



# Chronological History Fiscal Year 1984 Budget Submission

Prepared by:  
Comptroller  
Budget Operations Division  
Code BTF

APRIL 18, 1984

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1984

Item	Statistics	LEGISLATIVE REFERENCE								
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\*Pending

Prepared by:  
Comptroller  
Budget Operations Division  
Code BTF 453-2210

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1984 Budget Submission  
(In thousands of dollars)

Item	AUTHORIZATION					APPROPRIATION						
	Initial Budget Submission to Congress	House Comm. H.R. 2065 Rpt. 98-65 4-15-83 Appd. 4-27-83	Senate Comm. S. 1096 Rpt. 98-108 5-16-83 Appd. 6-15-83	P.L. 98-52 Appd. 7-15-83	Difference from Budget Submission	House Comm. H.R. 3133 Rpt. 98-223 5-24-83 Appd. 6-2-83	Senate Comm. H.R. 3133 Rpt. 98-152 6-14-83 Appd. 6-21-83	Conf. Comm. P.L. 98-45 Rpt. 98-264 6-23-83 Appd. 7-12-83	General Supplemental H.R. 3959 P.L. 98-181 Appd. 11-30-83	Pay Supplemental H.R. P.L. Appd. -84	Difference from Budget Submission	Difference from Budget Authorization
<b>TOTAL APPROPRIATIONS:</b>												
Research and Development.....	5,708,500	5,886,800	5,888,500	5,883,000	+174,500	5,803,500	2,016,900	2,011,900	2,011,900		-3,696,600	-3,871,100
Space Flight, Control and Data Communications.....	---	---	---	---	---	---	3,776,600	3,791,600	3,791,600		+3,791,600	+3,791,600
Construction of Facilities.....	150,500	138,920	142,100	142,100	-8,400	135,500	135,500	135,500	155,500 <sup>2/</sup>		+5,000	+13,400
Research and Program Management.....	1,247,500	1,242,500	1,247,500	1,242,500	-5,000	1,237,500	1,242,500	1,238,500	1,238,500		-9,000	-4,000
<b>GRAND TOTAL.....</b>	<b>7,106,500</b>	<b>7,268,220</b>	<b>7,278,100</b>	<b>7,267,600</b>	<b>+161,100</b>	<b>7,176,500</b>	<b>7,171,500</b>	<b>7,177,500</b>	<b>7,197,500</b>		<b>+91,000</b>	<b>-70,100</b>
<b>R&amp;D Appropriation:</b>												
OSTS.....	3,498,000	3,570,000	3,558,000	3,555,000	+57,000	3,548,000	427,400	427,400	427,400		-3,070,600	-3,127,600
OSSA.....	1,068,000	1,152,000	1,154,000	1,154,500	+86,500	1,133,000	1,136,000	1,136,000	1,136,000		+68,000	-18,500
OER.....	4,000	10,000	10,000	10,000	+6,000	9,000	9,000	9,000	9,000		+5,000	-1,000
OAST.....	438,300	454,600	466,300	463,300	+25,000	438,300	440,300	440,300	440,300		+2,000	-23,000
OSTDS.....	700,200	700,200	700,200	700,200	---	690,200	14,200	14,200	14,200		-686,000	-686,000
Undistributed <sup>1/</sup> .....	---	---	---	---	---	-15,000	-10,000	-15,000	-15,000		-15,000	-15,000
<b>TOTAL, R&amp;D.....</b>	<b>5,708,500</b>	<b>5,886,800</b>	<b>5,888,500</b>	<b>5,883,000</b>	<b>+174,500</b>	<b>5,803,500</b>	<b>2,016,900</b>	<b>2,011,900</b>	<b>2,011,900</b>		<b>-3,696,600</b>	<b>-3,871,100</b>
<b>SFC&amp;DC Appropriation:</b>												
OSTS.....	---	---	---	---	---	---	3,100,600	3,115,600	3,115,600		+3,115,600	+3,115,600
OSTDS.....	---	---	---	---	---	---	676,000	676,000	676,000		+676,000	+676,000
<b>TOTAL, SFC&amp;DC.....</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>3,776,600</b>	<b>3,791,600</b>	<b>3,791,600</b>		<b>+3,791,600</b>	<b>+3,791,600</b>
<b>CoF Appropriation:</b>												
OSF.....	53,300	55,120	53,300	53,300	---	53,300	53,300	53,300	73,300 <sup>2/</sup>		+20,000	+20,000
OSSA.....	1,600	1,600	1,600	1,600	---	1,600	1,600	1,600	1,600		---	---
OAST.....	24,000	24,000	24,000	24,000	---	24,000	24,000	24,000	24,000		---	---
OSTDS.....	5,200	5,200	5,200	5,200	---	5,200	5,200	5,200	5,200		---	---
OM.....	66,400*	58,000	58,000	58,000	-8,400	58,000	58,000	58,000	58,000		-8,400	---
Undistributed <sup>1/</sup> .....	---	-5,000	---	---	---	-6,600	-6,600	-6,600	-6,600		-6,600	-6,600
<b>TOTAL, CoF.....</b>	<b>150,500</b>	<b>138,920</b>	<b>142,100</b>	<b>142,100</b>	<b>-8,400</b>	<b>135,500</b>	<b>135,500</b>	<b>135,500</b>	<b>155,500</b>		<b>+5,000</b>	<b>+13,400</b>
<b>R&amp;PM Appropriation - Total.....</b>	<b>1,247,500</b>	<b>1,242,500</b>	<b>1,247,500</b>	<b>1,242,500</b>	<b>-5,000</b>	<b>1,237,500</b>	<b>1,242,500</b>	<b>1,238,500</b>	<b>1,238,500</b>		<b>-9,000</b>	<b>-4,000</b>
<b>TOTAL, NASA.....</b>	<b>7,106,500</b>	<b>7,268,220</b>	<b>7,278,100</b>	<b>7,267,600</b>	<b>+161,100</b>	<b>7,176,500</b>	<b>7,171,500</b>	<b>7,177,500</b>	<b>7,197,500</b>		<b>+91,000</b>	<b>-70,100</b>

\*Includes \$8.4M reimbursement to GSA for NASA utilized property at Ellington Air Force Base, Texas

<sup>1/</sup> General reduction to be distributed @ Agency's discretion.

<sup>2/</sup> +\$20M for Solid Rocket Booster assembly and refurbishment at KSC (see page 6).

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1984 Budget Submission  
(In thousands of dollars)

Item	AUTHORIZATION					APPROPRIATION							
	Initial Budget Submission to Congress	House Comm. H.R. 2065 Rpt. 98-65 4-15-83 Appd. 4-27-83	Senate Comm. S. 1096 Rpt. 98-108 5-16-83 Appd. 6-15-83	P.L. 98-52 Appd. 7-15-83	Difference from Budget Submission	House Comm. H.R. 3133 Rpt. 98-223 5-24-83 Appd. 6-2-83	Senate Comm. H.R. 3133 Rpt. 98-152 6-14-83 Appd. 6-21-83	Conf. Comm. P.L. 98-45 Rpt. 98-264 6-23-83 Appd. 7-12-83	General Supplemental H.R. 3959 P.L. 98-181 Appd. 11-30-83	Pay Supplemental H.R. P.L. Appd. - -84	Difference from Budget Submission	Difference from Budget Authorization	
<b>RESEARCH AND DEVELOPMENT.....</b>	5,708,500	5,886,800	5,888,500	5,883,000	+174,500	5,803,500	2,016,900	2,011,900	2,011,900		-3,696,600	-3,871,100	
253 Space Transportation Capability Development...	1,927,400	1,999,400	2,022,400	2,009,400	+82,000	1,977,400	427,400	427,400	427,400		-1,500,000	-1,582,000	
253 Space Transportation System Operations.....	1,570,600	1,570,600	1,535,600	1,545,600	-25,000	1,570,600	---	---	---		-1,570,600	-1,545,600	
254 Physics and Astronomy.....	514,600	566,600	558,600	562,100	+47,500	579,600	574,600	578,600	578,600		+64,000	+16,500	
254 Life Sciences.....	59,000	59,000	59,000	59,000	---	59,000	59,000	59,000	59,000		---	---	
254 Planetary Exploration.....	205,400	220,400	215,400	220,400	+15,000	205,400	205,400	205,400	205,400		---	-15,000	
254 Space Applications.....	289,000	306,000	321,000	313,000	+24,000	289,000	297,000	293,000	293,000		+4,000	-20,000	
254 Technology Utilization.....	4,000	10,000	10,000	10,000	+6,000	9,000	9,000	9,000	9,000		+5,000	-1,000	
402 Aeronautical Research and Technology.....	300,300	311,600	328,300	320,300	+20,000	300,300	302,300	302,300	302,300		+2,000	-18,000	
254 Space Research and Technology.....	138,000	143,000	138,000	143,000	+5,000	138,000	138,000	138,000	138,000		---	-5,000	
255 Tracking and Data Acq.....	700,200	700,200	700,200	700,200	---	690,200	14,200	14,200	14,200		-686,000	-686,000	
Undistributed.....	---	---	---	---	---	-15,000	-10,000	-15,000	-15,000		-15,000	-15,000	
<b>SPACE FLIGHT, CONTROL AND DATA COMMUNICATIONS.....</b>	---	---	---	---	---	---	3,776,600	3,791,600	3,791,600		+3,791,600	+3,791,600	
253 Space Transportation Capability Development..	---	---	---	---	---	---	1,530,000	1,500,000	1,500,000		+1,500,000	+1,500,000	
253 STCD Reserve.....	---	---	---	---	---	---	---	45,000	45,000		+45,000	+45,000	
253 Space Transportation Systems Operations.....	---	---	---	---	---	---	1,570,600	1,570,600	1,570,600		+1,570,600	+1,570,600	
255 Tracking and Data Acq.....	---	---	---	---	---	---	676,000	676,000	676,000		+676,000	+676,000	
<b>CONSTRUCTION OF FACILITIES..</b>	150,500	138,920	142,100	142,100	-8,400	135,500	135,500	135,500	155,500		+5,000	+13,400	
Space Shuttle Facilities..	41,300	43,120	41,300	41,300	---	41,300	41,300	41,300	61,300 <sup>2/</sup>		+20,000	+20,000	
Space Shuttle Payload Facilities.....	12,000	12,000	12,000	12,000	---	12,000	12,000	12,000	12,000		---	---	
Ames Research Center.....	3,900	3,900	3,900	3,900	---	3,900	3,900	3,900	3,900		---	---	
Dryden Flight Research Facility.....	800	800	800	800	---	800	800	800	800		---	---	
Jet Propulsion Laboratory.....	4,300	4,300	4,300	4,300	---	4,300	4,300	4,300	4,300		---	---	
Langley Research Center...	9,500	9,500	9,500	9,500	---	9,500	9,500	9,500	9,500		---	---	
Lewis Research Center.....	10,600	10,600	10,600	10,600	---	10,600	10,600	10,600	10,600		---	---	
Various.....	1,700	1,700	1,700	1,700	---	1,700	1,700	1,700	1,700		---	---	
Repair.....	19,500	19,500	19,500	19,500	---	19,500	19,500	19,500	19,500		---	---	
Rehabilitation and Modification.....	24,500	24,500	24,500	24,500	---	24,500	24,500	24,500	24,500		---	---	
Minor Construction.....	4,800	4,800	4,800	4,800	---	4,800	4,800	4,800	4,800		---	---	
Facility Planning and Design.....	9,200	9,200	9,200	9,200	---	9,200	9,200	9,200	9,200		---	---	
GSA Reimbursement.....	8,400	---	---	---	-8,400	---	---	---	---		-8,400	---	
Undistributed.....	---	-5,000	---	---	---	-6,600	-6,600	-6,600	-6,600		-6,600	-6,600	
<b>RESEARCH AND PROGRAM MANAGEMENT.....</b>	1,247,500	1,242,500	1,247,500	1,242,500	-5,000	1,237,500	1,242,500	1,238,500	1,238,500		-9,000	-4,000	
<b>TOTAL.....</b>	<b>7,106,500</b>	<b>7,268,220</b>	<b>7,278,100</b>	<b>7,267,600</b>	<b>+161,100</b>	<b>7,176,500</b>	<b>7,171,500</b>	<b>7,177,500</b>	<b>7,197,500</b>		<b>+91,000</b>	<b>-70,100</b>	

1/ General reduction to be distributed @ Agency's discretion.  
2/ +\$20M for Solid Rocket Booster repair and refurbishment (see page 6).

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**  
Chronological History of the FY 1984 Budget Submission  
(In thousands of dollars)

Item	AUTHORIZATION					APPROPRIATION							
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RESEARCH AND DEVELOPMENT....	5,708,500	5,886,800	5,889,500	5,883,500	+174,500	5,803,500	2,016,900	2,011,900	2,011,900		-3,696,600	-3,871,100	
OFFICE OF SPACE													
TRANSPORTATION SYSTEMS....	3,498,000	3,570,000	3,558,000	3,555,000	+57,000	3,548,000	427,400	427,400	427,400		-3,070,600	-3,127,600	
253 Space Transportation and Capability Development...	1,927,400	1,999,400	2,022,400	2,009,400	+82,000	1,977,400	427,400	427,400	427,400		-1,500,000	-1,582,000	
Shuttle Production and Capability Development..	1,500,000	1,570,000 <sup>1/</sup>	1,585,000 <sup>1/</sup>	1,575,000	+75,000	1,550,000 <sup>1/</sup>	---	---	---		-1,500,000	1,582,000	
Upper Stages.....	143,200	143,200	143,200	143,200	---	143,200	143,200	143,200	143,200		---	---	
Spacelab.....	119,600	119,600	119,600	119,600	---	119,600	119,600	119,600	119,600		---	---	
Engineering and Technology Base.....	93,100	85,100	93,100	85,100	-8,000	93,100	93,100	93,100	93,100		---	---	
Planetary Operations and Support Equipment.....	53,200	53,200	53,200	53,200	---	53,200	53,200	53,200	53,200		---	---	
Advanced Programs.....	15,000	25,000 <sup>2/</sup>	20,000 <sup>2/</sup>	25,000 <sup>2/</sup>	+10,000	15,000	15,000	15,000	15,000		---	-5,000	
Tethered Satellite System. Teleoperator Maneuvering System.....	3,300	3,300	3,300	3,300	---	3,300	3,300	3,300	3,300		---	---	
System.....	---	---	5,000	5,000	+5,000	---	---	---	---		---	-5,000	
253 Space Transportation Operations.....	1,570,600	1,570,600	1,535,600	1,545,600	-25,000	1,570,600	---	---	---		-1,570,600	-1,545,600	
Shuttle Operations.....	1,520,600	1,520,600	1,485,600	1,495,600	-25,000	1,520,600	---	---	---		-1,520,600	-1,485,600	
Flight Operations.....	(315,000)	(315,000)	*	*	*	(315,000)	---	---	---		(-315,000)	*	
Flight Hardware.....	(848,400)	(848,400)	*	*	*	(848,400)	---	---	---		(-848,400)	*	
Launch and Landing Operations.....	(357,200)	(357,200)	*	*	*	(357,200)	---	---	---		(-357,200)	*	
Expendable Launch Vehicle.	50,000	50,000	50,000	50,000	---	50,000	---	---	---		-50,000	-50,000	
OFFICE OF SPACE SCIENCE AND APPLICATIONS.....	1,068,000	1,152,000	1,154,000	1,154,500	+86,500	1,133,000	1,136,000	1,136,000	1,136,000		+68,000	-18,500	
254 Physics and Astronomy.....	514,600	566,600	558,600	562,100	+47,500	579,600	574,600	578,600	578,600		+64,000	+16,500	
Space Telescope.....	120,600	165,600 <sup>3/</sup>	170,600 <sup>3/</sup>	165,600	+45,000	165,600	165,600	165,600	165,600		+45,000	-5,000	
Gamma Ray Observatory Development.....	99,800	89,800	89,800	89,800	---	89,800	89,800	89,800	89,800		---	---	
Shuttle/Spacelab Payload Development and Mission Management.....	92,900	92,900	81,900 <sup>4/</sup>	88,400 <sup>4/</sup>	-4,500	92,900	92,900	92,900	92,900		---	+11,000	
Explorer Development.....	48,700	48,700	48,700	48,700	---	48,700	48,700	48,700	48,700		---	---	

\*Undistributed

<sup>1/</sup> House Auth: +\$60M to increase orbiter structural spares; +\$10M for engine spares.  
Senate Auth: +\$85M for fifth orbiter.  
House Approp: +\$50M for orbiter and engine spares.

<sup>2/</sup> House Auth: +\$10M for space station studies/space platform.  
Senate Auth: +\$5M for space station studies.  
Conf Comm: +\$10M for space station studies.

<sup>3/</sup> House Auth: +\$45M for development increases  
Senate Auth: +\$50M for cost overruns.

<sup>4/</sup> Senate Auth: -\$16M from Solar Optical Telescope (SOT) to offset Space Telescope increases; +\$5M for Space Plasma Laboratory.  
Conf Comm: +\$2.5M for space plasma lab; -\$7M for Solar Optical Telescope (SOT).

<sup>5/</sup> Transferred to Space Flight, Control and Data Communications Appropriation.

Prepared by:  
Comptroller  
Budget Operations Division  
Code BTF 453-2210

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1984 Budget Submission  
(In thousands of dollars)

Item	AUTHORIZATION					APPROPRIATION							
	Initial Budget Submission to Congress	House Comm. H.R. 2065 Rpt. 98-65 4-15-83 Appd. 4-27-83	Senate Comm. S. 1096 Rpt. 98-108 5-16-83 Appd. 6-15-83	P.L. 98-52 Appd. 7-15-83	Difference from Budget Submission	House Comm. H.R. 3133 Rpt. 98-223 5-24-83 Appd. 6-2-83	Senate Comm. H.R. 3133 Rpt. 98-152 6-14-83 Appd. 6-21-83	Conf. Comm. P.L. 98-45 Rpt. 98-264 6-23-83 Appd. 7-12-83	General Supplemental H.R. 3959 P.L. 98-181 Appd. 11-30-83	Pay Supplemental H.R. Appd. - -84	Difference from Budget Submission	Difference from Budget Authorization	
	Mission Operations and Data Analysis.....	79,500	80,500 <sup>1/</sup>	80,500	80,500	+1,000	79,500	79,500	79,500	79,500	---	-1,000	
	Research and Analysis.....	29,800	35,800 <sup>2/</sup>	33,800 <sup>2/</sup>	35,800	+6,000	49,800 <sup>2/</sup>	49,800	49,800	49,800	+20,000	+16,000	
	Suborbital Program.....	53,300	53,300	53,300	53,300	---	53,300	48,300	52,300	52,300	-1,000	-1,000	
254	Life Sciences.....	59,000	59,000	59,000	59,000	---	59,000	59,000	59,000	59,000	---	---	
	Life Sciences Flight Experiments.....	23,000	23,000	23,000	23,000	---	23,000	23,000	23,000	23,000	---	---	
	Research and Analysis.....	36,000	36,000	36,000	36,000	---	36,000	36,000	36,000	36,000	---	---	
254	Planetary Exploration.....	205,400	220,400	215,400	220,400	+15,000	205,400	205,400	205,400	205,400	---	-15,000	
	Galileo Development.....	79,500	79,500	79,500	79,500	---	79,500	79,500	79,500	79,500	---	---	
	Venus Radar Mapper.....	29,000	29,000	29,000	29,000	---	29,000	29,000	29,000	29,000	---	---	
	International Solar Polar Mission.....	8,000	8,000	8,000	8,000	---	8,000	8,000	8,000	8,000	---	---	
	Mission Operations and Data Analysis.....	43,400	43,400	43,400	43,400	---	43,400	43,400	43,400	43,400	---	---	
	Research and Analysis.....	45,500	60,500 <sup>3/</sup>	55,500	60,500	+15,000	45,500	45,500	45,500	45,500	---	-15,000	
254	Space Applications.....	289,000	306,000	321,000	313,000	+24,000	289,000	297,000	293,000	293,000	+4,000	-20,000	
	Solid Earth Observations..	74,400	83,400 <sup>4/</sup>	86,400 <sup>4/</sup>	83,400	+9,000	74,400	75,400 <sup>4/</sup>	75,400	75,400	+1,000	-8,000	
	Environmental Observations	163,000	166,000 <sup>5/</sup>	173,000 <sup>5/</sup>	170,000 <sup>5/</sup>	+7,000	163,000	165,000 <sup>5/</sup>	164,000	164,000	+1,000	-6,000	
	Materials Processing in Space.....	21,600	26,600	26,600	26,600	+5,000	21,600	26,600	23,600	23,600	+2,000	-3,000	
	Communications.....	21,100	21,100	26,100 <sup>5/</sup>	24,100 <sup>5/</sup>	+3,000	21,100	21,100	21,100	21,100	---	-3,000	
	Information Systems.....	8,900	8,900	8,900	8,900	---	8,900	8,900	8,900	8,900	---	---	
	OFFICE OF EXTERNAL RELATIONS	4,000	10,000	10,000	10,000	+6,000	9,000	9,000	9,000	9,000	+5,000	-1,000	
254	Technology Utilization.....	4,000	10,000	10,000	10,000	+6,000	9,000	9,000	9,000	9,000	+5,000	-1,000	
	Technology Dissemination...	2,200	2,200	2,200	2,200	---	2,200	2,200	2,200	2,200	---	---	
	Technology Applications...	1,800	1,800	1,800	1,800	---	1,800	1,800	1,800	1,800	---	---	
	Undistributed.....	---	6,000	6,000	6,000	+6,000	5,000	5,000	5,000	5,000	+5,000	-1,000	
	OFFICE OF AERONAUTICS AND SPACE TECHNOLOGY.....	438,300	454,600	466,300	463,300	+25,000	438,300	440,300	440,300	440,300	+2,000	-23,000	
402	Aeronautical Research and Technology.....	300,300	311,600	328,300	320,300	+20,000	300,300	302,300	302,300	302,300	+2,000	-18,000	
	Research and Technology Base.....	227,800	205,100 <sup>7/</sup>	212,800 <sup>7/</sup>	205,100	-22,700	217,800 <sup>7/</sup>	222,800 <sup>7/</sup>	217,800 <sup>7/</sup>	217,800 <sup>7/</sup>	-10,000	+12,700	
	Systems Technology.....	72,500	106,500 <sup>8/</sup>	115,500	115,200 <sup>7/</sup>	+42,700	82,500 <sup>8/</sup>	79,500 <sup>8/</sup>	84,500 <sup>8/</sup>	84,500 <sup>8/</sup>	+12,000	-30,700	

1/ House Auth: HEAO +\$1M.

2/ House Auth: Universities basic research programs +\$4M; universities research instrumentation +\$2M.

Senate Auth: Universities basic research +\$4M.

House &amp; Senate Approp: +\$20M for Physics and Astronomy and Planetary Exploration at agency's discretion.

3/ House Auth: +\$15M supporting research programs.

4/ House Auth: Research and Analysis +\$4M; Agristars +\$2M; Tech Transfer +\$3M.

Senate Auth: Research and Analysis +\$9M; Agristars +\$3M.

Conf Comm Auth: Research and Analysis +\$4M; Agristars +\$2M; Tech Transfer +\$3M.

Senate Approp: +\$1M for Multispectral Linear Array.

5/ House Auth: Advanced Tech Development +\$2M; Sun-Earth Interaction Study +\$1M.

Senate Auth: Space Physics/Tech Develop. +\$2M; UARS +\$4M; Atmospheric Dynamics +\$2M; Oceanic Research and Analysis +\$2M.

Conf Comm Auth: +\$2M OPEN; +\$5M UARSE/Atmospheric and Ocean Sensors.

Senate Approp: +\$2M for UARS/OPEN definition.

6/ Senate Auth: +\$5M Research and Analysis.

Conf Comm Auth: +\$3M Research and Analysis.

7/ Offsetting reductions to Systems Tech restorations.

8/ House Auth: Advanced Turboprop +\$20M; ATOPS +\$14M.

House Approp: +\$20M Advanced Turboprop (+\$10M from R&amp;T activities); NAS -\$5M; ATOPS -\$5M.

Conf Comm Auth: +\$20M Advanced Turboprop; +\$22.7M Systems Tech (ATOPS, Laminar Flow, etc.)

Senate Approp: -\$3M NAS; +\$10M Advanced Propulsion and Composite Materials.

Conf Comm Approp: -\$3M NAS; +\$15M Advanced Turboprop, Composite Materials, Laminar Flow.

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**  
 Chronological History of the FY 1984 Budget Submission  
 (In thousands of dollars)

Item	AUTHORIZATION					APPROPRIATION							
	Initial Budget Submission to Congress	House Comm. H.R. 2065 Rpt. 98-65 4-15-83 Appd. 4-27-83	Senate Comm. S. 1096 Rpt. 98-108 5-16-83 Appd. 6-15-83	P.L. 98-52 Appd. 7-15-83	Difference from Budget Submission	House Comm. H.R. 3133 Rpt. 98-223 5-24-83 Appd. 6-2-83	Senate Comm. H.R. 3133 Rpt. 98-152 6-14-83 Appd. 6-21-83	Conf. Comm. P.L. 98-45 Rpt. 98-264 6-23-83 Appd. 7-12-83	General Supplemental H.R. 8959 P.L. 98-181 Appd. 11-30-83	Pay Supplemental H.R. P.L. Appd.	Difference from Budget Submission	Difference from Budget Authorization	
254	<u>Space Research and Technology</u> .....	138,000	143,000	138,000	143,000	+5,000	138,000	138,000	138,000	138,000		---	-5,000
	Research and Technology Base.....	126,200	131,200 <sup>1/</sup>	126,200	131,200	+5,000	126,200	126,200	126,200	126,200		---	---
	Systems Technology Programs.....	7,200	7,200	7,200	7,200	---	7,200	7,200	7,200	7,200		---	---
	Standards and Practices...	4,600	4,600	4,600	4,600	---	4,600	4,600	4,600	4,600		---	---
	<u>OFFICE OF SPACE TRACKING AND DATA SYSTEMS</u> .....	700,200	700,200	700,200	700,200	---	690,200	14,200	14,200	14,200		-686,000	-686,000
255	<u>Tracking and Data Acq.</u> .....	700,200	700,200	700,200	700,200	---	690,200	14,200	14,200	14,200		-686,000	-686,000
	Space Network.....	294,700	294,700	294,700	294,700	---	284,700 <sup>2/</sup>	---	---	---		-294,700	-294,700
	Ground Network.....	231,500	231,500	231,500	231,500	---	231,500	---	---	---		-231,500	-231,500
	Communication and Data Systems.....	159,800	159,800	159,800	159,800	---	159,800	---	---	---		-159,800	-159,800
	Advanced Systems.....	14,200	14,200	14,200	14,200	---	14,200	14,200	14,200	14,200		---	---
	<u>UNDISTRIBUTED</u> .....	---	---	---	---	---	15,000 <sup>3/</sup>	-10,000	-15,000	-15,000		-15,000	-15,000
	<u>SPACE FLIGHT, CONTROL AND DATA COMMUNICATIONS</u> .....	---	---	---	---	---	---	3,776,600	3,791,600	3,791,600		+3,791,600	+3,791,600
	<u>OFFICE OF SPACE TRANSPORTATION SYSTEMS</u> .....	---	---	---	---	---	---	3,100,600	3,115,600	3,115,600		+3,115,600	+3,115,600
253	<u>Space Transportation and Capability Development</u> ....	---	---	---	---	---	---	1,530,000	1,545,000	1,545,000		+1,545,000	+1,545,000
	Shuttle Production and Capability Development....	---	---	---	---	---	---	1,530,000	1,500,000	1,500,000		+1,500,000	+1,500,000
	Reserve.....	---	---	---	---	---	---	---	45,000 <sup>4/</sup>	45,000		+45,000	+45,000
253	<u>Space Transportation Operations</u> .....	---	---	---	---	---	---	1,570,600	1,570,600	1,570,600		+1,570,600	+1,570,600
	Shuttle Operations.....	---	---	---	---	---	---	1,520,600	1,520,600	1,520,600		+1,520,600	+1,520,600
	Expendable Launch Vehicles...	---	---	---	---	---	---	50,000	50,000	50,000		+50,000	+50,000
	<u>OFFICE OF SPACE TRACKING AND DATA SYSTEMS</u> .....	---	---	---	---	---	---	676,000	676,000	676,000		+676,000	+676,000
255	<u>Tracking and Data Acq.</u> .....	---	---	---	---	---	---	676,000	676,000	676,000		+676,000	+676,000
	Space Network.....	---	---	---	---	---	---	284,700	284,700	284,700		+284,700	+284,700
	Ground Network.....	---	---	---	---	---	---	231,500	231,500	231,500		+231,500	+231,500
	Communication and Data Systems.....	---	---	---	---	---	---	159,800	159,800	159,800		+159,800	+159,800
	<u>CONSTRUCTION OF FACILITIES</u> ..	150,500	130,220	142,100	142,100	-8,400	135,500	135,500	135,500	155,500		+5,000	+13,400
	<u>JET PROPULSION LABORATORY</u> ...	4,300	4,300	4,300	4,300	---	4,300	4,300	4,300	4,300		---	---
255	<u>T-Construction of Frequency Standards Laboratory</u> .....	2,700	2,700	2,700	2,700	---	2,700	2,700	2,700	2,700		---	---
	<u>T-Modifications to Space Flight Operations Facility</u>	1,600	1,600	1,600	1,600	---	1,600	1,600	1,600	1,600		---	---

1/ +\$2.5M for university research instrumentation and lab equipment, +\$2.5M to augment advanced chemical propulsion technology.  
 2/ -\$10M from Tracking and Data Relay Satellite System payment to Federal Financing Bank.  
 3/ -\$15M from Solar Optical Telescope or at agency's discretion.  
 4/ +\$50M for orbiter/engine spares (reserve); -\$5M for Shuttle Training Aircraft advance payment.

Prepared by:  
 Comptroller  
 Budget Operations Division  
 Code BTF 453-2210

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1984 Budget Submission  
(In thousands of dollars)

Item	AUTHORIZATION					APPROPRIATION							Difference from Budget Submission	Difference from Budget Authorization
	Initial Budget Submission to Congress	House Comm. H.R. 2065 Rpt. 98-65 4-15-83 Appd. 4-27-83	Senate Comm. S. 1096 Rpt. 98-108 5-16-83 Appd. 6-15-83	P.L. 98-52 Appd. 7-15-83	Difference from Budget Submission	House Comm. H.R. 3133 Rpt. 98-223 5-24-83 Appd. 6-2-83	Senate Comm. H.R. 3133 Rpt. 98-152 6-14-83 Appd. 6-21-83	Conf. Comm. P.L. 98-45 Rpt. 98-264 6-23-83 Appd. 7-12-83	General Supplemental H.R. 3959 P.L. 98-181 Appd. 11-30-83	Pay Supplemental H.R. P.L. Appd.				
<b>CONSTRUCTION OF FACILITIES (Cont'd.)</b>														
402	AMES RESEARCH CENTER.....	3,900	3,900	3,900	3,900	---	3,900	3,900	3,900	3,900			---	---
	R-Construction of Fluid Mechanics Laboratory.....	3,900	3,900	3,900	3,900	---	3,900	3,900	3,900	3,900			---	---
255	DRYDEN FLIGHT RESEARCH FACILITY.....	800	800	800	800	---	800	800	800	800			---	---
	T-Construction of Aeronautical Tracking Facility	800	800	800	800	---	800	800	800	800			---	---
402	LANGLEY RESEARCH CENTER....	9,500	9,500	9,500	9,500	---	9,500	9,500	9,500	9,500			---	---
402	R-Modifications and Additions for Composite Materials Laboratory.....	5,100	5,100	5,100	5,100	---	5,100	5,100	5,100	5,100			---	---
	R-Modifications to 30 x 60 Ft. Wind Tunnel.....	4,400	4,400	4,400	4,400	---	4,400	4,400	4,400	4,400			---	---
402	LEWIS RESEARCH CENTER.....	10,600	10,600	10,600	10,600	---	10,600	10,600	10,600	10,600			---	---
402	R-Modifications for Small Engine Component Testing Facility.....	7,000	7,000	7,000	7,000	---	7,000	7,000	7,000	7,000			---	---
402	R-Modifications to Icing Research Tunnel.....	3,600	3,600	3,600	3,600	---	3,600	3,600	3,600	3,600			---	---
255	VARIOUS LOCATIONS.....	1,700	1,700	1,700	1,700	---	1,700	1,700	1,700	1,700			---	---
	T-Relocation of 26-Meter STDN Antenna, Spain (JPL).	1,700	1,700	1,700	1,700	---	1,700	1,700	1,700	1,700			---	---
253	SPACE SHUTTLE FACILITIES....	41,300	43,120	41,300	41,300	---	41,300	41,300	41,300	61,300			+20,000	+20,000
253	M-Modifications for Additional Chillers for Mission Control Center (JSC).....	2,300	2,300	2,300	2,300	---	2,300	2,300	2,300	2,300			---	---
253	M-Modifications to Mobile Launch Platform #3 (KSC)..	27,300	29,120	27,300	27,300	---	27,300	27,300	27,300	27,300			---	---
253	M-Modification of Manufacturing and Final Assembly Facilities for External Tanks (MAF).....	11,700	11,700	11,700	11,700	---	11,700	11,700	11,700	11,700			---	---
253	M-Construction of Solid Rocket Booster Assembly and Refurbishment Facility	---	---	---	---	---	---	---	---	10,000			+10,000	+10,000
253	M-Construction of Launch Complex 39, Logistic Facility.....	---	---	---	---	---	---	---	---	10,000			+10,000	+10,000
254	SHUTTLE PAYLOAD FACILITIES..	12,000	12,000	12,000	12,000	---	12,000	12,000	12,000	12,000			---	---
254	E-Construction of Cargo Hazardous Servicing Facility (KSC).....	9,000	9,000	9,000	9,000	---	9,000	9,000	9,000	9,000			---	---
254	E-Modifications to Spacecraft Assembly and Encapsulation Facility for Cargo Processing (KSC)....	3,000	3,000	3,000	3,000	---	3,000	3,000	3,000	3,000			---	---
255	N-REPAIR OF FACILITIES.....	19,500	19,500	19,500	19,500	---	19,500	19,500	19,500	19,500			---	---
255	N-REHABILITATION AND MODIFICATION OF FACILITIES.....	24,500	24,500	24,500	24,500	---	24,500	24,500	24,500	24,500			---	---

\*Proposed reimbursement for NASA utilized property at Ellington AFB, Texas.

Prepared by:  
Comptroller  
Budget Operations Division  
Code STF 453-2210

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**  
 Chronological History of the FY 1984 Budget Submission  
 (In thousands of dollars)

Item	AUTHORIZATION					APPROPRIATION							
	Initial Budget Submission to Congress	House Comm. H.R. 2065 Rpt. 98-65 4-15-83 Appd. 4-27-83	Senate Comm. S. 1096 Rpt. 98-108 5-16-83 Appd. 6-15-83	P.L. 98-52 Appd. 7-15-83	Difference from Budget Submission	House Comm. H.R. 3133 Rpt. 98-223 5-24-83 Appd. 6-2-83	Senate Comm. H.R. 3133 Rpt. 98-152 6-14-83 Appd. 6-21-83	Conf. Comm. P.L. 98-45 Rpt. 98-264 6-23-83 Appd. 7-12-83	General Supplemental H.R. 3959 P.L. 98-181 Appd. 11-30-83	Pay Supplemental H.R. P.L. Appd.	Difference from Budget Submission	Difference from Budget Authorization	
<b>CONSTRUCTION OF FACILITIES (Cont'd.)</b>													
255	N-MINOR CONSTRUCTION OF NEW FACILITIES AND ADDITIONS.....	4,800	4,800	4,800	4,800	---	4,800	4,800	4,800	48,000		---	---
255	N-FACILITY PLANNING AND DESIGN.....	9,200	9,200	9,200	9,200	---	9,200	9,200	9,200	9,200		---	---
255	N-GSA REIMBURSEMENT.....	8,400	---	---	---	-8,400	---	---	---	---		-8,400	---
---	UNDISTRIBUTED <sup>1/</sup> .....	---	-5,000	---	---	---	-6,600	-6,600	-6,600	-6,000		-6,600	-6,600
	RESEARCH AND PROGRAM MANAGEMENT...	1,247,500	1,242,500	1,247,500	1,242,500	-5,000	1,237,500	1,242,500	1,238,500	1,238,500		-9,000	-4,000
<b>BY INSTALLATION:</b>													
	Johnson Space Center.....	204,616	204,616	204,616	204,616	---	204,616	204,616	204,616	204,616		---	---
	Kennedy Space Center.....	173,472	173,472	173,472	173,472	---	173,472	173,472	173,472	173,472		---	---
	Marshall Space Flight Center....	186,663	186,663	186,663	186,663	---	186,663	186,663	186,663	186,663		---	---
	National Space Technology Laboratories.....	9,302	9,302	9,302	9,302	---	9,302	9,302	9,302	9,302		---	---
	Goddard Space Flight Center.....	183,726	183,726	183,726	183,726	---	183,726	183,726	183,726	183,726		---	---
	Ames Research Center.....	108,835	108,835	108,835	108,835	---	108,835	108,835	108,835	108,835		---	---
	Langley Research Center.....	139,081	139,081	139,081	139,081	---	139,081	139,081	139,081	139,081		---	---
	Lewis Research Center.....	121,857	121,857	121,857	121,857	---	121,857	121,857	121,857	121,857		---	---
	Headquarters.....	119,948	119,948	119,948	119,948	---	119,948	119,948	119,948	119,948		---	---
	Undistributed.....	---	-5,000	---	-5,000	-5,000	-10,000	-5,000 <sup>2/</sup>	-9,000	-9,000		-9,000	-4,000
<b>BY FUNCTION:</b>													
	Personnel and Related Costs.....	983,785	883,785	883,785	883,785	---	883,785	883,785	883,785	883,785		---	---
	Travel.....	25,700	25,700	25,700	25,700	---	25,700	25,700	25,700	25,700		---	---
	Facilities Services.....	186,488	186,488	186,488	186,488	---	186,488	186,488	186,488	186,488		---	---
	Technical Services.....	59,257	59,257	59,257	59,257	---	59,257	59,257	59,257	59,257		---	---
	Management and Operations Support.....	92,270	92,270	92,270	92,270	---	92,270	92,270	92,270	92,270		---	---
	Undistributed.....	---	-5,000	---	-5,000	-5,000	-10,000	-5,000 <sup>2/</sup>	0,000	-5,000		-9,000	-4,000

<sup>1/</sup> General reduction to minor programs @ agency discretion.  
<sup>2/</sup> General reduction other than personnel compensation and benefits.

AUTHORIZING APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FOR FISCAL YEAR 1984

APRIL 15, 1983.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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

REPORT

together with

ADDITIONAL VIEWS

[To accompany H.R. 2065]

The Committee on Science and Technology, to whom was referred the bill (H.R. 2065) 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 amendments (shown in italic in the bill accompanied by this report) and recommends that the bill, as amended, do pass.

The amendments are as follows:

Page 2, line 4 strike out "\$1,979,400,000" and insert "\$1,999,400,000" in lieu thereof.

Page 2, line 7 strike out "\$521,600,000" and insert "\$566,600,000" in lieu thereof.

Page 2, line 8 strike out "\$215,400,000" and insert "\$220,400,000" in lieu thereof.

Page 2, line 10 strike out "\$311,000,000" and insert "\$306,00,000" in lieu thereof.

Page 2, line 13 strike out "\$300,300,000" and insert "\$311,600,000, of which \$20,000,000 is authorized only for activities in the Ad-

vanced Turboprop program which are designed to lead to a flight test no later than 1987".

Page 2, line 14 strike out "\$148,000,000" and insert "\$143,000,000" in lieu thereof.

Page 3, strike out lines 1, 2, and 3 and insert in lieu thereof the following:

(B) Modifications to mobile launch platform, John F. Kennedy Space Center, including exercise of contract option to preserve launch umbilical tower (LUT), \$29,120,000; and

Page 4, in line 18 strike out the period and insert in lieu thereof a colon, and after and below line 18 insert the following:

*Provided*, That the total amount authorized to be appropriated by this subsection shall be \$5,000,000 less than the sum of the amounts contained in paragraphs (1) through (15) for individual projects.

Page 4, line 20 strike out "\$1,247,500,000" and insert "\$1,242,500,000" in lieu thereof.

Page 10, line 14 strike out in lieu thereof "fleet" and insert "fleet, as well as provisions for maintaining production readiness for a fifth orbiter vehicle."

Page 11, strike out lines 18 through 22.

Page 11, line 23 strike out "103(1)" and insert in lieu thereof "103(1)".

Page 12, after line 3 add a new Section 109 as follows:

Sec. 109. Notwithstanding any other provision of law, there shall be transferred to NASA three government-owned tracts of NASA-used land and improvements thereon (totalling approximately 33.5 acres) at Ellington Air Force Base, Texas, without any transfer of funds therefor.

and renumber the succeeding section.

Page 12, after line 6 insert "TITLE II".

Page 12, strike out line 24 and lines 1 and 2 on Page 13 and insert in lieu thereof the following:

a comprehensive statement of recommended policies, procedures, conditions, and limitations to which any transfer should be subject; and

(2) the Congress thereafter enacts a law which contains such policies, procedures, conditions, or limitations (or a combination thereof) as it deems appropriate for any such transfer.

PURPOSE OF THE BILL

TITLE I

The purpose of title I is to authorize appropriations to the National Aeronautics and Space Administration for fiscal year 1984 as follows:

Programs	Authorization fiscal year 1984	Page No.
Research and development.....	\$5,886,800,000	25
Construction of facilities.....	138,920,000	171
Research and program management.....	1,242,500,000	191
Total.....	\$7,268,220,000	

#### TITLE II

The purpose of title II is to authorize appropriation of \$29,336,000 for the National Oceanic and Atmospheric Administration to operate a land remote sensing system and to provide for limitations on the operation of the system.

## COMMITTEE ACTIONS

### TITLE I

#### RESEARCH AND DEVELOPMENT

##### SPACE TRANSPORTATION CAPABILITY DEVELOPMENT

NASA requested \$1,927,400,000 for space transportation capability development activities in fiscal year 1984. The Committee increased funding for shuttle production and capability development by \$70,000,000; decreased funding for engineering and technical base by \$8,000,000; and increased funding for advanced programs by \$10,000,000 resulting in a total recommended authorization of \$1,999,400,000 in fiscal year 1984.

*Shuttle production and capability development.* NASA requested \$1,500,000,000 for shuttle production and capability development activities in fiscal year 1984. Within this program, the Committee (1) added \$60,000,000 to increase orbiter structural spares, to preserve critical orbiter component subcontractors, to maintain critical skills, and to maintain production readiness for a fifth orbiter vehicle and (2) \$10,000,000 to increase funding for engine spares resulting in a total recommended authorization of \$1,570,000,000 for shuttle production and capability development activities in fiscal year 1984.

*Engineering and Technical Base.* NASA requested \$93,100,000 for engineering and technical base activities in fiscal year 1984. The engineering and technical base funding provides the core capability required to sustain an engineering and development base for various space transportation system activities. With completion of the development program the committee suggests increasing the involvement of in-house civil service manpower in these activities and therefore recommends a decrease of \$8,000,000 resulting in a total authorization of \$85,100,000 in fiscal year 1984.

*Advanced Programs.* NASA requested \$15,000,000 for advanced programs to provide technical and programmatic data for the definition and evaluation of candidate future space flight programs. The Committee fully supports NASA ongoing definition and evaluation studies related to a permanent manned space station. The Committee increased funding in this area to continue industrial involvement and to assure that alternative concepts and evolutionary approaches are considered. A total increase of \$10,000,000 was adopted for space station contractor studies, for alternative concept studies, and for studies and advanced technical development of an unmanned space platform which would be serviced and supported by the space shuttle orbiter with an extended orbit duration capability of 30 to 45 days resulting in a total recommended authorization of \$25,000,000 for advanced programs in fiscal year 1984.

The current budget request includes \$6 million for space station in-house studies with no plans to continue the current ongoing complementary industry studies. The increase recommended by the Committee would provide an additional \$6,000,000 to continue industry involvement in mission analysis and systems definition activities and to assure that private sector uses and commercial applications are fully considered.

The current mission analysis studies being conducted by NASA are focused on a manned space station. Any future decision on a space station will need to consider whether or not there are alternative approaches to the manned space station which could accomplish the same mission requirements. Therefore, \$2,000,000 was included to specifically fund studies which would identify alternative approaches.

One evolutionary approach which has been identified involves unmanned space platforms supported and serviced by the space shuttle orbiter with an extended orbit duration capability of 30 to 45 days. Within the increase recommended, \$2,000,000 was provided for in-house and contractor definition and evaluation studies of this approach.

#### PHYSICS AND ASTRONOMY

NASA requested \$514,600,000 for Physics and Astronomy programs in fiscal year 1984. The Committee recommended an increase of \$45,000,000 for the space telescope program, \$6,000,000 for research and analysis activities and \$1,000,000 for missions operations and data analysis resulting in a total recommended authorization of ~~\$521,600,000~~ *566,600,000*

NASA requested \$120,600,000 for the Space Telescope development and the Committee recommends an increase of \$45 million to a total of \$165,600,000. The additional funding is necessitated by development problems which have arisen, the resolution of which will require additional spares and additional fixtures, components, and equipment for testing purposes.

*Research and Analysis.* NASA requested \$29,800,000 for research and analysis activities in fiscal year 1984. The Committee recommended an increase of \$6,000,000 including \$4,000,000 to augment basic research programs—*theoretical and experimental research programs at universities which interpret and disseminate the results of flight missions, and \$2,000,000 for research instrumentation at universities to maintain and stimulate basic research in support of NASA science missions.*

*Mission Operations and Data Analysis.* An increase of \$1,000,000 is for the Mission Operations and Data Analysis program to support analysis of HEAO-11 data. This satellite has ceased operating but a great deal of data remains to be analyzed. The user community for this data, X-ray astronomers, is the same community that will use data provided by the Advanced X-Ray Astronomy facility, the next major new start recommended by the Astronomy Survey Committee. Thus, this increase will help maintain the scientific base for such a mission.

#### PLANETARY EXPLORATION

NASA requested \$205,400,000 for planetary exploration programs in fiscal year 1984. Within this line item the Committee increased the budget request for research and analysis activities by \$15,000,000 to \$60,500,000 resulting in a total recommended authorization of \$220,400,000 for planetary exploration.

The primary users of data generated by planetary missions are research scientists working in universities. In recommending this addition the Committee is taking a step toward rebuilding the university planetary research community which has been impacted by cuts since fiscal year 1981. For purposes of comparison, to provide the purchasing power that was available in fiscal year 1981 would require a budget level of \$72 million in fiscal year 1984 dollars.

The Committee is encouraged that the request includes funds to initiate the Venus Radar Mapper mission and that the Mission Operations and Data Analysis request is adequate to keep all existing spacecraft operating.

However the Research and Analysis budget request represented a reduction of 9.5 percent from fiscal year 1983 (down \$5 million to \$45.5 million). The requested level of funding would result in an adverse impact on supporting research in areas such as planetary geology, planetary atmospheres, and geochemistry. The recommended increase would not only augment these supporting programs but would also support non-Voyager Jupiter/Saturn data analysis and definition studies for the next generation of planetary missions such as the Mars Geochemical Orbiter, a Comet Rendezvous, and a Titan Probe, which have been recommended by the Solar System Exploration Committee.

#### SPACE APPLICATIONS

NASA requested ~~\$284,000,000~~ <sup>259</sup> for Space Applications Programs in fiscal year 1984. Within this line item the Committee recommended increases of \$9,000,000 in Solid Earth Observations; \$3,000,000 in Environment Observations; and \$5,000,000 for Materials Processing in Space. Therefore, the total recommended authorization for Space Applications is \$306,000,000.

*Solid Earth Observations.* NASA requested \$74,400,000 for this program in fiscal year 1984 and the Committee recommended an increase to \$83,400,000. The recommended increase would be for three distinct items. An increase of \$4,000,000 is recommended for Research and Analysis to support applications studies related to space-borne radars and the Global Resource Information System. NASA is flying sophisticated radars aboard the Shuttle (SIR-A, SIR-B) that will generate large amounts of data. The Committee intends that part of this increase be used to turn this radar data into useful information and to develop and verify techniques for using spaceborne radars, e/g., for geological prospecting.

The concept of a Global Resource Information System (GRIS) was developed in a 1981 Committee report of U.S. Civil Space Policy which requested NASA to prepare a plan for GRIS. The plan was submitted in February 1983, and seems to emphasize the computer hardware aspects of such a system. As there appears to be no funding for GRIS in the 1984 request, the Committee intends that \$1

million of this increase be applied to study the uses to which a GRIS could be put, and the way that it could be most accessible to users. The increase is put into this program element rather than into Information Systems to emphasize that the purpose is not hardware design but user-involvement.

An increase of \$2,000,000 would partially restore the OMB reduction of NASA's request for AgRISTARS. The apparent lack of a commercially viable market for LANDSAT data illustrates the need for the government to continue to develop these applications. The same general argument applies to the recommendation that an additional \$3,000,000 be added into the budget for Technology Transfer activities, specifically for tests to verify and demonstrate the validity and usefulness of space application systems.

By this action the Committee does not authorize and directs that no funds be used for, the Western Regional Evaluation and Test Experiment projects developed by Ames Research Center.

*Environmental Observations.* NASA requested \$163,000,000 for this program in fiscal year 1984 and the Committee recommends an increase to \$166,000,000. The addition of \$3,000,000 for space physics includes \$2 million for advanced technology development and experiment definition efforts by university research teams participating in the Origin of Plasmas in the Earth's Neighborhood (OPEN) program as well as \$1 million to support a study to be conducted by the National Research Council on Sun-Earth interactions. The study is explicitly requested and described in the section of Committee Views on Space Application.

*Materials Processing.* NASA requested \$21,600,000 for this program for fiscal year 1984 and the Committee recommended an increase to \$26,600,000. The Committee recommends that \$5,000,000 be added to this program for two purposes: the Committee believes that an area of great potential is the space-borne separation and purification of organic chemicals, i.e. pharmaceuticals. Therefore this increase should be used in part to establish at a university a center for basic research in the separation and purification of organics. In addition the Committee recommends an augmentation of research to be conducted through or in cooperation with private commercial firms with a view toward commercial applications of space processing. The Committee recommends that the Agency not put substantial additional resources into hardware until it has a better-defined sense of direction for this program.

#### TECHNOLOGY UTILIZATION

NASA requested \$4,000,000 for Technology Utilization programs in fiscal year 1984. The Committee recommends an increase of \$6,000,000 which would restore reduction made by OMB resulting in a total authorization of \$10,000,000.

The Administration has again proposed a reduction in this program the purpose of which is to make NASA-developed technology available to a broad spectrum of industry in spite of repeated Congressional actions to maintain it at a higher funding level. The fiscal year 1983 funding was \$9 million as a result of a \$5 million Congressional augmentation.

The Committee recommends that the increase be used to continue support for activities of all the Industrial Applications Centers and all the State Technology Applications Centers, and to augment and initiate "applications team" efforts in rural, robotic, and bioengineering areas. In particular the Technology Applications Center in Albuquerque should continue to be fully supported to carry out its activities with regard to remote sensing applications.

*Prompt Reporting of Inventions and Innovations.* The Committee notes with approval NASA's continuing efforts to obtain prompt reporting of both inventions and innovations, whether or not patentable, under section 305(b) of the National Aeronautics and Space Act of 1958 as amended. This reporting is an important element of the Technology Utilization Program, and, consonant with its actions increasing the authorization for Technology Utilization programs, the Committee directs NASA to continue these efforts to assure that new technology is made available expeditiously to potential users.

#### AERONAUTICAL RESEARCH AND TECHNOLOGY

NASA requested \$300,300,000 for Aeronautical Research and Technology. This amount represents an increase of 7.2 percent over the Fiscal Year 1983 appropriation.

The Committee feels that the aggregate amount requested by NASA is responsive to the thrust of the Administration's recent policy statement on aeronautical R&T, while at the same time recognizing the need for overall fiscal restraint. Upon close examination, however, the request shows clear evidence of further withdrawal from certain important technology validation activities with civil application that the Congress strongly supported in the past.

The Committee is also concerned with maintaining a proper balance between in-house and contracted work and between applied research and technology validation. In both instances, the program must contain a meaningful component of the latter—that is, both contracted work and technology validation activities—to maximize the transfer of research results into useful applications. The proposed Fiscal Year 1984 program moved away from balance in this regard.

Accordingly, the Committee recommends an increase of \$11.3 million, bringing the total authorization to \$311.6 million. Within this amount, \$20 million is authorized only to restore activities in the Advanced Turboprop Program which are designed to lead to a flight test no later than 1987. The Committee also recommends the following additional restoration to the civil systems technology area: \$14.0 million to be applied at NASA's discretion to upgrade the Advanced Transport Operating Systems, completion of the presently defined Laminar Flow Control Program, continuation of the Small Engine Component Technology Program, and start of the Advanced Turbofan Research Program. To offset these restorations, the Committee further recommends a general reduction in the R&T base of \$22.7 million.

The Committee is strongly in favor of proceeding as rapidly as possible with development of the Numerical Aerodynamic Simulator with the full funding as proposed by the Administration. The

Committee also applauds NASA's new initiative in the composite materials area, but would urge expansion of this program to include fundamental work on advanced metals.

#### SPACE RESEARCH AND TECHNOLOGY

The NASA budget request for fiscal year 1984 included \$138,000,000 for space research and technology activities. This program provides a technology base to support the conception and design of advanced space systems and to explore technology which will reduce the cost of space operations. The Committee recommends an increase of \$2,500,000 for university research instrumentation and laboratory equipment and an increase of \$2,500,000 to augment advanced chemical propulsion technology to support high-performance, long-life propulsion systems for orbital transfer vehicles; resulting in a total recommended authorization of \$143,000,000 in fiscal year 1984.

#### CONSTRUCTION OF FACILITIES

NASA requested \$150,500,000 for construction of facilities activities in fiscal year 1984. Within this amount NASA requested \$8,400,000 for reimbursement to the General Services Administration in exchange for the transfer of real properties at Ellington Air Force Base, Texas, to NASA Johnson Space Center. The Committee authorized transfer of this property which includes facilities that are primarily used for astronaut training such as aircraft hangers, warehouses, support buildings, and utilities required to support aircraft operations. However, the Committee deleted the \$8,400,000 from the budget request since the transfer can be implemented with no exchange of funds. The Committee further recommended a general reduction of \$5,000,000 and an increase of \$1,820,000 to preserve an Apollo launch umbilical tower resulting in a recommended authorization of \$138,920,000 for construction of facilities in fiscal year 1984.

#### RESEARCH AND PROGRAM MANAGEMENT

NASA requested \$1,247,500,000 for the Research and Program Management account in fiscal year 1984. The Committee believes that this amount can be reduced by \$5,000,000 without undue impact on the conduct of the agency's programs. Therefore, the Committee recommends an authorization of \$1,242,500,000.

#### LANGUAGE AMENDMENTS

##### *Section 106*

The Committee amended a new Section 106 which was proposed by NASA to clearly show the Committee's intent that NASA maintain production readiness for a fifth orbiter vehicle. The Committee added at the end of Section 106 the following "as well as provision for maintaining production readiness for a fifth orbiter vehicle".

##### *Section 107*

The Committee adopted a new Section 107 as amended which was proposed by NASA to amend Title III of the National Aeronautics and Space Act of 1958, as amended, by adding at the end thereof a section regarding "Misuse of Agency Name and Initials".

##### *Section 108*

The Committee adopted a new Section 108 which would amend Section 103(1) of the National Aeronautics and Space Act of 1958, as amended, to include "operation of the space transportation system" within the definition of the term "aeronautical and space activities".

##### *Title II*

The Committee adopted and amended a new Title II which would authorize funds to NOAA for operating the land remote sensing satellite system and would prohibit the transfer of weather and land satellites to the private sector until certain actions are taken by the Secretary of Commerce and the Congress. The Secretary is to submit to the Congress a comprehensive statement of recommended policies, procedures, conditions, and limitations to which any transfer should be subject. The transfer cannot take place until the Congress thereafter enacts into law such policies, procedures, conditions, and limitations as it deems appropriate for any such transfer. The intent of the amendment is to ensure early, formal Congressional involvement in setting the course for a possible transfer of the remote sensing satellite systems to the private sector while reserving final Congressional approval for any proposed transfer.

## COMMITTEE VIEWS

### U.S. CIVILIAN SPACE POLICY

There has been a great deal of public discussion in the past year regarding the activities of the United States in space. Much of this discussion has centered around three main issues: the interface between the civilian and military uses of space, the commercialization of space, and the lack of focused long-range goals.

In regard to the first issue, the National Aeronautics and Space Act of 1958 provides for the establishment of a civilian agency, separate from the military, to conduct the aeronautical and space activities of the United States Government. However, the Act also provides for independent civil and defense programs to share information and technology; share launch vehicles; and where appropriate, operate cooperative programs. At issue, is not the basic concept of sharing, but the degree of participation by NASA in activities beneficial to DOD.

NASA's involvement in "dual-role" technologies is most apparent at the opposite ends of its spectrum of activities namely; space research and technology and launch operations. The fundamental character of NASA's space research and technology program, in most cases, leads to advances in technology that are applicable to both civil and military applications. For example, NASA estimates that 85 percent of its fiscal year 1984 space research and technology budget request would contribute to potential military as well as civilian applications. At the other end of the scale, DOD is a major user of the NASA-developed Space Transportation System.

It can be seen from these illustrations that NASA plays an important, if subsidiary, role in national defense. However, any expansion of that role would run the risk of compromising the open nature of our civil space program and should be vigorously resisted. Although NASA cannot be divorced completely from national security activities, adherence to the policies of the Space Act requires that NASA's participation in these activities be limited.

On the second major issue, space commercialization, there are two general areas of concern. The first is, how to transfer existing space systems? The second is, what institutional mechanisms are needed to allow for smoother transitions from Government to industry in the future? Although the stated Administration policy is to encourage the private sector to become more involved in space activities, no comprehensive principles, guidelines, or institutional frameworks have been provided. Appropriate roles and cooperative approaches for the public and private sectors must be defined more clearly.

The third main issue is the lack of long-range civil space goals. Since the Apollo program, there has been no clear objective that the Nation could focus on and identify with. Long-range planning or goal setting is required to balance the numerous space program possibilities and opportunities against each other and against other existing national needs. Out of this balancing a program direction could be chosen which would be in the best interest of the Nation. Establishment of long-range goals would provide a better sense of direction and commitment to guide programmatic decisions through year to year budget decisions. The absence of long-range goals results in short-term policies which change too often to allow for a cohesive, rational view of our future direction and purpose in space.

### COMMERCIALIZATION OF SPACE

The Space Shuttle has ushered in a new era in the United States' space program by providing a unique and powerful space transportation capability. This capability has been made possible through the expenditure of public funds and the public trust must be protected as we move ahead with the commercialization and industrialization of space.

As the commercial opportunities offered by space exploration evolve, a new policy must be forged that provides opportunities for the American free enterprise system to use space for a variety of applications and technologies. We must assure that the strengths of free enterprise are extended to space activities, i.e. freedom of private business to organize and operate for profit in a competitive system. We should establish a policy which would encourage commercialization of space technology to the maximum extent feasible.

The Committee intends to meet this challenge and in a responsible manner address the total issue of commercialization of space by initiating intensive hearings on the subject. Sufficient time will be allowed, with the intention of providing a forum for meaningful dialogue on all facets of the issue. Aerospace industry executives and entrepreneurs will be invited to air their ideas on the direction that this Nation should take in formulating a space commercialization policy.

The first and foremost goal of the Committee will be to act in the best interest of the United States, and we look forward to these hearings in the belief that they will provide guidance and scope to this most important issue.

### SPACE TRANSPORTATION SYSTEM

The development of the Space Transportation System with the space shuttle as the centerpiece has established a new national resource which should be fully exploited to serve the needs for civil government, national security, commercial, and foreign users. However several uncertainties and unresolved issues strengthen the position of competitive foreign launch systems. These include the shuttle flight rate capability including adequacy of the orbiter fleet, the possible unavailability of expendable launch vehicles, and OMB's assertion that the government should not provide a launch

capability greater than that needed to satisfy government uses. These uncertainties increase the potential that commercial customers face a high probability of being "bumped" from planned Shuttle flights and threaten future access to space for commercial users. NASA should assume a leadership role in resolving these uncertainties and in assuring that launch services are available for government and commercial customers. Additionally, NASA should seek greater participation by the private sector in shuttle marketing activities.

*Orbiter Fleet Size.* The Committee continues to believe that additional orbiters beyond the currently planned four will be needed to accomplish civil, commercial, and defense missions; to provide flexibility for exploitation of the shuttle's capabilities through increased on-orbit power and mission life; and to provide adequate backup to the currently planned fleet.

*Expendable Launch Vehicles.* The Committee believes that maintenance of expendable launch vehicle capability, until the Shuttle flight capability can fully satisfy civil, commercial, national security, and foreign requirements, is in the best interest of the United States. The development of the Shuttle Space Transportation System has established a new national resource for scientific, national security, and civil application. Maintaining a balanced set of alternative launch capabilities during the early operational portion (1983-1990) of this new operational system will assure that space program assets developed during the past twenty-five years are fully utilized. Therefore, NASA is requested to submit to the Committee by September 1, 1983, a plan for maintenance of expendable launch vehicle capability in support of the new space transportation system. This plan shall include, but not be limited to, specific recommendations to allow U.S. expendable launch vehicles to be competitive with foreign launch vehicles and should include appropriate recommendations to facilitate commercial ventures.

*Space Shuttle Marketing.* Technical evolution of the space shuttle has progressed sufficiently such that the development of the full potential for marketing the system needs to receive senior NASA management attention. The Committee believes that NASA should use the expertise of the private sector to develop an effective marketing approach. Effective marketing of space shuttle capabilities to commercial and foreign customers should serve to decrease the government's share of operational costs and assure that the shuttle system achieves the full potential for which it was developed. Therefore, NASA shall communicate to the Congress at the earliest practicable time but not later than October 1, 1983, both short and long term plans to establish an effective private sector space shuttle payload marketing activity.

#### SOLID ROCKET BOOSTER REFURBISHMENT ACTIVITIES

The Committee is concerned about the progress being made on the Solid Rocket Booster Refurbishment Program in providing facilities, tooling, and procedures for these operations. In testimony, NASA has identified a current flight rate capability of 16 solid rocket booster sets per year with a goal of achieving 24 sets per year. For more than a year the Committee has been aware that

NASA does not have a comprehensive plan for solid rocket booster refurbishment activities which is the most significant known obstacle to achieving a flight rate capability of 24 flights per year. The Committee has two concerns. First, that time is running out in establishing the necessary provisions for achieving 24 sets per year by 1987. Second, that manufacturing operations are much different than the development of limited quantities of flight hardware and that, as such, NASA may not be totally familiar with the nuances of production operations. Accordingly, the Committee requests that NASA submit a comprehensive manufacturing plan for the Solid Rocket Booster Refurbishment activities which describes features such as incoming materials inspection techniques, tooling required, environmental building standards, material handling, thru-put scheduling, personnel selection and training, anticipated yield, component procurement, "gating" work tasks, management techniques (including computer support) and which outlines detailed schedules and milestones for achieving a refurbishment capability of 24 sets per year.

#### SPACE TELESCOPE

The Committee is very concerned about the current technical and management problems which are being experienced with the Space Telescope development program. The schedule slip of six months and cost growth of \$100 million which were discussed in February hearings is now assessed as a schedule slip of more than a year with a cost growth of more than \$200 million. The Committee recognizes the technical challenge of the Space Telescope development but believes that increased management focus at NASA headquarters, the cognizant field center, and at the contractors together with increased efforts on resource estimating will serve to bring these problems under control.

The Committee is also concerned that reprogramming of additional resources in fiscal years 1983 and 1984 for the Space Telescope from within space science and applications will result in further damage to the already constrained supporting research and technology activities. The Committee encourages NASA to request any additional funds which are required through the normal Congressional budget authorization and appropriation process.

#### PLANETARY EXPLORATION

The Committee fully supports a national commitment to a healthy, vigorous planetary exploration program. Planetary exploration contributes not only to our understanding of the Earth and its place in the universe but is also at the leading edge of our efforts to advance high technology. By studying other planets—their weather, their atmosphere, their chemistry, their geology—we learn more about the Earth. The accomplishments of our unmanned Viking landings on Mars and the Voyager missions to the outer planets have not only captured the interest and imagination of millions of Americans but demonstrated to the world our technological leadership.

*Requirement for Technology Development.* The Committee action in supporting a forward-looking planetary program—i.e. building

support for a vigorous research community—indicates a desire to see a balanced program of missions to the inner and outer planets. Indeed the Solar System Exploration Committee has made similar recommendations. The Committee notes that execution of such a program requires appropriate technology, and in particular that non-solar power sources will be needed for future missions to the outer planets. Therefore, the Committee requests that the Agency take the following two steps: (1) That the Agency report promptly on the status of long term plans for technology development (including power sources) for deep space missions beyond Galileo and ISPM. (2) That the agency request that the NASA Advisory Council, acting through its appropriate subgroups or combinations thereof, promptly initiate a review of the adequacy of current Space Research and Technology programs for supporting future planetary missions, and report the results of that review to the Committee by January 1, 1984.

*Infrared Telescope Facility in Hawaii (IRTF).* The Committee continues to support NASA involvement in ground based research facilities and in IRTF and reiterates the position it expressed in the report accompanying last year's authorization bill (House Report No. 97-502):

A research facility such as the Infrared Telescope Facility cannot operate efficiently when funding crises occur every fiscal year. Therefore, the Committee directs NASA to continue support for the Infrared Telescope Facility until an interagency agreement between NASA and NSF is completed which provides for NSF support of the facility, or until an independent, outside, scientific peer review finds that the facility should be closed.

#### SPACE APPLICATIONS

*Space Act Mandate.* The National Aeronautics and Space Act of 1958 provides that NASA shall provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof. The Committee urges increased efforts to improve NASA's ability to assist users and potential users of space technology. The Committee continues to support and encourage the Agency in what might be called "followthrough" activities. It is not enough merely to develop a technology or to fly a mission; the user community must be involved from the beginning in planning applications programs. The technology must be put to use and the justifying objectives of a mission must be reached. In the Applications programs (as in the Science programs) technologies and missions are not ends but means. The final objective is to use a space technology or mission "for the benefit of all mankind". The Agency should always be conscious of the use to which a technology will be put—or the use that scientists will make of data from a mission. Thus the Committee believes that both formally identified and indirect technology transfer programs must be continued, and that adequate support must be maintained for research communities that analyze the scientific data from missions. It is through this follow-through support, which is often at a relatively small

cost, that the Agency can maximize the benefits of the technology which is developed.

Programs to develop, verify, and disseminate remote sensing applications seem to be relatively underfunded, i.e. Technology Transfer was eliminated in FY 1983, and the current budget request, if left unchanged, would eliminate the NASA involvement in AgRIS TARS in FY 1984. The Committee is concerned that the Agency is withdrawing into the engineering and technology activities with which it is most comfortable while neglecting needed efforts focused on overcoming barriers to achieving larger benefits for broader segments of society.

*Study of Sun-Earth Interaction.* Many in the scientific community believe that a better scientific understanding of Sun-Earth interaction would contribute significantly to the solution of many global scientific problems. The inadequate funding for the Origin of Plasmas in the Earth's Neighborhood (OPEN) mission as well as the delay of the Upper Atmosphere Research Satellite (UARS) and the cancellation of the U.S. part of the International Solar Polar Mission (ISPM) all seem to indicate a lack of appreciation on the part of the Agency of the importance of Sun-Earth interactions. The Sun and its dynamics affect weather, climate, oceans and communications on Earth. Part of the reason for the lack of appreciation appears to be that the scientific community is split into factions—solar physicists, space-plasma physicists, meteorologists, stratospheric researchers, climatologists, and others. Yet the various phenomena are related and are often of critical and immediate economic importance on Earth. For this reason, the Committee has recommended an increase of \$1 million for a study, to be conducted through the National Research Council of the National Academies of Science and Engineering, of the scientific connections and importance of Sun-Earth interactions.

The study should lay out these interactions and their scientific and practical importance, and building on this base, develop a plan for Federal research (both basic and applied) in this area. In this latter respect the report of the Astronomy Survey committee might be a useful model.

The Committee would expect that the center-of-gravity of this study would lie with the Space Science and Space Applications Boards of the NAS and NAE, but emphasizes that other Academy groups would have to be brought into the study—for example the Climate Research Board and the Committee on Atmospheric Sciences. In this respect, the study would be somewhat analogous to that of the Astronomy Survey Committee which went beyond the Space Science Board as well as beyond NASA in its scope. Indeed the Agencies for whom the study would be of interest would include NASA, NOAA, DOD (Air Force and Navy in particular), NSF, and the USGS. The Committee feels that this study is timely, and requests that the Agency promptly initiate the study with a view toward completing it, or at least having a substantial interim report, in time for the FY 1985 budget consideration. The results of the study should be reported to both Houses of the Congress.

*Annual Report for Materials Processing.* The Committee is gratified that NASA, in cooperation with industry, has identified the electrophoresis process which demonstrates the real potential for

the application of space technology to the needs of mankind. The Committee believes, however, that the realization of the full potential for materials processing in space would be accelerated by better program focus and direction. To encourage this, the Committee requests that NASA submit to Congress in December 1983, and every year thereafter, a comprehensive annual report on its Materials Processing in Space Program. The report should outline program objectives and direction and include research and applied science goals, milestones, status reports, budget information, and information concerning commercial, interagency and international involvement.

#### AERONAUTICAL RESEARCH PERSONNEL

At the core of NASA's strength in aeronautics, over many decades, have been the efforts of highly dedicated, individual researchers working with NASA test facilities. The innovations produced by people such as Dick Whitcomb at the Langley Research Center have made an immense contribution to the progress of aeronautical science.

The Committee is concerned, however, that NASA may be losing sight of the value of such in-house research. Over time, more and more of its civil service staff has been applied to administrative tasks, especially to the monitoring of contracts.

The Committee recognizes the vital importance of industry involvement in NASA aeronautical programs. Such involvement is necessary to assure that research results are translated into useful applications. Nevertheless, the Committee is concerned that too great a percentage of NASA's in-house effort is expended on administrative matters. Accordingly, the Committee requests that the Administrator examine alternatives for conducting NASA programs with a view toward increasing the number of aeronautical research personnel by 220. The Committee further requests that the Administrator report his findings by September 30, 1983.

#### FLIGHT RESEARCH

Aeronautical research should be among NASA's highest priorities; however, it should be remembered that not all research takes place in a laboratory. There are many who argue that flight testing is too costly and computer simulation and prediction can take the place of actually building an aircraft and flying it. This hypothesis was thoroughly refuted by former NASA Administrator James Webb. When testifying before Congress in 1967, he said:

Flight testing of new concepts, designs, and systems is fundamental to aeronautics. Laboratory data alone, and theories based on these data, cannot give all the answers. . . . Each time a new aircraft flies, a "moment of truth" arrives for the designer as he discovers whether a group of individually satisfactory elements add together to make a satisfactory whole, or whether their unexpected interactions result in a major deficiency. Flight research plays the essential role in assuring that all the elements of an aircraft can be integrated into a satisfactory system.

The Committee supports the view that flight research is an essential phase of aeronautical R&T, and recognizing the high cost of flight testing encourages cooperative experimental flight programs between NASA and DOD. These programs should allow adequate NASA participation and involve aircraft sufficiently innovative and revolutionary to provide NASA with basic data for evaluating advanced aeronautical concepts, and ensure maximum technology transfer.

#### UNIVERSITY GRANTS FOR AERONAUTICAL RESEARCH

The Committee reaffirms the importance of university participation in the aeronautical research programs of NASA. Such participation is a very cost-effective means of obtaining high quality research results in a variety of fundamental discipline areas. In addition, strong university programs are needed to produce the next generation of aeronautical scientists.

Therefore, the Committee urges NASA to include in its program planning specific steps designed to assure the future vitality and productivity of university-based aeronautical research and training programs.

#### 40 X 80 WIND TUNNEL ACCIDENT INVESTIGATION

The Committee appreciates the work NASA has done in investigating the structural failure in the 40 x 80 foot wind tunnel at the Ames Research Center, California. However, the Committee is concerned about the fact the 80 x 120 foot addition to this tunnel was managed in a way which permitted design errors to remain undetected and field changes to be made without adequate "change board" control.

The Committee deeply regrets the setback in vital research activities for 2 years and the financial loss of \$12 million.

The Committee is also concerned about the division of responsibility for facilities design and construction in NASA. Such a division could lead to direction and management of large expensive projects by persons with little or no experience in construction. Accordingly, the Committee urges NASA to review and improve where appropriate the management approach and procedures for program planning and control of the design and construction of facilities at all NASA Centers. The Committee requests the Administrator to prepare a report by December 31, 1983, which describes what steps are being taken to avoid future structural facility failures. Specifically, the report should describe the organization, communication, and management tools to be used.

#### SPACE NUCLEAR REACTOR TECHNOLOGY

The Committee understands that space nuclear reactor technology will have both civilian and defense applications. It is also recognized that the technology base resulting from the presently existing agreement among NASA, DOE, and DARPA will provide the foundation for designing space power subsystems suitable for future, as yet unauthorized, NASA missions. It is the intent of the Committee to ensure that such mission definition analyses proceed

in a deliberate and timely manner. NASA is therefore instructed to establish a mission planning and definition activity as part of the SP-100 program management plan, and to present substantive evidence to the Committee on or before October 1, 1983, that the organizational arrangements for implementing such activity are in place. The Committee anticipates that such mission studies will serve to delineate the power ranges most suited to nonmilitary uses of space nuclear reactors, and substantiate the appropriate level of authorized NASA funding for this work.

The Committee further requests that NASA provide a summary report to the Committee concurrently with the submission of the President's annual budget to the Congress for each year that details plans, accomplishments, schedules, and long range budgetary projections related to its activities in the SP-100 program.

#### UNIVERSITY RESEARCH INSTRUMENTATION

NASA's support to universities has declined by approximately one-third over the last decade due to other major NASA program commitments. In an environment of reduced budgets, the portion of funds dedicated to research instrumentation and equipment had declined at an even faster rate. These factors, coupled with the increasing cost of scientific equipment and the desire to maintain strong student involvement in research, have created serious problems in upgrading and replacing obsolete equipment and, therefore, have undermined the research capability and productivity of the universities that support NASA's goals and the Nation's research and development needs. The university community is a critical element of the NASA and United States long-range research capability. The augmentation recommended by the Committee will complement the recent efforts of other government agencies in attempting to reverse this deteriorating trend by providing additional funds to universities for the acquisition of modern laboratory equipment in direct support of NASA's research goals.

#### COMMERCIALIZATION OF REMOTE SENSING: ADOPTION OF TITLE II OF THE BILL

The Committee has consistently supported the commercial application of NASA-developed space technologies, as evidenced by its continuing struggle to maintain vigorous Technology Utilization and Technology Transfer programs. This is in part because the Committee believes that technology developed for government purposes should, where appropriate, be more widely used, and also because in many cases only the private sector with its marketing creativity can take full advantage of a new technology.

Both these reasons are operative with respect to space remote sensing. In particular the present market for Landsat data seems to be lacking some of the creativity and vigor that would be expected in a freely competitive business situation.

Thus the Committee does not question the value of private sector involvement where the strengths of this sector can be given free play by the removal of government restriction and the easy entry of competition. The question is whether or not a rapid transfer of all remote sensing systems to the private sector at this time would

result in such free competition and freedom from government restraint.

Any private operation of space remote sensing systems will necessarily be somewhat restricted by government in order to ensure that the international obligations of the U.S. are observed; that the national security is not comprised; and that the public safety aspects of the weather system are maintained.

Further, if a transfer to the private sector involves a guaranteed data purchase contract with the U.S. Government, such a contract would surely inhibit other firms from entering the field, and there would be little or no competition.

It must be noted that even under the restrictive conditions described above it might still be in the best interest of the government to transfer the systems to a private sector operator, but such a decision would have to be made on the basis of careful consideration rather than on a facile assumption that any private sector operator would be more effective and efficient merely because of being in the private sector.

The Committee recognizes that the commercial market for remote sensing data is still developing, and that any private operator might need some financial assistance from the government for a period of time. This possibility is another reason why the whole issue must be looked at very carefully, and why alternatives must be considered.

One alternative approach that should be considered would involve government guarantee of data continuity for a period of years to encourage the development of a vigorous value-added industry and an associated market which eventually might justify commercialization. The value-added industry could be developed with no direct Federal subsidy (beyond the guarantee of data continuity), minimal regulation, and it would be possible for many firms to enter the business and compete.

Another alternative which the Committee does not intend to discourage is the possibility of one or more private sector entrepreneurs independently financing and launching their own land remote sensing systems. This would not limit private sector involvement to just the value-added industry. It is the intent of this Committee to encourage free enterprise and not to deter the private sector from undertaking such activities, provided they are conducted in a manner consistent with governmental policies.

The Committee also wants to be assured that there is opportunity to fully consider this issue during public hearings. Although the Committee is not opposed to commercialization in general, it must assure that the national assets represented by United States remote sensing satellite systems are used in the best national interest.

**EXPLANATION OF THE BILL**

**TITLE I**

The bill authorizes Research and Development in section 101(a), Construction of Facilities in section 101(b), and Research and Program Management in section 101(c). These activities are explained below.

**RESEARCH AND DEVELOPMENT**

**SUMMARY**

	Authorization, fiscal year 1984	Page No.
1. Space transportation capability development.....	\$1,999,400,000	25
2. Space transportation operations .....	1,570,600,000	45
3. Physics and astronomy .....	566,600,000	51
4. Planetary exploration .....	220,400,000	64
5. Life sciences .....	59,000,000	72
6. Space applications .....	306,000,000	78
7. Technology utilization.....	10,000,000	103
8. Aeronautical research and technology .....	311,600,000	105
9. Space research and technology.....	143,000,000	130
10. Tracking and data systems .....	700,200,000	151
<b>Total.....</b>	<b>5,886,800,000</b>	

**CONSTRUCTION OF FACILITIES**

**SUMMARY**

Projects	Authorization FY 1984	Page No.
1. Space Shuttle facilities at various locations as follows:		
A. Modifications for additional chillers for Mission Control Center; Lyndon B. Johnson Space Center.....	\$2,300,000	174
B. Modifications to Mobile Launch Platform No. 3; Kennedy Space Center.....	29,120,000	175
C. Modifications to the Manufacturing and Final Assembly Facilities for external tanks; Michoud Assembly Facility .....	11,700,000	177
2. Space Shuttle Payload Facilities:		
A. Construction of Cargo Hazardous Servicing Facility; Kennedy Space Center .....	9,000,000	179
B. Modifications to Spacecraft Assembly and Encapsulation Facility (SAEF-2) for cargo processing; Kennedy Space Center .....	3,000,000	179
3. Construction and modifications at the Jet Propulsion Laboratory:		
A. Construction of Frequency Standards Laboratory.....	2,700,000	180
B. Modifications to Space Flight Operations Facility .....	1,600,000	180
4. Construction of Fluid Mechanics Laboratory; Ames Research Center.....	3,900,000	181
5. Construction of Aeronautical Tracking Facility; Dryden Flight Research Facility.....	800,000	182

**SUMMARY—Continued**

Projects	Authorization FY 1984	Page No.
6. Modifications to Langley Research Center:		
A. Modifications and addition for Composite Materials Laboratory (1293A).....	5,100,000	182
B. Modifications to 30-by-60-foot tunnel (643).....	4,400,000	183
7. Modifications to Lewis Research Center:		
A. Modifications for Small Engine Component Testing Facility.....	7,000,000	184
B. Modifications to Icing Research Tunnel.....	3,600,000	185
8. Relocation of 26-meter STDN antenna, Spain.....	1,700,000	185
9. Repairs of facilities at various locations.....	19,500,000	185
10. Rehabilitation and modification of facilities at various locations.....	24,500,000	187
11. Minor construction of new facilities and additions to existing facilities at various locations.....	4,800,000	188
12. Facility planning and design.....	9,200,000	188
General reduction.....	5,000,000	
Total, construction at facilities.....	138,920,000	

**RESEARCH AND PROGRAM MANAGEMENT, \$1,242,500,000**

**SUMMARY OF BUDGET PLAN BY FUNCTION**

Personnel and related costs.....	\$883,785,000
Travel.....	25,700,000
Operation of installation.....	338,015,000
General reduction.....	5,000,000
<b>Total.....</b>	<b>1,242,500,000</b>

The Research and Program Management appropriation funds the performance and management of research, technology and test activities at NASA installations, and the planning, management and support of the many and varied contractor research and development tasks necessary to meet the Nation's ongoing objectives in aeronautical and space research. Objectives of the efforts funded by the Research and Program Management appropriation are to (1) provide the technical and management capability of the civil service staff needed to conduct the full range of programs for which NASA is responsible, (2) maintain facilities and laboratories in a state of operational capability and manage their use in support of research and development programs, and (3) provide effective and efficient technical and administrative support for the research and development programs. For 1984, an appropriation of \$1,242,500,000 is requested.

The 21,219 dedicated civil service personnel at eight major installations and Headquarters are funded by the Research and Program Management appropriation. This civil service workforce is NASA's most important resource and is vital to future space and aeronautics research activities. Seventy percent of the Research and Program Management appropriation is needed to provide for salaries and related costs of this civil service workforce. About two percent is for travel, vital to continue to manage successfully the Agency's in-house and contracted programs. The remaining amount of the Research and Program Management appropriation provides for the research, test and operational facility support, and for related goods and services necessary to operate the NASA installations and to accomplish NASA's approved missions efficiently and effectively.

NASA field centers report to the Program Associate Administrator responsible for the major portion of their technical program. The principal roles of fundamental importance assigned each of the eight NASA installations based on demonstrated capabilities and capacities to meet NASA's overall program goal are as follows:

*Office of Space Flight*

*Johnson Space Center:* Manage the integrated Space Shuttle program, including Orbiter production and operation; astronaut and

mission specialist selection and training; STS Operations including mission planning, operational procedures and flight control; and application of remote sensing to agricultural assessments and other Earth resources uses.

*Kennedy Space Center:* Launch of Space Shuttle flights; the ground operational phase of the Space Transportation System; and the preparation and launch of payloads on the Space Shuttle and expendable launch vehicles.

*Marshall Space Flight Center:* Manage the Space Shuttle main engine, solid rocket booster and external tank projects; management of NASA's activities on the Spacelab project; management of large automated spacecraft projects such as the Space Telescope; and experiments in materials processing in space.

*National Space Technology Laboratories:* Support Space Shuttle engine procurement and testing; regional Earth resources research and technology transfer; and support functions for other Government agencies located there.

#### *Office of Space Science and Applications*

*Goddard Space Flight Center:* Develop and operate the Earth orbital flight experiments and automated spacecraft to conduct scientific investigations and demonstrate practical applications; the management of the tracking and data acquisition activities for Earth orbital missions; management of the Delta launch vehicle program; management and launch of sounding rockets and balloons; and operation of an instrumented flight range for aeronautical and space research. The Wallops Facility is an operational element and component installation of the Goddard Space Flight Center.

#### *Office of Aeronautics and Space Technology*

*Ames Research Center:* Develop short haul aircraft and rotorcraft research and technology, computation fluid dynamics, planetary probe research, life sciences, aeronautical flight research and testing, as well as providing a contingency landing site for Space Shuttle operational missions at the Dryden Flight Research Facility, an operational element and component installation of Ames.

*Langley Research Center:* Develop long haul aircraft research and technology, emphasizing fuel conservation, safety and environmental effects; aerospace structures technology; environmental quality monitoring by remote sensing; and advanced space systems technology.

*Lewis Research Center:* Develop and maintain aeronautical and space propulsion-research and technology; space communications research and technology; space energy systems research and technology; and development of the Centaur Stage for use in the Space Shuttle and management of the Centaur expendable launch vehicle program.

The 1984 budget provides the necessary resources to apply these in-house capabilities to program activities. A summary description of, and the funding required by functional category, include:

## SECTIONAL ANALYSIS

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.

### TITLE I

#### *Section 101*

*Subsections (a), (b), and (c)* would authorize to be appropriated to the National Aeronautics and Space Administration funds, in the total amount of \$7,268,220,000, as follows: (a) for "Research and development," a total of 10 program line items aggregating the sum of \$5,886,800,000; (b) for "Construction of facilities," a total of 15 line items aggregating the sum of \$138,920,000; and (c) for "Research and program management," \$1,242,500,000. 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 101(d)* would authorize the use of appropriations for "Research and development" without regard to the provisions of subsection 101(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 101(e)* would provide 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 pro-

gram management" appropriation for periods not in excess of twelve months beginning at any time during the fiscal year.

*Subsection 101(f)* would authorize 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 101(g)* would provide that of the funds appropriated for "Research and development" and "Research and program management," not in excess of \$75,000 per project (including collateral equipment) may be used for construction of new facilities and additions to existing facilities, and for repair, rehabilitation, or modification of facilities.

#### *Section 102*

Section 102 would authorize upward variations of the sums authorized for the "Construction of facilities" line items (other than facility planning and design or for reimbursement to the General Services Administration for space utilized at Ellington Air Force Base) of 10 percent at the discretion of the Administrator or his designee, or 25 percent 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 101(b), paragraphs (1) through (16).

#### *Section 103*

Section 103 would provide that not more than one-half of 1 percent of the funds appropriated for "Research and development" may be transferred to and merged with 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 aeronautical and 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 104*

Section 104 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 105*

Section 105 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 106*

This section would allow for the procurement of structural and component spares necessary for the efficient operation of the four-orbiter fleet as well as for maintaining production readiness for a fifth orbiter.

#### *Section 107*

This section would amend Title III of the National Aeronautics and Space Act of 1958 so as to give the National Aeronautics and Space Administration's name and initials protection against false advertising and related misuses in essentially the same manner as the protection afforded the Central Intelligence Agency by Public Law 97-89. Similar protection is also presently provided to the FBI and a host of other agencies by 18 U.S.C. 709, the difference being that under this section (as under P.L. 97-89) the protection is obtained by civil proceedings in district courts to enjoin prohibited acts or practices rather than through criminal proceedings which could also involve fines and imprisonment, as is the case under 18 U.S.C. 709.

To this end, this section would prohibit the unauthorized use of the words "National Aeronautics and Space Administration" or the

letters "NASA," including certain combinations, variations and imitations thereof, alone or in combination with other words or letters, in association with certain commercially oriented activities, in a manner that conveys a false or misleading impression with respect to some relationship or connection with, or support, sponsorship or endorsement of NASA. Such prohibition would apply to misuse of the NASA name both in association with a firm or business name and in connection with a product or service offered to the public. Prohibited acts and practices may be enjoined, or other corrective action taken, under a civil proceeding in a district court of the United States as the result of action initiated by the Attorney General.

NASA's technological success often catches the imagination of the general public, and association with this success can be commercially advantageous. In addition, NASA encourages the utilization of the result of its research and development activities; indeed, a number of technological developments and resulting new products and services available to the public can accurately and properly be related to NASA activities. Occasionally, however, NASA's name is misused in a manner that conveys a false or misleading impression regarding the relationship of NASA to a firm or business, or to a product or service made available to the public.

This misuse of the NASA name can be misleading to the general public and is unfair to those who properly utilize NASA developed or supported technology and accurately state their relationship thereto. In addition, where the practices of the party engaging in such misuses are questionable and the product or services provided are not what the public expects, the reputation of both NASA and those properly associated with NASA activities may suffer.

While this problem has been a continuing one since the existence of NASA, it is expected to become more acute as the Space Shuttle becomes operational and more opportunities are made available for its commercial use, either on a reimbursable basis or under a joint endeavor with NASA. It would be particularly unfair, for example, to those who have participated in such activities and through private investment have achieved commercial success, to have to contend with false or misleading statements of those who have not made such investments.

While presently unauthorized use of the NASA seal and certain official insignia and badges are subject to the penalties of 18 U.S.C. 1017 and 701, respectively, there is no mechanism for direct enforcement when unauthorized, false or misleading use of NASA's name or initials is found to exist in relation to a business or commercial activity. Corrective action requires investigations founded on unfair trade practices and/or the trademark laws, usually in conjunction with the Federal Trade Commission and/or similar state agencies. These investigations are difficult, time consuming, with the outcome often speculative. The opportunity for direct enforcement would be more prompt and sure, to the benefit of both the consuming public and the commercial competitors of those engaged in such unauthorized or misleading activities.

There are, of course, a number of authorized or proper activities in connection or association with NASA under which the NASA name may be used in an accurate, factual manner that does not

create a false or misleading impression. There is no intent by this section to change NASA's policies, practices and procedures in this regard; but only to afford NASA better capabilities for corrective action in those instances where the NASA name is used in a manner reasonably calculated to convey the false or misleading impression of a relationship with NASA which in fact does not exist.

Section 108 expands the definition of the NASA administrator's responsibilities as found in the National Aeronautics and Space Act of 1958 to include the authority to operate the Space Shuttle, and related equipment and facilities.

#### Section 109

Section 109 would provide that the Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1984."

## TITLE II

#### Section 201

Section 201 authorizes \$29,336,000 for fiscal year 1984 to be used by the Secretary of Commerce to operate a civil land remote sensing satellite program including storage of a backup satellite.

#### Section 202

Section 202 stipulates that ownership or management of civil meteorological or ocean remote sensing satellites shall not be transferred unless the provisions of paragraphs 202(1) and 202(2) are fulfilled.

Paragraph 202(1) stipulates that the Secretary of Commerce shall not transfer ownership or management unless a statement of recommended policies, procedures, conditions and limitations for the proposed transfer is submitted to Congress.

Paragraph 202(2) requires transfer of ownership or management to be approved by law.

### Cost and Budget Data

The bill will authorize appropriations for fiscal year 1984 in the amount of \$7,268,100,000. In accordance with the requirements of Rule XIII, Clause 7 of the rules of the House of representatives, the Committees estimate for the next five years of NASA budget request is as follows:

Fiscal year:	
1984	\$7,268,000,000
1985	7,028,000,000
1986	6,429,000,000
1987	6,393,000,000
1988	5,574,000,000

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

### Effects 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 long-run inflationary effects on prices and cost 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. NASA employs about 21,000 civil servants and supports about 109,000 contractor employees, plus about 4,300 support services contractors. Assuming a multiplier effect of 2.5, the total, short-run employment effect on the United States' economy is about 336,000 jobs. This represents less than one-half of one percent of the total civilian labor force in the United States—too small to have a significant national effect, although there could be some specific cases of industry and regional employment and price changes influenced by NASA expenditures.

The most significant economic effects of NASA spending are long-run productivity advances from new technologies developed for the space and aeronautics programs. Many NASA sponsored advances in air and space and transportation, communications satellites, remote sensing satellites, and other innovations have improved the productive capacity of industry and stimulated the development and growth of many new businesses. These expanded business opportunities have and are expected to continue to stimulate more productive, non-inflationary private sector economic growth and job creation.

Although it is difficult to assess the results of the various macroeconomic studies of the effects of NASA spending on GNP, it is apparent from analyses done by the Midwest Research Institute, Mathematica, Inc., and others, that NASA high technology R&D expenditures have returned more to the economy in substantial and long-lasting productivity gains than has been spent. Since these gains are through spinoff commercial advances, they are "extra" returns above and beyond the primary goal of NASA programs: the successful completion of the various R&D mission assignments to meet public sector needs. Therefore, any gains which show positive economic returns in the long-run indicate a non-inflationary, significant return to the citizens of the United States.

### CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are 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; and large unchanged blocks of existing law is indicated by \* \* \*).

National Aeronautics and Space Act of 1958, as amended:

### DEFINITIONS

Sec. 103. As used in this Act—

(1) the term "aeronautics and space activities" means (A) \* \* \* (B) the development, construction, testing, and operation for research purposes of aeronautical and space vehicles, [and] (C) the operation of a space transportation system including the Space Shuttle, upper stages, space platforms, and related equipment, and (D) such other activities as may be required for the exploration of space;

### MISUSE OF AGENCY NAME AND INITIALS

Sec. 310. (a) No person (as defined by section 305) may (1) knowingly use the words "National Aeronautics and Space Administration" or the letters "NASA", or any combination, variation, or colorable imitation of those words or letters either alone or in combination with other words or letters, as a firm or business name in a manner reasonably calculated to convey the impression that such firm or business has some connection with, endorsement of, or authorization from, the National Aeronautics and Space Administration which does not, in fact, exist; or (2) knowingly use those words or letters or any combination, variation, or colorable imitation thereof either alone or in combination with other words or letters in connection with any product or service being offered or made available to the public in a manner reasonably calculated to convey the impression that such product or service has the authorization, support, sponsorship, or endorsement of, or the development, use, or manufacture by or on behalf of the National Aeronautics and Space Administration which does not, in fact, exist.

(b) Whenever it appears to the Attorney General that any person is engaged in an act or practice which constitutes or will constitute conduct prohibited by subsection (a), the Attorney General may initiate a civil proceeding in a district court of the United States to enjoin such act or practice.

### OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to clause 2(1)(3)(A), rule XI, and under the authority of rule X, clause 2(b)(1) clause (3)(f), of the Rules of the House of Representatives no findings and recommendations are under consideration by the Committee on Science and Technology for inclusion in the legislative report to accompany H.R. 2065.

### CONGRESSIONAL BUDGET ACT INFORMATION

This bill provides for new authorization rather than new budget authority and consequently the provisions of section 308(a) of the Congressional Budget Act of 1974 are not applicable. No authorization for State or local financial assistance is included in the bill.

### ESTIMATE AND COMPARISON, CONGRESSIONAL BUDGET OFFICE

No information pursuant to Section 403 of the Congressional Budget Act of 1974 has been provided to the Committee on Science

and Technology by the Congressional Budget Office as of April 15, 1983.

#### 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 RECOMMENDATIONS

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

#### NASA RECOMMENDATIONS

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:

FEBRUARY 25, 1983.

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

DEAR MR. SPEAKER: Submitted herewith is 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 1984. For that fiscal year, the bill would authorize appropriations totaling \$7,106,500,000, to be made to the National Aeronautics and Space Administration as follows:

- (1) for "Research and development" amounts totaling \$5,708,500,000;
- (2) for "Construction of facilities" amounts totaling \$150,500,000; and
- (3) for "Research and program management," \$1,247,500,000.

In addition, the bill would authorize such sums as may be necessary for fiscal year 1985, i.e., to be available October 1, 1984.

The enclosed draft bill follows generally the format of the National Aeronautics and Space Administration Authorization Act, FY 1983 (P.L. 97-324). 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 in some of the line items for which authorization to appropriate is requested.

Second, in addition to providing authorization of appropriations in the amounts recommended by the President in his Budget for fiscal year 1984, the bill also would provide authorization for such sums as may be necessary in fiscal year 1985. 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 6.

Third, Title II of P.L. 97-324, which authorized the Secretary of Commerce to plan and provide for the management and operation of a civil land remote sensing space satellite system, has been omitted, since this title became law last year.

Fourth, section 7 is a new section implementing the President's policy at maintaining Orbiter production within the context of a four-orbiter fleet by allowing the procurement of structural and component spares.

Fifth, section 8 is a new section which would amend the National Aeronautics and Space Act of 1958 to protect NASA's name and initials from false advertising and related misuse.

Finally, the last section of the draft bill, section 9, has been changed to provide that the bill, upon enactment, may be cited as the "National Aeronautics and Space Administration Authorization Act, 1984," rather than "1983."

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 this bill have been or will be furnished to the Committee on Science and Technology as appropriate.

The National Aeronautics and Space Administration recommends that the enclosed draft 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 M. BEGGS,  
*Administrator.*

# Calendar No. 166

98TH CONGRESS  
1st Session

SENATE

REPORT  
No. 98-108

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT

MAY 16, 1983.—Ordered to be printed

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

### REPORT

[To accompany S. 1096]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 1096) 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 amendments and recommends that the bill do pass

#### PURPOSE OF THE BILL

The purpose of this bill is to authorize appropriations to the National Aeronautics and Space Administration (NASA) totaling \$7,278,100,000 for fiscal year 1984 as follows:

	Budget request	Committee authorization
Fiscal year 1984:		
Research and development.....	\$5,708,500,000	\$5,888,500,000
Construction of facilities.....	150,500,000	142,100,000
Research and program management.....	1,247,500,000	1,247,500,000

### COMMITTEE ADJUSTMENTS TO NASA REQUEST FOR FISCAL YEAR 1984—SUMMARY

Fiscal year 1984	Administration request	Committee authorization
<b>Research and development:</b>		
Space transportation capability development.....	\$1,927,400,000	\$2,022,400,000
Space transportation operations.....	1,570,600,000	1,535,600,000
Physics and astronomy.....	514,600,000	558,600,000
Planetary exploration.....	205,400,000	215,400,000
Life sciences.....	59,000,000	59,000,000
Space applications.....	289,000,000	321,000,000
Technology utilization.....	4,000,000	10,000,000
Aeronautical research and technology.....	300,300,000	328,300,000
Space research and technology.....	138,000,000	138,000,000
Tracking and data acquisition.....	700,200,000	700,200,000
<b>Total.....</b>	<b>5,708,500,000</b>	<b>5,888,500,000</b>
Construction of facilities.....	150,500,000	142,100,000
Research and program management.....	1,247,500,000	1,247,500,000
<b>Grand total.....</b>	<b>7,106,500,000</b>	<b>7,278,100,000</b>

#### LEGISLATIVE HISTORY

On February 25, 1983, the fiscal year 1984 budget request for NASA was submitted to Congress. The Committee considered the budget request in hearings on March 8, 9, and 15. Testimony was received from the NASA Administrator and Deputy Administrator and from representatives of the Department of Defense (DOD), the aerospace industry, the space science and applications communities, and other outside witnesses. Senator Gorton, along with Senators Packwood and Danforth, introduced S. 1096 the National Aeronautics and Space Administration Authorization Act of 1984, which was referred to the Committee on Commerce, Science, and Transportation.

On April 21, 1983, the Committee considered S. 1096 and ordered it reported without amendment.

#### SUMMARY OF MAJOR PROVISIONS

For fiscal year 1984, the Committee's NASA authorization bill authorizes \$7,278,100,000, of which \$5,888,500,000 is for research and development, \$142,100,000 is for construction of facilities, and \$1,247,500,000 is for research and program management.

Within the total space transportation systems budget of \$3,558 million, the space transportation system capability development program is funded at a level of \$2,022,400,000 to complete the production of the third and fourth Space Shuttle orbiters and to initiate procurement in fiscal year 1984 for the fifth orbiter, a position the Committee has supported in the past. This funding also supports the production of the main engines, the solid rocket booster (SRB), and the external tank (ET), in addition to providing critical spares for the Shuttle.

Also, within the total space transportation system budget, the Committee has authorized \$1,535,600,000 for space transportation operations to provide for eight to nine Shuttle launches in fiscal

year 1984 and the continued procurement of the Delta expendable launch vehicles (ELV's) in fiscal year 1984.

The budget for space science programs in fiscal year 1984 is \$833 million, compared to \$683,100,000 in fiscal year 1983. This increase is made up largely of additions to research and analysis programs in physics and astronomy and in planetary exploration and to the Space Telescope project to meet the budget overruns for the project. The Solar Optical Telescope is delayed by a decrease of \$16 million from the administration's request.

The space applications funding for fiscal year 1984 is \$321 million, compared to a fiscal year 1983 operating level of \$351 million. There is a decrease of \$46 million for LANDSAT-4 for which operational responsibility is being transferred to the National Oceanic and Atmospheric Administration (NOAA). There are, however, total increases of \$32 million in the space applications programs for other remote sensing capabilities, technology transfer communications, and materials processing in space. The funding for technology utilization for fiscal year 1984 is \$10 million, up 1 million from fiscal year 1983.

The Committee authorized \$328,300,000 for aeronautical research and technology, compared to \$280 million in fiscal year 1983. The increase of \$48,300,000 in aeronautical research and technology is made of a \$33,200,000 increase in systems technology and a \$15,100,000 increase in research and technology base.

\$138 million is authorized for space research and technology, a \$15 million increase above the fiscal year 1983 level.

Tracking and data acquisition for fiscal year 1984 is \$700,200,000, up from the fiscal year 1983 level of \$498,900,000. Financing of the tracking and data relay satellite (TDRS) systems accounts for most of this increase.

The total research and development budget for the above-mentioned programs for fiscal year 1984 is \$5,888,500,000 compared to the fiscal year 1983 funding level of \$5,542,800,000.

The Committee recommendation for construction of facilities for fiscal year 1984 is \$142,100,000 and for research and program management, \$1,247,500,000.

S. 1096, as reported, includes language which requires the approval by this Committee and Congress of any transfer of the ownership or management of our civil remote sensing satellite systems to the private sector.

The bill also includes language which requires approval by this Committee and the House Science and Technology Committee of any administration decision to commercialize expendable launch vehicles.

## RESEARCH AND DEVELOPMENT

### SPACE TRANSPORTATION SYSTEMS—\$3,558,000,000

#### SPACE TRANSPORTATION CAPABILITY DEVELOPMENT \$2,022,400,000

The Committee has authorized \$2,022,400,000 in fiscal year 1984 for space transportation capability development, compared to the administration request of \$1,927,400,000. Of this \$95 million dollar increase, \$85 million, coupled with the administration request of

\$100 million for spare parts, is for the initiation of the procurement of a fifth Space Shuttle orbiter. \$5 million is for the advanced program budget for additional space station studies, and another \$5 million is for the teleoperator maneuvering system (TMS).

#### Summary of funding levels, fiscal year 1984

Shuttle production and capability development.....	\$1,585,000,000
Upper stages.....	143,200,000
Spacelab.....	119,600,000
Engineering and technical base.....	93,100,000
Payload operations and support equipment.....	53,200,000
Advanced programs.....	20,000,000
Tethered satellite system.....	3,300,000
Teleoperator maneuvering system.....	5,000,000
<b>Total.....</b>	<b>2,022,400,000</b>

The Space Shuttle is the key element of a versatile space transportation system (STS) that is available to a wide variety of national and international users. The Space Shuttle is the first reusable space vehicle and is configured to carry many different types of space applications, scientific, and national security payloads. This Space Shuttle offers unique capabilities that cannot be achieved with today's expendable launch vehicles—to retrieve payloads from orbit for reuse; to service and repair satellites in space; to transport to orbit, operate, and return space laboratories; to transport materials and equipment to orbit; and to perform rescue missions.

Shuttle production and capability development provides for the national fleet of Space Shuttle orbiters, including main engines, and provides for the launch site and mission operations control requirements, spares, production, tooling, and related supporting activities to meet appropriate national needs. More specifically, this line item contains the orbiter production contract for the third and fourth Shuttle orbiters and the changeover of the first orbiter into its operational configuration; the continuing capability development tasks for the orbiter, main engine, external tank (ET) and solid rocket booster (SRB); the provision of the second line of processing stations and equipment for launch and landing; the development of the filament wound case (FWC) solid rocket booster; the lay-in of spares and the ground support equipment; and the production rate tooling for the ET and SRB. Equipment modifications to two orbiters, mobile launchers, and launch pads for the 1986 launches of the Centaur as a space transportation system upper stage are also funded under this budget item. The second phase of development of the mission control center (MCC Level II), operations effectiveness studies, and changes and systems upgrading are also provided for under Shuttle production and capability development.

The upper stages program includes the effort necessary to provide upper stages for use with the Space Shuttle to place payloads in orbits and trajectories beyond the capability of the Shuttle alone, primarily for planetary and geosynchronous missions. Current developments include the two-stage configuration of the inertial upper stage (IUS), and the modification of the Centaur for use in the Shuttle.

The engineering and technical base provides the core capability for the engineering, scientific, and technical support required at the Johnson Space Center (JSC), the Kennedy Space Center (KSC), the Marshall Space Flight Center (MSFC), and the National Space Technology Laboratories (NSTL) for space transportation systems research and development activities.

The Spacelab is a major element of the STS and provides a versatile, reusable laboratory which will be flown to and from Earth orbit in the Shuttle orbiter cargo bay. The program is being carried out jointly by NASA and the European Space Agency (ESA). NASA's support of the Spacelab development effort includes hardware and system activation efforts which ensure Spacelab compatibility with the orbiter, leading to an operational capability.

Payload operations and support equipment provides for developing and placing into operational status the ground and flight systems necessary to support the NASA payloads during pre-launch processing, on-orbit mission operations, and, when appropriate, post-landing processing.

The advanced programs effort identifies potential future space programs and provides technical as well as programmatic data for their definition and evaluation. In support of this effort, advanced development activities are conducted to provide a basis for obtaining significant performance and reliability improvements and reducing future program risks and development costs through the effective use of new technology. Key elements of this activity are the numerous studies related to space stations.

The tethered satellite system (TSS) will provide a new capability for conducting space experiments at distances up to 100 kilometers from the Shuttle orbiter while being held in a fixed position relative to the orbiter. This program will be undertaken in conjunction with the Italian Government.

The orbiter production activities provide for the completion of fabrication and delivery of the four-orbiter fleet. Columbia (OV-102) was used to fly the four orbital flight tests and first operational mission; Challenger's (OV-099) maiden voyage was STS-6; and, Discovery (OV-103) and Atlantis (OV-104) are scheduled for delivery in September 1983 and December 1984, respectively. Progress on OV-103 and OV-104 to date indicates that the planned delivery dates can be achieved. Modifications to enable the launch of the Centaur upper stage on OV-099 and OV-104 are underway; the modification kits will be installed in fiscal year 1986. The Columbia (OV-102) is now undergoing a period of modification at KSC in order to prepare the vehicle for the launch of the first Spacelab mission, currently planned for September 1983. The Columbia will be modified to full operational configuration in fiscal year 1985, although these modifications may be rescheduled for an earlier date pending an evaluation of the training and vehicle processing requirements associated with maintaining orbiters having two different configurations. Orbiter spares procurements to establish the required level of spares availability at the KSC launch site are continuing, and close attention is being given to the estimated spares requirements as a function of the experience being gained during operations. The administration has authorized the inclusion in this budget request of the amounts required to procure extensive spares

to ensure the operational viability of four-orbiter fleet; initiation of procurement is planned for fiscal year 1983. However, the Committee recommends the initiation in fiscal year 1984 of procurement of a fifth orbiter, using the administration's \$100 million for spare parts plus the additional \$85 million in the Committee request.

At KSC the second line of vehicle processing stations is being phased in to support launch processing of two or more orbiters simultaneously. The second mobile launcher platform was brought online in August 1982 and the second bay of the orbiter processing facility became operational in June 1982. The second set of high bays in the vehicle assembly building (VAB) will be ready for operations in the summer of 1983, the launch processing system's software production capability and second firing room will be ready in the fall of 1983, and the SRB processing and storage facility will be available in early 1984. The second launch pad (Pad B) is now planned to be operational in January 1986, consistent with the requirements to support the launches of the Galileo and International Solar Polar Mission (ISPM) in May-June 1986. The third mobile launcher platform, on which design work was initiated in 1982, is planned for a September 1986 readiness date. Modifications to the mobile launcher platforms (MLP-1 and MLP-2) and to launch pad systems to be compatible with the use of the Centaur as a Shuttle upper stage were authorized in 1982 and the design work is underway.

Development testing and production continue on the Space Shuttle main engine (SSME) in its full power level (FPL) configuration. NASA has decided to wait until launches begin at Vandenberg Air Force Base in 1985 to operate the Shuttle main engines at full power (109 percent). Production engine delivery schedules have been adjusted for the addition of an engine (2027) to the production sequence to replace engine 2013, destroyed in an early FPL certification test. Engine test incidents in 1982 indicated the need for additional hardware fabrication to support the on-going FPL test schedules. Replacement of the hardware lost during the past year and provisions for long-lead hardware to support the ground test program are reflected in the current estimates for fiscal year 1983 and in the fiscal year 1984 request. Three different main engine problems contributed to a launch delay of approximately three months for the STS-6 flight. NASA has instituted additional engine tests in its engine testing protocol which should prevent these same problems from creating similar launch delays. On the positive side, however, the performance of the main engines in their first six flights has validated the concept of a reusable rocket engine having high thrust capability.

The experience with the SRB's during the initial flights has revealed the need for design improvements to reduce the amount of water impact damage to the SRB's aft end, particularly to the hydraulic power units mounted internally to the aft skirt. Interim fixes have been pursued, resulting in reduced damage to the SRB's on STS-5. Work is underway on new designs to provide a long-term solution.

The ET performance on its first six flights was excellent. The delivery of the new lightweight tank was made on schedule and with greater weight savings than initially baselined. The first flight of

the lightweight tank was STS-6. Emphasis continues on the cost-reduction/productibility/production readiness efforts to identify and implement the associated flow and processing improvements anticipated in the projections of operational tank costs and required to meet the increasing production build rates. Rate tooling for both the ET and SRB is based on maintaining a capability to increase production above that rate. Effort continues to identify "choke points" where additional tools or cells will be required at the Michoud Assembly Facility to meet the current capability requirement. Preliminary reviews indicate that additional tools and equipment will be necessary in a number of manufacturing areas; the preliminary findings will be defined in detail along with the implementation schedule and funding requirements. Based on fabrication and flight experience, there is a reduction in the amount in the amount of super lightweight ablator (SLA) required on the tank, and a number of SLA application tools have been eliminated.

The development of the filament wound case (FWC) for the SRB has been initiated to improve the performance of the Space Shuttle for high performance missions. The filament wound case contractor has been selected. The expected weight reduction in the SRB by using the FWC in place of the steel cases is estimated at 66,000 pounds, resulting in a payload capability improvement of approximately 5,500 pounds. Integration analyses were started in 1982 to determine the loads effects on the orbiter and the ET and to analyze the lift-off loads induced by the launch platform at the Vandenberg launch site.

In upper stages, a joint development program with the DOD, has been initiated for the use of the Centaur as a STS upper stage. The Centaur/STS will be a wide-body derivative of the Centaur stage used in the Atlas-Centaur program. The common vehicle, designated Centaur, will accommodate a 40-foot long, approximately 10,000-pound payload in the bay of the orbiter, and be capable of placing it into geosynchronous orbit. A longer version of the Centaur-G, known as G-prime, is being developed by NASA for planetary missions. The Air Force and NASA will equally share common design and development costs for the Centaur-G. An agreement on the Centaur was signed by the Air Force and NASA in November 1982. The Centaur-G-prime will be first used for launching the Galileo and ISPM spacecraft in 1986, replacing the previously planned planetary version of the inertial upper stage (IUS).

Another adjustment to the IUS production program will result in a reduction in the number of vehicles delivered to NASA for the launch of the tracking and data relay satellites (TDRSS). As a result of the restructuring of the tracking and data relay satellite system (TDRSS) service agreement to make the TDRSS a dedicated Government system, the near-term requirement for IUS vehicles to support the TDRSS launches has been reduced from six vehicles to four. The Air Force is planning to complete the two vehicles no longer required by NASA and to assign them to DOD missions. In the initial TDRS/IUS launch on STS-6, the TDRS was launched into the wrong orbit due to a malfunction of the IUS. NASA may delay the launch of the second TDRS; and scheduled for an STS-8 launch in August 1983 until the problems with the IUS are corrected. Two additional spacecraft will be launched to complete the

TDRSS in-orbit constellation. A ground spare spacecraft and IUS vehicle will be maintained to provide the capability to replace an orbital spacecraft in the event of a spacecraft failure.

The initial Spacelab flight units (module, pallets, and igloo) and ground equipment were delivered by the ESA in 1982. The first crew transfer tunnel, a U.S. development responsibility, was delivered to KSC in December 1982. Fabrication of the verification flight instrumentation for the initial Spacelab mission has now been completed, and integration of the software for the Spacelab simulator being used in training for this mission was also completed. Preparations for the flight of Spacelab-1 in September 1983 are well underway.

In advanced programs, mission analysis studies are in process for a possible future space station. A space station task force has been formed within NASA to review the merits and technical feasibility of establishing a permanent manned presence in space. Contractor mission analyses were initiated in 1982, and preliminary reports have been made by the contractor teams; final reports will be completed in mid-1983. In other advanced programs areas, the development of the tethered satellite system will continue, leading to the initiation of hardware development in fiscal year 1984. Preliminary definition of advanced transportation vehicle concepts, including orbital transfer vehicles, teleoperator maneuvering vehicles, and Shuttle derived launch vehicles, is also being conducted. Work is proceeding on the investigation of advanced systems, tools, and techniques for placement, retrieval, and maintenance/repair of spacecraft.

In payload operations and support equipment, payload integration support and payload-related hardware are developed and furnished for NASA payloads. A key activity currently underway is the support of the retrieval/repair mission for the solar maximum mission spacecraft, which is being undertaken with funding supplied by both NASA and the DOD. This mission is currently planned for mid-1984. Multimission payload equipment being developed includes a payload bay bridge structure to carry small payloads, apparatus for providing cooling of the heat generated in the orbiter bay by the radioisotope thermal generators (RTG's) used for planetary missions, and a standard mission cable wire harness for mixed cargos. The payload operations control center (POCC) at JSC is presently being readied to support the operations of the Spacelab-1 mission in September 1983.

**SPACE TRANSPORTATION OPERATIONS—\$1,535,600,000**

The Committee authorizes \$1,535,600,000 for fiscal year 1984, \$35.0 million less than the administration request.

*Summary of Finding Levels, fiscal year 1984*

Shuttle operations; flight operators; flight hardware; launch and landing operations.....	\$1,485,600,000
Expandable launch vehicles (Delta).....	50,000,000
Total.....	1,535,600,000

### *Committee comment*

While NASA declared the Space Shuttle operational last November, much remains to be demonstrated to ensure reliability and full utilization of the designed capabilities. Competition from other launch services will require that the Space Shuttle operate on a cost competitive basis and on a dependable, predictable schedule.

As a result, the Committee addressed the following questions:

(1) The appropriate size of the orbiter fleet to meet the defense and other governmental demands as well as commercial opportunities for the STS.

(2) The place of expendable launch vehicles (ELV's) during and after the phase-in of the STS.

(3) The implications for the orbiter fleet of a decision to proceed with a permanent space platform or station.

The Committee has authorized \$85 million in addition to the \$100 million proposed by the administration for spare parts for a five orbiter fleet. This \$185 million is committed to procurement of a fifth orbiter and is intended to maintain a schedule for acquisition of critical parts leading to delivery of another orbiter in late 1988 or early 1989.

This position is consistent with that which the Committee has held in past years. The Committee continues to believe that a Shuttle fleet of five orbiters is economically prudent and in the national interest. The cost reductions associated with Shuttle flights can only be realized through a higher flight rate which in turn can only occur with sufficient orbiters.

A report released by the National Research Council in April, 1983, estimates that in the 1990's a 4-orbiter fleet will be capable of 17 to 25 flights per year while 22 to 31 flights would be possible with a 5 orbiter fleet. This projection assumes that one orbiter will be dedicated to the U.S. Air Force at Vandenberg AFB, and optimistically, that no circumstances will take an orbiter out of service more frequently than the 5 months maintenance scheduled after every 15-25 missions. Our experiences to date, particularly with the Shuttle main engines on STS-6, leaves uncertain the likely service requirements of the Shuttle. Thus, the Committee believes that a five-orbiter fleet is marginally capable for the Nation's space transportation and services needs for the remainder of the century.

NASA's current goal is an annual launch rate of 24 by 1987. The agency's assumptions for meeting this goal are optimistic and the prospects marginal, at best by the NRC projections. At the same time, the per flight costs of the Shuttle cannot become competitive until the flight rate achieves or exceeds the 24 flights proposed by NASA.

Conceivably, a smaller fleet size could accommodate the defense and other requirements of the Government. Under this approach, commercial services would be provided primarily by other launch services, private or foreign. This was not the expectation by the Congress for the STS. The Nation cannot fully realize the intended benefits of the STS and recover the substantial public investment which has been made until the launch rate is increased and the unique in orbit and return capabilities of the Shuttle are utilized commercially. Furthermore, that commercial requirement is only now taking shape and is likely to expand heavily as the certainty of Shuttle services is established.

Closely related to the decision on the orbiter fleet size is that of the future of the expendable launch vehicles. The end of NASA's procurement of Delta and Atlas-Centaur and of DOD's procurement of Titan launch vehicles have been scheduled. These decisions are consistent with the original intention of making the Shuttle the Nation's sole space transportation system. However, the ELV's remain proven systems which private sector interests see as cost competitive for the limited back-up launch services for which they are designed.

With an operational five orbiter shuttle fleet, the Committee anticipates that government, commercial and international demands for transportation can be met in the foreseeable future. In time there likely could be little or no need for the existing expendable launch vehicles (ELVs). However, the Committee is aware that there will be a demand for backup capability using ELVs in the near term and the French Ariane rocket will be available in that period. Since the U.S. Government foresees phasing out of the ELV market, the Committee is encouraged that there is some private sector interest in keeping the production lines open. The Committee is fully supportive of efforts by the private sector to invest and seek commercial opportunities in space. The Committee wants to encourage those private sector initiatives that will augment the anticipated Shuttle fleet and compete with foreign launch capabilities. Such an imminent opportunity for U.S. ELVs is in the Intelsat communications market. The Committee expects the administration to develop expeditiously a policy and procedures whereby the private sector is able to compete for this market.

In developing a proposed policy and reaching a decision on commercialization of ELVs, the Committee expects to be fully informed and a partner in any decision reached. The Committee regrets the significant delays in the administration's action on this issue and the lack of opportunity for congressional input. There are a number of questions regarding any commercialization policy such as the relationship of ELVs to the shuttle fleet, the establishment of equitable costs to the private sector and the regulatory framework for private launch capabilities. The Committee expects to review the administration's proposed policy on a basis comparable to the procedure established under section 104 of this bill.

The Committee generally accepts that the next major national initiative in space could be a permanent platform or station, very likely manned. Realization of such capability will almost certainly expand the requirements for an orbiter fleet beyond those which the four vehicles can provide.

An additional \$5 million has been added to the \$12 million which the administration proposed for space station studies. At this level NASA should be able to retain involvement of the critical agency and contractor teams which have been studying the requirements for such a permanent space presence. The Committee urges NASA to direct its space stations work toward increased contractor effort in space station system and subsystem definition, trade and supporting studies, and advanced development.

The teleoperator maneuvering system (TMS) is a concept which would greatly expand the servicing capabilities of the Shuttle for on orbit placement and retrieval of space payloads. Anticipated applications include materials processing, advanced space observatory

servicing, debris capture, cryogenic servicing and support of space station assembly. These capabilities will become increasingly important as a more long-lived, multifunctional, complex payloads we launched.

Due to the fiscal year 1983 Shuttle operations operating plan exceeding the actual needs of the operations, this Committee has reduced the fiscal year 1984 administration request for Shuttle operations by \$35 million. Also, the Committee is aware of past indications by the DOD that they are willing to transfer some funds to NASA for Shuttle operations.

The Committee is concerned over the problems in the Space Shuttle main engines that accounted for most of the approximately 3-month delay in the launch of STS-6. While NASA has subsequently introduced additional tests in its engine testing protocol, the Committee, nevertheless, is watchful of the possibility of modifications to the main engines and the requirement for additional engine spares. The Committee anticipates that these requirements will be accommodated within NASA's space transportation operations budget.

#### SPACE SCIENCES—\$833,000,000

The Committee authorization for the space science—physics and astronomy, planetary exploration, life sciences—is \$833 million, \$54 million above the fiscal year 1984 administration request.

#### PHYSICS AND ASTRONOMY—\$558,600,000

The Committee recommends \$558,600,000, compared to the administration's request of \$514,600,000. This \$44 million increase is accounted for in the following Committee authorization changes to the administration budget:

(In millions of dollars)

	Administration request	Committee authorized
Mission operations and data analysis (HEAO-2 data analysis)	2.8	3.8
Research and analysis	29.8	33.8
Space telescope project	120.6	170.6
Shuttle/spacelab payload development and mission management	92.9	81.9
Solar optical telescope	(16.0)	(0.0)
Space Plasma Lab	(3.0)	(8.0)

#### Summary of funding levels, fiscal year 1984

Space Telescope development	\$170,600,000
Gamma Ray Observatory development	89,800,000
Shuttle/Spacelab payload development and mission management	81,900,000
Explorer development	48,700,000
Mission operations and data analysis	80,500,000
Research and analysis	33,800,000
Suborbital programs	53,300,000
Total	558,600,000

#### Committee comment

Shortly before hearings were held by the Committee on the fiscal year 1984 NASA budget, NASA revealed important management problems and budgetary overruns in the space telescope program.

A subsequent report in March for the House Appropriations Committee identified the deficiencies as: "(1) NASA and contractor gross underestimation of the technical difficulties involved with advanced technology requirements of the Space Telescope program; and (2) NASA's conscious decision to bypass development of prudent engineering test models usually associated with projects of such high-risk technology." The Committee does not disagree with these assessments and is monitoring the corrective management steps initiated by NASA.

Nevertheless, a launch delay of about a year and a project cost overrun of \$200 million are likely. The cost overrun figures remain uncertain although impacts are unavoidable in the fiscal year 1983 and 1984 budgets as well as in the out years. While the Committee is concerned about the circumstances that permitted the problems to occur, the first priority is to see the project successfully completed. For that reason, an additional \$50 million is authorized to meet the anticipated Space Telescope overrun costs for fiscal year 1984.

This addition is partially offset by deleting \$16 million from the Solar Optical telescope (SOT), which is scheduled for launch in late 1989 as a Spacelab payload. The project is currently in the extended definition phase under a contract signed in January 1983 with the facility contractor. The deletion of funds for the SOT does not signify disapproval of the project by the Committee.

The Committee added \$5 million for the Space Plasma Laboratory (SPL) which will be flown on a future Spacelab mission. SPL involves investigations of solar/terrestrial relationships, including effects of solar storms on the Earth's environment. The augmentation is intended to minimize the impact on the program from slippage in the mission.

An additional \$4 million is also authorized by the Committee, for research and analysis, which directly supports experimental and theoretical research at universities, as well as conceptual and experimental developments that form the basis of new missions. It also represents a high-return, low-cost investment by deriving notable scientific results from the unique data which has been collected from space at a very high public cost.

The Committee authorizes \$1 million, in addition to that requested by the administration, for the High Energy Astronomical Observatory (HEAO)-2/Einstein data analysis program. While the HEAO-2 Einstein satellite ceased operations in mid-1981, the 2½ years of X-ray data obtained from this satellite will be the best available for most of the 1980's. For this reason, the Committee believes that the additional funding will achieve continuity in the field of X-ray astronomy.

The Committee has expressed concern in the past about inadequate funding of the space sciences—physics and astronomy, planetary exploration, and life sciences—as the Shuttle development operations commanded a greater and greater share of the NASA

exploration program is achievable within practical budgetary limitations.

The Committee recognizes and applauds the role and imagination which has been played by the Solar System Exploration Committee (SSEC). The SSEC has just published its recommendations for a core program of low and moderate cost planetary missions to be flown through the remainder of this century. Of the missions proposed by the SSEC. The Venus radar mapper is included in the authorization as a new start for fiscal year 1984.

An additional \$10 million is authorized for research and analysis. The reasons for adding to this category are similar to those provided in the Committee comments for physics and astronomy.

The Committee continues to support the infrared telescope facility and expects that NASA will fund its operation unless and until the National Science Foundation provides the support.

**LIFE SCIENCES—\$59,000,000**

The Committee has authorized \$59.0 million for fiscal year 1984 as follows:

<i>Summary of funding levels, fiscal year 1984</i>	
Life sciences flight experiments.....	\$23,000,000
Research and analysis.....	36,000,000
<b>Total.....</b>	<b>59,000,000</b>

*Committee comment*

The Committee has strongly supported planetary exploration in the past. Previously, the costs of missions were increasing rapidly beyond what could reasonably be funded. This year's proposed budget gives hopeful indication that a steady, ambitious planetary budget. It is the Committee's intention that the balance reflected in the fiscal year 1984 authorization be maintained.

**PLANETARY EXPLORATION—\$215,400,000**

The Committee authorization of \$215,400,000 for fiscal year 1984 is \$10 million above the administration's request. Further, the addition is entirely for Research and Analysis.

<i>Summary of funding levels, fiscal year 1984</i>	
Galileo development.....	79,500,000
Venus radar mapping mission.....	29,000,000
International solar polar mission.....	8,000,000
Mission operations and data analysis.....	43,400,000
Research and analysis.....	55,500,000
<b>Total.....</b>	<b>215,400,000</b>

*Committee comment*

The life sciences program continues to be vitally important, in the view of the Committee, particularly if prolonged manned presence and activity in space is to be achieved. The successful first Shuttle extravehicular activity (EVA), accomplished on STS-6, was an additional step toward that end.

There continue to be important questions about man's adaptation to weightlessness, particularly regarding certain health effects. The 14 percent increase above the fiscal year 1983 budget for research and analysis is primarily in recognition of the importance of understanding and solving this problem.

**SPACE APPLICATIONS—\$321,000,000**

The objective of the space applications program is to conduct research and development activities that demonstrate space-related technology, systems, and other capabilities which provide down-to-Earth practical benefits. These activities are grouped in the following general areas: resource observations, environmental observations, applications systems, technology transfer, materials processing in space, communications and information systems. In each of these areas, programs are being planned and conducted to contribute to the solution of pressing national, as well as international, problems and needs. The funding levels for these activities are shown in the following tables:

<i>Summary of Funding Levels, Fiscal Year 1984</i>	
Solid earth observations.....	\$86,400,000
Environmental observations.....	173,000,000
Materials processing in space.....	26,600,000
Communications.....	26,100,000
Information systems.....	8,900,000
<b>Total.....</b>	<b>321,000,000</b>

*Committee comment*

The Committee attaches a great deal of importance to the overall space applications program. To insure that the Nation is investing sufficiently and wisely in this area, the Committee believes a long-term strategy and plan for the applications program is warranted, comparable to the excellent effort conducted by the Solar System Exploration Committee for the planetary exploration program. The Committee requests NASA to undertake such an effort covering all activities within the applications program. The Space Applications Board of the National Research Council might be able to assist in such an effort.

The Committee has taken the first step in augmenting various space applications activities: solid Earth observations (\$12 million); environment observations (\$10 million); materials processing in space (\$5 million); and communications (\$5 million).

**Solid Earth observations—\$86,400,000**

The Committee authorization of \$86,400,000 provides \$12 million more than the administration request. This increase is for AgRISTARS (\$3 million) and research and analysis (\$9 million).

<i>Summary of funding levels, fiscal year 1984</i>	
Landsat-4.....	\$15,800,000
Extended mission operations.....	1,000,000
Shuttle/Spacelab payloads.....	15,000,000
Geodynamics.....	28,000,000
AgRISTARS.....	3,000,000
Research and analysis.....	23,600,000
<b>Total.....</b>	<b>\$86,400,000</b>

*Committee comment*

The Committee believes that the space applications programs have generally been underemphasized in the administration's fiscal year 1984 request. This is of special concern since it is this research and development from which future space applications for defense and commerce, as well as science, will emerge. Further, this is an area in which we are being increasingly challenged by other nations. Even where a private sector role develops for operation of space applications, there will likely remain a necessary and desirable governmental role for research and development, particularly where the lead time to commercial application is too long and too costly and the level of effort is too risky for private sector entities to justify the endeavor.

The administration's proposed NASA budget contains little funding for continued sensor development for land remote sensing. In early March, the President announced his decision to pursue the transfer of the weather and land remote sensing satellites to the private sector.

The Committee is concerned that neither the operational capability nor continued R&D of land remote sensors is assured and that each could well be lost to aggressive foreign competition—a loss of a commercial opportunity which would have been pioneered by the United States at great public expense. The operational design life for the Landsat system is 1988, but it could cease earlier. The Committee requests NASA to undertake a study to determine the technical and cost implications of a Landsat retrieval and repair mission compared to the procurement of a follow-on satellite.

At the same time, there is private sector interest in operational responsibility for land remote sensing and the Committee intends that this interest be seriously and responsibly considered. Title II of S. 1096 provides that any transfer of the Earth or weather remote sensing satellite systems first be reviewed and approved by the appropriate authorizing committees and the Congress. This provision is intended to preserve the legitimate role of the Congress in assuring that any transfer is responsible, equitable and protects the public interest. It does not preclude or prejudice such a transfer.

Regardless of the rationale of the decision to transfer the satellite systems, the Committee believes that NASA retains a role for related R&D. Therefore, the Committee has authorized additional funds for R&D which supports future remote sensor development and utilization data. Thus, additional funds are authorized for: AgRISTARS (\$3 million); research and analysis (\$5 million); and technology transfer (\$4 million).

*Environmental observations—\$173,000,000*

This Committee's authorization of \$173 million includes an increase of \$10 million above the administration's request, to be allocated as follows: space physics/advanced technological development, (\$2 million); upper atmosphere research satellite—experiments, (\$4 million); atmospheric dynamics and radiation research and analysis, (\$2 million); and oceanic processes research and analysis, (\$2 million).

*Summary of funding levels, fiscal year 1984*

Upper atmosphere research and analysis.....	\$29,600,000
Atmospheric dynamics and radiation research and analysis.....	30,400,000
Oceanic processes research and analysis.....	20,200,000
Space physics/ATD research and analysis.....	17,700,000
Shuttle/Spacelab payload development.....	7,600,000
Operational satellite improvement program.....	600,000
Earth radiation budget experiment.....	15,500,000
Extended mission operations.....	27,400,000
Upper atmosphere research satellite experiments and mission definition.....	24,000,000
Total.....	173,000,000

*Committee comment*

The Committee's \$10 million increase above the administration's request includes \$2 million for the space physics/advanced technological development program. This increase is specifically for university research teams conducting experiments on the origin of plasmas in the Earth's neighborhood (OPEN). OPEN is a major initiative in the study of the Sun-Earth relationship, specifically the flow of charged particles through the Earth's space environment above the upper atmosphere. The Committee believes that the reductions proposed for OPEN by the administration would result in disbanding enough of the team capability which has been built to compromise excessively the achievement of the program goals.

While the upper atmosphere research satellite (UARS) mission has been delayed as a new start for fiscal year 1984, the experiments development is progressing. The additional funds for UARS (\$4 million) will sustain the UARS experiments development capabilities.

The Committee's recommendation for increased funding for atmospheric dynamics and radiation research and analysis and for oceanic processes research and analysis is based on a concern that, NASA has been relinquishing its atmospheric and ocean remote sensing R&D efforts which it traditionally has pursued. NASA should make a stronger effort to advance its remote sensing technologies and capabilities in these areas and therefore the Committee has added \$2 million for atmospheric R&D (for an advanced microwave sounder) and \$2 million for oceanic R&D (for an advanced scatterometer).

*Materials processing in space—\$26,600,000*

*Committee comment*

The limited understanding of materials processing in space and the applicable commercial applications places materials processing in space on a long-term, high-risk, high-cost, category that is generally beyond the capacity of most private commercial concerns. Further, the Committee recognizes that, until the technical capability and economic feasibility of new space processing techniques have been demonstrated, major financial commitments from the private sector will be slow in coming.

The need for additional funding in materials processing is pointed out by the termination in March, 1983, of a joint endeavor

agreement (JEA) between GTI Corp. and NASA. The JEA covered a materials processing alloy furnace scheduled to fly aboard the Shuttle in 1984. However, GTI's inability to identify sufficient customer market to support a viable commercial enterprise, GTI withdrew from the JEA.

The promise of materials processing in space remains high. The Committee authorizes an additional \$5 million above the administration request to continue the development of the technology and capabilities for potential users of materials processing in space. The Committee urges that NASA apply part of this increase to developing small-scale hardware for preliminary flight experiments and for validation or proof of concept. Further, part of the augmentation should be used for processes involving the separation and purification of biomaterials.

*Communications—\$26,100,000*

*Committee comment*

The Committee strongly supports NASA's ACTS effort and believes additional communications R&D efforts are justified. The Committee recommends that the additional \$5 million be applied to areas other than the ACTS program for research and systems studies of potentially feasible advanced communications systems for new services, such as video-conferencing, two-way computer transactions, and mobile communications. Also, NASA should emphasize high-risk research and development related to ground terminals and to intersatellite links.

*Information Systems—\$8,900,000*

The Committee authorization for fiscal year 1984 is \$8,900,000 identical to the administration request.

The objectives of the information systems programs are to: Develop and demonstrate advanced capabilities for managing, distributing, and processing data and information; implement information systems standards and provide transportable common software in order to lower data systems costs; and develop the basis for data services to provide improved access to, and rapid delivery of, space data and advanced data systems in support of the Nation's satellite programs and the space science and applications projects.

This program provides for timely development of data systems capabilities to meet the needs of flight missions and major space science and applications programs. The early demonstration of capabilities has a high potential for reducing ground data systems development risks and the chance of late data delivery.

TECHNOLOGY UTILIZATION—\$10,000,000

*Committee comment*

The NASA technology utilization program is a long standing effort to increase nonaerospace, commercial utilization of NASA-developed technology. Studies indicate that the demonstrated economic benefits are six times the cost of the technology utilization program.

The Committee remains concerned about an apparent disregard of congressional intent in the proposed funding request of \$4 million. In fiscal year 1983, the budget request was for \$4 million, but this Committee added \$5 million.

The intent of this Committee's \$6 million augmentation is to ensure that NASA will continue the development and implementation of a technology utilization function that actively applies to the full range of the agency's institutional expertise to nonaerospace technology problems of the industrial and public sectors.

AERONAUTICAL RESEARCH AND TECHNOLOGY—\$328,300,000

The Committee authorizes \$328,300,000 for fiscal year 1984, \$28 million above the administration request, to be allocated as follows:

Research and technology base.....	\$212,800,000
Systems technology programs.....	115,500,000
Total.....	328,300,000

*Committee comment*

The Committee is greatly concerned over this fourth consecutive decline in yearly shipments of civil aviation products (now at its lowest level since 1972) coinciding with pronounced growth in the foreign competitors' share of the world market for aircraft, engines, and related aviation products. Development and adoption of superior aeronautical technology for and by the U.S. aviation industry provides the soundest prospect for preserving U.S. industry's worldwide technological and market leadership. Failure in this objective invites the specter of economic and employment distress which has characterized the U.S. steel industry, its maritime industry, its textile industry, and most recently its automobile industry.

This Committee, and indeed both Houses of Congress, know that development of systems technology programs, long a major role of NASA, provide the technological edge which assures the competitive advantage needed to maintain the industry's strong position in world markets. This role of the agency has been amply reaffirmed by two independent studies completed in 1982. These are the National Research Council's study on aeronautics research and technology requested by the Senate Appropriations Committee and published in July, and the Office of Science and Technology Policy-directed study on aeronautical research and technology policy published in November.

The Committee is, therefore, distressed at the administration's second consecutive NASA budget request in which it has ignored the concern of Congress and sought to curtail sharply those systems technology programs which were oriented toward such civil aviation development. For fiscal year 1983 the administration proposed to reduce that category of programs by \$42 million. Congress restored \$48 million. For fiscal year 1984 the administration again proposes to reduce that category by \$10 million from the level provided by Congress for fiscal year 1983. In the authorization, the Committee restores \$28 million, confident that the Congress will

again recognize the urgency of a strong aeronautics systems technology program to preserve the competitive leadership of our civil aviation industry and the contributions of that leadership to our foreign trade balance, to domestic employment, and the quality and safety of aviation services for people throughout our Nation and the free world.

**SPACE RESEARCH AND TECHNOLOGY—\$138,000,000**

The Committee authorizes \$138 million for space research and technology, as requested by the administration.

*Summary of funding levels, fiscal year 1984*

Research and technology base.....	\$126,200,000
Systems technology programs.....	7,200,000
Standards and practices.....	4,600,000
<b>Total.....</b>	<b>138,000,000</b>

*Committee comment*

The Committee recognizes that a strong space research and technology base is vital to maintain our Nation's leadership in space and to pursue an aggressive space program. With increasing competition from foreign nations in areas of advanced satellite communications, remote sensing technologies, materials processing, and scientific research, adequate levels for this space systems technology base become even more critical in providing options for both the commercial and Government sectors to meet this competition.

**TRACKING AND DATA ACQUISITION—\$700,200,000**

The Committee authorizes the budget of \$700,200,000 for Tracking and Data Acquisition as requested.

*Summary of funding levels, fiscal year 1984*

Space network.....	\$294,700,000
Ground network.....	231,500,000
Communications and data systems.....	159,800,000
Advanced systems.....	14,200,000
<b>Total.....</b>	<b>700,200,000</b>

**CONSTRUCTION OF FACILITIES—\$142,100,000**

The Committee authorizes \$142,100,000 for construction of facilities, \$8,400,000 below the administration request. This authorization is for the following purposes:

- (1) Space Shuttle facilities at various locations as follows:
  - (A) Modifications for additional chillers for mission control center, Lyndon B. Johnson Space Center, \$2,300,000;
  - (B) Modifications to mobile launch platform, John F. Kennedy Space Center, \$27,300,000; and
  - (C) Modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility, \$11,700,000;

- (2) Space Shuttle payload facilities at various locations as follows:
  - (A) Construction of cargo hazardous servicing facility, John F. Kennedy Space Center, \$9 million; and
  - (B) Modifications to spacecraft assembly and encapsulation facility for cargo processing, John F. Kennedy Center, \$3 million;
- (3) Construction of frequency standards laboratory, Jet Propulsion Laboratory, \$2,700,000;
- (4) Modifications to space flight operations facility, Jet Propulsion Laboratory, \$1,600,000;
- (5) Construction of fluid mechanics laboratory, Ames Research Center, \$3,900,000;
- (6) Construction of aeronautical tracking facility, Hugh L. Dryden Flight Research Facility, \$800,000;
- (7) Modifications and addition for composite materials laboratory, Langley Research Center, \$5,100,000;
- (8) Modifications to 30-by 60-foot wind tunnel, Langley Research Center, \$4,400,000;
- (9) Modifications for small engine component testing facility, Lewis Research Center, \$7 million;
- (10) Modifications to icing research tunnel, Lewis Research Center, \$3,600,000;
- (11) Relocation of 26-meter STDN antenna, Spain, \$1,700,000;
- (12) Repair of facilities at various locations, not in excess of \$500,000 per project, \$19,500,000;
- (13) Rehabilitation and modification of facilities at various locations, not in excess of \$500,000 per project, \$24,500,000;
- (14) Minor construction of new facilities and additions to existing facilities at various locations, not in excess of \$250,000 per project, \$4,800,000; and
- (15) Facility planning and design not otherwise provided for, \$9,200,000.

*Committee comments*

The NASA request includes \$8,400,000 as a reimbursement to the General Services Administration (GSA) for land and facilities at Ellington Air Force Base, Tex. that NASA's Johnson Space Center has used since 1961 for aircraft operations and for astronautical flying proficiency programs. In 1974, Ellington Air Force Base declared the land and facilities excess.

The Committee's position is that NASA should assume title to the land and facilities in question without the transfer of the \$8,400,000 and that an intragovernment transfer of this nature is unwarranted.

**RESEARCH AND PROGRAM MANAGEMENT—\$1,247,500,000**

The Committee authorizes \$1,247.5 million for research and program management as requested.

*Summary of budget plan by function*

Personnel and Related Costs.....	\$883,785,000
Travel.....	25,700,000
Operation of Installation.....	338,015,000
Facilities Services.....	-186,488,000
Technical Services.....	-59,257,000
Management and Operations.....	-92,270,000
<b>Total.....</b>	<b>1,247,500,000</b>

**ESTIMATED COSTS**

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

U.S. CONGRESS,  
CONGRESSIONAL BUDGET OFFICE,  
Washington, D.C., April 29, 1983.

Hon. BOB PACKWOOD,  
Chairman, Committee on Commerce, Science and Transportation,  
U.S. Senate, 508 Dirksen Senate Office Building, Washington,  
D.C.

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional Budget Office has prepared the attached cost estimate for S. 1096, the National Aeronautics and Space Administration Authorization Act, 1984.

Should the Committee so desire, we would be pleased to provide further details on this estimate.

Sincerely,

ALICE M. RIVLIN,  
Director.

**CONGRESSIONAL BUDGET OFFICE COST ESTIMATE**

1. Bill number: S. 1096.
2. Bill title: National Aeronautics and Space Administration Authorization Act, 1984.
3. Bill status: As ordered reported by the Senate Committee on Commerce, Science and Transportation, April 21, 1983.
4. Bill purpose: Title I of the bill authorizes the appropriation to the National Aeronautics and Space Administration (NASA) of \$7,278 million for fiscal year 1984: \$5,888 million for research and development, \$142 million for construction of facilities, and \$1,248 million for research and program management. The authorization for research and development includes \$2,022 million for space shuttle development, \$1,536 million for space flight operations,

\$559 million for physics and astronomy, \$321 million for space applications, \$328 million for aeronautical research, and \$700 million for a tracking and data relay satellite system. The space shuttle development authorization provides for the production of structural spares and for the initial costs of procuring a fifth shuttle orbiter. Title I also authorizes such sums as may be necessary for increases in pay, retirement, and other employee benefits. Further, the bill prohibits the President from commercializing any of NASA's expendable launch vehicle technology without Congressional approval.

The amounts authorized are \$172 million higher than the President's fiscal year 1984 budget request for NASA and \$439 million higher than 1983 appropriations for the agency to date.

In addition, Title II of the bill authorizes a 1984 appropriation of \$29 million for the National Oceanic and Atmospheric Administration (NOAA) to finance operations for the land remote sensing satellite system (LANDSAT) and to provide storage for a second land scanning satellite. This section of the bill also prohibits the transfer of any land, meteorological, or ocean sensing space satellite to the private sector without Congressional approval.

5. Estimated cost to the Federal Government:

(By fiscal years, in millions of dollars)

	1984	1985	1986	1987	1988
<b>Estimated authorization level:</b>					
NASA-Civilian Space Program (Function 250).....	6,661				
NASA-Aeronautics (Function 400).....	617				
NASA-Allowance for Pay Increase (Function 920).....	48				
NOAA (Function 300).....	29				
<b>Total.....</b>	<b>7,355</b>				
<b>Estimated outlays:</b>					
NASA-Civilian Space Program (Function 250).....	4,961	1,472	210	16	2
NASA-Aeronautics (Function 400).....	405	163	36	11	2
NASA-Allowance for Pay Increase (Function 920).....	46	2			
NOAA (Function 300).....	20	9			
<b>Total.....</b>	<b>5,432</b>	<b>1,646</b>	<b>246</b>	<b>27</b>	<b>4</b>

Based on estimate. The estimate assumes that the full amounts authorized will be appropriated prior to the beginning of fiscal year 1984. It also includes \$48 million to reflect CBO's baseline estimate of a 5.5 percent federal pay increase for 1984. Estimated outlays are based on historical spending patterns for the major NASA programs.

6. Estimated cost to State and local governments: None.

7. Estimate comparison: None.

8. Previous CBO estimate: On April 19, 1983, the Congressional Budget Office prepared a cost estimate for H.R. 2065, the National Aeronautic and Space Administration Act of 1984, as ordered reported by the House Committee on Science and Technology, April 15, 1983. The House Committee bill authorized appropriations totalling \$7,343 million in 1984, \$10 million less than S. 1096.

9. Estimate prepared by: Charles Essick.

10. Estimate approved by: James L. Blum, Assistant Director, for Budget Analysis.

## REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation:

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, no effect on Federal paperwork or individual privacy.

## SECTION-BY-SECTION ANALYSIS

### TITLE I

*Section 1.* The first section states the short title of the bill, the "National Aeronautics and Space Administration Authorization Act, 1984".

#### *Section 101*

An authorization of \$7,278.1 million is provided as follows:

- (a) \$5,888.5 million for "Research and Development";
- (b) \$142.1 million for "Construction of Facilities"; and
- (c) \$1,247.5 million for "Research and Program Management".

#### *Section 102*

Authorization is provided for an increase in the "Construction of Facilities" funds of up to 10 percent, at the discretion of the NASA Administrator, and 25 percent, following a report to the Senate and House authorization committees justifying the increase.

#### *Section 103*

Up to ½ of 1 percent of the funds appropriated for research and development may be transferred to construction of facilities. This amount then may be added to \$10 million of the construction of facilities appropriations for additional construction of facilities and land acquisition, if the NASA Administrator justifies the expenditure.

#### *Section 104*

No appropriations may be used for any program deleted by Congress and no appropriations may exceed the amount authorized for that particular program in research and development and research and program management. For NASA to obtain funding for programs not presented to the Senate and House in the routine manner, NASA must first prepare a report justifying the proposal. Then, 30 days must elapse after receipt by the Senate and the House of this report or, the Senate and House authorization com-

mittees must approve in writing the proposal within 30 days of receipt of the report.

#### *Section 105*

Consideration shall be given to geographical distribution of Federal research funds whenever feasible.

#### *Section 106*

Funding is provided for the structural and component spares and the critical engine spares for the current four-orbiter Space Shuttle fleet and for the initiation of procurement of a fifth orbiter.

#### *Section 107*

The Senate and House authorization committees must approve any decision and proposed policy of the Administration to commercialize the expendable launch vehicles.

#### *Section 108*

Title III of the National Aeronautics and Space Act of 1958 is amended to protect NASA's name and initials against false advertising and related misuse.

### TITLE II

#### *Section 201*

\$29,336 million is provided in fiscal year 1984 to operate the land remote sensing satellite system and to store a backup satellite.

#### *Section 202*

The Senate and House authorization committees must review and approve any attempt to transfer the ownership or management of the civil remote sensing satellite system.

### CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new material is printed in italic, existing law in which no change is proposed is shown in roman):

### NATIONAL AERONAUTICS AND SPACE ACT OF 1958

#### TITLE III OF THAT ACT

#### APPROPRIATIONS

SEC. 309. . . .

#### MISUSE OF AGENCY NAME AND INITIALS

*SEC. 310. (a) No person (as defined by section 305) may (1) knowingly use the words "National Aeronautics and Space Administration" or the letters "NASA", or any combination, variation, or colorable imitation of those words or letters either alone or in combination with other words or letters, as a firm or business name in a*

*manner reasonably calculated to convey the impression that such firm or business has some connection with, endorsement of, or authorization from, the National Aeronautics and Space Administration which does not in fact exist; or (2) knowingly use those words or letters or any combination, variation, or colorable imitation thereof either alone or in combination with other words or letters in connection with any product or service being offered or made available to the public in a manner reasonably calculated to convey the impression that such product or service has the authorization, support, sponsorship, or endorsement of, or the development, use, or manufacture by or on behalf of, the National Aeronautics and Space Administration which does not in fact exist.*

*(b) Whenever it appears to the Attorney General that any person is engaged in an act or practice which constitutes or will constitute conduct prohibited by subsection (a), the Attorney General may initiate a civil proceeding in a district court of the United States to enjoin such act or practice. Such court shall proceed as soon as practicable to the hearing and determination, enter such restraining orders or prohibitions, or take such other action as is warranted, to prevent injury to the United States or to any person or class of persons for whose protection the action is brought.*

○

PUBLIC LAW 98-52—JULY 15, 1983

Public Law 98-52  
98th Congress

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.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

TITLE I

SEC. 101. That there is hereby authorized to be appropriated to the National Aeronautics and Space Administration to become available October 1, 1983:

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

- (1) Space transportation capability development, \$2,009,400,000;
- (2) Space transportation operations, \$1,545,600,000;
- (3) Physics and astronomy, \$562,100,000;
- (4) Planetary exploration, \$220,400,000;
- (5) Life sciences, \$59,000,000;
- (6) Space applications, \$313,000,000;
- (7) Technology utilization, \$10,000,000;
- (8) Aeronautical research and technology, \$320,300,000;
- (9) Space research and technology, \$143,000,000; and
- (10) Tracking and data systems, \$700,200,000; and

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

- (1) Space Shuttle facilities at various locations as follows:
  - (A) Modifications for additional chillers for mission control center, Lyndon B. Johnson Space Center, \$2,300,000; and
  - (B) Modifications to mobile launch platform, John F. Kennedy Space Center, \$27,300,000; and
  - (C) Modification of manufacturing and final assembly facilities for external tanks, Michoud Assembly Facility, \$11,700,000;
- (2) Space Shuttle payload facilities at various locations as follows:
  - (A) Construction of cargo hazardous servicing facility, John F. Kennedy Space Center, \$9,000,000; and
  - (B) Modifications to spacecraft assembly and encapsulation facility for cargo processing, John F. Kennedy Space Center, \$3,000,000;
  - (3) Construction of frequency standards laboratory, Jet Propulsion Laboratory, \$2,700,000;
  - (4) Modifications to space flight operations facility, Jet Propulsion Laboratory, \$1,600,000;
  - (5) Construction of fluid mechanics laboratory, Ames Research Center, \$3,900,000;

(6) Construction of aeronautical tracking facility, Hugh L. Dryden Flight Research Facility, \$800,000;

(7) Modifications and addition for composite materials laboratory, Langley Research Center, \$5,100,000;

(8) Modifications to 30- by 60-foot wind tunnel, Langley Research Center, \$4,400,000;

(9) Modifications for small engine component testing facility, Lewis Research Center, \$7,000,000;

(10) Modifications to icing research tunnel, Lewis Research Center, \$3,600,000;

(11) Relocation of 26-meter STDN antenna, Spain, \$1,700,000;

(12) Repair of facilities at various locations, not in excess of \$500,000 per project, \$19,500,000;

(13) Rehabilitation and modification of facilities at various locations, not in excess of \$500,000 per project, \$24,500,000;

(14) Minor construction of new facilities and additions to existing facilities at various locations, not in excess of \$250,000 per project, \$4,800,000; and

(15) Facility planning and design not otherwise provided for, \$9,200,000.

(c) For "Research and program management," \$1,242,500,000, 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 101(g), appropriations hereby authorized 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 twelve months beginning at any time during the fiscal year.

(f) Appropriations made pursuant to subsection 101(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 101(a) and 101(c), not in excess of \$75,000 for each project, including collateral equipment, may be used for construction of new facilities and additions to existing facilities, and for repair, rehabilitation, or modification of facilities: *Provided*, That, of the funds appropriated pursuant to subsection 101(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.

SEC. 102. Authorization is hereby granted whereby any of the amounts prescribed in paragraphs (1) through (14), inclusive, of subsection 101(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. 103. Not to exceed one half of 1 percent of the funds appropriated pursuant to subsection 101(a) hereof may be transferred to and merged with the "Construction of facilities" appropriation, and, when so transferred, together with \$10,000,000 of the funds appropriated pursuant to subsection 101(b) hereof (other than funds appropriated pursuant to paragraph (15) 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 101(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 (i) the nature of such construction, expansion, or modification, (ii) the cost thereof including the cost of any real estate action pertaining thereto, and (iii) 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. 104. 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 101(a) and 101(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. 105. 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. 106. The authorization for space transportation capability development includes provision for the production activities necessary to provide for a fleet of Space Shuttle orbiters, including the production of structural and component spares, necessary to ensure confident and cost-effective operation of the orbiter fleet, as well as provisions for maintaining production readiness for a fifth orbiter vehicle.

SEC. 107. Title III of the National Aeronautics and Space Act of 1958, as amended, is amended by adding at the end thereof the following new section:

#### MISUSE OF AGENCY NAME AND INITIALS

"SEC. 310. (a) No person (as defined by section 305) may (1) knowingly use the words 'National Aeronautics and Space Administration' or the letters 'NASA', or any combination, variation, or colorable imitation of those words or letters either alone or in combination with other words or letters, as a firm or business name in a manner reasonably calculated to convey the impression that such firm or business has some connection with, endorsement of, or authorization from, the National Aeronautics and Space Administration which does not, in fact, exist; or (2) knowingly use those words or letters or any combination, variation, or colorable imitation thereof either alone or in combination with other words or letters in connection with any product or service being offered or made available to the public in a manner reasonably calculated to convey the impression that such product or service has the authorization, support, sponsorship, or endorsement of, or the development,

use, or manufacture by or on behalf of the National Aeronautics and Space Administration which does not, in fact, exist.

"(b) Whenever it appears to the Attorney General that any person is engaged in an act or practice which constitutes or will constitute conduct prohibited by subsection (a), the Attorney General may initiate a civil proceeding in a district court of the United States to enjoin such act or practice."

SEC. 108. Section 103(1) of the National Aeronautics and Space Act of 1958, as amended, is amended, by striking out "and (C)" and inserting in lieu thereof "(C) the operation of a space transportation system including the Space Shuttle, upper stages, space platforms, and related equipment, and (D)".

SEC. 109. Notwithstanding any other provision of law, there shall be transferred to NASA three government-owned tracts of NASA used land and improvements thereon (totalling approximately 33.5 acres) at Ellington Air Force Base, Texas, without any transfer of funds therefor.

SEC. 110. Any decision or proposed policy by the President or the National Aeronautics and Space Administration to commercialize some or all of the existing expendable launch vehicle technologies and associated facilities and equipment shall be presented to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives for their review. No such decision or policy shall be implemented unless (A) a period of 30 days has passed after the receipt by each such committee of a full and complete statement of the decision or proposed policy and the facts and circumstances relied upon in support of such decision or proposed policy, 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 decision or proposed policy.

SEC. 111. This Act may be cited as the "National Aeronautics and Space Administration Authorization Act, 1984"

## TITLE II

SEC. 201. There is authorized to be appropriated \$29,336,000 for the fiscal year 1984 for the purpose of operating the land remote sensing satellite system, including provision for storage of a backup satellite.

SEC. 202. Notwithstanding title II of the National Aeronautics and Space Administration Authorization Act, 1983, the Secretary of Commerce shall not transfer the ownership or management of any civil land, meteorological, or ocean remote sensing space satellite system and associated ground system equipment unless, in addition to any other requirement of law—

(1) the Secretary of Commerce or his designee has presented, in writing, to the Speaker of the House of Representatives and the President of the Senate, and to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate, a comprehensive statement of recommended policies, procedures, conditions, and limitations to which any transfer should be subject; and

(2) the Congress thereafter enacts a law which contains such policies, procedures, conditions, or limitations (or a combination thereof) as it deems appropriate for any such transfer.

Approved July 15, 1983.

### LEGISLATIVE HISTORY—H.R. 2065 (S. 1096):

HOUSE REPORT No. 98-65 (Comm. on Science and Technology).  
SENATE REPORT No. 98-108 accompanying S. 1096 (Comm. on Commerce, Science,  
and Transportation).

CONGRESSIONAL RECORD, Vol. 129 (1983):

Apr. 26, considered and passed House.

June 15, S. 1096 considered and passed Senate.

June 28, H.R. 2065 considered and passed Senate, amended.

June 29, House concurred in Senate amendments.

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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-  
INDEPENDENT AGENCIES APPROPRIATION BILL, 1984

MAY 24, 1983.—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

[To accompany H.R. ———]

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 agencies, boards, commissions, corporations, and offices for the fiscal year ending September 30, 1984, and for other purposes.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

RESEARCH AND DEVELOPMENT

1983 appropriation..... \$5,542,800,000

Estimate, 1984.....	5,708,500,000
Recommended in bill.....	5,803,500,000
Increase above estimate.....	+ 95,000,000

The research and development account of the National Aeronautics and Space Administration includes the program elements that provide for development of the operational capability of the space shuttle and related systems. This account also includes various programs involving the application of space capabilities in remote sensing of land resources, ocean and atmospheric conditions; materials processing; and communications. In the area of space science it includes projects designed to explore the solar system and expand man's knowledge of the universe. Also included under this heading are development programs involving aeronautics technology which support the civilian and military capability of the United States in the area of airframe and engine manufacturing.

The committee recommends a total of \$5,803,500,000 for this account in fiscal year 1984. This is an increase of \$95,000,000 above the budget request. The recommendation includes the following increases and decreases for the program areas described below:

+ \$50,000,000 for orbiter and engine spares to be held in reserve.

+ \$45,000,000 for the space telescope. Bill language has also been included "capping" the 1984 total for telescope development at \$165,600,000—which represents the budget request plus the \$45,000,000 enhancement. It is expected that approximately an additional \$35,000,000 will be required through a reprogramming request in 1984. This action will increase the total space telescope effort to about \$200,000,000 in 1984.

The committee commissioned its surveys and investigations staff to report on problems encountered with the space telescope development program. The report suggested that the problems are significant and ongoing and will require substantial additional resources in fiscal years 1983, 1984 and 1985 to complete the project. In addition, the launch date is now expected to slip from January 1985 to June 1986. Total development costs for this program (which were originally estimated at a level of approximately \$595,000,000) are expected to reach \$1,000,000,000 before the telescope is launched. Because the investigative report highlighted severe management problems at both the agency and various contractors, the committee will review carefully reprogramming requests for additional funds before approval of such funds is granted.

+ \$20,000,000 for research and analysis in physics and astronomy and planetary programs to be distributed at the agency's discretion.

+ \$5,000,000 for technology utilization.

– \$5,000,000 from the \$20,000,000 requested for the numerical aerodynamic simulator.

– \$5,000,000 from the terminal configured vehicle (TCV) program.

+ \$20,000,000 for advanced turboprop work of which not less than \$10,000,000 shall be derived from the aeronautics research and technology activity.

—\$10,000,000 from tracking to be derived from the Tracking and Data Relay Satellite System payment to the Federal Financing Bank.

—\$15,000,000 from the solar optical telescope or other programs at the agency's discretion.

The committee has also included bill language "capping" the 1984 amounts for the following programs at these levels:

1. Space transportation capability development—\$1,927,400,000.
2. Space transportation operations—\$1,570,600,000.
3. Expendable launch vehicles—\$50,000,000.
4. Space station—\$14,000,000 (including \$6,000,000 in advance programs, \$6,000,000 in space research and technology—specific and \$2,000,000 in physics and astronomy—space lab payloads).
5. Tracking and Data Relay Satellite System operations—\$44,000,000.

Since the space shuttle development was announced more than 10 years ago, the committee has supported the program without hesitation. That support continues today and is evidenced by an add-on of \$50,000,000 for orbiter and engine spares in fiscal year 1984.

However, the committee is concerned that the original concept of the shuttle could be changed through significant national policy decisions occurring over the next 3 years. As originally conceived, the shuttle was designed to replace all major expendable launch vehicles—with the exception of an adequate backup of such vehicles for national defense purposes. Although the committee recognizes that no final decision has been made, it appears that this concept is fading. Government witnesses have testified that the space shuttle system should be used primarily as a launch vehicle for Government defense and civil payloads only. These witnesses further suggest that commercial customers for communications satellites and other purposes should begin to look to the commercialization of existing expendable launch vehicles.

It is clear that the space shuttle does not and will not recover costs until the flight rate reaches approximately 24 per year. Recovering total costs requires a flight rate of approximately 35 to 40 per year. A recent National Academy of Sciences' report, which was requested by the House and Senate Appropriations Committees, suggests that the capability of the space transportation system (four orbiters, external tanks, mobile launch platforms, solid rocket boosters, etc.) can support the launch of from 17 to 25 flights per year. The reports also suggests that to reach a 30-flight-per-year rate—a fifth orbiter is an absolute necessity. A very rough estimate of the cost of enhancing the space transportation system (including the cost of an additional orbiter) to reach the 30-flight-per-year rate is approximately \$2,500,000,000.

It is equally clear that because of what appears to be an uncertain market outlook for both Government and commercial payloads in the mid- and late 1980's, the shuttle will need to capture as much of that market as possible to reach the 24-flight-per-year rate. Competition from the French Ariane expendable launch vehicle has already eroded part of the shuttle's market share. Further

competition from American commercial expendable launch vehicle ventures could make it impossible for the shuttle to achieve a launch rate that is sufficient to ensure the space transportation system is a paying proposition.

The committee believes that a definitive statement of national policy would be helpful in determining future space transportation system requirements. If such a policy is designed to essentially "freeze" the shuttle system at its current hardware capability while encouraging the private commercialization of expendable launch vehicles—then it would appear that legitimate questions should be asked concerning the need for a fifth shuttle orbiter. Because of these uncertainties, and because of uncertainties concerning the actual funding requirements for the shuttle main engine in fiscal year 1984, the committee has placed the recommended additional \$50,000,000 for orbiter and engine spares in a temporary reserve through the use of "caps" on the space transportation system development and operations line items.

The committee believes that after making a \$15,000,000,000 investment in the space transportation system, no decision should be reached which would essentially exclude the use of that system for commercial satellites without consulting the Congress. In that connection, the committee directs that NASA maintain the existing shuttle pricing policy enumerated for the period 1986-88. The committee also requests that a report outlining national policy concerning the future of the space transportation system and commercial expendable launch vehicles be submitted to the Congress as soon as possible. Without such a policy declaration, it is difficult to determine what resources should prudently be made available to the space transportation system.

#### CONSTRUCTION OF FACILITIES

1983 appropriation.....	\$97,500,000
Estimate, 1984 .....	150,500,000
Recommended in bill.....	135,500,000
Decrease below estimate.....	-15,000,000

The committee recommends \$135,500,000 for the construction of facilities in 1984. This is a decrease of \$15,000,000 below the budget request. The committee directs that \$8,400,000 of the reduction be applied to the request in that amount for reimbursement to GSA for NASA-utilized property at Ellington Air Force Base. The additional \$6,600,000 should be applied at the agency's discretion from the requests for repair of facilities at various projects; rehabilitation and modification of facilities at various locations; minor construction; and facility planning and design.

#### RESEARCH AND PROGRAM MANAGEMENT

1983 appropriation.....	\$1,168,900,000
Estimate, 1984 .....	1,247,500,000
Recommended in bill.....	1,237,500,000
Decrease below estimate.....	-10,000,000

The committee recommends \$1,237,500,000 for research and program management in 1984. This is a decrease of \$10,000,000 below the budget estimate. The reduction should be applied on a priority

basis to other object classifications, such as contractual and consultant services, travel and public affairs. It is not the intention of the committee that this reduction be applied to personnel compensation. However, if the lapse rate for 1984, which for NASA has historically been higher than anticipated in the budget, is understated, then a part of the reduction can be applied to personnel compensation.

### GENERAL PROVISIONS

The committee recommends that the general provisions applicable to the Department and agencies carried in the current fiscal year be continued in fiscal year 1984, except section 416. That provision deals with the use of funds for Senate office buildings and has been deleted.

### LIMITATIONS AND LEGISLATIVE PROVISIONS

The following limitations and legislative provisions not heretofore carried in connection with any appropriation bill are recommended:

On pages 20 and 21, in connection with the National Aeronautics and Space Administration, Research and Development:

*not to exceed (1) \$1,927,400,000 for space transportation capability development; (2) \$1,570,600,000 for space transportation operations; (3) \$14,000,000 for a space station, including \$6,000,000 in advance programs, \$6,000,000 in space research and technology (specific) and \$2,000,000 in physics and astronomy (space lab payloads); (4) \$165,600,000 for space telescope development; (5) \$50,000,000 for expendable launch vehicles; and (6) not more nor less than \$44,000,000 shall be obligated for space communications operations and maintenance and support associated with the tracking and data relay satellite system, excluding amounts to be obligated for award fees earned on the contract; without the approval of the Committees on Appropriations;*

### PERMANENT OBLIGATIONAL AUTHORITY—FEDERAL FUNDS AND TRUST FUNDS

Substantial sums of new budget (obligational) authority are made available by permanent legislation for the continuation of certain government activities that are not subject to the annual appropriation process. Details of these activities for the agencies covered in this bill are reflected in appropriate tables appearing at the end of this report. The most significant are the life insurance programs of the Veterans Administration. The budget estimates that such permanent authorities will aggregate \$1,887,964,000 in fiscal year 1984.

### TRANSFER OF FUNDS

Pursuant to Clause 1(b), Rule X, of the House of Representatives, the following statement is made describing the transfers of funds provided in the accompanying bill.

The committee recommends that not to exceed \$271,114,000 be transferred from the various funds of the Federal Housing Administration to "Salaries and Expenses" of the Department of Housing and Urban Development. This will allow funds for activities of the Federal Housing Administration to be carried in a consolidated account covering all operating expenses of the Department.

The committee also recommends the transfer of the assets and liabilities of the New Communities Fund to the Revolving fund (liquidating programs). This will allow the program to be terminated and any expenses necessary to complete the orderly liquidation of the program will be funded by the Revolving fund (liquidating programs).

### RESCISSION OF FUNDS

Pursuant to Clause 1(b), Rule X of the House of Representatives, the following statement is made describing the rescission of funds provided for in the accompanying bill.

The committee recommends the proposed rescission of not more than \$93,326,000 of contract authority under the rent supplement program in the Department of Housing and Urban Development. The Department intends to convert the remaining 65,000 rent supplement units in insured projects to the section 8 program by the end of 1984. Thus, authority previously provided for units under the rent supplement program will be recaptured and is no longer required.

The committee also recommends the proposed rescission of not more than \$13,320,000 in contract authority under the rental housing assistance program in the Department of Housing and Urban Development. The Department proposes to convert projects under the rental assistance payments program to the section 8 program. This process is expected to be completed in 1984 with the conversion of the final 8,000 units. Therefore, authority previously provided for these units under the rental housing assistance program will be recaptured and is no longer required.

### 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 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 occurs, 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 \$54,191,352,000. This is \$9,462,093,104 above the President's request. Included in the total recommended are funds for veterans benefits, assisted housing, community development grants and environmental programs. 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.

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 Consumer Product Safety Commission, the Environmental Protection Agency, the Federal Emergency Management Agency, the National Aeronautics and Space Administration, the National Science Foundation and the Neighborhood Reinvestment Corporation.

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

The bill provides that several appropriations shall remain available for more than one year 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 the funds.

The committee has included limitations for official reception and representation expenses for selected agencies in the bill.

The bill contains administrative provisions under the Veterans Administration. Some of these provisions could possibly be construed as changing the application of existing law.

Sections 401 through 415 of title IV of the bill, all of which are carried in the 1983 HUD-Independent Agencies Appropriation Act, are general provisions 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.

The bill includes, in certain instances, limitations on the obligation of funds for particular functions or programs. These limitations include restrictions on the obligation of funds for administrative expenses, the use of consultants, and programmatic areas within the overall jurisdiction of a particular agency.

The language on pages 20 and 21, in connection with research and development, limits funds for certain projects without the approval of the Committees on Appropriations.

The provisions on pages 23 and 24, in connection with research and related activities, provide for the use of receipts from other research facilities and could require proportional reductions in legislative earmarkings.

The language on page 24, in connection with research and related activities, which limits and earmarks various program activities, could be construed as changing the application of existing law.

The provision on page 25, in connection with science education activities, could require proportional reductions in legislative earmarkings.

The provision on page 26, in connection with the Neighborhood Reinvestment Corporation, prohibits the use of funds for certain activities.

The provision on page 26, in connection with the Selective Service System, permits the President to exempt the agency from apportionment restrictions of the Budget and Accounting Act of 1921.

The appropriation language for general operating expenses on page 29 provides for reimbursement to the Department of Defense for the cost of overseas employee mail. This language has been carried previously, and permits free mailing privileges for VA personnel stationed in the Philippines.

The language on page 30, in connection with construction, major projects, which limits the use of advance planning funds, could be construed as changing the application of existing law.

The appropriation language for construction, minor projects, on page 30 provides that unobligated balances of previous appropriations may be used for any project with an estimated cost of less than \$2,000,000.

The appropriation language on page 32, in connection with the direct loan revolving fund, limits loans and permits mortgage assistance and could, under certain circumstances, be construed as changing the application of existing law.

The language on page 35, in connection with the limitations on administrative and nonadministrative expenses, requires the approval of the Committees on Appropriations for certain reprogrammings.

COMPARISON WITH BUDGET RESOLUTION

Section 308(a)(1)(A) of the Congressional Budget and Impoundment Control Act of 1974 (Public Law 93-344) requires that the report accompanying a bill providing new budget authority contain a statement detailing how that authority compares with the reports submitted under section 302 of the Act for the most recently agreed to current resolution on the budget for the fiscal year. As of the date when this bill was reported, final congressional action on the First Budget Resolution for fiscal year 1984 has not been completed, and it is therefore impossible to comply with this requirement.

The First Budget Resolution for fiscal year 1984 passed the House of Representatives on March 23, 1983. The amounts recommended in the accompanying bill are within the amounts assumed in the House passed Budget Resolution pursuant to section 302 of the Budget Act.

FIVE-YEAR PROJECTION OF OUTLAYS

In accordance with section 308(a)(1)(B) of the Congressional Budget Act of 1974 (Public Law 93-344), the following table contains 5-year projections of the outlays associated with the budget authority provided in the accompanying bill:

Budget authority.....	\$54,191,352,000
Outlays:	
1984.....	30,276,757,000
1985.....	7,857,465,000
1986.....	4,062,031,000
1987.....	2,007,314,000
1988 and future years.....	9,987,785,000

ASSISTANCE TO STATE AND LOCAL GOVERNMENTS

In accordance with section 308(a)(1)(C) of the Congressional Budget Act of 1974 (Public Law 93-344), the new budget authority and outlays provided by the accompanying bill for financial assistance to State and local governments are as follows:

Fiscal year 1984 new budget authority.....	\$18,553,949,000
Fiscal year 1984 outlays resulting therefrom.....	1,160,258,000

Calendar No. 244

98TH CONGRESS } SENATE { REPORT  
1st Session } No. 98-152

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT—  
INDEPENDENT AGENCIES APPROPRIATION BILL, 1984

JUNE 14 (legislative day, JUNE 13), 1983.—Ordered to be printed

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

REPORT

[To accompany H.R. 3133]

The Committee on Appropriations to which was referred the bill (H.R. 3133) making appropriations for the Department of Housing and Urban Development, and for sundry independent agencies, boards, commissions, corporations, and offices for the fiscal year ending September 30, 1984, and for other purposes, reports the same to the Senate with various amendments and presents herewith an explanation of the contents of the bill.

AMOUNT OF NEW BUDGET (OBLIGATIONAL) AUTHORITY

	<i>Fiscal year 1984:</i>
Amount of bill as recommended in House.....	\$54,426,088,000
Amount of change by Committee.....	4,738,390,190
Amount of bill as reported to Senate.....	49,687,697,810
Amount of appropriations to date, 1983.....	49,645,479,889
Amount of budget estimates, 1984.....	44,992,658,896
Over estimates for 1984.....	4,695,038,914
Over appropriations for 1983.....	42,217,921

<sup>1</sup> Excludes \$4,566,700,000 for revenue sharing deferred by the House.

## GENERAL STATEMENT

The Committee recommends new budget (obligational) authority of \$54,254,397,810 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 14 other agencies, commissions, boards, corporations, institutes, and offices. This amount is \$42,217,921 more than the appropriations enacted for fiscal year 1983 and \$4,695,038,914 more than the budget estimate for fiscal year 1984. The Committee notes that the "enacted levels" for fiscal year 1983, shown in the body of the report, assume the enactment of the Supplemental Appropriations Act for fiscal year 1983 (H.R. 3069).

### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

#### RESEARCH AND DEVELOPMENT

(INCLUDING SPACE FLIGHT, CONTROL, AND DATA COMMUNICATIONS)

1983 appropriation .....	\$5,542,800,000
1984 budget estimate .....	5,708,500,000
House allowance .....	5,803,500,000
Committee recommendation .....	5,793,500,000

The Committee recommends an appropriation of \$5,793,500,000 for research and development activities. This amount is \$85,000,000 more than the budget estimate and \$10,000,000 less than the House allowance.

#### PROGRAM DESCRIPTION

The objectives of the National Aeronautics and Space Administration (NASA) program of research and development are to extend our knowledge of the Earth, its space environment, and the universe; to expand the practical applications of space technology; to develop, operate, and improve manned and unmanned space vehicles; to provide technology for improving the performance of aeronautical vehicles while minimizing their environmental effects and energy consumption; and to assure continued development of the aeronautics and space technology necessary to accomplish national goals. The research and development program at NASA consists of the following activities:

*Space transportation systems (STS).*—This activity provides all of the transportation and associated capabilities required to conduct space operations. The major focus of NASA's space transportation program is the Space Shuttle—the first reusable space vehicle and the principal element of a versatile space transportation system designed to provide domestic and international users with round trip access to space for the 1980's and beyond. The operational era of the Space Shuttle was initiated in fiscal year 1983. Operational activities in fiscal year 1984 will support eight to nine flights and procurement, assembly and checkout of the solid rocket boosters, external tanks, and other hardware for

flights in subsequent years. Production activities in fiscal year 1984 will feature the final preparations for the delivery of the fourth flight orbiter in late 1984 and procurement of orbiter structural spares to insure the capability to repair an orbiter in the event of damage. The development of a lighter-weight solid rocket booster will be pursued to provide additional performance for west coast launches of the Space Shuttle. The appropriation will also provide expendable launch vehicles and services to augment the Space Shuttle.

*Space science and applications.*—This program utilizes space systems, supported by airborne and ground-based observations, to conduct scientific investigations of the Earth and its space environment, the Sun, the planets, and interplanetary and interstellar space, and the other stars of our galaxy and universe. Results from these investigations contribute to our understanding of the universe, including the key questions of life, matter, and energy. In addition, this program conducts the research and selected technology developments to encourage the practical application of space technologies to needs on Earth. In fiscal year 1984, work will continue on the development of the space telescope project, the Gamma Ray Observatory, the Galileo project and the international solar polar mission experiments and design and development efforts will be initiated on the Venus radar mapper (VRM) mission to be launched in 1988. Other space science activities will include preparation for the joint NASA/DOD solar maximum mission repair, Spacelab payloads, several explorer projects, and various research efforts. In addition, the space applications research and development will continue to cover the areas of solid Earth observations, environmental observations, materials processing in space, communications, and information systems, which are designed to accelerate and expand the availability and use of technology developed in all NASA programs into the private and public sectors of the economy. Among the major space applications activities planned for fiscal year 1984 are: operation of the Landsat thematic mapper (TM) data processing ground systems and completion of engineering characterization of the TM data; continued development of the Earth radiation budget experiment satellite system in cooperation with other Federal agencies; development of the upper atmospheric research satellite experiments and mission definition; initiation of design and development efforts on the advanced communications technology satellite (ACTS) payload to be launched in 1988; Shuttle/Spacelab payload development; and continued work in the areas of materials processing and communications research and development.

*Technology utilization.*—This program is designed to facilitate the transfer of NASA technology to the nonaerospace industry, as well as State and local governments. During fiscal year 1984, NASA will continue its efforts to help foster widespread dissemination of new technology developed by the Agency's programs.

*Aeronautics and space technology.*—The objectives of the aeronautical research and technology program are the advancement of aeronautical technology base; the maintenance of the long-term competitive position of the United States in the international aviation marketplace; and the

support of the military in maintaining the superiority of the Nation's military aircraft. Specific technology efforts in fiscal year 1984 will continue to be directed toward major improvements in high-performance aircraft and rotorcraft. New initiatives will be undertaken in developing a preeminent numerical aerodynamic simulation capability, an advanced composite structures technology, and technology for the next generation of rotorcraft. The objective of the space research and technology program is to provide the technology base necessary to support current and future space activities, to formulate technology options for the future, and to advance technology required to further reduce the costs of space activities. These activities emphasize the longer-range aspects of generic research and technology development in transportation, spacecraft, and space station systems which are crucial to future U.S. leadership in space.

*Tracking and data acquisition.*—This program provides for continuation of tracking and data acquisition for Earth orbital spacecraft, planetary missions, sounding rockets, and research aircraft. This support is currently provided by a worldwide network of NASA ground stations interconnected by a communications system which provides the capability for instantaneous transmission of data and critical commands between spacecraft and the flight control centers. Facilities are also provided to process into meaningful form the scientific, applications, and engineering data which are collected from flight projects. In 1984, the tracking and data relay satellite system (TDRSS) will become the primary system of support for essentially all Earth orbital spacecraft missions, providing a significant improvement in Earth orbital tracking and data acquisition capabilities. NASA will acquire this capability through an arrangement under which the contractor will establish the system and provide dedicated Government TDRSS services beginning in fiscal year 1983. In the interim, the Agency's spacecraft tracking and data network will support Earth orbital scientific and applications spacecraft and all Shuttle orbital flight tests as well as international missions and missions of other U.S. agencies. The deep space network tracking system will continue to support planetary missions in 1984 and subsequent years.

#### COMMITTEE RECOMMENDATION

The Committee recommends \$5,793,500,000 for this account. This is \$85,000,000 more than the budget request and \$10,000,000 less than the House allowance. The recommendation includes the following increases and decreases from the budget request:

+ \$35,000,000 for engine spares;

+ \$45,000,000 for the Space Telescope. Bill language has also been included capping the 1984 total for telescope development at \$165,600,000, which represents the budget request plus the \$45,000,000 enhancement. It is expected that approximately an additional \$40,000,000 will be required through a reprogramming request in 1984. (This action will increase the total space telescope effort to about \$205,000,000 in 1984);

+ \$20,000,000 for research and analysis in physics and astronomy and planetary programs to be distributed at the Agency's discretion;

– \$3,000,000 from the \$20,000,000 requested for the numerical aerodynamic simulator. The Committee directs NASA to purchase or lease only one mainframe computer for the system during fiscal year 1984 and expects a detailed program plan, including operational milestones, by March 1, 1984;

+ \$10,000,000 for advanced propulsion and composite materials (system technology program) of which not less than \$5,000,000 shall be derived from the aeronautics research and technology activity;

– \$10,000,000 from tracking to be derived from the tracking and data relay satellite system payment to the Federal Financing Bank;

– \$5,000,000 from the suborbital research program—reducing it to about the fiscal year 1983 level;

– \$5,000,000 from Shuttle production and capability development to account for the advanced purchase of a Shuttle training aircraft in fiscal year 1983 rather than in fiscal year 1984;

+ \$2,000,000 for environmental observations, specifically the origin of plasma in Earth's neighborhood and/or the upper atmosphere research satellite programs;

+ \$5,000,000 for materials processing in space;

+ \$1,000,000 for solid state observations program in order to accelerate the development of the multispectral linear array;

+ \$5,000,000 for technology utilization; and

– \$10,000,000 as a general reduction to be taken by the Agency in areas other than those augmented above.

The Committee shares the concern expressed by the House about the development of a clear national policy on the role of commercial space ventures. However, the Committee believes that encouraging the commercial development of expendable launch vehicles is in the national interest and will not adversely affect either the economics of the Space Shuttle system nor detract from the unique capabilities of the Shuttle. The Committee recognizes that, at this stage, the Shuttle flight rate is not based on a demand model and, consequently, maintaining a high flight rate is contingent on a policy decision to encourage utilization of this national resource. The Committee encourages the use of this induced traffic model approach in determining the flight rate in the future. The availability of commercial expendable launch vehicles provides a potential backup for the Shuttle, in order to reduce scheduling risk. Such a backup capability could actually enhance the appeal of the Shuttle as our primary launch system. The Committee is concerned that the Agency's policies and procedures are not consistent with those expressed by the President on May 16, 1983. The Committee recognizes that certain officials at NASA have been reluctant to adopt this policy in an attempt to shield the Shuttle from potential competition. The Committee believes this attitude has contributed to the confusion in the private sector concerning the future of expendable launch vehicles, has cast serious doubt on the ability of the Shuttle to compete against these older technologies, and brings into question the actual need for additional orbiters. Furthermore, the Committee is dubious about the claims

that higher Shuttle flight rates will lead to a self-supporting system. The Committee has always viewed the Shuttle's ability to increase our access to, and use of, space as a sufficient reason for its development. Of course, a higher flight rate and cost savings that reduce the per flight costs will be supported by the Committee.

Over the last several years, the Committee has explored the role of NASA and the National Science Foundation (NSF) in the area of ground-based astronomy. As a result, NASA and NSF have entered into an agreement concerning the infrared telescope facility at Mauna Kea, Hawaii. The Committee is pleased that a long-range funding plan has been developed for this facility, but is still concerned that the issue of the respective roles of NASA and NSF in astronomy has not been resolved. In particular, the Committee is concerned about the future of the Space Telescope. The Committee expects this facility to be available to the entire astronomy community through a broad-based peer review process. The Committee does not intend to sit idly by while the astronomy program is fractionalized. The Committee expects a joint NASA/NSF report on the process that will be used for the selection of principal investigators by March 1, 1984.

The Committee has divided the traditional research and development account into two accounts. This new structure highlights the operational nature of the Space Shuttle.

The Committee has also included bill language capping the 1984 amounts for the following programs at these levels:

- Space transportation capability development—\$427,400,000;
- Space transportation operations—\$1,570,600,000;
- Space Shuttle production and capability development—\$1,530,000,000;
- Expendable launch vehicles—\$50,000,000;
- Space station—\$14,000,000;
- Tracking and data relay satellite system operations—\$44,000,000;
- Numerical aerodynamic simulator—\$17,000,000; and
- Space Telescope—\$165,600,000.

In reference to the space station, the Committee suggests that NASA devote additional effort to exploring the potential benefits that can be derived through the design of a fully automated space platform. The Committee believes that an evolutionary approach to a manned space station is the most effective way of proceeding. In addition, the Committee expects that the development of an automated platform might lead to significant advancements in pattern recognition, robotics, and artificial intelligence.

Regarding that portion of the space network which consists of the tracking and data relay satellite system (TDRSS), the Committee is aware that the deployment of TDRS-A into its proper operational orbit has been delayed due to unforeseeable technical events thereby jeopardizing the planned start of service date of August 1, 1983. The Committee, during its deliberations of the fiscal year 1983 NASA appropriation, agreed that the fiscal year 1983 appropriation should be made available to NASA to initiate liquidation of its financial liability

under the TDRSS financial arrangement as of the planned start of service date. The Committee views the delayed deployment of TDRS-A in its proper operational orbit due to unforeseeable technical events as not constituting sufficient reason for NASA to not begin liquidating its financial obligations under existing TDRSS financial arrangements.

#### CONSTRUCTION OF FACILITIES

1983 appropriation .....	\$97,500,000
1984 budget estimate .....	150,500,000
House allowance .....	135,500,000
Committee recommendation .....	135,500,000

The Committee recommends an appropriation of \$135,500,000 for facilities activities in fiscal year 1984. This amount is 15,000,000 less than the budget estimate and the same as the House allowance.

#### PROGRAM DESCRIPTION

The construction of facilities account provides for contractual services for repair, rehabilitation, and modification of existing facilities; the construction of new facilities; and acquisition of related facility equipment; the design of facilities projects; and, advance planning related to future facilities needs.

#### COMMITTEE RECOMMENDATION

The Committee recommends \$135,500,000 for the construction of facilities in 1984. This is \$15,000,000 below the budget request and the same as the House allowance. The Committee expects that \$8,400,000 of the reduction will be applied to the reimbursement to GSA for NASA-utilized property at Ellington Air Force Base. The additional \$6,600,000 should be applied at the Agency's discretion to those projects that are unrelated to maintaining or increasing the Shuttle flight rates. The Committee is concerned that several procurements, currently being considered at NASA, would commit the Government to long-term obligations without the benefit of approval through the budget process. Consequently, the Committee has included bill language which would prohibit NASA from entering into long-term contractual arrangements with contractors for the lease or purchase of a contractor-funded facility that would substantially amortize such a facility over a period of time.

#### RESEARCH AND PROGRAM MANAGEMENT

1983 appropriation .....	\$1,197,400,000
1984 budget estimate .....	1,247,500,000
House allowance .....	1,237,500,000
Committee recommendation .....	1,242,500,000

<sup>1</sup>Includes \$28,500,000 in proposed pay supplemental (H.R. 3069).

The Committee recommends an appropriation of \$1,242,500,000 in fiscal year 1984 for research and program management. This amount is \$5,000,000 less than the budget estimate and \$5,000,000 more than the House allowance.

#### PROGRAM DESCRIPTION

The research and program management appropriation supports the performance and management of research, technology, and test activities at NASA installations, and the planning, management, and support of contractor research and development tasks necessary to meet the Nation's objectives in aeronautical and space research. Specifically, this appropriation provides the technical and management capability of the civil service staff needed to conduct the full range of programs for which NASA is responsible; maintains facilities and laboratories in a state of operational capability and manages their use in support of research and development programs; and provides technical and administrative support for the research and development programs at NASA.

#### COMMITTEE RECOMMENDATION

The Committee recommends \$1,242,500,000 for research and program management. This is \$5,000,000 less than the budget request and \$5,000,000 more than the House allowance. The Committee intends that this reduction should be applied to object classifications other than required funds for personnel compensation and benefits, such as contractual and consultant services, travel, and public affairs.

#### TITLE IV—GENERAL PROVISIONS

The Committee concurs with all of the general provisions that were included in the fiscal year 1983 HUD-Independent Agencies Appropriations Act (Public Law 97-272) and were included by the House in this bill (secs. 401-415). The Committee has, however, amended section 401 to permit the use of travel expenses from the Environmental Protection Agency's hazardous substance response trust fund. The Committee has, also, struck two new provisions added on the House floor. These provisions are as follows:

#### COMPLIANCE WITH RULE XVI, PARAGRAPH 7

Rule XVI, paragraph 7 states:

"Every report on general appropriation bills filed by the Committee on Appropriations shall identify with particularity each recommended amendment which proposes an item of appropriation which is not made to carry out the provisions of an existing law, a treaty stipulation, or an act or resolution previously passed by the Senate during that session."

The provision concerning payments to State and local government fiscal assistance trust fund (general revenue sharing) would fall under this rule as well as the new VA job training program included under the readjustment benefits account.

98TH CONGRESS  
1st Session

HOUSE OF REPRESENTATIVES

REPORT  
No. 98-264

#### MAKING APPROPRIATIONS FOR THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AND FOR SUNDRY INDEPENDENT AGENCIES, BOARDS, COMMISSIONS, CORPORATIONS, AND OFFICES

JUNE 23, 1983.—Ordered to be printed

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

#### CONFERENCE REPORT

[To accompany H.R. 3133]

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

The managers on the part of the House and the Senate at the conference of the disagreeing votes of the two Houses on the amendments of the Senate to the bill (H.R. 3133) making appropriations for the Department of Housing and Urban Development, and for sundry independent agencies, boards, commissions, corporations, and offices for the fiscal year ending September 30, 1984, 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:

#### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Amendment Nos. 33 and 34: 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:

*For necessary expenses, not otherwise provided for, including research, development, operations, services, minor construction, maintenance, repair, rehabilitation and modification of real and personal property; 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; including not to exceed (1) \$427,400,000 for space transportation capability development; (2) \$14,000,000 for a space station; (3) \$165,600,000 for space telescope development; (4) \$17,000,000 for Numerical Aerodynamic Simulation; without the approval of the Committees on Appropriations; \$2,011,900,000, to remain available until September 30, 1985.*

SPACE FLIGHT, CONTROL AND DATA COMMUNICATIONS

For necessary expenses, not otherwise provided for, in support of space flight, spacecraft control and communications activities of the National Aeronautics and Space Administration, including operations, production, services, minor construction, maintenance, repair, rehabilitation, and modification of real and personal property; tracking and data relay satellite services as authorized by law; purchase, hire, maintenance and operation of other than administrative aircraft; and including not to exceed (1) \$1,500,000,000 for space shuttle production and capability development; (2) \$1,570,600,000 for space transportation operations; (3) \$50,000,000 for expendable launch vehicles; and (4) not more nor less than \$44,000,000 shall be obligated for space communications operations and maintenance and support associated with the tracking and data relay satellite system, excluding amounts to be obligated for award fees earned on the contract; without the approval of the Committees on Appropriations; \$3,791,600,000 to remain available until September 30, 1985: Provided, That up to 5 per centum of the amount appropriated for "Research and Development" or "Space Flight, Control and Data Communications" may be transferred between such accounts with the approval of Committees on Appropriations.

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

The above amounts include the following changes from the budget:

- + \$50,000,000 for orbiter and engine spares to be held in reserve;
- + \$45,000,000 for the space telescope;
- + \$20,000,000 for research and analysis in physics and astronomy and planetary programs. The conferees expect that the funding level for the HEAO-2 (high energy astrophysical observatory) data analysis effort be maintained at the 1983 level;
- + \$5,000,000 for technology utilization;
- \$3,000,000 from the \$20,000,000 requested for the numerical aerodynamic simulator (NAS) program. The conferees agree in principle with the language in the Senate report concerning the purchase of computers for the NAS program. However, the conferees have no objection to the replacement of existing computer systems outside the NAS program at the Ames laboratory with new mainframe computers;
- + \$15,000,000 for advanced turboprop, composite materials and laminar flow control technology of which not less than \$10,000,000 shall be derived from the aeronautics research and technology activity;
- \$10,000,000 from tracking to be derived from the Tracking and Data Relay Satellite System payment to the Federal Financing Bank;
- \$1,000,000 from sub-orbital research program;
- \$5,000,000 from shuttle production and capability development to offset the advanced purchase of a shuttle training aircraft in fiscal year 1983 rather than fiscal year 1984;
- + \$1,000,000 for environmental observations;
- + \$2,000,000 for materials processing in space;
- + \$1,000,000 for solid state observations; and

- \$15,000,000 as a general unspecified reduction to be applied by the agency in areas other than those augmented above;

Finally, the committee of conference agrees with the new account structure proposed by the Senate which highlights the operational nature of the space shuttle. Transfer authority of up to five percent between the new accounts is provided with approval of the Committees on Appropriations.

Amendment No. 35: 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 prohibiting NASA from entering into long-term contractual arrangements with contractors for the lease or purchase of a contractor-funded facility that would substantially amortize such a facility over a period of time.

Amendment No. 36: Appropriates \$1,238,500,000 for research and program management, instead of \$1,237,500,000 as proposed by the House and \$1,242,500,000 as proposed by the Senate.

PUBLIC LAW 98-45—JULY 12, 1983

Public Law 98-45  
98th Congress

An Act

Making appropriations for the Department of Housing and Urban Development, and for sundry independent agencies, boards, commissions, corporations, and offices for the fiscal year ending September 30, 1984, 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 agencies, boards, commissions, corporations, and offices for the fiscal year ending September 30, 1984, and for other purposes, namely:

TITLE II

INDEPENDENT AGENCIES

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; 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; including not to exceed (1) \$427,400,000 for space transportation capability development; (2) \$14,000,000 for a space station; (3) \$165,600,000 for space telescope development; (4) \$17,000,000 for Numerical Aerodynamic Simulation; without the approval of the Committees on Appropriations; \$2,011,900,000, to remain available until September 30, 1985.

SPACE FLIGHT, CONTROL AND DATA COMMUNICATIONS

For necessary expenses, not otherwise provided for; in support of space flight, spacecraft control and communications activities of the National Aeronautics and Space Administration, including operations, production, services, minor construction, maintenance, repair, rehabilitation, and modification of real and personal property; tracking and data relay satellite services as authorized by law; purchase, hire, maintenance and operation of other than administrative aircraft; and including not to exceed (1) \$1,500,000,000 for space shuttle production and capability development; (2) \$1,570,600,000 for space transportation operations; (3) \$50,000,000 for expendable launch vehicles; and (4) not more nor less than \$44,000,000 shall be obligated for space communications operations and maintenance and support associated with the tracking and data relay satellite system, excluding amounts to be obligated for award fees earned on the contract; without the approval of the Committees

on Appropriations; \$3,791,600,000, to remain available until September 30, 1985: *Provided*, That up to 5 per centum of the amount appropriated for "Research and Development" or "Space Flight, Control and Data Communications" may be transferred between such accounts with the approval of the Committees on Appropriations.

CONSTRUCTION OF FACILITIES

For construction, repair, 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, \$135,500,000, to remain available until September 30, 1986: *Provided*, That, notwithstanding the limitation on the availability of funds appropriated under this heading 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 repair, rehabilitation and modification of facilities, minor construction of new facilities and additions to existing facilities, and facility planning and design: *Provided further*, That no amount appropriated pursuant to this or any other Act may be used for the lease or construction of a new contractor-funded facility for exclusive use in support of a contract or contracts with the National Aeronautics and Space Administration under which the Administration would be required to substantially amortize through payment or reimbursement such contractor investment, unless an appropriation Act specifies the lease or contract pursuant to which such facilities are to be constructed or leased or such facility is otherwise identified in such Act: *Provided further*, That the Administrator may authorize such facility lease or construction, with the approval of the Committees on Appropriations if he determines that deferral of such action until the enactment of the next appropriation Act would be inconsistent with the interest of the Nation in aeronautical and space activities.

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; lease, 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 \$75,000 per project for construction of new facilities and additions to existing facilities, repairs, and rehabilitation and modification of facilities; \$1,238,500,000: *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 \$35,000 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 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; to travel performed in connection with major disasters or emergencies declared or determined by the President under the provisions of the Disaster Relief Act of 1974 to site-related travel performed in connection with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980; or to payments to interagency motor pools where separately set forth in the budget schedules.

SEC. 402. Appropriations and funds available for the administrative expenses of the Department of Housing and Urban Development and the Selective Service System shall be available in the current fiscal year for purchase of uniforms, or allowances therefor, as authorized by law (5 U.S.C. 5901-5902); hire of passenger motor vehicles; and services as authorized by 5 U.S.C. 3109.

SEC. 403. Funds of the Department of Housing and Urban Development subject to the Government Corporation Control Act or section 402 of the Housing Act of 1950 shall be available, without regard to the limitations on administrative expenses, for legal services on a contract or fee basis, and for utilizing and making payment for services and facilities of Federal National Mortgage Association, Government National Mortgage Association, Federal Home Loan Mortgage Corporation, Federal Financing Bank, Federal Reserve banks or any member thereof, Federal home loan banks, and any insured bank within the meaning of the Federal Deposit Insurance Corporation Act, as amended (12 U.S.C. 1811-1831).

SEC. 404. No part of any appropriation contained in this Act shall remain available for obligation beyond the current fiscal year unless expressly so provided herein.

SEC. 405. 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

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

SEC. 406. 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 limitation.

SEC. 407. 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 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.

SEC. 408. None of the funds provided in this Act may be used, directly or through grants, to pay or to provide reimbursement for payment of the salary 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.

SEC. 409. No part of any appropriation contained in this Act for personnel compensation and benefits shall be available for other object classifications set forth in the budget estimates submitted for the appropriations without the approval of the Committees on Appropriations.

SEC. 410. None of the funds in this Act shall be used to pay the expenses of, or otherwise compensate, non-Federal parties intervening in regulatory or adjudicatory proceedings. Nothing herein affects the authority of the Consumer Product Safety Commission pursuant to section 7 of the Consumer Product Safety Act (15 U.S.C. 2056 et seq.).

SEC. 411. Except as otherwise provided under existing law or under an existing Executive order issued pursuant to an existing law, the obligation or expenditure of any appropriation under this Act for contracts for any consulting service shall be limited to contracts which are (1) a matter of public record and available for public inspection, and (2) thereafter included in a publicly available list of all contracts entered into within twenty-four months prior to the date on which the list is made available to the public and of all contracts on which performance has not been completed by such date. The list required by the preceding sentence shall be updated quarterly and shall include a narrative description of the work to be performed under each such contract.

SEC. 412. Except as otherwise provided by law, no part of any appropriation contained in this Act shall be obligated or expended by any executive agency, as referred to in the Office of Federal Procurement Policy Act (41 U.S.C. 401 et seq.) for a contract for services unless such executive agency (1) has awarded and entered into such contract in full compliance with such Act and the regulations promulgated thereunder and (2) requires any report prepared pursuant to such contract, including plans, evaluations, studies, analyses and manuals, and any report prepared by the agency which is substantially derived from or substantially includes any report prepared pursuant to such contract, to contain information concerning (A) the contract pursuant to which the report was prepared and (B) the contractor who prepared the report pursuant to such contract.

SEC. 413. No part of any appropriation contained in this Act shall be available to implement, administer, or enforce any regulation

which has been disapproved pursuant to a resolution of disapproval duly adopted in accordance with the applicable law of the United States.

SEC. 414. Except as otherwise provided in section 406, none of the funds provided in this Act to any department or agency shall be obligated or expended to provide a personal cook, chauffeur, or other personal servants to any officer or employee of such department or agency.

SEC. 415. None of the funds provided in this Act to any department or agency shall be obligated or expended to procure passenger automobiles as defined in 15 U.S.C. 2001 with an EPA estimated miles per gallon average of less than 22 miles per gallon.

This Act may be cited as the "Department of Housing and Urban Development-Independent Agencies Appropriation Act, 1984".

Approved July 12, 1983.

LEGISLATIVE HISTORY—H.R. 3123:

HOUSE REPORTS: No. 98-223 (Comm. on Appropriations) and No. 98-264 (Comm. of Conference).

SENATE REPORT No. 98-152 (Comm. on Appropriations),  
CONGRESSIONAL RECORD, Vol. 129 (1983):

June 1, 2, considered and passed House.

June 21, considered and passed Senate, amended.

June 29, House agreed to conference report; receded from its disagreement and concurred in certain Senate amendments and in others with amendments.  
Senate agreed to conference report and concurred in House amendments.

PUBLIC LAW 98-181—NOV. 30, 1983

97 STAT. 1153

Public Law 98-181  
98th Congress

An Act

Making supplemental appropriations for the fiscal year ending September 30, 1984,  
and for other purposes.

Nov. 30, 1983  
[H.R. 3959]

*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 provide supplemental appropriations for the fiscal year ending September 30, 1984, and for other purposes, namely:

Supplemental  
Appropriations  
Act, 1984

TITLE I

CHAPTER I

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONSTRUCTION OF FACILITIES

For an additional amount for "Construction of facilities", \$20,000,000, to remain available until September 30, 1986, for partial funding of the construction of facilities at the John F. Kennedy Space Center for the Solid Rocket Booster assembly and refurbishment contractor and for warehousing to be used by the Shuttle processing contractor: *Provided*, That with the funds appropriated under the "Space flight, control and data communications" account in the 1984 Housing and Urban Development-Independent Agencies Appropriation Act (Public Law 98-45), NASA may enter into a contract with Morton Thiokol, Inc., to amortize the Thiokol Casting Pit Covers over a twelve-year period for a total cost of not to exceed \$23,000,000 under the authority granted under Public Law 98-45.

Ante. p. 219.