the worthiness of new starts in space science, space applications, and aeronautics, building on and capitalizing on the data and experience already acquired.

With respect to section 308(a) of the Congressional Budget and Impoundment Control Act of 1974, a concurrent resolution pertaining to this authorization for fiscal year 1978 has not been agreed to. However, the amounts recommended in this bill for Functional Code 250—\$3.616 billion, and for Functional Code 400—\$423 million, are within the range of the estimates submitted to and reported by the Senate Budget Committee for the first concurrent resolution on the budget for fiscal year 1978.

This bill contains no budget authority to provide financial assistance to State and local governments.

The Congressional Budget Office has submitted to the committee its estimate on this bill pursuant to section 403 of the Congressional Budget and Impoundment Control Act of 1974. The CBO submission of April 26, 1977, follows:

## CONGRESSIONAL BUDGET OFFICE

## COST ESTIMATE

APRIL 26, 1977.

1. Bill number: H.R. 4088.
2. Bill title:  
National Aeronautics and Space Administration Authorization Act, 1978.
3. Bill status: As ordered reported by the Senate Committee on Commerce, Science, and Transportation.
4. Purpose of bill:  
This bill would authorize appropriations to NASA for research and development, construction of facilities and for research and program management for fiscal year 1978. It also raises the fiscal year 1977 authorization for the space shuttle by \$95 million, and provides certain guidelines for the allocation and disbursement of the fiscal year 1978 funds. This bill also nullifies \$6.5 million authorized by the NASA Authorization Act of 1976, and \$6 million authorized in fiscal year 1977 for which appropriations have not been made.
5. Cost estimate:  
Federal costs would be incurred as a result of the reauthorization of the various NASA programs. The estimated costs of these activities are shown below.

	COSTS					
	[In thousands of dollars]					
	Fiscal year—					
	1977	1978	1979	1980	1981	1982
Authorization level.....	95,000	4,038,789				
Estimated cost:						
Increase for Space Shuttle.....	67,260	23,940	2,850	950		
Research and development.....		1,915,758	956,313	121,161	36,768	
Construction of facilities.....		24,234	55,681	54,803	20,079	7,003
Research and program management.....		794,476	45,737	6,776		
Total.....	67,260	2,758,408	1,060,581	183,690	56,847	7,003

6. Basis of estimate:  
Outlays were calculated by applying the historical disbursement rates for NASA programs to the authorization levels in the bill. In the case of the fiscal year 1977 authorization increase for the Space Shuttle, the appropriate spendout rate was applied to the increment of \$95 million. The \$95 million authorized in fiscal year 1977 and \$3.615 million authorized in fiscal year 1978 are in function 250. The remaining \$424 million authorized for fiscal year 1978 is in function 400.
7. Estimate comparison: None.
8. Previous CBO estimate:  
An estimate was prepared on March 10, 1977, for the version of this bill reported by the House Committee on Science and

Technology. The fiscal year 1978 authorization in the House legislation was \$15.04 million above the level in this bill. Another estimate was prepared on April 14, 1977, for H.R. 4088 as considered by the Subcommittee on Science, Technology and Space. This bill is identical to the subcommittee version.

9. Estimate prepared by: Jack Garrity (225-7760).
10. Estimate approved by:  
James L. Blum, Assistant Director for Budget Analysis.

## LEGISLATIVE CHANGES

The committee considered several legislative amendments in its action on this NASA authorization bill.

All references in the bill S. 365 to the Committee on Aeronautical and Space Sciences were changed to the Committee on Commerce, Science and Transportation consistent with Senate Resolution 4, effective February 11, 1977.

The committee deleted section 7 of S. 365 which would have authorized to NASA total amounts for each appropriations category for fiscal year 1979. Since separate legislative action will be undertaken on the fiscal year 1979 authorization request, no action is necessary at this time. There is no provision for fiscal year 1979 authorizations in the House bill.

The committee added section 1(h) to rescind that portion of the fiscal year 1976 authorization for the first increment of the construction of facilities project to modify the 40 x 80-foot subsonic wind tunnel at the Ames Research Center for which appropriations have not been made. This reduces the authorization from \$12,500,000 to \$6 million. Reauthorization of the amount for the activities not funded is included as a part of this bill. The House included an identical provision in its bill.

Section 1(i) was added to rescind that portion of the fiscal year 1977 authorization for the construction of facilities project to modify launch complex 39, Kennedy Space Center, for which appropriations have not been made. This action reduces the authorization from \$18,855,000 to \$12,855,000. Reauthorization of the work not funded for the modification of mobile launch platform No. 2 is included in this bill. The House included an identical provision in its bill.

The committee added an amendment, as section 7 of the bill, to the fiscal year 1977 authorization for the Space Shuttle program to increase the amount for that program by \$95 million, from \$1,288,100,000 to \$1,383,100,000. This increased authorization advances to fiscal year 1977, from fiscal year 1978, the start on the production of Orbiter 103 and the refurbishment of Orbiter 101. This increased authorization is funded through H.R. 4876, the Economic Stimulus Appropriations Act, 1977. The House included an identical provision as section 8 in its bill.

The committee amended section 1(b)(10) to designate as individual line items the facility projects authorizing the second increments of construction of the "National transonic facility" and the modification of the 40 feet by 80 feet subsonic wind tunnel. These line items are identified as 1(b)(10) and (11), respectively, in the bill. While these proj-

ects are both designed to support aeronautical research, they are major individual, unrelated and separate undertakings and, therefore, the committee believes they should be reflected as individual line items rather than grouped under one line in the bill. The House bill differs from the committee recommendation in this report.

The House adopted, as section 1(h) of its bill, a floor amendment that would prohibit the use of any funds available to the Administrator of NASA for the design or procurement of a prototype supersonic transport aircraft (SST). The committee did not include any such provision in its amendment noting that NASA, in response to the request of the Subcommittee on Science, Technology and Space for comments on the House bill stated that no authority was requested in its authorization bill for the design or procurement of a prototype SST and consequently, that it had no objection to the amendment. In addition, the Office of Management and Budget has indicated that the administration does not support and has not requested funds for developing plans for an American SST. In view of these assurances, the committee believes it is superfluous to include a statutory prohibition of an activity that is not contemplated by either NASA or the administration. Furthermore, it is clear that the design or procurement of a prototype SST using Federal funds could only take place with the explicit authorization of Congress.

The House adopted, in section 7 of its bill, a floor amendment entitled, "Sunshine in Government" requiring the Administrator of NASA to establish conflict-of-interest regulations with respect to those NASA employees participating in the award of grants or contracts to entities in which such employee has a financial interest. The committee took no action on this matter.

The committee made two perfecting amendments to the bill to conform to the requirements of the Congressional Budget Act of 1974. First, the words "to become available October 1, 1977" were added to the second line of section 1 following the word "Administration" to make it clear that this is a fiscal year 1978 authorization bill. Second, in the first line of section 1(e) after the word "specified," the words "and to the extent provided" were inserted for clarification.

CHANGES IN EXISTING LAW

In compliance with subsection 4 of rule XXIX of the Standing Rules of the Senate changes in existing law made by the bill are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION Act, 1976

Public Law 94-39

SEC. 1. (a) \* \* \*

(b) For "Construction of facilities," including land acquisition as follows:

(1) \* \* \*

\* \* \* \* \*

(4) Modification of 40-by-80-foot subsonic wind tunnel, Ames Research Center, [~~\$12,500,000~~] *\$6,000,000*;

\* \* \* \* \*

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION Act, 1977

Public Law 94-307

SEC. 1. (a) For "Research and development," for the following programs:

(1) Space Shuttle, [~~\$1,288,100,000~~] *\$1,383,100,000*;

\* \* \* \* \*

SEC. 1. (b) For "Construction of facilities," including land acquisition, as follows:

(1) \* \* \*

\* \* \* \* \*

(14) (A) \* \* \*

(B) Modifications to launch complex 39, John F. Kennedy Space Center, [~~\$18,855,000~~] *\$12,855,000*;

\* \* \* \* \*

REGULATORY IMPACT STATEMENT

This bill authorizes the appropriation of funds for the conduct of space and aeronautical research and development activities to carry out the policy and purpose of the National Aeronautics and Space Act of 1958. These activities are conducted in NASA laboratories by NASA personnel and through contracts with industry, universities and research institutions for research and development and for supporting scientific and technical services. The committee has concluded the nature of these activities is such that there is no regulatory impact on individuals and businesses and, therefore, it is impracticable to include in this report a regulatory impact evaluation as set forth in paragraph 5(a), rule XXIX of the Standing Rules of the Senate.

SECTION-BY-SECTION ANALYSIS

Section 1, subsections (a), (b), and (c) authorize to be appropriated to the National Aeronautics and Space Administration funds, in the total amount of \$4,038,789,000, to become available October 1, 1977, as follows: (a) for "Research and development," a total of 12 program line items aggregating the sum of \$3,030,000,000; (b) for "Construction of facilities," a total of 17 line items aggregating the sum

of \$161,800,000; and (c) for "Research and program management," \$846,989,000. Subsection (c) would also authorize to be appropriated such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

*Subsection 1(d)* authorizes the use of appropriations for "Research and development" without regard to the provisions of subsection 1(g) for: (1) items of a capital nature (other than the acquisition of land) required at locations other than NASA installations for the performance of research and development contracts; and (2) grants to nonprofit institutions of higher education, or to nonprofit organizations whose primary purpose is the conduct of scientific research, for purchase or construction of additional research facilities. Title to such facilities shall be vested in the United States unless the Administrator determines that the national program of aeronautical and space activities will best be served by vesting title in any such grantee institution or organization. Moreover, each such grant shall be made under such conditions as the Administrator shall find necessary to insure that the United States will receive benefit therefrom adequate to justify the making of that grant.

In either case no funds may be used for the construction of a facility in accordance with this subsection, the estimated cost of which, including collateral equipment, exceeds \$250,000, unless the Administrator notifies the Speaker of the House, the President of the Senate and the specified committees of the Congress of the nature, location, and estimated cost of such facility.

*Subsection 1(e)* provides that, when so specified and to the extent provided in an appropriation Act, (1) any amount appropriated for "Research and development" or for "Construction of facilities" may remain available without fiscal year limitation, and (2) contracts for maintenance and operation of facilities, and support services may be entered into under the "Research and program management" appropriation for periods not in excess of twelve months beginning at any time during the fiscal year.

*Subsection 1(f)* authorizes the use of not to exceed \$35,000 of the "Research and program management" appropriation for scientific consultations or extraordinary expenses, including representation and official entertainment expenses, upon the authority of the Administrator, whose determination shall be final and conclusive.

*Subsection 1(g)* provides that of the funds appropriated for "Research and development" and "Research and program management," not in excess of \$25,000 per project (including collateral equipment) may be used for construction of new, or additions to existing facilities, and not in excess of \$50,000 per project (including collateral equipment) may be used for rehabilitation or modification of existing facilities; however, of the funds appropriated for "Research and development," not in excess of \$250,000 per project (including collateral equipment) may be used for construction of new facilities or additions to, or rehabilitation or modification of, existing facilities required for unforeseen programmatic needs.

*Subsection 1(h)* rescinds \$6,500,000 which represents that part of the authorization included in Section 1(b)(4) of the National Aero-

nautics and Space Administration Authorization Act, 1976, for which appropriations have not been made.

*Subsection 1(i)* rescinds \$6,000,000 which represents that part of the authorization included in Section 1(b)(14)(B) of the National Aeronautics and Space Administration Authorization Act, 1977, for which appropriations have not been made.

*Section 2.* Section 2 authorizes upward variations of the sums authorized for the "Construction of facilities" line items (other than facility planning and design) of 10 per centum at the discretion of the Administrator or his designee, or 25 per centum following a report by the Administrator or his designee to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate on the circumstances of such action, for the purpose of meeting unusual cost variations. However, the total cost of all work authorized under these line items may not exceed the total sum authorized for "Construction of facilities" under subsection 1(b), paragraphs (1) through (16).

*Section 3.* Section 3 provides that not more than one-half of 1 per centum of the funds appropriated for "Research and development" may be transferred to the "Construction of facilities" appropriation and, when so transferred, together with \$10,000,000 of the funds appropriated for "Construction of facilities," shall be available for the construction of facilities and land acquisition at any location if the Administrator determines (1) that such action is necessary because of changes in the space program or new scientific or engineering developments, and (2) that deferral of such action until the next authorization Act is enacted would be inconsistent with the interest of the Nation in aeronautical and space activities. However, no such funds may be obligated until 30 days have passed after the Administrator or his designee has transmitted to the Speaker of the House, the President of the Senate and the specified committees of Congress a written report containing a description of the project, its cost, and the reason why such project is necessary in the national interest, or each such committee before the expiration of such 30-day period has notified the Administrator that no objection to the proposed action will be made.

*Section 4.* Section 4 provides that, notwithstanding any other provision of this Act—

(1) no amount appropriated pursuant to this Act may be used for any program deleted by the Congress from requests as originally made to either the House Committee on Science and Technology or the Senate Committee on Commerce, Science, and Transportation;

(2) no amount appropriated pursuant to this Act may be used for any program in excess of the amount actually authorized for that particular program by subsections 1(a) and 1(c); and,

(3) no amount appropriated pursuant to this Act may be used for any program which has not been presented to or requested of either such committee,

unless (A) a period of 30 days has passed after the receipt by the Speaker of the House, the President of the Senate and each such committee of notice given by the Administrator or his designee containing a full and complete statement of the action proposed to be taken and the facts and circumstances relied upon in support of such proposed

action, or (B) each such committee before the expiration of such period has transmitted to the Administrator written notice to the effect that such committee has no objection to the proposed action.

*Section 5.* Section 5 expresses the sense of the Congress that it is in the national interest that consideration be given to geographical distribution of Federal research funds whenever feasible and that the National Aeronautics and Space Administration should explore ways and means of distributing its research and development funds whenever feasible.

*Section 6.* Section 6 authorizes the National Aeronautics and Space Administration, when so provided in an appropriation Act, to enter into and maintain a contract (or contracts) for tracking and data relay satellite services. The Government would incur no costs under such contract prior to the furnishing of such services except that the contract could provide for the payment for contingent liability of the Government which may accrue in the event the Government should decide for its convenience to terminate the contract before the expiration of the contract period. Such tracking and data relay satellite services would be furnished to the Administration in accordance with applicable authorization and appropriation Acts. It is envisaged that facilities may be required to be provided under such a contract in order to provide such services. The bill would authorize the construction of such facilities on Government-owned land if there is included in the contract a provision under which the United States may, in accordance with terms and conditions agreed upon in the contract, acquire title to the facilities upon contract termination. In January of each year the Administrator would be required to report to the Committee on Science and Technology and the Committee on Appropriations of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate the projected aggregate contingent liability, through the next fiscal year, of the Government under termination provisions of any contract authorized under this section. This section would become permanent law in that it is specified that the authority of the National Aeronautics and Space Administration to enter into and maintain the contract (or contracts) authorized in this section shall remain in effect unless repealed by legislation hereafter enacted by the Congress.

*Section 7.* Section 7 authorizes to be appropriated to the National Aeronautics and Space Administration for fiscal year 1977 additional funds in the amount of \$95 million for the Space Shuttle program increasing the amount authorized from \$1,288,100,000 to \$1,383,100,000. This section amends paragraph (1) of subsection 1(a) of the National Aeronautics and Space Administration Authorization Act, 1977 (Public Law 94-307).

*Section 8.* Section 8 provides that the Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1978."

#### SPACE BUDGETS OF OTHER AGENCIES

(The following table, the source for which is the Office of Management and Budget, shows new budget authority of all Government agencies:)

#### SPACE ACTIVITIES OF THE GOVERNMENT—HISTORICAL SUMMARY AND FISCAL YEAR 1978 BUDGET RECOMMENDATIONS<sup>1</sup>

(In millions of dollars (may not add due to rounding))

	NASA		Department of Defense	ERDA	Commerce	Interior	Agriculture	NSR	Total space
	Total	Space <sup>2</sup>							
1955.....	56.9	56.9	3.0						59.9
1956.....	72.7	72.7	30.3	7.0				7.3	117.3
1957.....	78.2	78.2	71.0	21.3				8.4	178.5
1958.....	117.3	117.3	205.6	21.3				3.3	347.9
1959.....	305.4	235.4	489.5	34.3					799.2
1960.....	523.6	461.5	560.9	43.3				1	1,065.8
1961.....	964.0	926.0	813.9	67.7				6	1,808.2
1962.....	1,824.9	1,796.8	1,298.2	147.8	50.7			1.3	3,294.8
1963.....	3,673.0	3,626.0	1,549.0	213.9	43.2			1.5	5,434.5
1964.....	5,099.7	5,046.3	1,599.3	210.0	2.8			3.0	6,861.4
1965.....	5,249.7	5,167.6	1,573.9	228.6	12.2			3.2	6,985.5
1966.....	5,174.9	5,094.5	1,688.8	186.8	26.5			3.2	6,999.8
1967.....	4,967.6	4,862.2	1,663.6	183.6	29.3			2.8	6,741.5
1968.....	4,588.8	4,452.5	1,921.8	145.1	28.1	0.2	0.5	3.2	6,551.4
1969.....	3,990.9	3,822.0	2,013.0	118.0	20.6	.2	.7	1.9	5,975.8
1970.....	3,745.8	3,547.0	1,678.4	102.8	8.0	1.1	.8	2.4	5,340.5
1971.....	3,311.2	3,101.3	1,512.3	94.8	27.4	1.9	.8	2.4	4,740.9
1972.....	3,306.6	3,071.0	1,407.0	35.2	31.3	5.8	1.6	2.8	4,574.7
1973.....	3,406.2	3,093.2	1,623.0	54.2	39.7	10.3	1.9	2.6	4,824.8
1974.....	3,036.9	2,758.5	1,756.0	41.7	60.2	9.0	3.1	1.8	4,640.3
1975.....	3,229.1	2,915.3	1,892.4	29.6	64.4	8.3	2.3	2.0	4,314.3
1976.....	3,550.3	3,226.9	1,983.3	23.3	71.5	10.4	3.5	2.4	5,321.4
TQ <sup>4</sup> .....	931.8	849.5	460.4	4.6	22.2	2.5	0.9	0.6	1,340.8
Budget:									
1977 estimate.....	3,749.8	3,372.5	2,291.5	22.6	89.8	9.5	4.7	2.4	5,793.0
1978 estimate.....	4,033.2	3,596.4	2,770.0	35.1	94.5	9.5	5.6	2.4	6,528.5

<sup>1</sup> Historical amounts are estimates based on best data available.

<sup>2</sup> Excludes amounts for aircraft technology in 1959 and succeeding years. Amounts for NASA-NACA aircraft and space activities not separately identifiable prior to 1959.

<sup>3</sup> Adjusted for net offsetting receipts.

<sup>4</sup> Transitional quarter.

95TH CONGRESS }  
1st Session }

SENATE

REPORT  
No. 95-281

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AUTHORIZATION, FISCAL YEAR 1978

JUNE 21 (legislative day, MAY 18), 1977.—Ordered to be printed

Mr. STEVENSON, from the committee of conference,  
submitted the following

CONFERENCE REPORT

[To accompany H.R. 4088]

The committee of conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill (H.R. 4088) to authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes, having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

That the House recede from its disagreement to the amendment of the Senate and agree to the same with an amendment as follows:

In lieu of the matter proposed to be inserted by the Senate amendment insert the following:

*That there is hereby authorized to be appropriated to the National Aeronautics and Space Administration to become available October 1, 1977:*

(a) For "Research and development," for the following programs:

- (1) Space Shuttle, \$1,354,200,000;
- (2) Space flight operations, \$267,800,000;
- (3) Expendable launch vehicles, \$134,500,000;
- (4) Physics and astronomy, \$223,200,000;
- (5) Lunar and planetary exploration, \$153,200,000;
- (6) Life sciences, \$33,300,000;
- (7) Space applications, \$239,800,000;
- (8) Aeronautical research and technology, \$234,000,000;
- (9) Space research and technology, \$99,700,000;
- (10) Energy technology applications, \$7,500,000;
- (11) Tracking and data acquisition, \$280,200,000;
- (12) Technology utilization, \$9,100,000.

(b) For "Construction of facilities," including land acquisition, as follows:

- (1) Construction of central hydraulic system, Hugh L. Dryden Flight Research Center, \$420,000;
- (2) Construction of additional technical processing facilities, Goddard Space Flight Center, \$3,100,000;
- (3) Modifications to various buildings for seismic protection, Jet Propulsion Laboratory, \$2,830,000;
- (4) Modification of chillers in central heating and cooling plant, Lyndon B. Johnson Space Center, \$2,540,000;
- (5) Modifications for utility control system, John F. Kennedy Space Center, \$2,130,000;
- (6) Rehabilitation of main heating plant, Langley Research Center, \$790,000;
- (7) Rehabilitation of unitary plan wind tunnel, Langley Research Center, \$930,000;
- (8) Modification of central chilled water system, Lewis Research Center, \$860,000;
- (9) Modifications for utility control system, National Space Technology Laboratories, \$620,000;
- (10) Large aeronautical facility: construction of national transonic facility, Langley Research Center, \$23,500,000;
- (11) Large aeronautical facility: modification of 40- by 80-foot subsonic wind tunnel, Ames Research Center, \$13,500,000;
- (12) Various locations: rehabilitation and modification of 64-meter antenna components, \$1,750,000;
- (13) Space Shuttle facilities at various locations as follows:
  - (A) Modifications to launch complex 39, John F. Kennedy Space Center, \$40,700,000;
  - (B) Modifications for solid rocket booster processing facilities, John F. Kennedy Space Center, \$1,730,000;
  - (C) Rehabilitation of barge channels, John F. Kennedy Space Center, \$2,090,000;
  - (D) Modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility, \$18,610,000;
  - (E) Rehabilitation and modification of Shuttle facilities, at various locations, \$1,750,000;
- (14) Space Shuttle payload facility: modifications and addition for Shuttle payload vertical processing, John F. Kennedy Space Center, \$6,410,000;
- (15) Rehabilitation and modification of facilities at various locations, not in excess of \$500,000 per project, \$18,900,000;
- (16) Minor construction of new facilities and additions to existing facilities at various locations, not in excess of \$250,000 per project, \$6,950,000;
- (17) Facility planning and design not otherwise provided for, \$11,780,000.

(c) For "Research and program management," \$846,989,000, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

(d) Notwithstanding the provisions of subsection 1(g), appropriations for "Research and development" may be used (1) for any items of a capital nature (other than acquisition of land) which may be required at locations other than installations of the Administration for the performance of research and development contracts, and (2) for grants to nonprofit institutions of higher education, or to nonprofit organizations whose primary purpose is the conduct of scientific research, for purchase or construction of additional research facilities; and title to such facilities shall be vested in the United States unless the Administrator determines that the national program of aeronautical and space activities will best be served by vesting title in any such grantee institution or organization. Each such grant shall be made under such conditions as the Administrator shall determine to be required to insure that the United States will receive therefrom benefit adequate to justify the making of that grant. None of the funds appropriated for "Research and development" pursuant to this Act may be used in accordance with this subsection for the construction of any major facility, the estimated cost of which, including collateral equipment, exceeds \$250,000, unless the Administrator or his designee has notified the Speaker of the House of Representatives and the President of the Senate and the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate of the nature, location, and estimated cost of such facility.

(e) When so specified and to the extent provided in an appropriation Act (1) any amount appropriated for "Research and development" or for "Construction of facilities" may remain available without fiscal year limitation, and (2) maintenance and operation of facilities, and support services contracts may be entered into under the "Research and program management" appropriation for periods not in excess of 12 months beginning at any time during the fiscal year.

(f) Appropriations made pursuant to subsection 1(c) may be used, but not to exceed \$35,000, for scientific consultations or extraordinary expenses upon the approval or authority of the Administrator and his determination shall be final and conclusive upon the accounting officers of the Government.

(g) Of the funds appropriated pursuant to subsections 1(a) and 1(c), not in excess of \$25,000 for each project, including collateral equipment, may be used for construction of new facilities and additions to existing facilities, and not in excess of \$50,000 for each project, including collateral equipment, may be used for rehabilitation or modification of facilities: Provided, That of the funds appropriated pursuant to subsection 1(a), not in excess of \$250,000 for each project, including collateral equipment, may be used for any of the foregoing for unforeseen programmatic needs.

(h) The authorization for appropriation to the National Aeronautics and Space Administration of \$6,500,000, which amount represents that part of the authorization provided for in section 1(b)(4) of the National Aeronautics and Space Administration Authorization Act, 1976, for which appropriations have not been made, shall expire on the date of the enactment of this Act.

(i) The authorization for appropriation to the National Aeronautics and Space Administration of \$6,000,000, which amount repre-

sents that part of the authorization provided for in section 1(b)(14)(B) of the National Aeronautics and Space Administration Authorization Act, 1977, for which appropriations have not been made, shall expire on the date of the enactment of this Act.

(j) No part of any funds available to the Administrator may be used for the design or procurement of a prototype supersonic transport aircraft.

Sec. 2. Authorization is hereby granted whereby any of the amounts prescribed in paragraphs (1) through (16), inclusive, of subsection 1(b)—

(1) in the discretion of the Administrator or his designee, may be varied upward 10 percent, or

(2) following a report by the Administrator or his designee to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate on the circumstances of such action, may be varied upward 25 percent,

to meet unusual cost variations, but the total cost of all work authorized under such paragraphs shall not exceed the total of the amounts specified in such paragraphs.

Sec. 3. Not to exceed one-half of 1 percent of the funds appropriated pursuant to subsection 1(a) hereof may be transferred to the "Construction of facilities" appropriation, and, when so transferred, together with \$10,000,000 of the funds appropriated pursuant to subsection 1(b) hereof (other than funds appropriated pursuant to paragraph (17) of such subsection) shall be available for expenditure to construct, expand, or modify laboratories and other installations at any location (including locations specified in subsection 1(b)), if (1) the Administrator determines such action to be necessary because of changes in the national program of aeronautical and space activities or new scientific or engineering developments, and (2) he determines that deferral of such action until the enactment of the next authorization Act would be inconsistent with the interest of the Nation in aeronautical and space activities. The funds so made available may be expended to acquire, construct, convert, rehabilitate, or install permanent or temporary public works, including land acquisition, site preparation, appurtenances, utilities, and equipment. No portion of such sums may be obligated for expenditure or expended to construct, expand, or modify laboratories and other installations unless (A) a period of 30 days has passed after the Administrator or his designee has transmitted to the Speaker of the House of Representatives and to the President of the Senate and to the Committee on Science and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate a written report containing a full and complete statement concerning (1) the nature of such construction, expansion, or modification, (2) the cost thereof including the cost of any real estate action pertaining thereto, and (3) the reason why such construction, expansion, or modification is necessary in the national interest, or (B) each such committee before the expiration of such period has transmitted to the Administrator written notice to the effect that such committee has no objection to the proposed action.

*Sec. 4. Notwithstanding any other provision of this Act—*

*(1) no amount appropriated pursuant to this Act may be used for any program deleted by the Congress from requests as originally made to either the House Committee on Science and Technology or the Senate Committee on Commerce, Science, and Transportation,*

*(2) no amount appropriated pursuant to this Act may be used for any program in excess of the amount actually authorized for that particular program by sections 1(a) and 1(c), and*

*(3) no amount appropriated pursuant to this Act may be used for any program which has not been presented to or requested of either such committee,*

*unless (A) a period of 30 days has passed after the receipt by the Speaker of the House of Representatives and the President of the Senate and each such committee of notice given by the Administrator or his designee containing a full and complete statement of the action proposed to be taken and the facts and circumstances relied upon in support of such proposed action, or (B) each such committee before the expiration of such period has transmitted to the Administrator written notice to the effect that such committee has no objection to the proposed action.*

*Sec. 5. It is the sense of the Congress that it is in the national interest that consideration be given to geographical distribution of Federal research funds whenever feasible, and that the National Aeronautics and Space Administration should explore ways and means of distributing its research and development funds whenever feasible.*

*Sec. 6. The National Aeronautics and Space Administration is authorized, when so provided in an appropriation Act, to enter into and to maintain a contract for tracking and data relay satellite services. Such services shall be furnished to the National Aeronautics and Space Administration in accordance with applicable authorization and appropriations Acts. The Government shall incur no costs under such contract prior to the furnishing of such services except that the contract may provide for the payment for contingent liability of the Government which may accrue in the event the Government should decide for its convenience to terminate the contract before the end of the period of the contract. Facilities which may be required in the performance of the contract may be constructed on Government-owned lands if there is included in the contract a provision under which the Government may acquire title to the facilities, under terms and conditions agreed upon in the contract, upon termination of the contract.*

*The Administrator shall in January of each year report to the Committee on Science and Technology and the Committee on Appropriations of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate the projected aggregate contingent liability of the Government under termination provisions of any contract authorized in this section through the next fiscal year. The authority of the National Aeronautics and Space Administration to enter into and to maintain the contract authorized hereunder shall remain in effect unless repealed by legislation hereafter enacted by the Congress.*

*Sec. 7. Paragraph (1) of subsection 1(a) of the National Aeronautics and Space Administration Authorization Act, 1977 (Public Law 94-307), is amended by striking out "\$1,288,100,000" and inserting in lieu thereof "\$1,383,100,000".*

*Sec. 8. This Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1978".*

And the Senate agree to the same.

WARREN G. MAGNUSON,  
ERNEST F. HOLLINGS,  
ADLAI E. STEVENSON,  
WENDELL H. FORD,  
HARRISON SCHMITT  
(for Barry M. Goldwater),  
HARRISON SCHMITT,  
*Managers on the Part of the Senate.*

OLIN E. TEAGUE,  
DON FUQUA,  
ROBERT A. ROE,  
JAMES F. LLOYD,  
DALE MILFORD,  
JOHN W. WYDLER,  
LARRY WINN, JR.,  
*Managers on the Part of the House.*

#### JOINT EXPLANATORY STATEMENT OF THE COMMITTEE OF CONFERENCE

The managers on the part of the House and the Senate at the conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill (H.R. 4088) to authorize appropriations to the National Aeronautics and Space Administration for fiscal year 1978 for Research and Development, Construction of Facilities, and Research and Program Management, and for other purposes, submit the following joint statement to the House and the Senate in explanation of the effect of the action agreed upon by the managers and recommended in the accompanying conference report.

The NASA request for fiscal year 1978 totaled \$4,034,789,000. The House authorized \$4,053,829,000 and the Senate amendment authorized \$4,038,789,000. The committee of conference agrees to a total authorization for fiscal year 1978 of \$4,049,429,000, as follows:

## SUMMARY, FISCAL YEAR 1978

	Budget request <sup>1</sup>	House	Senate	Committee of Conference
<b>Research and development:</b>				
Space Shuttle	\$1,349,200,000	\$1,349,200,000	\$1,354,200,000	\$1,354,200,000
Space flight operations	267,800,000	270,800,000	265,800,000	267,800,000
Expendable launch vehicles	136,500,000	129,500,000	136,500,000	134,500,000
Physics and astronomy	224,200,000	229,200,000	226,200,000	228,200,000
Lunar and planetary exploration	158,200,000	161,200,000	150,200,000	153,200,000
Life sciences	33,300,000	33,300,000	33,300,000	33,300,000
Space applications	233,800,000	211,900,000	239,800,000	239,800,000
Earth resources operational systems	0	26,900,000	0	0
<b>Aeronautical research and technology</b>				
Space research and technology	231,000,000	236,500,000	231,000,000	234,000,000
Energy technology applications	97,700,000	101,700,000	97,700,000	99,700,000
Tracking and data acquisition	4,500,000	9,500,000	4,500,000	7,500,000
Technology utilization	281,700,000	278,700,000	281,700,000	280,200,000
	8,100,000	9,100,000	9,100,000	9,100,000
<b>Total</b>	<b>3,026,000,000</b>	<b>3,047,500,000</b>	<b>3,030,000,000</b>	<b>3,041,500,000</b>
Construction of facilities	161,800,000	158,340,000	161,800,000	160,940,000
Research and program management	846,989,000	847,989,000	846,989,000	846,989,000
<b>Grand total</b>	<b>4,034,789,000</b>	<b>4,053,829,000</b>	<b>4,038,789,000</b>	<b>4,049,429,000</b>

<sup>1</sup> Includes Carter amendments to original fiscal year 1978 budget request.

The points in disagreement and the conference resolution of them are as follows:

1. The House authorized \$1,349,200,000 for the Space Shuttle program, agreeing with the NASA request.

The Senate authorized \$1,354,200,000, an increase of \$5 million to provide for a more efficient orbiter production program reflecting schedule adjustments to accommodate an earlier start on production activities funded by the \$95 million added to this program in fiscal year 1977 through the Economic Stimulus Appropriations Act, 1977.

The conference substitute authorizes \$1,354,200,000 for the Space Shuttle program.

2. NASA requested \$267,800,000 for the space flight operations program. The House authorized \$270,800,000, an increase of \$3 million, the net result of adding \$5 million to the space transportation system operations subprogram for space industrialization studies, and reducing the space transportation system operations capability development subprogram by \$2 million.

The Senate authorized \$265,800,000, agreeing with the House in its \$2 million reduction in the subprogram, space transportation system operations capability development.

The conference substitute authorizes \$267,800,000 for the space flight operations program, including \$2 million for space industrialization studies.

3. The House authorized \$129,500,000 for the expendable launch vehicles program, a reduction of \$7 million in the NASA request, believing that maturity of the program should enable NASA to achieve greater economies in the area of supporting activities.

The Senate authorized \$136,500,000, an amount identical with the NASA request.

The conference substitute authorizes \$134,500,000.

4. NASA requested \$224,200,000 for the physics and astronomy program. The House increased the request by \$5 million with the added funds to be used for augmenting the supporting research and technology base in the university community.

The Senate authorized \$226,200,000, an increase of \$2 million in the NASA request, believing that NASA should pursue more aggressively its responsibilities with respect to the upper atmospheric research, technology, and monitoring program assigned to it by title IV of the National Aeronautics and Space Act of 1958, as amended.

The committee of conference authorizes \$228,200,000 for the physics and astronomy program.

The conferees agree that NASA should make every effort to provide the support necessary to enhance the contribution of educational institutions to the physics and astronomy program including work in the area of upper atmospheric research.

5. NASA requested \$158,200,000 for the lunar and planetary exploration program. The House authorized \$161,200,000, an increase of \$3 million in the requested amount. The increase resulted from the addition of \$7 million to initiate development of the lunar polar orbiter mission, the addition of \$1 million to augment the planned level of activities and to offset the effects of inflation in supporting research and technology, and a reduction of \$5 million in Mars follow-on studies, believing that future Mars mission definition could be accomplished with less funding.

The Senate authorized \$150,200,000 reducing the NASA request for Mars follow-on mission definition studies by \$8 million.

The conference substitute authorizes \$153,200,000 for the lunar and planetary exploration program.

The conferees request that NASA conduct the preparatory work with the objective of presenting the lunar polar orbiter project as a high priority new initiative in its fiscal year 1979 budget request.

6. NASA requested \$233,800,000 for the space applications program. The House authorized \$211,900,000, a reduction of \$21,900,000 in the request. The House reduction is the net result of transferring the Landsat-D spacecraft project and the \$26,900,000 associated therewith to a new line item in the bill, and the addition of \$5 million to the subprogram, weather and climate observation and forecasting, to offset the effects of inflation and thereby maintain a reasonably constant level of effort in this subprogram area.

The Senate authorized \$239,800,000, increasing the NASA request by \$6 million, of which \$2 million was for the inclusion of a proven multispectral scanner on the first Landsat-D spacecraft, \$2 million was for studies in the subprogram, space communications, to define and develop a satellite based system for conducting surveillance of the 200-mile limit, and of which \$2 million was to support, within the subprogram, environmental quality monitoring, the investigation of the potential of satellite systems to detect and monitor oil spills in U.S. waters.

The conference substitute authorizes \$239,800,000 for the space applications program.

The conferees request that NASA allocate \$2 million of the amount authorized for the space applications program to provide for the inclusion of a proven multispectral scanner on the first Landsat-D spacecraft. The conferees also direct that NASA allocate within the space applications program such funds as are necessary to develop and investigate fully the potential contributions of space technology to the subprograms of weather and climate, space communications and environmental quality as these potentials are addressed in the respective House and Senate reports on this bill. In addition to oil spills, NASA should also investigate the application of space technology to the monitoring and control of other ocean pollution problems such as waste disposal.

7. The House established a new research and development appropriations line item program entitled, "Earth Resources Operational Systems" not included in the NASA request, and authorized \$26,900,000 for the program to include those activities associated with the Landsat-D spacecraft development project. This action reflects a transfer of the Landsat-D project and the funding requested therefor from the space applications program.

The Senate did not include a comparable line item program in its amendment to the bill.

The conference substitute does not include this line item since the functions of and the funding for this activity have been included in the space applications program.

8. NASA requested \$231 million for the aeronautical research and technology program. The House increased the request by \$5,500,000 with \$3 million to be applied to accelerate work on the superplastic forming and diffusion bonding of materials and to reverse the downward trend in independent university aeronautical research, and with \$2,500,000 to be applied to establish a new subline item for agricultural aircraft systems technology, increasing the request of \$1 million for this activity to a total of \$3,500,000.

The Senate authorized the NASA request of \$231 million for this program.

The conference substitute authorizes \$234 million for the aeronautical research and technology program.

In increasing the authorized amount for the aeronautical research and technology program, the conferees note the importance of aeronautical research to the economy and request NASA to continue to emphasize this function through increased funding and manpower commitments to assure the Nation retains its favorable competitive position in domestic and international markets.

9. The House authorized \$101,700,000 for the space research and technology program, an increase of \$4 million in the NASA request. This increase was to be applied to the research and technology base subprogram and to be divided equally to offset the effects of inflation and to augment advanced propulsion technology efforts, particularly in the area of fundamental research and exploratory development in new propulsion concepts.

The Senate authorized the NASA request of \$97,700,000 for this program.

The conference substitute authorizes \$99,700,000 for the space research and technology program.

The conferees agree that the increase of \$2 million above the request is to be used to augment work on advanced propulsion concepts including electric and gaseous core reactor propulsion.

10. NASA requested \$4,500,000 for the energy technology applications program. The House authorized \$9,500,000 adding \$5 million to the request to significantly broaden the system definition effort and to initiate a comprehensive environmental impact and benefit analysis on a satellite solar power system concept.

The Senate authorized \$4,500,000, the NASA request.

The conference substitute authorizes \$7,500,000 for this program.

The conferees agree that \$4 million of the amount authorized for this program is to be applied to studies on the satellite solar power system concept.

11. The House authorized \$278,700,000 for the tracking and data acquisition program, a reduction of \$3 million in the NASA request, expecting that greater economies could be achieved in the program.

The Senate authorized \$281,700,000, the amount of the NASA request.

The conference substitute authorizes \$280,200,000 for the tracking and data acquisition program.

12. NASA requested \$860,000 for the construction of a crew training facility for the Space Shuttle program at the Lyndon B. Johnson Space Center.

The House did not authorize this facility, indicating that NASA had not substantiated this facility on the basis of an 8-year life-cycle cost. The House also expressed its concern about the existence of the neutral buoyancy facility at the Marshall Space Flight Center and the cost that would be incurred in operating two facilities.

The Senate authorized the construction of this facility project noting that testimony stated a net savings of \$3.3 million would accrue over a period of 8 years.

The conference substitute does not include this facility project as a line item.

The conferees agree that the astronaut crew training facility is deferred pending a consolidated update by NASA of the justifications, cost and current schedule therefor with particular reference to life-cycle costs. This consolidated update is to be submitted to the Committee on Science and Technology of the House of Representatives, and the Committee on Commerce, Science, and Transportation of the Senate. Should NASA continue to believe there exists a pressing and unique need for this facility, NASA, following a reasonable period for committee review such as 30 days after the submission of such consolidated update, may proceed with the acquisition of such facility utilizing existing resources in accordance with procedures set forth in annual NASA authorization acts.

13. NASA requested \$18,610,000 for a construction of facilities project for modifications to the Michoud Assembly Facility to support the manufacturing and final assembly of external tanks for the Space Shuttle program. The House reduced the request by \$2,600,000 believing that construction of a new chemical waste treatment facility included in the project should be deferred until completion of final design of the facility.

The Senate authorized this "Construction of Facilities" line item in its entirety at the requested amount of \$18,610,000.

The committee of conference adopts the Senate position.

The conferees request that the results of the bench tests conducted to assist in the design of the chemical waste treatment facility be submitted to the authorizing committees of the House and the Senate.

14. The House authorized \$847,989,000 for the "Research and Program Management" appropriations category increasing the NASA request for personnel travel by \$1 million.

The Senate authorized the NASA request of \$846,989,000 for this appropriations category.

The conference substitute authorizes \$846,989,000 for the "Research and Program Management" appropriations category.

15. The Senate amendment added two clarifying provisions to the bill to conform to the requirements of the Congressional Budget Act of 1974. First, the words "to become available October 1, 1977" were added to the second line of section 1 following the word "Administration". Second, the words, "and to the extent provided" were inserted in the first line of subsection 1(e) after the word "specified."

The House bill did not include the foregoing language.

The committee of conference adopts the Senate provisions.

16. The House bill consolidated the two projects for large aeronautical facilities as items 10(A) and 10(B) in subsection 1(b)(10).

The Senate amendment established each of these projects as an individual line item noting they are major, individual, unrelated and separate undertakings and believing they should be presented accordingly. The remaining line items in subsection 1(b) were renumbered accordingly.

The conference substitute adopts the Senate position.

17. The House adopted as section 1(h) a prohibition against the use of any funds available to the Administrator of NASA for the design or procurement of a prototype supersonic transport aircraft.

There was no comparable provision included in the NASA authorization request to the Congress for fiscal year 1978.

The Senate did not include an equivalent provision in its amendment to the bill.

The conference substitute adopts the House provision.

18. The House adopted a section 7 in its bill entitled, "Sunshine in Government" requiring NASA employees with specified financial interests to file publicly available statements thereon, and requiring the Administrator of NASA to implement the requirements of the section and to file a report to the Congress thereon. There was no comparable provision included in the NASA authorization request for fiscal year 1978.

The Senate amendment did not include a comparable provision.

The conference substitute does not include this provision.

WARREN G. MAGNUSON,  
ERNEST F. HOLLINGS,  
ADLAI E. STEVENSON,  
WENDELL H. FORD,  
HARRISON SCHMITT  
(for Barry M. Goldwater),  
HARRISON SCHMITT,  
*Managers on the Part of the Senate.*

OLIN E. TEAGUE,  
DON FUQUA,  
ROBERT A. ROE,  
JAMES F. LLOYD,  
DALE MILFORD,  
JOHN W. WYDLER,  
LARRY WINN, JR.,  
*Managers on the Part of the House.*

○

PUBLIC LAW 95-76—JULY 30, 1977

**Public Law 95-76**  
**95th Congress**

**An Act**

July 30, 1977  
[H.R. 4068]

To authorize appropriations to the National Aeronautics and Space Administration for research and development, construction of facilities, and research and program management, and for other purposes.

National  
Aeronautics and  
Space  
Administration  
Authorization  
Act, 1976.  
Research and  
development.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That there is hereby authorized to be appropriated to the National Aeronautics and Space Administration to become available October 1, 1977:

(a) For "Research and development," for the following programs:

- (1) Space Shuttle, \$1,354,200,000;
- (2) Space flight operations, \$267,800,000;
- (3) Expendable launch vehicles, \$134,500,000;
- (4) Physics and astronomy, \$228,200,000;
- (5) Lunar and planetary exploration, \$153,200,000;
- (6) Life sciences, \$33,300,000;
- (7) Space applications, \$239,800,000;
- (8) Aeronautical research and technology, \$234,000,000;
- (9) Space research and technology, \$99,700,000;
- (10) Energy technology applications, \$7,500,000;
- (11) Tracking and data acquisition, \$280,200,000;
- (12) Technology utilization, \$9,100,000.

(b) For "Construction of facilities," including land acquisition, as follows:

- (1) Construction of central hydraulic system, Hugh L. Dryden Flight Research Center, \$420,000;
- (2) Construction of additional technical processing facilities, Goddard Space Flight Center, \$3,100,000;
- (3) Modifications to various buildings for seismic protection, Jet Propulsion Laboratory, \$2,830,000;
- (4) Modification of chillers in central heating and cooling plant, Lyndon B. Johnson Space Center, \$2,540,000;
- (5) Modifications for utility control system, John F. Kennedy Space Center, \$2,130,000;
- (6) Rehabilitation of main heating plant, Langley Research Center, \$790,000;
- (7) Rehabilitation of unitary plan wind tunnel, Langley Research Center, \$980,000;
- (8) Modification of central chilled water system, Lewis Research Center, \$860,000;
- (9) Modifications for utility control system, National Space Technology Laboratories, \$620,000;
- (10) Large aeronautical facility: construction of national transonic facility, Langley Research Center, \$23,500,000;
- (11) Large aeronautical facility: modification of 40- by 80-foot subsonic wind tunnel, Ames Research Center, \$13,500,000;
- (12) Various locations: rehabilitation and modification of 64-meter antenna components, \$1,750,000;
- (13) Space Shuttle facilities at various locations as follows:
  - (A) Modifications to launch complex 39, John F. Kennedy Space Center, \$40,700,000;

Facilities,  
construction.

PUBLIC LAW 95-76—JULY 30, 1977

(B) Modifications for solid rocket booster processing facilities, John F. Kennedy Space Center, \$1,730,000;

(C) Rehabilitation of barge channels, John F. Kennedy Space Center, \$2,090,000;

(D) Modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility, \$18,610,000;

(E) Rehabilitation and modification of Shuttle facilities, at various locations, \$1,750,000;

(14) Space Shuttle payload facility: modifications and addition for Shuttle payload vertical processing, John F. Kennedy Space Center, \$6,410,000;

(15) Rehabilitation and modification of facilities at various locations, not in excess of \$500,000 per project, \$18,900,000;

(16) Minor construction of new facilities and additions to existing facilities at various locations, not in excess of \$250,000 per project, \$5,950,000;

(17) Facility planning and design not otherwise provided for, \$11,780,000;

(c) For "Research and program management," \$846,989,000, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

Research and  
program  
management.

(d) Notwithstanding the provisions of subsection 1(g), appropriations for "Research and development" may be used (1) for any items of a capital nature (other than acquisition of land) which may be required at locations other than installations of the Administration for the performance of research and development contracts, and (2) for grants to nonprofit institutions of higher education, or to nonprofit organizations whose primary purpose is the conduct of scientific research, for purchase or construction of additional research facilities; and title to such facilities shall be vested in the United States unless the Administrator determines that the national program of aeronautical and space activities will best be served by vesting title in any such grantee institution or organization. Each such grant shall be made under such conditions as the Administrator shall determine to be required to insure that the United States will receive therefrom benefit adequate to justify the making of that grant. None of the funds appropriated for "Research and development" pursuant to this Act may be used in accordance with this subsection for the construction of any major facility, the estimated cost of which, including collateral equipment, exceeds \$250,000, unless the Administrator or his designee has notified the Speaker of the House of Representatives and the President of the Senate and the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate of the nature, location, and estimated cost of such facility.

Program  
specifications.

(e) When so specified and to the extent provided in an appropriation Act (1) any amount appropriated for "Research and development" or for "Construction of facilities" may remain available without fiscal year limitation, and (2) maintenance and operation of facilities, and support services contracts may be entered into under the "Research and program management" appropriation for periods not in excess of 12 months beginning at any time during the fiscal year.

(f) Appropriations made pursuant to subsection 1(c) may be used, but not to exceed \$35,000, for scientific consultations or extraordinary expenses upon the approval or authority of the Administrator and his

Notice to Speaker  
of the House,  
President of the  
Senate and  
congressional  
committees.

Scientific  
consultation-  
or  
extraordinary  
expenses.

## PUBLIC LAW 95-76—JULY 30, 1977

	determination shall be final and conclusive upon the accounting officers of the Government.
Limitations.	(g) Of the funds appropriated pursuant to subsections 1(a) and 1(c), not in excess of \$25,000 for each project, including collateral equipment, may be used for construction of new facilities and additions to existing facilities, and not in excess of \$50,000 for each project, including collateral equipment, may be used for rehabilitation or modification of facilities: <i>Provided</i> , That of the funds appropriated pursuant to subsection 1(a), not in excess of \$250,000 for each project, including collateral equipment, may be used for any of the foregoing for unforeseen programmatic needs.
Ames Research Center.	(h) The authorization for appropriation to the National Aeronautics and Space Administration of \$6,500,000, which amount represents that part of the authorization provided for in section 1(b)(4) of the National Aeronautics and Space Administration Authorization Act, 1976, for which appropriations have not been made, shall expire on the date of the enactment of this Act.
89 Stat. 218.	(i) The authorization for appropriation to the National Aeronautics and Space Administration of \$6,000,000, which amount represents that part of the authorization provided for in section 1(b)(14)(B) of the National Aeronautics and Space Administration Authorization Act, 1977, for which appropriations have not been made, shall expire on the date of the enactment of this Act.
John F. Kennedy Space Center.	(j) No part of any funds available to the Administrator may be used for the design or procurement of a prototype supersonic transport aircraft.
90 Stat. 677.	SEC. 2. Authorization is hereby granted whereby any of the amounts prescribed in paragraphs (1) through (16), inclusive, of subsection 1(b)—
Use of funds, restriction.	(1) in the discretion of the Administrator or his designee, may be varied upward 10 percent, or
Cost variations.	(2) following a report by the Administrator or his designee to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate on the circumstances of such action, may be varied upward 25 percent,
Report to congressional committees.	to meet unusual cost variations, but the total cost of all work authorized under such paragraphs shall not exceed the total of the amounts specified in such paragraphs.
Unforeseen program changes, transfer of funds, authorization.	SEC. 3. Not to exceed one-half of 1 percent of the funds appropriated pursuant to subsection 1(a) hereof may be transferred to the "Construction of facilities" appropriation, and, when so transferred, together with \$10,000,000 of the funds appropriated pursuant to subsection 1(b) hereof (other than funds appropriated pursuant to paragraph (17) of such subsection) shall be available for expenditure to construct, expand, or modify laboratories and other installations at any location (including locations specified in subsection 1(b)), if (1) the Administrator determines such action to be necessary because of changes in the national program of aeronautical and space activities or new scientific or engineering developments, and (2) he determines that deferral of such action until the enactment of the next authorization Act would be inconsistent with the interest of the Nation in aeronautical and space activities. The funds so made available may be expended to acquire, construct, convert, rehabilitate, or install permanent or temporary public works, including land acquisition, site preparation, appurtenances, utilities, and equipment. No portion of such sums may be obligated for expenditure or expended to construct, expand, or
Report to Speaker of the House, President of the Senate and congressional committees.	

## PUBLIC LAW 95-76—JULY 30, 1977

modify laboratories and other installations unless (A) a period of 30 days has passed after the Administrator or his designee has transmitted to the Speaker of the House of Representatives and to the President of the Senate and to the Committee on Science and Technology of the House of Representatives and to the Committee on Commerce, Science, and Transportation of the Senate a written report containing a full and complete statement concerning (1) the nature of such construction, expansion, or modification, (2) the cost thereof including the cost of any real estate action pertaining thereto, and (3) the reason why such construction, expansion, or modification is necessary in the national interest, or (B) each such committee before the expiration of such period has transmitted to the Administrator written notice to the effect that such committee has no objection to the proposed action.

## SEC. 4. Notwithstanding any other provision of this Act—

(1) no amount appropriated pursuant to this Act may be used for any program deleted by the Congress from requests as originally made to either the House Committee on Science and Technology or the Senate Committee on Commerce, Science, and Transportation,

(2) no amount appropriated pursuant to this Act may be used for any program in excess of the amount actually authorized for that particular program by sections 1(a) and 1(c), and

(3) no amount appropriated pursuant to this Act may be used for any program which has not been presented to or requested of either such committee,

unless (A) a period of 30 days has passed after the receipt by the Speaker of the House of Representatives and the President of the Senate and each such committee of notice given by the Administrator or his designee containing a full and complete statement of the action proposed to be taken and the facts and circumstances relied upon in support of such proposed action, or (B) each such committee before the expiration of such period has transmitted to the Administrator written notice to the effect that such committee has no objection to the proposed action.

SEC. 5. It is the sense of the Congress that it is in the national interest that consideration be given to geographical distribution of Federal research funds whenever feasible, and that the National Aeronautics and Space Administration should explore ways and means of distributing its research and development funds whenever feasible.

SEC. 6. The National Aeronautics and Space Administration is authorized, when so provided in an appropriation Act, to enter into and to maintain a contract for tracking and data relay satellite services. Such services shall be furnished to the National Aeronautics and Space Administration in accordance with applicable authorization and appropriations Acts. The Government shall incur no costs under such contract prior to the furnishing of such services except that the contract may provide for the payment for contingent liability of the Government which may accrue in the event the Government should decide for its convenience to terminate the contract before the end of the period of the contract. Facilities which may be required in the performance of the contract may be constructed on Government-owned lands if there is included in the contract a provision under which the Government may acquire title to the facilities, under terms and conditions agreed upon in the contract, upon termination of the contract.

The Administrator shall in January of each year report to the Com-

Use of funds, restrictions.

Notice to Speaker of the House, President of the Senate and congressional committees.

Research funds, geographical distribution. 42 USC 2459 note.

Satellite services, contract authorization. 42 USC 2463.

Report to congressional committees.

## PUBLIC LAW 95-76—JULY 30, 1977

mittee on Science and Technology and the Committee on Appropriations of the House of Representatives and the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate the projected aggregate contingent liability of the Government under termination provisions of any contract authorized in this section through the next fiscal year. The authority of the National Aeronautics and Space Administration to enter into and to maintain the contract authorized hereunder shall remain in effect unless repealed by legislation hereafter enacted by the Congress.

Space shuttle.

90 Stat. 677.

Short title.

Sec. 7. Paragraph (1) of subsection 1(a) of the National Aeronautics and Space Administration Authorization Act, 1977 (Public Law 94-307), is amended by striking out "\$1,288,100,000" and inserting in lieu thereof "\$1,383,100,000".

Sec. 8. This Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1978".

Approved July 30, 1977.

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**LEGISLATIVE HISTORY:**

HOUSE REPORTS: No. 95-67 (Comm. on Science and Technology) and No. 95-448 (Comm. of Conference).

SENATE REPORTS: No. 95-120 (Comm. on Commerce, Science, and Transportation) and No. 95-281 (Comm. of Conference).

CONGRESSIONAL RECORD, Vol. 123 (1977):

Mar. 17, considered and passed House.

May 13, considered and passed Senate, amended.

June 21, Senate agreed to conference report.

July 19, House agreed to conference report.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATION BILL, 1978

JUNE 2, 1977.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. BOLAND, from the Committee on Appropriations, submitted the following

REPORT

together with

ADDITIONAL AND DISSENTING VIEWS

[To accompany H.R. 7554]

The Committee on Appropriations submits the following report in explanation of the accompanying bill making appropriations for the Department of Housing and Urban Development, and for sundry independent executive agencies, boards, bureaus, commissions, corporations, and offices for the fiscal year ending September 30, 1978, and for other purposes.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

RESEARCH AND DEVELOPMENT

1977 appropriation.....	\$2,856,425,000
Estimate, 1978.....	2,969,300,000
Recommended in bill.....	2,943,600,000
Decrease below estimate.....	25,700,000

<sup>1</sup>Includes \$15,000,000 requested in H. Doc. 95-93, and excludes \$56,700,000 deferred for subsequent consideration.

The Committee recommends an appropriation of \$2,943,600,000 for 1978. This is a decrease of \$25,700,000 below the budget estimate. Within the total recommended, the following changes are made from the amount requested in the budget plan:

(1) An increase of \$5,000,000 to advance the critical work on space industrialization—including the assembly of large objects in space and the development of space manufacturing techniques.

(2) An additional \$5,000,000 for continued work on a solar satellite power generating system that could provide clean, competitive electric power in the next century.

(3) Reductions of \$7,000,000 for expendable launch vehicle activities; \$5,000,000 for a Mars follow-on mission; and \$3,000,000 for tracking and data acquisition activities. This action is consistent with recommendations made by the House Science and Technology Committee.

(4) Denial of \$20,700,000 for development of a Jupiter Orbiter Probe. The Jupiter Orbiter Probe is being denied on a budget priority basis. Two years ago, in fiscal year 1976, the Committee recommended delaying the Pioneer Venus mission for one year in order to strike a budget priority decision between Pioneer Venus and the space telescope. This action was taken because some astronomers had been critical of NASA's space science program, pointing out that a disproportionate level of dollars have been used on planetary astronomy missions rather than deep space astronomy—which is the principal *raison d'être* of the space telescope.

Ultimately, Pioneer Venus was not delayed because development funding had already begun. Still, the underlying rationale of the Committee's concern over the space telescope has been one of budget priorities. The question being asked was—is this the right project, at the right cost, at the right time—or should these resources be devoted to other NASA projects with potentially earlier payoffs?

In approving the space telescope and denying the Jupiter Orbiter Probe, the Committee is again making a budget priority choice. The telescope has been described by the scientific community as the number one astronomy project in the 1980's. Not every project can have first priority and clearly, planetary exploration has received substantial funding through NASA's space science budget over the past 15 years. Therefore, the Jupiter mission can be delayed until the next available launch window.

The Committee has consistently supported development of a space shuttle. In past reports, the shuttle has been characterized as opening a new transportation era that will make space flight routine. The shuttle can provide this Nation with an economical and efficient space vehicle that will carry a variety of payloads—including commercial, applications, scientific and military—into both low and high earth orbit.

During the past year, the Committee's Surveys and Investigations Staff submitted a comprehensive study on the current status of the shuttle system. That analysis raised a number of important questions, including most significantly, problems associated with engine development. The results of the study have impacted the 1978 funding decisions in the following manner.

A total of \$141,700,000 was included in the 1978 request for production of the third, fourth and fifth shuttle orbiter flight vehicles. Of that amount, \$95,000,000 was advanced to fiscal year 1977 in the Economic Stimulus Appropriation Bill recently signed by the President. That action was taken to prevent a costly funding gap in production of the third orbiter and to save thousands of highly skilled technical jobs. At the same time, the Committee recognizes that unless additional funds are provided in 1978, a new funding and employment gap would develop at some point during the fiscal year. In short, by advancing the production of orbiter 103 from 1978 to 1977, the entire out-year schedule is advanced, and at least a part of what would have been requested in fiscal year 1979 must be made available in 1978.

Therefore, the Committee is recommending \$75,000,000 for continued production of the third orbiter, and up to \$10,000,000 for the most critical long-lead requirements for the fourth and fifth orbiters. The balance of \$56,700,000 is deferred until fiscal year 1978 at which time the Committee will make an additional recommendation concerning continued funding of the third, fourth and fifth orbiters. This decision will, in part, be based on a final report on selected shuttle development problems.

While the Committee is deferring \$56,700,000 of funding for orbiter production, it is doing so without prejudice. The Committee supports a full five orbiter shuttle fleet. In fact, it is unlikely that a three orbiter concept would be economically viable in that such a fleet could not assure launch capability to all users from both the eastern and western test ranges. However, the timing and level of orbiter production funding must still rest on conclusive evidence that there are no major serious shuttle development problems.

#### CONSTRUCTION OF FACILITIES

1977 appropriation.....	\$118,000,000
Estimate, 1978.....	161,800,000
Recommended in bill.....	160,940,000
Decrease below estimate.....	-860,000

The Committee recommends \$160,940,000 for construction of facilities in 1978. This is a decrease of \$860,000 below the budget request. The funds provided are the same as those requested with the exception of an \$860,000 reduction for construction of a water immersion facility for shuttle pilot training at the Johnson Space Center. The above decrease is consistent with a similar reduction made in the 1978 House authorization bill.

#### RESEARCH AND PROGRAM MANAGEMENT

1977 appropriation.....	\$844,575,000
Estimate, 1978.....	848,989,000
Recommended in bill.....	844,000,000
Decrease below estimate.....	-2,989,000

The Committee recommends \$844,000,000 for research and program management in 1978. This is a decrease of \$2,989,000 below the budget estimate.

The reduction should be taken from lower priority functions. For example, in the following areas, savings were revealed through the use of the detailed zero-base budget justifications which are discussed beginning on page two of the report. The Committee suggests that similar reductions could be achieved at other NASA centers.

#### ADP—PROGRAMS AND OPERATIONS

By conducting a project-by-project review of its computer applications, Marshall Space Flight Center was able to reduce its programs and operations budget by about 13 percent, in the face of a 5.5 percent cost increase. Similar reviews at the other centers should result in savings in 1978.

#### EDUCATIONAL/INFORMATIONAL PROGRAMS

While important, this essentially public relations activity is not of sufficient priority to justify increases in fiscal year 1978.

#### SUPPLIES, MATERIALS AND EQUIPMENT

By holding equipment purchases to the minimum amount necessary and controlling the use of supplies and materials, including aircraft fuel, any increases in costs should be offset.

#### TRANSPORTATION

By reducing usage of and maintenance support contracts for administrative aircraft, general purpose motor vehicles and special purpose mobile equipment, cost increases can be offset.

#### TITLE IV—GENERAL PROVISIONS

The Committee recommends that the general provisions applicable to the Department and agencies carried in the current fiscal year be continued in 1978 except that the travel limitation in section 401 has been modified to limit such expenses to the amounts established for travel in the budget estimates. The additional 10 percent relief provided for the past two years has been deleted because per diem and other travel rates are not expected to increase appreciably during fiscal year 1978.

### INFLATIONARY IMPACT STATEMENT

Clause 2(1)(4) of rule XI of the House of Representatives requires that each Committee report on a bill or resolution shall contain a statement as to whether enactment of such bill or resolution may have an inflationary impact on prices and costs in the operation of the national economy.

Critics of government spending suggest that practically any spending by government is inflationary. If that were true, then the funds proposed in this bill would be inflationary. However, all Federal spending is not inherently inflationary. It should be analyzed in the context of the economic situation in which it is occurring, the financial condition of the government at the time, and the sectors of the economy which the spending may affect.

The amount proposed for appropriation totals \$70,230,183,000. This is \$487,529,000 below the President's request. Included in the total recommended are funds for veterans benefits, housing assistance, community development grants, environmental programs and general revenue sharing. Other funds will support advanced technology and science that directly and indirectly increase productivity.

It is the considered opinion of the Committee that enactment of this bill will not have an inflationary impact on prices and costs in the operation of the national economy.

Further information on the purpose of the spending proposed in this bill can be obtained in other parts of the report. Also, a large amount of detailed statistical and financial information can be obtained in the hearings conducted in developing this bill.

### CHANGES IN THE APPLICATION OF EXISTING LAW

The Committee submits the following statements in compliance with Clause 3, Rule XXI of the House of Representatives, describing the effects of provisions proposed in the accompanying bill which may be considered, under certain circumstances, to change the application of existing law, either directly or indirectly:

1. The Committee, in a number of instances, has found it necessary to recommend funding for ongoing activities and programs where authorizations have not been enacted to date. This includes some or all of the programs under the Department of Housing and Urban Development, the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Science Foundation.

2. In many cases, the Committee has recommended appropriations which are less than the maximum amounts authorized for the various programs which are funded in the bill. Whether these actions constitute a change in the application of existing laws is subject to individual interpretation, but the Committee felt this fact should be mentioned.

3. The bill provides that several appropriations shall remain available until expended for which the basic authorizing legislation does not presently authorize such extended availability. Most of these items have been carried in previous appropriation acts. The Committee deems such language desirable in order to provide for the effective use of funds.

4. The Committee has included limitations for official entertainment or reception and representation expense for selected agencies in the bill.

5. The bill contains a number of administrative provisions under the Environmental Protection Agency and the Veterans Administration which have been carried for a number of years. Some of these could possibly be construed as changing the application of existing law.

6. Sections 401 through 408 of title IV of the bill contain a number of general provisions, all of which are essentially as carried in previous appropriation acts, which place limitations on the use of funds in the bill and which might, under some circumstances, be construed as changing the application of existing law.

95TH CONGRESS }  
1st Session }

SENATE

REPORT  
No. 95-280

## DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT—INDEPENDENT AGENCIES APPROPRIATION BILL, 1978

JUNE 21 (legislative day, MAY 18), 1977.—Ordered to be printed

Mr. PROXMIRE, from the Committee on Appropriations, submitted the following

## REPORT

[To accompany H.R. 7554]

The Committee on Appropriations, to which was referred the bill (H.R. 7554) making appropriations for the Department of Housing and Urban Development, and for sundry independent executive agencies, boards, institutes, commissions, corporations, and offices for the fiscal year ending September 30, 1978, and for other purposes, reports the same to the Senate with various amendments and presents herewith an explanation of the contents of the bill.

## GENERAL STATEMENT

The Committee recommends new budget (obligational) authority of \$67,641,480,000 for the Department of Housing and Urban Development, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Science Foundation, the Veterans' Administration, and 11 other agencies, commissions, boards, corporations, institutes and offices. This amount is \$541,716,000 over the appropriations enacted for fiscal year 1977, \$2,522,032,000 below the budget estimate for fiscal year 1978, and \$1,850,203,000 less than was provided in the House bill for fiscal year 1978.

It should be noted that the Committee has adjusted the House figures to reflect decisions (1) to reverse House action placing the \$750,000,000 housing for the elderly program on budget and (2) to consider the full request for major construction of veterans' medical care facilities as well as the total NASA research and development request rather than defer consideration of certain projects. A fuller explanation of these actions will be found in the discussion of these accounts.

A table setting forth the budgetary impact of the bill can be found on page 79 of this report. The table compares the total recommended by the Committee with the amount allocated in the first concurrent budget resolution for the programs addressed by this bill. It should be noted that substantial amounts of new budget authority have been reserved pending the passage of authorizing legislation currently being considered by the Congress. Examples are the extension of wastewater treatment construction grants and proposals to increase veterans benefits.

The summary table on page 3 of this report provides an analysis of the amounts recommended in the bill as compared to the appropriations enacted in fiscal year 1977, the estimates for fiscal year 1978, and the amounts recommended by the House.

## HIGHLIGHTS

The Committee has recommended a number of changes in the House bill. The most significant are:

3. An increase of \$69,400,000 for the National Aeronautics and Space Administration research and development program, reflecting a decision to proceed with the Jupiter Orbiter/Probe and provide the total requested for procurement of Space Shuttle orbiters 104 and 105.

## REPROGRAMING AND INITIATION OF NEW PROGRAMS

The Committee continues to have a particular interest in being informed of reprogramings both between accounts and within the confines of a single account which may not change either the total amount available in the account nor any of the purposes for which the appropriation is legally available but which represent a significant departure from budget plans presented to the Committee in the various budget justifications.

Consequently the Committee directs that the Department of Housing and Urban Development and the agencies funded through this bill notify the chairman of the HUD-Independent Agencies Subcommittee prior to reprogramming of funds in excess of \$250,000 or 10 percent, whichever is less, between programs or activities. The Committee recognizes that, in some cases, reprogramings may occur because of the functioning of law or other circumstances beyond the control of the agency. This rule is not meant to apply in those situations. The Committee desires to be notified of reprogramming actions which involve less than the above-mentioned amounts if such actions would have the effect of committing the agency to significant funding requirements in future years. Finally the Committee wishes to be informed regarding substantial reorganization of offices, programs, or activities prior to the implementation of such reorganizations.

### ZERO-BASE BUDGETING

The Committee requested the Congressional Budget Office to work with the Environmental Protection Agency's Office of Energy, Minerals and Industry on the production of a zero-base budget analysis of EPA's energy research and development budget—a \$96,427,000 account. The result was a 177-page document that gave priority ranking to 101 decision packages within three major groupings—control technology (41 packages), health and ecological effects (55 packages), and program integration (5 packages). These 101 decision packages represented 39 discrete subtasks with each subtask usually being broken into three packages.

The first package represented the lowest budget necessary to perform the subtask. If such a level could not be identified it was set at approximately 25 percent less than the fiscal 1978 budget request. The second package represented a "first increment" above the base level, representing the amount necessary to bring the budget up to the fiscal 1978 budget request. The third and final package, the "additional increment," represented the amount the agency would like to see appropriated in the absence of budget restraints within a ceiling of 25 percent more than the fiscal 1978 budget request.

Finally the document contained a list of the decision packages that would be deleted on the basis of low priority if the energy R. & D. budget were cut by \$10 million as well as an alternative list of decision packages that would be funded if the Committee were to increase the budget by \$10 million. In addition the document examined a reordering of priorities based on a reduction of \$4 million in the budget request for health and ecological effects and a \$4 million increase in funding for control technology.

The House Appropriations Committee commissioned two similar zero-base budget studies that are discussed in the House report on the HUD-Independent Agencies Appropriations Bill for fiscal 1978 (House Report 95-380). In addition the Congressional Budget Office, at the request of this Committee, is working with the Department of Housing and Urban Development on a similar analysis of HUD's policy development and research budget. The analysis was not completed in time to be discussed in this report.

### EQUAL EMPLOYMENT OPPORTUNITY

#### NASA

The median grade for white males at NASA was 7 grades higher than for white females, 8 higher than for minority females, and 2 grades above the median grade for minority males. At the same time, the median salary of white males was \$14,000 higher than for white females, \$16,000 higher than the median salary for minority females, and \$6,200 higher than the median salary for minority males.

Other statistics compiled by the Civil Service Commission and analyzed by the staff indicate that a disproportionate number of white males enjoy a substantial advantage over minorities and women with regard to both promotions and in-grade step increases.

All in all, the equal employment opportunity record among these five large agencies is not encouraging. The Committee continues to be painfully aware of the lack of minorities and women graduating in the science and engineering disciplines who are qualified to fill career positions at some of the science oriented agencies funded by this bill. Nevertheless, the Committee directs each agency that falls under this appropriation to reassess its equal employment and promotion goals for women and minorities and to substantially improve its Equal Employment Opportunity profiles in the coming fiscal year.

### STATUS OF AUTHORIZATIONS

The Committee notes that authorizations for many of the programs administered by a number of the agencies funded through this legislation have not yet been acted upon by the Congress. Included in this category are programs of the Department of Housing and Urban Development, the Environmental Protection Agency, the National Science Foundation and the National Aeronautics and Space Administration.

### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

#### RESEARCH AND DEVELOPMENT

1977 appropriation.....	\$2,856,425,000
Estimate, 1978.....	3,026,000,000
House allowance.....	2,943,600,000
Committee recommendation.....	3,013,000,000

<sup>1</sup> Includes \$15,000,000 requested in H.Doc. 95-93. The House deferred consideration of \$56,700,000 for Shuttle orbiters four and five. Thus the House report reflects a request of \$2,969,300,000.

The Committee recommends an appropriation of \$3,013,000,000 for research and development activities at the National Aeronautics and Space Administration. This amount is \$69,400,000 above the House allowance and \$13,000,000 below the budget estimate.

The National Aeronautics and Space Administration (NASA) conducts the nonmilitary space programs of the United States, including the exploration of space and its utilization for peaceful purposes, and conducts advanced research and development related to space and aeronautics in support of both civil and military requirements. The Research and Development program at NASA consists of the following activities:

*Space flight.*—Space Flight activities provide all the transportation and associated support and capabilities required to conduct space operations. The fiscal year 1978 request for Space Flight, a total of \$1,753,500,000, is mostly committed to the continuing development of the Space Shuttle system, but it also includes the incremental funding for the procurement of a full five-orbiter fleet.

Important efforts that the Shuttle brings together include: the European commitment of about \$575,000,000 for the Spacelab; the DOD development of the interim upper stage and the West Coast launch complex, the NASA responsibilities for the Shuttle development and for the East Coast launch facilities; and finally the payloads that are coming from the entire spectrum of space users and explorers—scientific, applications, military, and commercial.

*Space Science.*—The Space Science program utilizes space systems, supported by airborne and ground-based observations, to conduct scientific investigations of the Earth and its atmosphere, the Moon, the Sun, the inner and outer planets, and interplanetary and interstellar space, as well as the other stars of our galaxy and universe.

The budget includes \$36,000,000 for the initiation of a Space Telescope which would provide for major scientific advances in astronomy. The project is designed to capitalize on the unique environment of space, above the obscuring effects of the earth's atmosphere, and thus contribute new knowledge about the composition, origin, size and evolution of the universe. The telescope is planned to be launched by the space shuttle in 1983.

Another \$20,700,000 is proposed for a Jupiter Orbiter/Probe mission, which would cost a total of \$280,000,000 over five years. This mission will conduct the first comprehensive study of Jupiter, its atmosphere, its environment and its 12 satellites (moons). The proposed new mission to Jupiter is planned as the next major step in a long-range strategy, recommended by NASA, for conducting a systematic scientific investigation of the solar system.

The budget includes \$15,000,000 for Mars follow-on studies to allow NASA and NASA's scientific advisory groups to examine future science objectives, experiments, and mission concepts to continue exploration of Mars as a potential follow-up mission to the successful Viking missions.

*Space applications.*—Through research and development activities, this program applies space-related technology, systems, and other capabilities in such areas as detection and monitoring of the Earth's resources, observing and forecasting of the weather and climate, monitoring of the environment, observing the dynamics of the Earth, forecasting and monitoring of ocean conditions, space communications, and the processing of materials in space.

An advanced-technology earth resources survey satellite, LANDSAT-D (total cost of \$215,000,000 to \$240,000,000 over 6 years), is initiated in the 1978 budget at a first year cost of \$26,900,000 to continue the experimental program to investigate the potential benefits of the use of these satellites in areas such as surveying the distribution of natural resources, agricultural forecasting, land use management, and monitoring the effects of strip mining.

A search and rescue satellite system demonstration at a first year cost of \$5,600,000 and a total U.S. cost of \$15,900,000 over four years is proposed in 1978 as a cooperative venture with Canada. It will involve placing instruments on board earth-orbiting satellites to demonstrate potential improvements in detecting and locating distress signals from downed aircraft and distressed marine vessels.

*Aeronautics and Space Technology.*—In aeronautics, NASA's principal focus is on developing, in concert with the U.S. aviation industry,

the technologies which will give the next generation of civil transports a much higher miles-per-gallon efficiency than possible today, together with far lower noise and pollution levels. The incorporation of new engines, control systems, structural materials, and aerodynamic concepts could cut national aviation fuel consumption in half. The fiscal year 1978 budget requests a 21.5 percent (\$40,900,000) increase for aeronautical research and technology including support for quiet, clean, fuel-efficient subsonic transport aircraft that can compete effectively in world markets.

*Energy Technology Applications.*—NASA's Energy Technology Applications program is designed to identify and evaluate the Space Agency's aerospace technologies and capabilities which have energy applications, and to provide support to other Government agencies engaged in national energy programs. NASA is continuing to work closely with ERDA on studies of possible space-based energy delivery systems and on the conversion of space technology to terrestrial use. The majority of the funding in this area comes to NASA from ERDA in the form of reimbursable orders, running today at a rate of some \$100,000,000 per year.

*Tracking and Data Acquisition.*—This program provides tracking and data acquisition support to the entire NASA flight program, including automated missions to the planets and in Earth orbit, manned missions, sounding rockets, and aerodynamic test flights. A major aspect of the Tracking and Data Acquisition program in the future will be the Tracking and Data Relay Satellite System (TDRSS) which will support essentially all earth orbital spacecraft missions and will greatly improve NASA's earth orbital tracking and data acquisition capabilities. NASA has entered into a formal arrangement with Western Union to provide commercial tracking and data relay services from space in support of all low earth orbital missions through the TDRSS system beginning in 1980.

*Technology Utilization.*—NASA's technology utilization program is designed to accelerate the transfer into the economy and into the public sector, of new advances in technology generated by NASA and NASA contractors.

#### COMMITTEE CHANGES

The Committee recommends the following changes in the House-passed bill:

- + \$7,000,000 for expendable launch vehicles, providing the full budget request.
- + \$1,000,000 for tracking and data acquisition, leaving intact a House reduction of \$2,000,000 below the budget request.
- + \$20,700,000 for the Jupiter Orbiter/Probe.
- + \$56,700,000 for procurement of space shuttle orbiters 104 and 105. The Committee, while approving the full NASA Shuttle production request of \$141,700,000, directs NASA to assure the House and Senate Committees on Appropriations that timely completion of major Shuttle program milestones has been achieved, including engine testing, prior to obligation of the \$56,700,000 of this request deferred by the House.

+ \$2,000,000 for upper atmosphere-ozone depletion research, an increase of the same amount over the budget request in accordance with the Senate authorization bill.

- \$3,000,000 for Mars follow-on research, leaving a total of \$7,000,000 for this program.

- \$5,000,000 for continued studies of a solar satellite power system.

- \$5,000,000 for studies of the assembly of large objects in space.

- \$5,000,000 for vertical/short takeoff and landing aircraft development work in accordance with a General Accounting Office recommendation based on a finding that commercial airlines are not interested in this research.

The Committee recommends a two year obligational authority limitation on the use of the funds provided through this account. Last year the Committee considered such a limitation but deferred final action pending a report from NASA on the difficulties that would be caused.

A letter report was received on September 30 but contained nothing more than generalized arguments to the effect that such action would have a detrimental impact because of the multi-year nature of NASA's projects and the long lead time involved in NASA procurements. These arguments would be compelling if the Committee were proposing a one year limitation. However in view of the fact that the limitation allows NASA an extra year beyond the year in which the funds were requested to obligate the money, the Committee feels that NASA should be able to adjust itself to such a limitation without undue hardship, as have other agencies funded through this bill.

The Committee notes that NASA, in January, reprogrammed \$27,000,000 that had first been made available in fiscal year 1975, more than 2 years earlier, from the Apollo-Soyuz Test Project to the space shuttle. This illustrates the potential for abuse of making funding available for an extended period. In this instance funding was not stretched out to accommodate complex program requirements but was simply transferred from one program to another for purposes completely unrelated to the purposes which the funds were appropriated.

The Committee notes that NASA has been asked to prepare a technology readiness report by September, 1977, dealing with producing an advanced supersonic transport by the early 1980's. While the Committee has consistently approved limited funding for research on SST-related technology, it believes that the position of the Administration, as expressed by the Office of Management and Budget, should be adhered to with regard to any such report. The Administration specifically has stated that it "does not support and has not requested funds for developing plans for an American SST."

Further, the Committee agrees with OMB that if such a study were to be made "some other agency of the government other than NASA should be responsible for such a wide ranging analysis of a possible future American SST."

OMB has noted that the private sector is in the best position to assess the economic viability of an advanced SST and that marketplace and environmental considerations would be extremely important in any discussions concerning a new generation of SST's.

It is clear that no federally supported commercial SST program could be initiated without specific authorization by Congress. The

Committee wishes to emphasize to NASA that any movement toward resurrecting an SST should be fully presented to the Committee in advance of any final decision.

The Committee requests that the Agency report not later than July 31, 1977 on the feasibility and costs and benefits of putting the Large Format Camera on the second orbital flight test of the space shuttle.

#### CONSTRUCTION OF FACILITIES

1977 appropriation.....	\$118,090,000
Estimate, 1978.....	161,800,000
House allowance.....	160,940,000
Committee recommendation.....	160,940,000

The Committee recommends an appropriation of \$160,940,000 for NASA's construction of facilities program. This amount is the same as the House approved allowance and \$860,000 below the budget estimate.

Appropriations for construction of facilities provide for contractual services for the design, major rehabilitation, and modification of facilities; the construction of new facilities; minor construction; the purchase of land and equipment related to construction and modification; and advanced design related to facilities planned for future authorization.

In concurring with the House reduction of \$860,000, the Committee agrees that funding for construction of a water immersion facility for shuttle pilot training at the Johnson Space Center be denied as it is not authorized. At the same time, the amount recommended by the Committee will provide a \$42,850,000 increase over the amount appropriated in fiscal year 1977, including \$71,290,000 for Space Shuttle Facilities including Payload Facilities; \$23,500,000 for further construction on the National Transonic Facility; and \$13,500,000 for modification of the 40x80 foot subsonic wind tunnel.

#### RESEARCH AND PROGRAM MANAGEMENT

1977 appropriation.....	\$844,575,000
Estimate, 1978.....	846,989,000
House allowance.....	844,000,000
Committee recommendation.....	841,989,000

For Research and Program Management, the Committee recommends \$841,989,000 which is \$5,000,000 below the budget estimate and \$2,011,000 below the House approved figure.

This appropriation provides for (1) the civil service staff needed to perform in-house research, technology, and test activities, and to plan, manage, and support the Research and Development programs; and (2) the other elements of operational capability of the laboratories and facilities such as utilities; logistics support including travel and transportation, maintenance, and operation of facilities; and technical and administrative support. To assure overall effectiveness and economy in NASA's field operations, responsibility for planning and direction of NASA's field center operations is consolidated in one senior line official, the Associate Administrator for Center Operations.

It should be noted that the space agency is proceeding with the implementation of an institutional assessment conducted last year to

clarify the roles and missions of the NASA centers and the Jet Propulsion Laboratory. Apparently some consolidations and realignments have occurred as a result of this assessment and the agency anticipates further implementation of changes in personnel both this year and through fiscal year 1979.

On June 17 the Committee was informed that NASA was being required by the administration to cut an additional 180 positions in fiscal 1977 and a total of 500 positions in fiscal 1978 below the budget estimate. In view of these developments the Committee has recommended a reduction of \$5,000,000, or approximately 225 positions below the budget request.

The Committee recommends \$20,000 for the Administrator's scientific consultation and extraordinary expense fund rather than the \$35,000 requested in the President's budget. The Committee feels that the amount recommended is adequate to fund all legitimate expenses.

#### TITLE IV—GENERAL PROVISIONS

The Committee agrees with the House that the General Provisions applicable to the Department and agencies in fiscal year 1977 and substantially reiterated in title IV should be controlling once again this year with the following exceptions:

(4) The Committee has recommended the inclusion of language prohibiting the use of funds provided in this act by any agency or department to transport any officer or employee between his residence and his place of employment, with the exception of the Secretary of the Department of Housing and Urban Development. Although the Committee is pleased by the new administration's decision to hold such luxuries to the minimum, the Committee believes that the Congress should forcefully emphasize that a failure to comply with 31 U.S.C. 638(a) is completely unacceptable.

(5) The Committee has recommended the inclusion of language prohibiting the use of funds to pay a consultant, either directly or through a grant, in excess of the daily equivalent rate paid to a GS-18 employee. Although the Committee recognizes that agencies are generally prohibited from making such payments directly, the Committee has learned of instances of consultants being paid as much as \$600 a day.

The Committee notes that the House has modified language contained in last year's bill regarding a limitation on travel expenditures to remove a 10-percent flexibility factor. The Committee concurs in the House decision to limit such expenses to the amounts established for travel in the various budget estimates in view of the fact that travel rates are not expected to increase significantly in the course of fiscal year 1978.

HOUSING AND URBAN DEVELOPMENT-INDEPENDENT  
 AGENCIES APPROPRIATION BILL, FISCAL YEAR 1978

JULY 12, 1977.—Ordered to be printed.

Mr. BOLAND, from the committee of conference,  
 submitted the following

CONFERENCE REPORT

[To accompany H.R. 7554]

The committee of conference on the disagreeing votes of the two Houses on the amendments of the Senate to the bill (H.R. 7554) "making appropriations for the Department of Housing and Urban Development, and for sundry independent executive agencies, boards, bureaus, commissions, corporations, and offices for the fiscal year ending September 30, 1978, and for other purposes," having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

Amendment No. 24: Reported in disagreement. The managers on the part of the House will offer a motion to recede and concur in the amendment of the Senate with an amendment appropriating \$2,995,300,000, instead of \$2,943,600,000 as proposed by the House and \$3,013,000,000 as proposed by the Senate.

The item reported in disagreement is the \$20,700,000 denied by the House for the Jupiter Orbiter Probe.

The Committee of Conference is in agreement with the recommendations contained in the report of the House except for the following changes:

- + \$56,700,000 for shuttle orbiter production. The conferees agree that none of the \$56,700,000 restored for shuttle orbiter production may be obligated until shuttle program milestones, including engine testing, are met to the satisfaction of the House and Senate Committees on Appropriations:
- \$5,000,000 for space industrialization;
- \$2,000,000 for a solar satellite power generating system;
- + \$7,000,000 for expendable launch vehicles;
- + \$1,000,000 for tracking and data acquisition;
- \$3,000,000 for a Mars follow-on mission; and
- \$3,000,000 for V-STOL development.

Amendment No. 25: Inserts language as proposed by the Senate limiting the availability of research and development funds until September 30, 1979, instead of providing that such funds remain available until expended as proposed by the House.

Amendment No. 26: Earmarks not to exceed \$25,000 for scientific consultations or extraordinary expense, instead of \$35,000 as proposed by the House and \$20,000 as proposed by the Senate.

TITLE IV—GENERAL PROVISIONS

Amendment No. 45: Reported in technical disagreement. The managers on the part of the House will offer a motion to recede and concur in the amendment of the Senate with an amendment as follows:

SEC. 409. None of the funds provided in this Act may be used, directly or through grants, to pay or to provide reimbursement for payment of a consultant (whether retained by the Federal Government or a grantee) at more than the daily equivalent of the maximum rate paid for GS-18, unless specifically authorized by law.

The conference agreement adopts the text of the Senate amendment amended to change the section number.

The managers on the part of the Senate will move to concur in the amendment of the House to the amendment of the Senate.

Amendment No. 46: Reported in technical disagreement. The managers on the part of the House will offer a motion to recede and concur in the amendment of the Senate with an amendment as follows:

SEC. 410. None of the funds provided in this Act to any department or agency may be expended for the transportation of any officer or employee of such department or agency between his domicile and his place of employment, with the exception of the Secretary of the Department of Housing and Urban Development, who, under title 5, United States Code, section 101, is exempted from such limitations.

The conference agreement adopts the text of the Senate amendment amended to change the section number.

The managers on the part of the Senate will move to concur in the amendment of the House to the amendment of the Senate.

CONFERENCE TOTAL—WITH COMPARISONS

The total new budget (obligational) authority for the fiscal year 1978 recommended by the Committee of Conference, with comparisons to the fiscal year 1977 amount, the 1978 budget estimates, and the House and Senate bills for 1978 follow:

New budget (obligational) authority, fiscal year 1977	\$67,099,764,000
Budget estimates of new (obligational) authority, fiscal year 1978	70,774,412,000
House bill, fiscal year 1978	70,241,683,000
Senate bill, fiscal year 1978	67,648,491,000
Conference agreement	69,352,854,000
Conference agreement compared with:	
New budget (obligational) authority, fiscal year 1977	+2,253,090,000
Budget estimates of new (obligational) authority, fiscal year 1978	-1,421,558,000
House bill, fiscal year 1978	-888,829,000
Senate bill, fiscal year 1978	+1,704,363,000

<sup>1</sup> Includes \$56,700,000 of budget estimates not considered by the House.

## PUBLIC LAW 95-119—OCT. 4, 1977

Public Law 95-119  
95th Congress

## An Act

Oct. 4, 1977  
[H.R. 7554]Department of  
Housing and  
Urban  
Development—  
Independent  
Agencies  
Appropriation  
Act, 1978.

Making appropriations for the Department of Housing and Urban Development, and for sundry independent executive agencies, boards, bureaus, commissions, corporations, and offices for the fiscal year ending September 30, 1978, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of Housing and Urban Development, and for sundry independent executive agencies, boards, bureaus, commissions, corporations, and offices for the fiscal year ending September 30, 1978, and for other purposes, namely:

## TITLE I

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

## RESEARCH AND DEVELOPMENT

For necessary expenses, not otherwise provided for, including research, development, operations, services, minor construction, maintenance, repair, rehabilitation and modification of real and personal property; tracking and data relay satellite services as authorized by law; and purchase, hire, maintenance, and operation of other than administrative aircraft, necessary for the conduct and support of aeronautical and space research and development activities of the National Aeronautics and Space Administration, \$3,013,000,000, to remain available for obligation until September 30, 1979.

## CONSTRUCTION OF FACILITIES

For construction, rehabilitation and modification of facilities, minor construction of new facilities and additions to existing facilities, and for facility planning and design not otherwise provided, for the National Aeronautics and Space Administration, and for the acquisition or condemnation of real property, as authorized by law, \$160,940,000, to remain available for obligation until September 30, 1980: *Provided*, That, notwithstanding the limitation on the availability of funds appropriated under this head by this appropriation Act, when any activity has been initiated by the incurrence of obligations therefor, the amount available for such activity shall remain available until expended, except that this provision shall not apply to the amounts appropriated pursuant to the authorization for rehabilitation and modification of facilities, minor construction of new facilities and additions to existing facilities, and facility planning and design.

42 USC 1440.

## RESEARCH AND PROGRAM MANAGEMENT

For necessary expenses of research in Government laboratories, management of programs and other activities of the National Aeronautics and Space Administration, not otherwise provided for, including uniforms or allowances therefor, as authorized by law (5 U.S.C. 5901-5902); awards; hire, maintenance and operation of administrative aircraft; purchase (not to exceed twenty-seven for replacement only) and hire of passenger motor vehicles; and maintenance and repair of real and personal property, and not in excess of \$25,000 per project for construction of new facilities and additions to existing facilities, and not in excess of \$50,000 per project for rehabilitation and modification of facilities; \$844,000,000: *Provided*, That contracts may be entered into under this appropriation for maintenance and operation of facilities, and for other services, to be provided during the next fiscal year: *Provided further*, That not to exceed \$25,000 of the foregoing amount shall be available for scientific consultations or extraordinary expense, to be expended upon the approval or authority of the Administrator and his determination shall be final and conclusive.

## TITLE IV

## GENERAL PROVISIONS

Sec. 401. Where appropriations in titles I and II of this Act are expendable for travel expenses of employees and no specific limitation has been placed thereon, the expenditures for such travel expenses may not exceed the amounts set forth therefor in the budget estimates submitted for the appropriations: *Provided*, That this section shall not apply to travel performed by uncompensated officials of local boards and appeal boards of the Selective Service System; to travel performed directly in connection with care and treatment of medical beneficiaries of the Veterans Administration; or to payments to inter-agency motor pools where separately set forth in the budget schedules: *Provided further*, That the limitations may be increased by the Secretary when necessary to allow for travel performed by employees of the Department of Housing and Urban Development as a result of increased Federal Housing Administration inspection and appraisal workload.

Travel expenses.

Sec. 404. None of the funds provided in this Act may be used for payment, through grants or contracts, to recipients that do not share in the cost of conducting research resulting from proposals for projects not specifically solicited by the Government: *Provided*, That the extent of cost sharing by the recipient shall reflect the mutuality of interest of the grantee or contractor and the Government in the research.

Research projects.

Sec. 405. No part of any appropriation contained in this Act shall remain available for obligation beyond the current fiscal year unless expressly so provided herein.

Fiscal year limitation.

**Sec. 407. No funds appropriated by this Act may be expended—**

(1) pursuant to a certification of an officer or employee of the United States unless—

(A) such certification is accompanied by, or is part of, a voucher or abstract which describes the payee or payees and the items or services for which such expenditure is being made, or

(B) the expenditure of funds pursuant to such certification, and without such a voucher or abstract, is specifically authorized by law; and

Audit.

(2) unless such expenditure is subject to audit by the General Accounting Office or is specifically exempt by law from such an audit.

**Sec. 409. None of the funds provided in this Act may be used directly or through grants, to pay or to provide reimbursement for payment of a consultant (whether retained by the Federal Government or a grantee) at more than the daily equivalent of the maximum rate paid for GS-18, unless specifically authorized by law.**

5 USC 5332 note.  
Certain  
government  
transportation.  
prohibition.

**Sec. 410. None of the funds provided in this Act to any department or agency may be expended for the transportation of any officer or employee of such department or agency between his domicile and his place of employment, with the exception of the Secretary of the Department of Housing and Urban Development, who, under title 5, United States Code, section 101, is exempted from such limitations.**

Short title.

**This Act may be cited as the "Department of Housing and Urban Development—Independent Agencies Appropriation Act, 1978".**

**Approved October 4, 1977.**

**LEGISLATIVE HISTORY:**

**HOUSE REPORTS:** No. 95-380 (Comm. on Appropriations) and No. 95-495 (Comm. of Conference).

**SENATE REPORT** No. 95-280 (Comm. on Appropriations).

**CONGRESSIONAL RECORD**, Vol. 123 (1977):

June 15, considered and passed House.

June 24, considered and passed Senate, amended.

July 19, House agreed to conference report; concurred in certain Senate amendments with amendments.

July 22, Sept. 23, Senate agreed to conference report; concurred in certain House amendments with amendments; disagreed to Beard amendment.

Sept. 28, House receded and concurred in Senate amendment.

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PUBLIC LAW 95-355—SEPT. 8, 1978

92 STAT. 523

Public Law 95-355  
95th Congress

## An Act

Making supplemental appropriations for the fiscal year ending September 30, 1978, and for other purposes.

Sept. 8, 1978  
[H.R. 13467]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, to supply supplemental appropriations (this act may be cited as the "Second Supplemental Appropriations Act, 1978") for the fiscal year ending September 30, 1978, and for other purposes, namely:

Second  
Supplemental  
Appropriations  
Act, 1978.TITLE II—INCREASED PAY COSTS FOR THE FISCAL  
YEAR 1978

For additional amounts for appropriations for the fiscal year 1978 ~~for~~ increased pay costs authorized by or pursuant to law, as follows:

NATIONAL AERONAUTICS AND SPACE  
ADMINISTRATION

"Research and program ~~management~~", \$45,761,000;

## TITLE III

## GENERAL PROVISIONS

SEC. 301. No part of any appropriation contained in this Act shall remain available for obligation beyond the current fiscal year unless expressly so provided herein. Fiscal year limitation.

SEC. 302. Except where specifically increased or decreased elsewhere in this Act, the restrictions contained within appropriations, or provisions affecting appropriations or other funds, available during the fiscal year 1978, limiting the amounts which may be expended for personal services, or for purposes involving personal services, or amounts which may be transferred between appropriations or authorizations available for or involving such services, are hereby increased to the extent necessary to meet increased pay costs authorized by or pursuant to law.

SEC. 303. The Supplemental Treasury and Post Office Departments Appropriation Act, 1949 (62 Stat. 561), also known as the Act of June 19, 1948, is amended by adding at the end thereof the following:

26 USC 1 et seq.

"No disbursement may be made from the appropriation to the Treasury Department entitled 'Bureau of Internal Revenue Refunding Internal Revenue Collections' except (a) refunds to the limit of liability of an individual tax account, and (b) refunds due from any credit provision of the Internal Revenue Code enacted prior to January 1, 1978."

Approved September 8, 1978.

## LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 95-1350 (Comm. on Appropriations) and No. 95-1475 (Comm. of Conference).

SENATE REPORT No. 95-1061 (Comm. on Appropriations).

CONGRESSIONAL RECORD, Vol. 124 (1978):

July 20, considered and passed House.

Aug. 4, 7, considered and passed Senate, amended.

Aug. 17, House agreed to conference report.

Aug. 25, Senate agreed to conference report.

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