

*National Aeronautics
and Space Administration*



BUDGET ESTIMATES

FISCAL YEAR 1969
Volume IV

ADMINISTRATIVE OPERATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1969 ESTIMATES

ADMINISTRATIVE OPERATIONS

TABLE OF CONTENTS

VOLUME IV

	<u>Page No.</u>
<u>General Statement</u>	AO iii
<u>Summary Tables</u>	
Summary of obligations by installation.....	SUM 1
Number of positions by installation.....	SUM 2
Distribution of obligations by function by installation.....	SUM 3
Distribution of functions by object classification...	SUM 4
Distribution of obligations by object classification by installation.....	SUM 5
Analysis of requirements for passenger-carrying motor vehicles.....	SUM 6
<u>Justification by Function</u>	
Personnel.....	AO 1-1
Travel.....	AO 1-16
Automatic data processing.....	AO 1-20
Facilities services.....	AO 1-23
Technical services.....	AO 1-29
Administrative support.....	AO 1-34

Installation Presentations

Manned Space Flight Installations

John F. Kennedy Space Center, NASA.....	AO 2-1
Manned Spacecraft Center.....	AO 2-12
Marshall Space Flight Center.....	AO 2-19

Space Science and Applications Installations

Goddard Space Flight Center.....	AO 2-34
Wallops Station.....	AO 2-41

Advanced Research and Technology Installations

Ames Research Center.....	AO 2-50
Electronics Research Center.....	AO 2-57
Flight Research Center.....	AO 2-65
Langley Research Center.....	AO 2-72
Lewis Research Center.....	AO 2-83
Space Nuclear Propulsion Office.....	AO 2-94
NASA Headquarters.....	AO 2-100
Special Analysis for Jet Propulsion Laboratory.....	AO 2-106

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ADMINISTRATIVE OPERATIONS

GENERAL STATEMENT

The Administrative Operations appropriation includes funding for the personnel and operational activities that provide the capability to perform the programs of NASA. It is the appropriation responsible for the direction, management, and execution of the objectives assigned to NASA by the National Aeronautics and Space Act of 1958. The objectives of this appropriation are to:

Provide the personnel staff necessary to plan, manage, and support scientific missions. The staff is comprised of approximately 43% professional scientists and engineers, 27% technicians and technically-oriented wage board employees, 14% professional administrators, and 16% clerical employees.

Provide operational capability to the laboratories and facilities for in-house research and planning, directing, and executing out-of-house effort.

Support the research and development programs through the development of general purpose computer capability.

Provide the necessary logistics support to the programs, including travel and transportation, upkeep of facilities, and administrative support.

The Administrative Operations appropriation request is subdivided into six functional categories. These functional categories are:

1. Personnel Related Costs which is comprised of compensation and benefits for civil service personnel and for personnel of other government agencies detailed to NASA, and includes supporting personnel costs, i.e., the cost of personnel movements, as provided by law, the cost of recruiting and personnel investigation services provided by the Civil Service Commission, and the cost of personnel training.
2. Travel includes the cost of program related travel, travel to meetings and technical seminars, and administrative travel.
3. Automatic Data Processing includes the cost of lease, purchase, and maintenance of equipment, and the cost of providing contract services for programming and operations for general purpose computer capability.

4. Facilities Services includes the cost of the acquisition of facilities through lease and minor construction, maintenance and related services, custodial services, facility operations, and range operations at the John F. Kennedy Space Center, NASA.
5. Technical Services includes the cost of certain engineering services, and scientific and technical information and education programs.
6. Administrative Support includes the cost of communications, administrative printing, administrative supplies, materials, equipment, transportation support, and other support services.

Installations are institutionally administered by the Associate Administrator having primary responsibility for the research and development programs conducted at the installation. The Associate Administrator for Manned Space Flight is responsible for the Kennedy Space Center, Manned Spacecraft Center, and Marshall Space Flight Center; the Associate Administrator for Space Science and Applications is responsible for the Goddard Space Flight Center and Wallops Station; and the Associate Administrator for Advanced Research and Technology is responsible for the Ames Research Center, Electronics Research Center, Flight Research Center, Langley Research Center, Lewis Research Center, and the Space Nuclear Propulsion Office. The Associate Administrator for Organization and Management is the institutional director for NASA Headquarters.

The organization and operation of a NASA installation are largely products of its prime missions and research responsibilities. For example, the installations under the cognizance of the Associate Administrator for Manned Space Flight are engaged primarily in the development, procurement, and launching of large launch vehicles and manned spacecraft systems, and their auxiliary equipment. In addition, they are responsible for the mission planning and operations during the mission. These activities require a large contractor effort which must be directed, monitored, and coordinated by senior professional NASA personnel located at contractor plants, launch and tracking sites, and at NASA installations. The support required for the manned program activity is large in comparison to other installations because of the scope of the technical objectives and the diversity of effort.

Installations under the cognizance of the Associate Administrator for Advanced Research and Technology are primarily engaged in research, both in-house and contract, and monitoring of relatively small research contracts with universities and nonprofit institutions. These installations utilize installation laboratories in the intensive pursuit of areas of basic research which require support of a different type than the large project undertakings, although these installations do have important flight project responsibilities. The size of the Administrative Operations budget at each installation is, therefore, influenced by the objectives and characteristics of the research and development mission.

1968 OPERATING PLAN

The determinations of the program level for Administrative Operations in 1969 were affected to a considerable extent by Congressional action on the 1968 budget. The budget estimate for 1968 was \$671.3 million. Subsequent to the submission of the budget, the Civil Service Commission increased the salary scales for junior and middle grade scientists and engineers, causing an unbudgeted increase of \$3.0 million. The Congressional authorization for Administrative Operations was \$648.2 million. Plans were developed by NASA to operate at this level by decreasing planned employment by 250 positions, reducing overtime, travel, planned ADP equipment rentals and procurement, the procurement of supplies, materials and equipment, planned service contracts, and minor construction. The final appropriation of \$628 million required far more extensive reductions, with the largest part of the reductions necessarily coming in the last half of the year. The 1968 operating plan was established at \$628.0 million and has been adjusted only by the increase of \$12.5 million necessary to provide for the cost of the 1967 Federal Employees Pay Act enacted in December 1967, and by an appropriation transfer of \$127,000 to reimburse the General Services Administration for rental space. The \$12,373,000 net increase in the operating plan above the amount appropriated is financed by a transfer from the Research and Development appropriation.

To achieve the reductions necessitated by the amount appropriated, significant decreases were required throughout Administrative Operations. They include: reduction of the employment ceiling of 34,126 on July 1, 1967, to 32,422 on June 30, 1968; reduction of budgeted paid overtime by 35%; reduction of budgeted travel by 15%; and reduction of all other budgeted costs by 17%.

1969 BUDGET ESTIMATE

In developing the 1969 appropriation request, it was contemplated that the reduced level of operations required in 1968 would be continued in 1969 despite increases in personnel compensation resulting from career development, the extra day of pay in 1969, annualization of wage board increases, and the cost of 150 additional personnel at the Electronics Research Center. Accordingly, for 1969, \$648.2 million is requested and includes requirements above the 1968 base only for the full year cost of the 1967 Federal Employees Pay Act, \$18.6 million, and the cost of providing certain support services at the Goddard Space Flight Center with civil service personnel in lieu of Research and Development contracts. This latter item requires an increase of \$1.6 million to the Administrative Operations appropriation.

The cost of the second increment of the 1967 Federal Employees Pay Act, which will be effective on July 1, 1968, is not included in the 1969 NASA budget. The estimated government-wide cost of this increment of the pay legislation is included in the President's Budget as a one-line item.

1968 MANPOWER PROGRAM

The current 1968 manpower plan of 32,422 permanent personnel is 1,704 less than the 1968 budget. The lower number of personnel results from the actions taken by NASA to operate at the reduced appropriation levels. The largest decrease, 700, is at the Marshall Space Flight Center, and significant decreases occur at all other field installations except for the Kennedy Space Center and the Electronics Research Center. The increase at the Kennedy Space Center is required to provide the necessary support for Apollo launch operations. The increase of 116 at the Electronics Research Center provides an increment of the planned phased staffing at this new Center.

1969 MANPOWER PROGRAM

The 1969 budget is predicated upon an end-year permanent complement of 32,727, which is an increase of 305 over the planned strength at the end of 1968. The increase will occur at the Electronics Research Center, 150, and at the Goddard Space Flight Center, 155. The increase of 150 for the Electronics Research Center is the 1969 increment of their phased buildup and will bring their strength to 966 at the end of the year. The increase at the Goddard Space Flight Center will provide for certain Center operations to be conducted by civil service personnel instead of by Research and Development contracts as in prior years. The ceiling for all other installations will be held to the employment level planned for the end of 1968.

DISTRIBUTION BY FUNCTIONAL CATEGORY

The following summary table indicates the distribution of the total appropriation requirements:

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel related costs....	\$413,957,000	\$436,075,000	\$442,502,000
Travel.....	17,953,000	16,491,000	16,530,000
Automatic data processing..	36,919,000	31,506,000	31,487,000
Facilities services.....	106,209,000	92,635,000	94,928,000
Technical services.....	23,689,000	18,790,000	18,785,000
Administrative support.....	<u>47,858,000</u>	<u>44,876,000</u>	<u>43,968,000</u>
Total.....	<u>\$646,585,000</u>	<u>\$640,373,000</u>	<u>\$648,200,000</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1969 ESTIMATES

ADMINISTRATIVE OPERATIONS

SUMMARY OF OBLIGATIONS BY INSTALLATION

	<u>Fiscal Year</u> <u>1967</u>	<u>Fiscal Year</u> <u>1968</u>	<u>Fiscal Year</u> <u>1969</u>
<u>MANNED SPACE FLIGHT</u>	<u>\$317,102,000</u>	<u>\$312,957,000</u>	<u>\$312,984,000</u>
John F. Kennedy Space Center, NASA.....	92,742,000	93,831,000	97,710,000
Manned Spacecraft Center.....	95,659,000	95,908,000	97,096,000
Marshall Space Flight Center...	128,701,000	123,218,000	118,178,000
<u>SPACE SCIENCE AND APPLICATIONS</u>	<u>80,798,000</u>	<u>77,392,000</u>	<u>79,502,000</u>
Goddard Space Flight Center....	71,069,000	68,525,000	70,594,000
Wallops Station.....	9,729,000	8,867,000	8,908,000
<u>ADVANCED RESEARCH AND TECHNOLOGY</u>	<u>188,128,000</u>	<u>188,882,000</u>	<u>195,108,000</u>
Ames Research Center.....	33,824,000	33,563,000	33,975,000
Electronics Research Center....	12,219,000	15,467,000	19,079,000
Flight Research Center.....	9,488,000	9,439,000	9,728,000
Langley Research Center.....	64,337,000	62,095,000	62,765,000
Lewis Research Center.....	66,280,000	66,220,000	67,352,000
Space Nuclear Propulsion Office.....	1,980,000	2,098,000	2,209,000
<u>SUPPORTING OPERATIONS</u>			
NASA Headquarters.....	<u>60,557,000</u>	<u>61,142,000</u>	<u>60,606,000</u>
TOTAL.....	<u>\$646,585,000</u>	<u>\$640,373,000</u>	<u>\$648,200,000</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1969 ESTIMATES

NUMBER OF PERSONNEL POSITIONS

	<u>Fiscal Year 1967</u>	<u>Fiscal Year 1968</u>	<u>Fiscal Year 1969</u>
<u>MANNED SPACE FLIGHT</u>	<u>14,510</u>	<u>13,896</u>	<u>13,896</u>
John F. Kennedy Space Center, NASA.....	2,720	2,931	2,931
Manned Spacecraft Center.....	4,704	4,579	4,579
Marshall Space Flight Center.....	7,086	6,386	6,386
<u>SPACE SCIENCE AND APPLICATIONS</u>	<u>4,300</u>	<u>4,183</u>	<u>4,338</u>
Goddard Space Flight Center.....	3,782	3,686	3,841
Wallops Station.....	518	497	497
<u>ADVANCED RESEARCH AND TECHNOLOGY</u>	<u>12,417</u>	<u>12,064</u>	<u>12,214</u>
Ames Research Center.....	2,173	2,092	2,092
Electronics Research Center.....	700	816	966
Flight Research Center.....	590	566	566
Langley Research Center.....	4,161	3,990	3,990
Lewis Research Center.....	4,676	4,485	4,485
Space Nuclear Propulsion Office...	117	115	115
<u>SUPPORTING OPERATIONS</u>			
NASA Headquarters.....	<u>2,499</u>	<u>2,279</u>	<u>2,279</u>
<u>TOTAL PERMANENT POSITIONS.....</u>	<u>33,726</u>	<u>32,422</u>	<u>32,727</u>
<u>POSITIONS OTHER THAN PERMANENT</u>	<u>2,182</u>	<u>2,182</u>	<u>2,182</u>
<u>TOTAL POSITIONS.....</u>	<u>35,908</u>	<u>34,604</u>	<u>34,909</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1969 ESTIMATES

ADMINISTRATIVE OPERATIONS

DISTRIBUTION OF OBLIGATIONS BY FUNCTION
BY INSTALLATION

FUNCTION	Wallops	Wallops	J. E. KEENEY SPACE CENTER, Wallops	Wallops OPERATIONS CENTER	Wallops SPACE FLIGHT CENTER	Wallops SPACE CENTER	Wallops SPACE FLIGHT CENTER	Wallops STATION	Wallops LABORATORY	Wallops RESEARCH CENTER						
Personnel																
1967	\$413,957,000	\$183,031,000	\$33,108,000	\$59,664,000	\$90,259,000	\$52,242,000	\$47,089,000	\$5,153,000	\$142,807,000	\$25,923,000	\$7,407,000	\$7,098,000	\$46,865,000	\$53,823,000	\$1,691,000	\$35,877,000
1968	436,075,000	192,539,000	37,683,000	63,672,000	91,184,000	55,289,000	49,988,000	5,301,000	149,922,000	26,943,000	10,126,000	7,205,000	48,726,000	55,029,000	1,893,000	38,325,000
1969	442,502,000	192,680,000	39,979,000	64,747,000	87,954,000	57,854,000	52,508,000	5,346,000	154,684,000	27,372,000	12,428,000	7,368,000	49,246,000	56,327,000	1,943,000	37,284,000
Travel																
1967	17,953,000	8,398,000	867,000	4,433,000	3,098,000	2,766,000	2,630,000	136,000	4,141,000	861,000	310,000	197,000	1,542,000	1,058,000	193,000	2,648,000
1968	16,491,000	7,857,000	819,000	4,093,000	2,945,000	2,310,000	2,183,000	127,000	3,815,000	793,000	440,000	211,000	1,188,000	988,000	195,000	2,509,000
1969	16,530,000	7,857,000	819,000	4,093,000	2,945,000	2,310,000	2,183,000	127,000	3,860,000	793,000	485,000	211,000	1,188,000	988,000	195,000	2,503,000
Automatic Data Processing																
1967	36,919,000	18,352,000	1,302,000	6,430,000	10,620,000	7,375,000	7,284,000	91,000	9,999,000	1,819,000	1,031,000	103,000	6,557,000	463,000	26,000	1,193,000
1968	31,506,000	17,529,000	1,200,000	6,843,000	9,486,000	5,972,000	5,897,000	75,000	6,676,000	1,544,000	1,273,000	51,000	3,515,000	293,000	---	1,329,000
1969	31,487,000	17,257,000	1,320,000	6,843,000	9,094,000	5,991,000	5,916,000	75,000	6,825,000	1,544,000	1,366,000	51,000	3,515,000	349,000	---	1,414,000
Facilities Services																
1967	106,209,000	71,867,000	47,801,000	12,647,000	11,419,000	11,252,000	8,110,000	3,142,000	22,118,000	3,932,000	1,971,000	1,161,000	6,452,000	8,602,000	---	972,000
1968	92,635,000	63,562,000	43,403,000	10,861,000	9,298,000	7,944,000	5,634,000	2,310,000	20,363,000	3,191,000	2,007,000	1,162,000	6,077,000	7,926,000	---	766,000
1969	94,928,000	65,093,000	45,305,000	11,047,000	8,741,000	7,777,000	5,432,000	2,345,000	21,376,000	3,174,000	2,943,000	1,268,000	6,247,000	7,744,000	---	682,000
Technical Services																
1967	23,689,000	5,694,000	---	1,256,000	4,438,000	1,455,000	1,365,000	90,000	2,080,000	205,000	554,000	80,000	310,000	865,000	66,000	14,460,000
1968	18,790,000	3,498,000	---	834,000	2,664,000	839,000	746,000	93,000	1,853,000	70,000	704,000	88,000	310,000	671,000	10,000	12,600,000
1969	18,785,000	3,200,000	---	834,000	2,366,000	825,000	736,000	89,000	1,840,000	70,000	636,000	83,000	310,000	670,000	71,000	12,920,000
Administrative Support																
1967	47,858,000	29,760,000	9,664,000	11,229,000	8,867,000	5,708,000	4,591,000	1,117,000	6,983,000	1,104,000	946,000	849,000	2,611,000	1,469,000	4,000	5,407,000
1968	44,876,000	27,972,000	10,726,000	9,605,000	7,641,000	5,038,000	4,077,000	961,000	6,253,000	1,022,000	917,000	722,000	2,279,000	1,313,000	---	5,613,000
1969	43,968,000	26,897,000	10,287,000	9,532,000	7,078,000	4,745,000	3,819,000	926,000	6,523,000	1,022,000	1,221,000	747,000	2,259,000	1,274,000	---	5,803,000
Total																
1967	646,585,000	317,102,000	32,743,000	95,659,000	178,701,000	80,798,000	71,069,000	9,729,000	188,128,000	33,824,000	12,219,000	9,488,000	64,337,000	66,280,000	1,980,000	60,557,000
1968	640,373,000	312,957,000	93,831,000	95,908,000	123,218,000	77,392,000	68,525,000	8,867,000	188,882,000	33,563,000	15,467,000	9,439,000	62,095,000	66,220,000	2,098,000	61,142,000
1969	648,200,000	312,000,000	97,210,000	97,096,000	118,178,000	79,502,000	70,504,000	8,000,000	190,100,000	33,975,000	15,079,000	9,728,000	62,765,000	67,350,000	2,000,000	60,606,000

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 FISCAL YEAR 1969 ESTIMATES
 ADMINISTRATIVE OPERATIONS
 DISTRIBUTION OF FUNCTIONS BY OBJECT CLASSIFICATION

Object Classification	Total NASA	Personnel	Travel	Automatic Data Processing	Facilities Services	Technical Services	Administrative Support
FISCAL YEAR 1967							
Personnel compensation	\$381,148,000	\$381,148,000	---	---	---	---	---
Personnel benefits	28,744,000	28,744,000	---	---	---	---	---
Benefits for former personnel	49,000	49,000	---	---	---	---	---
Travel & transp. of persons	19,517,000	262,000	\$17,953,000	---	---	---	\$1,302,000
Transportation of things	4,819,000	771,000	---	---	---	\$166,000	3,882,000
Rents, communications, and utilities	47,701,000	---	---	\$17,927,000	\$17,315,000	---	12,459,000
Printing and reproduction	6,458,000	---	---	---	---	899,000	5,559,000
Other services	107,010,000	2,383,000	---	13,493,000	62,680,000	18,338,000	10,115,000
Services of other agencies	11,310,000	600,000	---	79,000	6,291,000	2,360,000	2,001,000
Supplies and materials	20,719,000	---	---	---	10,057,000	419,000	10,243,000
Equipment	13,219,000	---	---	5,420,000	4,061,000	1,507,000	2,231,000
Landis and structures	5,805,000	---	---	---	5,805,000	---	---
Grants, subsidies & contributions	12,000	---	---	---	---	---	12,000
Insurance claims and indemnities	54,000	---	---	---	---	---	54,000
Totals	\$646,585,000	\$413,957,000	\$17,953,000	\$36,919,000	\$106,209,000	\$23,689,000	\$47,854,000
FISCAL YEAR 1968							
Personnel compensation	\$400,419,000	\$400,419,000	---	---	---	---	---
Personnel benefits	30,777,000	30,777,000	---	---	---	---	---
Benefits for former personnel	1,137,000	1,137,000	---	---	---	---	---
Travel & transp. of persons	18,120,000	284,000	\$16,491,000	---	---	---	\$1,345,000
Transportation of things	4,683,000	753,000	---	---	---	\$147,000	3,783,000
Rents, communications, and utilities	51,637,000	---	---	\$19,630,000	\$18,111,000	---	13,896,000
Printing and reproduction	6,036,000	---	---	---	---	769,000	5,267,000
Other services	94,481,000	2,085,000	---	11,827,000	55,839,000	15,204,000	9,521,000
Services of other agencies	9,514,000	620,000	---	16,000	5,956,000	1,351,000	1,571,000
Supplies and materials	17,004,000	---	---	---	8,502,000	418,000	8,084,000
Equipment	4,842,000	---	---	33,000	2,565,000	901,000	1,344,000
Landis and structures	1,662,000	---	---	---	1,662,000	---	---
Grants, subsidies & contributions	22,000	---	---	---	---	---	22,000
Insurance claims and indemnities	39,000	---	---	---	---	---	39,000
Totals	\$640,373,000	\$436,075,000	\$16,491,000	\$31,506,000	\$92,635,000	\$18,790,000	\$44,871,000
FISCAL YEAR 1969							
Personnel compensation	\$407,328,000	\$407,328,000	---	---	---	---	---
Personnel benefits	31,247,000	31,247,000	---	---	---	---	---
Benefits for former personnel	100,000	100,000	---	---	---	---	---
Travel & transp. of persons	18,169,000	294,000	\$16,530,000	---	---	---	\$1,345,000
Transportation of things	4,545,000	788,000	---	---	---	\$143,000	3,614,000
Rents, communications, and utilities	53,457,000	---	---	\$20,314,000	\$19,181,000	---	13,962,000
Printing and reproduction	6,031,000	---	---	---	---	761,000	5,270,000
Other services	95,528,000	2,125,000	---	11,132,000	57,678,000	15,204,000	9,389,000
Services of other agencies	9,494,000	620,000	---	16,000	5,963,000	1,331,000	1,564,000
Supplies and materials	16,244,000	---	---	---	8,150,000	442,000	7,652,000
Equipment	4,544,000	---	---	25,000	2,498,000	904,000	1,117,000
Landis and structures	1,458,000	---	---	---	1,458,000	---	---
Grants, subsidies, and contributions	22,000	---	---	---	---	---	22,000
Insurance claims and indemnities	33,000	---	---	---	---	---	33,000
Totals	\$648,200,000	\$442,502,000	\$16,530,000	\$31,487,000	\$94,928,000	\$18,785,000	\$43,968,000

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 FISCAL YEAR 1969 ESTIMATES
 ADMINISTRATIVE OPERATIONS

DISTRIBUTION OF OBLIGATIONS BY OBJECT CLASSIFICATION
 BY INSTALLATION

OBJECT CLASSIFICATION	TOTAL NASA	SUBTOTAL, OFFICE OF MANNED SPACE FLIGHT	J. F. KENNEDY SPACE CENTER, NASA	MANNED SPACECRAFT CENTER	MARSHALL SPACE FLIGHT CENTER	SUBTOTAL, OFFICE OF SPACE SCIENCE AND APPLICATIONS	CODDARD SPACE FLIGHT CENTER	Wallops Station	SUBTOTAL, OFFICE OF ADVANCED RESEARCH AND TECHNOLOGY	AMES RESEARCH CENTER	ELECTRONICS RESEARCH CENTER	FLIGHT RESEARCH CENTER	LANGLEY RESEARCH CENTER	LEWIS RESEARCH CENTER	SPACE NUCLEAR PROPULSION OFFICE	HEADQUARTERS
FISCAL YEAR 1967																
Personnel compensation	381,148,000	168,842,000	30,521,000	55,008,000	83,313,000	48,169,000	43,503,000	4,666,000	131,989,000	23,952,000	6,716,000	6,551,000	43,351,000	49,900,000	1,519,000	37,148,000
Personnel benefits	28,744,000	12,588,000	2,273,000	4,043,000	6,252,000	3,547,000	3,193,000	349,000	9,950,000	1,833,000	510,000	480,000	3,267,000	3,738,000	168,000	2,638,000
Benefits for former personnel	49,000	1,000	---	1,000	---	---	---	---	20,000	---	---	---	---	20,000	---	28,000
Travel & transp. of persons	19,517,000	9,774,000	1,843,000	4,695,000	3,236,000	2,870,000	2,668,000	202,000	4,200,000	864,000	328,000	200,000	1,550,000	1,065,000	193,000	2,673,000
Transportation of things	4,819,000	2,168,000	1,436,000	585,000	147,000	1,502,000	1,379,000	123,000	854,000	57,000	83,000	23,000	468,000	220,000	3,000	295,000
Rents, communications, and utilities	47,701,000	23,967,000	7,392,000	8,429,000	8,146,000	8,030,000	7,604,000	426,000	13,331,000	3,787,000	1,459,000	234,000	4,565,000	3,286,000	---	2,373,000
Printing and reproduction	6,458,000	4,051,000	2,558,000	629,000	864,000	377,000	360,000	17,000	295,000	36,000	78,000	9,000	100,000	72,000	---	1,735,000
Other services	107,010,000	70,823,000	35,450,000	16,658,000	18,715,000	8,969,000	7,657,000	1,312,000	13,157,000	1,805,000	1,731,000	1,340,000	4,029,000	4,221,000	31,000	14,061,000
Services of other agencies	11,330,000	7,771,000	4,581,000	688,000	2,502,000	417,000	339,000	78,000	975,000	151,000	321,000	115,000	22,000	300,000	66,000	2,167,000
Supplies and materials	20,719,000	11,262,000	4,339,000	2,827,000	4,096,000	2,978,000	1,686,000	1,292,000	5,835,000	726,000	444,000	294,000	2,407,000	1,964,000	---	644,000
Equipment	13,219,000	3,050,000	1,197,000	1,128,000	725,000	1,635,000	1,066,000	569,000	6,768,000	359,000	549,000	223,000	4,501,000	1,136,000	---	1,766,000
Lands and structures	5,805,000	2,797,000	1,130,000	963,000	704,000	2,304,000	1,609,000	695,000	704,000	253,000	---	18,000	77,000	356,000	---	---
Grants, subsidies & contributions	12,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12,000
Insurance claims and indemnities	54,000	28,000	22,000	5,000	1,000	5,000	5,000	---	4,000	1,000	---	---	---	2,000	---	17,000
Totals	646,585,000	317,102,000	92,742,000	95,659,000	128,701,000	80,798,000	71,069,000	9,729,000	188,128,000	33,824,000	12,219,000	9,488,000	64,337,000	66,280,000	1,980,000	60,557,000
FISCAL YEAR 1968																
Personnel compensation	400,419,000	176,578,000	34,506,000	58,694,000	83,378,000	51,113,000	46,273,000	4,840,000	138,601,000	24,899,000	9,270,000	6,622,000	45,109,000	51,009,000	1,692,000	34,127,000
Personnel benefits	30,777,000	13,603,000	2,816,000	4,376,000	6,411,000	3,731,000	3,368,000	363,000	10,567,000	1,899,000	686,000	500,000	3,434,000	3,851,000	197,000	2,876,000
Benefits for former personnel	1,137,000	855,000	---	60,000	795,000	---	---	---	---	---	---	---	---	---	---	282,000
Travel & transp. of persons	18,120,000	9,267,000	1,839,000	4,345,000	3,083,000	2,424,000	2,218,000	206,000	3,891,000	815,000	470,000	221,000	1,196,000	994,000	195,000	2,538,000
Transportation of things	4,683,000	2,193,000	1,529,000	506,000	158,000	1,446,000	1,316,000	130,000	757,000	48,000	50,000	30,000	400,000	225,000	4,000	287,000
Rents, communications, and utilities	51,637,000	25,298,000	8,089,000	9,022,000	8,187,000	8,806,000	8,344,000	462,000	14,725,000	3,935,000	1,835,000	245,000	5,310,000	3,400,000	---	2,808,000
Printing and reproduction	6,036,000	3,952,000	2,677,000	450,000	825,000	160,000	145,000	15,000	275,000	10,000	75,000	15,000	100,000	75,000	---	1,649,000
Other services	94,481,000	62,688,000	31,954,000	15,192,000	15,542,000	6,185,000	4,899,000	1,286,000	12,331,000	1,190,000	2,141,000	1,275,000	3,560,000	4,155,000	10,000	13,277,000
Services of other agencies	9,514,000	7,094,000	4,364,000	678,000	2,052,000	193,000	120,000	73,000	523,000	151,000	190,000	15,000	22,000	145,000	---	1,704,000
Supplies and materials	17,004,000	9,086,000	4,639,000	2,129,000	2,318,000	2,331,000	1,269,000	1,062,000	5,087,000	541,000	457,000	275,000	2,500,000	1,314,000	---	500,000
Equipment	4,842,000	1,713,000	1,057,000	354,000	302,000	550,000	220,000	330,000	1,517,000	50,000	288,000	215,000	164,000	800,000	---	1,062,000
Lands and structures	1,662,000	612,000	346,000	100,000	166,000	450,000	350,000	100,000	600,000	25,000	---	25,000	300,000	250,000	---	---
Grants, subsidies & contributions	22,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22,000
Insurance claims and indemnities	39,000	18,000	15,000	7,000	1,000	7,000	7,000	---	6,000	---	5,000	1,000	---	2,000	---	10,000
Totals	640,373,000	312,957,000	93,831,000	95,908,000	123,218,000	77,392,000	68,525,000	8,867,000	188,882,000	33,563,000	15,467,000	9,439,000	62,095,000	66,220,000	2,098,000	61,142,000
FISCAL YEAR 1969																
Personnel compensation	407,328,000	177,609,000	36,741,000	59,756,000	81,112,000	53,508,000	48,626,000	4,882,000	142,887,000	25,291,000	11,268,000	6,765,000	45,601,000	52,223,000	1,739,000	33,324,000
Personnel benefits	31,247,000	13,576,000	2,885,000	4,449,000	6,242,000	3,919,000	3,553,000	366,000	10,930,000	1,927,000	900,000	506,000	3,462,000	3,932,000	200,000	2,822,000
Benefits for former personnel	100,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	100,000
Travel & transp. of persons	18,169,000	9,267,000	1,839,000	4,345,000	3,083,000	2,424,000	2,218,000	206,000	3,947,000	815,000	525,000	222,000	1,196,000	994,000	195,000	2,531,000
Transportation of things	4,545,000	2,193,000	1,529,000	506,000	158,000	1,252,000	1,122,000	130,000	813,000	48,000	96,000	40,000	400,000	225,000	4,000	287,000
Rents, communications, and utilities	53,457,000	25,536,000	8,125,000	9,224,000	8,187,000	9,269,000	8,817,000	452,000	15,569,000	3,916,000	2,533,000	260,000	5,460,000	3,400,000	---	3,083,000
Printing and reproduction	6,031,000	3,943,000	2,668,000	450,000	825,000	160,000	145,000	15,000	277,000	10,000	72,000	20,000	100,000	75,000	---	1,651,000
Other services	95,528,000	63,614,000	33,993,000	15,103,000	14,518,000	5,647,000	4,375,000	1,272,000	12,756,000	1,201,000	2,470,000	1,299,000	3,560,000	4,155,000	71,000	13,511,000
Services of other agencies	9,494,000	7,086,000	4,356,000	678,000	2,052,000	193,000	120,000	73,000	518,000	151,000	185,000	15,000	22,000	145,000	---	1,697,000
Supplies and materials	16,244,000	8,288,000	4,359,000	2,129,000	1,800,000	2,321,000	1,259,000	1,062,000	5,135,000	541,000	605,000	275,000	2,500,000	1,214,000	---	500,000
Equipment	4,544,000	1,371,000	917,000	354,000	100,000	509,000	209,000	300,000	1,596,000	50,000	423,000	225,000	164,000	734,000	---	1,068,000
Lands and structures	1,458,000	483,000	283,000	100,000	100,000	300,000	150,000	150,000	675,000	25,000	---	100,000	300,000	250,000	---	---
Grants, subsidies & contributions	22,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22,000
Insurance claims and indemnities	33,000	18,000	15,000	2,000	1,000	---	---	---	5,000	---	2,000	1,000	---	2,000	---	10,000
Totals	648,200,000	312,984,000	97,710,000	97,096,000	118,178,000	79,502,000	70,594,000	8,908,000	195,108,000	33,975,000	19,079,000	9,728,000	62,765,000	67,352,000	2,209,000	60,606,000

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FISCAL YEAR 1969 ESTIMATES

ADMINISTRATIVE OPERATIONS

ANALYSIS OF REQUIREMENTS FOR PASSENGER-CARRYING MOTOR VEHICLES

The appropriation language provides for the acquisition of ten passenger motor vehicles, all of which are for replacement purposes only. All vehicles scheduled for replacement meet, or will meet, the criteria established by the General Services Administration for replacement of vehicles due either to age, mileage, or a combination of these factors.

A summary analysis of the planned acquisitions by type of vehicle in FY 1969 is as follows:

	<u>Total</u>	<u>Medium Sedans</u>	<u>Other Sedans</u>	<u>Station Wagons</u>	<u>Ambulances</u>	<u>Buses</u>
Planned fleet, July 1, 1968.	187	1	46	110	13	17
Number to be purchased in FY 1969.....	10	-	4	6	-	-
Number of disposals planned:	-10	-	-2	-8	-	-
To be replaced by identical vehicle type.....	(8)	(-)	(2)	(6)	(-)	(-)
To be replaced by another vehicle type.....	<u>(2)</u>	<u>(-)</u>	<u>(-)</u>	<u>(2)*</u>	<u>(-)</u>	<u>(-)</u>
Planned fleet, June 30, 1969	187	1	48	108	13	17

*Two station wagon disposals will be replaced with "Other Sedans" (also, note the difference of two between the purchases and replacements for "Other Sedans").

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Personnel.....	\$413,957,000	\$436,075,000	\$442,502,000	\$+6,427,000

DESCRIPTION:

The estimate for personnel and related costs includes the regular pay, overtime, holiday, Sunday and nightwork differential pay, of NASA personnel in permanent, temporary, part-time and intermittent positions, and the cost of military personnel and personnel of other agencies detailed to NASA. It also includes the Government's contribution to the Civil Service Retirement Fund for permanent employees, the contribution to social security for other than permanent employees, the Government's share of the cost of employees' life insurance and health benefits, incentive awards and the cost of severance pay. The estimate provides for the cost of travel to initial duty station, travel incident to permanent changes in station and the cost of shipment of household goods and personal effects for transferred employees. Reimbursement to the Civil Service Commission for security investigations and examining services, and payments to other agencies and non-government institutions for personnel training are also included in this activity.

DISTRIBUTION OF FUND REQUIREMENTS BY INSTALLATION:

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Kennedy Space Center.....	\$33,108,000	\$37,683,000	\$39,979,000
Manned Spacecraft Center.....	59,664,000	63,672,000	64,747,000
Marshall Space Flight Center...	90,259,000	91,184,000	87,954,000
Goddard Space Flight Center....	47,089,000	49,988,000	52,508,000
Wallops Station.....	5,153,000	5,301,000	5,346,000
Ames Research Center.....	25,923,000	26,943,000	27,372,000
Electronics Research Center....	7,407,000	10,126,000	12,428,000
Flight Research Center.....	7,098,000	7,205,000	7,368,000
Langley Research Center.....	46,865,000	48,726,000	49,246,000
Lewis Research Center.....	53,823,000	55,029,000	56,327,000
Space Nuclear Propulsion Office.....	1,691,000	1,893,000	1,943,000
NASA Headquarters.....	<u>35,877,000</u>	<u>38,325,000</u>	<u>37,284,000</u>
Total.....	<u>\$413,957,000</u>	<u>\$436,075,000</u>	<u>\$442,502,000</u>

BASIS OF FUND REQUIREMENTS:

The planned end of year employment for NASA civil service personnel includes 32,422 permanent employees in 1968 and 32,727 permanent employees in 1969. The plan for nonpermanent employees is 2,182, in 1968 and 1969. The total complement, therefore, is 34,604 positions in 1968 and 34,909 positions in 1969. The distribution of the permanent positions by installation is as follows:

DISTRIBUTION OF POSITIONS BY INSTALLATION

	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Permanent Positions</u>			
Kennedy Space Center.....	2,720	2,931	2,931
Manned Spacecraft Center.....	4,704	4,579	4,579
Marshall Space Flight Center.....	7,086	6,386	6,386
Goddard Space Flight Center.....	3,782	3,686	3,841
Wallops Station.....	518	497	497
Ames Research Center.....	2,173	2,092	2,092
Electronics Research Center.....	700	816	966
Flight Research Center.....	590	566	566
Langley Research Center.....	4,161	3,990	3,990
Lewis Research Center.....	4,676	4,485	4,485
Space Nuclear Propulsion Office.....	117	115	115
Headquarters.....	<u>2,499</u>	<u>2,279</u>	<u>2,279</u>
Subtotal.....	33,726	32,422	32,727
<u>Nonpermanent Positions</u>			
Total.....	<u>2,182</u>	<u>2,182</u>	<u>2,182</u>
Total.....	<u>35,908</u>	<u>34,604</u>	<u>34,909</u>

The number of permanent positions for 1968 is 1,704 fewer than included last year for 1968. The reduction is a result of the effect of the Congressional action on NASA's 1968 budget request. The authorization for Administrative Operations was \$648.2 million or a \$23.1 million reduction from the original \$671.3 million budget request. The plans which were developed to operate at this level reduced the employment level of 34,126 contemplated in the 1968 budget by 250 positions to a revised level of 33,876. This was accomplished by limiting the planned growth at the Electronics Research Center to 150 and keeping the Langley Research Center at the end 1967 level rather than increasing them as planned in the 1968 budget.

The appropriation, as enacted by Congress, was \$20.2 million less than the authorization, which required further reductions in the planned end year

employment levels. In general, each installation was assigned a 4% reduction in their planned end-year employment in order to operate within the reduced fund availability. The general reduction was adjusted to reflect changes in the Research and Development program which resulted from Congressional action and to reflect other programmatic requirements. The adjustments at the Kennedy Space Center (KSC), the Manned Spacecraft Center (MSC), the Marshall Space Flight (MSFC), the Goddard Space Flight Center (GSFC) and Headquarters were modified to reflect changes in programmatic emphasis. The Research and Development programs reduced or eliminated, impacted the workload at some centers more than others. Because the R&D program reduction impact at MSFC was substantially greater than at other installations, the reduction in personnel was commensurately greater. Because of the magnitude of the required reduction in staff at MSFC, and the timing of final appropriation action, use of reduction-in-force procedures are necessary to effect the bulk of the cut.

The reduction at the Goddard Space Flight Center is 96, which is less than the general pro-rata reduction. The GSFC ceiling was adjusted to provide the manpower needed to support adequately the manned space flight tracking effort for which they are responsible. In a similar manner the reduction at the Manned Spacecraft Center (MSC) was adjusted to accommodate requirements of the Apollo program. As the Apollo program moves toward extensive flight activity, the workload placed on KSC increases. The Kennedy Space Center personnel strength was augmented by 211 positions to accommodate this growth in their workload.

The other case of departure from a proportional reduction is at the Headquarters field offices. A review of the offices in the Los Angeles, California area was conducted and as a result, the functions of the NASA Pasadena Office and the Western Support Office will be consolidated and the Western Support Office abolished.

In addition to the changes noted above, there were changes to installation allocations because of modifications in agency structure and mission emphasis. The most notable of these occurred when the NASA Resident Office at Downey, California, was transferred from the cognizance of Headquarters and divided between the Manned Spacecraft Center and the Marshall Space Flight Center. This change amounted to a 70 increase to MSC and a 56 increase to MSFC. The other changes were minor.

The following table summarizes the changes for 1968 permanent position allocations to Institutional Directors from the 1968 budget to the current plan.

CHANGES IN THE 1968 PERMANENT POSITION PLAN

<u>Institutional Director</u>	<u>Plan in 1968 Budget</u>	<u>Internal NASA Realign- ments</u>	<u>Effect of Appropriation Reduction in 1968</u>	<u>1968 Plan in 1969 Budget</u>
Manned Space Flight.....	14,384	+126	-614	13,896
Space Science and Applications.....	4,300	---	-117	4,183
Advanced Research and Technology.....	12,831	-14	-753	12,064
Supporting Operations...	<u>2,611</u>	<u>-112</u>	<u>-220</u>	<u>2,279</u>
Total.....	<u>34,126</u>	<u>-0-</u>	<u>-1,704</u>	<u>32,422</u>

Permanent Positions

In 1969 NASA is requesting an increase of 305 permanent positions above the planned 1968 end of year employment level. An increase of 150 positions is proposed for the Electronics Research Center as the 1969 increment of their phased build-up and will bring their strength to 966 at the end of the year. The remaining 155 positions are for the Goddard Space Flight Center to provide for the performance of certain functions by civil service personnel rather than by contract. The employment level for all other installations will be held to the end 1968 level.

Nonpermanent Positions

The 1968 and 1969 plan for nonpermanent positions is 2,182, the same level as for 1967. These positions are used for varied programs, of which the largest is the NASA summer employment program. NASA hires college students and high school and college faculty members during the summer to augment its work force at the peak vacation period and to provide these people exposure to the NASA technical effort. The benefits to the participants are numerous, and the education and training they receive is a considerable national asset. A portion of the nonpermanent positions is used to provide for NASA's participation in the President's Youth Opportunity Campaign. This program presents underprivileged youths the opportunity to work at summer jobs at the various NASA installations, when unskilled personnel can be effectively used.

In addition, some of these positions are used during the remainder of the year to provide for the Agency's participation in the Back-to-School part of the Youth Opportunity Campaign. This program continues during the school year, and the underprivileged youths are employed at a variety of unskilled tasks during a limited work-week of not more than 15 hours.

As in the past, the Agency continues to provide significant training opportunities for technically oriented college students participating in the cooperative training program throughout the year. The student employed under a cooperative training agreement works for a term at a NASA installation and then spends a term in regular study at his college or university. This work-study program combines practical experience with theory and has been an outstanding recruitment source for NASA.

Experts and consultants are also included under nonpermanent positions. They are usually employed for a few days at a time when their expertise is required.

Manpower Utilization

DISTRIBUTION OF PERMANENT POSITIONS BY PROGRAM

<u>Direct Positions</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Manned Space Flight</u>	<u>10,536</u>	<u>10,277</u>	<u>10,260</u>
Gemini.....	30	---	---
Apollo.....	9,300	7,937	7,202
Apollo applications.....	888	2,015	2,707
Advanced missions.....	318	325	351
<u>Space Science and Applications</u>	<u>3,219</u>	<u>2,989</u>	<u>3,080</u>
Physics and astronomy.....	1,401	1,362	1,393
Lunar and planetary.....	405	284	286
Launch vehicle development.....	182	---	---
Launch vehicle procurement.....	445	476	469
Bioscience.....	271	276	279
Space applications.....	515	591	653
<u>University Affairs</u>			
Sustaining University Program.....	<u>57</u>	<u>54</u>	<u>54</u>
<u>Advanced Research and Technology</u>	<u>8,104</u>	<u>7,871</u>	<u>8,030</u>
Basic research.....	1,284	1,243	1,307
Space vehicle systems.....	1,462	1,362	1,329
Electronics systems.....	1,133	1,123	1,189
Human factor systems.....	383	374	379
Space power and electric propulsion systems.....	948	925	950
Nuclear rockets.....	409	198	188
Chemical propulsion.....	367	376	392
Aeronautical vehicles.....	2,118	2,270	2,296
<u>Tracking and Data Acquisition</u>	<u>976</u>	<u>958</u>	<u>952</u>
<u>Technology Utilization</u>	<u>51</u>	<u>47</u>	<u>47</u>
Subtotal, direct.....	22,943	22,196	22,423
<u>Support Positions</u>			
Director and staff.....	920	899	900
Administrative support.....	5,487	5,125	5,134
R&D support.....	<u>4,376</u>	<u>4,202</u>	<u>4,270</u>
Subtotal, support.....	10,783	10,226	10,304
Subtotal, permanent.....	33,726	32,422	32,727
Other than permanent.....	<u>2,182</u>	<u>2,182</u>	<u>2,182</u>
Total.....	<u>35,908</u>	<u>34,604</u>	<u>34,909</u>

A large portion of the civil service effort will continue to be applied in the manned space flight area. In 1967, the Gemini program was completed and the Apollo effort was peaking. In 1968 and 1969, there is a decline in the manpower applied to Apollo with some increase in the manpower required for the Apollo Applications area.

The effort applied to Space Science and Applications programs shows a decline between 1967 and 1968 because of changes in the authorized R&D program activity. The level in 1969 will be slightly higher than in 1968 because of the additional civil service personnel planned for the Goddard Space Flight Center in 1969.

The manpower working on Advanced Research and Technology programs shows a decline between 1967 and 1968. The chief reason for the change is the effect of Congressional action on the 1968 budget. The largest decline is in the Nuclear Rockets program. In 1969 there is an increase in the effort applied to the Aeronautical Vehicles and Electronics Systems programs.

The effort applied to the Tracking and Data Acquisition program is relatively unchanged over the three fiscal years. The increased effort required to prepare for the tracking of the manned Apollo missions has offset the declines in requirements for other programs.

The decline in the number of support positions between 1967 and 1968 relates to the position reductions made by the Agency in order to operate within the reduced appropriation. The increase in these positions in 1969 is related to the 305 new positions being requested.

The distribution of permanent positions by installation identifies where the effort is being applied and the distribution of permanent positions by program relates the staff to principal areas of work. Another aspect of agency employment is the composition of the work force by major skill as follows:

COMPOSITION OF PERMANENT STAFF BY OCCUPATIONAL GROUP

<u>Occupational Group</u>	<u>1967</u>		<u>1968</u>		<u>1969</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Professional scientists and engineers	14,015	41.5	13,919	42.9	14,037	42.9
Technicians.....	4,175	12.4	4,115	12.7	4,221	12.9
Wage board.....	5,162	15.3	4,557	14.1	4,577	14.0
Professional administrative.....	4,601	13.6	4,464	13.8	4,487	13.7
Clerical.....	<u>5,773</u>	<u>17.2</u>	<u>5,367</u>	<u>16.5</u>	<u>5,405</u>	<u>16.5</u>
Total.....	<u>33,726</u>	<u>100.0</u>	<u>32,422</u>	<u>100.0</u>	<u>32,727</u>	<u>100.0</u>

As reflected above, professional scientists and engineers comprise over forty-two percent of the NASA work force. Technicians and technically oriented wage board employees, who work in direct support of the professional technical staff, make up another twenty-seven percent of the complement. The types of positions included in each category are described below:

Professional scientists and engineers includes professional positions engaged in aerospace research, development, operations, and related work, including the development and operation of specialized facilities and supporting equipment. In addition, positions in the medical and biological sciences are included.

Technician positions include scientific and engineering aids, shop superintendents, quality assurance specialists, production planners and inspectors, technicians in drafting, photography, and related positions.

Wage board positions include trade, craft and general labor positions (both supervisory and nonsupervisory) which are compensated on the basis of prevailing local wage rates.

Professional administrative positions include professional management positions in the fields of general management, financial management, procurement contracting, personnel, security, library and editorial work, and related fields for which a university degree or the equivalent, and specialized training and experience are basic qualifications.

Clerical positions include secretarial, specialized and general clerical, administrative assistant, and related positions, the qualification requirements for which are clerical training and experience or specialized non-professional experience in the areas of supply, fiscal, logistics, statistics, or related activities.

SUMMARY OF PERSONNEL COSTS:

	<u>1967</u>	<u>1968</u>	<u>1969</u>
A. <u>COMPENSATION AND BENEFITS</u>			
1. <u>COMPENSATION</u>			
a. Permanent positions...	\$361,883,000	\$383,335,000	\$390,349,000
b. Nonpermanent positions	5,959,000	5,514,000	5,723,000
c. Reimbursable details..	4,041,000	4,379,000	4,486,000
d. Overtime and holiday pay.....	8,752,000	6,645,000	6,222,000
e. Other compensation....	<u>513,000</u>	<u>546,000</u>	<u>548,000</u>
Subtotal.....	\$381,148,000	\$400,419,000	\$407,328,000
2. <u>BENEFITS</u>	<u>28,374,000</u>	<u>30,988,000</u>	<u>30,572,000</u>
Subtotal.....	<u>\$409,522,000</u>	<u>\$431,407,000</u>	<u>\$437,900,000</u>
B. <u>SUPPORTING COSTS</u>			
1. Movement of personnel.....	\$1,449,000	\$1,967,000	\$1,869,000
2. Civil Service Commission services.....	370,000	455,000	451,000
3. Personnel training.....	<u>2,616,000</u>	<u>2,246,000</u>	<u>2,282,000</u>
Subtotal.....	<u>\$4,435,000</u>	<u>\$4,668,000</u>	<u>\$4,602,000</u>
Total, Personnel.....	<u>\$413,957,000</u>	<u>\$436,075,000</u>	<u>\$442,502,000</u>

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>COMPENSATION</u>	<u>\$381,148,000</u>	<u>\$400,419,000</u>	<u>\$407,323,000</u>
a. <u>Permanent Positions</u>	361,883,000	383,335,000	390,349,000

The largest segment of cost, compensation of personnel in permanent positions, amounts to \$390,349,000 in 1969, an increase of \$7.0 million over 1968. The estimate is based upon the position structure at the start of each year, as modified by the addition of new positions, within grade advances, career development, etc. After these modifications, the year-end position structure is established and the cost effect for the year is calculated based on the estimated time these modifications are in effect. The derivation of the cost for personnel in permanent positions is detailed below:

Cost of position structure - beginning of the year.....	\$351,378,000	\$372,222,000	\$385,393,000
Cost of additions to the structure:			
New positions.....	4,115,000	3,942,000	3,296,000
Salary legislation and pay raises.....	13,399,000	16,469,000	---
Within grade advances.....	5,791,000	5,753,000	5,578,000
Career development.....	6,438,000	5,574,000	5,422,000
Structure changes.....	304,000	252,000	---
Abolished positions.....	-6,067,000	-15,856,000	---
Effect of separation replacement policy.....	<u>-3,136,000</u>	<u>-2,963,000</u>	<u>-3,964,000</u>
Cost of position structure - end of year.....	\$372,222,000	\$385,393,000	\$395,725,000
Offsets:			
Lapse of new positions.....	-2,204,000	-2,141,000	-455,000
Delay in filling vacancies....	-5,874,000	-3,271,000	-3,562,000
Lapse on salary legislation and pay raises.....	-2,225,000	-4,197,000	---
Lapse on within grade advances	-2,919,000	-2,409,000	-2,671,000
Lapse on career development increases.....	-3,420,000	-2,552,000	-2,567,000
Partial year funding of separations.....	+1,553,000	+1,345,000	+1,835,000
Partial year funding of abolished positions.....	+2,943,000	+9,893,000	---
Terminal leave payments.....	+925,000	+1,806,000	+1,099,000
Work days in excess of 52 weeks	+1,402,000	---	+1,468,000
Reimbursement received from other government agencies for work performed by NASA employees.....	<u>-520,000</u>	<u>-532,000</u>	<u>-523,000</u>
Net cost of permanent positions...	<u>\$361,883,000</u>	<u>\$383,335,000</u>	<u>\$390,349,000</u>

Development of Salary Structure and Cost Estimate

The cost of new positions represents the salary requirements for additional positions to be allocated during this year. The salary level projected for them is slightly less than the projected agency average salary.

The increased costs due to salary legislation and pay raises are the result of Congressional action, the revision of special pay provisions by the Civil Service Commission and the periodic wage surveys for Wage Board employees. The 1967 increase is related to the Federal Employees Pay Act of 1966 passed in July 1966 and made retroactive to the beginning of FY 1967, the increase in February 1967 of the pay schedules for junior and middle grade scientists and engineers and the periodic area wage surveys conducted at each of our installations during 1967. The increase shown for 1968 represents only the first increment of Federal Employees Pay Act of 1967 effective in October 1967, and the periodic wage surveys conducted in 1968. The cost of the second increment of that pay act is not included in this budget request. The estimated government-wide cost of this increment is included in the President's budget as a one-line item.

The calculations for within grade advances, career development, and the effect of the separation replacement policy savings are the product of the NASA Position Management System, which was established in the agency in 1966. The system is an outgrowth of the computer-assisted program developed as part of the NASA Human Resources Study which was conducted over a six-month period in 1965 and provides an accurate profile and analysis of the existing agency position structure and is used as the basis for budget projections.

The changing character of work patterns result in shifts in the position structure between Wage Board and General Schedule positions. These structure changes differ in each installation to meet the needs of each.

The offset item, abolished positions, is the annual salary cost of the position reductions directed for NASA in 1967 and 1968. The other offset item, effect of separation replacement policy, is the savings in annual salaries resulting from the agency policy of replacing two-thirds of the separations in professional positions at the entrance level rather than at the grade of the separated employee. The amounts saved in 1967 and 1968 are lower because of the significant number of positions abolished rather than refilled in these years.

The cost of the position structure at the end of the year and the net cost, that is compensation actually paid, differ because the end year structure carries all salaries on an annual salary basis, and does not include such costs as terminal leave payments and work days in excess of 52 weeks. The differences from the salary structure are generally characterized as lapse items, and may be either deductive or additive to the schedule, depending upon the type of action.

The lapse on new positions represents the savings for the additional positions which become available to the agency during the fiscal year for the period of time required to place the new employees on the rolls.

Delays in filling vacancies represents the savings in annual salaries for the interval between the time an employee leaves the agency and the time a replacement is placed on the rolls. For 1969 this time interval is estimated at about five weeks. This is a change from last year's estimate which has been lowered to reflect the more rapid turnaround which results from lower ceilings. The estimate of savings in 1969 is higher than that for 1968 because in 1968 large numbers of positions were abolished rather than re-filled after being vacated.

The savings from lapse on salary legislation and pay raises results because these are effective for only part of the year in which they occur. The pay legislation in 1967 occurred virtually at the start of the year and resulted in no significant savings. On the other hand the pay legislation in 1968 was effective in October and resulted in approximately a one-fourth savings in annual cost. Similarly the change in the salary for junior and middle grade scientists and engineers was effective in February 1967, and cost in 1967, is only five-twelfth's of the annual rate. Since wage board employees' increases are established at various times during the year, and vary by geographical location, the savings amount reflects these variances.

Lapses on within grade advances and career development increases represent the savings for the period that employees were paid at salaries lower than those held at the end of the year. Partial year funding of abolished positions represents the cost of these positions before they were abolished. Partial year funding of separation is the cost of positions at the higher rate, which subsequently are filled at a lower grade because of the separation replacement policy.

Terminal leave payments are for accrued annual leave due separating employees and are an offset against the salary savings realized by the separation. The estimate is based upon prior experience.

Reimbursement received from other government agencies reflects the expected payments, chiefly from the Environmental Sciences Services Administration, for work performed by NASA.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
b. Nonpermanent Positions.....	\$5,959,000	\$5,514,000	\$5,723,000

The cost of nonpermanent positions is for the varied temporary employment programs carried on by NASA, such as the cooperative student training program, the summer student and faculty employment programs, participation in the President's Youth Opportunity Campaign, and other similar programs. The increase in 1969 over 1968 results chiefly from the full years effect of the recent pay legislation.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
c. Reimbursable Details.....	\$4,041,000	\$4,379,000	\$4,486,000

The services of a small group of military officers and civilian detailees from other government agencies are utilized in the conduct of NASA's program where such use is appropriate. The increases which are estimated result from recent pay legislation.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
d. Overtime and Holiday Pay.....	\$8,752,000	\$6,645,000	\$6,222,000

The decrease in overtime and holiday pay planned for 1969 is a continuation of effort to reduce cost in this area to the lowest possible level. The level of overtime as a percentage of permanent compensation, was 2.4% in 1967 which will be lowered to 1.7% in 1968 and 1.6% in 1969.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
e. Other Compensation.....	\$513,000	\$546,000	\$548,000

Other compensation costs provided for cost of living allowances, the cost of nightwork differential in which any employee whose regular tour of duty includes time between 6:00 p.m. and 6:00 a.m. receives ten percent additional compensation, and for Sunday work under which any employee whose regular scheduled work includes Sunday receives an increase of twenty-five percent for that day. The costs are relatively stable over the three years.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
2. BENEFITS.....	\$28,374,000	\$30,988,000	\$30,572,000

In addition to compensation, NASA makes an employer's contribution to personnel benefits as authorized and required by law. The following table indicates the costs of personnel benefits by the major categories:

<u>Category of Cost</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Contribution to the Civil Service Retirement Fund.....	\$23,583,000	\$24,937,000	\$25,466,000
Contribution for employee life insurance.....	1,125,000	1,159,000	1,171,000
Contribution for employee health insurance.....	2,726,000	2,769,000	2,822,000
Contribution to FICA.....	186,000	177,000	199,000
Incentive awards.....	376,000	426,000	430,000
Other personnel benefits.....	329,000	383,000	384,000
Severance pay.....	49,000	1,137,000	100,000
Total.....	<u>\$28,374,000</u>	<u>\$30,988,000</u>	<u>\$30,572,000</u>

The largest portion of the personnel benefits cost is the Agency's contribution to the Civil Service Retirement Fund. NASA contributes to the fund an amount equal to six and one-half percent of each permanent employee's salary. This contribution matches the amount contributed by the employee. The increase in 1969 is directly related to the increase in personnel compensation.

The agency contribution toward the cost of employee life and health insurance is based upon employee participation. FICA or social security contributions are for nonpermanent employees who are not covered by the Civil Service Retirement Act.

The cost of the incentive awards program and other personnel benefits is relatively stable from 1968 to 1969. The incentive awards program provides for cash awards for outstanding contributions to NASA, superior employee performance and for suggestions for improvement of the Agency's operations. Other personnel benefits provide for such items as uniform allowances and a special commuting allowance for personnel at the Space Nuclear Propulsion Office in Nevada. The severance pay estimate is related to the legal requirement to pay severance pay for employees separated through no fault of their own. The 1969 estimate is for the carry over of such costs into 1969 and results from reduction-in-force actions in 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
B. SUPPORTING COSTS.....	\$4,435,000	\$4,668,000	\$4,602,000

Supporting personnel costs provide for the expenses of moving employees employed by the government either to their initial duty station or reassignment, of security investigations and other recruitment costs, and of maintaining and expanding the skills of our employees.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. Movement of Personnel.....	\$1,449,000	\$1,967,000	\$1,869,000

The Legislation approved in 1966 provided that the government would pay for certain relocation costs, such as the expenses of selling and buying a home, the cost of one trip to the new duty station for the purpose of securing new housing, and the cost of family relocation allowances. These benefits are in addition to those previously paid to employees. The 1968 estimate is based upon projected full year costs after one year of operation under the new law. The 1969 level is expected to be slightly lower than 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
2. Civil Service Commission services.....	\$370,000	\$455,000	\$451,000

The Civil Service Commission conducts security investigations and provides generalized recruitment services to NASA. The cost of security investigations is a function of two variables, the number of investigations to be conducted and the unit-charge made by the Civil Service Commission. Compilation of center estimates of the number to be conducted and the projected unit-charge for each year is the basis for the cost estimate. In addition to these services, the Civil Service Commission modernized in 1966 its system of recruiting and staffing the civil service by the establishment of a network of Interagency Boards of Examiners to assume the examining process formerly carried out through the operations of 661 separate agency boards of examiners and the Commission's 11 examining offices. The boards will be financed by user agencies on a pro-rata basis. The estimated cost to NASA for these services will remain about the same level for 1968 and 1969.

	<u>1967</u>	<u>1968</u>	<u>1969</u>
3. Personnel training.....	\$2,616,000	\$2,246,000	\$2,282,000

The maintenance and expansion of the skills of personnel is essential to an organization such as NASA which is charged with the responsibility for complex technical programs. Such training is provided within the framework of the Government Employees Training Act of 1958. Part of the training is provided by other government agencies. When employees participate in training courses of other agencies, NASA is able to benefit from existing programs. The remainder of the training is provided through nongovernment sources, and the cost is for tuition, fees and related costs for training at colleges, universities, technical institutes and related institutions, and for the cost of seminars and workshops in which groups of employees receive training in courses of agency-wide interest. Such training is used to maintain and to expand employee skills. The increase in 1969 is primarily at the Electronics Research Center and is related to the increased complement at that center.

ADMINISTRATIVE OPERATIONS
FISCAL YEAR 1969 ESTIMATES

TRAVEL

	1967	1968	1969	Change in 1969
Travel.....	\$17,953,000	\$16,491,000	\$16,530,000	\$+39,000

DESCRIPTION:

The estimates include the cost of transportation, per diem, and incidental costs required for employee travel for the purpose of direction and coordination of Research and Development, Construction of Facilities, and administrative management programs; travel for contract management and flight mission support; and travel to launching sites and tracking stations. It also includes the cost of travel to NASA-sponsored meetings and conferences, as well as meetings sponsored outside NASA, when such travel is in the interest of the agency; of travel by non-NASA employees (31 USC 22a); and of travel by unpaid members of research advisory committees. Charter, contract, or lease of passenger aircraft and the cost of local transportation by taxi, bus, or private automobile for which the employee is reimbursed are included in the estimate. Costs for travel to initial duty station and for permanent change of station are excluded from this estimate and included under Personnel Related Costs. The costs of motor pool operations are included under Administrative Support.

DISTRIBUTION OF FUND REQUIREMENTS BY INSTALLATION:

	1967	1968	1969
Kennedy Space Center.....	\$867,000	\$819,000	\$819,000
Manned Spacecraft Center.....	4,433,000	4,093,000	4,093,000
Marshall Space Flight Center....	3,098,000	2,945,000	2,945,000
Goddard Space Flight Center.....	2,630,000	2,183,000	2,183,000
Wallops Station.....	136,000	127,000	127,000
Ames Research Center.....	841,000	793,000	793,000
Electronics Research Center.....	310,000	440,000	485,000
Flight Research Center.....	197,000	211,000	211,000
Langley Research Center.....	1,542,000	1,188,000	1,188,000
Lewis Research Center.....	1,058,000	988,000	988,000
Space Nuclear Propulsion Office.	193,000	195,000	195,000
NASA Headquarters.....	2,648,000	2,509,000	2,503,000
Total.....	\$17,953,000	\$16,491,000	\$16,530,000

BASIS OF FUND REQUIREMENTS:

SUMMARY OF TRAVEL BY MAJOR CATEGORY

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
<u>Program Related Travel</u>				
Direction, coordination, and management of Research and Development and Construction of Facilities program activities.....	\$10,354,000	\$9,763,000	\$9,610,000	\$-153,000
Flight mission support..	1,982,000	2,003,000	2,145,000	+142,000
Overseas travel to launch and tracking sites.....	<u>708,000</u>	<u>678,000</u>	<u>735,000</u>	<u>+57,000</u>
Subtotal.....	<u>\$13,044,000</u>	<u>\$12,444,000</u>	<u>\$12,490,000</u>	<u>\$+46,000</u>
<u>Meetings and Technical Seminars</u>				
Government-sponsored meetings.....	\$1,184,000	\$976,000	\$976,000	---
Other than government- sponsored meetings and technical seminars.....	<u>1,179,000</u>	<u>980,000</u>	<u>980,000</u>	<u>---</u>
Subtotal.....	<u>\$2,363,000</u>	<u>\$1,956,000</u>	<u>\$1,956,000</u>	<u>---</u>
Administrative Travel.....	<u>\$2,546,000</u>	<u>\$2,091,000</u>	<u>\$2,084,000</u>	<u>\$-7,000</u>
Total, Travel.....	<u>\$17,953,000</u>	<u>\$16,491,000</u>	<u>\$16,530,000</u>	<u>\$+39,000</u>

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Direction, coordination and management of programs...	\$10,354,000	\$9,763,000	\$9,610,000	\$-153,000

The travel most directly related to Research and Development and Construction of Facilities activities is included under program related travel. The amount for this purpose accounts for over 75% of the travel requirements in 1969. The largest individual item is for direction, coordination and manage-

ment of research and development and construction of facilities program activities. Because of the complexity of the programs and the distribution of contractor and subcontractor effort throughout the entire United States, coordination of activities requires frequent examination by personnel responsible for the program. In addition to coordination of activities, the cost of travel for the management of contracts places with industry, universities, and others is included here.

The costs for this travel are estimated to be \$153,000 lower in 1969 than in 1968. The largest part of the decrease is due to the change in orientation from the development of the launch technique at the Kennedy Space Center to actual flight mission operations, and in a similar change at the Manned Spacecraft Center from spacecraft development to flight mission operations. These decreases are partially offset by an increase at the Electronics Research Center which reflects the additional responsibilities there in 1969 for both direction and coordination of program activities, and for management of an increased number of contracts.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Flight mission support.....	\$1,982,000	\$2,003,000	\$2,145,000	\$+142,000

As projects reach the flight stage, support is required for prelaunch, launch, and post-launch activities. The amount of travel required for this purpose is directly related to both the number and complexity of the launches. The increase is reflected in the travel requirements for the manned space flight Centers to support the approved Apollo launch schedule.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Overseas travel to launch and tracking sites.....	\$708,000	\$678,000	\$735,000	\$+57,000

Overseas travel to launch and tracking sites includes travel required for instrumentation of the tracking sites, inspection of the sites prior to launch, and the cost of travel of additional personnel required during launches. The increase is related to the extended Apollo flights in 1969.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Meetings and technical seminars.....	\$2,363,000	\$1,956,000	\$1,956,000	---

Travel to meetings and technical seminars permits employees engaged in program activities to participate at both government-sponsored and nongovernment-sponsored meetings and technical seminars with other outstanding representatives of the aerospace community. This participation allows personnel to benefit from exposure to advances in the field arising outside NASA, as well as allowing personnel to present both accomplishments and problems to their associates. Many of the government-sponsored meetings are made up of working panels convened to solved certain problems for the benefit of the government. Authorization to attend any meetings of the types described is granted only after assurance that the meeting attendance will be in the interest of NASA. The estimate for this travel in 1969 is the same as for 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Administrative travel.....	\$2,546,000	\$2,091,000	\$2,084,000	\$-7,000

Administrative travel includes travel for the direction and coordination of general management matters. It provides for travel by functional managers in such areas as personnel, financial management, and procurement; to assure that agency policies and procedures are being implemented and carried out properly throughout the agency. Travel by senior officials to review center requirements and operations and the travel of center officials to NASA Headquarters is provided for in this category. This category also provides for travel in and around the vicinity of the centers, including bus and taxi services and rental of motor vehicles, and travel of unpaid members of research advisory committees. The slight reduction in 1969 for travel is related to the manpower reduction at Marshall Space Flight Center, and is partially offset by an increased requirement at the Electronics Research Center to accommodate the projected manpower buildup.

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

AUTOMATIC DATA PROCESSING

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Automatic data processing...	\$36,919,000	\$31,506,000	\$31,487,000	\$-19,000

DESCRIPTION:

The funds budgeted in this category provide for the acquisition of automatic data processing (ADP) equipment by lease or purchase, maintenance of NASA owned equipment, and the procurement of programming and operation services. Both electronic data processing and ancillary electric accounting machine equipments are included. The overall requirement for ADP is divided by appropriation in accordance with the purpose serviced by the equipment. The Administrative Operations appropriation provides for the general purpose, scientific and business data processing which support the overall installation operations. Other appropriations provide for data processing systems and operations which are dedicated to specific programs or projects, or are integrated into larger systems. A full discussion of total ADP requirements is found in the special ADP analysis which appears in Volume I of this budget.

DISTRIBUTION OF FUND REQUIREMENTS BY INSTALLATION:

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Kennedy Space Center.....	\$1,302,000	\$1,200,000	\$1,320,000
Manned Spacecraft Center...	6,430,000	6,843,000	6,843,000
Marshall Space Flight Center.....	10,620,000	9,486,000	9,094,000
Goddard Space Flight Center	7,284,000	5,897,000	5,916,000
Wallops Station.....	91,000	75,000	75,000
Ames Research Center.....	1,819,000	1,544,000	1,544,000
Electronics Research Center	1,031,000	1,273,000	1,366,000
Flight Research Center.....	103,000	51,000	51,000
Langley Research Center....	6,557,000	3,515,000	3,515,000
Lewis Research Center.....	463,000	293,000	349,000
Space Nuclear Propulsion Office.....	26,000	---	---
NASA Headquarters.....	1,193,000	1,329,000	1,414,000
Total.....	<u>\$36,919,000</u>	<u>\$31,506,000</u>	<u>\$31,487,000</u>

BASIS OF FUND REQUIREMENTS:

SUMMARY OF AUTOMATIC DATA PROCESSING

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Lease of equipment.....	\$18,532,000	\$19,630,000	\$20,314,000	+\$684,000
Purchase of equipment.....	5,420,000	33,000	25,000	-8,000
Maintenance of equipment..	<u>1,542,000</u>	<u>1,863,000</u>	<u>1,560,000</u>	<u>-303,000</u>
Subtotal, Equipment.....	25,494,000	21,526,000	21,899,000	+373,000
Programming and operation services.....	<u>11,425,000</u>	<u>9,980,000</u>	<u>9,588,000</u>	<u>-392,000</u>
Total, Automatic data processing.....	<u>\$36,919,000</u>	<u>\$31,506,000</u>	<u>\$31,487,000</u>	<u>\$ -19,000</u>
	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Lease of equipment.....	\$18,532,000	\$19,630,000	\$20,314,000	+\$684,000

The lease requirements for ADP equipment represent approximately 65% of the total ADP costs funded from the Administrative Operations appropriation. The estimate for 1969 is \$684,000 higher than the amount required in 1968. Of this increase, \$302,000 is required at the Goddard Space Flight Center to provide for the overlap of leased peripheral equipment during the final installment of third generation equipment, procured in prior years, and the continuation of the phase-out of the second generation equipment. The balance of the increase is required at the Kennedy Space Center (\$120,000), Electronics Research Center (\$127,000), Lewis Research Center (\$64,000), and Headquarters (\$85,000). The costs at all other installations are estimated to remain essentially the same in 1969. The increase for Kennedy Space Center of \$120,000 is due to the phase-in of a third generation computer, and will, when it becomes fully programmed and operational, replace two IBM 7010 computers. The increase of \$127,000 at the Electronics Research Center is required to provide peripheral equipment to support the installation there of a NASA-owned computer released from the Goddard Space Flight Center in 1968. The other increases in leased costs are required to support increased workload requirements at the Lewis Research Center and Headquarters.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Purchase of equipment.....	\$5,420,000	\$33,000	\$25,000	-\$8,000

The requirement for equipment to be purchased in 1969 amounts to \$25,000 and is \$8,000 less than the amount for purchase in 1968. The entire amount is required at Flight Research Center for a disk drive to be added to a general purpose computer system, and is required to handle the increased data reduction generated by the additional aircraft being tested at the Center.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Maintenance of equipment...	\$1,542,000	\$1,863,000	\$1,560,000	\$-303,000

The funds required for ADP maintenance will be \$303,000 less than the amount required in 1968. The decreases occur at the Goddard Space Flight Center (\$273,000) and at the Marshall Space Flight Center (\$30,000), and all other installations' costs will be constant in 1969.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Programming and operational services.....	\$11,425,000	\$9,980,000	\$9,588,000	\$-392,000

In 1969, the cost of contractor programming and operation services which are related to the larger and more sophisticated systems in operation are more than offset by the peaking in 1967 of costs related to the changeover of equipment. The largest decrease (\$348,000) occurs at the Marshall Space Flight Center as a result of the centralization and consolidation of automatic data processing capability associated with the installation of third generation equipment. All other centers will be at the 1968 level, except the Electronics Research Center, where there is a reduction of \$34,000.

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

FACILITIES SERVICES

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Facilities services.....	\$106,209,000	\$92,635,000	\$94,928,000	\$+2,293,000

DESCRIPTION:

Facilities services includes the rental of lands and buildings, the procurement of electricity, water, gas, and other utilities; and maintenance of buildings and grounds, and minor construction and facility modifications. It also includes custodial services consisting of security services, janitorial services, cleaning, exterminating and refuse handling, laundry and fire protection. Funds required also provide for the maintenance and repair of general purpose instruments, research equipment, and shop equipment. Requirements for general purpose building materials, hardware, and electronics supplies and materials, as well as procurement of mechanical, laboratory and shop equipment are also included in the estimate. The requirement for major contractual service effort at the Merritt Island Launch Area and reimbursement to the Air Force for services provided to the Kennedy Space Center are also included in this category.

DISTRIBUTION OF FUND REQUIREMENTS BY INSTALLATION:

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Kennedy Space Center..	\$47,801,000	\$43,403,000	\$45,305,000
Manned Spacecraft Center.....	12,647,000	10,861,000	11,047,000
Marshall Space Flight Center.....	11,419,000	9,298,000	8,741,000
Goddard Space Flight Center.....	8,110,000	5,634,000	5,432,000
Wallops Station.....	3,142,000	2,310,000	2,345,000
Ames Research Center..	3,932,000	3,191,000	3,174,000
Electronics Research Center.....	1,971,000	2,007,000	2,943,000
Flight Research Center Langley Research Center.....	1,161,000	1,162,000	1,268,000
Lewis Research Center.	6,452,000	6,077,000	6,247,000
Space Nuclear Propul- sion Office.....	8,602,000	7,926,000	7,744,000
NASA Headquarters.....	---	---	---
	<u>972,000</u>	<u>766,000</u>	<u>682,000</u>
Total.....	<u>\$106,209,000</u>	<u>\$92,635,000</u>	<u>\$94,928,000</u>

BASIS OF FUND REQUIREMENTS:

SUMMARY OF FACILITIES SERVICES

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
<u>Acquisition of Facilities</u>				
Rental of real property	\$1,822,000	\$1,975,000	\$2,611,000	+\$636,000
Minor construction and modifications.....	<u>5,846,000</u>	<u>1,692,000</u>	<u>1,488,000</u>	<u>-204,000</u>
Subtotal.....	<u>\$7,668,000</u>	<u>\$3,667,000</u>	<u>\$4,099,000</u>	<u>+\$432,000</u>
<u>Maintenance and Related Services</u>				
Maintenance, repair, and alteration of buildings and grounds	\$14,979,000	\$13,150,000	\$13,004,000	\$-146,000
Maintenance and repair of equipment.....	3,296,000	3,127,000	3,094,000	-33,000
Custodial services.....	<u>11,355,000</u>	<u>9,988,000</u>	<u>9,974,000</u>	<u>-14,000</u>
Subtotal.....	<u>\$29,630,000</u>	<u>\$26,265,000</u>	<u>\$26,072,000</u>	<u>\$-193,000</u>
<u>Operations of Facilities.</u>				
Utilities.....	\$11,861,000	\$12,361,000	\$12,634,000	+\$273,000
Supplies and equipment.	<u>14,078,000</u>	<u>11,037,000</u>	<u>10,618,000</u>	<u>-419,000</u>
Subtotal.....	<u>\$25,939,000</u>	<u>\$23,398,000</u>	<u>\$23,252,000</u>	<u>\$-146,000</u>
<u>Range Operations.....</u>	<u>\$42,972,000</u>	<u>\$39,305,000</u>	<u>\$41,505,000</u>	<u>+\$2,200,000</u>
<u>Total, Facilities Services.....</u>	<u>\$106,209,000</u>	<u>\$92,635,000</u>	<u>\$94,928,000</u>	<u>+\$2,293,000</u>
	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Rental of real property	\$1,822,000	\$1,975,000	\$2,611,000	+\$636,000

Rental of land and property is required to house personnel and provide storage and warehouse space for supplies and materials where space is not available in government-owned facilities. Funds required for this purpose are estimated at \$2,611,000 in 1969, an increase of \$636,000 over the 1968 estimate. The major increases are at Goddard Space Flight Center (\$193,000) as a result of higher rental cost to provide additional and more adequate off-site office and laboratory space, and at the Electronics Research Center

(\$500,000) which reflects the projected buildup in manpower and laboratories during 1969.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Minor construction and modifications.....	\$5,846,000	\$1,692,000	\$1,488,000	\$-204,000

This activity provides for additions, modifications, and minor construction of facilities within statutory limitations. The requirements are of a continuing nature which are generated by changes in the research and development program, as well as development of new technology. The 1969 estimate is reduced \$204,000 due mainly to reductions at Goddard Space Flight Center and at the manned space flight centers. The decrease at Goddard Space Flight Center is due to the completion of the current phase of the Center housing plan. The decreases at the manned space flight centers reflect the completion of much of the planned minor construction. Increases include \$75,000 at the Flight Research Center for the storage of aircraft parts and other maintenance materials, and \$50,000 at Wallops Station for minor repair projects.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Maintenance, repair, and alterations of buildings and grounds.....	\$14,979,000	\$13,150,000	\$13,004,000	\$-146,000

The amount required for maintenance and repair of buildings and grounds is estimated at \$13,004,000, a decrease of \$146,000 from 1968. Most of the reduction is reflected in the cut back in operations at the Marshall Space Flight Center and the decision to defer selected maintenance, repair, and alterations of buildings and grounds at Goddard Space Flight Center. The requirements at the rest of the Centers remain at relatively the same level as 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Maintenance and repair of equipment.....	\$3,296,000	\$3,127,000	\$3,094,000	\$-33,000

Maintenance and repair consists of work necessary to keep mechanical laboratory and shop equipment operational. The net reduction of \$33,000 is a result mainly of a decrease of \$158,000 at Marshall Space Flight Center due to the cut back in operations, and the increase of \$119,000 at the Electronics Research Center compatible with the increased activity expected in 1969.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Custodial services.....	\$11,355,000	\$9,988,000	\$9,974,000	\$-14,000

The requirement for custodial services decreases by \$14,000 in 1969 as compared to 1968. This change is the result of several small offsetting increases and decreases.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Utilities.....	\$11,861,000	\$12,361,000	\$12,634,000	+\$273,000

Funds required for utilities will increase in 1969 by \$273,000 to a total of \$12,634,000. The increase is primarily at the research centers. The increase at Langley Research Center (\$135,000) is required in order to operate facilities there at the level required to carry out the R&D program assigned to LRC. The other major increase will be at the Manned Spacecraft Center as a result of a full year's operation of new facilities and extended mission operations support. Other changes are minor with the exception of the Lewis Research Center where a decrease of \$69,000 will be made in the use of electrical power in 1969.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Supplies and equipment...	\$14,078,000	\$11,037,000	\$10,618,000	\$-419,000

The requirement for supplies and equipment in 1969 represents a decrease of \$419,000. The major changes occur at the research and the manned space flight centers. A decrease will be made at Lewis Research Center primarily through the reduction of inventories. Other decreases are at Kennedy Space Center because of a reduction in requirements for alterations of facilities, and at Marshall Space Flight Center due to a cut back in personnel and operations. These decreases are partially offset by an increase at the Electronics Research Center where an additional \$168,000 is required to stock and operate the additional laboratory facilities.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Range operations.....	\$42,972,000	\$39,305,000	\$41,505,000	+\$2,200,000

Over 40% of the estimate for all of NASA facilities services relates to services procured at the Kennedy Space Center through major support con-

tractors for services, utilities, and for support received from the Air Force Eastern Test Range. Services received through contractors are primarily utilized at the Merritt Island Launch Area. These services are provided by three major support contractors, and cover facilities engineering and planning, maintenance, repair, and operation of facilities and utilities, maintenance of roads and grounds, supply operations, fire protection, industrial health services, security, computer operations, publication and graphics support, photography and library services. Reimbursements to the Air Force, except for utilities, are primarily for requirements at the Cape Kennedy Air Force Station complex, including maintenance and repair of buildings and equipment, security, exterminating, printing, medical services, photography and supply support. For convenience in understanding the requirement, these requirements are consolidated under Facilities Services, and not distributed to other categories. The estimate for range operations in 1969 is \$41.5 million, an increase of \$2.2 million over 1968. During 1968, the transition from the activation and initial occupancy activity at Launch Complex 39 was accomplished. The following table summarizes funding requirements by purpose:

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
ADP operations.....	\$2,838,000	\$2,453,000	\$2,800,000	\$+347,000
Utilities.....	3,632,000	3,775,000	3,936,000	+161,000
Maintenance, repair, alteration, and opera- tion of facilities.....	16,836,000	15,823,000	15,862,000	+39,000
Custodial services.....	5,481,000	4,868,000	5,848,000	+980,000
Engineering services....	1,153,000	1,000,000	850,000	-150,000
Support services.....	<u>13,032,000</u>	<u>11,386,000</u>	<u>12,209,000</u>	<u>+823,000</u>
Total.....	<u>\$42,972,000</u>	<u>\$39,305,000</u>	<u>\$41,505,000</u>	<u>\$+2,200,000</u>

The increases related to ADP operations, maintenance and operation of facilities, custodial services and support services are due to the resumption of launch activity which was interrupted by the Apollo 204 accident. The anticipated buildup in range operations was delayed after the accident. This delay was in effect for half of 1968. The currently approved launch schedule requires more intensive activity, particularly at Launch Complex 39, during the last half of 1968, and the activity level reached by the end of the year will continue through 1969. The estimate for 1969 represents the cost of continuing this level of activity for the year.

Funds required for utilities at Kennedy Space Center will increase by \$161,000. This increase is required for electricity and relates to increased Launch Complex 39 operations and the occupancy of two new wing additions to the KSC Headquarters Building.

A decrease of \$150,000 in engineering services reflects reduced requirements for design of facility modifications as Apollo hardware configurations and support requirements are determined.

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

TECHNICAL SERVICES

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
Technical services....	\$23,689,000	\$18,790,000	\$18,785,000	\$-5,000

DESCRIPTION:

The estimate for technical services provides for the costs of engineering services, and of scientific and technical information and educational/informational programs. Included in engineering services are the costs of engineering design and reliability and quality assurance studies. The scientific and technical information programs, which furnish up-to-date reporting of scientific and technical programs, provide for the support of the technical libraries located at various installations, the acquisition and dissemination of scientific and technical literature, and for educational/informational programs.

DISTRIBUTION OF FUND REQUIREMENTS BY INSTALLATION:

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Kennedy Space Center.....	---	---	---
Manned Spacecraft Center.....	\$1,256,000	\$834,000	\$834,000
Marshall Space Flight Center...	4,438,000	2,664,000	2,366,000
Goddard Space Flight Center....	1,365,000	746,000	736,000
Wallops Station.....	90,000	93,000	89,000
Ames Research Center.....	205,000	70,000	70,000
Electronics Research Center....	554,000	704,000	636,000
Flight Research Center.....	80,000	88,000	83,000
Langley Research Center.....	310,000	310,000	310,000
Lewis Research Center.....	865,000	671,000	670,000
Space Nuclear Propulsion Office	66,000	10,000	71,000
NASA Headquarters.....	<u>14,460,000</u>	<u>12,600,000</u>	<u>12,920,000</u>
Total.....	<u>\$23,689,000</u>	<u>\$18,790,000</u>	<u>\$18,785,000</u>

BASIS OF FUND REQUIREMENTS:

SUMMARY OF TECHNICAL SERVICES

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
<u>ENGINEERING SERVICES</u>				
Reliability and quality assurance studies.....	\$603,000	\$424,000	\$424,000	---
Engineering design.	1,833,000	958,000	618,000	\$-340,000
Other.....	<u>1,185,000</u>	<u>912,000</u>	<u>996,000</u>	<u>+84,000</u>
Subtotal.....	3,621,000	2,294,000	2,038,000	-256,000
<u>SCIENTIFIC AND TECHNICAL INFORMA- TION AND EDUCA- TIONAL PROGRAMS</u>				
Operation of NASA technical library	2,733,000	2,243,000	2,263,000	+20,000
Educational/infor- mation programs..	5,982,000	4,359,000	4,480,000	+121,000
Scientific and technical infor- mation.....	<u>11,353,000</u>	<u>9,894,000</u>	<u>10,004,000</u>	<u>+110,000</u>
Subtotal.....	20,068,000	16,496,000	16,747,000	+251,000
Total.....	<u>\$23,689,000</u>	<u>\$18,790,000</u>	<u>\$18,785,000</u>	<u>\$-5,000</u>

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
ENGINEERING SERVICES...	\$3,621,000	\$2,294,000	\$2,038,000	\$-256,000

Engineering services provide for reliability and quality assurance studies, engineering design and other related costs. The estimated costs in 1969 are \$2,294,000 which is \$256,000 less than in 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Reliability and quality assurance studies	\$603,000	\$424,000	\$424,000	---

The cost for reliability and quality assurance will be \$424,000 in 1969, the same as 1968. These funds will provide for the operation of the Reliability and Quality Assurance Training School operated by Marshall Space Flight Center, and the development of reliability methodology guidelines and for studies of integrated testing and system design trade-off analyses.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Engineering design....	\$1,833,000	\$958,000	\$618,000	\$-340,000

Engineering design provides for the design of minor construction projects, repair and alteration requirements, special tools, equipment and machine parts. The costs for 1969 are \$618,000, which represent a decrease of \$340,000 under the \$958,000 estimated for 1968. The largest decrease, \$225,000, is identified with Marshall Space Flight Center's discontinuance of support contractor effort for engineering design services. The other major reduction is at the Electronics Research Center, as a result of curtailment of equipment and integration studies.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Other.....	\$1,185,000	\$912,000	\$996,000	+\$84,000

Other engineering services requirements include such special services as the nuclear safety effort at the Plum Brook reactor, and studies essential to the operation of the Nuclear Rocket Development Station (NRDS) in Nevada. The estimated costs will be \$84,000 more in 1969 than in 1968. The largest portion of the increase, \$61,000 is related to requirements for additional special studies at NRDS due to the anticipated 1969 R&D program to be carried on there. The other increase is a net amount reflecting minor increases and decreases at various other centers.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
SCIENTIFIC AND TECHNICAL INFORMATION AND EDUCATIONAL PROGRAMS	\$20,068,000	\$16,496,000	\$16,747,000	+\$251,000

Included in these programs are the costs of the technical libraries, educational/information programs and the scientific and technical information services. The funding required to finance these programs is \$16,747,000 in 1969, an increase of \$251,000 over 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Operation of technical libraries.....	\$2,733,000	\$2,243,000	\$2,263,000	+\$20,000

The cost of the operation of technical libraries in 1969 will be \$2,263,000, which is an increase of \$20,000 over 1968. This increase is required to support the Electronics Research Center library at a level commensurate with its larger complement.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Educational/Informa- tional Programs.....	\$5,982,000	\$4,359,000	\$4,480,000	+\$121,000

The educational/informational programs, which will cost \$4,480,000 in 1969, provide for a scope of activities designed to disseminate information about the space program, and its results, as widely as practicable, as directed in the Space Act. The activities include the gathering and exposition of newsworthy material for the mass communications media, and providing information and support in response to their requests. Other activities are designed to serve the expressed needs of students through the secondary level, and their teachers. Of these activities, the spacemobile program, a touring lecture-demonstration, is the most extensive. The 30 mobile units, each of which is manned by a qualified and experienced teacher, are used in about 11,000 lecture demonstrations a year. Most of these are to in-school groups, and over 400 were for teachers at workshops and other in-service training sessions. It is estimated that over 2.5 million people a year attend spacemobile lectures, and an additional 11.5 million see or hear the lectures on radio and TV.

Information about results of the space program is also made available to the educational community through: (1) development of space-related materials of instruction to supplement the regular course materials; (2) assistance with almost 500 teacher workshops and professional education conferences; (3) sponsorship of the Youth Science Congresses in cooperation with the National Science Teachers Association; and (4) participation in Science Fairs and other motivational programs.

Publications, motion pictures, and exhibits are the other media used to communicate information about how space is being explored and what is being learned. Publications and motion pictures provide the primary resource materials which are drawn upon most by students and teachers. Information in all three forms is also available to the general public, and to the many special audiences seeking information about aerospace research and technology.

About 3,500,000 copies of publications are distributed each year, most in response to written inquiries received from teachers, students, and the general public. Publications are also made available through the spacemobile program, and handed out to visitors at exhibits and at NASA installations.

Schools at the elementary and secondary level make up about 80% of the live viewing audience of over four million for NASA films. The remainder is divided about equally between higher education and teacher training, and civic and community group audiences. It is estimated that over 50 million people a year view NASA motion pictures made available by request to television stations.

Exhibits at over 700 showings were seen by almost 34 million persons, not including Expo 67 or the Paris Air Show.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Scientific and technical information.....	\$11,353,000	\$9,894,000	\$10,004,000	\$+110,000

The scientific and technical information activity includes the cost of the NASA Scientific and Technical Information Facility, documentation services, manuscript preparation, systems development and translation services. These services are estimated to cost \$10.0 million in 1969 which is approximately \$.1 million higher than required in 1968. The largest requirement is the NASA Scientific and Technical Information Facility under the cognizance of Headquarters, which will cost \$5.4 million in 1969. This is an increase of \$.2 million over the 1968 costs and is required because of the additional number of scientific and technical reports becoming available from research and development programs. The level of cost for all other information services, estimated at \$4.6 million, is slightly below 1968. These costs are for the documentation of world-wide aerospace journal literature; the preparation of manuscript material such as handbooks, data compilations, monographs, and technical reviews; analyzing, evaluating, and testing new methods and systems in the field of scientific communications to increase the effectiveness of the technical information program; and translating foreign language technical books, reports, and journal articles required to meet the needs of NASA and its contractor scientific personnel which are used to keep abreast of world developments in the space sciences and related fields.

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

ADMINISTRATIVE SUPPORT

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change <u>in 1969</u>
Administrative support services.....	\$47,858,000	\$44,876,000	\$43,968,000	\$-908,000

DESCRIPTION:

Included in Administrative Support Services are general services which support overall installation operations. The administrative expenses for communications, printing and reproduction, supplies, materials and equipment, transportation (motor pool, administrative aircraft services and operations, and movements by common carrier), and other services (installation operations and medical services), are provided in this section of the budget estimate.

DISTRIBUTION OF FUND REQUIREMENTS BY INSTALLATION:

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Kennedy Space Center.....	\$9,664,000	\$10,726,000	\$10,287,000
Manned Spacecraft Center.....	11,229,000	9,605,000	9,532,000
Marshall Space Flight Center.....	8,867,000	7,641,000	7,078,000
Goddard Space Flight Center.....	4,591,000	4,077,000	3,819,000
Wallops Station.....	1,117,000	961,000	926,000
Ames Research Center.....	1,104,000	1,022,000	1,022,000
Electronics Research Center.....	946,000	917,000	1,221,000
Flight Research Center.....	849,000	722,000	747,000
Langley Research Center.....	2,611,000	2,279,000	2,259,000
Lewis Research Center.....	1,469,000	1,313,000	1,274,000
Space Nuclear Propulsion Office...	4,000	---	---
NASA Headquarters.....	<u>5,407,000</u>	<u>5,613,000</u>	<u>5,803,000</u>
Total.....	<u>\$47,858,000</u>	<u>\$44,876,000</u>	<u>\$43,968,000</u>

BASIS OF FUND REQUIREMENTS:

SUMMARY OF ADMINISTRATIVE SUPPORT SERVICES

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
<u>COMMUNICATIONS</u>				
Leased lines and long distance tolls.....	\$4,632,000	\$4,876,000	\$4,944,000	+\$68,000
Local telephone service.....	5,588,000	6,259,000	6,088,000	-171,000
Other communications.	<u>1,485,000</u>	<u>1,743,000</u>	<u>1,959,000</u>	<u>+216,000</u>
Subtotal.....	<u>11,705,000</u>	<u>12,878,000</u>	<u>12,991,000</u>	<u>+113,000</u>
<u>ADMINISTRATIVE PRINTING</u>	<u>5,558,000</u>	<u>5,267,000</u>	<u>5,270,000</u>	<u>+3,000</u>
<u>SUPPLIES, MATERIALS AND EQUIPMENT</u>				
Supplies and mate- rials.....	9,746,000	7,591,000	7,159,000	-432,000
Equipment.....	<u>3,278,000</u>	<u>2,819,000</u>	<u>2,591,000</u>	<u>-228,000</u>
Subtotal.....	<u>13,024,000</u>	<u>10,410,000</u>	<u>9,750,000</u>	<u>-660,000</u>
<u>TRANSPORTATION</u>				
Center operations....	6,497,000	6,318,000	5,897,000	-421,000
Common carrier.....	<u>1,813,000</u>	<u>1,733,000</u>	<u>1,748,000</u>	<u>+15,000</u>
Subtotal.....	<u>8,310,000</u>	<u>8,051,000</u>	<u>7,645,000</u>	<u>-406,000</u>
<u>ADMINISTRATIVE SUPPORT SERVICES</u>				
Installation support services.....	7,905,000	6,762,000	6,789,000	+27,000
Medical services.....	<u>1,356,000</u>	<u>1,508,000</u>	<u>1,523,000</u>	<u>+15,000</u>
Subtotal.....	<u>9,261,000</u>	<u>8,270,000</u>	<u>8,312,000</u>	<u>+42,000</u>
Total, Administrative Support Services... \$	<u>47,858,000</u>	<u>44,876,000</u>	<u>43,968,000</u>	<u>\$-908,000</u>
	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
COMMUNICATIONS.....	\$11,705,000	\$12,878,000	\$12,991,000	+\$113,000

The funds required for communications include the cost of leased lines, long distance tolls, local telephone exchange services, and other communications; such as, TWX, telegraph, and postage. Installations and their major

subinstallations are located in twelve states and the District of Columbia. In addition, business is conducted with companies and institutions in all the states. Consequently, the cost of communications to integrate these centers of work is large. It should be noted that operational communications related to flight activities and dedicated leased lines are not funded in the Administrative Operations appropriation, but are included in the estimates for Research and Development.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Leased lines and long distance tolls.....	\$4,632,000	\$4,876,000	\$4,944,000	+\$68,000

The cost of leased lines and long distance tolls provide for the inter-city telephone services for the various installations. The cost of leased lines includes the leasing of the circuits and associated equipment for rapid and reliable contact with contractor plants and other key sites. Long distance toll costs are in addition to the cost of leased lines and include both commercial tolls and reimbursement to the General Services Administration for NASA's use of the Federal Telecommunications System. The increase in requirements of \$68,000 is largely at the Manned Spacecraft Center and is related to the expanded Apollo flight activity.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Local telephone service.....	\$5,588,000	\$6,259,000	\$6,088,000	\$-171,000

Local telephone service includes not only the cost of providing on-site telephone exchange services, but also the cost of off-site service in the area immediately surrounding our installations. The amount of service provided each installation is determined by the number of personnel, both civil service and contractor, served by the exchange. The decrease in 1969 is largely related to the reduction in the number of new telephone installations and moves required at the Kennedy Space Center. In 1968 there were significant costs for this activity related to the internal rearrangement of staff in the Manned Spacecraft Operations Building, and initial occupancy of wings recently added to the KSC Headquarters Building. This decrease is partially offset by a small increase at the Electronics Research Center related to their increased staff.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>Change in 1969</u>
Other communications.....	\$1,485,000	\$1,743,000	\$1,959,000	+\$216,000

Other communications costs provide for costs for cable services, TWX services, and postage. The increase in 1969 is principally related to the increased cost of postage caused by the postal rate increases made effective in January 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
ADMINISTRATIVE PRINTING.....	\$5,558,000	\$5,267,000	\$5,270,000	\$+3,000

Estimates for administrative printing include funds for contractual printing and the related composition and binding operations. This includes services performed by other agencies, chiefly the Government Printing Office, or by commercial printing firms. All common processes of duplicating, including photostating, blueprinting, microfilming, and other photographic reproduction, are included. In 1969, the costs for printing are about the same as in 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
SUPPLIES, MATERIALS AND EQUIPMENT.....	\$13,024,000	\$10,410,000	\$9,750,000	\$-660,000

Administrative supplies, materials, and equipment include those items of a general nature which service the entire installation. Excluded are supplies, materials, equipment, and related services which are related directly to a specific project (funded in the R&D appropriation) and those that are facility oriented (included in Facilities Services). Of the amount required in 1969, \$7,159,000 is for supplies and materials, and \$2,591,000 for purchased and rented equipment. The overall requirement decreases by \$660,000 in 1969, with the largest part of the decrease (\$476,000) at the Marshall Space Flight Center related to the cut back in personnel and operations in 1968. The other significant reduction (\$194,000) at the Kennedy Space Center, is related to the completion of the buildup in 1968 and the stabilization of requirements in 1969. Other changes are minor with the exception of an increase at the Electronics Research Center of \$94,000 which is due to the buildup of personnel and operations and a decrease of \$30,000 at Wallops Station.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
TRANSPORTATION.....	\$8,310,000	\$8,051,000	\$7,645,000	\$-406,000

Transportation services include local motor pool operations and associated services, center aircraft operations and services, as well as the movement of supplies, materials, equipment, and related items by common carrier. Center operations costs of \$5,897,000, are \$421,000 lower in 1969 than in 1968. The net reduction results from a decrease of \$204,000 at Goddard Space Flight Center as a result of purchasing fewer motor vehicles and the conversion of a portion of the on-site driver-messenger services contract to civil service operation, and a decrease of \$134,000 at the manned space flight centers because of reduced requirements for aircraft

servicing and motor pool operations. The aircraft servicing decreases at the Kennedy Space Center because of the engine overhaul on the Gulfstream in 1968, will not be required in 1969. Motor pool operations at the Manned Spacecraft Center and the Marshall Space Flight Center decrease because of reduced requirements.

Transportation by common carrier, for which \$1,748,000 is required in 1969, provides for the shipment costs for the movement of supplies, materials, equipment, and other items such as NASA exhibits. Funds required remain about the same in 1969 as in 1968.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
ADMINISTRATIVE SUPPORT				
SERVICES.....	\$9,261,000	\$8,270,000	\$8,312,000	\$+42,000

Administrative support services include installation support services and center medical services. The funding required for 1969 is \$8,312,000, which is \$42,000 more than in 1968. The increase at the Electronics Research Center (\$146,000) is partially offset by decreases at the Manned Spacecraft Center (\$42,000) and the Kennedy Space Center (\$45,000). The other changes are minor.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
Installation support				
services.....	\$7,905,000	\$6,762,000	\$6,789,000	\$+27,000

Installation support services include those services which support the installation generally; such as, logistics support, radiation control, supply operations, mail and messenger services, rigging, and related services. The increased requirement at the Electronics Research Center of \$100,000 related to the buildup at that center is partially offset by decreases at other centers.

	<u>1967</u>	<u>1968</u>	<u>1969</u>	Change in 1969
Medical services.....	\$1,356,000	\$1,508,000	\$1,523,000	\$+15,000

Medical services include the cost of the installations' health units and of employee health maintenance programs. The cost in 1969 increases slightly, by \$15,000, because the increase (\$46,000) at the Electronics Research Center related to the increased staffing is partially offset by a decrease (\$31,000) at Headquarters.

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

JOHN F. KENNEDY SPACE CENTER, NASA

MISSION:

The Kennedy Space Center was established at Cape Kennedy, Florida, as a separate Center within NASA in July 1962. Prior to that time, it had been the Launch Operations Directorate of the Marshall Space Flight Center. It serves as the primary Center within NASA for the test, checkout, and launch of space vehicles. This presently includes launch of manned and unmanned vehicles at Kennedy Space Center, Florida, and unmanned vehicles at the Western Test Range. Kennedy Space Center has participated in the flight preparations for projects Mercury and Gemini; and Saturn vehicle development flights. The Center is now concentrating on the Apollo program unmanned and manned launches, as well as scientific unmanned launches. Kennedy Space Center is specifically responsible for:

1. Launch vehicle checkout and preparation.
2. Spacecraft and payload checkout and preparation.
3. Launch facility design, construction, maintenance, and operations.
4. Final integration and integrated checkout of vehicle, spacecraft and launch facilities, and the conduct of actual launch operations.
5. Operation and coordination of supporting facilities, ground support equipment, and tracking and data acquisition and logistics support required for operation of all NASA activities at the Eastern and Western Test Ranges.

In fulfilling its assigned programs, the Kennedy Space Center has developed into a highly flexible "space port" capable of handling a wide variety of launch activities for present and future manned and unmanned space missions.

DESCRIPTION:

The Kennedy Space Center is situated approximately 50 miles east of Orlando, Florida, in northeast Brevard County.

The total land area occupied by the installation is approximately 87,800 acres, including 84,303 acres owned by NASA. In addition to the land area occupied, the state of Florida has dedicated to the United States exclusive use rights to some 53,563 acres of State-owned submerged lands.

In addition to the operation and maintenance of all facilities at the Kennedy Space Center, the Center is responsible for certain facilities within the national Eastern Test Range launch area. The total capital investment of Kennedy Space Center including work in progress, contractor-held facilities at various locations, and the Western Test Range, as of June 30, 1967, is \$948,606,000.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$33,108,000	\$37,683,000	\$39,979,000
Travel.....	867,000	819,000	819,000
Automatic data processing.....	1,302,000	1,200,000	1,320,000
Facilities services.....	47,801,000	43,403,000	45,305,000
Technical services.....	---	---	---
Administrative support.....	<u>9,664,000</u>	<u>10,726,000</u>	<u>10,287,000</u>
Total, fund requirements.....	<u>\$92,742,000</u>	<u>\$93,831,000</u>	<u>\$97,710,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Gemini.....	---	---	---
Apollo.....	1,497	1,708	1,735
Apollo applications.....	21	48	48
<u>Space Science and Applications</u>			
Launch vehicle procurement.....	<u>145</u>	<u>145</u>	<u>145</u>
Subtotal, positions by program.....	1,663	1,901	1,928

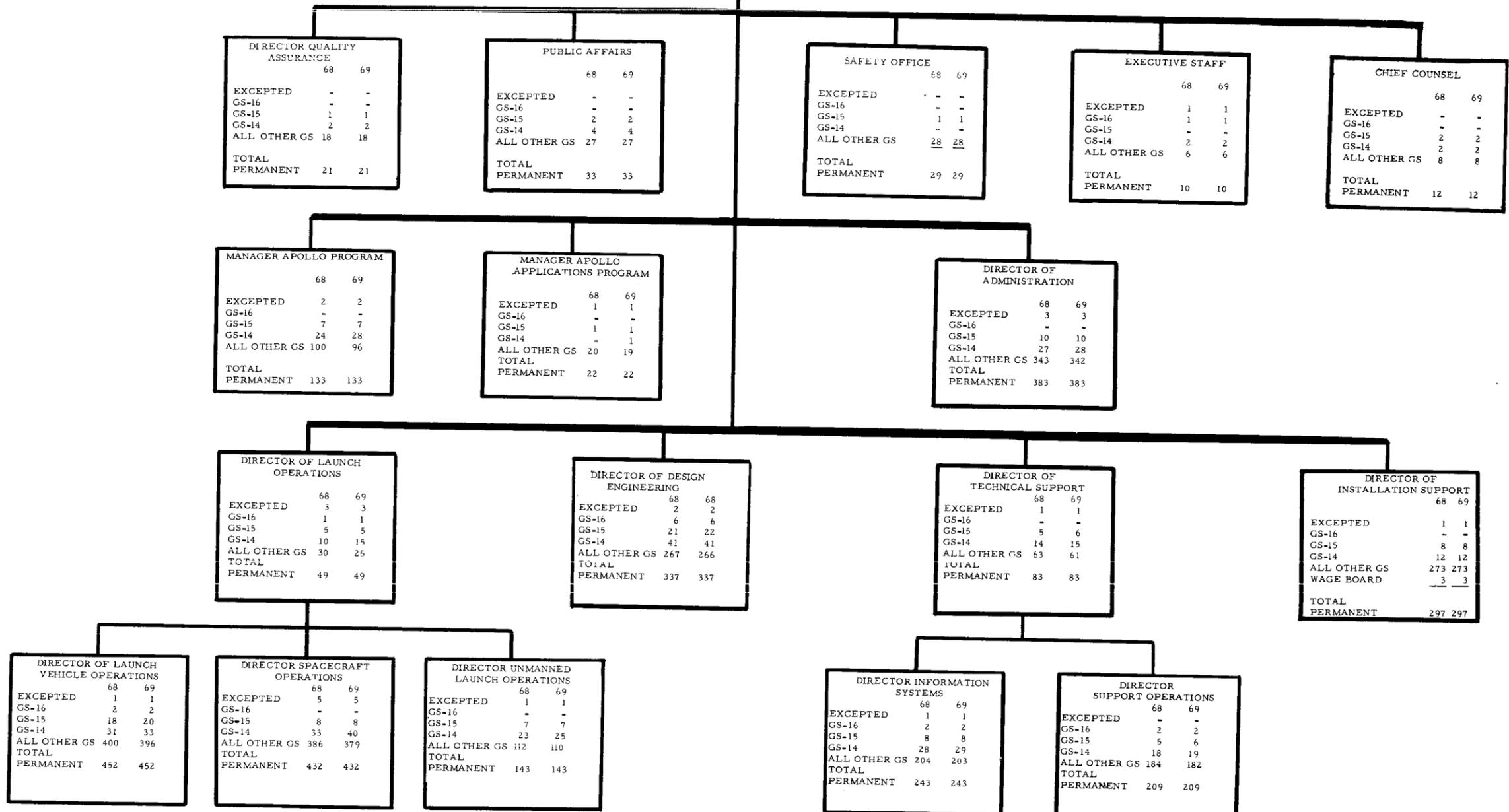
	<u>1967</u>	<u>1968</u>	<u>1969</u>
2. <u>Support positions:</u>			
Director and staff.....	61	61	61
Administrative support.....	602	575	548
Research and development support.....	<u>394</u>	<u>394</u>	<u>394</u>
Subtotal, support positions.....	<u>1,057</u>	<u>1,030</u>	<u>1,003</u>
Total, permanent positions.....	<u><u>2,720</u></u>	<u><u>2,931</u></u>	<u><u>2,931</u></u>

STAFFING SUMMARY			
	68	69	
EXCEPTED	25	25	
GS-16	14	14	
GS-15	111	116	
GS-14	275	300	
ALL OTHER GS	2,503	2,473	
WAGE BOARD	3	3	
TOTAL			
PERMANENT	2,931*	2,931*	
TEMPORARY	65	65	
	2,996	2,996	

*NOTE: Includes 34 permanent positions assigned to Daytona Beach operations, not functionally part of Kennedy Space Center and not reflected on Organizational Chart.

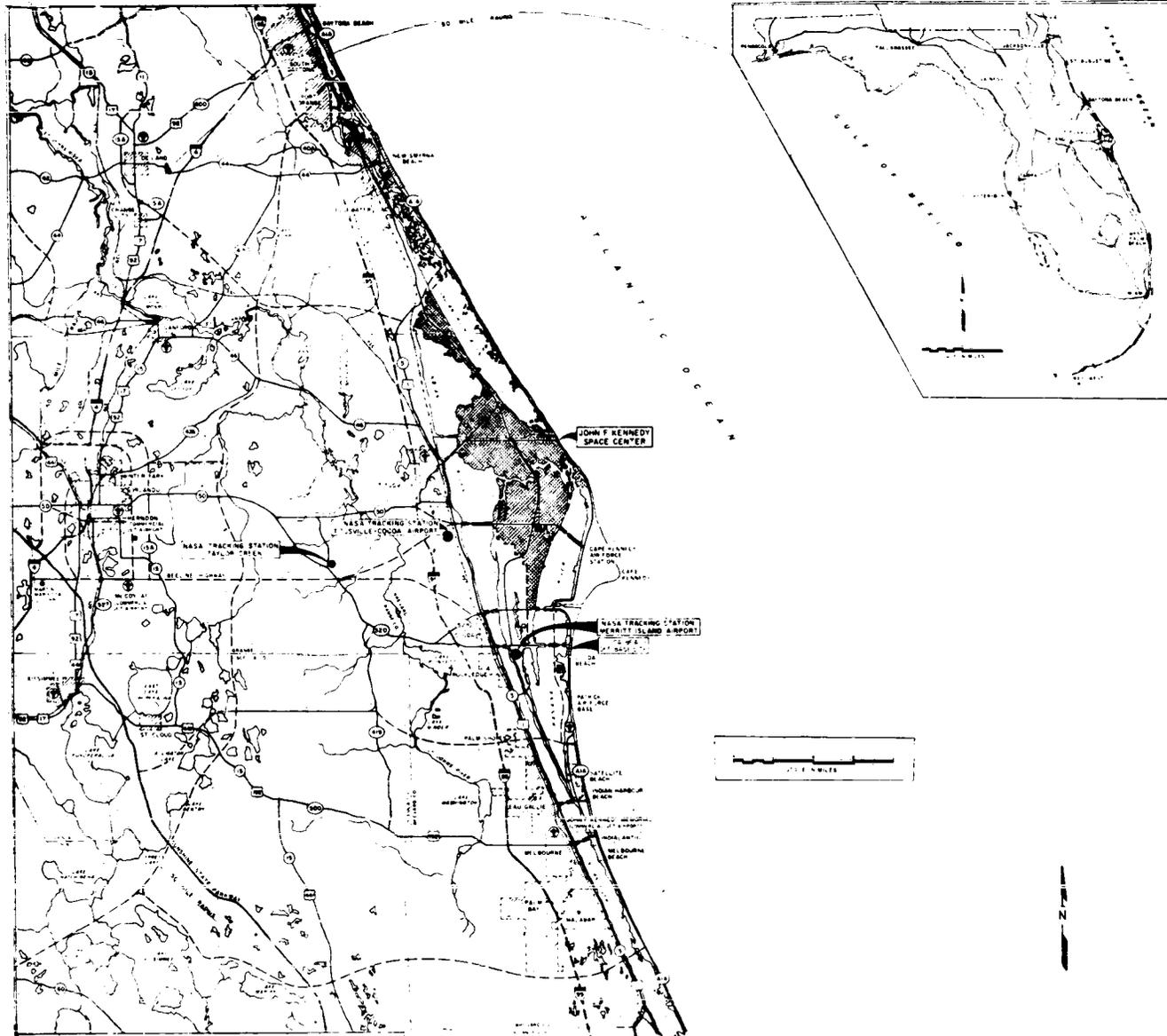
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ORGANIZATIONAL & STAFFING CHART
JOHN F. KENNEDY SPACE CENTER, NASA

DIRECTOR			
	68	69	
EXCEPTED	3	3	
GS-16	-	-	
GS-15	1	1	
GS-14	-	-	
ALL OTHER GS	5	5	
TOTAL			
PERMANENT	9	9	



284-948 O - 68 (Follows P. AO 2-3)

JOHN F. KENNEDY SPACE CENTER, NASA
FISCAL YEAR 1969 ESTIMATES
VICINITY MAP



AO 2-5

JOHN F. KENNEDY SPACE CENTER, NASA

FISCAL YEAR 1969 ESTIMATES

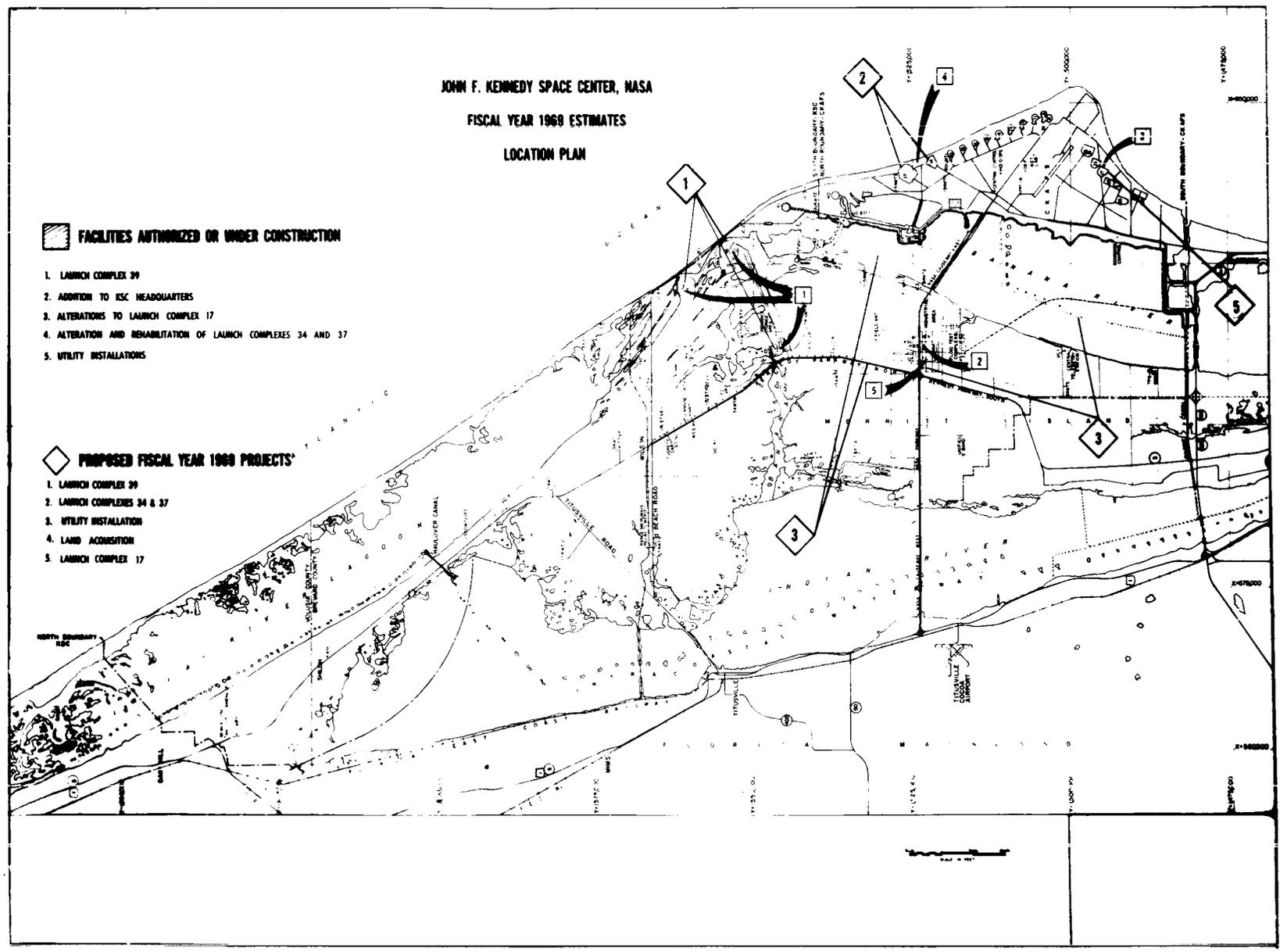
LOCATION PLAN

 FACILITIES AUTHORIZED OR UNDER CONSTRUCTION

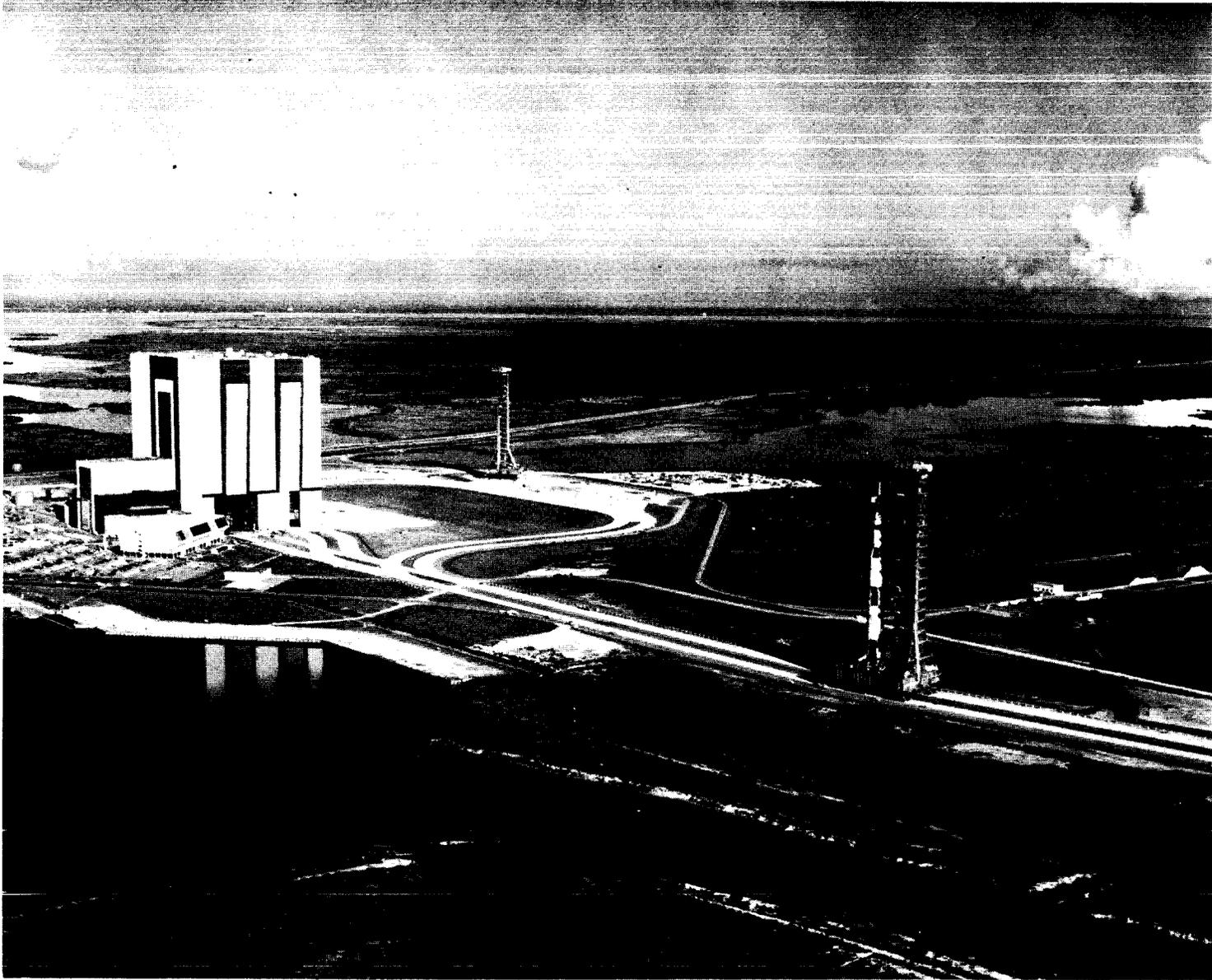
- 1. LAUNCH COMPLEX 39
- 2. ADDITION TO KSC HEADQUARTERS
- 3. ALTERATIONS TO LAUNCH COMPLEX 17
- 4. ALTERATION AND REHABILITATION OF LAUNCH COMPLEXES 34 AND 37
- 5. UTILITY INSTALLATIONS

 PROPOSED FISCAL YEAR 1969 PROJECTS

- 1. LAUNCH COMPLEX 39
- 2. LAUNCH COMPLEXES 34 & 37
- 3. UTILITY INSTALLATION
- 4. LAND ACQUISITION
- 5. LAUNCH COMPLEX 17



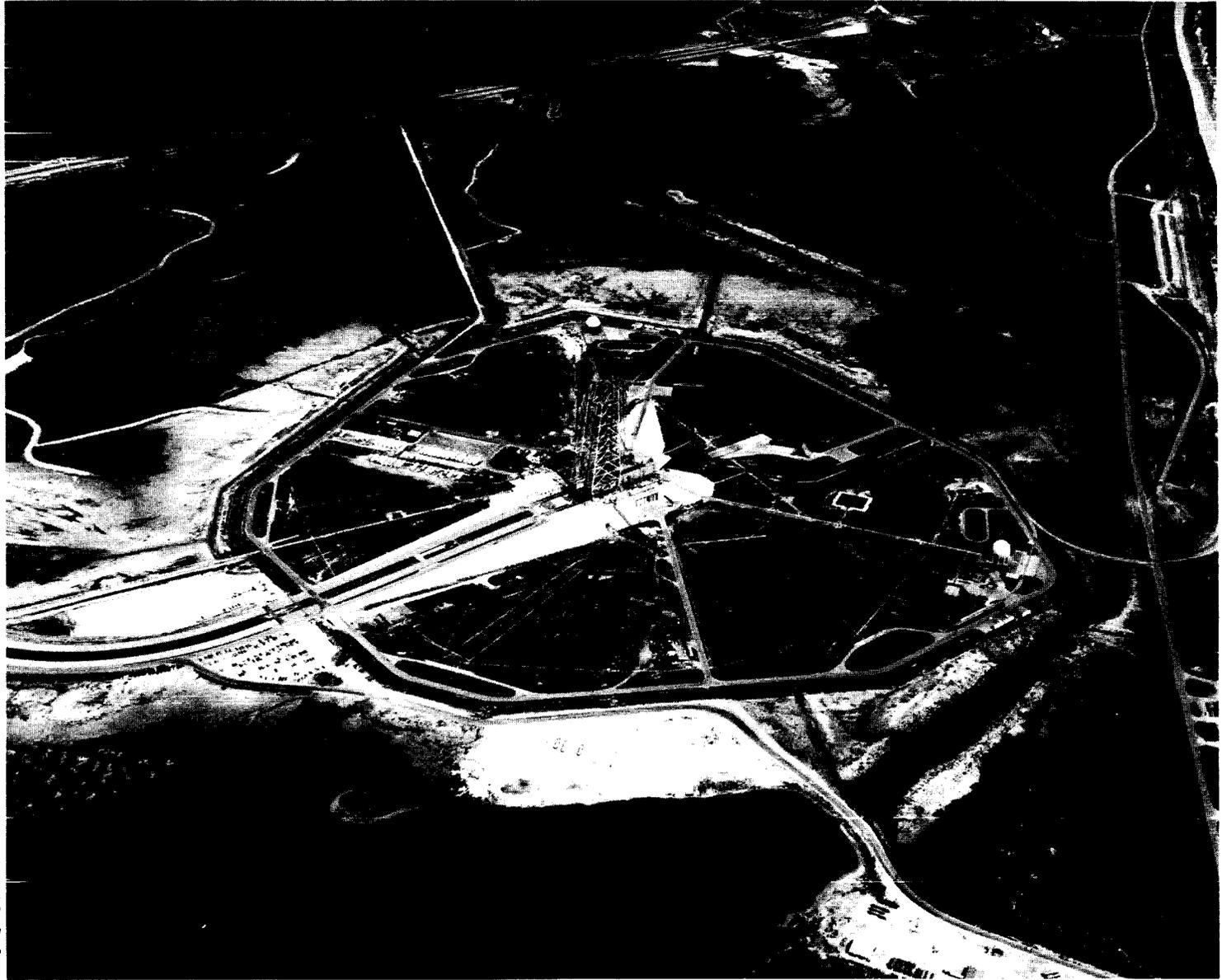
John F. Kennedy Space Center, NASA



AO 2-7

Vertical Assembly Building

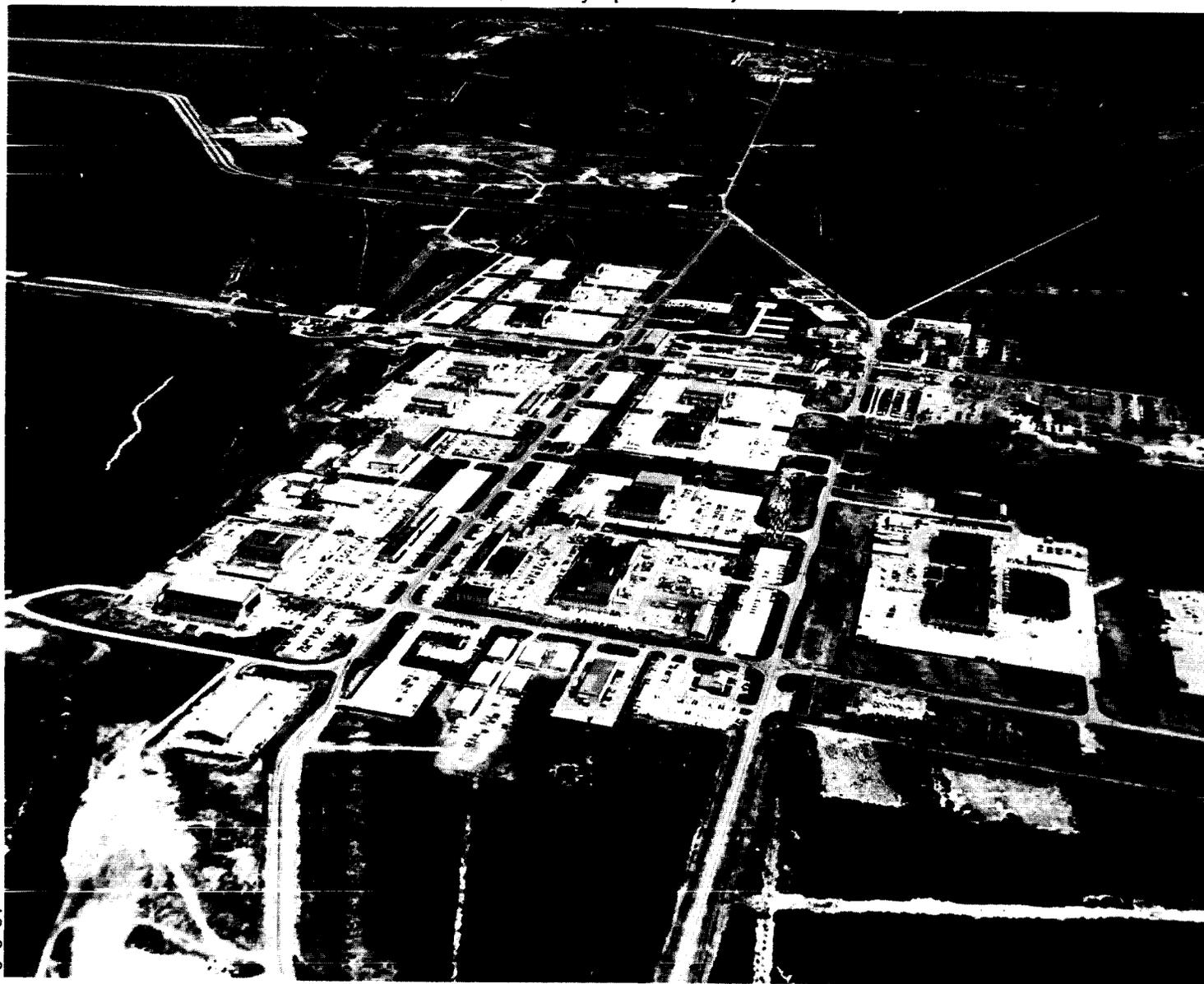
John F. Kennedy Space Center, NASA



AO 2-8

Pad 39A

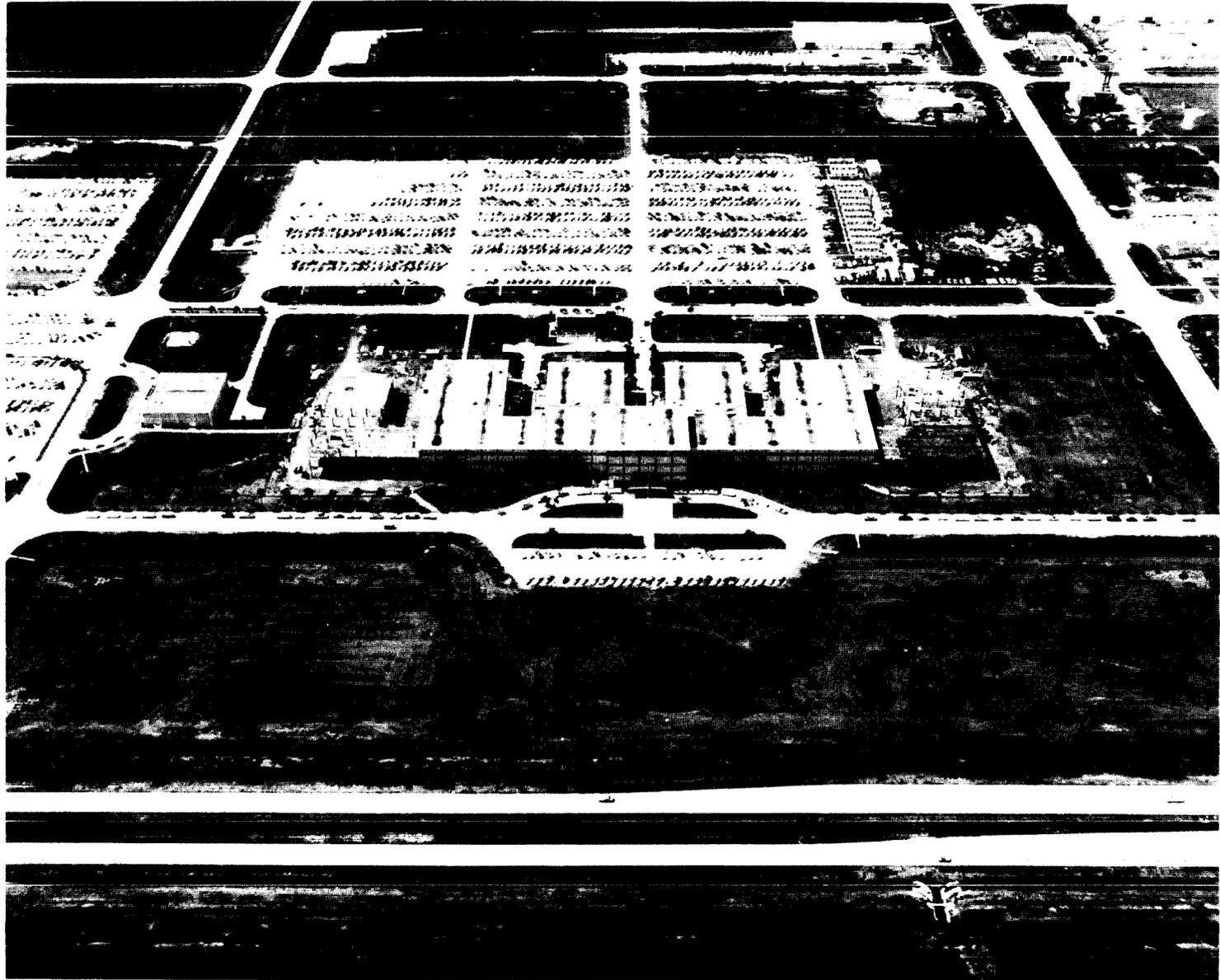
John F. Kennedy Space Center, NASA



AO 2-9

Industrial Area

John F. Kennedy Space Center, NASA



Headquarters Building

John F. Kennedy Space Center, NASA



AO 2-11

Visitor Information Center

ADMINISTRATIVE OPERATIONS
FISCAL YEAR 1969 ESTIMATES
MANNED SPACECRAFT CENTER

MISSION:

The Manned Spacecraft Center was established in November 1961 at Houston, Texas, as NASA's primary Center for the design, development, and manufacture of manned spacecraft, and for selection and training of astronaut crews and the conduct of space flight missions. Manned Spacecraft Center and its predecessor organization, the NASA Space Task Group, have completed two major programs: (1) the Mercury program, which was the United States' pioneering venture into manned space flight; and (2) the Gemini program, which extended manned flight capability in space in many significant ways. Manned Spacecraft Center is now heavily engaged in the Apollo program and is also proceeding with necessary program planning and technical analysis of the Apollo Applications program and other post-Apollo activities.

The Apollo program utilizes the capabilities of the Manned Spacecraft Center in several ways. This Center is responsible for:

1. The design, development, and fabrication of the Apollo spacecraft, including the command and service modules, and the lunar module.
2. Over-all program management and control of the spacecraft including module integration, testing, and qualification.
3. Conduct of a program of spacecraft environmental testing.
4. Selection and training of astronauts and preparation of primary and backup crews for each mission.
5. Operation of the Mission Control Center and control of the space flight missions from lift-off to recovery.
6. Development of scientific experiments to be flown on Apollo flights.
7. Operation of the Lunar Receiving Laboratory, which provides a central complex where samples of materials brought to earth by lunar exploration teams may be received, quarantined, processed, undergo limited experiments, and be distributed to the scientific community for further analysis.

The longer duration flights planned for the Apollo Applications missions will make it necessary to use the experienced personnel of this Center to upgrade spacecraft and lunar module subsystems. This Center is also responsible for the development of earth sensor experiment modules and biomedical,

bioscience, and behavioral experiment modules to be flown on Apollo Applications missions.

DESCRIPTION:

The Manned Spacecraft Center is located two miles east of the town of Webster, Texas. The site is approximately 20 miles southeast of downtown Houston and 25 miles northwest of Galveston, Texas. Total NASA-owned land consists of 1,620 acres. The Center also holds an additional 55,880 acres under use agreement at the White Sands Test Facility. The total capital investment of the Manned Spacecraft Center, including work in progress, contractor-held facilities at various locations, and the White Sands Test Facility, as of June 30, 1967, is \$351,469,000.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$59,664,000	\$63,672,000	\$64,747,000
Travel.....	4,433,000	4,093,000	4,093,000
Automatic data processing.....	6,430,000	6,843,000	6,843,000
Facilities services.....	12,647,000	10,861,000	11,047,000
Technical services.....	1,256,000	834,000	834,000
Administrative support.....	<u>11,229,000</u>	<u>9,605,000</u>	<u>9,532,000</u>
Total, fund requirements.....	<u>\$95,659,000</u>	<u>\$95,908,000</u>	<u>\$97,096,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Gemini.....	29	---	---
Apollo.....	2,981	2,935	2,403
Apollo applications.....	221	286	798
Advanced missions.....	114	114	114

	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Space Science and Applications</u>			
Physics and astronomy.....	---	18	23
Lunar and planetary.....	---	12	16
Space applications.....	26	26	35
<u>Advanced Research and Technology</u>			
Space vehicle systems.....	4	8	10
Electronics systems.....	4	4	4
Human factor systems.....	8	8	8
Space power and electric propulsion systems.....	3	3	3
Chemical propulsion.....	2	2	2
<u>Technology Utilization</u>	<u>5</u>	<u>5</u>	<u>5</u>
Subtotal, positions by program.....	3,397	3,421	3,421
2. <u>Support positions:</u>			
Director and staff.....	93	93	93
Administrative support.....	1,019	856	856
Research and development support.....	<u>195</u>	<u>209</u>	<u>209</u>
Subtotal, support positions.....	<u>1,307</u>	<u>1,158</u>	<u>1,158</u>
Total, permanent positions.....	<u>4,704</u>	<u>4,579</u>	<u>4,579</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ORGANIZATION AND STAFF SUMMARY
MANNED SPACECRAFT CENTER

STAFFING SUMMARY	
Executed	48 69
GS-16	35 35
GS-15	30 30
GS-14	202 202
All other GS	232 232
Wage Board	165 165
Total personnel	439 439
Temporaries	156 156
Total positions	4325 4325

OFFICE OF THE DIRECTOR	
Executed	10 10
GS-16	8 8
GS-15	0 0
GS-14	1 1
All other GS	0 0
Wage Board	0 0
Total	19 19

PUBLIC AFFAIRS OFFICE	
Executed	68 69
GS-16	0 0
GS-15	0 0
GS-14	4 4
All other GS	14 14
Wage Board	0 0
Total	86 87

FLIGHT SAFETY OFFICE	
Executed	68 69
GS-16	1 1
GS-15	2 2
GS-14	11 11
All other GS	112 112
Wage Board	1 1
Total	197 197

LEGAL OFFICE	
Executed	67 68
GS-16	0 0
GS-15	0 0
GS-14	4 4
All other GS	16 16
Wage Board	0 0
Total	87 88

NASA REGIONAL AUDIT OFFICE	
Executed	68 69
GS-16	0 0
GS-15	0 0
GS-14	0 0
All other GS	0 0
Wage Board	0 0
Total	68 69

NASA REGIONAL INSPECTOR	
Executed	68 69
GS-16	0 0
GS-15	0 0
GS-14	0 0
All other GS	0 0
Wage Board	0 0
Total	68 69

APOLLO SPACECRAFT PROGRAM OFFICE	
Executed	68 69
GS-16	8 8
GS-15	54 54
GS-14	9 9
All other GS	281 281
Wage Board	0 0
Total	329 329

APOLLO APPLICATIONS PROGRAM OFFICE	
Executed	68 69
GS-16	2 2
GS-15	15 15
GS-14	18 18
All other GS	58 58
Wage Board	0 0
Total	97 97

DIRECTOR OF ENGINEERING AND DEVELOPMENT	
Executed	68 69
GS-16	3 3
GS-15	0 0
GS-14	6 6
All other GS	18 18
Wage Board	0 0
Total	95 96

DIRECTOR OF SCIENCE AND APPLICATIONS	
Executed	68 69
GS-16	1 1
GS-15	2 2
GS-14	4 4
All other GS	4 4
Wage Board	0 0
Total	83 84

DIRECTOR OF MEDICAL RESEARCH AND OPERATIONS	
Executed	68 69
GS-16	2 2
GS-15	1 1
GS-14	1 1
All other GS	15 15
Wage Board	0 0
Total	87 88

DIRECTOR OF FLIGHT CREW OPERATIONS	
Executed	68 69
GS-16	0 0
GS-15	1 1
GS-14	1 1
All other GS	2 2
Wage Board	0 0
Total	7 7

DIRECTOR OF FLIGHT OPERATIONS	
Executed	68 69
GS-16	1 1
GS-15	3 3
GS-14	3 3
All other GS	14 14
Wage Board	0 0
Total	73 74

DIRECTOR OF ADMINISTRATION	
Executed	68 69
GS-16	2 2
GS-15	1 1
GS-14	3 3
All other GS	20 20
Wage Board	0 0
Total	97 97

ADVANCED SPACECRAFT TECHNOLOGY DIVISION	
Executed	68 69
GS-16	1 1
GS-15	8 8
GS-14	17 17
All other GS	66 66
Wage Board	0 0
Total	93 94

INFORMATION SYSTEMS DIVISION	
Executed	68 69
GS-16	0 0
GS-15	2 2
GS-14	5 5
All other GS	13 13
Wage Board	0 0
Total	88 89

SPACE PHYSICS DIVISION	
Executed	68 69
GS-16	1 1
GS-15	3 3
GS-14	21 21
All other GS	48 48
Wage Board	0 0
Total	75 76

LUNAR AND EARTH SCIENCE DIVISION	
Executed	68 69
GS-16	3 3
GS-15	4 4
GS-14	7 7
All other GS	45 45
Wage Board	0 0
Total	97 98

PREVENTIVE MEDICINE OFFICE	
Executed	68 69
GS-16	0 0
GS-15	0 0
GS-14	2 2
All other GS	3 3
Wage Board	0 0
Total	73 74

ASTRONAUT OFFICE	
Executed	68 69
GS-16	1 1
GS-15	5 5
GS-14	20 20
All other GS	16 16
Wage Board	0 0
Total	42 42

FLIGHT SUPPORT DIVISION	
Executed	68 69
GS-16	0 0
GS-15	4 4
GS-14	8 8
All other GS	168 168
Wage Board	0 0
Total	250 250

RESOURCES MANAGEMENT DIVISION	
Executed	68 69
GS-16	1 1
GS-15	0 0
GS-14	11 11
All other GS	142 142
Wage Board	0 0
Total	160 160

PROCUREMENT AND CONTRACTS DIVISION	
Executed	68 69
GS-16	0 0
GS-15	5 5
GS-14	20 20
All other GS	222 222
Wage Board	0 0
Total	248 248

CREW SYSTEMS DIVISION	
Executed	68 69
GS-16	2 2
GS-15	7 7
GS-14	27 27
All other GS	139 139
Wage Board	0 0
Total	147 147

COMPUTATION AND ANALYSIS DIVISION	
Executed	68 69
GS-16	0 0
GS-15	1 1
GS-14	7 7
All other GS	120 120
Wage Board	0 0
Total	138 138

LUNAR SURFACE PROJECT OFFICE	
Executed	68 69
GS-16	0 0
GS-15	1 1
GS-14	15 15
All other GS	5 5
Wage Board	0 0
Total	20 20

APPLICATIONS SUPPORT OFFICE	
Executed	68 69
GS-16	3 3
GS-15	6 6
GS-14	15 15
All other GS	25 25
Wage Board	0 0
Total	50 50

PROTODRIFT RESEARCH OFFICE	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	6 6
All other GS	19 19
Wage Board	0 0
Total	27 27

AIRCRAFT OPERATIONS OFFICE	
Executed	68 69
GS-16	0 0
GS-15	1 1
GS-14	2 2
All other GS	12 12
Wage Board	0 0
Total	27 27

MISSION PLANNING AND ANALYSIS DIVISION	
Executed	68 69
GS-16	3 3
GS-15	16 16
GS-14	21 21
All other GS	161 161
Wage Board	0 0
Total	239 239

PERSONNEL DIVISION	
Executed	68 69
GS-16	0 0
GS-15	0 0
GS-14	5 5
All other GS	68 68
Wage Board	0 0
Total	72 72

MANAGEMENT SERVICES DIVISION	
Executed	68 69
GS-16	0 0
GS-15	1 1
GS-14	6 6
All other GS	70 70
Wage Board	0 0
Total	77 77

INSTRUMENTATION AND ELECTRONIC SYSTEMS DIVISION	
Executed	68 69
GS-16	2 2
GS-15	7 7
GS-14	20 20
All other GS	141 141
Wage Board	0 0
Total	170 170

DISTANCE AND CONTROL DIVISION	
Executed	68 69
GS-16	1 1
GS-15	17 17
GS-14	23 23
All other GS	52 52
Wage Board	0 0
Total	141 141

TEST AND OPERATIONS OFFICE	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	12 12
All other GS	22 22
Wage Board	0 0
Total	89 90

ADVANCED STATE LABORATORY	
Executed	68 69
GS-16	4 4
GS-15	4 4
GS-14	3 3
All other GS	25 25
Wage Board	0 0
Total	6 6

MEDICAL OPERATIONS	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	6 6
All other GS	19 19
Wage Board	0 0
Total	10 10

FLIGHT CREW SUPPORT DIVISION	
Executed	68 69
GS-16	1 1
GS-15	4 4
GS-14	14 14
All other GS	12 12
Wage Board	1 1
Total	234 234

FLIGHT CONTROL DIVISION	
Executed	68 69
GS-16	0 0
GS-15	5 5
GS-14	16 16
All other GS	121 121
Wage Board	0 0
Total	196 196

ADMINISTRATIVE SERVICES DIVISION	
Executed	68 69
GS-16	0 0
GS-15	1 1
GS-14	1 1
All other GS	346 346
Wage Board	92 92
Total	215 215

TECHNICAL SERVICES DIVISION	
Executed	68 69
GS-16	0 0
GS-15	0 0
GS-14	1 1
All other GS	95 95
Wage Board	0 0
Total	113 113

OPERATION AND MAINTENANCE DIVISION	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	20 20
All other GS	112 112
Wage Board	0 0
Total	142 142

STRUCTURAL AND MECHANICAL DIVISION	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	23 23
All other GS	115 115
Wage Board	0 0
Total	192 192

OPERATIONAL PLANNING AND ANALYSIS OFFICE	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	2 2
All other GS	29 29
Wage Board	0 0
Total	33 33

WORLD WIDE RESEARCH OFFICE	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	7 7
All other GS	29 29
Wage Board	0 0
Total	70 70

MEDICAL RESEARCH DIVISION	
Executed	68 69
GS-16	1 1
GS-15	1 1
GS-14	7 7
All other GS	29 29
Wage Board	0 0
Total	70 70

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

AMES RESEARCH CENTER

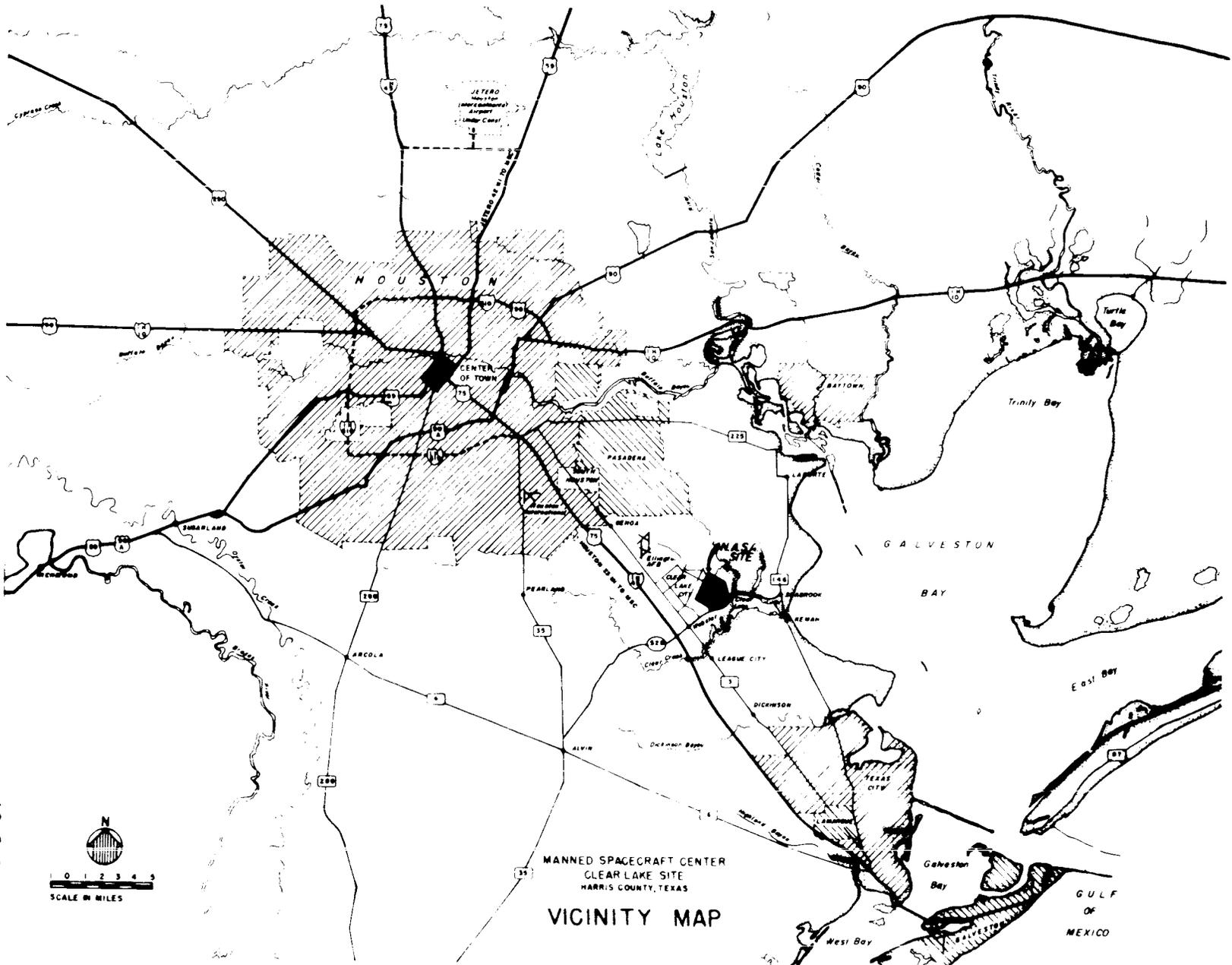
MISSION:

Ames Research Center has a major research responsibility in the life sciences and space sciences, a flight project management responsibility, and the operational responsibility for the NASA Convair 990 aircraft to conduct airborne scientific experiments in addition to the traditional research mission in the physical sciences. In the current and budget years, this installation has flight project management responsibility for the Pioneer and Biosatellite projects. Pioneer provides scientific observations of phenomena in interplanetary space from an unmanned spacecraft, and the Biosatellite project explores the biological effects of the space environment on primates and other earth organisms.

Research in the physical sciences includes studies in atmosphere entry and environmental physics, guidance and control systems, and aeronautics. The work in entry and environmental physics includes basic studies of the physics of high-temperature gases, the stability, control, and performance of a wide range of spacecraft configurations, and of materials and structures for spacecraft. In the area of gas physics, particular emphasis is placed on problems associated with flight into earth and other planetary atmospheres. Through this effort, significant contributions have been made to the design of the Mercury, Gemini, and Apollo spacecraft, the design of Mars and Venus entry vehicles, and the design of ballistic missiles.

The work in guidance and control systems is broad in nature and is applicable to manned and unmanned spacecraft, as well as aircraft. Current emphasis in guidance systems is directed mainly at current and follow-on manned missions. This includes an intensive theoretical and experimental effort in the areas of midcourse navigation and terminal guidance with a smaller effort directed at studies involving lunar approach, lunar landing, and rendezvous. The research in control systems is directed at examining various techniques applicable to unmanned satellites and probes and techniques applicable to vertical and short take-off (V/STOL) aircraft, the supersonic transport, and manned spacecraft.

The research program in aeronautics is directed at fundamental studies in aerodynamics, propulsion and operating problems associated with supersonic aircraft with particular emphasis on the supersonic transport, a wide variety of V/STOL vehicles, and hypersonic research aircraft. This includes studies of piloting problems with numerous fixed-base, moving-base, and flight simulators.



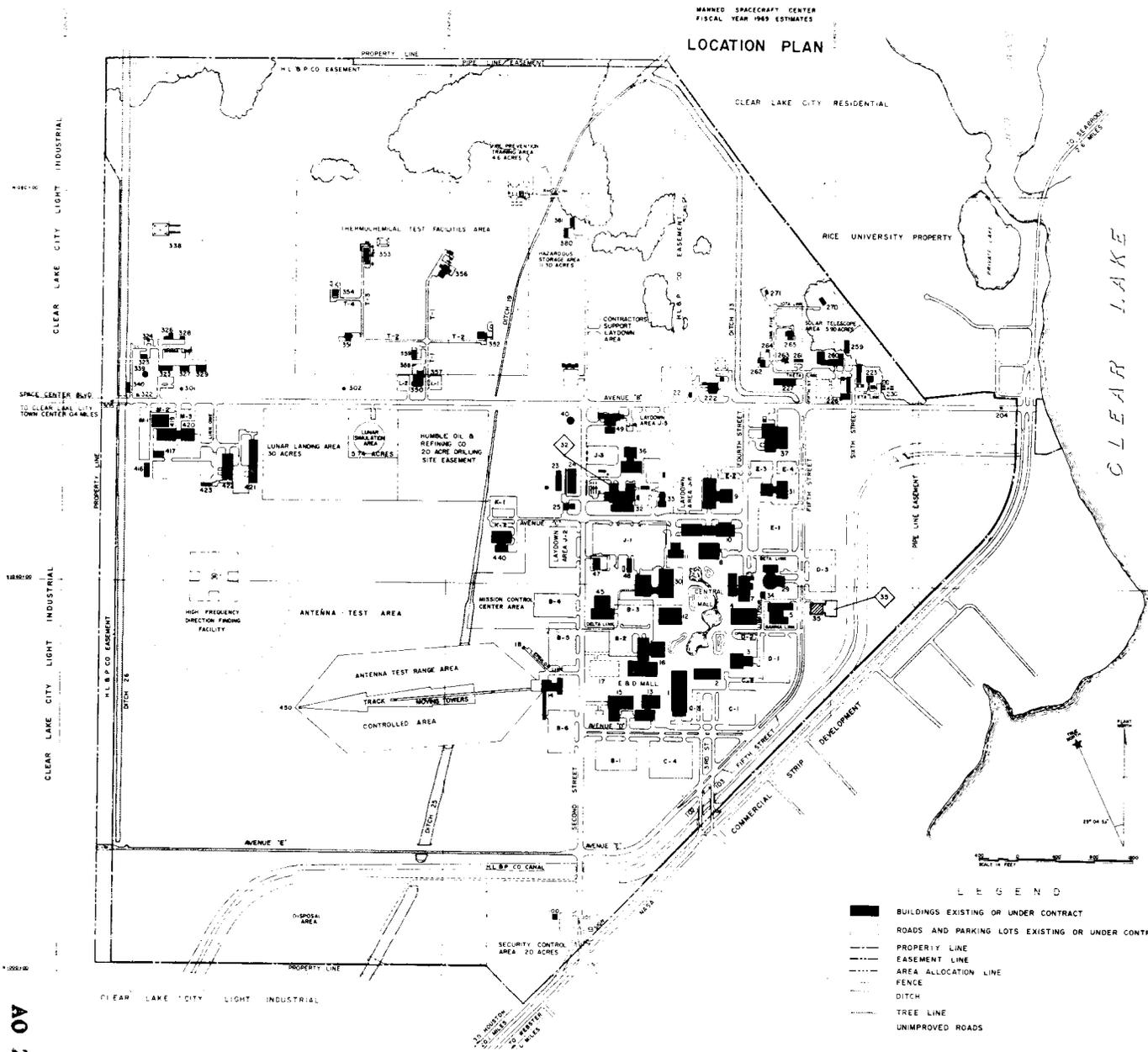
AO 2-16



MANNED SPACECRAFT CENTER
 CLEAR LAKE SITE
 HARRIS COUNTY, TEXAS
 VICINITY MAP

MANNED SPACECRAFT CENTER
FISCAL YEAR 1969 ESTIMATES

LOCATION PLAN



FACILITY INDEX

FACILITY NO	FACILITY TITLE	FUNDING YEAR
1	AUDITORIUM	62
2	PROJECT MANAGEMENT BUILDING	62
3	CENTRAL CAFETERIA	62
4	FLIGHT OPERATIONS OFFICE	62
5	MISSION SIMULATION AND TRAINING FACILITY	62
6	LIFE SYSTEMS LABORATORY	62,65
7	TECHNICAL SERVICES OFFICE	62
8	TECHNICAL SERVICES FACILITY	62
9	TECHNICAL SERVICES SHOP	62
10	BRANCH CAFETERIA	62
12	CENTRAL DATA OFFICE	62
13	SYSTEMS EVALUATION LABORATORY	62
14	ANEMIC CHAMBER TEST FACILITY	62
15	ANTENNA TEST FACILITY	62
16	SPIN CRAFT RESEARCH OFFICE AND LABORATORY	62,64
18	LEM BORESIGHT RANGE CONTROL BUILDING	64
24	CENTRAL HEATING AND COOLING PLANT	64,65,66,68
25	FIRE STATION	62
29	FLIGHT ACCELERATION FACILITY	62
30	MISSION CONTROL CENTER-HOUSTON	63
31	LUNAR MISSION AND SPACE EXPLORATION FACILITY	62,65
32	SPACE ENVIRONMENT SIMULATION LABORATORY	62,65
33	ULTRA HIGH VACUUM SPACE CHAMBER FACILITY	64
34	FLIGHT ACCELERATION MOTOR-GENERATOR BUILDING	63
35	FLIGHT CREW TRAINING FACILITY	65
36	CONTRACTOR SUPPORT FACILITY	62
37	LUNAR RECEIVING LABORATORY	67
40	ELEVATED WATER TANK	62
45	PROJECT ENGINEERING FACILITY	64,65
47	SOUTHWESTERN BELL TELEPHONE BUILDING	64
48	EMERGENCY POWER BUILDING (MCC-1)	63
49	VIBRATION AND ACOUSTIC TEST FACILITY	64
60	SECURITY CONTROL CENTER	62
101	GUARDHOUSE	62
102	GUARDHOUSE	62
103	GUARDHOUSE	62
204	GUARDHOUSE	62
221	ELECTRICAL SUBSTATION	62
222	ATMOS. RE-ENTRY MAT & STRUCTURES EVAL. FACILITY	64
223	SEWAGE TREATMENT PLANT	62,64
225	SERVICE CONTRACTORS COMPLEX	62,64
227	PRINTING AND REPRODUCTION FACILITY	64
230	CREW SYSTEMS BIOLOGICAL FACILITY	64
239	EQUIPMENT STORAGE BUILDING	66
250	TRANSLATION AND DOCKING FACILITY	64
261	RADIOLOGICAL CALIBRATION AND WASTE STORAGE FACILITY	63
282	ARC JET, RADIANT HEATING AND WASTE STORAGE FACILITY	63
283	HEALTH PHYSICS LABORATORY	64
284	BIOLOGICAL INCUBATOR	66
285	RADIATION AND FIELDS ACCELERATOR LABORATORY	65
270	SOLAR TELESCOPE FACILITY	65
271	SOLAR RADIO TELESCOPE FACILITY	66
301	WATER WELL NO 1	62
302	WATER WELL NO 2	62
309	GUARDHOUSE	62
322	WATER TREATMENT	62
323	FILTER CLEANING AND STORAGE FACILITY	65
324	CLASSIFIED WASTE DISINTEGRATOR FACILITY	65
325	MAINTENANCE SHOP FACILITY	65
326	ROADS AND GROUNDS EQUIPMENT MAINTENANCE FACILITY	65
327	M.S.C. WORK CONTROL CENTER	65
328	ROADS AND GROUNDS MATERIALS STORAGE FACILITY	65
329	WAREHOUSE FACILITY	66
338	WATER-LAND IMPACT TEST FACILITY	66
339	GROUND WATER STORAGE TANK	65
340	GAS METERING STATION	62
350	THERMOCHEMICAL TEST FACILITY	63
351	THERMOCHEMICAL SPACE CHAMBER FACILITY	63
352	ELECTRO EXPLOSIVE DEVICES TEST FACILITY	63
353	REACTION CONTROL TEST FACILITY	63
354	SPACE POWER SYSTEMS TEST FACILITY	63
356	COMPONENTS TEST FACILITY	63
357	THERMOCHEMICAL TEST AREA GATE HOUSE	63
358	THERMOCHEMICAL SEWAGE TREATMENT FACILITY	63
359	THERMOCHEMICAL EQUIPMENT STORAGE FACILITY	64
380	HAZARDOUS MATERIAL STORAGE FACILITY	64
381	CENTRAL GAS CYLINDER STORAGE FACILITY	64
416	VETERIN. OFFICE SUPPORT FACILITY	65
417	GARAGE	62
419	SUPPORT OFFICE	62
420	SUPPORT SHOP AND WAREHOUSE	62
421	MISSION SUPPORT WAREHOUSE	64
422	LOGISTIC SUPPORT WAREHOUSE	65
423	A.S.C.A.T.S. INTERIM FACILITY	66
440	ELECTRONIC SYSTEMS COMPATIBILITY FACILITY	64
450	ANTENNA SERVICE BUILDING AND TOWER	64

- LEGEND**
- BUILDINGS EXISTING OR UNDER CONTRACT
 - ROADS AND PARKING LOTS EXISTING OR UNDER CONTRACT
 - PROPERTY LINE
 - EASEMENT LINE
 - AREA ALLOCATION LINE
 - FENCE
 - DITCH
 - TREE LINE
 - UNIMPROVED ROADS
 - FACILITIES AUTHORIZED & UNDER CONSTRUCTION
 - 80 FLIGHT CREW TRAINING FACILITY
 - PROPOSED FISCAL YEAR 1969 PROJECTS
 - 32 MODIFICATIONS TO THE ENVIRONMENTAL TESTING LAB
 - 35 ADDITION TO FLIGHT CREW TRAINING FACILITY

AO 2-17

NASA
8-67-20711

Manned Spacecraft Center



AO 2-18

Aerial View

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

GEORGE C. MARSHALL SPACE FLIGHT CENTER

MISSION:

The Marshall Space Flight Center became a part of NASA in July 1960, and has served as NASA's primary Center for the design, development, and test of launch vehicles and space transportation systems for manned space flights. Marshall Space Flight Center also includes the Michoud Assembly Facility at New Orleans, Louisiana; the Slidell Central Computer Facility nearby; and the Mississippi Test Facility in southwest Mississippi. Building on the wealth of experience gained through work on Army missile programs, Marshall Space Flight Center has, since its transfer from the Army, successfully completed the Saturn I program, and is now managing:

1. The Saturn IB program which provides a launch vehicle for Apollo spacecraft development and serves as a carrier for large scientific satellite payloads.
2. The Saturn V program which will provide the launch vehicle for actual manned lunar landing missions, planetary missions, and future very large scientific satellite payloads.
3. Selected payloads for Apollo Applications missions, such as the Apollo telescope mount and the S-IVB orbital workshop.

In carrying out its management responsibilities for these programs, Marshall Space Flight Center has developed the capability to:

1. Design, develop, and manufacture large launch vehicle systems, including vehicle systems test and integration.
2. Conduct test programs such as the static testing program for the S-IC and S-II stages at the Mississippi Test Facility.
3. Design, develop, and test large launch vehicle engines such as the H-1, J-2, and F-1 systems.
4. Develop and integrate scientific experiment payload packages to be flown on Saturn-Apollo vehicles or subsequent post-Apollo missions.

In support of its assigned programs, Marshall Space Flight Center also maintains the research and development capability to conduct advanced studies on launch vehicle and space systems, space navigation techniques, astronautics, and space science investigations. Its capability for both research and

for the management of industrial operations give Marshall Space Flight Center a highly flexible base for manned space programs.

DESCRIPTION:

Operations of Marshall Space Flight Center are conducted at three primary locations.

The first location, the main Marshall Space Flight Center site, is near Huntsville, Alabama, on Army property at the Redstone Arsenal. The Center occupies 1,797 acres under a nonrevocable use permit from the Army, and 64 leased acres. The capital investment as of June 30, 1967, is \$551,022,000. Certain facilities such as the Redstone Arsenal Army Air Field and some utilities are used jointly by NASA and the Army. The Huntsville location has deep-water access via the Tennessee, Ohio, and Mississippi Rivers.

The second location, the Michoud Assembly Facility, is located 15 miles east of New Orleans, Louisiana. The main facility occupies 890 acres. The Slidell Central Computer Facility, a satellite facility 20 miles to the northeast, occupies 14 additional acres bringing the total acreage to 904. The capital investment as of June 30, 1967, is \$142,382,000. Michoud Assembly Facility space totals 3,483,862 square feet, including the main assembly plant, covering an area of 43 acres under one roof. The vehicle prime contractors produce the Saturn IB and Saturn V booster stages at this location. The Michoud Assembly Facility is on the Gulf Intra-Coastal Waterway, and has deep-water access via the Mississippi River.

The third location, the Mississippi Test Facility, is in southwest Mississippi, approximately 50 miles northeast of New Orleans, Louisiana. Total land area is 138,870 acres of which 13,428 acres make up the actual test area owned by NASA. The remaining 125,442 acres are held as a buffer zone. In the buffer area, 7,568 acres are owned by NASA, and 117,874 acres are under restrictive easement. Capital investment for the Mississippi Test Facility as of June 30, 1967, is \$233,953,000. Test stands include a dual-position stand for testing the Saturn V first stage (S-IC), and two stands for testing the 1,000,000-pound thrust Saturn V second stage (S-II). The vehicle prime contractors are responsible for conducting tests on the stands. The site has deep-water access for transporting large boosters via the Pearl River and the Intra-Coastal Waterway.

The total capital investment of the Marshall Space Flight Center, including work in progress and contractor-held facilities at various locations, as of June 30, 1967, is \$927,357,000.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$90,259,000	\$91,184,000	\$87,954,000
Travel.....	3,098,000	2,945,000	2,945,000
Automatic data processing.....	10,620,000	9,486,000	9,094,000
Facilities services.....	11,419,000	9,298,000	8,741,000
Technical services.....	4,438,000	2,664,000	2,366,000
Administrative support.....	<u>8,867,000</u>	<u>7,641,000</u>	<u>7,078,000</u>
Total, fund requirements....	<u>\$128,701,000</u>	<u>\$123,218,000</u>	<u>\$113,178,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Apollo.....	4,502	3,015	2,791
Apollo applications.....	526	1,535	1,704
Advanced missions.....	140	150	175
<u>Space Science and Applications</u>			
Physics and astronomy.....	5	9	12
Lunar and planetary.....	61	11	16
Launch vehicle procurement.....	10	8	7
Bioscience.....	1	5	7
Space applications.....	3	4	3
<u>Advanced Research and Technology</u>			
Basic research.....	53	45	59
Space vehicle systems.....	100	97	94
Electronics systems.....	95	90	93
Human factor systems.....	14	14	18
Space power and electric propulsion systems.....	3	11	12

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Nuclear rockets.....	52	24	24
Chemical propulsion.....	14	17	18
<u>Tracking and Data Acquisition.....</u>	4	10	12
<u>Technology Utilization.....</u>	<u>10</u>	<u>7</u>	<u>7</u>
Subtotal, positions by program.....	5,593	5,052	5,052
2. <u>Support positions:</u>			
Director and staff.....	151	137	137
Administrative support.....	714	671	671
Research and development support.....	<u>628</u>	<u>526</u>	<u>526</u>
Subtotal, support positions.....	<u>1,493</u>	<u>1,334</u>	<u>1,334</u>
Total, permanent positions.....	<u>7,086</u>	<u>6,386</u>	<u>6,386</u>

**NATIONAL AERONAUTIC AND SPACE ADMINISTRATION
ORGANIZATION AND STAFFING CHART
MARSHALL SPACE FLIGHT CENTER**

OFFICE OF DIRECTOR

EXCEPTED	68	69
GS-16	9	9
GS-15	1	1
GS-14	3	3
GS-14	0	0
ALL OTHER GS	10	10
WAGEBOARD	0	0
TOTAL PERMANENT	23	23

SAFETY OFFICE

EXCEPTED	68	69
GS-16	1	1
GS-15	0	0
GS-14	1	1
ALL OTHER GS	4	4
WAGEBOARD	0	0
TOTAL PERMANENT	7	7

ASST DIR. FOR SCIENTIFIC & TECH ANALYSIS

EXCEPTED	68	69
GS-16	1	1
GS-15	0	0
GS-14	0	0
ALL OTHER GS	0	0
WAGEBOARD	0	0
TOTAL PERMANENT	1	1

EXECUTIVE STAFF

EXCEPTED	68	69
GS-16	3	3
GS-15	0	0
GS-14	7	7
GS-14	8	8
ALL OTHER GS	38	38
WAGEBOARD	0	0
TOTAL PERMANENT	56	56

PUBLIC AFFAIRS OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	1	1
GS-14	3	3
ALL OTHER GS	22	22
WAGEBOARD	0	0
TOTAL PERMANENT	26	26

CHIEF COUNSEL

EXCEPTED	68	69
GS-16	0	0
GS-15	2	2
GS-14	4	4
ALL OTHER GS	13	13
WAGEBOARD	0	0
TOTAL PERMANENT	19	19

LABOR RELATIONS OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	0	0
GS-14	1	1
ALL OTHER GS	2	2
WAGEBOARD	0	0
TOTAL PERMANENT	4	4

PATENT COUNSEL

EXCEPTED	68	69
GS-16	0	0
GS-15	1	1
GS-14	4	4
ALL OTHER GS	4	4
WAGEBOARD	0	0
TOTAL PERMANENT	9	9

STAFFING SUMMARY

EXCEPTED	68	69
GS-16	47	47
GS-15	56	56
GS-14	375	375
GS-14	773	773
ALL OTHER GS	4486	4486
WAGEBOARD	689	689
TOTAL PERMANENT	6386	6386
NON-PERMANENT	274	274
TOTAL POSITIONS	6660	6660

MANAGEMENT SERVICES OFFICE

EXCEPTED	68	69
GS-16	1	1
GS-15	0	0
GS-14	5	5
ALL OTHER GS	141	141
WAGEBOARD	25	25
TOTAL PERMANENT	182	182

PURCHASING OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	2	2
GS-14	8	8
ALL OTHER GS	203	203
WAGEBOARD	0	0
TOTAL PERMANENT	213	213

TECHNICAL SERVICES OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	2	2
GS-14	6	6
ALL OTHER GS	265	265
WAGEBOARD	218	218
TOTAL PERMANENT	491	491

FINANCIAL MANAGEMENT OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	5	5
GS-14	13	13
ALL OTHER GS	148	148
WAGEBOARD	0	0
TOTAL PERMANENT	166	166

MANPOWER UTILIZATION & ADMINISTRATION OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	3	3
GS-14	9	9
ALL OTHER GS	101	101
WAGEBOARD	0	0
TOTAL PERMANENT	113	113

FACILITIES & DESIGN OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	5	5
GS-14	15	15
ALL OTHER GS	15	15
WAGEBOARD	0	0
TOTAL PERMANENT	35	35

RESEARCH AND DEVELOPMENT OPERATIONS

EXCEPTED	68	69
GS-16	3	3
GS-15	0	0
GS-14	1	1
ALL OTHER GS	3	3
WAGEBOARD	0	0
TOTAL PERMANENT	7	7

INDUSTRIAL OPERATIONS

EXCEPTED	68	69
GS-16	2	2
GS-15	0	0
GS-14	3	3
ALL OTHER GS	19	17
WAGEBOARD	0	0
TOTAL PERMANENT	24	22

ADVANCED SYSTEMS OFFICE

EXCEPTED	68	69
GS-16	2	2
GS-15	0	0
GS-14	12	12
GS-14	16	16
ALL OTHER GS	50	50
WAGEBOARD	0	0
TOTAL PERMANENT	80	80

SYSTEMS ENGRG OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	1	1
GS-14	7	7
GS-14	11	11
ALL OTHER GS	42	42
WAGEBOARD	0	0
TOTAL PERMANENT	61	61

EXPERIMENTS OFFICE

EXCEPTED	68	69
GS-16	1	1
GS-15	3	3
GS-14	4	4
ALL OTHER GS	19	19
WAGEBOARD	0	0
TOTAL PERMANENT	27	27

OPERATIONS MANAGEMENT OFFICE

EXCEPTED	67	68
GS-16	0	0
GS-15	4	4
GS-14	14	14
ALL OTHER GS	35	35
WAGEBOARD	0	0
TOTAL PERMANENT	53	53

CONTRACTS OFFICE

EXCEPTED	68	69
GS-16	1	1
GS-15	4	4
GS-14	14	14
ALL OTHER GS	101	101
WAGEBOARD	0	0
TOTAL PERMANENT	120	120

PLANNING & RESOURCES OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	4	4
GS-14	4	4
ALL OTHER GS	27	27
WAGEBOARD	0	0
TOTAL PERMANENT	35	35

PROJECT LOGISTICS OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	3	3
GS-14	5	5
ALL OTHER GS	9	9
WAGEBOARD	0	0
TOTAL PERMANENT	17	17

AERO-ASTRODYNAMICS LABORATORY

EXCEPTED	68	69
GS-16	1	1
GS-15	7	7
GS-15	29	29
GS-14	36	36
ALL OTHER GS	250	250
WAGEBOARD	2	2
TOTAL PERMANENT	325	325

ASTRONOMICS LABORATORY

EXCEPTED	68	69
GS-16	6	6
GS-15	5	5
GS-15	58	58
GS-14	104	104
ALL OTHER GS	599	599
WAGEBOARD	88	88
TOTAL PERMANENT	860	860

COMPUTATION LABORATORY

EXCEPTED	68	69
GS-16	2	2
GS-15	4	4
GS-15	10	10
GS-14	28	28
ALL OTHER GS	119	119
WAGEBOARD	0	0
TOTAL PERMANENT	163	163

MANUFACTURING ENGINEERING LABORATORY

EXCEPTED	68	69
GS-16	3	3
GS-16	2	2
GS-15	13	13
GS-14	39	39
ALL OTHER GS	361	361
WAGEBOARD	232	232
TOTAL PERMANENT	650	650

SATURN I/IB PROGRAM OFFICE

EXCEPTED	68	69
GS-16	2	2
GS-16	2	2
GS-15	17	14
GS-14	30	28
ALL OTHER GS	79	79
WAGEBOARD	0	0
TOTAL PERMANENT	130	125

SATURN/APOLLO APPLICATIONS PROGRAM OFFICE

EXCEPTED	68	69
GS-16	1	1
GS-16	3	3
GS-15	9	18
GS-14	30	36
ALL OTHER GS	77	92
WAGEBOARD	0	0
TOTAL PERMANENT	120	150

SATURN V PROGRAM OFFICE

EXCEPTED	68	69
GS-16	1	1
GS-16	5	5
GS-15	24	20
GS-14	64	60
ALL OTHER GS	196	184
WAGEBOARD	0	0
TOTAL PERMANENT	290	270

ENGINE PROGRAM OFFICE

EXCEPTED	68	69
GS-16	1	1
GS-16	4	4
GS-15	9	8
GS-14	32	30
ALL OTHER GS	34	37
WAGEBOARD	0	0
TOTAL PERMANENT	80	80

PROPULSION & VEHICLE ENGINEERING LABORATORY

EXCEPTED	68	69
GS-16	2	2
GS-16	7	7
GS-15	50	50
GS-14	104	104
ALL OTHER GS	531	531
WAGEBOARD	25	25
TOTAL PERMANENT	719	719

QUALITY & RELIABILITY ASSURANCE LABORATORY

EXCEPTED	68	69
GS-16	1	1
GS-16	4	4
GS-15	28	28
GS-14	63	63
ALL OTHER GS	435	435
WAGEBOARD	4	4
TOTAL PERMANENT	535	535

SPACE SCIENCES LABORATORY

EXCEPTED	68	69
GS-16	1	1
GS-16	2	2
GS-15	14	14
GS-14	20	20
ALL OTHER GS	68	68
WAGEBOARD	0	0
TOTAL PERMANENT	105	105

TEST LABORATORY

EXCEPTED	68	69
GS-16	1	1
GS-16	5	5
GS-15	18	18
GS-14	35	35
ALL OTHER GS	181	181
WAGEBOARD	95	95
TOTAL PERMANENT	335	335

MICHOUD ASSEMBLY FACILITY

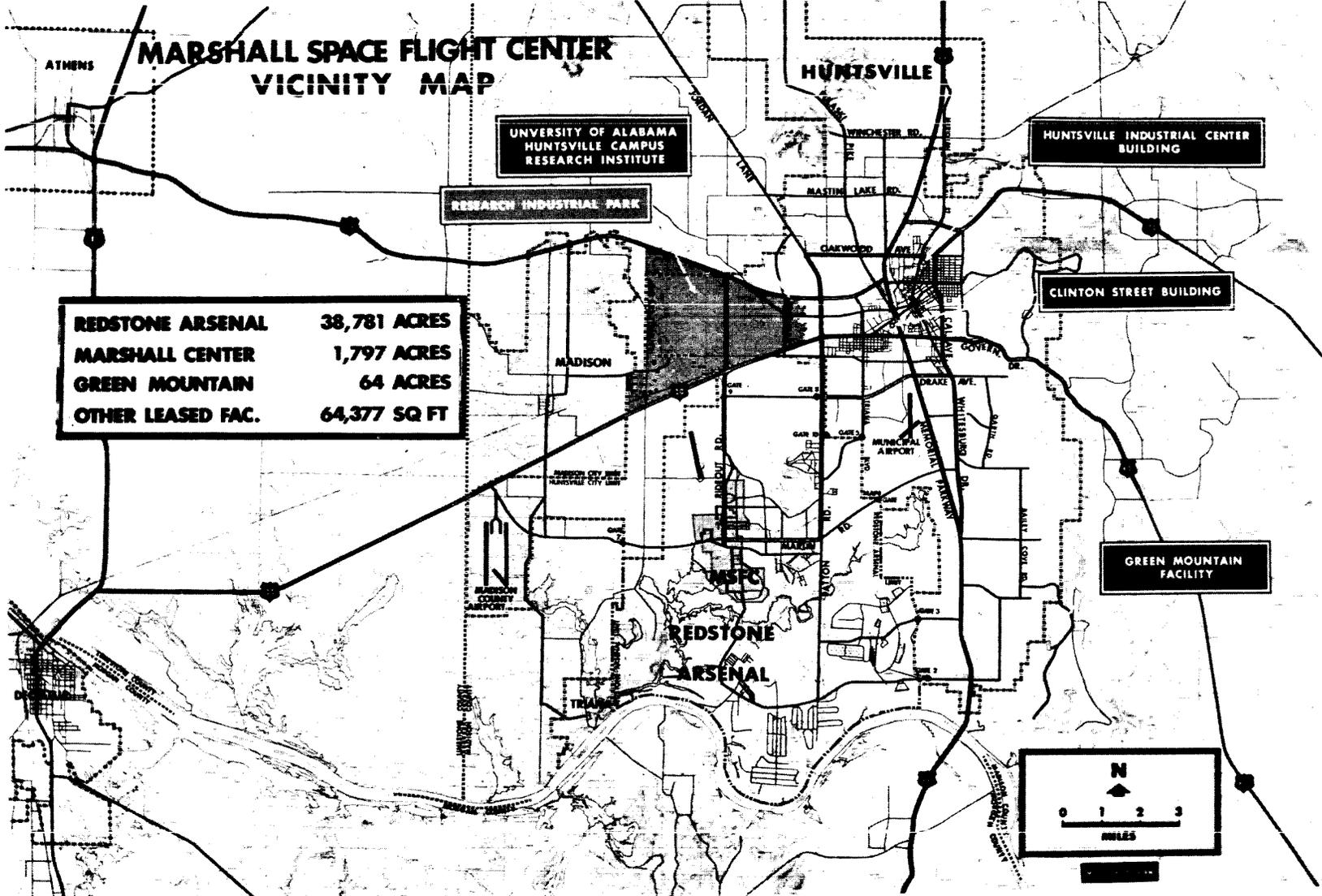
EXCEPTED	68	69
GS-16	1	1
GS-16	1	1
GS-15	9	8
GS-14	16	15
ALL OTHER GS	146	140
WAGEBOARD	0	0
TOTAL PERMANENT	175	170

MISSION OPERATIONS OFFICE

EXCEPTED	68	69
GS-16	0	0
GS-15	1	1
GS-15	5	5
GS-14	7	10
ALL OTHER GS	30	24
WAGEBOARD	0	0
TOTAL PERMANENT	4	4

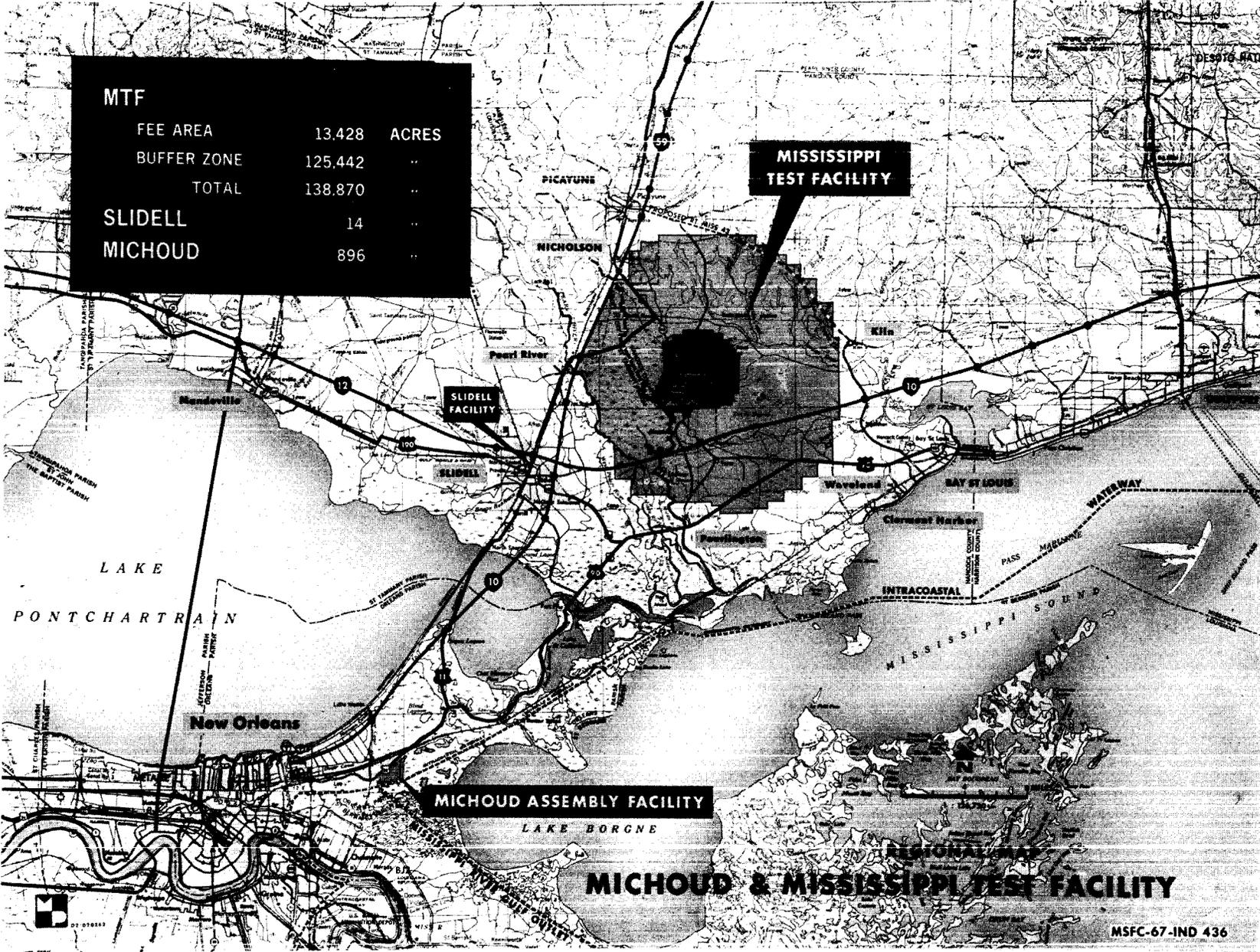
MISSISSIPPI TEST FACILITY

EXCEPTED	68	69
GS-16	1	1
GS-16	1	1
GS-15	4	4
GS-14	11	11
ALL OTHER GS	70	70
WAGEBOARD	0	0
TOTAL PERMANENT	87	87

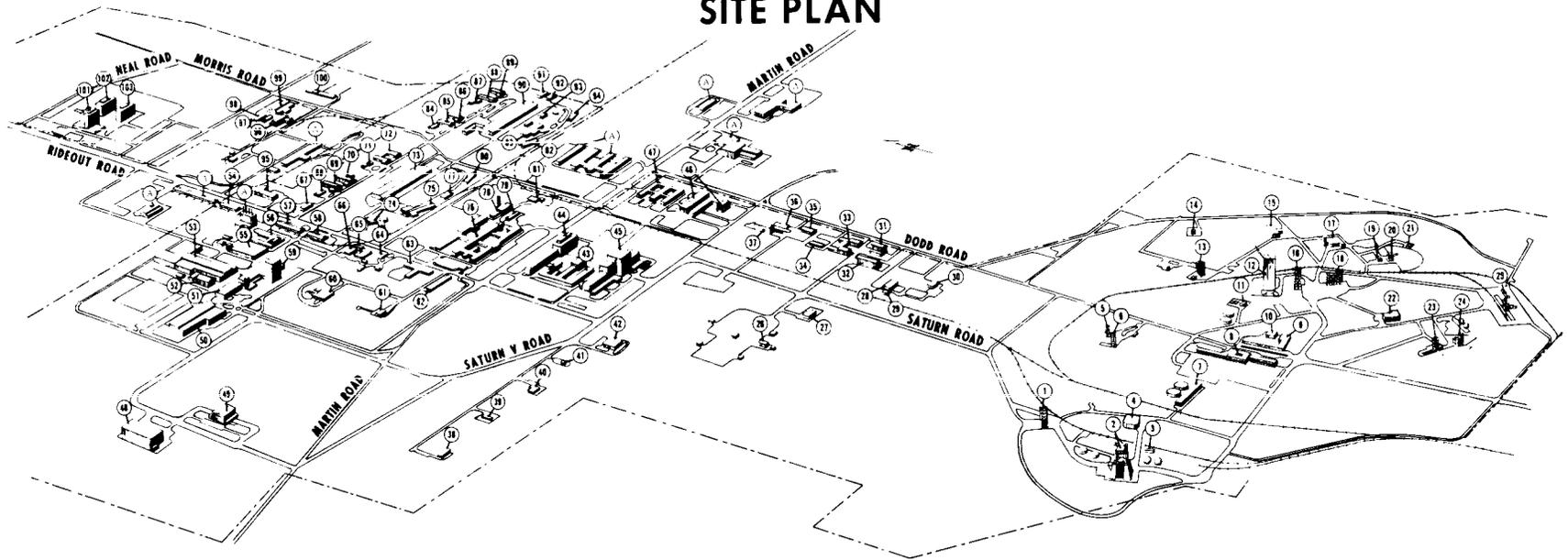


AO 2-24

MTF			
FEE AREA	13,428	ACRES	
BUFFER ZONE	125,442		..
TOTAL	138,870		..
SLIDELL	14		..
MICHOUD	896		..



MARSHALL SPACE FLIGHT CENTER SITE PLAN



TEST AREA

WEST AREA

- 1 4696 F-1 ENGINE TEST STAND
- 2 4670 SATURN STATIC TEST STAND (S-1C)
- 3 4674 HELIUM COMPRESSOR BUILDING
- 4 4674 CONTROL CENTER BUILDING
- 5 INTERIM TEST STAND
- 6 JUPITER "HOP" TEST STAND
- 7 4667 PUMP HOUSE
- 8 4666 TEST DIVISION ENGINEERING BUILDING

EAST AREA

- 9 4566 ENGINEERING BUILDING
- 10 4567 BOILER HOUSE AND PUMP STATION
- 11 S-4549 DEIONIZED WATER TREATMENT PLANT
- 12 4550 ADVANCED SATURN DYNAMIC TEST STAND
- 13 4522 TEST STAND (LOX-LH2 COMPONENTS)
- 14 4530 TEST STAND (LOX-RP COMPONENTS)
- 15 4561 CONTROL AND SERVICE CENTER
- 16 4557 DYNAMIC TEST STAND (SATURN I/IB)
- 17 4583 COMPONENTS TEST LABORATORY
- 18 4548 F-1 TURBO TEST FACILITY
- 19 S-4539 TEST PREPARATION BUILDING
- 20 4540 ACOUSTIC MODEL TEST FACILITY
- 21 4541 CONTROL BUILDING
- 22 4570 BLOCKHOUSE
- 23 4564 POWER PLANT TEST STAND (H-1 ENGINE)
- 24 4514 LIQUID HYDROGEN FACILITY (S-IVB)
- 25 4572 STATIC TEST TOWER (S-1/IB)

TEST SUPPORT AREA

- 26 4646 GSE TEST CONTROL CENTER
- 27 4648 HIGH PRESSURE FLUID TEST FACILITY
- 28 S-4659 SUPPORT BUILDING (N2 VAPORIZATION FAC)
- 29 S-4660 BOILER HOUSE
- 30 S-4647 GAS STORAGE & COMPRESSOR BLDG.
- 31 S-4655 ENGINE PREPARATION BUILDING
- 32 S-4656 SATURN V GSE ASSEMBLY BUILDING
- 33 S-4653 COMPONENTS SUPPORT BUILDING
- 34 4678 SUB STORES BUILDING
- 35 S-4654 TECHNICAL SYSTEMS WAREHOUSE
- 36 S-4651 SHOP BUILDING (QUONSET)
- 37 4649 TRANSPORTATION HANGAR

ENGINEERING & LABORATORY AREA

PROPULSION & VEHICLE ENGINEERING

- 38 4628 LOW TEMPERATURE TEST FACILITY
- 39 4622 LIQUID HYDROGEN TEST PAD
- 40 4623 ACCELERATOR AND TEST CELL FACILITY
- 41 4624 HYDROGEN PEROXIDE STATION
- 42 4605 NON-DESTRUCTIVE TEST LABORATORY
- 43 4612 MATERIALS LABORATORY
- 44 4610 PROPULSION & VEHICLE ENG. LAB
- 45 4619 STRUCTURES AND MECHANICS LABORATORY
- 46 4650 GUIDED MISSILE TEST SHOP & INSTRUMENT LAB.
- 47 4663 COMPUTATION LABORATORY

MANUFACTURING & QUALITY

- 48 S-4755 VEHICLE COMPONENTS HANGAR
- 49 S-4752 COMPONENTS AND SUBASSEMBLY ACCEPTANCE BLDG.

- 50 4708 MISSILE ASSEMBLY AND INSPECTION HANGAR
- 51 4760 SURFACE TREATMENT FACILITY
- 52 S-4706 C-5 MOCK-UP SHELTER
- 53 4705 MISSILE ASSEMBLY SHOP AND HANGAR
- 54 4723 MATERIAL TEST LABORATORY
- 55 4711 PRECISION MACHINE SHOP
- 56 4712 FIELD OFFICE BUILDING (MECHANICAL ENG. LAB)
- 57 4727 MACHINE SHOP AND OFFICE BUILDING
- 58 4728 EQUIPMENT TEST SHOP
- 59 4707 MISSILE COMPONENT HANGAR & HYDROSTATIC TEST

ASTRONICS AND GENERAL SUPPORT

- 60 4750 HIGH ALTITUDE TEST FACILITY
- 61 4748 LIQUID PROPELLANT TEST SUPPORT BUILDING
- 62 S-4747 AIR COMPRESSOR STATION
- 63 4746 OFFICE TEST LABORATORY
- 64 4741 BERYLLIUM FACILITY
- 65 4731 WIND TUNNEL FACILITY
- 66 4732 VACUUM TANK FACILITY
- 67 4306 CAFETERIA
- 68 4312 OFFICE BUILDING
- 69 4311 SHOCK TUNNEL FACILITY
- 70 4313 STRUCTURAL TESTING LABORATORY STORAGE
- 71 4332 ENVIRONMENTAL TEST LABORATORY
- 72 4331 TESTING AND DEVELOPMENT SHOP
- 73 4471 STORAGE AND OFFICE BUILDING
- 74 4485 FINANCIAL MANAGEMENT OFFICE BUILDING
- 75 4491 COMPUTATION LABORATORY
- 76 4487 GUIDANCE AND CONTROL BUILDING ASTRONICS LABORATORY

- 77 S-4479 STORAGE SHED
- 78 4476 ACCELERATION AND ENVIRONMENTAL TEST FACILITY
- 79 S-4436 AUTOMATION CHECKOUT BUILDING
- 80 4492 ELECTRICAL SYSTEM LABORATORY
- 81 4475 HAZARDOUS OPERATIONS LABORATORY
- 82 4493 MACHINE AND SHEET METAL SHOP
- 83 4483 VEHICLE MAINTENANCE SHOP
- 84 4352 NITROGEN STORAGE BUILDING
- 85 4351 ADMINISTRATIVE BUILDING
- 86 4353 PHOTOGRAPHIC LABORATORY
- 87 4372 EQUIPMENT STORAGE (LAUNCHING AND HANDLING)
- 88 4371 STORAGE (SPECIFIC ITEMS)
- 89 4373 E.S.E. LABORATORY
- 90 4481 ENGINEERING AND MACHINE SHOP/OFFICE
- 91 S-4498 STORAGE BUILDING (QUONSET)
- 92 S-4499 STORAGE BUILDING (QUONSET)
- 93 4482 OPERATIONS SUPPORT BUILDING
- 94 4494 TECHNICAL DOCUMENTATION CENTER

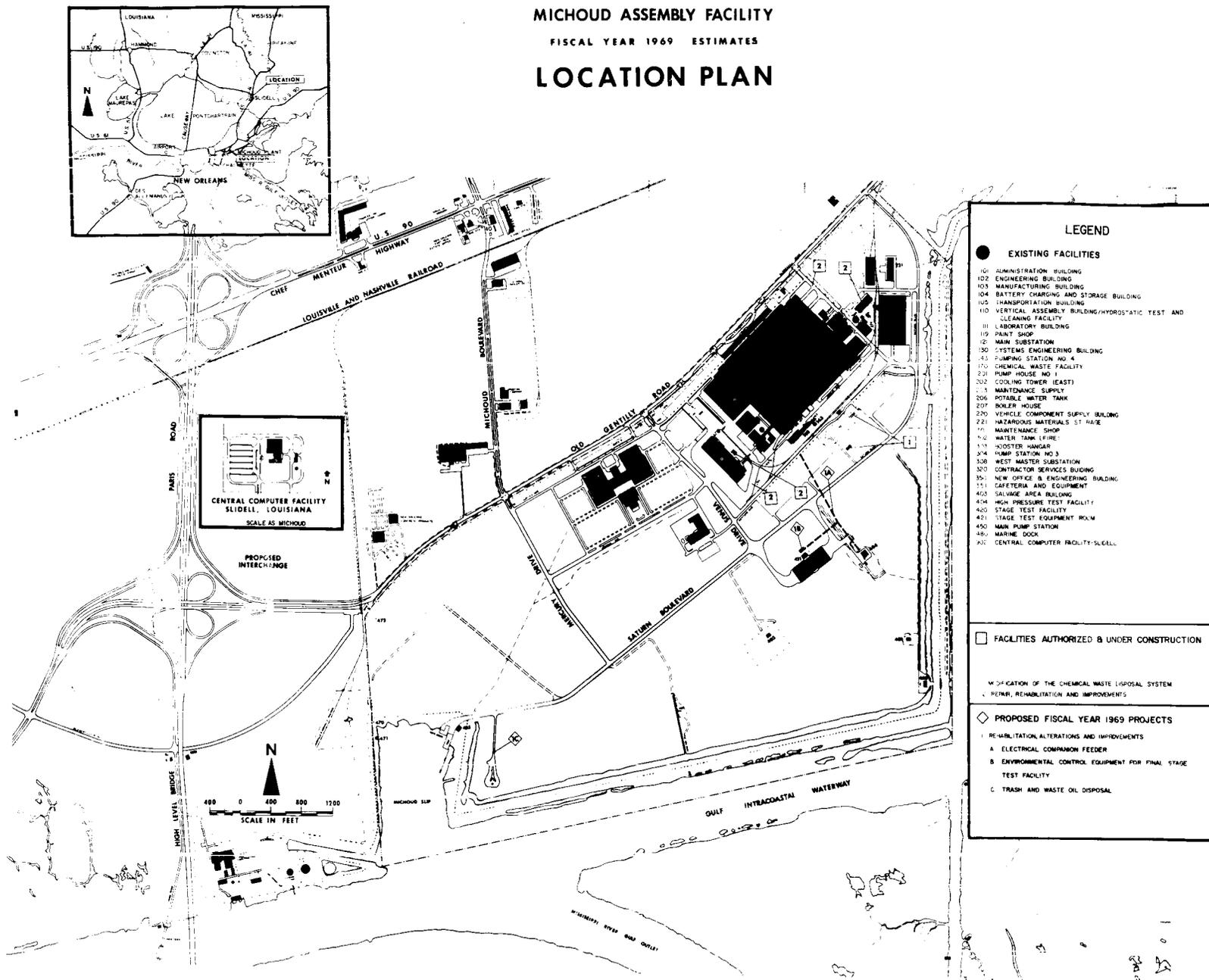
HEADQUARTERS AREA

- 95 S-4207 CENTRAL COMMUNICATIONS FACILITY
 - 96 4241 STORAGE BUILDING
 - 97 S-4244 BUTLER BUILDING (STORAGE AND SHOPS)
 - 98 S-4251 SUPPORT SERVICES EQUIPMENT SHED
 - 99 4250 TECHNICAL SERVICES OPERATIONS BUILDING
 - 100 4249 SUPPORT SERVICES OPERATIONS AND MEDICAL CENTER
 - 101 4200 CENTRAL LABORATORY AND OFFICE BUILDING
 - 102 4202 PROJECT ENGINEERING BUILDING
 - 103 4201 ENGINEERING AND ADMINISTRATION BUILDING
- ARMY BUILDINGS

MICHLOUD ASSEMBLY FACILITY

FISCAL YEAR 1969 ESTIMATES

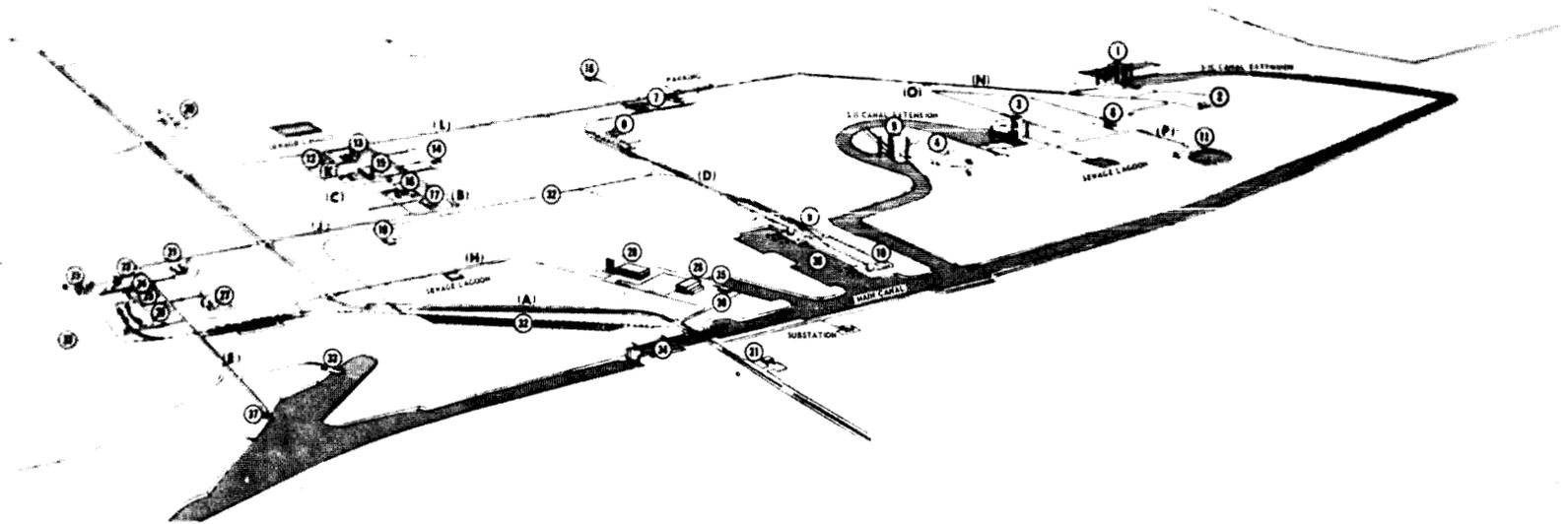
LOCATION PLAN



AO 2-27

10/15/68

MISSISSIPPI TEST FACILITY SITE PLAN



SATURN V TEST COMPLEX

1. SATURN S-IC STATIC TEST FAC. (DUAL POSITION)
2. S-IC TEST CONTROL CENTER
3. S-II POSITION A-2
4. S-II TEST CONTROL CENTER
5. S-II POSITION A-1
6. DATA ACQUISITION CENTER
7. HIGH PRESSURE GAS COMPRESSOR FACILITY
8. RP-1 STORAGE AND TRANSFER AREA
9. LH2 TRANSFER AREA
10. LOX STORAGE AND TRANSFER AREA
11. HI PR WATER STORAGE, PUMP, & DISTR SYSTEM

ENGINEERING AND ADMINISTRATION COMPLEX

12. COMMUNICATIONS & TELEPHONE BUILDING
13. TEST AREA CONTROL CENTER
14. DATA HANDLING CENTER
15. OFFICE AND ADMINISTRATION BUILDING

16. ELECTRONICS INSTR & MATERIALS LAB
17. SONIC MEASURING FACILITY
- ACOUSTIC LAB
18. SONIC MEASURING FACILITY
- METEOROLOGY LAB
19. CENTRAL HEATING PLANT

INDUSTRIAL COMPLEX

20. COMPONENTS SERVICE FACILITY
21. EMERGENCY SERVICES BLDG.
22. SITE MAINTENANCE BLDG.
23. TEST MAINTENANCE BLDG.
24. COMPRESSED GAS CYLINDER STORAGE
25. INFLAMMABLE MATERIAL STORAGE
26. WAREHOUSE
27. MOBILE EQUIPMENT OPERATION BLDG.
28. S-IC STAGE STORAGE BUILDING
29. S-II STAGE STORAGE & C/O FAC.
30. CRYOGENIC BARGE SERVICE BUILDING

31. SECURITY CONTROL FACILITY

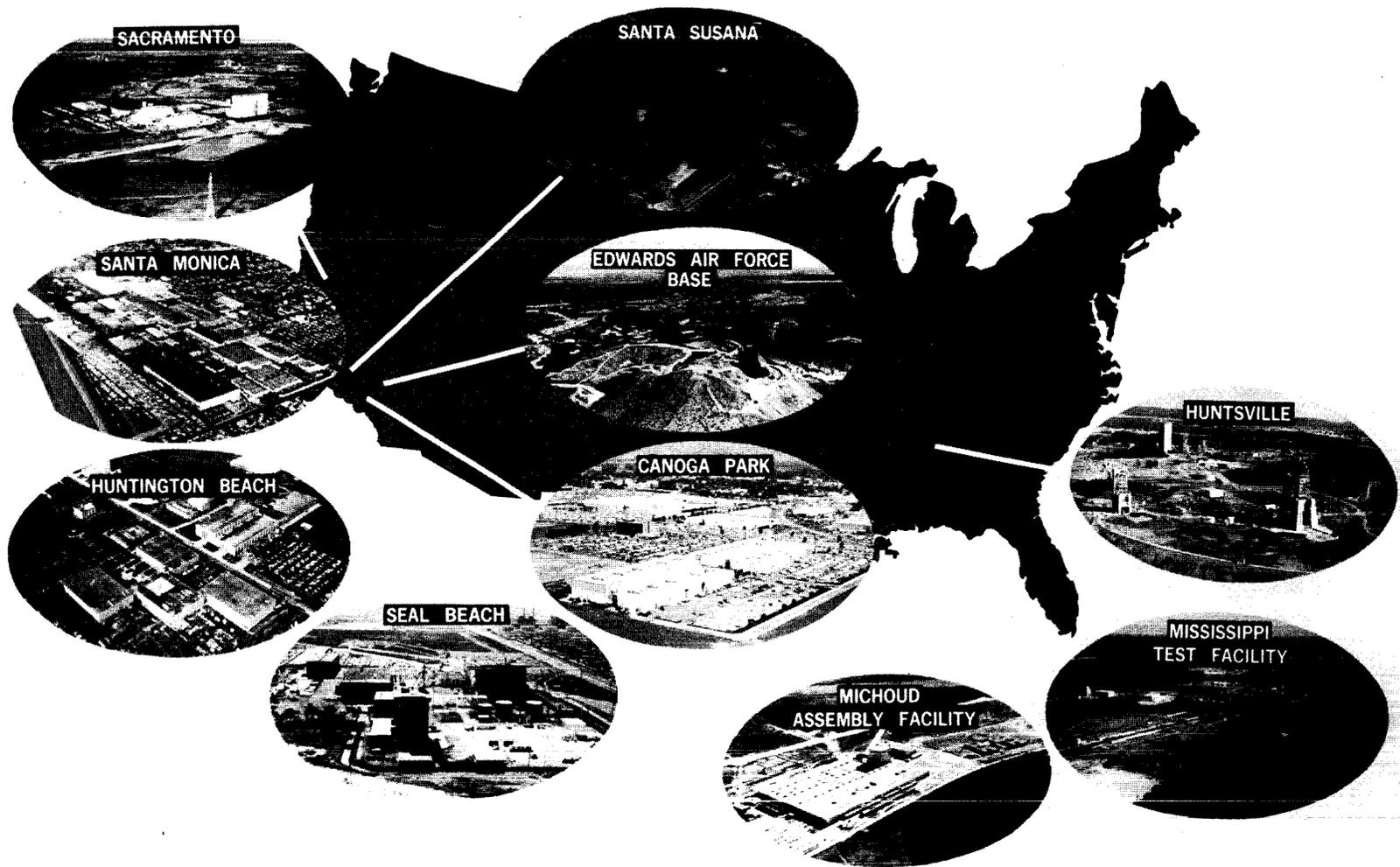
TRANSPORTATION & MISC.

32. RAILROAD & SWITCHING YARD
33. RP-1 TRANSFER DOCK
34. NAVIGATION LOCK & BRIDGE
35. BOOSTER TRANSFER DOCK
36. CRYOGENIC DOCK AND CANAL EXTENSION
37. CONSTRUCTION DOCK

AO 2-28

IND B7816J

MARSHALL SPACE FLIGHT CENTER PROGRAM FACILITIES



AO 2-29

Marshall Space Flight Center



AO 2-30

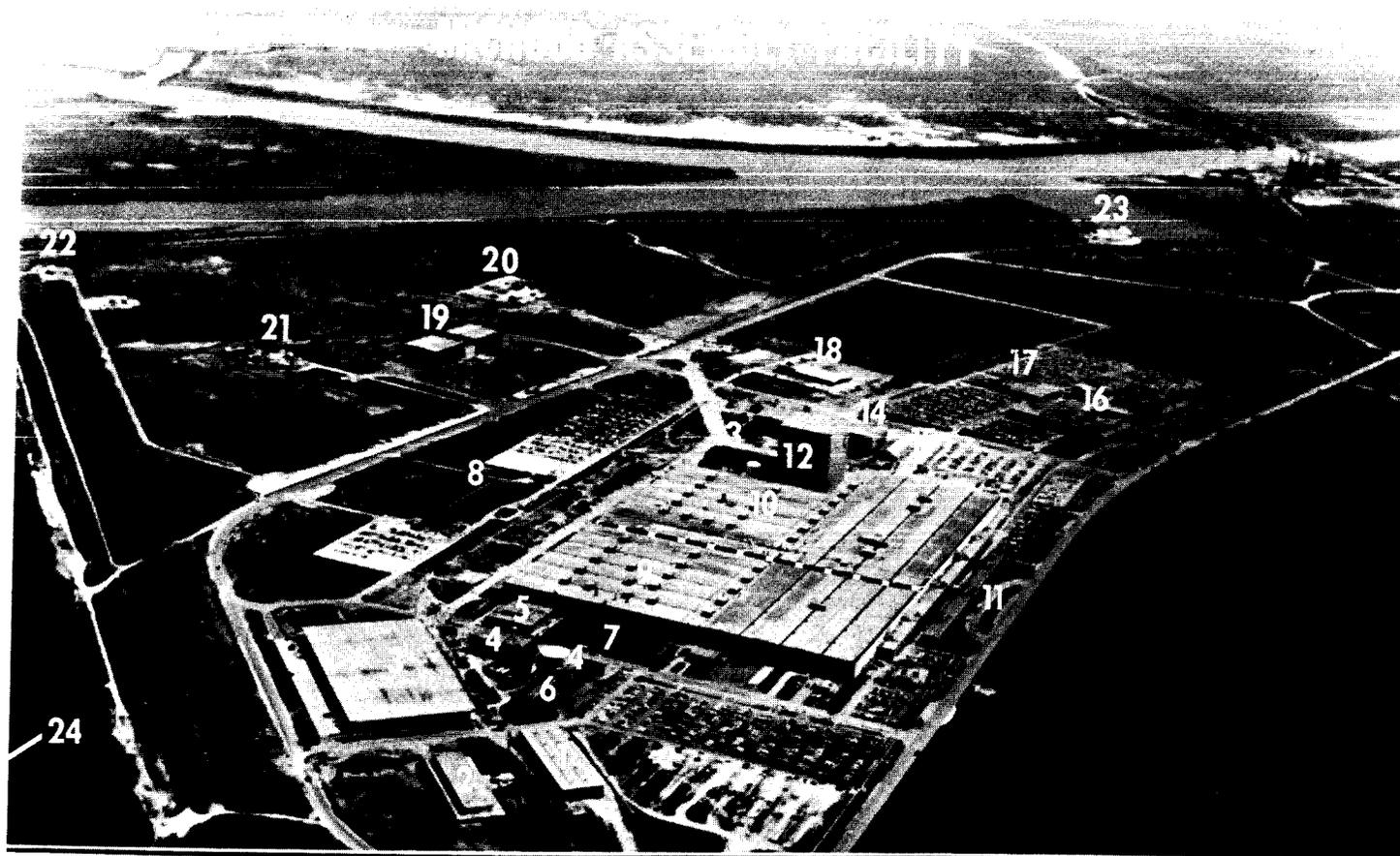
Aerial View

Marshall Space Flight Center



AO 2-31

Aerial View



1. MAINTENANCE SUPPLY
2. HAZARDOUS MATLS
3. VEHICLE COMPONENT SUPPLY
4. BOILER PLANT & FUEL TANKS
5. BATTERY CHARGING
6. COOLING TOWER
7. LABORATORY
8. CHEMICAL WASTE RESERVOIR

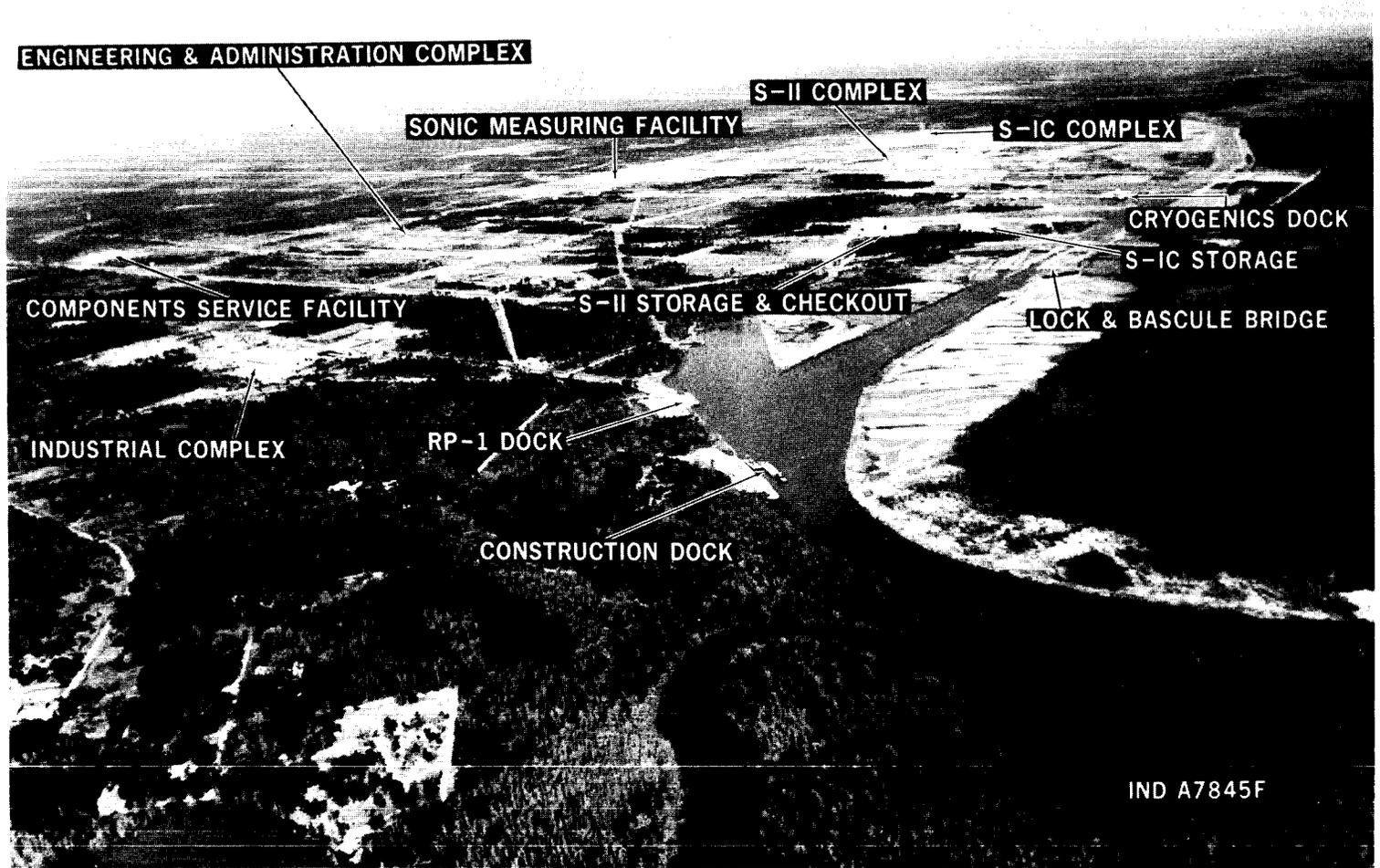
9. CHRYSLER FAB AREA (S-1B)
10. BOEING FAB AREA (S-1C)
11. ENGINEERING BUILDINGS
12. VERT ASSY & HYDROSTATIC TEST
13. SYSTEMS ENGINEERING BLDG
14. BOOSTER HANGAR
15. MAINTENANCE
16. ENGINEERING & OFFICE BLDG

17. CAFETERIA
18. CONTRACTOR SERVICES BLDG
19. STAGE TEST & CHECK OUT
20. SALVAGE YARD
21. HIGH PRESSURE TEST FACILITY
22. MAIN PUMPING STATION
23. BARGE DOCK
24. LOX & LH₂ PLANT

AO 7-32

IND 8904F

MISSISSIPPI TEST FACILITY—AERIAL VIEW



AO 2-33

IND A7845F

ADMINISTRATIVE OPERATIONS
FISCAL YEAR 1969 ESTIMATES
GODDARD SPACE FLIGHT CENTER

MISSION:

The Goddard Space Flight Center, established in 1959 as the first major United States laboratory devoted to the investigation and exploration of space, conducts a wide-ranging program of experimentation in the space sciences. As a result, Goddard Space Flight Center has developed many diverse capabilities: the management of complex satellite projects; the development of wholly integrated spacecraft, ranging from systems engineering to development and integration; the development and operation of satellite tracking networks; data acquisition and analysis; and scientific research to include both theoretical studies and the development of many significant scientific experiments flown in satellites.

Although the majority of Goddard Space Flight Center's personnel are at the Greenbelt site, other personnel are located at the Goddard Institute for Space Studies in New York City; and throughout the world, managing the operation of satellite tracking and communications network stations.

Goddard Space Flight Center is responsible for the development of the sounding rocket program; the management of communications and meteorological satellite programs, such as the Applications Technology and Nimbus Satellites; the management of scientific satellite projects to include the Orbiting Geophysical (OGO), Orbiting Solar (OSO), and the Orbiting Astronomical (OAO) Observatories and the Explorer series; project management of NASA's Delta launch vehicle; and management and operation of two world-wide tracking and data acquisition networks, the Space Tracking and Data Acquisition Network and the Manned Space Flight Network.

Significant achievements of the Goddard Space Flight Center in 1967 included:

Scientific Satellites - Major scientific satellites successfully orbited in 1967 included: OSO III and IV, to map the sun; Explorer 34, to investigate lunar space and lunar events from a point midway to the moon; Explorer 35, the lunar anchored interplanetary monitoring probe designed to undertake a detailed study of the interaction between the solar wind and the moon, (this represented the 50th successful launch using the Goddard-managed Delta booster); OGO-D, designed to obtain data on particles, fields and characteristics of the earth's atmosphere; also the U. K. III Satellite, an international cooperative project with the United Kingdom. The Center further assisted in the launch of the first Italian Satellite, San Marco, from an Indian Ocean platform.

Meteorological/Communications Satellites - During 1967, Goddard Space Flight Center, on behalf of the Environmental Science Services Administration, launched three operational weather satellites, ESSA IV, V and VI. The ESSA concept is based on the highly successful Tiros series. Three Intelsats, operational communications satellites of the Communications Satellite Corporation, were also launched by this Center during 1967. During the year, Goddard Space Flight Center also successfully orbited the Applications Technology Satellite III which, in addition to meteorology, serves space-borne communications and scientific research. This satellite obtained the first color weather photographs from a synchronous orbit.

Sounding Rockets - The sounding rocket program consisted of 162 scientific rocket launchings in 1967, including 20 launches in conjunction with foreign scientists.

Tracking and Data Acquisition - The Goddard-managed Space Tracking and Data Acquisition Network provided communications and tracking coverage for unmanned scientific and applications satellites in 1967. At year's end, the Manned Space Flight Network provided global tracking support for the first unmanned Apollo flight (Apollo 4). Insertion ships and tracking aircraft were being readied to support on-coming manned Apollo flights in 1968.

DESCRIPTION:

The Goddard Space Flight Center, located 15 miles northeast of Washington, D. C., and 1 mile east of the Baltimore-Washington Parkway, Greenbelt, Maryland exit, is situated on a 553-acre main site. Three additional plots of 639 acres comprise our remote site area and contain the Goddard Antenna Test Range, the Goddard Optical Facility, the Propulsion Research Facility, the Magnetic Fields Component Test Facility, the Attitude Control Test Facility, and the Network Training and Test Facility. Total capital investment as of June 30, 1967, under the cognizance of Goddard Space Flight Center, including the Manned Space Flight Network, the Space Tracking and Data Acquisition Network, Apollo ships, and the Goddard Space Flight Center main site at Greenbelt, Maryland, is \$495,734,000.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$47,089,000	\$49,988,000	\$52,508,000
Travel.....	2,630,000	2,183,000	2,183,000
Automatic data processing.....	7,284,000	5,897,000	5,916,000
Facilities services.....	8,110,000	5,634,000	5,432,000

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Technical services.....	\$1,365,000	\$746,000	\$736,000
Administrative support.....	<u>4,591,000</u>	<u>4,077,000</u>	<u>3,819,000</u>
Total, fund requirements.....	<u>\$71,069,000</u>	<u>\$68,525,000</u>	<u>\$70,594,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Apollo.....	2	4	5
Apollo applications.....	1	12	16
<u>Space Science and Applications</u>			
Physics and astronomy.....	1,053	1,028	1,073
Lunar and planetary.....	21	25	20
Launch vehicle procurement.....	41	32	32
Bioscience.....	11	11	10
Space applications.....	363	359	409
<u>Advanced Research and Technology</u>			
Basic research.....	5	2	2
Space vehicle systems.....	48	45	49
Electronics systems.....	71	60	72
Space power and electric propulsion systems.....	44	28	44
Chemical propulsion.....	6	8	15
<u>Tracking and Data Acquisition</u>	816	795	787
<u>Technology Utilization</u>	<u>4</u>	<u>3</u>	<u>3</u>
Subtotal, positions by program.....	2,486	2,412	2,537
2. <u>Support positions:</u>			
Director and staff.....	16	15	15
Administrative support.....	905	828	848
Research and development support.....	<u>375</u>	<u>431</u>	<u>441</u>
Subtotal, support positions.....	<u>1,296</u>	<u>1,274</u>	<u>1,304</u>
Total, permanent positions.....	<u>3,782</u>	<u>3,686</u>	<u>3,841</u>

GODDARD SPACE FLIGHT CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ORGANIZATION AND STAFFING SUMMARY

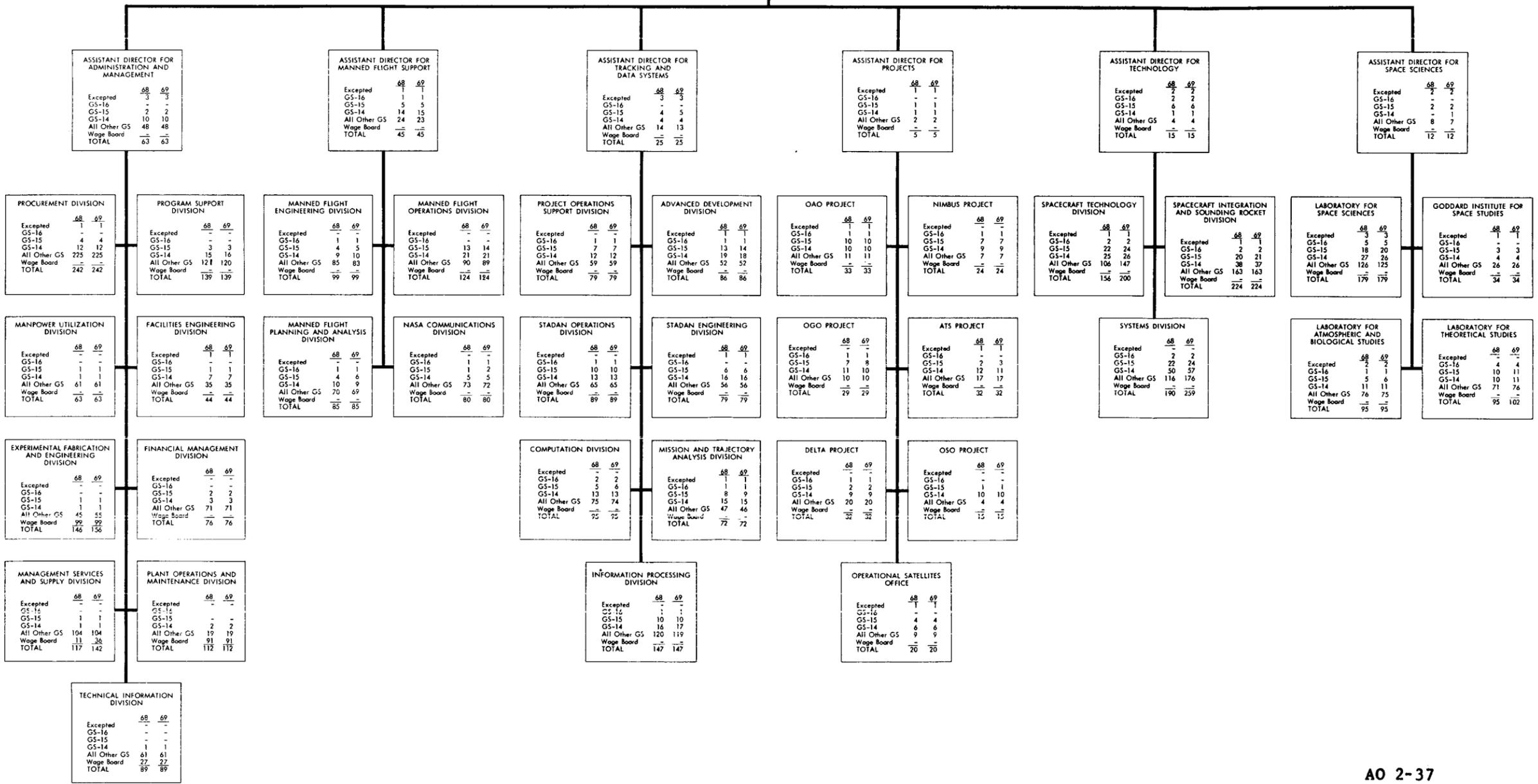
STAFFING SUMMARY	
Excepted	68 69
GS-16	35 35
GS-15	33 33
GS-14	263 283
All Other GS	502 512
Wage Board	2625 2725
TOTAL	228 253
PERMANENT	3686 3841

CHIEF ADVANCED PLANS STAFF	
Excepted	68 69
GS-16	1 1
GS-15	- -
GS-14	2 2
All Other GS	2 2
Wage Board	- -
TOTAL	7 7

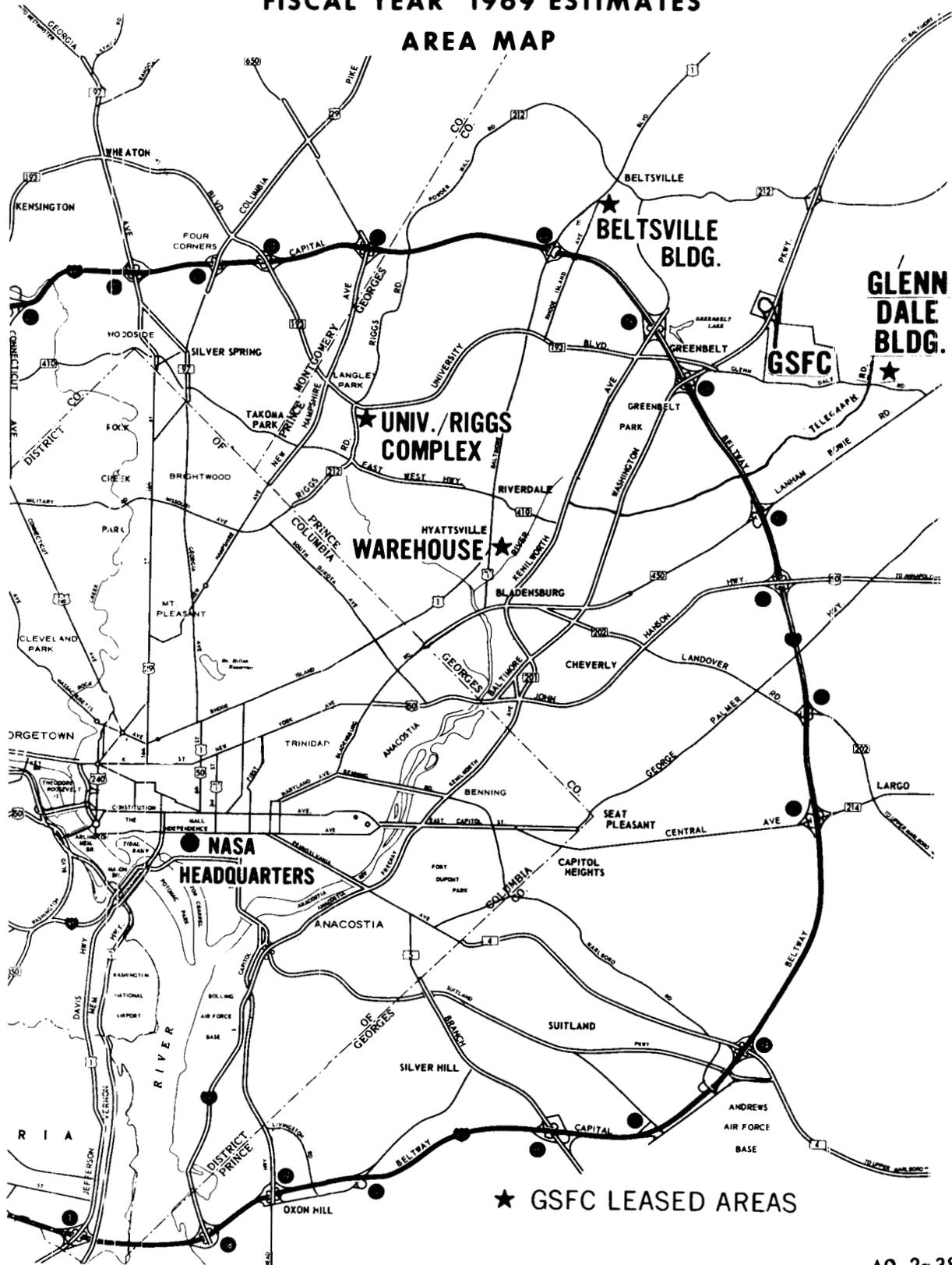
OFFICE OF THE DIRECTOR	
Excepted	68 69
GS-16	3 3
GS-15	- -
GS-14	- -
All Other GS	5 5
Wage Board	- -
TOTAL	8 8

ASSISTANT DIRECTOR FOR SYSTEMS RELIABILITY	
Excepted	68 69
GS-16	2 2
GS-15	- -
GS-14	2 2
All Other GS	4 4
Wage Board	5 5
TOTAL	13 13

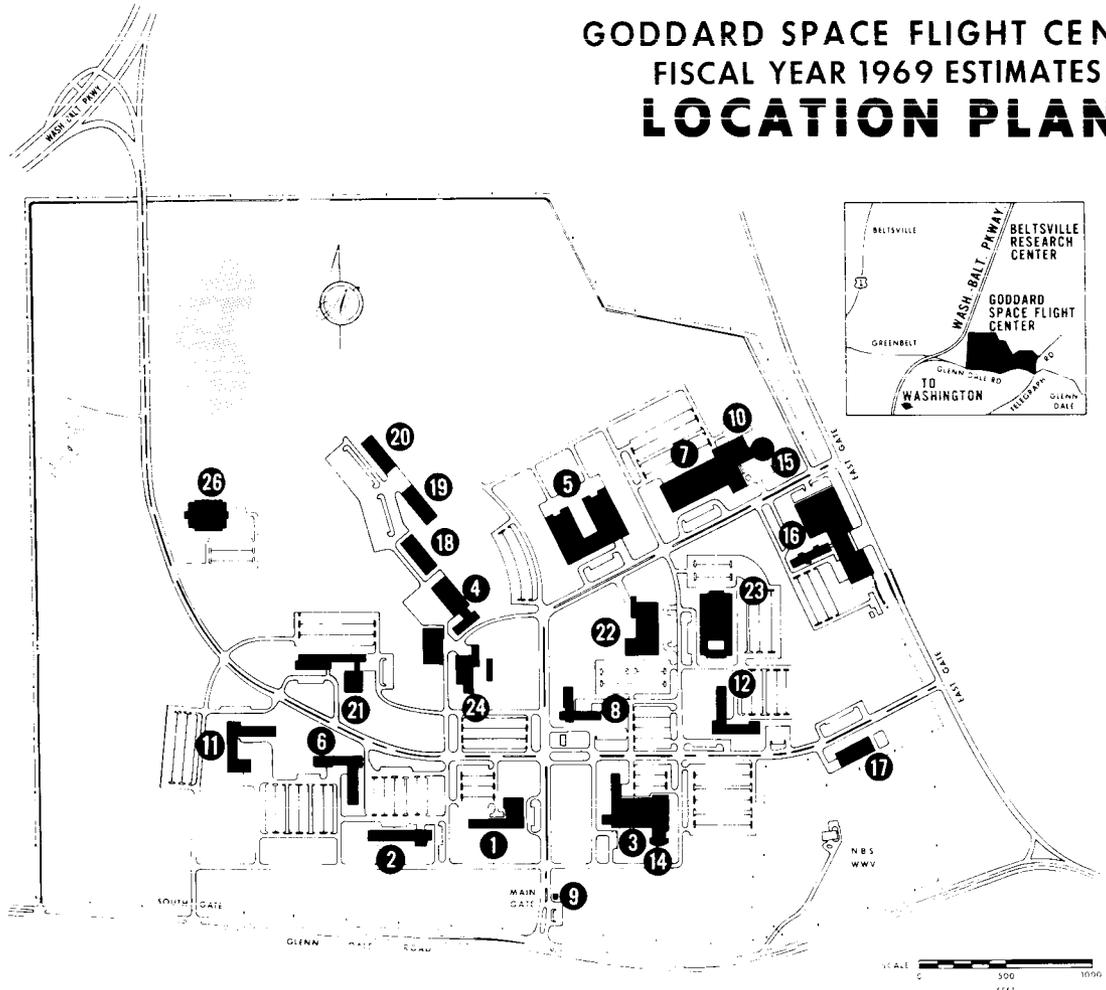
TEST AND EVALUATION DIVISION	
Excepted	68 69
GS-16	1 1
GS-15	- -
GS-14	42 44
All Other GS	217 215
Wage Board	- -
TOTAL	272 272



**GODDARD SPACE FLIGHT CENTER
FISCAL YEAR 1969 ESTIMATES
AREA MAP**

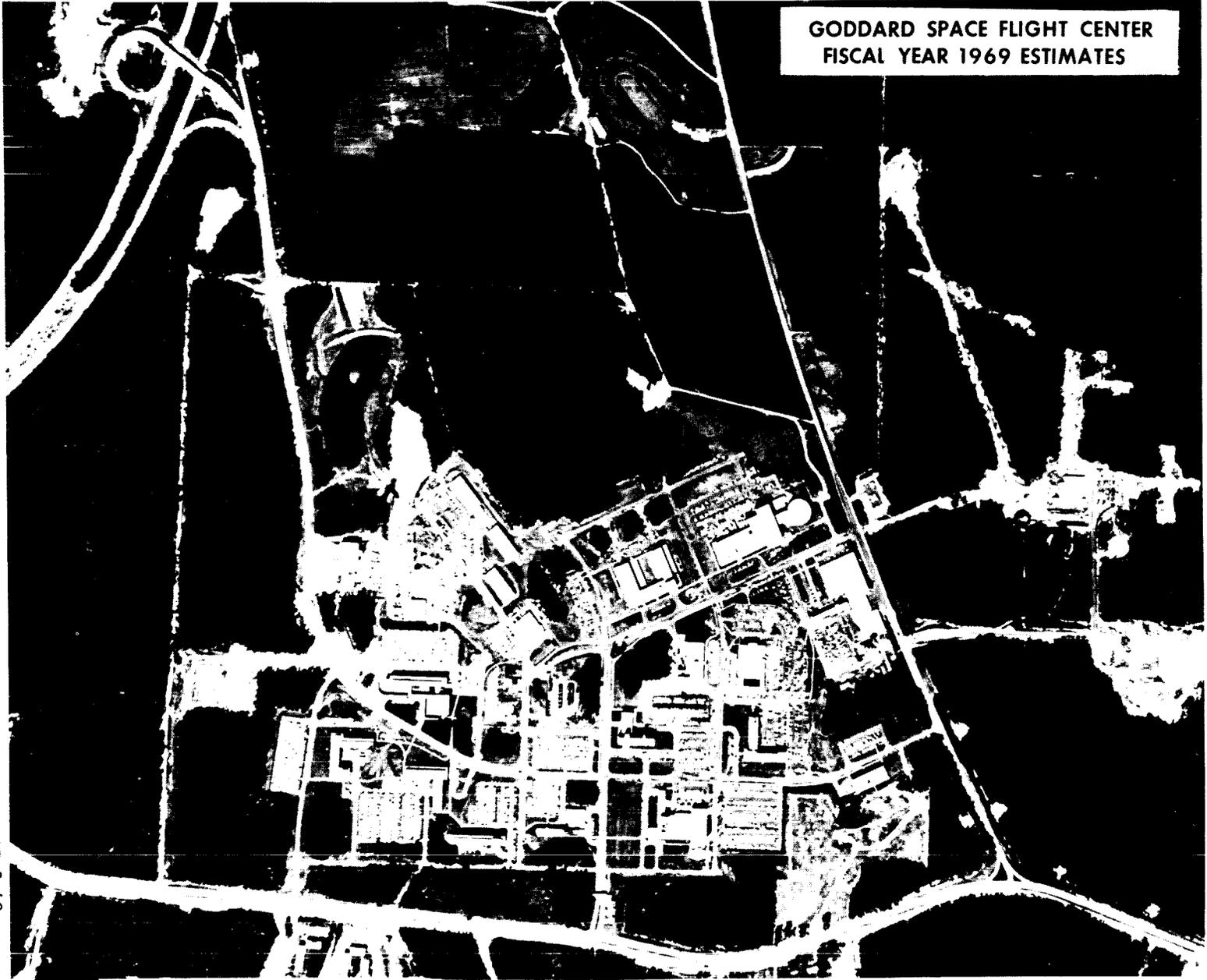


GODDARD SPACE FLIGHT CENTER FISCAL YEAR 1969 ESTIMATES LOCATION PLAN



- | | |
|--|--|
| <ul style="list-style-type: none"> 1 SPACE PROJECTS BUILDING 2 RESEARCH PROJECTS LABORATORY 3 CENTRAL FLIGHT CONTROL AND RANGE OPERATIONS LABORATORY 4 BOILER HOUSE AND ELECTRIC SUBSTATION 5 INSTRUMENT CONSTRUCTION AND INSTALLATION LABORATORY 6 SPACE SCIENCES LABORATORY 7 PAYLOAD TESTING FACILITY 8 SATELLITE SYSTEMS LABORATORY 9 GATE HOUSE 10 ENVIRONMENTAL TESTING LABORATORY 11 APPLIED SCIENCES LABORATORY 12 TRACKING AND TELEMETRY LABORATORY 14 SPACECRAFT OPERATIONS FACILITY 15 LAUNCH PHASE SIMULATOR 16 DEVELOPMENT OPERATIONS BUILDING 17 MULTI-PURPOSE BUILDING 18 MULTI-PURPOSE BUILDING | <ul style="list-style-type: none"> 19 MULTI-PURPOSE BUILDING 20 MULTI-PURPOSE BUILDING 21 METEOROLOGICAL SYSTEMS DEVELOPMENT LABORATORY 22 MECHANICAL TEST FACILITY AND QUALITY ASSURANCE LABORATORY 23 DATA INTERPRETATION LABORATORY 24 ADDITION TO CENTRAL HEATING AND REFRIGERATION PLANT 26 NASA SPACE SCIENCE DATA CENTER |
|--|--|
-
- EXISTING FACILITIES
 - FACILITIES UNDER CONSTRUCTION

GODDARD SPACE FLIGHT CENTER
FISCAL YEAR 1969 ESTIMATES



AO 2-40

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

WALLOPS STATION

MISSION:

Wallops Station was established as the Pilotless Aircraft Research Station of the National Advisory Committee for Aeronautics (NACA) in 1945. This installation's early mission included wind tunnel and laboratory investigations of a variety of aerodynamic problems of flight, as well as serving as a launch site for meteorological and sounding rockets. When the resources and facilities of NACA were transferred to the newly established National Aeronautics and Space Administration (NASA) in 1958, this facility was renamed Wallops Station.

Today, the primary mission of Wallops Station is to prepare, assemble, and launch experimental payloads; position them correctly in space at the right velocity; track them, and acquire meaningful data. The data are then processed and turned over to the experimenter to be analyzed. The rocket-borne experiments flown from the Wallops Island range are conceived, and for the most part designed and built by scientists and engineers in the laboratories and research centers of NASA, other Government agencies, colleges and universities, and the world-wide scientific community. They are brought by teams of experimenters to Wallops Station where the payloads are checked out, prepared for flight, and mated to an appropriate launch vehicle. Wallops personnel participate in these latter tasks and perform those engineering functions necessary to design and establish ground facilities and instrumentation systems compatible with test requirements.

In addition to supporting the launching of sounding rocket propelled experiments, Wallops uses its facilities for a variety of other research projects. The testing and development of components and instrumentation to be flown in later types of vehicles and spacecraft is a continuing Wallops project. A sizeable portion of Wallops effort is devoted to NASA's program of international cooperation in space research. Some 50 countries have sent representatives to Wallops Station over the past few years to observe its operation or to receive training in methods and techniques of launching sounding rockets and satellite payloads. The four-stage Scout, the largest launch vehicle at Wallops, is used in the launch of small scientific satellites, another important element of the Wallops research program. The Owl series of University Explorers, a small scientific satellite project for which Wallops has project management responsibility, is well underway. Responsibility for the management of the Owl series of Explorers provides Wallops with the capability of managing a project from initial design to the ultimate launch, tracking and data acquisition phases. In addition to

project management responsibility, Wallops conducts a variety of scientific experiments including the recent Gravity Preference experiment and the "C" Band Radar System (GEOS-B) experiment.

Wallops Station's achievements during the past calendar year include: the first in a series of four Gravity Preference experiments; the launching of 368 sounding rockets and 220 test rockets; and the participation in a number of international projects highlighted by the joint United States/Japanese launch of 20 meteorological rockets at Wallops Station and assistance with the Italian San Marco II launch off the coast of Africa. The Station continues to play an important part in the training of foreign nationals in the techniques of launch operations. Sixteen personnel from France, Germany, Spain and Japan received training at Wallops Station during the past calendar year and a total of 104 persons from 14 countries visited the installation to observe its operations or seek assistance in establishing a sounding rocket launch facility of their own.

DESCRIPTION:

Wallops Station includes three separate areas on the Atlantic Coast of Virginia's eastern shore: the main base (formerly Chincoteague Naval Air Station), the Wallops Island launching site and the Wallops mainland. The administrative offices, the range control center, support shops and the main telemetry buildings are located on the main base. Wallops Island is about seven miles southeast of the main base and is connected to the mainland by a causeway and bridge. The island is about five miles long and its widest point is only one-half mile. Located on the island are rocket storage buildings, blockhouses, assembly shops and the launch sites. The Wallops mainland is a one-half mile strip west of the island and houses the radar and optical tracking sites. An additional Wallops holding is the Eastville tracking site located about 50 miles south of Wallops Station.

Wallops Station, totaling 6,561 acres, consists of 2,313 acres on the main base; 3,000 acres on Wallops Island, 108 acres on the mainland tracking site; and 1,140 acres of unusable marsh land. The Eastville tracking site consists of an additional 53 acres of government-owned property. The total capital investment as of June 30, 1967, including off-site holdings was \$100,062,000.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$5,153,000	\$5,301,000	\$5,346,000
Travel.....	136,000	127,000	127,000
Automatic data processing.....	91,000	75,000	75,000

<u>Functions</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Facilities services.....	\$3,142,000	\$2,310,000	\$2,345,000
Technical services.....	90,000	93,000	89,000
Administrative support.....	<u>1,117,000</u>	<u>961,000</u>	<u>926,000</u>
Total, fund requirements.....	<u>\$9,729,000</u>	<u>\$8,867,000</u>	<u>\$8,908,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Space Science and Applications</u>			
Physics and astronomy.....	68	71	69
Launch vehicle procurement.....	5	4	4
Bioscience.....	8	10	12
Space applications.....	5	5	4
<u>Advanced Research and Technology</u>			
Space vehicle systems.....	32	32	34
Space power and electric propulsion systems.....	2	---	---
Aeronautical vehicles.....	20	20	22
<u>Tracking and Data Acquisition.....</u>	<u>41</u>	<u>43</u>	<u>43</u>
Subtotal, positions by program.....	181	185	188
2. <u>Support positions:</u>			
Director and staff.....	6	7	7
Administrative support.....	207	191	191
Research and development support.....	<u>124</u>	<u>114</u>	<u>111</u>
Subtotal, support positions.....	<u>337</u>	<u>312</u>	<u>309</u>
Total, permanent positions.....	<u>518</u>	<u>497</u>	<u>497</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ORGANIZATION AND STAFFING CHART
Wallops Station

STAFFING CHART		
	<u>68</u>	<u>69</u>
Excepted	2	2
GS-16	1	1
GS-15	8	9
GS-14	16	18
All Other GS	354	361
Wage Board	<u>116</u>	<u>106</u>
Total Permanent	<u>497</u>	<u>497</u>
Temporary	<u>24</u>	<u>24</u>
Total Positions	521	521

DIRECTOR		
	<u>68</u>	<u>69</u>
Excepted	2	2
All Other GS	<u>5</u>	<u>5</u>
Total Permanent	7	7

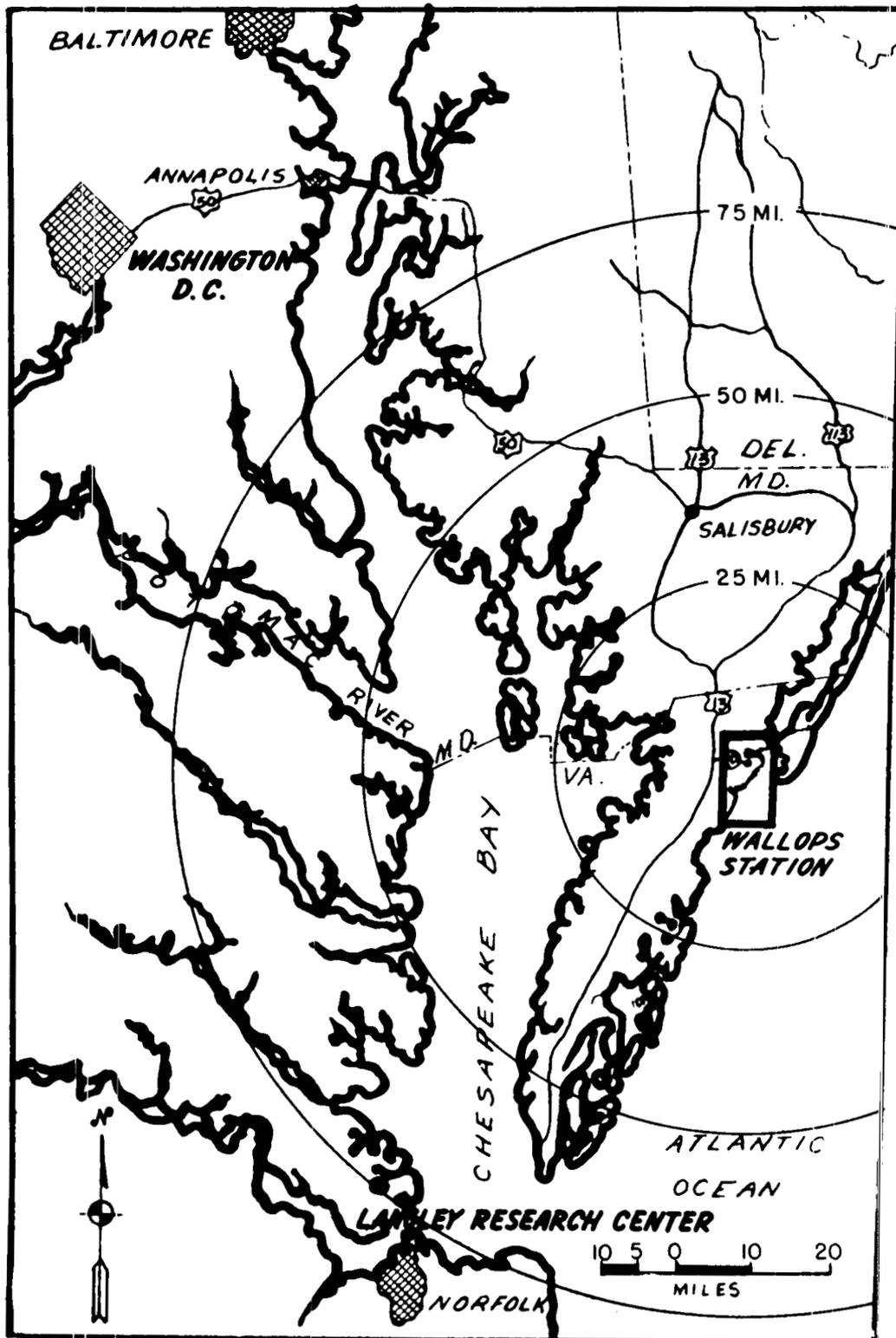
FLIGHT TEST DIVISION		
	<u>68</u>	<u>69</u>
GS-15	3	3
GS-14	5	5
All Other GS	113	117
Wage Board	<u>19</u>	<u>15</u>
Total Permanent	140	140

RANCE ENGINEERING DIVISION		
	<u>68</u>	<u>69</u>
GS-16	1	1
GS-15	4	5
GS-14	9	11
All Other GS	<u>76</u>	<u>72</u>
Total Permanent	90	89

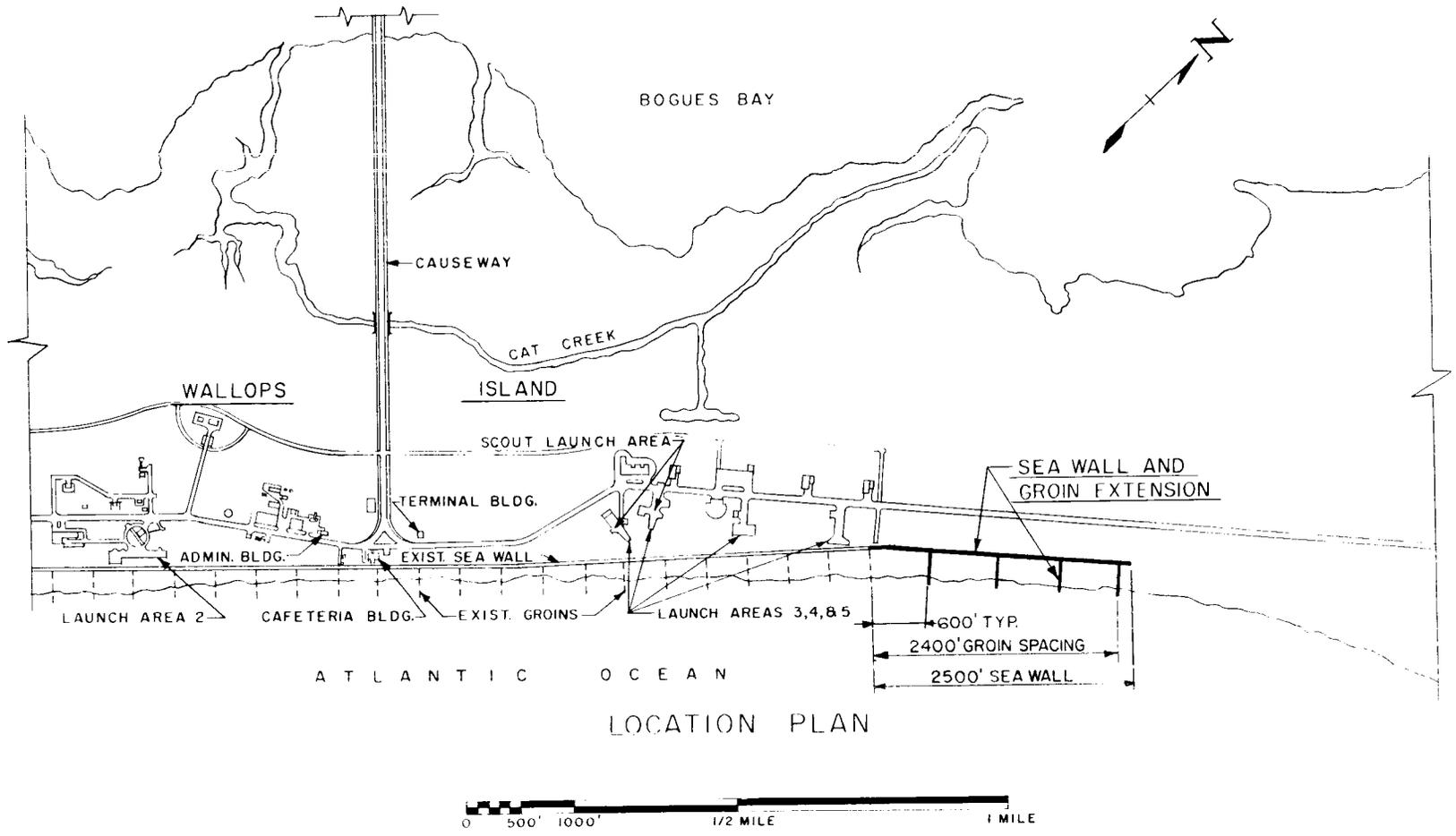
ADMINISTRATIVE MANAGEMENT DIVISION		
	<u>68</u>	<u>69</u>
GS-15	1	1
GS-14	1	1
All Other GS	<u>100</u>	<u>100</u>
Total Permanent	102	102

TECHNICAL SERVICES DIVISION		
	<u>68</u>	<u>69</u>
GS-14	1	1
All Other GS	60	67
Wage Board	<u>97</u>	<u>91</u>
Total Permanent	158	159

WALLOPS STATION LOCATION



WALLOPS STATION
FISCAL YEAR 1969 ESTIMATES



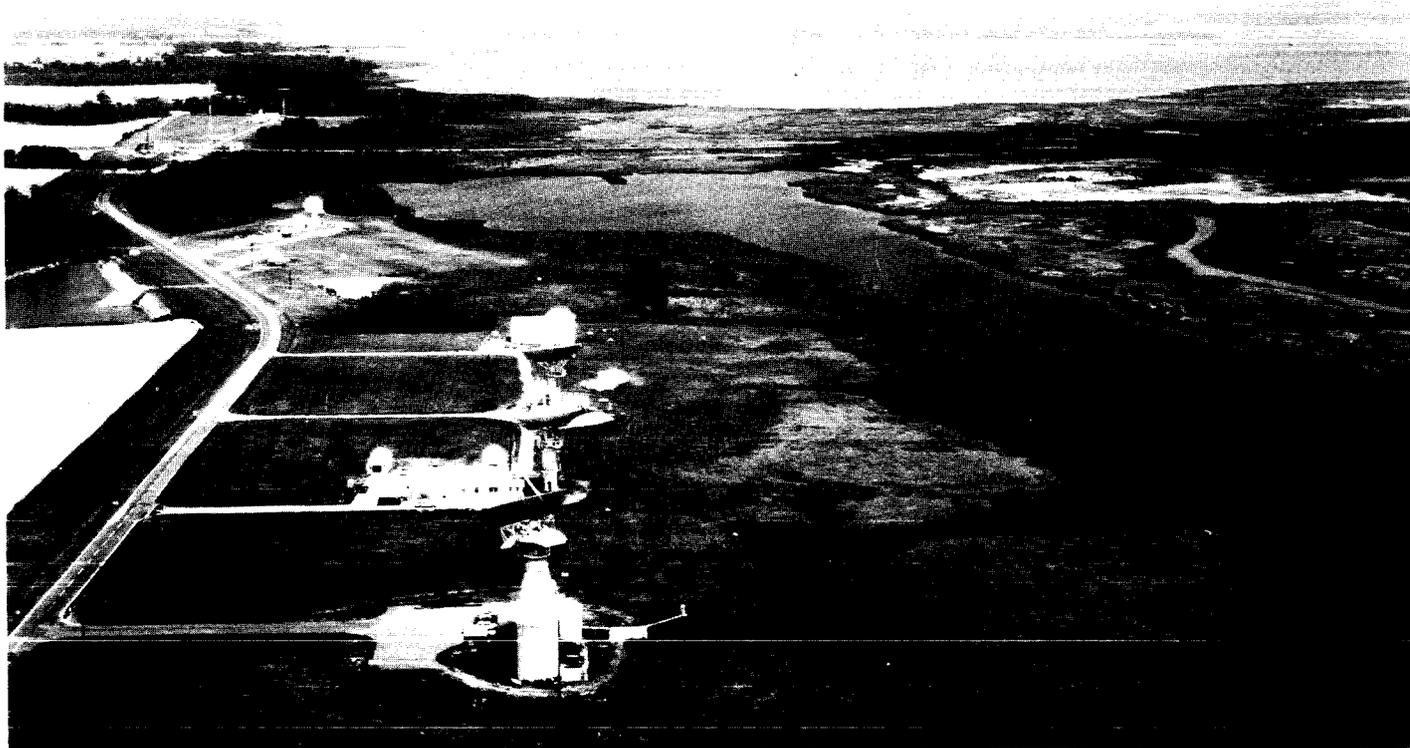
AO 2-46

LOCATION PLAN



AO 2-47

Wallops Station



AO 2-48

Tracking Radar Facilities on Wallops Mainland



AO 2-49

South End of Wallops Island Looking North

Research in the space sciences includes studies in the field of solar physics, planetary environments, and geophysics. This includes ground-based and sounding rocket experiments as well as experiments requiring specialized instruments aboard satellites and space probes. The work covers studies pertaining to magnetic fields and plasmas in space, studies to determine the composition and structure of planets and of planetary and stellar atmospheres, and studies of cratering mechanics in natural materials to aid in understanding the structure of lunar surfaces.

Research in the life sciences is conducted in three major areas: (1) basic research in the physiological and behavioral sciences concerned with obtaining a basic understanding of the effects of terrestrial and extraterrestrial environments and of space flight stresses upon living organisms, including man; (2) studies in exobiology oriented towards the prediction, detection, and study of extraterrestrial fossils, chemicals, and life forms; and (3) research in long-term advanced life support systems and in the human factors aspects of the relationships between man and the machines which will transport and support him during lunar and planetary exploration.

DESCRIPTION:

The Ames Research Center was established in 1940, and is located at the southern end of San Francisco Bay on land contiguous to the U. S. Naval Air Station, Moffett Field, California. Its physical plant comprises many specialized facilities for aerospace research in the traditional physical sciences as well as the space sciences and life sciences, all of which are included in the mission of the Center. These include conventional wind tunnels, entry-heating simulators, and free-flight ballistic test facilities capable of conducting tests at speeds up to and above earth escape speed as well as laboratories equipped to study solar and geophysical phenomena, life synthesis, life detection, and life environmental factors. The Ames Research Center occupies about 365 acres of land. Certain other facilities, such as the utilities and airfield runways, are used jointly by NASA and the Navy. The total capital investment of the Ames Research Center, including work in progress and contractor-held facilities, as of June 30, 1967, is \$210,781,000.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$25,923,000	\$26,943,000	\$27,372,000
Travel.....	841,000	793,000	793,000
Automatic data processing.....	1,819,000	1,544,000	1,544,000

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Facilities services.....	\$3,932,000	\$3,191,000	\$3,174,000
Technical services.....	205,000	70,000	70,000
Administrative support.....	<u>1,104,000</u>	<u>1,022,000</u>	<u>1,022,000</u>
Total, fund requirements.....	<u>\$33,824,000</u>	<u>\$33,563,000</u>	<u>\$33,975,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
{ Gemini.....	1	---	---
{ Apollo.....	6	7	7
<u>Space Science and Applications</u>			
Physics and astronomy.....	136	126	126
Lunar and planetary.....	40	40	41
Bioscience.....	216	216	216
Rep. Space applications.....	9	10	8
<u>Advanced Research and Technology</u>			
{ Basic research.....	285	271	271
{ Space vehicle systems.....	288	251	251
{ Electronics systems.....	158	144	143
{ Human factor systems.....	181	181	181
{ Chemical propulsion .., ..	4	6	8
Rep. Aeronautical vehicles.....	<u>399</u>	<u>413</u>	<u>413</u>
Subtotal, positions by program.....	1,723	1,665	1,665
2. <u>Support positions:</u>			
Director and staff.....	50	48	48
Administrative support.....	321	310	310
Research and development support.....	<u>79</u>	<u>69</u>	<u>69</u>
Subtotal, support positions.....	<u>450</u>	<u>427</u>	<u>427</u>
Total, permanent positions.....	<u>2,173</u>	<u>2,092</u>	<u>2,092</u>

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ORGANIZATION AND STAFFING CHART
AMES RESEARCH CENTER**

STAFFING SUMMARY		
	68	69
Excepted	20	20
GS-16	28	28
GS-15	124	130
GS-14	197	204
All Other GS	1095	1083
Wage Board	627	627
Total Permanent	2092	2092
Temporary	18	12
Total Positions	2110	2110

DIRECTOR		
	68	69
Excepted	2	2
GS-16	2	2
GS-15	1	3
GS-14	0	0
All Other GS	7	7
Wage Board	-	-
Total Permanent	14	14

OFFICE OF ADVANCED RESEARCH AND TECHNOLOGY (NASA HQTRS)		
---	--	--

TECHNOLOGY UTILIZATION OFFICE		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	1	1
GS-14	1	1
All Other GS	2	2
Wage Board	-	-
Total Permanent	4	4

PROGRAMS & RESOURCES OFFICE		
	68	69
Excepted	-	-
GS-16	1	1
GS-15	1	1
GS-14	1	1
All Other GS	8	8
Wage Board	-	-
Total Permanent	11	11

PUBLIC AFFAIRS OFFICE		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	-	-
GS-14	1	1
All Other GS	4	4
Wage Board	-	-
Total Permanent	5	5

MEDICAL OFFICE		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	1	1
GS-14	1	1
All Other GS	-	-
Wage Board	-	-
Total Permanent	1	1

LEGAL OFFICE		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	2	2
GS-14	1	2
All Other GS	1	2
Wage Board	-	-
Total Permanent	6	6

ASSISTANT DIRECTOR AERONAUTICS & FLIGHT MECHANICS		
	68	69
Excepted	1	1
GS-16	-	-
GS-15	1	1
GS-14	1	1
All Other GS	5	5
Wage Board	-	-
Total Permanent	8	8

ASSISTANT DIRECTOR ASTRONAUTICS		
	68	69
Excepted	1	1
GS-16	-	-
GS-15	-	-
GS-14	1	1
All Other GS	1	1
Wage Board	-	-
Total Permanent	3	3

ASSISTANT DIRECTOR LIFE SCIENCES		
	68	69
Excepted	2	2
GS-16	-	-
GS-15	-	-
GS-14	-	-
All Other GS	3	3
Wage Board	-	-
Total Permanent	5	5

ASSISTANT DIRECTOR DEVELOPMENT		
	68	69
Excepted	1	1
GS-16	-	-
GS-15	-	-
GS-14	-	-
All Other GS	1	1
Wage Board	-	-
Total Permanent	2	2

ASSISTANT DIRECTOR ADMINISTRATION		
	68	69
Excepted	1	1
GS-16	-	-
GS-15	-	-
GS-14	2	2
All Other GS	1	1
Wage Board	-	-
Total Permanent	4	4

MISSION ANALYSIS DIVISION		
	68	69
Excepted	3	3
GS-16	1	1
GS-15	5	6
GS-14	11	12
All Other GS	27	25
Wage Board	-	-
Total Permanent	47	47

AERONAUTICS DIVISION		
	68	69
Excepted	-	-
GS-16	2	2
GS-15	6	6
GS-14	14	14
All Other GS	68	66
Wage Board	48	50
Total Permanent	138	138

THERMO & GAS-DYNAMICS DIVISION		
	68	69
Excepted	2	2
GS-16	2	2
GS-15	18	21
GS-14	23	21
All Other GS	86	90
Wage Board	29	24
Total Permanent	160	160

EXOBIOLGY DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	4	4
GS-14	5	7
All Other GS	37	36
Wage Board	1	-
Total Permanent	47	47

SYSTEMS ENGINEERING DIVISION		
	68	69
Excepted	-	-
GS-16	1	1
GS-15	6	6
GS-14	10	10
All Other GS	11	10
Wage Board	2	3
Total Permanent	30	30

SERVICES & SUPPLY DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	-	-
GS-14	1	1
All Other GS	43	43
Wage Board	26	26
Total Permanent	70	70

RESEARCH FACILITIES & EQUIPMENT DIVISION		
	68	69
Excepted	-	-
GS-16	1	1
GS-15	6	6
GS-14	9	9
All Other GS	107	107
Wage Board	94	94
Total Permanent	217	217

FULL SCALE & SYSTEMS RESEARCH DIVISION		
	68	69
Excepted	-	-
GS-16	6	6
GS-15	15	15
GS-14	20	21
All Other GS	67	66
Wage Board	5	5
Total Permanent	113	113

VEHICLE ENVIRONMENT DIVISION		
	68	69
Excepted	1	1
GS-16	5	5
GS-15	11	11
GS-14	16	17
All Other GS	36	37
Wage Board	28	28
Total Permanent	149	149

ENVIRONMENTAL BIOLOGY DIVISION		
	68	69
Excepted	2	2
GS-16	1	1
GS-15	6	6
GS-14	5	5
All Other GS	37	39
Wage Board	6	4
Total Permanent	57	57

PROJECT PIONEER		
	68	69
Excepted	1	1
GS-16	-	-
GS-15	6	6
GS-14	9	9
All Other GS	46	47
Wage Board	1	-
Total Permanent	43	47

FISCAL DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	-	-
GS-14	-	-
All Other GS	56	55
Wage Board	-	-
Total Permanent	56	55

TECHNICAL SERVICES DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	1	1
GS-14	-	-
All Other GS	11	11
Wage Board	244	244
Total Permanent	256	256

INSTRUMENTATION DIVISION		
	68	69
Excepted	1	1
GS-16	-	-
GS-15	5	5
GS-14	8	8
All Other GS	69	60
Wage Board	107	116
Total Permanent	190	190

SPACE SCIENCES DIVISION		
	68	69
Excepted	1	1
GS-16	2	2
GS-15	15	14
GS-14	12	13
All Other GS	33	35
Wage Board	4	1
Total Permanent	67	67

BIOTECHNOLOGY DIVISION		
	68	69
Excepted	-	-
GS-16	1	1
GS-15	3	3
GS-14	13	13
All Other GS	36	36
Wage Board	-	-
Total Permanent	53	53

PROJECT MINUTE LIFE		
	68	69
Excepted	1	1
GS-16	1	1
GS-15	1	4
GS-14	17	17
All Other GS	42	41
Wage Board	4	4
Total Permanent	68	68

PROFORMER DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	1	1
GS-14	2	2
All Other GS	51	51
Wage Board	-	-
Total Permanent	54	54

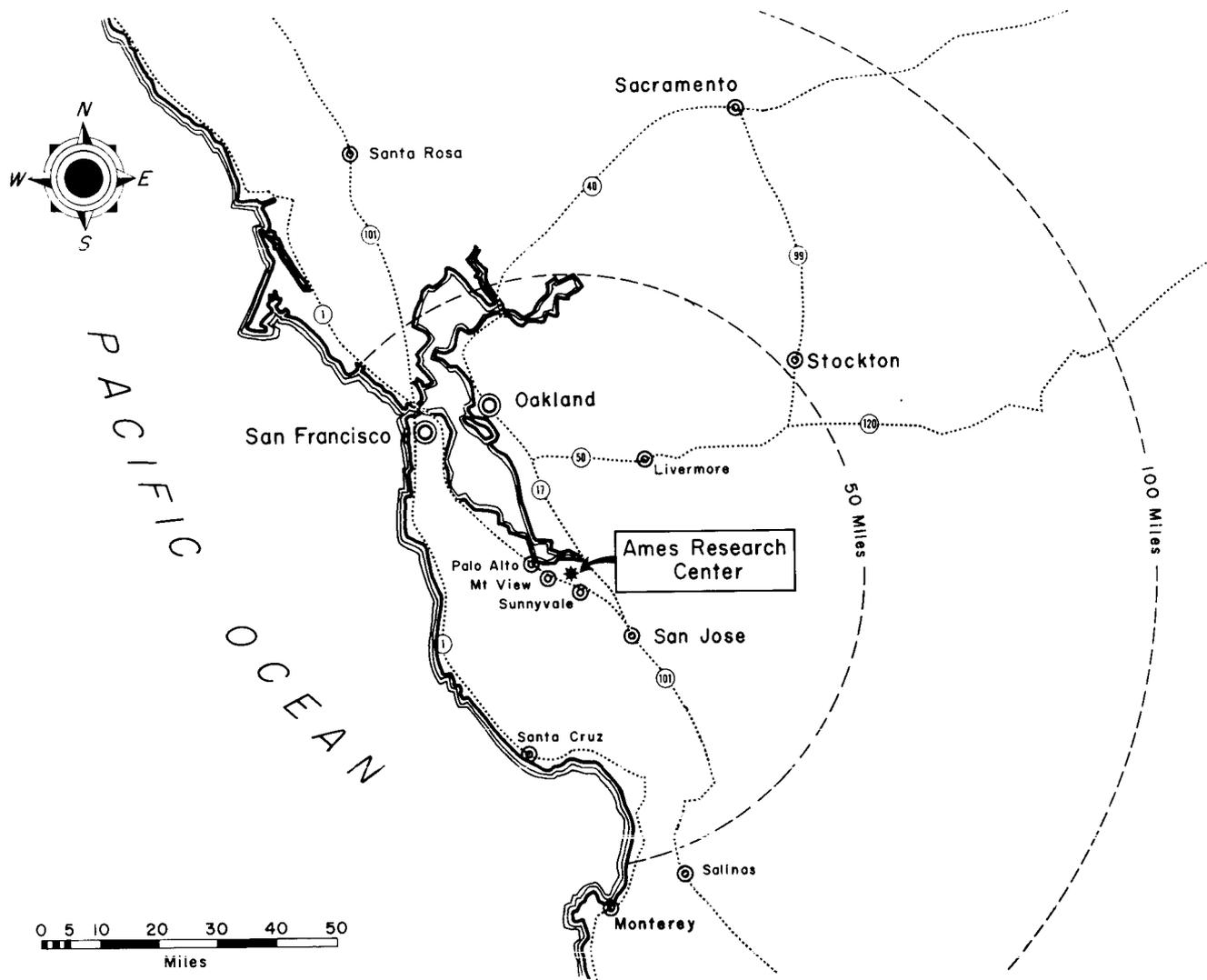
COMMUNICATIONS DIVISION		
	68	69
Excepted	-	-
GS-16	1	1
GS-15	1	1
GS-14	5	5
All Other GS	53	53
Wage Board	-	-
Total Permanent	60	60

SIMULATION SCIENCES DIVISION		
	68	69
Excepted	-	-
GS-16	1	1
GS-15	3	3
GS-14	7	7
All Other GS	11	13
Wage Board	16	16
Total Permanent	40	40

PROCUREMENT DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	1	1
GS-14	2	2
All Other GS	58	58
Wage Board	-	-
Total Permanent	61	61

TECHNICAL INFORMATION DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	-	-
GS-14	-	-
All Other GS	39	39
Wage Board	12	12
Total Permanent	51	51

AMES RESEARCH CENTER FISCAL YEAR 1969 ESTIMATES VICINITY MAP



AMES RESEARCH CENTER
FISCAL YEAR 1969 ESTIMATES
LOCATION PLAN
DATE: SEPTEMBER 1, 1967

LEGEND

N-100	ADMINISTRATION BUILDING
N-101	AUDITORIUM
N-102	ADMINISTRATION BUILDING ANNEX
N-103	ENGINEERING SERVICES BUILDING
N-104	SPACE TECHNOLOGY BUILDING
N-104A	SPACE TECHNOLOGY BUILDING ANNEX
N-105	PILOT MODEL (4-35) 7-FOOT HYPERSONIC WIND TUNNEL
N-106	12 FOOT PRESSURE WIND TUNNEL
N-106A	12 FOOT PRESSURE WIND TUNNEL AUXILIARIES BUILDING
N-107	1 BY 3 FOOT SUPERSONIC WIND TUNNEL
N-108	SUPERSONIC FREE FLIGHT WIND TUNNEL
N-109	PRESSURIZED BALLISTIC RANGE
N-110	FLIGHT SIMULATION LABORATORY
N-111	AIRPLANE HANGAR AND SHOP
N-112	STRUCTURAL FABRICATION SHOP
N-113	INSTRUMENT RESEARCH LABORATORY
N-114	MODEL FINISHING SHOP
N-115	7 BY 10 FOOT WIND TUNNEL NUMBER 1
N-116	7 BY 10 FOOT WIND TUNNEL NUMBER 2
N-118	14 FOOT TRANSONIC WIND TUNNEL
N-18A	ELECTRICAL EQUIPMENT BUILDING
N-19	ELECTRICAL SERVICES BUILDING
N-20	TECHNICAL SERVICES BUILDING
N-21	40 BY 80 FOOT WIND TUNNEL
N-21A	BIO-SATELLITE CENTRIFUGE
N-21B	VERTICAL HEIGHT APPARATUS
N-22	2 BY 7 FOOT TRANSONIC WIND TUNNEL
N-23	HYPERVELOCITY BALLISTIC RANGE
N-24	PAYLOAD INTEGRATION AND TEST FACILITY
N-25	SUBSTATION
N-26	6 BY 8 FOOT SUPERSONIC WIND TUNNEL
N-27	UNITARY PLAN WIND TUNNEL BUILDING
N-27A	11 FOOT TRANSONIC WIND TUNNEL
N-27B	9 BY 7 FOOT SUPERSONIC WIND TUNNEL
N-27C	8 BY 7 FOOT SUPERSONIC WIND TUNNEL
N-27D	UNITARY PLAN WIND TUNNEL AUXILIARIES BUILDING
N-28	42 INCH SHOCK TUNNEL
N-29	35 FOOT HYPERSONIC WIND TUNNEL
N-29A	35 FOOT HYPERSONIC WIND TUNNEL AUXILIARIES BUILDING
N-30	PHYSICAL SCIENCES RESEARCH LABORATORY
N-31	HYPERSONIC HELIUM TUNNEL
N-32	PILOT MODEL OF HYPERVELOCITY FREE FLIGHT FACILITY
N-33	DATA REDUCTION BUILDING
N-34	GASDYNAMICS LABORATORY
N-34A	MASS TRANSFER BOLLER HOUSE
N-35	CAFETERIA BUILDING
N-36	BIO-SCIENCE CASQUET JRY
N-37	HYPERVELOCITY FREE FLIGHT FACILITY
N-38	MACH 50 HELIUM TUNNEL
N-39	LIFE SCIENCES RESEARCH LABORATORY
N-39A	LIFE SCIENCES HIGH BAY
N-40	SPACE ENVIRONMENT RESEARCH FACILITY
N-41	ADMINISTRATIVE MANAGEMENT BUILDING
N-42	STRUCTURAL DYNAMICS LABORATORY
N-43	FLIGHT AND GUIDANCE SIMULATION LABORATORY
N-43A	SIMULATION EQUIPMENT BUILDING
N-44	SYSTEMS ENGINEERING FACILITY



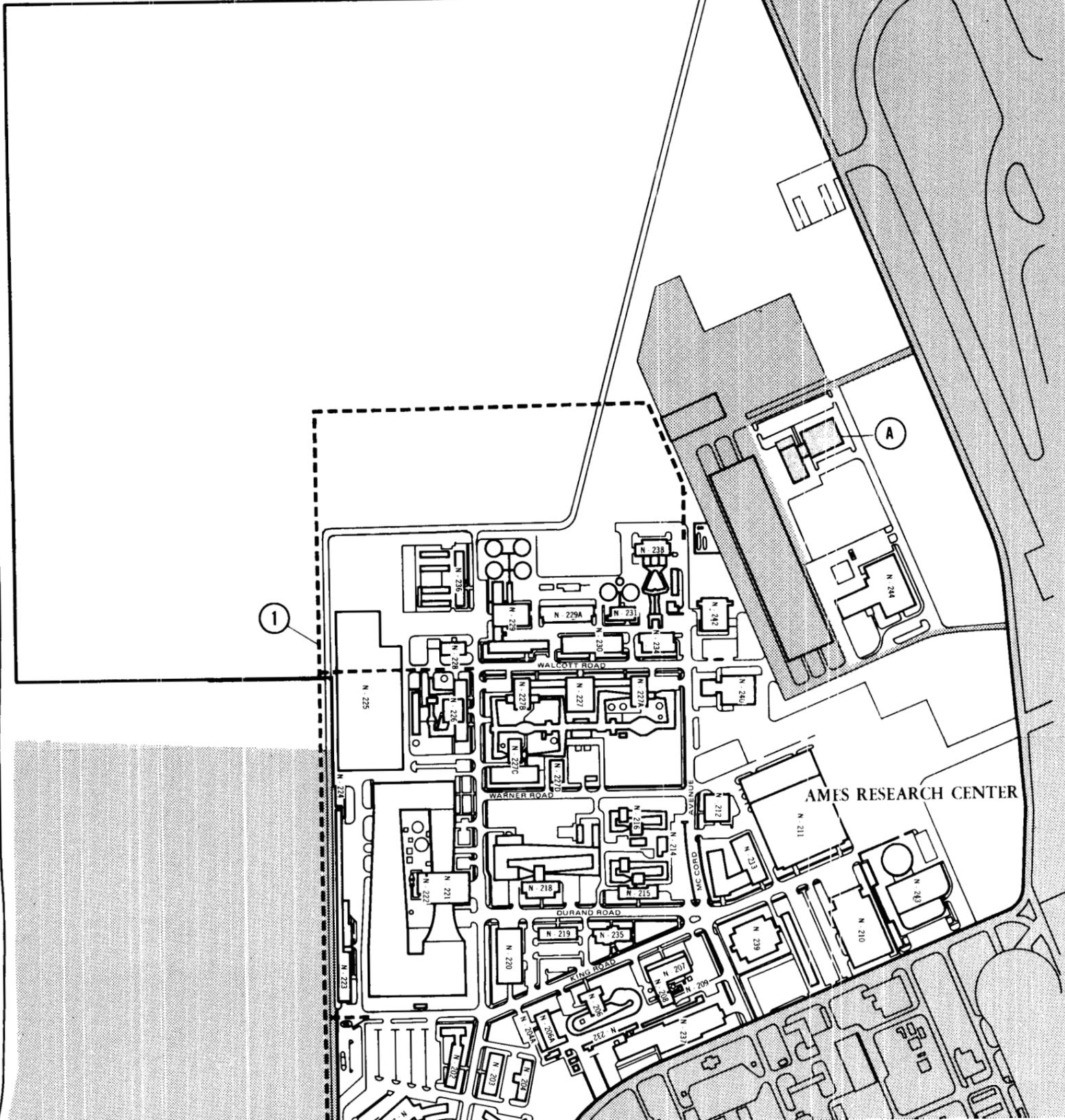
FISCAL YEAR 1968 PROJECT

- A. SPACE SCIENCE RESEARCH LABORATORY (AUTHORIZED BUT NOT FUNDED)

PROPOSED FISCAL YEAR 1969 FACILITY

- I. WATER SUPPLY AND DISTRIBUTION SYSTEM

STEVENS CREEK



AMES RESEARCH CENTER

AMES RESEARCH CENTER
FISCAL YEAR 1969 ESTIMATES



AO 2-56

ADMINISTRATIVE OPERATIONS
FISCAL YEAR 1969 ESTIMATES
ELECTRONICS RESEARCH CENTER

MISSION:

The mission of the Electronics Research Center is to increase the nation's capability in space by providing the knowledge and advanced technology needed to improve performance and reliability of space and aeronautical electronic systems and components. The Center meets this responsibility in two principal ways:

First, the Center organizes, manages, and conducts a comprehensive program of basic and applied aerospace electronics research to: (a) investigate concepts and techniques that will provide the technological foundation for the development of electronic equipment of reduced weight, size, power drain, and complexity, able to operate for long periods of time in the temperature, radiation, vacuum, and other conditions of an aerospace flight environment; (b) investigate concepts and techniques, establish performance characteristics, test procedures, and specifications for aerospace electronic components and techniques that will make aerospace electronics equipment inherently more reliable; and (c) devise new electronic concepts and techniques and prove their feasibility both analytically and experimentally, leading to aerospace electronic equipment with performance characteristics far beyond those of today.

Second, the Center provides a focal point for national aerospace electronics research, coordinating nation-wide research efforts and sponsoring electronics research conducted by industry, universities, and private institutions. In this capacity, the Center: (a) responds to the needs of specific aerospace programs and projects for new electronic techniques, concepts, and devices, and helps shape future electronics research to resolve anticipated problems in these programs; (b) distributes knowledge about basic and applied research on aerospace electronics within NASA and also to industry, universities, and other members of the scientific and engineering community; and (c) provides to NASA programs and projects aerospace electronic scientists and engineers who are fully knowledgeable in the electronics state-of-the-art.

Electronics research being managed and conducted by the Center during FY 1968 and FY 1969 is largely contracted with industry and universities and is focused in the following areas:

1. Aerospace electronics materials and components.

2. Guidance and navigation of space vehicles, aircraft, and the supporting ground-based equipment.
3. Space vehicle and aircraft control, stabilization, and information systems.
4. Electronic system simulation, analysis, evaluation, and integration in the fields of guidance, control, navigation, tracking, communication, and instrumentation.
5. Electrical and electronic power conditioning and distribution.
6. Bioelectronics.
7. Space and ground-based computers, computing systems, and instrumentation technology.
8. Solid state physics, microwave propagation, microwave communications, and transmitting and receiving phenomena.
9. Optical communications.
10. Astrophysical measurements.

An in-house research effort is being conducted by the Center staff on those tasks offering great promise for aerospace electronics technology and on those problems requiring first-hand experience on the part of the Center personnel in order to contract, monitor, and evaluate related research with industry and universities.

DESCRIPTION:

The Electronics Research Center is being constructed on a tract in the Kendall Square area of Cambridge, Massachusetts. The site, $1\frac{1}{2}$ miles west of the center of Boston, Massachusetts, is immediately north of the Massachusetts Institute of Technology and $1\frac{1}{2}$ miles from Harvard University. The tract is bounded on the north by Binney Street, on the south by Broadway, on the east by Third Street, and on the west by the New York Central Railroad. In addition to the Center site, an auxiliary site will be required for the field tests and research that cannot be conducted at the main site. The total area to be occupied at the Kendall Square site in Cambridge is 226 acres. The total capital investment of the Electronics Research Center, including work in progress and contractor-held facilities, as of June 30, 1967, is \$11,577,000.

Construction of foundations for the high-rise laboratory, auditorium, and the center support structures has been completed, and construction of the structures themselves has begun and is scheduled for completion as follows:

High-Rise Laboratory - October 1969
 Auditorium and Office Addition - July 1969
 Center Service Building - May 1969

Award of the contract for construction of the Space Guidance Laboratory and Optics Laboratory is planned during FY 1968.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$7,407,000	\$10,126,000	\$12,428,000
Travel.....	310,000	440,000	485,000
Automatic data processing.....	1,031,000	1,273,000	1,366,000
Facilities services.....	1,971,000	2,007,000	2,943,000
Technical services.....	554,000	704,000	636,000
Administrative support.....	<u>946,000</u>	<u>917,000</u>	<u>1,221,000</u>
Total, fund requirements.....	<u>\$12,219,000</u>	<u>\$15,467,000</u>	<u>\$19,079,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Apollo applications.....	---	2	3
<u>Space Science and Applications</u>			
Physics and astronomy.....	1	4	5
Lunar and planetary.....	1	2	3
Launch vehicle development.....	16	---	---
Launch vehicle procurement.....	---	24	29
Space applications.....	13	18	23

	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Advanced Research and Technology</u>			
Basic research.....	94	91	121
Space vehicle systems.....	6	4	5
Electronics systems.....	245	308	385
Human factor systems.....	16	20	21
Space power and electric.....			
propulsion systems.....	7	15	19
Aeronautical vehicles.....	<u>2</u>	<u>---</u>	<u>---</u>
Subtotal, positions by program.....	401	488	614
2. <u>Support positions:</u>			
Director and staff.....	26	27	28
Administrative support.....	186	205	221
Research and development support.....	<u>87</u>	<u>96</u>	<u>103</u>
Subtotal, support positions.....	<u>299</u>	<u>328</u>	<u>352</u>
Total, permanent positions.....	<u>700</u>	<u>816</u>	<u>966</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ELECTRONICS RESEARCH CENTER
ORGANIZATION AND STAFFING CHART

STAFFING SUMMARY

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	10	10
GS-16	12	12
GS-15	77	89
GS-14	98	118
ALL OTHER GS	609	722
WAGE BOARD	10	15
TOTAL PERM.	816	966
TEMPORARY	35	35
TOTAL	851	1001

OFFICE OF THE DIRECTOR

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	3	3
GS-16	0	0
GS-15	6	6
GS-14	5	5
ALL OTHER GS	13	16
WAGE BOARD	0	0
TOTAL	27	30

ADMINISTRATION OFFICE

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	1	1
GS-16	0	0
GS-15	8	8
GS-14	8	9
ALL OTHER GS	218	232
WAGE BOARD	10	15
TOTAL	245	265

PROGRAMS AND RESOURCES OFFICE

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	0	0
GS-16	1	1
GS-15	2	2
GS-14	3	3
ALL OTHER GS	48	52
WAGE BOARD	0	0
TOTAL	54	58

SYSTEMS DIVISION

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	2	2
GS-16	2	2
GS-15	7	9
GS-14	3	5
ALL OTHER GS	23	29
WAGE BOARD	0	0
TOTAL	37	47

ELECTRONICS COMPONENTS DIVISION

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	1	1
GS-16	3	3
GS-15	24	28
GS-14	25	32
ALL OTHER GS	98	126
WAGE BOARD	0	0
TOTAL	151	190

GUIDANCE AND CONTROL DIVISION

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	1	1
GS-16	2	2
GS-15	10	12
GS-14	21	24
ALL OTHER GS	76	97
WAGE BOARD	0	0
TOTAL	110	136

INSTRUMENTATION AND DATA PROCESSING RESEARCH DIV.

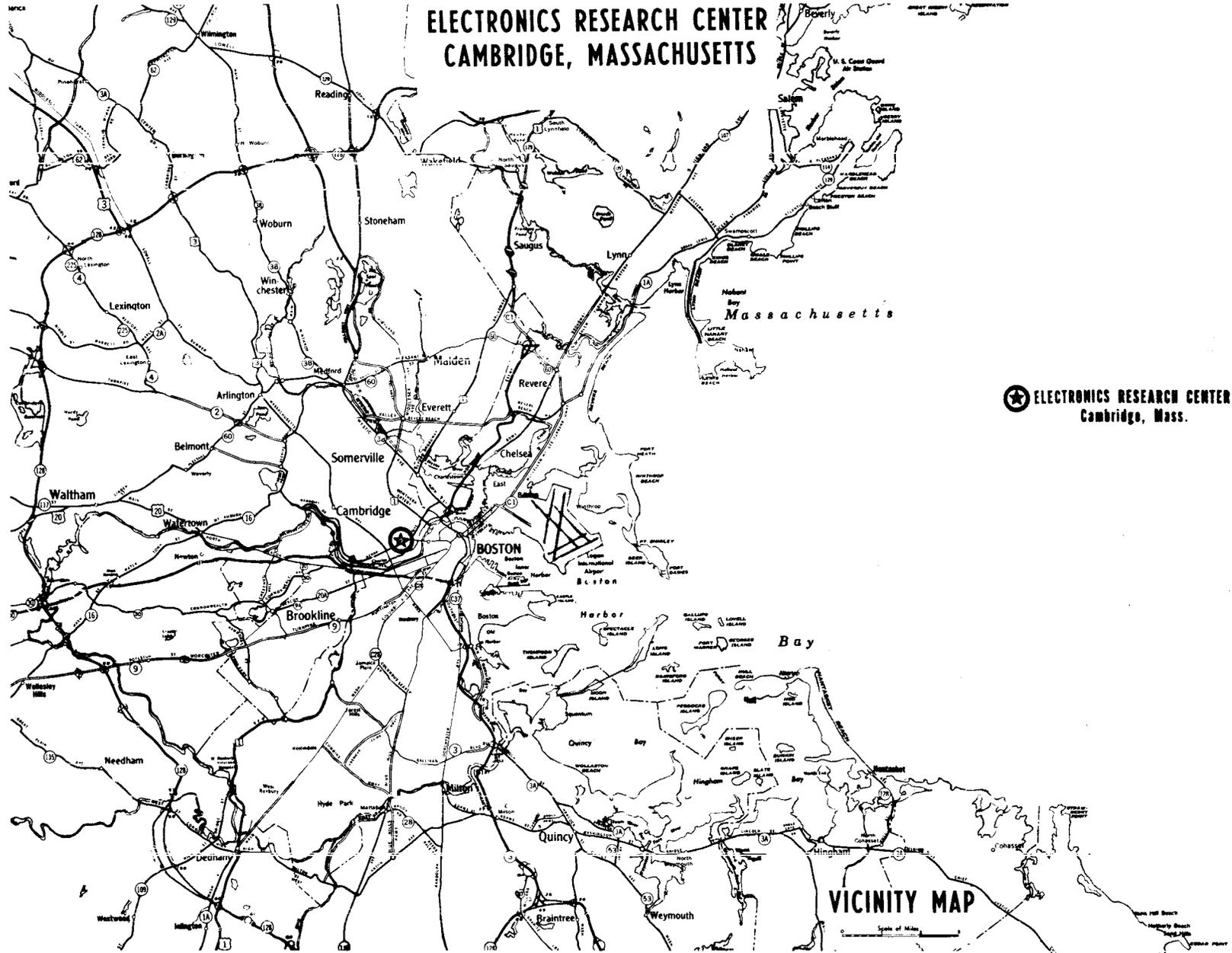
	<u>FY68</u>	<u>FY69</u>
EXCEPTED	1	1
GS-16	2	2
GS-15	6	8
GS-14	13	17
ALL OTHER GS	71	89
WAGE BOARD	0	0
TOTAL	93	117

ELECTROMAGNETIC DIVISION

	<u>FY68</u>	<u>FY69</u>
EXCEPTED	1	1
GS-16	2	2
GS-15	14	16
GS-14	20	23
ALL OTHER GS	62	81
WAGE BOARD	0	0
TOTAL	99	123

AO 2-61

ELECTRONICS RESEARCH CENTER CAMBRIDGE, MASSACHUSETTS



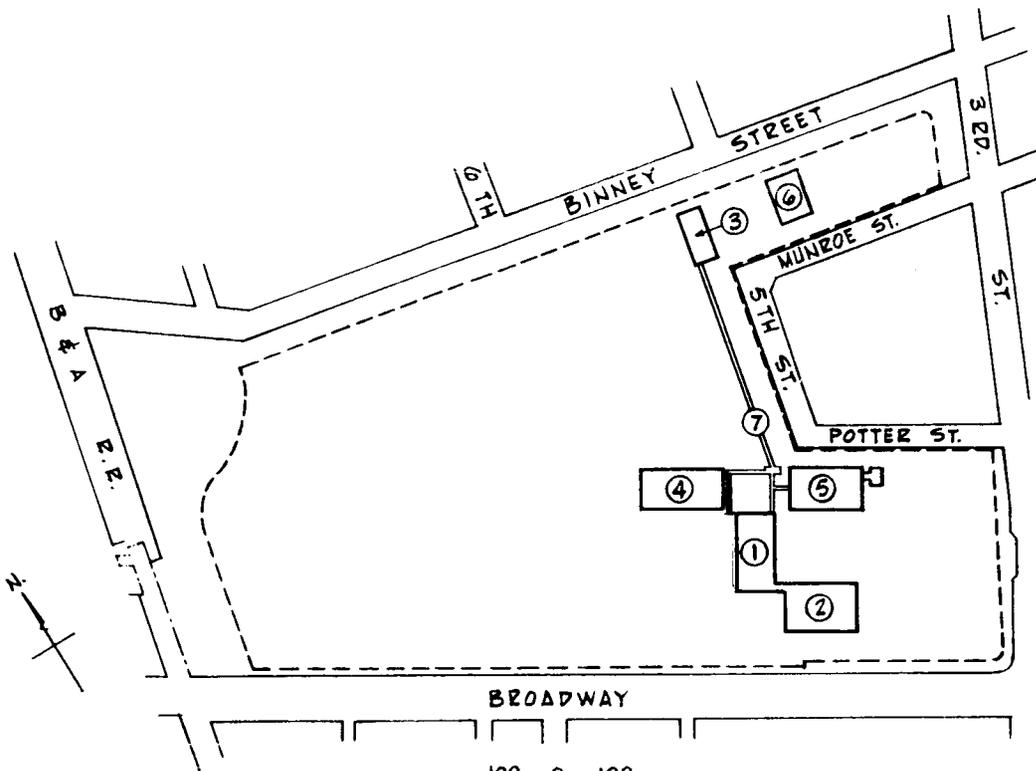
 **ELECTRONICS RESEARCH CENTER**
Cambridge, Mass.

VICINITY MAP

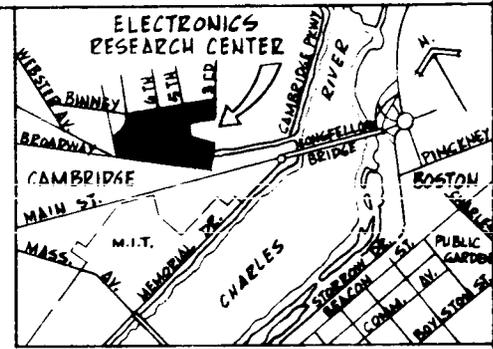
Scale of Miles

AO 2-62

ELECTRONICS RESEARCH CENTER
 FISCAL YEAR 1969 ESTIMATES
 LOCATION PLAN
 CAMBRIDGE, MASS.



BROADWAY
 100 0 100
 SCALE IN FEET



- ① HIGH-RISE LABORATORY
- ② AUDITORIUM
- ③ CENTER SUPPORT FACILITY
- ④ SPACE GUIDANCE SPECIAL PURPOSE LAB.
- ⑤ SPACE OPTICS SPECIAL PURPOSE LAB.
- ⑥ SHIPPING & RECEIVING FAC.-CTE. SUPPORT II
- ⑦ UTILITY TUNNEL-CTE. SUPPORT FAC. II

LEGEND:
 □ FY 65, 66 & 67 FACILITIES

--- PROJECT BOUNDARY

AO 2-63

ELECTRONICS RESEARCH CENTER
CAMBRIDGE, MASS.



AO 2-64

AERIAL VIEW

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

FLIGHT RESEARCH CENTER

MISSION:

The Flight Research Center, established in 1947, conducts aeronautical and space research within and outside the atmosphere. The work includes effort on problems of take-off, landing, low-speed flights, supersonic and hypersonic flight, and re-entry to verify predicted characteristics and to identify unexpected problems in actual flight.

The current and projected programs at this Center include: aeronautical projects, such as X-15, XB-70, supersonic transport and hypersonic research; space vehicle systems projects in which the flight behavior of advanced re-entry vehicles including M2-F2, HL-10, and X24A heavyweight lifting bodies is studied; and electronic systems projects such as display, guidance, and control in advanced flight missions and improvements on systems and sensors used in biomedical monitoring, tracking, and data acquisition.

Most important of the facilities and special equipment for conducting programs at the Flight Research Center are the aircraft. They range from general aviation aircraft for handling qualities investigations to century series fighters used for pilot proficiency and general investigations and to X-15 rocket aircraft used for hypersonic research and re-entry investigations. Special purpose vehicles such as lifting bodies, variable stability aircraft, or airborne simulators are contractor procured or developed in-house. Specialized laboratory facilities are available to complement the flight activities with proper preliminary research and testing. Simulation equipment is used to guide and assist in the performance of productive flight activities. A three-station radar for tracking and data acquisition is operated to support the flight activity.

DESCRIPTION:

The Flight Research Center, Edwards, California, is 65 air miles northeast of Los Angeles. The Center is located at the north end of Edwards Air Force Base on 218 acres of land leased from the Air Force. Utilities are provided by the Air Force on a reimbursable basis. The Center is adjacent to Rogers Dry Lake, a 55-square-mile area with a complex of runways varying in length from 5 to 11 miles.

The physical plant consists of an office-laboratory building with adjoining shops, a flight maintenance hangar and a calibration hangar, and a high temperature loads calibration facility. Auxiliary buildings include warehouses, an auxiliary power systems building, and a communications building. The main station of the three-station radar range operated by the Center is

located on the third floor of the office-laboratory building. The total capital investment of the Flight Research Center, including work in progress and contractor-held facilities, as of June 30, 1967, is \$41,069,000.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$7,098,000	\$7,205,000	\$7,367,000
Travel.....	197,000	211,000	212,000
Automatic data processing.....	103,000	51,000	51,000
Facilities services.....	1,158,000	1,148,000	1,254,000
Technical services.....	83,000	102,000	97,000
Administrative support.....	<u>849,000</u>	<u>722,000</u>	<u>747,000</u>
Total, fund requirements.....	<u>\$9,488,000</u>	<u>\$9,439,000</u>	<u>\$9,728,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Apollo.....	12	---	---
<u>Space Science and Applications</u>			
Physics and astronomy.....	1	---	---
<u>Advanced Research and Technology</u>			
Space vehicle systems.....	71	68	68
Electronics systems.....	25	20	20
Human factor systems.....	18	11	11
Aeronautical vehicles.....	312	321	321
<u>Tracking and Data Acquisition.....</u>	34	34	34
<u>Technology Utilization.....</u>	<u>1</u>	<u>1</u>	<u>1</u>
Subtotal, positions by program.....	474	455	455

	<u>1967</u>	<u>1968</u>	<u>1969</u>
2. <u>Support positions:</u>			
Director and staff.....	11	11	11
Administrative support.....	<u>105</u>	<u>100</u>	<u>100</u>
Subtotal, support positions.....	<u>116</u>	<u>111</u>	<u>111</u>
Total, permanent positions.....	<u>590</u>	<u>566</u>	<u>566</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ORGANIZATION AND STAFFING CHART

FLIGHT RESEARCH CENTER

STAFFING SUMMARY		
	68	69
Excepted	6	6
GS-16	6	6
GS-15	14	19
GS-14	32	31
All Other GS	281	277
Wage Board	227	227
Total Permanent	566	566

OFFICE OF THE DIRECTOR		
	68	69
Excepted	2	2
GS-16	1	1
GS-15	2	2
GS-14	-	-
All Other GS	8	8
Wage Board	21	21
Total Permanent	34	34

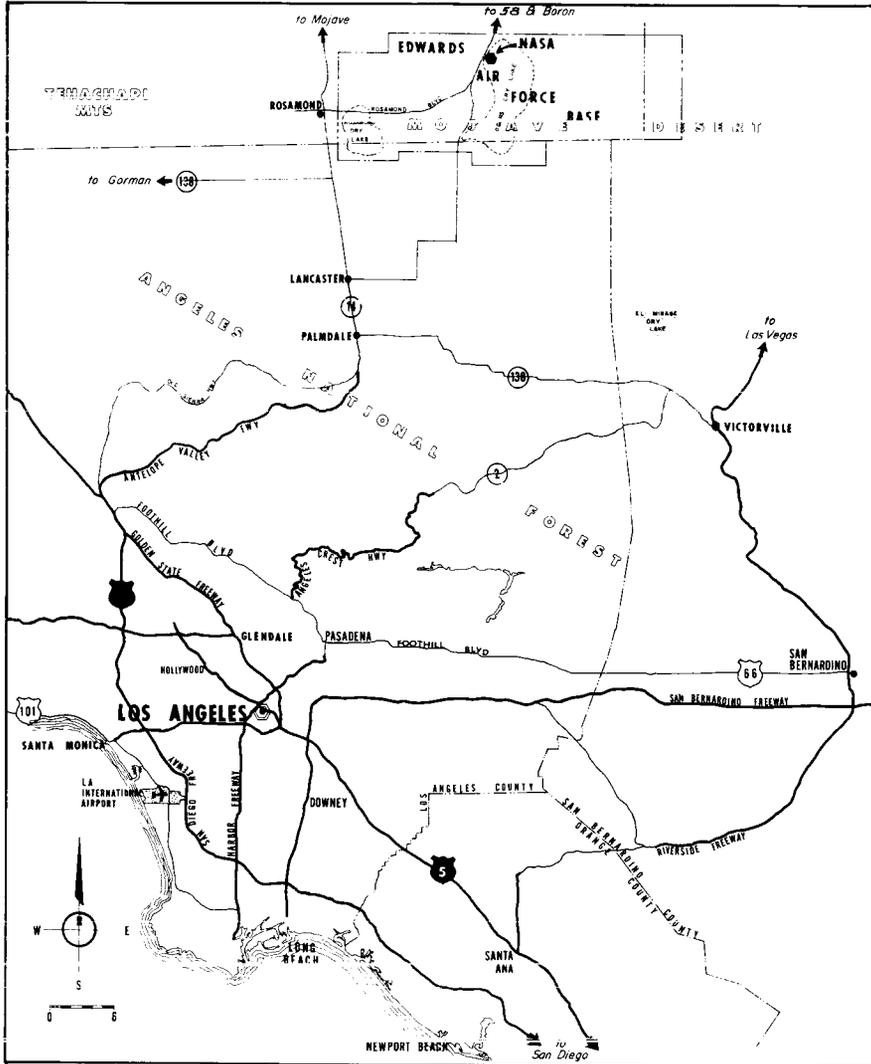
RESEARCH DIVISION		
	68	69
Excepted	1	1
GS-16	4	4
GS-15	5	8
GS-14	16	15
All Other GS	82	80
Wage Board	3	3
Total Permanent	111	111

OPERATIONS DIVISION		
	68	69
Excepted	2	2
GS-16	-	-
GS-15	4	5
GS-14	5	4
All Other GS	21	21
Wage Board	121	121
Total Permanent	153	153

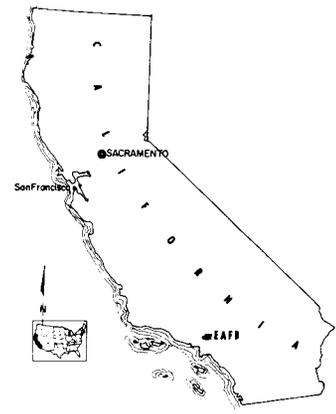
DATA SYSTEMS DIVISION		
	68	69
Excepted	-	-
GS-16	1	1
GS-15	1	2
GS-14	8	9
All Other GS	86	84
Wage Board	64	64
Total Permanent	160	160

BIOMEDICAL OFFICE		
	68	69
Excepted	1	1
GS-16	-	-
GS-15	-	-
GS-14	1	1
All Other GS	7	7
Wage Board	0	0
Total Permanent	9	9

ADMINISTRATIVE DIVISION		
	68	69
Excepted	-	-
GS-16	-	-
GS-15	2	2
GS-14	2	2
All Other GS	77	77
Wage Board	18	18
Total Permanent	99	99



FLIGHT RESEARCH CENTER FISCAL YEAR 1969 ESTIMATES VICINITY MAP



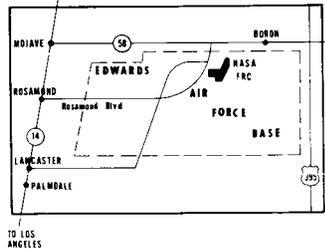
KEY PLAN

AO 2-69



FLIGHT RESEARCH CENTER FISCAL YEAR 1969 ESTIMATES LOCATION PLAN

- ① LABORATORY (4800)
- ② MAIN HANGAR (4802)
- ③ CALIBRATION HANGAR (4801)
- ④ AUXILIARY POWER UNIT BUILDING X-15 (4830)
- ⑤ BOILER HOUSE (4805)
- ⑥ PAINT STORAGE SHED (4804)
- ⑦ WAREHOUSE N^o 1, N^o 2, A.G.E. (4808)(4806)
- ⑧ WAREHOUSE N^o 3 (4809)
- ⑨ TRAILER PARKING
- ⑩ PAINT SPRAY BUILDING (4803)
- ⑪ HIGH TEMPERATURE LOADS CALIBRATION FACILITY (4820)
- ⑫ COMMUNICATION BUILDING (4824)
- ⑬ WAREHOUSE N^o 4 (4810)
- ⑭ ABLATIVE BUILDING (4821)
- ⑮ SUB-STATION 9A

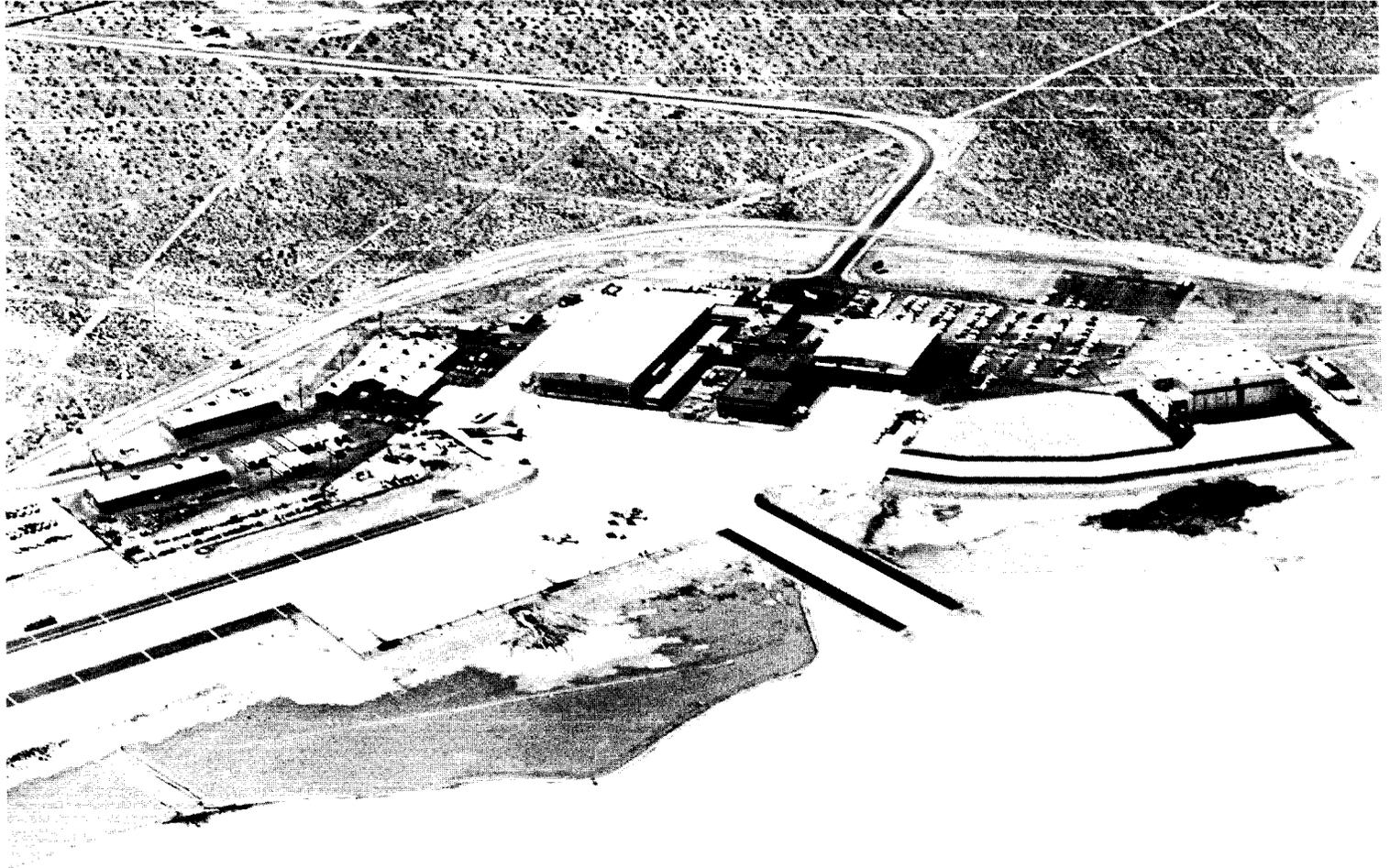


LEGEND
 - - - - - PROPERTY LINE
 - - - - - CHAIN LINK FENCE
 ■ ■ ■ ■ ■ EXISTING FACILITIES



AO 2-70

**FLIGHT RESEARCH CENTER
FISCAL YEAR 1969 ESTIMATES**



AO 2-71

ADMINISTRATIVE OPERATIONS
FISCAL YEAR 1969 ESTIMATES
LANGLEY RESEARCH CENTER

MISSION:

The activities of the Langley Research Center are directed to the maintenance and improvement of the United States position in aeronautics and space. Langley Research Center assists in the attainment of this objective through an extensive program of advanced research and technology which includes analytical studies and scientific investigations in wind tunnels, specialized laboratories, and in free-flight. Langley Research Center is principally concerned with the identification of new scientific opportunities for flight progress, the recognition and mastery of critical problems which must be solved to achieve advanced aerospace flight goals, the provision of a sound technological basis for the establishment of new programs, and for the successful design, development, and operation of flight vehicles of all types. In carrying out its mission, Langley Research Center works closely with the aerospace and educational communities in a planned effort to enhance this nation's manpower capabilities.

The Langley Research Center aeronautical research program is focused on the formulation and improvement of the technological basis for the successful development and utilization of aircraft of all types. These include efficient supersonic and high-subsonic-speed transports, high-performance military aircraft, effective V/STOL aircraft, practicable hypersonic ramjet-powered vehicles, and safe general aviation aircraft. Experience gained in Langley Research Center's broad program of aeronautical research provides an outstanding basis for this Center's direct support of the military services, the Federal Aviation Administration, and the industry in their progressive aircraft development efforts, such as the F-111, C-5A, FX, VFAX, AX, and the supersonic transport.

Major emphasis in Langley Research Center's high-speed aerodynamics research has been directed to the evolution and refinement of practicable aircraft design characteristics to provide maximum flight efficiency and performance while exhibiting appropriate operational capabilities from cruise speed to the landing condition. The Langley Research Center variable-sweep wing for supersonic aircraft represents a major advance toward this goal, and is finding important applications in military and commercial aircraft.

A Langley Research Center design concept, the supercritical wing, offers strong potentials for increased efficiency at higher subsonic speeds, and is being aggressively evaluated and refined. This is one of many concepts which have been the products over the years of Langley Research Center's broad program of advanced research and technology.

Configurations for hypersonic vehicles are under investigation in wind tunnels and through research using rocket-propelled free-flight experimental techniques to increase our understanding of the complex problems involved in the design and operation of an airplane intended for flight in this speed range. Another challenging research objective in the hypersonic range is the efficient integration of advanced propulsion systems into high performance aircraft. A Langley Research Center program for the establishment and demonstration of the technology for practicable hypersonic ramjet aircraft propulsion systems is rapidly progressing.

Wide ranges of scientific investigations are leading to the establishment of rational criteria for the design of efficient and operationally effective V/STOL aircraft, including the development of advanced helicopter technology, as in the promising application of the hingeless rotor concept pioneered by Langley Research Center. In investigations on V/STOL aircraft, a subject of research at this Center since the late 1940's, considerable emphasis is placed on defining and providing adequate stability and control over the expanding operating ranges, and to achieve optimum man/machine compatibility.

At Langley Research Center, unique flight simulators, fixed and rotor-wing aircraft flight experiments, and laboratory facilities are used to explore and master problems of advanced flight operations. These include supersonic transport airways integration and terminal approach and landing, fighter combat maneuvers, flying qualities and piloting-aid requirements for efficient all-weather terminal-area operations of V/STOL aircraft, simplified aircraft proximity warning indicators, and other improved piloting aids for general aviation aircraft. Other subjects of interest to this Center in the operational area are the detection of clear-air turbulence, the improvement of the directional control and braking of aircraft on wet and slippery runways, the definition of spin characteristics and optimum recovery techniques of new aircraft, and the behavior of the new large jet transport aircraft in emergency ditching on water.

A broad research program at Langley Research Center continues to update and extend basic criteria for atmospheric, acoustical, maneuvering, and other operational loading of aircraft structures, and for prediction and control of the associated dynamic response and flutter of large and flexible aircraft under such environments. Research is providing improved construction technologies for high-performance aircraft including the development of the potentials of advanced materials, multi-material arrangements and structural configurations that offer promise of better accommodation of the high loadings and deflections, severe aerodynamic heating, fatigue stresses, corrosive atmospheres, and cryogenic fuel storage for future operations.

Langley Research Center is cooperating extensively in the national effort to reduce the seriousness of the aircraft noise problem. This Center is developing aircraft configuration features and operating procedures designed to ameliorate sonic boom effects; is studying the basic nature of propulsion system sound generation and propagation as a foundation for the development and demonstration of new compressor arrangements, inlet absorbers and flow

controls, and jet mixing processes that can substantially improve the noise characteristics of future systems. Other noise studies include the investigation of the effectiveness and safety of variations in take-off, climb, terminal approach and landing, and airport operational procedures that can reduce airport community annoyances; and the definition of factors that control the subjective annoyance character of aircraft noise and its effects on ground structures. The Langley Research Center conducts a broad range of timely space research in support of major national projects such as the manned Apollo mission, and manages important laboratory and flight activities designed to increase the Center's knowledge of the universe and to provide this nation a rational technological foundation for the definition, assessment, and successful execution of future space endeavors.

In support of the Apollo lunar landing and applications programs, Langley Research Center is contributing significantly in every area of the flight mission. This research includes the prediction of the structural dynamic characteristics of large launch vehicles such as the Saturn V in combination with the Apollo spacecraft, simulator development and astronaut indoctrination in effective operational techniques and piloting aids for execution of critical lunar landing and rendezvous maneuvers, investigation of lunar module landing loads and demonstration of the prototype landing system under simulated lunar gravity, the provision of advanced topographical and characteristics data on lunar terrain for landing site selection and piloting guidance, the establishment of mobility characteristics and surface operational techniques for space-suited explorers under lunar gravity, the development of control moment gyrostabilization and precision-pointing-control technology for the Apollo telescope mount spacecraft cluster, scientific contributions to the knowledge of atmosphere entry, aerothermodynamics, heat shielding, and the circumvention of entry communications "blackout," the investigation and development of a parawing ground-landing system capability, and the provision of advanced technological experiments for the Apollo Applications program.

Other basic research and development activities, the depth and scope of which are intended to contribute vitally to the attainment of national flight aspirations, include the precision pointing of space optical systems; the establishment of requirements and advanced design concepts for controlled atmosphere entry and landing spacecraft, refurbishable orbital logistical spacecraft, re-usable launch systems, manned orbital research laboratories, orbital astronomical laboratories, and expandable space structures; the definition and alleviation of space radiation, micrometeoroid, thermal, and vacuum hazards to vehicular systems, electronic and optical components, viable tissues, and materials; the evaluation and enhancement of the ability of man to work in the space domain; and the generation of improved technology for long-duration regenerative life support components and systems, simplified navigation and control systems, advanced horizon sensors, precision stabilization equipment, reliable and efficient space instrumentation and communication devices, high-reliability solid-propellant rocket motors and vehicles, thrust-modulating hybrid-propellant rocket motors, and unique aerospace materials.

The Langley Research Center maintains a leading position in the investigation of fluid physics problems. Its work in magnetoplasmdynamics is making contributions to the geophysical and stellar sciences, and is disclosing new potentials in electrical propulsion. In the area of magnetoplasmdynamics, an arc device under study appears promising as an advanced propulsion technique with potential usefulness beyond the ion engine concept.

Langley Research Center is responsible for the development, procurement, and operation of the solid-propellant Scout launch vehicle in its various national and international satellite and entry vehicle applications; for other spacecraft systems and experiments for evaluation of the earth's atmospheric characteristics, the radiation and micrometeoroid hazards of the earth and moon environments, the lunar gravitational field, and the properties of the lunar surface; and provides research and development support for a number of other unmanned spacecraft and launch vehicle projects.

An extensive program of research is conducted by Langley Research Center to provide guidance and technology for the formulation and execution of advanced planetary flight missions. This includes the comprehensive analysis of the scientific merits, technical feasibility, and costs of various alternate mission schemes; the optimization of space systems arrangements and operational modes; the investigation of heat transfer and heat shielding concepts for planetary-atmosphere and earth-return entry vehicles; the development and demonstration of efficient atmosphere decelerators and landing systems; the provision of technology for advanced deep-space guidance and control systems, and electrical power supplies; and the development of practicable and effective approaches to the achievement of acceptable levels of sterilization in planetary landing spacecraft.

DESCRIPTION:

The Langley Research Center, Hampton, Virginia, is located approximately 100 air miles south of Washington, D. C. The Center is divided into two separate areas adjacent to the runway facilities of the Langley Air Force Base, and occupies 772 acres of government-owned land. The west area consists of 750 acres of which 430 acres are owned by NASA and 320 acres are under permit from the Air Force. The east area consists of 22 acres under permit from the Air Force. Runways, some utilities, and certain other facilities are used jointly by NASA and the Air Force. In addition, there are 110 acres of NASA-owned land located in the city of Newport News, Virginia, 3,276 acres under permit from other government agencies, and 26 acres under lease. The total acreage owned, under permit, or leased, is 4,184. The total capital investment of Langley Research Center, including work in progress and contractor-held facilities, as of June 30, 1967, is \$337,124,000.

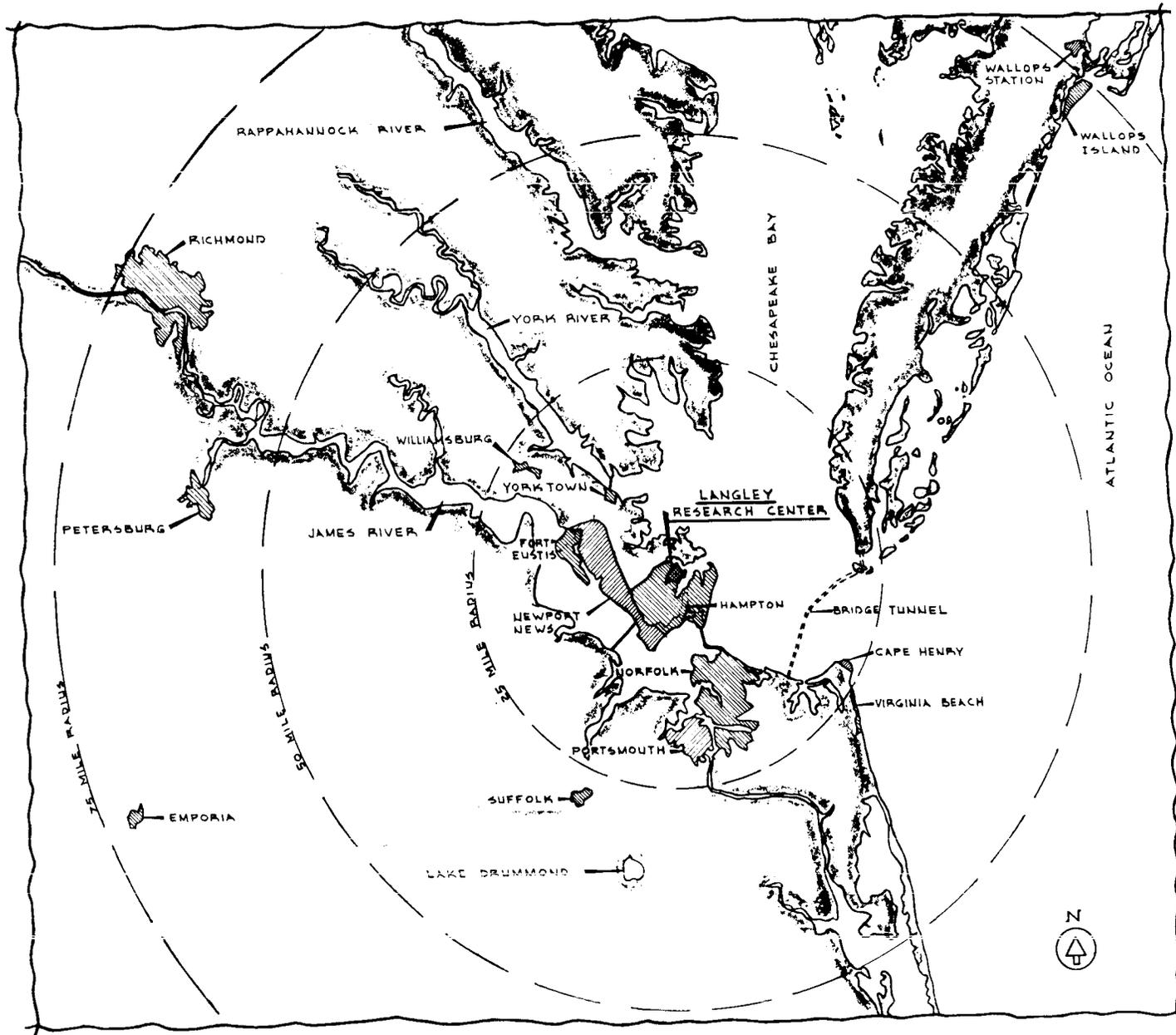
SUMMARY OF RESOURCES REQUIREMENTS:

	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$46,865,000	\$48,726,000	\$49,246,000
Travel.....	1,542,000	1,188,000	1,188,000
Automatic data processing.....	6,557,000	3,515,000	3,515,000
Facilities services.....	6,452,000	6,077,000	6,247,000
Technical services.....	310,000	310,000	310,000
Administrative support.....	<u>2,611,000</u>	<u>2,279,000</u>	<u>2,259,000</u>
Total, fund requirements....	<u>\$64,337,000</u>	<u>\$62,095,000</u>	<u>\$62,765,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Apollo.....	17	2	2
Apollo applications.....	---	14	14
Advanced missions.....	6	6	6
 <u>Space Science and Applications</u>			
Physics and astronomy.....	72	41	18
Lunar and planetary.....	155	132	132
Launch vehicle procurement.....	37	35	35
Bioscience.....	2	2	2
Space applications.....	14	15	15

	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Advanced Research and Technology</u>			
Basic research.....	334	327	347
Space vehicle systems.....	679	645	606
Electronics systems.....	441	405	380
Human factor systems.....	121	115	115
Space power and electric propulsion systems.....	22	21	21
Chemical propulsion.....	40	41	47
Aeronautical vehicles.....	811	819	826
<u>Tracking and Data Acquisition.....</u>	21	19	19
<u>Technology Utilization.....</u>	<u>5</u>	<u>5</u>	<u>5</u>
Subtotal, positions by program.....	2777	2644	2590
2. <u>Support positions</u>			
Director and staff.....	35	35	35
Administrative support.....	511	511	511
Research and development support.....	<u>838</u>	<u>800</u>	<u>854</u>
Subtotal, support positions.....	<u>1,384</u>	<u>1,346</u>	<u>1,400</u>
Total, permanent positions.....	<u>4,161</u>	<u>3,990</u>	<u>3,990</u>



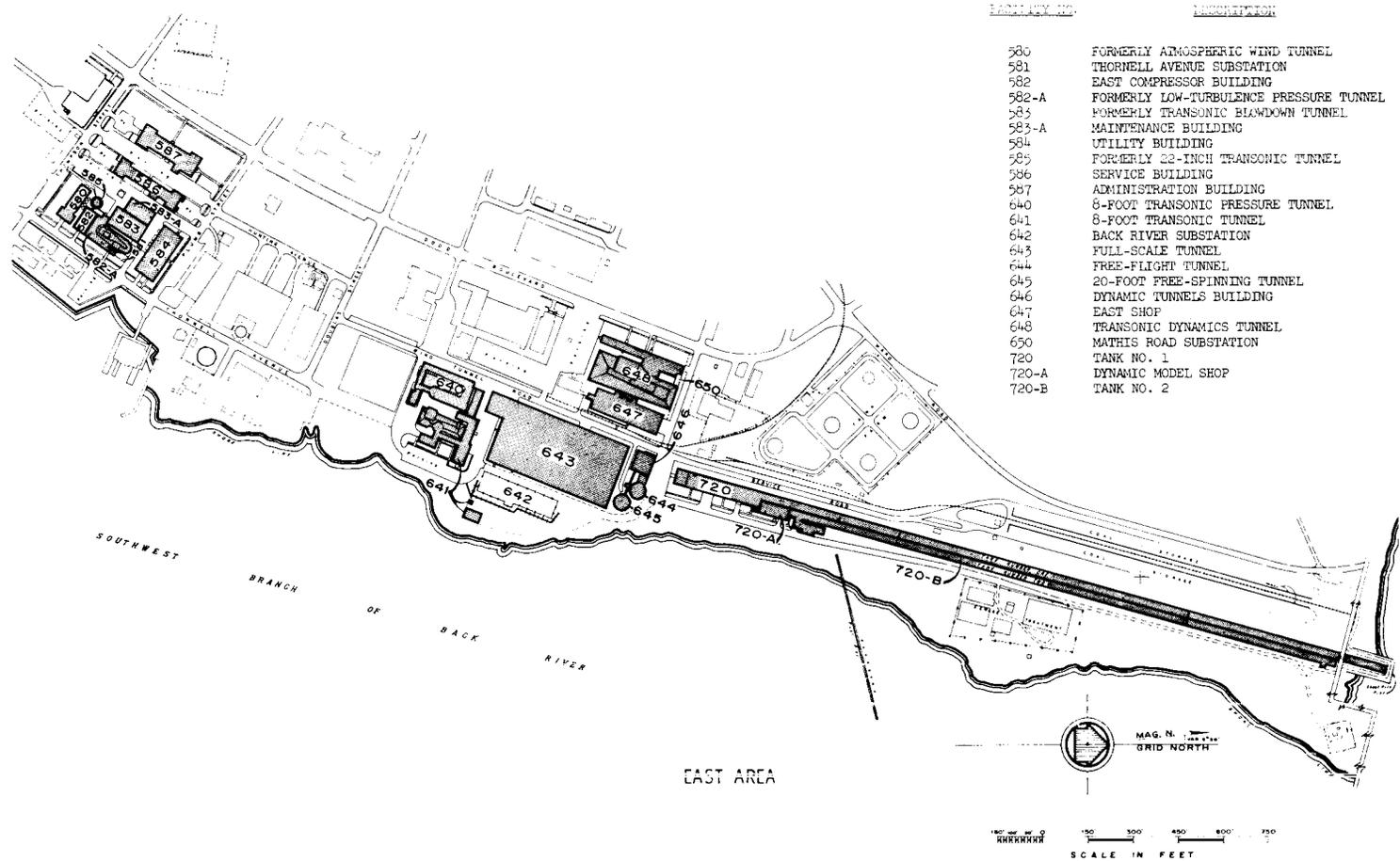
AO 2-79

LANGLEY RESEARCH CENTER AND VICINITY

1" = 8 MILES

LANGLEY RESEARCH CENTER FISCAL YEAR 1969 ESTIMATES

LOCATION PLAN



AO 2-80

Langley Research Center



AO 2-81

Langley Research Center



AO 2-82

ADMINISTRATIVE OPERATIONS
FISCAL YEAR 1969 ESTIMATES
LEWIS RESEARCH CENTER

MISSION:

The principal mission of the Lewis Research Center is research and development in the areas of aircraft and spacecraft propulsion, and power generation systems for spacecraft.

The emphasis at the Lewis Research Center is predominantly research; however, the entire spectrum of activities is undertaken going from basic research to applied research to development. The scope of research ranges from work on individual components through complete systems.

Most of the critical areas which limit the performance of engines and power systems are the subjects of in-house research effort at this Center. Research by commercial and university laboratories is also conducted under contracts directed by Lewis Research Center personnel.

Several large launch vehicle and power generation development programs are assigned here. The Centaur and Agena launch vehicle **projects are under** this Center's supervision. The 260-inch solid rocket **project, the SNAP-8** nuclear powered electric generating system, and SERT (Space Electric Rocket Test) contracts are directed, and there is also considerable supporting in-house research effort on these projects. New projects in their early phases include the development of a quiet engine (turbofan jet) and improved **hydrogen-oxygen burning rocket engines.**

The research and development activities at Lewis Research Center cover many technical fields. Some examples of major activity are discussed in the following paragraphs:

It is expected that engines for future supersonic planes will be of a turbofan design incorporating high by-pass ratios, high compressor pressure ratios, and high turbine inlet temperatures. A large part of the research effort at Lewis Research Center is aimed directly at solving the problems that limit the development of engines for supersonic flight. Among these research efforts are: slotted compressor blades to increase pressure ratio per stage, cooled turbine blades, high-speed bearings, air inlets, exhaust nozzles, combustor configurations, higher energy fuels, and fuel tank fire hazard evaluations. A large addition to the Propulsion Systems Laboratory is being built to test full-scale engines for supersonic air planes.

The problems of the supersonic combustion ramjet engine for hypersonic flight speeds up to Mach 7 are being studied in existing facilities, and construction of a new facility has begun at Plum Brook to extend the effort to engines of practical size.

At the lower end of the speed scale, the effects of cross flow on high-pressure ratio lift fans for V/STOL aircraft will be investigated in the return passage of the 8- by 6-foot Supersonic Wind Tunnel.

Contributions to rocket technology continue to flow from Lewis Research Center. Relatively small scale chemical rockets are used to study the problems of combustion instability, fuel-oxidant mixing, regenerative cooling of nozzles, ablative nozzles, and nozzle insulating coatings. Pumps for cryogenic propellants and turbines to drive the pumps are investigated at the Plum Brook Station.

Various problems in connection with the development of the nuclear powered rocket engine are also conducted at Plum Brook. A 60-megawatt thermal reactor facility is used to determine the effects of radiation on materials, especially at very low temperatures, and the Nuclear Rocket Dynamics and Controls Facility is used for problems on the start-up phase when liquid hydrogen enters pumps and mock-ups of reactors.

Electric rockets for deep space propulsion have benefited greatly from the work in the Electric Propulsion Research Building and the newer Electric Propulsion Laboratory. These buildings contain many large vacuum tanks where the space environment essential to electric propulsion research is approximated.

Many devices for power generation in space are being studied. The solar cell converts sunlight directly into electricity. Batteries and fuel cells convert stored chemicals into electricity. For a large and sustained power supply, however, an adaptation of the familiar turbine driven generator seems most practical. To achieve the tremendous weight reduction necessary means many years of intensive research and development. Instead of steam, the turbines will be driven by liquid metal vapor (Rankine cycle) or by heated gas (Brayton cycle). The only way to reject the waste heat is by direct radiation to space, so very large radiators will be required. High rotative speeds will reduce weight, but call for new designs of compressors, turbines, bearings, and electric generators. The heat source may be either a nuclear reactor, or the sun's rays concentrated by a large concave mirror. A 20-foot flight-weight mirror has been assembled at the Lewis Research Center and a 30-foot mirror is planned.

A \$28 million Space Power Facility is nearing completion at Plum Brook where nuclear powered electric generating systems will be operated under simulated space environment conditions for long periods of time.

Another type of electric generator and another source of energy are more distant prospects. A stream of ionized plasma flowing through a coil

will generate electricity in that coil (magnetohydrodynamics). The success of this effort and of related activities depends largely on the development of superconducting electric magnets. The Lewis Research Center has been a leader in this field, and recently constructed a magnet with a field of 140,000 gauss over a six-inch bore.

The performance of propulsion and power generation systems, launch vehicles, spacecraft, and practically all hardware is paced by physical limitations of available materials. Lewis Research Center has maintained a substantial materials research effort aimed at raising these limitations and improving component and system performance. The Center's activity covers the entire temperature range of materials usage going from the cryogenic temperature of liquified gases to the high temperatures encountered in the rocket nozzles of aircraft engine combustors and turbine wheels.

The material research **includes both fundamental studies of what makes materials strong or weak, and the development of new materials.** "Super" alloys, corrosion resistant coatings, ultrapure tungsten, and composites made of metal whiskers, fibers, or sintered granules are among the many products investigated.

DESCRIPTION:

The Lewis Research Center occupies two sites in north central Ohio. The older one was established in 1941 on 200 acres adjacent to the Cleveland Municipal Airport. The original area has been expanded to 364 acres, of which 15 are leased from Cleveland for use as a parking lot. Funds for the purchase of these 15 acres are included in the FY 1968 budget. Here there are over 90 buildings, including two large supersonic wind tunnels, two zero gravity research facilities (free drop shafts, one of which is an underground evacuated shaft 477 feet deep in which zero gravity durations of about ten seconds are obtained), a large Propulsion Systems Laboratory in which full-scale engines are operated under simulated high-altitude conditions, three rocket laboratories, three materials research buildings, 18 major space simulation facilities ranging from **4 to 30 feet in diameter**, a 50-foot diameter Space Power Chamber 120-feet long in which altitudes up to **100,000 feet are simulated, an Energy Conversion Laboratory, an Instrument Research Laboratory, a High Energy Fuels Laboratory, a Chemistry Laboratory, an Engine Research Building containing 64 test cells and covering nearly four acres, four office buildings, machine shops, and other service buildings.**

A newer site, established in 1956, is located south of Sandusky, Ohio, about 50 miles west of Cleveland on land formerly occupied by the Plum Brook Ordnance Works. Known as the Plum Brook Station, it occupies 6,031 acres of which 5,981 are owned by the government, and 50 are in easements. Funds for the purchase of an additional 3,000 acres, to serve as a buffer zone around the present site, are included in the FY 1968 budget. There

are over 200 buildings on this site, 55 built by NASA and the rest by the former tenants. The major facilities include: a Reactor Facility, an Altitude Rocket Test Facility, a Cryogenic Propellant Research Facility, a Heat Transfer Facility, a Spacecraft Dynamics Research Facility, a Rocket Pump Laboratory, a Rocket Turbine Laboratory, a Rocket Turbopump Laboratory, a Rocket Systems Hydraulic Laboratory, a Fluorine Pump Laboratory, and a temporary site for testing rockets at sea-level conditions. A Spacecraft Propulsion Research Facility is nearing completion to test the ignition and operation of spacecraft propulsion systems after a period of soaking in a space environment. Also nearing completion is the Space Power Facility for testing full-scale nuclear powered electric generating systems. The research programs at Plum Brook are under the technical direction of personnel located at Cleveland. They are conducted at the larger site because of the need for large separation distances to minimize hazards. The total capital investment of the Lewis Research Center, including work in progress and contractor-held facilities, as of June 30, 1967, is \$354,514,000, of which \$95,680,000 represents facilities located at the Plum Brook Station.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$53,823,000	\$55,029,000	\$56,334,000
Travel.....	1,058,000	988,000	988,000
Automatic data processing	463,000	293,000	349,000
Facilities services.....	8,602,000	7,926,000	7,737,000
Technical services.....	865,000	671,000	670,000
Administrative support...	<u>1,469,000</u>	<u>1,313,000</u>	<u>1,274,000</u>
Total, fund requirements	<u>\$66,280,000</u>	<u>\$66,220,000</u>	<u>\$67,352,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. Permanent positions by program:			
<u>Manned Space Flight</u>			
Apollo.....	1	2	2

	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Space Science and Applications</u>			
Launch vehicle development.....	166	-	-
Launch vehicle procurement.....	176	198	187
Space applications.....	25	93	93
<u>Advanced Research and Technology</u>			
Basic research.....	481	475	475
Space vehicle systems.....	182	171	171
Electronics systems.....	61	60	60
Human factor systems.....	1	1	1
Space power and electric propulsion systems.....	833	817	821
Nuclear rockets.....	245	64	54
Chemical propulsion.....	275	278	278
Aeronautical vehicles.....	541	665	682
<u>Technology Utilization.....</u>	<u>7</u>	<u>7</u>	<u>7</u>
Subtotal, positions by program.....	2994	2831	2831
2. <u>Support positions:</u>			
Director and staff.....	18	17	17
Administrative support.....	585	582	582
Research and development support.....	<u>1079</u>	<u>1055</u>	<u>1055</u>
Subtotal, support positions.....	<u>1682</u>	<u>1654</u>	<u>1654</u>
Total, permanent positions.....	<u>4676</u>	<u>4485</u>	<u>4435</u>

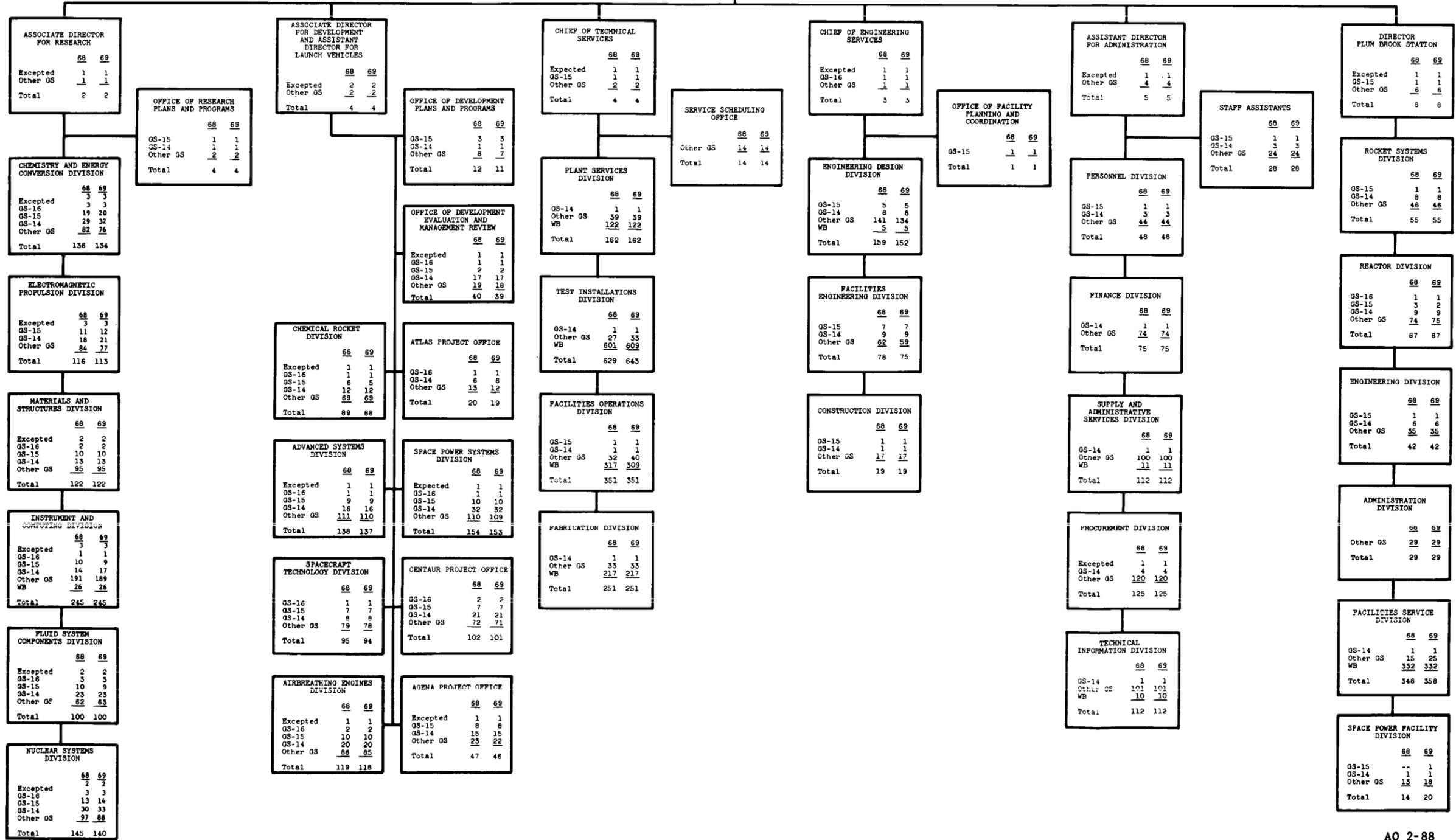
National Aeronautics and Space Administration
 Organization and Staffing Chart
 Lewis Research Center
 Cleveland, Ohio

STAFFING SUMMARY		
	68	69
Expected	33	37
GS-16	24	24
GS-15	163	163
GS-14	338	350
Other GS	2286	2274
WB	1641	1641
Total	4485	4485

DIRECTOR'S OFFICE		
	68	69
Expected	2	2
GS-16	2	2
Other GS	2	2
Total	6	6

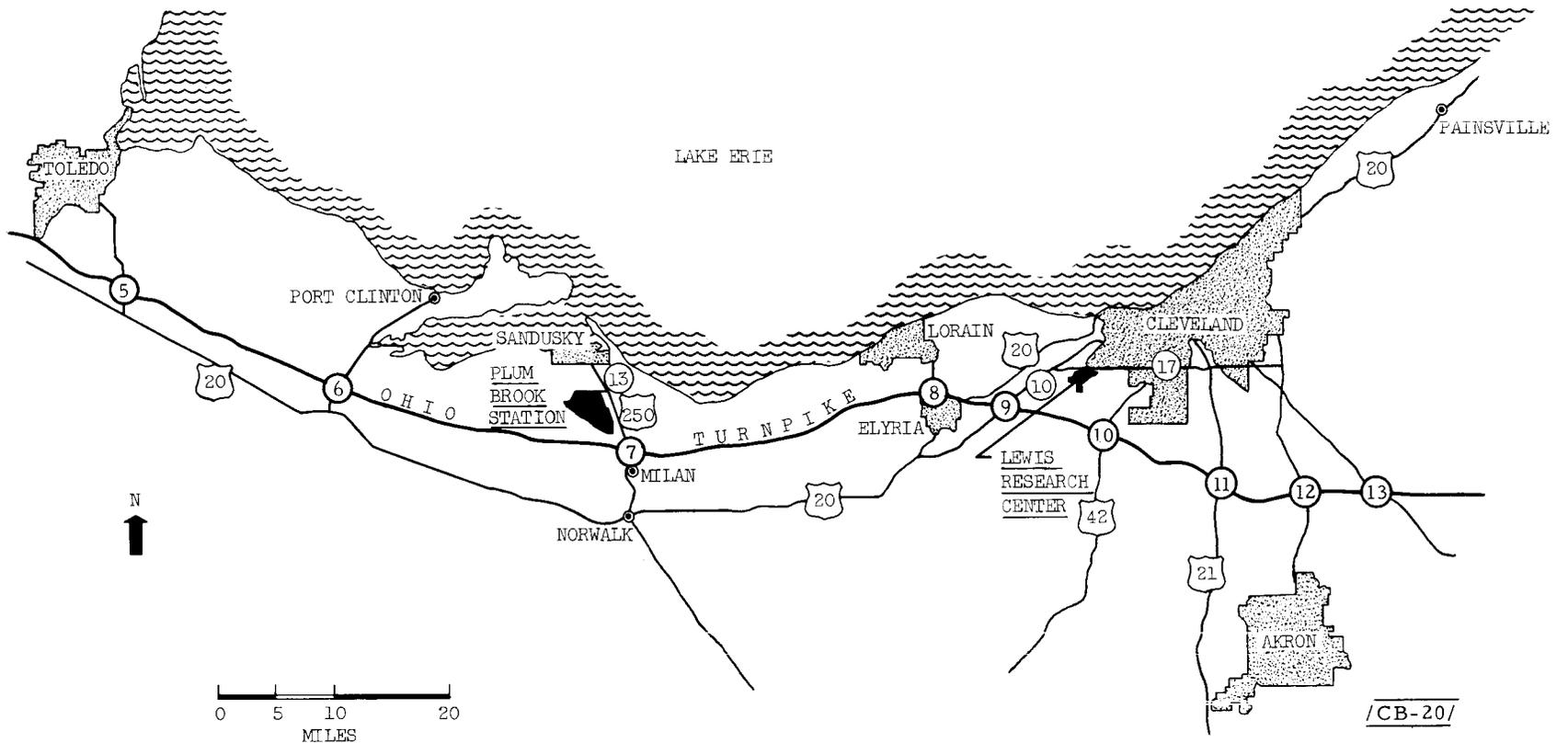
BUDGET OFFICE		
	68	69
Expected	1	1
GS-14	1	1
Other GS	9	9
Total	11	11

ASSISTANT DIRECTOR FOR PUBLIC AFFAIRS		
	68	69
Expected	1	1
GS-15	1	1
GS-14	1	1
Other GS	16	16
Total	19	19



LEWIS RESEARCH CENTER
FISCAL YEAR 1969 ESTIMATES

LOCATION OF LEWIS RESEARCH CENTER INCLUDING
PLUM BROOK STATION



AO 2-89

/CB-20/

LEWIS RESEARCH CENTER
FISCAL YEAR 1969 ESTIMATES

LOCATION PLAN

LEGEND-EXISTING BUILDINGS

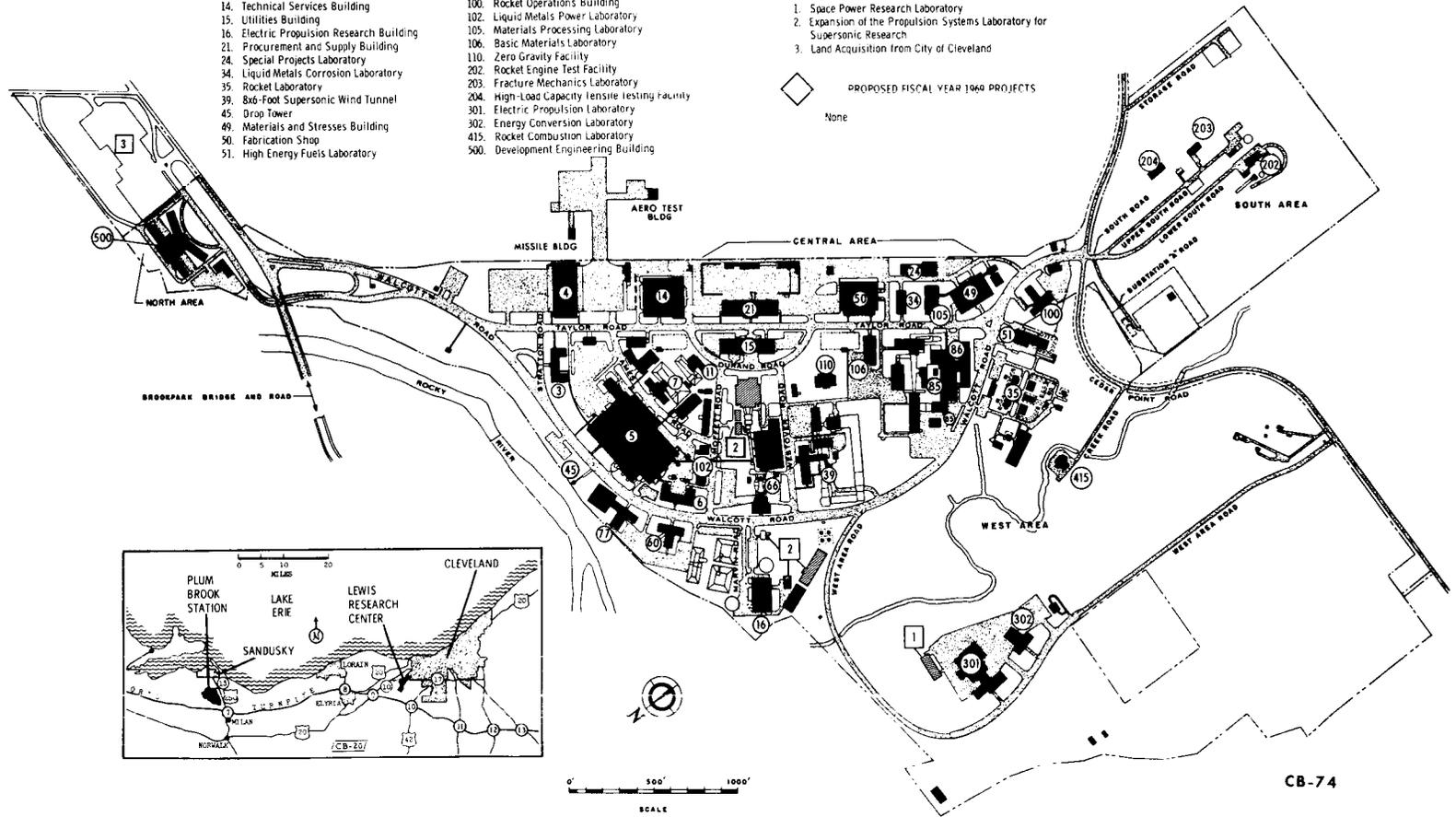
- | | |
|---|--|
| 3. Administration Building | 60. Propulsion Systems Laboratory operations building |
| 4. Flight Research Building | 66. Propulsion Systems Laboratory |
| 5. Engine Research Building | 77. Instrument Research Laboratory |
| 6. Chemistry Laboratory | 87. 10x10 Foot Supersonic Wind Tunnel |
| 7. Space Power Chambers | 86. 10x10-Foot Supersonic Wind Tunnel Office and Computer Center |
| 11. Icing Research Tunnel | 100. Rocket Operations Building |
| 14. Technical Services Building | 102. Liquid Metals Power Laboratory |
| 15. Utilities Building | 105. Materials Processing Laboratory |
| 16. Electric Propulsion Research Building | 106. Basic Materials Laboratory |
| 21. Procurement and Supply Building | 110. Zero Gravity Facility |
| 24. Special Projects Laboratory | 202. Rocket Engine Test Facility |
| 34. Liquid Metals Corrosion Laboratory | 203. Fracture Mechanics Laboratory |
| 35. Rocket Laboratory | 204. High-Load Capacity Lenslike Testing Facility |
| 39. 8x6-Foot Supersonic Wind Tunnel | 301. Electric Propulsion Laboratory |
| 45. Drop Tower | 302. Energy Conversion Laboratory |
| 49. Materials and Stresses Building | 415. Rocket Combustion Laboratory |
| 50. Fabrication Shop | 500. Development Engineering Building |
| 51. High Energy Fuels Laboratory | |

FACILITIES AUTHORIZED AND UNDER CONSTRUCTION

1. Space Power Research Laboratory
2. Expansion of the Propulsion Systems Laboratory for Supersonic Research
3. Land Acquisition from City of Cleveland

PROPOSED FISCAL YEAR 1969 PROJECTS

None

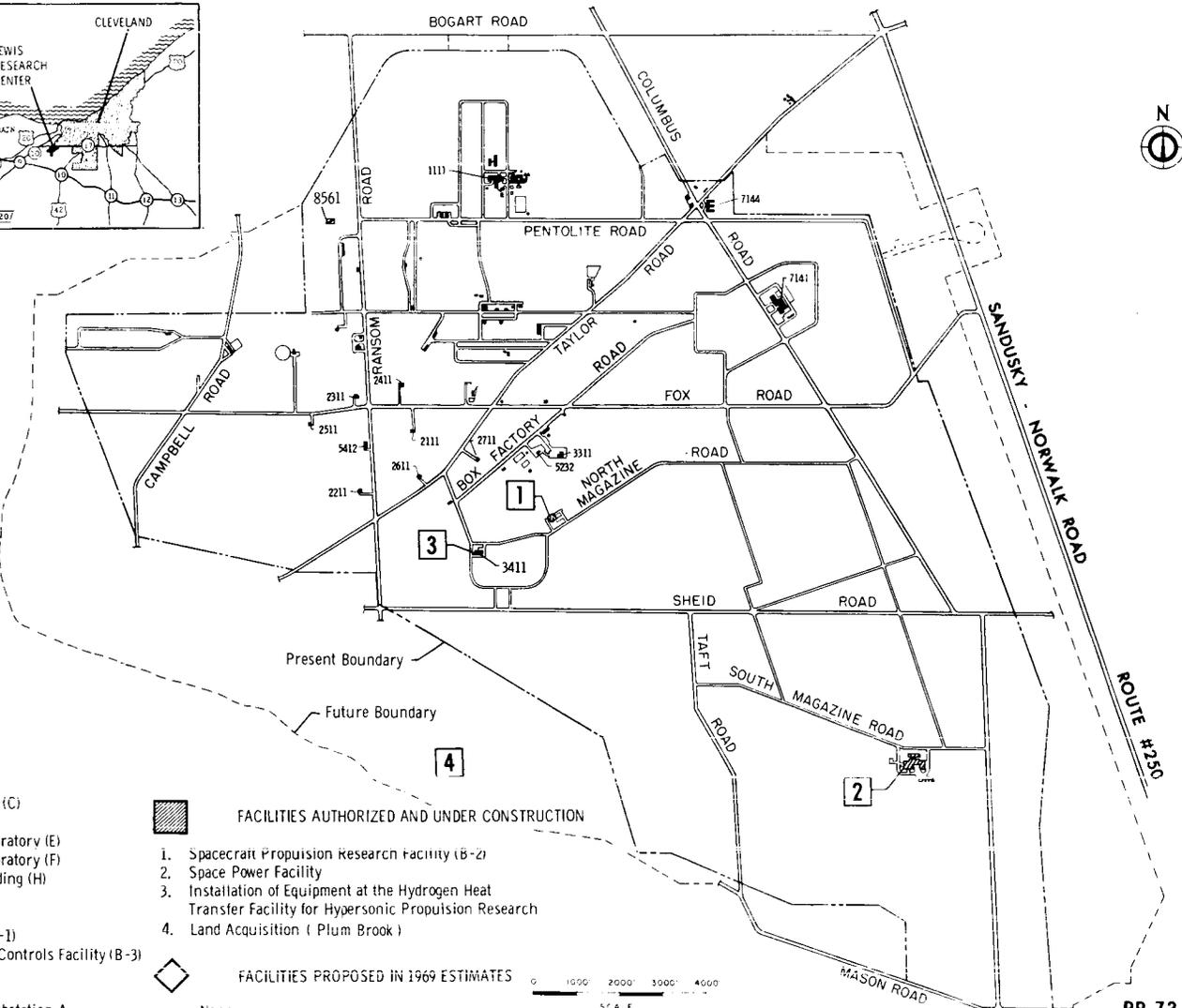
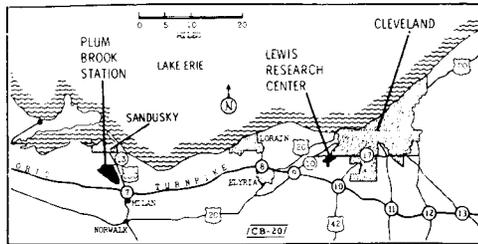


AO 2-90

CB-74

LEWIS RESEARCH CENTER
 PLUM BROOK STATION
 FISCAL YEAR 1969 ESTIMATES

LOCATION PLAN

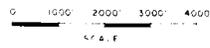


LEGEND

- EXISTING FACILITIES**
- 1111 Reactor Facility Group
 - 7144 Administration Building
 - 2141 Rocket Pump Laboratory (A)
 - 2111 Rocket Turbo-pump Laboratory (C)
 - 2311 Rocket Turbine Laboratory (D)
 - 2411 Rocket Systems Dynamics Laboratory (E)
 - 2511 Rocket Systems Hydraulic Laboratory (F)
 - 5412 Central Control and Data Building (H)
 - 2611 Fluorine Pump Laboratory (I)
 - 2711 Rocket Systems Laboratory (J)
 - 3111 Altitude Rocket Test Facility (B-1)
 - 3311 Nuclear Rocket Dynamics and Controls Facility (B-3)
 - 3411 Heat Transfer Facility
 - 7141 Engineering Building
 - 8561 133-34.5 KV Electric Power Substation A

- FACILITIES AUTHORIZED AND UNDER CONSTRUCTION**
1. Spacecraft Propulsion Research Facility (B-2)
 2. Space Power Facility
 3. Installation of Equipment at the Hydrogen Heat Transfer Facility for Hypersonic Propulsion Research
 4. Land Acquisition (Plum Brook)

- FACILITIES PROPOSED IN 1969 ESTIMATES**
- None



AO 2-91

LEWIS RESEARCH CENTER
FISCAL YEAR 1969 ESTIMATES

CLEVELAND FACILITIES



AO 2-92

LEWIS RESEARCH CENTER
FISCAL YEAR 1969 ESTIMATES

PLUM BROOK FACILITIES



A10 2-93

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

SPACE NUCLEAR PROPULSION OFFICE

MISSION:

The mission of the Space Nuclear Propulsion Office is to provide the necessary research, design and engineering data, test hardware, and general technology required to develop nuclear rocket systems with power levels, operating times, restart conditions, and specific impulse values suitable to advanced space exploration missions. Through the use of nuclear rocket propulsion, significant performance advantages accrue to such missions as lunar logistics operations, deep space probing with heavy spacecraft, and unmanned planetary fly-by.

As a result of changes in the space program planning, a decision has been made to initiate the development of the 1500 megawatt, approximately 75,000 pound thrust NERVA I engine for flight status by early FY 1976.

DESCRIPTION:

The nuclear rocket program is a joint AEC-NASA undertaking. To ensure an integrated program, the Space Nuclear Propulsion Office, established by an interagency agreement between Atomic Energy Commission and NASA, manages all aspects of the program.

The Space Nuclear Propulsion Office consists of a Headquarters office located at Germantown, Maryland, and three field extensions located in Ohio, New Mexico, and Nevada. At the Nevada location, the Nuclear Rocket Development Station was established to provide a site for ground static testing of the reactors, engines, and eventually, vehicles associated with nuclear rocket development.

The Nuclear Rocket Development Station consists of a 90,000-acre site owned by the Atomic Energy Commission, approximately 90 miles northwest of Las Vegas, Nevada. The total capital investment of NASA-funded facilities including work in progress and contractor-held facilities, as of June 30, 1967, is \$54,634,000.

SUMMARY OF RESOURCES REQUIREMENTS:

	<u>FUNDS</u>		
<u>Functions</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$1,688,000	\$1,889,000	\$1,939,000
Travel.....	196,000	199,000	199,000

	<u>1967</u>	<u>1968</u>	<u>1969</u>
Automatic data processing.....	\$26,000	---	---
Facilities services.....	---	---	---
Technical services.....	66,000	\$10,000	\$71,000
Administrative support.....	<u>4,000</u>	<u>---</u>	<u>---</u>
Total, fund requirements.....	<u>\$1,980,000</u>	<u>\$2,098,000</u>	<u>\$2,209,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Advanced Research and Technology</u>			
Nuclear rockets.....	<u>110</u>	<u>109</u>	<u>109</u>
Subtotal, positions by programs..	110	109	109
2. <u>Support positions</u>			
Director and staff.....	2	2	2
Administrative support.....	2	2	2
Research and development support.....	<u>3</u>	<u>2</u>	<u>2</u>
Subtotal, support positions.....	<u>7</u>	<u>6</u>	<u>6</u>
Total, permanent positons.....	<u>117</u>	<u>115</u>	<u>115</u>

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 ORGANIZATION AND STAFFING CHART
 SPACE NUCLEAR PROPULSION OFFICE

STAFFING SUMMARY		
	<u>68</u>	<u>69</u>
Excepted	3	3
GS-16	6	6
GS-15	25	25
GS-14	30	32
Other GS	<u>51</u>	<u>49</u>
Total Permanent	115	115
Temporary	-	-
Total Positions	115	115

OFFICE OF THE MANAGER		
	<u>68</u>	<u>69</u>
Excepted	2	2
GS-16	-	-
GS-15	1	1
GS-14	1	2
Other GS	<u>1</u>	-
Total Permanent	5	5

ALBUQUERQUE EXTENSION		
	<u>68</u>	<u>69</u>
Excepted	-	-
GS-16	-	-
GS-15	1	1
GS-14	-	-
Other GS	-	-
Total Permanent	1	1

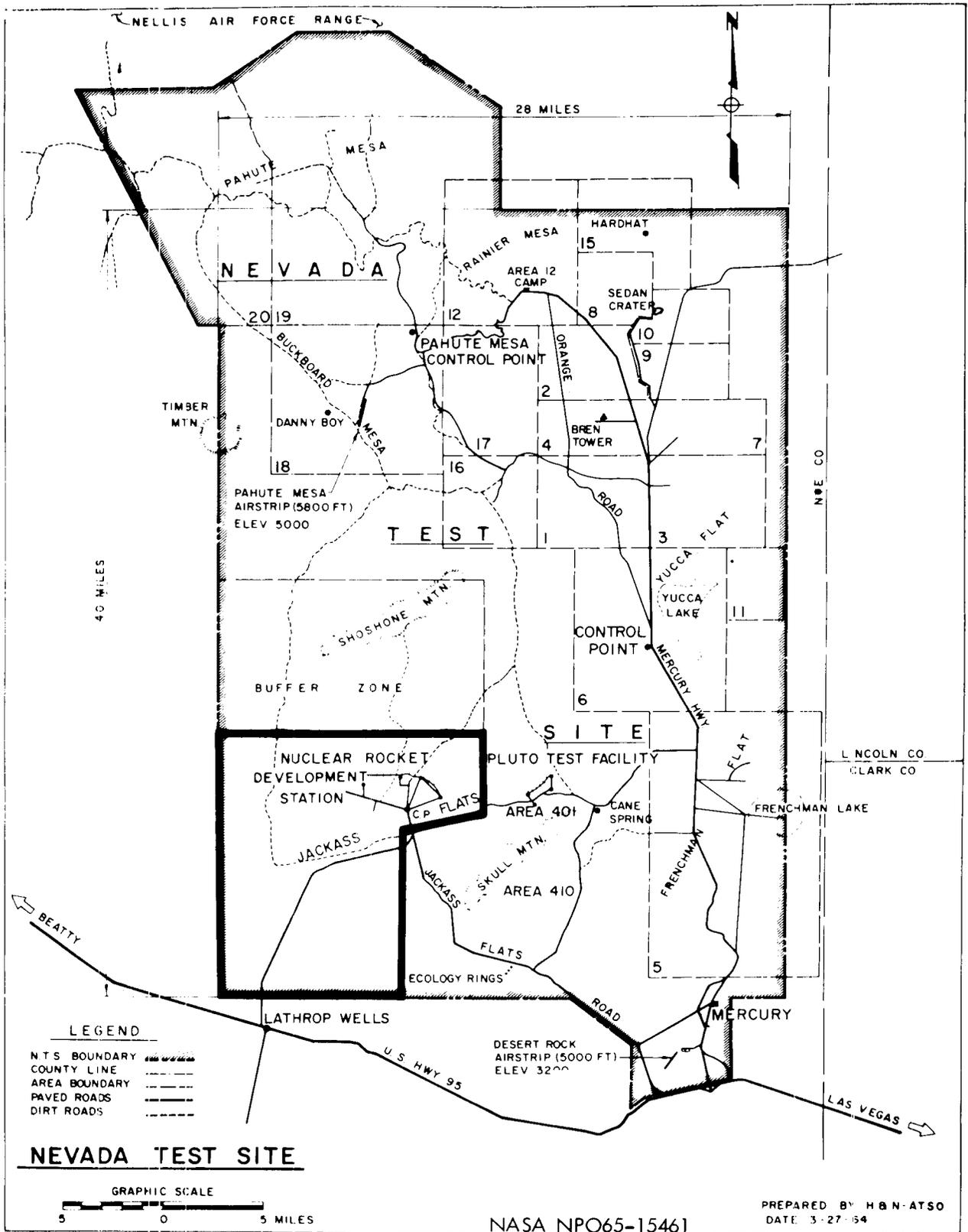
NERVA BRANCH		
	<u>68</u>	<u>69</u>
Excepted	-	-
GS-16	1	1
GS-15	3	3
GS-14	-	-
Other GS	-	-
Total Permanent	4	4

CLEVELAND EXTENSION		
	<u>68</u>	<u>69</u>
Excepted	1	1
GS-16	2	2
GS-15	14	14
GS-14	20	21
Other GS	<u>30</u>	<u>29</u>
Total Permanent	67	67

ADVANCED ENGINE BRANCH		
	<u>68</u>	<u>69</u>
Excepted	-	-
GS-16	1	1
GS-15	2	2
GS-14	-	-
Other GS	<u>1</u>	<u>1</u>
Total Permanent	4	4

NEVADA EXTENSION		
	<u>68</u>	<u>69</u>
Excepted	-	-
GS-16	1	1
GS-15	3	3
GS-14	9	9
Other GS	<u>19</u>	<u>19</u>
Total Permanent	32	32

FACILITIES BRANCH		
	<u>68</u>	<u>69</u>
Excepted	-	-
GS-16	1	1
GS-15	1	1
GS-14	-	-
Other GS	-	-
Total Permanent	2	2



NELLIS AIR FORCE RANGE

28 MILES

NEVADA

PAHUTE MESA

RAINIER MESA

HARDHAT

AREA 12 CAMP

SEDAN CRATER

2019

12

8

10

9

BUCKBOARD

PAHUTE MESA CONTROL POINT

ORANGE

TIMBER MTN

DANNY BOY

BREN TOWER

2

4

7

PAHUTE MESA AIRSTRIP (5800 FT) ELEV 5000

TEST

1

3

YUCCA FLAT

40 MILES

SHOSHONE MTN

YUCCA LAKE

BUFFER ZONE

CONTROL POINT

6

MERCURY HWY

SITE

LINCOLN CO CLARK CO

NUCLEAR ROCKET DEVELOPMENT STATION

PLUTO TEST FACILITY

FRENCHMAN LAKE

C.P. FLATS

AREA 401

CANE SPRING

JACKASS

AREA 410

5

FLATS

FRENCHMAN

BEATTY

LATHROP WELLS

DESERT ROCK AIRSTRIP (5000 FT) ELEV 3200

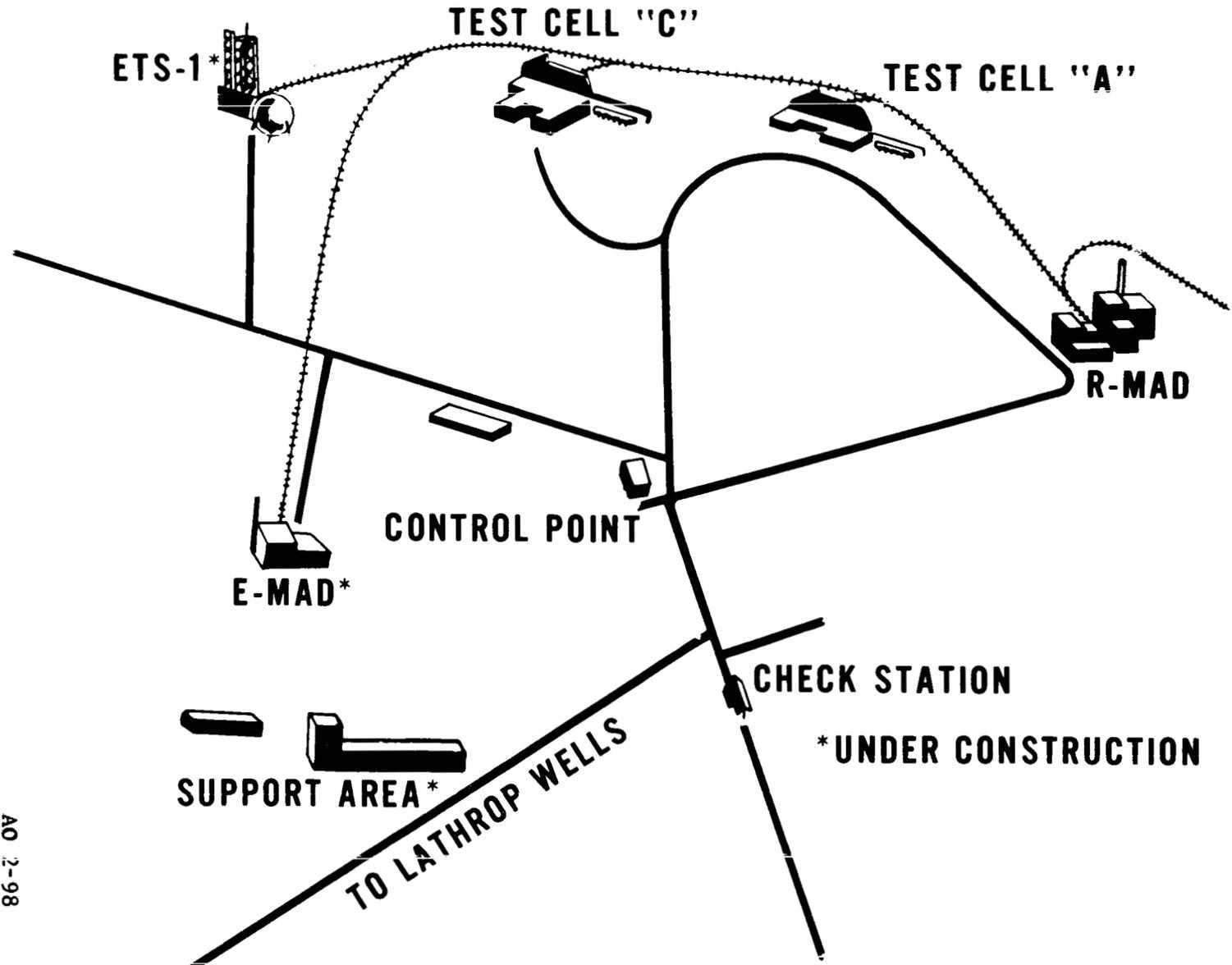
MERCURY

U.S. HWY 95

LAS VEGAS

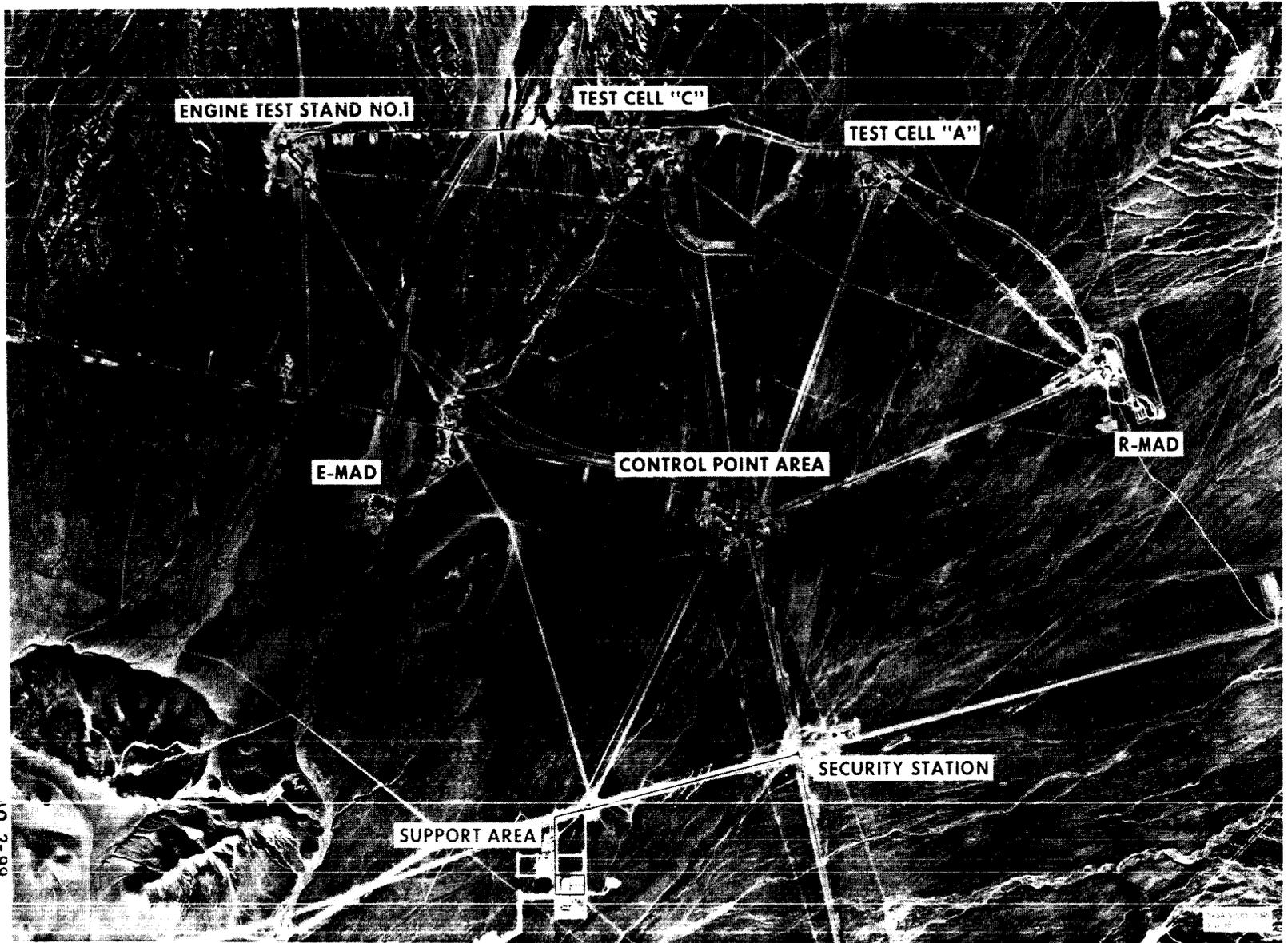
NEVADA TEST SITE

NUCLEAR ROCKET DEVELOPMENT STATION LAYOUT



AO 2-98

NUCLEAR ROCKET DEVELOPMENT STATION



AO 2-99

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

NASA HEADQUARTERS

MISSION:

The mission of the National Aeronautics and Space Administration Headquarters is to plan and provide executive direction for the programs authorized by the Congress, and to implement the national objectives stated in the National Aeronautics and Space Act of 1958, as amended. The principal statutory functions are:

1. To conduct research into, and for the solution of, problems of flight within and outside the earth's atmosphere and to develop, construct, test, and operate aeronautical and space vehicles for research purposes.
2. To conduct activities required for the exploration of space with manned and unmanned vehicles.
3. To arrange for participation by the scientific community in planning scientific measurements and observations to be made through use of aeronautical and space vehicles, and conduct or arrange for the conduct of such measurements and observations.
4. To provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.

The following offices at Headquarters assist management in carrying out the technical aspects of this mission:

Office of Manned Space Flight - Responsible for all NASA activities directly involving manned space flight missions. Programs include:

Apollo - To provide a broad national capability for manned space exploration, including earth orbital, lunar orbital, and lunar surface operations, and to achieve the specific objective of manned lunar landing and return within this decade;

Apollo Applications - To include the improvement of manned space operations and hardware technology and the initiation of extended use of men for scientific, technological, and applied observations in space, and to provide a fuller understanding of the abilities of men, vehicles, and systems to

function effectively in the space environment by extending the flight of existing Apollo/Saturn equipment; and

Advanced Missions - To plan a broad program of explorations which will achieve and maintain a position of space leadership for the United States.

The Office of Manned Space Flight has launch responsibility for all major manned and unmanned missions **utilizing the three installations primarily concerned with the manned space flight programs.** These installations are: the George C. Marshall Space Flight Center, including Mississippi Test Facility, Michoud Assembly Facility, and Slidell where a computer facility is located; the Manned Spacecraft Center, including NASA activities at the White Sands Test Facility; and the John F. Kennedy Space Center, NASA, including NASA activities at the Eastern and Western Test Ranges.

Office of Space Science and Applications - Responsible for the NASA automated space flight program directed toward scientific investigations of the earth, moon, sun, planets, and interplanetary space **utilizing ground-based, airborne, and space techniques** such as sounding rockets, earth satellites, and deep space probes; for scientific experiments to be conducted by man in space and selection and training of astronaut-scientists; for the research and development of space flight applications in such areas as meteorology, communications, navigation, geodesy, and earth resources surveys, and for the support of operational systems using these developments; and for the development, procurement, and use of light and medium class launch vehicles, such as Centaur.

The Office of Space Science and Applications has an over-all institutional responsibility for those NASA installations primarily involved in space science and applications programs. These are the Goddard Space Flight Center, Wallops Station, the Jet Propulsion Laboratory (a government-owned facility operated for NASA by the California Institute of Technology), and the NASA Pasadena Office, a component field activity of Headquarters.

Office of Advanced Research and Technology - Responsible for the planning, direction, execution, evaluation, documentation, and dissemination of the results of all NASA research and technology programs which are conducted primarily to demonstrate the feasibility of a concept, structure, component, or system which may have general application to the nation's aeronautical and space objectives. This office is also responsible for coordinating NASA's total program of supporting research and technology related to carrying out the specific flight missions in order to avoid unnecessary duplication and to insure an integrated and balanced agency research program.

In addition, this office has over-all institutional responsibility for the research centers primarily involved in carrying out NASA's advanced

research programs. These installations are: the Ames Research Center, the Electronics Research Center, the Flight Research Center, the Langley Research Center, the Lewis Research Center, and the Space Nuclear Propulsion Office.

Office of Tracking and Data Acquisition - Responsible for the development, implementation, and operation of tracking, data acquisition, communications, and data processing facilities, systems, and services required for NASA flight systems. In addition, this office is responsible for agency-wide coordination of the management of automatic data processing systems and services.

The NASA Pasadena Office, Pasadena, California, was established in 1966 as a component field activity of the NASA Headquarters' Office of Space Science and Applications. The mission of the NASA Pasadena Office (NaPO) is to negotiate and administer NASA contracts with the California Institute of Technology for the operation of the Jet Propulsion Laboratory; provide patent and technology utilization services as they relate to prime and subcontracts at the Jet Propulsion Laboratory; and perform such additional procurement, contract administration, and other functions as may be assigned by the Associate Administrator for Space Science and Applications. In addition, certain public affairs, communications and financial management functions, which are presently the responsibility of the Western Support Office (WSO) in Santa Monica, California, are being transferred to NaPO. WSO, which has provided administrative and technical support to NASA elements on the west coast, is in the process of being closed. Those functions performed by WSO which are not being transferred to NaPO are being absorbed by other NASA field installations and Headquarters. This organizational change will be completed by the end of March 1968.

DESCRIPTION:

The NASA Headquarters is located at 400 Maryland Avenue, S.W., Washington, D. C., and also occupies other buildings in the District of Columbia and nearby Virginia. Except for some office space leased in the District of Columbia and a storage area in Virginia, personnel occupy government-owned buildings. The NASA Pasadena Office is physically located at the Jet Propulsion Laboratory in Pasadena, California.

SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel	\$35,877,000	\$38,068,000	\$37,281,000
Travel	2,648,000	2,415,000	2,406,000
Automatic data processing ...	1,193,000	1,329,000	1,379,000
Facilities services	972,000	746,000	662,000
Technical services	14,460,000	12,997,000	13,054,000
Administrative support	<u>5,407,000</u>	<u>5,587,000</u>	<u>5,824,000</u>
Total, fund requirements ..	<u>\$60,557,000</u>	<u>\$61,142,000</u>	<u>\$60,606,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
<u>Manned Space Flight</u>			
Apollo	282	264	257
Apollo applications	119	113	124
Advanced missions	58	55	56
<u>Space Science and Applications</u>			
Physics and astronomy	65	65	67
Lunar and planetary	127	62	58
Launch vehicle procurement	31	30	30
Bioscience	33	32	32
Space applications	57	61	63
<u>University Affairs</u>			
Sustaining university program	57	54	54

	<u>1967</u>	<u>1968</u>	<u>1969</u>
<u>Advanced Research and Technology</u>			
Basic research	32	32	32
Space vehicle systems	52	41	41
Electronics systems	33	32	32
Human factor systems	24	24	24
Space power and electric propulsion systems	34	30	30
Nuclear rockets	2	1	1
Chemical propulsion	26	24	24
Aeronautical vehicles	33	32	32
<u>Tracking and Data Acquisition</u>	<u>60</u>	<u>57</u>	<u>57</u>
<u>Technology Utilization</u>	<u>19</u>	<u>19</u>	<u>19</u>
Subtotal, positions by program	1,144	1,033	1,033

2. Support positions:

Director and staff	451	446	446
Administrative support	330	294	294
Research and development support	<u>574</u>	<u>506</u>	<u>506</u>
Subtotal, support positions	<u>1,355</u>	<u>1,246</u>	<u>1,246</u>
Total, permanent positions	<u>2,499</u>	<u>2,279</u>	<u>2,279</u>

STAFFING SUMMARY			
	68	69	
Excepted	197	197	
GS-16	83	83	
GS-15	411	411	
GS-14	360	360	
All Other GS	1,205	1,205	
Wage Board	23	23	
Total Permanent	2,279	2,279	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ORGANIZATION AND STAFFING CHART
NASA HEADQUARTERS

ADMINISTRATOR			
	68	69	
Excepted	7	7	
GS-16	-	-	
GS-15	1	1	
GS-14	-	-	
All Other GS	4	4	
Wage Board	-	-	
Total Permanent	12	12	

GENERAL COUNSEL			
	68	69	
Excepted	7	7	
GS-16	-	-	
GS-15	10	10	
GS-14	7	7	
All Other GS	28	28	
Wage Board	-	-	
Total Permanent	52	52	

POLICY			
	68	69	
Excepted	3	3	
GS-16	-	-	
GS-15	7	7	
GS-14	2	2	
All Other GS	11	11	
Wage Board	-	-	
Total Permanent	18	18	

PROGRAM PLANS & ANALYSIS			
	68	69	
Excepted	6	6	
GS-16	-	-	
GS-15	4	4	
GS-14	1	1	
All Other GS	6	6	
Wage Board	-	-	
Total Permanent	17	17	

EXECUTIVE SECRETARY			
	68	69	
Excepted	2	2	
GS-16	-	-	
GS-15	5	5	
GS-14	6	6	
All Other GS	43	43	
Wage Board	5	5	
Total Permanent	61	61	

HEADQUARTERS COMMUNICATIONS CENTER			
	68	69	
Excepted	1	1	
GS-16	-	-	
GS-15	1	1	
GS-14	-	-	
All Other GS	7	7	
Wage Board	-	-	
Total Permanent	9	9	

MANAGEMENT & DEVELOPMENT			
	68	69	
Excepted	1	1	
GS-16	-	-	
GS-15	-	-	
GS-14	-	-	
All Other GS	1	1	
Wage Board	-	-	
Total Permanent	2	2	

(AD HOC) AEROSPACE SAFETY INTERIM WORK GROUP			
	68	69	
Excepted	-	-	
GS-16	-	-	
GS-15	-	-	
GS-14	-	-	
All Other GS	-	-	
Wage Board	-	-	
Total Permanent	-	-	

(AD HOC) PERSONNEL MANAGEMENT REVIEW COMMITTEE			
	68	69	
Excepted	-	-	
GS-16	-	-	
GS-15	-	-	
GS-14	-	-	
All Other GS	-	-	
Wage Board	-	-	
Total Permanent	-	-	

ORGANIZATION & MANAGEMENT			
	68	69	
Excepted	15	15	
GS-16	1	1	
GS-15	30	30	
GS-14	36	36	
All Other GS	275	275	
Wage Board	17	17	
Total Permanent	374	374	

INDUSTRY AFFAIRS			
	68	69	
Excepted	8	8	
GS-16	1	1	
GS-15	21	21	
GS-14	45	45	
All Other GS	66	66	
Wage Board	-	-	
Total Permanent	141	141	

SPECIAL CONTRACTS NEGOTIATION & REVIEW			
	68	69	
Excepted	2	2	
GS-16	-	-	
GS-15	1	1	
GS-14	-	-	
All Other GS	1	1	
Wage Board	-	-	
Total Permanent	4	4	

TECHNOLOGY UTILIZATION			
	68	69	
Excepted	4	4	
GS-16	-	-	
GS-15	8	8	
GS-14	12	12	
All Other GS	56	56	
Wage Board	-	-	
Total Permanent	80	80	

UNIVERSITY AFFAIRS			
	68	69	
Excepted	2	2	
GS-16	2	2	
GS-15	4	4	
GS-14	8	8	
All Other GS	38	38	
Wage Board	-	-	
Total Permanent	54	54	

DOD AND INTERAGENCY AFFAIRS			
	68	69	
Excepted	4	4	
GS-16	-	-	
GS-15	1	1	
GS-14	1	1	
All Other GS	3	3	
Wage Board	-	-	
Total Permanent	9	9	

INTERNATIONAL AFFAIRS			
	68	69	
Excepted	3	3	
GS-16	1	1	
GS-15	4	4	
GS-14	2	2	
All Other GS	20	20	
Wage Board	-	-	
Total Permanent	30	30	

LEGISLATIVE AFFAIRS			
	68	69	
Excepted	2	2	
GS-16	-	-	
GS-15	6	6	
GS-14	1	1	
All Other GS	18	18	
Wage Board	1	1	
Total Permanent	28	28	

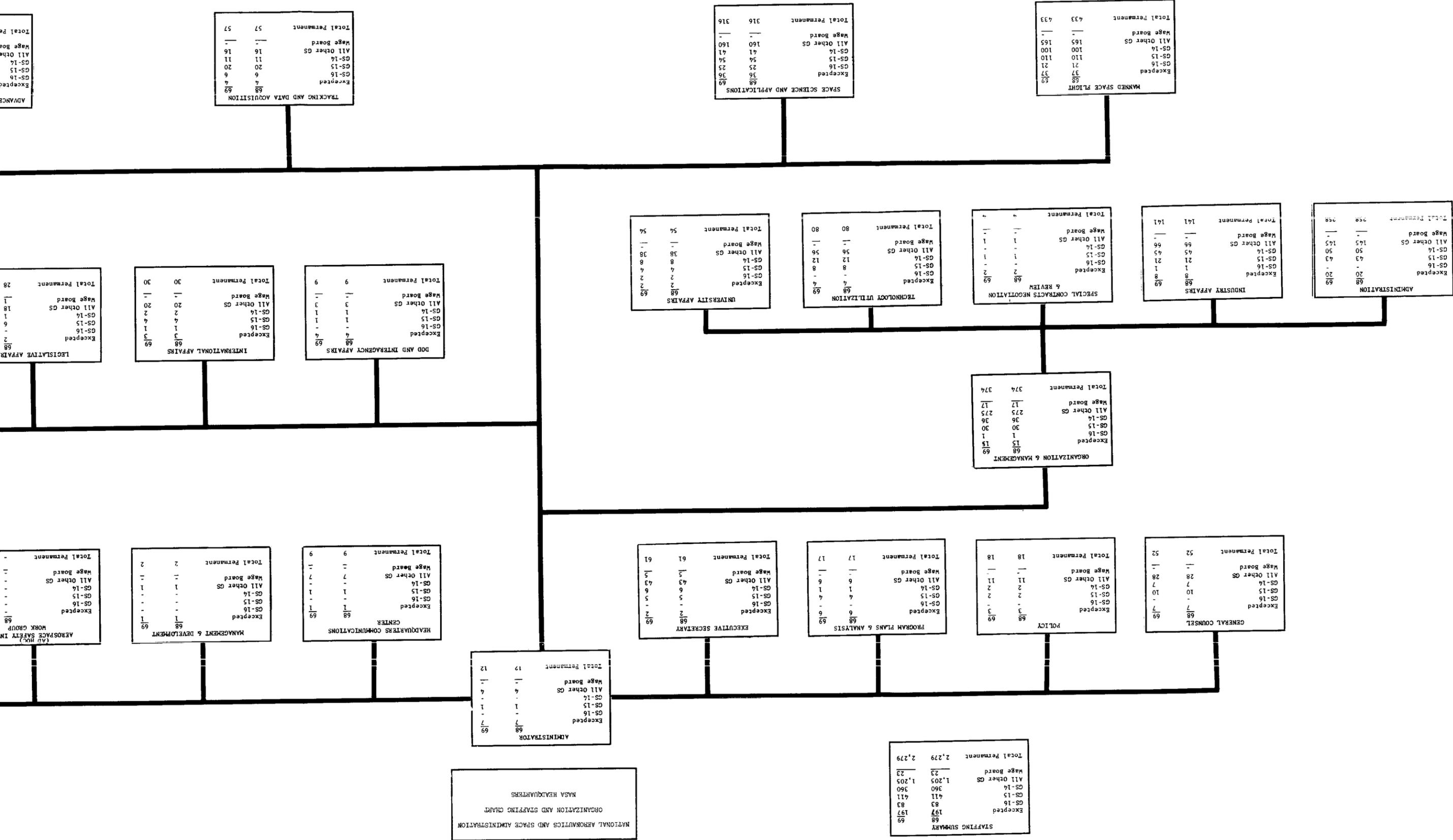
PUBLIC AFFAIRS			
	68	69	
Excepted	5	5	
GS-16	-	-	
GS-15	15	15	
GS-14	17	17	
All Other GS	72	72	
Wage Board	-	-	
Total Permanent	109	109	

MANNED SPACE FLIGHT			
	68	69	
Excepted	37	37	
GS-16	21	21	
GS-15	110	110	
GS-14	100	100	
All Other GS	165	165	
Wage Board	-	-	
Total Permanent	433	433	

SPACE SCIENCE AND APPLICATIONS			
	68	69	
Excepted	36	36	
GS-16	25	25	
GS-15	54	54	
GS-14	41	41	
All Other GS	160	160	
Wage Board	-	-	
Total Permanent	316	316	

TRACKING AND DATA ACQUISITION			
	68	69	
Excepted	4	4	
GS-16	6	6	
GS-15	20	20	
GS-14	11	11	
All Other GS	16	16	
Wage Board	-	-	
Total Permanent	57	57	

ADVANCED RESEARCH AND TECHNOLOGY			
	68	69	
Excepted	28	28	
GS-16	26	26	
GS-15	71	71	
GS-14	20	20	
All Other GS	70	70	
Wage Board	-	-	
Total Permanent	215	215	



STAFFING SUMMARY			
	68	69	
Excepted	197	197	
GS-16	83	83	
GS-15	411	411	
GS-14	360	360	
All Other GS	1,205	1,205	
Wage Board	23	23	
Total Permanent	2,279	2,279	

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
ORGANIZATION AND STAFFING CHART
NASA HEADQUARTERS

ADMINISTRATOR			
	68	69	
Excepted	7	7	
GS-16	-	-	
GS-15	1	1	
GS-14	-	-	
All Other GS	4	4	
Wage Board	-	-	
Total Permanent	12	12	

GENERAL COUNSEL			
	68	69	
Excepted	7	7	
GS-16	-	-	
GS-15	10	10	
GS-14	7	7	
All Other GS	28	28	
Wage Board	-	-	
Total Permanent	52	52	

POLICY			
	68	69	
Excepted	3	3	
GS-16	-	-	
GS-15	7	7	
GS-14	2	2	
All Other GS	11	11	
Wage Board	-	-	
Total Permanent	18	18	

PROGRAM PLANS & ANALYSIS			
	68	69	
Excepted	6	6	
GS-16	-	-	
GS-15	4	4	
GS-14	1	1	
All Other GS	6	6	
Wage Board	-	-	
Total Permanent	17	17	

EXECUTIVE SECRETARY			
	68	69	
Excepted	2	2	
GS-16	-	-	
GS-15	5	5	
GS-14	6	6	
All Other GS	43	43	
Wage Board	5	5	
Total Permanent	61	61	

HEADQUARTERS COMMUNICATIONS CENTER			
	68	69	
Excepted	1	1	
GS-16	-	-	
GS-15	1	1	
GS-14	-	-	
All Other GS	7	7	
Wage Board	-	-	
Total Permanent	9	9	

MANAGEMENT & DEVELOPMENT			
	68	69	
Excepted	1	1	
GS-16	-	-	
GS-15	-	-	
GS-14	-	-	
All Other GS	1	1	
Wage Board	-	-	
Total Permanent	2	2	

(AD HOC) AEROSPACE SAFETY INTERIM WORK GROUP			
	68	69	
Excepted	-	-	
GS-16	-	-	
GS-15	-	-	
GS-14	-	-	
All Other GS	-	-	
Wage Board	-	-	
Total Permanent	-	-	

(AD HOC) PERSONNEL MANAGEMENT REVIEW COMMITTEE			
	68	69	
Excepted	-	-	
GS-16	-	-	
GS-15	-	-	
GS-14	-	-	
All Other GS	-	-	
Wage Board	-	-	
Total Permanent	-	-	

ORGANIZATION & MANAGEMENT			
	68	69	
Excepted	15	15	
GS-16	1	1	
GS-15	30	30	
GS-14	36	36	
All Other GS	275	275	
Wage Board	17	17	
Total Permanent	374	374	

INDUSTRY AFFAIRS			
	68	69	
Excepted	8	8	
GS-16	1	1	
GS-15	21	21	
GS-14	45	45	
All Other GS	66	66	
Wage Board	-	-	
Total Permanent	141	141	

SPECIAL CONTRACTS NEGOTIATION & REVIEW			
	68	69	
Excepted	2	2	
GS-16	-	-	
GS-15	1	1	
GS-14	-	-	
All Other GS	1	1	
Wage Board	-	-	
Total Permanent	4	4	

TECHNOLOGY UTILIZATION			
	68	69	
Excepted	4	4	
GS-16	-	-	
GS-15	8	8	
GS-14	12	12	
All Other GS	56	56	
Wage Board	-	-	
Total Permanent	80	80	

UNIVERSITY AFFAIRS			
	68	69	
Excepted	2	2	
GS-16	2	2	
GS-15	4	4	
GS-14	8	8	
All Other GS	38	38	
Wage Board	-	-	
Total Permanent	54	54	

DOD AND INTERAGENCY AFFAIRS			
	68	69	
Excepted	4	4	
GS-16	-	-	
GS-15	1	1	
GS-14	1	1	
All Other GS	3	3	
Wage Board	-	-	
Total Permanent	9	9	

INTERNATIONAL AFFAIRS			
	68	69	
Excepted	3	3	
GS-16	1	1	
GS-15	4	4	
GS-14	2	2	
All Other GS	20	20	
Wage Board	-	-	
Total Permanent	30	30	

LEGISLATIVE AFFAIRS			
	68	69	
Excepted	2	2	
GS-16	-	-	
GS-15	6	6	
GS-14	1	1	
All Other GS	18	18	
Wage Board	1	1	
Total Permanent	28	28	

PUBLIC AFFAIRS			
	68	69	
Excepted	5	5	
GS-16	-	-	
GS-15	15	15	
GS-14	17	17	
All Other GS	72	72	
Wage Board	-	-	
Total Permanent	109	109	

MANNED SPACE FLIGHT			
	68	69	
Excepted	37	37	
GS-16	21	21	
GS-15	110	110	
GS-14	100	100	
All Other GS	165	165	
Wage Board	-	-	
Total Permanent	433	433	

SPACE SCIENCE AND APPLICATIONS			
	68	69	
Excepted	36	36	
GS-16	25	25	
GS-15	54	54	
GS-14	41	41	
All Other GS	160	160	
Wage Board	-	-	
Total Permanent	316	316	

TRACKING AND DATA ACQUISITION			
	68	69	
Excepted	4	4	
GS-16	6	6	
GS-15	20	20	
GS-14	11	11	
All Other GS	16	16	
Wage Board	-	-	
Total Permanent	57	57	

ADVANCED RESEARCH AND TECHNOLOGY			
	68	69	
Excepted	28	28	
GS-16	26	26	
GS-15	71	71	
GS-14	20	20	
All Other GS	70	70	
Wage Board	-	-	
Total Permanent	215	215	

ADMINISTRATIVE OPERATIONS

FISCAL YEAR 1969 ESTIMATES

JET PROPULSION LABORATORY

This presentation of administrative operations-type costs at the Jet Propulsion Laboratory is for information only and should not be considered a part of NASA's FY 1969 Administrative Operations budget estimates.

Although the plant and equipment are entirely government-owned, the Jet Propulsion Laboratory is managed and staffed by the California Institute of Technology under a contract with NASA. Because it is a contractor operation, the cost of operating Jet Propulsion Laboratory is funded almost entirely from the Research and Development appropriation. Cost of leasing administrative aircraft and purchase of passenger motor vehicles are funded from the Administrative Operations appropriation and are included in the NASA Headquarters' budget.

MISSION:

Under task orders issued by NASA, the Jet Propulsion Laboratory performs a variety of engineering, scientific, and management missions which include:

1. Lunar and deep-space automated scientific exploration.
2. Project management of complete spacecraft systems.
3. Tracking, data acquisition, and data reduction and analysis required by lunar and deep-space flights.
4. Conduct a program of supporting research and technology.

Specific examples of the Jet Propulsion Laboratory's activity in these areas are:

Lunar Exploration - By the end of 1967, six Surveyor spacecraft had been launched, four of which successfully soft-landed on the moon. The last Surveyor was successfully launched on January 7, 1968. Surveyors have returned several thousands of photographs of selected areas of the moon's topography, and have established that the weight bearing capacity of the lunar surface is sufficient to permit a safe landing by Apollo astronauts, and have provided vast quantities of other engineering and scientific data. This highly successful spacecraft was designed and developed by Hughes Aircraft Company under a contract with Jet Propulsion Laboratory. The Jet Propulsion Laboratory managed the contract and provided technical guidance,

conducted the missions from the Space Flight Operations Facility, and reduced and evaluated scientific and engineering data received.

During the past two years, Jet Propulsion Laboratory has also been deeply involved in the conduct of the Lunar Orbiter flight project which was managed by the Langley Research Center. Conduct of the five flight missions was accomplished from Jet Propulsion Laboratory's Space Flight Operations Facility, while tracking and data acquisition was performed by the Deep Space Network. The Lunar Orbiter program, now completed, has provided us with photographic coverage of the entire lunar surface at a level of detail ten times greater than that attainable from earth-based observations.

Planetary Exploration - Jet Propulsion Laboratory has project management responsibility for Mariner, our primary instrument of planetary exploration. This series of spacecraft was designed at the Jet Propulsion Laboratory, which is also responsible for integration, assembly, and testing of the spacecraft. Mariner II accomplished the first successful flyby of Venus in 1962, and in 1965, Mariner IV photographed the surface of Mars as it passed within 6,200 miles of the planet's surface. Mariner V was launched in June 1967 and four months later passed within 2,131 miles of Venus providing information on the atmospheric composition of the planet and other scientific data. Two more Mariner flyby missions to Mars are planned for 1969. Also, work on two Mariner Mars 1971 orbiter missions and two Titan Mars 1973 missions with probes will begin in 1969.

Supporting Research and Technology - The Jet Propulsion Laboratory maintains a strong program of supporting research and technology and advanced development. Much of the knowledge being generated by this research will no doubt find application in the solution of future problems in space exploration. Active research in such areas as fluid physics, electrophysics, materials, applied mathematics, and guidance and control is under way.

Another activity of considerable importance is the development and fabrication of scientific experiments to be flown on vehicles other than Jet Propulsion Laboratory spacecraft. These have included high-altitude balloons, Aerobee rockets, NASA aircraft, and earth orbiters. The scientific teams involved in these experiments frequently include faculty members of various universities and staff members from NASA field installations.

Tracking and Data Acquisition - The Jet Propulsion Laboratory manages the operation of the world-wide Deep Space Network. The Deep Space Network is comprised of tracking and data acquisition stations located around the world and the Space Flight Operations Facility in Pasadena. The Space Flight Operations Facility is the central communications and control facility during the conduct of flight missions. Not only does the Deep Space Network provide support to Jet Propulsion Laboratory flight missions such as Surveyor and Mariner, but it also provides tracking and data acquisition for projects such as Lunar Orbiter and Pioneer which are managed by other NASA field installations.

DESCRIPTION:

The Jet Propulsion Laboratory is located in Pasadena, California, approximately 20 miles north of downtown Los Angeles. Subsidiary facilities are located at Goldstone, California (tracking and data acquisition), Edwards Air Force Base, Muroc, California (solid-propellant formulation and testing), and Table Mountain, California (open air testing and astronomy).

At Pasadena, the Laboratory occupies 160.2 acres of land of which 145.9 acres are owned by NASA and 14.3 acres are leased. At Goldstone, facilities are located on land occupied under permit from the Army. At Edwards Air Force Base, facilities are located on land occupied under permit from the Air Force. The facilities at Table Mountain are located on land occupied under permit from the Forest Service of the Department of Agriculture. The capital investment of the Jet Propulsion Laboratory, including work in progress and contractor-held facilities, as of June 30, 1967, is \$148,271,000.

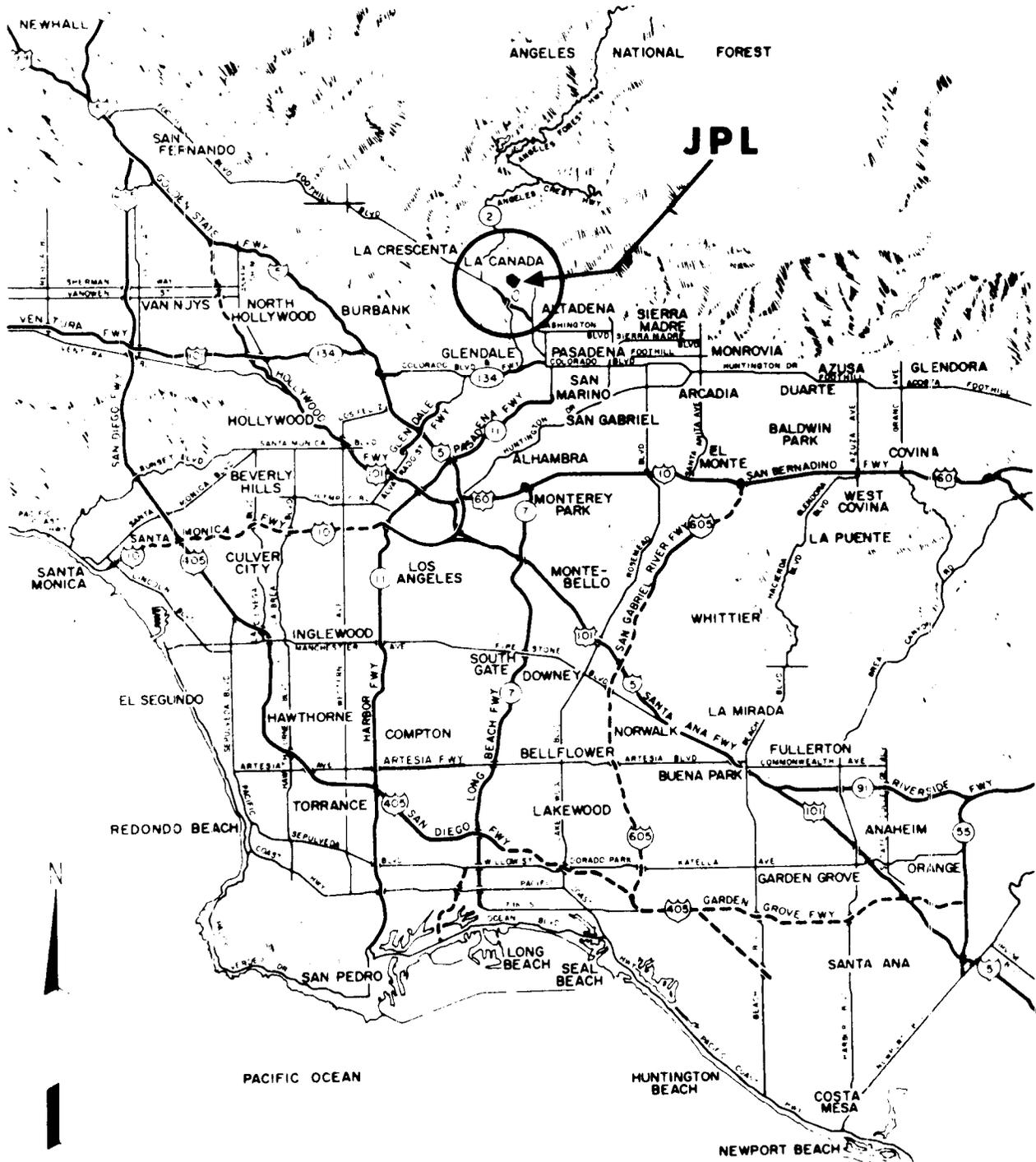
SUMMARY OF RESOURCES REQUIREMENTS:

<u>Functions</u>	<u>FUNDS</u>		
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Personnel.....	\$56,139,000	\$59,380,000	\$59,023,000
Travel.....	2,758,000	2,450,000	2,350,000
Automatic data processing.....	6,468,000	5,582,000	4,137,000
Facilities services.....	6,854,000	5,719,000	5,710,000
Technical services.....	1,587,000	1,282,000	1,145,000
Administrative support.....	<u>3,928,000</u>	<u>3,370,000</u>	<u>3,209,000</u>
Total, fund requirements.....	<u>\$77,734,000</u>	<u>\$77,783,000</u>	<u>\$75,574,000</u>

PERSONNEL

	<u>1967</u>	<u>1968</u>	<u>1969</u>
1. <u>Permanent positions by program:</u>			
Lunary and planetary.....	1,186	880	884
Tracking and data acquisition.....	358	348	312

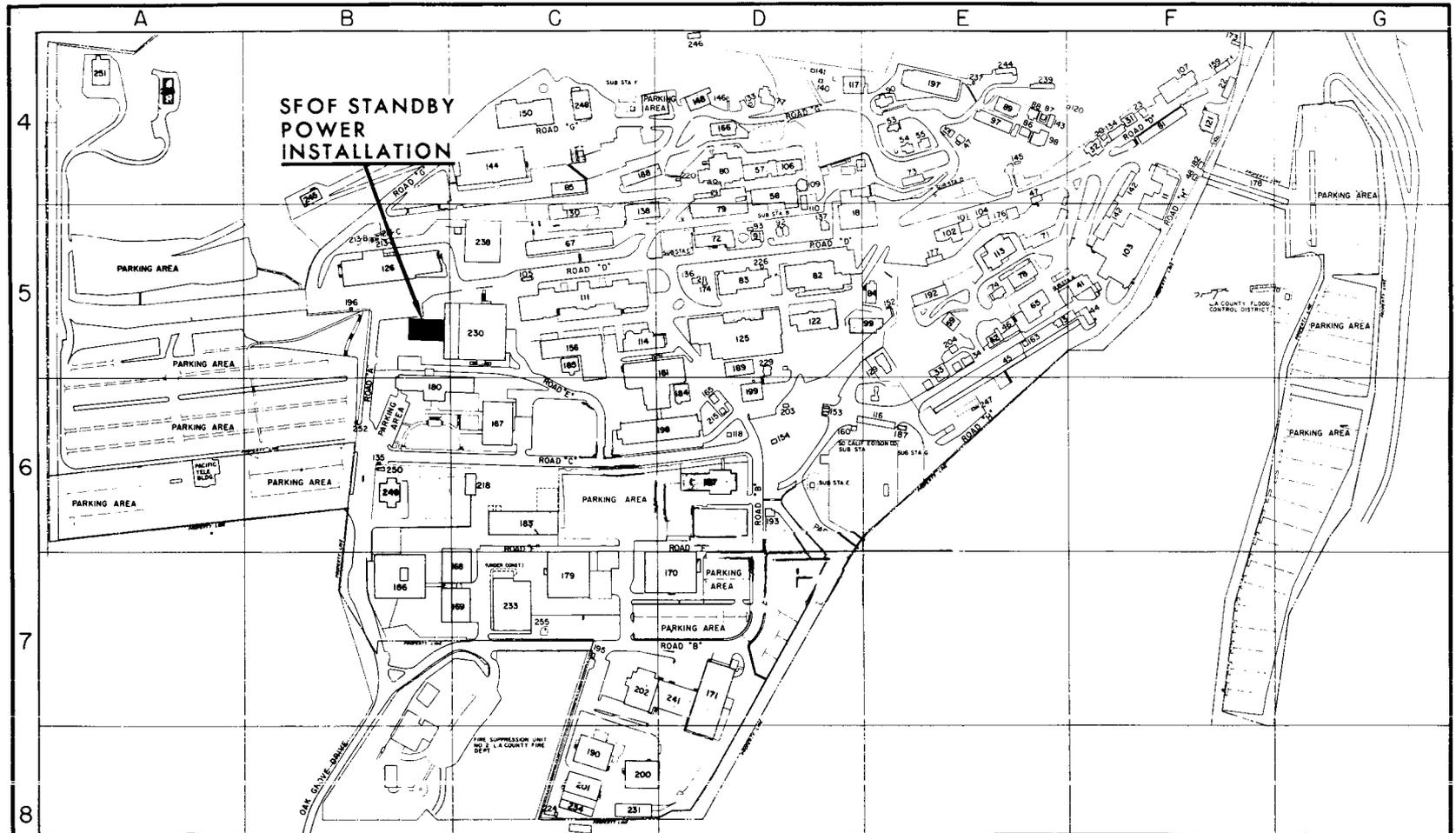
	<u>1967</u>	<u>1968</u>	<u>1969</u>
Supporting research and technology.....	698	735	774
Research and development services.....	<u>474</u>	<u>482</u>	<u>475</u>
Subtotal, positions by program.....	2,716	2,445	2,445
2. <u>Support positions</u>	<u>1,934</u>	<u>1,705</u>	<u>1,705</u>
Total, permanent positions.....	<u>4,650</u>	<u>4,150</u>	<u>4,150</u>



JET PROPULSION LABORATORY

FISCAL YEAR 1969 ESTIMATES

LOCATION PLAN



AO 2-111

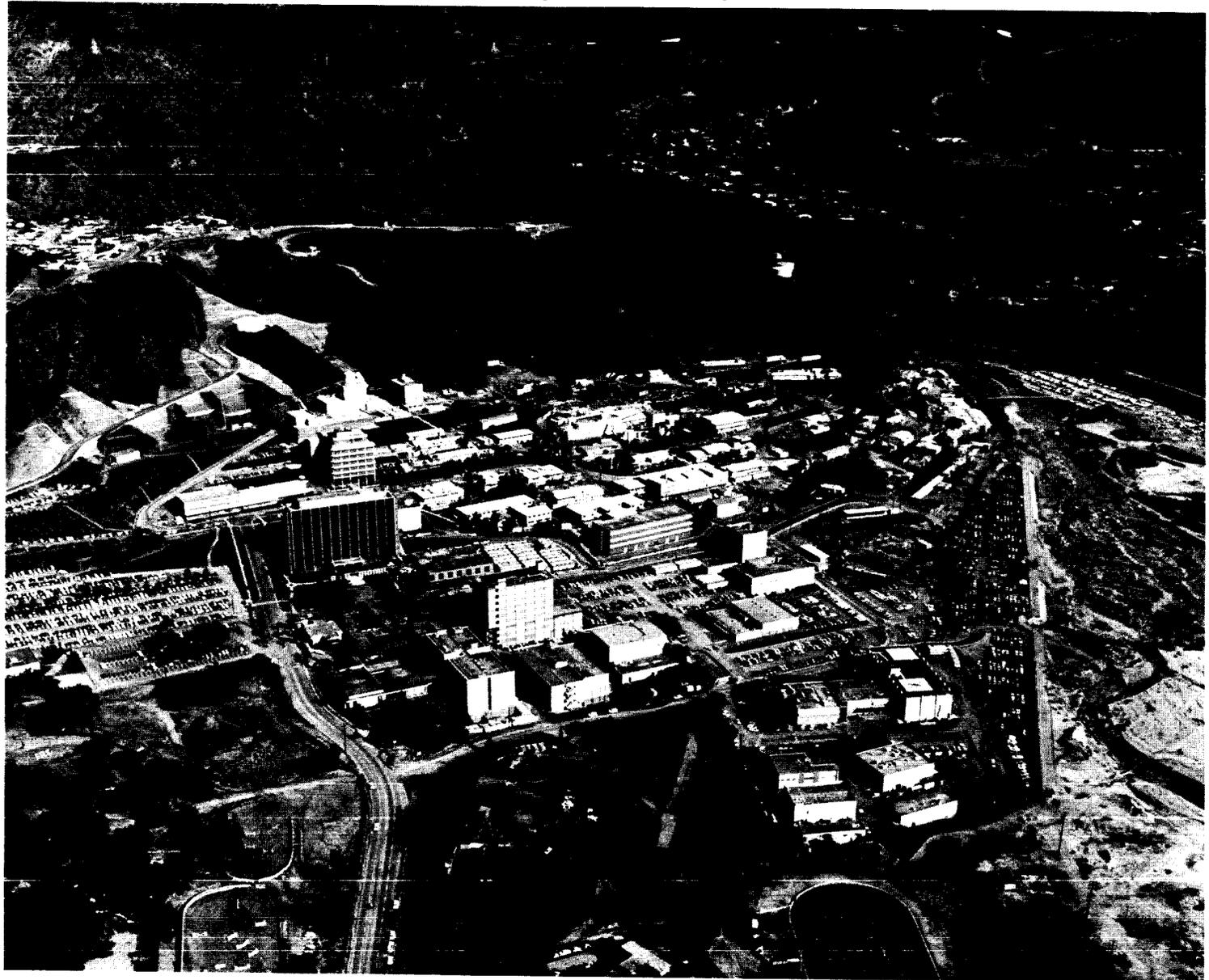
JET PROPULSION LABORATORY

FISCAL YEAR 1969 ESTIMATES

BUILDING LEGEND

BLDG. NO.	TITLE	LOCATION	BLDG. NO.	TITLE	LOCATION	BLDG. NO.	TITLE	LOCATION	BLDG. NO.	TITLE	LOCATION
11	Space Sciences Laboratory.	4-F	105	Guard Shelter	5-C	171	Matl. Services Bldg	7-D	233	Engineering Devlpmt Bldg.	7-C
13	Offices, Lab & Shop.	5-E	106	Test Cell (Air Fuel).	4-D	172	Carpenter Shop.	5-F	234	Lumber Storage Bldg.	8-C
18	Structural Test Lab.	5-D	107	Test Cell	4-F	173	Test Shelter.	4-F	235	Microwave Lab (Proposed)	
20	Shop Test Cell No 2 (Liquid).	4-F	109	Cooling Tower (Wind Tunnel).	4-D	174	Cooling Tower.	5-D	237	Cooling Tower	4-E
22	Thermocouple Lab.	4-F	110	Fuel Storage Tank.	4-D	175	Water Reservoir.	3-F	238	Telecommunications Lab.	5-C
23	Shop Test Cell No 12 (Liquid).	4-F	111	Administration Bldg.	5-C	176	Fire House.	5-E	239	Low Temp. Solid Propellant Mag	4-E
31	Test Cell (Liquid).	4-F	113	Gas Metering Lab.	5-E	177	Heavy Equip. Servicing Shed.	5-E	240	High Magnetic Test Facility (Prop)	
32	Test Cell (Liquid).	4-F	114	Cafeteria & Offices.	5-C	178	Bailey Bridge.	4-F	241	Shipping & Receiving Dock	7-D
33	Test Cell (Liquid).	5-E	115	Heating Plant (Solid).	4-E	179	Spacecraft Assy. Facility.	7-C	242	Fuel & Oxidizer Stor. Dock (Prop)	
34	Shop Test Cell No 33 (Liquid).	5-E	116	Propellant Storage Dock.	6-E	180	Central Engr. Bldg.	6-B	243	Remote Antenna Range Contr. Bldg.	2-C
41	Hi Temp Lab.	5-F	117	Test Cell (Solid).	4-D	182	Bus Stop Shelter.	4-F	244	Hi Temp. Storage Magazine	4-E
42	Test Cell (Liquid).	5-E	118	Cooling Tower.	6-D	183	Physical Science Lab.	6-C	245	Spectroscopy Lab.	4-B
44	Credit Union.	5-F	120	Cooling Tower.	4-F	184	Electronic Stores.	6-D	246	Soils Test Lab.	4-D
45	Aerodynamics & Steam Lab.	5-E	121	Cafeteria.	4-F	185	Telecommunications Annex.	6-C	247	Dynamitron.	6-E
46	Shop Test Cell No 42 (Liquid).	5-E	122	Engineering Offices.	5-D	186	Space Sciences Division Bldg.	7-B	248	Ten Ft. Space Simulator	4-C
47	Plant Protection.	4-E	124	Incinerator.	6-E	187	Chemical Storage.	6-E	249	Central Security Control Bldg. (Prop)	
48	Guard Shelter.	4-F	125	Combined Electronics.	5-D	188	Engineering Facilities Bldg.	4-C	250	Main Guard Gate (Proposed)	
53	Conditioning Lab (Solid).	4-E	126	Administrative Services.	5-B	189	Electronics Lab Annex.	5-D	251	Gyro Lab	4-A
54	Blending Lab (Solid).	4-E	129	Test Cell (Chemistry).	5-E	190	Engineering Offices.	8-C	252	Guard Shelter.	6-B
55	Mixing Lab (Solid).	4-E	130	Space Science Lab.	5-C	191	Hazardous Test Bay.	3-F	253	LowMag. Interference Lab. (Prop)	
57	Test Cell (Air Fuel).	4-D	131	Maintenance Storage.	4-F	192	Propulsion Component Storage.	5-E	255	Sewage Lift Station.	7-C
58	Compressor Building.	4-D	133	Service Dock	4-D	193	Heliport Dispatchers Office.	6-D	256	Model Range Control Bldg. (Prop)	
59	Chem. Lab.	5-E	134	Shop Test Cell.	4-F	195	Guard Shelter.	7-C			
65	Materials Lab.	5-E	135	Guard Shelter	6-B	196	Guard Shelter.	5-B			
66	Carpenter Shop.	5-F	136	Cooling Tower.	5-D	197	Solid Propellant Process Lab.	4-E			
67	Engineering Offices & Lab.	5-C	137	Cooling Tower.	5-D	198	Guidance Lab.	6-D			
71	Mechanics Stores.	5-E	138	Engineering Offices.	5-C	199	Celestial Simulator Bldg.	6-D			
72	Engineering Offices.	5-D	140	Magazine X Temp.	4-D	200	Plant Engineering Services.	8-C			
73	Utilities Area Storage.	4-E	141	Magazine X Temp.	4-D	201	Carpenter Shop.	8-C			
74	Test Cell (Chemistry).	5-E	142	Utilities Dock.	4-F	202	Plant Engineering Bldg.	7-C			
77	Soil Science Lab.	4-D	143	Solid Rocket Dock.	4-E	203	Emitter Storage Bldg.	6-D			
78	Hydraulics Lab.	5-E	144	Environmental Lab.	4-C	204	Test Cell "F" Equip. Bldg.	5-E			
79	Wind Tunnel (20 Inch).	4-D	145	Magazine-Propellant.	4-E	205	High Gain Antenna Tower.	2-C			
80	Wind Tunnel (12 & 21 Inch).	4-D	146	Magazine-Temp.	4-D	206	Rotator Platform.	2-D			
81	Space Sciences Lab.	4-F	147	Cooling Tower.	4-E	207	Rotator Pad.	2-D			
82	Environmental Test Lab.	5-D	148	Energy Conversion Lab.	4-D	208	Impedance Platform.	2-C			
83	Chem. Lab & Eng. Office.	5-D	150	25 Foot Space Simulator.	4-C	209	Illuminator Tower.	2-D			
84	Test Cell & Solid Chemistry.	5-E	152	Hazardous Chemical Storage.	5-E	210	Blaine Track.	2-D			
85	Space Sciences Office.	4-C	153	Magazine-Solid Propellant.	6-D	211	Magnetometer Bldg.	3-B			
86	Oxidizer Grinding (Solid).	4-E	154	Magazine-General Storage.	6-D	212	Antenna Laboratory.	2-D			
87	Ovens (Solid).	4-E	156	Guided Missile Engineering.	5-C	213	Cooling Towers 'A', 'B' & 'C'.	5-B			
88	Mixing Lab (Solid).	4-E	157	Matl. Research Lab.	6-D	215	Cooling Tower.	6-D			
89	Processing Lab (Solid).	4-E	158	Matl. Research Process Lab.	6-D	218	Visitor Control Building.	6-C			
90	Shop-Test Cell No 51.	4-E	159	Pump House (Water).	4-F	220	C.R.S. Terminal Bldg.	4-D			
91	Air Dryer (Wind Tunnel).	5-D	160	Pump House (Sewage).	6-D	224	Sewer Lift Station.	8-C			
92	Cooling Tower (Wind Tunnel).	5-D	161	Guidance Lab.	5-C	226	Solvent Storage Bldg.	5-D			
93	Vaporizer (Wind Tunnel).	5-D	163	Cooling Tower.	5-E	227	Guard Shelter.	4-C			
97	Development Lab & Offices.	4-E	165	Cooling Tower.	6-D	228	Cooling Towers (A & B).	4-B			
98	Preparation Shop (Solid).	4-E	166	Cooling Tower.	4-D	229	Shielded Room Bldg.	5-D			
99	Chemistry Lab (Solid).	5-E	167	Cafeteria.	6-C	230	Space Flight Operations Comm- and Facility.	5-C			
101	Transportation Offices.	5-E	168	Space Sciences Instrmt Sys Lab.	7-C	231	Paint Shop.	8-C			
102	Transportation Shop.	5-E	169	Surveyor Project Bldg.	7-C	232	Communications Assy. Bldg. (Proposed)				
103	Fabrication Shop.	5-F									
104	First Aid.	5-E	170	Fabrication Shop.	7-D						

Jet Propulsion Laboratory



Aerial View

U. S. GOVERNMENT PRINTING OFFICE : 1968 O - 284-948

AO 2-113