NASA
National Aeronautics and
Space Administration

Chronological History
Fiscal Year 1986
Budget Submission

Prepared by:

Comptroller
Institutional Program Analysis Division
Code BI

APR 25 1986

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1986

Item	Statistics	LEGISLATIVE REFERENCE: AUTHORIZATION PAGE NUMBERS: House Auth Comm	Senate Auth Comm	Conference Comm (Auth)	P.L. 99-170	APPROPRIATION PAGE NUMBERS: House Approp Comm	Senate Approp Comm	Conference Comm (Approp)	P.L. 99-160	P.L. 99-177
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Research and Development	1,2,3	7,8,20	31	61	61	65,66	70-73,75	76	76	---
Space Station	2,3	13,14	31	---	---	---	---	---	---	---
Space Transportation Capability Development	2,3	8	33-35	---	---	---	---	---	---	---
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Life Sciences	2,3	---	39,40	---	---	---	---	---	---	---
Planetary Exploration	2,3	---	40-43	---	---	---	---	---	---	---
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Technology Utilization	2,4	---	48	---	---	---	---	---	---	---
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Aeronautical Research and Technology	2,4	10	49-52	---	---	---	---	---	---	---
Space Research and Technology	2,4	---	52	---	---	---	---	---	---	---
Tracking and Data Advanced Systems	2,4	---	52	---	---	---	---	---	---	---
Space Flight, Control and Data Communications	2,4	7,10,20	52	61	61	66,67	73,74	76	76	---
Space Shuttle Production and Operational Capability	2,4	10,11	52-54	---	---	---	---	---	---	---
Space Transportation Operations	2,4,5	11	54,55	---	---	---	---	---	---	---
Space and Ground Network Communications and Data Systems	2,5	11	55-57	---	---	---	---	---	---	---
Construction of Facilities	2,5,6	7,11,20,21	57	61	61	67	74	77	77	---
Space Flight Facilities	2,5	20	57	---	---	---	---	---	---	---
Space Shuttle Payload Facilities	2,5	20	57	---	---	---	---	---	---	---
Ames Research Center	2,5	20	57	---	---	---	---	---	---	---
Goddard Space Flight Center	2,5	20	57	---	---	---	---	---	---	---
Jet Propulsion Laboratory	2,5	20,21	57	---	---	---	---	---	---	---
Langley Research Center	2,5	20	57	---	---	---	---	---	---	---
Various Locations	2,6	21	57	---	---	---	---	---	---	---
Repair	2,6	21	57	---	---	---	---	---	---	---
Rehabilitation and Modification	2,6	21	57	---	---	---	---	---	---	---
Minor Construction	2,6	21	57	---	---	---	---	---	---	---
Facility Planning and Design	2,6	21	57	---	---	---	---	---	---	---
Research and Program Management	2,6	7,11,21	57-58	61	61	67	74	77	77	---
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Prepared by:
Comptroller
Institutional Program Analysis Division
Code BI 453-2212

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1986 Budget Submission
(In thousands of dollars)

	AUTHORIZATION							APPROPRIATION						
Item	Initial Budget Submission to Congress	House Comm. H.R. 1714 Rpt. 99-32 3-28-85 Appd. 3-28-85	House Floor H.R. 1714 Rpt. 99-32 3-28-85 Appd. 4-2-85	Senate Comm. H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-24-85	Senate Floor H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-27-85	Conf. Comm. P.L. 99-170 Rpt. 99-379 11-19-85 Appd. 12-5-85	Difference From Budget Submission	House Comm. H.R. 3038 Rpt. 99-212 7-18-85 Appd. 7-18-85	House Floor H.R. 3038 Rpt. 99-212 7-25-85 Appd. 7-25-85	Senate Comm. H.R. 3038 Rpt. 99-129 8-28-85 Appd. 8-28-85	Senate Floor H.R. 3038 Rpt. 99-129 10-18-85 Appd. 10-18-85	Conf. Comm. P.L. 99-160 Rpt. 99-363 11-8-85 Appd. 11-25-85	Difference From Budget Submission	Difference From Budget Authorization
Total Appropriations:														
Research and Development	2,881,800	2,862,800	2,862,800	2,755,800	2,755,800	2,786,800	-95,000	2,756,800	2,756,800	2,790,800	2,745,300	2,756,800	-125,000	-30,000
Space Flight, Control and Data Communications	3,509,900	3,529,900	3,529,900	3,386,900	3,386,900	3,372,900	-137,000	3,402,900	3,402,900	3,412,900	3,345,700	3,397,900	-112,000	25,000
Construction of Facilities	149,300	148,300	148,300	139,300	139,300	139,300	-10,000	139,300	139,300	141,300	139,700	139,300	-10,000	---
Research and Program Management	1,345,000	1,345,000	1,300,000	1,370,000	1,370,000	1,367,000	22,000	1,367,000	1,367,000	1,370,000	1,339,900	1,362,000	17,000	-5,000
Undistributed	---	---	-330,300 1/	---	---	---	---	---	---	---	---	---	---	---
Total, NASA	7,886,000	7,886,000	7,510,700	7,652,000	7,652,000	7,666,000	-220,000	7,666,000	7,666,000	7,715,000	7,570,600	7,656,000	-230,000	-10,000
R&D Appropriation:														
OSS	230,000	230,000	230,000	200,000	200,000	205,000	-25,000	200,000	200,000	210,000	205,000	205,000	-25,000	---
OSF	459,300	444,300	444,300	477,200	477,200	437,300	-22,000	444,300	444,300	444,300	444,300	439,300	-20,000	2,000
OSSA	1,613,200	1,619,200	1,619,200	1,533,400	1,533,400	1,580,200	-33,000	1,546,200	1,546,200	1,565,200	1,555,200	1,547,200	-66,000	-33,000
OAST	522,000	522,000	522,000	504,400	504,400	520,000	-2,000	522,000	522,000	522,000	522,000	522,000	---	2,000
OSTDS	16,200	16,200	16,200	14,800	14,800	16,200	---	16,200	16,200	16,200	16,200	16,200	---	---
OCP	41,100	31,100	31,100	26,000	26,000	28,100	-13,000	28,100	28,100	33,100	33,100	28,100	-13,000	---
Undistributed Reduction of 1.1%	---	---	---	---	---	---	---	---	---	---	-30,500 2/	---	---	---
General Reduction	---	---	---	---	---	---	---	---	---	---	---	-1,000	-1,000	-1,000
Total, R&D	2,881,800	2,862,800	2,862,800	2,755,800	2,755,800	2,786,800	-95,000	2,756,800	2,756,800	2,790,800	2,745,300	2,756,800	-125,000	-30,000
SFC&DC Appropriation:														
OSTS	2,701,600	2,726,600	2,726,600	2,641,600	2,641,600	2,671,600	-30,000	2,701,600	2,701,600	2,701,600	2,681,600	2,701,600	---	30,000
OSTDS	808,300	803,300	803,300	745,300	745,300	701,300	-107,000	701,300	701,300	711,300	701,300	701,300	-107,000	---
Undistributed Reduction of 1/1%	---	---	---	---	---	---	---	---	---	---	-37,200 2/	---	---	---
General Reduction	---	---	---	---	---	---	---	---	---	---	---	-5,000	-5,000	-5,000
Total, SFC&DC	3,509,900	3,529,900	3,529,900	3,386,900	3,386,900	3,372,900	-137,000	3,402,900	3,402,900	3,412,900	3,345,700	3,397,900	-112,000	25,000
CoF Appropriation:														
OSF	31,100	31,100	31,100	31,100	31,100	31,100	---	31,100	31,100	24,600	24,600	31,100	---	---
OSSA	20,700	20,700	20,700	20,700	20,700	20,700	---	20,700	20,700	20,700	20,700	20,700	---	---
OAST	13,100	13,100	13,100	13,100	13,100	13,100	---	13,100	13,100	13,100	13,100	13,100	---	---
OSTDS	17,400	17,400	17,400	17,400	17,400	17,400	---	17,400	17,400	17,400	17,400	17,400	---	---
OM	67,000	67,000	67,000	67,000	67,000	67,000	---	67,000	67,000	67,000	67,000	67,000	---	---
Congressional Action	---	-1,000	-1,000	-10,000	-10,000	-10,000	-10,000	-10,000	-10,000	-1,500	-3,100	-10,000	-10,000	---
Total, CoF	149,300	148,300	148,300	139,300	139,300	139,300	-10,000	139,300	139,300	141,300	139,700	139,300	-10,000	---
R&PM Appropriation:	1,345,000	1,345,000	1,300,000	1,370,000	1,370,000	1,367,000	22,000	1,367,000	1,367,000	1,370,000	1,339,900	1,362,000	17,000	-5,000
Undistributed	---	---	-330,300 1/	---	---	---	---	---	---	---	---	---	---	---
TOTAL, NASA	7,886,000	7,886,000	7,510,700	7,652,000	7,652,000	7,666,000	-220,000	7,666,000	7,666,000	7,715,000	7,570,600	7,656,000	-230,000	-10,000

1/ Undistributed reduction to freeze 86 budget at 85 level.
2/ Undistributed reduction of 1.1%

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1986 Budget Submission
(In thousands of dollars)

		AUTHORIZATION							APPROPRIATION						
	Item	Initial Budget Submission to Congress	House Comm. H.R. 1714 Rpt. 99-32 3-28-85 Appd. 3-28-85	House Floor H.R. 1714 Rpt. 99-32 3-28-85 Appd. 4-2-85	Senate Comm. H.R. 1714 Rpt. 99-51 6-24-85 Appd. 6-24-85	Senate Floor H.R. 1714 P.L. 99-71 6-24-85 Appd. 6-27-85	Conf. Comm. P.L. 99-170 Rpt. 99-370 11-19-85 Appd. 12-5-85	Difference From Budget Submission	House Comm. H.R. 3038 Rpt. 99-212 7-18-85 Appd. 7-18-85	House Floor H.R. 3038 Rpt. 99-212 7-25-85 Appd. 7-25-85	Senate Comm. H.R. 3038 Rpt. 99-129 8-28-85 Appd. 8-28-85	Senate Floor H.R. 3038 Rpt. 99-129 10-18-85 Appd. 10-18-85	Conf. Comm. P.L. 99-160 Rpt. 99-363 11-8-85 Appd. 11-25-85	Difference From Budget Submission	Difference From Budget Authorization
	Research and Development.....	2,881,800	2,862,800	2,862,800	2,755,800	2,755,800	2,786,800	-95,000	2,756,800	2,756,800	2,790,800	2,745,300	2,756,800	-125,000	-30,000
253	Space Station.....	230,000	230,000	230,000	200,000	200,000	205,000	-25,000	200,000	200,000	210,000	205,000	205,000	-25,000	---
253	Space Transportation Capability Development....	459,300	444,300	444,300	477,200	477,200	437,300	-22,000	444,300	444,300	444,300	444,300	439,300	-20,000	2,000
254	Physics and Astronomy.....	630,400	637,400	637,400	608,400	608,400	620,400	-10,000	605,400	605,400	620,400	610,400	605,400	-25,000	-15,000
254	Life Sciences.....	72,000	72,000	72,000	68,000	68,000	68,000	-4,000	68,000	68,000	70,000	70,000	68,000	-4,000	---
254	Planetary Exploration.....	359,000	359,000	359,000	349,000	349,000	354,000	-5,000	354,000	354,000	354,000	354,000	354,000	-5,000	---
254	Space Applications.....	551,400	550,800	550,800	508,000	508,000	537,800	-14,000	518,800	518,800	520,800	520,800	519,800	-32,000	-18,000
254	Technology Utilization.....	11,100	11,100	11,100	9,500	9,500	11,100	---	11,100	11,100	11,100	11,100	11,100	---	---
254	Commercial Use of Space.....	30,000	20,000	20,000	16,500	16,500	17,000	-13,000	17,000	17,000	22,000	22,000	17,000	-13,000	---
402	Aeronautical Research and Technology.....	354,000	354,000	354,000	350,400	350,400	354,000	---	354,000	354,000	354,000	354,000	354,000	---	---
254	Space Research and Technology.....	168,000	168,000	168,000	154,000	154,000	166,000	-2,000	168,000	168,000	168,000	168,000	168,000	---	2,000
255	Tracking and Data Advanced Systems.....	16,200	16,200	16,200	14,800	14,800	16,200	---	16,200	16,200	16,200	16,200	16,200	---	---
	Undistributed Reduction of 1/1%.....	---	---	---	---	---	---	---	---	---	---	-30,500[2/]	---	---	---
	General Reduction.....	---	---	---	---	---	---	---	---	---	---	---	-1,000	-1,000	-1,000
	Space Flight, Control and Data Communications.....	3,599,900	3,529,900	3,529,900	3,386,900	3,386,900	3,372,900	-137,000	3,402,900	3,402,900	3,412,900	3,345,700	3,397,900	-112,000	25,000
253	Space Shuttle Production and Operational Capability	976,500	1,011,500	1,011,500	941,500	941,500	961,500	-15,000	976,500	976,500	976,500	956,500	976,500	---	15,000
253	Space Transportation Operations.....	1,725,100	1,715,100	1,715,100	1,700,100	1,700,100	1,710,100	-15,000	1,725,100	1,725,100	1,725,100	1,725,100	1,725,100	---	15,000
255	Space and Ground Network, Communications and Data Systems.....	808,300	803,300	803,300	745,300	745,300	701,300	-107,000	701,300	701,300	711,300	701,300	701,300	-107,000	---
	Undistributed Reduction of 1.1%.....	---	---	---	---	---	---	---	---	---	---	-37,200[2/]	---	---	---
	General Reduction.....	---	---	---	---	---	---	---	---	---	---	---	-5,000	-5,000	-5,000
	Construction of Facilities.....	149,300	148,300	148,300	139,300	139,300	139,300	-10,000	139,300	139,300	141,300	139,700	139,300	-10,000	---
	Space Flight Facilities.....	29,900	29,900	29,900	29,900	29,900	29,900	---	29,900	29,900	23,400	23,400	29,900	---	---
	Space Shuttle Payload Facilities.	1,200	1,200	1,200	1,200	1,200	1,200	---	1,200	1,200	1,200	1,200	1,200	---	---
	Ames Research Center.....	8,200	8,200	8,200	8,200	8,200	8,200	---	8,200	8,200	8,200	8,200	8,200	---	---
	Goddard Space Flight Center.....	11,800	11,800	11,800	11,800	11,800	11,800	---	11,800	11,800	11,800	11,800	11,800	---	---
	Jet Propulsion Laboratory.....	8,900	8,900	8,900	8,900	8,900	8,900	---	8,900	8,900	8,900	8,900	8,900	---	---
	Langley Research Center.....	4,900	4,900	4,900	4,900	4,900	4,900	---	4,900	4,900	4,900	4,900	4,900	---	---
	Various Locations.....	17,400	17,400	17,400	17,400	17,400	17,400	---	17,400	17,400	17,400	17,400	17,400	---	---
	Repair.....	22,000	22,000	22,000	22,000	22,000	22,000	---	22,000	22,000	22,000	22,000	22,000	---	---
	Rehabilitation and Modification..	27,000	27,000	27,000	27,000	27,000	27,000	---	27,000	27,000	27,000	27,000	27,000	---	---
	Minor Construction.....	6,000	6,000	6,000	6,000	6,000	6,000	---	6,000	6,000	6,000	6,000	6,000	---	---
	Facility Planning and Design.....	12,000	12,000	12,000	12,000	12,000	12,000	---	12,000	12,000	12,000	12,000	12,000	---	---
	Congressional Action.....	---	-1,000	-1,000	-10,000	-10,000	-10,000	-10,000	-10,000	-10,000	-1,500	-3,100	-10,000	-10,000	---
	Research and Program Management....	1,345,000	1,345,000	1,300,000	1,370,000	1,370,000	1,367,000	22,000	1,367,000	1,367,000	1,370,000	1,339,900	1,362,000	17,000	-5,000
	Undistributed.....	---	---	-330,300[1/]	---	---	---	---	---	---	---	---	---	---	---
	TOTAL, NASA.....	7,886,000	7,886,000	7,510,700	7,652,000	7,652,000	7,666,000	-220,000	7,666,000	7,666,000	7,715,000	7,570,600	7,656,000	-230,000	-10,000

1/ Undistributed reduction to freeze 86 budget at 85 level.
2/ Undistributed reduction of 1.1%.

Chronological History of the FY 1986 Budget Submission
(In thousands of dollars)

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Research and Development	2,881,800	2,862,800	2,862,800	2,755,800	2,755,800	2,786,800	-95,000	2,756,800	2,756,800	2,790,800	2,745,300	2,756,800	-125,000	-30,000
Office of Space Station	230,000	230,000	230,000	200,000	200,000	205,000	-25,000	200,000	200,000	210,000	205,000	205,000	-25,000	---
253 Space Station	230,000	230,000	230,000	200,000	200,000	205,000	-25,000	200,000	200,000	210,000	205,000	205,000	-25,000	---
Utilization	15,000	15,000	15,000	15,000	15,000	15,000	---	15,000	15,000	15,000	15,000	15,000	---	---
Advanced Development	82,000	82,000	82,000	82,000	82,000	82,000	---	82,000	82,000	82,000	82,000	82,000	---	---
Program Management/Integration	52,000	52,000	52,000	52,000	52,000	52,000	---	52,000	52,000	52,000	52,000	52,000	---	---
Operational Readiness	7,000	7,000	7,000	7,000	7,000	7,000	---	7,000	7,000	7,000	7,000	7,000	---	---
Systems Definition	74,000	74,000	74,000	74,000	74,000	74,000	---	74,000	74,000	74,000	74,000	74,000	---	---
Congressional Action	---	---	---	-30,000	-30,000	-25,000	-25,000	-30,000	-30,000	-20,000	-25,000	-25,000	-25,000	---
Office of Space Flight	459,300	444,300	444,300	477,200	477,200	437,300	-22,000	444,300	444,300	444,300	444,300	439,300	-20,000	2,000
253 Space Transportation Capability Development	459,300	444,300	444,300	477,200	477,200	437,300	-22,000	444,300	444,300	444,300	444,300	439,300	-20,000	2,000
Spacelab	96,700	91,700	91,700	96,700	96,700	96,700	---	96,700	96,700	96,700	96,700	96,700	---	---
Upper Stages	122,000	122,000	122,000	174,400	174,400	122,000	---	122,000	122,000	122,000	122,000	122,000	---	---
Engineering and Technical Base	109,700	109,700	109,700	109,700	109,700	109,700	---	109,700	109,700	109,700	109,700	109,700	---	---
Payload Operations and Support Equipment	63,900	60,900	60,900	63,900	63,900	60,900	-3,000	63,900	63,900	63,900	63,900	63,900	---	-3,000
Advanced Programs	21,000	21,000	21,000	21,000	21,000	21,000	---	21,000	21,000	21,000	21,000	21,000	---	---
Tethered Satellite System	21,000	14,000	14,000	14,000	14,000	14,000	-7,000	21,000	21,000	21,000	21,000	21,000	---	7,000
Orbital Maneuvering Vehicle	25,000	25,000	25,000	10,000	10,000	13,000	-12,000	10,000	10,000	10,000	10,000	10,000	-15,000	3,000
Congressional Action	---	---	---	-12,500	-12,500	---	---	---	---	---	---	---	---	---
General Reduction	---	---	---	---	---	---	---	---	---	---	---	-5,000	-5,000	-5,000
Office of Space Science and Applications	1,613,200	1,619,200	1,619,200	1,533,400	1,533,400	1,580,200	-33,000	1,546,200	1,546,200	1,565,200	1,555,200	1,547,200	-66,000	-33,000
254 Physics and Astronomy	630,400	637,400	637,400	608,400	608,400	620,400	-10,000	605,400	605,400	620,400	610,400	605,400	-25,000	-15,000
Hubble Space Telescope Development	127,800	127,800	127,800	127,800	127,800	127,800	---	127,800	127,800	127,800	127,800	127,800	---	---
Gamma Ray Observatory Development	87,300	87,300	87,300	87,300	87,300	87,300	---	87,300	87,300	87,300	87,300	87,300	---	---
Shuttle/Spacelab Payload Development and Mission Management	135,500	135,500	135,500	120,500	120,500	125,500	-10,000	110,500	110,500	125,500	115,500	110,500	-25,000	-15,000
Explorer Development	55,200	55,200	55,200	55,200	55,200	55,200	---	55,200	55,200	55,200	55,200	55,200	---	---
Mission Operations and Data Analysis	119,900	119,900	119,900	119,900	119,900	119,900	---	119,900	119,900	119,900	119,900	119,900	---	---
Research and Analysis	42,300	49,300	49,300	42,300	42,300	42,300	---	42,300	42,300	42,300	42,300	42,300	---	---
Suborbital Program	62,400	62,400	62,400	62,400	62,400	62,400	---	62,400	62,400	62,400	62,400	62,400	---	---
Congressional Action	---	---	---	-7,000	-7,000	---	---	---	---	---	---	---	---	---
254 Life Sciences	72,000	72,000	72,000	68,000	68,000	68,000	-4,000	68,000	68,000	70,000	70,000	68,000	-4,000	---
Life Sciences Flight Experiments	33,400	33,400	33,400	33,400	33,400	33,400	---	33,400	33,400	33,400	33,400	33,400	---	---
Research and Analysis	38,600	38,600	38,600	38,600	38,600	38,600	---	38,600	38,600	38,600	38,600	38,600	---	---
Congressional Action	---	---	---	-4,000	-4,000	-4,000	-4,000	-4,000	-4,000	-2,000	-2,000	-4,000	-4,000	---
254 Planetary Exploration	359,000	359,000	359,000	349,000	349,000	354,000	-5,000	354,000	354,000	354,000	354,000	354,000	-5,000	---
Galileo Development	39,700	39,700	39,700	39,700	39,700	39,700	---	39,700	39,700	39,700	39,700	39,700	---	---
Venus Radar Mapper	112,000	112,000	112,000	112,000	112,000	112,000	---	112,000	112,000	112,000	112,000	112,000	---	---
Ulysses (ISPM)	5,600	5,600	5,600	5,600	5,600	5,600	---	5,600	5,600	5,600	5,600	5,600	---	---
Mars Observer (MGCO)	43,800	43,800	43,800	33,800	33,800	38,800	-5,000	38,800	38,800	38,800	38,800	38,800	-5,000	---
Mission Operations and Data Analysis	95,000	95,000	95,000	95,000	95,000	95,000	---	95,000	95,000	95,000	95,000	95,000	---	---
Research and Analysis	62,900	62,900	62,900	62,900	62,900	62,900	---	62,900	62,900	62,900	62,900	62,900	---	---

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1986 Budget Submission
(In thousands of dollars)

	Item	Initial Budget Submission to Congress	House Comm. H.R. 1714 Rpt. 99-32 3-28-85 Appd. 3-28-85	House Floor H.R. 1714 Rpt. 99-32 3-28-85 Appd. 4-2-85	Senate Comm. H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-24-85	Senate Floor H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-27-85	Conf. Comm. P.L. 99-170 Rpt. 99-379 11-19-85 Appd. 12-5-85	Difference From Budget Submission	House Comm. H.R. 3038 Rpt. 99-212 7-18-85 Appd. 7-18-85	House Floor H.R. 3038 Rpt. 99-212 7-25-85 Appd. 7-25-85	Senate Comm. H.R. 3038 Rpt. 99-129 8-28-85 Appd. 8-28-85	Senate Floor H.R. 3038 Rpt. 99-129 10-18-85 Appd. 10-18-85	Conf. Comm. P.L. 99-160 Rpt. 99-361 11-8-85 Appd. 11-25-85	Difference From Budget Submission	Difference From Budget Authorization
	AUTHORIZATION														
254	Space Applications	551,800	550,800	550,800	508,000	508,000	537,800	-14,000							
	Solid Earth Observations	74,900	74,900	74,900	70,600	70,600	74,900	---							
	Environmental Observations	317,500	316,500	316,500	291,000	291,000	311,500	-6,000							
	Materials Processing in Space	34,000	34,000	34,000	34,000	34,000	36,000	+2,000							
	Communications	106,200	106,200	106,200	96,200	96,200	101,200	-5,000							
	Information Systems	19,200	19,200	19,200	16,200	16,200	19,200	---							
	General Reduction	---	---	---	---	---	-5,000	-5,000							
	Office of Commercial Programs	41,100	31,100	31,100	26,000	26,000	28,100	-13,000							
254	Technology Utilization	11,100	11,100	11,100	9,500	9,500	11,100	---							
	Technology Dissemination	6,300	6,300	6,300	*	*	6,300	---							
	Technology Applications	4,800	4,800	4,800	*	*	4,800	---							
254	Commercial Use of Space	30,000	20,000	20,000	16,500	16,500	17,000	-13,000							
	Congressional Action	---	---	---	---	---	---	---							
	Office of Aeronautics and Space Technology	522,000	522,000	522,000	504,400	504,400	520,000	-2,000							
402	Aeronautical Research and Technology	354,000	354,000	354,000	350,400	350,400	354,000	---							
	Research and Technology Base	239,300	239,300	239,300	235,700	235,700	239,300	---							
	Systems Technology Programs	114,700	114,700	114,700	114,700	114,700	114,700	---							
254	Space Research and Technology	168,000	168,000	168,000	154,000	154,000	166,000	-2,000							
	Research and Technology Base	140,000	140,000	140,000	140,000	140,000	140,000	---							
	Systems Technology Programs	20,000	20,000	20,000	20,000	20,000	20,000	---							
	Standards and Practices	8,000	8,000	8,000	8,000	8,000	8,000	---							
	Congressional Action	---	---	---	-14,000	-14,000	-2,000	-2,000							
	Office of Space Tracking and Data Systems	16,200	16,200	16,200	14,800	14,800	16,200	---							
255	Advanced Systems	16,200	16,200	16,200	14,800	14,800	16,200	---							
	Undistributed Reduction of 1.1%		---	---	---	---	---	---							
	General Reduction	---	---	---	---	---	---	---							
	Space Flight, Control and Data Communications	3,509,900	3,529,900	3,529,900	3,386,900	3,386,900	3,372,900	-137,000							
	Office of Space Flight	2,701,600	2,726,600	2,726,600	2,641,600	2,641,600	2,671,600	-30,000							
253	Shuttle Production and Operational Capability	976,500	1,011,500	1,011,500	941,500	941,500	961,500	-15,000							
	Orbiter	333,600	378,600	378,600	323,600	323,600	333,600	---							
	Launch and Mission Support	163,900	158,900	158,900	163,900	163,900	158,900	-5,000							
	Propulsion Systems	454,000	454,000	454,000	454,000	454,000	454,000	---							
	Changes and System Upgrading	25,000	20,000	20,000	---	---	15,000	-10,000							
	Congressional Action	---	---	---	---	---	---	---							
253	Space Transportation Operations	1,725,100	1,715,100	1,715,100	1,700,100	1,700,100	1,710,100	-15,000							
	Shuttle Operations	1,725,100	1,715,100	1,715,100	1,700,100	1,700,100	1,710,100	-15,000							
	APPROPRIATION														
	Undistributed Reduction of 1.1%											-30,500 1/			
	General Reduction	---										---	-1,000	-1,000	-1,000
	Space Flight, Control and Data Communications								3,402,900	3,402,900	3,412,900	3,345,700	3,397,900	-112,000	25,000
	Office of Space Flight								2,701,600	2,701,600	2,701,600	2,681,600	2,701,600	---	30,000
253	Shuttle Production and Operational Capability								976,500	976,500	976,500	956,500	976,500	---	15,000
	Orbiter								333,600	333,600	333,600	323,600	333,600	---	---
	Launch and Mission Support								163,900	163,900	163,900	163,900	163,900	---	5,000
	Propulsion Systems								454,000	454,000	454,000	454,000	454,000	---	---
	Changes and System Upgrading								25,000	25,000	25,000	25,000	25,000	---	10,000
	Congressional Action								---	---	---	-10,000	---	---	---
253	Space Transportation Operations								1,725,100	1,725,100	1,725,100	1,725,100	1,725,100	---	15,000
	Shuttle Operations								1,725,100	1,725,100	1,725,100	1,725,100	1,725,100	---	15,000

*No Congressional Direction.

1/ Undistributed Reduction of 1.1%.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1986 Budget Submission
(In thousands of dollars)

Item	Initial Budget Submission to Congress	AUTHORIZATION: House Comm. H.R. 1714 Rpt. 99-32 3-28-85 Appd. 3-28-85	AUTHORIZATION: House Floor H.R. 1714 Rpt. 99-32 3-28-85 Appd. 4-2-85	AUTHORIZATION: Senate Comm. H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-24-85	AUTHORIZATION: Senate Floor H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-27-85	AUTHORIZATION: Conf. Comm. P.L. 99-170 Rpt. 99-379 11-19-85 Appd. 12-5-85	Difference From Budget Submission	APPROPRIATION: House Comm. H.R. 3038 Rpt. 99-212 7-18-85 Appd. 7-18-85	APPROPRIATION: House Floor H.R. 3038 Rpt. 99-212 7-25-85 Appd. 7-25-85	APPROPRIATION: Senate Comm. H.R. 3038 Rpt. 99-129 8-28-85 Appd. 8-28-85	APPROPRIATION: Senate Floor H.R. 3038 Rpt. 99-129 10-18-85 Appd. 10-18-85	APPROPRIATION: Conf. Comm. P.L. 99-160 Rpt. 99-363 11-8-85 Appd. 11-25-85	Difference From Budget Submission	Difference From Budget Authorization
Data Systems	808,300	803,300	803,300	745,300	745,300	701,300	-107,000	701,300	701,300	711,300	701,300	701,300	-107,000	---
255 Space and Ground Network Communications and Data Systems	808,300	803,300	803,300	745,300	745,300	701,300	-107,000	701,300	701,300	711,300	701,300	701,300	-107,000	---
Space Network	400,800	400,800	400,800	341,800	341,800	293,800	-59,000	293,800	293,800	303,800	293,800	293,800	-107,000	---
Ground Network	219,300	219,300	219,300	219,300	219,300	219,300	---	219,300	219,300	219,300	229,300	219,300	---	---
Communications and Data Systems	188,200	188,200	188,200	188,200	188,200	188,200	---	188,200	188,200	188,200	188,200	188,200	---	---
Congressional Action	---	-5,000	-5,000	-4,000	-4,000	---	-4,000	---	---	---	-10,000	---	---	---
Undistributed Reduction of 1.1%	---	---	---	---	---	---	---	---	---	---	-37,200[1/]	---	---	---
General Reduction	---	---	---	---	---	---	---	---	---	---	---	-5,000	-5,000	-5,000
Construction of Facilities	149,300	148,300	148,300	139,300	139,300	139,300	-10,000	139,300	139,300	141,300	139,700	139,300	-10,000	---
253 Space Flight Facilities	29,900	29,900	29,900	29,900	29,900	29,900	---	29,900	29,900	23,400	23,400	29,900	---	---
M-Construction of Orbiter Modification and Refurbishment Facility (KSC)	14,000	14,000	14,000	14,000	14,000	14,000	---	14,000	14,000	14,000	14,000	14,000	---	---
M-Construction of Thermal Protection System Facility (KSC)	3,600	3,600	3,600	3,600	3,600	3,600	---	3,600	3,600	3,600	3,600	3,600	---	---
M-Modifications for Advanced Technology Engine Test Stand S-1C (MSFC)	6,500	6,500	6,500	6,500	6,500	6,500	---	6,500	6,500	---	---	6,500	---	---
M-Modifications for Enhanced Life Support Systems Testing (JSC)	1,100	1,100	1,100	1,100	1,100	1,100	---	1,100	1,100	1,100	1,100	1,100	---	---
M-Modifications to Pad A Payload Change-Out Room (KSC)	2,200	2,200	2,200	2,200	2,200	2,200	---	2,200	2,200	2,200	2,200	2,200	---	---
M-Modifications to Space Shuttle Main Engine support Systems (NSTL)	2,500	2,500	2,500	2,500	2,500	2,500	---	2,500	2,500	2,500	2,500	2,500	---	---
254 Space Shuttle Payload Facilities	1,200	1,200	1,200	1,200	1,200	1,200	---	1,200	1,200	1,200	1,200	1,200	---	---
M-Construction of Payload Control Rooms (KSC)	1,200	1,200	1,200	1,200	1,200	1,200	---	1,200	1,200	1,200	1,200	1,200	---	---
402 Ames Research Center	8,200	8,200	8,200	8,200	8,200	8,200	---	8,200	8,200	8,200	8,200	8,200	---	---
R-Construction of Numerical Aerodynamic Simulation Facility	8,200	8,200	8,200	8,200	8,200	8,200	---	8,200	8,200	8,200	8,200	8,200	---	---
254 Goddard Space Flight Center	11,800	11,800	11,800	11,800	11,800	11,800	---	11,800	11,800	11,800	11,800	11,800	---	---
E-Construction of Additions to Research Projects Laboratory	3,800	3,800	3,800	3,800	3,800	3,800	---	3,800	3,800	3,800	3,800	3,800	---	---
E-Construction of Spacecraft Systems Development and Integration Facility	8,000	8,000	8,000	8,000	8,000	8,000	---	8,000	8,000	8,000	8,000	8,000	---	---
255 Jet Propulsion Laboratory	8,900	8,900	8,900	8,900	8,900	8,900	---	8,900	8,900	8,900	8,900	8,900	---	---
E-Construction of Microdevices Laboratory	8,900	8,900	8,900	8,900	8,900	8,900	---	8,900	8,900	8,900	8,900	8,900	---	---
402 Langley Research Center	4,900	4,900	4,900	4,900	4,900	4,900	---	4,900	4,900	4,900	4,900	4,900	---	---
R-Modifications to 16-Foot Transonic Tunnel for Improved Productivity and Research Capability	4,900	4,900	4,900	4,900	4,900	4,900	---	4,900	4,900	4,900	4,900	4,900	---	---

1/ Undistributed Reduction of 1.1%.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Chronological History of the FY 1986 Budget Submission
(In thousands of dollars)

Item	Initial Budget Submission to Congress	AUTHORIZATION: House Comm. H.R. 1714 Rpt. 99-32 3-28-85 Appd. 3-28-85	AUTHORIZATION: House Floor H.R. 1714 Rpt. 99-32 3-28-85 Appd. 4-2-85	AUTHORIZATION: Senate Comm. H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-24-85	AUTHORIZATION: Senate Floor H.R. 1714 Rpt. 99-91 6-24-85 Appd. 6-27-85	AUTHORIZATION: Conf. Comm. P.L. 99-170 Rpt. 99-379 11-19-85 Appd. 12-5-85	Difference From Budget Submission	APPROPRIATION: House Comm. H.R. 3038 Rpt. 99-212 7-18-85 Appd. 7-18-85	APPROPRIATION: House Floor H.R. 3038 Rpt. 99-212 7-25-85 Appd. 7-25-85	APPROPRIATION: Senate Comm. H.R. 3038 Rpt. 99-129 8-28-85 Appd. 8-28-85	APPROPRIATION: Senate Floor H.R. 3038 Rpt. 99-129 10-18-85 Appd. 10-18-85	APPROPRIATION: Conf. Comm. P.L. 99-160 Rpt. 99-363 11-8-85 Appd. 11-25-85	Difference From Budget Submission	Difference From Budget Authorization
255 Various Locations	17,400	17,400	17,400	17,400	17,400	17,400	---	17,400	17,400	17,400	17,400	17,400	---	---
T-Modification of 64-Meter Antenna DDS-14, Goldstone, California (JPL)	8,500	8,500	8,500	8,500	8,500	8,500	---	8,500	8,500	8,500	8,500	8,500	---	---
T-Modification of 64-Meter Antenna DDS-43, Canberra Australia (JPL)	8,900	8,900	8,900	8,900	8,900	8,900	---	8,900	8,900	8,900	8,900	8,900	---	---
255 N-Repair of Facilities	22,000	22,000	22,000	22,000	22,000	22,000	---	22,000	22,000	22,000	22,000	22,000	---	---
255 N-Rehabilitation and Modification of Facilities	27,000	27,000	27,000	27,000	27,000	27,000	---	27,000	27,000	27,000	27,000	27,000	---	---
255 N-Minor Construction and Additions to Facilities	6,000	6,000	6,000	6,000	6,000	6,000	---	6,000	6,000	6,000	6,000	6,000	---	---
255 N-Facility Planning and Design	12,000	12,000	12,000	12,000	12,000	12,000	---	12,000	12,000	12,000	12,000	12,000	---	---
Congressional Action	---	-1,000	-1,000	-10,000	-10,000	-10,000	-10,000	-10,000	-10,000	-1,500	-3,100	-10,000	-10,000	---
Research and Program Management	1,345,000	1,345,000	1,300,000	1,370,000	1,370,000	1,367,000	22,000	1,367,000	1,367,000	1,370,000	1,339,900	1,362,000	17,000	-5,000
By Installation:														
Johnson Space Center	213,713	213,713	213,713	213,713	213,713	213,713	---	213,713	213,713	213,713	213,713	213,713	---	---
Kennedy Space Center	189,331	189,331	189,331	189,331	189,331	189,331	---	189,331	189,331	189,331	189,331	189,331	---	---
Marshall Space Flight Center	195,805	195,805	195,805	195,805	195,805	195,805	---	195,805	195,805	195,805	195,805	195,805	---	---
National Space Technology Laboratories	11,131	11,131	11,131	11,131	11,131	11,131	---	11,131	11,131	11,131	11,131	11,131	---	---
Goddard Space Flight Center	199,719	199,719	199,719	199,719	199,719	199,719	---	199,719	199,719	199,719	199,719	199,719	---	---
Ames Research Center	123,908	123,908	123,908	123,908	123,908	123,908	---	123,908	123,908	123,908	123,908	123,908	---	---
Langley Research Center	149,059	149,059	149,059	149,059	149,059	149,059	---	149,059	149,059	149,059	149,059	149,059	---	---
Lewis Research Center	139,896	139,896	139,896	139,896	139,896	139,896	---	139,896	139,896	139,896	139,896	139,896	---	---
Headquarters	122,438	122,438	122,438	122,438	122,438	122,438	---	122,438	122,438	122,438	122,438	122,438	---	---
Congressional Action	---	---	-45,000	25,000 1/	25,000 1/	22,000	22,000	22,000	22,000	25,000	-5,100	17,000	17,000	-5,000
By Function:														
Personnel and Related Costs	931,813	931,813	931,813	913,813	931,813	931,813	---	931,813	931,813	931,813	931,813	931,813	---	---
Travel	31,000	31,000	31,000	31,000	31,000	31,000	---	31,000	31,000	31,000	31,000	31,000	---	---
Facilities Services	212,272	212,272	212,272	212,272	212,272	212,272	---	212,272	212,272	212,272	212,272	212,272	---	---
Technical Services	66,071	66,071	66,071	66,071	66,071	66,071	---	66,071	66,071	66,071	66,071	66,071	---	---
Management and Operations Support	103,844	103,844	103,844	103,844	103,844	103,844	---	103,844	103,844	103,844	103,844	103,844	---	---
Congressional Action	---	---	-45,000	25,000 1/	25,000 1/	22,000	22,000	22,000 2/	22,000 2/	25,000 1/	-5,100	17,000	17,000	-5,000

1/ Restoration of pay cut $42 million and a reduction of -$17 million.
2/ Restoration of pay cut $42 million (undistributed); and a reduction of -$20 million.

99TH CONGRESS
1st Session
HOUSE OF REPRESENTATIVES
REPORT
99-32

AUTHORIZING APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FOR FISCAL YEAR 1986

MARCH 28, 1985.—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 AND MINORITY VIEWS

[To accompany H.R. 1714]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was referred the bill (H.R. 1714) to authorize appropriations to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, 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 accompanying this report) and recommends that the bill, as amended, do pass.

The amendments are as follows:

On page 11, strike all of section 107 and renumber the succeeding sections accordingly.

On page 12, line 7, after "Cost Control" insert "and such other recommendations as may be included in the OMB report "Management of the United States Government—1986"

PURPOSE OF BILL

TITLE I

The purpose of title I is to authorize appropriations to the National Aeronautics and Space Administration for fiscal year 1986 as follows:

Programs	Authorization fiscal year 1986	Page No.
Research and development	$2,862,800,000	28
Space flight, control and data analysis	3,529,900,000	156
Construction of facilities	148,300,000	186
Research and program management	1,345,000,000	199
Total	7,886,000,000	216

TITLE II

The purpose of title II is to set a reimbursement pricing policy for the Space Transportation System for commercial and foreign users which is consistent with the objectives of the Space Transportation System and encourages the full and effective use of space.

TITLE III

The purpose of title III is to authorize appropriations to the Department of Transportation to become available October 1, 1985, $586,000 for salaries and expenses of the Office of Commercial Space Transportation.

COMMITTEE AMENDMENTS

SEC. 107 (AS INTRODUCED)

NASA proposed an amendment to the National Aeronautics and Space Act as amended, to provide that any invention made or used in outer space on a space vehicle under the jurisdiction or control of the United States shall be considered made or used in the United States for the purposes of patent law (title 35 of the U.S. Code).

The Committee recommends an amendment to delete this provision (Sec. 107 of H.R. 1714, as introduced). Although the Committee has a long record of support for taking the initiative in improving Federal patent laws to encourage innovation and reward risk-takers, the Committee believes this proposed change to the patent laws deserves greater scrutiny. The Committee feels that a more adequate hearing record on the language is warranted in order to understand the consequences of such a proposal on current domestic patent and other laws.

SEC. 109 (AS REPORTED)

H.R 1714, as introduced, contains a provision to require the NASA Administrator to review those recommendations of the President's Private Sector Survey on Cost Control as are pertinent to NASA and to report to Congress on their implementation status within 90 days of enactment.

The Committee recommends an amendment to this language to require the Administrator additionally to review those recommendations contained in the OMB report "Management of the United States Government—1986" that are pertinent to NASA.

COMMITTEE ACTIONS

TITLE I

RESEARCH AND DEVELOPMENT

SPACE TRANSPORTATION CAPABILITY DEVELOPMENT

NASA requested $459,300,000 for Space Transportation Capability Development activities in fiscal year 1986. The Committee decreased funding for Spacelab activities by $5,000,000; decreased funding for payload operations and support equipment by $3,000,000; and decreased funding for the Tethered Satellite System by $7,000,000 resulting in a total recommended authorization of $444,300,000 in fiscal year 1986.

Spacelab.—NASA requested $96,700,000 for Spacelab activity in fiscal year 1986. This funding category provides for the development and production of Spacelab hardware as well as providing for mission planning, and flight and ground operations for all operational Spacelab missions. Since this program has experienced some delays due to changes in the Space Shuttle launch schedule, a reduction can be sustained with no significant impact. The Committee, therefore, recommends a funding decrease of $5,000,000 resulting in a total authorization of $91,700,000 in fiscal year 1986.

Payload operations and support equipment.—NASA requested $63,900,000 for payload operations and support equipment in fiscal year 1986. The payload operations and support equipment funding provides for the developing and placing into operational status the ground and flight systems necessary to support Space Transportation System payloads during prelaunch processing, on-orbit mission operations, and post-landing processing. Delays in a number of payload flight schedules permit a $3,000,000 funding reduction resulting in a total authorization of $60,900,000 in fiscal year 1986.

Tethered satellite system.—NASA requested $21,000,000 for the Tethered Satellite System in fiscal year 1986. The Tethered Satellite System is a cooperative program with the Italian government that will provide a unique new facility for conducting space experiments at distances of up to 100 kilometers from the Space Shuttle Orbiter while being held in a fixed position relative to the Orbiter. Since some program delays are being encountered in the development of the Italian satellite, funding for the U.S. part of the cooperative effort could be reduced with no overall impact on the program. The Committee therefore recommends a funding decrease of

$7,000,000 resulting in a total authorization of $14,000,000 in fiscal year 1986.

PHYSICS AND ASTRONOMY

NASA requested $630,400,000 for physics and astronomy activities in fiscal year 1986. The Committee increased funding for research and analysis by $7,000,000 resulting in a total recommended authorization of $637,400,000 for fiscal year 1986. The Committee recommends that within available funding for Shuttle/Spacelab Payload Development, $3,000,000 be authorized for development of intermediate-size Shuttle science payloads.

Research and analysis.—NASA requested $42,300,000 for research and analysis in fiscal year 1986. This funding category provides for supporting research and technology in the science disciplines, advanced technology development for future missions, and analysis of data from existing missions. The Committee recommends adding a total of $7 million as described below, resulting in a total recommended authorization of $49,300,000 for fiscal year 1986.

While the Committee acknowledges the budget situation which results in no new starts this year, the Committee also recognizes the importance of new starts in maintaining a healthy space science community. For this reason the Committee has made several additions with a view to facilitating the rapid and low risk development of several missions.

For more than two decades NASA has been conducting advanced technology development on an experiment, Gravity-Probe B, that would test a particular effect predicted by Einstein's general theory of relativity. The effect predicted is very small, so that a delicate and expensive apparatus is needed, and for the same reason the experiment must be done in the zero-gravity conditions of space. With the advent of the Shuttle it is possible to conduct a test on the Shuttle to see if the apparatus will work before committing to the full experiment. The Committee recommends adding $4 million to move the Agency toward the Shuttle test of the relativity experiment.

The Committee is aware that this project proposes to adopt an innovative management approach, and the Committee applauds this. However, part of the reason that the Committee has recommended this addition is the assurance that this management approach will meet not only performance, but also cost and schedule targets. Therefore this will be a test of both the apparatus and also of the management approach, and both must succeed if the experiment is to move to the next phase.

The infant field of x-ray astronomy was invigorated by the High Energy Astronomy Observatory 1 and -2 satellites but they stopped returning data in 1981. NASA plans to follow up this successful start by building the Advanced X-ray Astronomy Facility (AXAF). The advanced x-ray optics of AXAF could present a significant risk to the development program. Therefore, the Committee recommends adding $2 million for continued advanced technology development of AXAF in order to minimize technical uncertainties and to indicate a commitment to the eventual start of development of this mission.

The field of infrared astronomy was revolutionized by the infrared Astronomy Satellite (IRAS, which conducted an all-sky survey from space) and NASA plans to follow with the Space Infrared Telescope Facility (SIRTF). There is a need to develop and test technologies for the maintenance and servicing of this cryogenically cooled telescope so it can be operated for a period of years which would represent a significant improvement over the one-year lifetime of IRAS. Therefore, the Committee recommends adding $1 million for advanced technology development for SIRTF to indicate a commitment to the eventual start of development of this mission.

Shuttle/Spacelab payload development.—NASA requested $135,500,000 for Shuttle/Spacelab Payload Development activities in the Physics and Astronomy program, and the Committee recommends that amount. This funding is to develop and fly science experiments on Shuttle. The Committee recommends that $3 million of these funds be earmarked for development of intermediate size Shuttle payloads. This action is taken in recognition of the importance of such payloads to the university science community, as demonstrated both by testimony and by the report of the NASA Shuttle Science Working Group.

SPACE APPLICATIONS

NASA requested $551,800,000 for space application activties in fiscal year 1986. Within the Environmental Observations activities, the Committee increased funding $4 million for Oceanic processes research and analysis, increased funding $3 million for Space physics research and analysis and decreased funding $8 million for the Scatterometer development, resulting in a total recommended authorization of $550,800,000 for fiscal year 1986.

NASA requested $20,600,000 for oceanic processes research and analysis activities in fiscal year 1986. The Committee recommends an increase of $4 million for the Ocean Topography Experiment (TOPEX) to prepare for an early start on development. TOPEX was planned for a 1990 launch (based on an expected FY 1986 start) in order to have to have maximum overlap with the NROSS satellite and therefore make maximum impact on the World Ocean Climate Experiment (WOCE) and the Tropical Ocean Global Atmosphere (TOGA) research program. An increment to the Oceanic processes research and analysis budget would enable effort to begin the integration of science instruments onto the spacecraft.

NASA requested $17,800,000 for Space physics research and analysis activities in fiscal year 1986. The International Solar Terrestrial Physics (ISTP) program is planned as a six satellite joint program between NASA (three satellites), the European Space Agency (two satellites), and Japan (one satellite). The United States has indicated to its foreign partners an intent to carry out this program, and a new start had been anticipated in fiscal year 1986. A small investment now in detailed studies of science instruments and related engineering tradeoffs could minimize program runout costs and help prevent schedule delays. Therefore, the Committee recom-

mends an increase of $3 million in space physics research and analysis for ISTP to prepare for an early start on development.

NASA requested $31,700,000 for the Scatterometer instrument development activities in fiscal year 1986. The Scatterometer instrument is being developed by NASA for flight on the Navy NROSS oceanographic satellite. The Navy program is being delayed and therefore the NASA program can be allowed to slip slightly. In particular, because the Scatterometer is for the most part well-known technology it should be possible to delay the construction schedule to reduce spending in fiscal year 1986 without a significant impact on total costs. Therefore, the Committee recommends without prejudice a $8 million decrease in the Scatterometer development funding for fiscal year 1986.

COMMERCIAL USE OF SPACE

NASA requested $30,000,000 for the commercial use of space program in fiscal year 1986. The Committee decreased funding for this program by $10,000,000 making a total recommended authorization of $20,000,000 for fiscal year 1986. The Committee fully supports the establishment of NASA's Office of Commercial Programs and NASA's efforts to facilitate the commercial use of space. The Committee believes that the $20,000,000 authorization, which provides for a very significant increase over fiscal year 1985 funding is fully adequate to support the planned activities of this office for the next fiscal year. This office is not yet operating at a fully mature level, having been established in November 1984. Budget justifications presented to the Committee currently exist, in part, in conceptual form. The Committee's recommendation is made to bring the authorization to a level which provides for growth at a more realistic, yet challenging, pace. Part of the challenge posed to this office will be the ability to obtain, prior to the obligation of government funding, a matching commitment from the private sector to support program initiatives. The recommended authorizing level should challenge NASA and the private sector to forge new relationships that will lead toward greater commercial activity in space.

AERONAUTICAL RESEARCH AND TECHNOLOGY

NASA requested $354,000,000 for Aeronautical Research and Technology. This amount represents an increase of 3.5 percent over the Fiscal Year 1985 appropriation.

The Committee is concerned about the long-term budgetary trend which has failed even to keep pace with inflation, much less with the increasing sophistication of aeronautics and heightened competition in world civil aircraft markets. For example, the request for Fiscal Year 1986 is only 15 percent greater than the actual amount spent in Fiscal Year 1980, without considering inflation. Stated in constant 1980 dollars, the budget has declined 16 percent during the same period. Furthermore, the effect of this decline in purchasing power has not been applied uniformly. Since the costs of facility operation (e.g. aircraft fuel, nitrogen gas for the National Transonic Facility) have continued and in fact, have increased, the impact of lower budgets has fallen disproportionately on the support of basic aeronautical research, the seed corn of the next crop of advances in aviation.

The Committee recognizes that overall federal deficits must be brought under control and that each agency and program must contribute by holding down expenses and finding innovative ways to carry out its mission. The Committee appreciates NASA's efforts in this regard and supports the aggregate budget level as requested for Aeronautical Research and Technology.

Within the total amount, the Committee recommends the following changes:

1. Increase the funds applied to Rotorcraft Systems Technology (other than the X-Wing project) by $4.0 million. Funding in this area has declined precipitously in recent years and the Committee feels work should be continued in the areas of noise, vibration, controls and computational structural dynamics.
2. Restore $2.0 million of the funds cut from the Hot Section Technology Program.
3. Increase the funding for high speed aeronautics, including advanced propulsion concepts, advanced structures and materials, and airframe/propulsion intergration. ($4.1 million).
4. Eliminate funding for the Oblique Wing flight test ($4.7 million).
5. Reduce funding within Fluid and Thermal Physics R&T by approximately $1.4 million, for work on adaptable wall and magnetic balance wind tunnel test techniques.
6. Eliminate all funding (approximately $4.0 million) for planning of the Altitude Wind Tunnel. The overwhelming opinion of experts who examine this project is that the benefit to be gained is marginal and not worth the estimated construction cost. Furthermore, the people presently assigned to this task at Lewis Research Center should be redeployed to fundamental aeropropulsion research.
7. Within the Flight Systems Research and Technology line item, increase the amount devoted to rotorcraft icing research to at least $1.0 million.

SPACE FLIGHT, CONTROL, AND DATA COMMUNICATIONS

SPACE SHUTTLE PRODUCTION AND OPERATION CAPABILITY

NASA requested $976,500,000 for Shuttle production and operational capability activities in fiscal year 1986. The Committee increased funding for the Orbiter by $45,000,000, and decreased funding for launch and mission support activities by $5,000,000, and decreased funding for changes and system upgrading by $5,000,000 resulting in a total recommended authorization of $1,011,500,000 in fiscal year 1986.

Orbiter.—NASA requested $333,600,000 for Orbiter production and related support in fiscal year 1986. The Committee recommends an increase of $45,000,000 for Orbiter funding to augment the structural spares activities (particularly critical skills needed for production and installation of electrical, mechanical, and fluid systems) and to avoid further erosion of the production base there-

by maintaining production readiness for an additional Orbiter vehicle. Therefore, the total recommended authorization for Orbiter activities in fiscal year 1986 is $378,600,000.

Launch and mission support.—NASA requested $163,900,000 for launch and mission support activities in fiscal year 1986. Launch and mission support funding provides for a variety of improvements in such areas as mission preparation, mission operation, astronaut training, and launch and recovery operations. The Committee recommends a funding decrease of $5,000,000 which can be accommodated without a degradation of mission capability. This results in a total authorization of $158,900,000 in fiscal year 1986.

Changes and system upgrading.—NASA requested $25,000,000 for changes and system upgrading in fiscal year 1986. These funds provide for potential changes and system modifications as well as unanticipated new requirements not covered in the budget estimates for Shuttle production and operation capability development. In view of the fact that Shuttle development is nearing completion, the Committee recommends a funding decrease of $5,000,000 resulting in a total authorization of $20,000,000 in fiscal year 1986.

SPACE TRANSPORTATION OPERATIONS

NASA requested $1,725,100,000 for space transportation operations in fiscal year 1986. The Committee believes that increased operational efficiencies beyond those currently planned can be achieved and recommends a $10,000,000 funding decrease resulting in a total authorization of $1,715,100,000 in fiscal year 1986.

SPACE AND GROUND NETWORK COMMUNICATIONS AND DATA SYSTEMS

For fiscal year 1986, NASA requested $808,300,000 for space and ground network communications and data systems activities. The Committee recommended a decrease of $5,000,000 resulting in a total recommended authorization of $803,300,000 for space and ground network, communications and data systems activities.

The Committee recognizes that NASA may seek reprogramming authority for additional funds to support the ongoing operation of the STDN ground network due to delays in the implementation of the Tracking and Data Relay Satellite System. However NASA is directed to pursue all initiatives that will yield improved operational efficiencies and reduce long term funding requirements, while avoiding those actions that could degrade basic communications capabilities and jeopardize existing or planned missions. Initiatives NASA may want to consider include increasing the level of reimbursables, revising mission coverage policies, extending data processing turnaround time where feasible from user's standpoint, and obtaining greater funding contributions from other program offices for mission unique requirements.

CONSTRUCTION OF FACILITIES

NASA requested $149,300,000 for the construction of facilities in fiscal year 1986. The Committee reduced this by $1,000,000 resulting in a total recommended authorization of $148,300,000.

The reduction is to be taken at the discretion of the Administrator.

The Committee felt that some of the research and development programs augmented by other actions were of higher priority than the construction projects requested.

RESEARCH AND PROGRAM MANAGEMENT

NASA requested $1,345,000,000 for Research and Program Management in fiscal year 1986. The bulk of these funds are intended to pay NASA's civil service staff (about 70 percent). Another approximate 10 percent goes to pay utility bills. The remaining 20 percent covers such housekeeping functions as security, equipment repair, custodial services, and business computer operations.

The Committee is aware that cuts to the R&PM request taken in previous years have generally been applied to this latter category. It believes that NASA should apply greater resources, rather than less, to this area, particularly the inspection and routine maintenance of buildings and equipment. For this reason, the Committee recommends the requested amount for R&PM.

LANGUAGE PROVISIONS

TITLE I

SECTION 105

The Committee adopted section 105 which expresses the sense of the Congress that the national interest is served by geographical distribution of Federal research funds whenever feasible, and that NASA explore ways to further this end.

SECTION 106

The Committee adopted a new section 106 to grant authority to the NASA Inspector General to administer to or take from any person an oath, affirmation or affidavit, whenever necessary in the performance of the Inspector General's duties. The language was requested by NASA.

SECTION 107

The Committee adopted a new section 107 to reflect the intent of Congress that authorization be provided to ensure confident and cost-effective operation of the Space Transportation System and to maintain production readiness for a fifth orbiter vehicle. Similar language was contained in the FY 1985 NASA Authorizations.

SECTION 108

The Committee adopted a new section 108 to extend the life of the National Commission on Space from "twelve months" to "eighteen months." The National Commission on Space was established under Title II of the FY 1985 NASA Authorization, P.L. 98-361.

SECTION 109

The Committee adopted a new section 109 which would require the Administrator to review the recommendations of the President's Private Sector Survey on Cost Control, and recommendations included in the OMB report "Management of the United States Government—Fiscal Year 1986, and to report to Congress within 90 days of enactment of this Act on the implementation status of those recommendations pertinent to NASA.

SECTION 110

The Committee adopted a new section 110 requiring the Administrator to initiate a feasibility study to ensure a timely flight opportunity for a physically disabled American.

TITLE II

The Committee adopted a new Title II that sets forth objectives for the Space Transportation System and would establish a pricing policy for commercial and foreign users of the Space Shuttle for fiscal years 1989 through 1991. Under this policy, the price to be charged such users would be based on the sum of: 1) the average "additive cost" to the government of operating the Space Transportation System to provide additional flights to commercial and foreign users over and above the costs associated with those flights necessary to meet the space transportation needs of the United States government; and 2) a "capital recovery charge" equal to the cost of an Orbiter amortized over 100 flights.

"Additive cost" is the total increase in Space Transportation System operating costs sustained by the U.S. government in providing flights for commercial and foreign customers (see Figure 1). This cost includes both the increase in the operating cost of the "fixed base" (e.g., personnel and facilities) above that required to support only U.S. government flight activity, as well as the consumables and expendables that are required for each flight. As shown in Figure 1, the Committee assumed that the government base of Space Shuttle flight activity would be 16 flights per year and that commercial and foreign demand would equal 8 flights per year, yielding a total Space Transportation System capacity requirement of 24 flights per year.

Although additional analyses will be required by NASA to determine the specific charges that will comply with these policies, the Agency currently estimates that the "additive cost" fee would be about $44 million per flight (in constant FY 1982 dollars) and the "capital recovery charge" would be equal to about $22 million per flight (in constant FY 1982 dollars). These factors would yield an estimated price of about $66 million (in constant FY 1982 dollars) for a dedicated commercial or foreign flight of the Space Transportation System.

Title II also establishes an upper limit for the Space Transportation System launch price that could be charged commercial and foreign users. This upper limit is set at the "average operating cost of a dedicated commercial flight" of the Space Transportation System. NASA currently estimates that for the FY 89-91 period, this cost would equal $71.4 million per flight (in constant FY 82 dollars).

Members of the Committee have expressed much concern over foreign launch competition and the adverse economic impact that the loss of a substantial amount of commercial and foreign space launch business could have on this country. Accordingly, Title II would permit the NASA Administrator, under certain conditions enumerated in the legislation, to reduce the total amount charged commercial and foreign users. However, the Administrator could not set a price lower than the average "additional cost" of a commercial or foreign flight. In other words, under certain conditions, such as achieving the goal of enhancing the international competitive position of the United States in providing space transportation services and capabilites, the Administrator could waive some or all of the "capital recovery charge."

The Committee has sought to structure a Space Transportation System pricing policy that in it entirety would serve the best intrests of the United States. As articulated in the legislation, this policy would contribute to the expansion of U.S. private sector investment and involvement in space, make the Space Transportation System available to appropriate foreign users as a means of promoting international cooperative activity in apace, maintain the United States position of world leadership in space transportation, and maximize the national economic benefits of the system.

The Committee believes that its recommended pricing policy strikes a fair and equitable balance between ensuring that the government fully recovers all of the expenses that it incurs in providing Space Transportation System flights to commercial and foreign users and encouraging the development of new space commercialization ventures.

The Space Transportation System pricing policy established by the Committee would also result in a price that should be stable over a range of launch rates and an extended period of time. This long-term stability should provide an additional incentive for private investors to pursue space commercialization ventures.

The Shuttle pricing policy reported by the Committee would not guarantee lauches for U.S. expendable launch vehicles (ELV's) a decision which could hamper the success of current efforts in the private sector to commercialize government-developed ELV's. On the other hand, although the legislation would not guarantee the viability of the U.S. domestic ELV industry, it would also not preclude competition for launch services by the private sector. Indeed, the Commercial Space Launch Act (P.L. 98-575, October 30, 1984) reported last year by the Committee and enacted into law, encourages such competition. The Committee believes that if an ELV venture cannot be competitive with the Space Transportation System prices set under the policies contained in the reported bill, there is little likelihood that the ELV venture would be competitive internationally with foreign ELVs. Indeed, the Committee has repeatedly heard testimony that higher Shuttle prices would generally enhance the competitive position of foreign ELV operators,

rather than U.S. domestic ELV operators.[1] Thus, the recommended pricing policy weighs in favor of providing a strong international competitive position for the United States in providing space transportation services and capabilities, and maximizing the opportunities to achieve a broad set of national space objectives.

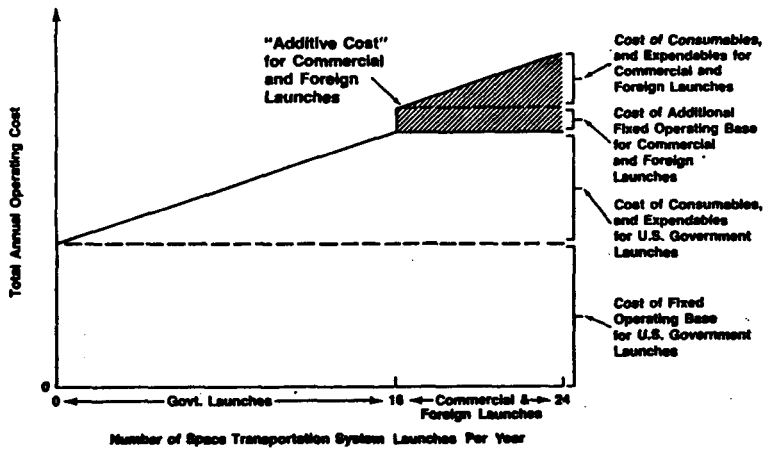

Figure 1. Graphic Description of "Additive Cost"

TITLE III

The Committee adopted a new Title III which authorizes $586,000 to be appropriated for the Department of Transportation Office of Commercial Space Transportation.

The Office of Commercial Space Transportation was created following enactment during the 98th Congress on the Commercial Space Launch Act, (P.L. 98-575, October 30, 1984).

COMMITTEE VIEWS

NATIONAL COMMISSION ON SPACE

The National Aeronautics and Space Administration's Authorization Act of 1985 (P.L. 98-361) established a National Commission on Space whose purposes are:

(1) to maintain the Nation's preeminence in space science; technology, and applications;

(2) to promote the peaceful exploration and utilization of the space environment; and

(3) to articulate goals and develop options for the future direction of the Nation's civilian space program.

[1] 1986 NASA Authorization Hearings, Subcommittee on Space and Applications, Committee on Science and Technology, U.S. House of Representatives, Ninety-ninth Congress, First Session.

The legislation further provided that the Commission be established within ninety days of enactment of the Act (or by October 15, 1984). On October 13, 1984, the President formally established the Commission by Executive Order, yet absent from it was the designation of Commission Members. The Act envisioned Presidential appointment of 15 Commissioners, representing Federal, State, and local government, industry, business, labor, academia, and the general population with special expertise in science and technology, within that same timeframe.

The National Commission on Space currently exists in name only. The Committee continues to await the appointment of Commission Members to the National Commission on Space. This situation is viewed with particular dismay because the Commission's life is limited. Although the Committee has recommended in H.R. 1714 to extend the life of the Commission by 6 months, only if appointment of commissioners is imminent will the Commission be afforded the full year to produce its report, as was envisioned in P.L. 98-361.

The National Commission on Space was conceived because of the perception of the need for high level, independent policy advice on civilian space policy issues commanding public attention. Many changes in the space arena are occurring. The United States is entering a new era of international competition and cooperation in space, and therefore this Nation must strengthen the commitment of its public and private technical, financial, and institutional resources, so that the United States will not lose its leadership position during this decade. In addition, while there continues to be a crucial Government role in space science, advanced research and development, provision of public goods and services and coordination of national and international efforts, advances in applications of space technology have raised many issues regarding public and private sector roles and relationships in technology development, applications, and marketing. Moreover, the private sector will continue to evolve as a major participant in the utilization of the space environment.

The Nation also stands on the edge of a new frontier with the Nation's commitment to a permanently manned Space Station in low-Earth orbit.

The long range perspective of the Commission should provide an important focus to the current debates on the Nation's civilian space activities.

The Committee strongly encourages the Administration's attention to the start up of the Commission activities. The contribution the Committee seeks from this high level, independent Commission in identifying long-range goals and policy options for the United States civilian space program is intently awaited.

SPACE STATION OPERATIONAL COSTS

The Committee notes with approval the NASA plan to proceed with a deliberately paced and carefully detailed definition and design of a Space Station (Phase B) over a 21 month period. The Committee further notes that a highly competitive preliminary design study (Phase A) is nearing completion and the majority of competitive contractors have been chosen for the Phase B defini-

tion effort. These definition study activities should provide a strong technical foundation for the design, development and operation of a Space Station in the 1990's.

Testimony before the Committee has indicated that the NASA management planning for the hardware development aspects (cost, performance and schedule) of the program are well understood. However, while expressing an appreciation of the need for control of the operational cost of a Space Station, NASA has not identified the management approach for focusing on this critical aspect of Space Station during design and development.

Ultimately, successful use of the Space Station will depend on both its technical utility and operational cost. The Committee observes that both of these aspects need to be carefully addressed by NASA and its contractors with equal emphasis during the definition, design and development phases. To that end the Committee requests that NASA review its plans to:

1. Predict and determine operational costs,
2. Establish appropriate benchmarks by which to measure operational cost projections during the evolution of the Space Station throughout the definition and design and development phases,
3. Provide assurance that management visibility is developed and maintained to monitor achievement of operational cost objectives,
4. Provide adequate incentives within NASA and its contractors to assure appreciation of and adequate attention to operational cost prediction and control, and
5. Evaluate the affect of alternative technical approaches and programmatic changes throughout the definition, design and development phases to assure that their impact on operational cost are fully understood.

The Committee is fully aware that NASA, in managing an evolutionary system such as the Space Station, necessarily will need to modify operational cost goals as the system matures. Therefore, as part of the annual authorization process the Committee requests that future reporting to the Committee include operational cost information and such other related evaluations as NASA may deem useful in providing a full and current status of the predicted operational cost for the Space Station. Further, so that the Committee may be familiar with NASA's approach to operational cost analysis, prediction and control, NASA is requested to submit a plan outlining the agency's approach for achieving visibility of the status of operational cost parameters by December 15, 1985.

SPACE STATION—INTERNATIONAL PARTICIPATION

The international space community appears to have enthusiastically responded to the Adminstration's invitation to participate in the Space Station program.

Potential international partners fully understand both the magnitude of the investment required and the potential benefits to be gained from the Space Station project. By sharing developmental and operating costs, participants will be afforded an opportunity to pursue independent space objectives that might not otherwise be achievable.

International participation in Space Station should be encouraged through the negotiation of fair and equitable arrangements between NASA and participants on issues of: Space Station program and operations management; transfer of Space Station technology among participants; access rights to Space Station capabilities; and protection of proprietary investments.

International participation in Space Station can be achieved on a basis that is consistent with this country's national security interests and our objective of maintaining a leadership position in space science and space technology. However, the scope and complexity of this project will require that an innovative approach be taken in structuring cooperative agreements to ensure a broad distribution of technical, scientific, and commercial opportunities that will accrue from this exciting project.

SPACE SHUTTLE ORBITER

In the past year, the Space Shuttle has continued to prove its reliability, flexibility, and efficiency in serving as the Nation's primary Space Transportation System. However, a number of key policy issues relating to the Orbiter remain unresolved. NASA should continue to play an active role in addressing and resolving these issues in an expeditious manner.

Orbiter fleet size.—The Committee continues to believe that an additional Orbiter beyond the currently planned four will be needed to accomplish civil, commercial, and defense missions and Space Station-related activities, to exploit the Shuttle's potential for extended on-orbit life, and to provide adequate backup to the currently planned fleet. The Committee is becoming increasingly concerned that if the United States does not soon determine whether or not it is going to build an additional Orbiter, the production base may have declined to such an extent that the country will no longer be able to build the vehicle for a reasonable amount of money. The Committee hopes that this issue can be resolved in the coming year.

Extended duration Orbiter.—Last year, the Committee expressed its belief that there was significant justification for developing an extended on-orbit duration capability for the Orbiter and requested that NASA report to the Committee on the costs and technical aspects of undertaking an effort that would provide that capability. In its report dated November 21, 1984, NASA identified the following areas as those for which missions of approximately 14 days duration would have utility: vapor and solution crystal growth, high thermal gradient crystal growth, developmental biology, cosmic ray detection, solar data during an entire pass, and full earth coverage from polar orbit. The report also indicated that the cost of providing this capability would be in the range of $78-100 million. The report concluded, however, that the requirements for on-orbit stay times in the range of 10-20 days are small, and therefore do not warrant the development of the capability.

The Committee understands that the Chairman of the Space and Earth Sciences Advisory Committee Task Force on Scientific Uses

of the Space Station recently wrote to NASA expressing the view that the scientific community believes that even a modest extension of the current 7 to 9 day mission duration capability of the Orbiter to 12 to 14 days would have great research benefit and would be strongly supported within the space research community. Given this expression of support and interest by the space research community and the continuing interest of this Committee in a 12-14 day on-orbit stay capability for the Space Shuttle, the Committee requests that NASA reassess its views on this subject and report to the Committee on the results of that reassessment by September 1, 1985.

SOLID ROCKET BOOSTERS

The Committee maintains a strong interest in the reduction of Space Transportation System operating costs as a means of achieving the national goal of routine low-cost access to space. NASA is directed to continue all efforts in this regard.

One aspect of this effort has been the question of developing a second source for production of the solid rocket boosters used on each mission. The Committee has expressed a desire in the past to learn whether competition would indeed produce significant savings for this element of the Space Transportation System.

A study on this issue is presently underway within NASA, with a decision expected in the near future. The Committee awaits the Administrator's report on the decision reached, including such information necessary for the Committee's review of this question. The Committee expresses full confidence that the Administrator will render a decision that accords with the results of this analysis, meets the present and future needs of the Space Transportation System, and recognizes the fiscal prudence sought by the American taxpayer.

JOINT NASA/DOD STUDY OF FUTURE SPACE TRANSPORTATION NEEDS

The Committee strongly supports the Administration's plan to conduct a joint NASA/DOD study of the future space transportation needs of the United States. In the closing years of the next decade and the early years of the twenty-first century, the space transportation needs of this country may begin to change. By that time:

—The growing success of space commercialization ventures could place an increasing demand for lower cost reusable space transportation systems.

—Potential military projects could require a capability to place payloads into orbit that are as much as five times heavier than can be carried by the Space Shuttle.

—Other civil or military projects could require the availability of a manned Trans-Atmospheric Vehicle that can readily carry light payloads from a runway on Earth into space on a quick reaction basis.

—Once in space, there will be a growing need to move men and materials from one orbit or inclination into a separate orbit or inclination and then back again.

If the United States is to be able to successfully fulfill the space transportation needs of the next several decades, we must begin now to identify the basic nature and bounds of those needs.

The Committee requests that NASA, in coordination with DOD, prepare and submit to the Committee by September 1, 1985, a detailed plan and approach for conducting a joint NASA/DOD study of the space transportation needs of the United States for the period 1995-2010.

SPACE AND EARTH SCIENCE, SPACE APPLICATIONS

Earth science.—The Committee recognizes that many activities carried under "Space Applications" are in fact Earth science. In last year's NASA authorization bill (P.L. 98-361) the Committee acknowledged the importance of Earth science by amending the National Aeronautics and Space Act of 1958 to add to NASA's objectives the "expansion of human knowlege of the Earth." Indeed, space is a good vantage point for many Earth science programs, and many applications arise from work in the Earth sciences as exemplified by the use of geology to find minerals. Nevertheless, the Committee wishes to reiterate its support for and interest in space applications programs.

New starts.—In view of the overall budget situation, the Committee accepts the absence of new starts in science and applications programs. Indeed, there seems to be a similar acceptance generally in the science community, although this acceptance is accompanied by anxiety about the future. There are four very mature programs which are candidates for starts next year—ISTP, TOPEX, GP-B, and the Comet Rendezvous and Asteroid Flyby (CRAF)—with AXAF and SIRTF close behind. There are good arguments for all of these missions and according to testimony there is no scientific rationale for assigning them relative priorities.

The Agency is faced with the unenviable task of maintaining a balanced program across disciplines in the face of difficult budget restraints. In addition, the undisputed value of advancing fundamental science must be balanced against the near-term benefits of applications programs.

The pressure generated by this situation may create an opportunity to mitigate this situation or prevent its recurrence. NASA often finds itself faced with conflicting goals in that the agency needs to plan ahead and continue to open technological options, but at the same time it must avoid spending Advanced Technology Development funds on projects that probably never will be developed. At this time, the Committee perceives there to be more potential filght projects in the pipeline than realistically will be developed in the short-term. Therefore, the Agency could take this opportunity to review critically all the projects being studied and to eliminate any that are unlikely to be developed. Any resources so released could be applied to higher priority, near-term projects to help alleviate the incipient build-up of candidate new start missions.

The Committee reiterates its understanding that sometimes a mission must be studied in detail before its feasibility can be as-

sessed, and therefore every study will not necessarily lead to a flight mission.

The Committee requests that NASA critically review all potential future missions now being studied or in advanced technology development, with a view to (i) terminating work on those unlikely to be developed and (ii) concentrating efforts on more likely near-term new starts. The Agency should work with and through existing advisory groups and keep the Committee fully and currently informed of the process. A summary report showing the results of the study and any funding actions taken should be submitted to the Committee by October 1, 1985.

Planetary exploration.—The Committee reiterates its full support of 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 landing 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.

The Committee actions adding funds for specific missions are not intended to prejudice any other candidate mission, such as the CRAF mission.

Shuttle flight opportunities.—The Committee agrees with the findings of the September 1984 Report of the Shuttle Science Working Group on the need to provide for more frequent shuttle flight opportunities for university scientists. Too little emphasis has been placed by NASA on development and integration of intermediate class payloads for shuttle science. The existence of this issue several years after the Shuttle's first flight demonstrates the difficulty in giving science a high priority in an agency committed to large engineering projects. In light of the Committee's interest in the development of intermediate class payloads, $3 million has been earmarked for this purpose in the Shuttle/Spacelab Payload Development line.

The Committee strongly endorses the SSWG finding that "NASA should encourage the use of the Shuttle for science and technology investigations from the broader, worldwide research community than that represented by the established NASA-supported groups." Most of the current space science investigations have been solicited through the development of the Spacelab program which allows for only 10–20 investigations per year. The accomodation of intermediate class payloads would provide a greater number of flight opportunities at a lower cost.

The Committee urges NASA to learn from its experience with the shuttle and make extra efforts to ensure the usefulness of the Space Station in the early stages of its development for space science and applications. Such attention to end uses will be equally important for commercial users who will be particularly concerned about costs and will want to minimize special preparations necessary for operating in space.

The Committee notes with approval NASA's efforts in developing the Spartan and Hitchhiker instrument carriers as a way to make available frequent, low-cost opportunities to conduct science on the Shuttle. NASA is encouraged to develop adequate carrier capacity so that carrier hardware never becomes a bottleneck to science. If such carriers are to be flown on a space-available basis as payloads-of-opportunity they will have to be held in a standby status, which means that several carriers will need to be available for experiment integration.

Although the Committee agrees with most of the Shuttle Science Working Group's report, questions exist with regard to the efficacy of three specific recommendations: The report recommended (i) a budget of $25 million for the development of intermediate class instruments; (ii) a Program Management Office for developing such instruments and (iii) a Shuttle Science Oversight Committee.

The Committee is interested in NASA's efforts in support of shuttle intermediate class payload development and requests that the Administrator report to it by July 15, 1985 on the Agency's progress and on future plans in support of those efforts. The report should also include the funding needs anticipated by the Agency for intermediate class payload development over the next five years, the organizational framework envisioned by the Agency necessary for meeting the goal of increased scientific involvement on the shuttle, NASA's views of the proper balance between Spacelab and intermediate class payload development, and an analysis of the recommendations of the SSWG Report.

Cost of missions.—Facing as we are in a long list of highly recommended missions juxtaposed against a very constrained budget and recognizing the success of the Solar System Exploration Committee (SSEC) in creating a satisfactory and low-cost Planetary program, the Committee is stimulated to urge both the agency and the science community to look at creative ways to reduce the costs of missions while conserving their science value. The work of the SSEC is a good model. Other possible approaches include: (i) The "management experiment" proposed for the Shuttle test of Gravity Probe-B which promises to save time and money, (ii) consideration of flying a version of IRAS modified to study point sources, (iii) studying the use of data from existing spacecraft to ensure that maximum effective return is achieved from each mission, (iv) further studying missions thought to be particularly cost-effective such as SME and IUE to extract lessons from them.

The Committee would cautiously suggest, based on testimony and experience, that when faced with a budget problem the science community often finds it easier to ask for more money than to re-examine its programs and priorities. The request for an extra $25 million for intermediate class payloads might be an example of this tendency. Scientists are quite properly more interested in doing research than program management, but in the present situation some program restructuring may be necessary. If this is the case, the restructuring should be done with a view to maintaining the maximum scientific value possible which will require input from the science community.

Space telescope operations and maintenance.—The Committee continues to be concerned that operating costs for the Space Tele-

scope (ST) and similar long-life facilities may absorb funds needed for developing new missions. The Committee is also concerned that NASA take steps to ensure that the ST is able to achieve full observing capability for a high fraction of its time on orbit. If operating costs can be kept low and if the observing time on the ST is high, there will be observing opportunities—both time and funding—for many scientists.

The Committee notes that although ST will not be launched until near the end of FY 1986, the FY 1985 operating plan contains $74 million and the FY 1986 request contains $88 million for ST operations, maintenance and refurbishment. NASA must work to minimize these costs where necessary, and above all to ensure a high science return from this investment.

Much of the Committee's concern in this matter is based on a 1984 report of the Subcommittee on Space Science and Applications, "Space Telescope Cost, Schedule and Performance Review, 1984", which recommends several reports by NASA. The Committee is displeased that the reports requested have not been prepared, although one was requested specifically to support the FY 1986 request for operations and maintenance funding. Based on informal discussions with the agency, the Committee is assured that the reports will be available on the following schedule:

—A report on detailed plans for the operation, maintenance, and refurbishment of the ST: by May 1, 1985.
—Analytical review of ST development as an aid to the management of future large science programs, by January 15, 1986.
—Report on the impact of the ST Science Institue on the ST development program with a review toward aiding future space science activities: by January 15, 1986.
—A Report on the early post-launch operations of the ST Science Institute by January 15, 1988.

Two recommendations were not given a specific due date. They are (i) that NASA take steps to ensure "ample scientific return" from ST and pay particular attention to opportunities for remote observing; and (ii) that NASA work with relevant advisory committees to consider "how long-term observatories should be maintained and operated."

The Committee expects that the Agency will meet the revised schedule for the reports, and move effectively and promptly in the areas not having specific deadlines.

Given that NASA will be building more such long-term science facilities it is very important that the lessons of ST be extracted and made available to others. Even the Space Station will be in some respects a long-term observatory, and its development and operation could be beneficially informed by the ST experience. The Committee intends to have this experience recorded and the lessons made explicit, rather than relying on institutional memory.

THE INTERNATIONAL GEOSPHERE/BIOSPHERE PROGRAM

The International Geosphere/Biosphere Program (IGBP) is a proposed program of international research aimed at understanding the Earth as a living planet. More specifically, the program would seek to describe and understand (i) the interactive physical, chemical, and biological processes that regulate the Earth's unique environment for life, (ii) the changes that are occurring in the system, and (iii) how they are influenced by human actions.

This idea surfaced as a U.S. initiative at Unispace '82, was advanced by activities at the National Research Council, and last fall was formally considered by the International Council of Scientific Unions (ICSU). ICSU subsequently adopted a resolution to investigate the possibility of such a formal international research program and formed an advisory group to make a recommendation for implementation at the next ICSU council meeting in 1986. A U.S. Committee on IGBP has been formed by the National Research Council to develop the U.S. proposal to ICSU.

The Committee believes that this program is very important, particularly because the Earth is undergoing several changes due to activities of man compounded by natural changes. Thus, the Earth could be experiencing a "greenhouse" effect due to increasing atmospheric carbon dioxide from burning fossil fuels while natural processes such as the EL Nino ocean warming and the El Chichon volcano are also affecting the atmosphere. Separation and understanding of these effects is becoming feasible: advances in computer technology for handling data and in Earth-observing satellites now begin to make study of the Earth as a system practical.

The United States' participation in IGBP could involve many agencies including NASA, NOAA, NSF, the Departments of Energy, Agriculture, Interior, and Defense, and EPA. A NASA Advisory Committee on Earth System Science recognized that any study of the Earth as a system would involve this large spectrum of agencies, and has been structured to include most of these organizations on the Committee. Therefore, the United States is moving toward developing an appropriately broad science program.

Many NASA activities will contribute to the IGBP research program. Flight missions include the Upper Atmosphere Research Satellite (UARS), the Ocean Topography Experiment (TOPEX), the Navy Research Ocean Satellite System (NROSS) (which is a Navy satellite with a NASA instrument), the Geopotential Research Mission (GRM), and the Ocean Color Imager (OCI). Also, NASA's interdisciplinary research program and its Goddard Institute of Space Science will contribute substantially to the science base of IGBP.

The Committee believes that IGBP is very important, and that as it proceeds observation of the Earth from space will become an integral component. The Committee encourages NASA to continue its research and development activities to support IGBP and also to continue its support of the Earth Systems Science Committee and the National Research Council Committee on IGBP.

REMOTE SENSING RESEARCH AND DEVELOPMENT

Section 501(a) of the Land Remote Sensing Commercialization Act of 1984 (Public Law 98-365) directs NASA "to continue and to enhance [its] programs of remote-sensing research and development." As the most noteworthy recent event in NASA's remote sensing program has been the cancellation of most of it work on multi-linear array (MLA) technology, the Committee could be expected to conclude that the Agency has neither continued nor en-

hanced its program. Certainly, the Committee does not see the vigorous program that was envisioned by the language in P.L. 98-365.

The Committee is not questioning the work NASA is doing in this area. The quality is acceptable but the quantity is lacking. In particular, there seems to be much too little work on the applications of remote sensing from space. The Committee maintains a great faith in this technology as potentially one of the greatest benefits for all mankind. But the benefits will not just happen. NASA must support the research, especially applications research, necessary to realize the benefits.

Section 501(e) of Public Law 98-365 calls for a national plan for research and development, to be jointly developed by NOAA and NASA and submitted to the congress by July 17, 1985. The committee looks forward to the timely receipt of this report as a forerunner of a more vigorous NASA program.

The Committee reiterates that it considers the Nation's remote-sensing capabilities as an important national asset. Public Law 98-365 recognized this by providing that any commercial activity must operate in such a way as to preserve the public interest and our national security. NASA's research activities should support this national asset, much as NASA's communications research and development program supports our national communications satellite industry.

COMMERCIAL USE OF SPACE

The development and expansion of a commercial orientation within government and particularly NASA has significantly progressed over the past year as a result of Presidential and Congressional commitments to expand opportunities for private sector involvement in space. Notably, during 1984, NASA established an Office of Commercial Programs to serve as a focus for an agency-wide program to encourage private sector investment in space and to assist new high technology commercial space ventures. The agency also issued, at the end of last year, a Commercial Use of Space Policy which contains numerous initiatives to reduce the technical, financial and institutional risks of doing business in space.

NASA's first order of business is clearly to mobilize its internal resources in such a manner that it can be prepared to address the policy changes and other initiatives that are intended to facilitate the private sector's entry into space. Fiscal Year 1986 marks the first formal budget request of the Office of Commercial Programs, and the office is currently staffed at a three-quarters operating level. The Committee notes with some concern the effect of the current Federal hiring freeze which prohibits the agency from hiring from the commercial community which it intends to serve.

The Fiscal Year 1986 funding request will go toward the support of Centers for the Commercial Development of Space; stimulating NASA Research with Commercial Potential; increasing the availability of NASA facilities; stimulating private sector commercial research; and outreach to establish new links with the private sector.

The success of these initiatives will in large part depend on the strength of the partnership that can be forged between government, private industry and universities. To this end, NASA has had considerable success in setting up formal relationships through contractual mechanisms such as the Joint Endeavor Agreement (JEA), Technical Exchange Agreement (TEA) and the Industrial Guest Investigator (IGI). The Office of Commercial Programs has a particular contribution to make in seeking greater employment of these mechanisms and consolidating their contractual processes in order to promote cooperative activity.

NASA has identified in testimony before the Committee that it intends to pursue those initiatives contained in NASA's Commercial Use of Space Plan that relate to stimulating research and development. The Committee believes this is an appropriate course and one in line with the agency mission. NASA should work with and be guided by industry in planning and carrying out research and development to maximize opportunities for commercial development of space. In this regard, the guidance of the NASA Advisory Council Task Force on Commercialization will be particularly important.

NASA should also explore with equal intensity those initiatives that will eliminate technical, financial or institutional barriers to private sector participation in space.

Use of the procurement process to foster commercialization

To this end, the creative use of procurement authority would appear to offer one of the most potentially effective methods by which NASA could promote the growth of privately developed spaceware and services. NASA has made preliminary identification of this avenue in the aforementioned policy statement on the Commercial Use of Space (initiative A-5—"NASA Purchase of Commercial Space Products") whereby NASA might agree to purchase commercial space products to meet NASA requirements or other established needs. This initiatives would appear to offer distinct advantages to NASA, and to the Nation, including enhanced competition, lower costs and the availability of new and alternative technicologies, products and capabilities.

The willingness of private investors to undertake the risks of privately financing commercial space ventures is a recent phenomenon, and a trend that should be fostered by NASA and the Congress. This kind of private sector participation in space development should trigger a reevaluation of the government's traditional methods of doing business. The process should at the least be sensitive to certain obstacles that may stand as disincentives to private sector participation in space. For example, new commercial systems may be perceived to involve a greater risk factor than those which have been developed with government funds, or have already been procured and tested successfully. New aerospace companies may also be sensitive to the financial expenses associated with marketing and technology development costs.

The Committee's intention is that NASA's procurement process be structured in a manner that allows new companies to compete equitably with established government contractors. The willingness of entrepreneurs to privately finance aerospace hardware or serv-

ices might be recognized in the procurement process to the extent necessary to offset any negative evaluation NASA might make in conjunction with a greater risk factor associated with a new commercial venture. NASA could develop different mechanisms to equalize competitive procurements and thus further commercialization. Such mechanisms could include the use of private financing as a selection criterion for Source Evaluation Boards, or as a tie-breaker, in competitive procurements.

The Committee recognizes that the use of such a positive criterion for private financing might be inappropriate in certain cases, for instance, if a private venture interfered with other national goals, or NASA obligations. These exceptions could be dealt with by NASA as appropriate.

Use of procurement procedures appears fully consistent with current law and policy, which include:

—The National Aeronautics and Space Act, as amended, which sets forth as a matter of national policy that NASA "seek and encourage, to the maximum extent possible, the fullest commercial use of space."

—The President's National Policy on the Commercial Use of Space (July 20, 1984) which states the intent to "facilitate long-term contracts with new space ventures if the government has a need for the product and if the purchase would be cost-efficient."

—The Competition in Contracting Act of 1984 (P.L. 98-369, July 18, 1984) which directs agencies to use competitive procurement procedures whenever possible.

NASA is requested to study means by which the agency can utilize existing procurement authority in a manner that effectively encourages commercial space ventures. NASA should report its findings to the Committee by September 1, 1985.

FLIGHT OPPORTUNITIES FOR THE PHYSICALLY DISABLED

The Committee is highly supportive of the efforts of NASA to ensure that a wide spectrum of Americans will have an opportunity to fly in space. The Space Transportation System is a unique and very valuable national asset which must be used to benefit all Americans.

There are hundreds of thousands of Americans who have become disabled as the result of spinal cord damage due to accidents or combat wounds. These Americans are proud and courageous individuals who have a lifetime of barriers which bar their opportunities to being as fully productive as they are capable of being.

In the zero-G environment of space all of the invidious barriers to access are removed and all space travelers are equally weightless. The Committee sees this flight as far more than a symbolic voyage of indomitable courage. It is an historic opportunity to prove that those who bear the lifelong burden of a handicap on Earth may be freed to become highly valuable and fully productive members of the space based materials processing economy of the future.

It is ironic that this program was perfectly characterized by Apollo 11 astronaut Neal Armstrong on July 20, 1969, as he became the first man to set a tentative foot on the lunar surface with the prohetic words, "That's one small step for a man, one giant leap for mankind."

REORIENTATION OF AEROPROPULSION

RESEARCH AND TECHNOLOGY AT LEWIS RESEARCH CENTER

NASA has three field centers that carry out most of the agency's aeronautical research and technology development. The Lewis Research Center in Cleveland has lead responsibility for aeropropulsion research and technology.

The Committee is concerned about a recent change in the approach to conducting this effort at Lewis. Previously, the Center's aeropropulsion work was organized along discipline lines, with generic research being performed across the board in all areas related to aircraft engines (e.g. inlets, compressors, combustors, turbines, power transfer, controls, etc.). Under the new approach, all work, with a few exceptions, will be aimed at several highly focused, project-style thrusts such as the Advanced Turboprop Project or more general categories such as high-speed aircraft. Basic research on components will henceforth only be done to solve problems that arise in pursuing these focused efforts.

The Committee is concerned about this change for two reasons. First, the flow of new ideas that come from basic research may dry up because small but valuable areas of research will be dropped; and second, NASA may no longer be able to serve as a center of expertise for industry in many generic areas. The Committee requests that NASA monitor closely the effect of this change, paying close attention to the views of industry, and report the results to the Committee annually for the next several years.

COMPUTATIONAL FLUID DYNAMICS

Computational fluid dynamics is a new research method, made possible by the advent of supercomputers, that allows simulation of the aerodynamic forces on an aircraft, giving answers that previously were obtainable only through more expensive wind tunnel or actual flight testing. As such, it represents a dramatic breakthrough in research capability as well as a practical aid to aircraft designers.

The centerpiece of NASA's work in developing computational fluid dynamics techniques and in using them for research purposes is the Numerical Aerodynamic Simulator. This system, built around the latest commercially available central processor, will provide a quantum leap in computing power, allowing researchers to solve problems that are not possible with current computers.

The Initial Operating Capability of NASA is scheduled for late 1986. Subsequently, plans envision replacing the central processor every few years as technology advances, thereby keeping the system at the forefront of computer capability.

The Committee recognizes and supports the costs associated with establishing the basic NASA capability, but is concerned about the level of ongoing cost to operate, maintain and upgrade the capability of NASA. Therefore, the Committee requests that NASA provide, by October 1, 1985, a ten-year plan showing estimated costs for NASA broken down into ongoing operations, hardware replacements, software modifications, etc.

EXPLANATION OF THE BILL

TITLE I

The bill authorizes Research and Development in section 101(a), Space Flight, Control and Data Communications in section 101(b), Construction of Facilities in section 101(c), and Research and Program Management in section 101(d). These activities are explained below:

RESEARCH AND DEVELOPMENT

SUMMARY

		Authorization fiscal year 1986	Page No.
1.	Space Station	$230,000,000	28
2.	Space transportation capability development.	444,300,000	32
3.	Physics and astronomy	637,400,000	43
4.	Life sciences	72,000,000	56
5.	Planetary exploration	359,000,000	60
6.	Space applications	550,800,000	69
7.	Technology utilization	11,100,000	94
8.	Commercial use of space	20,000,000	96
9.	Aeronautical research and technology.	354,000,000	97
10.	Space research and technology	168,000,000	127
11.	Tracking and data advanced systems.	16,200,000	154
	Total	2,862,800,000	00

SPACE FLIGHT, CONTROL AND DATA COMMUNICATIONS

SUMMARY

		Authorization, fiscal year 1986	Page No.
1.	Shuttle production and operational capability.	$1,011,500,000	156
2.	Space transportation operations	1,715,100,000	163
3.	Space and ground networks, communication and data systems.	803,300,000	168
	Total	3,529,900,000	

CONSTRUCTION OF FACILITIES

SUMMARY

	Project	Authorization fiscal year 1986	Page No.
1.	Space Transportation Facilities, at various locations, as follows:		
	A. Construction of Orbiter Modification and Refurbishment Facility, Kennedy Space Center.	$14,000,000	188
	B. Construction of Thermal Protection System Facility, Kennedy Space Center.	3,600,000	188
	C. Modifications for Advanced Technology Engine Test Stand S-1C, Marshall Space Flight Center.	6,500,000	189
	D. Modifications for Enhanced Life Support Systems Testing, Johnson Space Center.	1,100,000	190
	E. Modifications to Pad A Payload Change-Out Room, Kennedy Space Center.	2,200,000	190
	F. Modifications to Space Shuttle Main Engine Support Systems, National Space Technology Laboratories.	2,500,000	191
2.	Construction of Payload Control Rooms, Kennedy Space Center.	1,200,000	191
3.	Construction of Additions to Research Projects Laboratory, Goddard Space Flight Center.	3,800,000	192
4.	Construction of Spacecraft Systems Development and Integration Facility.	8,000,000	193
5.	Construction of Microdevices Laboratory, Jet Propulsion Laboratory.	8,900,000	194
6.	Construction of Numerical Aerodynamic Simulation Facility, Ames Research Center.	8,200,000	194
7.	Modifications to 16-Foot Transonic Tunnel for Improved Productivity and Research Capability, Langley Research Center.	4,900,000	195
8.	Modification of 64-Meter Antenna DSS-14, Goldstone, California, Jet Propulsion Laboratory.	8,500,000	195

SUMMARY—Continued

	Project	Authorization fiscal year 1986	Page No.
9.	Modification of 64-Meter Antenna DSS-43, Canberra, Australia, Jet Propulsion Laboratory.	8,900,000	196
10.	Repair of Facilities at Various Locations, Not In Excess of $750,000 Per Project.	22,000,000	196
11.	Rehabilitation and Modification of Facilities at Various Locations, Not In Excess of $750,000.	27,000,000	197
12.	Minor Construction of New Facilities and Additions to Facilities, Not In Excess of $500,000 Per Project.	6,000,000	198
13.	Facility Planning and Design	12,000,000	199
	General reductions	*—1,000,000*	

RESEARCH AND PROGRAM MANAGEMENT, $1,345,000,000

SUMMARY OF THE BUDGET PLAN BY FUNCTION

Personnel and related costs	$931,813,000
Travel	31,000,000
Operation of installation	382,187,000
Total	1,345,000,000

The Research and Program Management authorization of appropriations 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) provide base maintenance of facilities 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 1986, an appropriation of $1,345,000,000 is requested.

PERSONNEL AND RELATED COSTS, $931,813,000

COMPENSATION AND BENEFITS

1. Compensation

a. Permanent Positions.—This part of Personnel and Related Costs covers the salaries of the full-time permanent civil service workforce and is the largest part of this functional category.

b. Other Than Full-Time Permanent Positions.—This category includes the salaries of NASA's non-permanent workforce. Programs such as students participating in cooperative training, summer employment, youth opportunity, and temporary clerical support are covered in this category.

c. Reimbursable Detailees.—In accordance with existing agreements, NASA reimburses the parent Federal organization for the salaries and related costs of persons detailed to NASA.

d. Overtime and Other Compensation.—Overtime, holdiay, post and night differential, and hazardous duty pay are included in this category. Also included are incentive awards for outstanding achievement and superior performance awards.

2. Benefits

In addition to compensation, NASA makes the employer's contribution to personnel benefits as authorized and required by law. These benefits include contributions to the Civil Service Retirement Fund, employees' life and health insurance, payments to the Medicare fund for permanent employees, and social security contributions for non-permanent personnel. Payments to the Civil Service Retirement Fund for re-employed annuitants and for severance pay to former employees involuntarily separated through no fault of their own are also included.

SUPPORTING COSTS

1. Transfer of personnel.

Relocation costs, such as the expenses or selling and buying a home, and the movement and storage of household goods are provided under this category.

2. Office of Personnel Management services.

The Office of Personnel Management is reimbursed for certain activities such as security investigations on new hires, recruitment advertising, and career-maturity surveys.

3. Personnel training.

Training is provided within the framework of the Government Employees Training Act of 1958. Part of the training costs consists of courses offered by other Government agencies, and the remainder provides for training through nongovernment sources.

TRAVEL, $31,000,000

PROGRAM TRAVEL

The largest pat of travel is for direction, coordination and management of program activities including international programs and activities. The complexity of the programs and the geographical distribution of NASA installations and contractors necessitate the need for this category of travel. As projects reach the flight stage, support is required for prelaunch activities, including overseas travel to launch and tracking sites. The amount of travel required for flight projects is significant as it is directly related to the number of systems and subsystems, the number of design reviews, and the number and complexity of the launches and associated ground operations.

SCIENTIFIC AND TECHNICAL DEVELOPMENT TRAVEL

Travel to scientific and technical meetings and sminars permits employees engaged in research and development to participate at both Government sponsored and nongovernment sponsored seminars. This participation allows personnel to benefit from exposure to technological advances which arise outside NASA, as well as allowing personnel to present both accomplishments and problems to their associates and provides for the dissemination of technical results to the U.S. community. Many of the Government sponsored meetings are working panels convened to solve certain problems for the benefit of the Government.

MANAGEMENT AND OPERATIONS TRAVEL

Management and operations travel provides for the direction and coordination of general management matters and travel by officials to review the status of programs. It includes travel by functional managers in such areas as personnel, financial management and procurement. This category also includes the cost of travel in and around the Installations; travel of unpaid members of research advisory committees; and initial duty station, permanent change of assignment, and other family travel expenses. Payments to interagency motor pools are included in the Operation of Installation function (Management and Operations subfunction).

OPERATION OF INSTALLATION, $382,187,000

FISCAL YEAR 1986 BUDGET PLAN

Facilities services	$212,272,000
Technical services	66,071,000
Management and operations	103,844,000
Total	382,187,000

Operation of Installation provides a broad range of services, supplies, and equipment in support of the centers' institutional activities. These are divided into three major subfunctional areas: Facilities Services (the cost of renting real property, maintaining and repairing institutional facilities and equipment, and the cost of custodial services and utilities); Technical Services (the cost of automatic data processing for management activities, and the cost of educational and information programs and technical shops supporting institutional activities); and Management and Operations (the cost of administrative communications, printing, transportation, medical, supply, and related services). A description of each major subfunction follows:

FACILITIES SERVICES

1. Rental of real property

Rental of real property includes the rental of building space directly by NASA or through the General Services Administration to meet offsite office, warehousing, and other requirements which cannot otherwise be provided in existing buildings at the NASA Installation. Most of the funding is required for rental of the NASA Headquarters complex of buildings in the District of Columbia, and nearby Maryland and Virginia that are either Government-owned or leased for which NASA must provide rental payments to the General Services Administration in accordance with P.L. 92-313. Also included in this item is rental of trailers required to accommodate special short-term needs.

2. Maintenance and related activities

Maintenance and related activities include the recurring day-to-day maintenance of facilities (ground, buildings, structures, etc.) and equipment which is accomplished by non-Civil Service personnel. This involves the mowing and care of grassy areas, care of trees and shrubs, elevators, cranes, pressure vessel inspections, painting and protective coatings, general buildings maintenance, and the maintenance of installed mechanical, electrical, and other systems. In addition, this item includes feasibility studies, project design, construction supervision, inspection, and other institutional facility engineering functions. Included also are any applicable costs associated with recurring facility work as well as materials, hardware, and equipment used in facility maintenance activities, whether accomplished by civil service personnel or contractors. In the cost of equipment, related maintenance and other services are reflected for office, shop, laboratory and other facilities equipment as well as administrative internal communications and television monitoring equipment.

3. Custodial services

Custodial services include janitorial and building cleaning services, pest control, fire protection services, security services including badging and identification, lock and safe repair, trash and refuse handling, window blinds and light fixture cleaning, and laundry and dry cleaning of facility related items.

4. Utilities services

Utilities services include the purchase of utilities such as electricity, natural gas, fuel oil, coal, steam, propane, and other fuel commodities as well as water and sewage treatment services. Also included are the related maintenance and operating costs of the utility plans and systems.

TECHNICAL SERVICES

1. Automatic data processing

a. Equipment.—This category provides for the lease, purchase and maintenance of general purpose data processing equipment which supports institutional operations at each installation. Excluded is equipment dedicated to specific research or operational systems which is funded from the Research and Development appropriation.

b. Operations.—Operations services include programming, computer operations and related services for institutional applications including payroll, financial management, security, maintenance, personnel, logistics, and procurement records and reports.

2. Scientific and technical information and educational programs

a. Libraries.—The technical libraries are established to provide installation staffs with books, periodicals, technical reports and other scientific documentation.

b. Education and Information Programs.—The educational and informational programs provide for the documentation and dissemination of information about the Agency's programs to the general public, the educational community at the elementary and secondary levels, and the mass communications media. Assistance to the mass communications media includes the assembly and exposition of newsworthy material in support of requests in the form of press kits, news releases, television and radio information tapes and clips, and feature material.

c. Shop and Support Services.—Shop and support services include general fabrication shops, reliability and quality assurance activities, safety, photographic services, graphics, and audio-visual material.

MANAGEMENT AND OPERATIONS

1. Administrative communications

Included in this category are costs of leased lines not dedicated to a specific program or project, long distance tolls (including FTS charges), teletype services, and local telephone service.

2. Printing and reproduction

Included in this category are the costs for duplicating, blueprinting, microfilming, and other photographic reproductions. Also included in this category are Government Printing Office printing costs, contractual printing and the related composition and binding operations.

3. Transportation

Transportation services include the operation and maintenance of all general purpose motor vehicles used by both civil service and support contractor personnel. The cost of movement of supplies and equipment by commercial carriers and payments to interagency motor pools are also in this category.

4. Installation common services

Installation common services include support activities at each installation such as: occupational medicine and environmental health; mail service; supply management; patent services; administrative equipment; office supplies and materials; and postage.

SECTIONAL ANALYSIS

A BILL TO AUTHORIZE APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FOR RESEARCH AND DEVELOPMENT, SPACE FLIGHT CONTROL, AND DATA COMMUNICATIONS, CONSTRUCTION OF FACILITIES, AND RESEARCH AND PROGRAM MANAGEMENT, AND FOR OTHER PURPOSES

TITLE I

Section 101

Subsections (a), (b), (c), and (d) would authorize to be appropriated to the National Aeronautics and Space Administration, funds, in the total aggregated amount of $7,886,000,000, as follows: (a) for "Research and development," a total of 11 program line items aggregating the sum of $2,862,800,000; (b) for "Space flight, control and data communications," a total of 3 line items aggregating the sum of $3,529,900,000; (c) for "Construction of facilities," a total of 12 line items, but no more than the sum of $148,300,000; and (d) for "Research and program management," $1,345,000,000.

Subsection 101(e) would authorize the use of appropriations for "Research and development" and "Space flight, control and data communications" without regard to the provisions of subsection 1(h) 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 ensure 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 construction of a facility in accordance with this subsection, the estimated cost of which, including collateral equipment, exceeds $500,000, 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(f) would provide that, when so specified and to the extent provided in an appropriation Act, (1) any amount appropriated for "Research and development," "Space flight, control and data communications," or for "Construction of facilities" may remain available without fiscal year limitation, and (2) contracts for maintenance and operation of facilities, and support services may be entered into under the "Research and program management" appropriation for periods not in excess of twelve months beginning at any time during the fiscal year.

Subsection 101(g) would authorize the use of not to exceed $35,000 of the "Research and program management" appropriation for scientific consultation or extraordinary expenses, including representation and official entertainment expenses, upon the authority of the Administrator, whose determination shall be final and conclusive.

Subsection 101(h) would provide that of the funds appropriated for "Research and development," "Space flight, control and data communications," and "Research and program management," not in excess of $100,000 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. This section also provides that not in excess of $500,000 per project of "Research and development" and "Space flight, control and data communications" funds may be used for any of the above for unforeseen programmatic needs.

Section 102

Section 102 would authorize upward variations of the sums authorized for the "Construction of facilities" line items (other than facilities planning and design) 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 1(c).

Section 103

Secton 103 would provide that not more than one-half of 1 percent of the funds appropriated for "Research and development" and "Space flight, control and data communications" 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," (other than the funds for facilities planning and design) 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 in the national interest.

Section 104

Section 104 would provide that, notwithstanding any other provisions 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 this particular program by subsections 1(a), 1(b) and 1(d), and

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

unless 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.

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

Section 106 would provide the NASA Office of Inspector General (OIG) staff with statutory oath administration authority during the course of OIG investigations and audits.

The NASA OIG staff is one of the few within the executive branch which lacks this authority. Inspector General organizations in the executive departments have authority to administer oaths while investigating fraud or misconduct per 5 U.S.C. 303(a). Some independent agencies have oath administration powers in their statutes; these include the General Services Administration, the Small Business Administration and the Veterans Administration.

Section 107

Section 107 would provide for the procurement of structural spares to ensure cost effective operation of the Space Transportation System and to maintain production readiness for a fifth orbiter vehicle.

Section 108

Section 108 would amend Title II of the FY 1985 NASA Authorization which established a National Commission on Space. The amendment would provide that the Commission recommend a long range plan on U.S. civilian space activity within eighteen months. The original act envisioned a report within a 12 month timeframe.

Section 109

Section 109 would direct NASA to report to Congress within a 90 day period the implementation status of those recommendations contained in the President's Private Sector Survey on Cost Control and such other recommendations as may be included in the OMB report "Management of the United States Government—1986" which directly affect NASA.

Section 110

Section 110 would direct the Administrator to initiate a feasibility study and planning efforts as may be necessary to provide a timely flight opportunity for a physically disabled American.

TITLE II

Section 201

Section 201(1) sets forth that the Space Transportation System is a vital element of the United States space program.

Section 201(2) sets forth that the Space Transportation System is the primary space launch system for United States national security and civil governmental missions.

Section 201(3) sets forth that the Space Transportation System contributes to the expansion of United States private investment and involvement in space.

Section 201(4) sets forth that the availability of the Space Transportation System to foreign users for peaceful purposes is an important means of promoting international cooperative activities in the national interest and in maintaining the freedom of space for activities which enhance the security and welfare of mankind.

Section 201(5) sets forth the commitment of the United States in maintaining world leadership in space transportation.

Section 201(6) sets forth that making the Space Transportation System fully operational and cost effective in providing routine access to space will maximize the national economic benefits of the system.

Section 201(7) sets forth that the national goals and objectives for the Space Transportation System can be furthered by a stable and fair pricing policy for the Space Transportation System.

Section 202

Section 202 sets forth the purpose of the title which is to set a reimbursement pricing policy for the Space Transportation System for commercial and foreign users which is consistent with the objectives of the Space Transportation System and encourages full and effective use of space.

Section 203

Section 203 defines certain terms for the purposes of Title II.

Section 203(1) defines "Administrator" as the Administrator of the National Aeronautics and Space Administration.

Section 203(2) defines "additive costs" as the direct and indirect costs to the National Aeronautics and Space Administration of providing additional flights of the Space Transportation System

beyond the costs associated with those flights necessary to meet the United States Government's space transportation needs, including the average direct and indirect costs of program charges for manpower, expended hardware, refurbishment of hardware, spare parts, propellants, provisions, consumables, launch and recovery services, program support, and contract administration.

Section 203(3) defines "operating costs" as the total direct and indirect costs to the National Aeronautics and Space Administration to operate the Space Transportation System, including the direct and indirect costs of program charges for manpower, expended hardware, refurbishment of hardware, spare parts, propellants, provisions, consumables, launch and recovery services, program support, and contract administration.

Section 203(4) defines "capital recovery charge" as a charge determined by the Administrator based on the cost of an orbiter amortized over 100 flights.

Section 204(a) directs the Administrator, except as provided in subsections (c) and (e), to charge each commercial or foreign user of the Space Transportation System, as reimbursement, a pro rata portion of an amount determined under subsection (b). The authority under this title is in addition to the authority granted the NASA Administrator in Section 203(c)(5) of the National Aeronautics and Space Act, as amended.

Section 204(b)(1) defines the amount referred to in subsection (a) as equal to the sum of the average additive cost of a flight plus a capital recovery charge for a flight.

Section 204(b)(2) sets a maximum amount for the purpose of paragraph (1) as the average operating cost of a dedicated commercial flight of the Space Transportation System.

Section 204(c) authorizes the Administrator to reduce the amount charged any commercial or foreign user of the Space Transportation System, but not below that user's pro rata portion of the average additive cost of a flight of the Space Transportation System, as necessary to achieve one or more of the following goals: (1) the preservation of the role of the United States as a leader in space research, technology and development; (2) the efficient use of the Space Transportation System; (3) the long range goal of greatly increasing commercial space activities; and (4) the goal of enhancing the international competitive position of the United States in providing space transportation services and capabilities.

Section 204(d) directs the Administrator to assume twenty four flights per year of the Space Transportation System for the purposes of this title.

Section 204(e) authorizes the Administrator to set an amount lower than the amount determined under subsections (a), (b), and (c), or provide no cost flights for any commercial or foreign users of the Space Transportation System who is involved in research and development programs with NASA.

Section 205 sets forth the effective date of this title as applying to flights of the Space Transportation System during the period beginning October 1, 1988, and ending September 30, 1991.

TITLE III

Section 301 would amend Section 24 of the Commercial Space Launch Act (P.L. 98-575) to authorize appropriations to the Office of Commercial Space Transportation, Department of Transportation, totaling $586,000 for fiscal year 1986.

EFFECTS OF LEGISLATION ON INFLATION

In accordance with Rule XI, Clause 2(1) 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 80 percent of spending directly for jobs and the remainder for materials. NASA employs about 21,800 civil servants and supports about 133 thousand contractor and support services employees. Assuming multiplier effect 2.5, the total, short-run employment effect on the United States economy is about 390 thousand 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. There could however be some specific cases of industrial and regional employment and price changes influenced by NASA expenditures.

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, H.R. 1714, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

SECTION 204 OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, 1985

FUNCTIONS OF THE COMMISSION

SEC. 204. (a) * * *

* * * * * * *

(c) Within [twelve] *eighteen* months after the date of the establishment of the Commission, the Commission shall submit to the President and to the Committee on Commerce, Science and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives, a long range plan for United States civilian space activity incorporating the results of the studies conducted under this section, together with recommendations for such legislation as the Commission determines to be appropriate.

SECTION 24 OF THE COMMERCIAL SPACE LAUNCH ACT

AUTHORIZED APPROPRIATIONS

SEC. 24. There are authorized to be appropriated to the Secretary $4,000,000 for fiscal year 1985. *There is authorized to be appropriated to the Secretary to carry out this Act $586,000 for fiscal year 1986.*

* * * * * * *

OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to Rule XI, Clause 2(l)(3) of the Rules of the House of Representatives, and under the authority of Rule X, Clause 2(b)(1) and Clause 3(f), the following statement is made concerning the Committee's oversight findings and recommendations.

The results and findings from those oversight activities are incorporated in the recommendations found in the present bill and report.

CONGRESSIONAL BUDGET ACT INFORMATION

The 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.

CONGRESSIONAL BUDGET OFFICE—COST ESTIMATE

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, March 28, 1985.

Hon. DON FUQUA,
Chairman, Committee on Science and Technology,
Rayburn House Office Building, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for H.R. 1714, the National Aeronautics and Space Administration Act, 1986.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,
Sincerely,

RUDOLPH G. PENNER.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 1714.
2. Bill title: The National Aeronautics and Space Administration Act, 1986.
3. Bill status: As ordered reported by the House Committee on Science and Technology on March 27, 1985.
4. Bill purpose: This bill authorizes the appropriation of $7,886 million for the National Aeronautics and Space Administration and $568 thousand for the Office of Commercial Space Transportation within the Department of Transportation for fiscal year 1986 and establishes a space shuttle pricing policy for foreign and commercial users during fiscal years 1989 through 1991.

The authorization includes $2,727 million for the production and operation of the space shuttle, $230 million for the development of a space station, $2,633 million for other research and development activities, and $803 million for the space tracking system. The bill also includes $148 million for construction of facilities and $1,345 million for research and program management. The total amount authorized is the same as the President's budget request and approximately $375 million above the fiscal year 1985 appropriations for NASA.

5. Estimated cost to the Federal Government:

[By fiscal years, in million of dollars]

	1986	1987	1988	1989	1990
Authorization level:					
Function 250: Civilian space	7,264				
Function 400: Aeronautics and commercialization	623				
Total	7,887				
Estimated outlays:					
Function 250: Civilian space	5,351	1,648	245	18	1
Function 400: Aeronautics and commercialization	396	180	44	2	1
Total	5,747	1,829	289	20	2

H.R. 1714 establishes a pricing policy for foreign and commercial users of the space shuttle in fiscal years 1989 through 1991. According to this policy, the price charged to these users could be between $40 million and $71 million (all prices in 1982 dollars) for a dedicated shuttle mission. This is below the current NASA proposal for that period of $87 million and generally below the $71 million price that will be in effect for fiscal years 1986 through 1988.

The budgetary impact of the H.R. 1714 pricing policy cannot be accurately estimated. There is now no pricing policy in place for that period that would provide a basis for comparison. Also, the effect of pricing on demand for such services and the competitive position of the shuttle relative to other launch systems further complicate such estimates. The highest current estimates of foreign and commercial demand for flights are around six per year. Given this assumption and a $40 million price per flight, the loss of reimbursements relative to the current Administration proposal would be about $280 million (in 1982 dollars), assuming no effects on demand. If the price under H.R. 1714 were at the higher end of the estimated range, and the flight rate lower, however, the difference would be substantially less.

The costs of this bill fall within budget function 250.

Basis of estimate: The authorization levels are the amounts specified in the bill. The outlay estimates assume that all funds authorized will be appropriated prior to the beginning of fiscal year 1986 and that spending will reflect historical patterns.

6. Estimated cost to State and local governments: None.
7. Estimate comparison: None.

8. Previous CBO estimate: None.
9. Estimate prepared by: Paul M. DiNardo.
10. Estimate approved by C.G. Nuckols (for James L. Blum, Assistant Director for Budget Analysis).

Oversight Findings and Recommendations, Committee on Government Operations

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

Committee Recommendation

A quorum being present, the Committee favorably reported the bill H.R. 1714 by voice vote, and recommends its enactment.

NASA Recommendations

Hon. Thomas P. O'Neill, Jr.,
Speaker of the House of Representatives,
Washington, DC.

Dear Mr. Speaker: Submitted herewith is a draft bill, "To authorize appropriations to the National Aeronautics and Space Administration for research and development; space flight, control and data communications; construction of facilities; and research and program management; and for other purposes," together with the sectional analysis thereof.

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 1986. For that fiscal year, the bill would authorize appropriations totaling $7,886,000,000, to be made to the National Aeronautics and Space Administration as follows:

(1) for "Research and development," amounts totaling $2,881,800,000;

(2) for "Space flight, control and data communications," amounts totaling $3,509,900,000;

(3) for "Construction of facilities," amounts totaling $149,300,000; and

(4) for "Research and program management," $1,345,000,000.

In addition, the bill would authorize such sums as may be necessary for fiscal year 1987, i.e., to be available October 1, 1986.

The enclosed draft bill follows generally the format of the National Aeronautics and Space Administration Authorization Act, 1985 (P.L. 98-361). However, the bill differs in substance from the prior Act in several respects.

First, subsections 1(a), 1(b), 1(c), and 1(d), the authorizations for the four NASA appropriation accounts, 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 1986, the bill also would provide authorization for such sums as may be necessary for fiscal year 1987. 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, section 7 is a new section which would povide statutory oath administration authority to the NASA Office of Inspector General staff, an authority presently enjoyed by all the executive departments and many of the independent agencies.

Forth, section 8 is a new section which would amend the patent section of the National Aeronautics and Space Act of 1958, as amended, to provide that any invention made or used in outer space on a space vehicle under the jurisdiction or control of the United States shall be considered made or used in the United States for purposes of patent law.

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, 1986," rather than "1985."

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 House 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.

MINORITY VIEWS OF HON. TOM LEWIS, HON. RON PACKARD, HON. SID MORRISON, AND HON. ROBERT S. WALKER

Special Advisory Committees

NASA spends billions of dollars every year on their Aeronautics and Space program, and while Congressional oversight is a necessary and important function, we believe there has to be some confidence between this Committee and the activities of NASA.

This year the Tranportation, Aviation, and Materials Subcommittee established the Congressional Advisory Committee on Aeronautics to review NASA's aeronautics program. NASA also has advisory committees. The expertise of the Congressional Advisory Committee is not in question; however, we have some concern over the fundamental process of calling upon other experts to review experts after experts in as much as a different committee would in all likelihood arrive at a different set of priorities. We believe this process disjoints our efforts to come to a consensus of what is best for the country in terms of aeronautics research and development.

Tom Lewis.
Ron Packard.
Sid Morrison.
Bob Walker.

Calendar No. 198

99TH CONGRESS
1st Session

SENATE

REPORT
99-91

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT OF 1986

JUNE 24 (legislative day, JUNE 3), 1985.—Ordered to be printed

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

REPORT

together with

ADDITIONAL VIEWS

[To accompany H.R. 1714]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (H.R. 1714) to authorize appropriations to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, construction of facilities, and research and program management, and for other purposes, having considered the same, reports favorably thereon with an amendment in the nature of a substitute 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 $7,652 million for fiscal year 1986 as follows:

	Budget request	Committee authorization
Fiscal year 1986:		
Research and development	$2,881,800,000	$2,755,800,000
Space flight, control, and data communications	3,509,900,000	3,386,900,000
Construction of facilities	149,300,000	139,300,000
Research and program management	1,345,000,000	1,370,000,000

51-010 O

COMMITTEE ADJUSTMENTS TO NASA REQUEST FOR FISCAL YEAR 1986—SUMMARY

Fiscal year 1986	Administration request	Committee authorization
Research and Development:		
Space transportation capability development	$459,300,000	$477,200,000
Space station	230,000,000	200,000,000
Physics and Astronomy	630,400,000	608,400,000
Life Sciences	72,000,000	68,000,000
Planetary Exploration	359,000,000	349,000,000
Space Applications	501,800,000	508,000,000
Technology Utilization	11,100,000	9,500,000
Commercial Use of Space	30,000,000	16,500,000
Aeronautical Research and Technology	354,000,000	350,400,000
Space Research and Technology	168,000,000	154,000,000
Space tracking and Data systems	16,200,000	14,800,000
Total	2,881,800,000	2,755,800,000
Space Flight, Control, and Data Communications:		
Space Shuttle Production, and Operational Capability	976,500,000	941,500,000
Space Transportation Operations	1,725,100,000	1,700,100,000
Space Tracking and Data Acquisition	808,300,000	745,300,000
Total	3,509,900,000	3,386,900,000
Construction of facilities	149,300,000	139,300,000
Research and Program Management	1,345,000,000	1,370,000
Grand Total	7,886,000,000	7,652,000,000

LEGISLATIVE HISTORY

On February 1, 1984, the fiscal year 1986 budget request for the NASA was submitted to Congress. The Committee considered the budget request in hearings on February 26, March 27 and 28, and April 3 and 4. Testimony was received from the NASA Administrator and from representatives of the Department of Defense (DOD), the aerospace industry, the space science and application communities, and other outside witnesses. On June 12, 1984, Senator Gorton, along with Senators Danforth, Hollings, Riegle, Long, Inouye, Exon, Ford, Gore, Rockefeller, Denton, Heflin, Lautenberg, Glenn, and Matsunaga, introduced the National Aeronautics and Space Administration Authorization Act of 1986, S. 1278, which was referred to the Committee on Commerce, Science, and Transportation.

On June 13, 1984, the Committee considered S. 1278. Because the House NASA authorization bill (H.R. 1714) had already been referred to the Committee, the Committee offered S. 1278 as an amendment in the nature of a substitute to H.R. 1714. The Committee then ordered H.R. 1714 to be reported, without objection.

SUMMARY OF MAJOR PROVISIONS

For fiscal year 1986, the Committee's NASA authorization bill authorizes $7,652,000,000, of which $2,755,800,000 is for research and development; $3,386,900,000 is for space flight, control, and data communications; $139,300,000 is for construction of facilities; and $1,370,000,000 is for research and program management.

The Space Transportation Capability Development budget of $477,200,000 is $17,900,000 greater than the fiscal year 1986 NASA budget request of $459,300,000 and provides for continued development of Spacelab hardware. Also included in the fiscal year 1986 funding are development and operational activities for upper stages and for continued design and development of the hardware for the United States/Italian Tethered Satellite System. Space Transportation Systems funding in fiscal year 1986 also provides for the new start of the Orbital Maneuvering Vehicle (OMV) an integral transportation element in the Space Shuttle and space station programs.

The Committee has provided $200,000,000 for the continuation of extended definition and design studies for the permanently manned space station. The Committee's space station recommendation is $30 million below the administration's request of $230,000,000.

The budget for the Space Sciences programs for fiscal year 1986 is $1,025,400,000, compared to the administration's request of $1,061,400,000. The Committee's Space Science recommendation retains the administration's budget request for research and analysis in Physics and Astronomy and in Planetary Exploration, and supports the ongoing activities of the Hubble Space Telescope program and the planetary missions to Venus (Venus Radar Mapper), Jupiter (Galileo) and the Sun (Ulysses).

The Space Applications funding for fiscal year 1986 is $508 million, compared to the administration's budget request of $551,800,000. Space Applications funding retains the administration's request for Materials Processing in Space and authorizes $80 million for the Advanced Communications Technology Satellite (ACTS) program and $114 million for the Upper Atmosphere Research Satellite program.

The Committee has authorized $16,500,000 for Commercial Use of Space, compared to the administration's request of $30 million and to a fiscal year 1985 appropriation of $8,500,000.

The Committee's authorization provides $350,400,000 for Aeronautical Research and Technology, compared to the administration's request of $354,400,000 and to the fiscal year 1985 appropriation of $342,400,000.

Space Research and Technology is funded at a level of $154,000,000, compared to the administration's request of $168,000,000.

The authorization for Tracking and Data Acquisition Advanced Systems is maintained at the fiscal year 1985 appropriation level of $14,800,000.

The total Research and Development budget for the above-mentioned programs for fiscal year 1986 is $2,755,800,000, compared to a fiscal year 1986 budget request of $2,881,800,000 and a fiscal year 1985 funding level of $2,422,600,000.

Within the Space Flight, Control, and Data Communications budget of $3,386,900,000, the Space Shuttle Production and Operational Capability is funded at a level of $941,500,000. This funding level enables NASA to continue production of Space Shutte structural spares and main engines.

Shuttle Operations activities within Space Flight, Control, and Data Communications are funded at a level of $1,700,100,000. This funding provides for the procurement of the external tanks, the solid rocket motors and boosters hardware; flight operations; and launch and landing activities.

Finally, within Space Flight, Control, and Data Communications, $745,300,000 is made available for space and ground networks, communications, and data systems, most of which supports the Tracking and Data Relay Satellite System (TDRSS).

The Committee recommendation for construction of facilities for fiscal year 1986 is $139,300,000, which is $10 million less than the administration's budget request. The Committee recommendation for Research and Program Management is $1,370 million, compared to the administration's budget request of $1,345,000,000.

S. 1278, and H.R. 1714 (as reported by the Committee), includes language prohibiting the use of the space station to carry or deploy nuclear weapons or any other weapons of mass destruction.

Also, this bill directs the President or the NASA Administrator to report to the Senate and House authorization committees on Space Shuttle pricing policy for fiscal years 1989-91. Furthermore, before this policy can be implemented, these two committees must have had 30 days to review this policy and, where appropriate and necessary, recommend legislation establishing a Shuttle pricing policy for fiscal years 1989-91.

This legislation defers NASA's fiscal year 1986 principal payment of $107 million to the Federal Financing Bank. This payment is currently scheduled pursuant to a loan agreement which finances the TDRSS.

This bill also authorizes $586,000 for the Office of Commercial Space Transportation of the Department of Transportation (DOT) for fiscal year 1986 and extends the life of the National Commission on Space from twelve months to eighteen months.

Research and Development—$2,755,800,000

Space Station—$200,000,000

The Committee has authorized $200 million for fiscal year 1986 for the space station program, $30 million below the administration's request.

The U.S. space station will provide a permanently manned facility in space, which will enhance the Nation's science and applications programs, which will allow further commercial use of space, and will stimulate advanced technologies. A vigorous but deliberately paced Space Station program will permit us to maintain the preeminence in space our Nation has attained through various manned and unmanned programs.

The space station will be a multipurpore facility providing a permanent human presence in space to conduct essential scientific and technical research, to perform unique commercial activities, and to perform more efficiently operational tasks in space, such as satellite servicing. The use of the space station will involve extensive national and international user community participation. The program definition phase will feature continuing emphasis on and iteration of user requirements. The space station will incorporate a modular design philosophy which will permit the system to evolve through time, as warranted, to provide greater user utility and

operational capabilities. Its manned and unmanned elements will be designed to facilitate maximum on-orbit maintainability/restorability, operational autonomy, and simplified user interfaces. Implicit in these objectives is the recognized need to optimize the synergistic effects of the man/machine combination in space via automation, robotics, and artificial intelligence technology. The space station will provide essential system elements and operational considerations for an integrated national space capability. The space station facility (core and associated platforms) will be placed and maintained in low-Earth orbit by the STS, thereby building upon the previous national investment in space.

A basic premise of the space station program is to perform a thoroughly detailed front-end definition including: engineering design by industrial contractors; subsystem advanced development and tests in dedicated test beds; early flight experiments on the Space Shuttle to prove system feasibility; and continued trade studies for system optimization. It will also include a thorough analysis of a "man-tended" space station option. Detailed definition, thoroughly digested and incorporated into hardware specifications, provides the greatest single assurance of program success and the achievement of cost and schedule targets. Throughout the definition period, NASA will work to identify better growth potential and evolutionary configurations to insure that the space station is able to grow. Following an extensive definition program, consisting of both in-house and contracted activities, NASA will begin development in fiscal year 1987 with a goal of 1993 for an initial operational space station.

Committee Comments

The Committee continues to believe that the administration's proposal to develop a permanently manned space station is an initiative that could dramatically enhance our exploratory and operational capabilities in space, as well as yield unforeseen and significant benefits with terrestrial applications. The Committee notes with approval that the Phase B systems definition and design contracts have begun and that the international memoranda of understanding have been signed.

The Committee is pleased that the space science community has increased its support for and participation in the space station program and further believes that this growing involvement is due to NASA's increased willingness to incorporate the goals and objectives of the space science community in the planning of the space station. In his testimony before the Committee, Dr. Peter Banks, the Chairman of NASA's Task Force on Scientific Uses of the Space Station (TFSUSS), stated that the national space research community has dramatically changed its opinion about the space station program and that the Task Force has been gratified with NASA's reception to concepts and advice generated by the Task Force.

Although there are still issues to be resolved relative to the conduct of space science aboard the space station, the Committee notes with approval that NASA has made a good faith effort to understand the concerns of the space science community and to address these concerns, where practical. Key issues, however, such as the nature of any coorbiting platform(s) and how NASA will be able to develop new experiments for the space station, without distorting the ongoing programs of space science research unconnected with the space station, are still unresolved. So that the Committee may better understand the nature and productivity of the dialogue between the space science community and NASA, the Committee requests that NASA prepare a report, by December 31, 1985, which assesses the results of the TFSUSS-sponsored space station summer study held April 13–14, 1984. Furthermore, the Committee requests that NASA include in this report which of the recommendations of this summer study it intends to implement, how it intends to implement these recommendations, and the associated costs.

Over the past year, NASA has expressed a growing willingness to incorporate automation and robotics technologies in the space station initial operating capability (IOC). NASA's Advanced Technology Advisory Committee (ATAC) and the California Space Institute Automation and Robotics Panel have both made recommendations for advancing automation and robotics technologies in and through the space station program. The California Space Institute study recommends that NASA's advancement and demonstration of automation and robotics technologies increase to a funding range of $100 million to $190 million by 1990, a range of funding that the Committee believes will be difficult to accommodate given the present program funding profile. The Committee requests NASA to report by December 31, 1985, how and to what extent it intends to implement the recommendations of the ATAC and the California Space Institute and what would be the associated costs implementing these recommendations.

During the time that the Phase B memoranda of understanding have been negotiated and signed, the Committee has been increasingly aware of the complexities and sensitivities of the international element of his space station program. Even though the memoranda of understanding are essentially in place, there will continue to be ongoing discussions related to technology transfer, the protection of proprietary data rights, and the assignment of selected elements of the IOC facility. In addition, international Phase B participants have already expressed concern about the nature of a Phase C/D commitment by the United States to the space station program. The Committee expects NASA to examine all possible agreements that could satisfy the goals and objectives of the participants and also expects to be kept informed on a regular basis about any developments in the area of international participation.

Consistent with its position 1 year ago, the Committee feels that the space station is a facility that should be used for peaceful purposes. Senator Gorton, therefore, included language in the fiscal year 1986 authorization bill which reaffirms this position. Section 7 of H.R. 1714, as reported by the Committee, restates Article IV of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies. It is not the Committee's intent to preclude the DOD from conducting research and development activities on the space station, but it is the Committee's intent to ensure that

the space station is used for peaceful purposes, as it has been characterized since the program's inception.

The Committee recognizes that some delay in the program may be inevitable due to a reduction in the funding from the administration's original budget request. The Committee, however, urges NASA and the Phase B contract participants to make every attempt possible to complete the Phase B contracts as close as possible to the previously scheduled 21-month contract period so that Phase C/D development can begin as early as possible.

SPACE TRANSPORTATION CAPABILITY DEVELOPMENT—$477,200,000

The Committee has authorized $477,200,000 for fiscal year 1986, $17,900,000 more than the administration's request, and makes specific authorizations as follows:

Upper Stages	$174,400,000
Tethered Satellite System	14,000,000
Orbital Maneuvering Vehicle	10,000,000

The principle areas of activity in Space Transportation Capability Development are efforts related to the Spacelab, the upper stages that place satellites in high altitude orbits, the engineering and technical base support at NASA centers, payload operations and support equipment, advanced programs study and evaluation efforts, the development and first flight of the United States/Italy tethered satellite system, and the development of the Orbital Maneuvering Vehicle.

The Spacelab is a major element of the Space Transportation Systems (STS) program and provides a versatile, reusable laboratory which will be flown to and from Earth orbit in the Shuttle orbiter cargo bay. The development program which has been carried out jointly by NASA and the European Space Agency (ESA) continues with the second verification mission, Spacelab 2, scheduled for July, 1985. NASA's support of the Spacelab development effort includes ancillary flight and ground hardware and system integration activation efforts which assure Spacelab compatibility with the experiments and orbiter. The first operational mission, Spacelab 3, flew April 29–May 5 and was of the same general configuration as the first Spacelab mission.

The upper stages project 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. The program provides for procurement of stages for NASA missions, for technical monitoring and management activities for government and commercial upper stages, for a Solid Rocket Motor integrity program to establish an engineering data base for upper stage components, and for the NASA share of the joint Air Force development effort on the Centaur upper stages 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), the White Sands Test Facility (WSTF), and the National Space Technology Laboratories (NSTL); for Space Transportation Systems research and development activities. In fiscal year 1985 and subsequent years, computational capability is included to provide for complex flow dynamics modeling and other analyses in support of MSFC programs.

Payload operations and support equipment provides for developing and placing into operational status the ground and flight systems necessary to support the Space Transportation System payloads during prelaunch processing, on-orbit mission operations, and, when appropriate, post-landing processing. Included within this program area are the development and the initial operation of the Payload Operations Control Center, satellite servicing tools and techniques development, STS support services for NASA payloads flight demonstrations, and multimission payload support equipment.

The advanced programs effort identifies potenital future space programs and provides technical as well as programmatic data for their definition and evaluation. NASA plans space programs far in advance, to improve performance and reliability, and to reduce future risks and costs through the effective use of new technology.

The Tethered Satellite System, (TSS), initiated in 1984, will allow NASA to conduct space experiments in regions remote from the Shuttle orbiter. The objectives of the initial TSS mission, scheduled for 1988, are twofold: (1) To verify the controlled deployment, operation, and retrieval of the Tethered Satellite, and (2) to quantify the interaction between the satellite-tether and space plasma in the presence of a current drawn through the tether. The development of the Orbital Maneuvering Vehicle will allow NASA to deliver, retrieve, and service payloads more easily than it can with the current Space Transportation System.

Spacelab

The first Spacelab operational flight (SL–3) was launched in April 1985. The second verification flight (SL–2) is scheduled for July 1985. Activities before flight include physical integration, checkout of the Spacelab elements, and support of training, including the operations of the Spacelab simulator. After the flight, SL–2 will require deintegration of the Spacelab system components and postflight data analysis. Also, in fiscal year 1985, processing of the second flight of the Materials Science Laboratory (MSL) and preparation for the first Hitchhiker flights will take place. NASA will integrate the first life sciences mission (SLS–1) and astronomical observations mission (ASTRO–1), and will conduct analytical integration, configuration management, and software development for future flights.

Upper Stages

In upper stages, a joint development program with the DOD was initiated in fiscal year 1983 for the use of the Centaur as an STS upper stage. The common vehicle, designated Centaur, will accommodate a 40-foot long, approximately 10,000-pound payload in the bay of the orbiter, and is capable of placing it into geosynchronous orbit. It will be available in 1987. A longer version of the Centaur-G, known as G-Prime, is being developed by NASA for launch of the Galileo and Ulysses spacecraft in May 1986.

In February 1985, NASA disclosed certain cost overruns associated with the Centaur-G and Centaur-G Prime upper stages. According to NASA, the cost overruns are not related to any technical deficiencies and the two Centaur-G Prime upper stages are expected to be available for the May 1986, launches of the Ulysses and Galileo missions.

The total Centaur development cost overrun is approximately $60-$70 million. Of this amount, it is expected that the Air Force will absorb $20 million in fiscal year 1985. NASA intends to absorb approximately $25 million in fiscal year 1985 within certain contingency funds. The remaining $25 million in development cost overruns, however, will affect NASA's fiscal year 1986 requirements. In addition, another $30 million to $40 million will be required in fiscal year 1986 for growth in the support requirements of maintenance and engineering, for modifications to the orbiter, and for additional launch operations requirements.

The Inertial Upper Stage (IUS) was developed under a DOD contract to provide the capability to place payloads of up to 5,000 pounds into geosynchronous orbit. The first IUS was successfully launched in October 1982 on a Titan 34-D booster. The first IUS/STS launch in April 1983, carried the TDRS-1 spacecraft. The IUS failed to operate during the second stage boosts. The IUS anomalies were resolved by joint USAF/NASA action, and the DOD/NASA/Industry Anomaly Investigation Team determined that the IUS is ready for flight.

The first mission of this re-tested IUS occurred on January 24, 1985, abroad STS mission 51-C, the first DOD dedicated Shuttle mission. By placing a DOD satellite into geosynchronous orbit, the IUS met its mission objectives successfully.

NASA has bought four IUS vehicles for launch of the initial four TDRSS spacecraft; the first three were funded through the TDRSS contract while the fourth is funded under this budget element.

The objective of the Payload Assist Module (PAM) program is to provide low cost transportation, principally for commercial spacecraft, from the Shuttle's low Earth orbit to geosynchronous orbit. The Delta class PAM-D is capable of injecting up to 2,750-pound payloads into geosynchronous transfer orbit. The Atlas-Centaur class (PAM-A) is capable of inserting 4,400-pound payloads into the same orbit. PAM-DII is being developed commercially and will be capable of placing a 4,100-pound payload into geosynchronous transfer orbit and will be available for launch by mid 1985. Twenty-seven PAM-D's have been successfuly launched on the Delta, Atlas, and Space Shuttle. Nine of these launches have occurred since the two PAM-Ds failed on STS-11.

The Transfer Orbital Stage (TOS) is a three-axis stabilized perigee stage that is being commercially developed by the Orbital Science Corporation for use in the Shuttle. It will be able to place in the 6,000 to 13,000 pounds into geosynchronous transfer orbit and thus bridge the gap between PAM-DII and Centaur. The scheduled launch availability is late 1987.

The Solid Rocket Motor Integrity program began during fiscal year 1984 to establish an urgently needed engineering data base for use of composite materials in upper stage motor nozzles, to minimize risk to planned missions and to restore user confidence in U.S. launch systems. NASA is examining physical and mechanical properties of selected components to developing and means of instrumenting manufacturing processes and their effect on material properties. It will conduct motor testing to verify analysis and create an engineering data base.

Engineering and technical base

The Engineering and Technical Base provides the core capability for the engineering, scientific, and technical support required at the JSC, the KSC, the MSFC, the WSTF, and the NSTL for research and development. In fiscal year 1985 and subsequent years, computational capability is included to provide for complex flow dynamics modeling and other analyses in support of MSFC programs.

Payload operations and support equipment

Payload operations funding is required to furnish payload services for NASA launches. Major payloads receiving support during this year include Galileo, Venus Radar Mapper, Ulysses, Tracking and Data Relay Satellite, Hubble Space Telescope, Spartan Halley, Astro-1, and Spacelabs-2 and -3. Further, efforts will continue to provide the means to maintain and repair satellites on-orbit by developing a series of tools, aids, and techniques, and to demonstrate capabilities and methods of improving the efficiency of on-orbit operations. The demonstrations will provide the experience necessary for realization of the Shuttle's potential for satellite servicing missions and on-orbit assembly functions.

Advanced programs

In fiscal year 1986, major emphasis will be placed on system concept definition and key advanced developments in crew systems, geostationary unmanned platforms, reusable Orbital Transfer Vehicles (OTV's), new capability mission kits for orbital maneuvering vehicles, future tethered systems applications, satellite servicing systems near and remote from the orbiter, and generic space systems capabilities. The overall goal continues to be the definition of the space elements needed for space operations over the next twenty years.

NASA will continue intensive study of unmanned launch vehicles in coordination with USAFO. Depending on present discussions, a major poriton of the fiscal year 1985 funds may go to a joint project office. Alternatively, NASA may issue study contracts with senior level NASA/DOD coordination.

Tethered Satellite System

The development of a TSS will provide a new facility for conducting space experiments at distances up to 100 kilometers from the Space Shuttle orbiter while being held in a fixed position relative to the orbiter.

The United States TSS hardware development of the deployment mechanism began in fiscal year 1984 following the completion of an advanced development phase initiated in fiscal year 1983. The United States is also responsible for overall program management and orbiter integration. The Italians completed the definition

phase in fiscal year 1983 and initiated the satellite hardware development in 1984. They are responsible for the satellite development and instrument and experiment integration. Some program delays are being encountered on the development of the Italian satellite and the presently planned 1988 launches are being reevaluated.

Orbital Maneuvering Vehicle

The Orbital Maneuvering Vehicle (OMV) will provide a new STS reusable extension capability for conducting orbital operations with spacecraft and payloads beyond the practical reach of the STS. The reusable OMV, operating as far as 800-1,400 nautical miles from the orbiter, will provide delivery, maneuvering, and retrieval of satellite payloads to and from altitudes or inclinations beyond the existing STS capability; reboost of satellites to original operational altitudes or higher; delivery of multiple payloads to different orbital altitudes and inclinations in a single flight; and safe deorbit of satellites which have completed their useful life.

The funding in fiscal year 1985 will allow NASA to begin to develop flight hardware for the OMV after completing in 1985 systems definition efforts begun with fiscal year 1984 Advanced Programs funding. Initiation of hardware development in fiscal year 1986 will lead to an initial operating capability in 1990 or 1991 at a total estimated cost of about $400 million. In fiscal year 1986, funding will allow NASA to design the OMV comprehensively, and confirm its requirements, and have a long lead time to pursued flight hardware and tooling.

COMMITTEE COMMENTS

The Committee authorization of $477,200,000 includes specific authorizations of $174 million for upper stages; $14 million for the TSS, and $10 million for the OMV. Also, the Committee authorizes an additional $52 million above the Administration's request of $122 million for upper stages to accommodate the fiscal year 1986 cost overruns of the Centaur upper stage program. The Committee recognizes that the recently revealed problems associated with the Centaur program only exacerbate an already demanding schedule for the Centaur-supported planetary missions, Galileo and Ulysses, which are both scheduled for launch in May 1986. The Committee expects NASA To make every effort possible to conduct these two launches within the narrow "window" in May 1986, and expects to be kept informed about any other problems with this program.

Because of the budgetary pressures that exist in fiscal year 1986, the Committee has provided only $52 million of the projected $60 million cost overrun for the Centaur upper stage development and production program. This program is expected to absorb this difference.

The Committee authorizes a total of $14 million for fiscal year 1986 for the TSS, $7 million below the Administration's request. Because of delays in this program, particularly in the U.S. announcement of its science investigators, the originally scheduled launch date of December 1987 has now slipped to September 1988. The $7 million reduction is predicated on this delay.

Also, the Committee authorizes $10 million in fiscal year 1986 for the OMV, the only "new start" included in the budget request. Although the budget request for the OMV calls for $25 million in fiscal year 1986, the $15 million reduction is required largely due to budgetary pressures. This reduction does not reflect any Committee opposition to this initiative. The Committee supports this new initiative understands that with $10 million, NASA will still be able to keep the OMV program on the planned schedule of the first vehicle delivery in 1990.

The Committee believes the OMV is an integral element in the Space Shuttle program and will likely be required to service and/or reboost the Space Telescope before it is required for use in conjunction with the space station. Therefore, the Committee believes that, in spite of budgetary pressures, it is important to begin this important element of the required space infrastructure in fiscal year 1986.

SPACE SCIENCE—$1,025,400,000

The Committee authorization for the Space Sciences—Physics and Astronomy, Life Sciences, and Planetary Exploration—is $1,025,400,000, $35 million below the fiscal year 1986 administration request.

PHYSICS AND ASTRONOMY—$1,025,400,000

The Committee recommends $608,400,000 for Physics and Astronomy, compared to the administration's request of $630,400,000.

Within the Committee's recommendation for Physics and Astronomy, the Committee specifically authorizes $42,300,000 for Research and Analysis and $119,900,000 for Mission Operations and Data Analysis, both as requested by the Administration. Also, the Committee authorizes $15 million for the Solar Optical Telescope (SOT), $15 million below the administration's request. In addition, to conform to the recommended authorization for Physics and Astronomy, the Committee directs NASA to make a general reduction of $7 million within Physics and Astronomy.

The major objective of the Physics and Astronomy program is to increase our knowledge of the origin, evolution, structure and composition of the universe, including the Sun, the stars, and the other celestial bodies. Space-based research is being conducted to investigate the structure and dynamics of the Sun and its long- and short-term variations; cosmic ray, x-ray, ultraviolet, optical, infrared, and radio emissions from stars, interstellar gas and dust, pulsars, neutron stars, quasars, black holes and other celestial sources; and the laws governing the interactions and processes occurring in the universe. Many of the phenomena being investigated are not detectable from ground-based observatories because of the obscuring or distorting effects of the Earth's atmosphere.

To achieve the objectives of the Physics and Astronomy program, NASA employs theoretical and laboratory research; aircraft, balloon and sounding rocket flights; Shuttle/Spacelab flights; and free-flying spacecraft. Research teams involved in this program are located at universities, industrial laboratories, NASA field centers, and other government laboratories. The scientific information ob-

tained and the technology developed in this program are made available to the scientific communities for the application to and the advancement of scientific knowledge, education and technology.

The Physics and Astronomy missions undertaken to date have been extraordinarily successful, and a number of missions continue to produce a rich harvest of scientific data—the International Ultraviolet Explorer (IUE) and the Solar Maximum Mission (SMM) are still operating, and new scientific results are continually emerging from the analysis of the High Energy Astronomical Observatories and Infrared Astronomical Satellite data sets.

Hubble Space Telescope

The Hubble Space Telescope will make a major contribution to understanding the stars and galaxies, the nature and behavior of the gas and dust between them, and the broad question of the origin and scale of the universe. Operating in space above the atmospheric veil surrounding the Earth, the Space Telescope will increase by more than 1 hundredfold the volume of space accessible for observations. With its significant improvements in resolution and precision in light sensitivity and in wavelength coverage, the Hubble Space Telescope will permit scientists to conduct investigations that could never be carried out using ground-based observatories due to the obscuring and distorting effects of the Earth's atmosphere.

The Hubble Space Telescope will enhance the ability of astronomers to study radiation in the visible and ultraviolet regions of the spectrum. It will be more sensitive than ground-based telescopes and will record greater detail about the objects under study. It will make possible observations of objects so remote that the light will have taken many billions of years to reach the Earth. As a result, we will be able to look far into the distant past of our universe. The Hubble Space Telescope will also contribute significantly to the study of the early state of stars and the formatiom of solar systems, as well as to the observation of such highly-evolved objects as supernova remnants and white dwarfs stars. With the Hubble Space Telescope, we may be able to determine the nature of quasars and the processes by which they emit such enormous amounts of energy, and it may also be possible to determine whether some nearby stars have planetary systems.

The Hubble Space Telescope will be an automated observatory, delivered into orbit by the Space Shuttle. Data from its scientific instruments will be transmitted to Earth via the Tracking Data Relay Satellite System. The Hubble Space Telescope design will permit in-orbit maintenance, repair, and/or retrieval by the Space Shuttle for return to Earth for required refurbishment and then relaunch by the Space Shuttle.

During fiscal year 1984, significant progress was made on the Hubble Space Telescope with the completion of the scientific instrument verification and acceptance program at the Goddard Space Flight Center, delivery of the Optical Telescope Assembly, the Science Instrument Control and Data Handling Unit, the Wide Field/Planetary Camera, the Faint Object Spectrograph and the High Speed Photometer to the Lockheed Missiles and Space Company for assembly and verification into the spacecraft, and the continued structural and electronic development activities at Lockheed.

In fiscal year 1985, the program focus will be placed on the assembly and verification activities at Lockheed. In addition, completion and delivery of the three flight Fine Guidance Sensors, the High Resolution Spectrograph, and the Faint Object Camera is scheduled.

The fiscal year 1986 funding is required to complete the integration and testing of the total Hubble Space Telescope System before the integrated system is shipped to the KSC for launch in the second half of 1986.

Gamma Ray Observatory

The objective of the Gamma Ray Observatory (GRO) mission is to measure gamma ray radiation from the universe and to explore the fundamental physical processes powering it. Certain celestial phenomena are accessible only at gamma ray energies. The observational objectives of the Gamma Ray Observatory are to search for direct evidence of the synthesis of the chemical elements; to observe high energy astrophysical processes occurring in supernova, neutron stars and black holes; to locate gamma ray burst sources; to measure the diffuse gamma ray radiation for cosmological evidence of its origin; and to search for unique gamma ray emitting objects.

Cosmic gamma rays represent one of the last frontiers of the electromagnetic spectrum to be explored. The low flux levels of gamma ray quanta, and the high background they produce through their interaction with the Earth's atmosphere, coupled with the demand for better spectral, spatial, and temporal resolution of source features, combine to require that large gamma ray instruments be flown in space for a prolonged period. Gamma rays provide unique information on the most intriguing astronomical objects yet discovered, including quasars, neutron stars, and black holes. The GRO is scheduled for launch by the Space Shuttle in 1988. The spacecraft is designed to accommodate four large gamma ray instruments and will be designed to allow for rendezvous with the Space Shuttle and refueling by the Space Shuttle or the OMV. Because of the necessity for long exposures, the spacecraft will be pointed in a fixed direction in space for periods of a few hours up to two weeks at a time.

In fiscal year 1984, NASA held critical design reviews for the instruments, and the preliminary design review for the spacecraft. In addition, it began fabrication of the spacecraft and instrument hardware. In fiscal year 1985, NASA will hold the spacecraft critical design review. All subsystem fabrication will be underway in fiscal year 1985 and the fabrication of the spacecraft flight structure will be initiated.

The fiscal year 1986 funding is required for calibration of the science instruments; for continuation of the spacecraft fabrication and delivery of the Command and Data Handling system; and for continuation of the ground operations preparations.

Shuttle Spacelab Payload Development and Mission Management

The objectives of Shuttle/Spacelab payload development and mission management are to develop instruments to conduct experiments and acquire new knowledge in the disciplines of physics and astronomy, to develop experiment interface hardware for material processing, to develop sounding rocket class payloads for flight on the Space Shuttle and to manage the mission planning and execution of all NASA Spacelab payloads. This project supports the development of all physics and astronomy experiments, the system management and engineering development of the flight equipment and software, the payload specialist training and support, the physical integration of the payload with the Spacelab system, the operation of the payloads during flight, the dissemination of data to experimenters, and the analysis of physics and astronomy flight data. In addition, this project funds the mission management efforts for all NASA Spacelab payloads.

Instruments are currently under development for several Shuttle/Spacelab missions with primary emphasis on physics and astronomy. These instruments are divided into two classes: multiuser instruments and principal investigator instruments. The multiuser instruments are those instruments that have a broad capability, can accommodate a number of principal investigator-furnished instruments, and have a larger user community. The principal investigator instruments are those proposed for a specific scientific investigation by a single investigator who may not have coinvestigators. Spacelab-2, which is the second verification flight of the European-built Spacelab, is scheduled for launch in mid-1985. The objectives of Spacelab-2 are to verify the Spacelab igloo and pallet systems and to obtain scientific data, with emphasis on astrophysics and solar physics. The Instrument Pointing System, developed by the European Space Agency, will be flown for the first time on the Spacelab-2 mission.

Three ultraviolet telescopes are also currently in development leading to a launch in 1986 (ASTRO-1). This mission is designed to conduct investigations in ultraviolet imaging, spectrophotometry, and polarimetry at very high resolution. The ASTRO-1 mission will also carry two widefield cameras to conduct unique scientific observations of Halley's Comet in the near earth environment. ASTRO-1, as well as reflights of this instrumentation, are designed to allow scientific investigations of a broad range of objects, from nearby comets and planets to the most distant quasars.

The SOT, which is a multiuser instrument facility, is currently in the definition and preliminary design phase. The development phase is planned to begin in fiscal year 1985, leading to a launch in the early 1990's. The SOT will provide extremely high resolution images of the Sun's surface and atmosphere, permitting for the first time masurement matched to the spatial scale of fundamental solar phenomena.

Spacelab 3, primarily a materials processing and life sciences mission, was flown in April 1985.

In fiscal year 1986, mission management of the Spacelab mission will continue. Development of the SOT and the Space Plasma Lab will continue. Mission management for the nonphysics and astronomy missions includes all Spacelab efforts except instrument development and data analysis. Effort will continue on the Shuttle High Energy Astrophysics Lab. Fiscal year 1986 funding also is required for the development of low-cost sounding rocket class payloads which will be flown on the Space Shuttle to provide more flight opportunities to the science community.

Explorer development

The Explorer program provides the principal means of conducting investigations of stellar physics and of the near-Earth interplanetary environment having limited, specific objectives and not requiring major observatories. Included in the present program are missions to study atmospheric and magnetospheric physics; the several magnetospheric boundaries; interplanetary phenomena; cosmic ray investigations; and x ray, ultraviolet, and infrared astronomy. Studies are conducted to define future high priority science explorer missions. NASA engages in cooperative missions with other Federal agencies and other nations whenever this cooperation will assist in achieving mission objectives.

Solar terrestrial and atmospheric explorers provide the means for conducting studies of the Earth's near-space environment. The program requires a wide variety of satellites in orbits extending from the very lowest reaches of the upper atmosphere, to the interplanetary medium beyond the Earth's magnetosphere. Efforts in fiscal year 1984 included launch of the Active Magnetospheric Particle Tracer Explorer (AMPTE). The AMPTE, a cooperative project with the Republic of Germany and the United Kingdom, consists of two spacecraft and one sub-satellite. The mission is studying the solar wind at the subsolar point and will identify particle entry windows, energization processes, and transport processes into the magnetosphere. The San Marco-D mission, a cooperative project with Italy, which is scheduled for a fiscal year 1985 launch, will include a group of United States experiments to study the relationship between solar activity and the Earth's meteorological phenomena.

Astrophysics explorers have been instrumental in conducting the first astronomical sky surveys in the gamma ray, x ray, ultraviolet and low frequency radio regions of the electromagnetic spectrum. A prime example is the Infra-Red Astronomical Satellite, which has just completed a highly successful survey mission.

In fiscal year 1985, development will continue on the Cosmic Background Explorer (COBE) and on the x ray imaging instrument to be flown on the German Roentgen Satellite (ROSAT). COBE will carry out a definitive all-sky exploration of the diffuse cosmic background radiation of the universe between the wavelengths of 1 micrometer and 9.6 millimeters. The detailed information that COBE will provide on the spectral and spatial distribution of low energy background radiation is expected to yield significant insights into basic cosmological questions of the origin and evolution of the universe.

ROSAT, a cooperative project between the Federal Republic of Germany and the United States, will perform high resolution imaging studies of the x ray sky. The United States will provide a high

resolution imaging instrument and launch services, and Germany will provide the spacecraft and other instrumentation.

In response to an innovative suggestion from industry, NASA is considering a new approach to providing a spacecraft platform for the Extreme Ultraviolet Explorer (EUVE) and other future explorers. Under this approach, NASA would obtain spacecraft services through a privately owned and developed platform, which could be shared with commercial users. A request for proposal was released by NASA to industry in January 1985.

Work also is continuing in fiscal year 1985 on the Cosmic Ray Isotope Experiment (CRIE). The CRIE sensor, which will be launched in 1986 on a DOD spacecraft, will study galactic cosmic rays and accelerated nuclei from solar flares. In addition, instrumentation development is being continued for reflight of the Long Duration Exposure Facility to gather data on the relative energies and abundances of the rare heavy cosmic ray nuclei. This spacecraft is scheduled to be launched in 1986 by the Space Shuttle, with subsequent retrieval about 2½ years later.

Fiscal year 1985 funding will also support definition studies of potential future explorer missions, including the x ray Timing Explorer and the Far Ultraviolet Spectroscopy Explorer.

Fiscal year 1986 funding is required for the continuation of COBE development activities leading to a launch in 1988. During fiscal year 1986, the COBE science instrument fabrication will be completed. The COBE cryogenic device and all other major system elements will be delivered beginning in late 1986. Fiscal year 1986 funding is also required for continuation of EUVE design and development activities and for continuation of development activities on experiments which will be flown on the German ROSAT mission in 1987 and on a DOD satellite in 1986.

Mission operations and data analysis

The purpose of the mission operations and data analysis effort is to conduct operations and to analyze data from the physics and astronomy satellites after launch. This program also supports the continued operation of a number of spacecraft, after their originally planned objectives have been achieved, for purposes of conducting investigations that have continuing, high scientific significance. The funding supports the data analysis activities on the many investigators at universities and other research organizations associated with astrophysics and solar terrestrial operational satellite projects. Actual satellite operation, including operation control centers and related data reduction and engineering support activities, are typically carried out under a variety of mission support or center support contracts.

In addition to the normal support required for mission operations, the Hubble Space Telescope program encompasses several unique aspects which must be provided for well in advance of launch. The Hubble Space Telescope is designed for operation for more than a decade using the Space Shuttle/Orbital Maneuvering Vehicle combination or the space station for on-orbit maintenance of the spacecraft and in-orbit replacement or repair of the scientific instruments. The Hubble Space Telescope will be used primarily by observers selected on the basis of proposals submitted in response to periodic solicitations. Science operations will be carried out through an independent Space Telescope Science Institute. The Institute will operate under a long-term contract with NASA. NASA will retain operational responsibilities for the observatory, and the Institute will implement NASA policies in the areas of planning, management, and scheduling of the scientific operations of the Hubble Space Telescope.

Fiscal year 1986 funds will provide support for the continued mission operations and data analysis activities for the International Ultraviolet Explorer, and continued analysis of the extensive data obtained by the Infrared Astronomical Satellite and the High Energy Astronomy Observatories. Fiscal year 1986 funding will provide for the continued operation and analysis of data collected from the repaired Solar Maximum Mission, and preparation for the operation of the Hubble Space Telescope. In fiscal year 1986, the development of mission operations procedures as well as development of the science operations ground system for the Hubble Space Telescope will be continued. The Hubble Space Telescope Science Institute activities such as the development of the Guide Star Selection System and Science Data Analysis Software will be continued, and will lead to initial operational capability. In fiscal year 1986, maintenance and refurbishment preparation activities such as the purchase of orbital replacement units and space support equipment will be continued so that NASA can service the Hubble Space Telescope in orbit.

Research and analysis

The research and analysis program provides for the research and technology necessary to define, plan, and support flight projects. Preliminary studies to define missions and payload requirements are carried out as are theoretical and ground based supporting research and advanced technology development. Activities included are supporting research and technology, advanced technology development and data analysis.

During fiscal year 1986, the supporting research and technology program will support those tasks which contribute to maintaining a firm base for a viable physics and astronomy program. Emphasis will continue on infrared detector development and on expansion of technology activities related to large x ray mirrors, advanced x ray detectors, gamma ray spectrometers, and instrumentation. Emphasis will also be placed on the development of a large array microchannel plate, and on intensified charge-coupled imagery devices. In the area of solar physics, activities will support the Solar Maximum Mission, especially through theoretical studies of high energy phenomena. Development of advanced generation instrument concepts will continue, especially for the extreme ultraviolet and x ray wavelengths and for analyzing the structure and dynamics of the solar interior.

Fiscal year 1986 funding will also support continued feasibility and definition studies on future potential candidate missions such as the Advanced X ray Astrophysics Facility, Gravity Probe-B mission, and the Space Infrared Telescope Facility. In the data analysis activities to be carried out at universities and government research centers in fiscal year 1986, emphasis will be placed on cor-

relative studies involving data acquired from several sources (spacecraft, balloons, sounding rockets, research aircraft and ground observatories).

Suborbital programs

The suborbital program provides versatile, relatively low-cost research tools that complement the capabilities of balloons, aircraft, free-flying spacecraft, and the Space Shuttle in all the space science disciplines, including the study of the Earth's ionosphere and magnetosphere, space plasma physics, stellar astronomy, solar astronomy, and high enegy astrophysics. These programs are done by both domestic researchers and in corporation with international researchers.

COMMITTEE COMMENTS

The Committee regrettably authorizes only $15 million of the administration's $30 million request for the SOT. Since SOT is not time-sensitive and because it is in an earlier, less vulnerale phase of its program life, its fiscal year 1986 authorization is reduced to accommodate budgetary pressures. The Committee, nonetheless, continues to support SOT as the major initiative in solar physics for the remainder of the century. The Committee expects that this $15 million reduction, in and of itself, should not significantly affect the currently scheduled launch date of mid-1991.

The quality of NASA's Physics and Astronomy program, the return that our Nation receives from its investment in Physics and Astronomy missions, and the health of our university space science programs depend on the Physics and Astronomy Research and Analysis program. Because it recognized the significance of the Physics and Astronomy Research and Analysis program to the Nation's space science infrastructure, the Committee authorizes the administration's fiscal year 1986 request for Research and Analysis, $42,300,000.

The Committee believes that, in spite of the present budgetary climate, it is important to maximize the return on our investment in such large observatories as the IRAS and SMM, and the Hubble Space Telescope, which is scheduled for an August 1986 launch. Accordingly, the Committee recommends the administration's fiscal year 1986 budget request for Mission Operations and Data Analysis, $119,000,000.

Consistent with its position in prior years, the Committee maintains its strong support for the Advanced X ray Astrophysics Facility and the Space Infrared Telescope Facility, the number one priority observatories in their respective fields of x ray astronomy and infrared astronomy. The Committee recognizes that "freezing" NASA's budget will likely have an adverse effect on the Advanced Technology Development efforts of these two programs. Nevertheless, the Committee encourages NASA to maintain to the greatest extent possible the infrastructure associated with these two programs to avoid any further departure from their respective schedules.

The Committee continues to support Gravity Probe-B as the leading free-flyer relativity mission for the 1980's. This program has made significant progress during the past year and the Committee urges NASA to give Gravity Probe-B every consideration possible for a new start in fiscal year 1987, within available resources.

In the past, the Committee has urged NASA to assume a greater role in upgrading university laboratory research equipment. The Committee notes with concern, however, that NASA may not have taken on its share of this responsibility, an omission which will adversely affect our university space science programs and, ultimately, NASA's space science efforts. the Committee, once again, urges NASA to target this problem and make a concerted effort to help restore our university laboratory research equipment to a more productive state of use. The Committee expects to be kept informed about NASA's plans and efforts on this issue.

LIFE SCIENCES—$68,000,000

The Committee has authorized $68 million for fiscal year 1986, $4 million below the administration's budget request.

The goals of the Life Sciences program are to provide a sound scientific, medical, and technical basis for safe and effective manned space flight, and to advance the understanding of the basic mechanisms of biological precesses by using the unique capabilities of the space program. Results from the research program are applied to: the immediate needs in the maintenance and health of the astronauts; understanding the response of biological systems to weightlessness; the design of the advanced life support systems fo use on future missions; and understanding the biosphere of the planet Earth, its origin, evolution, and present state.

The Life Sciences program is the key to sustaining a permanent manned presence in space and to using the space environment to study living systems. These activities include both ground-based and space research efforts, which are mutually supportive and integrated, and use a composite of disciplines and techniques in both biology and medicine to address space-related medical problems and fundamental biological processes.

Life Sciences Flight Experiments

The objective of the Life Sciences Flight Experiments program is to assimilate information and scientific questions from the various life sciences disciplines and translate them into payloads designed to expand our understanding of the basic physiological mechanisms involved in adaptation to weightlessness. The program includes selection, definition, inflight execution, data analysis, and reporting of medical and biological investigations.

Current activities involve the development of life sciences flight experiments to be flown on Spacelabs-2 and -4 and the first dedicated Life Sciences Spacelab mission (Space, Life Sciences-1) (SLS-1). Most of the experiments onboard the early Shuttle flights will serve as pathfinding activities for SLS-1. Activities on Spacelab-3, which was flown in April, involved evaluation of functional performance and compatibility of hardware that is essential to human and animal investigations which will be conducted on SLS-1 and follow-on missions. Hardware development and mission planning activities are proceeding on schedule for the U.S. vestibular experi-

ment which will be flown on the German-D1 mission; these are follow-up investigations to those conducted on Spacelab-1 in 1983.

Eighteen investigations have been tentatively selected for flight on SLS–1 with six more investigations to be conducted on later flights. The definition phase activities have been completed and the design and development of the flight hardware is well underway.

Fiscal year 1986 funding is required for the continued definition and development of hardware which will be flown on future Spacelab missions; i.e., SLS–1 German-D1, and the second dedicated life sciences mission. Flight hardware integration and experiment development associated with Spacelab-2, -3, and D-1 will be completed in preparation for launches in 1985. The SLS–1 mission is under review. This mission originally was scheduled for launch in early 1986. In addition, the selection process for experiments for the follow-on dedicated Spacelab life sciences missions has been initiated through the release of a new flight Announcement of Opportunity and experiment proposals are now being evaluated.

Research and analysis

The research and analysis activity of the Life Sciences program is concerned with ground-based and pre-flight research in basic biology and in those medical problem areas that affect manned space-flight. The program is comprised of five elements: (1) space medicine; (2) advanced life support systems research; (3) gravitational biology; (4) exobiology; and (5) biospheric research.

The Life Sciences Space Medicine program is responsible for bringing the technology and practice of medicine to bear on solving the problems of sustaining, supporting, and protecting individuals working in the space environment. The Advanced Life Support Systems research program concentrates on enhancing our ability to support long-duration manned presence in space and on optimizing the productivity of the STS crews.

The Gravitational Biology program explores the role of gravity in life processes and uses gravity as an environmental tool to investigate fundamental biological questions. The Exobiology program is directed toward furthering our understanding of the origin and evolution of life, and life related molecules, on Earth and elsewhere in the universe. The Biospheric Research program explores the interaction between the biota and the contemporary environment to develop an understanding of global biogeochemical cycles.

In fiscal year 1985, Life Sciences Reserch and Analysis activities will support continued efforts in the five program areas described above and will emphasize the formulation of improved approaches to the operational management of space adaptation syndrome.

Committee Comments

The reduction of $4 million in the Committee's authorization below the administration's budget request is a general reduction in the Life Sciences program.

The Committee views with concern the recent removal of the SLS–1 mission from the Space Shuttle manifest. The Committee recognizes the ongoing scheduling difficulties in the Shuttle manifest, but the Committee also believes that mission deserves a higher priority than that of "mission of opportunity." Biomedical research has assumed and will continue to assume a significant role as NASA increases the Shuttle flight rate and as the space station program evolves. The fact that SLS–1 is the first dedicated life sciences Spacelab mission underscores the significance of a timely launch and also points out the delays that have already occurred in this mission. The Committee urges NASA to conduct that mission in as timely a manner as possible to avoid further delays and to adhere to the greatest degree possible to the scheduled launch of SLS–2 which is currently manifested for February, 1987.

Planetary Exploration—$349,000,000

The Committee authorization of $349 million for Planetary Exploration in fiscal year 1985 is $10 million below the administration's request. Within Planetary Exploration, the Committee specifically authorizes $33,000,000 for the Mars Observer program, $10 million below the administration's request; $95 million for Mission Operations and Data Analysis; and $62,900,000 for Research and Analysis.

Summary of funding levels, fiscal year 1986

Galileo Development	$39,700,000
Venus Radar Mapping Mission	112,000,000
Ulysses (ISPM)	5,600,000
Mars Observer (MGCO)	33,800,000
Mission Operations and Data Analysis	95,000,000
Research and Analysis	62,900,000
Total	349,000,000

The Planetary Exploration program encompasses the scientific exploration of the planets and their satellites, comets, and asteroids, and the interplanetary medium. The program objectives are: (1) to determine the nature of planets, comets, and asteroids as a means of understanding the origin and evolution of the solar system; (2) to understand the Earth better through comparative studies with the other planets; (3) to understand how the appearance of life in the solar system is related to the chemical history of the system; and (4) to provide a scientific basis for the future use of resources available in near Earth space. The projects undertaken in the past have been highly successful. The strategy that has been adopted calls for a balanced emphasis on the earth-like inner planets, and giant gaseous outer planets, and the small bodies (comets and asteroids). Missions to these planetary bodies start at the level of reconnaissance and exploration to achieve the most fundamental characterization of the bodies, and proceed to a level of more detailed study.

The reconnaissance phase of inner planet exploration began in the 1960's and has now been completed, although we still know little about the nature of the Venus surface. Mars has provided program focus because of its potential as a site of bilological activity. The Viking landings in 1976 carried the exploration of Mars forward to a new level of scientific and technological achievement, thereby setting the stage for the next step of detailed study. Analyses of meteorities and the moon rock samples returned by Apollo

continue to be highly productive, producing new insights into the early history of the inner solar system and revision theoretical concepts. The continuing Pioneer Venus mission is carrying the study of the Earth's nearest planetary neighbor and closest planetary analogue beyond the reconnaissance stage to the point where we have made a basis characterization of the massive cloud-covered atmosphere of Venus, including fundamental data about the formation of the planet.

The exploration of the giant outer planets began relatively recently. The Pioneer-10 and 11 flybys to Jupiter in 1973 and 1974 were followed by the Voyager-1 and 2 spacecraft encounters in 1979. Voyager-1 then encountered Saturn in November 1980 and Voyager-2 did the same in August 1981. The Voyager data on these planets, their satellites, and their rings have revolutionized our concepts of the formation and evolution of the solar system. Now, the Pioneer-10 and 11 and Voyager-1 spacecraft are on escape trajectories from the solar system and will continue to return scientific data about the outer reaches of the solar system. The Voyager-2 spacecraft is headed for an encounter with Uranus in 1986 that will provide our first look at this giant outer planet. Its trajectory then will carry the spacecraft on to Neptune in 1989.

Galileo development

The Galileo orbiter/probe mission will be launched to Jupiter in 1986 by the Space Shuttle/Centaur Upper Stage. The comprehensive science payload is expected to extend our knowledge of Jupiter and its system of satellites well beyond the profound discoveries of the Voyager and Pioneer missions. During 20 months of operation in the Jovian system, Galileo will have the capability to provide as many as eleven targeted encounters with the Galilean Satellites. However, the number of tour orbits at Jupiter will be decreased by one orbit if the decision is made after launch to incorporate a flyby of the asteroid Amphritrite. If the asteroid flyby is incorporated, the plan is to extend the length of the Jupiter tour from 20 months to 22 months to permit the achievement of all major objectives previously encompassed by the eleven orbit tour.

During fiscal year 1985, major activities of the Gelileo program will involve completion of the environmental test cycle, retrofit to selected subsystems with more radiation resistant electronic components, and completion of development of the flight software.

The fiscal year 1986 funding will provide for completion of the integration and testing, the prelaunch checkout at the Jet Propulsion Laboratoy and for the prelaunch and launch activities at the Kennedy Space Center in support of the May, 1986 launch. Funding in fiscal year 1986 will also be used for the final development of the ground systems and the associated software to support mission operations. In addition, fiscal year 1986 funds are required to reimburse the Department of Energy (DOE) for completing development of the Radioisotope Thermoelectric Power Generators required for the orbiter.

Venus Radar Mapper

The Venus Radar Mapper (VRM) mission, initiated in fiscal year 1984, will provide global maps of the cloud-shrouded surface of Venus. The VRM, using a synthetic aperture radar, will obtain global radar imagery of Venus with resolution sufficient to address fundamental questions regarding the origin and evoluation of the planet. VRM will also obtain altimetric and gravity data to determine accurately the gravity field, internal stresses, and density variations of the planet's interior. This data will be analyzed so that the evolutionary history of Venus can be compared with that of the Earth. The VRM, scheduled for launch in 1988 on the Shuttle/Centaur Upper Stage, will map virtually the entire planet in 243 days.

During fiscal year 1985, major activities will include completion of final spacecraft and instrument systems design, testing breadboard development models of the radar circuits, building and development model of the radar, and preparing the detailed designs of the spacecraft subsystems.

Fiscal year 1986 funds will provide for completion of all design efforts for the spacecraft, radar instrument, and mission operations lead Voyager program. Spare flight computers and other equipment will be obtained from the Galileo launch in 1986.

Ulysses (Formerly International Solar Polar Mission)

Ulysses is a joint NASA and ESA endeaveor that will fly a package of experiments to invetigate the Sun at high solar latitudes that cannot be studied from the Earth's orbit. Ulysses, which will provide data on the effects of solar activity on the Earth, will be launched in 1986 on the Shuttle/Centaur Upper Stage.

ESA will provide the spacecraft and some instrumentation and the United States will provide the remainder of the instrumentation, the launch, tracking support, and the radioactive thermal power generators. The mission is designed to obtain the first view of the Sun above and below the plane in which the planets orbit the Sun. The mission will study the relationship between the Sun and its magnetic field and particle emissions (solar wind and cosmic rays) as a function of solar latitude, thereby providing an insight into the effects of solar activity on the Earth's weather and climate.

The Ulysses Mission was restructured in fiscal year 1981, from a two-spacecraft mission—one provided by the United States and one provided by ESA—to a single ESA spacecraft mission.

United States' participation in the program remains substantial however. NASA is developing five of the nine principal investigator instruments and three of the four European investigations have U.S. coinvestigators.

During fiscal year 1983, the U.S. flight instruments were delivered to the ESA spacecraft developer for integration and system testing. All spacecraft testing has been completed, and the spacecraft is being partially disassembled for storage until launch.

The fiscal year 1986 funding is required to support U.S. principal investigators in their mission planning, and is required for retrofitting of the U.S. instruments with the spacecraft prior to shipment to the KSC. In addition, fiscal year 1986 funds are required to complete the ground system development activities and to reimburse DOE for the continued development of the Radioisotope Thermoelectric Power Generators.

Mars Observer Mission (Formerly Mars Geoscience/Climatology Orbiter)

The Mars Observer mission is the first planetary mission using a new approach to low-cost inner solar system mission exploration. This approach, which was recommended by the Solar System Exploration Committee, starts with a well-defined and focused science objective and makes use of high inheritance, modified production line Earth-orbital spacecraft. The objective of the Mars Observer Mission is to extend and complement the data acquired by the Mariner and Viking missions by mapping the global surface composition, atmospheric structure and circulation, topography, figure, gravity, and magnetic fields of Mars to determine the location of volatile reservoirs and characterize their interaction with the Martian environment.

The Mars Observer Mission will be launched in 1990 using the Space Shuttle and will be inserted into Martian orbit in 1991 to perform geochemical, geophysical, and climatological mapping of the planet over a period of 2 years.

The fiscal year 1986 funds are required for the continued design and development activities leading to the preliminary design review in late fiscal year 1986. This spacecraft design is a modified Earth-orbital spacecraft design. Fiscal year 1986 funding is also required for initiation of design and development activitries for experiments selected in response to the Announcement of Opportunity. In addition, development activities will be continued in fiscal year 1986 on the x band transponder to be flown on the Mars Observer mission.

Mission Operations and Data Analysis

The objectives of the mission operations and data analysis activities are in-flight operation of planetary spacecraft and the analysis of date from these missions. Currently, two major classes of planetary spacecraft are operating—the Pioneer and the Voyager spacecraft.

The two Voyager spacecraft are now traveling through the outer solar system on trajectories that will take them into interstellar space. Voyager-1 continues to provide data on the interplanetary medium in that distant part of the solar system. In January, 1986, Voyager-2 will make a close flyby of the planet Uranus, the first time this planet has ever been visited by a spacecraft. The observatory phase of this encounter, beginning in November, 1985, include detailed observations of the planet, its rings, and moons. After the Uranus encounter is completed, the spacecraft will continue on to the planet Neptune, where, in 1989, it will provide us with our first close look at this distant planet.

Pioneer 10 and 11 will continue to explore the outermost solar system. Pioneer 10 will soon enter the unexplored region beyond Pluto where the Sun's influence is secondary to those of true interstellar space. These spacecraft will continue the search for gravitational evidence of a tenth planet. Pioneer 6-9 are still collecting information on the interplanetary magnetic field and solar wind as they orbit the Sun. In 1986, these spacecraft will be used to observe Comet Halley as it passes in their vicinity.

The Pioneer Venus orbiter continues to obtain data from Venus' atmosphere and magnetosphere. In early 1986, the spacecraft's spin axis will be adjusted to allow ultraviolet observation of Comet Halley. The Pioneer Venus will be the only spacecraft able to observe the Comet at its closest approach to the Sun and will provide critical additions to data from foreign spacecraft making observations at other points in the Comet's orbit.

Fiscal year 1986 funding is required for the continued operation and data analysis activities in support of the Voyager and Pioneer operations. In addition, the Voyager Neptune encounter activities will start in April 1986. Planetary flight support funding is required in fiscal year 1986 for preparation of the 1986 launches of Galileo and Ulysses as well as for the Voyager Uranus encounter. In addition, the fiscal year 1986 funding is required for the operation of the Galileo and Ulysses missions, both of which will be launched in May 1986.

Research and analysis

The research and analysis program contains four elements required (1) to assure that data and samples returned from flight missions are fully exploited; (2) to undertake complementary laboratory and theoretical efforts; (3) to define science rationale and develop required technology to undertake future planetary missions; and (4) to coordinate an International Halley's Comet Watch and provide co-investigator support to the European Space Agency's Giotto Mission to Halley's Comet.

The International Halley's Comet Co-Investigations and Watch will capitalize on the opportunity to observe Comet Halley during its next apparition in 1985-86 by supporting co-investigators on the ESA's Giotto mission, and by conducting complementary remote-sensing investigations using both Earth-orbiting and ground-based facilities. The Giotto mission will fly by Halley's Comet in 1986. Concurrently, an observation program called the International Halley Watch, coordinated by the United States, will conduct worldwide scientific observations of the Comet Halley. The Research and Analysis funding provides for, among other things, the continued operation of the Infrared Telescope facility on Mauna Kea. HI.

COMMITTEE COMMENTS

The Committee's recommended $10 million reduction below the administration's budget request for the Mars Observer program in no way indicates any lessening of the Committee's support for the Mars Observer program. The Committee continues to support fully this mission, its objectives, and its high priority as established by the Solar Systems Exploration Committee (SSEC). Furthermore, the Committee continues to support the SSEC's innovative approach of using spacecraft inheritance and commonality of systems and personnel for its core program of planetary missions. The Committee expects that the recommended authorization for the Mars Observer program will still permit NASA to meet the currently scheduled 1990 launch. The funds authorized in fiscal year 1986

also should permit NASA to proceed with the spacecraft contracts as well as the contracts for the science instruments.

The Committee notes the apparent direction that the Soviet Union is proceeding with its planetary program and, in particular, with its planned Mars Phobos mission, scheduled for a 1988 launch. Although the Mars Observer mission is scheduled for launch in 1990, there still may be opportunities for cooperation between some aspects of the Mars Observer and Mars Phobos missions, along with other future Mars-related missions. To this end, the Committee requests that NASA prepare a report by December 31, 1985, in association with non-Government space scientists, examining the opportunities for joint East-West Mars-related activities, including an unmanned Mars sample return and all activities that might contribute to an international manned mission to Mars.

Recognizing the significance of a Voyager encounter with Uranus in 1985 and with Neptune in 1989, the Committee believes that complete funding of the administration's 1986 budget request for Mission Operations and Data Analysis (MO&DA) activities is warranted. In addition, the scheduled launches in 1986 of Galileo and Ulysses will require maximum funding in MO&DA to optimize the scientific return of these two missions.

Recognizing that NASA's Space Science Research and Analysis activities are the lifeblood of many university and college space science programs and that for years funding for Planetary Exploration Research and Analysis has not grown commensurately with the rest of NASA's budget, the Committee authorizes the fiscal year 1986 administration budget request of $62,900,000 for Planetary Exploration Research and Analysis.

The Committee notes that the first of the SSEC's Mariner Mark II missions, the Comet Rendezvous/Asteroid Flyby, will be competing for a new start approval in the fiscal year 1987 budget. Recognizing the time sensitivity of the CRAF mission, the Committee strongly supports it as one of several new starts in fiscal year 1987 and urges NASA to give this program additional consideration due to the unique nature of this unprecedented comet encounter.

Space Applications

Solid Earth Observations—$70,600,000

The Committee authorization of $70,600,000 is $4,300,000 below the administration's request of $74,900,000. Within Solid Earth Observations, the Committee authorizes $20,100,000 for Research and Analysis, as requested by the administration.

The objectives of the Solid Earth Observations program are to use space observations and experiments to understand the global, physical, chemical, and biological processes involving the land areas of the Earth and the interactions of these land areas with the Earth's oceans and atmosphere; to improve our ability to evaluate the composition and geometry of the Earth's mineral and energy resources; and to increase our understanding of the Earth, its interior structure and composition, its rotational dynamics, the processes related to the movement and deformation of its crust, and the mechanisms associated with the occurrence of earthquakes.

Principal elements of the program include the development of spaceborne and supporting ground systems; improved data processing and analysis techniques; sensor and technique development; as well as basic and applied research for identifying, monitoring, analyzing, and modeling the vegetated, geological, and geophysical features of the Earth.

The objective of the Shuttle/Spacelab payload development project is to develop, test, and evaluate Earthviewing remote sensing instruments and systems to obtain data for solid Earth observations research. The Shuttle Imaging Radar, which was flown on the Shuttle in October 1984, has demonstrated the utility of spaceborne imaging radar for geologic exploration. The Large Format Camera, required for high resolution mapping applications, was flown successfully on the Shuttle in 1984 and an additional reflight of the camera is planned for 1986. The next generation Shuttle Imaging Radar, involving use of SIR-B components and multi-polarized, dual frequency instruments, is under consideration.

Studies of the movement and deformation of the Earth's crust, the rotational dynamics of the Earth, and the Earth's gravity and magnetic fields provide information which is needed; to understand the processes leading to the release of crustal strain in the form of earthquakes, to improve our understanding of the formation of mineral deposits, to contribute the long-term weather and climate forecasting, and to understand better the Earth as a planet. Space techniques such as laser ranging to satellites and the Moon, and very long baseline interferometry using radio stars or satellites, are the only methods which can provide the precise measurements needed for these studies.

Advanced spectrometer technology development activities include fundamental research in remote sensing. This involves developing an imaging spectrometer and some continuing development of multispectral linear array technology. The imaging spectrometer and multilinear array solid-state sensor research focuses on the development of such features as electronic scan, inherent geometric and spectral registration, and programmable high spatial and spectral resolution. The critical technology development and supporting research on the linear array focal plane and the Shuttle Imaging Spectrometer will continue in fiscal year 1986.

Landsat-4 was launched on July 16, 1982, to provide Multispectral Scanner and Thematic Mapper images for many applications in civil remote sensing. NOAA assumed operational responsiblity for the Landsat-4 spacecraft and the Multispectral Scanner in January 1983, and for Thematic Mapper operations and data processing in August 1984. The Landsat-5 spacecraft was modifed before its launch in March 1984 to correct for anomalies developed inorbit on Landsat-4.

Committee Comments

The continued uncertainty of the U.S. Government's involvement in remote sensing in space creates an even more compelling reason for a vigorous NASA research and development effort in remote

sensing. The Committee, therefore has authorized the administration's request of $20,100,000 in Research & Analysis. Despite the approved contract between EOSAT and the Department of Commerce to privatize the existing Federal Landsat system, a gap in the availability of new Landsat data seems inevitable. Also, foreign nationals are about to orbit competing land remote sensing systems which, in some respects, will be superior to our own and will make our competitive position difficult.

The Committee believes that if the United States is to ensure for years to come its long-term would leadership in land remote sensing technologies, NASA should assume the responsibility of advancing our Nation's remote sensing capabilities. Therefore, the Committee urges NASA to focus its remote sensing research and development activities with the objective of ensuring a continuous and stable strategy for U.S. Government involvement in remote sensing.

The Committee expects NASA to accommodate a reduction of $4,300,000 below the administration's request as a general reduction in Solid Earth Observations.

Environmental Observations—$291,000,000

This Committee recommendation for Environmental Observations, $291 million, is $26,500,000 below the administration's request of $317,500,000 and includes a general reduction of $1,500,000. Within Environmental Observations, the Committee specifically authorizes $26,700,000 for the Scatterometer program and $114 for the Upper Atmosphere Research Satellite program.

The objectives of NASA's Environmental Observations program are to improve the understanding of processes in the magnetosphere, atmosphere, and the oceans; to provide space observations of parameters involved in these processes; and to extend the national capabilities to predict environmental phenomena, both short- and long-term, and their interaction with human activities. Because many of these phenomena are global or regional, they can be most effectively, and sometimes solely, studied from space. NASA's program includes scientific research efforts plus the development of new technology for global and synoptic measurements. NASA's research satellites provide a unique view of the radiative, chemical, plasma acceleration, and dynamic processes occurring in the magnetosphere, atmosphere, and oceans.

To achieve these goals, a number of significant objectives have been established for the next decade. These include advancing the understanding of the upper atmosphere through the determination of the spatial and temporal distribution of ozone and select nitrogen, hydrogen, and chlorine species in the upper atmosphere and their sources in the lower atmosphere; optimizing the use of space-derived measurements in understanding large scale weather patterns; advancing our knowledge of severe storms and forecasting capabilities, ocean productivity, circulation, and air-sea interactions; improving the knowledge of seasonal climate variability leading to a long-term strategy for climate observation and prediction; and enabling a comprehensive understanding of the solar terrestrial processes and a detailed determination of the physics and coupling between the solar wind, magnetosphere, ionosphere, and the atmosphere.

Atmospheric Dynamics and Radiation Research and Analysis

Fiscal year 1986 funding for Atmospheric Dynamics and Radiation Research and Analysis is required to conduct aircraft flights to study the detail of flows around thunderstorms and fronts, continue comparison of models, study atmospheric scale interactions, and develop techniques to display model outputs in 3-dimensions. In fiscal year 1986 three major interagency field experiments will significantly improve our understanding of the atmosphere for air/ocean interaction which generate crippling New England snowstorms (GALE), the physics of small strong downdrafts called microbursts which are on the scale of tornadoes (MIST), and the mechanism of regional precipitation quantification (SPACE) through space, aircraft, radar balloon, and surface-based observations. Other activities will involve continued retrieval and archiving of global International Satellite Cloud Climatology Project data sets, analysis of data from the Earth Radiation Budget Experiment and the Stratospheric Aerosol and Gas Experiment, and continued ground-based and rocket flight support for solar irradiance monitoring. Technology development of active temperature, pressure, and moisture sounders as well as basic Laser-Radar technology development will also be continued in fiscal year 1986.

Oceanic processes research and analysis

In fiscal year 1986, Oceanic Processes Research and Analysis activities will concentrate on the experimental design for the World Ocean Circulation Experiment and the Tropical Ocean and Global Atmosphere program, as well as on the development of numerical models and associated data assimilation techniques for use in determining the general circulation of the oceans. In biological oceanography, the analysis of data from Nimbus-7 will be continued to help with the conceptual design of the Global Flux Experiment. In addition, NASA will conduct the preliminary design of the Ocean Color Imager, including accommodation studies for the NOAA-K and SPOT-3 spacecraft. In polar oceanography, NASA will emphasize experimental design for the Arctic Basic research effort (POLESTAR), and will work with the World Data Center for Snow and Ice on processing and archival of microwave radiometer data. NASA will also determine how to process synthetic aperture radar data from the ERS-1 satellite. In addition, the transition of the Pilot Ocean Data System from a technical demonstration to a scientific support facility will be completed in fiscal year 1986. NASA will complete interagency coordination with the Office of Naval Research, the National Science Foundation, and NOAA for the use of spaceborne observing techniques in oceanographic research, including the definition of interfaces between the Pilot Ocean Data System and the computing facilities and data archives of other agencies.

Space physics research and analysis

During fiscal year 1985, the Space Physics Research and Analysis activities will be continued with particular emphasis on the analy-

sis of data from ISEE-3, which spent most of 1983 in the Earth's magnetotail, and the International Cometary Explorer's encounter of comet Giacobini-Zinner in 1985. Definition studies will be continued during fiscal year 1986 on such missions as the potential cooperative Japanese and European International Solar-Tethered Satellite System and on the chemical release investigations in support to the Combined Chemical Release and Radiation Effects Satellite which is being developed by the DOD.

Earth radiation budget experiment

The Earth Radiation Budget Satellite (ERBS) was successfully launched in 1984, and data continues to be collected from the satellite. The Earth Radiation Budget Experiment (ERBE) instruments which wll be flown on NOAA-G have been completed. NOAA-F was launched December 12, 1984, with a set of ERBE instruments; the NOAA-G launch is scheduled for August 1985. NASA also is continuing to support NOAA by managing the implementation of the NOAA and the Geostationary Operational Environmental Satellites (GOES) series on a reimbursable basis.

Extended mission operations

Fiscal year 1985 funding for Extended Mission Operations is required to support continuing mission operations and data analysis activities for the International Sun-Earth Explorers, the Interplanetary Monitoring Platform and the Dynamics Explorers. Extended operations support of the Active Magnetospheric Particle Tracer Explorer, which was launched in 1984, will be continued in fiscal year 1986. Operation of the Nimbus and Solar Mesophere Explorer SME satellites and processing of the collected data will be continued, as will activities to provide ground truth for a NASA-developed ozone instrument to be flown on a NOAA weather satellite. The SME and Nimbus satellites continue to produce extremely valuable data on ozone concentrations which will be used to estimate the occurrence of natural variations, sea surface temperatures, aerosol measurements, and ocean productivity. Correlative ground truth activities will also be continued in fiscal year 1986; these *in situ* observations are needed to verify the quality of remote observations and to improve our ability to intercept them. In addition, fiscal year 1986 funding is required for operation and data analysis activities associated with the Earth Radiation Budget Satellite, which was launched in 1984.

Scatterometer

Design and development activities were initialed in fiscal year 1985 on the Scatterometer which will be flown on the Navy Remote Ocean System (N-ROSS) in mid-1989 to acquire global ocean data for operational and research usage by both the military and civil sectors.

The Nimbus spacecraft continues to collect unique data which is being used in the study of long-term trends of the Earth's atmosphere, oceans, and polar ice, and provides near real-time data. Collection and analysis of the SME data continues. The Dynamics Explorer continues to collect valuable data on magnetosphere-ionosphere coupling processes. In addition, the ISEE-3 spacecraft, renamed International Cometary Explorer, has completed an exploration of the Earth's geomagnetic tail and is being redirected toward a planned encounter in 1985 with the comet Giacobini-Zinner.

Upper Atmosphere Research Satellite (UARS) mission

The UARS will place a set of instruments in Earth orbit which will measure the state of the stratosphere, and provide data about the Earth's upper atmosphere in spatial and temporal dimensions which are presently unattainable. Detailed definition studies of the instruments have been completed, and the design and development activities have begun.

The fiscal year 1986 funds are required for continuation of the design and development activities on the UARS instruments leading to the critical design review for approximately one-half of the full instrument complement. In addition, the spacecraft design and development activities will be continued in fiscal year 1986, leading to the observatory preliminary design review in 1986 and the critical design review in early 1987.

NASA will also continue advanced technology development on prospective future missions, for example, TOPEX.

COMMITTEE COMMENT

The Committee authorizes $114 million for the UARS program with the understanding that a $20 million reduction from the administration's budget request of $134 million should not, in and of itself, delay the launch of UARS from its currently scheduled launch date of October 1989. Notwithstanding this reduction the Committee fully supports UARS as our Nation's foremost initiative to gather a global data set of the upper atmosphere.

The Committee's $5 million reduction from the administration's request of $31,700,000 for the Scatterometer is based on the recently revealed 13-month launch slip of the N-ROSS, on which the Scatterometer will fly. The new launch date is September 1990 and the new delivery date for the Scatterometer is January 1989. Also, it is the Committee's understanding that launch slippage has increased NASA's cost for the Scatterometer due to inflation and the requirement to maintain NASA's Scatterometer team for a longer time than originally planned. The Committee expects to be kept informed about any other delays in the Scatterometer program and the N-ROSS program.

The Committee continues to support both the Ocean Topography Experiment (TOPEX) and the International Solar Terrestrial Physics (ISTP) program as important elements in NASA's agenda for Environmental Observations missions. Although NASA is enjoying the international participation of France in the TOPEX program and France and Japan in the ISTP program, NASA also has assumed the responsibility that goes along with the complexities and sensitivities of cooperative programs.

With this in mind, the Committee urges NASA to proceed with TOPEX and ISTP, within available resources, to protect the cooperative nature of both programs. The Committee believes that unless NASA demonstrates that it can be a trusted partner in such coop-

erative efforts, the United States will not be able to enjoy the synergistic and cost-effective elements that so often accompany cooperative programs such as TOPEX and ISTP.

Materials Processing in Space—$34,000,000

The Committee authorization of $34 million for Material Processing in Space for fiscal year 1986 is identical to the Administration's request.

The Material Processing in Space program emphasizes the science and technology of processing materials to understand constraints imposed by gravitational forces and the unique capabilities made possible by controlling these processes in the space environment. Ground-based research, technology development, and payload definition activities in fiscal year 1985 concentrate on six major processing areas: metals and alloys, electronic material, glass and ceramics, biotechonolgy, combustion, and fluid dynamics and transport phenomena. These activities will provide the scientific basis for future space applications of materials processing technology as well as a better understanding of how these processes occur on the ground. Definition studies will be performed for Shuttle experiment candidates in areas such as containerless experiments, combustion science, solidification and crystal growth, and blood storage. Also included are maintenance of capabilities for experimentation in drop tubes, towers, and aircraft. An outreach program, consisting of technical publications, workshops, experiment accommodation studies, and support for Joint Endeavor and Technical Exchange Agreements, are included in this program.

Materials Experiment Operations is a consolidation of ongoing activities which provide a range of experimental capabilities for all scientific and commercial participants in the materials processing program. These include Shuttle middeck experiments, the Material Experiment Assembly and the Materials Science Laboratory, which is carried in the orbiter bay. These capabilities will enable users to develop different experiments in a cost effective manner and allow a better understanding of the technnical risks associated with experiment concepts before attempting to develop more complex hardware. In addition, reflight of investigations on Shuttle/Spacelab missions and the middeck is provided for in Material Experiment Operations.

Committee Comments

Both the administration's proposal to develop a permanently manned space station and the commercial space development initiative tout microgravity research as one of the cornerstones of their respective programs. Yet, the Committee notes with concern that NASA's Microgravity Sciences and Applications Division, or Materials Processing in Space (MPS) program, continues to suffer in a number of ways from too low a priority within the Agency. Although the Committee is pleased that the fiscal year 1986 budget request for MPS is increased by 25 percent above the fiscal year 1985 appropriation, it is clear that, compared to our counterparts in the Soviet Union, the ESA, and Japan, NASA's investment in this area of research is well below a competitive level of funding. Therefore, the Committee authorizes the administration's request of $34 million for Materials Processing in Space as an expression of the Committee's high regard for this critically important area of research.

The Committee also notes that the flight opportunities for microgravity experiments have fallen far short of the demand and need. For example, NASA's removal of Materials Science Laboratory (MSL-1), the first Spacelab dedicated to microgravity research, from the Shuttle manifest, is one indication of the low priority of MPS activities within NASA. Only if NASA demonstrates a commitment to these flight opportunities will laboratories and investigators across te Nation make the initial investment that is required for this type of research. Accordingly, the Committee urges NASA to accommodate on other MSL missions, to the greatest extent possible, the experiments that were previously scheduled for MSL-1.

The Committee also is aware that NASA is considering the implementation of a policy which would assign a higher priority of NASA's Shuttle payloads which have been delayed more than 6 months. Although the Committee understands the difficulties associated with scheduling payloads on the Shuttle, the Committee nonetheless believes that only by flying more microgravity experiments on a timely basis can we develop the data base that is critical to the best use of the space station and to the advancement of commercial space activities such as space manufacturing. Therefore, the Committee urges NASA to give special consideration to implementing this policy to avoid any further congestion in the experiments awaiting a Shuttle flight and to develop this fundamentally important data base.

The Committee recognizes the growing interest in the field of microgravity sciences and notes that several new Joint Endeavor Agreement related to MPS activities have been signed over the past year. This growing interest also is reflected in the expanding number of new MPS proposals that NASA has received over the past year. However, due to an insufficient level of funding, NASA's flexibility to analyze and assess these proposals has been limited. Recognizing the significance of microgravity experiments to the future utility of the space station and to commercial space activities in general, the Committee urges NASA to give the Materials Processing in Space program the funding and consideration that is commensurate with that program's role in the development of these two initiatives. Only then can we as a Nation move beyond the rhetoric and onto the threshold of the vast number of opportunities associated with space utilization.

Communications—$96,200,000

The Committee authorizes $96,200,000 for fiscal year 1986 in lieu of the administration's request of $106,200,000, and specifically authorizes $80 million for the Advanced Communications Technology Satellite (ACTS) program.

Summary of funding levels, fiscal year 1986

Advanced Communications Technology Satellite	$80,000,000

Research and Analaysis	10,600,000
Search and Rescue	1,300,000
Technical Consultation and Support Studies	3,100,000
Experiment Coordination and Operations Support	1,200,000
Total	$96,200,000

Advanced Communications Technology Satellite

The objective of NASA's ACTS flight-test program is to prove the feasibility of certain advanced communications technologies through a flight test program.

The specific technologies to be validated include: (1) the use of multiple fixed and scanning spot antenna beams; (2) frequency reuse; (3) beam interconnectivity at both intermediate frequencies and at baseband; (4) advanced system network concepts; and (5) dynamic rain-compensation techniques. These technologies will apply to a wide range of communications systems in the 1990's. NASA signed a contract in August 1984 with RCA to develop the flight and ground hardware leading to a 1989 launch. TRW, Comsat, Motorola, Electromagnetic Sciences, Hughes, and other manufacturers are major subcontractors.

The ACTS spacecraft will be launched from the Shuttle into geostationary orbit.The spacecraft will consist of a commercial communications bus and a multibeam communications package, including a multibeam antenna, baseband processor, RF matrix switch, traveling wave tube amplifier, and low noise receiver. The ground segment will consist of a NASA ground station and a master control station. Following launch and checkout, a 2-year program of user-funded experiments will be initiated during which time ACTS system technologies will be tested, evaluated, and validated. Over 40 organizations, including DOD, have requested consideration for experiment opportunities on ACTS to date.

Research and analysis

The Communications Research and Analysis program continues to provide development of component and device technology required by NASA, other government agencies, and U.S. industry for advanced communications satellite systems. Big payoff items leading to greater spectrum and bandwidth efficiency are being pursued. In addition, in fiscal year 1985, the Mobile Satellite activities will continue to address the development of critical enabling technologies needed to insure growth of a commercial mobile satellite service.

The mobile communications technologies activity is aimed at accelerating the introduction of a commercial mobile satellite service in the United States at developing ground segment technology which is more efficient in its use of power, bandwidth, and orbital slots and at developing networking techniques needed to insure its growth. The Mobile Satellite, which has been formally coordinated with Canada, is expected to be implemented through a Joint Endeavor Agreement as follows: a U.S. system operator, who would procure, own, and operate the satellite, would supply a small percentage of the satellite channel capacity to NASA for use in terminal hardware validation and in carrying out other government experiments. The operator would use the additional channel capacity to develop commercial markets. In exchange, NASA would provide standard launch services.

Search and rescue

The Search and Rescue program is an international cooperative program that demonstrates the use of satellite technology to detect and locate aircraft or vessels in distress. The United States, Canada, France, and the Soviet Union developed the system in which Norway, the United Kingdom, and Sweden also participate. Three COSPAS satellites are currently in operation and NOAA-F was successfully launched on December 12, 1984. Over 350 lives have been saved in numerous incidents worldwide and the list continues to grow on a weekly basis. During fiscal year 1984, the demonstration and evalulation phase of the program was officially completed, and a new agreement was signed to continue operation of the system.

Technical consultation and support program

The technical consultation and support program will continue to provide for studies of radio interference, propagation, and special systems required for the growth of existing satellite services and the extension of new satellite applications. Support to the Department of State, the Federal Communications Commission, the National Telecommunications and Information Administration, and the Federal Emergency Management Agency in the development of frequency and orbit sharing techniques and strategies for upcoming World Administrative Radio Conferences will continue.

Experiment coordination and operations program

The experiment coordination and operations support program assists other Federal agencies and public sector organizations in the development of experimental satellite communications for emergency, disaster, and public service applications. Operations of the Applications Technology Satellites (ATS)-1 and -3 are continuing through contracts with the Universities of Hawaii and Miami, respectively.

More than 20 organizations are currently using the ATS-1 and ATS-3 satellites for communication experiments. ATS-3 is supporting emergency medical experiments conducted in conjunction with the Southern Regional Medical Consortium (SRMC). The SRMC experiments determine the value and cost effectiveness of mobile communications via satellite for emergency notification, vehicle dispatch and two-way voice and biomedical telemetry between paramedics and hospital physicians. Efforts toward rural, wilderness, and offshore oil rig applications are emphasized. Similarly, in the Pacific Basin, ATS-1 connects 22 islands and provides disaster relief, medical, educational, and emergency service. This satellite service has been a valuable asset to Pacific users who, prior to ATS-1, received their news 24 hours after the fact.

NASA will continue to maintain approval and policy control of the ATS program. NASA fiscal year 1986 activities will include continued planning for educational and public service communications; the development of low cost ground terminals for the mobile satellite program; continuing support for the management and op-

eration of the Denver Satellite Access Facility; and continuing support for ATS experimenters.

Committee Comments

The Committee continues to believe that NASA has a significant role in advanced communications satellite research and development and that the ACTS program is a logical and critical program through which NASA can support this national requirement.

In the fiscal year 1985 NASA authorization (Public Law 98-361, section 101), the Committee directed NASA to conduct a flight test of ACTS no later than 1989, and that remains the Committee's position. The Committee understands that the $10 million reduction assumed in the fiscal year 1986 NASA authorization still enables a 1989 flight test of ACTS, which should assist in reaffirming our Nation's competitive position in the world communications satellite market.

The Committee also is aware of NASA's intent to shut down the ATS-1, effective August 1, 1985. The loss of this Pacific Basin-New Zealand-Australia Communications Network will seriously affect important professional networks that have been established over long periods of time. With this in mind, the Committee requests that NASA find another option to take the place of ATS-1 in the Pacific Basin as soon as reasonably possible, and report back to the Committee on its efforts within 6 months.

Information Systems—$16,200,000

The Committee authorization for fiscal year 1986 is $16,200,000, $3 million below the administration's request. The Committee expects this $3 million reduction to be applied without prejudice to the Information Systems programs.

The objectives of the Information Systems programs are to develop and demonstrate advanced capabilities for managing, distributing, and processing data and information; to implement information systems standards and provide common software to lower data systems costs; and to 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.

Commercial Programs

The Committee authorizes, as follows, $26 million for Commercial Programs, $15,100,000 below the administration's budget request.

Summary of funding levels for fiscal year 1986

Technology Utilization	$9,500,000
Commercial Use of Space	$16,500,000
Total	26,000,000

Technology Utilization—$9,500,000

The NASA Technology Utilization program is designed to enhance national economic growth and productivity through the transfer of new technology resulting from NASA research and development programs to the nonaerospace sectors of the economy. This program has generated use of aerospace technology in U.S. industry, and, in addition, technological advances have found use in important public sector areas such as medicine, transportation, environment, and public safety. The objectives of the program are: (1) to accelerate and facilitate the application and use of new technology, and thus shorten the time between development of advanced aeronautics and space technologies and their infusion into the economy; (2) to encourage multiple secondary uses of NASA technology in industry, education, and government where a wide spectrum of technological problems and needs exists; and (3) to understand more fully the technology transfer process and its effect on the economy, and to develop applications of NASA's aerospace expertises—its technology, technologists and unique facilities—to important non-aerospace needs of the Nation.

Commercial Use of Space—$16,500,000

The objective of the Commercial Use of Space program is to increase private sector awareness of space opportunities and to encourage increased industry investment and participation in high technology, space-based research and development. Expansion of the level of private sector investment in commercial space activities will help the United States retain its leadership in science and technology and will accrue associated benefits to our Nation. The program will be built on Shuttle and related space-based operational capabilities. The program is responsive to the President's National Space Strategy and National Policy on the Commercial Use of Space, both of which direct NASA to expand private sector investment and involvement in space activities. The fiscal year 1985 House and Senate Authorization Conference report directed that NASA propose a new line item for this activity in the fiscal year 1986 budget request.

Fiscal year 1985 activities include implementing the National Policy on the Commercial Use of Space, establishing an organizational focal point for commercial programs at NASA, and initiating efforts to foster commercial use of and access to space. These efforts include additional Centers for Commercial Development of Space, increased accessibility to NASA facilities and equipment, especially in space, small focused research efforts on processes having commercial potential, and the incorporation of other functions designed to facilitate private sector use of space for commercial ventures. Fiscal year 1986 activities will provide a continuation and some enhancement of the fiscal year 1985 program initiatives. These efforts are designed to encourage significant private investment in commercial enterprises that take advantage of the unique

characteristics of space, such as vacuum, microgravity, and radiation.

Committee Comments

The Committee authorizes $16,500,000 for the Commercial Use of Space Program in fiscal year 1986. This reduction of $13,500,000 million for the administration's fiscal year 1986 budget request of $30 million does not reflect any lessening of support by the Committee for the Commercial Use of Space program. The Committee advocates the general and specific objectives of this program and believes that the program provides the linkage between the private sector and the Federal Government required to stimulate commercial space activities. Providing the university community and private sector greater access to Federal ongoing research and facilities and promoting interaction between public and private researchers should do much to stimulate the U.S. economy and to enhance the U.S. technological leadership in space.

Unfortunately, the severe fiscal constraints that exist in this year's budget preclude the Committee from providing as rapid a rate of growth in the Commercial Space program as assumed in last year's authorization. The Committee hopes the fiscal year 1987 Budget will provide more flexibility.

The Committee notes that commercial and university interest in space activity is growing and that aerospace and non-aerospace firms alike are becoming increasingly intrigued by the opportunities that are likely to ensue from the commercial development of space. This is evidenced by the number of Joint Endeavor Agreements and Technical Exchange Agreements that have been established during the past year between NASA and the private sector.

Furthermore, the Committee is encouraged by the interest shown by the business and academic communities in NASA's proposed Centers for the Commercial Development of Space. NASA is encouraged to maximize, within the available resources in fiscal year 1986, the opportunities related to these Centers so as to further enhance private sector investment and involvement in commercial space activities.

Aeronautical Research and Technology

The Committee authorizes $350,400,000 for fiscal year 1986, $3,600,000 below the administration's request. This reduction reflects the elimination from Research and Technology (R&T) Base of $4 million planned for activities related to the Altitude Wind Tunnel at Lewis Research Center and the addition of $400,000 for Rotorcraft R&T Base activities.

Summary of funding levels, fiscal year 1986

Research and Technology Base	$235,700,000
Systems Technology Programs	114,700,000
Rotorcraft Systems Technology	(20,500,000)
High-Performance Aircraft Systems Technology	(21,800,000)
Subsonic Aircraft Systems Technology	(0)
Advanced Propulsion Systems Technology	(44,200,000)
Numerical Aerodynamic Simulation	(28,200,000)
Total	350,400,000

The objective of the Aeronautical Research and Technology program is to conduct an effective and productive program that contributes materially to the enduring preeminence of U.S. civil and military aviation by: (1) conducting appropriate levels of disciplinary and systems research at the leading edge of technology in those areas critical to the continued superiority of U.S. aircraft; (2) maintaining the research centers in positions of excellence in facilities and technical staff; (3) assuring timely transfer of research results to the U.S. aeronautical industry; (4) assuring appropriate involvement of universities and industry; and (5) providing on a reimbursable basis aeronautical development support to other government agencies and U.S. industry.

Conducted well in advance of and independent of specific applications, the Aeronautical Research and Technology program includes both fundamental research in the aeronautical disciplines and systems research directed at interaction among disciplines, components, and subsystems applicable to general classes of advanced aircraft. The program involves participation by aeronautical manufacturers from the industrial base essential to both military and civil aviation to ensure that the technology is compatible with practical design considerations and can be successfully transferred into application.

The Research and Technology Base program includes disciplinary research which is both broadly applicable to all classes of aircraft (such as general aviation, transports, rotorcraft, and hypersonic and other high-performance aircraft), as well as the disciplinary research which is unique to any of these classes of aircraft. Funding for the technical operation of wind tunnels, propulsion facilities, computional facilities, simulators, and flight research operations is covered in the most appropriate disciplinary elements of the research and technology base. The increased research and technology base funding will support, in addition to inflation, the operation of the national transonic facility, which will be in the first year of operational status, as well as the operating costs for the numerical aerodynamic simulator.

The Systems Technology Programs are designed to extend the scientific discoveries and findings flowing from the R&T Base through applied research to demonstration and validation for selective technologies which thereafter provide the design phase for advanced military and commercial products undertaken by private industry.

Rotorcraft systems technology

The rotorcraft systems technology program conducts research on two fronts. The first thrust consists of efforts in broad systems technology areas that advance the state-of-the-art in flight dynamics and controls. The second thrust involves advanced concepts which are investigated in conjunction with DOD and the Federal Aviation Administration. These currently include the X-wing rotor demonstration test on the Rotor Systems Research Aircraft (RSRA) and XV-15 tilt rotor flight testing. In both of these thrusts, inte-

grated system testing is required and involves large-scale wind tunnel testing, flight testing, and moving-base simulation.

In full-scale testing, preparations continue for the startup of the 40×80-foot wind tunnel in early 1986. A tail rotor was thoroughly documented for loads and acoustics on the outdoor aerodynamics research facility for a fiscal year 1986 main rotor/tail rotor interference test in the 40×80-foot wind tunnel. The main rotor rig for that test was shake tested and load cells were calibrated.

Under the joint DARPA/NASA RSRA/X-wing Program, the prime objective is to perform an x-wing rotor conversion from rotary to stopped-rotor flight and return to rotary wing flight. It will also investigate through flight research the dynamic stability, performance, and rotor control characteristics of the X-wing rotor system. In 1985, the final modification to the RSRA will be completed. The fabrication of the X-wing rotor system will also be completed and installed on the aircraft.

The X-wing rotor program will be generating ground-based, piloted simulation, propulsion system testbed data and vehicle management systems data in support of the flight investigation of the X-wing rotor on the RSRA. In particular, the flight testing will culminate in the historic demonstration of conversion from rotary to stopped-rotor to rotary flight.

Supporting the Navy joint services advanced vertical lift (JVX) program, XV-15 tilt rotor flight testing continued. A side arm controller was evaluated. New steel hubs were installed, enabling high gross weights and more demanding maneuvers to be evaluated. The advanced technology blades (ATB) were installed on the aircraft, and a limited evaluation begun. In ground-based testing, reports on the very successful hover tests of the XV-15, JVX, and ATB rotors were issued. Preparation began for a 40×80-foot wind tunnel test. Using point support by the Navy, NASA, and the Army, it will be possible to complete flight evaluation of the ATB rotor and perform military suitability tests. Wind tunnel and simulation tests will also be supported for JVX.

High Performance Aircraft Systems Technology

The objective of the High Performance Aircraft Systems Technology program is to generate validated engineering methods and design data applicable to the development of advanced high-performance, high-speed aircraft for military and civil applications. The programs objectives are accomplished by analysis, ground-base simulations, wind tunnel experimental research, and flight research tests of aircraft.

The flight research activity in fiscal year 1986 will involve a variety of high-performance aircraft to investigate advanced concepts. Several projects will continue their flight test phases during this period. Under the joint NASA/Air Force Advanced Fighter Technology Integration projects, the F-16 aircraft will complete its flight program, and the F-111 mission adaptive wing will continue the research program with evaluation of the automatic mode for in-flight adjustment of wing camber. The F-15 HIDEC will continue flight research to evaluate the potential of improving performance and mission effectiveness due to engine-airframe control integration. The joint NASA/DARPA X-29A forward-swept wing aircraft will complete the baseline flight program and begin the flight research phase to exploit fully the technologies designed into the aircraft.

The F-18 high angle-of-attack aircraft will start the flight research program with focus on aerodynamics and control system design for aircraft operations at high angles of attack. Vortex flap technology will be evaluated to determine if a flight research program using a NASA F-106 aircraft should be initiated in fiscal year 1986.

The fiscal year 1986 funding level reflects the start of the final design and construction phase of the oblique wing research aircraft. A single contractor will be selected from those participating in the preliminary design contracts during fiscal year 1985. The NASA F-8 digital fly-by-wire test aircraft will be converted to the research testbed for the flight program. This aircraft provides for easy installation of the oblique wing, a well defined, readily modifiable, highly flexible, digital flight control system.

During fiscal year 1986, the HOST program will continue to concentrate on developing improvements in high-temperature instrumentation, predictive methods for structural analysis, aerothermomechanical environment and life. Research will be conducted using the newly developedd high-temperature structures laboratory at Lewis Research Center to study the behavior of turbine blade material and actual burner liner hardware under realistic, complex aerothermomechanical loading conditions. Work will continue on the development of specialized structural analysis codes designed to predict the detailed turbine engine component stress-strain response over an entire mission. Life prediction methodology will be extended to anistotropic superalloys. Ceramics research will focus on identifying critical processing variables affecting reliability, development of methodology for measuring crack growth, and nondestructive evaluation techniques for monitoring small flaws.

Subsonic aircraft systems technology

The objective of the subsonic aircraft systems technology programs is to provide a substantiated base of key technologies, design data, and validated design procedures. Individual concepts are examined in the systems context with other interacting components and technologies to define techniques and procedures for obtaining maximum benefit from these applications. To this end, the advanced composite structures technology program was designed to develop a composite primary airframe structures technology base that achieves the full potential of weight, fuel, and cost savings possible for the design of civil and military transport aircraft in the 1990's. However, due to budgetary constraints, NASA has proposed terminating this program at the end of fiscal year 1985.

Advanced Propulsion Systems Technology

The objective of the Advanced Propulsion Systems Technology program is to explore and exploit advanced concepts for future aircraft engines in high-payoff technology areas through the focusing of fundamental research and technology efforts and integration of advanced propulsion components.

Activities in the Advanced Turboprop Systems program are focused on development of a broad research and technology data base and systems integration activities in preparation for flight verification which is necessary to establish large-scale advanced turboprop feasibility. The design of the large-scale advanced propeller (LAP) was completed by Hamilton Standard, and the fabrication of the 9-foot-diameter unit is underway, along with the fabrication of a 2-foot-diameter aeroelastic model to evaluate the aeroelastic scalability of the 9-foot LAP. Lockheed-Georgia has been selected as the prime contractor for the propeller test assessment (PTA) and is now progressing toward the key flight evaluation of the LAP in fiscal year 1987.

A contract has also been awarded to General Electric Company for a ground test of a gearless counter-rotation propfan concept. Model tests in the 2-foot-diameter size are verifying the counter-rotation propeller performance and acoustics predictions, and fabrication for the ground test vehicle is well underway with test initiation planned for June, 1985. Evaluation of 2-foot-diameter geared counter-rotation models is also underway with good results at Hamilton Standard, and contracts were signed with Pratt & Whitney and Allison Gas Turbine to evaluate and verify technology for large-scale gearboxes.

Wind tunnel aerodynamic, acoustic, and stability and control investigations were conducted for aft-mounted single- and counter-rotation turboprops. It was determined that the source noise directivity patterns are different for single- and counter-rotation propellers and that normal forces generated by the propellers at takeoff conditions are greater for counter-rotation than single-rotation configurations.

In fiscal year 1986, advanced turboprop systems program activities will consist of continued development of the broad-based supporting technology and preparation for the flight evaluation of the large-scale advanced propeller. Analysis and testing of the low- and high-speed propeller/inlet/diffuser testing will be completed. Three LAP rotors will be delivered to the propeller test assessment program and evaluated at static conditions with a modified gearbox and engine, as well as tested at low-speed conditions for performance, structural integrity, and cabin acoustics in the Ames Research Center's 40x80-foot wind tunnel.

Wind tunnel tests of a one-ninth scale model of the PTA aircraft will also be accomplished to determine the flying qualities of the airframe/turboprop combination. Evaluation of the gearless counter-rotation concept will be concluded. High-speed wind tunnel investigations will be continued for wing- and aft-mounted single- and counter-rotation configurations for stability and control evaluation, as well as code verification. Acoustics efforts will include counter-rotation source noise prediction modeling, cabin acoustics investigations, and experimental evaluation of counter-rotation propeller configurations.

Contracted studies to evaluate the suitability of advanced turboprop technology for application to multipurpose subsonic naval aircraft, general aviation aircraft, and military tactical transports will be completed. Test and analysis of acoustics and performance results will be completed on the unique, high-radius-ratio, counter-rotating, gearless model propulsion system. The full size, first build of this system will be completed, and ground testing will begin.

The general aviation/commuter engine technology effort will continue to focus on the development of a fundamental understanding and analytical data base for flow phenomena and heat transfer in small gas turbine engine components.

Numerical Aerodynamic Simulation

The objective of the Numerical Aerodynamic Simulation (NAS) program is to augment the Nation's capabilities in computational fluid dynamics and other areas of computational physics by developing a preeminent capability for numerical simulation of aerodynamic flows. This program will provide the computational capabilities required to solve problems which are currently intractable.

NASA began major hardware procurements for the NAS in fiscal year 1984, leading toward assembly of the initial operating configuration during fiscal year 1985. Full-scale development of the NAS network hardware begins with the delivery of the integrated support processor complex (front-end computers and supporting equipment) in early fiscal year 1985. The first high-speed processor, a Cray 2 supercomputer, will be delivered late in fiscal year 1985 and will be integrated into the NAS network. Extensive hardware and software test and integration activities will follow. During fiscal year 1985, construction will begin for the NAS facility.

The first part of fiscal year 1986 will be an intense test and integration period leading to operational status of the NAS IOC during the third quarter of fiscal year 1986. System software development will continue for all components of the NAS network leading toward an operational readiness review for the NAS IOC in the third quarter of fiscal year 1986. During fiscal year 1986, procurment of hardware and software for the NAS extended operating configuration will begin. RD 13-49 components in the extended operating configuration are the high-speed processor number two, the expanded graphics subsystem, and the expanded long-haul communications subsystem.

The successful operation of the initial NAS configuration in fiscal year 1986 will not only provide the world's premier computational capability for NASA and the Nation, but will also provide the critical networking capabilities required to support the expanded NAS extended operating configuration which will reach operational status in early fiscal year 1989.

Committee Comments

During the past year, aeronautical industry events have raised questions regarding the need for the scheduled flight test of NASA's LAP/PTA Advanced Turboprop program. The Committee recognizes that, while an industry flight test of a specific advanced turboprop configuration will provide a discrete set of data, it is still important to develop the generic data profile for the remaining critical technology issues of structural integrity and acoustics.

Because these technology issues cannot be adequately tested in small-scale model testing, the Committee believes that a full-scale flight test as previously planned for the Advanced Turpoprop

(ATP) program is still a valid and necessary objective. The Committee authorizes the administration's request of $42 for the ATP program, and consistent with the Committee's fiscal year 1985 authorization, continues to expect this program's flight test by 1987. This should allow the test data to be available soon enough to enhance our Nation's competitive position in the world aviation market in the early 1990's.

The Committee authorization also reflects a $4 million reduction from the Administration's $4 million request for the Altitude Wind Tunnel. Based on testimony presented to the Committee, this proposal Lewis Research Center facility would provide only a modest increase in capabilities over existing wind tunnels, and the estimated development cost and annual operating costs could not be justified by the slight increase in capabilities.

The Committee authorization also includes an additional authorization of $.4 million for Rotorcraft R&T Base activities.

Space Research and Technology—$154,000,000

The Committee authorizes $154.0 million for Space Research and Technology, $14 million below the administration's request of $168 million. The Committee expects this reduction to be applied without prejudice.

The overall goal of the space research and technology program is to advance the technology base in support of NASA's role as an effective, productive, and long-term contributor to the continued preeminence of the United States in space. The specific objectives of this program are: (1) to support a broad-based advanced technology program designed to provide new concepts, materials, components, devices, software, and subsystems for use in United States civil and military space activities; (2) to assure preeminent national capability through extensive and interrelated participation in the program by the NASA centers, other government agencies, universities, and industrial research and technology organizations; and (3) to support a strong institutional base to maintain NASA centers in positions of recognized excellence in critical space technologies.

The fiscal year 1985 program supports these objectives by emphasing disciplinary technologies that provide the necessary data base and understanding to create new opportunities for future national civil, military, and commercial space mission objectives, and on systems technology programs directed at obtaining fundamental data from in-space experimentation, and transferring advanced technology into space programs through more focused efforts that provide proof of concept to support technology readiness for anticipated applications.

Tracking and Data Advanced Systems—$14,800,000

The Committee authorizes $14,800,000 for Tracking and Data Advanced Systems, $1,400,000 below the Administration's request of $16,200,000.

The overall objective of the Advanced Systems program is to perform studies and to develop tracking and data systems and techniques required: (1) to obtain new and improved tracking and data capabilities that will meet the needs of approved new missions and near term new starts; and (2) to improve the cost effectiveness and reliability needed for overall support of the total mix of spaceflight missions.

This program remains a vital element in the Space Tracking and Data Systems program. Activity continues under this program to assess the dramatic changes taking place in the state-of-the-art in telecommunications, electronic micro-circuitry, and computer technology. This effort is critical for proper planning and for the application of new technology to future support capabilities that are cost effective and reliable. Efforts include the investigation of upcoming missions and studies of ground systems and telecommunications links to determine design approaches and overall trade-offs for the lowest life-cycle costs to support future space missions.

Space Flight, Control, and Data Communication—$3,386,900,000

Shuttle Production and Operational Capability—$941,500,000

The Committee authorizes $941,500,000 for fiscal year 1986, $35 million below the administration's request. This reduction is achieved by authorizing $110 million for Shuttle structural spares, $10 million below the administration's request, and by eliminating the administration's $25 million request for Changes and Systems Upgrading.

The Space Shuttle is the key element of a versatile 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. The 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 operational capability development provides for the national fleet of Space Shuttle orbiters, including main engines, and provides for the launch site facilities, initial spares, production tooling, and related supporting activities to meet the needs of NASA, the DOD, and other domestic and international users of space. More specifically, this line item contains the orbiter production for three flight orbiters; the full mofidication of Columbia (OV-102) to its operational configuration; the procurement of major structural orbiter components to be used as spares for the operational orbiter fleet; the residual development tasks for the orbiter, main engine, external tank and solid rocket booster (SRB); JSC mission support capability development; the equipment provisioning of the facilities for launch and landing at the KSC; the development of the filament wound case solid rocket booster; the initial lay-in of spares and the ground support equipment; and the rate tooling for the external tank and SRB. Modifications of two orbiters, two mobile launch platforms, and both launch pads for the conduct of the planetary missions (Galileo and Ulysses) in 1986 are also funded under this budget item.

Orbiter

The continuation of the orbiter production has been a major activity during the past year. The planned four-orbiter fleet includes: Columbia (OV-102), the orbiter vehicle developed and flown on the four test and evaluation flights; Challenger (OV-099), the second flight orbiter, which was fabricated using elements of the structural test article; and two orbiters—Discovery (OV-103) and Atlantis (OV-104)—of a lighter-weight configuration. OV-103 was delivered in November, 1983. OV-104 was delivered in April, 1985. The final phase of operational modifications for OV-102 will be complete in fiscal year 1985. Work began in fiscal year 1982 on modifications to orbiters and the related systems integration analyses for the use of the Centaur and its payloads. The provisioning of orbiter spares is an on-going activity to support the requirements for the initial lay-in of line replaceable units of equipment at the launch site. In addition, the budget provides for the extensive acquisition of orbiter structural spares to support the four-orbiter fleet.

At KSC the second line of vehicle processing stations is being phased in to support the parallel launch processing of orbiters. Parallel processing can be done in the Orbiter Processing Facility (OPF) and Vehicle Assembly Building. Parallel processing at the launch pad will be possible after Pad B completion in January 1985, consistent with the requirements to support the Centaur launches of Galileo and Ulysses in May 1986. The third mobile launch platform (MLP) is planned for a September 1986 operational readiness date.

Launch and mission support

Launch and Mission Support provides for the second set of processing stations at KSC to support parallel orbiter processing; the additional astronaut training, mission preparation, and mission operation capabilities required for higher flight rates; the modifications to the launch sites to accommodate the new Centaur upper stage; and studies of program-level improvements for the operations and management of the STS.

The first line of facilities at KSC activated during Design, Development, Test, and Engineering/Evaluation supports the launch processing and evaluation of an orbiter vehicle from landing through launch. The second line of processing stations is being phased in to support parallel launch processing of more than one orbiter through the various work areas. The second high bay of the OPF and the second MLP were activated in late fiscal year 1982 to support parallel processing of OV-102 and OV-099. The second set of high bays in the Vehicle Assembly Building, the software production facility, and the second control room were activated in fiscal year 1983 to enable parallel processing through orbiter external tank mate. A solid rocket booster processing and storage facility was activated in fiscal year 1984 to facilitate SRB handling, including off-loading of segments from rail cars, segment rotation capability, storage capability for two flight sets (16 segments), and the assembly of SRB aft segments. When Pad B is activated in fiscal year 1986, parallel processing will be possible from the start of OPF flow through launch. A third MLP will be activated in late fiscal year 1986 to help meet the flight rate scheduled in 1987 and beyond. Facility modifications supporting the fiscal year 1986 Centaur launches are in process.

Propulsion systems

Initial certification of the Space Shuttle main engine at a full power level was completed in fiscal year 1983. During the course of that certification, it became apparent that the main engine configuration required additional design modifications to achieve an acceptable level of reliability and maintainability. The modifications focus on the high pressure pumps and the hot gas manifold. Development of the pump modification was essentially completed in fiscal year 1984 and the new pumps began certification at the full power level thrust level early in the second quarter of fiscal year 1985. The redesign of the hot gas manifold is complete and the changes will be available for test in fiscal year 1986.

A major replanning of the main engine program was completed last year. As a result, NASA began a study of engine improvement which involves alternative rocket engine contractors and a technology engine effort at the MSFC. During the past year, six flights of the Space Shuttle (up to and including Mission 41-D) were completed with no main engine anomalies affecting flight performance.

The experience with the SRB's during earlier flights indicated the need for design improvements to reduce the amount of water impact damage to the SRB aft skirt, and to the hydraulic power units mounted internally to the aft skirt. Design improvements implemented to date have proven to be successful in reducing structural damage. Problems still exist with water intrusion damage to the thrust vector control servo actuators. Modifications are being implemented to the thrust vector control system to eliminate this problem. To reduce the water impact velocity, which is the major contributor to the damage at water impact, larger main parachutes were developed and used successfully on STS 41-F and STS 51-A and will continue to be used on subsequent flights.

The first high performance SRB motor was successfully flown on STS-8. The performance characteristics of the motor were well within specifications and achieved design goals. Post-flight inspection of the motor indicated more than desirable erosion. As a result, some minor changes to the manufacturing process for the carbon phenolic nozzle material may be necessary. Efforts are underway to correct this design margin problem.

The SRB program includes the development of an FWC motor case. This will enable NASA to replace the heavier steel motor case segments for high performance launches. The performance increase is achieved by reducing the Shuttle lift-off weight resulting in a payload capability improvement of approximately 4600 pounds. The full scale development hydrotests were completed, the first static test firing (DM-6) was successfully conducted, structural test articles have been delivered to MSFC for dynamic load tests, and all segments to support the first flight from Vandenberg Launch and Landing Site have been wound.

Performance of the eternal tank on all 16 Shuttle flights has been excellent. The Vandenberg Launch Site received its first flight tank in October 1984. All flight hardware has been delivered

on or ahead of schedule. Weight savings on the lightweight tanks have been greater than those in the baseline and should continue to be realized as additional planned improvements are implemented. Cost reduction and production readiness continue to be a high priority, as NASA introduces additional tooling and equipment to meet production requirements of 24 tanks per year.

Changes and Systems Upgrading

Changes and Systems Upgrading provides funding for potential changes and system modifications as well as unanticipated new requirements not covered in the budget estimates for the above activities and other program elements.

COMMITTEE COMMENTS

The Committee authorization for Shuttle Production and Operational Capability reflects a reduction of $10 million from the $120 million requested by the administration for orbiter structural spares. The Committee understands that the remaining $110 million will be sufficient to ensure the scheduled delivery of the structural spares as well as to maintain critical prime contractor skills. This reduction should not be interpreted as a lessening of the Committee's support for NASA's structural spares program or for the fifth orbiter. The Committee continues to support this program as a necessary and integral element of our Nation's STS. Severe fiscal limitations in the fiscal year 1986 budget, however, require that all programmatic activities bear part of the budget reduction effort.

At this time, future Shuttle requirements and the need for the fifth orbiter are uncertain. Space commercialization, the deployment and operation of the space station, the Strategic Defense Initiative, and other potential DOD requirements each represent future initiatives which, separately or collectively, could create a real and identifiable need for a fifth orbiter. The Committee is hopeful that over the next six months NASA will be able to identify this need if, in fact, it exists. Furthermore, the Committee encourages NASA to incorporate within the fiscal year 1987 budget request any decision to build a fifth orbiter, should the Agency identify this requirement.

The Committee also recommends a $25 million reduction from the administration's request of $25 million for Changes and Systems Upgrading. With the delivery of the orbiter Atlantis in April, 1985, activities related to the development of the Shuttle may be deemphasized without any degradation of the capabilities of the STS.

The Committee also notes with concern the brake failures associated with Shuttle mission 51-D, especially in light of the attention that NASA's Aerospace Safety Advisory Panel has given to the Shuttle landing gear over the past 2 years. The Committee expects to be kept informed of NASA's response to this landing gear failure and encourages NASA to reexamine the landing gear recommendations of the Aerospace Safety Advisory Panel.

SPACE TRANSPORTATION OPERATIONS—$1,700,100,000

The Committee authorizes $1,700,100,000 for fiscal year 1986, $25 million less than the administration request.

Space Transportation Operations provides the standard operation support services for the primary U.S. space launch system: the Space Shuttle. Within Shuttle Operations, flight hardware is produced, refurbished and repaired, and manpower, propellants, and other materials are furnished to conduct and support both flight and ground operations. The Space Shuttle operations program provides for the launch of NASA missions and, on a reimbursable basis, DOD, other U.S. Government, commercial, and international missions. The launch schedule calls for 9 flights in fiscal year 1985 and 15 flights, including the first launch from the West Coast, in fiscal year 1986, and a planned 17 flights in fiscal year 1987. The flight rate is planned to reach 24 launches per year by 1989.

The Space Shuttle provides launch services to non-NASA users on a reimbursable basis, as determined by the greater of each payload's length or weight. For flights launched during the first pricing phase (through fiscal year 1985), standard commercial launch services are priced at $18,300,000,00 (75$) with a $4,300,000 (RY$) use charge. Launches in this phase are priced at $16 million (75$). Launches occurring in the second pricing phase (fiscal year 1986 through fiscal year 1988) are priced at $71 million (82$) for commercial launches and $55,500,000 (82$) for DOD launches. The Bureau of Labor Statistics' indices are used to convert base year pricing (75$ and 82$) to real year dollars for billing purposes.

The Shuttle operations budget request funds three principal areas: flight operations, flight hardware, and launch and landing operations. Flight operations consists of mission support, integration, and support. The flight hardware program provides for the procurement of the external tanks, solid rocket motors, booster hardware, and propellants; spare components for the main engines orbiter spares; external tanks disconnect and SRB rate gyros sustaining engineering and logistics support for external tank/solid rocket booster/main engine flight hardware elements; and maintenance and operation of flight crew equipment. Launch and landing operations provides for the launch and landing operations of the Space Shuttle and its cargo.

At KSC, four operational flights were processed and launched in fiscal year 1984. The first two flights included vehicles which were stacked, processed and launched during the Shuttle Processing Contract (SPC) transition, a 6-month period when the incumbent contractors and the SPC (Lockheed) worked together toward a March, 1984 turnover. The full transition was completed on schedule after the successful launch of STS 41-B. The remaining two flights were processed by the SPC and included STS 41-D, the maiden voyage of Discovery. KSC planning includes launch of an additional nine flights in fiscal year 1985, including the first flight of the fourth orbiter, Atlantis. In addition, during fiscal year 1985, KSC will be responsible for processing Discovery at KSC for preparation for the first flight at the Vandenburg launch site in early 1986. A consolidated operations contract covering most of the flight

operation functions performed at JSC is in preparation; award date is anticipated to be early 1985.

Committee Comment

The Committee expects that as the Shuttle flight rate continues to increase during fiscal year 1985, NASA should be able to achieve greater economies in its Shuttle operations while adequately supporting the Shuttle flight schedule for fiscal year 1986. Accordingly, the Committee expects NASA to accommodate the $25 million reduction in funding below the administration's budget request without any degradation in Shuttle safety and reliability.

The Committee retains a strong interest in reducing the operating costs of the Space Transportation System, and notes with interest NASA's ongoing study of possible savings resulting from a second source for the solid rocket boosters.

This question is of great importance to the Committee. The solid rocket boosters have a significant effect on the overall price of the Shuttle and play a critical role in the STS.

The Committee anticipates that NASA's study will examine the process and financing requiring to develop a second solid rocket booster source. It is expected that the study will examine whether competition in the solid rocket booster program over both the short-term and long-term will enhance the economic viability of the Shuttle.

NASA's decision is expected to conform to the goal of ensuring routine low-cost access to space. The Committee further expects the administrator to pursue the course which provides the most cost-effective means of supplying solid rocket boosters to the space program, and best meets the present and future needs of the Space Transportation System.

Space and Ground Network, Communications, and Data Systems—$745,300,000

The Committee authorizes $745,300,000 for Space and Ground Network, Communications, and Data Systems, $63 million below the administration's budget request. This recommendation is achieved by the deferral of the scheduled $107 million principal payment to the Federal Financing Bank, by the additional authorization of $48 million to the TDRSS program, and by implementing a general reduction of $4 million.

The purpose of this program is to provide vital tracking, command, telemetry, and data acquisition support to meet the requirements of all NASA flight projects. In addition to NASA flight projects, support is provided on a reimbursable basis for projects of the DOD, other government agencies, commercial firms, and other countries and international organizations engaged in space research.

Support is provided for sounding rockets and balloons, research aircraft, and Earth orbital and planetary missions. The program also includes the support of the Space Shuttle and Spacelab flights program. The various types of support provided include: (1) tracking to determine the position and trajectory of vehicles in space; (2) acquisition of scientific and space applications data from on-board experiments and sensors; (3) acquisition of engineering data on the performance of spacecraft and launch vehicle systems; (4) transmission of commands from ground stations to spacecraft; (5) communication with astronauts; (6) transfer of information between the various ground facilities and control centers; (7) processing of data acquired from the launch vehicles and spacecraft; and (8) reception of television transmission from space vehicles. Such support is essential for achieving the scientific objectives of all flight missions, for executing the critical decisions which must be made to assure the success of these flight missions, and, in the case of Shuttle missions, to insure safety of the crew.

Tracking and acquisition of data for the spaceflight projects is accomplished through the use of a worldwide network of NASA ground stations, and by the first of a system of three tracking and data relay satellites in geosynchronous orbit working with a simple highly specialized ground station. Ground facilities are interconnected by ground communications lines, undersea cables, and communications satellite circuits which are leased from communications carriers, both domestic and foreign. This interconnection provides the communications capability needed between spacecraft and the control centers from which the flights are directed.

To meet the support requirements levied by the wide variety and large number of flight projects, NASA has established three basic support capabilities to meet the needs of all classes of NASA flight missions. These are the Spaceflight Tracking and Data Network (STDN), which supports Earth orbital missions; the Deep Space Network (DSN), which supports planetary and interplanetary flight missions; and the TDRSS, which will provide all low Earth orbital mission support when it becomes full operational. The STDN will continue to provide Earth orbital support until three TDRSS spacecraft are launched, properly positioned, and have completed pre-operational testing to ensure reliable mission operations support.

When the TDRSS is fully operational, a phaseout of selected STDN ground stations will be initiated. This is presently planned for the first half of 1986. Certain facilities of the STDN will be retained to provide support to geosynchronous and highly elliptical missions which cannot be supported via the TDRSS or to provide launch and Shuttle landing support. These remaining facilities, except for the launch and Shuttle landing support facilities, are being consolidated with the DSN stations under the management of the Jet Propulsion Laboratory. The consolidation, when completed, will provide a single network to support geosynchronous, highly elliptical, and planetary missions. The consolidated network will also support those spacecraft, now in low-Earth orbit, which are not compatible with TDRSS.

The Space Network consists of the TDRSS and a number of NASA ground elements to provide the necessary tracking, telemetry, command, and communication services to low Earth-orbital spacecraft. The TDRSS itself will consist of a three-satellite system in geosynchronous orbit and a single ground terminal located at White Sandss, New Mexico. The satellites communicate with the user spacecraft in space and relay information to and from the ground terminal. From the ground terminal, satellite and ground

communication links interconnect the NASA elements of the network and any remotely located user facilities.

The administration's fiscal year 1986 request includes funding for: repayment, including a $30 million prepayment, of the loans extended by the Federal Financing Bank for TDRSS development; payments to the TDRSS contractor for continuing TDRSS production, TDRSS services, and for maintenance and operation of the White Sands Complex; manpower and services necessary to operate and maintain the other NASA elements of the network; and systems engineering, engineering analyses, and other support services to the network elements such as mission planning, logistics, and documentation.

The TDRS–1 was launched in April, 1983, and the Inertial Upper Stage (IUS) booster failed to deliver the TDRS spacecraft into the correct orbit. In later June, 1983, the mission was recovered through a complex sequence of maneuvers and the spacecraft was placed into its nominal orbit. Since that time, the spacecraft has supported subsequent Shuttle missions, including Spacelab–1 and Landsat 5, while continuing the test and checkout of the TDRSS spacecraft and ground terminal. The TDRS–1 spacecraft experienced partial failure of the Ku-Band forward link that provides communication from TDRSS to the user spacecraft. The cause of this failure has been isolated and a modification has been implemented on subsequent spacecraft.

The launches of TDRS–2 and –3 were originally delayed while modifications were made to the IUS to rectify the causes of the anomaly experienced during the first launch. The redesigned and retested IUS performed successfully when it deployed a DOD satellite into geosynchronous orbit as part of mission 51–C, which occurred January 24–27, 1985. TDRS–2 was to have been deployed by the IUS on mission 51–E, scheduled for a March, 1985 launch. One week before the scheduled launch, however, a defective cell in a 24-cell flight battery of TDRS–2 was discovered. At this same time, a timing problem was discovered in TDRS–1 during testing. It was also determined that the problem is generic to all TDRS spacecraft. TDRS–2 was removed from the orbiter Challenger and mission 51–E was cancelled. The timing problem is being analyzed and modifications will be made to the TDRS spacecraft that have not been deployed.

The launches of TDRS–2 and TDRS–3 will complete the operational constellation of two TDRS's with TDRS–1 being used as an on-orbit spare. The first ground spare spacecraft has completed environmental testing and is now in storage. Current planning provides for launch of the initial four spacecraft using the IUS and the launch of subsequent spacecraft using a competitively procured upper stage.

As of January 1, 1985, the Ground Network included the STDN, consisting of 11 geographically dispersed ground stations which support Earth orbital mission; the DSN, consisting of three stations approximately 120 degrees apart in longitude for continuous mission viewing, which support planetary and interplanetary flight missions; and support for Aeronautics Balloon and Sounding Rocket programs at the Wallops Flight Facility, the Dryden Flight Research Facility, the Moffett Field Flight Complex, and White Sands Missile Range, as well as instrumentation support at the National Balloon Facility at Palestine, TX.

Funds requested for the Communications and Data Systems program provide for the implementation and operation of facilities and systems which are required for data transmission, mission control and data processing support.

Information is crucial to determining the condition of the spacecraft and payload control. Data received from the various spacecraft must be processed into a usable form before transfer to control centers and experimenters. Such support is mandatory for achieving mission objectives. Missions supported included Shuttle, NASA scientific and applications missions, and international cooperative efforts.

Committee Comments

The Committee's fiscal year 1986 recommendation of $745,300,000 for Space Tracking and Data Acquisition includes an additional $48 million above the administration's budget request for the TDRSS to accommodate the costs associated with the recent TDRSS problems as described above.

It is uncertain when NASA will be able to launch TDRS–2 and –3, but until TDRS–2 and –3 are deployed and operational, NASA must continue to operate its full complement of STDN ground stations. Meanwhile, NASA will continue to incur costs associated with keeping open these STDN ground stations. Within the fiscal year 1986 budget request NASA can support these ground stations only through January 1986. Therefore, the Committee's additional authorization of $48 million is for 8 months of TDRSS activities beyond January 1986. Of this $48 million, $28 million is for keeping open the STDN ground stations; the balance of this additional authorization, $20 million, is for extension of checkout and testing of the satellites with the ground stations; production and preparation activities of subsequent spacecraft; and delayed handling and launch related costs.

The Committee expects to be kept informed about any additional resource requirements and technical deficiencies associated with TDRSS as well as the resolution of the current problem and launch delays.

The Committee authorization for Space Tracking and Data Acquisition also reflects a deferral of NASA's fiscal year 1986 principal payment of $107 million to the Federal Financing Bank. This payment is currently scheduled pursuant to NASA's loan agreement with the Federal Financing Bank to finance TDRSS development. Payment of the $107 million in principal will be deferred until 1993, when the current contract terminates, and 1994. However, NASA is expected to pay the Federal Financing Bank in fiscal year 1986 the scheduled *interest* payment of $157 million.

Both the Congressional Budget Office and the Senate Budget Committee have concluded that this $107 million deferral will not result in any additional outlays in fiscal year 1986 nor affect in any way the Committee's direct spending authority.

Finally, the Committee assumes a general reduction of $4 million for Space Tracking and Data Acquisition as part of its overall budget deficit reduction program.

Construction of Facilities—$139,300,000

The Committee authorizes $139,300,000 for Construction of Facilities, $10 million below the administration's request. This authorization is for the purposes described below, and the $10 million reduction is to be applied to these projects, at the discretion of NASA:

(1) Space transportation facilities at various locations as follows:
  (A) Construction of orbiter modification and refurbishment facility, John F. Kennedy Space Center, $14 million;
  (B) Construction of thermal protection system facility, John F. Kennedy Space Center, $3,600,000;
  (C) Modifications for advanced technology engine test stand S-1C, George C. Marshall Space Flight Center, $6,500,000;
  (D) Modification for enhanced life support systems testing, Lyndon B. Johnson Space Center, $1,100,000;
  (E) Modifications to Pad A payload change-out room, John F. Kennedy Space Center, $2,200,000;
  (F) Modifications to space shuttle main engine support systems, National Space Technology Laboratories, $2,500,000;
(2) Space Shuttle payload facilities at various locations as follows:
  (A) Construction of payload control rooms, John F. Kennedy Space Center, $1,200,000;
  (B) Construction of spacecraft systems development and integration facility, Goddard Space Flight Center, $8 million;
(3) Construction of additions to research projects laboratory, Goddard Space Flight Center, $3,800,000;
(4) Construction of microdevices laboratory, Jet Propulsion Laboratory, $8,900,000;
(5) Construction of numberical aerodynamic simulation facility, Ames Research Center, $8,200,000;
(6) Modifications of the 16-foot transonic tunnel for improved productivity and research capability, Langley Research Center, $4,900,000;
(7) Modification of 64-meter antenna, DSS-14, Goldstone, California, $8,500,000;
(8) Modifications of 64-meter antenna, DSS-43, Canberra, Australia, $8,900,000;
(9) Repair of facilities at various locations, not in excess of $750,000 per project, $22 million;
(10) Rehabilitation and modification of facilities at various locations, not in excess of $750,000 per project, $27 million;
(11) Minor construction of new facilities and additions to existing facilities at various locations, not in excess of $500,000 per project, $6 million; and
(12) Facility planning and design not otherwise provided for, $12 million.

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

The funds requested for 1986 provide for: the continuation of prior year's endeavors in meeting the facilities requirements for the Space Shuttle; Space Shuttle Payload support operations; modification of aeronautical research and development facilities; repair, rehabilitation, and modification of other facilities to maintain, upgrade, and improve the usefulness of the NASA physical plant; minor construction of new facilities; and facility planning and design activities.

The projects and amounts in the budget estimate reflect Space Shuttle and Space Shuttle Payload requirements that are time sensitive to meet specific milestones. Other program requirements for 1986 include the construction of additions to the research project laboratory, and construction of a spacecraft systems development and integration facility at Goddard Spacecraft Center; construction of a microdevices laboratory at the Jet Propulsion Laboratory; ongoing construction on the numerical aerodynamic simulatoin facility at the Ames Research Center; modifications to the 16-foot transonic tunnel for improved productivity and research capability at the Langley Research Center; and modification of 64-meter antennas, DDS-14, Goldstone, CA, and DSS-43, Canberra, Australia.

The fiscal year 1986 program continues to meet the objectives of preserving and enhancing the capabilities and usefulness of existing facilities and ensures safe, economical, and efficient use of the NASA physical plant. This request continues the necessary rehabilitation and modification program as in prior years and continues a repair program. The purpose of the repair program is to restore facilities to a condition substantially equivalent to their originally designed capability. The minor construction program continues to provide a means to accomplish smaller facility projects which accommodate changes in technical and institutional requirements.

Committee Comments

The Committee's reduction in funding of $10 million below the administration's budget request is made without prejudice.

Research and Program Management—$1,370,000,000

The Committee authorizes $1,370 million for Research and Program Management, $25 million above the administration's request of $1,345 million. This increase is the net result of an increase of $42 million for civil service pay and a general reduction of $17 million.

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 contractor research and development tasks necessary to meet the Nation's objectives in aeronautical and space research. Objectives of the efforts funded by the Research and Program Management appropriation are: (1) to 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) to provide base maintenance of facilities and manage their use in support

of research and development programs; and (3) to provide effective and efficient technical and administrative support for the research and development programs.

The 21,800 permanent and temporary civil service personnel at eight major installations and Headquarters are funded by the Research and Program Management appropriation. This civil service work force 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 work force. About two percent is for travel, which is vital to management of 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.

Committee Comment

The Committee recognizes that the lifeblood of NASA is its personnel and that in order to maintain the level of continuity and efficiencies that are critical to each of the agency's programs, NASA's civil servant pay should not create unnecessary disruptions in the civil service work force of the Agency. Accordingly, the Committee rejects the five percent pay reduction for NASA's civil servants that is assumed in the administration's budget request and authorizes an additional $42 million for Research and Program Management to restore this reduction.

The Committee also recommends a $17 million general reduction in Research and Program Management which can be achieved by delaying or eliminating less critical activities. Furthermore, the Committee expects that the general reduction will not affect civil service pay.

Shuttle Pricing Policy

COMMITTEE COMMENTS

The Committee has chosen, at this point in the authorization process, to await the administration's decision relative to establishing a Shuttle pricing policy for commercial and foreign customers during fiscal years 1989-91. The Committee has held hearings on this issue and notes that the administration's efforts in addressing the Shuttle pricing policy have moved from the Cabinet Council on Commerce and Trade to the Senior Interagency Group on Space, which will present the final recommendation(s) to the President. Furthermore, this issue is being addressed indirectly by the office of the U.S. Trade Representative as it studies a related trade matter.

In the interests of allowing the Federal interagency process to analyze fully the Shuttle pricing policy with as few restrictions as possible, the Committee will wait for the administration's decision on a Shuttle pricing policy for fiscal years 1989-91. Pursuant to Section 8 of this bill, the Committee intends to assess this policy decision and its potential effect on the domestic expendable launch vehicle industry, the commercial development of space, and the overall goals and requirements of the Nation's space program. If the Committee believes that the administration's policy decision is not in the best interests of the Nation and the civil space program, the Committee will then propose legislation to establish a Shuttle pricing policy that more completely satisfies our national goals and objectives in space as well as those of the Nation as a whole.

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, DC, June 14, 1985.

Hon. John C. Danforth,
Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Dirksen Senate Office Building, Washington, DC.

Dear Mr. Chairman: The Congressional Budget Office has prepared the attached cost estimate for S. 1278, the National Aeronautics and Space Administration Act, 1985.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,
Sincerely,

Rudolph G. Penner, *Director.*

CONGRESSIONAL BUDGET OFFICE—COST ESTIMATE

1. Bill number: S. 1278.
2. Bill title: The National Aeronautics and Space Administration Act, 1986.
3. Bill status: As ordered reported by the Senate Committee on Commerce, Science, and Transportation on June 13, 1985.
4. Bill purpose: This bill authorizes the appropriation of $7,652 million for the National Aeronautics and Space Administration (NASA) and $586,000 for the Office of Commercial Space Transportation within the Department of Transportation for fiscal year 1986.

The authorization includes $2,642 million for the production and operation of the space shuttle, $200 million for the development of a space station, $2,556 for other research and development activities, and $745 million for the space tracking system. The bill also includes $139 million for construction of facilities and $1,370 million for research and program management. Also, NASA's scheduled $107 million repayment to the Federal Financing Bank is deferred. The total amount authorized $234 million below the President's fiscal year 1986 budget request and $142 million above the fiscal year 1985 appropriation for NASA.

5. Estimated cost to the Federal Government:

[In millions of dollars]

	Fiscal years—				
	1986	1987	1988	1989	1990
Authorization level:					
Function 250 civilian space	7,028.8				
Function 400 aeronautics	623.2				
Commercialization	.6				
Total	7,652.6				
Estimated outlays:					
Function 250 civilian space	5,201,0	1,580.2	232.3	15.3	
Function 400 Aeronautics	397.9	178.2	43.5	2.2	1.4
Commercialization	.5	.1			
Total	5.599.4	1,758.5	275.8	17.5	1.4

The costs of this bill fall within budget function 250.

Basis of estimate: The authorization levels are the amounts specified in the bill. The outlay estimates assume that all funds authorized will be appropriated prior to the beginning of fiscal year 1986 and that spending will reflect historical patterns.

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

7. Estimate comparison: None.

8. Previous CBO estimate: On March 28, 1985, CBO prepared a cost estimate for H.R. 1714, a bill to authorize appropriations for the National Aeronautics and Space Administration, as ordered reported by the House Committee on Science and Technology. The appropriations authorized in S. 1278 are about $234 million less than are contained in the House bill, and estimated outlays are correspondingly less. The House bill did not include language authorizing the deferral of principal repayments to the Federal Financing Bank, and includes $107 million for such repayments.

9. Estimate prepared by: Paul M. DiNardo.

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 effect on individuals and businesses and no effect on individual privacy.

Section 10 of this bill extends the life of the National Commission on Space, established last year pursuant to Public Law 98-361, from twelve months to eighteen months. This will give the Commission a full year to complete its assessment of the civilian space program, because the Commission was unable to initiate its formal proceedings and activities for the first six months of its existence, through no fault of its own. The Committee does expect an increase in paperwork as the Commission performs its studies and analyses. This increase will not be burdensome, however.

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):

The National Aeronautics and Space Administration Authorization Act, 1985

Section 204 of that Act

FUNCTIONS OF THE COMMISSION

Sec. 204. (a)–(b) * * *

(c) Within [twelve] *18* months after the date of the establishment of the Commission, the Commission shall submit to the President and to the Committee on Commerce, Science and Transportation of the Senate and the Committee on Science and Technology of the House of Representatives, a long range plan for United States civilian space activity incorporating the results of the studies conducted under this section, together with recommendations for such legislation as the Commission determines to be appropriate.

The Commercial Space Launch Act

Section 24 of that Act

AUTHORIZED APPROPRIATIONS

Sec. 24. There are authorized to be appropriated to the Secretary $4,000,000 for fiscal year 1985. *There are authorized to be appropriated to the Secretary to carry out this Act $586,000 for fiscal year 1986.*

ADDITIONAL VIEWS OF MR. RIEGLE

There are a number of issues in this legislation which are very important to me. Since being named ranking member of the Subcommittee on Science, Technology and Space, I have had an opportunity to learn a great deal about our civilian space program, and its critical importance to the technological base in our country. The bill that has been approved is the product of many hours of work by many different people. It is a tremendous compromise given the budgetary situation, which makes it difficult to fund all of the worthwhile efforts within NASA. The fact that we have developed a bill that has been unanimously reported by this Committee, and one whose funding level has been endorsed by the chairman and ranking member of the appropriations subcommittee is testimony to the consensus which exists in support of our civilian space program.

The legislation provides for full funding in the research and analysis budget. This is the principal source of funding for university research, and is truly the basis for our future space program, and for areas that we can't even conceive of today. This is a program that is extremely important to the University of Michigan among others, and the funding level contained in this bill ensures that we will maintain the scientific base, both in terms of data and manpower, to continue our leadership in space.

I am pleased that the legislation calls for $200 million for the space station program. While this is not the level of funding originally requested, it will be sufficient to keep the program on track. I see the space station as an inevitable step in the worldwide effort to fully realize the commercial benefits of space. Presently, the United States is the only western nation with the technological capability to put a station in orbit by the end of the century; but only if we make a commitment now to achieve that goal, we stand a good chance of losing this opportunity to other nations, such as Japan or the European Space Agency.

One area of extreme importance to America's competitive posture is the aeronautics budget, and I am most pleased that we have been able to accommodate almost the entire request. At this time, we are still the world's leader in aeronautical research and production. If you go anywhere in the world, the majority of aircraft flying are of U.S. origin. In large part, this position has been made possible through the partnership between government and industry in the development of new airframes, engines, and avionics. While our overall balance of trade has been bleeding this Nation, the trade in aircraft, and associated items remains positive.

This situation can change at any time, and we have already seen an increase in efforts by European companies to market the Airbus for U.S. carriers, as well as attempts to market aircraft from other nations. OMB proposed a total elimination of NASA support for aeronautical research, on the theory that private industry would fund the program. In my view, this is another example of a short-sighted policy suggestion by OMB and one which would put at risk our entire aeronautics industry. There is no doubt in my mind that if we eliminate funding in this area, we will see Europe, Japan, and other countries moving to fill the market around the world, with the permanent loss of thousands of jobs and an important technological base in the United States. I feel that we have made the appropriate decision to continue funding for this program and know that it will help to maintain the health of this industry.

Finally, Mr. Chairman, a related comment about shuttle pricing policies. As you know, the President is due to issue his recommendation for the next phase of shuttle pricing, and therefore our bill is silent on that issue. This decision, which we will all become involved in, will determine the viability and success of our entire commercial program for the next decade. A policy which prices the shuttle too high will doom that program, and all related programs to a residual status in the world marketplace. I, for one, do not believe that our competitors will raise their launch costs anywhere near that of some of the proposed shuttle prices. If the decision places shuttle prices in the high end of the ranges proposed, we are handing millions of dollars to overseas competitors. In my view, the shuttle has proven its value many times over, and it is still a young system. I do not want to take any actions now which will in any way jeopardize its future success, the success of our commercialization activities, and in a very real sense our economic future in space.

There are tremendous opportunities, both scientific and commercial, to be realized in space. That program has been a highly successful example of Government-industry cooperation, and I hope that we will continue that effort. This bill is consistent with that goal, and I am pleased that we have achieved consensus in support of its objectives.

DON RIEGLE.

Public Law 99-170
99th Congress
An Act

Dec. 5, 1985
[H.R. 1714]

To authorize appropriations to the National Aeronautics and Space Administration for research and development, space flight, control and data communications, 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, That this Act may be cited as the "National Aeronautics and Space Administration Authorization Act of 1986".

National Aeronautics and Space Administration Authorization Act of 1986.

TITLE I—NASA AUTHORIZATION

SEC. 101. There is hereby authorized to be appropriated to the National Aeronautics and Space Administration to become available October 1, 1985:

(a) For "Research and development", for the following programs:
(1) Space station, $205,000,000;
(2) Space transportation capability development, $437,300,000;
(3) Physics and astronomy, $620,400,000;
(4) Life sciences, $68,000,000;
(5) Planetary exploration, $354,000,000;
(6) Space applications, $537,800,000;
(7) Technology utilization, $11,100,000;
(8) Commercial use of space, $17,000,000;
(9) Aeronautical research and technology, $354,000,000;
(10) Space research and technology, $166,000,000; and
(11) Tracking and data advanced systems, $16,200,000.

(b) For "Space flight, control and data communications", for the following programs:
(1) Space shuttle production and operational capability, $961,500,000;
(2) Space transportation operations, $1,710,100,000; and
(3) Space and ground network, communications and data systems, $701,300,000.

(c) Except as provided in the last sentence of this subsection for "Construction of facilities", including land acquisition, as follows:
(1) Space transportation facilities at various locations as follows:
(A) Construction of orbiter modification and refurbishment facility, John F. Kennedy Space Center, $14,000,000;
(B) Construction of thermal protection system facility, John F. Kennedy Space Center, $3,600,000;
(C) Modifications for advanced technology engine test stand S-1C, George C. Marshall Space Flight Center, $6,500,000;
(D) Modification for enhanced life support systems testing, Lyndon B. Johnson Space Center, $1,100,000;
(E) Modifications to Pad A payload change-out room, John F. Kennedy Space Center, $2,200,000; and

(F) Modifications to space shuttle main engine support systems, National Space Technology Laboratories, $2,500,000;
(2) Space shuttle payload facilities at various locations as follows:
(A) Construction of payload control rooms, John F. Kennedy Space Center, $1,200,000; and
(B) Construction of spacecraft systems development and integration facility, Goddard Space Flight Center, $8,000,000;
(3) Construction of additions to research projects laboratory, Goddard Space Flight Center, $3,800,000;
(4) Construction of microdevices laboratory, Jet Propulsion Laboratory, $8,900,000;
(5) Construction of numerical aerodynamic simulation facility, Ames Research Center, $8,200,000;
(6) Modifications to the 16-foot transonic tunnel for improved productivity and research capability, Langley Research Center, $4,900,000;
(7) Modification of 64-meter antenna, DSS-14, Goldstone, California, $8,500,000;
(8) Modification of 64-meter antenna, DSS-43, Canberra, Australia, $8,900,000;
(9) Repair of facilities at various locations, not in excess of $750,000 per project, $22,000,000;
(10) Rehabilitation and modification of facilities at various locations, not in excess of $750,000 per project, $27,000,000;
(11) Minor construction of new facilities and additions to existing facilities at various locations, not in excess of $500,000 per project, $6,000,000; and
(12) Facility planning and design not otherwise provided for, $12,000,000.

Notwithstanding paragraphs (1) through (12), the total amount authorized by this subsection shall not exceed $139,300,000.

(d) For "Research and program management", $1,367,000,000, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

(e) Notwithstanding the provisions of subsection (h), appropriations hereby authorized for "Research and development" and "Space flight, control and data communications" 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 ensure 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" and "Space flight, control and data communications" pursuant to this Act may be used in accordance

Contracts.
Grants.

with this subsection for the construction of any major facility, the estimated cost of which, including collateral equipment, exceeds $500,000, unless the Administrator or the Administrator's 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.

42 USC 2459a.

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

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

(h) Of the funds appropriated pursuant to subsections (a), (b), and (d), not in excess of $100,000 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 (a) or (b), not in excess of $500,000 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 (11), inclusive, of section 101(c)—

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

Report.

(2) following a report by the Administrator or the Administrator's 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 per centum, 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 per centum of the funds appropriated pursuant to section 101(a) or 101(b) may be transferred to and merged with the "Construction of facilities" appropriation, and, when so transferred, together with $10,000,000 of funds appropriated pursuant to section 101(c) (other than funds appropriated pursuant to paragraph (12) of such section) shall be available for expenditure to construct, expand, and modify laboratories and other installations at any location (including locations specified in section 101(c)), 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) the Administrator 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 period of 30 days has passed after the Administrator or the Administrator's designee has transmitted to the Speaker of the House of Representatives and to the President of the Senate and 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.

Prohibition. Report.

SEC. 104. Notwithstanding any other provision of this Act, no amount appropriated pursuant to this Act may be used for any program—

Prohibition.

(1) deleted by the Congress from requests as originally made either to the Committee on Commerce, Science, and Transportation of the Senate or the Committee on Science and Technology of the House of Representatives;

(2) in excess of the amount actually authorized for that particular program by subsections (a), (b), and (d) of section 101; and

(3) which has not been presented to either such committee, unless a period of thirty 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 the Administrator's 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.

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.

42 USC 2459 note.

SEC. 106. No civil space station authorized under section 101(a)(1) may be used to carry or place in orbit any nuclear weapon or any other weapon of mass destruction, to install any such weapon on any celestial body, or to station any such weapon in space in any other manner. This civil space station may be used only for peaceful purposes.

Prohibition.

SEC. 107. On and after the date of enactment of this Act, the Inspector General of the National Aeronautics and Space Administration may administer to or take from any person an oath, affirmation or affidavit, whenever necessary in the performance of the functions assigned by the Inspector General Act of 1978 (5 U.S.C. App.). Any such oath, affirmation or affidavit, when administered or taken by or before an investigator or such other employee of the Office of the Inspector General as may be designated by the Inspector General, shall have the same force and effect as if administered or taken by or before an officer having a seal.

SEC. 108. The authorization for space shuttle production and operational capability includes provisions for the production activities necessary to provide for a fleet of four space shuttle orbiters,

including the production of structural and component spares, necessary to ensure confident and cost effective operation of the four orbiter fleet as well as provisions for maintaining production readiness for a fifth orbiter vehicle.

42 USC 2451 note.

SEC. 109. Section 204(c) of the National Aeronautics and Space Administration Authorization Act, 1985 (Public Law 98-361; 98 Stat. 430) is amended by striking "twelve" and inserting in lieu thereof "18".

Report.

SEC. 110. Within ninety days of the date of enactment of this Act, the Administrator shall review those recommendations of the President's Private Sector Survey on Cost Control and such other recommendations as may be included in the Office of Management and Budget report "Management of the United States Government—1986" and shall submit a report to 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 on the implementation status of each such recommendation which affects the National Aeronautics and Space Administration and which are within the authority and control of the Administrator.

Study. Handicapped persons. 42 USC 2451 note.

SEC. 111. The Administrator shall initiate an immediate feasibility study to ensure flight opportunities for a diverse segment of the American public, including a physically disabled American.

Report. 42 USC 2466c note.

SEC. 112. The Administrator shall examine and report to the Congress on the feasibility of providing space shuttle launch services on a basis of royalty recovery over the economic life of commercial products produced or processed in space.

Study. Report. 42 USC 2466c note.

SEC. 113. The Administrator shall conduct a study and report to the Congress on a proposed pricing policy for certain services such as on-orbit service, repair or recovery of spacecraft.

Banks and banking.

SEC. 114. (a) In accordance with the provisions of this section, during fiscal year 1986 the National Aeronautics and Space Administration shall defer payment to the Federal Financing Bank of the amount attributable to principal for which the Administration is obligated during such fiscal year as a result of the contract regarding tracking and data relay satellite services (NAS 5-25,000) entered into under section 6 of the National Aeronautics and Space Administration Authorization Act, 1978 (42 U.S.C. 2463).

Contracts.

(b) The amount of any payment deferred under subsection (a) shall be added to the amount of principal for which the Administration is obligated during fiscal year 1993 as a result of such contract. After the addition of such amount, if the total amount of repayments and prepayments under such contract for which the Administration is obligated during fiscal year 1993 exceeds the total amount of repayments and prepayments under such contract for which the Administration was obligated during fiscal year 1992, the Administration may defer payment of such excess until fiscal year 1994.

Contracts.

(c) The Administrator of the National Aeronautics and Space Administration is authorized to renegotiate such contract, if the Administrator determines that such renegotiation is necessary to enable the Administration to defer payments as provided in this section.

President of U.S. Report.

SEC. 115. The President shall submit to the Congress at the earliest practicable date, but not later than May 1, 1986, a report on any action taken with respect to the establishment in 1992 of an International Space Year. Such report shall include descriptions of possible international missions and related research and educational activities and such other activities as the President may deem appropriate.

TITLE II—SHUTTLE PRICING POLICY FOR COMMERCIAL AND FOREIGN USERS

Space Transportation System. 42 USC 2466.

SEC. 201. The Congress finds and declares that—

(1) the Space Transportation System is a vital element of the United States space program, contributing to the United States leadership in space research, technology, and development;

(2) the Space Transportation System is the primary space launch system for both United States national security and civil government missions;

(3) the Space Transportation System contributes to the expansion of United States private sector investment and involvement in space and therefore should serve commercial users;

(4) the availability of the Space Transportation System to foreign users for peaceful purposes is an important means of promoting international cooperative activities in the national interest and in maintaining access to space for activities which enhance the security and welfare of mankind;

(5) the United States is committed to maintaining world leadership in space transportation;

(6) making the Space Transportation System fully operational and cost effective in providing routine access to space will maximize the national economic benefits of the system; and

(7) national goals and the objectives for the Space Transportation System can be furthered by a stable and fair pricing policy for the Space Transportation System.

42 USC 2466a.

SEC. 202. The purpose of this title is to set the reimbursement pricing policy for the Space Transportation System for commercial and foreign users which is consistent with the findings included in section 201, encourages the full and effective use of space, and is designed to achieve the following goals—

(1) the preservation of the role of the United States as a leader in space research, technology, and development;

(2) the efficient and cost effective use of the Space Transportation System;

(3) the achievement of greatly increased commercial space activity; and

(4) the enhancement of the international competitive position of the United States.

42 USC 2466b.

SEC. 203. For purposes of this title, the term—

(1) "Administrator" means the Administrator of the National Aeronautics and Space Administration; and

(2) "additive cost" means the average direct and indirect costs to the National Aeronautics and Space Administration of providing additional flights of the Space Transportation System beyond the costs associated with those flights necessary to meet the space transportation needs of the United States Government.

42 USC 2466c.

SEC. 204. (a) The Administrator shall establish and implement a pricing system to recover reimbursement in accordance with the pricing policy under section 202 from each commercial or foreign user of the Space Transportation System, which except as provided in subsections (c), (d), and (e) shall include a base price of not less

than $74,000,000 for each flight of the Space Transportation System in 1982 dollars.

Report.

(b) Each year the Administrator shall submit to the President of the Senate, the Speaker of the House of Representatives, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives, a report, transmitted contemporaneously with the annual budget request of the President, which shall inform the Congress how the policy goals contained in section 202 are being furthered by the shuttle price for foreign and commercial users.

(c)(1) If at any time the Administrator finds that the policy goals contained in section 202 are not being achieved, the Administrator shall have authority to reduce the base price established in subsection (a) after forty-five days following receipt by the President of the Senate, the Speaker of the House, the Committee on Commerce, Science, and Transportation of the Senate, and the Committee on Science and Technology of the House of Representatives of a notice by the Administrator containing a description of the proposed reduction together with a full and complete statement of the facts and circumstances which necessitate such proposed reduction.

(2) In no case shall the minimum price established under subsection (c)(1) be less than additive cost.

(d) The Administrator may set a price lower than the price determined under subsection (a) or (c), or provide no-cost flights, for any commercial or foreign user of the Space Transportation System who is involved in research, development or demonstration programs with the National Aeronautics and Space Administration.

(e) Notwithstanding the provisions of subsection (a), the Administrator shall have the authority to offer reasonable customer incentives consistent with the policy goals in section 202.

42 USC 2466 note.

SEC. 205. This title shall apply to flights of the Space Transportation System beginning on and after October 1, 1988.

TITLE III—OFFICE OF COMMERCIAL SPACE TRANSPORTATION

49 USC app. 2623.

SEC. 301. Section 24 of the Commercial Space Launch Act (Public Law 98-575; 98 Stat. 3064) is amended by adding at the end thereof the following: "There is authorized to be appropriated to the Secretary to carry out this Act $586,000 for fiscal year 1986.".

Approved December 5, 1985.

LEGISLATIVE HISTORY—H.R. 1714:

HOUSE REPORTS: No. 99-32 (Comm. on Science and Technology) and No. 99-379 (Comm. of Conference).
SENATE REPORT No. 99-91 (Comm. on Commerce, Science, and Transportation).
CONGRESSIONAL RECORD, Vol. 131 (1985):
Apr. 3, considered and passed House.
June 27, considered and passed Senate, amended.
Nov. 21, Senate and House agreed to conference report.

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99TH CONGRESS | HOUSE OF REPRESENTATIVES | REPORT
1st Session | | 99-212

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT-INDEPENDENT AGENCIES APPROPRIATION BILL, 1986

JULY 18, 1985.—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. 3038]

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, 1986, and for other purposes.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

RESEARCH AND DEVELOPMENT

1985 appropriation	$2,422,600,000
Estimate, 1986	2,881,800,000
Recommended in bill	2,756,800,000
Decrease below estimate	−125,000,000

The research and development account of the National Aeronautics and Space Administration includes funding for the space station and 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 areas of airframe and engine manufacturing.

The Committee recommends a total of $2,756,800,000 for this account in fiscal year 1986. This is a decrease of $125,000,000 below the budget request and an increase of $334,200,000 above the 1985 level. The recommendation includes the following increases, decreases, and changes to the program areas described below:

—$30,000,000 from the space station. The bill provides for a program level of $200,000,000 for the space station in 1986. The Committee expects NASA to recommend the actual distribution of the $30,000,000 reduction within the space station program. It urges the Agency, however, to make the reduction on the basis of priorities required to balance properly Phase B definition studies and advanced technology work. In addition, language has been included in the bill which permits the Administrator, at his discretion, to increase the total available for space station from $200,000,000, to $210,000,000. Such an increase, however, must be derived from the $10,000,000 provided in this account for the Orbital Maneuvering Vehicle (OMV), which has been funded at $10,000,000 in fiscal year 1986.

—$15,000,000 from the Orbital Maneuvering Vehicle. As is indicated above, this would reduce the OMV program level in 1986 to $10,000,000—unless the Administrator elects to add these funds to the space station activity.

—$25,000,000 from the Solar Optical Telescope. This reduction provides for a program level of $5,000,000 in 1986. In making this recommendation, the Committee notes that the Solar Optical Telescope has been funded in fiscal years 1983, 1984, and 1985 at the respective levels of $4,000,000, $6,000,000 and $9,800,000. NASA intended to use a part of the $9,800,000 available in 1985 to initiate development work on the Solar Optical Telescope. The Committee, however, took strong exception to the concept of beginning this program without formally requesting it as a "new start". Because of these concerns, the Agency agreed not to proceed with development funding for this program—pending a 1986 funding decision. In that connection the Committee believes it is important to point out that the cost of this program has grown from an estimated $100,000,000 to more than $300,000,000. Because of this cost growth, the Committee strongly urges NASA to make a decision relative to whether this program should proceed to a development commitment in 1986. In making that decision, the Committee believes it is important that NASA evaluate the Agency's 1987 and 1988 anticipated budget levels and determine if this and other programs can reasonably be accommodated within those estimated funds. In this connection, it is the Committee's judgment that NASA should preserve the funding stream for projects already underway—and should only commit to new projects that can be funded at an efficient obligation rate concomitant with the Agency's estimated future budget allocations.

—$4,000,000 from Life Sciences.

—$5,000,000 from Mars Observer.

—$25,000,000 from Scatterometer.

—$5,000,000 from Upper Atmospheric Research Satellite.

—$5,000,000 from Advanced Communications Technology Satellite.

—$13,000,000 from Commercial Programs. The 1986 budget request for Commercial Programs included $41,100,000. Within that amount, $30,000,000 was intended to be made available for commercial use of space and $11,100,000 for technology utilization. The reduction of $13,000,000 may be taken from these activities at the discretion of the Agency.

+$2,000,000 for Microgravity Materials Research. The Committee is concerned that insufficient resources have been made available for various aspects of microgravity research within NASA. It is vitally important that the basic research be adequately addressed in this area before the design components of a space station materials processing laboratory can properly be determined.

The Committee is also "capping" the 1986 amounts for a number of programs. In accordance with the agreement as outlined in a letter from NASA to the Committee, dated August 9, 1984, these "caps", if included in the conference report, may not be lifted without the approval of the Committees on Appropriations.

1. Space Station—$200,000,000 (with the option described above to increase this amount to $210,000,000).
2. Upper Stages—$122,000,000.
3. Orbital Maneuvering Vehicle—$10,000,000.
4. Space Telescope—$127,800,000.
5. Solar Optical Telescope—$5,000,000.
6. Gamma Ray Observatory—$87,300,000.
7. Galileo—$39,700,000.
8. Scatterometer—$6,000,000.
9. Upper Atmospheric Research Satellite—$129,000,000.
10. Commercial Programs—$28,100,000.

In connection with the space station, in the 1985 HUD-Independent Agencies report, the Committee suggested that if future budget deficits did not permit the full development of the space station—it was essential that the permanently manned element not be the principal or sole survivor of budget retrenchments. Since that concern was expressed, the budget situation has deteriorated. Indications are that it will continue to severely restrict future NASA appropriations. Because of that fact, in the hearings held on the 1986 NASA appropriation, it was clearly expressed that the Committee did not want to find the Nation in a situation that permitted the development of the manned aspects of the space station while the platforms, laboratories and payload servicing functions were stretched out. It is that concern, expressed both last year and this year, that drove the Committee's recommendation to explore a complementary man-tended option. The Committee is encouraged that NASA recognizes the potentially serious implications of future funding constraints and stands ready to cooperate with the Agency to achieve the common goal of a permanently manned space station that includes *at the outset* the useful and productive activities planned.

Finally, the Committee recognizes that NASA is engaged in coordination of highly complex efforts to negotiate international participation in the space station program. It is pleased to see the successful conclusion of a memorandum of understanding with the European Space Agency, Canada and Japan for the cooperation and parallel activities during Phase B definition studies. The Committee encourages NASA to utilize the expertise resident in the United States academic community to formulate arrangements for international involvement and requests that NASA arrange for an academic organization to submit a report on alternative ways that the benefits of the academic community might be utilized by the Agency with respect to the international aspects of space station.

In connection with the ongoing search and rescue program, the Committee is pleased that NASA has progressed to an operational status and supports the continued carriage of search and rescue instruments on National Oceanographic and Atmospheric Administration polar orbiting weather satellites. The Committee also strongly supports the NASA concept of a backup satellite carrying search and rescue instruments which was described in hearings on the 1986 appropriation. This satellite would ensure that the United States' commitments to the international search and rescue program could be met even if an early failure of the NOAA satellite or a search and rescue instrument occurred. It is understood that a study is underway to examine the feasibility and cost of a backup satellite, and the Committee requests that NASA provide a copy of the study when it is completed. Further, the Agency is urged to proceed with the development of this satellite as soon as possible so that United States' international commitments can be met.

The Committee also recognizes and supports the continuing NASA effort to provide for system improvements such as the development of new distress transmitters, specifically designed for satellite detection, global coverage, and the possibility of instantaneous detection using geosyncronous satellites. It is hoped that this work will proceed as rapidly as technology will permit.

Finally, the Committee strongly urges that some improvements to the presently deployed emergency locator transmitters should be addressed. It is not satisfactory that units with a false alarm rate of over 97 percent and a non-activation rate of 70 percent continue to be mandated by the Federal government when an improved technical standard has been developed and can be provided for respective satellite monitoring. It is recognized that NASA cannot initiate the necessary administrative action to mandate improved transmitters, but as the developer of the satellite system, NASA should urge the Federal Aviation Administration to proceed and should make available technical expertise to support any FAA initiative in this area.

SPACE FLIGHT CONTROL AND DATA COMMUNICATIONS

1985 appropriation	$3,601,800,000
Estimate, 1986	3,509,900,000
Recommended in bill	3,402,900,000
Decrease below estimate	−107,000,000

The space flight control and data communications account includes the program elements that provide for the national fleet of space shuttle orbiters, including main engines, launch site and mission operations, control requirements, initial spares, production tooling, and related supporting activities. This account also provides the standard operational support services for the space shuttle and the expendable launch vehicles, and includes tracking, telemetry, command, and data acquisition support required to meet all NASA flight projects.

The Committee recommends a total of $3,402,900,000 for this activity in fiscal year 1986. This is a decrease of $107,000,000 below the budget request and is $198,900,000 below the 1985 appropriation. The Committee directs that the full $107,000,000 reduction be

taken from the repayment of the loan principal to the Federal Financing Bank for the Tracking and Data Relay Satellite System.

The Committee has recommended no reductions in funding for the Space Transportation System (STS) in this or the research and development accounts. This approach is intended to provide NASA with maximum flexibility in dealing with a number of STS related funding problems. These include an ongoing effort to upgrade the orbiter's crosswind landing capability, shuttle-Centaur development difficulties, and a requirement for additional funds to maintain existing tracking facilities until the second TDRSS spacecraft is successfully launched. Because of these and other concerns, the Committee again felt it was important to attach the highest funding priority to the Space Transportation System.

CONSTRUCTION OF FACILITIES

1985 appropriation	$150,000,000
Estimate, 1986	149,300,000
Recommended in bill	139,300,000
Decrease below estimate	−10,000,000

The Committee recommends $139,300,000 for the construction of facilities in 1986. The reduction includes, without prejudice, either the $8,000,000 requested for construction of spacecraft systems development and integration facility at the Goddard Space Flight Center, or the $8,900,000 requested for construction of a microdevices laboratory at the Jet Propulsion Laboratory. The Committee believes that this project can be deferred until fiscal year 1987 or 1988. The Committee is also recommending a specific project reduction owing to the fact that in the past three fiscal years general appropriation retrenchments in this account have been allocated to minor construction and repair and rehabilitation of NASA facilities. Further reductions in these areas will cause expensive and unnecessary costs that are not warranted.

RESEARCH AND PROGRAM MANAGEMENT

1985 appropriation	$1,317,000,000
Estimate, 1986	1,345,000,000
Recommended in bill	1,367,000,000
Increase above estimate	+22,000,000

The Committee is recommending $1,367,000,000, a net increase of $22,000,000 above the budget request for research and program management. The increase is made up of $42,000,000 for restoration of the five percent pay reduction assumed in the President's 1986 budget and a partial offset of $20,000,000 in non-personnel compensation and benefits object classes. The Committee requests that NASA submit a report by September 1, 1985, indicating how the offsetting reduction would be applied.

ADMINISTRATIVE PROVISION

The Committee has included bill language establishing a ceiling on the shuttle launch price of $71,400,000 for the period 1989 through 1991. This action mirrors the recommendation of the House Science and Technology Committee in the bill, H.R. 1714, as reported from the Committee.

The Committee recognizes that this issue was debated before the House in April of this year and that the House amended the Committee on Science and Technology's proposed language. However, that amendment would raise the shuttle launch cost ceiling to approximately $106,000,000. The Committee believes such a level would only serve to enhance the prospects of foreign commercial expendable launch vehicle (ELV) interests. In fact, this problem is so serious it should be noted that the Administrator of NASA withdrew the agency's recommendation of a shuttle launch price of $87,000,000 for the period 1989 through 1991. In taking that action, the Administrator made the following points:

—It is becoming increasingly clear that the shuttle will not be able to compete effectively with the European Ariane launch vehicle at a price of $87,000,000 per flight. Projections of demand for space launch services, earlier predicted as high as 30 to 40 satellites per year, have eroded to a level of no more than 17 to 20 satellite launches each year during the 1989 to 1991 period. The shuttle and U.S. expendable launch vehicles each have the capacity to handle the entire market alone. Arianespace, with only a modest investment, could also increase its capacity sufficiently to handle the entire market. Thus, launch services have become a buyers' market rather than a sellers' market.

—It has been demonstrated that while many factors are considered in the selection of a launch vehicle, a price advantage of about five percent will strongly influence the buyers' selection. During the past twelve months, under the current shuttle price of $71,000,000 covering the 1986 through 1988 period, the shuttle has lost one-half of the available payloads to Ariane. In fact, in the most recent competition for launches, NASA has witnessed Arianespace consistently underbidding the shuttle and capturing a larger share of the market.

—It has become increasingly evident that available U.S. expendable launch vehicles cannot make inroads against Ariane. Spokesmen for U.S. companies who are attempting to market commercial ELVs have testified to the Congress that the shuttle price must be raised to approximately $120,000,000 to $150,000,000 per flight in order for U.S. ELVs to compete with the shuttle. At that price, however, there is an excellent chance that all or most of the entire satellite launch market would be surrendered to Ariane.

—In addition to preventing U.S. space transportation leadership, high shuttle prices will also inhibit the commercial development of space. The commercial production of new medicines, semi-conductors and other materials is highly dependent on initial low-cost transportation to orbit. The McDonnell-Douglas Corporation, which is a leader in the field of developing new commercial applications in space, has advised the Department of Commerce that the original proposed price of $87,000,000 for a full payload shuttle flight would drastically reduce the number of potential products the company would be willing to investigate from the 11 currently planned to only four.

The shuttle is a national asset. The Federal government, through NASA and the Department of Defense, has invested approximately

$18,000,000,000 in the space transportation system. It has been the policy of this and past Administrations that the shuttle be the primary space launch system for all U.S. government missions. Without capping the shuttle price at $71,400,000 for the period 1989 through 1991, the Committee believes that NASA would see virtually every commercial communications satellite launched by Ariane and would experience a serious erosion in the potential commercialization of space. In short, the Committee believes that after spending $18,000,000,000 on the shuttle system, the setting of a price significantly higher than $71,400,000 would make very little sense.

TITLE IV

GENERAL PROVISIONS

The Committee recommends that the general provisions applicable to the Department and agencies carried in the current fiscal year be continued in fiscal year 1986.

Inflationary Impact Statement

Clause 2(l)(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 government at the time, and the sectors of the economy which the spending may affect.

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 this 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 National Aeronautics and Space Administration and 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 1985 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 administrative provision on page 27, establishing a ceiling on shuttle launch prices, could be construed as changing the application of existing law.

LIMITATIONS AND LEGISLATIVE PROVISIONS

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

On page 24, in connection with the National Aeronautics and Space Administration, research and development:

Provided, That of the funds provided herein, not to exceed $200,000,000 shall be available for a space station, except that the Administrator of the National Aeronautics and Space Administration may increase the aforementioned amount by the $10,000,000 made available herein for the orbital maneuvering vehicle

On page 27, in connection with the National Aeronautics and Space Administration, administrative provision:

Notwithstanding any other provision of this Act, the space shuttle pricing policy for commercial and foreign users for the period beginning on October 1, 1988, and ending on September 30, 1991, shall be in the manner provided for in title II of H.R. 1714, the National Aeronautics and Space Administration Authorization Act of 1986, as reported to the House of Representatives on March 28, 1985

Calendar No. 280

99TH CONGRESS } SENATE { REPORT
1st Session } { 99-129

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT—INDEPENDENT AGENCIES APPROPRIATION BILL, 1986

AUGUST 28, 1985.—Ordered to be printed
Filed under authority of the order of the Senate of AUGUST 1 (legislative day, JULY 16), 1985

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

REPORT

[To accompany H.R. 3038]

The Committee on Appropriations to which was referred the bill (H.R. 3038) 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, 1986, and for other purposes, reports the same to the Senate with various amendments and presents herewith an explanation of the contents of the bill.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

RESEARCH AND DEVELOPMENT

1985 appropriation	$2,422,600,000
1986 budget estimate	2,881,800,000
House allowance	2,756,800,000
Committee recommendation	2,790,800,000

The Committee recommends an appropriation of $2,790,800,000 for research and development activities. This amount is $91,000,000 less than the budget estimate and $34,000,000 more 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 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 appropriations provides for the following research, development, and procurement activities of NASA:

Space station.—The United States will continue with the design and definition of a space station; initial orbital activities are planned for launch within the decade. A U.S. space station will provide space-based facilities to allow for enhancement of the Nation's science and applications programs and for development of capabilities for commercial exploitation of space, while exploring advanced technologies potentially useful to the economy. In fiscal year 1986, definition studies, advanced technology developments, and preliminary design will be pursued. One of the main objectives of the definition and design period will be to clarify future costs and capabilities of any potential station configuration. In particular, emphasis will be placed on insuring that potential station configurations provide a balance between manned and unmanned elements that can be readily adaptable to changing future national requirements and future technologies.

Space transportation systems.—The principal areas of activity in space transportation capability development are: efforts related to the spacelab, the upper stages that place satellites in high altitude orbits not attainable by the shuttle, the engineering and technical base, payload operations and support equipment, advanced programs study and evaluation efforts, the development of the United States/Italy tethered satellite system, and development of the orbital maneuvering vehicle. Development of a reusable orbital maneuvering vehicle will begin in 1986 with initial operations planned for 1990. The OMV will retrieve spacecraft, provide remote satellite servicing and other operations beyond shuttle capability. The European Space Agency developed spacelab successfully completed its first mission in December 1983 along with both

its second developmental and first operational missions during 1985. Dedicated missions for fiscal year 1986 involve use of the spacelab module, pallets, and other minor structures for science and applications missions. Efforts on space transportation system upper stages will be pursued further. Development of the common NASA/USAF Centaur/STS upper stage will continue. In 1985, two Centaur/STS upper stages will be delivered for the 1986 launches of the Galileo and the Ulysses missions. Additional STS upper stages will be procured for the Venus radar mapper, tracking and data relay satellite missions, and other NASA missions. The tethered satellite system will provide a new capability for conducting space experiments in regions remote from the space shuttle orbiter, especially in the upper atmosphere.

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. The major physics and astronomy activities in fiscal year 1986 include: final integration and testing of the Hubble space telescope leading to launch in the second half of 1986; fabrication and testing of major Gamma Ray Observatory subsystems; and continuation of shuttle/spacelab instrument development and mission management activities including development of sounding rocket-class payloads to be flown on the shuttle. Spacelabs 2 and 3 have successfully been launched in 1985 and spacelab-4 is scheduled for launch in 1986. Work is also continuing on several Explorer projects to continue research thrusts started in prior years. In the planetary exploration area, the major fiscal year 1986 activities will be the final testing of the Galileo spacecraft leading to launch to Jupiter in May 1986, the delivery of the Ulysses (formerly the International Solar Polar Mission) spacecraft by ESA for launch in 1986, and the continuation of the Venus radar mapper spacecraft design and development activities with critical design reviews on the spacecraft and synthetic aperture radar. The Mars observer mission (formerly Mars geoscience/climatology orbiter) design and development activities will also be continued in fiscal year 1986. Voyager 2 (launched in 1977) is targeted to encounter the planet Uranus in 1986 and Neptune in 1989. The major activities in the space applications area include analysis of data from the shuttle imaging radar [SIR] plus the upgrading of the SIR instrument for geological mapping in the land and ocean environment, continuation of shuttle/spacelab development efforts along with definition activities on advanced instruments, and development of instruments to be flown on the tethered satellite system. Development efforts will also continue in 1986 on the upper atmospheric research satellite mission which will conduct research on the Earth's upper atmosphere to assess its susceptibility to chemical change. Development activities will be continued on the scatterometer that will be flown on the Navy's remote ocean sensing system to measure wind velocity on the surface of the ocean. In the space communications area, development activities will be continued in 1986 on the advanced communications technology satellite [ACTS] planned for launch in 1989. The ACTS mission involves the development and demonstration of technologies required for future communications satellites.

Commercial programs.—These programs include the technology utilization and commercial use of space. The Technology Utilization Program is designed to facilitate the transfer of NASA developed technology to the nonaerospace sectors of the U.S. economy. During fiscal year 1986, NASA will continue its efforts to help foster widespread dissemination of new technology developed by the Agency's programs.

The commercial use of space is designed to increase private sector awareness of the opportunities in space. Private industry will be encouraged to invest and participate in high technology research and development utilizing the unique characteristics of space.

Aeronautics and space technology.—The objective of the Aeronautical Research and Technology Program is to provide the broad technology base essential to the preservation of U.S. leadership in aviation. Specific technology efforts in fiscal year 1986 will continue to be directed toward major improvements in high-performance aircraft, supersonic aircraft, rotorcraft, advanced propulsion, and numerical aerodynamics simulation. Major thrusts of fiscal year 1986 activities include: continuing advancement in both basic aeronautical disciplines and systems research, maintaining and operating specialized facilities essential to aeronautical research, and pursuing technological advances in critical areas of high risk and potentially high payoff to the Nation. The objectives of the Space Research and Technology Program are to provide the technology base necessary to support current and future space activities and to formulate and advance technology options for the future. These activities emphasize the longer-range aspects of generic research and technology development which are crucial in maintaining future U.S. leadership.

Tracking and data advanced systems.—The overall objective of the Advanced Systems Program is to perform studies to ensure capability for tracking and data acquisitions, communications, and data processing support required by all NASA flight projects in accomplishing their mission objectives.

COMMITTEE RECOMMENDATION

The Committee recommends $2,790,800,000 for this account. This is $91,000,000 less than the budget request and $34,000,000 more than the House allowance. This represents an increase of $368,200,000, or 15 percent, over the fiscal year 1985 level.

The following table displays the Senate recommendation and compares it to that of the House:

	Amount requested	House recommendation	Senate recommendation
Space station	$230,000,000	-$30,000,000	-$20,000,000
Orbital maneuvering vehicle	25,000,000	-15,000,000	-15,000,000
Solar optical telescope	30,000,000	-25,000,000	-10,000,000
Life sciences	72,000,000	-4,000,000	-2,000,000
Mars observer	43,600,000	-5,000,000	-5,000,000
Scatterometer	31,700,000	-25,000,000	-11,000,000
Upper atmospheric research satellite	134,000,000	-5,000,000	-10,000,000
Advanced communication technology satellite	90,000,000	-5,000,000	-10,000,000
Commercial programs	41,100,000	-13,000,000	-8,000,000
Materials processing (microgravity research)	34,000,000	• 2,000,000	
Total		-125,000,000	-91,000,000

The Committee provided $210,000,000 for the Space Station Program which is $20,000,000 less than the request and $10,000,000 above the House allowance. The Committee continues to be strongly supportive of the space station and automation and robotics initiative which is part of the Space Station Program. The Committee provided bill language last year to assure that automation and robotics advanced technologies were made an integral part of the planning and development for the space station.

The Committee is pleased with the results of its mandated report on the findings of the automation and robotics panel of specialists from industry, universities, and government. The Committee is also pleased with the way the NASA Advanced Technology Advisory Committee [ATAC] functioned to develop an integrated NASA approach for submission to the space station contractors prior to the initiation of phase B activities. The principal reason for the addition of $10,000,000 over the House recommendation is to continue the space station automation and robotics initiative.

The Committee was impressed by the conclusion in its mandated report that computer assisted design [CAD] and computer assisted manufacturing techniques could significantly increase the efficiency of NASA space station operations. The report noted that compatible CAD representations, provided by all contractors, can allow the space station to be managed without the large amount of paper currently required for the Space Transportation System.

More importantly, however, the report noted that the use of computer aided engineering teams would open complex projects to a far greater pool of innovative thinking and knowledge.

In that regard, the Committee is very interested in the possibility that the use of computer aided design, manufacturing, and engineering will permit smaller contractors to be more involved in NASA projects traditionally dominated by a relatively small group of large contractors. The Committee requests that the agency, within 6 months, report to the Committee on the use of computer aided systems to reduce costs, and increase efficiency.

The Committee in making its difficult decisions relating to specific programs has attempted to move forward the orbital manuevering vehicle so that it will be operational when the Hubble space telescope will require servicing. The Committee has funded both the solar optical telescope [SOT] and the advanced communications technology satellite [ACTS] at the maximum level prudent within existing budget constraints. The Committee believes that NASA should have previously identified the solar optical telescope as a new start. The Committee does not now want to penalize this important space physics program which represents the largest science facility that NASA currently plans to operate from the shuttle. The launch date of 1990 can still be supported with the recommended funding level. The Committee has also funded the advanced communications technology satellite at a level that will permit a launch at the end of 1989. ACTS is unique in that roughly 22 percent of the total program cost will be contributed by private industry and associated experiments.

The Committee is supportive of the NASA efforts in aeronautics and space technology such as the Advanced Turboprop Program and the Rotary Engine Development Program. Although the Committee is not making any specific funding recommendations it will closely monitor the performance of these programs, the adequacy of NASA's level of commitment to ensure timely development of these technologies, and the Committee shall reevaluate its position for fiscal 1987.

In keeping with prior year practice, the Committee has deleted program caps contained in the House bill.

The Committee has monitored the progress of the Gravity Probe B Program over a considerable period of time. It has as its objective the addressing of the pure science question of how to test Einstein's general theory of relativity by means of orbiting gyroscopes. Most recently a flight development program using a shuttle flight to verify the functioning gyroscopes and magnetic shielding prior to the flight of the system as a free flyer. The Committee urges NASA to continue support of the definition phase with the view toward a flight test fiscal year 1990–91 time period.

The Committee has noted with interest the increasing private sector entrepreneurial activity by firms engaged in developing space hardware and services through privately funded investment, without Federal appropriations. This trend should be encouraged as a means of enlarging an important new field of industrial innovation and development and leveraging, under certain circumstances, tight Federal budgets for new space projects with private funds. To this end, the Committee encourages NASA to examine technical, legal, and procedural barriers to private funding initiative for developing and marketing space hardware and services. The Committee requests NASA to investigate and report, before submission of its fiscal year 1987 budget, on the various opportunities for supporting private initiatives on projects currently under consideration as new start candidates including Space Transportation System capability enhancement, space station components, microgravity processing, and other potential new line items.

The Committee has been advised of the programmatic, research, and professional activities of national significance being conducted at the Florida Agricultural and Mechanical University College of Pharmacy. This institution has concentrated research emphasis on matters closely related to the activities of NASA and the National Institutes of Health in the area of chronophysiology and chronopharmacology. These research efforts may have significant impact on space travel, spacelabs, as well as transmeridian air flights while on Earth.

The Committee, therefore, directs NASA to examine the research and training activities being conducted at Florida A&M University College of Pharmacy, and make recommendations as to how these efforts could augment the ongoing life science and health programs of the agency.

SPACE FLIGHT, CONTROL, AND DATA COMMUNICATIONS

1985 appropriation	$3,601,800,000
1986 budget estimate	3,509,900,000
House allowance	3,402,900,000
Committee recommendation	3,412,900,000

The Committee recommends an appropriation of $3,412,900,000 in fiscal year 1986 for the space flight, control, and data communications activities. This amount is $97,000,000 less than the budget estimate and $10,000,000 more than the House allowance.

PROGRAM DESCRIPTION

The space flight, control, and data communications appropriation provides for the production and operational activities for the space transportation system and the tracking, telemetry, command, and data acquisition support of all NASA flight projects.

Space transportation system.—Shuttle production and operational capability and space transportation operations are the key elements of the space transportation system that are contained within this appropriation. The Shuttle Production and Operational Capability Program provides for the national fleet of space shuttle orbiters including main engines, launch site and mission operational control requirements, initial structural and operational spares, production tooling, and related supporting activities. In 1985, Columbia (OV-102) will undergo a major modification process that will strengthen the internal structure and provide Columbia with greater vehicle load-carrying capability. Atlantis (OV-104) was delivered in April 1985. Discovery (OV-103) is presently planned to be used for the first west coast launch in 1986. Other major activities planned for fiscal year 1986 include: continued improvement and testing of the space shuttle's main engines to increase their durability and reliability at full power level, fabrication of engines and spare components to support the planning flight rate buildup to 24 per year, the ongoing fabrication of the various major structural spares (such as the wings), and the initial launch of the filament wound composite motor case for the solid rocket booster. Launch and mission support activities at the Kennedy Space Center will be enhanced to meet the increased flight rate of up to 20 east coast launches per year. During 1986, a second launch pad and third mobile launch platform will be activated. The Space Transportation Operations Program provides the standard operational support services for the space shuttle and the expendable launch vehicles.

Within shuttle operations, external tank and solid rocket booster flight hardware is provisioned, overhauled, and repaired and the manpower, propellants, and other materials are furnished to conduct both flight and ground (launch and landing) operations.

The Space Shuttle Operations Program provides for the launch of NASA, Department of Defense, other U.S. Government, domestic commercial and international missions on a reimbursable basis. The fiscal year 1986 budget supports 14 launches with the flight rate continuing to build consistent with increased demands for launch and operational services by users. The NASA Expendable Launch Vehicle Program (Scout, Delta, Atlas, Centaur, and Atlas F) will be completely funded on a reimbursable basis in 1986. The Delta Program will continue to support the last two launches currently scheduled through 1986. The Atlas Centaur Program includes two international missions planned for 1985 and three Government missions planned through 1987.

Space tracking and data acquisition.—This program provides vital tracking, telemetry, command, and data acquisition support for Earth-orbital spacecraft, planetary missions, sounding rockets, balloons, and research aircraft. This support is currently provided by a worldwide network of NASA ground stations, and by the first of a system of three tracking and data relay satellites in geosynchronous orbit working with a single highly specialized ground station. Facilities are also provided to process into meaningful form the scientific, applications, and engineering data which are collected from flight projects. In addition to providing support to NASA flight programs in 1986, support is provided on a reimbursable basis for projects for the Department of Defense and other Government agencies, commercial firms, and other countries and international organizations engaged in space research endeavors.

COMMITTEE RECOMMENDATION

The Committee recommends $3,412,900,000 for this account. This is $97,000,000 less than the budget request and $10,000,000 more than the House allowance. The Committee has recommended no reductions in the funding for the space transportation system [STS]. While no additional resources above the budget have been provided this year in the spares program the Committee has not changed its conviction of the requirement for a fifth orbiter. The reduction of $97,000,000 from the budget request is composed of a reduction of $107,000,000 for a scheduled repayment to the Federal Financing Bank of principal owed for development of the Tracking and Data Relay Satellite (TDRSS) offset by a $10,000,000 increase for ground station support required by delays in establishing the TDRSS network.

CONSTRUCTION OF FACILITIES

1985 appropriation	$150,000,000
1986 budget estimate	149,300,000
House allowance	139,300,000
Committee recommendation	141,300,000

The Committee recommends an appropriation of $141,300,000 for facilities activities. This amount is $8,000,000 less than the budget estimate and $2,000,000 more than the House allowance.

PROGRAM DESCRIPTION

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

COMMITTEE RECOMMENDATION

The Committee recommends $141,300,000 for the construction of facilities. This is $8,000,000 less than the budget request and $2,000,000 more than the House allowance. The Committee expects the agency to reprioritize all projects and activities within the account and make the proposed reduction from those activities that the agency deems of a lower priority. The Committee does not concur with the House directive that only space science facilities should be considered for reductions.

NASA has submitted a budget request for a project to modify propulsion test systems that are essential in meeting the cost effectiveness and extended life goals of the space shuttle main engine [SSME]. This project, the fundamental thrust of which the Committee supports, will provide an integrated subsystem test bed for hot firing of the SSME. The Committee is concerned, however, about the decision to modify a test stand for this purpose at the Marshall Space Flight Center rather than at the National Space Technology Laboratories, which was established for large engine testing at a Federal cost of over $300,000,000, and where an empty stand is available for modification. The Committee is further concerned about reports of expenditures from research and development funds to modify this stand.

The Committee has reduced the amount for this account by $8,000,000 from the budget request and directs that $6,500,000 of this reduction be taken from the test stand modification until the Committee has had a chance to review the proposal further.

The Committee recommends bill language which will continue the Agency's ability, in absence of specific advance statutory authorization, to enter into certain multiyear obligations for facilities if such arrangements must be executed before such statutory authorization can be provided. The Committee expects, however, that the Agency will seek Committee concurrence, as is current practice, prior to the use of this authority.

RESEARCH AND PROGRAM MANAGEMENT

1985 appropriation	$1,317,000,000
1986 budget estimate	1,387,000,000
House allowance	1,367,000,000
Committee recommendation	1,370,000,000

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 $1,370,000,000 for research and program management. This is $17,000,000 less than the budget request and $3,000,000 more than the House allowance. The Committee directs the Agency to take the reduction in nonpersonnel compensation and benefits object classes. The Committee requests a report from the Agency by October 1, 1985, indicating how the reduction would be arrived at.

The Committee last year added bill language establishing the NASA Advanced Technology Advisory Committee [ATAC] who were to report back to the Committees on Appropriations by April 1, 1985. The ATAC report was to identify promising advanced robotics or automation technologies, not in use in prior or existing spacecraft, totaling no less than 10 percent of the total development costs of the space station. The ATAC Committee is required to provide the Committees on Appropriations a semiannual report on the status and progress of automation and robotics activities in conjunction with the space station.

The Committee expects the ATAC group to provide a guide on how NASA is following the ATAC report as far as the expenditures made semiannually in the previously identified new and promising advanced robotics or automation technologies. Specifically, the Committee directs that obligations and outlays for automation and robotics in terms of dollars and percent of appropriated funds for the space station shall be contained in the reports delivered on April 1 and September 1 of each year to the Committees on Appropriations. The Committee further directs that the report shall be annotated to refer back to specific pages in the April 1, 1985, ATAC report and indicate which recommendation the obligation or outlay is fulfilling.

The Committee also recommends additional bill language which continues the flat per diem program of the Agency. A report on this experiment is expected before the end of fiscal year 1985, and the Committee believes it prudent to continue this test effort pending its full analysis and evaluation.

TITLE IV—GENERAL PROVISIONS

The Committee concurs with all of the general provisions that were included in the fiscal year 1985 HUD–Independent Agencies Appropriations Act (Public Law 98–371) and were included by the House in this bill with the exception of two minor clarifications in section 401. These changes would exempt travel related to RCRA by EPA from the limitation and make clear that where increases over the budget estimates in individual accounts have been made, expenditures for travel may exceed amounts shown in the budget estimate by a proportionate amount.

The Committee also recommends a new general provision (section 416) which permits a transfer between appropriated accounts for the Environmental Protection Agency of up to 2 percent. The Committee expects the agency to continue its practice of obtaining prior Committee approval for such resource shifts.

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."

Until authorizations are enacted for the Department of Housing and Urban Development, the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Science Foundation, each of the accounts for these activities are potentially within the ambit of this provision.

Compliance With Paragraph 12, Rule XXVI of the Standing Rules of the Senate

Paragraph 12 of Rule XXVI requires that Committee reports on a bill or joint resolution repealing or amending any statute or part of any statute, include "(a) the text of the statute or part thereof which is proposed to be repealed; and (b) a comparative print of that part of the bill or joint resolution making the amendment and of the statute or part thereof proposed to be amended, showing by stricken-through type and italics, parallel columns, or other appropriate typographical devices the omissions and insertions which would be made by the bill or joint resolution if enacted in the form recommended by the committee."

COMPARATIVE STATEMENT OF NEW BUDGET (OBLIGATIONAL) AUTHORITY FOR FISCAL YEAR 1985 AND BUDGET ESTIMATES AND AMOUNTS RECOMMENDED IN THE BILL FOR FISCAL YEAR 1986

[Amounts in dollars]

Item	1985 Appropriation	Budget estimate	House allowance	Committee recommendation	Senate committee recommendation compared with (+ or −)		
					1985 Appropriation	Budget estimate	House allowance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INDEPENDENT AGENCIES							
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION							
Research and development	2,422,600,000	2,681,800,000	2,756,800,000	2,790,800,000	+368,200,000	−91,000,000	+34,000,000
Space flight, control and data communications	3,601,800,000	3,509,900,000	3,402,900,000	3,412,900,000	−188,900,000	−97,000,000	+10,000,000
Construction of facilities	150,000,000	149,300,000	139,300,000	141,300,000	−8,700,000	−8,000,000	+2,000,000
Research and program management	1,317,000,000	1,387,000,000	1,267,000,000	1,270,000,000	+53,000,000	−17,000,000	+3,000,000
Total, National Aeronautics and Space Administration	7,491,400,000	7,728,000,000	7,566,000,000	7,715,000,000	+223,600,000	−213,000,000	+49,000,000

Public Law 99-160
99th 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, 1986, and for other purposes.

Nov. 25, 1985
[H.R. 3038]

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, 1986, and for other purposes, namely:

Department of Housing and Urban Development-Independent Agencies Appropriations Act, 1986.

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; $2,756,800,000, to remain available until September 30, 1987.

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; $3,397,900,000, to remain available until September 30, 1987.

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, $139,300,000, to remain available until September 30, 1988: *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, if he determines, in consultation with the Committees on Appropriations, 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 thirty for replacement only) and hire of passenger motor vehicles; and maintenance and repair of real and personal property, and not in excess of $100,000 per project for construction of new facilities and additions to existing facilities, repairs, and rehabilitation and modification of facilities; $1,367,000,000: *Provided*, That contracts may be entered into under this appropriation for maintenance and operation of facilities, and for other services, to be provided during the next fiscal year: *Provided further*, That not to exceed $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: *Provided further*, That of funds provided for the National Aeronautics and Space Administration under this or any other account, $400,000 shall be available for the activities of the National Commission on Space, established by the National Aeronautics and Space Administration Authorization Act, 1985 (Public Law 98–361; 98 Stat. 422).

MISSISSIPPI TECHNOLOGY TRANSFER CENTER

(a) The Congress finds that—

(1) section 9 of Mississippi Senate Bill No. 2984, 1985 Regular Session, which became effective on July 1, 1985, provides appropriations for constructing, furnishing and equipping a building and related facilities, to be known as the Mississippi Technology Transfer Center, at the National Space Technologies Laboratories in Hancock County, Mississippi; and

(2) operation and maintenance of the Mississippi Technology Transfer Center by the Federal Government is in the national interest.

(b) The Administrator of the National Aeronautics and Space Administration may—

(1) enter into an agreement with the State of Mississippi by which title to the Mississippi Technology Transfer Center shall be transferred to the Government of the United States and by which such Center shall be operated by the Government of the United States;

(2) accept title to such Center on behalf of the Government of the United States; and

(3) after title has been transferred under paragraph (2) of this subsection, operate and maintain such Center, subject to the availability of appropriations for such purposes.

*Public Law 99-177
99th Congress

Joint Resolution

Increasing the statutory limit on the public debt.

Dec. 12, 1985
[H.J. Res. 372]

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That subsection (b) of section 3101 of title 31, United States Code, is amended by striking out the dollar limitation contained in such subsection and inserting in lieu thereof "$1,847,800,000,000, or $2,078,700,000,000 on and after October 1, 1985,".

Ante, p. 814.

PART C—EMERGENCY POWERS TO ELIMINATE DEFICITS IN EXCESS OF MAXIMUM DEFICIT AMOUNT

SEC. 251. REPORTING OF EXCESS DEFICITS.

2 USC 901.

(a) INITIAL ESTIMATES, DETERMINATIONS, AND REPORT BY OMB AND CBO.—

(1) ESTIMATES AND DETERMINATIONS.—The Director of the Office of Management and Budget and the Director of the Congressional Budget Office (in this part referred to as the "Directors") shall with respect to each fiscal year—

(A) estimate the budget base levels of total revenues and budget outlays that may be anticipated for such fiscal year as of August 15 of the calendar year in which such fiscal year begins (or as of January 10, 1986, in the case of the fiscal year 1986),

(B) determine whether the projected deficit for such fiscal year will exceed the maximum deficit amount for such fiscal year and whether such deficit excess will be greater than $10,000,000,000 (zero in the case of fiscal years 1986 and 1991), and

(C) estimate the rate of real economic growth that will occur during such fiscal year, the rate of real economic growth that will occur during each quarter of such fiscal year, and the rate of real economic growth that will have occurred during each of the last two quarters of the preceding fiscal year.

(2) REPORT.—The Directors jointly shall report to the Comptroller General on August 20 of the calendar year in which such fiscal year begins (or on January 15, 1986, in the case of the fiscal year 1986), estimating the budget base levels of total revenues and total budget outlays for such fiscal year, identifying the amount of any deficit excess for such fiscal year, stating whether such excess is greater than $10,000,000,000 (zero in the case of fiscal years 1986 and 1991), specifying the estimated rate of real economic growth for such fiscal year, for each quarter of such fiscal year, and for each of the last two quarters of the preceding fiscal year, indicating whether the estimate includes two or more consecutive quarters of negative real economic growth, and specifying (if the excess is greater than $10,000,000,000, or zero in the case of fiscal years 1986 and 1991), by account, for non-defense programs, and by account and programs, projects, and activities within each account, for defense programs, the base from which reductions are taken and the amounts and percentages by which such accounts must be reduced during such fiscal year, in accordance with the succeeding provisions of this part, in order to eliminate such excess.

(3) DETERMINATION OF REDUCTIONS.—The amounts and percentages by which such accounts must be reduced during a fiscal year shall be determined as follows:

(A)(i) If the deficit excess for the fiscal year is greater than $10,000,000,000 (zero in the case of fiscal years 1986 and 1991), such deficit excess shall be divided into halves.

(ii) In the case of fiscal year 1986, the amount of such excess—

(I) shall be multiplied by seven twelfths before being divided into halves in accordance with clause (i), and

(II) shall not exceed $11,700,000,000.

(B) Subject to the exemptions, exceptions, limitations, special rules, and definitions set forth in this section and in sections 255, 256, and 257, the reductions necessary to eliminate one-half of the deficit excess for the fiscal year (as adjusted under subparagraph (A)(ii) in the case of fiscal year 1986) shall be made in outlays under accounts within major functional category 050 (in this part referred to as outlays under "defense programs"), and the reductions necessary to eliminate the other half of the deficit excess (or the adjusted deficit excess, in the case of fiscal year 1986) shall be made in outlays under other accounts of the Federal Government (in this part referred to as outlays under "non-defense programs").

(C)(i) The total amount by which outlays for automatic spending increases scheduled to take effect during the fiscal year are to be reduced shall be determined in accordance with clause (ii) of this subparagraph.

(ii) Each such automatic spending increase shall be reduced—

(I) to zero (a uniform percentage reduction of 100 percent), or

(II) by a uniform percentage reduction of less than 100 percent calculated in a manner to reduce total outlays for the fiscal year by one-half of the deficit excess (or the adjusted deficit excess, in the case of fiscal year 1986), if the elimination of all such increases would reduce total outlays for the fiscal year by more than one-half of the deficit excess (or the adjusted deficit excess, in the case of fiscal year 1986) for the fiscal year.

(D) The total amount of the outlay reductions determined under subparagraph (C) shall be divided into two amounts:

(i) an amount equal to the outlay reductions attributable to programs specified in subparagraph (A) of section 257(l); and

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(ii) an amount equal to the outlay reductions attributable to programs specified in subparagraph (B) of section 257(l).

(E)(i) For purposes of subparagraph (B), one-half of the amount of the reductions determined under clause (i) of subparagraph (D) shall be credited as reductions in outlays under defense programs, and the total amount of reductions in outlays under defense programs required under subparagraph (B) shall be reduced accordingly.

Defense and national security.

(ii) Sequestration of new budget authority and unobligated balances to achieve the remaining reductions in outlays under defense programs required under subparagraph (B) shall be determined as provided in subsection (d).

(F)(i) For purposes of subparagraph (B)—

(I) one-half of the amount of the reductions determined under clause (i) of subparagraph (D), and

(II) the amount of the reductions determined under clause (ii) of subparagraph (D),

shall be credited as reductions in outlays under non-defense programs, and the total amount of reductions in outlays under non-defense programs required under subparagraph (B) shall be reduced accordingly.

(ii) The maximum reduction permissible for each program to which an exception, limitation, or special rule set forth in subsection (c) or (f) of section 256 applies shall be determined, and the total amount of reductions in outlays under non-defense programs required under subparagraph (B) shall be reduced by the amount of the reduction determined with respect to each such program.

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(iii)(I) Except as provided in subclause (II), the maximum reduction permissible for each of the programs to which the special rules set forth in sections 256(d) and 256(k) apply shall be determined, and the total amount of outlays under non-defense programs required under subparagraph (B) shall be reduced by the amount of the maximum reductions so determined.

(II) If the maximum reduction determined in accordance with subclause (I) with respect to the programs to which that subclause relates would reduce outlays for such programs by an amount in excess of the remaining amount of the reduction in outlays in non-defense programs required under subparagraph (B), outlays for such programs shall instead be reduced proportionately by such lesser percentage as will achieve such remaining required reductions.

(iv)(I) Sequestrations and reductions under the remaining non-defense programs shall be applied on a uniform percentage basis so as to reduce new budget authority, new loan guarantee commitments, new direct loan obligations, obligation limitations, and spending authority as defined in section 401(c)(2) of the Congressional Budget Act of 1974 to the extent necessary to achieve any remaining required outlay reductions.

Ante, p. 1056.

(II) For purposes of determining reductions under subclause (I), any reduction in outlays of the Commodity Credit Corporation under an order issued by the President under section 252 for a fiscal year, with respect to contracts entered into during that fiscal year, that will occur during the succeeding fiscal year, shall be credited as reductions in outlays for the fiscal year in which the order is issued.

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The determination of which accounts are within major functional category 050 and which are not, for purposes of subparagraph (B), shall be made by the Directors in a manner consistent with the budget submitted by the President for the fiscal year 1986; except that for such purposes no part of the accounts entitled "Federal Emergency Management Agency, Salaries and expenses (58–0100–0–1–999)" and "Federal Emergency Management Agency, Emergency management planning and assistance (58–0101–0–1–999)" shall be treated as being within functional category 050.

Report.

(4) ADDITIONAL SPECIFICATIONS.—The report submitted under paragraph (2) must also specify (with respect to the fiscal year involved)—

(A) the amount of the automatic spending increase (if any) which is scheduled to take effect in the case of each program providing for such increases, the amount and percentage by which such increase is to be reduced, the amount by which the deficit excess (as adjusted under paragraph (3)(A)(ii), in the case of fiscal year 1986) will be reduced as a result of the elimination or reduction of automatic spending increases (stated separately for increases under programs listed in subparagraph (A) of section 257(1) and increases under programs listed in subparagraph (B) of that section), and the amount (if any) of each such increase, stated in terms of percentage points, which will take effect after reduction under this part;

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(B) the amount of the savings (if any) to be achieved in the application of each of the special rules set forth in subsections (c) through (l) of section 256, along with a statement of (i) the new Federal matching rate resulting from the application of subsection (e) of that section, and (ii) the amount of the percentage reduction in payments to the

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States under section 204 of the Federal-State Extended Unemployment Compensation Act of 1970; and

(C)(i) for defense programs, by account and by program, project, and activity within each account, the reduction (stated in terms of both percentage and amount) in new budget authority and unobligated balances, together with the estimated outlay reductions resulting therefrom; and

(ii) for non-defense programs, by account, the reduction, stated in terms of both percentage and amount, in new budget authority, new loan guarantee commitments, new direct loan obligations, obligation limitations, and spending authority as defined in section 401(c)(2) of the Congressional Budget Act of 1974, together with the estimated outlay reductions resulting therefrom.

(5) BASIS FOR DIRECTORS' ESTIMATES, DETERMINATIONS, AND SPECIFICATIONS.—The estimates, determinations, and specifications of the Directors under the preceding provisions of this subsection and under subsection (c)(1) shall utilize the budget base, criteria, and guidelines set forth in paragraph (6) and in sections 255, 256, and 257. In the event that the Directors are unable to agree on any items required to be set forth in the report, they shall average their differences to the extent necessary to produce a single, consistent set of data that achieves the required deficit reduction. The report of the Directors shall also indicate the amount initially proposed for each averaged item by each Director.

(6) BUDGET BASE.—In computing the amounts and percentages by which accounts must be reduced during a fiscal year as set forth in any report required under this subsection for such fiscal year, the budget base shall be determined by—

(A) assuming (subject to subparagraph (C)) the continuation of current law in the case of revenues and spending authority as defined in section 401(c)(2) of the Congressional Budget Act of 1974;

(B) assuming, in the case of all accounts to which subparagraph (A) does not apply, appropriations equal to the prior year's appropriations except to the extent that annual appropriations or continuing appropriations for the entire fiscal year have been enacted;

(C) assuming that expiring provisions of law providing revenues and spending authority as defined in section 401(c)(2) of the Congressional Budget Act of 1974 do expire, except that excise taxes dedicated to a trust fund and agricultural price support programs administered through the Commodity Credit Corporation are extended at current rates; and

(D) assuming (i) that Federal pay adjustments for statutory pay systems (I) will be as recommended by the President, but (II) will in no case result in a reduction in the levels of pay in effect immediately before such adjustments; and (ii) that medicare spending levels for inpatient hospital services will be based upon the regulations most recently issued in final form or proposed by the Health Care Financing Administration pursuant to sections 1886(b)(3)(B), 1886(d)(3)(A), and 1886(e)(4) of the Social Security Act.

Deferrals proposed under section 1013 of the Impoundment Control Act of 1974 during the period beginning October 1 of such fiscal year (or the date of the enactment of this joint resolution in the case of fiscal year 1986) and ending with the date on which the final order is issued under section 252(b) for such fiscal year (or February 1, 1986, in the case of fiscal year 1986) shall not be taken into account in determining such budget base.

(b) REPORT TO PRESIDENT AND CONGRESS BY COMPTROLLER GENERAL.—

(1) REPORT TO BE BASED ON OMB-CBO REPORT.—The Comptroller General shall review and consider the report issued by the Directors for the fiscal year and, with due regard for the data, assumptions, and methodologies used in reaching the conclusions set forth therein, shall issue a report to the President and the Congress on August 25 of the calendar year in which such fiscal year begins (or on January 20, 1986, in the case of the fiscal year 1986), estimating the budget base levels of total revenues and total budget outlays for such fiscal year, identifying the amount of any deficit excess for such fiscal year (adjusted in accordance with subsection (a)(3)(A)(ii), in the case of fiscal year 1986), stating whether such deficit excess (or adjusted deficit excess, in the case of fiscal year 1986) will be greater than $10,000,000,000 (zero in the case of fiscal years 1986 and 1991), specifying the estimated rate of real economic growth for such fiscal year, for each quarter of such fiscal year, and for each of the last two quarters of the preceding fiscal year, indicating whether the estimate includes two or more consecutive quarters of negative economic growth, and specifying (if the excess is greater than $10,000,000,000, or zero in the case of fiscal years 1986 and 1991), by account, for non-defense programs, and by account and programs, projects, and activities within each account, for defense programs, the base from which reductions are taken and the amounts and percentages by which such accounts must be reduced during such fiscal year in order to eliminate such deficit excess (or adjusted deficit excess, in the case of fiscal year 1986). Such report shall be based on the estimates, determinations, and specifications of the Directors and shall utilize the budget base, criteria, and guidelines set forth in subsection (a)(6) and in sections 255, 256, and 257.

(2) CONTENTS OF REPORT.—The report of the Comptroller General under this subsection shall—

(A) provide for the determination of reductions in the manner specified in subsection (a)(3); and

(B) contain estimates, determinations, and specifications for all of the items contained in the report submitted by the Directors under subsection (a).

Such report shall explain fully any differences between the contents of such report and the report of the Directors.

(c) REVISED ESTIMATES, DETERMINATIONS, AND REPORTS.—

(1) REPORT BY OMB AND CBO.—On October 5 of the fiscal year (except in the case of the fiscal year 1986), the Directors shall submit to the Comptroller General a revised report—

(A) indicating whether and to what extent, as a result of laws enacted and regulations promulgated after the submission of their initial report under subsection (a), the excess deficit (adjusted in accordance with subsection (a)(3)(A)(ii), in the case of fiscal year 1986) identified in the report

26 USC 3304 note. Defense and national security.
Post, p. 1072.
Ante, p. 1056.
Post, pp. 1082, 1086, 1092.
Ante, p. 1056.
Post, pp. 1082, 1086, 1092.
98 Stat. 1075. 42 USC 1395ww. 2 USC 684.

submitted under such subsection has been eliminated, reduced, or increased, and

(B) adjusting the determinations made under subsection (a) to the extent necessary.

The revised report submitted under this paragraph shall contain estimates, determinations, and specifications for all of the items contained in the initial report and authorized under subsection (d)(3)(D)(i) and shall be based on the same economic and technical assumptions, employ the same methodologies, and utilize the same definition of the budget base and the same criteria and guidelines as those used in the report submitted by the Directors under subsection (a) (except that subdivision (II) of paragraph (6)(D)(i) of such subsection shall not apply), and shall provide for the determination of reductions in the manner specified in subsection (a)(3).

(2) REPORT BY COMPTROLLER GENERAL.—

(A) On October 10 of the fiscal year (except in the case of the fiscal year 1986), the Comptroller General shall submit to the President and the Congress a report revising the report submitted by the Comptroller General under subsection (b), adjusting the estimates, determinations, and specifications contained in that report to the extent necessary in the light of the revised report submitted to him by the Directors under paragraph (1) of this subsection.

(B) The revised report of the Comptroller General under this paragraph shall provide for the determination of reductions as specified in subsection (a)(3) and shall contain all of the estimates, determinations, and specifications required (in the case of the report submitted under subsection (b)) pursuant to subsection (b)(2)(B).

(d) SEQUESTRATION OF DEFENSE PROGRAMS.—

(1) DETERMINATION OF UNIFORM PERCENTAGE.—The total amount of reductions in outlays under defense programs required for a fiscal year under subsection (a)(3)(B) after the reduction under subsection (a)(3)(E)(i) shall be calculated as a percentage of the total amount of outlays for the fiscal year estimated to result from new budget authority and unobligated balances for defense programs.

(2) SEQUESTRATION OF NEW BUDGET AUTHORITY AND UNOBLIGATED BALANCES.—

(A) Sequestration to achieve the remaining reduction in outlays under defense programs shall be made by reducing new budget authority and unobligated balances (if any) in each program, project, or activity under accounts within defense programs by the percentage determined under paragraph (1), computed on the basis of the combined outlay rate for new budget authority and unobligated balances for such program, project, or activity determined under subparagraph (B).

(B)(i) The combined outlay rate for new budget authority and unobligated balances for a program, project, or activity shall be determined by the Directors from data then available to them as supplemented by additional data from the heads of the appropriate departments or agencies of the executive branch. If the outlay rate for unobligated balances is not available for any program, project, or activity, the outlay rate used shall be the outlay rate for new budget authority.

(ii) The weighted average (by budget authority) for the combined outlay rates so determined for all the programs, projects, and activities within an account shall be compared to the historical outlay rates for that account previously estimated by the Directors. If the Directors determine that it is necessary to make the combined outlay rate for a program, project, or activity as determined under the first sentence of this subparagraph consistent with the historical rates for such account, they may adjust the outlay rate for such program, project, or activity.

(C) For purposes of this paragraph:

(i) The term "outlay rate", with respect to any program, project, or activity, means—

(I) the ratio of outlays resulting in the fiscal year involved from new budget authority for such program, project, or activity to such new budget authority; or

(II) the ratio of outlays resulting in the fiscal year involved from unobligated balances for such program, project, or activity to such unobligated balances.

(ii) The term "combined outlay rate", with respect to any program, project, or activity, means the weighted average (by budget authority) of the ratios determined under subclauses (I) and (II) of clause (i) for such program, project, or activity.

(3) SEQUESTRATION FROM NATIONAL DEFENSE ACCOUNTS THROUGH TERMINATION OR MODIFICATION OF EXISTING CONTRACTS.—

(A)(i) Subject to the provisions of this paragraph, the President, with respect to any fiscal year, may provide for—

(I) the termination or modification of an existing contract within any program, project, or activity within a account within major functional category 050; and

(II) the crediting, to the amount of new budget authority and unobligated balances otherwise required to be reduced from such program, project, or activity, of the net reduction achieved for the appropriate fiscal year by such termination or modification, based upon the combined outlay rate for such program, project, or activity determined under paragraph (2)(B).

(ii) The remaining required outlay reductions in such program, project, or activity shall be achieved by sequestering new budget authority and unobligated balances based upon the combined outlay rate for such program, project, or activity determined under paragraph (2)(B).

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(B) Not later than September 5 of the calendar year in which the fiscal year begins (January 15 in the case of fiscal year 1986), the President shall transmit to the Comptroller General and the Committees on Armed Services and on Appropriations of the Senate and House of Representatives and make available to the Directors a report concerning the contracts proposed to be terminated or modified under this paragraph for such fiscal year. The report shall—

(i) identify the contracts proposed to be terminated or modified and the proposed date of termination or modification of each such contract;

(ii) identify the anticipated outlay savings for the fiscal year involved and the anticipated reduction in obligated balances with respect to each such proposed termination or modification, together with an explanation of the relationship between the obligated balances that could be cancelled and the estimated outlay savings resulting therefrom;

(iii) provide documentation of the anticipated savings in outlays and obligated balances; and

(iv) provide a complete rationale for the effect of each proposed termination or modification on the contract concerned and on the program, project, or activity involved.

Contracts.

(C) Not later than September 30 of the calendar year in which the fiscal year begins (February 15 in the case of fiscal year 1986), the Comptroller General shall certify to the President and the Congress, with respect to each contract which is proposed to be terminated or modified—

(i) whether the Comptroller General is able to verify that the estimated outlay savings for the fiscal year involved are achievable and would be achieved in that year; and

(ii) whether the ratio between the projected outlay savings and the anticipated reduction in obligated balances is reasonable.

Report.

(D)(i) In the case of a fiscal year other than fiscal year 1986, each proposed contract termination or modification described in subparagraph (A) with respect to which the certification by the Comptroller General under subparagraph (C) is affirmative (with respect to both clause (i) and clause (ii) of such subparagraph) shall be included in the report of the Directors under subsection (c)(1). The report shall include the information about each such contract described in subparagraph (B)(ii).

(ii) In the case of fiscal year 1986, each proposed contract termination or modification described in subparagraph (A) with respect to which the certification by the Comptroller General under subparagraph (C) is affirmative (with respect to both clause (i) and (ii) of such subparagraph) shall be included in the modification authorized by section 252(a)(6)(D)(iii) in the order issued by the President under section 252(a)(1) with respect to fiscal year 1986.

Post, p. 1072.

(iii) The authority of the President described in subparagraph (A) is not effective in the case of any proposed contract termination or modification with respect to which the certification by the Comptroller General under subparagraph (C) is not affirmative (with respect to both clause (i) and clause (ii) of such subparagraph).

(E) For any contract termination or modification proposed pursuant to this paragraph, the President shall certify to Congress, within thirty days after the effective date of the contract termination or modification, that the amounts proposed for deobligation under such contract have in fact been deobligated and cancelled.

(e) DATES FOR SUBMISSION OF REPORTS AND ISSUANCE OF ORDERS.—If the date specified for the submission of a report by the Directors or the Comptroller General under this section or for the issuance of an order by the President under section 252 falls on a Sunday or legal holiday, such report shall be submitted or such order issued on the following day.

Infra.

(f) PRINTING OF REPORTS.—Each report submitted under this section shall be printed in the Federal Register on the date it is issued; and the reports of the Comptroller General submitted to the Congress under subsections (b) and (c)(2) shall be printed as documents of the House of Representatives and the Senate.

Federal Register, publication.

(g) EXCEPTION.—The preceding provisions of this section shall not apply if a declaration of war by the Congress is in effect.

2 USC 902.

SEC. 252. PRESIDENTIAL ORDER.

Report.

(a) ISSUANCE OF INITIAL ORDER.—

(1) IN GENERAL.—On September 1 following the submission of a report by the Comptroller General under section 251(b) which identifies an amount greater than $10,000,000,000 (zero in the case of fiscal years 1986 and 1991) by which the deficit for a fiscal year will exceed the maximum deficit amount for such fiscal year (or on February 1, 1986, in the case of the fiscal year 1986), the President, in strict accordance with the requirements of paragraph (3) and section 251(a)(3) and (4) and subject to the exemptions, exceptions, limitations, special rules, and definitions set forth in sections 255, 256, and 257, shall eliminate the full amount of the deficit excess (as adjusted by the Comptroller General in such report in accordance with section 251(a)(3)(A)(ii), in the case of fiscal year 1986) by issuing an order that (notwithstanding the Impoundment Control Act of 1974)—

Ante, p. 1063.

Post, pp. 1082, 1086, 1092.

2 USC 621 note.

(A) modifies or suspends the operation of each provision of Federal law that would (but for such order) require an automatic spending increase to take effect during such fiscal year, in such a manner as to prevent such increase from taking effect, or reduce such increase, in accordance with such report; and

(B) eliminates the remainder of such deficit excess (or adjusted deficit excess, in the case of fiscal year 1986) by sequestering new budget authority, unobligated balances, new loan guarantee commitments, new direct loan obligations, and spending authority as defined in section 401(c)(2) of the Congressional Budget Act of 1974, and reducing obligation limitations, in accordance with such report—

Ante, p. 1056.

(i) for funds provided in annual appropriation Acts, from each affected program, project, and activity (as set forth in the most recently enacted applicable appropriation Acts and accompanying committee reports for the program, project, or activity involved, including joint resolutions providing continuing appropriations and committee reports accompanying Acts referred to in such resolutions), applying the same reduction percentage as the percentage by which the account involved is reduced in the report submitted under section 251(b), or from each affected budget account if the program, project, or activity is not so set forth, and

Ante, p. 1063.

(ii) for funds not provided in annual appropriation Acts, from each budget account activity as identified in

the program and financing schedules contained in the appendix to the Budget of the United States Government for that fiscal year, applying the same reduction percentage as the percentage by which the account is reduced in such report.

(2) SPECIAL SEQUESTRATION PROCEDURES FOR NATIONAL DEFENSE FOR FISCAL YEAR 1986.—

(A) IN GENERAL.—Notwithstanding subparagraph (B)(i) of paragraph (1), the order issued by the President under paragraph (1) with respect to fiscal year 1986 shall sequester, from each program, project, or activity within an account within major functional category 050, such amounts of new budget authority and unobligated balances as are specified (in accordance with section 251(a)(3)(E)(ii)) in the report submitted by the Comptroller General under section 251(b).

Ante, p. 1063.

(B) FLEXIBILITY WITH RESPECT TO MILITARY PERSONNEL ACCOUNTS.—

(i) Notwithstanding subparagraph (B)(i) of paragraph (1), the order issued by the President under paragraph (1) with respect to fiscal year 1986 may, with respect to any military personnel account—

(I) exempt any program, project, or activity within such account from the order;

(II) provide for a lower uniform percentage to be applied to reduce any program, project, or activity within such account than would otherwise apply; or

(III) take actions described in both subclauses (I) and (II).

(ii) If the President uses the authority under clause (i), the total amount by which outlays are not reduced for fiscal year 1986 in military personnel accounts by reason of the use of such authority shall be determined. Reductions in outlays under defense programs in such total amount shall be achieved by a uniform percentage sequestration of new budget authority and unobligated balances in each program, project, and activity within each account within major functional category 050 other than those military personnel accounts for which the authority provided under clause (i) has been exercised, computed on the basis of the outlay rate for each such program, project, and activity determined under section 251(d).

Ante, p. 1063.

(iii) The President may not use the authority provided by clause (i) unless he notifies the Comptroller General and the Congress on or before January 10, 1986, of the manner in which such authority will be exercised.

(C) FLEXIBILITY AMONG PROGRAMS, PROJECTS, AND ACTIVITIES WITHIN ACCOUNTS.—

(i) New budget authority and unobligated balances for any program, project, or activity within an account within major functional category 050 may be reduced under an order issued by the President under paragraph (1) for fiscal year 1986, subject to clauses (ii) and (iii) of this subparagraph, by up to two times the percentage otherwise applicable to the program, project, or activity (determined after any reduction under subparagraph (B)). To the extent such reductions are made under such an order, the President may provide in the order for an increase in new budget authority and unobligated balances for another program, project, or activity within the same account within major functional category 050 for fiscal year 1986, but such program, project, or activity may not be increased above the level in the base set forth in such order.

(ii) No order issued by the President under paragraph (1) for fiscal year 1986 may result in a base closure or realignment that would otherwise be subject to section 2687 of title 10, United States Code.

Ante, p. 716.

(iii) New budget authority and unobligated balances for any program, project, or activity within major functional category 050 for fiscal year 1986 which is 10 percent (or more) greater than the amount requested in the budget submitted by the President under section 1105 of title 31, United States Code, for fiscal year 1986 may not be reduced by more than the percentage applicable to the program, project, or activity (determined after any reduction under subparagraph (B)).

Ante, p. 1063.

(3) ORDER TO BE BASED ON COMPTROLLER GENERAL'S REPORT.—The order must provide for reductions in the manner specified in section 251(a)(3), must incorporate the provisions of the report submitted under section 251(b), and must be consistent with such report in all respects. The President may not modify or recalculate any of the estimates, determinations, specifications, bases, amounts, or percentages set forth in the report submitted under section 251(b) in determining the reductions to be specified in the order with respect to programs, projects, and activities, or with respect to budget activities, within an account, with the exception of the authority granted to the President for fiscal year 1986 with respect to defense programs pursuant to paragraph (2)(C).

Ante, p. 1063.

(4) EFFECT OF SEQUESTRATION UNDER INITIAL ORDER.—Notwithstanding section 257(7), amounts sequestered under an order issued by the President under paragraph (1) for fiscal year 1987 or any subsequent fiscal year shall be withheld from obligation pending the issuance of a final order under subsection (b) and shall be permanently cancelled in accordance with such final order upon the issuance of such order.

Post, p. 1092.

(5) ACCOMPANYING MESSAGE.—At the time the actions described in the preceding provisions of this subsection with respect to any fiscal year are taken, the President shall transmit to both Houses of the Congress a message containing all the information required by section 251(a)(4) and further specifying in strict accordance with paragraph (3)—

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(A) within each account, for each program, project, and activity, or budget account activity, the base from which each sequestration or reduction is taken and the amounts which are to be sequestered or reduced for each such program, project, and activity or budget account activity; and

Ante, p. 1063.

(B) such other supporting details as the President may determine to be appropriate.

Upon receipt in the Senate and the House of Representatives, the message (and any accompanying proposals made under subsection (c)) shall be referred to all committees with jurisdiction over programs, projects, and activities affected by the order.

(6) EFFECTIVE DATE OF INITIAL ORDER.—

(A) FISCAL YEAR 1986.—The order issued by the President under paragraph (1) with respect to the fiscal year 1986 shall be effective as of March 1, 1986.

(B) FISCAL YEARS 1987-1991.—The order issued by the President under paragraph (1) with respect to the fiscal year 1987 or any subsequent fiscal year shall be effective as of October 1 of such fiscal year (and the President shall withhold from obligation as provided in paragraph (4), pending the issuance of his final order under subsection (b), any amounts that are to be sequestered or reduced under such order).

(C) TREATMENT OF AUTOMATIC SPENDING INCREASES.—

(i) FISCAL YEAR 1986.—Notwithstanding any other provision of law, any automatic spending increase that would (but for this clause) be first paid during the period beginning with the date of the enactment of this joint resolution and ending with the effective date of an order issued by the President under paragraph (1) for the fiscal year 1986 shall be suspended until such order becomes effective, and the amounts that would otherwise be expended during such period with respect to such increases shall be withheld. If such order provides that automatic spending increases shall be reduced to zero during such fiscal year, the increases suspended pursuant to the preceding sentence and any legal rights thereto shall be permanently cancelled. If such order provides for the payment of automatic spending increases during such fiscal year in amounts that are less than would have been paid but for such order, or provides for the payment of the full amount of such increases, the increases suspended pursuant to such sentence shall be restored to the extent necessary to pay such reduced or full increases, and lump-sum payments in the amounts necessary to pay such reduced or full increases shall be made, for the period for which such increases were suspended pursuant to this clause.

(ii) FISCAL YEARS 1987-1991.—Notwithstanding any other provision of law, any automatic spending increase that would (but for this clause) be first paid during the period beginning with the first day of such fiscal year and ending with the date on which a final order is issued pursuant to subsection (b) shall be suspended until such final order becomes effective, and the amounts that would otherwise be expended during such period with respect to such increases shall be withheld. If such final order provides that automatic spending increases shall be reduced to zero during such fiscal year, the increases suspended pursuant to the preceding sentence and any legal rights thereto shall be permanently cancelled. If such final order provides for the payment of automatic spending increases during such fiscal year in amounts that are less than would have been paid but for such final order, or provides for the payment of the full amount of such increases, the increases suspended pursuant to such sentence shall be restored to the extent necessary to pay such reduced or full increases, and lump-sum payments in the amounts necessary to pay such reduced or full increases shall be made, for the period for which such increases were suspended pursuant to this clause.

(iii) PROHIBITION AGAINST RECOUPMENT.—Notwithstanding clauses (i) and (ii), if an amount required by either such clause to be withheld is paid, no recoupment shall be made against an individual to whom payment was made.

(iv) EFFECT OF LUMP-SUM PAYMENTS ON NEEDS-RELATED PROGRAMS.—Lump-sum payments made under the last sentence of clause (i) or clause (ii) shall not be considered as income or resources or otherwise taken into account in determining the eligibility of any individual for aid, assistance, or benefits under any Federal or federally-assisted program which conditions such eligibility to any extent upon the income or resources of such individual or his or her family or household, or in determining the amount or duration of such aid, assistance, or benefits.

(D) SPECIAL RULES FOR FISCAL YEAR 1986.—(i) For purposes of applying this section and section 251 with respect to the fiscal year 1986—

Ante, p. 1063.

(I) the order issued by the President under paragraph (1) of this subsection shall be considered the final order of the President under this section; and

(II) the Committees on Appropriations of the House of Representatives and the Senate may, after consultation with each other, define the term "program, project, and activity", and report to their respective Houses, with respect to matters within their jurisdiction, and the order issued by the President shall sequester funds in accordance with such definition.

(ii) If the Comptroller General declares in the report issued under section 251(b) for fiscal year 1986 that as a result of laws enacted and regulations promulgated after the date of the enactment of this joint resolution and prior to the issuance of such report the excess deficit for the fiscal year (adjusted in accordance with section 251(a)(3)(A)(ii) has been eliminated, the order issued under this subsection for the fiscal year shall so state (and shall make available for obligation and expenditure any amounts withheld pursuant to subparagraph (C)(i) of this paragraph).

(iii) The order issued by the President under paragraph (1) with respect to fiscal year 1986 shall be modified before the effective date for such order prescribed under subparagraph (A) to include in the order the changes in budget authority and unobligated balances, and related changes in outlay reductions, authorized for such fiscal year under section 251(d)(3)(D)(ii).

(b) ISSUANCE OF FINAL ORDER.—

(1) IN GENERAL.—On October 15 of the fiscal year (except in the case of the fiscal year 1986), after the submission of the revised report submitted by the Comptroller General under section 251(c)(2), the President shall issue a final order under this section to eliminate the full amount of the deficit excess as identified by the Comptroller General in the revised report submitted under section 251(c)(2) but only to the extent and in the manner provided in such report. The order issued under this subsection— President of U.S. *Ante*, p. 1063.

(A) shall include the same reductions and sequestrations as the initial order issued under subsection (a), adjusted to the extent necessary to take account of any changes in relevant amounts or percentages determined by the Comptroller General in the revised report submitted under section 251(c)(2),

(B) shall make such reductions and sequestrations in strict accordance with the requirements of section 251(a)(3) and (4), and

(C) shall utilize the same criteria and guidelines as those which were used in the issuance of such initial order under subsection (a).

The provisions of subsection (a)(3) shall apply to the revised report submitted under section 251(c)(2) and to the order issued under this subsection in the same manner as such provisions apply to the initial report issued under section 251(b) and to the order issued under subsection (a).

(2) ORDER REQUIRED IF EXCESS DEFICIT IS ELIMINATED.—If the Comptroller General issues a revised report under section 251(c)(2) stating that as a result of laws enacted and regulations promulgated after the submission of the initial report of the Comptroller General under section 251(b) the excess deficit for a fiscal year (adjusted in accordance with section 251(a)(3)(A)(ii), in the case of fiscal year 1986) has been eliminated, the order issued under this subsection shall so state and shall make available for obligation and expenditure any amounts withheld pursuant to subsection (a)(4) or (a)(6)(C). Report.

(3) EFFECTIVE DATE OF FINAL ORDER.—

(A) Except as provided in subsection (a)(6)(A), the final order issued by the President under paragraph (1) shall become effective on the date of its issuance, and shall supersede the order issued under subsection (a)(1).

(B) Any modification or suspension by such order of the operation of a provision of law that would (but for such order) require an automatic spending increase to take effect during the fiscal year shall apply for the one-year period beginning with the date on which such automatic increase would have taken effect during such fiscal year (but for such order).

(c) PROPOSAL OF ALTERNATIVES BY THE PRESIDENT.—A message transmitted pursuant to subsection (a)(5) with respect to a fiscal year may be accompanied by a proposal setting forth in full detail alternative ways to reduce the deficit for such fiscal year to an amount not greater than the maximum deficit amount for such fiscal year. *Ante*, pp. 1039, 1040, 1044, 1047, 1055.

(d) EXISTING PROGRAMS, PROJECTS, AND ACTIVITIES NOT TO BE ELIMINATED.—No action taken by the President under subsection (a) or (b) of this section shall have the effect of eliminating any program, project, or activity of the Federal Government. Prohibition. *Ante*, p. 1063.

(e) RELATIVE BUDGET PRIORITIES NOT TO BE ALTERED.—Nothing in the preceding provisions of this section shall be construed to give the President new authority to alter the relative priorities in the Federal budget that are established by law, and no person who is or becomes eligible for benefits under any provision of law shall be denied eligibility by reason of any order issued under this part. *Ante*, p. 1063. Prohibition.

2 USC 903.

SEC. 253. COMPLIANCE REPORT BY COMPTROLLER GENERAL.

On or before November 15 of each fiscal year (or on or before April 1, 1986, in the case of the fiscal year 1986), the Comptroller General shall submit to the Congress and the President a report on the extent to which the President's order issued under section 252(b) for such fiscal year complies with all of the requirements contained in section 252, either certifying that the order fully and accurately complies with such requirements or indicating the respects in which it does not. *Ante*, p. 1072.

2 USC 904.

SEC. 254. CONGRESSIONAL ACTION.

(a) SPECIAL PROCEDURES IN THE EVENT OF A RECESSION.—

(1) IN GENERAL.—The Director of the Congressional Budget Office shall notify the Congress at any time if—

(A) during the period consisting of the quarter during which such notification is given, the quarter preceding such notification, and the four quarters following such notification, such Office or the Office of Management and Budget has determined that real economic growth is projected or estimated to be less than zero with respect to each of any two consecutive quarters within such period, or

(B) the Department of Commerce preliminary reports of actual real economic growth (or any subsequent revision thereof) indicate that the rate of real economic growth for each of the most recent reported quarter and the immediately preceding quarter is less than one percent.

Upon such notification the Majority Leader of each House shall introduce a joint resolution (in the form set forth in paragraph (2)) declaring that the conditions specified in this paragraph are met and suspending the relevant provisions of this title for the remainder of the current fiscal year or for the following fiscal year or both.

(2) FORM OF JOINT RESOLUTION.—

(A) The matter after the resolving clause in any joint resolution introduced pursuant to paragraph (1) shall be as follows: "That the Congress declares that the conditions specified in section 254(a)(1) of the Balanced Budget and Emergency Deficit Control Act of 1985 are met; and—

"(1) the provisions of sections 3(7), 301(i), 302(f), 304(b), and 311(a) of the Congressional Budget and Impoundment Control Act of 1974, section 1106(c) of title 31, United States Code, and part C of the Balanced Budget and Emergency Deficit Control Act of 1985 are suspended for the remainder of the current fiscal year, and

"(2) the provisions of sections 3(7), 301(i), 304(b), and 311(a) (insofar as it relates to section 3(7)) of the Congressional Budget and Impoundment Control Act of

1974, sections 302(f) and 311(a) (except insofar as it relates to section 3(7)) of that Act (but only if a concurrent resolution on the budget under section 301 of that Act, for the fiscal year following the current fiscal year, has been agreed to prior to the introduction of this joint resolution), sections 1105(f) and 1106(c) of title 31, United States Code, and part C of the Balanced Budget and Emergency Deficit Control Act of 1985 are suspended for the fiscal year following the current fiscal year.

Ante, pp. 1044, 1055.
Ante, p. 1039.
Ante, p. 1040.
Ante, p. 1063.
Ante, p. 1063.

This joint resolution shall not have the effect of suspending any final order which was issued for the current fiscal year under section 252(b) of the Balanced Budget and Emergency Deficit Control Act of 1985 if such order was issued before the date of the enactment of this joint resolution.".

Ante, p. 1072.

(B) The title of the joint resolution shall be "Joint resolution suspending certain provisions of law pursuant to section 254(a)(2) of the Balanced Budget and Emergency Deficit Control Act of 1985."; and the joint resolution shall not contain any preamble.

Ante, p. 1078.

(3) COMMITTEE ACTION.—Each joint resolution introduced pursuant to paragraph (1) shall be referred to the Committee on the Budget of the House involved; and such Committee shall report the joint resolution to its House without amendment on or before the fifth day on which such House is in session after the date on which the joint resolution is introduced. If the Committee fails to report the joint resolution within the five-day period referred to in the preceding sentence, it shall be automatically discharged from further consideration of the joint resolution, and the joint resolution shall be placed on the appropriate calendar.

(4) CONSIDERATION OF JOINT RESOLUTION.—

(A) A vote on final passage of a joint resolution reported to a House of the Congress or discharged pursuant to paragraph (3) shall be taken on or before the close of the fifth calendar day of session of such House after the date on which the joint resolution is reported to such House or after the Committee has been discharged from further consideration of the joint resolution. If prior to the passage by one House of a joint resolution of that House, that House receives the same joint resolution from the other House, then—

(i) the procedure in that House shall be the same as if no such joint resolution had been received from the other House, but

(ii) the vote on final passage shall be on the joint resolution of the other House.

When the joint resolution is agreed to, the Clerk of the House of Representatives (in the case of a House joint resolution agreed to in the House of Representatives) or the Secretary of the Senate (in the case of a Senate joint resolution agreed to in the Senate) shall cause the joint resolution to be engrossed, certified, and transmitted to the other House of the Congress as soon as practicable.

(B)(i) A motion in the House of Representatives to proceed to the consideration of a joint resolution under this paragraph shall be highly privileged and not debatable. An amendment to the motion shall not be in order, nor shall it be in order to move to reconsider the vote by which the motion is agreed to or disagreed to.

(ii) Debate in the House of Representatives on a joint resolution under this paragraph shall be limited to not more than five hours, which shall be divided equally between those favoring and those opposing the joint resolution. A motion to postpone, made in the House of Representatives with respect to the consideration of a joint resolution under this paragraph, and a motion to proceed to the consideration of other business, shall not be in order. A motion further to limit debate shall not be debatable. It shall not be in order to move to table or to recommit a joint resolution under this paragraph or to move to reconsider the vote by which the joint resolution is agreed to or disagreed to.

(iii) All appeals from the decisions of the Chair relating to the application of the Rules of the House of Representatives to the procedure relating to a joint resolution under this paragraph shall be decided without debate.

(iv) Except to the extent specifically provided in the preceding provisions of this subsection or in subparagraph (D), consideration of a joint resolution under this subparagraph shall be governed by the Rules of the House of Representatives.

(C)(i) A motion in the Senate to proceed to the consideration of a joint resolution under this paragraph shall be privileged and not debatable. An amendment to the motion shall not be in order, nor shall it be in order to move to reconsider the vote by which the motion is agreed to or disagreed to.

(ii) Debate in the Senate on a joint resolution under this paragraph, and all debatable motions and appeals in connection therewith, shall be limited to not more than five hours. The time shall be equally divided between, and controlled by, the majority leader and the minority leader or their designees.

(iii) Debate in the Senate on any debatable motion or appeal in connection with a joint resolution under this paragraph shall be limited to not more than one hour, to be equally divided between, and controlled by, the mover and the manager of the joint resolution, except that in the event the manager of the joint resolution is in favor of any such motion or appeal, the time in opposition thereto shall be controlled by the minority leader or his designee.

(iv) A motion in the Senate to further limit debate on a joint resolution under this paragraph is not debatable. A motion to table or to recommit a joint resolution under this paragraph is not in order.

(D) No amendment to a joint resolution considered under this paragraph shall be in order in either the House of Representatives or the Senate.

(b) CONGRESSIONAL RESPONSE TO PRESIDENTIAL ORDER.—

(1) REPORTING OF RESOLUTIONS, AND RECONCILIATION BILLS AND RESOLUTIONS, IN THE SENATE.—

(A) COMMITTEE ALTERNATIVES TO PRESIDENTIAL ORDER.—Within two days after the submission of a report by the

Comptroller General under section 251(c)(2), each standing committee of the Senate may submit to the Committee on the Budget of the Senate information of the type described in section 301(d) of the Congressional Budget Act of 1974 with respect to alternatives to the order envisioned by such report insofar as such order affects laws within the jurisdiction of the committee.

Ante, p. 1063.

Ante, p. 1040.

(B) INITIAL BUDGET COMMITTEE ACTION.—Not later than two days after issuance of a final order by the President under section 252(b) with respect to a fiscal year, the Committee on the Budget of the Senate may report to the Senate a resolution. The resolution may affirm the impact of the order issued under such section, in whole or in part. To the extent that any part of the order is not affirmed, the resolution shall state which parts are not affirmed and shall contain instructions to committees of the Senate of the type referred to in section 310(a) of the Congressional Budget Act of 1974, sufficient to achieve at least the total level of deficit reduction contained in those sections which are not affirmed.

Report.

Ante, p. 1072.

Ante, p. 1053.

(C) RESPONSE OF COMMITTEES.—Committees instructed pursuant to subparagraph (B), or affected thereby, shall submit their responses to the Budget Committee no later than 10 days after the resolution referred to in subparagraph (B) is agreed to, except that if only one such Committee is so instructed such Committee shall, by the same date, report to the Senate a reconciliation bill or reconciliation resolution containing its recommendations in response to such instructions. A committee shall be considered to have complied with all instructions to it pursuant to a resolution adopted under subparagraph (B) if it has made recommendations with respect to matters within its jurisdiction which would result in a reduction in the deficit at least equal to the total reduction directed by such instructions.

(D) BUDGET COMMITTEE ACTION.—Upon receipt of the recommendations received in response to a resolution referred to in subparagraph (B), the Budget Committee shall report to the Senate a reconciliation bill or reconciliation resolution, or both, carrying out all such recommendations without any substantive revisions. In the event that a committee instructed in a resolution referred to in subparagraph (B) fails to submit any recommendation (or, when only one committee is instructed, fails to report a reconciliation bill or resolution) in response to such instructions, the Budget Committee shall include in the reconciliation bill or reconciliation resolution reported pursuant to this subparagraph legislative language within the jurisdiction of the noncomplying committee to achieve the amount of deficit reduction directed in such instructions.

(E) POINT OF ORDER.—It shall not be in order in the Senate to consider any reconciliation bill or reconciliation resolution reported under subparagraph (D) with respect to a fiscal year, any amendment thereto, or any conference report thereon if—

(i) the enactment of such bill or resolution as reported;

(ii) the adoption and enactment of such amendment; or

(iii) the enactment of such bill or resolution in the form recommended in such conference report,

would cause the amount of the deficit for such fiscal year to exceed the maximum deficit amount for such fiscal year, unless the report submitted under section 251(c)(1) projects negative real economic growth for such fiscal year, or for each of any two consecutive quarters during such fiscal year.

Ante, p. 1063.

(F) TREATMENT OF CERTAIN AMENDMENTS.—In the Senate, an amendment which adds to a resolution reported under subparagraph (B) an instruction of the type referred to in such subparagraph shall be in order during the consideration of such resolution if such amendment would be in order but for the fact that it would be held to be nongermane on the basis that the instruction constitutes new matter.

(G) DEFINITION.—For purposes of subparagraphs (A), (B), and (C), the term "day" shall mean any calendar day on which the Senate is in session.

(2) PROCEDURES.—

(A) IN GENERAL.—Except as provided in subparagraph (B), in the Senate the provisions of sections 305 and 310 of the Congressional Budget Act of 1974 for the consideration of concurrent resolutions on the budget and conference reports thereon shall also apply to the consideration of resolutions, and reconciliation bills and reconciliation resolutions reported under this paragraph and conference reports thereon.

Ante, pp. 1047, 1053.

(B) LIMIT ON DEBATE.—Debate in the Senate on any resolution reported pursuant to paragraph (1)(B), and all amendments thereto and debatable motions and appeals in connection therewith, shall be limited to 10 hours.

(C) LIMITATION ON AMENDMENTS.—Section 310(d)(2) of the Congressional Budget Act shall apply to reconciliation bills and reconciliation resolutions reported under this subsection.

Ante, p. 1053.

(D) BILLS AND RESOLUTIONS RECEIVED FROM THE HOUSE.—Any bill or resolution received in the Senate from the House, which is a companion to a reconciliation bill or reconciliation resolution of the Senate for the purposes of this subsection, shall be considered in the Senate pursuant to the provisions of this subsection.

(E) DEFINITION.—For purposes of this subsection, the term "resolution" means a simple, joint, or concurrent resolution.

(c) CERTAIN RESOLUTIONS TREATED AS RECONCILIATION BILLS.—Resolutions described in subsection (b) of this section and bills reported as a result thereof shall be considered in the Senate to be reconciliation bills or resolutions for purposes of the Congressional Budget Act of 1974.

2 USC 621 note.

2 USC 905.

SEC. 255. EXEMPT PROGRAMS AND ACTIVITIES.

(a) SOCIAL SECURITY BENEFITS AND TIER I RAILROAD RETIREMENT BENEFITS.—Increases in benefits payable under the old-age, survivors, and disability insurance program established under title II of

the Social Security Act, or in benefits payable under section 3(a), 3(f)(3), 4(a), or 4(f) of the Railroad Retirement Act of 1974, shall not be considered "automatic spending increases" for purposes of this title; and no reduction in any such increase or in any of the benefits involved shall be made under any order issued under this part. 42 USC 401. 45 USC 231b, 231c.

(b) VETERANS PROGRAMS.—The following programs shall be exempt from reduction under any order issued under this part:

Veterans' compensation (36-0153-0-1-701); and

Veterans' pensions (36-0154-0-1-701).

(c) NET INTEREST.—No reduction of payments for net interest (all of major functional category 900) shall be made under any order issued under this part.

(d) EARNED INCOME TAX CREDIT.—Payments to individuals made pursuant to section 32 of the Internal Revenue Code of 1954 shall be exempt from reduction under any order issued under this part. 26 USC 32.

(e) OFFSETTING RECEIPTS AND COLLECTIONS.—Offsetting receipts and collections shall not be reduced under any order issued under this part.

(f) CERTAIN PROGRAM BASES.—Outlays for programs specified in paragraph (1) of section 257 shall be subject to reduction only in accordance with the procedures established in section 251(a)(3)(C) and 256(b). *Post*, p. 1092. *Ante*, p. 1063. *Post*, p. 1086.

(g) OTHER PROGRAMS AND ACTIVITIES.—

(1) The following budget accounts and activities shall be exempt from reduction under any order issued under this part: Claims, etc.

Activities resulting from private donations, bequests, or voluntary contributions to the Government;

Alaska Power Administration, Operations and maintenance (89-0304-0-1-271);

Appropriations for the District of Columbia (to the extent they are appropriations of locally raised funds);

Bonneville Power Administration fund and borrowing authority established pursuant to section 13 of Public Law 93-454 (1974), as amended (89-4045-0-3-271); 16 USC 838k.

Bureau of Indian Affairs miscellaneous trust funds, tribal trust funds (14-9973-0-7-999);

Claims, defense (97-0102-0-1-051);

Claims, judgments, and relief acts (20-1895-0-1-806);

Coinage profit fund (20-5811-0-2-803);

Compensation of the President (11-0001-0-1-802); President of U.S.

Eastern Indian land claims settlement fund (14-2202-0-1-806);

Exchange stabilization fund (20-4444-0-3-155);

Federal payment to the railroad retirement account (60-0113-0-1-601);

Foreign military sales trust fund (11-8242-0-7-155);

Health professions graduate student loan insurance fund (Health Education Assistance Loan Program) (75-4305-0-3-553);

Intragovernmental funds, including those from which the outlays are derived primarily from resources paid in from other government accounts, except to the extent such funds are augmented by direct appropriations for the fiscal year during which an order is in effect;

Payment of Vietnam and USS Pueblo prisoner-of-war claims (15-0104-0-1-153);

Payment to civil service retirement and disability fund (24-0200-0-1-805);

Payments to copyright owners (03-5175-0-2-376);

Payments to health care trust funds (75-0580-0-1-572);

Payments to military retirement fund (97-0040-0-1-054);

Payments to social security trust funds (75-0404-0-1-571);

Payments to state and local government fiscal assistance trust fund (20-2111-0-1-851);

Payments to the foreign service retirement and disability fund (11-1036-0-1-153 and 19-0540-0-1-153);

Payments to trust funds from excise taxes or other receipts properly creditable to such trust funds;

Postal service fund (18-4020-0-3-372);

Salaries of Article III judges;

Soldiers and Airmen's Home, payment of claims (84-8930-0-7-705);

Southeastern Power Administration, Operations and maintenance (89-0302-0-1-271);

Southwestern Power Administration, Operations and maintenance (89-0303-0-1-271);

Tennessee Valley Authority fund, except non-power programs and activities (64-4110-0-3-999);

Western Area Power Administration, Construction, rehabilitation, operations, and maintenance (89-5068-0-2-271); and

Western Area Power Administration, Colorado River basins power marketing fund (89-4452-0-3-271).

(2) Prior legal obligations of the Government in the following budget accounts and activities shall be exempt from any order issued under this part:

Agency for International Development, Housing, and other credit guarantee programs (72-4340-0-3-151);

Agricultural credit insurance fund (12-4140-0-3-351);

Biomass energy development (20-0114-0-1-271);

Check forgery insurance fund (20-4109-0-3-803);

Community development grant loan guarantees (86-0162-0-1-451);

Credit union share insurance fund (25-4468-0-3-371);

Economic development revolving fund (13-4406-0-3-452);

Employees life insurance fund (24-8424-0-8-602);

Energy security reserve (Synthetic Fuels Corporation) (20-0112-0-1-271);

Export-Import Bank of the United States, Limitation of program activity (83-4027-0-3-155);

Federal Aviation Administration, Aviation insurance revolving fund (69-4120-0-3-402);

Federal Crop Insurance Corporation fund (12-4085-0-3-351);

Federal Deposit Insurance Corporation (51-8419-0-8-371);

Federal Emergency Management Agency, National flood insurance fund (58-4236-0-3-453);

Federal Emergency Management Agency, National insurance development fund (58-4235-0-3-451);

Federal Housing Administration fund (86-4070-0-3-371);

Federal Savings and Loan Insurance Corporation fund (82-4037-0-3-371);
Federal ship financing fund (69-4301-0-3-403);
Federal ship financing fund, fishing vessels (13-4417-0-3-376);
Geothermal resources development fund (89-0206-0-1-271);
Government National Mortgage Association, Guarantees of mortgage-backed securities (86-4238-0-3-371);
Health education loans (75-4307-0-3-553);
Homeowners assistance fund, Defense (97-4090-0-3-051);
Indian loan guarantee and insurance fund (14-4410-0-3-452);
International Trade Administration, Operations and administration (13-1250-0-1-376);
Low-rent public housing, Loans and other expenses (86-4098-0-3-604);
Maritime Administration, War-risk insurance revolving fund (69-4302-0-3-403);
Overseas Private Investment Corporation (71-4030-0-3-151);
Pension Benefit Guaranty Corporation fund (16-4204-0-3-601);
Rail service assistance (69-0122-0-1-401);
Railroad rehabilitation and improvement financing fund (69-4411-0-3-401);
Rural development insurance fund (12-4155-0-3-452);
Rural electric and telephone revolving fund (12-4230-8-3-271);
Rural housing insurance fund (12-4141-0-3-371);
Small Business Administration, Business loan and investment fund (73-4154-0-3-376);
Small Business Administration, Lease guarantees revolving fund (73-4157-0-3-376);
Small Business Administration, Pollution control equipment contract guarantee revolving fund (73-4147-0-3-376);
Small Business Administration, Surety bond guarantees revolving fund (73-4156-0-3-376);
Veterans Administration, Loan guaranty revolving fund (36-4025-0-3-704);
Veterans Administration, National service life insurance fund (36-8132-0-7-701);
Veterans Administration, Service-disabled veterans insurance fund (36-4012-0-3-701);
Veterans Administration, Servicemen's group life insurance fund (36-4009-0-3-701);
Veterans Administration, United States Government life insurance fund (36-8150-0-7-701);
Veterans Administration, Veterans insurance and indemnities (36-0120-0-1-701);
Veterans Administration, Veterans reopened insurance fund (36-4010-0-3-701); and
Veterans Administration, Veterans special life insurance fund (36-8455-0-8-701).

(h) LOW-INCOME PROGRAMS.—The following programs shall be exempt from reduction under any order issued under this part:
Aid to families with dependent children (75-0412-0-1-609);
Child nutrition (12-3539-0-1-605);
Food stamp programs (12-3505-0-1-605 and 12-3550-0-1-605);
Grants to States for Medicaid (75-0512-0-1-551);
Supplemental Security Income Program (75-0406-0-1-609); and
Women, infants, and children program (12-3510-0-1-605).

(i) IDENTIFICATION OF PROGRAMS.—For purposes of subsections (g) and (h), programs are identified by the designated budget account identification code numbers set forth in the Budget of the United States Government, 1986—Appendix.

2 USC 906.

SEC. 256. EXCEPTIONS, LIMITATIONS, AND SPECIAL RULES.

(a) EFFECT OF REDUCTIONS AND SEQUESTRATIONS.—

(1) REDUCTIONS IN AUTOMATIC SPENDING INCREASES.—Notwithstanding any other provision of law, any change in the Consumer Price Index or any other index measuring costs, prices, or wages (or in any component of any such index), under a program listed in section 257(1), that is not taken into account for purposes of determining the amount of an automatic spending increase (if any) under such program for a fiscal year for which an order is issued under section 252 shall not be taken into account for purposes of determining any automatic spending increase during any fiscal year thereafter.

Post, p. 1092.

Ante, p. 1072.

(2) SEQUESTRATIONS.—Any amount of new budget authority, unobligated balances, obligated balances, new loan guarantee commitments, new direct loan obligations, spending authority (as defined in section 401(c)(2) of the Congressional Budget Act of 1974), or obligation limitations which is sequestered or reduced pursuant to an order issued under section 252 is permanently cancelled, with the exception of amounts sequestered in special or trust funds, which shall remain in such funds and be available in accordance with and to the extent permitted by law, including the provisions of this Act.

Ante, p. 1056.
Ante, p. 1072.

(b) TREATMENT OF FEDERAL ADMINISTRATIVE EXPENSES.—

(1) Notwithstanding any other provision of this title, administrative expenses incurred by the departments and agencies, including independent agencies, of the Federal Government in connection with any program, project, activity, or account shall be subject to reduction pursuant to an order issued under section 252, without regard to any exemption, exception, limitation, or special rule which is otherwise applicable with respect to such program, project, activity, or account under this part.

(2) Notwithstanding any other provision of law, administrative expenses of any program, project, activity, or account which is self-supporting and does not receive appropriations shall be subject to reduction under a sequester order, unless specifically exempted in this joint resolution.

State and local government.

(3) Payments made by the Federal Government to reimburse or match administrative costs incurred by a State or political subdivision under or in connection with any program, project, activity, or account shall not be considered administrative expenses of the Federal Government for purposes of this section, and shall be subject to reduction or sequestration under this part to the extent (and only to the extent) that other payments made by the Federal Government under or in connection with that program, project, activity, or account are subject to such

reduction or sequestration; except that Federal payments made to a State as reimbursement of administrative costs incurred by such State under or in connection with the unemployment compensation programs specified in subsection (h)(1) shall be subject to reduction or sequestration under this part notwithstanding the exemption otherwise granted to such programs under that subsection.

(c) EFFECT OF ORDERS ON THE GUARANTEED STUDENT LOAN PROGRAM.—(1) Any reductions which are required to be achieved from the student loan programs operated pursuant to part B of title IV of the Higher Education Act of 1965, as a consequence of an order issued pursuant to section 252, shall be achieved only from loans described in paragraphs (2) and (3) by the application of the measures described in such paragraphs.

(2) For any loan made during the period beginning on the date that an order issued under section 252 takes effect with respect to a fiscal year and ending at the close of such fiscal year, the rate used in computing the special allowance payment pursuant to section 438(b)(2)(A)(iii) of such Act for each of the first four special allowance payments for such loan shall be adjusted by reducing such rate by the lesser of—

(A) 0.40 percent, or

(B) the percentage by which the rate specified in such section exceeds 3 percent.

(3) For any loan made during the period beginning on the date that an order issued under section 252 takes effect with respect to a fiscal year and ending at the close of such fiscal year, the origination fee which is authorized to be collected pursuant to section 438(c)(2) of such Act shall be increased by 0.50 percent.

(d) SPECIAL RULES FOR MEDICARE PROGRAM.—

(1) MAXIMUM PERCENTAGE REDUCTION IN INDIVIDUAL PAYMENT AMOUNTS.—The maximum permissible reduction for the health insurance programs under title XVIII of the Social Security Act for any fiscal year, pursuant to an order issued under section 252, consists only of a reduction of—

(A) 1 percent in the case of fiscal year 1986, and

(B) 2 percent in the case of any subsequent fiscal year,

in each separate payment amount otherwise made for a covered service under those programs without regard to this part.

(2) TIMING OF APPLICATION OF REDUCTIONS.—

(A) IN GENERAL.—Except as provided in subparagraph (B), if a reduction is made under paragraph (1) in payment amounts pursuant to a sequestration order, the reduction shall be applied to payment for services furnished during the effective period of the order. For purposes of the previous sentence, in the case of inpatient services furnished for an individual, the services shall be considered to be furnished on the date of the individual's discharge from the inpatient facility.

(B) PAYMENT ON THE BASIS OF COST REPORTING PERIODS.—In the case in which payment for services of a provider of services is made under title XVIII of the Social Security Act on a basis relating to the reasonable cost incurred for the services during a cost reporting period of the provider, if a reduction is made under paragraph (1) in payment amounts pursuant to a sequestration order, the reduction shall be applied to payment for costs for such services incurred at any time during each cost reporting period of the provider any part of which occurs during the effective period of the order, but only (for each such cost reporting period) in the same proportion as the fraction of the cost reporting period that occurs during the effective period of the order.

(C) EFFECTIVE PERIOD OF ORDER FOR FISCAL YEAR 1986.—For purposes of this paragraph, the effective period of a sequestration order for fiscal year 1986 is the period beginning on March 1, 1986, and ending on September 30, 1986.

(3) NO INCREASE IN BENEFICIARY CHARGES IN ASSIGNMENT-RELATED CASES.—If a reduction in payment amounts is made under paragraph (1) for services for which payment under part B of title XVIII of the Social Security Act is made on the basis of an assignment described in section 1842(b)(3)(B)(ii), in accordance with section 1842(b)(6)(B), or under the procedure described in section 1870(f)(1), of such Act, the person furnishing the services shall be considered to have accepted payment of the reasonable charge for the services, less any reduction in payment amount made pursuant to a sequestration order, as payment in full.

(4) NO EFFECT ON COMPUTATION OF AAPCC.—In computing the adjusted average per capita cost for purposes of section 1876(a)(4) of the Social Security Act, the Secretary of Health and Human Services shall not take into account any reductions in payment amounts which have been or may be effected under this part.

(e) TREATMENT OF CHILD SUPPORT ENFORCEMENT PROGRAM.—Any order issued by the President under section 252 shall accomplish the full amount of any required reduction in expenditures under sections 455 and 458 of the Social Security Act by reducing the Federal matching rate for State administrative costs under such program, as specified (for the fiscal year involved) in section 455(a) of such Act, to the extent necessary to reduce such expenditures by that amount.

(f) TREATMENT OF FOSTER CARE AND ADOPTION ASSISTANCE PROGRAMS.—Any order issued by the President under section 252 shall make the reduction which is otherwise required under the foster care and adoption assistance programs (established by part E of title IV of the Social Security Act) only with respect to payments and expenditures made by States in which increases in foster care maintenance payment rates or adoption assistance payment rates (or both) are to take effect during the fiscal year involved, and only to the extent that the required reduction can be accomplished by applying a uniform percentage reduction to the Federal matching payments that each such State would otherwise receive under section 474 of that Act (for such fiscal year) for that portion of the State's payments which is attributable to the increases taking effect during that year. No State may, after the date of the enactment of this joint resolution, make any change in the timetable for making payments under a State plan approved under part E of title IV of the Social Security Act which has the effect of changing the fiscal year in which expenditures under such part are made.

(g) FEDERAL PAY.—

(1) IN GENERAL.—For purposes of any order issued under section 252—

(A) Federal pay under a statutory pay system, and

(B) elements of military pay,

Education.

20 USC 1071.
Ante, p. 1072.

42 USC 1395;
42 USC 1395u.
98 Stat. 1093.

42 USC 1395gg.

20 USC 1087-1.

42 USC 1395mm.

20 USC 1087-1.

Ante, p. 1072.

98 Stat. 1311, 1312.
42 USC 655, 658.

42 USC 1395.

Ante, p. 1072.

Ante, p. 1072.

42 USC 670.
State and local government.

98 Stat. 1167, 3296.
42 USC 674.

42 USC 670.

42 USC 1395.

shall be subject to reduction under an order in the same manner as other administrative expense components of the Federal budget; except that no such order may reduce or have the effect of reducing the rate of pay to which any individual is entitled under any such statutory pay system or the rate of any element of military pay to which any individual is entitled under title 37, United States Code, or any increase in rates of pay which is scheduled to take effect under section 5305 of title 5, United States Code, section 1009 of title 37, United States Code, or any other provision of law.

(2) DEFINITIONS.—For purposes of this subsection:

(A) The term "statutory pay system" shall have the meaning given that term in section 5301(c) of title 5, United States Code.

(B) The term "elements of military pay" means—

(i) the elements of compensation of members of the uniformed services specified in section 1009 of title 37, United States Code,

(ii) allowances provided members of the uniformed services under sections 403a and 405 of such title, and

(iii) cadet pay and midshipman pay under section 203(c) of such title.

Ante, pp. 636–638. 98 Stat. 2536. 37 USC 405. 37 USC 203.

(C) The term "uniformed services" shall have the meaning given that term in section 101(3) of title 37, United States Code.

(h) TREATMENT OF PAYMENTS AND ADVANCES MADE WITH RESPECT TO UNEMPLOYMENT COMPENSATION PROGRAMS.—(1) For purposes of section 252—

Ante, p. 1072.

(A) any amount paid as regular unemployment compensation by a State from its account in the Unemployment Trust Fund (established by section 904(a) of the Social Security Act),

42 USC 1104.

(B) any advance made to a State from the Federal unemployment account (established by section 904(g) of such Act) under title XII of such Act and any advance appropriated to the Federal unemployment account pursuant to section 1203 of such Act, and

42 USC 1321. 42 USC 1323.

(C) any payment made from the Federal Employees Compensation Account (as established under section 909 of such Act) for the purpose of carrying out chapter 85 of title 5, United States Code, and funds appropriated or transferred to or otherwise deposited in such Account,

42 USC 1109. 5 USC 8501 *et seq.*

shall not be subject to reduction.

(2)(A) A State may reduce each weekly benefit payment made under the Federal-State Extended Unemployment Compensation Act of 1970 for any week of unemployment occurring during any period with respect to which payments are reduced under an order issued under section 252 by a percentage not to exceed the percentage by which the Federal payment to the State under section 204 of such Act is to be reduced for such week as a result of such order.

26 USC 3304 note. *Ante*, p. 1072.

(B) A reduction by a State in accordance with subparagraph (A) shall not be considered as a failure to fulfill the requirements of section 3304(a)(11) of the Internal Revenue Code of 1954.

26 USC 3304 note. 26 USC 3304.

(i) TREATMENT OF MINE WORKER DISABILITY COMPENSATION INCREASES AS AUTOMATIC SPENDING INCREASES.—An order issued by the President under section 252 may not result in eliminating or reducing an increase in disability benefits under the Federal Mine Safety and Health Act except in the manner provided for automatic spending increases under section 252(a)(1)(A), and no such increase may, pursuant to such section, be reduced below zero.

Ante, p. 1072. 30 USC 801 note.

(j) COMMODITY CREDIT CORPORATION.—

Agriculture and agricultural commodities.

(1) POWERS AND AUTHORITIES OF THE COMMODITY CREDIT CORPORATION.—This title shall not restrict the Commodity Credit Corporation in the discharge of its authority and responsibility as a corporation to buy and sell commodities in world trade, to use the proceeds as a revolving fund to meet other obligations and otherwise operate as a corporation, the purpose for which it was created.

(2) REDUCTION IN PAYMENTS MADE UNDER CONTRACTS.—(A) Payments and loan eligibility under any contract entered into with a person by the Commodity Credit Corporation prior to the time an order has been issued under section 252 shall not be reduced by an order subsequently issued. Subject to subparagraph (B), after an order is issued under such section for a fiscal year, any cash payments made by the Commodity Credit Corporation—

Ante, p. 1072.

(i) under the terms of any one-year contract entered into in such fiscal year and after the issuance of the order; and

(ii) out of an entitlement account,

to any person (including any producer, lender, or guarantee entity) shall be subject to reduction under the order.

(B) Each contract entered into with producers or producer cooperatives with respect to a particular crop of a commodity and subject to reduction under subparagraph (A) shall be reduced in accordance with the same terms and conditions. If some, but not all, contracts applicable to a crop of a commodity have been entered into prior to the issuance of an order under section 252, the order shall provide that the necessary reduction in payments under contracts applicable to the commodity be uniformly applied to all contracts for the next succeeding crop of the commodity, under the authority provided in paragraph (3).

(3) DELAYED REDUCTION IN OUTLAYS PERMISSIBLE.—Notwithstanding any other provision of this joint resolution, if an order under section 252 is issued with respect to a fiscal year, any reduction under the order applicable to contracts described in paragraph (1) may provide for reductions in outlays for the account involved to occur in the fiscal year following the fiscal year to which the order applies. No other account, or other program, project, or activity, shall bear an increased reduction for the fiscal year to which the order applies as a result of the operation of the preceding sentence.

(4) UNIFORM PERCENTAGE RATE OF REDUCTION AND OTHER LIMITATIONS.—All reductions described in paragraph (2) which are required to be made in connection with an order issued under section 252 with respect to a fiscal year—

(A) shall be made so as to ensure that outlays for each program, project, activity, or account involved are reduced by a percentage rate that is uniform for all such programs, projects, activities, and accounts, and may not be made so as to achieve a percentage rate of reduction in any such item exceeding the rate specified in the order; and

(B) with respect to commodity price support and income protection programs, shall be made in such manner and under such procedures as will attempt to ensure that—

(i) uncertainty as to the scope of benefits under any such program is minimized;

(ii) any instability in market prices for agricultural commodities resulting from the reduction is minimized; and

(iii) normal production and marketing relationships among agricultural commodities (including both contract and non-contract commodities) are not distorted.

In meeting the criterion set out in clause (iii) of subparagraph (B) of the preceding sentence, the President shall take into consideration that reductions under an order may apply to programs for two or more agricultural commodities that use the same type of production or marketing resources or that are alternative commodities among which a producer could choose in making annual production decisions.

(5) NO DOUBLE REDUCTION.—No agricultural price support or income protection program that is subject to reduction under an order issued under section 252 for a fiscal year may be subject, as well, to modification or suspension under such order as an automatic spending increase. *Ante*, p. 1072.

(6) CERTAIN AUTHORITY NOT TO BE LIMITED.—Nothing in this joint resolution shall limit or reduce, in any way, any appropriation that provides the Commodity Credit Corporation with budget authority to cover the Corporation's net realized losses.

(k) COMMUNITY AND MIGRANT HEALTH CENTERS, INDIAN HEALTH SERVICES AND FACILITIES, AND VETERANS' MEDICAL CARE.—

(1) The maximum permissible reduction in budget authority for any account listed in paragraph (2) for any fiscal year, pursuant to an order issued under section 252, shall be—

(A) 1 percent in the case of the fiscal year 1986, and

(B) 2 percent in the case of any subsequent fiscal year.

(2) The accounts referred to in paragraph (1) are as follows:

(A) Community health centers (75–0350–0–1–550).

(B) Migrant health centers (75–0350–0–1–550).

(C) Indian health facilities (75–0391–0–1–551).

(D) Indian health services (75–0390–0–1–551).

(E) Veterans' medical care (36–0160–0–1–703).

For purposes of the preceding provisions of this paragraph, programs are identified by the designated budget account identification code numbers set forth in the Budget of the United States Government—Appendix.

(l) TREATMENT OF OBLIGATED BALANCES.—

(1) IN GENERAL.—Except as provided in paragraph (2), obligated balances shall not be subject to reduction under an order issued under section 252. *Ante*, p. 1072.

(2) EXCEPTION.—Existing contracts in major functional category 050 (other than (A) those contracts which include a specified penalty for cancellation or modification by the Government and which if so cancelled or modified would result (due to such penalty) in a net loss to the Government for the fiscal year, and (B) those contracts the reduction of which would violate the legal obligations of the Government) shall be subject to reduction, in accordance with section 251(d)(3), under an order issued under section 252. *Ante*, p. 1063.

(3) DEFINITION.—For purposes of this subsection, the term "existing contracts" shall include all military and civilian contracts in major functional category 050 which exist at the time the order involved is issued under section 252. *Ante*, p. 1072.

2 USC 907.

SEC. 257. DEFINITIONS.

For purposes of this title:

(1) The term "automatic spending increase" (except as otherwise provided in sections 255 and 256) means— *Ante*, pp. 1082, 1086.

(A) increases in budget outlays due to changes in indexes in the following Federal programs:

Black lung benefits (20–8144–0–7–601);

Central Intelligence Agency retirement and disability system fund (56–3400–0–1–054);

Civil service retirement and disability fund (24–8135–0–7–602);

Comptrollers general retirement system (05–0107–0–1–801);

Foreign service retirement and disability fund (19–8186–0–7–602);

Judicial survivors' annuities fund (10–8110–0–7–602);

Longshoremen's and harborworkers' compensation benefits (16–9971–0–7–601);

Military retirement fund (97–8097–0–7–602);

National Oceanic and Atmospheric Administration retirement (13–1450–0–1–306);

Pensions for former Presidents (47–0105–0–1–802);

Railroad retirement tier II (60–8011–0–7–601);

Retired pay, Coast Guard (69–0241–0–1–403);

Retirement pay and medical benefits for commissioned officers, Public Health Service (75–0379–0–1–551);

Special benefits, Federal Employees' Compensation Act (16–1521–0–1–600);

Special benefits for disabled coal miners (75–0409–0–1–601); and

Tax Court judges survivors annuity fund (23–8115–0–7–602); and

(B) increases in budget outlays due to changes in indexes in the following Federal programs:

7 USC 1781 note.

National Wool Act (12–4336–0–3–351);

Special milk program (12–3502–0–1–605); and

Vocational rehabilitation (91–0301–0–1–506).

For purposes of the preceding provisions of this paragraph, programs are identified by the designated budget account identification code numbers set forth in the Budget of the United States Government, 1986—Appendix.

(2) The terms "budget outlays" and "budget authority" have the meaning given to such terms in sections 3(1) and 3(2), respectively, of the Congressional Budget and Impoundment Control Act of 1974. 2 USC 622.

(3) The term "concurrent resolution on the budget" has the meaning given to such term in section 3(4) of the Congressional Budget and Impoundment Control Act of 1974.

(4) The term "deficit" has the meaning given to such term in section 3(6) of the Congressional Budget and Impoundment Control Act of 1974. *Ante*, p. 1039.

(5) The term "maximum deficit amount", with respect to any fiscal year, means the maximum deficit amount for such fiscal

year determined under section 3(7) of the Congressional Budget and Impoundment Control Act of 1974. *Ante*, p. 1039.

(6) The term "real economic growth", with respect to any fiscal year, means the growth in the gross national product during such fiscal year, adjusted for inflation, consistent with Department of Commerce definitions.

(7) The terms "sequester" and "sequestration" (subject to section 252(a)(4)) refer to or mean the cancellation of new budget authority, unobligated balances, obligated balances, new loan guarantee commitments, new direct loan obligations, and spending authority as defined in section 401(c)(2) of the Congressional Budget Act of 1974, and the reduction of obligation limitations. *Ante*, p. 1072. *Ante*, p. 1056.

(8) The term "account" means an item for which appropriations are made in any appropriation Act used to determine the budget base, and, for items not provided for in appropriation Acts, such term means an item for which there is a designated budget account identification code number in the Appendix to the President's budget.

LEGISLATIVE HISTORY—H.J. Res. 372:

HOUSE REPORTS: No. 99-351 (Comm. of Conference) and No. 99-433 (Comm. of Conference).
SENATE REPORT No. 99-144 (Comm. on Finance).
CONGRESSIONAL RECORD, Vol. 131 (1985):
Aug. 1, Sept. 4, considered and passed House.
Oct. 3-6, 8-10, considered and passed Senate, amended.
Nov. 1, House receded and concurred in Senate amendment and in others with amendments.
Nov. 1, 4-6, Senate agreed to conference report; concurred in House amendments with amendments.
Nov. 6, House disagreed to Senate amendments.
Nov. 7, Senate insisted on amendments, agreed to further conference.
Dec. 11, House and Senate agreed to conference report.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 21, No. 50 (1985):
Dec. 12, Presidential statement.

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