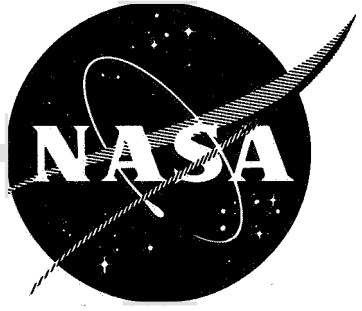
NHB 8800.5 (II)
MARCH 1967
EDITION

TECHNICAL FACILITIES CATALOG

VOLUME III



I IONAL AERONAU S AND SPACE ADMINISTRI TION

TECHNICAL FACILITIES CATALOG

As stated in the Preface, the Catalog is arranged in two volumes for ease of handling, and groups the technical facilities under the cognizant NASA installation. In each volume, the facilities are indexed alphabetically by functional name and keyword descriptor, NASA-wide and by individual field installation.

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TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

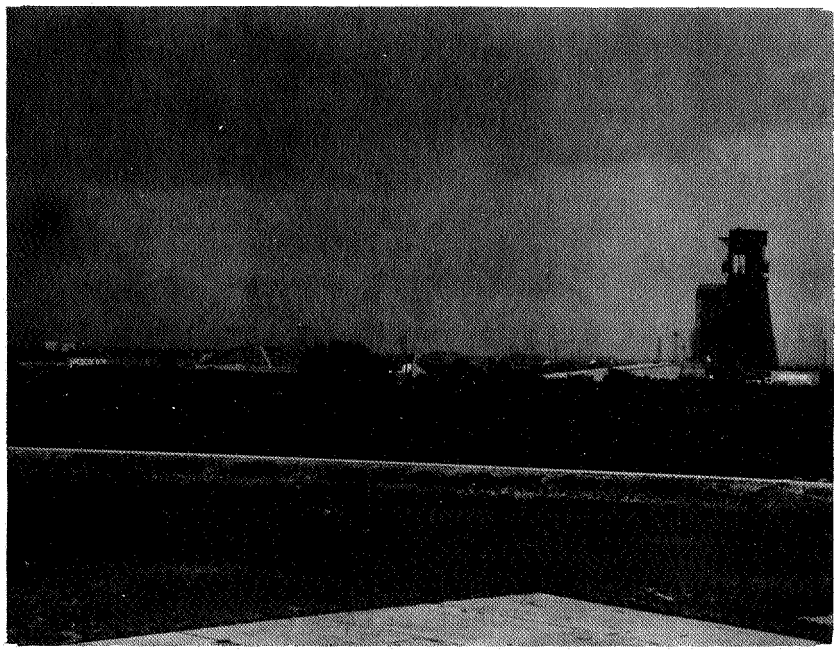
FACILITY NO: 10-00-01-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida.

2. FACILITY NAME: Launch Complex 12

3. LOCATION *(if other than in 1. above):*

Cape Kennedy Air Force Station, Flordia.



4. FUNCTIONAL NAME: **Missile Launch Complex (No. 12)**

5. TECHNOLOGICAL AREAS SUPPORTED: The purpose of this facility is to launch various unmanned spacecraft containing aerospace technological experiments and applications.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility was originally built for and was used to support the development of the Air Force Single Stage Atlas Weapons System. Later, this facility was modified to suit the multistage Atlas-Agena vehicle for launching unmanned spacecraft for various programs. Recently, this facility has been used to support such programs as Ranger, Mariner, Fire, OGO; OAO, and ATS.

The major facility components within this complex are: a launcher with ramp; umbilical tower; service structure; first, second and third stage fuel storage and loading area; blockhouse; launch contractor ready room; range contractor shop; operations support building and POL building.

The present use of this complex is limited exclusively to the Atlas-Agena vehicle which in its present configuration can launch a payload of 5,950 lbs. into earth orbit, 950 lbs. into earth escape velocity, and 600 lbs. to Mars or Venus.

6. NARRATIVE DESCRIPTION

General Dynamics/Convair is the contractor for the overall launch and the first and second stage booster. Lockheed operates the Agena third stage and Lewis Research Center is the program manager. The Air Force Range Contractor performs the nonlaunch operations and maintenance function.

7. POTENTIAL:. This complex will be modified through a FY 67 C of F program which will improve existing capabilities **or** replace worn out equipment rather than enlarge capability. Enlarge visitors observation room, provide sanitation facility, long line. instrumentation cable replacement, pad cooling, transfer room, and instrumentation room air conditioning replacement. Project cost ***$700,000.***

8. PLANS: The FY C of F program will have design complete in October 1966 and will be constructed in July, August, and September of 1967.

9. BLDG. NO. 1676 10. YR. BUILT: 1957 11. FAC. CAT. CODE: 381-00

12. INITIALCOST: $ 6,552 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 6,761 K 16. LIFE EXPECT. 10 yrs 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):* Gen. Dynamics/ Convair

20. OTHER SOURCES OF INFO: COE Contracts No, 817 (Dwg. File 201-27931,201-28033 No. 73 (Dwg, File 201-152), No. 57 (Dwg, File 201-362).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

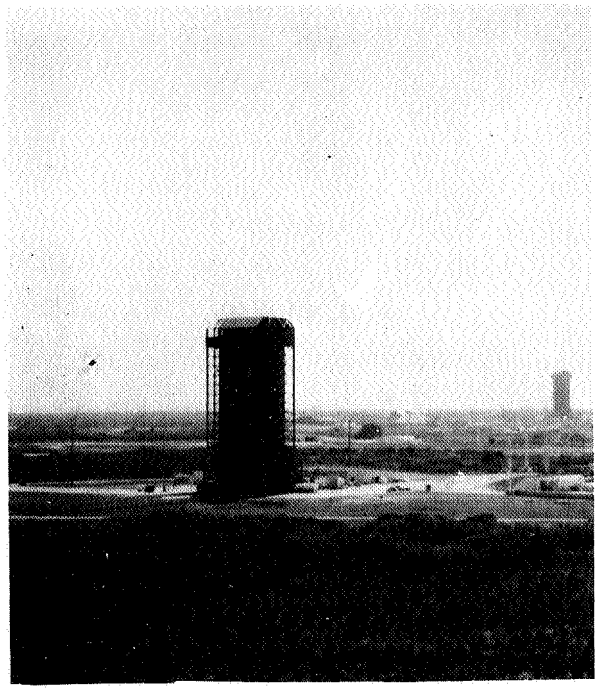
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-02-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Launch Complex 13**

3. LOCATION *(if other than in 1. above):*
Cape Kennedy Air Force Station, Flordia.





4. FUNCTIONAL NAME: **Missile Launch Complex (No. 13)**

5. TECHNOLOGICAL AREAS SUPPORTED: **The purpose of this facility is to launch various unmanned spacecraft containing aerospace technological experiments and applications.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This 'facility was originally built for and was used to support the development of the Air Force Single Stage Atlas Weapons System. Later, this facility was modified to suit the multistage Atlas-Agena vehicle for launching unmanned spacecraft for various programs. Recently, a new service structure was constructed at this facility to accommodate such programs as Lunar Orbiter, ATS, and OGO.

The major facility components within this complex are: a launcher with ramp; umbilical tower; service structure; first, second, and third stage fuel storage and loading area; blockhouse; and launch contractor ready room.

The present use of this complex is limited exclusively to the Atlas-Agena vehicle which in its present configuration can launch a payload of *5,950* lbs. into earth orbit, *950* lbs. into earth escape velocity, and 600 lbs. to Mars or Venus.

6. NARRATIVE DESCRIPTION

General Dynamics/Convair is the contractor for the overall launch and the first and second stage booster., Lockheed operates the Agena third stage and Lewis Research Center is the program manager. The Air Force Range Contractor performs the nonlaunch operations and maintenance function.

7. POTENTIAL: This area will be proposed to be modified through a special program which will adapt the complex for the forthcoming Long Tank Atlas Vehicle. The service structure platforms will be modified as required and the umbilical tower will be raised, Project cost approximately $250K.

8. PLANS: The construction schedule is being made.

9. BLDG. NO.	1680	10. YR. BUILT:	1958	11. FAC. CAT. CODE:	381-00
12. INITIAL COST: $	9,706 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	9,706 K	16. LIFE EXPECT.	25	17. OWNERCODE:	USAF
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.):*	Gen. Dynamics/ Convair		

20. OTHERSOURCES OF INFO: As built drawings and specifications, available from Design Engineering Directorate, KSC, (Drawings, specification, and contract data will be submitted at a later date.)

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate KSC.

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

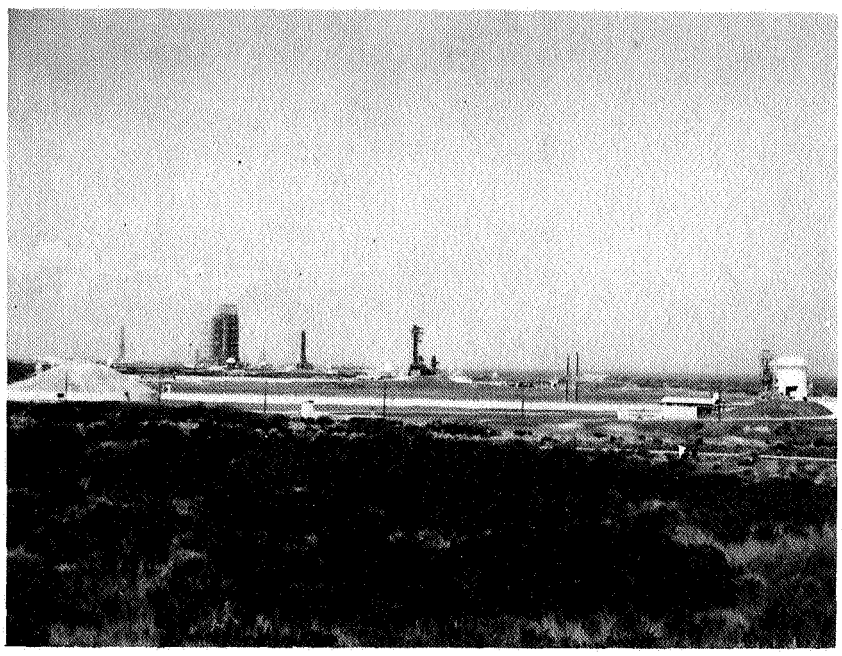
FACILITY NO: 10-00-03-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida,**

2 FACILITY NAME: **Launch Complex 16**

3. LOCATION *(if other than in 1. above):*

Cane Kennedv Air Force Station. Flordia.



4. FUNCTIONAL NAME: Missile Launch **Complex (No. 16)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Apollo Static Test Facility. Purpose is to operational test the propulsion system for the Apollo Service Module and associated support equipment.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility was originally built for and was used to support the development of the Air Force Titan II Weapons System. Recently, this facility was modified to accommodate the present Apollo static test function.

The test stand at this facility is a steel tankmounted on the old launch stand and ramp. The old service structure has been removed. The umbilical tower remains at this facility and has been adapted to carry utilities and controls to the test tank. The fuel and gas systems have been modified and are operational. The original block-house is being utilized as the command and monitoring area and the ready room now serves as office space.

The present use of this complex is limited exclusively to the testing of the Apollo Service Module.

6. NARRATIVE DESCRIPTION

North American Aviation operates the complex and testing under KSC supervision and the Air Force Range Contractor performs the nontesting operations and maintenance function.

7. POTENTIAL: **The facility as presently configured is suitable only for the present mission.**

8. PLANS: **None**

9. BLDG. NO.	13100	10. YR. BUILT:	1957	11. FAC. CAT. CODE:	381-00
12. INITIAL COST: $	3,700 K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	3,937 K	16. LIFE EXPECT.	10 yrs	17. OWNER CODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.)*:	**North American Aviation**		

20. OTHER SOURCES OF INFO: **All drawings for LC-16 are indexed into the MK Technical Data Indexing System (ADP) under Location Code D16.00.00.0.**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Design Engineering Directorate, KSC.**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: **Civil Engineering Division - MF KSC**

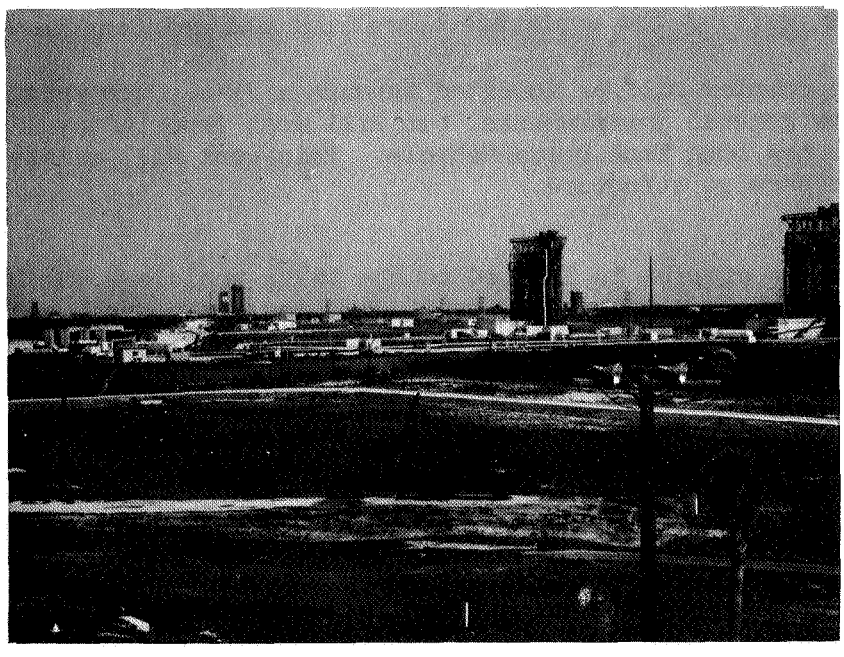
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: **10-00-04-00**

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Launch Complex 17A and 17B

3. LOCATION (if *other than in 1. above):* Cape Kennedy Air Force Station, Florida



4. FUNCTIONALNAME: Missile Launch Complex (No. 17A and 17B)

5. TECHNOLOGICAL AREAS SUPPORTED: The purpose of this facility is to launch various unmanned spacecraft containing aerospace technological experiments and applications.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility was originally built for and was used to support the development of the AF Single Stage Thor Weapons System. This facility was then modified to suit the multistage Thor-Delta vehicle for launching unmanned spacecraft for various programs. Later modifications provided for the launch of the Thrust Augmented Delta (TAD). Recently, this facility has been used to support such programs as OSO, IMP, GEOS, BIOS, ECHO, Explorer, Tiros, Pioneer, Early Bird, Telstar, Relay, Syncom, and INTELSAT.

The major facility components within this complex are: pad 17A and 17B launchers and instrumentation rooms; umbilical towers; service structures; and fuel storage areas.

6. NARRATIVE DESCRIPTION

Other single facility components serving both these pads are: a blockhouse; a ready room; and a spacecraft air conditioning area.

The present use of this complex is limited exclusively to the Delta vehicle which in its present configuration can launch a payload of 880 lbs. into earth orbit, 150 lbs. into earth escape velocity, and 120 lbs. to Mars or Venus. The respective figures for the Thrust Augmented Delta are 1185, 210, and 160 lbs.

Douglas Aircraft Company is the contractor for the overall launch and the Goddard Space Flight Center is the spacecraft and program manager. The AF Range Contractor performs the nonlaunch operations and maintenance function.

7. POTENTIAL: The complex will be modified through a FY-67 CofF Program which will provide some general improvements, but will most importantly adapt launcher area 17B for the new Long Tank Delta Vehicle. This work will add height and platforms to the service structure.

8. PLANS: Use of this complex is limited to the Delta vehicle. The Delta can lift a payload of 880 lbs. into earth orbit, 150 lbs. into earth escape velocity and 120 lbs. to Mars or Venus. The respective figures for TAD are 1185, 210 and 160 lbs.

Douglas Aircraft Co. is the contractor for the overall launch and services for all stages. Goddard Space Flight Center is the spacecraft and program manager. The Air Force Range Contractor performs the non-launch operations and maintenance functions.

9. BLDG. NO.	1270	10. YR. BUILT:	1957	11. FAC. CAT. CODE:	381-00
12. INITIAL COST: $	2,982 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	3,003 K	16. LIFE EXPECT.	10 yrs	17. OWNER CODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.)*:	Douglas Aircraft Company		

20. OTHERSOURCES OF INFO: Contracts 204, 303, 310, 2400 mods. (Dwg. files 201-305, 201-441, 201-437, 201-25, 068).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

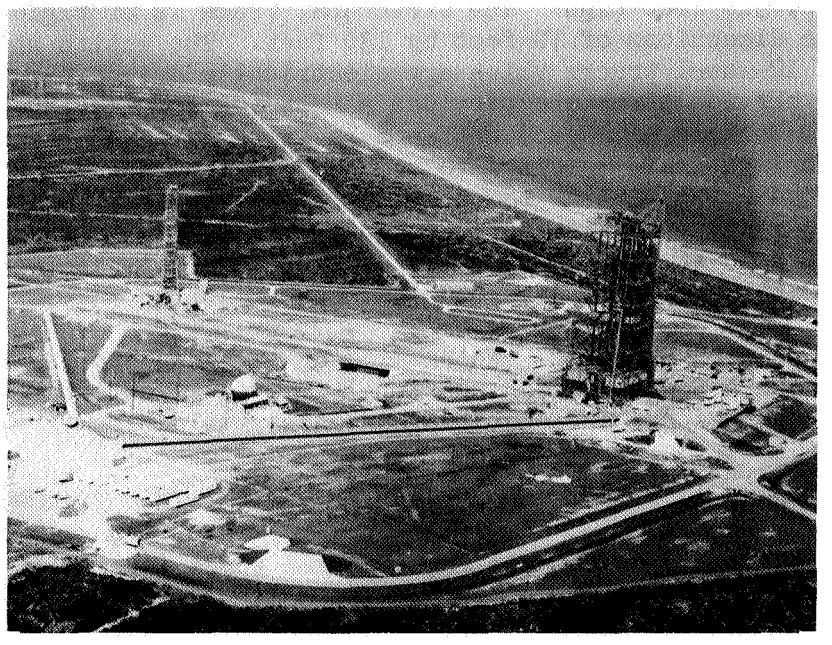
DATE OF RESUME: 1966

FACILITY NO: 10-00-05-00

1. REPORTING INSTALLATION: **John** F. Kennedy space Center, Florida

2. FACILITY NAME: Launch Complex 34

3. LOCATION *(if other than in 1. above):* Cape Kennedy Air Force Station, Florida



4. FUNCTIONAL NAME: Missile Launch Complex (No. 34)

5. TECHNOLOGICAL AREAS SUPPORTED: Assembly, Checkout, and Launch of the Apollo/ Saturn IB Vehicle.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The major facility components within this complex are:

A. Control Building. The Control Building houses and provides blast protection for the personnel, instrumentation, and control equipment required for launch activities. It is a two-story building containing 9,500 square feet of floor space. The building is igloo shaped with a dome constructed of 5 feet of reinforced concrete covered with sand and is designed to withstand a pressure of 2188 psi. The first floor houses equipment used for tracking, telemetry, closed circuit television, and communications. The second floor houses launch control equipment, monitoring and recording consoles, and a glass enclosed observation room.

6. NARRATIVE DESCRIPTION

B. Automatic Ground Control Station. This is a concrete structure located beneath the launch pad which contains a portion of the checkout equipment necessary to perform vehicle prelaunch tests.

C. Umbilical Tower. The umbilical tower and swing arms support pneumatic, purge, coolant, and cryogenic lines; also electrical cables and environmental ducts related directly to the launch vehicle. The tower is a steel structure 240 feet high including the base building.

D. Service Structure. The service structure is a rail-mounted, inverted V-shaped structure, 310 feet high. The structural frame is of rigid-box-truss design with base dimensions of 70 feet by 130 feet. The entire structure is mounted on four 12-wheel trucks which are electrically driven by a diesel generator. The service structure provides a means of assembly and checkout of the Saturn IB Vehicle and Spacecraft and is enclosed by doors and retractable silos. A bridge crane is fixed to and supported by the main verticle members of the tower legs. A 40 .ton hoist and 60 ton hoist are mounted on the bridge, with maximum vertical hook heights of 245 feet. A monorail with two smaller hoists is at the 310-foot level. The tower is also equipped with four elevators with a capacity of 3,000 lbs. each.

E. Operations Support Building. This building is a one-story structure containing 31,600 square feet of floor space. It provides laboratory facilities for telemetry, GSE, network checkout and component evaluation.

7. POTENTIAL: This complex can be used for advanced space missions that use the SIB Vehicle.

8. PLANS: Modifications and additions are planned in the FY 68 construction program to update the facility for the Apollo applications program.

9. BLDG. NO. 21900 10. YR. BUILT: 1961 11. FAC. CAT. CODE: 381

12. INITIAL COST: $ 6,813 K 13. NASA B.O.D. 1961 14. STATUS CODE: Active

15. ACCUM. COST: $ 25,340 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: All drawings for LC-34 are indexed into the MK Technical Data Indexing System (ADP) under Location Code D34.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

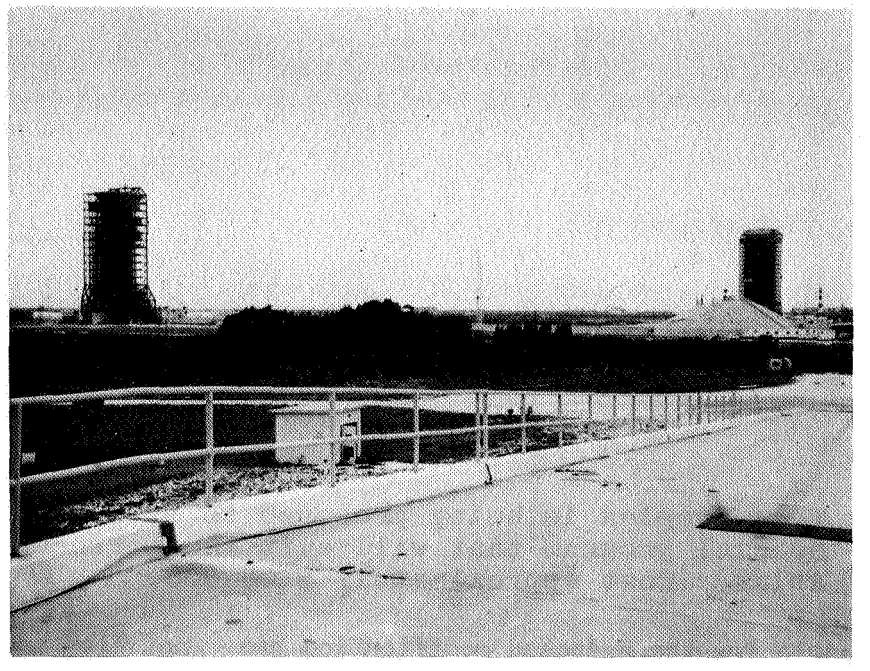
DATE OF RESUME: 1966

FACILITY NO: 10-00-06-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Launch Complex 36A and 36B**

3. LOCATION *(if other than in 1. above)*:
Cape Kennedy Air Force Station, **Flordia.**



4. FUNCTIONAL NAME: Missile Launch Complex (No. 36A and 36B)

5. TECHNOLOGICAL AREAS SUPPORTED: **The purpose of this facility is to support the development of the Centaur vehicle and to launch the unmanned Surveyor spacecraft.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility, in its present configurations, is suitable for launching the Atlas-Centaur Space Vehicle.

The major facility components within this complex are: a launcher with ramp; umbilical tower; service structure; first, second, and third stage fuel storage and loading area; blockhouse; launch contractor ready room; and POL building. The blockhouse and ready room serve pads 36A and 36B jointly.

The present use of this complex *is* limited exclusively to the Atlas-Centaur vehicle which in its present configuration can launch a payload of 8,500 lbs. into earth orbit, 2,300 lbs. into earth escape velocity, and 1300 lbs. to Mars or Venus.

General Dynamics/Convair is the contractor for the overall launch and all vehicle stages and Lewis Research Center is the program manager. The Air Force Range Contractor performs the nonlaunch operations and maintenance function.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: This complex is being proposed to be modified through a special program that will suit the forthcoming Long Tank Atlas. Cost approximately $100,000.

8, PLANS: Schedule for the proposed modification has not been made,

9. BLDG. NO. 5500

10. YR. BUILT 36A-1963 368-1961 36B-1964

11. FAC. CAT. CODE: 381-00

12. INITIAL COST: $ 36A-2,785 36B-5,693 K

13. NASA B.O.D. 36A-1963 36B-1964

14. STATUSCODE: Active

15. ACCUM. COST: $ 36A-7,420 36B-5,703 K

16. LIFE EXPECT. 10 yrs

17. OWNER CODE: NASA

18. OPER. CODE: Contr.

19. CONTRACTOR NAME *(if contr. oper.)*: Gen. Dynamics/ Convair

20. OTHERSOURCESOFINFO: All drawings for LC-36 are indexed into the MK Technical Data Indexing System (ADP) under Location Code D36.00.00.0

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

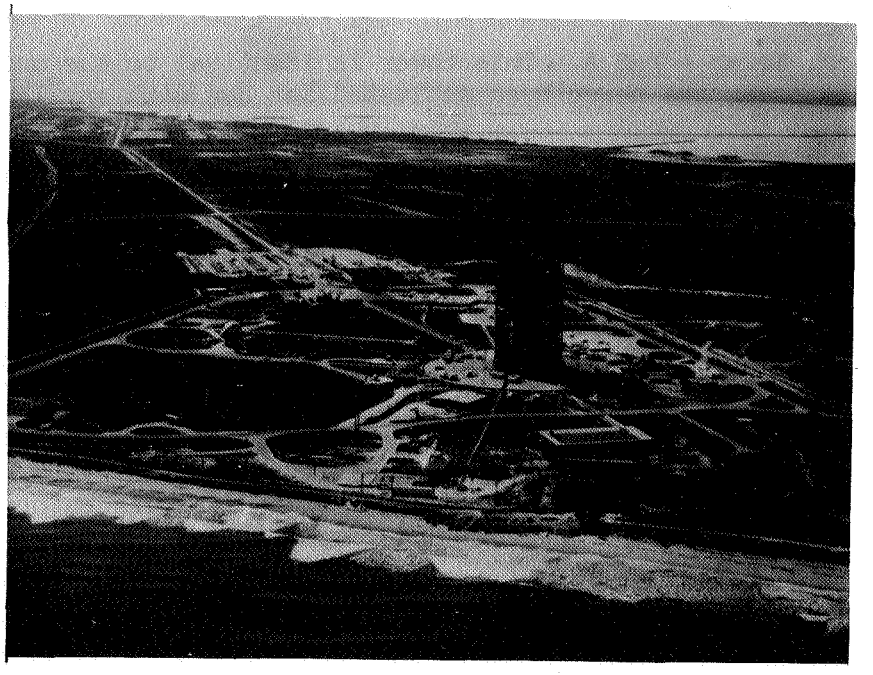
DATE OF RESUME: 1966

FACILITY NO: 10-00-07-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Launch Complex 37

3. LOCATION *(if other than in* 1. ***above):*** Cape Kennedy Air Force Station, Florida



4. FUNCTIONALNAME: Missile Launch Complex (No. 37)

5. TECHNOLOGICAL AREAS SUPPORTED: Assembly, Checkout and Launch of the Apollo/ Saturn IB Vehicle.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The major facility components within this complex are:

A. Control Building. The Control Building houses and provides blast protection for the personnel, instrumentation, and control equipment required for launch activities. It is a *two-story* building containing 9,500 square feet of floor space. The building is igloo shaped with a dome constructed of 5 feet of reinforced concrete covered with sand and is designed to withstand a pressure of 2188 psi. The first floor houses equipment used for tracking, telemetry, closed circuit television, and communications. The second floor houses launch control equipment, monitoring and recording consoles, and a glass enclosed observation room.

6. NARRATIVE DESCRIPTION

B. Automatic Ground Control Station - Pad B. This is a concrete structure located beneath the launch pad which contains a portion of the checkout.

C. Automatic Ground Control Station - Pad A. This station is identical to and serves the same purpose as the one at Pad B. However, this station has never been activated for use with any launch vehicle.

D. Umbilical Tower - Pad B. The umbilical tower and swing arms support pneumatic, purge, coolant, and cryogenic lines; also electrical cables and environmental ducts related directly to the launch vehicle. The tower is a steel structure 268 feet high including the base building.

E. Umbilical Tower - Pad A. This tower is identical to the one at Pad B. However, this tower has never been activated for use with any launch vehicle.

F. Service Structure. The service structure is a rail-mounted, steel structure, 300 feet high. The entire structure is mounted on four 12-wheel trucks which are electrically driven by a diesel generator. The service structure provides a means of assembly and checkout of the Saturn IB Vehicle and Spacecraft and the launch vehicle can be totally enclosed by retractable sides. and hurricane gates. The structure has a 10 ton, a 40 ton, and a 60 ton hoist mounted on a moveable boom at the 300 foot level. It is also equipped with three, elevators with a capacity of 3000 lbs. each and a manlift which travels from ground level to the 90 foot level.

G. Operations Support Building. This building is a one-story structure having 31,600 square feet of floor space. It provides laboratory facilities for telemetry, GSE, network checkout and component evaluation.

7. POTENTIAL: This complex can be used for advanced space missions that use the SIB Vehicle.

8. PLANS: Modifications and additions are planned in the FY 68 Constr. Program to update the facility for the Apollo Applications Program.

9. BLDG. NO. 25300 | 10. YR. BUILT: 1963 | 11. FAC. CAT. CODE: 381-00

12. INITIAL COST: $ 28,476 K | 13. NASA B.O.D. 1963 | 14. STATUS CODE: Pad B Inactive Pad A Active

15. ACCUM. COST: $ 28,508 K | 16. LIFE EXPECT. Indef. | 17. OWNER CODE: NASA

18. OPER. CODE: NASA | 19. CONTRACTOR NAME *(if contr. oper.):* None

20. OTHER SOURCES OF INFO: All drawings for LC-37 are indexed into the MK Technical Data Indexing System (ADP) under Location Code D37.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

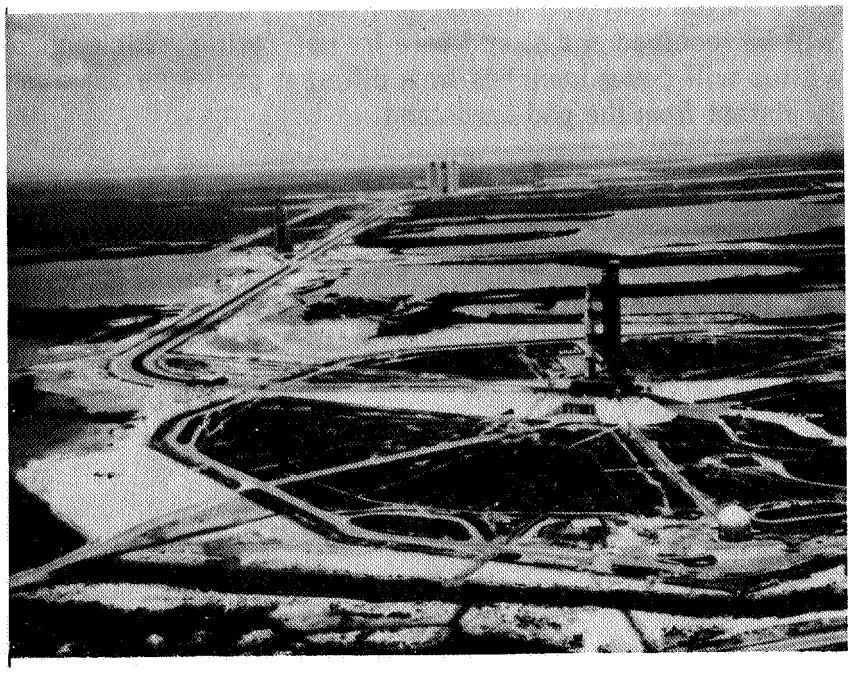
DATE OF RESUME: 1966
FACILITY NO: 10-00-08-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Launch Complex 39 - Pads A and B**

3. LOCATION *(if other than in 1. above):*

Cape Kennedy Air Force Station, Flordia.



4. FUNCTIONAL NAME: Missile Launch Complex (No. 39A and 39B)

5. TECHNOLOGICAL AREAS SUPPORTED: **Saturn V Vehicle Launch Facility.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: Launch Complex 39 presently consists of two launch pads, A and B. The basic pad configuration is essentially circular with a diameter of 3000 feet. At the top of the pad, the elevation is approximately 40 feet above the surrounding grade. Service roads at the perimeter of each pad installation provide access to propellant facilities, camera sites, and other support equipment. The built-up portion of each pad is of heavy reinforced concrete and steel construction. Concrete and steel support piers for the mobile launcher and arming tower are built up from the hardstand. A transportable wedge type flame deflector to protect the missile and launch platform during a launch is positioned in a cut out below the missile. Below ground to the west of the hardstand is the pad terminal connection room providing all connections between the mobile launcher, pad facilities and LCC equipment. A liquid oxygen storage tank of 960,000 gallon capacity is located 1560 feet from the center of the vehicle

6. NARRATIVE DESCRIPTION

and a liquid hydrogen tank of **360,000** capacity is located **1465** feet from the center of the vehicle. The transfer operations from the tank to the launch vehicle will be controlled and monitored remotely in the **LCC** during propellant loading. Three **RP-1** storage tanks with a combined usable capacity of 235,000 gallons are located near the pad perimeter. A burn pond for gaseous hydrogen is located approximately 900 feet northeast of the hardstand area. Excess hydrogen is safely disposed of by burn-off. A holding pond located approximately **1000** feet to the northwest of the hardstand area is designed to catch any spilled **RP-1** fuel and waste water, On the east side of the pad hardstand and beneath the ground is a high pressure gas storage facility consisting of banks of nitrogen and helium bottles. Gas from the converter-compressor facility located between the VAB and pad areas will be received and stored here for use during vehicle checkout and launch. Six camera sites will cover launches from different positions approximately **1300** feet radially distant from the pad hardstand.

7. POTENTIAL: N/A

8. PLANS: N/A

9. BLDG. NO. A-58-1703 / B-J7-337

10. YR. BUILT: A-1965 / B-1966

11. FAC. CAT. CODE: 381-00

12. INITIAL COST: $ A-24,075 / B-20,957 K

13. NASA B.O.D. A-1965 / B-1966

14. STATUS CODE: Active

15. ACCUM. COST: $ NASA K

16. LIFE EXPECT. Indef.

17. OWNER CODE: NASA

18. OPER. CODE: NASA

19. CONTRACTOR NAME *(if contr. oper.)*: Bendix-Boeing

20. OTHER SOURCES OF INFO: **LC-39A was constructed by COE Contract No. 48 (Dwg. file 203-102), and LC-39B by COE Contract No, 155 (Dwg, 203-327).**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Design Engineering Directorate, KSC**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: **Civil Engineering Division - MF KSC**

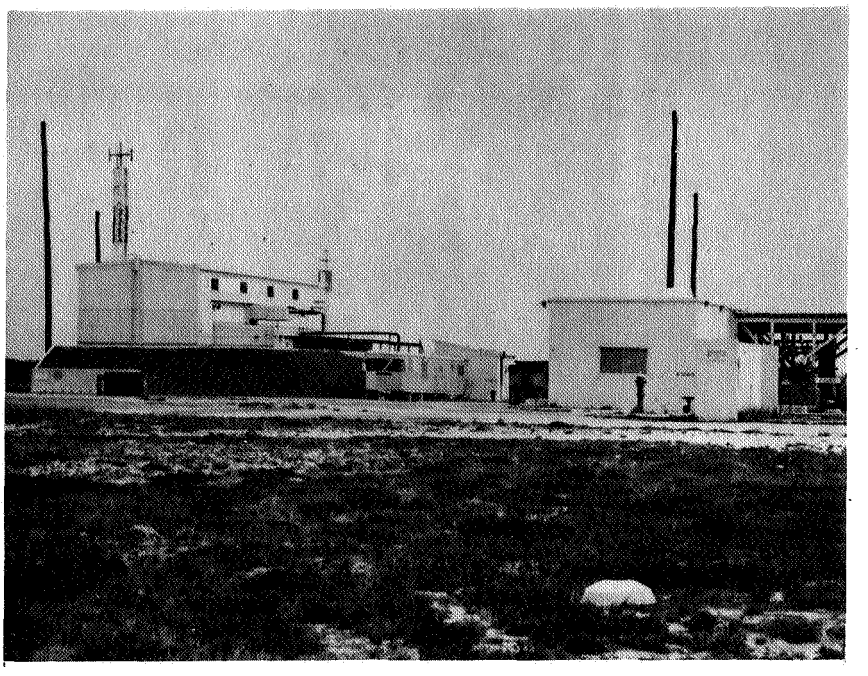
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-09-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Spin Test Building**

3. LOCATION *(if other than in 1. above):*
Cape Kennedy Air Force Station, Flordia.



4. FUNCTIONAL NAME: **Spin Test Facility, Delta Vehicle**

5. TECHNOLOGICAL AREAS SUPPORTED: **All Delta Vehicle Missions are balanced, pyros installed.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This building contains reinforced concrete walls, a roll-back roof, and a pneumatic crane with two 2 ton hoists. The building is completely air-conditioned with deluge sprinklers and a cone of protection against lightning.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: To be modified for a cryogenic test facility for bio-satellite program.

8. PLANS:

9. BLDG. NO. 2841 10. YR. BUILT: 1955 11. FAC. CAT. CODE: 340-40

12. INITIAL COST: $ 250 K 13. NASA B.O.D. 1961 14. STATUS CODE: Active

15. ACCUM. COST: $ 250 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*: Douglas

20. OTHER SOURCES OF INFO: Contract No. 95 (Dwg. file 201-185).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

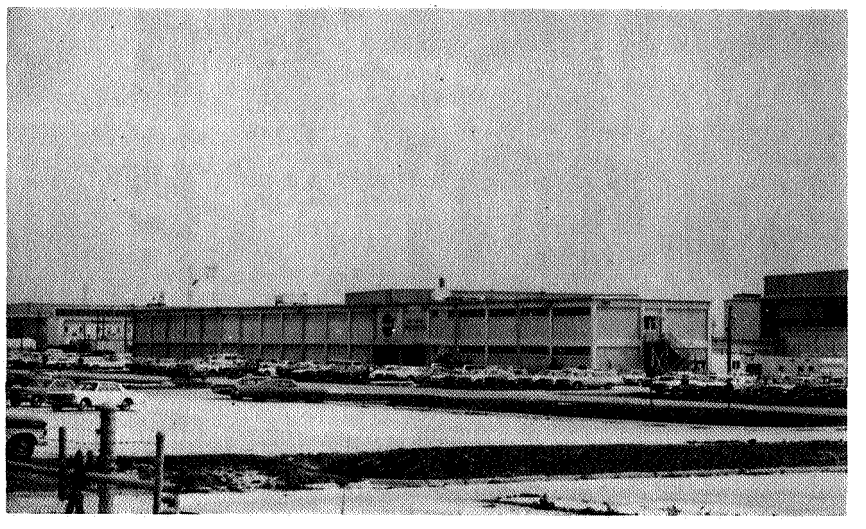
DATE OF RESUME: 1966
FACILITY NO: 10-00-10-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Engineering and Laboratory Building (E&L)**

3. LOCATION *(if other than in 1. above):*

Cape Kennedy Air Force Station, Flordia.



4. FUNCTIONAL NAME: **Missile Launch Engineering Support Facility (E&L)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Air Conditioned office space,**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility is utilized by scientific, technical, and engineering personnel of NASA and associated support contractor personnel in planning and directing projects and tasks assigned to NASA for launching space vehicles and completing scheduled missions. The basic structure contains a 1122 square foot Autopilot and Stabilized Lab. The remaining portion of the basic structure (4300 square feet) houses technical scientific and engineering personnel.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 1704 10. YR. BUILT: 1958 11. FAC. CAT. CODE: 610-10

12. INITIAL COST: $ 972 K 13. NASA B.O.D. 1958 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,258 K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*:

20. OTHERSOURCESOFINFO: All drawings for the E&L Building are indexed into the MK Technical Data Indexing System (ADP) under Location Code E01.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

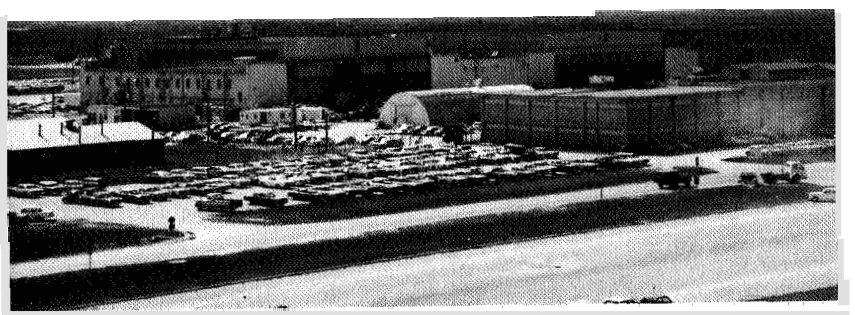
DATE OF RESUME: 1966

FACILITY NO: 10-00-11-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITYNAME: **Missile Assembly Building "R & D"**

3. LOCATION *(if other than in 1. above):*
Cape Kennedy Air Force Station, Florida



4. FUNCTIONAL NAME: **Missile Assembly Facility (R&D)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Saturn Apollo**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility is composed of Hangar R and Hangar D. Each of these hangars contains a net usable area of 30,000 square feet and each has a high bay assembly area containing *21,900* square feet.

A. Hangar D. (Steel frame construction)

1. High Bay Area, This area contains two 15 ton traveling bridge cranes and four temporary structures utilized by support contractors for offices and storage space.

2. Lean-to-Areas. These areas provide office space and are air-conditioned.

B. Hangar R. (Steel frame construction)

1. High Bay Area. This area contains two 15 ton traveling bridge cranes and a controlled storage area for missile components.

2. Lean-to-Areas. These areas provide office space and are used by support contractors. Approximately 500 square feet of these lean-to-areas is used for panel fabrication and control cable manufacture.

6. NARRATIVE DESCRIPTION

3. Test Pit. Hangar R also contains a test pit which was used for functional testing and adjustment of the control system on the Redstone missile.

7. POTENTIAL: Miscellaneous controlled storage and air conditioned office and laboratory space.

8. PLANS: RSA-56-4003, 4, 5.

9. BLDG. NO. 1708 10. YR. BUILT: 1956 11. FAC. CAT. CODE: 220-14

12. INITIALCOST: $ 2,572 K 13. NASA B.O.D: Mar 1956 14. STATUS CODE: Active

35. ACCUM. COST: $ 2.712 K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Contracts 94, 1405, 2698, 3068 (Dwg. files 201-224; 201-22,032; 201-22,050; 201-23,768; 201-24,869; 201-25,879;201-25,978; 201-26,904; 201-26,597; 201-26,997.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

FACILITY NO: 10-00-12-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Missile Assembly Building "S"

3. LOCATION *(if other than in 1. above):* Cape Kennedy Air Force Station, Florida



4. FUNCTIONAL NAME: Missile Assembly Facility (S)

5. TECHNOLOGICAL AREAS SUPPORTED: Laboratory, office and checkout facilities for the Lunar Orbiter and the Biosatellite Unmanned Spacecraft program.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility provides laboratory, office, and checkout space for the Lunar Orbiter and the Bio-satellite Unmanned Spacecraft programs.

The facility is a permanent, usable concrete and metal building with a gross area of 60,759 square feet.

1. Air Conditioning Units

   a. Clean Room - 4 units, 60 tons each
   b. Northside Hangar - 2 units, 20 tons each
   c. Southside Hangar - 2 units, 25 tons each
   d. South Annex - 1 unit, 60 tons

6. NARRATIVE DESCRIPTION

e. North Annex - 2 units, 10 tons each
f. Standby - 2 units, 7½ tons each
g. Standby - 1 unit, 7½ tons (portable)
h. Clean Room 15-A-2 - 2 units, 6 tons (portable)

2. Cranes

a. 2-15 tons each (operative)
b. 2-15 tons each (non operative)
c. 1-2 ton, in Clean Roam #15, class 100,000
d. 1-5 ton, in Clean Roam #22, class 100,000
e. 1-2 ton, Hoist on monorail in Clean Roam #21
f. 1-5 ton Hoist in room #15A

3. Sub-Stations

a. 500 KVA, 13,200/120/208 V.A.C.
b. 750 KVA, 13,200/277/480 V.A.C.
c. 150 KVA, 13,200/120/208 V.A.C.
d. 300 KVA, 13,200/120/208 V.A.C.
e. 300 KVA, 13,200/120/208 V.A.C.

4. Secondary Voltages Available

a. 120/208 V.A.C.
b. 277/480 V.A.C.
c. 28 volts D.C.
d. 400 cycles

7. POTENTIAL: Two gas storage sheds proposal in rear or hangar at estimated cost of $15,200. Possible rehabilitation of South Annex to be utilized by ULO spacecraft work, not estimated.

8. PLANS: Gas storage shed job in FY 69 Budget - no plans for South Annex yet.

9. BLDG. NO. 1726 10. YR. BUILT: May 57 11. FAC. CAT. CODE: 220-14

12. INITIAL COST: $ --- K 13. NASA B.O.D. 12/16/65 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,433 K (6/30/66) 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.)*: Boeing Aircraft Co., Inc., General Electric Co., Inc.

20. OTHER SOURCES OF INFO: Contract 224 (Dwg. file 201-323)

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

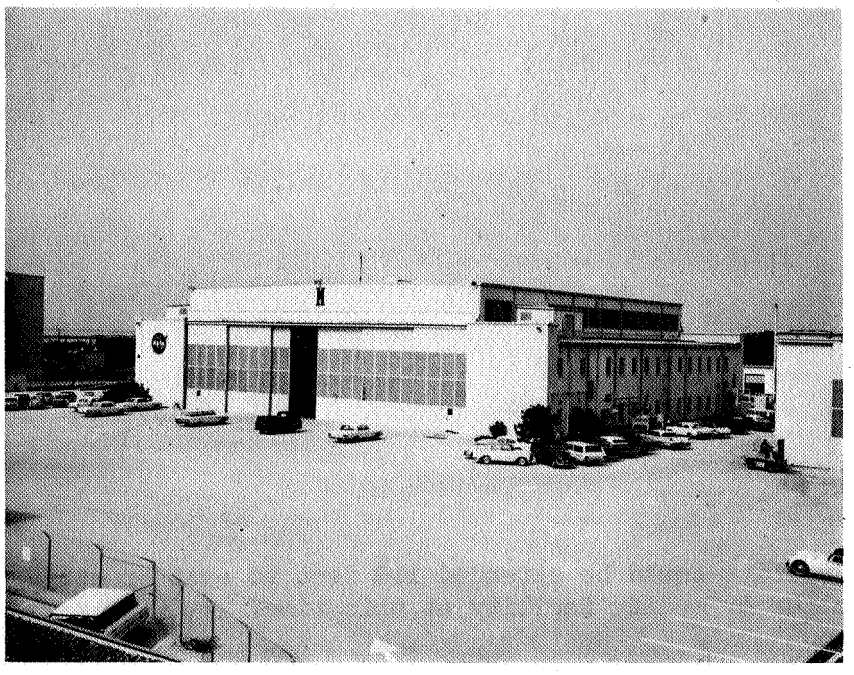
DATE OF RESUME: 1966

FACILITY NO: **10-00**-13-*00*

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Missile Assembly Building "M"

3. LOCATION *(if other than in 1. above):* Cape Kennedy Air Force Station, Florida



4. FUNCTIONAL NAME: Missile Assembly Facility (M)

5. TECHNOLOGICAL AREAS SUPPORTED: Facility can be essentially considered as a missile servicing and parts cleaning laboratory. It could be used for any similar testing or missile checkout work requiring High Bays & cranes.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility has a gross area of 41,450 square feet not counting the adjacent outside buildings (Delta ***Leak*** Check, POL, Storage Warehouses, and Fabrication Lab). It is a permanent type building of concrete and steel construction. This facility is now used for servicing, clean-up, off-loading, missile weighing, primacord explosives installation, and certification of missile guidance systems. Several special purpose laboratories are included, some of which are the: Metrology Lab; Radio Frequency Testing Laboratory; and a LOX Staging Area.

The Electronics Laboratory has a vector analysis table for guidance systems certification and rehabilitation. There are two 25 ton traveling overhead cranes in the high bay with separate rails running east and west.

6. NARRATIVE DESCRIPTION

These rails are arranged so that both cranes can travel on one set of rails. There are also two static 5 ton hoists located in the central hangar area.

South end offices and laboratories are air-conditioned with a 40 ton air-conditioning unit. North end offices and laboratories are air-conditioned with a 30 ton air-conditioning unit.

7. POTENTIAL: Facility could be extended 100 feet to east or west. No plans to expand, alter or modify facility at this time.

8. PLANS: Plans for extensions or additions are currently inactive.

9. BLDG. NO. 1731 10. YR. BUILT: 1956 11. FAC. CAT. CODE: 220-14

12. INITIAL COST: $ 1,239 K 13. NASA B.O.D. 9/14/65 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,239 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME (if contr. oper.): Douglas Aircraft Company

20. OTHER SOURCES OF INFO: As built drawings and specifications, available from Design Engineering Directorate, KSC. (Drawings, specification, and contract data will be submitted at a later date.)

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Civil Engineering Division - MF KSC

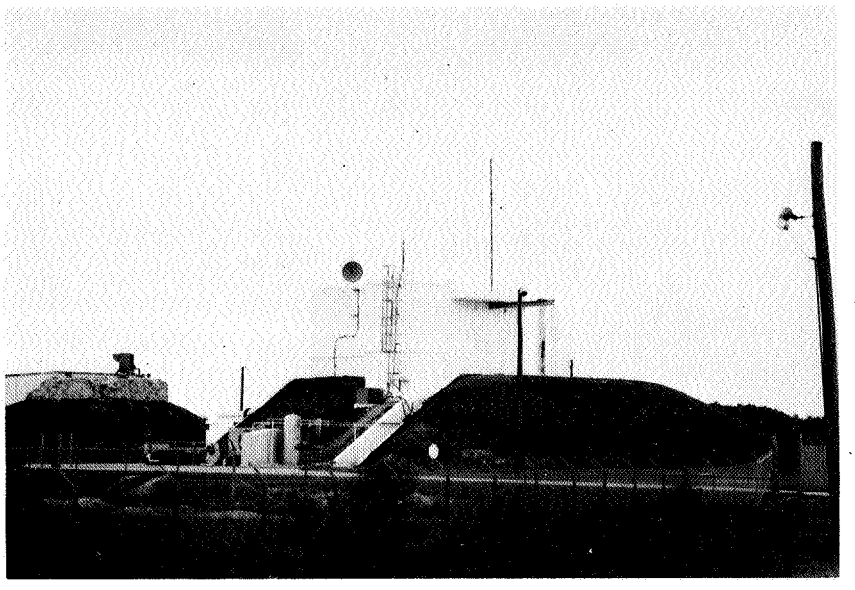
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: **10-00-14-00**

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Sterilization and Assembly Building (Former name) now called Fuel and Test Building, Explosive Safe Area (modified).

3. LOCATION *(if other than in 1. above):* Area 5/6 Explosive Safe Complex
Cape Kennedy Air Force Station, Florida



4. FUNCTIONALNAME: Fuel and **Test** Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Used as checkout and spacecraft testing facility. **Could** be used for other unmanned spacecraft checkout purposes.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This permanent, usable concrete facility has a gross area of 980 square feet. The building **was** modified in 1965 for the **Lunar** Orbiter Project and now contains the following: personnel change room for fueling suits; air packs; safety shower and eye washer; one **(1)** ton and five (5) ton monorail cranes; a totally conductive type floor fully grounded; a mechanical **room** containing a condensing unit and controls for approximately 13.2 tons of air-conditioning capability. Current **plans** are to increase the air-conditioning capability ***to*** approximately 40 tons to attain 55 to 75 degrees and 45 per cent relative humidity. The change **room** contains a 1.5 ton window type air-conditioning unit, **two** nitrogen systems (one of

6. NARRATIVE DESCRIPTION

2200 psi and one of 6000 psi), one helium supply at 2200 psi, a roof ventilation system. and two oxidizer-fuel venting evacuators. These ventilators are interlocked with the air-conditioning system to shut off air-conditioned air when ventilators are energized.

7. POTENTIAL: No existing plans to modify building but plans are existent for Langley Research Center to provide funds for additional air cond. capacity to 40 tons for Lunar Orbiter Spacecraft Testing and Checkout.

8. PLANS:

9. BLDG. NO. 54445 | 10. YR. BUILT: 1956 | 11. FAC. CAT. CODE: 310-21

12. INITIAL COST: $ 0.809 K June 30, 1966 | 13. NASA B.O.D. None | 14. STATUS CODE: Active

15. ACCUM. COST: $ 0.809 K | 16. LIFE EXPECT. Indef. | 17. OWNER CODE: NASA

18. OPER. CODE: Contr. | 19. CONTRACTOR NAME (*if contr. oper.*): Boeing Aircraft Company

20. OTHER SOURCES OF INFO: All drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code F04.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

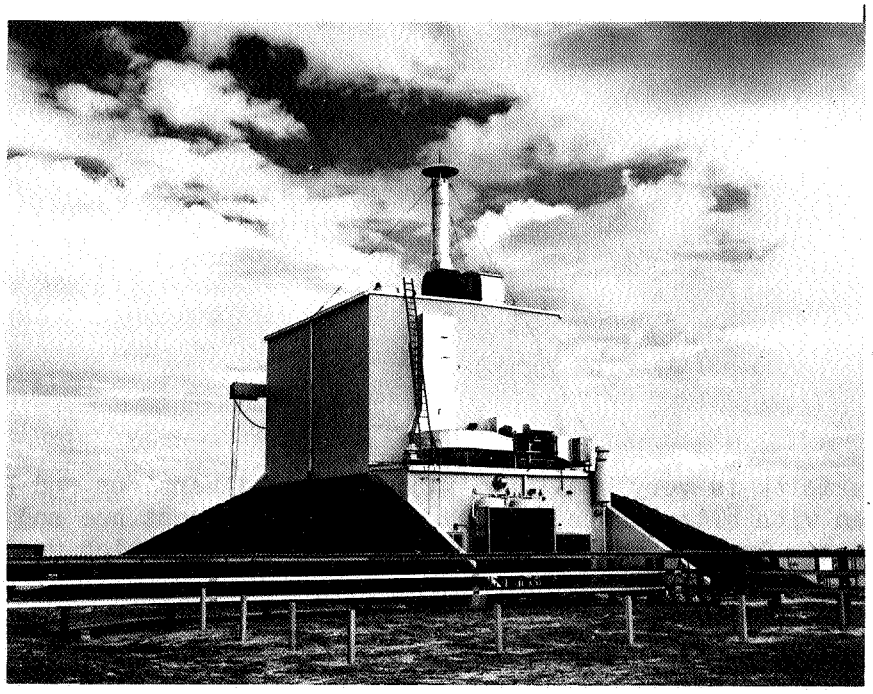
DATE OF RESUME: 1966

FACILITY NO: 10-00-15-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Fuel Transfer and Conditioning Facility

3. LOCATION *(if other than in 1. above):* Cape Kennedy Air Force Station, Florida



4. FUNCTIONAL NAME: Fuel Transfer and Conditioning Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Area 5/6, Explosive Safe Complex, Lunar Orbiter Project.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This all concrete facility has an inside *gross* area of 225 square feet. This facility has the purpose of conditioning (by cooling); propellant carts, propellants, and service propellant carts. The room is cooled by a 3 ton air-conditioner. A portable emergency eye washer and shower is located outside the main entrance to the building. A static ground system is provided for grounding and bonding all equipment, carts, and propellant drums. An area vent is provided in the roof of the building and two vapor disposal units are mounted on the East and West walls. The building is also equipped with MITOC intercom system and paging outlets.

6. NARRATIVE DESCRIPTION

7, POTENTIAL: Facility is very small (15'x15') inside dimensions and has little potential, even with alterations for any use except current use and possibly storage purposes. It has earth revetments on three sides which would prohibit expansion.

8. PLANS: No present plans to expand, alter or modify this facility.

9. BLDG. NO. 5-4446 10. YR. BUILT: 9/64 11. FAC. CAT. CODE: 310-22

12. INITIAL COST: $ 309.8 K 13. NASA B.O.D. June 30, 1966 14. STATUSCODE: Active

15. ACCUM. COST: $ 326.8 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: All drawings for this facility are indexed into the MK Technical Rata Indexing System (ADP) under Location Code F04.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

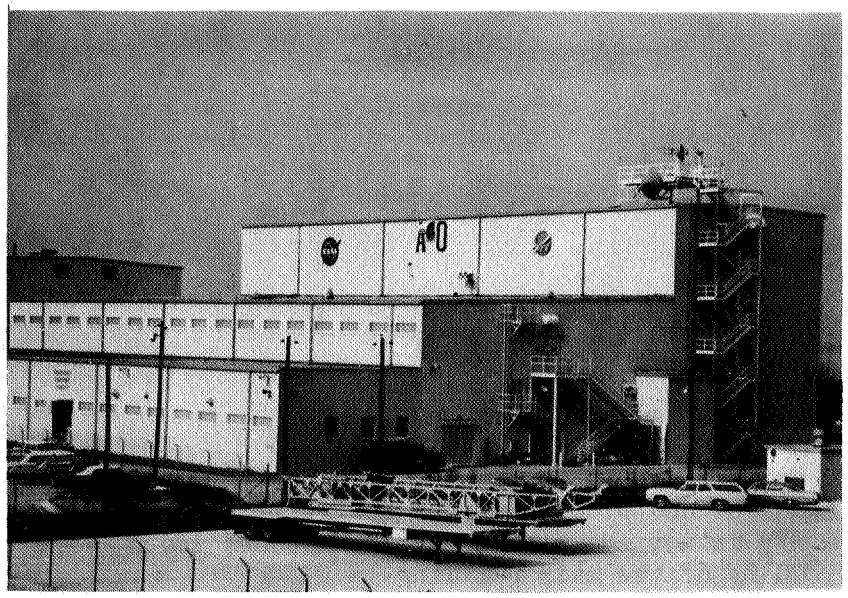
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-16-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Spacecraft Building #2 (Hangar AO)

3. LOCATION *(if other than in 1. above):* Cape Kennedy Air Force Station, Florida



4. FUNCTIONAL NAME: Spacecraft Assembly and Checkout Facility (Hangar AO)

5. TECHNOLOGICAL AREAS SUPPORTED: Prelaunch assembly and checkout of lunar and planetary spacecraft.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This permanent, usable, steel frame facility has a *gross* area of 50,170 square feet including 6,370 square feet in the first floor addition. The air lock area has two large doors each 40 feet high and 25 feet wide. One door leads to the outside parking and loading area and the other door leads to the high bay area.

In the high bay area there are two 10 ton travelling bridge cranes. The hoist for each crane has a 45 foot hook height. The air lock area also has a 10 ton hoist on a monorail with a 45 foot hook height.

There is a horizontal laminar clean room in the high bay area of about 100,000 cleanliness level.

6. NARRATIVE DESCRIPTION

Air-conditioning for the main building is from a 326 ton chilled water system. The first floor addition has a 31.2 ton chilled water system. Shop air is supplied at 100 psi and high bay air is supplied at 200 psi.

The first floor addition is 180 feet by 35 feet 4 inches and is partitioned for offices, mechanical equipment rooms, battery storage, battery laboratory, inertial sensor laboratory, Camopus Simulator Laboratory, Celestial Simulator Laboratory and lobby.

7. POTENTIAL: Facility could be extended 100' to the west. Preliminary thinking is to add a second floor over the new first floor addition. This addition (6,370 SF) is not shown on attached sketches and not included in gross area of 43,800 SF of the main building.

8. PLANS:

9. BLDG. NO. 60530 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 310-21

12. INITIAL COST: $ --- K 13. NASA B.O.D. 9/64 14. STATUS CODE: Active

June 30, 1966

15. ACCUM. COST: $ 1.149 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):* Jet Propulsion Laboratory, Inc.

20. OTHER SOURCES OF INFO: All drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code E14.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

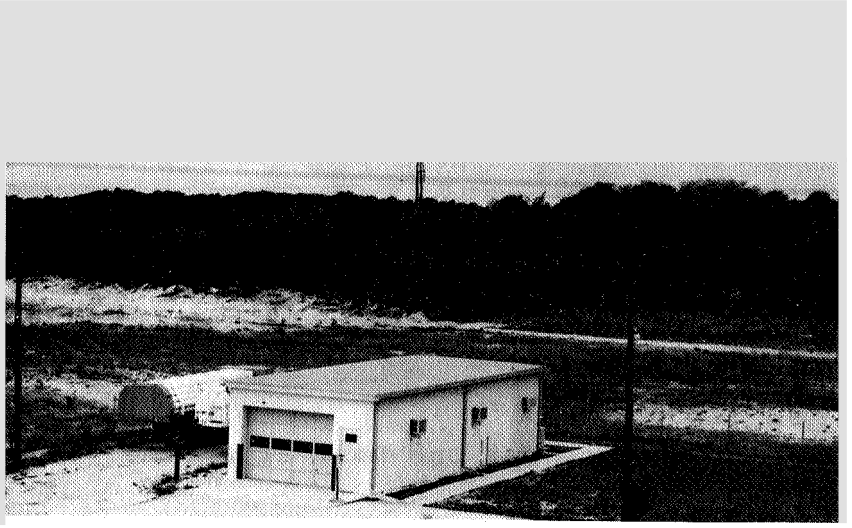
DATE OF RESUME: 1966

FACILITY NO: 10-00-17-00

1 REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida,**

2. FACILITY NAME: **Second Stage Leak Test Building**

3. LOCATION *(ifother than in* **1.** *above):* **Facility No, 60535, Area 49 Cape Kennedy Ais Force Station, Flordia.**



4. FUNCTIONAL NAME: Leak Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: **Pressure Test of Heliumsphere and Propellant Tanks of the Delta Vehicle Second Stage.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility has a net area of 697 square feet, The Test Cell contains 564 square feet and the Control Room contains 133 square feet. This facility is used to test the heliumsphere pressurized to 1815 psi for two minutes and at 1315 psi for one hour. The propellant tanks will be tested to 415 psi for two minutes and at 25 psi for one hour. Gaseous nitrogen used for pressurization is obtained from tube banks, No explosives are stored or used in this building.

6. NARRATIVE DESCRIPTION

7. OTENTIAL: Capable of Testing but one unit t a time.

8.' PLANS: Continue present usage.

9. BLDG. NO. 60535 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310.21

12. INITIALCOST: $ 26.223 K 13. NASA B.O.D. 1964 14. STATUSCODE: Active

15. ACCUM. COST: $ 26.223 K 16. LIFE EXPECT. 25 yrs 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.)*: Douglas AC

20. OTHERSOURCESOF INFO: As built drawings and specifications, available from Design Engineering Directorate, KSC. (Drawings, specification, and contract data will be submitted at a later date.)

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division, MF KSC

TECHNICAL FACILITIES RESUME

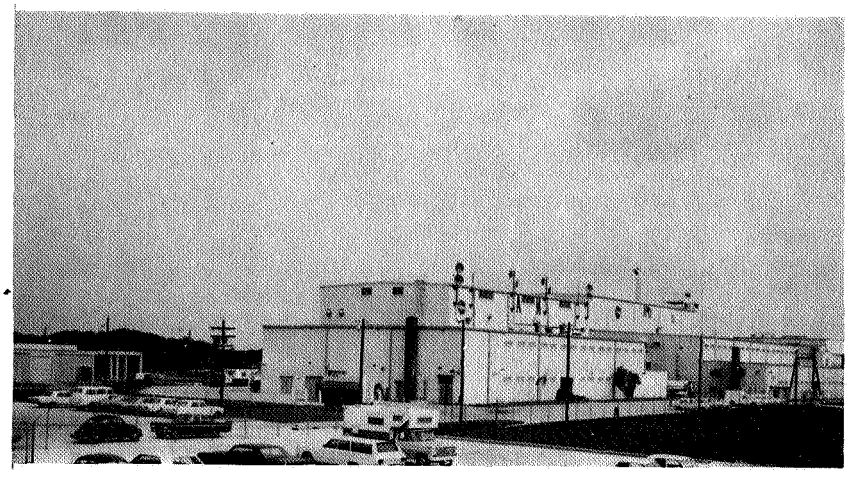
DATE OF RESUME: 1966

FACILITY NO: 10-00-18-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Unmanned Spacecraft Building, Number 1

3. LOCATION *(if other than in 1. above):* Cape Kennedy Air Force Station, Florida



4 FUNCTIONAL NAME: Spacecraft Test Facility, Unmanned (No. 1)

5. TECHNOLOGICAL AREAS SUPPORTED: Facility provides laboratories, offices and spacecraft testing facilities for Pioneer, ATS, OSQ, Bluebird satellites.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facilith has a *gross* area of 27,262 square feet. The High Bay Test Area has a class A, 8 inch reinforced floor of 10,000 pound/wheel loading capacity. The office 'and laboratory area has a 200 square foot loading capacity. The building is also equipped with two overhead type doors of 15 feet 6 inches width and 20 feet 8 inches height. The building also contains a 297,000 BTU oil-fired heating boiler. Fuel oil for firing this boiler is stored in a 1500 gallon underground tank.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Existing plans to add second floor to this facility at a cost of $117,000 (est.). Project placed in 1968 budget. Hangar possibly could be extended 50'-100' to the west, but no plans or program to this effect.

8. PLANS:

9. BLDG. NO. 60550 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 310-21

12. INITIAL COST: $ --- K 13. NASA B.O.D. 11/62 14. STATUS COCE: Active

June 1966

15. ACCUM. COST: $ .69730 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: All drawings for *this* facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code E13.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

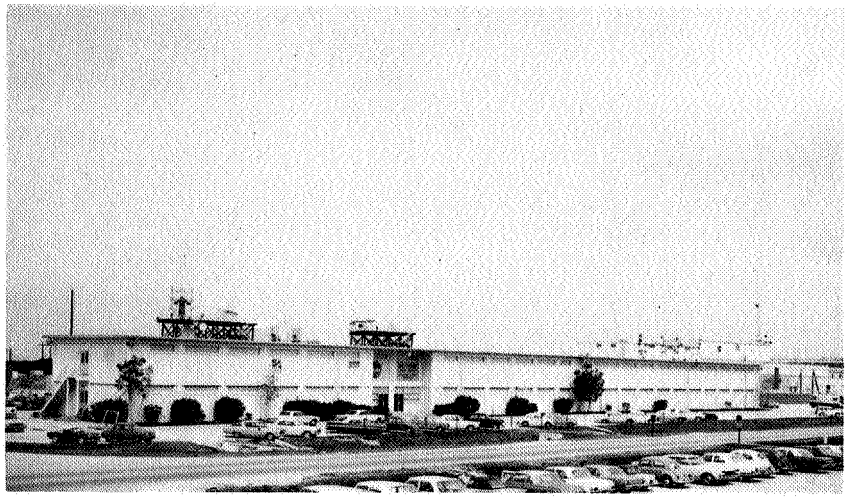
DATE OF RESUME: 1966

FACILITY NO: 10-00-19-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **E & O Building**

3. LOCATION *(if other than in 1. above):* **Cape Kennedy Air Force Station Flordia**



4. FUNCTIONAL NAME: **Missile Launch Engineering Support Facility (E&O)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Apollo and Gemini Programs**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: **The engineering and Operations Building is a two-story structure located at the Cape Kennedy Industrial Area. This building provides 32,000 square feet of office space for personnel supporting various programs such as Apollo and Gemini. The building is air-conditioned and constructed of reinforced concrete frame with masonry walls.**

6. NARRATIVE DESCRIPTION

7. POTENTIAL: None

8. PLANS: None

9. BLDG. NO. 60650 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 610-10

12. INITIALCOST: $ 525 K 13. NASA B.O.D. 1961 14. STATUSCODE: Active

15. ACCUM. COST: $ 584 K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr.* oper.):

20. OTHER SOURCES OF INFO: Contract 3168 (Dwg. files 201-26,816 and 201-27, 446).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

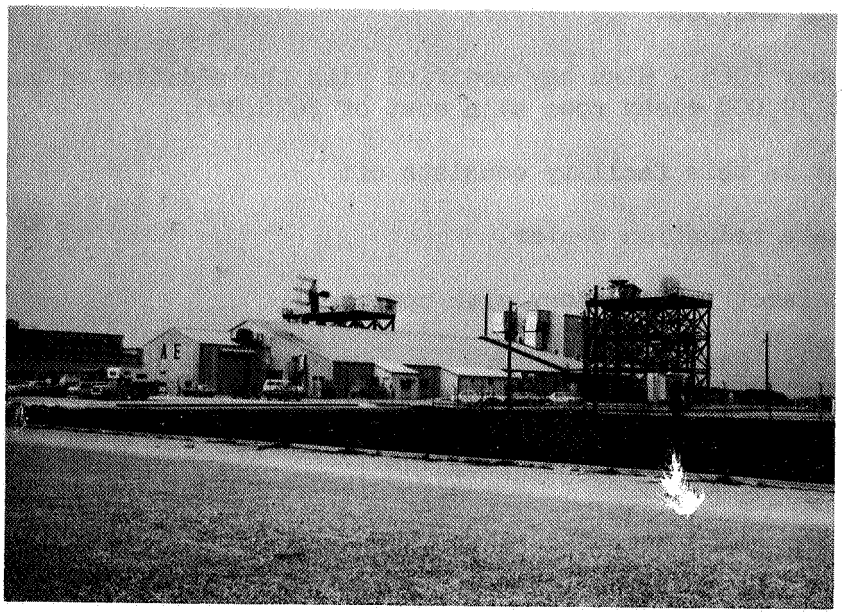
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-20-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Spacecraft Assembly and Checkout Building (AE)

3. LOCATION *(ifother than in 1. above):* Cape Kennedy Air Force Station, Florida



4. FUNCTIONAL NAME: Spacecraft Assembly and Checkout Facility (AE)

5. TECHNOLOGICAL AREAS SUPPORTED: Supports majority of spacecraft prelaunch assembly for Unmanned Launch Operations (ULO).

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This building is constructed of a steel frame with metal siding except the west end which has concrete block curtain walls. The building contains 27,000 square feet of floor space consisting of a low bay with laboratories (20,000 square feet) and a high bay with laboratories (7,000 square feet). The low bay has one 2 tone crane with a 20 foot lift height. The high bay has one 5 ton crane and one 2 ton hoist with a lifting height of 35 feet. The high bay also has a class 10,000 clean room.

BOD's:

1. June 1961 - High bay built and low bay modified for approximately $418,866.

6. NARRATIVE DESCRIPTION

2. November 1961 - Added antenna tower at north end of the building at a cost of $40,000.

3. December 1961 - Added new boiler at a cost of $7,000.

4. April 1962 - Low bay modified for mariner at a cost of $150,000.

5. July 1963 - High bay modified with the addition of an air lock plus a 2 ton hoist at a cost of $95,090.

6. March 1964 - Added antenna tower at north end of the building at a cost of $40,000.

7. December 1965 - High bay modified with the addition of an air lock plus 10,000 clean room at a cost of $638,000,.

Support equipment in this facility consists of:

1. One data reduction center.

2. One telemetry laboratory with computer.

3. One Solar Panel Laboratory.

4. Four separated clean rooms (class 10,000) but only one integrated operating area.

7. POTENTIAL: Facility could be extended to west approx. 100'. The existing High Bay area could be brought to a microbiological level of cleanliness (class 100).

8. PLANS: Status of current plans for extensions or modifications are inactive.

9. BLDG. NO.	60680	10. YR. BUILT:	1959	11. FAC. CAT. CODE:	310-21
12. INITIAL COST: $	512,000 K	13. NASA B.O.D.	6/61	14. STATUS CODE:	Active
15. ACCUM. COST: $	1,197 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA (1960)
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.)*:	N/A		

20. OTHER SOURCES OF INFO: All drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code E12.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

FACILITY NO: 10-00-21-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Pyrotechnics/H_2O_2 Building

3. LOCATION *(if other than in 1. above):* Cape Kennedy Air Force Station, Florida.



4. FUNCTIONAL NAME: Pyrotechnics and H_2O_2 Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Used for recycling (clean, repair and pressurization) of suits, boots, and gloves for astronauts protection ensemble (Self contained Auxiliary Protective Ensemble).

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility was modified during 1966 to add a storage area, classroom office area, white (clean) room, and a supplemental suit storage area. These additions were added between the Pyrotechnic Building and the H_2O_2 Building.

This facility is divided into the following areas:

1. Pyrotechnic Building - 1288 square feet with a ceiling height of 17 ft.
2. Change Area - 118 square feet with a ceiling height of 8 ft. 9 in.
3. Air Lock - 71 square feet with a ceiling height of 8 ft. 9 in.
4. White Roam - 314 square feet with a ceiling height of 14 ft. 6 in.
5. Supplemental Storage Area - 1397 square feet with a ceiling height of 8 ft.
6. Office Area - 360 square feet with a ceiling height of 9 ft.

6. NARRATIVE DESCRIPTION

7. H_2O_2 Building - 1324 square feet with a ceiling height of 15 ft. 9 in.

There are no cranes or hoists in this combined facility but there is a 15 foot by 12 foot power door for the Pyrotechnic and H_2O_2 Building. The clean room contains two laminar flow benches of class 3 cleanliness. There are two A/C condensing units (3KW and 5KW) in the modified part of the facility. An existing multizone air handling unit (20 tons, 10 tons and 7½ tons) supplies cooled air to the Pyrotechnic Building and the Suit Storage Area. There is a 300 KVA substation on the exterior of the west side of the facility which can supply 120/208 volt, 3 phase, 4 wire power.

The facility contains no data reduction center and no separate heating plant. It is heated by strip heaters in the ducts of the air-conditioning system.

7. POTENTIAL: No additional potential except expanding to the west possibly.

6. PLANS: No current plans for expansions, alterations or modifications.

9. BLDG. NO.	66220	10. YR. BUILT:	1960 1966	11. FAC. CAT. CODE:	310-21		
12. INITIAL COST: $	125.5 K	13. NASA B.O.D.	7/66	14. STATUS CODE:	Active		
15. ACCUM. COST: $	135 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA		
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.)*:	Bendix Corporation				

20. OTHER SOURCES OF INFO: As built drawings and specifications, available from Design Engineering Directorate, KSC. (Drawings, specification and contract data will be submitted at a later date.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate - KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-22-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Hangar AF

3. LOCATION (if *other than in* I. *above):* Cape Kennedy Air Force Station, Florida.



4. FUNCTIONAL NAME: Saturn Support Facility (Hangar AF)

5. TECHNOLOGICAL AREAS SUPPORTED: Now Sat IB and Sat V Staff Headquarters and Administrative Support Offices. Could be utilized for any spacecraft Assembly or Checkout facility.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility has a *gross* area of 66,170 square feet. It is constructed on a concrete foundation with cement block and metal exterior sides and a built-up metal roof. There are four large sliding doors on the front and rear sides of the building. Each of these doors is 45 feet high. There are two 40 ton travelling cranes with 10 ton outrigger hoists on each crane included in this facility.

Air-conditioners in the north side of this facility have a 123 ton cooling load and in the south side have a 125 ton cooling load.

The boiler room design load is 1,300 MBH. There are no Data Reduction Centers, Telemetry Labs, but there is an RF Screen Room (10 feet by 10 feet) in the north lean-to.

6. NARRATIVE DESCRIPTION

A High Pressure Gas Storage Building is adjacent to this facility. This building is of concrete block construction with a built-up sloping roof.

7. POTENTIAL: The facility could be expanded to the west or south.

8. PLANS: N/A

9. BLDG. NO. 66250

10. YR. BUILT: 1962

11. FAC. CAT. CODE: 220-14

12. INITIAL COST: $ 1,786 K

13. NASA B.O.D. -

14. STATUS CODE: Active

15. ACCUM. COST: $ 1,912 K

16. LIFE EXPECT. Indef.

17. OWNER CODE: NASA

18. OPER. CODE: Contr.

19. CONTRACTOR NAME *(if contr. oper.)*: Douglass Aircraft Co., Boeing Aircraft Co., Inc., Bendix Corporation, Inc.

20. OTHER SOURCES OF INFO: All drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code E08.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

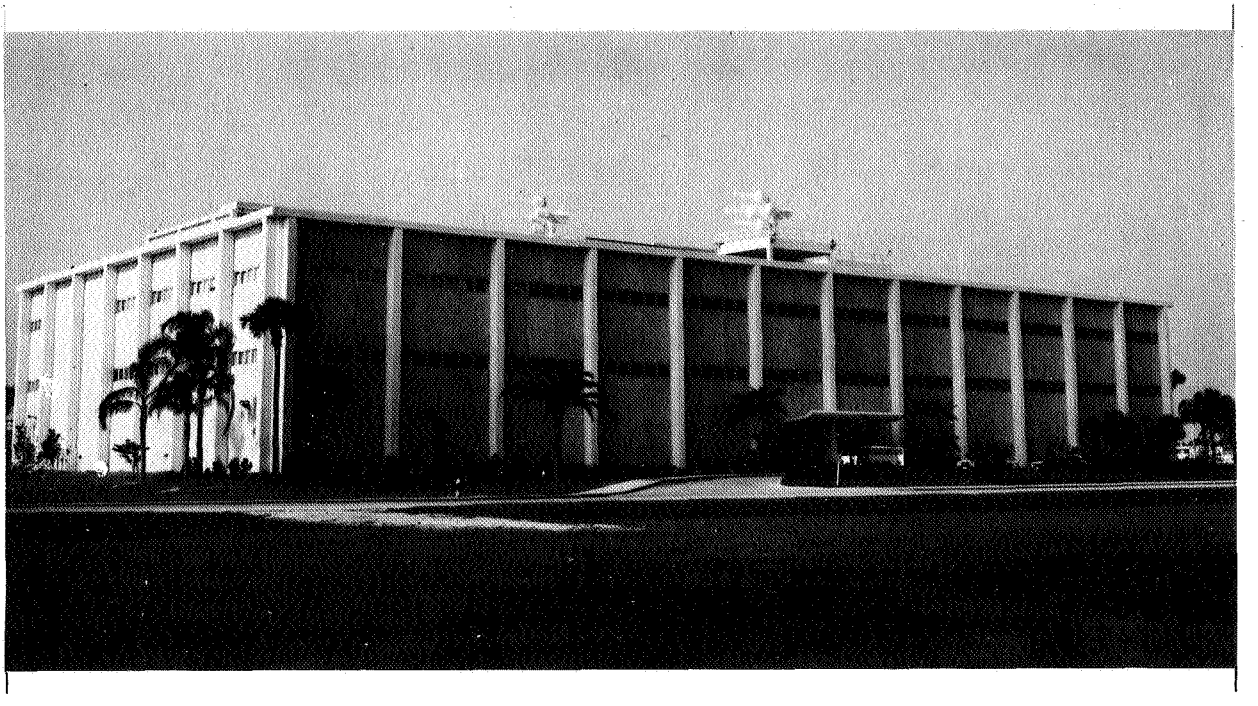
DATE OF RESUME: 1966

FACILITY NO: 10-00-23-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Central Instrumentation Facility**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Instrumentation Support Facility (CIF)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Saturn Apollo**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The CIF Building is a three-story structure centrally in the NASA Industrial Area on Merritt Island. This facility consists of the main building of 133,000 square feet and an auxilliary antenna building of 7800 square feet located approximately one mile north of the Industrial Area. This building has special construction features necessary to properly house electronic instrumentation and laboratory equipment. Some of these features are: elevated floors in areas requiring extensive cabling; interfloor cable ducts; incandescent lighting to minimize electro-magnetic interferences; and a high order of temperature and humidity control to safeguard the instrumentation equipment and to provide the correct environment for instrument calibration and repair.

6. NARRATIVE DESCRIPTION

This facility houses the Assistant Director for instrumentation and the majority of his organization. It contains all of the offices, laboratories, and test stations required to accomplish the following responsibilities: ground instrumentation systems for telemetry and on-board flight television operations and development; special tracking systems research, development, and operations; environmental facility and special purpose measuring systems; general instrumentation support laboratories; timing correlation and distribution; coordination and resolution of all NASA frequency problems; instrumentation systems reliability; analytical studies and analyses relating to instrumentation systems; overall instrumentation planning and coordination, both for long range and for each mission; and processing data and fulfilling test and flight data requirements for KSC and other data users.

7. POTENTIAL: The CIF will provide support to all NASA launch complexes both on KSC and the ETR.

8. PLANS: (Same as above)

9. BLDG. NO.	M6-342	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	140-10
12. INITIAL COST: $	5,729 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	5,729 K	16. LIFE EXPECT.	Indef	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: All drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Locator Code B03.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

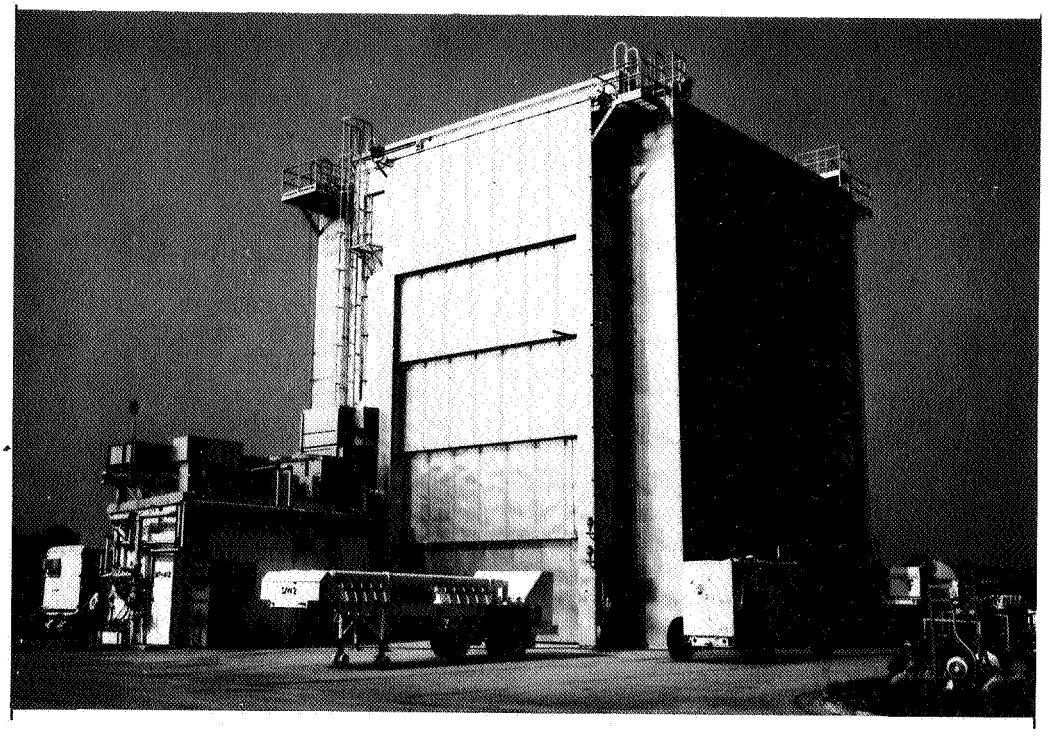
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-25-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Crogenic Test Buildings**



4. FUNCTIONALNAME: Cryogenic **Test Facility (No. 1 and 2)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Mercury, Gemini and Apollo Programs**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: Each of these buildings is air-conditioned and consists of one test cell, a laboratory, and a dressing room with a total floor area of approximately 1,900 square feet. One primary design feature in each of these buildings is the capacity to raise all four walls of the test cell during transfer of cryogenic fluids. This is accomplished by opening 40 foot high motorized doors. A water deluge fire protection system is installed in each test cell and each building is equipped with a gas detection and alarm system.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. #1 M7-1412 #2 M7-1410

10. YR. BUILT: 1964

11. FAC. CAT. CODE: 310-22

12. INITIAL COST: $ 600 K

13. NASA B.O.D. 1964

14. STATUSCODE: Active

15. ACCUM. COST: $ 616 K

16. LIFE EXPECT. Indef.

17. OWNERCODE: NASA

18. OPER. CODE: NASA

19. CONTRACTOR NAME *(if contr. oper.):* NAA & MAC

20. OTHER SOURCES OF INFO: **These facilities are indexed into the MK Technical Data Indexing System** (ADP) **under Locator Codes B09.00.00.0 (No. 1) and B10.00.00.0 (No. 2).**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Design Engineering Directorate, KSC**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: **Civil Engineering Division - MF KSC**

TECHNICAL FACILITIES RESUME

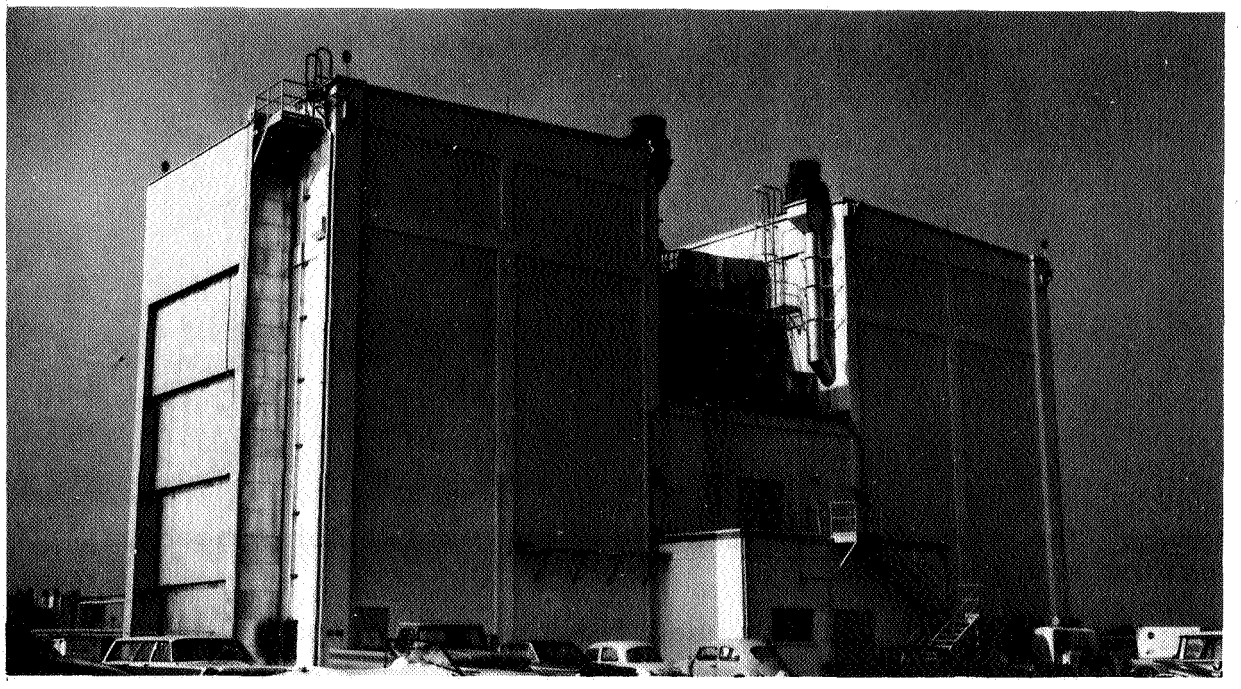
DATE OF RESUME: 1966

FACILITY NO: 10-00-25-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida.

2. FACILITY NAME: Environmental Systems Test Facility

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Systems Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Spacecraft ECS Operations

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility contains test equipment for spacecraft environmental control systems. Basically, the facility consists of two test cells and a central structure containing control rooms on the second floor and equipment storage rooms on the first floor. Pre-installation acceptance laboratories for the validation of spacecraft components are also located on the first floor.

Each test cell is approximately 40 feet square and 60 feet high and each has a crane with a hook height of 45 feet. The building is irregular in shape and has a total of 11,600 square feet of floor space, The entire building is air-conditioned and is compatible with the hazardous testing planned. It has a reinforced concrete frame with masonry exterior walls. The bridge crane capacity in each test cell is 10 tons.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The High-Bays and test labs are useful for spacecraft testing and checkout.

8. PLANS: The facility will be used for the entire Apollo program.

9. BLDG. NO. M7-961 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310-22

12. INITIALCOST: $ 834 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,010 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHERSOURCESOFINFO: All drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Locator Code **B05.00.00.0.**

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

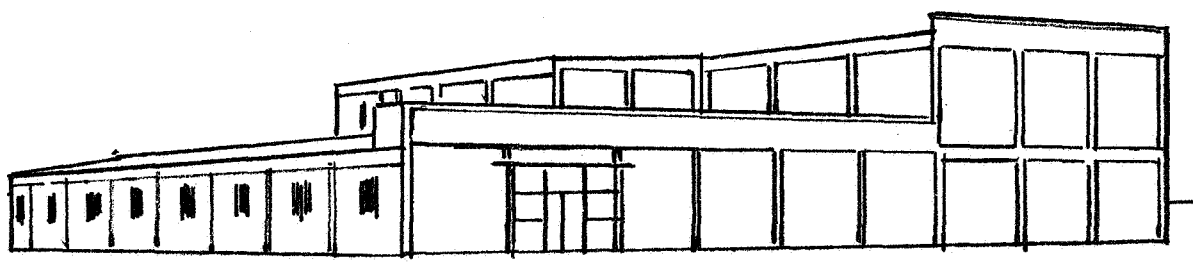
DATE OF RESUME: 1966

FACILITY NO: 10-00-26-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Flight Crew Support Building**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flight Crew Training **Facility**

5. TECHNOLOGICAL AREAS SUPPORTED: **Manned Spacecraft Operation**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The Flight Crew Training Building houses simulators to train'astronauts for Apollo missions. This building contains a high bay area of 56 feet by 200 feet and a low bay area of 152 feet by 200 feet. The gross area of the entire structure is 36,000 square feet. Two mission simulators are located in the high bay area and computers, periferal equipment and consoles are located in the low bay area. Other areas are used for office space and for operations and maintenance personnel.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The facility is capable of further expansion. An FY-66 addition is being processed, An FY-66 addition of 32,180 SF is programmed.

8. PLANS:

9. BLDG. NO.	M7-409	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	Unknown
12. INITIAL COST: $	2.163 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	2.453 K	16. LIFE EXPECT.	Indef	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Contract 159 (Dwg. file 203-252).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

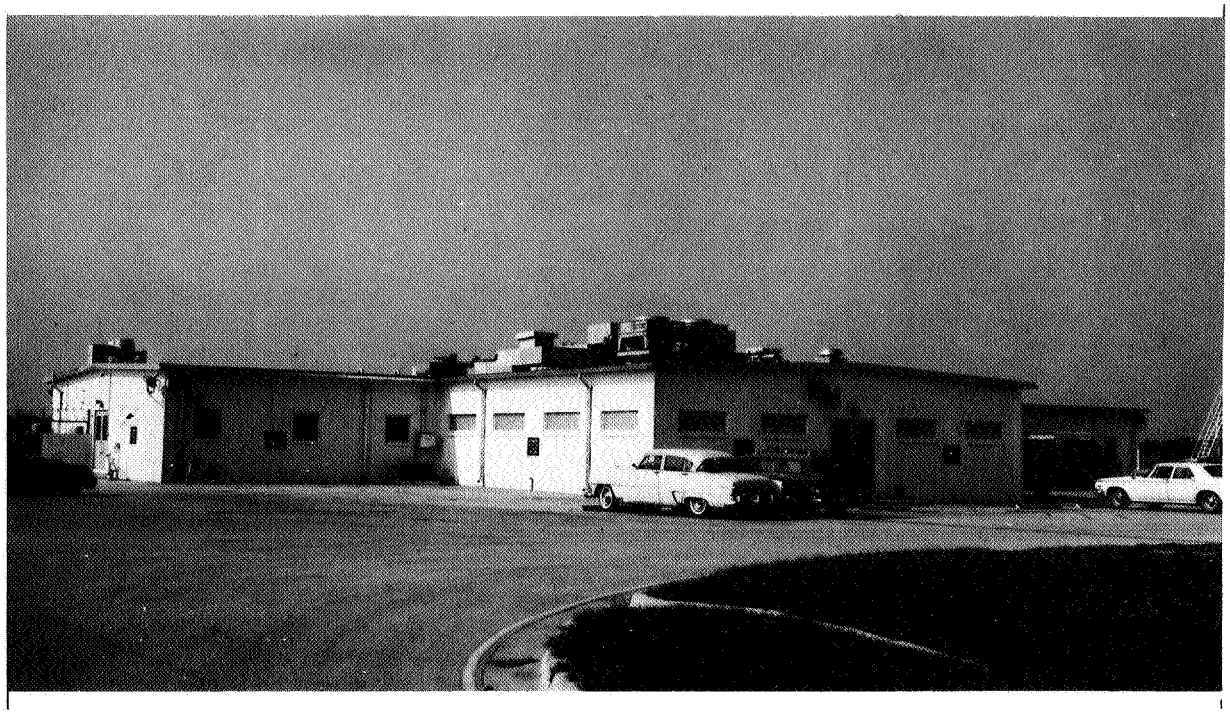
DATE OF RESUME: 1966

FACILITY NO: 10-00-27-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida.

2. FACILITY NAME: Fluid Test Support Building

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Fluid Test** Facility

5. TECHNOLOGICAL AREAS SUPPORTED: **Hypergolic Propulsion** Systems, Cryogenic fuel cell system, Life Support systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility is constructed of concrete block and provides office and lab space for operational personnel connected with spacecraft systems testing and checkout, The original building was 50 feet by 160 feet. However, an addition 50 feet by 45 feet has been added. Also, a mechanical room ***33*** feet by **23** feet has been added.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The building has potential as an office, lab and component cleaning shop.

8. PLANS: The building will continue to be used to support spacecraft testing.

9. BLDG. NO. M7-1061

10. YR. BUILT: 1964

11. FAC. CAT. CODE: 310-22

12. INITIAL COST: $ 228 K

13. NASA B.O.D. 1964

14. STATUSCODE: Active

15. ACCUM. COST: $ 493 K

16. LIFE EXPECT. Indef.

17. OWNER CODE: NASA

18. OPER. CODE: NASA

19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHERSOURCESOFINFO: Drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Locator Code B06.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

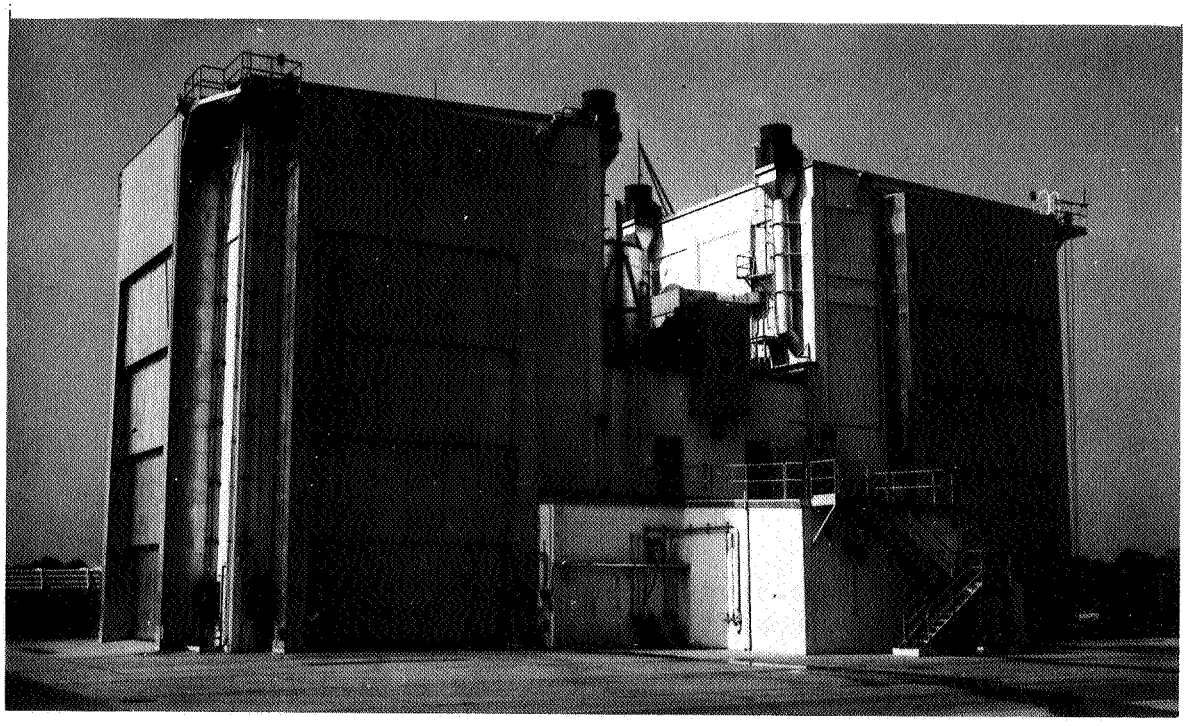
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-28-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITYNAME: **Hypergolic Test Facility #1 and #2**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONALNAME: **Hypergolic Test Facility (No. 1 and 2)**

5. TECHNOLOGICAL AREAS SUPPORTED: **PropePlant Systems**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Hypergolic Test Buildings provide space and equipment for testing, fueling, servicing, and checkout of the spacecraft hypergolic propulsion systems. There are two test cells in each building approximately 40 feet by 40 feet by 60 feet high. The central two story structure provides control rooms, equipment rooms, and'locker rooms. Each air-conditioned building contains 7100 square feet of floorspace and is provided with special features for safe handling of hypergolic fuels and oxidizers, The large test cell doors (22 feet wide by 40 feet high) are equipped with inflatable seals for excluding contaminants that certain tests require, Each test cell is equipped with a 10 ton bridge crane. Each building has fuel and oxidizer servicing areas and has the capability for testing and servicing a completely fueled spacecraft,

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The buildings have capability for test/servicing a completely fueled spacecraft.

8. PLANS: The buildings will be used for the entire Apollo/LEM Program.

9. BLDG. NO. #1 M7-1212 #2 M7-1210 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310-22

12. INITIAL COST: $ 977 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,034 K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: These facilities are indexed into the MK Technical Data Indexing System under Locator Codes **B07.00.00.0** (No, 1) and B08.00.00.0 (No, 2).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

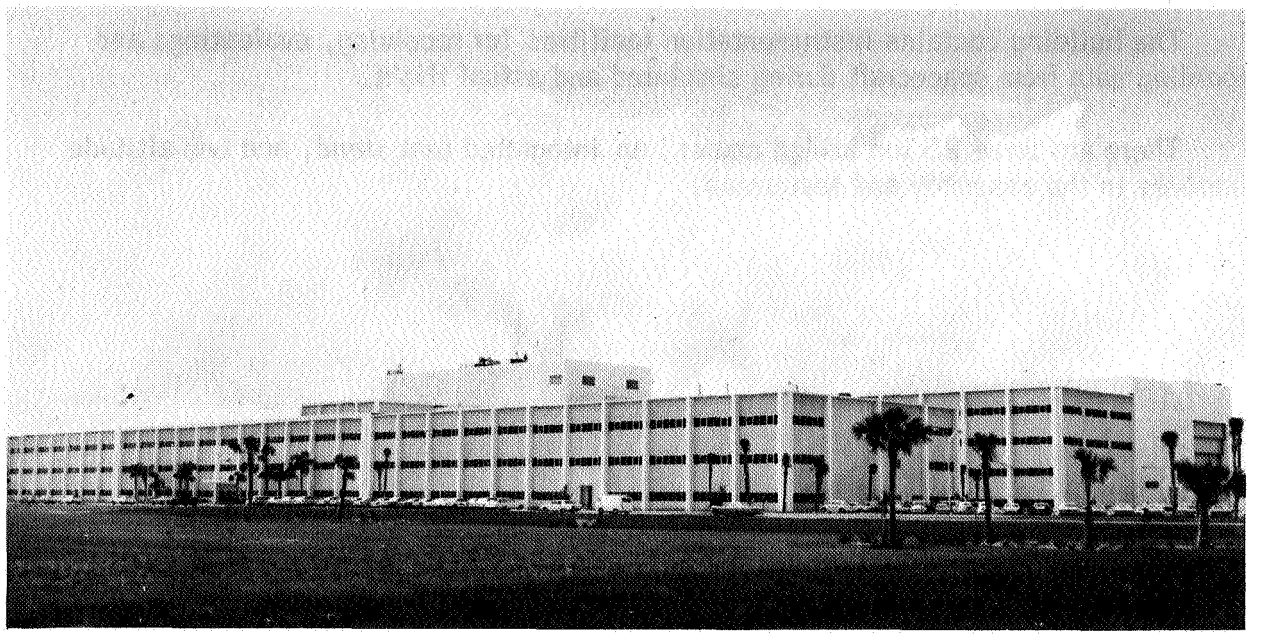
DATE OF RESUME: 1966

FACILITY NO: 10-00-29-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Operations and Checkout Building**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Flight Crew and Spacecraft Test Facility**

5. TECHNOLOGICAL AREAS SUPPORTED: **This facility is used for assembly and checkout of all manned spacecraft and provides for crew training and preflight preparations.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is a multi-story structure containing about 576,000 square feet of usable floorspace. The building *is* more than 100 feet high in the high bay area and is constructed ot concrete and steel frame with a masonry exterior. It is completely air-conditioned and has moveable partitions and modular utilities to provide flexibility for interchange between the various areas. The building has been divided into five functional areas: engineering and administration; auditorium and cafeteria; laboratory and control room; high bay and low bay assembly and test area; and a utility and service area, These are further subdivided as necessary within the basic functions.

Spacecraft will be delivered to this building by special rubber tired transporters and brought first into the low and high bay areas to check systems integrity.

6. NARRATIVE DESCRIPTION

Once the spacecraft is completely checked out and systems integrity is established, it will be taken to the Fluid Test Complex for hazardous checkout. From there it goes to the VAB for mating with the launch vehicle.

Accommodations for astronaut preflight activities will be included in the vicinity of spacecraft checkout operations, These include a crew preparation area, a training and flight simulation area, a technical and briefing area, transient quarters, and a bio-medical area,

The building contains instrumentation facilities for receiving, evaluating, and recording data from spacecraft during simulated and actual flight.

There are three 25 ton bridge cranes, an integrated test stand, and two altitude chambers in the assembly and test areas.

7. POTENTIAL: Basic facility can handle spacecraft planned for the Apollo Spplications program as presently contemplated.

8. PLANS: No plans for further expansion at present.

9. BLDG. NO.	M7-355	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	310-21
12. INITIALCOST: $	8,147M K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	25,714M K	16. LIFE EXPECT.	Indef.	17. OWNERCODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHERSOURCESOFINFO: Contracts 1439, 88, 91, 106, 115, 146, 147, 165, 175, 180, 196, 199, 200, 201, 208, 215, 218, 223, 235, 243, 248, 261, 269, 274, 276, 306, 314, 315, 316, 317, 342, 355.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-30-00

1 REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2 FACILITY NAME: **Field Ordnance Test Laboratory**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Pyrotechnics Test Facility**

5. TECHNOLOGICAL AREAS SUPPORTED: **Pyrotechnic Testing, Inspection and Associated Electric and Electronic Instrumentation**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility provides two structurally shielded test cells for testing small pyrotechnic (explosive) devices used on board such spacecraft as Gemini and Apollo. Shaped charges, fuses, detonators and initiators are destructive tested. Bridge wires, insulation and circuits are nondestruct tested.

The building contains 1589 square feet of usable floorspace with two test cells surrounded by 12 inch thick reinforced concrete walls, A control room and lab are adjacent to the test cells. The opening into each test cell is 3 feet 6 inches by 7 feet.

This facility is sited in the KSC Industrial Area at a safe distance from adjoining buildings, consistent with existing siting regulations.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The facility could be used to inspect or test any of the small explosive or potentially explosive devices found in the industry.

8. PLANS: It is planned to continue using this facility for the Apollo and LEM programs.

9. BLDG. NO. M7-1417 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 310-21

12. INITIAL COST: $ 159,447 K 13. NASA B.O.D. 1/65 14. STATUS CODE: Active

15. ACCUM. COST: $ 159,477 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME (if *contr. oper.):*

20. OTHER SOURCES OF INFO: Drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code B11.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

FACILITY NO: 10-00-31-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Parachute Building**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Parachute** Facility

5. TECHNOLOGICAL AREAS SUPPORTED: **Recovery Operations, Crew Systems**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility provides for storage, receiving, inspection, and packing of Gemini and Apollo parachutes; also, other recovery equipment, flight crew equipment, and EVA equipment. The building area is 8,200 square feet and is equipped with a parachute packing table 189 feet long. There are two 30 ton and one 12 ton hydraulic presses and a vacuum system installed in this facility for use in packing parachutes. The building is equipped with an air-conditioning and humidity control system required for the special handling and care of parachutes.

This facility is also equipped with a fabric repair shop capable of repairing or fabricating such items as storage bags, astronaut harnesses, and EVA umbilicals.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The building could be used for processing/holding a variety of flight hardware items for other program recovery systems,

8. PLANS: The building will continue to be used for recovery equipment storage and checkout through the Apollo program.

9. BLDG. NO. M7-657 10. YR. BUILT: May 64 11. FAC. CAT. CODE: 310-10

12. INITIALCOST: $ 329.422 K 13. NASA B.O.D. May 64 14. STATUSCODE: Active

15. ACCUM. COST: $ 329,422 K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code B37.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

FACILITY NO: 10-00-32-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida.

2. FACILITY NAME: Propellant Systems Component Lab

3. LOCATION *(if other than in 1. above)*:



4. FUNCTIONAL NAME: Propellant Systems Component Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Contaminated Components of Saturn - Apollo Propellant Systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility contains 6,800 square feet of floorspace. The lab is used for receiving, dissassembly, cleaning, reassembly, and testing of contaminated components of Apollo/Saturn propellant systems.

This facility also provides space for offices, a general shop, verification lab, horizontal flow clean room, change room, rough cleaning room, and a shipping and receiving area.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Activation of LC-39 requires 300% expansion of Lab facilities.

8. PLANS: New facilities to be constructed adjacent to CCF at LC-39. Rehab. Apr.

9. BLDG. NO. H5-1634 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310-22

12. INITIALCOST: $ 125.0 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 198.051 K 16. LIFE EXPECT. 25 yrs 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if* contr. *oper.):* Bendix

20. OTHER SOURCES OF INFO: Drawings for this facility are indexed.into the MK Technical Data Indexing System (ADP) under Location Code C43.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

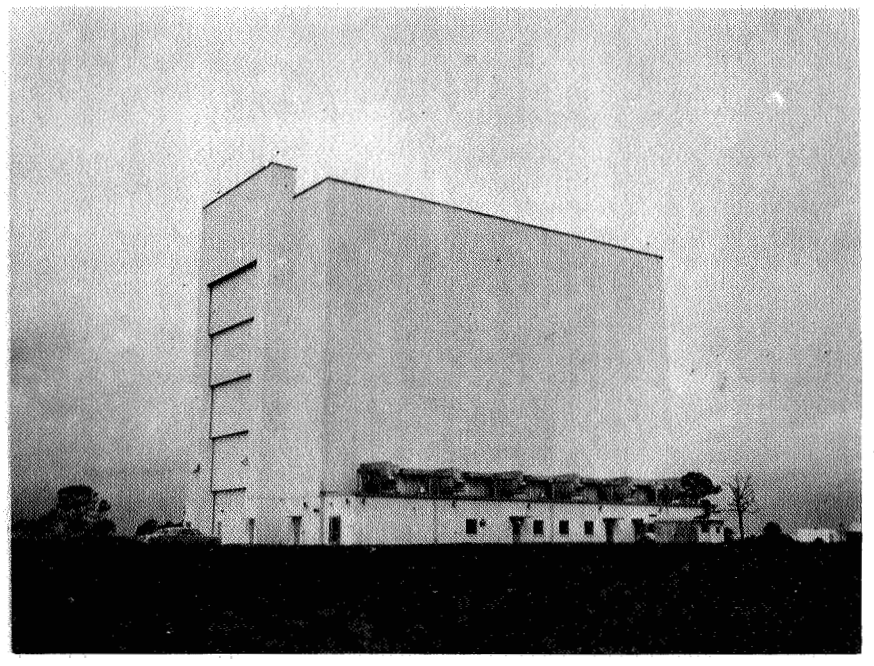
DATE OF RESUME: 1966

FACILITY NO: 10-00-33-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Pyrotechnic Installation Building**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Pyrotechnic Installation Facility**

5. TECHNOLOGICAL AREAS SUPPORTED: **Manned Spacecraft Operations**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility contains a high bay test area 80 feet by 150 feet and two low bay service areas 20 feet by 150 feet. This building is air-conditioned and designed to be compatible with the planned hazardous operations.

A 90 foot high motorized door at the south side of the high bay area permits entrance of a fully mated spacecraft. However, the basic use of this building is for the installation of pyrotechnic devices, static weighings for mission profile center of gravity determination, propulsion thrust vector alignments, and certain optical alignments of guidance and control system components of spacecraft.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: None

8. PLANS: None

9. BLDG. NO. M7-1469 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310-22

12. INITIAL COST: $ 1,204 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,288 K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*:

20. OTHER SOURCES OF INFO: Drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code B12.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

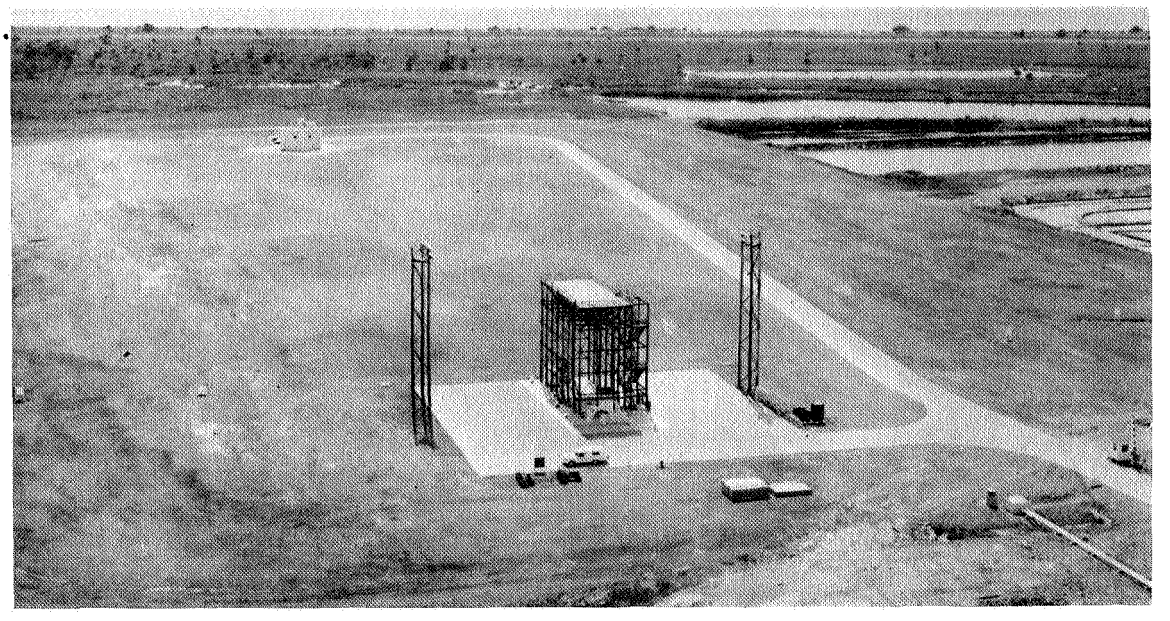
DATE OF RESUME: 1966

FACILITY NO: **10-00-34-00**

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Radar Boresight Range

3. LOCATION *(if other thnn in 1. above):*



4. FUNCTIONAL NAME: Radar Boresight Range

5. TECHNOLOGICAL AREAS SUPPORTED: Radar Boresighting, RFI checks Agena/Gemini Docking checks.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is used for testing the radiating capabilities and characteristics of antenna systems such as the Gemini rendezvous radar antenna and Agena transponder antenna.

This facility is made up of a control building 20 feet by 20 feet by 20 feet. This two story, air-conditioned building contains a mechanical room on the first floor, a control room on the second floor, and a pedestal on the roof for mounting a test antenna. Also, a jib hoist with a 500 lb. lifting capacity is mounted on the roof for lifting equipment from the ground. A timber tower 25 feet by 65 feet by 50 feet high provides for an "RF quiet" platform testing "on board" RF systems and also

6. NARRATIVE DESCRIPTION

a platform suitable for performing such tests as the docking of the Gemini and Agena. A 1000 foot by 200 foot graded area is maintained between the control building and the timber tower to provide a controlled reflective surface for radar boresight testing.

7. POTENTIAL: The boresight range and timber tower will continue to be useful for testing RF systems, antenna, transponders, and instrumentation for Apollo/LEM and other programs. Control Bldg. footings will be reinforced to handle the LEM.

8. PLANS:

9. BLDG. NO.	M7-867 M7-863 Tower	10. YR. BUILT:	1963	11. FAC. CAT. CODE:	140-16
12. INITIAL COST: $	95 K	13. NASA B.O.D.	3/64	14. STATUS CODE:	Active
15. ACCUM. COST: $	215 K	16. LIFE EXPECT.	Indef.	17. OWNERCODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if eontr. oper.):*			

20. OTHER SOURCES OF INFO: Drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code B38.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

FACILITY NO: 10-00-35-00

1 REPORTING INSTALLATION: John F. Kennedy Space Center, Florida.

2 FACILITY NAME: LC-39 Launch Control Center

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Missile Control Facility (LC-39)

5. TECHNOLOGICAL AREAS SUPPORTED: Central control. for vehicle checkout and launch.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is a reinforced concrete building on a mat foundation. The building is 385 feet long, 166 feet wide, and 76 feet high and is designed to control the prelaunch and launch operations of the Saturn V vehicle. This building has four main firing control rooms, various offices, shops, laboratories, storage rooms, and personnel facilities. The first floor contains a main lobby and a cafeteria with a seating and service capacity of 500 persons per one half hour. Office, shop, and laboratory areas are located primarily on the first two floors of this structure and these provide for many diverse activities. The four firing bays are located on the third floor. Each firing bay houses launch operations equipment for one of the launch pads and each is equipped with closed circuit television for supervision of all launch operations. The floors in each firing room are the raised pedestal type approximately 1 foot 6 inches high to allow space for communications and control cabling. A hydraulic hoist is located

6. NARRATIVE DESCRIPTION

at the southwest roof corner. This hoist has a capacity of $7\frac{1}{2}$ tons and is designed to lift loads from the ground level to the roof. The building also contains four elevators located at the east and west ends of the building which operate from the first to fourth floors.

7. POTENTIAL: N/A

8. PLANS: N/A

9. BLDG. NO. K6-900 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 381-20

12. INITIAL COST: $ 7,000 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 8,612 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):* N/A

20. OTHER SOURCES OF INFO: Contract 61 (Dwg. file 203-100).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

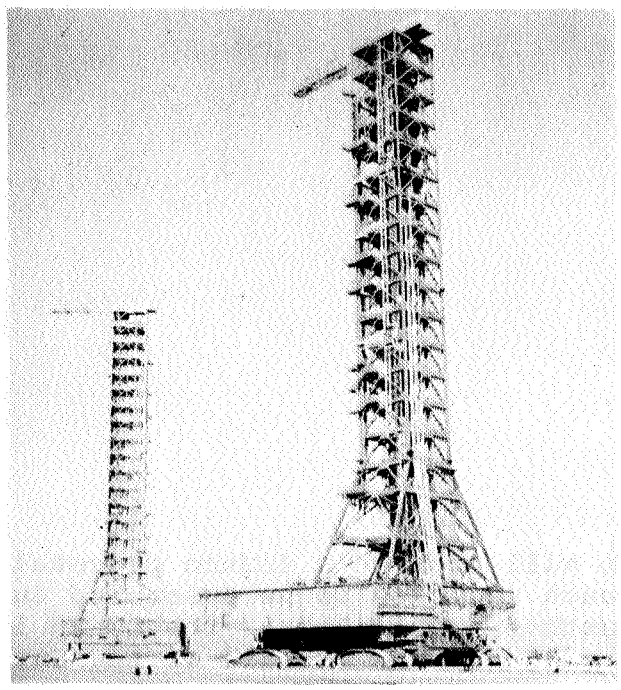
DATE OF RESUME: 1966

FACILITY NO: 10-00-36-00

1 REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2 FACILITY NAME: **Launch Umbilical Tower, LC 39**

3 LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Missile Launch Umbilical** Tower **(LC-39)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Saturn V checkout, assembly, fueling and launch.**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The three Mobile Launchers at KSC's Launch Complex 39 function as a base and umbilical tower for the Saturn V launch vehicle,

The Mobile Launchers are positioned in the VAB high bay during assembly and checkout of the Saturn V stages, They are stationed at the pad for fueling and launch and at the parking area for modification and refurbishment.

The Mobile Launcher (empty) weighs approximately 10.5 million pounds. Three levels in the base provide approximately 12,000 square feet of floorspace each.

6. NARRATIVE DESCRIPTION

The Mobile Launcher supports umbilical service arms, 18 work platforms, and 2 elevators with a load capacity of *2,500* pounds each. A *25* ton hammerhead crane is at the *380* foot level. This crane rotates *360* degrees in either direction at 1 revolution per minute. The Mobile Launcher is supported by. ground mount mechanisms at each Mobile Launcher location. In addition four extensible columns are provided at the pad to absorb the dynamic loads generated by a shutdown before liftoff. Three tail service masts at level "0" provide support for electrical cable LOX drain and RP-1 fill and drain lines, and hydraulic lines and pneumatic lines.

7. POTENTIAL: The ML will provide a launch pedestal and umbilical tower for launch vehicles to be assembled in any of the VAB bays and to be launched from eitherof the LC-39 launch pads.

8. PLANS: The ML's will be used for all of the Saturn V/Apollo launches,

9. BLDG. NO.	K6-546	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	
12. INITIAL COST: $	30,000 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	30,000 K	16. LIFE EXPECT.	Indef	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: EDV-1 Contract (MG)

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

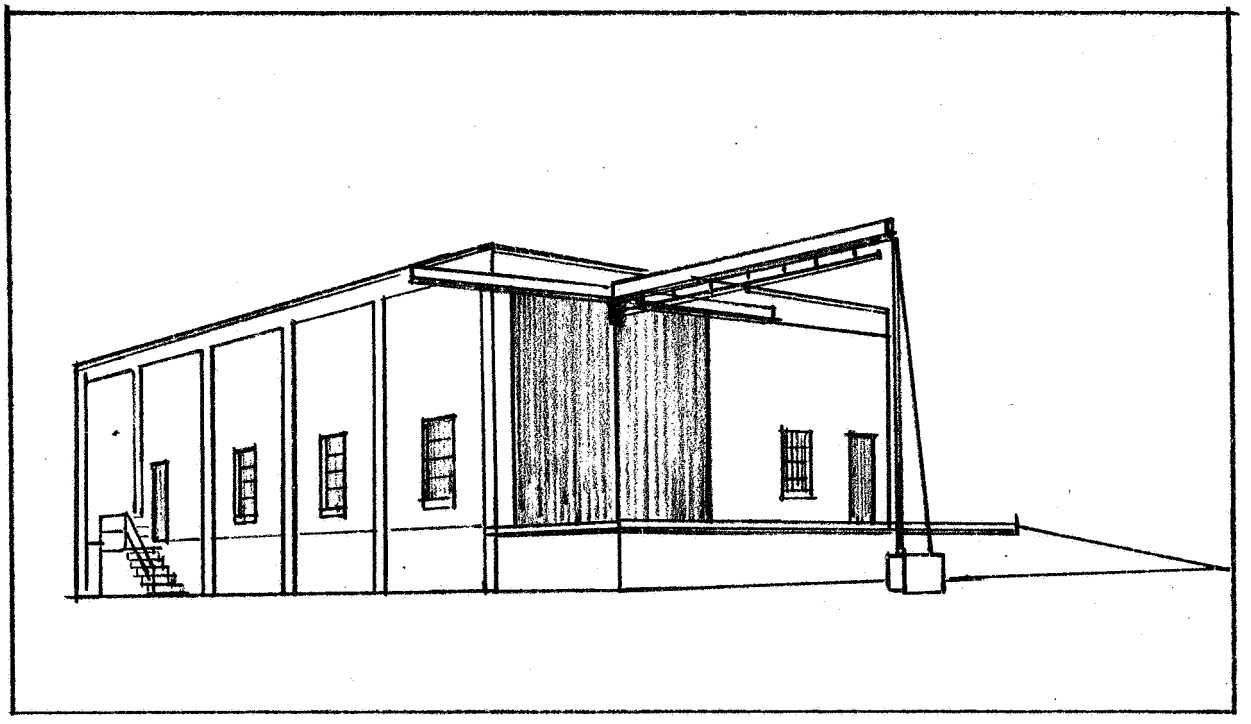
DATE OF RESUME: **1966**

FACILITY NO: 10-00-37-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Ordnance Lab**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Pyrotechnic/Ordnance Laboratory (LC-39)

5. TECHNOLOGICAL AREAS SUPPORTED: **Ordnance Systems**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is part of the Ordnance Storage Complex at LC-39. It provides space for receiving, inspection and maintenance of rectro-rockets, escape rockets, and small pyrotechnic devices.

The building contains 2600 square feet of usable floorspace and is air-conditioned. A 1 ton monorail hoist is also provided. The large entrance door is 16 feet by 15 feet by 33 feet 4 inches.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The building would be useful for servicing/storing other ordnance items as needed. The facility will continue to be used throughout the Apollo Program.

8. PLANS:

9. BLDG. NO. —. 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 310-22

12. INITIAL COST: $ 140,540 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 140,540 K 16. LIFEEXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Contract 163 (Dwg. file 203-198).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

FACILITY NO: 10-00-38-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITYNAME: **Vehicle Assembly Building - High Bay**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Space Vehicle Assembly Facility (VAB/LC-39)**

5. TECHNOLOGICAL AREAS SUPPORTED: **Saturn V Vehicle**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The VAB high bay provides 4 checkout cells for access and housing of the Mobile Launcher during assembly and checkout of the Saturn V vehicle. Building cranes are used for stacking the vehicle stages and extensible platforms are provided for access to and checkout of the various stages, Spacecraft and vehicle assembly and checkout equipment are housed within the platforms. Vehicle ordnance is installed on the vehicle from these checkout platforms prior to leaving the building,

Each bay is provided with a doorway for ingress of the Mobile Launcher and Crawler Transporter and egress of the Mobile Launcher with the vehicle aboard on the Crawler Transporter, The doorway is closed by a system of horizonal sliding

6. NARRATIVE DESCRIPTION

and vertical lift doors for weather protection and opens for egress to the Crawlerway and Launch Pads.

7. POTENTIAL: 250 ton crane and platform relocating capability allow adaption of the facility to most any vehicle configuration.

8. PLANS:

9. BLDG. NO. K6-848 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 220-14

12. INITIALCOST: $ * K 13. NASA B.O.D. 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indefi 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

*Building still under construction.

20. OTHERSOURCES OF INFO: Contract 61 (Dwg. file 203-100 and 203-138).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966

FACILITY NO: 10-00-39-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITYNAME: **Vehicle Assembly Building - Low Bay**

3. LOCATION *(if other than in 1. above):*

See picture page 10-75

4. FUNCTIONAL NAME: **Space Vehicle Assembly Facility (VAB/LC-39**

5. TECHNOLOGICAL AREAS SUPPORTED: **Saturn V Vehicle**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The VAB low bay houses assembly and test facilities for the Saturn II and Saturn IV-B, the second and third stages of the Saturn V vehicle, There are 8 check-out cells, 4 for each stage, with 2 presently outfitted and 2 for future needs, As the stages arrive at the low bay, they are handled with a 175 ton capacity crane which is mounted on **dollies** for rolling into the checkout cells. Each cell has three work platforms for checking out the stages.

The instrumentation unit for the Saturn V is also check out in the **low** bay where necessary shops and clean-room facilities are provided.

6. NARRATIVE DESCRIPTION

The stages and instrumentation unit are delivered to the **VAB** high bay, upon completion **of** checkout, for mating with the booster stage **of** the Saturn V vehicle.

7. POTENTIAL: **Checkout cell flexibility and 175 ton crane capacity allow adaption of the facility to most any stage configuration.**

8. PLANS: **Not defined.**

9. BLDG. NO. K6-848 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 220-14

12. INITIALCOST: $ * K 13. NASA B.O.D. 1966 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT, Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

***Building still under construction.**

20. OTHER SOURCES OF INFO: **Contract 61 (Dwg. files 203-100 and 203-138).**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Design Engineering Directorate, KSC**

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: **Civil Engineering Division - MF KSC**

TECHNICAL FACILITIES RESUME

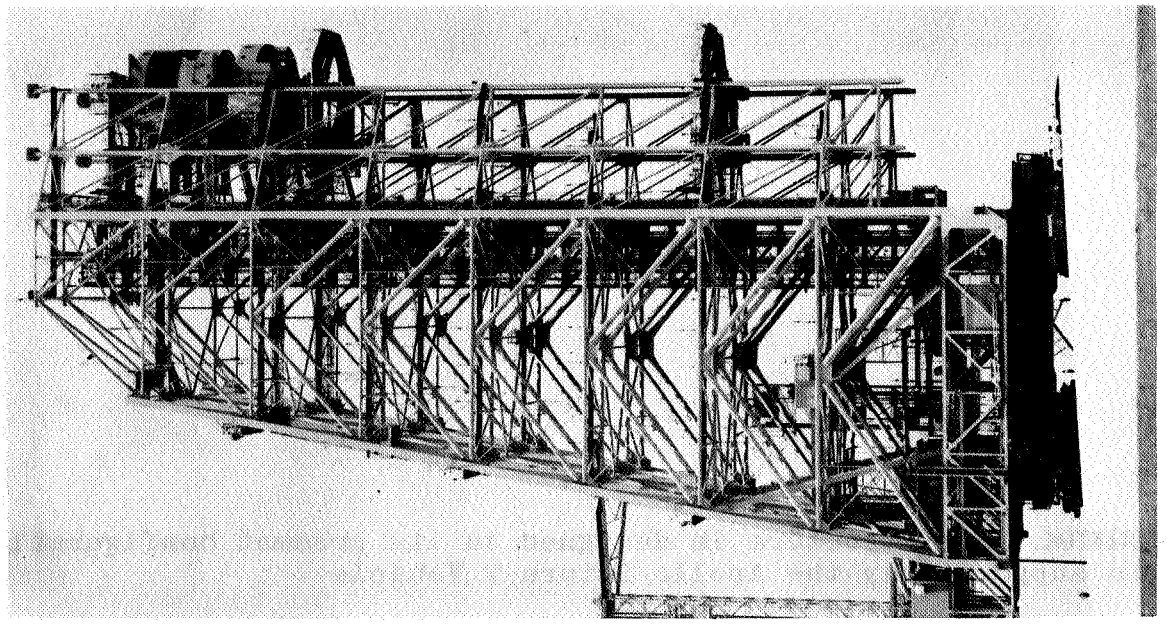
DATE OF RESUME: 1966

FACILITY NO: 10-00-40-00

1. REPORTING INSTALLATION: **John F. Kennedy Space Center, Florida.**

2. FACILITY NAME: **Launch Complex 39, Mobile Service Structure**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Missile** Launch **Service Structure, Mobile** ***(LC-39)***

5. TECHNOLOGICAL AREAS SUPPORTED: Apollo/Saturn V Vehicle

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Mobile Service Structure is designed to accommodate the Saturn V launch vehicle and spacecraft. The Mobile Service Structure will be used at the launch pad for the following operations: inspection and malfunction operations for the Saturn V launch vehicle stage; fueling and checkout operations for the spacecraft; and final ordnance hook-up and final verification for the spacecraft. This structure is further designed to accommodate the associated electrical support equipment and ground support equipment. Platform access is afforded by 2 self-propelled platforms serving the launch vehicle and 3 stationary but repositionable platforms serving the spacecraft. Two of the spacecraft platforms are enclosed and air-conditioned,

6. NARRATIVE DESCRIPTION

The overall height of the Mobile Service Structure is 402 feet above grade. The dimensions of the structure base are 133 feet wide by 130 feet long, A 52 foot cantilevered frame, for platform support, overhangs the launch deck of this structure. In addition to stairs, access to platforms and tower landings from the base structure is provided by two 5000 pound capacity passenger/freight elevators with speeds of 600 feet per minute. Access from ground level to the base structure is provided by stairs, one man-lift, and one elevator. This elevator has a 5000 pound capacity and a speed of 200 feet per minute,

7. POTENTIAL: This structure is designed in its present configuration to support only the Apollo/Saturn V Vehicle

8. PLANS: Plans

9. BLDG. NO.	K7-188	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	852-12
12. INITIAL COST: $	13,300 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Const.
15. ACCUM. COST: $	15,900 K	16. LIFE EXPECT.	Indef	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.)*:		Bendix	

20. OTHER SOURCES OF INFO: Contract 131 (Dwg. file 203-208).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division, MF KSC

TECHNICAL FACILITIES RESUME

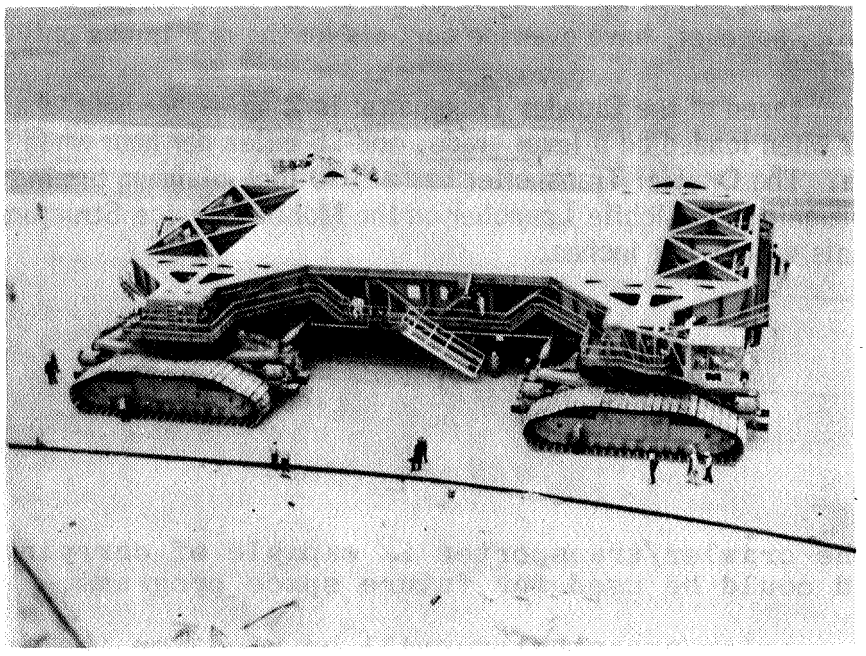
DATE OF RESUME: 1966

FACILITY NO: 10-00-41-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida,

2. FACILITY NAME: Crawler

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Missile Crawler Transporter Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Transporting Launch Vehicle, ML, and Mobile Service Structure between Park Areas, VAB and Pad,

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Crawler Transporter is used to transport the Mobile Launcher and the Mobile Service Structure. The Mobile Launcher, including the space vehicle, is transported from the VAB to the launch pad. The Mobile Service Structure is transported from its parking area to and from the launch pad.

The Crawler Transporter has the capability of lifting, transporting, and lowering the Mobile Launcher on the Mobile Service Structure, without the aid of any auxilliary equipment. The Crawler Transporter also supplies limited electrical power to the Mobile Launcher and the Mobile Service Structure during transit.

6. NARRATIVE DESCRIPTION

The Crawler Transporter consists of a rectangular chassis which is supported through a suspension system by four dual-tread crawler trucks. The overall length is 131 feet and the overall width is 114 feet, The unit weighs approximately 5.5 million pounds, The Crawler Transporter is powered by self-contained diesel electric generation units. Electric motors in the crawler trucks propel the vehicle, Electric motor-driven pumps provide hydraulic power for steering and suspension control. Air-conditioning and ventilation is provided where required.

Control cabs are located at each end and their control function depends on the direction of travel. The leading cab in the direction of travel has complete control of the vehicle. The rear cab will, however, have override controls for the rear trucks only,

The maximum speed of the Crawler Transporter is 2 miles per hour when unloaded, 1 mile per hour when loaded on a level grade, and .5 miles per hour when fully loaded and a 5% grade. The Crawler Transporter has a 500 foot minimum turning radius and is capable of positioning the Mobile Launcher on the Mobile Service Structure on the facility support pedestals within ± 2 inches.

7. POTENTIAL: **The crawler/transporter is capable of carrying tremendous loads and could be used for future space programs.**

8. PLANS: **The crawler/transporters will be used for the future Apollo programs.**

9. BLDG. NO.	-	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	N/A
12. INITIAL COST: $	N/A K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	N/A K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: **EDV-1 Contract (MG).**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Design Engineering Directorate, KSC**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

DATE OF RESUME: 1966
FACILITY NO: 10-00-42-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida.

2. FACILITY NAME: **LC-39 Launch Equipment Shop**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Missile Launch Equipment Facility**

5. TECHNOLOGICAL AREAS SUPPORTED: **Technical Support for the fabrication and repair of launch equipment for the Saturn V Program,**

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This building consists of approximately 26,300 square feet of shop and office space. The shop area contains a sheet metal and welding shop, machine shop, electrical and communications shop, wood working and plastics shop, and a painting and plating shop. This is a permanent type building with reinforced concrete frame and masonry finish.

A 5 ton bridge crane with a 16 foot hook height serves the machine shop area. All floors are designed for 200 pounds per square foot except the material storage

6. NARRATIVE DESCRIPTION

area at the east end of the high bay. This floor is designed to support a 7,500 pound wheel load, with a maximum axle load of 30,000 pounds. The welding shop is served by a 2 ton monorail system.

7. POTENTIAL: N/A

8. PLANS: N/A

9. BLDG. NO. K-61247 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 219-11

12. INITIAL COST: $ 1414 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 1485 K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*: Bendix and NASA

20. OTHER SOURCES OF INFO: Contract No. 144 (Dwg. file 203-232).

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Civil Engineering Division - MF KSC

TECHNICAL FACILITIES RESUME

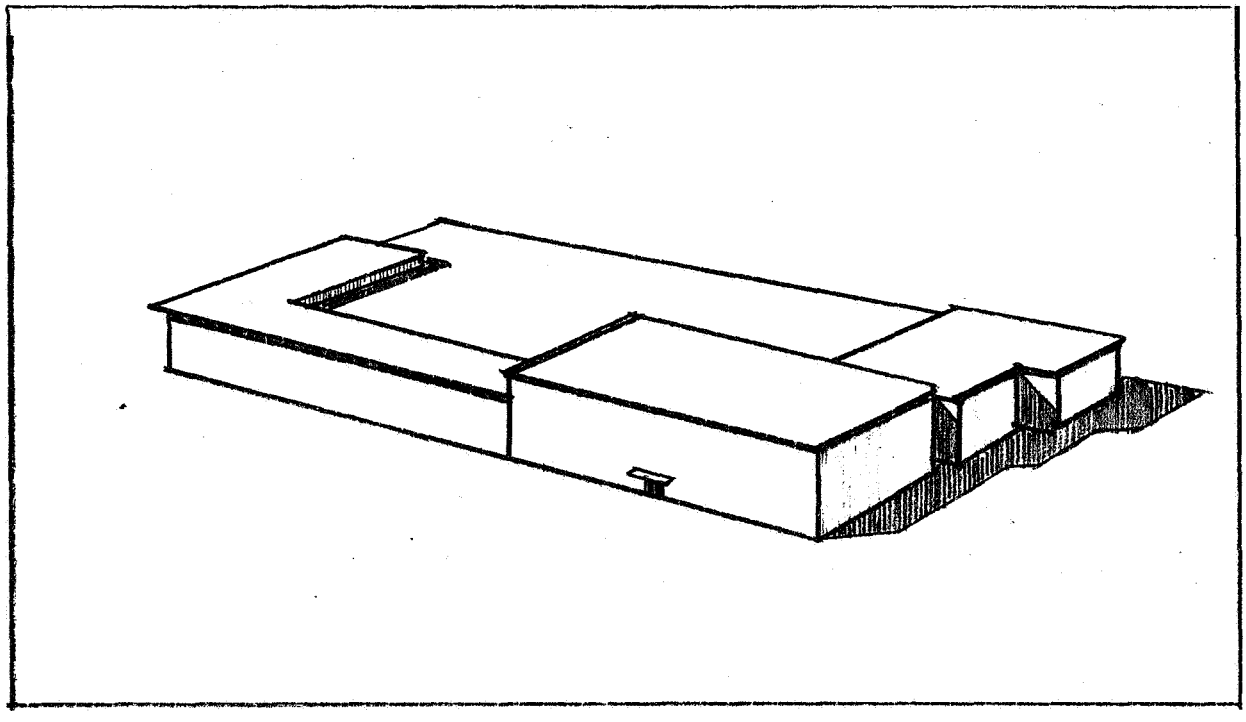
DATE OF RESUME: 1966

FACILITY NO: 10-00-43-00

1. REPORTING INSTALLATION: John F. Kennedy Space Center, Florida

2. FACILITY NAME: Mission Control Center

3. LOCATION (if other than in 1. above):



4. FUNCTIONAL NAME: Mission Control Center

5. TECHNOLOGICAL AREAS SUPPORTED: Checkout, launch control, tracking and astronaut training for Gemini Program plus checkout and tracking of Apollo program (until adoption of Unified "S" Band). Facility could be used for similar checkout, launch control, and tracking for other new mission.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility has a *gross* area of 32,000 square feet. It is built on a concrete foundation with cement block walls and concrete floors. Electric power is supplied from 5 transformers with the following ratings: 1-750KVA; 3-300 KVA; and 1-225 KVA. One of the three 300 KVA transformers is used for critical power and the remaining transformers are maintained for industrial power. However, these units are arranged so that any one or all can be switched to critical power usage or industrial usage.

There are two hot water heating boilers of 245,000 BTU output, one 150 ton water chiller, with seven fan coil units, and one 125 ton water chiller with six fan coil units.

6. NARRATIVE DESCRIPTION

In the new west addition (about 1100 square feet), there is a 10 ton DX air-conditioning unit. Also, included in this addition are two 2000 gallon septic tanks and a 13,200 volt primary electric overhead power line system with voltages stepped down through the above mentioned transformers to usable building and equipment voltages of 480/277 volts and 120/208 volt wye-connected power systems.

7. POTENTIAL: Facility could be expanded or altered if desired.

8. PLANS: No plans exist for modifications, alterations or expansions to this facility.

9. BLDG. NO. 1385A

10. YR. BUILT: 1957

11. FAC. CAT. CODE: 140-10

12. INITIAL COST: $ 496.4 K

13. NASA B.O.D. 1961

14. STATUS CODE: Active

15. ACCUM. COST: $ 859.5 K

16. LIFE EXPECT. Indef.

17. OWNER CODE: NASA

18. OPER. CODE: Contr.

19. CONTRACTOR NAME *(if contr. oper.)*: RCA, Bendix Corp., Link Precision, Inc.

20. OTHER SOURCES OF INFO: Drawings for this facility are indexed into the MK Technical Data Indexing System (ADP) under Location Code F03.00.00.0.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Design Engineering Directorate, KSC

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Civil Engineering Division - MF KSC

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TECHNICAL FACILITIES RESUME

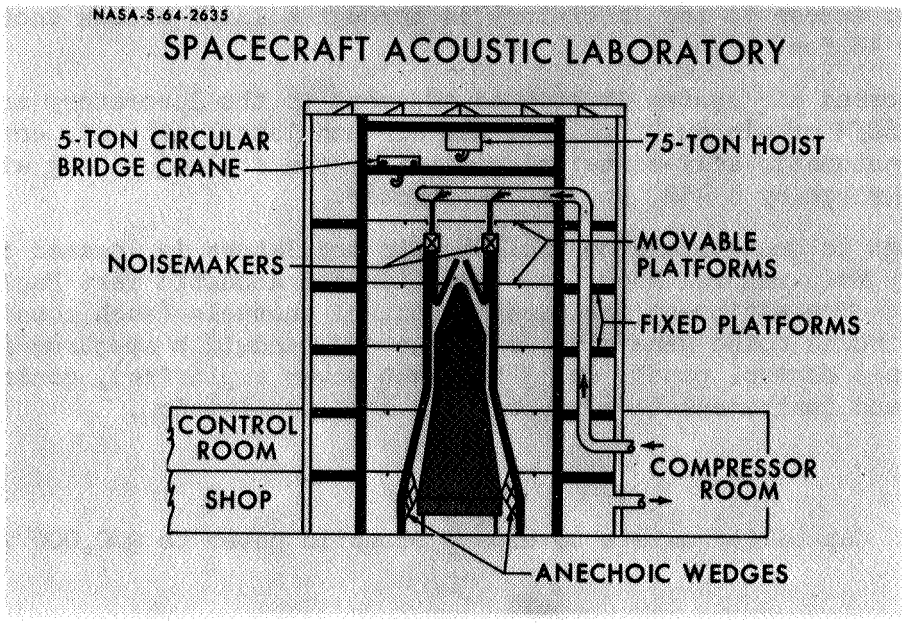
DATE OF RESUME: July 15, 1966

FACILITY NO: **11-00-01-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Spacecraft Acoustic Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Acoustic Test Laboratory, Spacecraft

5. TECHNOLOGICAL AREAS SUPPORTED: Dynamic structural testing; dynamic systems testing.

6. **NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:**

This laboratory can simulate launch noise, in-flight turbulence, static load and oscillating load environments for an integrated spacecraft in its launch attitude. The test system is basically a shroud enveloping the forward 60 feet of a spacecraft and consists of a set of 16 axially oriented ducts which are contoured and closely spaced to the external skin of the vehicle; the shroud is tailored to the Apollo external mold line. Both progressive wave and reverberant acoustic fields can be generated by varying the spacing between outer wall of the ducts and the vehicle, or by using the entire tower volume as a large reverberant chamber. Each duct is driven by a 10,000 acoustic watt air modulator and sound pressure levels up to 170 dB (re: 2×10^{-5} N/M^2) can be obtained.

A test vehicle up to 30 feet in diameter and 95 feet in height can be

6. NARRATIVE DESCRIPTION

accommodated in the laboratory. A 75-ton fixed point hoist is mounted on the centerline of the laboratory for stacking of modular components of the test vehicle (hook height is 90 feet) and a 5-ton circular bridge crane is to be used to handle shroud components.

Permanent platforms are installed at elevations of 15, 30, 45, 60, and 75 feet. Moveable platforms are also located at these elevations and serve to support the shroud system as well as to provide personnel access to the test setup. A freight elevator, with a 4000 pound capacity, services the platforms.

Dimensions of the laboratory are 60 feet by 70 feet with a clear height of 90 feet; access to the laboratory is through a large access door 32 feet wide by 40 feet high.

A compressed air system is located adjacent to the laboratory and provides 27,000 SCFM of air at 40 psig to the air modulators; the air compressor has an automatic self-contained control system for regulating air delivery and is driven by a 4500 hp induction motor.

Equipment to operate and control the air modulators is located in the facility Main Control Room (see Vibration and Acoustic Test Facility Resume). The equipment includes 16 control channels (each consisting of an electronic noise generator, a 1/3 octave bandwidth spectrum shaper, mixer/gain control panel, and 3 kilowatt power amplifier), control consoles, and instrumentation support for data acquisition.

7. POTENTIAL: Capability exists to expand acoustic power to 300,000 watts.

8. PLANS: None

9. BLDG. NO.	49	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	320 10
12. INITIAL COST: $	3054 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	3054 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure, April 1965, pp 7-35 to 7-38

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Structural Dynamics Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Structural Dynamics Branch (ES2)
Phone: (Area Code 713) 483-3007

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-02-00

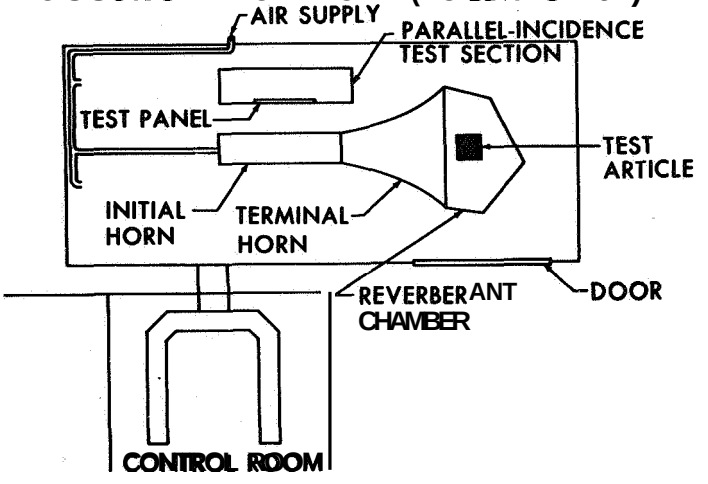
1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Components Acoustic Laboratory

3. LOCATION *(if other than in 1. above):*

NASA-S-64.1639

PLAN VIEW OF SMALL COMPONENT ACOUSTIC LABORATORY (BUILDING 262)



4. FUNCTIONAL NAME: Acoustic Test Laboratory, Components

5. TECHNOLOGICAL AREAS SUPPORTED: Dynamic structural testing, transmission loss of panels, component environmental testing, communications system testing.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The facility has a 600 cubic foot reverberant chamber and a parallel incidence progressive wave chamber capable of mounting a panel up to 30 by 40 inches. Including a 3000 SCFM air compressor, an octave band random shaper system, a 1500 VA audio power amplifier and an 18-channel instrumentation system, the facility can produce high intensity sound fields up to 166 dB* in the reverberant chamber and 170 dB in the progressive wave chamber; the acoustic source produces 20,000 watts of acoustic power by modulating the air stream from the air compressor. The acoustic source can also be coupled to the test room volume to provide a reverberant chamber of 15,000 cubic feet with sound levels up to 155 dB. The laboratory includes a calibration tube for performance tests of high intensity acoustic sources.

*Decibels re: 2×10^{-5} Newtons per square meter.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Instrumentation capability can be expanded to 50 channels.

8. PLANS: Qualification testing of Apollo and Apollo Applications Program components and systems; and manned spaceflight experiments hardwsre.

9. BLDG. NO. 262 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 10

12. INITIALCOST: $ 300 K 13. NASA B.O.D. 1964 14. STATUSCODE: Active

15. ACCUM. COST: $ 360 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*
Brown & Root–Northrop

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure, April, 1965, pp 7–38 to 7–41

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Structural Dynamics Branch

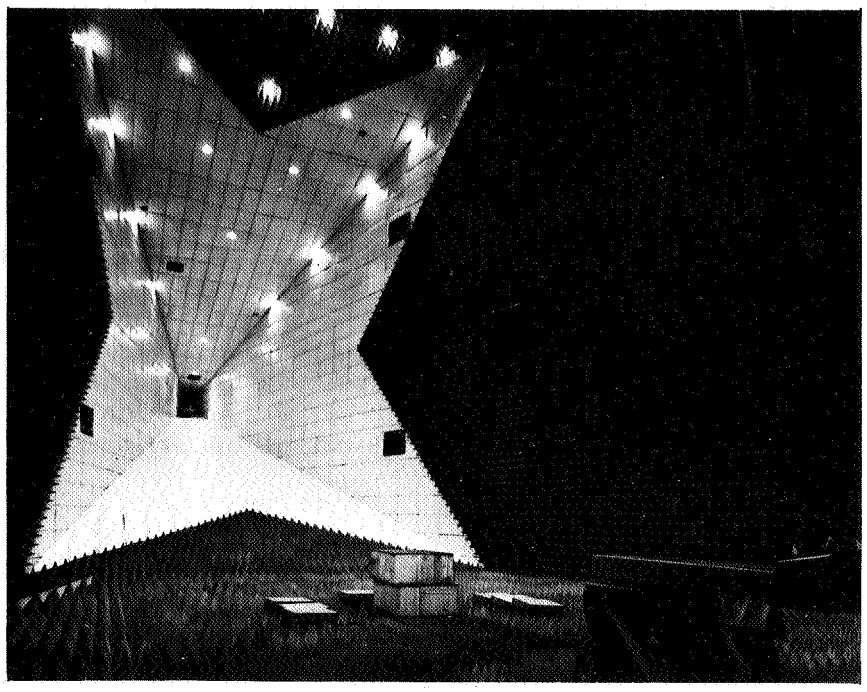
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Structural Dynamics Branch (ES2)
Phone: (Area Code 713) 483-3007

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 15, 1966
	FACILITY NO:	11-00-03-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Anechoic Chamber

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Anechoic Chamber

5. TECHNOLOGICAL AREAS SUPPORTED: Electromagnetic interference testing, antenna impedance or radiation pattern testing.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Anechoic Chamber is configured and designed as a modified flared-waveguide horn of all metal construction with RF absorbing material on the inner surfaces. The actual shape of the chamber is that of a modified square "working room" with a full-cross section sized door for access of large objects, attached to a regular tapered section. The "working room" has a clear height of 50 feet and an overall length of 60 feet. The width of the "working room" varies between 50 feet at the large door to 36 feet at the beginning of the tapered portion, affording a nominal usable floor space of approximately 3000 square feet for the "working room". The absorber on the floor surfaces are not bonded and are readily removed. A small integrally shielded room with personnel access door is subtended to the underside of the horn apex and is used as a transmitting room whenever the chamber is used as an antenna pattern range. High level lighting provides adequate floor illumination

6. NARRATIVE DESCRIPTION

and a 373 ton air conditioning system provides a satisfactory working environment. Two personnel access doors at ground level, one double and one single, provides adequate access for small equipment and personnel. Power receptacles for 120 volt ac, single phase, and 28 volt dc are provided by receptacles along the north edge of the "working room" for convenience. Three cable connector panels are provided for passing "hard-line" connections through the wall. The overall length of the Anechoic Chamber is 150 feet. The electromagnetic shielding is a minimum of -100 db from 10 Kc to 10,000 Mc.

The RF absorbed performance within a "quiet zone" of cylindrical shape, 20 feet in diameter by 57 feet long, located in the "working room" has the following reflection versus incident performance with frequency: (all minimums) -30 db @220 Mc, -40 db @500 Mc, -45 db @1250 Mc, and -55 db @3-35 Gc.

The Anechoic Chamber Room is:
A 900 square foot shielded room with two personnel access doors, one double and one single, and three cable connector panels for "hard-line" penetrations. This room is physically joined by a corridor to the Anechoic Chamber and shares a single personnel access door and cable connector panel with it. It is shielded to the same level (-100 db min.) as the Anechoic Chamber. This room has installed a swept signal generator system and receiver spectrum plotting system covering the frequency range between 10 Kc and 10 Gc, controlled from the consoles in the room. The low level signal generators are "hard-lined" to a shielded room measuring 8 feet by 12 feet which houses the driver/power amplifier stages providing a nominal output of 100 watts over the frequency range.

7. POTENTIAL: Volume required for testing large objects. High performance of absorber may lend itself to radar cross-section measurements.

8. PLANS: Electromagnetic Compatibility Test using "open-loop" measurements on Apollo S/C communications equipment mounted inside mockups.

9. BLDG. NO.	14	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	320 10
12. INITIAL COST: $	822 K	13. NASA B.O.D.	Oct. 1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.)*:*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Instrumentation and Electronic Systems Division
Phone: (Area Code 713) 483-2189

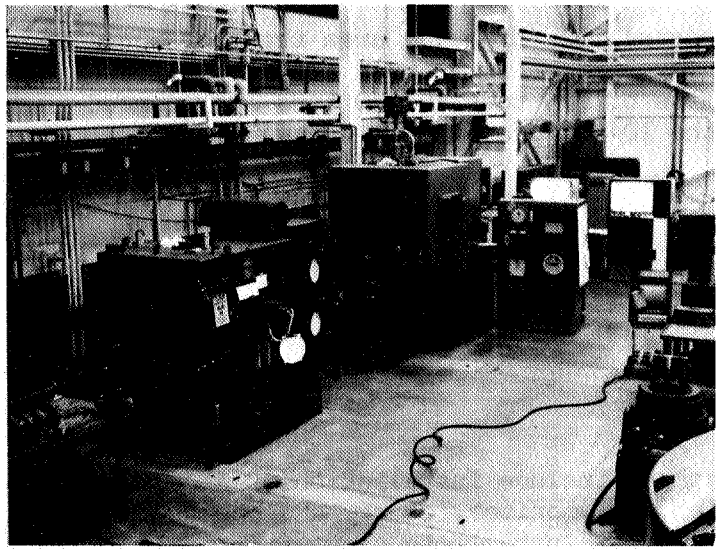
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-04-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Environmental Test and Evaluation Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Laboratory, Instrument

5. TECHNOLOGICAL AREAS SUPPORTED: Environmental qualification, testing, and evaluation of instruments for use on manned spaceflight vehicles.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility provides capability for quality assurance testing, engineering testing and flight qualification verification of flight instruments and electronic systems. Environmental conditions are simulated for temperature, pressure, vacuum, constant acceleration, mechanical shock, vibration, explosive atmosphere, salt fog and humidity. The following equipment and capability exists at the present time.

a. Temperature: -300°F to +500°F
b. Altitude: 1×10^{-8} torr
c. Acceleration: Up to 100g for 200 pounds
d. Shock: 80g maximum force for 300 pounds with combinations of half sine, sawtooth, and square wave outputs
e. Vibration: Up to 10,000 force pounds sine with automatic equalization and analysis of random spectra.

6. NARRATIVE DESCRIPTION

f. Explosive atmosphere: Variable pressure from sea level to 80,000 feet with working volume of approximately 1 cubic yard.

g. Salt fog: Working volume of 12 cubic feet with salt concentration variable to a maximum of 20 percent by weight. Also has variable temperature capability between +40°F and +185°F.

h. Combined environments: (1) Temperature-Altitude; -300°F to +470°F in a vacuum of 1×10^{-8} torr. (2) Temperature-Humidity; +40°F to +185°F with relative humidity range between 5 percent to 98 percent.

i. Tem-press-humidity; +40°F to +200°F with pressure range from 25 to 0.1 PSIA in a relative humidity that can be varied manually. The working volume of this chamber is approximately 1 cubic yard.

The laboratory is located in a high-bay area that has a ceiling height of 36 feet and an access door 34 feet six inches high by 18 feet 7 inches wide. Two cranes with load limits of 1-½ tons and 10 tons are located in this same area. The hook height of the 10-ton crane is 26 feet.

7. POTENTIAL: Present plans include installation of an automatic test data acquisition system which will monitor, store, and process instrumentation test data on a real time basis. Approximate cost of installation estimated at $23,000.

8. PLANS: Completion of installation of system mentioned in item g. above is scheduled for first quarter of FY 67.

9. BLDG. NO.	15	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	320-60
12. INITIAL COST: $	350 K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	940 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.):*	Lockheed Electronics Company		

20. OTHER SOURCES OF INFO: "Major Test Facilities of Engineering and Development Directorate," Brochure.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Instrumentation & Electronic Systems Div. (AC 713) 483-2871

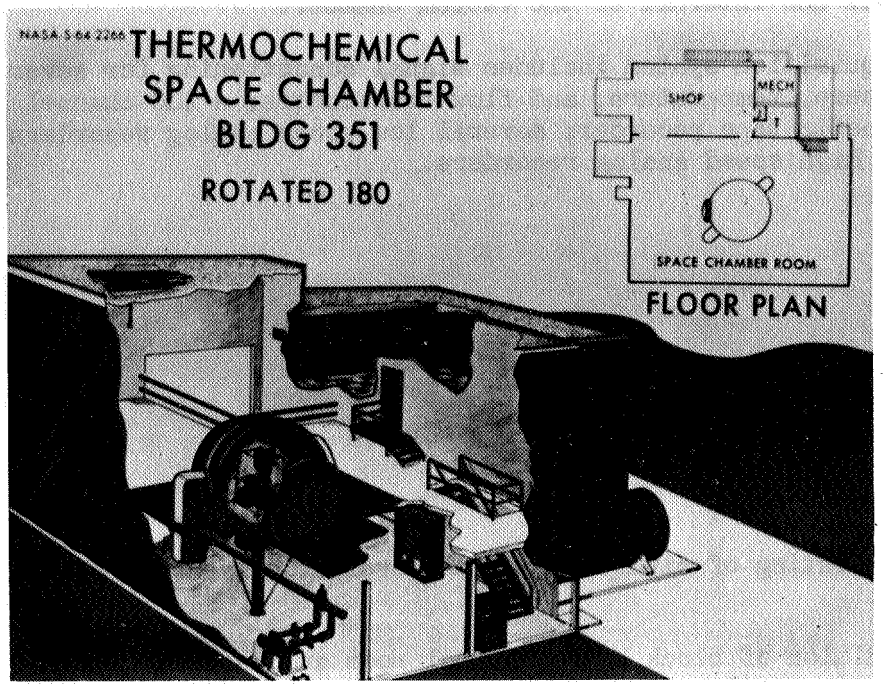
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-05-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Space Chamber Test Facility

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Spacecraft subsystems (primarily power generation and attitude control) design verification and development.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is designed to accomplish complex tests on spacecraft subsystems in a high vacuum and a selectable thermal environment. The net useable volume is effectively a 13-foot sphere with a 9-foot diameter entrance passage. The location and structural aspects of the facility permit an extensive degree of hazardous testing.

Vacuum levels of 1×10^{-5} torr are maintained with complex test configurations that present significant outgassing and leak gas loads. Direct effluent gas loads to approximately one SCFM permit altitude simulation between 50 and 1000 microns.

6. NARRATIVE DESCRIPTION

Thermal simulation from -320°F to +300°F is accomplished by flowing LN_2 or GN_2 through thermal shrouds which optically envelope the interior of the vacuum sphere. The shrouds and thermal control system are designed to permit thermal isolation of three independent areas within the vacuum chamber, and the capability of controlling each area at different temperatures. Facility design allows for future installation of a solar simulator.

External test article accessory, control, and instrumentation functions are accommodated by many feedthrough penetrations. Approximately 500 electrical functions and 30 fluid flow functions are available at quick change interfaces both external and internal of the vacuum chamber.

The data acquisition system includes signal conditioning for several types of force, pressure, temperature, and flow transducers; a 400 channel low speed digital magnetic tape recorder; several low speed analog recorders; and 24 channels of high speed analog recorders.

7. POTENTIAL: Testing of direct energy conversion devices and systems.

8. PLANS: Addition of block house control room and laboratory area to facilitate liquid hydrogen testing as well as advanced power systems development testing.

9. BLDG. NO. 351 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310 22

12. INITIAL COST: $ 810.5 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,000 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Propulsion and Power - Major Test Facilities of the Engineering and Development", MSC, Houston, Texas

21. COGNIZANT ORGANIZATIONAL COMPONENT: Propulsion and Power Division
Thermochemical Test Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Thermochemical Test Branch (EP6)
Phone: (Area Code 713) 483-4991

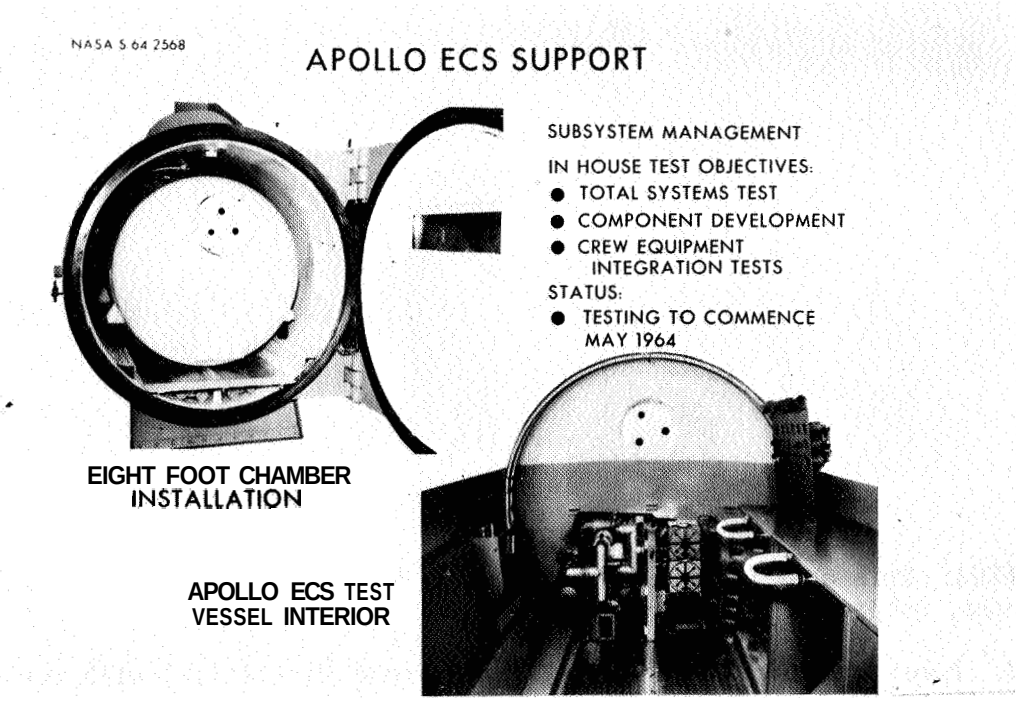
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-06-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Eight Foot Diameter Altitude Chamber

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility (8-ft.)

5. TECHNOLOGICAL AREAS SUPPORTED: Development and qualification testing of environmental control systems, portable life support systems, space suits, and design verification of system components during manned and unmanned tests.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The 8-foot diameter altitude chamber is an end loading horizontal cylinder chamber approximately 20 feet long. A section of the chamber is separated by an internal door to form an observed air lock. The chamber is connected to the pumping system through a system of pipes and isolation valves which allows testing in either chamber but not simultaneously. The pumping system is capable of pumping the system to a simulated altitude of 225,000 feet by two blowers backed by an oil-sealed pump. The chamber controls consist of manually operated ball and gate valves mounted in a central control panel. The chamber operator can view the chamber interior through a viewing window. In addition, a system of closed circuit television allows the operators and monitors to view the systems under test. Temperature and pressure are continuously monitored during the test and are displayed to the operators as well as recorded by a Data Acquisition System. Chamber Environmental

6. NARRATIVE DESCRIPTION

Control Systems supply pre-conditioned 100% oxygen to both the chamber and the lock. An intercommunication system provides communication capability between test subjects and operating crews and monitors.

7. POTENTIAL: This chamber (when relocated in 1966) will be used for training lock observers, subjects, and operating crews.

8. PLANS: A new chamber (LEM Internal Environment Simulation) will replace this chamber in 1966.

9. BLDG. NO. 7 **10. YR. BUILT:** Unknown **11. FAC. CAT. CODE:** 320 30

12. INITIAL COST: $ Excess USAF Property K **13. NASA B.O.D.** 1962 **14. STATUS CODE:** Active

15. ACCUM. COST: $ 100 K **16. LIFE EXPECT.** Indef. **17. OWNER CODE:** NASA

18. OPER. CODE: NASA **19. CONTRACTOR NAME** *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Crew Systems - "Major Test Facilities of the Engineering and Development Directorate, April, 1965", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Crew Systems Division, Systems Test Branch

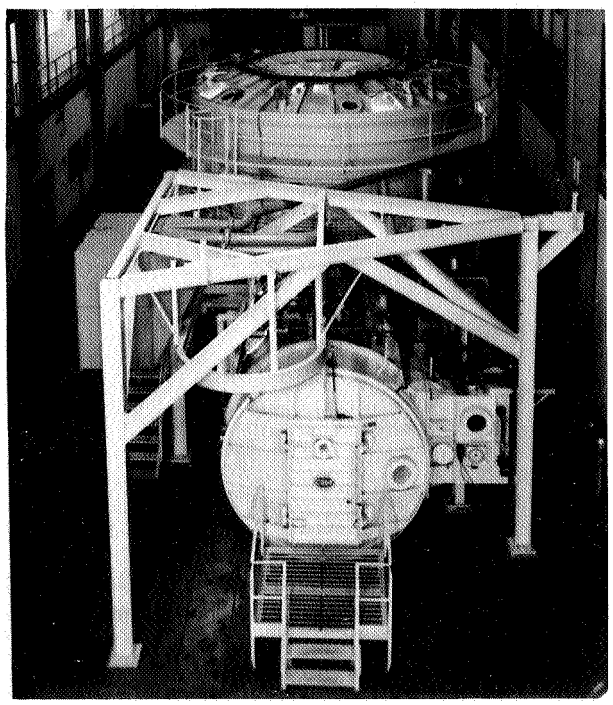
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Systems Test Branch (EC4)
Phone: (Area Code 713) 483-4291

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 15, 1966
	FACILITY NO:	11-00-07-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Twenty Foot Diameter Altitude Chamber

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility **(20-ft.)**

5. TECHNOLOGICAL AREAS SUPPORTED: Development and qualification testing (See Item 6)

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The 20-foot diameter altitude chamber is a top loading-cylindrical stainless steel vessel that is approximately 22 feet high. A 10-foot diameter two compartment air lock, 20 feet long is attached to the main chamber. The outer air lock is joined by a 70 cubic-foot parasite rapid decompression chamber. The main chamber may be pumped down to a simulated altitude of 225,000 feet by two blowers backed by an oil-sealed pump. The air locks may be pumped to altitude immediately. Tests are monitored by chamber and lock operators, test monitors, medical monitors, and test conductors located at consoles in the control room. The chamber may be rapidly recompressed at controlled dates in the event of a manned test system failure which requires such action.

6. NARRATIVE DESCRIPTION

Temperature and pressure are continuously monitored during the test and are displayed to the operators as well as recorded by a Data Acquisition System. Chamber environmental control systems supply pre-conditioned 100% oxygen to both the main chamber and the locks. Closed circuit television monitors all manned and unmanned operations within the chamber and locks. An intercommunication system allows test subjects and operating crew and monitors to communicate during the test.

This facility supports the following technological areas: Development and qualification testing of boilerplate, spacecraft, environmental control systems (ECS), space suits, extravehicular activity equipment (EVA), and system components during manned and unmanned tests; astronaut training for EVA; and rapid decompression testing.

7. POTENTIAL: Additional capability for space simulation could be achieved by adding (a) diffusion pumps (b) cold shroud (c) thermal simulation sources.

8. PLANS: None

9. BLDG. NO. 7 **10. YR. BUILT:** 1961 **11. FAC. CAT. CODE:** 320 30

12. INITIAL COST: $ 600 K **13. NASA B.O.D.** Aug. 1964 **14. STATUS CODE:** Active

15. ACCUM. COST: $ 600 K **16. LIFE EXPECT.** Indef. **17. OWNER CODE:** MASA

18. OPER. CODE: NASA **19. CONTRACTOR NAME** *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Crew Systems - Major Test Facilities of the Engineering and Development Directorate, April, 1965", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Crew Systems Division
Systems Test Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief., Systems Test Branch (EC4)
Phone: (Area Code 713) 483-4291

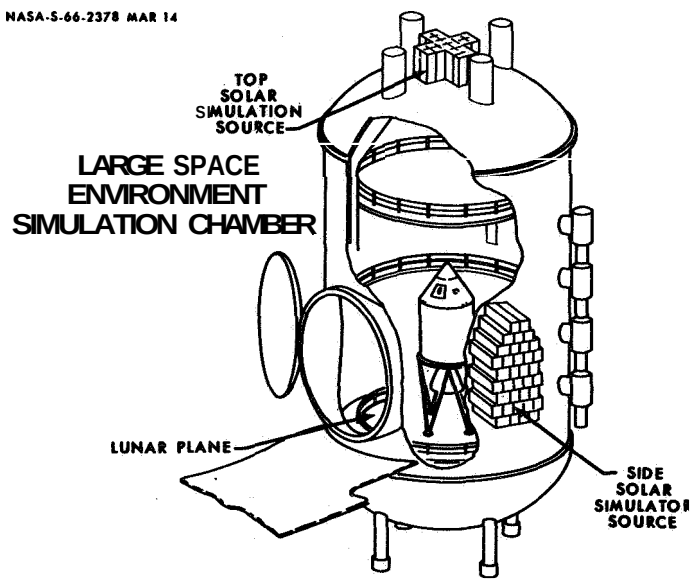
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-08-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Space Environment Simulation Chamber "A"

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility (Chamber "A")

5. TECHNOLOGICAL AREAS SUPPORTED: Approximation of space environment conditions of temperature, pressure and solar light, for testing of spacecraft and equipment

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is approximately 120 feet high by 65 feet wide and has an inside free volume of approximately 5.5 feet by 90 feet. The entire chamber is lined with a liquid nitrogen cooled heat-sink which can be cooled to approximately 80°K. Vacuum is achieved by a "rough-pumping" system of mechanical pumps and blowers, 14 oil diffusion pumps, and 1350 square feet of cryopanels cooled with refrigerated helium. Ultimate chamber pressure is approximately 6×10^{-7} torr. The chamber has a 40-foot vehicle access door and four personnel access air-locks at three separate levels.

Carbon-arcs simulate solar radiation from the top and side of the chamber. The top "sun" has a target area 13 feet in diameter and the side sun has a target area 13 feet wide by 33 feet high.

6. NARRATIVE DESCRIPTION

The floor of the test volume of the chamber includes a 45-foot diameter rotating section, that rotates 180° clockwise and counter-clockwise. The rotating plane can be cooled with liquid nitrogen to 80°K or electrically heated to 400°K.

7. POTENTIAL: (1) addition of four more diffusion pumps, (2) expansion of solar simulation targets to 20 by 65 feet by 20-foot diameter (3) addition of fifth personnel air lock.

8. PLANS: (1) and (2) abcve, FY 1967; (3) above, -requested in FY 68 C of F Budget

9. BLDG. NO. 32 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320 21

12. INITIAL COST: $ **33,246 K 13. NASA B.O.D. 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ 49,868 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA/Contr. 19. CONTRACTOR NAME *(if contr. oper.):*
Brown & Root-Northrop

**SESL facility (Bldg, 32) cost $49,868,000 and includes Chamber A, Chamber B, Laboratory complex, buildings, and 2 ACE stations.

20. OTHER SOURCES OF INFO: "Tour of SESL" NASA Manned Spacecraft Center, Houston, Texas January 21, 1966. "Space Environment Simulation Laboratory. Test Facilities" Houston, NASA-MSC, February 8, 1966.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Space Environment Simulation Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Space Environment Simulation Branch (ES6)
Phone: (Area Code 713) 483-2816

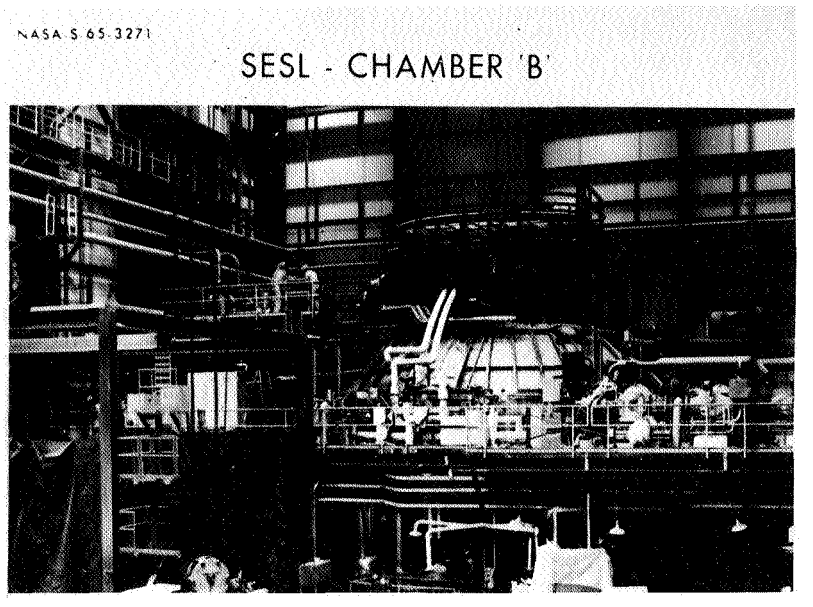
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-09-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Space Environment Simulation Chamber "B"

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Environmental Test Facility (Chamber "B")

5. TECHNOLOGICAL AREAS SUPPORTED: Approximation of space environment conditions of temperature, pressure, and solar light, for testing of spacecraft and equipment.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is 43 feet high by 35 feet in diameter and has an inside free volume 25 feet wide by 27 feet high. There is one double personnelair-lock at floor level. The ultimate pressure is 2×10^{-6} torr (approx.). Vacuum is achieved by mechanical pumps and blowers, and 12 oil diffusion pumps. Entire test volume of chamber is lined with liquid nitrogen cooled heat-sinks. Temperature of the floor of the chamber can be controlled between 80 and 400°K. Solar radiation is simulated by seven Argon-carbon-arc modules in the top of the chamber. Target area of this "sun" is 5.6 feet in diameter.

Tap head of Chamber B is removable (by utilizing a 50-ton overhead bridge crane) for the installation of large test articles.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Provisions are made to expand top solar simularor to 20-foot diameter target area.

8. PLANS: Requested in C of F Fiscal Year 67-68 funding.

9. BLDG. NO. 32 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320 21

12. INITIAL COST: $ **16,123 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ **49,868 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):* Brown & Root-Northrop

**SESL Facility cost $49,868,000 and includes Chamber, Chamber B, laboratory complex, buildings, and 2 ACE stations

20. OTHER SOURCES OF INFO: "Tour of SESL" NASA-Manned Spacecraft Center, Houston, Texas, January 21, 1966. "Space Environment Simulation Laboratory Test Facilities" Houston, NASA-MSC February 8, 1966.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Space Environment Simulation Branch

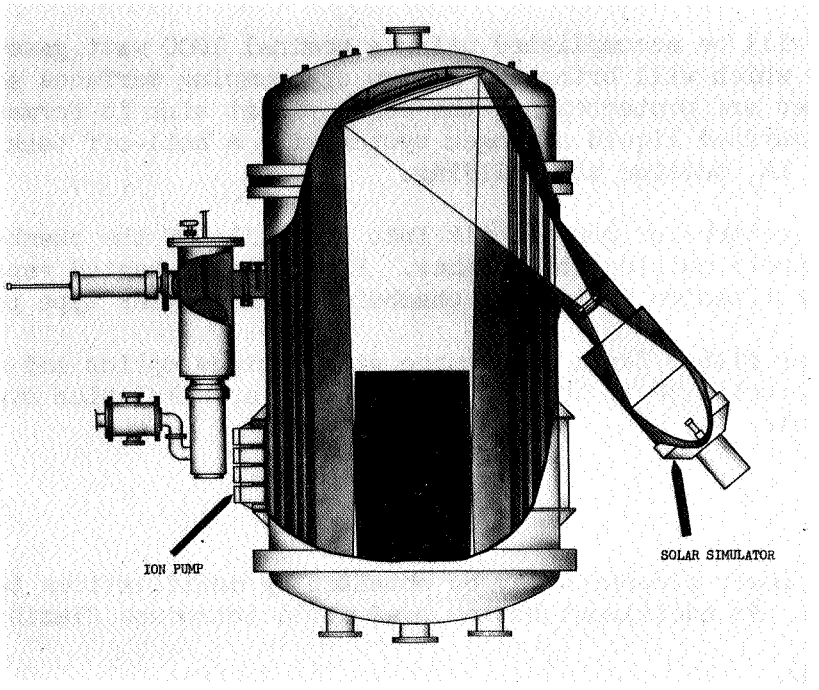
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Space Environment Simulation Branch (ES6)
Phone: (Area Code 713) 483-2816

TECHNICAL FACILITIES RESUME	DATE OF RESUME: July 15, 1966
	FACILITY NO: **11-00-10-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston

2. FACILITY NAME: Ultra High Vacuum Space Simulation Chamber "D"

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility (Chamber "D")

5. TECHNOLOGICAL AREAS SUPPORTED: Testing, development and reeearch on spacecraft systems, components or complete craft, or materials, processes, etc., in ultra-high vacuum, with space environment simulations.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is capable of vacuum simulation of space with solar simulation produced by a filtered Xenon arc source, and the heat sink of space simulated by an LN_2 cold wall.

The working Volume is 6 feet in diameter by 6 feet high and can be evacuated to 5×10^{-7} torr by a combination of pumping means. The vessel is 9 feet in diameter and 18 feet in height. The cylindrical vessel is oriented with its axis vertical and the lower flange is 17 feet above the building floor. The test article or experiment will be mounted on the bottom head and will be elevated into the chamber by a set of three screwlifts extending down from above.

The bottom head will be prepared in a Class 100,000 Clean Room adjacent to

6. NARRATIVE DESCRIPTION

the chamber and will be rolled on casters to the loading position under the chamber. Most of the control and electrical leads and fluid lines or other necessary connections from the test article will penetrate the bottom head. This will give the capability to test these devices before placing the head on the chamber.

The total weight of the test load should not exceed 2000 pounds.

Pumpdown of the chamber to its ultimate pressure should not exceed 24 hours. Roughing pumps and diffusion pumps prepare the chamber for the ultimate stages of pumping which shall be a combination of cryopumping, gettering with titanium and getter ion pumping.

Cryopumping will be accomplished using a nominal 1000 watt gaseous helium refrigerator which will bring the helium cryopumping surfaces as low as 14°K. These surfaces are protected and the chamber heat sink is formed by a circulating, pressurized liquid nitrogen system with a boil-off tank and storage tank for the LN_2 outside the building.

There are 96 getter-ion pumps built into the walls of the chamber with the permanent magnets outside the chamber. Electrically heated vaporizers will sublimate the titanium inside the chamber for the getter type pumping.

A Perkin-Elmer filter Zenon Arc source with various optics and a parabolic mirror will provide 60 to 140 watts/sq. ft. solar simulation over a 3.5 foot diameter circle.

7. POTENTIAL: Lower pressures may be obtained by modifications to utilize helium cryosorption. An additional bottom head would introduce flexibility.

8. PLANS: None

9. BLDG. NO. 33 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 320 21

12. INITIAL COST: $ 750 K 13. NASA B.O.D. 1966 14. STATUS CODE: In Constr.

15. ACCUM. COST: $ 750 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA/Contr. 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: None

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief., Structures and Mechanids Division (ES)
Phone: (Area Code 713) 483-4407

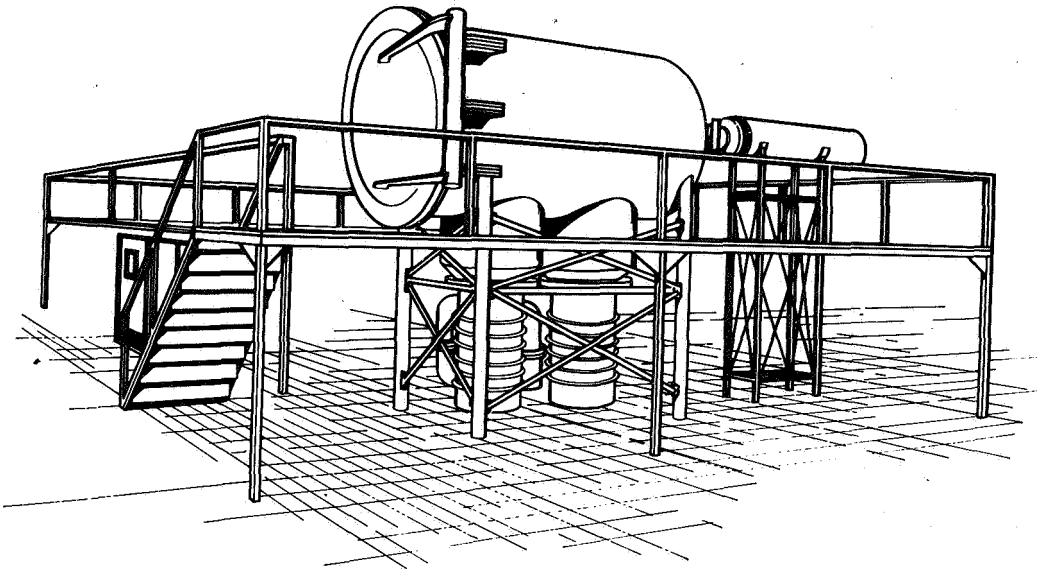
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-11-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: High to Ultra-High Vacuum Chamber "E"

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility (Chamber "E")

5. TECHNOLOGICAL AREAS SUPPORTED: Testing, development and research on spacecraft systems and components in high-vacuum, with space environment simulations; thermal-vacuum studies.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This 7-foot diameter by 13-foot long chamber has an internal work space 4 feet in diameter by 6 feet long with the helium shroud and 5 feet in diameter by 10 feet long with just the LN_2 shroud. Hard points are provided for test objects: 1×10^{-9} torr with helium cryopumping and 1×10^{-8} torr with diffusion pumps only. The solar simulator has a 1 sun intensity, a carbon arc source covering 40" diameter target with plus or minus 8% uniformity.

The chamber has two 32-inch diffusion pumps backed by a 10-inch diffusion pump and a KT-500 mechanical pump. This gives an effective pumping speed of approximately 12,000 liters per second for the mechanical-diffusion pumping system.

A pumping speed of 480,000 leters per second is provided by a combination

6. NARRATIVE DESCRIPTION

of liquid nitrogen and 20°K gaseous helium cryopanels.

The chamber is equipped with heaters to allow bakeout temperatures of 500°F.

The helium refrigerator is an A. D. Little Model 3.

Hard point design in chamber designed to take 500 pound test load.

One full opening door at end of chamber for access.

Included with this facility in the same building are the following vacuum chambers:

Chamber "D" (separate resume prepared for this chamber)
" F
" G
" H
" I
" K
" L
Chamber N

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 33 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 21

12. INITIAL COST: $ 250 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 250 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA/Contr. 19. CONTRACTOR NAME *(if contr. oper.)*: Brown & Root-Northrop

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Structures and Mechanics Division (ES)
Phone: (Area Code 713) 483-4407

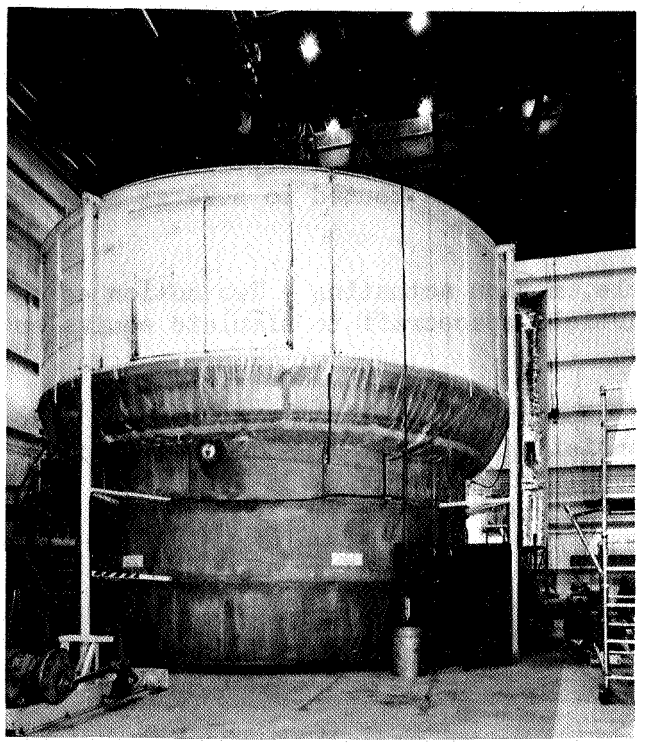
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-12-00

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Water Test Chamber

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Water Test Chamber Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Operational and developmental testing of spacecraft postlanding systems and spacecraft recovery equipment. Development of preliminary postlanding procedures and techniques for flight crews and recovery personnel; spacecraft postlanding motion analysis.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The chamber consists of a 16 foot high, 25 foot diameter steel water tank surrounded by a catwalk and covered by a 10 foot high, 31 foot diameter removal bonnet. A 250 square foot work area, located outside the chamber enclosure, is connected to the catwalk.

Supporting systems associated with the chamber provide the following:

a. Water supply - Provides filtered, chlorine treated, recirculated water. The water depth can be adjusted from 1 ft. to 14., and the water temperature can be controlled.

6. NARRATIVE DESCRIPTION

b. Chamber air conditioning - 50 ton system capable of supplying 4550 CFM of 58°F to 60°F air snd a humidifier capable of maintaining chamber humidity at 85 to 95 percent.

c. Solar Radiation - 32 individually controlled (1000 Watts each) radiant heaters.

d. Wind Velocity - A pneumatic operated fan capable of providing up to 10 KTS. wind velocity.

e. Lighting - Capable of supporting underwater and chamber photography and television coverage.

f. Communications - Underwater speaker system suitable for scuba swimmer communication and two way voice capability inside the chambsr and on the adjacent work area which can be routed to several areas within the building which houses the test chamber.

g. Test article, motion actuating - Two motion actuators designed to oscillate a test article spacecraft to simulate equivalent motions produced at sea.

h. Hoisting Equipment - Overhead monorail crane assembly located above the chamber and consisting of one 7 1/2 ton, one 4 ton, and four 2 ton hoists. The maximum lifting height is 35 feet above the building floor and 19 feet above the test chamber tank.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 260 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 320 21

12. INITIALCOST: $ 20 K 13. NASA B.O.D. 1963 14. STATUS CODE: Active

15. ACCUM. COST: $ 161 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*.

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Landing and Recovery Division

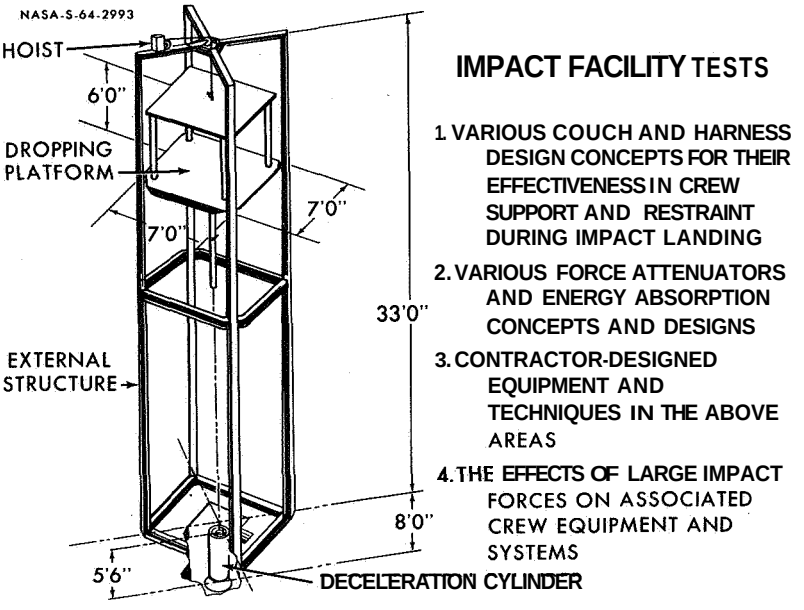
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Landing and Recovery Division (FL)
Phone: (Area Code 713) 483-3126

TECHNICAL FACILITIES RESUME	DATE OF RESUME: July 15, 1966
	FACILITY NO: 11-00-13-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Impact Test Facility

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Impact Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Impact testing of spacecraft components; test and evaluation of crew support systems, restraint systems, force attenuations and energy absorption systems; qualification testing of spacecraft systems for spaceflight.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of (a) a 33-foot high external structure with guide rails and a hoist, (b) a 7-foot by 7-foot dropping platform with an attached striker, and (c) a hydraulic decelerator. The inner cylinder of the hydraulic decelerator is perforated with about 600 holes. These holes may be unplugged in a predetermined manner to select the wave form of the decelerator time curve. When the dropping platform with test object is released, the platform drops a perdetermined distance and the striker enters the hydraulic decelerator. The hydraulic fluid is driven from the deceleration chamber to the preselected holes within the cylinder to absorb the energy of impact and to provide the desired deceleration time curve. A spring-loaded onset mechanism allows proper onset adjustment. The following capability exists: 0 to 23 feet drop height; 0 to 38 ft/sec. velocity change; 8-100 g deceleration range; 0 to 280

6. NARRATIVE DESCRIPTION

millisecond time range; 0 to 10,000 g/sec, onset; 1/2 size versine, triangular, and trapezoid wave simulation and a payload capability of 1 to 2000 lbs, which may be located on the platform with g vertical clearance.

This facility is instrumented with strain gages, transducers, accelerometers, and data acquisition equipment. A lighting system and high speed motion picture installation prwide visual data of impact motions and stopping distances.

The facility is used for equipment testing and is not manrated.

7. POTENTIAL: Capabilities increased by (a) modifications to permit manrating and (b) by addition of velocity imparter.

8. PLANS: None

9. BLDG. NO.	7	**10. YR. BUILT:**	1965	**11. FAC. CAT. CODE:**	320 21
12. INITIAL COST: $	314 K	**13. NASA B.O.D.**	1965	**14. STATUS CODE:**	Active
15. ACCUM. COST: $	435 K	**16. LIFE EXPECT.**	Indef.	**17. OWNER CODE:**	NASA
18. OPER. CODE:	NASA	**19. CONTRACTOR NAME (if *contr. oper.*):***			

20. OTHER SOURCES OF INFO: MSC Internal Note No. MSC-In-65-EC-3, "Operation Characteristics of the Crew Systems Division Impact Test Facility", NASA, June 1, 1965.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Crew Systems Division, Systems Test Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief., Systems Test Branch (EC4)
Phone: (Area Code 713) 483-4291

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-14-00

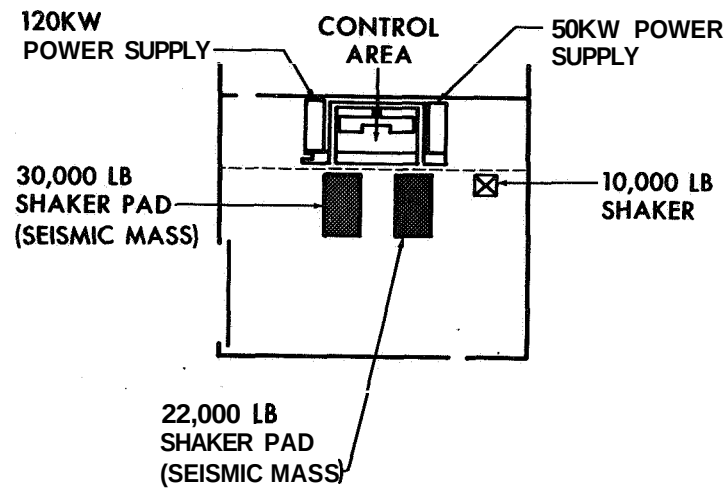
1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: General Vibration Laboratory

3. LOCATION *(if other than in 1. above):*

NASA-S-64-2643

LAYOUT OF GENERAL VIBRATION LABORATORY



4. FUNCTIONAL NAME: Vibration Test Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Dynamic structural testing; component environmental testing.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory has the capability to test structures, systems, and components with a wide variety of shaker systems: (1) A 30,000 force-pound shaker (Ling L249); (2) A 10,000 force-pound shaker (Ling); (3) A horizontal slip table driven by two 10,000 force-pound thrusters (Ling A-310); (4) Two 1500 force-pound shakers (Ling); (5) A six-channel modal survey system (each channel consists of a 150 force-pound thruster and a 1000 watt power amplifier).

A wide variety of control equipment is available including power amplifiers (one 120 kilowatt and two 6 kilowatt units), two random equalizers, two feedback controlled oscillators, and miscellaneous laboratory instruments. In addition much of the equipment in the Spacecraft Vibration Laboratory (see resume) is available for use in this facility. The laboratory has

6. NARRATIVE DESCRIPTION

two seismic masses with air spring supports for vibration isolation; each mass is 17 feet long by 10 feet wide, by 6 feet deep. Overall dimensions of the laboratory are 65 feet by 85 feet. The entire laboratory is served by a 20-ton overhead bridge crane. Access to the laboratory is through a large door 30 feet high by 23 feet wide and five personnel doors. Steel tiedown beams are located on eight-foot centers and run flush with the laboratory floor along the 85-foot axis. A small control room 28 feet by 14 feet is located adjacent to the seismic mass area, which is the central test area in the laboratory.

A portion of the laboratory is used as an assembly or staging area for test articles being prepared for use in any of the three laboratories in the facility.

Instrumentation support for data acquisition is provided from the Main Control Room (see resume of Vibration and Acoustic Test Facility).

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 49 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320 10

12. INITIALCOST: $ 1808 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*
Brown & Root-Northrop

20. OTHER SOURCES OF INFO: 'Major Test Facilities of the Engineering and Development Directorate", Brochure, April, 1965, pp 7-26 to 7-29

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Structural Dynamics Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Structural Dynamics Branch (ES2)
Phone: (Area Code 713) 483-3007

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-15-00

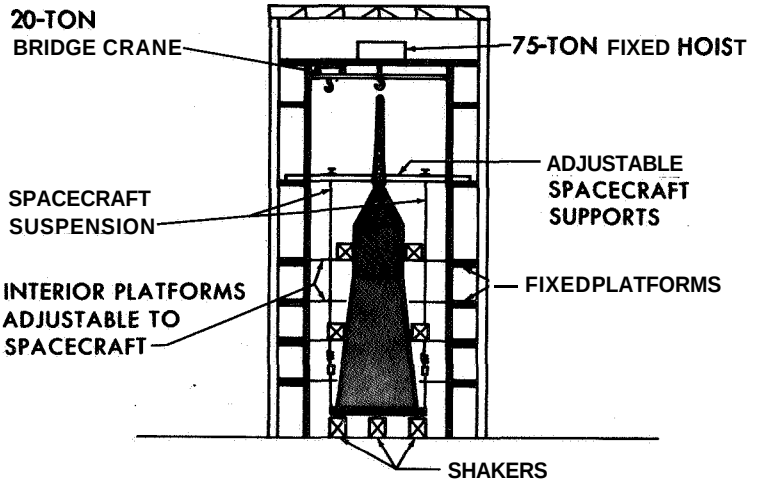
1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Spacecraft Vibration Laboratory

3. LOCATION *(ifother than in 1. above):*

NASA-3-64-2631

SPACECRAFT VIBRATION LABORATORY



4. FUNCTIONAL NAME: Vibration Test Laboratory, Spacecraft

5. TECHNOLOGICAL AREAS SUPPORTED: Dynamic structural testing; dynamic systems testing.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory was designed for vibration testing of an entire integrated spacecraft in its launch attitude. The testing is performed *using* either six 10,000 force-pound thrusters or *six* 150 force-pound thrusters; energy levels high enough to excite the structure for determination of resonant frequencies, mode shapes, and damping characteristics will be used. Spacecraft on-board systems may be included and operational during the test.

Dimensions of the laboratory are 60 feet by 60 feet with a clear height of 93 feet; access to the laboratory is through a large access door, 32 feet wide by 40 feet high. Clear floor area inside the permanent platforms is approximately 35 feet by 45 feet (none of the adjustable platforms or supports depicted in the facility sketch are available). A 75-ton fixed point hoist is mounted on the center line of the laboratory for stacking of

6. NARRATIVE DESCRIPTION

modular components of a test vehicle (hook height is 93 feet), and a 20-ton bridge crane can provide general purpose material handling.

Permanent platforms are installed at elevations of 15, 25, 35, 45, 65, and 85 feet. Each platform is 8 feet wide and runs along the perimeter of the tower on three sides; each platform provides receptacles for mounting adjustable platforms for personnel access to test articles. A freight elevator with an 8000-pound capacity services the platforms.

Equipment to operate and control the thrusters is located in the facility Main Control Room (see Vibration and Acoustic Test Facility Resume); the equipment includes three 175-kilowatt power amplifiers, six 1-kilowatt power amplifiers, random shaping and control consoles, sine control consoles, and instrumentation support for data acquisition.

7. POTENTIAL: Expansion to 12-channel systems (either 10,000 force-pound or 150 force-pound).

8. PLANS: None

9. BLDG. NO.	49	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	320 10
12. INITIAL COST: $	3104 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	3104 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):* Brown & Root-Northrop			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure, April, 1965, pp7-29 to 7-32

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Structural Dynamics Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Structural Dynamics Branch (ES2)
Phone: (Area Code 713) 483-3007

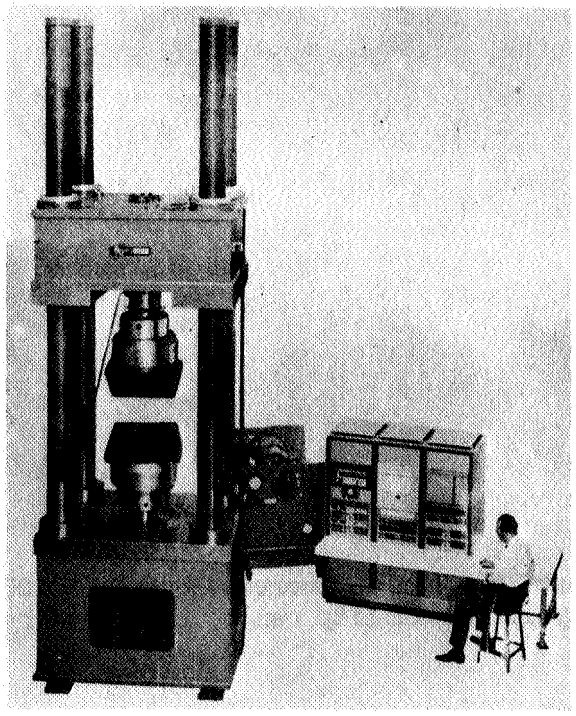
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-16-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: 600,000 Pound Capacity Universal Testing Machine

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Structural Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: General purpose machine for calibration and testing of structures and structural components.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This machine is a closed loop electro-hydraulic testing system with a nominal load capacity of ±600,000 pounds. The load cell is supported in the adjustable upper crosshead. This moveable crosshead, supported by four 10-inch columns allows a maximum vertical opening of 72 inches between tension-compression grips or 120 inches between compressioa platens, which are 48 inches square. The grips are hydraulically operated and hydraulically locked in alignment. Maximum travel of the ram is 10 inches. The machine can be controlled in three modes; stress or load, strain, or ram motion. Mode of control can be switched without stopping a test. Readout is accomplished on a strip chart, X-Y recorder on a direct reading linear indicator.

6. NARRATIVE DESCRIPTION

The machine can be programmed to function in any of the standard functions; sine, cosine, half-sine, half-cosine, ramp, triangular, or square waves and arbitrary functions utilizing a rotating drum programmer. Present cyclic capability is 10 cpm. This can be greatly increased by increasing the hydraulic pump size.

7. POTENTIAL: Load capability can be increased to **1,000,000 pounds** by increasing operating pressure; cyclic capability can be increased by increasing pump volume.

8. PLANS: None

9. BLDG. NO. 13 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 320 50

12. INITIAL COST: $ 185 K 13. NASA B.O.D. 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ 200 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*:
Brown & Root-Northrop

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division

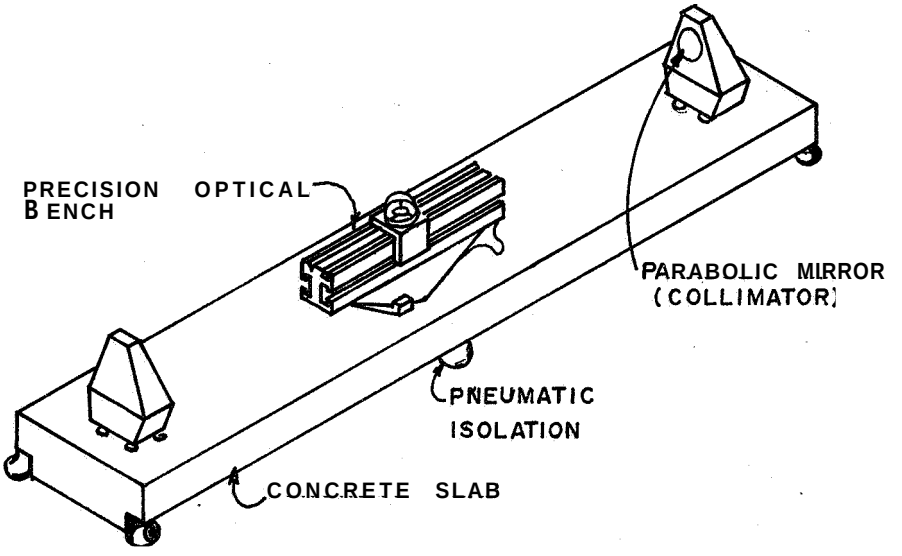
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Structures & Mechanics Division (ES)
Phone: (Area Code **713) 483-2878**

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 15, 1966
	FACILITY NO:	11-00-17-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Physical Optics Laboratory

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Optical Laboratory, Physical

5. TECHNOLOGICAL AREAS SUPPORTED: Lens test and evaluation, optical detectors, telescopes, filters, infrared-ultraviolet-visible spectrum.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is equipped to perform the measurements of MIL-STD-150A for testing of optical components. The entire energy range where optical techniques apply is covered. Special calibration and test procedures will be developed and proved for unique optical instrumentation. Standardized procedures will be developed for flight instrument test and prototype calibration and adjustment.

The facility is centered around a 30' by 4' by 2½' concrete test slab isolated from vibration effects by servo-controlled air bladders. Two 16" diameter parabolic mirrors of 150" focal length are used as diffraction limited collimators. A high precision research optical bench modified for large aperture systems serves as a test bed.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Can be expanded to employ modulation transfer techniques for optical evaluation of lenses and to accommodate large aperture and long focal length systems.

8. PLANS: Addition of modulation transfer instrumentation and special monochromatic light sources.

9. BLDG. NO. 15 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 390 00

12. INITIAL COST: $ 30 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 80 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME (if *contr. oper.):*

20. OTHER SOURCES OF INFO MSC Working Paper "Criteria for IESD Physical Optics Laboratory", April 1, 1966

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Instrumentation & Electronics Systems Division (EE)
Phone: (Area Code 713) 483-2871

TECHNICAL FACILITIES RESUME

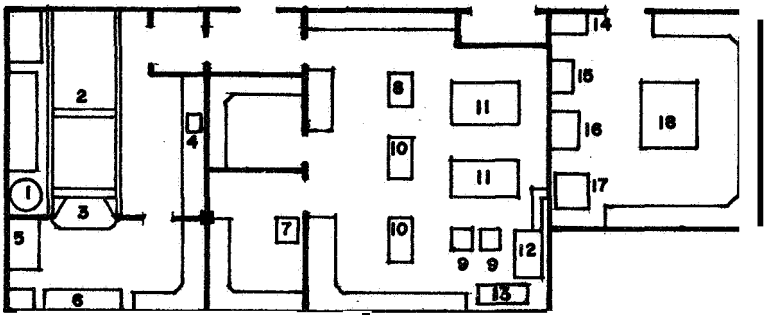
DATE OF RESUME: July 15, 1966

FACILITY NO: 11-00-18-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Microcircuit Laboratory

3. LOCATION *(if other than in 1. above):*



MAJOR EQUIPMENT– MICROCIRCUIT LABORATORY

1. WHIRL COATER
2. COPYBOARD
3. MINIATURIZATION CAMERA
4. SHADOWGRAPH
5. VACUUM FRAME
6. PHOTOGRAPHY BATH
7. WATER PURIFIER
8. CVC VACUUM CHAMBER
9. HIGH VOLTAQE POWER SUPPLY
10. EDWARDS VACUUM CHAMBER
11. DIFFUSION FURNACES
12. EPITAXY REACTOR
13. GAS PANEL
14. K & S BONDER
15. HALL EFFECT CONSOLE
16. HALL EFFECT MAGNET
17. R F GENERATOR
18. COORDINATOGRAPH

4. FUNCTIONAL NAME: Microcircuit Techniques Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Microcircuitry for spacecraft electronic data and communication systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is used to fabricate prototype integrated microcircuit electronic packages using thin-film, silicon monolithic and hybrid configurations. The laboratory is equipped for all phases of microcircuit prototype manufacture which includes artwork, photo-reduction, engraving, device fabrication, and potting (encasing) in the final form. The laboratory is also used to evaluate techniques for fabricating microcircuits. The following are specific laboratory capabilities:

a. Fabrication of prototype versions of microcircuits for spacecraft electronic systems.

b. Research and development to improve the size, weight, and reliability of the microcircuits used in spacecraft electronic systems.

6. NARRATIVE DESCRIPTION

c. Evaluation of various microcircuit and packaging techniques which are proposed by industry for spacecraft applications.

d. Providing engineering support and consultation to other Manned Spacecraft Center activities in the area of microcircuitry.

Laboratory equipment includes a Borruwdale Future Foto reduction camera; a bag-Streit XY Coordinatograph; a Nikon, Model 6, shadowgraph; Edwards High Vacuum Ltd., coating units, 19E6/138 and 19E6/145; a Consolidated Vacuum Corp., Model W-260-TSL, Sonoweld bonder; a Kulicke and Soffa MXIII CS, microdensitometer; a MacBeth quantalog transmittance and reflectance meter; a Varian 3703, 6-inch electromagnet; a Precision Equipment Co. mask alignment fixture; a die slicer; and a Zeiss optical interferometer; four tube gas diffusion furnace, RF Epitaxy unit and Hall Effect measuring equipment.

7. POTENTIAL: Capable of supporting the development of fabrication and evaluation of all types. of microcircuits (silicon monolithic, thin film and hybrid).

8. PLANS: None

9. BLDG. NO.	15	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	320 60
12. INITIAL COST: $	230 K	13. NASA B.O.D.	July 1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	450 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and 'Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation and Electronic Systems Division
Phone: (Area Code 713) 483-2871

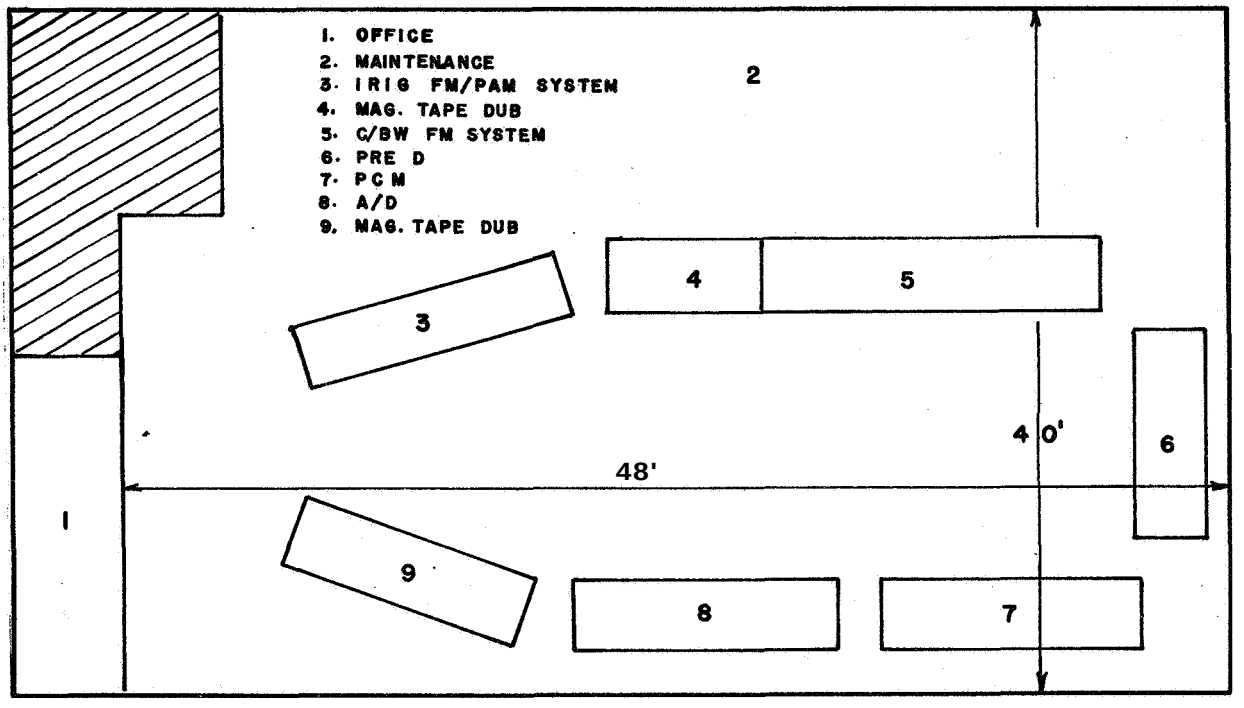
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-19-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Telemetry Receiving Techniques Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Telemetry Receiving Techniques Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Demultiplexing equipment development; data format conversion, demultiplexing, digitizing, recording, analysis.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is designed to accommodate work in the areas of engineering data analysis and telemetry data processing.

Facilities are available in the laboratory for accomplishing the following:

a. Demultiplexing and Demodulation. The laboratory is equipped to accommodate IRIG FM telemetry, AIA FM telemetry, MARK IV FM telemetry, PAM, PDM, and PCM telemetry.

b. Magnetic tape systems. The laboratory is equipped with several tape systems capable of recording and reproducing intelligence frequencies up to 1.5 Mc in the direct mode and has all the standard single carrier FM capabilities for both IRIC wideband carriers and predetection carriers.

6. NARRATIVE DESCRIPTION

c. Analog-to-digital conversion. The Laboratory is equipped with a micro-sadic A/D system which accepts continuous data signals and PAM, PDM telemetry signals. The system operates at rates from 100 cps to 20,000 cps. It records the digital output .on a computer-compatible magnetic tape.

d. Display. The laboratory is equipped to prwide oscillograph and pen recordings of the output data from each of the systems in item number 1.

The capabilities listed abwe make it possible for the laboratory to support the following types of programs.

(1) Data analysis in support of IESD developmental programs.

(2) Support of the operational Apollo program in the area of telemetry ground-support equipment.

(3) Support of the Gemini and Apollo field test programs in the areas of telemetry checkout, receiving, recording, and data analysis.

(4) Investigation, analysis, and development of specialized receiving, demodulation, and recording techniques and hardware associated with spacecraft data systems.

(5) Various data processing functions in support of the central data reduction facility.

7. POTENTIAL: Expansion capability to meet the immediate future requirements of the Apollo Program in the areas of data processing and conversion, engineering data analysis and telemetry systems analysis.

8. PLANS: A "hardline" data transmission system linking the subject laboratory with several other Building 15 laboratories for engineering analysis purposes.

9. BLDG. NO. 15 | 10. YR. BUILT: 1964 | 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 200 K | 13. NASA B.O.D. May 1964 | 14. STATUS CODE: Active

15. ACCUM. COST: $ 850 K | 16. LIFE EXPECT. Indef. | 17. OWNER CODE: NASA

18. OPER. CODE: NASA | 19. CONTRACTOR NAME (*if contr.* oper.):

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief., Instrumentation and Electronic Systems Division
Phone: (Area Code 713) 483-2871

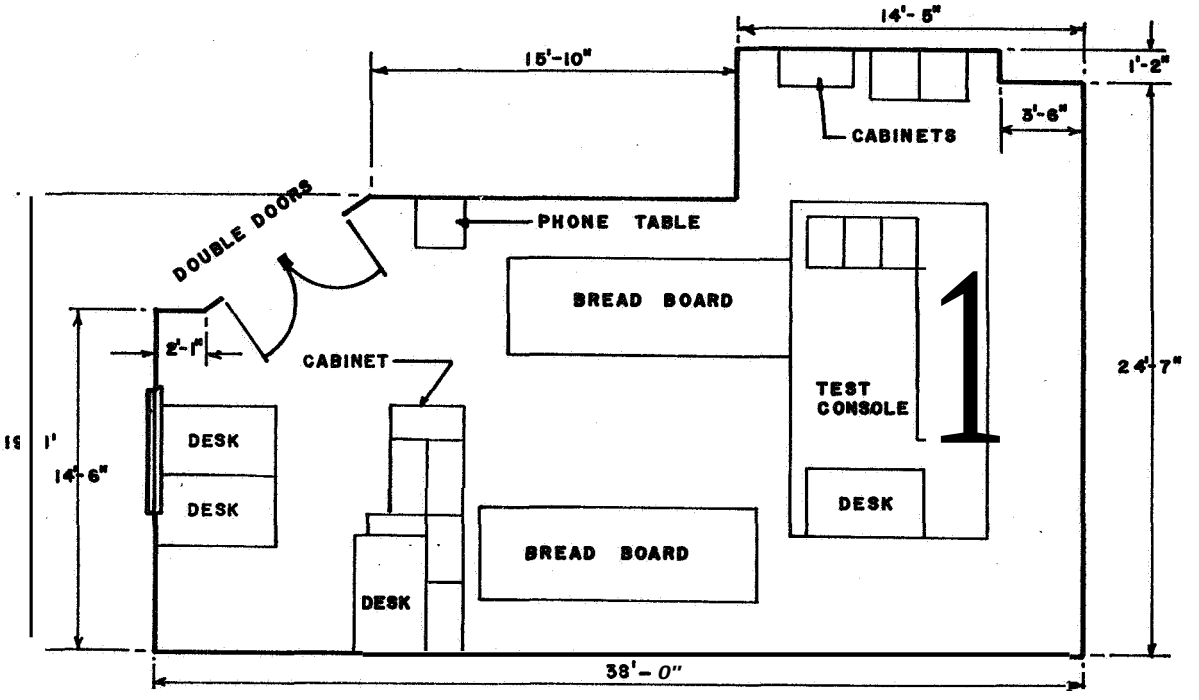
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-20-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Development Flight Instrumentation (DFI) Breadboard Checkout Laboratory

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Instrumentation Development Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Design verification and acceptance of (Apollo) spacecraft development flight instrumentation, Government furnished equipment (GFE) systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility functions as a checkout area for entire DFI GFE systems. The various types of flight hardware (transducers, signal conditioning, radio frequency telemetry and tracking equipment) are assembled together on a large breadboard and detailed hardware and system tests are performed to verify equipment compatibility and integrity prior to shipment to prime contractor. The facility has the capability of manual and automatic testing, and real-time and post-test data display and evaluation. Magnetic and paper recording devices are available.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: **Undefined**

8. PLANS: **To be utilized by the Natural Resources Program after completion of the DFI Program.**

9. BLDG. NO. 15 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 175 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 175 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: **Unknown**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Instrumentation and Electronic Systems Division**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation and Electronic Systems Division (EE)
Phone: (Area Code 713) 483-2871

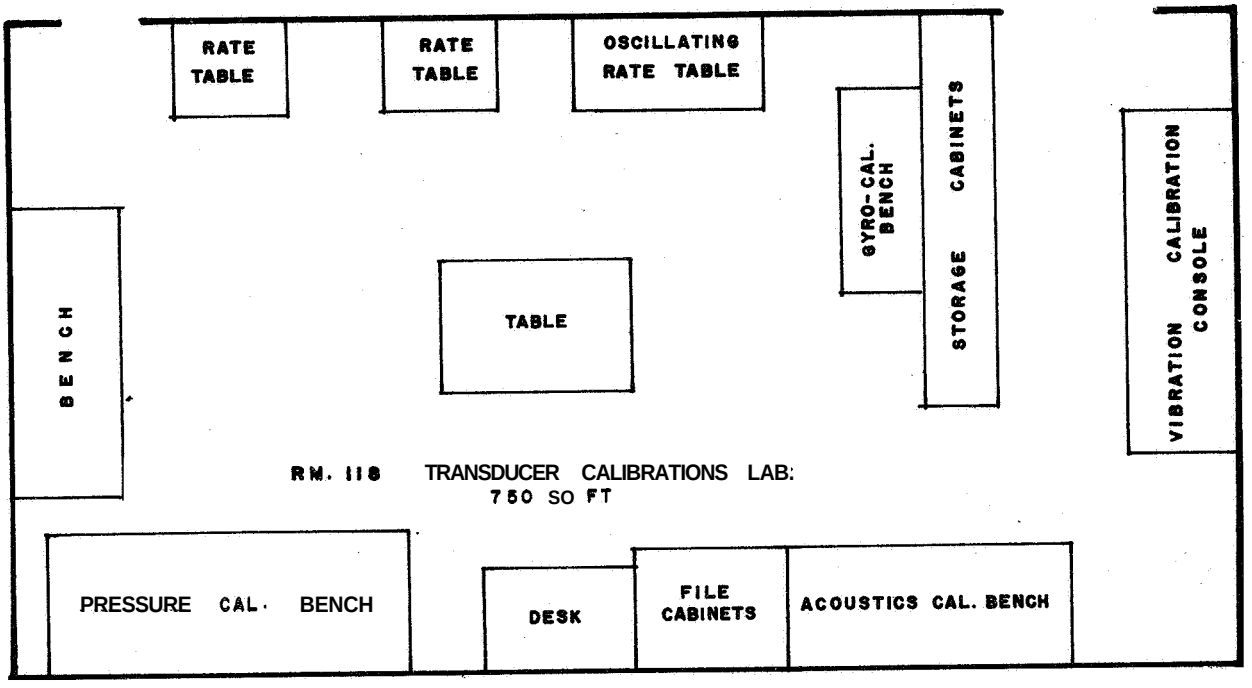
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-21-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Transducer Calibration Laboratory

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Transducer Calibration Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Calibration and/or evaluation of flight transducers used on spacecraft vehicles.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility provides calibration and evaluation capabilities for flight transducers in the folluwing areas: Pressure, acceleration, vibration, angular acceleration, acoustic noise. The following equipment and capability exists at the present time:

1. Pressure - 6 ranges from 0 to 10 psi to 0 - 500 psi with accuracy of plus or minus 0.05% F.S.; 1 range, 0 - 6000 psi with accuracy of 0.1% F.S.
2. Acceleration - Range: 0 - 10 G, Accuracy: plus or minus 0.5%
3. Vibration - Range: 1 to 75 G, Frequency: 10 cps to 8 kc, Accuracy: plus or minus 3%.

6. NARRATIVE DESCRIPTION

4. Angular Acceleration - Range: 0 -200°/Sec; 0 - 10,000°/Sec^2; Accuracy: 0.5% to 5%.

5. Acoustic noise - Range: 100 db to 150 db; Frequency: 20 cps to 8 kc; Accuracy of Standard: 0.2 db/

6. Strain Gage Link Evaluation and Calibration - Range.: 6 ranges up to 60,000 lbs; from -100°F to 1000°F; Application rate: 0.025 to 2 inches per minute. Test Article size: up to 36 inches long.

The laboratory contains approximately 750 square feet area.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 15 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 390 00

12. INITIAL COST: $ 75 K 13. NASA B.O.D. 1964 14. STATUSCODE: Active

15. ACCUM. COST: $ 130 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):*
Lockheed Electronics Company

20. OTHER SOURCES OF INFO: "Major 'test Facilities of Engineering and Development Directorate", Brochure.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation and Electronic Systems Division (EE)
Phone: (Area Code 713) 483-2871

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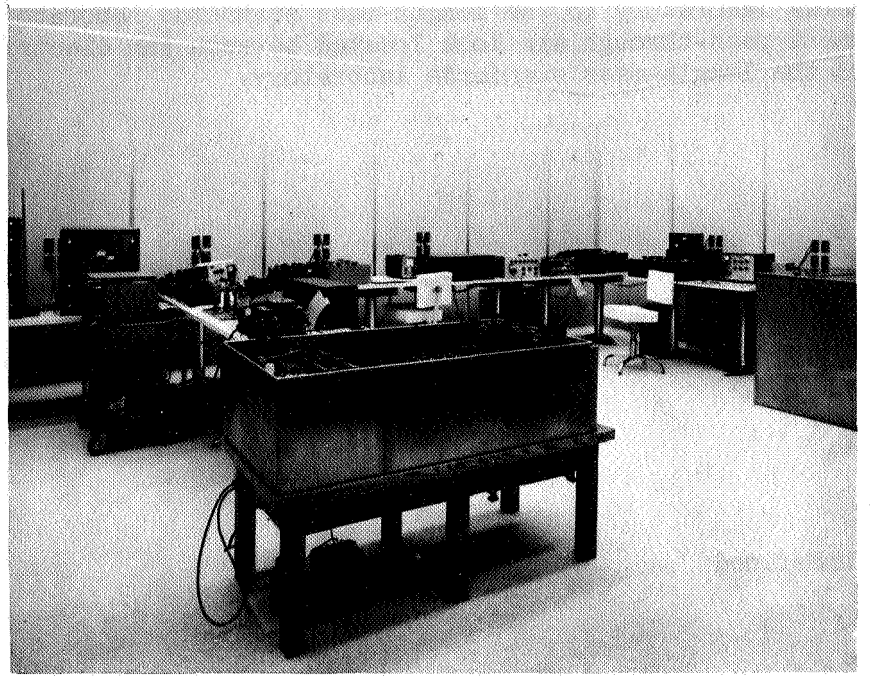
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-22-00

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Standards and Calibration Laboratory

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Instrument Calibration Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Calibration of all electronics and physical sciences measuring instruments.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Measurement Standards and Calibration Facility calibrates all measuring instruments used within the Manned Spacecraft Center (including those used by on-site contractors). This requires the facility to maintain primary, secondary, and working level calibration standards which are referenced to the United States National Standards maintained by the National Bureau of Standards (NBS). The facility calibrates on the average of 2800 instruments per month and utilizes a total floor area of approximately 8254 square feet. The complex consists of eight laboratories located in Building 15 and a satellite laboratory and equipment issue room located in Building 36. Technical capability of this facility includes measurement calibrations for current, voltage, resistance, power, voltage ration, magnetic field, phase angle, frequency, inductance, capacitance, voltage standing wave ratio, field strength, impedance, attenuation, liquid flow, gas flow, pressure, vacuum, temperature,

6. NARRATIVE DESCRIPTION

humidity, acoustics, acceleration, length, mass, volume, angles, roundness, force, viscosity, light radiation, and thermal radiation.

The primary standard laboratory utilizes Building 15 high-bay clean room complex that contains four rooms. One room 16'-11" by 8' is used as a "ready room" in addition to providing office space for the laboratory supervisor. A second room 16'-11" by 9'-10" is used as the optical standards laboratory. The third room 18'-1" by 17'-5" is used as the electrical standards laboratory. This fourth laboratory has a ceiling height of 26' and one wall consists of removable panels that provides a 20' by 20' access capability into the laboratory. The complex is equipped with a personnel air lock shower for passage from the optical standards laboratory to the length-mass standards laboratory. There is also an equipment pass-through air lock located between the electrical standards laboratory and the length-mass standards laboratory.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 15 10. YR. BUILT: FY-64 11. FAC. CAT. CODE: 390 00

12. INITIAL COST: $ 125 K 13. NASA B.O.D. FY-64 14. STATUS CODE: Active

15. ACCUM. COST: $ 775 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):*
Lockheed Electronics Company/Philco Corporation

20. OTHER SOURCES OF INFO: (a) "Major Test Facilities of Engineering and Development Directorate", Brochure; (b) MSC Management Manual 38-1-3 dated 4-13-65 "Measurement Instruments Calibration Service"; (c) MSC Quality Assurance Manual, Sub-Part I, MSC Calibration Program.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation and Electronic Systems Division
'Phone: (Area Code 713) 483-2871

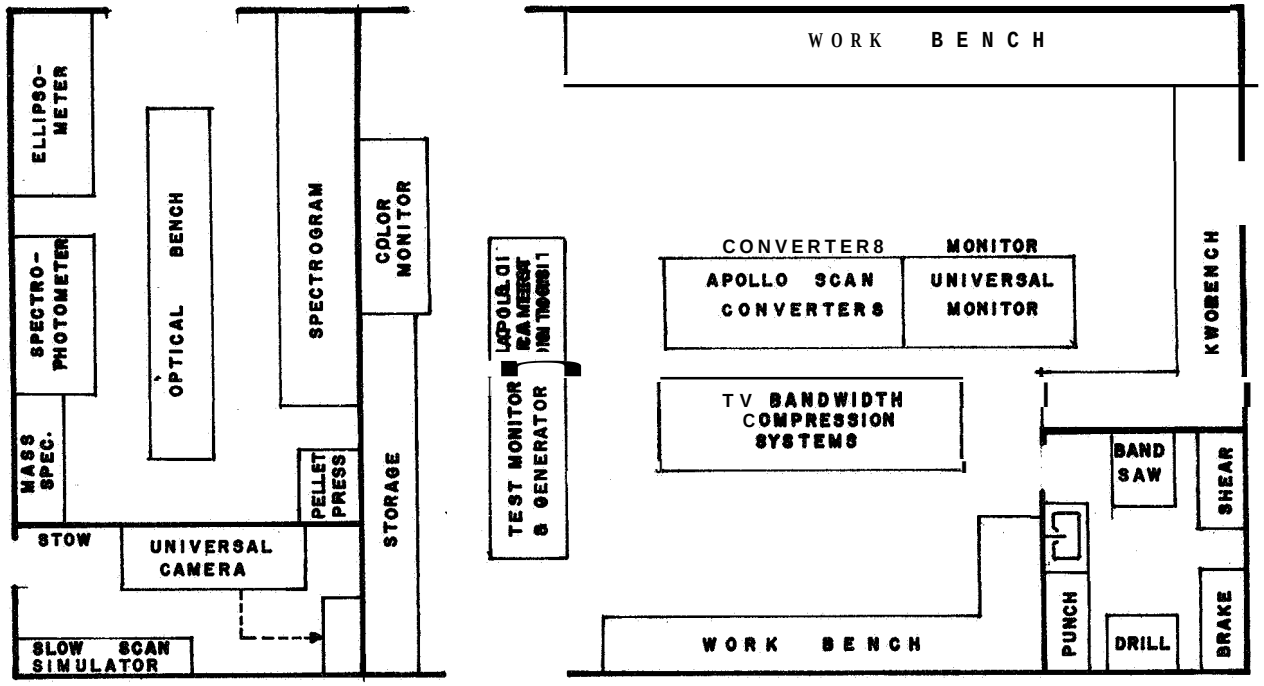
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-23-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Television Systems Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Television Systems Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Spacecraft television, ground facilities processing equipment, image sensor development.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Television Systems Laboratory contains equipment and facilities for the development, test, evaluation, and flight qualification of spacecraft television systems, including system components for ground processing. Specific capabilities of the laboratory are:

a. Equipment for test and evaluation of the television cameras (and its associated GSE equipment) which will be used for the Apollo CSM, Block I, Block 11, LEM, and Lunar surface.

b. Equipment for the development of special ground processing equipment such as scan converters which allow viewing of Apollo slow-scan television over domestic television networks.

6. NARRATIVE DESCRIPTION

c. Specialized equipment for the development and evaluation of highly sophisticated synchronization techniques such as high-frequency burst synchronization.

d. Capabilities for the development and evaluation of both analog and digital video bandwidth compression techniques.

e. The laboratory also has special recorder equipment that can be utilized for the development and evaluation of spacecraft color cameras.

f. An area is provided for precise electro-optical system development and optical measurements, including equipment capable of determining all properties of the lens systems used in the TV cameras.

g. A secure room is maintained for development and evaluation of advanced classified image sensors. Apparatus in this area provides means of operating and evaluating image sensors under optical, electrical and thermal extremes.

7. POTENTIAL: Capability of supporting the development and evaluation of any known or foreseeable (advanced) spacecraft TV system, or components. Expansion limited to very specialized modifications to support unique prototype designs.
8. PLANS: Continue to support development of improved advanced TV systems.

9. BLDG. NO.	15	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	320 60
12. INITIAL COST: $	50 K	13. NASA B.O.D.	May 1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	800 K	16. LIFE EXPECT.	Indef.	17. OWNERCODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division
Phone: (Area Code *713) 483-2871*

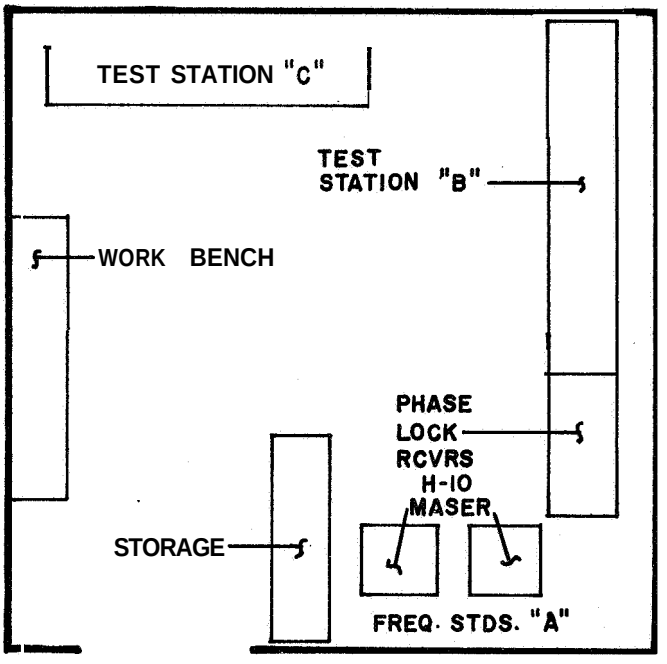
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-24-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Spacecraft Timing Systems Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Timing Systems Laboratory, Spacecraft

5. TECHNOLOGICAL AREAS SUPPORTED: Development, evaluation, test and checkout of spacecraft timing systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is divided into three major sections, as follows:

a. Primary frequency standards - There are two Varian H-10 Hydrogen Masers with stabilities of about 1 part in 10^{13}. The output of each maser is fed into a separate phase lock loop receiver. These-receivers will each provide the following signals **for** use in the laboratory: 5 mc, 1 mc, and 100 kc each 1 volt across 50 ohms.

b. Test Station - Systems evaluation, long term test and type qualification - This station consists of the following major elements: Time code generators (driven by the primary frequency standards), frequency comparison equipment, digital comparison equipment, error data recorders.

6. NARRATIVE DESCRIPTION

Each of the above elements is provided in duplicate to increase the reliability on very long term tests. The time code generators in conjunction with the digital comparison equipment provide a continuous monitor of spacecraft timer digital outputs. The frequency comparison equipment is used to continuously monitor the stability of spacecraft timer oscillators with reference to the primary frequency standards. The error data recorders provide a visual record of any errors which may occur in the digital output signals from the spacecraft timer.

c. Test Station - Systems evaluation, short term test and flight qualification - This station consists of the following major elements: Time code generator (driven by internal crystal or frequency standard), digital comparator equipment, error data recorder. Each of these elements perform the same function as in Test Station b above. Redundancy is not provided since the tests are short term.

The digital comparison equipment in Test Stations b and c will accommodate IRIG "E" and IRIG "B" time code formats. In addition, Test Station b will evaluate square wave signals of the following repetition rates: 1 Hz, 10 Hz, 100 Hz, 1 KHz, 6.4 KHz, 512 KHz, 1024 KHz, 2048 KHz, 4096 KHz.

7. POTENTIAL: Undefined

8. PLANS: Installation of a $25,000 auxiliary power system to prevent test shutdown and loss of continuity in the event of a power failure.

9. BLDG. NO. 15 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 269 K 13. NASA B.O.D. 1967 14. STATUS CODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. 10 years 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief,, Instrumentation & Electronic Systems Division
Phone: (Area Code 713) 483-2871

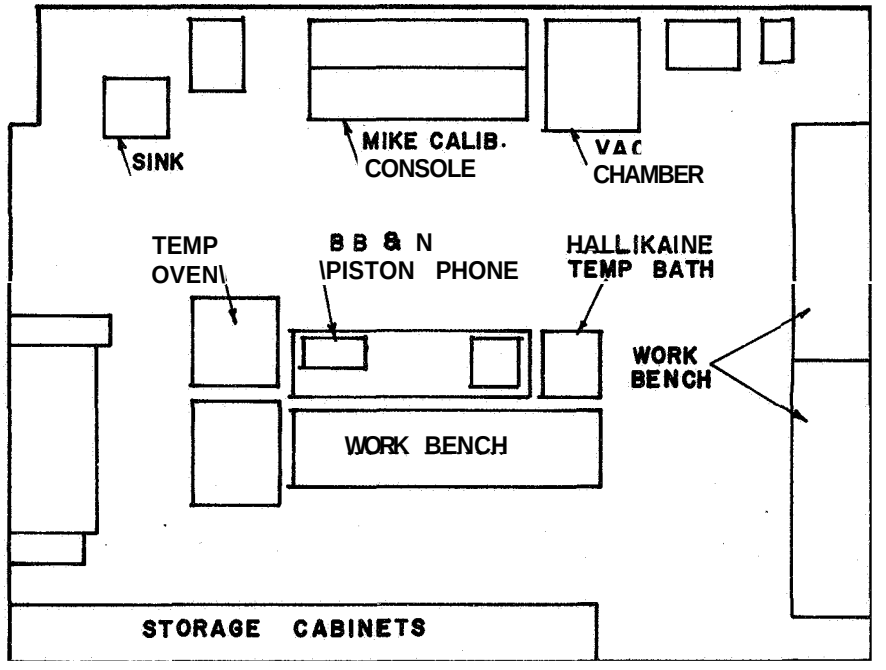
GPO 906-303

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 15, 1966
	FACILITY NO:	**11-00-25-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Measurements hboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Measurements Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: On-board (spacecraft) measurements in the areas of temperature, acoustic, pressure, vibration, acceleration, and inertial.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory contains equipment used to accomplisy instrumentation measurements required for spacecraft development at the Manned Spacecraft Center. The laboratory equipment includes:

a. Standard electronic measuring and recording equipment, and

b. A Hallikaine Instruments Constant Temperature Bath. This temperature bath provides a temperature range of -100°F to +500°F. It is used for thermocouple and resistance-thermometer calibrations.

c. A Bolt, Beranek, and Newman, Inc. Model 901D microphone calibrator. A calibrator provides, with modifications, linearity evaluations of microphones in the range of 110 to 170 db, frequency response from below 5 up to

6. NARRATIVE DESCRIPTION

200 cps, and absolute sensitivity measurements within ± 0.2 db. The calibrator is large enough to be used for limited acoustic testing of small components.

d. A resonant plane wave tube driven by an Altec 288C loudspeaker capable of producing sound pressure level up to 160 db at specific frequencies up to 10,000 cps.

Other equipment in the laboratory such as temperature and vacuum chambers provide facilities for limited environmental testing. An area adjacent to the laboratory contains more complete environmental simulation equipment used in tests which support development, evaluation, and qualification of measurement systems.

7. POTENTIAL: Facilities can be extended to provide automatic operation and increased accuracy of systems.

8. PLANS: Extend range of plane wave tube to provide higher sound pressure levels at additional frequencies.

9. BLDG. NO. 15 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 50 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 50 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of Engineering and Development Directorate", Brochure

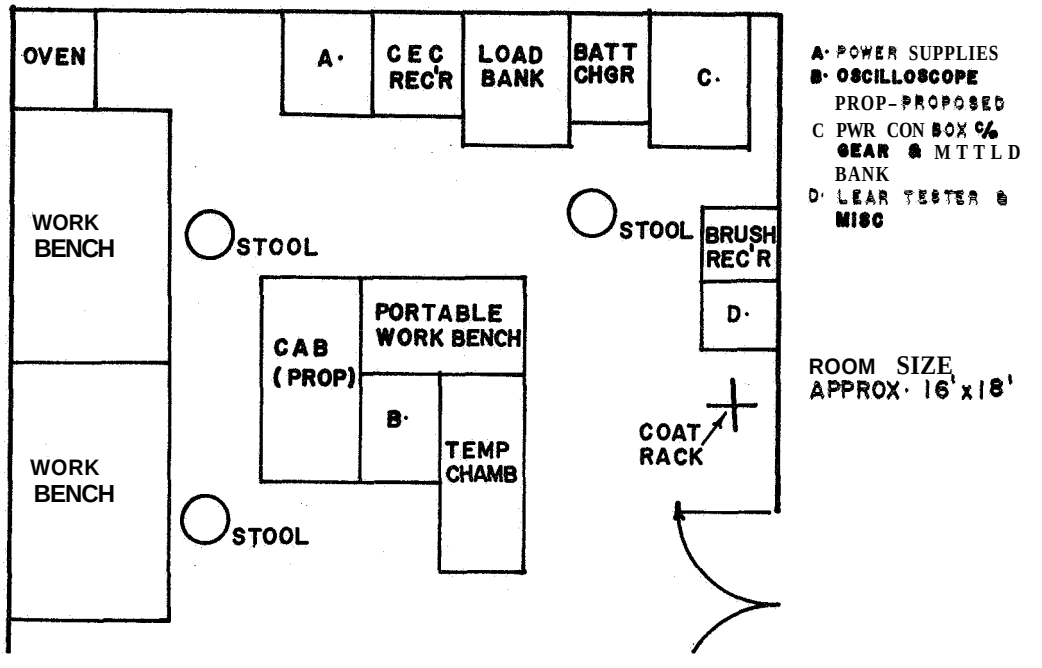
21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief., Instrumentation & Electronic Systems Division (EE)
Phone: (Area Code 713) 483-2871

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Electrical Power and Sequencer Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Electrical Power nd Sequen er Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Checkout, Testing, Evaluation, and Qualification of spacecraft power distribution, batteries, inverters, sequencers, electrical power and control assemblies.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is equipped with special load banks, power supplies, and test consoles. The load banks can provide continuously adjustable resistance type loads up to 30 amps (above 50 amps with fan cooling). The power supplies can supply filtered dc power at either constant potential or constant current up to 10 amps. The test console can make pin-to-pin continuity checks, either sequentially or selectively, on power-control assembly circuits. The test console can be used to make simultaneous continuity checkouts of over 100 power-control boxes for Apollo developmental flights. The laboratory contains facilities for evaluating and qualifying batteries for spececraft, evaluating and verifying battery handling procedures, performing component checkout tests on batteries for spacecraft flights, and performing checkout tests on power control boxes for spacecraft flights. The laboratory has a normal complement of battery test equipment and instruments, and it is also capable

6. NARRATIVE DESCRIPTION

of designing and building special test consoles to facilitate testing power control boxes.

7. POTENTIAL: Capability for in-house analysis of spacecraft electrical parer equipment and systems problems **via** breadboard duplicate systems.

8. PLANS: None

9. BLDG. NO. 15 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 60

12. INITIALCOST: $ 8 K 13. NASA B.O.D. May 1964 14. STATUSCODE: Active

15. ACCIJM. COST: $ 44 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: **"Major** Test Facilities of Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division (EE)
Phone: (Area Code 713) 483-2871

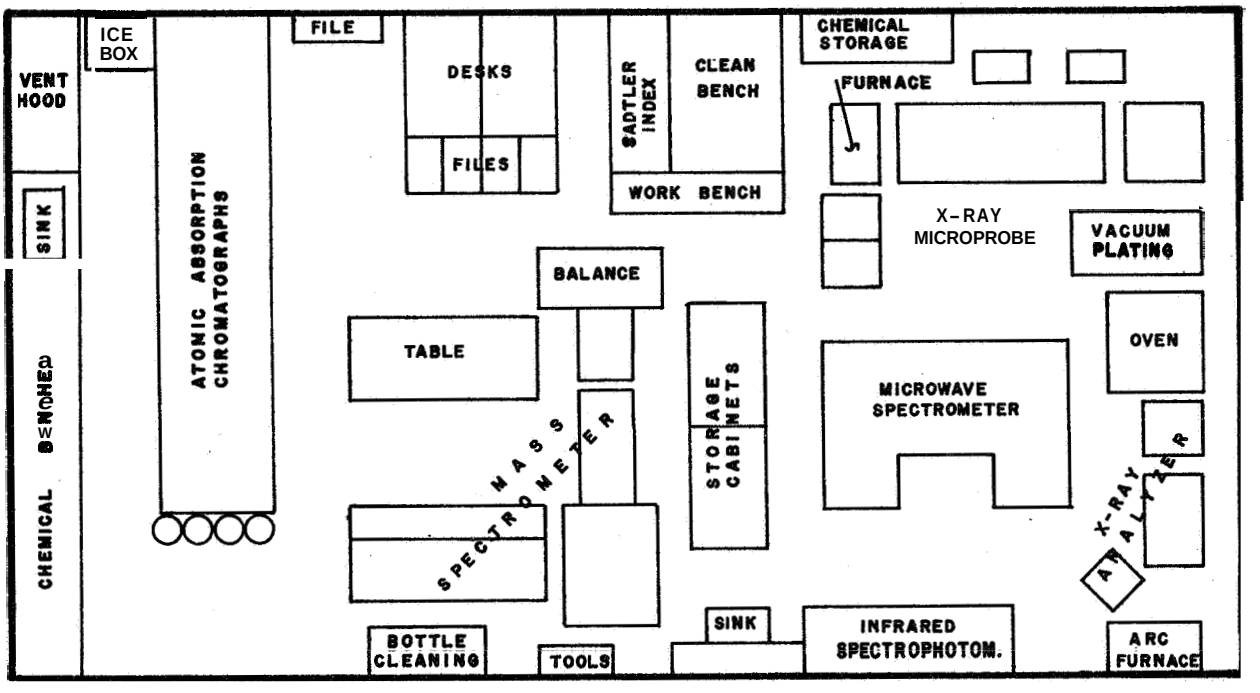
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-27-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Analytical Instrumentation Calibration Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Instrumentation Calibration Laboratory, Analytical

5. TECHNOLOGICAL AREAS SUPPORTED: Analysis of gases, liquids, and solids used in connection with various tests of flight equipment.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility provides instrumental chemical analysis of solids, liquids, and gases including cryogenic materials. Trace impurities in the parts per million range are determined to verify if the sample conforms to specifications. Samples as small as one micron of metals and alloys can be analyzed for mixture of components, grain structure and impurities. Dynamic radiographic inspection (using TV camera and monitor) is available for examination of electronic components and determination of failure mode of defective or malfunctioning instruments. Major instruments supporting the facility include a dynamic X-ray, mass spectrometer, infrared spectrometer, atomic absorption spectrometer, X-ray microprobe, X-ray diffractometer, metallograph and chromatographs. In addition, the facility combines its unique capability into investigation of advanced analytical instrumentation techniques and

6. NARRATIVE DESCRIPTION

procedures such as evaluating a microwave spectrometer for analyses type work that is being performed presently.

7. POTENTIAL: None

8. PLANS: None

9. BLDG. NO. 15 10. YR. BUILT: FY 64 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 85** K 13. NASA B.O.D. FY 64 14. STATUS CODE: Active

15. ACCUM. COST: $ 500 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.)*: Lockheed Electronics Co./Philco Corporation

20. OTHER SOURCES OF INFO: (a) "Major Test Facilities of Engineering and Development Directorate", Brochure. (b) Engineering and Development Directorate Laboratory Support Capability, MSC Announcement **65-52,** dated **4-15-65.** (c) Material Control, Analysis of Liquids, Gases and Solids, MSC Quality Assurance Manual, Pt. No. **2.13** dated November, **1965.**

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Instrumentation & Electronic Systems Division (EE) Phone: (Area Code **713) 483-2871**

**Equipment only

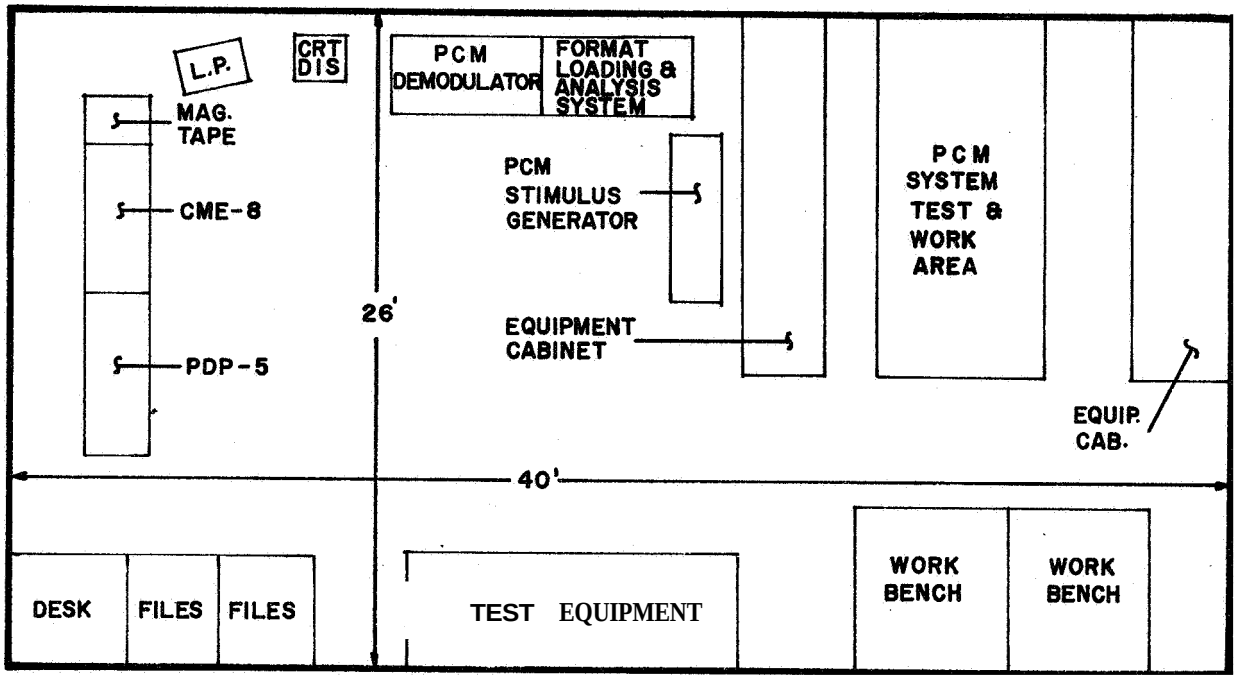
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-28-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Digital Techniques Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Digital Techniques Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Spacecraft data acquisition systems, Flight qualification test process control and data analysis.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory has facilities for theoretical study, design, and automatic testing of digital data systems. The following equipment is available in the laboratory.

a. Process control unit. The unit consists of a Digital Equipment Corporation, PDP-5 computer; a CME-8 memory extension; an arithmetic extension unit; a Holley Corporation line printer; a high-speed paper-tape reader and punch; two Digital Equipment Corporation DECTAPE Magnetic tape units; and a precision cathode ray tube display.

b. Pulse code modulation (PCM) decommutation system. The PCM decommunication system is a Telemetric, Incorporated, Model 620 Decommutator.

6. NARRATIVE DESCRIPTION

c. Format loading and analysis system: The format loading and analysis system consists of a computer-controlled PCM simulator and bit error detector. The computer controlled simulator has the capability of inserting dynamic digital values in any PCM format time slot.

d. PCM stimulus generator: The PCM stimulus generator was designed in the Digital Techniques Laboratory. It can simulate both analog and digital inputs for PCM system evaluation and analysis.

e. The laboratory also has standard laboratory test equipment such as digital counters, timers, meters, oscilloscopes, and digital logic modules.

Laboratory facilities provide the capability for automatic testing and analysis under computer control of Apollo R&D instrumentation such as multicoders and VCO's and Apollo operational Pulse Code Modulation Systems. Capabilities also exist for testing the LM Signal Processor Assembly to make detail analysis of nodulation indexes, etc. Extensive system breadboard capabilities exist in order to test specific circuits used in the design of Apollo operational systems. Capabilities exist also to provide other MSC Divisions with standard format punch paper tape utilized in programming other automated test systems.

7. POTENTIAL: Capability of performing engineering analysis and development of Advanced Spacecraft Data Management and Communication Processing Systems.

8. PLANS: To perform spacecraft Data Management simulation studies utilizing existing equipment.

9. BLDG. NO. 15 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 247 K 13. NASA B.O.D. May 1964 14. STATUSCODE: Active

15. ACCUM. COST: $ 550 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division (EE)
Phone: (Area Code **713) 483–2871**

TECHNICAL FACILITIES RESUME

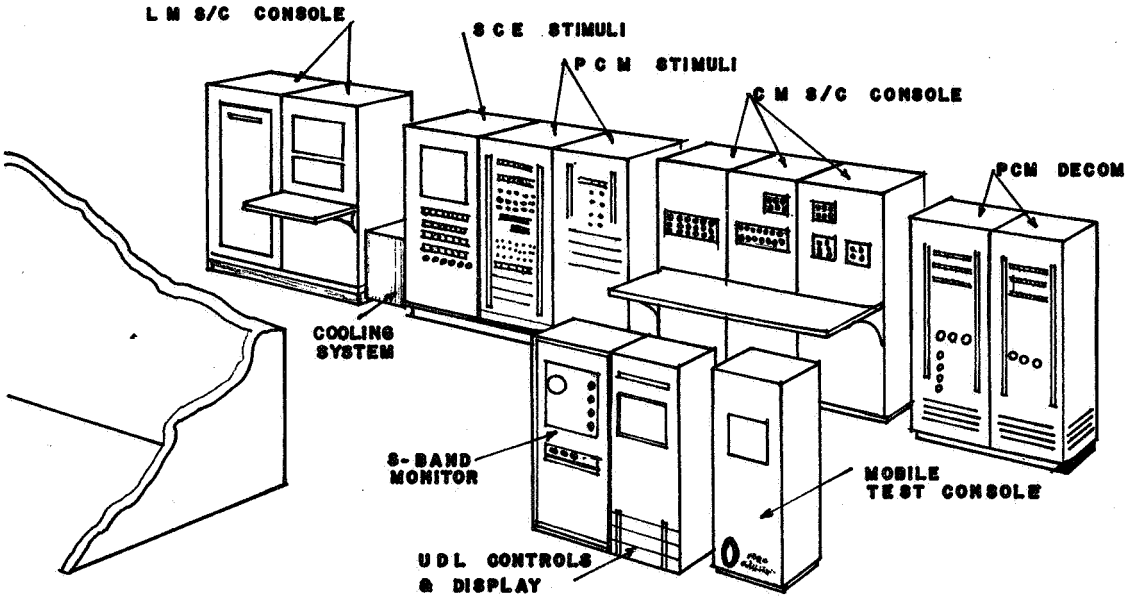
DATE OF RESUME: July 15, 1966

FACILITY NO: **11-00-29-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Spacecraft Systems Test Laboratory

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Communications and Instrumentation Systems Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Testing of (Apollo) spacecraft communications and instrumentation systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is implemented with spacecraft (SC) test consoles for mounting, integrating, interfacing, and controlling individual or combined Command Module (CM) and Lunar Module (LM) communications and instrumentation systems. System test sets composed of unique test consoles and laboratory test equipment are utilized in testing these SC systems. These sets provide SC systems input stimuli, operational monitoring, and data logging capability. System tests are performed to insure that SC electronic units are compatible, and establish system performance limitations, plus operational constraints as necessary to document and certify SC system operation.

Capabilities include the following:

6. NARRATIVE DESCRIPTION

a. Test in detail to further define any incompatibilities encountered during cursory SC system tests.

b. Provide a simple and efficient method for testing integrated electronic units to certify their compatibility after update modifications have been incorporated.

c. Provide a means for quickly proving feasibility of new operational and test concepts.

d. Provide sub-system and system test beds for problem injection studies, thereby, predicting problem areas as well as determining methods for problem resolution.

e. Conduct empirical studies to verify analytical approaches.

Major support components or equipment:

SC system test consoles.

SC system test sets.

7. POTENTIAL: Update facility to test modified Apollo SC communications and instrumentation systems, plus proposed or existing systems which interface with Apollo communications and instrumentation systems.

8. PLANS: Updating of SC test consoles and system test sets in FY *1968.*

9. BLDG. NO.	15	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	320 60
12. INITIAL COST: $	132 K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	132 K	16. LIFE EXPECT.	Indef.	17. OWNER CQDE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: None

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division (EE)
Phone: (Area Code *713) 483–2871*

TECHNICAL FACILITIES RESUME

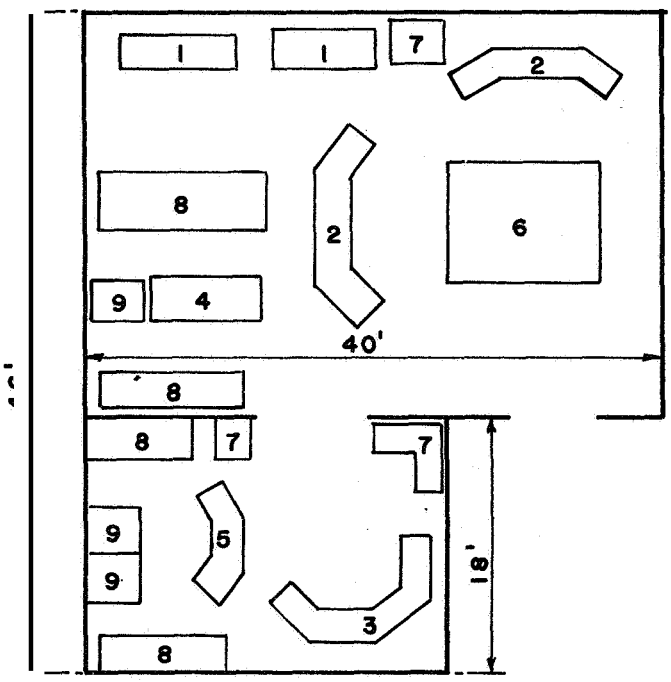
DATE OF RESUME: July 15, 1966

FACILITY NO: 11-00-30-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Telemetry Systems Laboratory

3. LOCATION *(if other than in 1. above):*



1. IRIG COMMUTATOR CONSOLES
2. PROPORTIONAL BANDWIDTH FM CONSOLES
3. CONSTANT BANDWIDTH FW CONSOLES
4. SINGLE SIDEBAND MULTIPLEX CONSOLE
5. APOLLO UNIFIED S-BAND MULTIPLEXER CONSOLE
6. CLEAN ASSEMBLY AREA
7. STORAGE
8. WORK BENCHES AND TOOLS
9. DESKS

4. FUNCTIONAL NAME: Telemetry Systems Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Flight qualification of spacecraft telemetry systems, GFE hardware, design and development of advanced anolog data systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

"his laboratory is used to: (a) Automatically provide precision stimuli to telemetry multiplexing equipment which is being subjected to simulated spacecraft environments; (b) automatically record the response and performance of the equipment under test; and (c) interface with a special purpose computer in a separate facility which analyzes the equipment performance relative to manned spacecraft requirements.

The facility occupies approximately 1600 sq. ft. of floor space and is comprised of seven basic test consoles. These consoles are used to the following specific kinds of telemetry equipment:

6. NARRATIVE DESCRIPTION

a. Constant bandwidth FM equipment.
b. Proportional bandwidth FM equipment (2 ea.).
c. IRIG commutators (3 ea.).
d. Single sideband multiplexing equipment.
e. Apollo unified S-band multiplexing equipment.

Each console is comprised of commercially available test equipment grouped in standard 19" relay racks and can be operated independently. Typical consoles contain (a) telemetry demodulators, (b) oscilloscopes, (c) voltmeters, (d) voltage and frequency converters, (e) automatic switching and data logging (punched tape), (f) wave analyzers, (g) precision voltage sources and power supplies, (h) temperature chambers, and (i) cooling blowers.

7. POTENTIAL: Present equipment can accommodate several sohpisticated development projects simultaneously with large volume qualification testing on production line basis.

8. PLANS: No expansion anticipated. Development, evaluation and qualification testing of advanced systems to be continued.

9. BLDG. NO. 15 | 10. YR. BUILT: 1964 | 11. FAC. CAT. CODE: 320-60

12. INITIAL COST: $ 282 K | 13. NASA B.O.D. May 64 | 14. STATUSCODE: Active

15. ACCUM. COST: $ 310 K | 16. LIFE EXPECT. Indef. | 17. OWNERCODE: NASA

18. OPER. CODE: NASA | 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate, ·· Brochure.

21. COGNIZANT ORGANIZATIONAL COMPONENT:
Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Div. (EE)
(AC 713) 483-2871

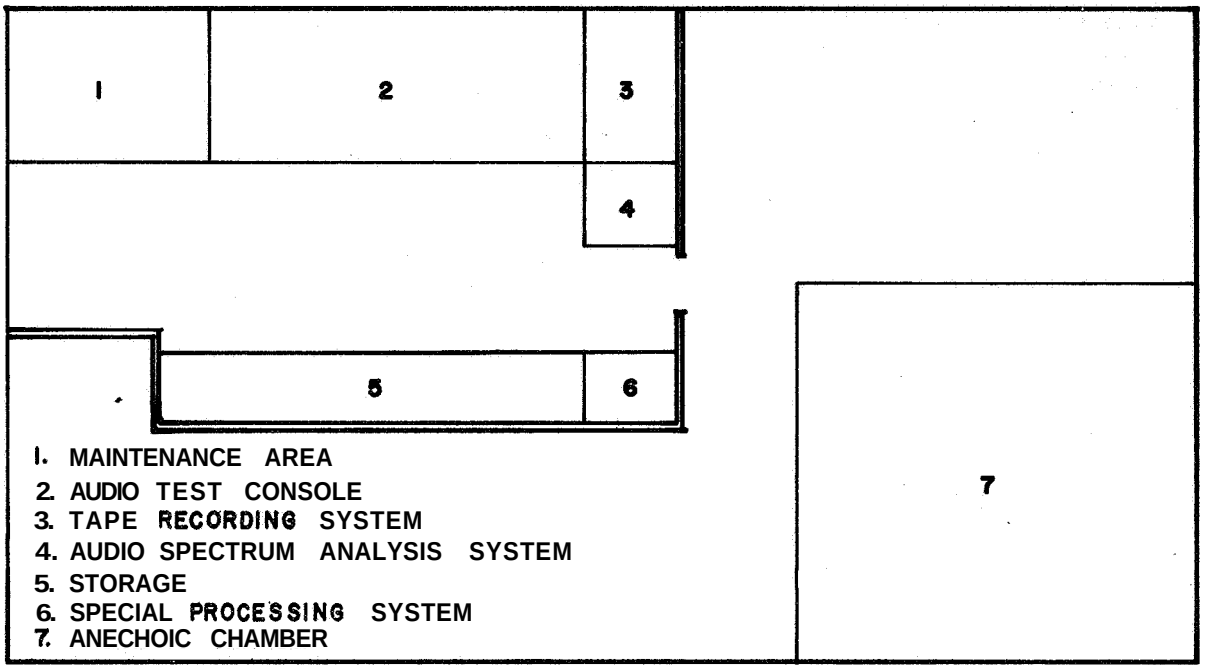
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-31-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Audio Systems Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Audio Systems Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Speech bandwidth compression systems development, audio devices development, audio devices and system testing and evaluation.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is used to test and evaluate audio devices (microphones, earphones, speakers, and speech systems). The following are specific capabilities of this laboratory:

a. Testing and evaluation of headsets, microphones, and audio processing circuits of the Apollo and Gemini spacecraft, including acceptance and qualification tests of flight equipment.

b. Construction of breadboard versions of spacecraft audio circuits to isolate design shortcomings and to investigate design modifications.

c. Development of bandwidth compression techniques to reduce the frequency spectrum required for the transmission of voice communications.

6. NARRATIVE DESCRIPTION

d. Development of headsets and microphones for space suit communication systems.

e. Development of voice and telemetry systems for the Apollo extra-vehicular mobility unit.

f. Analysis and measurement of noise attenuation properties of space helmets.

Major equipment in the laboratory include, (1) a 6-foot anechoic chamber which exhibits free field characteristics above 250 cps, (2) a versatile audio test console, (3) a somagraph for analyzing frequency content of speech, (4) several tape recorders and (5) an "Electronic Dummy".

7. POTENTIAL: Capability for development and analysis of audio processing systems on a complete transmission link basis.

8. PLANS: Future plans include the development of a universal voice link simulation system and expansion of the Audio Test Console Capability.

9. BLDG. NO. 15 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 32 K 13. NASA B.O.D. May 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 175 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Instrumentation and Electronic Systems Division
Phone: (Area Code 713) 483-2871

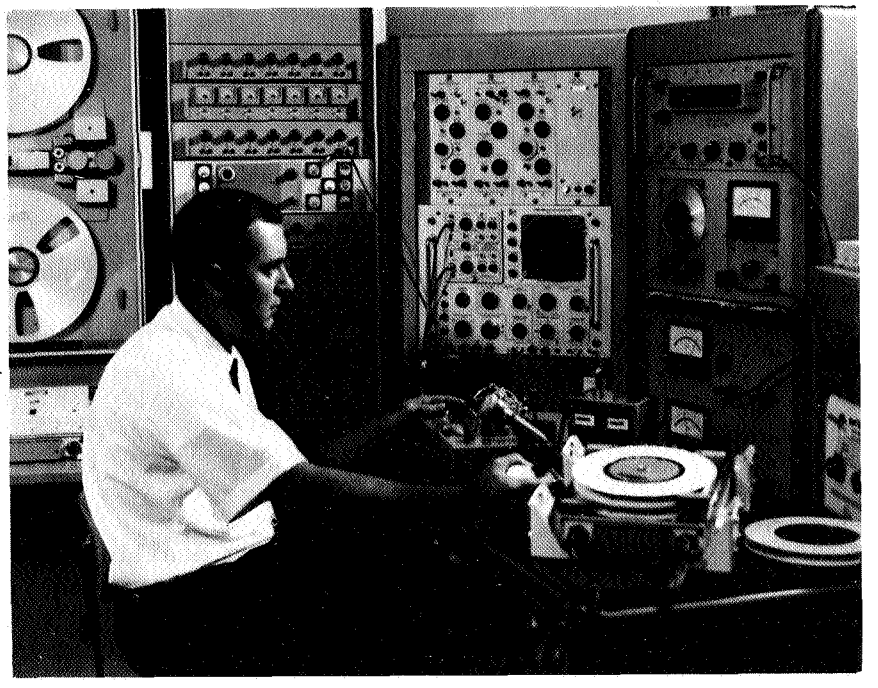
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-32-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Magnetic Tape Recording Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Magnetic Tape Recording Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Magnetic tape system development, test and checkout, calibration, and evaluation.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is capable of supporting the development, test and checkout, calibration, and evaluation of spacecraft magnetic tape recording/reproducting systems.

All magnetic tape systems utilized on the Apollo Developmental Flight Instrumentation Program have been supported by the tape laboratory during test and checkout, calibration, and flight qualification testing. The laboratory is currently supporting the Apollo Operational Data Storage Equipment and numerous magnetic tape systems, utilized on space programs other than Apollo, during test and checkout, calibration, and evaluation phases.

6. NARRATIVE DESCRIPTION

The laboratory is equipped with an Ampex FR 600 magnetic tape system (low and intermediate bandwidth), analog signal generation equipment, digital word generator and bit comparator, and a data evaluation console. These equipments provide the laboratory with capability to measure and analyze magnetic tape system design characteristics including frequency response, signal-to-noise, crosstalk, flutter, harmonic distortion, bit error, bit error rate, and bit jitter.

The tape system laboratory capability evolution, as planned, is such that advanced magnetic tape systems can be supported during Apollo Spacecraft and Experiment Support;, Saturn Apollo Applications Systems Support, and Advanced Manned Mission Support Programs. Refer to Items 7 and 8.

7. POTENTIAL: A wideband magnetic tape system, recording oscillograph (galvanometers included), wave analyzer, high frequency oscillator and amplifier, and assoc. lab test equip. must be added for support of advanced manned spacecraft programs.

8. PLANS: Equipment specifications are being prepared. Total estimated cost is $130,000.

9. BLDG. NO.	15	10. YR. BUILT:	1962	11. FAC. CAT. CODE:	320-60
12. INITIAL COST: $	60 K	13. NASA B.O.D.	1962	14. STATUS CODE:	Active
15. ACCUM. COST: $	125 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of Engineering and Development Directorate," Brochure.

21. COGNIZANT ORGANIZATIONAL COMPONENT:

Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Instrumentation & Electronic Systems Div. (EE)
(AC 713) 483-2871

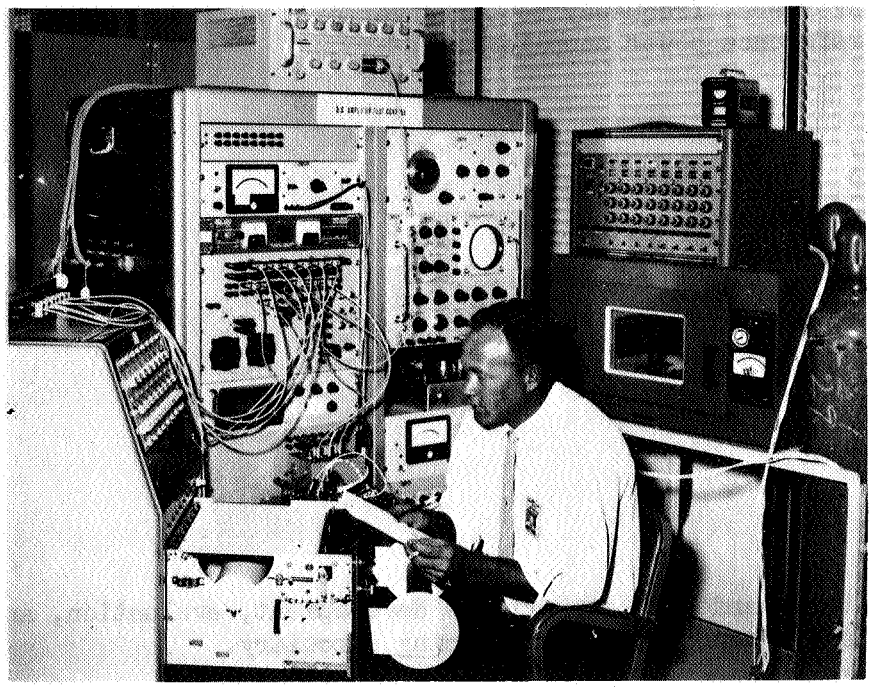
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: , **11-00-33-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Signal Conditioning Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Signal Conditioning Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Electronic equipment functional evaluation of spacecraft signal conditioning systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The primary function of this facility is to evaluate through electrical tests the functional characteristics of the various circuits, modules, assemblies, and systems associated with spacecraft signal conditioning methods. Typical tasks performed include: (1) test and evaluation of potential flight equipment (2) Type and Flight Qualification of flight hardware (3) assistance to spacecraft systems engineers in the solving of systems interface problems *(4)* advanced development work in the areas of microminiaturization of power programming and electronic circuitry utilizing digital and/or analog techniques.

The laboratory is equipped with a wide selection of precision commercial and specialized test instruments. The major items of the commercial instruments are: (1) wideband, high gain oscilloscopes (2) digital AC and DC voltmeters

6. NARRATIVE DESCRIPTION

(3) various AC and DC signal sources ***(4)*** various AC and DC power supplies (5) paper recorders, and (6) engineering temperature chamber. The major items of the specialized test equipment are: (1) amplifier test console, which is designed to operate and test up to eight signal conditioning amplifiers simultaneously *(2)* amplifier test programmer which is designed to determine drift characteristics during a temperature transient or for a long term test *(3)* a 320 point scanner/ comparator which will automatically scan *320* channels of data and indicate a "go-no-go" condition for each channel with respect to preset voltage or resistance bands *(4)* console which will test phase sensitive demodulators, AC to DC converters, DC to DC converters, frequency to DC converters, active filters, and precision AC or DC reference power suppliers.

7. POTENTIAL: Can be expanded to support the development, evaluation, and qualification of **any** known signal conditioning circuitry.

8. PLANS: None

9. BLDG. NO. 15 10. YR. BUILT: 1962 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 38 K 13. NASA B.O.D. 1962 14. STATUSCODE: Active

15. ACCUM. COST: $ 183 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if **contr.** oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of Engineering and Development Directorate". Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division (EE)
Phone: (Area Code *713) 483-2871*

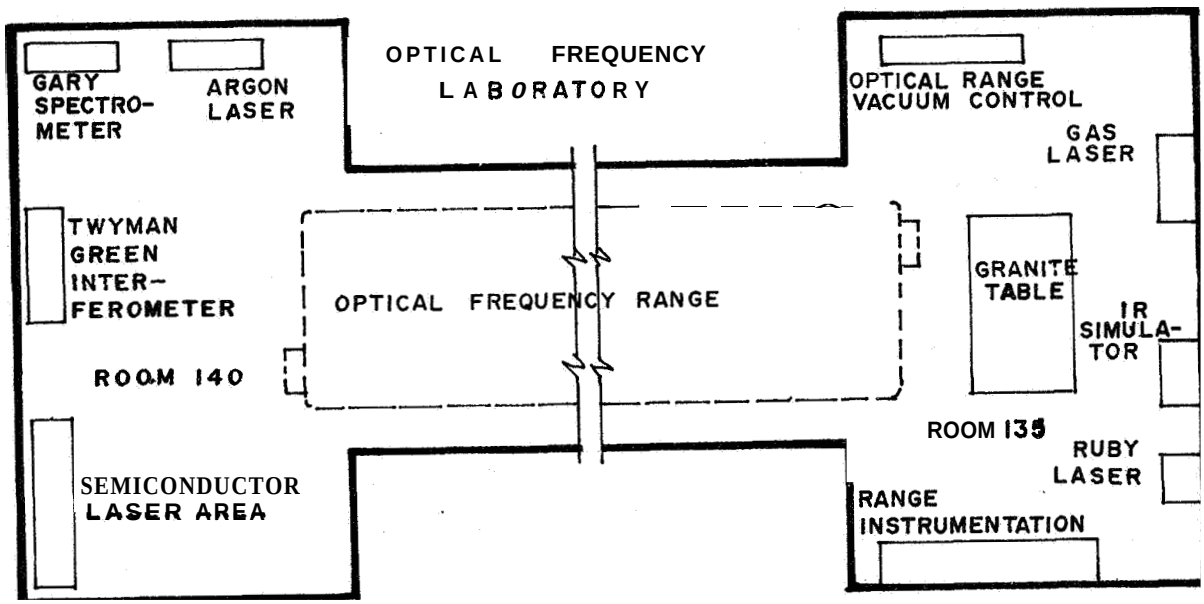
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-34-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Optical Frequency Laboratory and Range

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Optical Frequency Laboratory and Range

5. TECHNOLOGICAL AREAS SUPPORTED: Analysis of laser, infrared radars, high data rate laser deep space communication systems, and infrared detectors and trackers.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The complete analysis of active infrared and optical systems can be conducted in the optical frequency laboratory. Three laser source types are available for system evaluation - semiconductor, gas, and solid. Background noise may be simulated accurately by use of infrared broadband sources and radiometer monitoring equipment. System optics can be evaluated in a double pass interferometer. Standard sources are available in several line spectra for the accurate calibration of equipment and instruments. A mechanically stable platform for very accurate laser transmitter and receiver work is provided. Complete laser radar evaluation may be conducted with the optical frequency range. This range consists of a cylindrical vacuum tube 80 meters in length and 4 meters in diameter housed in an air conditioned tunnel. The tube can be evacuated to 10^{-3} torr. The facility dimensions

6. NARRATIVE DESCRIPTION

have been designed specifically for the testing of a laser pulsed radar. The tube interior is painted with a very low reflecting paint and its sides have been designed to be very smooth to prevent unwanted reflections. Two-axis tables are mounted at each end of the tube, and may be operated and monitored from the end terminal room. Test carts are provided inside the tube. Their distance from the two-axis tables may be varied by movement along an optical track which runs the entire length of the tube. Temperature over the entire length of the tube may be controlled within ± 2 degrees F. Provision has been made for the introduction of other gases for test purposes,

The range can be used for the evaluation of optical systems and verification of theoretical studies. For example.

a. Reflectivity measurements on various materials as a function of frequency may be made without wall effects in a known ntmosphere.

b. Absorption, scattering, and dispersion measurements may be made under the same conditions.

c. Operational checkouts on complete systems may be performed under both passive and active conditions.

7. POTENTIAL: See Item 6

8. PLANS: None

9. BLDG. NO.	14	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	390 00
12. INITIAL COST: $	502 K	13. NASA B.O.D.	1967	14. STATUS CODE:	Active
15. ACCUM. COST: $	669 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division
Phone: (Area Code 713) 483-2871

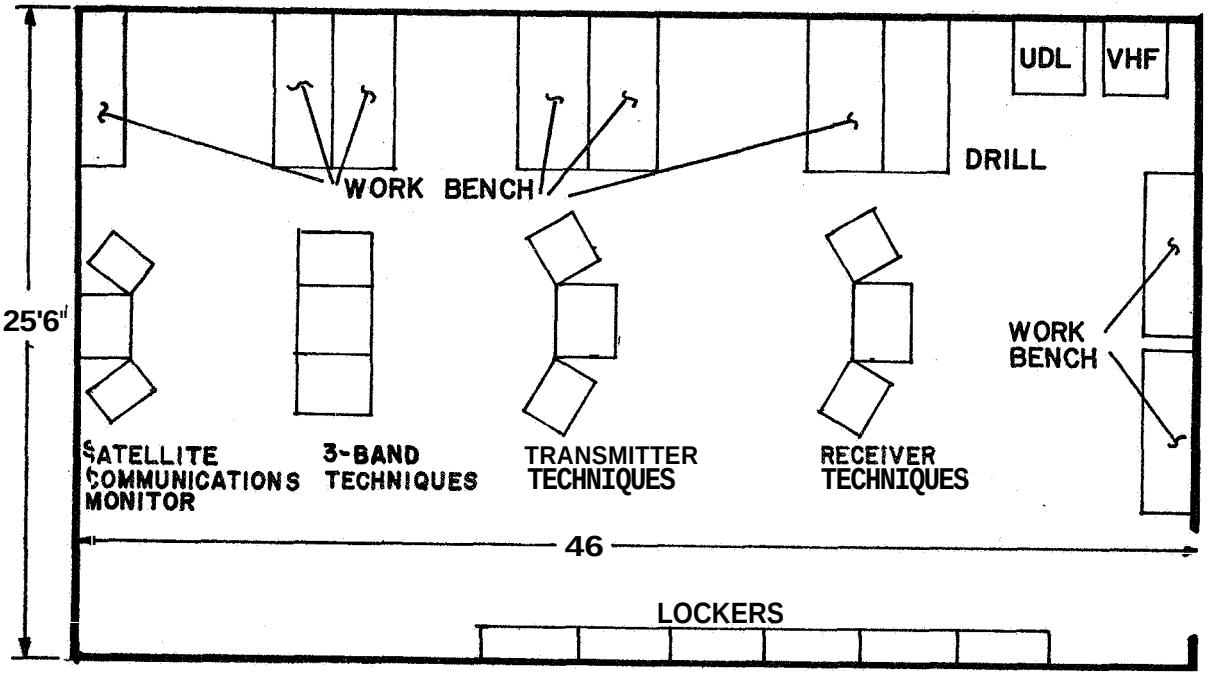
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-35-00**

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Radio Frequency Communications Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Communications Laboratory, R. F.

5. TECHNOLOGICAL AREAS SUPPORTED: Communications, tracking, and command systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is used in the design, development, testing and evaluation of radio frequency communications systems and techniques for manned spacecraft. It is equipped with standard and special test equipment to support the unified S, X, and C-band systems, the up-data link system, VHF/AM-FM systems, HF system and VHF beacon system. The laboratory tests and evaluates telemetry transmitters used on Apollo development flight test vehicles. Laboratory equipment includes oscilliscopes, audio and radio frequency generators, VTVM's, oscillators, amplifiers, discriminators, recorders, and special test hardware such as a UDL bench test set, unified S, X, and C-band test sets, and spacecraft teleprinter bench test equipment.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 14 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 500 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,000 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division
Phone: (Area Code *713) 483–2189*

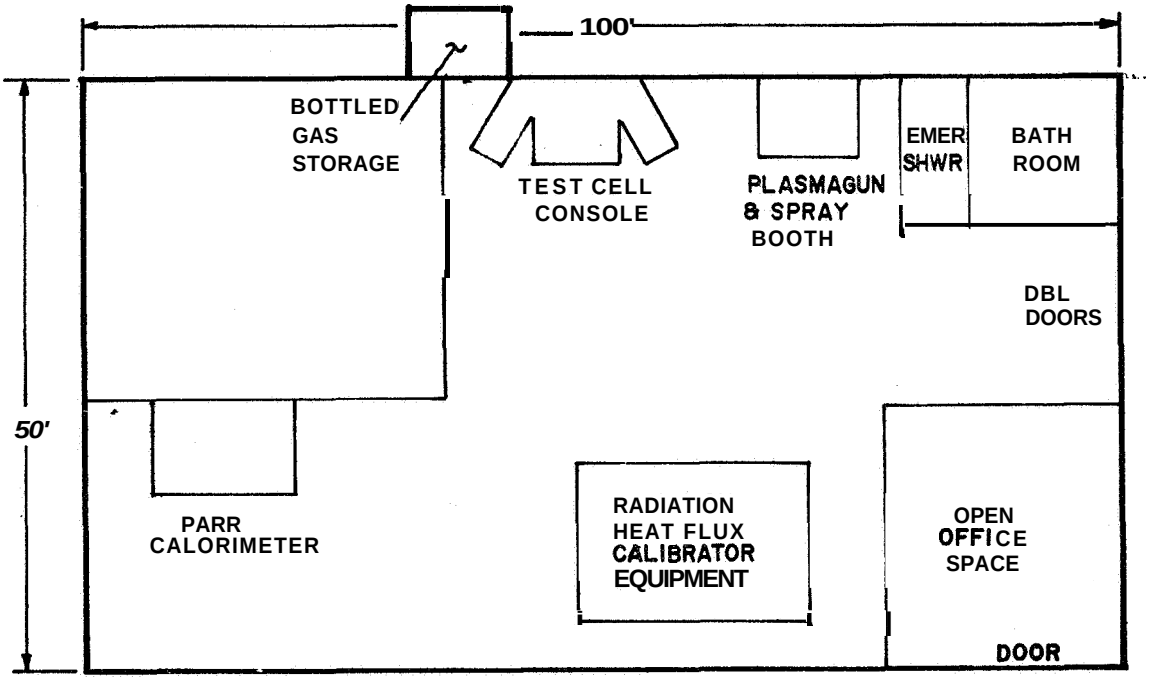
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-03-01-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: High Temperature Evaluation Laboratory

3. LOCATION *(if other than in 1. above):* Ellington Air Force Base, Texas



4. FUNCTIONAL NAME: Temperature Evaluation Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: High temperature thermal sensor evaluation, heat transfer sensor design and evaluation, development and evaluation of heat shield instrumentation, high temperature coating technique evaluation.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

In this facility there are 4 basic pieces of equipment: (1) Hand held Plasma Arc Gun, used for coating thermal sensors with protective coating material and-for high (above 3000°C) temperature evaluation of thermal sensors. (2) Oxyacetylene Torch, an automated test facility using models mounted on water cooled strings for sensor design evaluation. (3) Radiant Heat Flux Calibration Console, an automated water cooled, fixed mount device for calibration of calorimeters and thermal sensor evaluation. (4) High Temperature Oven, a manually controlled 3000°C oven for evaluation and calibration of thermal sensors. The function of this facility has been the design, development, evaluation and analysis of high temperature thermal sensor and heat shield sensor systems in support of the Apollo Program.

Major support components or equipment - Automated oxygen/acetylene gas system, water spray, heat control booth, high temperature test cell.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Could be expanded to include design and development of all thermal sensor requirements. Could also encompass heat transfer testing by conduction and convection as well as rediation.

8. PLANS:

9. BLDG. NO.	333	10. YR. BUILT:	1962	11. FAC. CAT. CODE:	320 60
12. INITIAL COST: $	250 K	13. NASA B.O.D.	1962	14. STATUS CODE:	Inactive
15. ACCUM. COST: $	300 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: 'Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division
Phone: (Area Code **713) 483–2871**

TECHNICAL FACILITIES RESUME

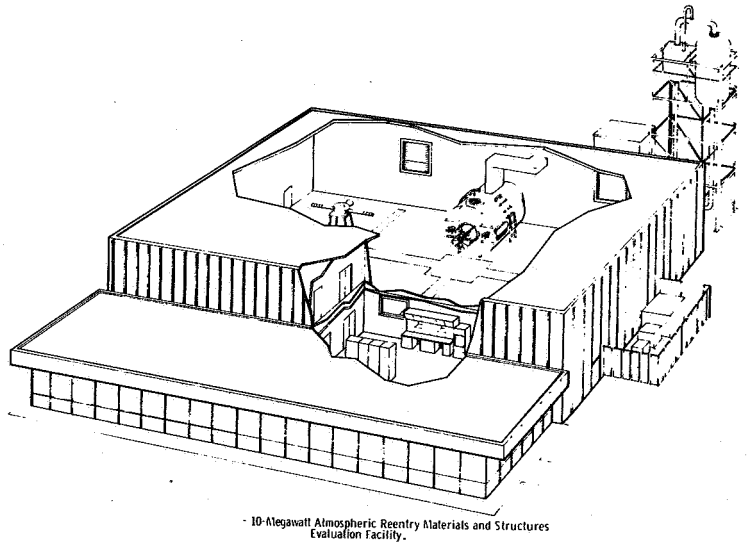
DATE OF RESUME: July 15, 1966

FACILITY NO: 11-00-36-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Atmospheric Reentry Materials and Structures Evaluation Laboratory

3. LOCATION *(if other than in 1. above):*



10-Megawatt Atmospheric Reentry Materials and Structures Evaluation Facility.

4. FUNCTIONAL NAME: Reentry Materials and Structures Evaluation Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Simulation of hyperthermal conditions encountered by spacecraft structures and materials during entry into the earth's atmosphere and other planetary atmospheres.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of two water cooled electric arc gas heaters, a radiant heat system, two atmospheric test positions, each equipped with a model insertion system, a variable pressure test position consisting of a vacuum chamber with built-in insertion system, diffuser, heat exchanger, and a four stage steam ejection vacuum system, a water cooling system, a gas supply system, and a 10 megawatt DC power supply. The facility will be capable of simulating stagnation point convective heating rates of 10 to 1000 BTU/ft^2 sec. and total gas stream enthalpies of 2000 to 25,000 BTU/lb_m on test models with diameters up to 2 feet. Additional radiant heat may be superimposed on test models having diameters up to 1.5 inches, over a range from 10 to 1000 BTU/ft^2 sec. The stagnation pressure on test models may be varied Over a range from 0.01 to 1 atmosphere by using a selection of subsonic and supersonic nozzles. The vacuum chamber static pressure will be controllable using air bleed

6. NARRATIVE DESCRIPTION

valves located upstream of the first stage of the steam ejector vacuum system along with cutting off individual steam ejector stages. The facility will also be capable of simulating shear forces of approximately 0.001 to 25 lb/ft2 on large full-scale samples of reentry heat shield panels. The facility will be capable of operating using simulated air, as well as O_2, N_2, He, Ar, CO_2, or combinations of these gases for simulating planetary atmospheres or a specific test gas species as required to meet specific test objectives,

7. POTENTIAL: Addition of a multi-megawatt ultra-high enthalpy arc heater for simulating enthalpies associated with superorbital reentries into the earth's asmosphere.

8. PLANS: Procurement of ultra high enthalpy arc heater in FY 67

9. BLDG. NO.	222	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	310 50
12. INITIAL COST: $	2,900 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Constr.
15. ACCUM. COST: $	2,900 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA/Contr.	19. CONTRACTOR NAME *(if contr. oper.)*:	Brown & Root-Northrop		

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure, April 1966

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Thermal Technology Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Thermal Technology Branch (ES5)
Phone: (Area Code 713) 483-3678

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-37-00**

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Laboratory Complex of Building 7

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Life Sciences Laboratory Complex (Bldg. 7)

5. TECHNOLOGICAL AREAS SUPPORTED: Development of Crew Support Equipment such as Portable Life Support Systems, Survival Equipment, Space Suits, Instrumentation, Mechanical Systems, Material Testing, Chemical Analysis, etc.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This Laboratory Complex contains the following specific facilities:

a. Portable Life Support Systems Laboratory - Located in Rooms 105 and 106; contains clean areas, test equipment and specialized tools for evaluating and maintaining Apollo and Gemini portable and ground ventilation units and systems. The Laboratory contains a test system to simulate metabolic man-for measuring Life Support System Performance. Facilities exist to fabricate mockups of systems, special test set-ups, and special breathing apparatus.

b. Crew Provisions and Survival Equipment Laboratory - Located in Room 301. Provides the specialized areas for the design, development, and

6. NARRATIVE DESCRIPTION

fabrication of inflatables such as life vests, life rafts, and special inflatables for astronaut survival. The Laboratory contains heavy duty machines for fabricating, cutting, cementing, sealing, and testing of fabricated inflatable structures. A 3-foot by 3-foot low pressure (50 micron) altitude chamber is used for evaluation of finished inflatable structures.

c. Space Suit Laboratory - Located in Roams 203, 205, and 206. This laboratory is used to support the tests, maintenance, stowage, and repairs of Gemini and Apollo Space Suits. In this laboratory, subjects are dressed, fitted, and pretested for altitude chamber tests. Support equipment exists for pressurization, ventilation, and communication for pretest preparation. A large screen exists for photographic documentation of suited subject configurations.

d. Environtron Chamber - Located on main floor, Building 7. This environmental simulation chamber is used to test and evaluate the effects of temperature, vacuum, and mixed atmospheres on Crew Systems components. The chamber contains 27 cubic feet, and can obtain a vacuum of 500 microns. Thermal simulation capability exists over a range of +400°F to -100%.

e. Data Acquisition System - Located in Roams 113-114. This system provides centralized recording and communication control for collecting the output of tests of all major test-facilities located in Building 7. The system consists of a Beckman 210 Digital Data System supplemented by an AIC/10 communication system and a Kintel 1900 television system; master control panels control these systems.

f. Electrical System Workshop - Located in Room 112. This workshop is used to calibrate, repair, store, and modify various electrical equipment used in testing.

(See continuation on attached sheet)

7. POTENTIAL: Adaptable to support advanced spacecraft programs

8. PLANS: None

9. BLDG. NO.	7	10. YR. BUILT:	1963	11. FAC. CAT. CODE:	390 00
12. INITIAL COST: $	1000 K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	2350 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Crew Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Crew Systems Division (EC)
Phone: (Area Code 713) 483-4931

g. Systems Instrumentation Laboratory and Mechanical Systems Workshop - Located in Rooms 116 and 117. This laboratory and workshop is used for designing and fabricating such equipment as instrumentation racks, displays, and controls used for testing and for forming and processing components made of metals, woods, and plastics used in testing.

h. Chemistry Laboratory - Located in Room 219. This laboratory is used to chemically analyze such expendables used during space flights and tests as lithium hydroxide, carbon dioxiode, water, etc. The laboratory contains the following type of analytical equipment: spectrographs, refractometers, balances, titrators, a small vacuum system, and catalyst test equipment.

i. Analytical Instrumentation Laboratory - Located in Room 103. This laboratory is used to analyze spacecraft atmosphere used in simulation testing. In addition, the laboratory analyzes the outgassing products from spacecraft and space suit materials from exposure to oxygen, heat, and vacuum. Laboratory equipment includes spectrophotometers, gas chromatographs, mass spectrometer and an x-ray spectograph and diffractometer.

TECHNICAL FACILITIES RESUME

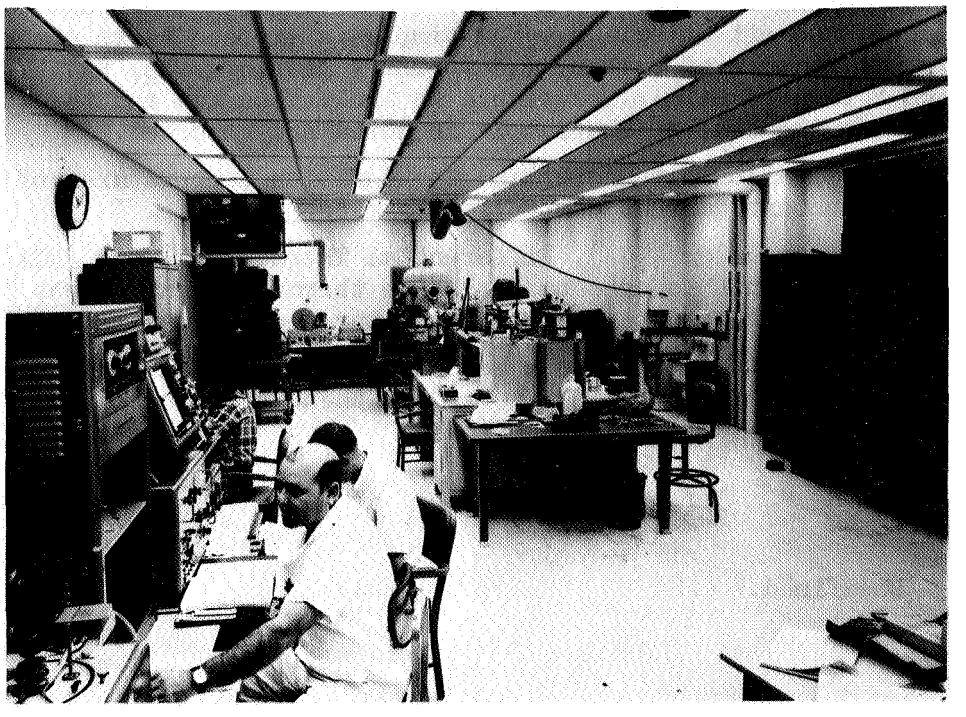
DATE OF RESUME: July 15, 1957

FACILITY NO: 11-00-38-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Materials Environmental Testing Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Materials Environment Laboratory, Space Suit

5. TECHNOLOGICAL AREAS SUPPORTED: Thermal protection for space suit assembly materials.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This laboratory is used to evaluate, develop, and test thermal properties of space suit materials. A spectral refractometer performs measurements of reflectance and transmittance of materials at angles of incidence between 10° and 70° and wave lengths between .24 to 2.5 microns. Four (4) light sources are used (Mercury, Hydrogen, Tungsten, and 1400°F. Heated Cavity) and three detectors (Photomultiplier, Lead Sulphide, Thermocouple). In operation the light from the source is passed through a monochromater into the sample and then the reflected or transmitted radiation collected at the detector. The detector signal is amplified and recorded on a strip chart recorder.

A thermal conductance and materials extravehicular environmental test chamber performs thermal conductance measurements on space suit materials and extravehicular environmental tests on space suit components.

6. NARRATIVE DESCRIPTION

Extravehicular environmental simulation capabilities include vacuums in 'the 10^{-7} torr range, liquid nitrogen cryowalls, and carbon arc solar simulation (0 to 2200 BTU/FT-HR). The nitrogen cryoshroud encloses a cylindrical area 35 inches high by 20 inches in diameter. The effective area of the solar simulation beam is a 1 to 6 inch diameter circle variable.

A thermal conductance measurement system for the testing of space suit materials is utilized in the chamber. Bondary temperatures on the materials may be controlled from -150°F to +250°F. The sample compression loading may be varied from 0 to 3 psi.

A Flame Propagation Rate Determination Unit determines Flame Propagation Rate of Nonmetallic Spacecraft Materials. The sample is exposed to an atmosphere of pure oxygen or mixture of oxygen, and an inert gas (e.g. H2, H_e)....at pressures from 2 to 14.7 psig. .The sample is ignited on top and the time for the flame to reach the base of the sample is noted and recorded.

A recorder is also available to determine the ignition temperatures of wire insulations. A constant current controller is also available.

A Thermogravimetric Analyzer (TGA), Differential Thermal Analyzer (DTA) and Effluent Gas Analyzer unit is used to determine thermal/vacuum weight loss/gain, phase change and glass transition temperatures of nonmetallic materials.

In the TGA, the sample is exposed to a selected atmosphere (any mixture of 3 gases to 14.7 psia; or vacuum to 10^{-7} torr) and then it is heated (to a maximum of 1100°C) to observe weight loss or gain.

(See page 11-81)

7. POTENTIAL: Undefined.

8. PLANS: None

9. BLDG. NO. 7 | 10. YR. BUILT: 1964 | 11. FAC. CAT. CODE: 320-50

12. INITIAL COST: $ 75 K | 13. NASA B.O.D. 1964 | 14. STATUS CODE: Active

15. ACCUM. COST: $ 100 K | 16. LIFE EXPECT. Indef. | 17. OWNER CODE: NASA

18. OPER. CODE: NASA | 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Crew Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Crew Systems Division (EC)
(AC 713) 483-5586

6. NARRATIVE DESCRIPTION

In the DTA, the sample is exposed to similar atmospheres and then heated (to 550°C) to determine thermal transition in the sample. The effluent gases can be directed into a gas chromatograph for analysis.

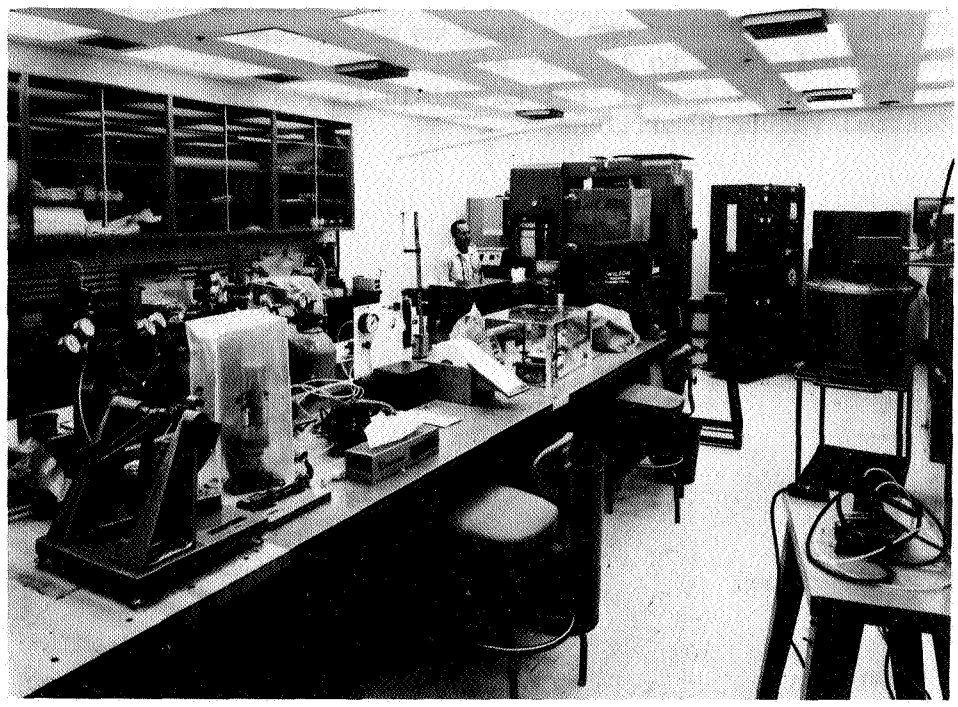
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-39-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Nonmetallic Materials Physical Testing Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Materials Physical Test Laboratory, Nonmetallic

5. TECHNOLOGICAL AREAS SUPPORTED: Development, evaluation and testing of nonmetallic materials

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory is used for the development, evaluation, and testing of fibrous, plastic, and elastromeric materials for space environmental applications. ***Some*** of the properties **that** can be determined in this lab are listed below:

Breaking Strength	Ultimate Elongation	Thermal Conductivity
Tear Strength	Energy Absorption	Air Permeability
Seal Strength	Repeated Stress Properties	Flexibility
Peel Strength	Burst Strength	Stiffness
Bond Strength	Young's Modulus of Elasticity	Folding Endurance
Compression Strength	Multigas Transmission	Resistance to Alvasion
Flexure Strength	Impact Strength	Resistance to wear
		Hardness

6. NARRATIVE DESCRIPTION

Thickness
Microscopic and Photographic Study
Hydrostatic Strength
Fabric Analysis
Moisture Content
Effect of exposure to high vacuum at elevated temperatures
Effect of exposure to high vacuum at cryogenic temperatures
Specific Gravity

In addition to the multitude of small equipment required to determine the above, this lab contains an instron tensil testor and small vacuum chamber (1X 10-10 for ultimate). The chamber can be used to expose the materials to various vacuums and temperatures (-300°F to 1600°F) simultaneously prior to above tests. Also the instron can be used to tensil test materials inside the vacuum chamber under various thermal vacuum conditions.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 7 10. YR. BUILT: 1962-64 11. FAC. CAT. CODE: 320 50

12. INITIALCOST: $ 100 K 13. NASA B.O.D. 1962-64 14. STATUSCODE: Active

15. ACCUM. COST: $ 150 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Crew Systems Division

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Chief, Crew Systems Division (EC)
Phone: (Area Code 713) 483-5586

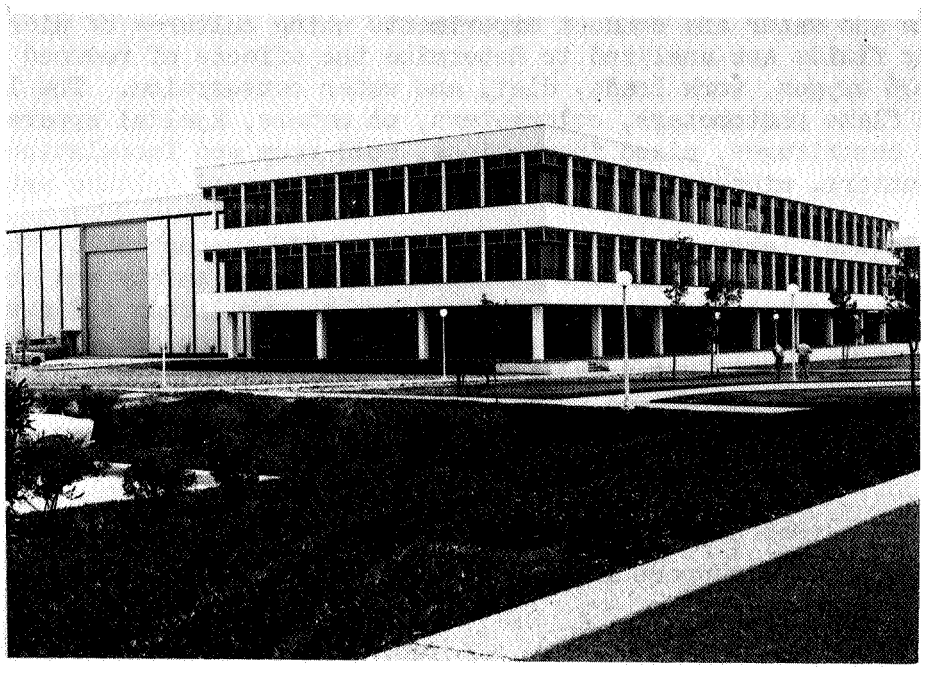
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-40-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Laboratory Complex of Building 7A

3. LOCATION ***(if other than in I. above):***



4. FUNCTIONAL NAME: Life Sciences Laboratory Complex (Bldg. 7A)

5. TECHNOLOGICAL AREAS SUPPORTED: Development and support of crew systems functions as related to life sciences.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This hboratory Complex contains the following specific functional areas:

a. Crew Performance Laboratory - Located in **Room** 248. This Laboratory provides the capability to perform various performance tests involving pressure suit operations. Programmed behavioral equipment and physiological and biomedical monitoring equipment is used. Gastric mobility, static/ dynamic pressure suit mobility, visual fields as affected by helmet/visor design, pilot proficiency, and controlled studies of pilot proficiency, and controlled studies of pilot response **to** stress are conducted. Integrated performance tests are carried **out** in (Gemini and Apollo) spacecraft module mockups located in other parts of the building. Simulations **for** 1/6 g, 6 degree-of-freedom, and a 5 degree-of-freedom air brearing system

6. NARRATIVE DESCRIPTION

are used for testing extravehicular life support systems, suit mobility, and integrated performance.

b. Instrument Development Laboratory - Located in Rooms 312, 351, and 351A. This Laboratory contains instrumentation and facilities for evaluating developmental gas analysis equipment and for analyzing atmospheric samples from tests. The laboratory contains a mass spectrometer, gas chromatograph, vapor fractometer, and miscellaneous equipment for gas analysis,

c. Microbiology, Special Biochemistry and Clinical Biochemistry Laboratories - Located in Rooms 239, 240, and 241. These laboratories are used to analyze and test body fluids and water and conduct experiments using cultures of microorganisms. Body fluids are analyzed to determine the effects of reduced pressure, temperature, 100% oxygen, work loads, diet, and water consumption. The laboratories contain flame photometers, colormeters, ph meters, kjeldal apparatus, chromatographs, centrifuges, mixed incubations, cold roam and inoculation room, sterilizers, counters, microscopes, chemicals, glassware, and culture materials.

d. Physiological Laboratory - Located in Rooms 335 through 341. This laboratory is used to evaluate the design criteria for crew safety and comfort. Performance of space suits, regulators, tubing, masks, umbilicals and associated equipment for dispensing respiratory gases and for ventilation are studied by analytical respiratory gases. A treadmill is available for determining physiological factors during exercise and wearing space suits during various working modes. The laboratory also evaluates nutritional requirements, methods of packaging and preparation of food, and the stability and palatability of food after storage.

(See continuation on attached sheet)

7. POTENTIAL: Adaptable to support advanced manned spacecraft programs.

8. PLANS: None

9. BLDG. NO.	7	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	320 30
12. INITIAL COST: $	1350 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	2350 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Crew Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Crew Systems Division–(EC)
Phone: (Area Code 713) 483-4931

e. Metabolism Laboratory - Located in Roams 335-341. This laboratory is used to investigate the physiological effects of the thermal stresses encountered in space flight. Areas of study include that of heat dissapation, metabolid requirements in pressurized and unpressurized suits, and metabolic requirements for water, oxygen, and food.

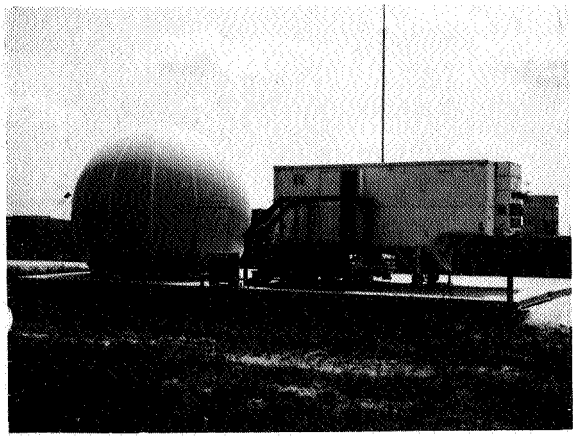
TECHNICAL FACILITIES RESUME

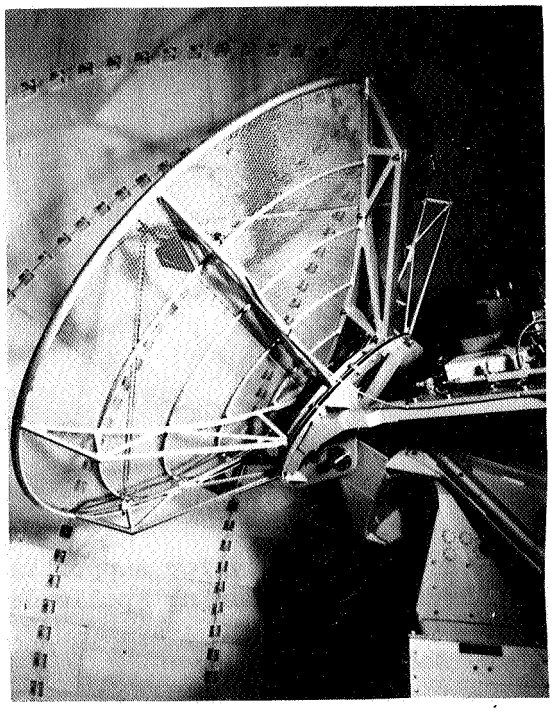
DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-41-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Radio Telescope

3. LOCATION *(if other than in 1. above):*





4. FUNCTIONAL NAME: Radio Telescope Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Gathering solar flare data

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This telescope measures the radio frequency emitted from the sun during solar disturbances. Major equipment of the telescope is a dish antenna which tracks the sun, three radio frequency receivers, three analog recorders, one analog digitizer, one digital magnetic tape system, and associated calibrated equipment.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Capability Tor supporting operational decisions concerning radiation environment in space during Apollo deep space missions.

8. PLANS: None

9. BLDG. NO.	271	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	320 20
12. INITIAL COST: $	14 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	16 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

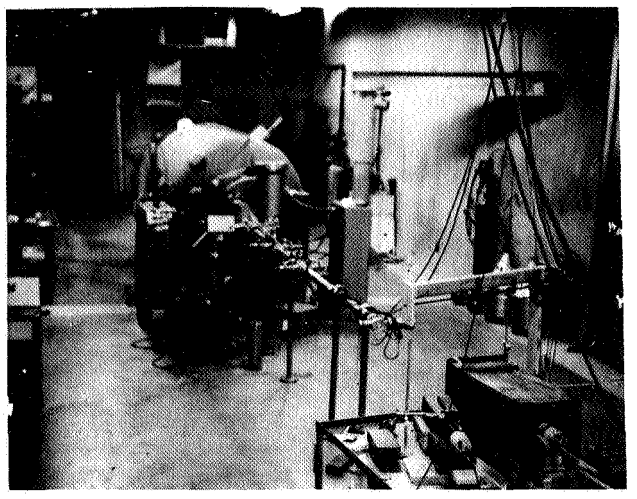
21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Radiation and Fields Branch

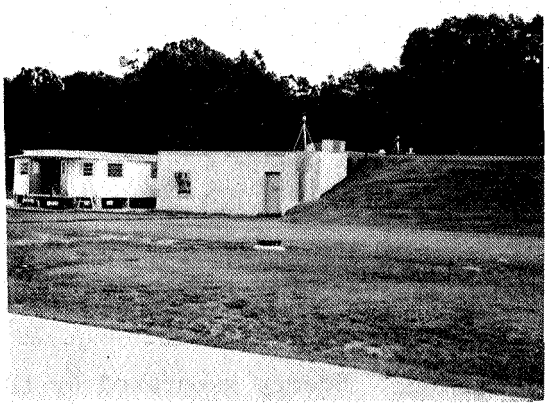
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
Phone (Area Code 713) 483-4800

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Van de Graff Facility

3. LOCATION *(if other than in 1. above):*





4. FUNCTIONAL NAME: Accelerator Facility, Van de Graaff

5. TECHNOLOGICAL AREAS SUPPORTED: Development of radiation detectors and instrumentation to perform radiation experiments.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is used to calibrate various types of radiation equipment such as detectors and other instruments.

The major items of equipment are: One 3 Mev Van de Graff accelerator; a 30 inch target vacuum chamber for accepting experiments of life size and reducing pressure to a 5×10^{-7} torr for flight calibration work; and a neutron generator and associated equipment.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Energy generated by the accelerator can be varied from 0.5 to 3 Mev for proton generation.

8. PLANS: To expand caiibration of radiation type of instruments.

9. BLDG. NO.	265	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	320 30
12. INITIAL COST: $	75,000 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	80,000 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Radiation and Fields Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division (EF)
Phone: (Area Code 713) 483-4800

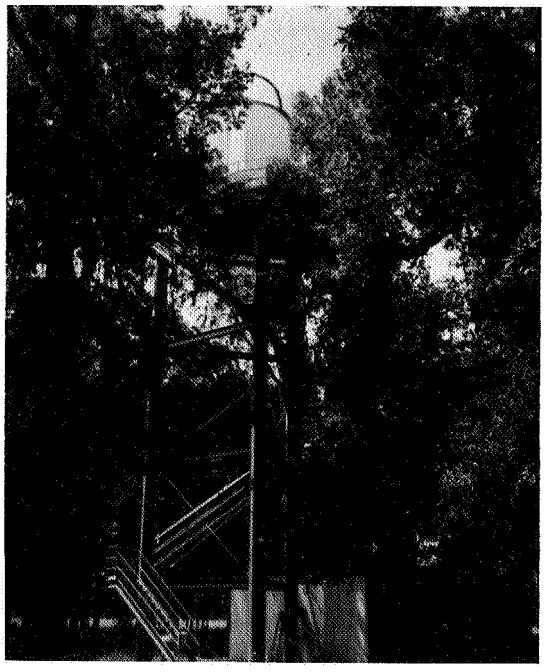
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-43-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Solar Radio Frequency Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Solar Radio** Frequency Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Solar flare observation

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory and telescope track the sun from sunrise to sunset monitoring three internationally cleared radio frequencies. As a part of the Solar Particle Alert Network, it will observe solar flares and related activities.

The solar telescope tower, in addition to the telescope equipped with a hydrogen-alpha filter, has a solar spectrograph and its associated equipment.

This facility will also serve as a training site for the optical phase of the Apollo space radiation warning system.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: To develop a real-time warning capability

9. BLDG. NO. 270 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320 20

12. INITIALCOST: $ 75 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 75 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Radiation and Fields Branch

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
Phone: (Area Code 713) 483-4800

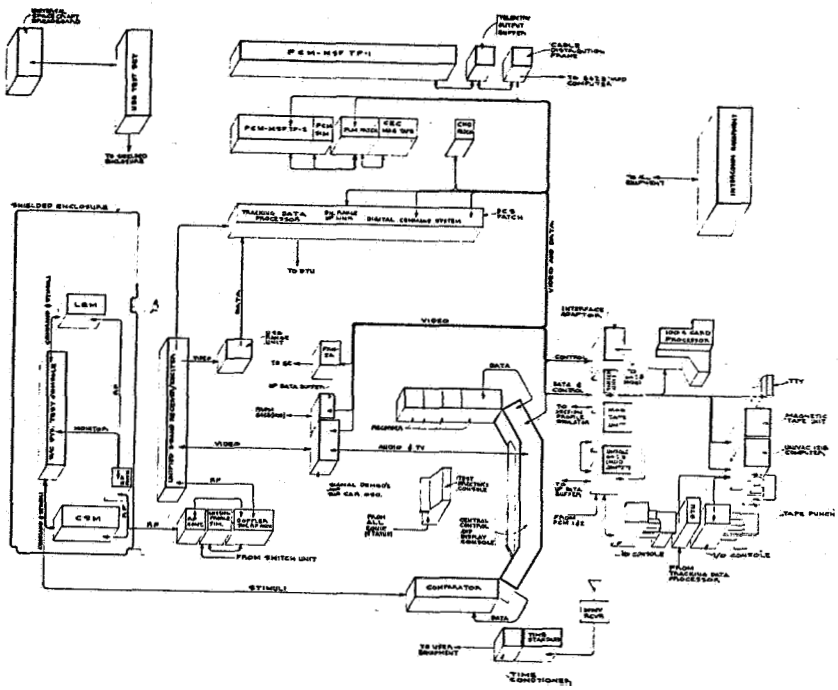
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-44-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Electronic Systems Compatibility Laboratory

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Electronic Systems Compatibility Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Spacecraft - Manned Space Flight Network (MSFN) RF Systems and related areas; Compatibility and Performance Evaluation, Special Investigation, Mission Profile Simulation.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Electronic System Compatibility Laboratory has the capability to operate both the ground (MSFN) and spacecraft communications systems simultaneously in a manner which simulates actual space flights. This is accomplished by electrically simulating the RF space link under carefully controlled laboratory conditions. RF doppler, propagation attenuation and Range Code delay, antenna pattern nulls, etc., can be varied by computer program or manual control.

This facility's ground and spacecraft system equipnent has been selected to be identical to, or to accurately simulate, operational units. Spacecraft equipment is mounted in a Breadboard designed to simulate as closely as possible the installation configuration of a spacecraft. All electronic equipment directly affected by or affecting the RF systems is included;

6. NARRATIVE DESCRIPTION

transducer and guidance computer interfaces are simulated. Ground equipment, in addition to the RF equipment, includes: MSFN-type PCM decommutators (2); a 642B (modified) computer; timing; subcarrier oscillator and demodulator; up data buffer; tracking data processor; digital command system; a 1218 computer. Special purpose ground equipment includes a comparator with which RF input modulation information is automatically compared with RF output demodulated information.

The communication equipments are hard-wired to the simulated RF space link where precise amounts of attenuation, noise, doppler shift and antenna pattern effects are introduced. Effects on the systems are monitored and evaluated in real-time by use of the specially designed control, display and comparison equipment. The special equipment is supplemented by several recorders of various types which permits detailed analysis of tests.

The several systems and sub-systems comprising the facility are integrated in such a manner as to provide a versatile complex which can be adapted to a variety of test programs. Examples of ESCP utilization for support of these programs are:

a. Tests to conform spacecraft and ground systems compatibility and performance without requiring flight tests.

b. Data handling, reduction, recording and analysis techniques can be evaluated under controlled conditions.

c. Modifications to either prototype or operational equipment can be evaluated without flight testing.

d. Malfunctions can be investigated as they occur and in the event of intermittant faults, several test runs can be made.

7. POTENTIAL:

Can be expanded to include Checkout Systems Experimental Laboratory.

8. PLANS: Addition of Office/Laboratory wing adjoining High Bay and an operational on-board checkout equipment package in FY 68. Estimated cost: $4200K

9. BLDG. NO. 440 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 3,200 K 13. NASA B.O.D. 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ 3,200 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA/Contr. 19. CONTRACTOR NAME *(if contr. oper.)*: Lockheed Electronics Company

20. OTHER SOURCES OF INFO: "Electronic Systems Test Program", Report No. EB65-3101-U, Volumes I, II, III, IV

21. COGNIZANT ORGANIZATIONAL COMPONENT: Information systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Information Systems Division (EB)
Phone: (Area Code 713) 483-3987

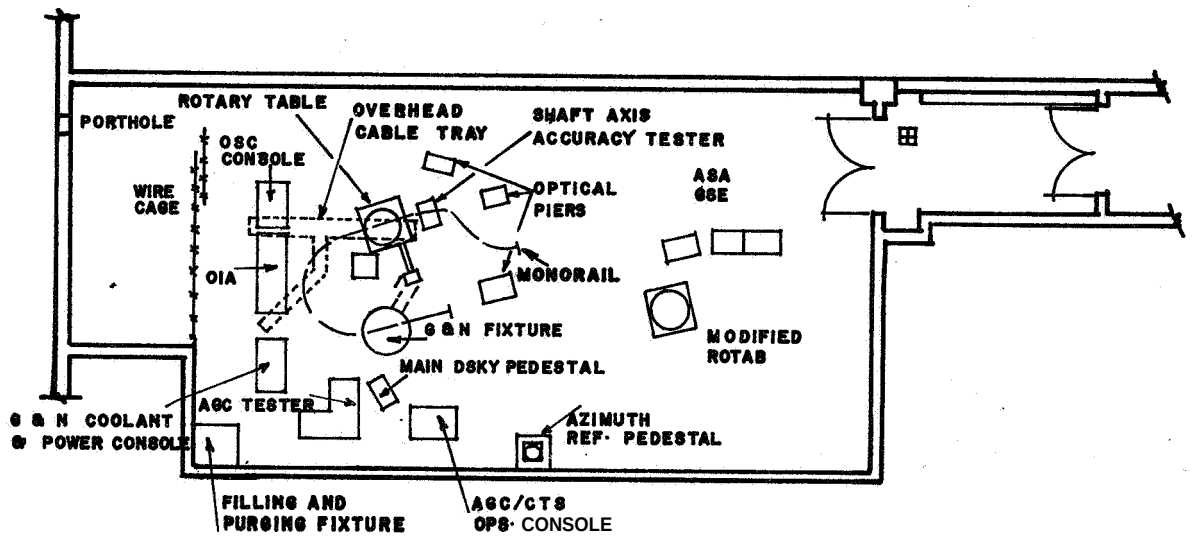
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-45-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Guidance and Navigation Systems Laboratory

3. LOCATION *(if other than in 1. pboue):*



4. FUNCTIONAL NAME: Guidance and Navigation Systems Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Optical and Inertial Guidance System Testing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The universal test station (UTS) is the area in which the Apollo Guidance and Navigation (G&N) system is checked out and tested. The UTS consists of these major units: optics-inertial analyzer (OIA), G&N coolant and power console (CPC), oscillograph console (OSC), Apollo guidance computer test set (CTS), AGC/CTS operation console (AGC-OC), AGC calibration system, GSE junction box (OJB) shaft accuracy tester, AGC simulator, and optical targets grouped around the rotary table and G&N mounting fixture.

This test station can be used for individual sub-system checkout (ISS), as well as G&N system checkout. Prior to ISS checkout, the inertial measuring unit (IMU), the power and servo assembly (PSA), and the GSE-PSA

6. NARRATIVE DESCRIPTION

junction box (SJB) are secured to mounting fixtures which, in turn, are mounted on the rotary table. Other airborne components are installed in the G&N mounting fixture. All G&N system airborne Components except main panel display and keyboard (DSKY) are installed in the G&N mounting fixture during system checkout.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 16 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 310 10

12. INITIAL COST: $ 265 K 13. NASA B.O.D. 1965 14. STATUSCODE: Active

15. ACCUM. COST: $ 1,050 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):*
Lockheed Electronics Company

20. OTHER SOURCES OF INFO: Guidance and Control Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Guidance and Control Division

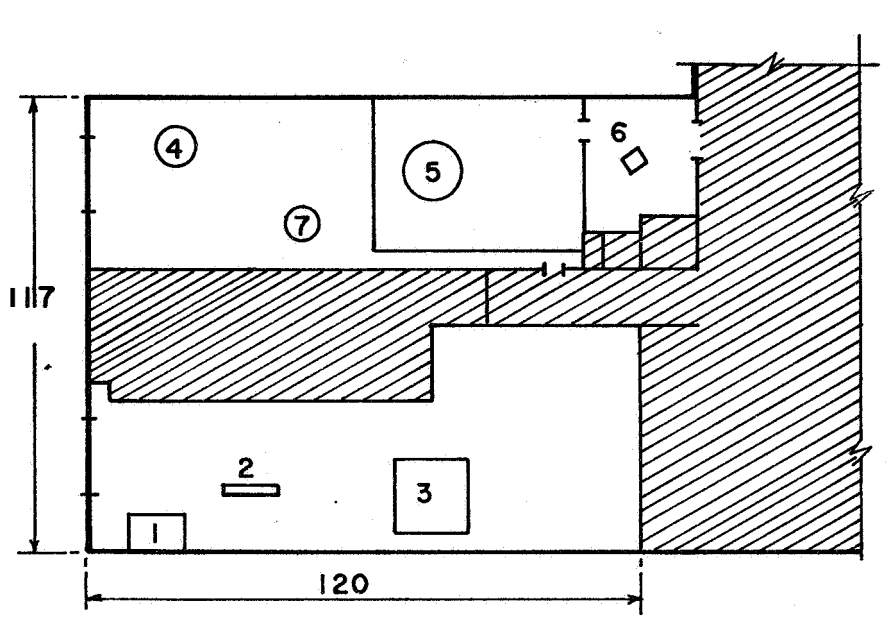
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Guidance and Control Division (EG2)
Phone: (Area Code 713) 483-3066

TECHNICAL FACILITIES RESUME DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-46-00

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Systems Dynamics Laboratory

3. LOCATION *(if other than in 1. above):*



BLG. 16A
SYSTEMS
DYNAMIC
LABORATORY

4. FUNCTIONAL NAME: Stabilization and Control Systems Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Closed-loop system testing of spacecraft stabilization and control systems; control system component performance testing.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility provides the capability for evaluation, development, and dynamic testing of spacecraft guidance and control systems. The Laboratory houses several types of equipment used in the development and dynamic testing of spacecraft control systems hardware.

a. Air-bearing Tables

The larger table (numbered 5 in item 3 above) is air-bearing supported and has three degrees of rotational freedom. It serves as a space vehicle motion simulator providing a research and development test bed for space vehicle attitude control systems, including electronics and sensors.

6. NARRATIVE DESCRIPTION

Instrumentation is such as to provide necessary signals between the table and the control console. Fine balance is accomplished remotely from the control console. This table is scheduled to be operational by September, 1966.

A second table (#4), smaller and less sophisticated is presently operational in this area.

The third air-bearing table, (#7), is a single-axis table and is presently operational.

b. Three-axis Servoed Flight Simulator

This simulator (#6) is a precision electro-hydraulic positioner which dynamically simulates the angular flight motions of space vehicles. In conjunction with the analog computer, it dynamically simulates the vehicle motions in real time.

c. Loading Devices

Special purpose auxiliary equipment is used in this facility for the purpose of loading gimbal and fin actuators during the overall control system tests. Typical examples are the Service Propulsion System engine gimbal test stand (#3) and Single Axis Inertial Test Stand (#2). Other, smaller equipments, are available in this laboratory for functional checkout and performance verification of control systems components such as rate gyros, cold gas thrusters for air-bearing table use, actuator motors and clutches.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO.	16	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	310 10
12. INITIALCOST: $	-- K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	1,700 K	16. LIFE EXPECT.	Indef.	17. OWNERCODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if eontr. oper.)*:	Lockheed Electronics Company		

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Guidance and Control Division

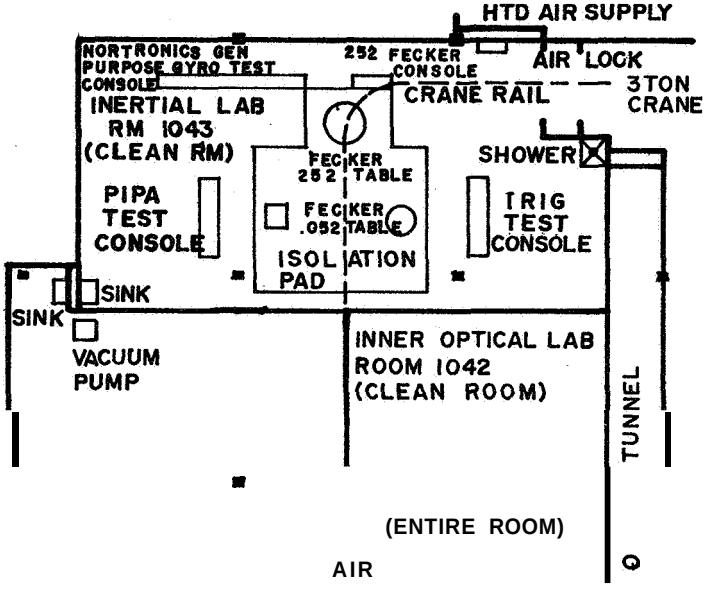
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Guidance and Control Division (EG2)
Phone: (Area Code 713) 483-3066

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 15, 1966
	FACILITY NO:	11-00-47-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Inertial Optical Laboratories

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Inertial and Optical Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Test and evaluation of inertial component and sub-sys-tems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

a. Inertial Lab - This lab contains equipment capable of performing complete acceptance tests on 24IRIG gyros and 16 PIPA accelerometers. The Nortronics General Purpose Gyro Test Console has the capability of testing any single-degree-of-freecom *gyro,* Capabilities also exist to test inertial sub-systems, e.g., inertial platforms.

b. Optics Labs - This lab performs analytical and experimental studies of space visibility problems and determination of crew backup guidance capabilities. The optical instrument design studies directed toward "fixes" of (Apollo) spacecraft optical system problems, the lunar landing visibility studies, the analyses of optical systems and spacecraft window fouling components, and the general visibility research to improve the

6. NARRATIVE DESCRIPTION

analytical techniques in this field. Efforts will include performing functional accuracy and reliability tests of the Command/Service Module and **Lunar** Module optical equipment,

INERTIAL LABORATORY EQUIPMENT

25 IRIG Console
DATE Console
Table
16 PIPA Console
Optical Dividing **Head**
Mounting Pier
General Purpose Console
252 Table
Ultra Rodex Table

OPTICS LABORATORY EQUIPMENT

Beck Optical Bench CE-3C2
Two Axis Tracking Mount
Venco Vacuum System 1802
Gaertner Optical Bench L360N
SIL Image Converter
10 KW Solar Spot Lamp
Helium Neon Laser .3 mw
Two Micro Flat Tables 3' x 6'
Cenco Vacuum Pump

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 16
10. YR. BUILT: 1965
11. FAC. CAT. CODE: 310 10
12. INITIALCOST: $ 320 K
13. NASA B.O.D. 1965
14. STATUSCODE: Active
15. ACCUM. COST: $ 800 K
16. LIFE EXPECT. Indef.
17. OWNER CODE: NASA
18. OPER. CODE: Contr.
19. CONTRACTOR NAME *(if contr. oper.):* Lockheed Electronics Company

20. OTHER SOURCES OF INFO: Guidance and Control Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Guidance and Control Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Guidance and Control-Division (EG2)
Phone: (Area Code 713) 483-3066

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-48-00**

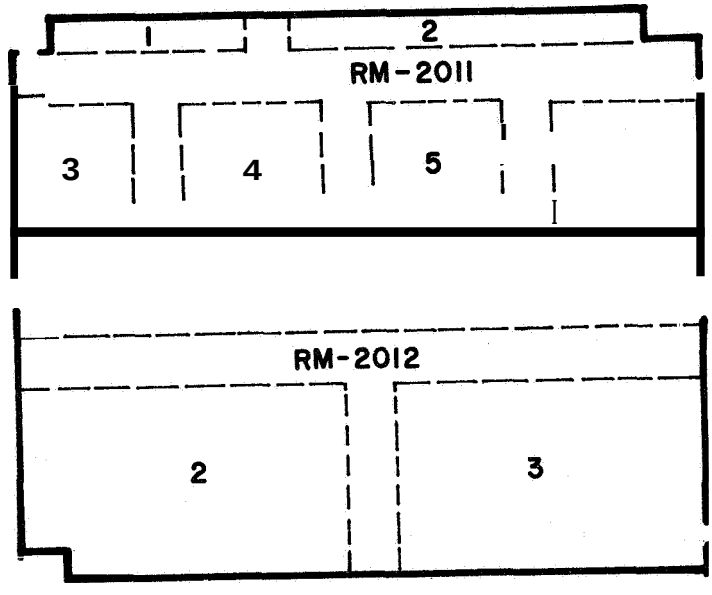
1. REPORTING INSTALLATION: Nanned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Guidance and Control Electronics Laboratory

3. LOCATION *(if other than in I. above):*

RM- 2011 (NASA)

1-MICROLOGIC BREADBOARDING
2-EQUIPMENT & COMPONENTS
3-NAVCOR DIGITAL GOMPUTER
4-SYSTEMS BUILDUP
5-SYSTEMS EVALUATION
6-ELECTRONIC FABRICATION



4. FUNCTIONAL NAME: Guidance and Control Electronics Laboratory

5. TECHNOLOGICALAREASSUPPORTED: Research, design and development of electronic systems for control of spacecraft attitude and translation motions.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is a completely equipped and instrumented Electronics Laboratory that provides the capability to carry analog and digital control systems through all phases of conception, design, development, breadboarding, testing, evaluation and prototype construction.

In addition to standard electronics lab equipment, analog and digital module computing equipment is used for parameter optimization in static and dynamic, open-loop and closed-loop system studies.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Development and construction of spacecraft flight hardware

8. PLANS: Flight hardware development for Apollo Applications **Program.**

9. BLDG. NO.

10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310 10

12. INITIALCOST: $ Unknown K 13. NASA B.O.D. 1964 14. STATUSCODE: Active

15. ACCUM. COST: $ 800 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA/Contr. 19. CONTRACTOR NAME *(if contr. oper.):*
Lockheed Electronics Company

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Guidance and Control Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Guidance and Control Division (EG2)
Phone: (Area Code 713) 483-3066

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-49-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Cartographic Laboratory

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Cartographic Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Lunar-Surface Technology; Cartography

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is utilized for making photogrammetric and densitometric measurements to evaluate potential lunar landing sites; evaluation of materials produced by other agencies; and for supplying cartographic materials to other MSC agencies.

Major items of equipment are: B-8 Stereomat automated platters, densitometers, Gerber X-Y plotter, mann comparator, stereoscopes, and isodensitracers. The laboratory **has** an area of approximately 1600 square feet.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Can furnish material for future space explorations to both military and civilian organizations.

8. PLANS: To increase scope of information for flight programs.

9. BLDG. NO. 31 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 320 20

12. INITIALCOST: $ Unknown K 13. NASA B.O.D. 1966 14. STATUSCODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA/Contr. 19. CONTRACTOR NAME *(if contr. oper.):*
Lockheed Electronics Company

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Lunar Surface Technology Branch

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
Phone: (Area Code 713) 483-4800

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-50-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Lunar Topographic and Geologic Simulation Area

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Lunar Topographic and Geologic Simulation Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Lunar Surface Technology

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This simulated lunar surface area consists of a circular area 328 feet in diameter. It is considered an accurate reproduction of the lunar surface. The landscape does not represent any particular lunar area, but it does contain craters, ridges, rays, and hummocks. Different colors and sizes of porous slag material are used to simulate lunar geologic relationships. A mock-up of the Lunar Module is in the area for engineering studies and astronaut training.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO.	N/A	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	390 00
12. INITIAL COST: $	60,000 K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	None K	16. LIFEEXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Lunar Surface Technology Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
Phone: (Area Code 713) 483-4800

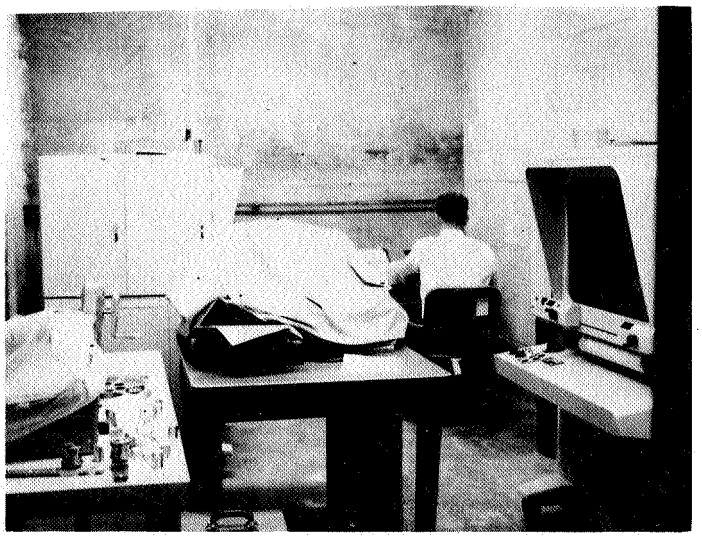
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-51-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Radiation Instruments Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Radiation Instruments Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Environment measurement, dosimetry verification of space shielding and lunar surface experiments.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory develops spacecraft radiation instruments for inflight and lunar surface. It has a dark room and reading room for developing and analyzing radio emulsions from the Gemini and Apollo missions. There are also areas for magnetometer studies. The laboratory has approximately 3000 square feet.

Major equipment consists of: multichannel analyzers, X-Y plotters, closed circuit television, radiation survey meters, scallers, sensors, and dark room equipment.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Additional radiation equipment can be developed for spaceflights as astronauts expand their flight areas.

8. PLANS: Design and develop radiation instruments for future space explorations.

9. BLDG. NO.	31	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	320 20
12. INITIAL COST: $	1,900,000 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	1,970,000 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.)*:			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Radiation and Fields Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
Phone: (Area Code 713) 483-4800

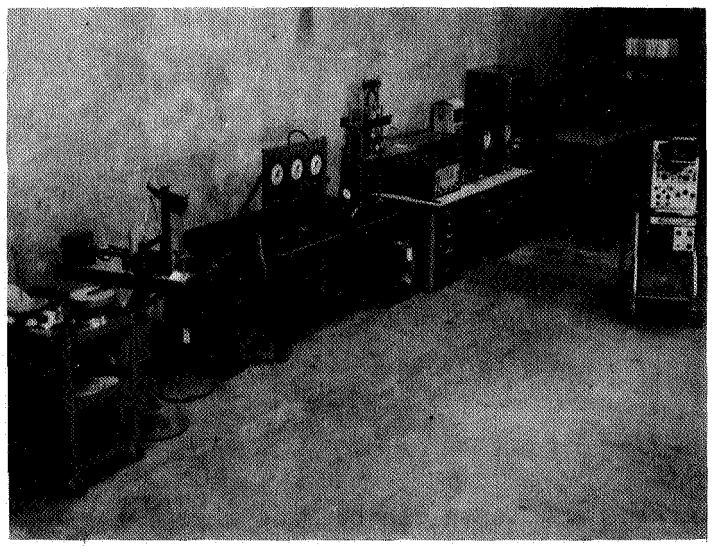
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-52-00**

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Gsophysics Laboratory

3. LOCATION *(if other than in 1. above):*



4 FUNCTIONAL NAME: Geophysics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Analysis of probable lunar surface conditions and materials

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory establishes analytical and physical models of the lunar surface. These models are devised from experiments which determine how the physical environment of the moon might change the properties of terrestrial and hypothetical lunar materials.

In order to design measurements techniques, the models are measured in simulated field environment. From these experiments the knowledge gained will be used by the astronauts to interpret measurements on the moon. Major items of equipment are strip and polaroid recorders, seismometer, and standard electronic instruments. This laboratory has approximately 1400 square feet of floor space.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Experiments and tests can be made which will be useful in future space explorations.

8. PLANS: Additional recording equipment for further tests.

9. BLDG. NO.	31	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	320 20
12. INITIALCOST: $	Unknown K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Lunar Surface Technology Branch

22. LOCAL OFFICE TOCONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
Phone: (Area Code 713) 483-4800

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-53-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Geology and Geochemistry Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Geology and Geochemistry Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Lunar geological exploration

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility supplies direct support for geological exploration to be performed by astronauts on the moon.

In addition, astronaut training programs, chemical and electronic tests on rock specimens, and evaluations of instruments and tools for use on the moon, are conducted in the laboratory.

Major equipment, part of which is located at Ellington AFB but will be moved to the Site, is: rock crushers, saws, spectographs, electron microprobe, thermal analysis, diffractometer and assorted electronic equipment. The area of the laboratory is approximately 3400 square feet.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 31 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 320 20

12. INITIALCOST: $ Unknown K 13. NASA B.O.D. 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Lunar Surface Technology Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
phone: (Area Code 713) 483-4800

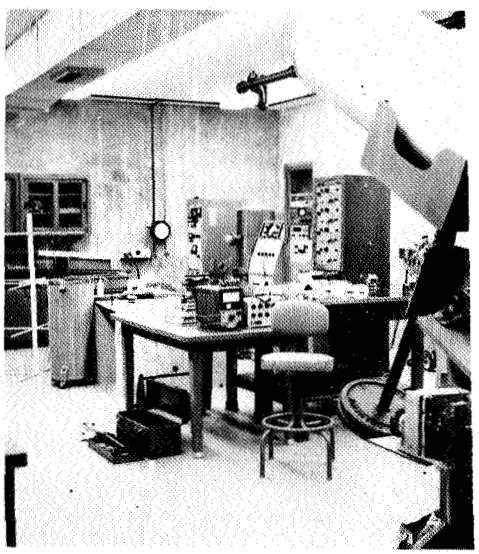
TECHNICAL FACILITIES RESUME

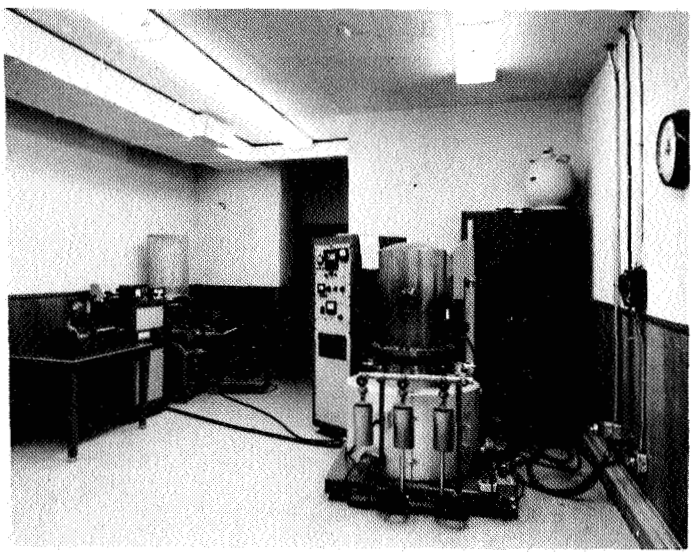
DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-54-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Planetary Atmospheres Laboratory

3. LOCATION ***(if other than in 1. above):***





4. FUNCTIONAL NAME: Planetary Atmospheres Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Study and analysis of interplanetary space weather and atmospheric densities.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The function of this facility is to calibrate lunar surface experiments associated with atmospheric measurements, to provide data related to weather and atmospheric density during flight, and to define environment for planets and interplanetary space.

Major equipment is vacuum equipment and various kinds of weather equipment. The lab has approximately 836 square feet of floor space.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: To increase atmospheric and calibration experiments

9. BLDG. NO.	31	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	320 20
12. INITIALCOST: $	Unknown K	13. NASA B.O.D.	1966	14. STATUSCODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Space Science Division
Meteoroid Technology and Optics Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Assistant Chief, Space Science Division
Phone: (Area Code 713) 483-4800

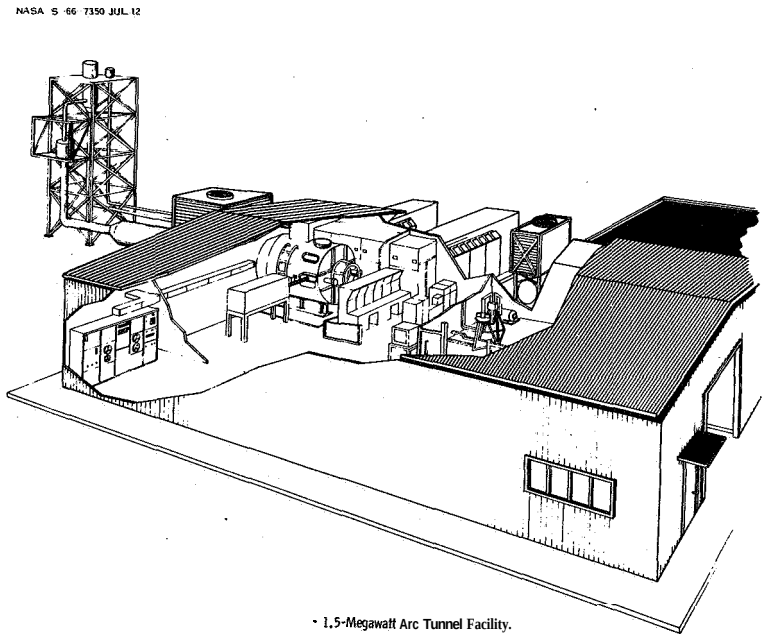
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-55-00**

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: 1.5 Megawatt Arc Tunnel Facility

3 LOCATION *(if other than in 1. above):*



1.5-Megawatt Arc Tunnel Facility.

4 FUNCTIONAL NAME: Arc Tunnel, 1.5 Megawatt

5 TECHNOLOGICAL AREAS SUPPORTED: Simulation of heating rates, pressures, and gas enthalpies associated with manned spacecraft reentry into the earth's atmosphere from orbital lunar, and planetary missions.

6 NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of two arc heaters, a vacuum chamber with built-in model insertion system, diffuser, heat exchanger, and a four-stage stream ejection vacuum system. This facility shares a 250 gpm, 500 psi closed loop water cooling system and gas supply system with the 1 Megawatt Arc Jet Facility.

This facility is capable of simulating gas stream enthalpies of 2000 to 57,000 BTU/lb and heating rates of 10 to 1500 BTU/ft2 sec. in test models 1 to 6 inches in diameter. The stagnation pressure on test models may be varied from 0.01 to 3 atmospheres by using a selection of subsonic and supersonic nozzles. By using a radiant convective plenum in one of the arc heaters, radiant heating rates of 100 to 1000 BTU/ft^2 sec. and convective heating rates of 100 to 1000 BTU/ft^2 sec. may be obtained in a 1 inch diameter test sample.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Addition of channel flow nozzles for simulating shear forces of 1 to 50 lb/ft^2

8. PLANS: Design and construction of these nozzles will be initiated in FY-67

9. BLDG. NO.	262	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	320 50
12. INITIAL COST: $	278 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	278 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA/Contr.	19. CONTRACTOR NAME *(if contr. oper.):*	Brown & Root-Northrap		

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure, April 1966

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Thermal Technology Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Thermal Technology Branch (ES6)
Phone: (Area Code 713) 483-3678

TECHNICAL FACILITIES RESUME

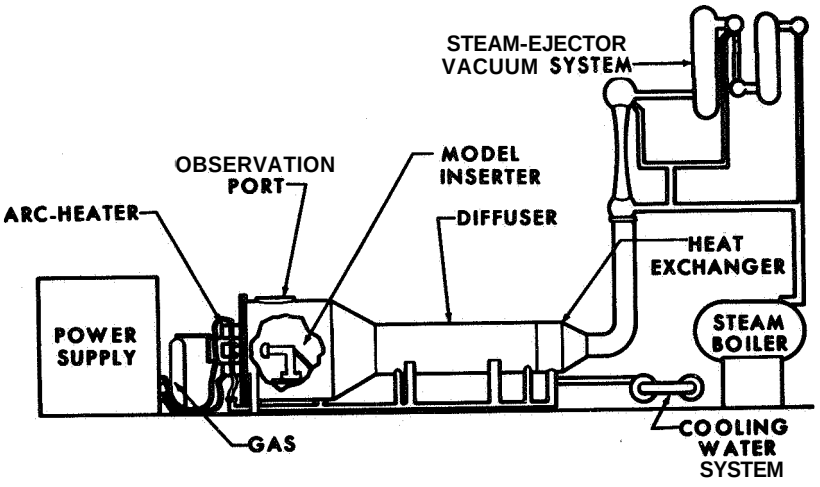
DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-56-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: 1 Megawatt Arc Jet Facility

3. LOCATION *(if other than in 1. above):*

NASA-S-66-2575 MAR 21



4. FUNCTIONAL NAME: Arc Jet Facility, Subsonic 1.0 Megawatt

5. TECHNOLOGICAL AREAS SUPPORTED: Simulation of the heat transfer rates and gas enthalpies associated with manned spacecraft reentry into the earth's atmosphere from earth orbital and lunar missions

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of a 1 megawatt subsonic atmospheric exhausting arc heater and a model insertion system. The facility shares a 250 gpm, 500 psi closed loop water cooling system, a gas supply system with the 1.5 megawatt arc tunnel facility. The facility contains an X-ray char monitoring system which provides real time displays of the char and char-origin interface recession of charring ablation materials on both motion picture film and a television monitor. Using subsonic splash test techniques, heating rates of 50 to 600 BTU/ft^2 sec. can be obtained, on test samples 2 to 4 inches in diameter, with gas stream enthalpies of 4000 to 15,000 BTU/lb_m. Using duct nozzle configurations, heating rates of 10 to 300 BTU/ft^2 sec. and shear forces from .001 to 16 lb/ft^2 on 2 by 6 inch test models, the facility may be operated using simulated air (composed of N_2 and O_2), He, Ar, or combinations of these gases.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: **None beyond present capacity**

8. PLANS: **None**

9. BLDG. NO. 262 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 320 50

12. INITIALCOST: $ 545 K 13. NASA B.O.D. 1963 14. STATUSCODE: Active

15. ACCUM. COST: $ 545 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA/Contr. 19. CONTRACTOR NAME *(if contr. oper.)*:
Brown & Root-Northrop

20. OTHER SOURCES OF INFO: "Major **Test Facilities of the Engineering and Development Directorate", Brochure, April** *1966*

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Structures and Mechanics Division**
Thermal Technology Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: **Chief, Thermal Technology Branch (ES5).**
Phone: (Area Code 713) 483-3678

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-57-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Radar Boresight Range Facility

3. LOCATION *(if other than in 1. above):*

4. FUNCTIONAL NAME: Radar Boresight Range

5. TECHNOLOGICAL AREAS SUPPORTED: Development of spacecraft rendezvous and landing radar systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is housed in a two-story structure with approximately 1250 square feet of floor space. The facility will use an antenna range transmitting tower, located 2500 feet away.

The facility is being initially used in the development of (Apollo) spacecraft rendezvous and landing radar systems. The rendezvous radar is designed to measure the range and bearing from the Lunar Module (LM) to the Command Service Module (CSM) during rendezvous maneuvers and when the LM is on the surface of the moon. The landing radar is designed to measure LM to moon altitude, angle of approach to the lunar surface, and the velocity of approach during the LM lunar landing phase. The facility is capable of performing the following functions in testing the accuracy of the radar systems:

6. NARRATIVE DESCRIPTION

a. Rendezvous radar

(1) Establish an incident, 10,000 MH (+500) circular electromagnetic field which will simulate an incident plane wave of constant amplitude. The field will be centered over an active aperture of the rendezvous antenna which is mounted on a partial LM mock up installed on the 3 axis antenna positioner.

(2) Provide for supporting, positioning, and indicating the orientation of the mock up.

(3) Establish a frame of reference for making measurements.

(4) Determine the radiation source location.

(5) Establish an optical line of sight from a source of radiation to the rendezvous radar to permit comparison with the radar line of sight measurement.

(6) Provides for optical alignment, calibration, and checkout of the boresight range before and during operation.

(7) Provides for a radiation pattern recording function to supplement the boresight measuring function.

b. Landing Radar

(1) Provide for boresighting of the three velocity beams and the altimeter (range) beam. . (See attached sheet for continuation)

7. POTENTIAL: Free space range is adaptable to a wide variety of radar systems.

8. PLANS: None

9. BLDG. NO.	18	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	310 10
12. INITIAL COST: $	248 K	13. NASA B.O.D.	May, 1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	423 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation & Electronic Systems Division.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Instrumentation and Electronic Systems Division (EE)
Phone: (Area Code 713) 483-2189

(2) Provide for measuring and recording beam patterns and doppler spectrum.

(3) Provide for supporting, positioning, and indicating the orientation of the test mock up.

(4) Establish a frame of reference for making measurements.

(5) Provide for alignment, calibration, and checkout of the range before and during operation.

(6) Provide for comparison between the actual range, attitude, and velocity and the quantities indicated by the landing radar.

The recording, receiving, and control equipment is mounted in a three section console located on the second floor of Building 18. The receiver is designed for antenna test instruments and covers a frequency range of 20 MH to above 100,000 MH. The antenna pattern recorder is capable of recording frequencies from 500 to 2500 H.

The positioning equipment consists of a heavy duty three axis antenna positioner located on the roof of Building 18. Because of the high accuracy required, the positioner is independently mounted directly from the ground on temperature stabilized columns. Included in the positioning equipment are: (1) a field probe for measuring the uniformity of the field strength across the receiving aperture, (2) a polarization tester to measure the degree of circularity of the transmitted signal, (3) standard gain horns to establish the absolute gain of the antennas under test, 'and (4) a boresight alignment telescope for initial zeroing of the angular coordinate system.

Following is a list of boresight range specifications and capabilities:

1. The range is approximately 2500 feet in length.

2. The reflectivity level is minus 35 db.

3. Angular readout of the positioner is 0.1 MR (16 bits).

4. The range is validated for a 15 foot by 15 foot quiet zone in front of the positioner.

5. Control and recording instrumentation will be used to record all radar data for later processing in the Computation and Data Reduction Division.

6. Data processing equipment includes a digital format generator, tape recorder, analog signal conditioners, strip chart recorders, and visual displays.

7. Equipment protection is provided for by weatherproof covers, a lightning rod, cable tie down in case of high winds, and storage facilities.

TECHNICAL FACILITIES RESUME

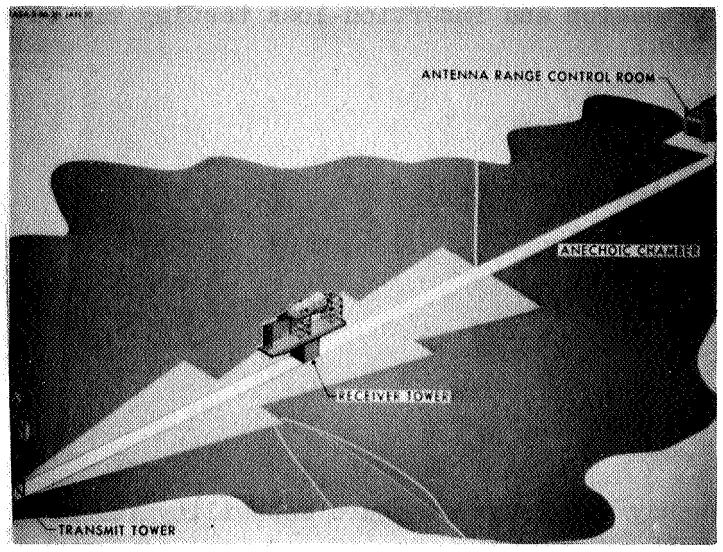
DATE OF RESUME: July 15, 1966

FACILITY NO: 11-00-58-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Antenna Range

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Antenna Test Range

5. TECHNOLOGICAL AREAS SUPPORTED: Measurements of antenna radiation patterns

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is a combination ground-reflecting/free-space antenna range of 1,000 or 2,000 foot length with fixed receiver height of 35 feet and variable transmitter height of 0-75 feet. It also consists of a heavy duty two-axis positioner capable of supporting test objects of diameters to 15 feet, lengths to 60 feet and weight to 20,000 pounds. All motions and data control or readout are performed remotely from a central control room. Data readout is by means of polar or rectangular plots, digital contour plots and digital punched paper tape. A pattern integrator with spherical convertor is installed. The range of frequencies currently covered by the facility is 200 mc to 12,400 mc. Both linear and circular feeds are available in this frequency range with parabolic reflectors of 6, 8, or 12 foot diameters for the high frequency ranges and log-periodics for the low frequency range. Installed transmitters tune 50 - 12,400 mc and receiver tunes from 20 - 100,000 mc.

6. NARRATIVE DESCRIPTION

An auxiliary positioner/model tower with 3 axis controller and 20 - 100,000 mc receiver is available for small model pattern measurements inside the Anechoic Chamber. The positioner load limit is 10,000 pounds and the model tower load limit is 750 pounds. Source generators cover a frequency range of 10 - 11,000 mc. The entire data recording system may be switched from the outdoor antenna range to the Anechoic Chamber when that facility is used as a shielded indoor antenna range.

An Antenna Systems Laboratory is available to support the Antenna Range. The laboratory is located in Building 14 adjacent to the high-bay crane area. Work benches and storage cabinets occupy about 1000 square feet. The laboratory is equipped for making RF impedance measurements from 65 Kc to 11 Kc with bridges and slotted lines. Attenuation and insertion-loss testing may be performed in this frequency range also,

7. POTENTIAL: Wide frequency and large aperture capability for measurements of antenna radiation patterns.

8. PLANS: None

9. BLDG. NO. 14 **10. YR. BUILT:** 1965 **11. FAC. CAT. CODE:** 132 90

12. INITIALCOST: $ 548 K **13. NASA B.O.D.** Oct 196[illegible] **14. STATUSCODE:** Active

15. ACCUM. COST: $ Unknown K **16. LIFE EXPECT.** Indef. **17. OWNERCODE:** NASA

18. OPER. CODE: NASA **19. CONTRACTOR NAME** *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Major Test Facilities of the Engineering and Development Directorate", Brochure; and the Lummus Company, "Concept Study for Antenna Range and Associated Facilities Building 14"

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO:

Chief, Instrumentation and Electronic Systems Division (EE)
Phone: (Area Code 713) 483-2871

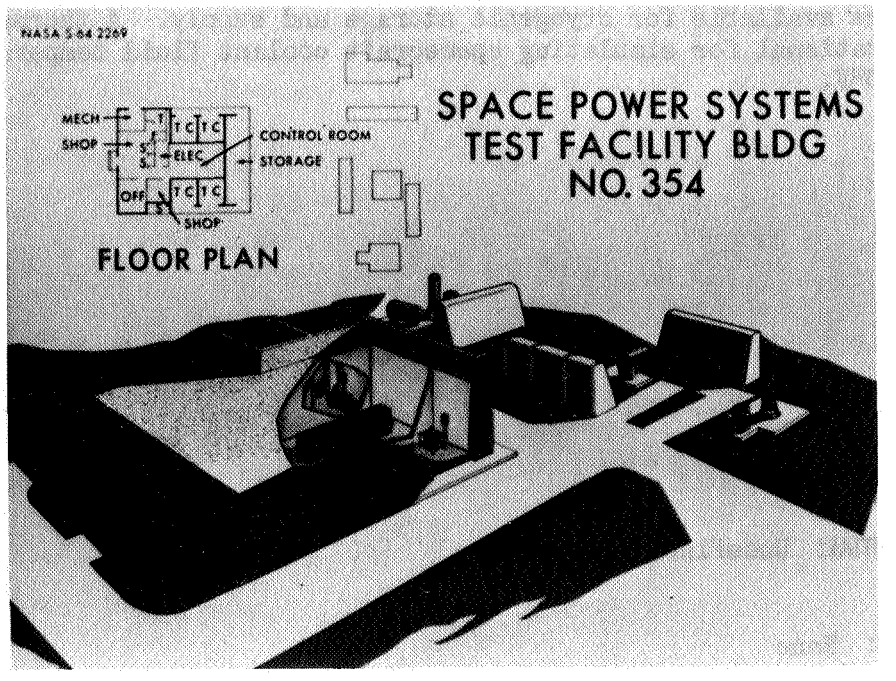
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-59-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Power Systems Test Facility

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Power Systems Test Facility, Spacecraft

5. TECHNOLOGICAL AREAS SUPPORTED: Thermal, transient, life, optimization and failure mode investigations.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility basically consists of 4 test cells separated by 12" reinforced concrete walls from a central control room. Three additional remote storage and test areas are available for hazardous testing of fueled cryogenic storage systems. Each of the test sites has power and instrumentation cabling hard-wired to the control room. Two independent data acquisition systems are available, one is a 400 channel digital tape system which displays and records test measurements on magnetic tape and on paper tape with a digital printer for quick look information. A similar 50 channel digital system is available without magnetic tape recording capability. The recording speed of both systems is presently limited by the digital printer to 5 channels per second. Additional specialized instrumentation includes a programmable transient load simulator which is capable of switching electrical loads from 50 to 5000 watts with switching times less than

6. NARRATIVE DESCRIPTION

100 microseconds. Data obtained with this system is recorded on an 18 channel direct write oscillograph. Two major facility items have been authorized and will be operational in FY-67. These include a 5 foot diameter thermal-vacuum chamber capable of maintaining pressure levels below 10^{-4}mm Hg and environmental temperatures ranging from -60°F to +250°F and a thermal chamber with a 6'x6'x7' working area and environmental temperature control from -30°F to +250°F. The latter chamber will be utilized primarily for thermal evaluation on fully-fueled spacecraft cryogenic systems.

Gaseous reactant supply systems are presently installed and instrumented in two test cells for GO_2 and GH_2 and portable dewars (1000 gallon LH_2 and 250 gallon LO_2) are available for cryogenic storage and supply. A thermal control system is operational for simulating spacecraft coolant fluid temperatures from -50°F to +250°F.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 354 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310 22

12. INITIALCOST: $ 560 K 13. NASA B.O.D. 1965 14. STATUSCODE: Active

15. ACCUM. COST: $ 1,000 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Propulsion and Power Division - Major Test Facilities of the Engineering and Development Directorate, April, 1965" MSC, Houston, Texas

21. COGNIZANT ORGANIZATIONAL COMPONENT: Propulsion and Power Division
Thermochemical Test Branch

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Chief, Thermochemical Test Branch (EP6)
Phone: (Area Code 713) 483-4991

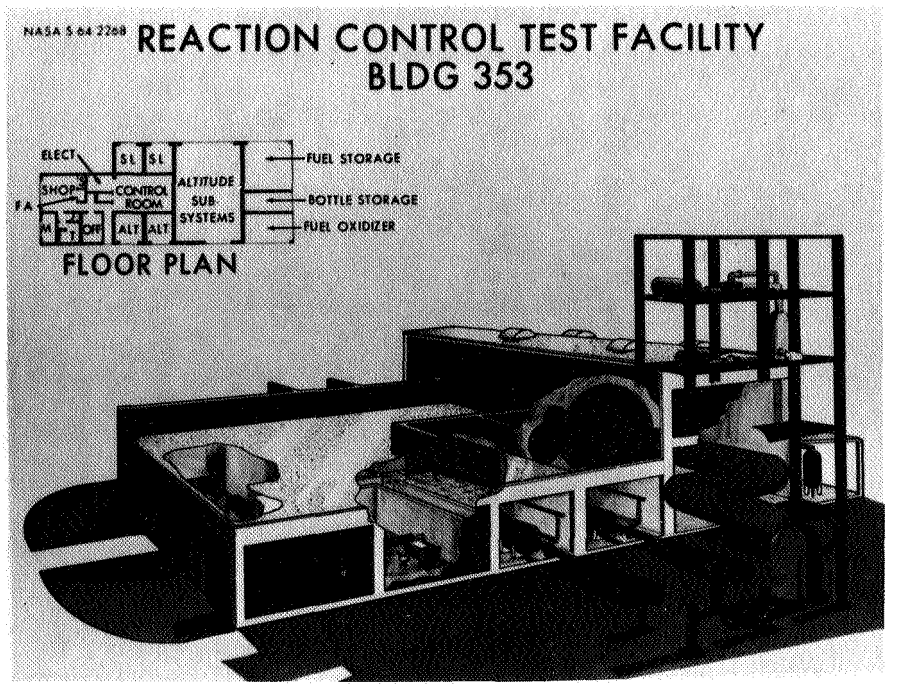
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-60-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Auxiliary Propulsion Test Facility

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Auxiliary Propulsion Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Testing of small liquid rocket engines under sea level and simulated altitude conditions.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Auxiliary Propulsion Test Facility provides the capability for evaluating the performance of storable propellant (nitrogen tetroxide - hydrazine blends) reaction control rocket engines in the thrust range from 5 to 1000 pounds. Engine and propellant performance studies, materials evaluation, radiation and ablation cooled engine development tests, systems dynamic tests, engine ignition tests and integrated thruster/stabilization and control system testing are accomplished in this facility.

Specifically there *are* five engine firing locations within this facility; three sea level test cells, a 20 foot diameter systems altitude chamber and a 40" horizontal firing single engine altitude chamber. The 20 foot systems chamber is located in a 2200 square foot high bay area and is capable of engine firings at cell pressures of 0.05 psia with a dynamic

6. NARRATIVE DESCRIPTION

steam ejection system or 0.001 psia with mechanical pumps and roots blower. The single engine stand is capable of cell pressures to 0.06 psia with the steam ejectors. High speed digital and analog data acquisition systems are located in the central control room.

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 353 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 310 22

12. INITIAL COST: $ 1,695 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 2,000 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Propulsion and Power - Major Test Facilities of the Engineering and Development Directorate", MSC, Houston, Texas

21. COGNIZANT ORGANIZATIONAL COMPONENT: Propulsion and Power Division
Thermochemical Test Branch

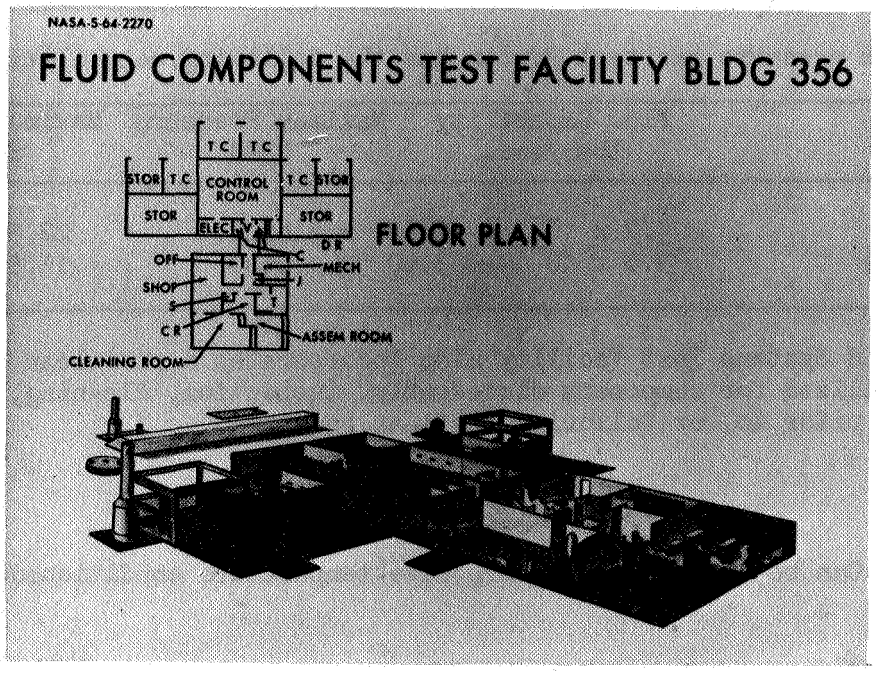
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Thermochemical Test Branch (EP6)
Phone: (Area Code 713) 483-4991

TECHNICAL FACILITIES RESUME	DATE OF RESUME: July 15, 1966
	FACILITY NO: 11-00-61-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Fluid Systems Test Facility

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Fluid Systems Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Component and system cold flow, life cycling, proof and pressure, compatibility, leakage, dynamic response, and flight anomaly testing of spacecraft propulsion systems.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The facility test complex incorporates four test cells, fluid storage areas, and a control room housed in a reinforced concrete building with a floor area of 4424 square feet. The four test cells are designated as the oxidizer, fuel, demineralized water, and high pressure gas test cells. Nitrogen tetroxide is used in the oxidizer cell and various blends of hydrazine are used in the fuel test cell. The high pressure gas test cell will utilize both gaseous nitrogen and helium. Ready storage for the entire test area is included in the fluid components fuel storage area. The facility support building which is adjacent to the test complex has a floor area of 2862 square feet and contains a mechanical shop, a degreasing and pickling area, a laminar flow clean room, and a field office.

6. NARRATIVE DESCRIPTION

Test System	Flow Capability GPM	Maximum Pressure PSIG	Maximum Supply Gallons
Oxidizer	0.15 -- 660	1100	1250
Fuel	0.084 -- 535	1100	1250
Demineralized Water	0.15 -- 650	1100	1535

The high pressure gas test system has the following capabilities:

Gas	Flow Capability lbs./sec.	Maximum Pressure PSIG	Maximum Supply SCFM
Helium	5.2×10^{-5} -- 0.52	6600	22,500
Nitrogen	3.6×10^{-3} -- 3.60	6600	11,500

The Fluid Systems Test Facility also incorporates a pre-clean and clean room utilized for component disassembly, inspection, cleaning, and reassembly, prior to, or following test, as required.

7. POTENTIAL: Can be expanded to incorporate temperature conditioned propellant testing.

8. PLANS: None

9. BLDG. NO. 356 10. YR, BUILT: 1965 11. FAC. CAT. CODE: 310 22

12. INITIAL COST: $ 1,427 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,600 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Propulsion and Power - Major Test Facilities of the Engineering and Development Directorate, April, 1965" MSC, Houston, Texas

21. COGNIZANT ORGANIZATIONAL COMPONENT: Propulsion and Power Division
Thermochemical Test Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Thermochemical Test Branch (EP6)
Phone: (Area Code 713) 483-4991

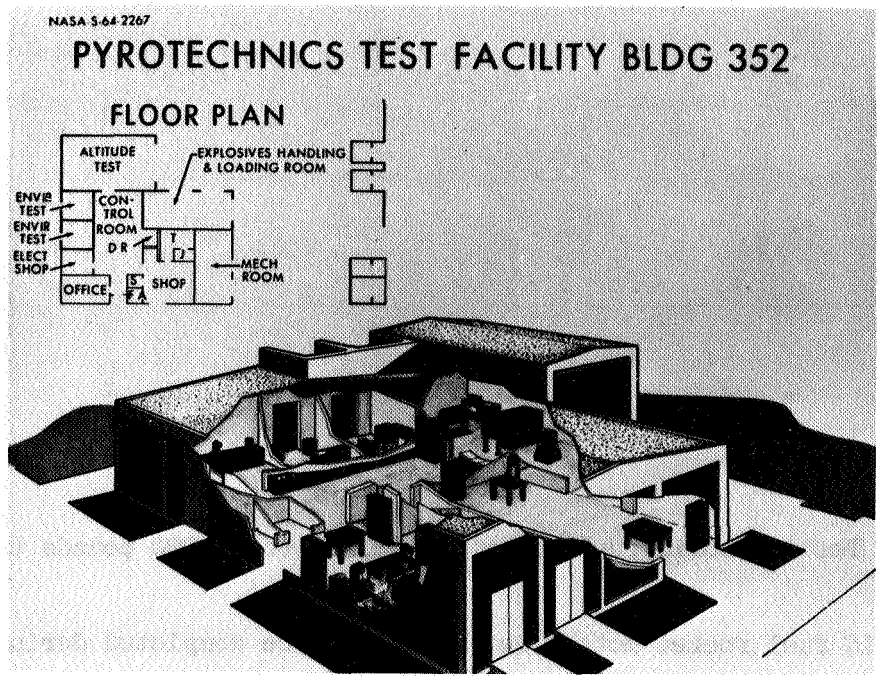
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-62-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Pyrotechnics Test Facility

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Pyrotechnics Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Environmental and functional testing of spacecraft pyrotechnic devices and other spacecraft systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility has six test cells positioned around a central control roam. The test cells house the environmental test equipment and provide space for functional testing of pyrotechnic devices. The control roan contains the data acquisition system and control panels for the environmental test equipment. The facility is equipped with a Universal Initiator Test Set for functional testing of all types of electro-explosive initiators. This unit has a current capability of up to 30 amps with controlled pulse durations from 1 microsecond to 11 seconds and a capability for firing EBW initiators.

Environmental testing capabilities include: Six temperature chambers with an included range from -300°F to +1000°F; vibration at temperatures from -100°F to +300°F or at a vacuum up to 200,000 feet of altitude; two vacuum

6. NARRATIVE DESCRIPTION

chambers capable of 1×10^{-7} torr with temperatures from -100°F to +300°F; vacuum chamber, six-foot diameter, with vacuum capability to 10 microns; centrifuge, six-foot diameter, capable of 5000 G pounds; shock test machine capable of up to 1000 g's with a 35 pound load,

7. POTENTIAL: Testing solid fuel rocket motors up to 10,000 pounds thrust.

8. PLANS: Solid fuel rocket motor test stand will be completed during FY 67.

9. BLDG. NO.	352	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	310 22
12. INITIAL COST: $	542.9 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	700.0 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Propulsion and Power - Major Test Facilities of the Engineering and Development Directorate, April, 1965" MSC, Houston, Texas

21. COGNIZANT ORGANIZATIONAL COMPONENT: Thermochemical Test Branch
Propulsion and Power Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Thermochemical Test Branch (EP6)
Phone: (Area Code 713) 483-4991

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-63-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Kouston, Texas

2. FACILITY NAME: Test Article Spacecraft Work Area

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Test Article Spacecraft Assembly Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Postlanding Test Article Spacecraft Assembly and Checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The controlled work area is 24 ft. wide, 60 ft. long, and 25 ft. high with a 24 ft. by 25 ft. equipment entrance. 100 psi pneumatic tool outlets and 110 V AC power outlets are available in the area.

Facility, maintenance and cleaning, special clothing, and operations requirements are established which comply, with minor modifications, to MSC-SPEC-5 (Apollo spacecraft, cleanliness specifications, dated April 4, *1966.*)

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 260 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 390 00

12. INITIALCOST: $ 30 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 30 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES Of INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Landing and Recovery Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Landing and Recovery Division (FL)
Phone: (Area Code 713) 483-3126

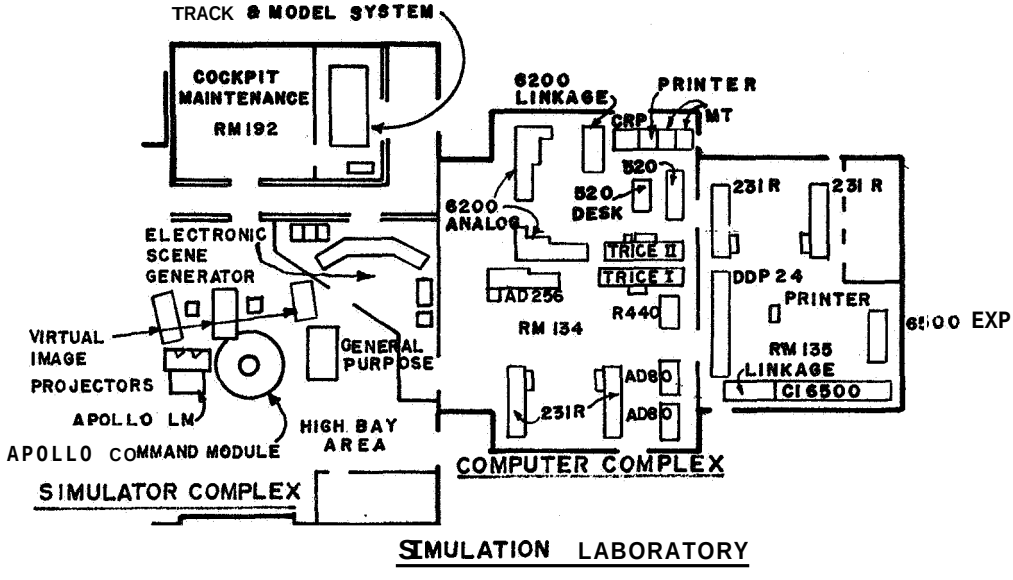
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-64-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Simulation Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Guidance and Control Sirnulation Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Simulation studies of spacecraft guidance and control systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is capable of doing engineering type of simulations ranging from the dynamics of an individual control component to a mission simulation containing two six-degree-of-freedom vehicles with all of their guidance and control functions. The analytical part of these simulations are performed on a variety of general and special purpose computers. Where man-in-the-loop is needed, several cockpits are available with the ability to generate out-the-window scenes for more realistic performance and better evaluation of the system being simulated. The following is a list of equipment contained in this facility:

6. NARRATIVE DESCRIPTION

TRICE Digital Differential Analyzer (DDA) system with model 440 digital computer
TRICE Digital Differential Analyzer (DDA) system with model 250 digital computer
4 Model 231R analog computers
Model 256 analog computer
2 Model AD80 analog computers
Hybrid system (2 Model 6200 analog and Model 520 digital computer plus linkage)
Computer portion of part task trainer (Model 6500 analog and Model DDP24 digital computer plus linkage)
Apollo Command Module cockpit mockups, Block I and II
Apollo Lunar Module cockpit mockup
Electronic Scene Generator
TV/Mode 1 System

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 16 **10. YR. BUILT:** 1964 **11. FAC. CAT. CODE:** 310 10

12. INITIALCOST: $ 2,000 K **13. NASA B.O.D.** 1964 **14. STATUSCODE:** Active

15. ACCUM. COST: $ 10,000 K **16. LIFE EXPECT.** Indef. **17. OWNER CODE:** NASA

18. OPER. CODE: NASA/Contr. **19. CONTRACTOR NAME** *(if contr. oper.):*
Lockheed Electronics Company

20. OTHER SOURCES OF INFO: "Major Test Facilities of Engineering and Development Directorate", Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Guidance and Control Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Guidance and Control Division (EG2)
Phone: (Area Code 713) 483-3066

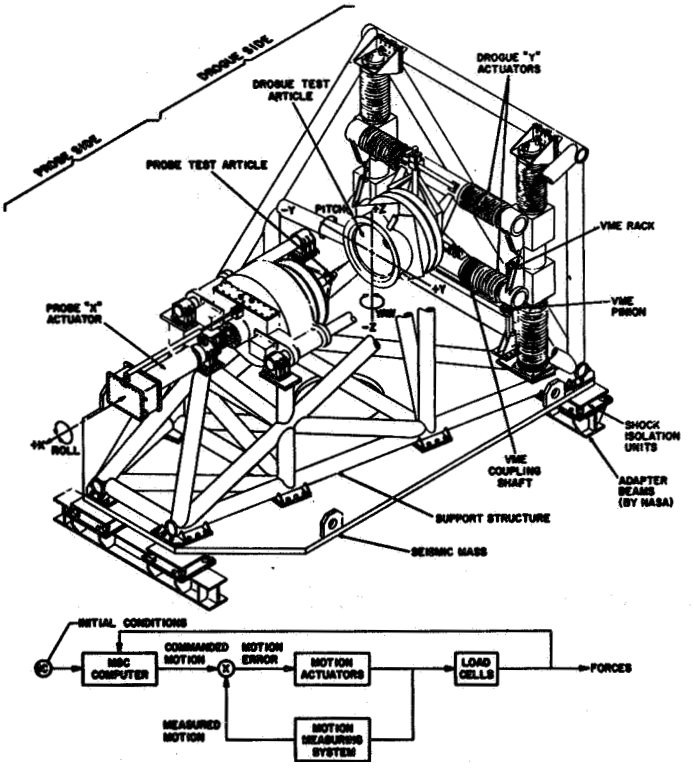
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO.: 11-00-65-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Apollo Docking Test Device (ADTD)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Docking Test Facility, Full Scale Apollo Spacecraft (ADTD)

5. TECHNOLOGICAL AREAS SUPPORTED: Dynamic simulation of all Apollo docking maneuvers by servo-acuation of the Command Service Module and Lunar Module docking interfaces.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The ADTD consists of hydraulically actuated movable mounts for the full-scale probe and drogue which are to be attached to the Apollo Command Service Module and Lunar Module respectively. The drogue mount has vertical, horizontal, pitch, and yaw degrees of freedom of motion, while the probe mount has longitudinal and roll degrees of freedom for a total of six. The test device is designed to safely withstand an axial load of 3000 pounds and a lateral load of 3200 pounds applied to the probe tip and drogue surface at the point of impact. A mathematical model programmed on a hybrid computer simulates three dimensional vehicle dynamics in zero gravity including the effects of elastic bending modes, fuel slosh, and rigid body motions of the docking vehicles. The hydraulic system is sealed to permit installation and docking system testing in the T/V (temperature and vacuum) Chamber B of MSC's Space Environmental Simulation Laboratory.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Could be modified to accept future docking hardware or to simulate the dynamics of future vehicles.

8. PLANS: None

9. BLDG. NO. 13 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 320 50

12. INITIAL COST: $ 875 K 13. NASA B.O.D. 1966 14. STATUS CODE: Constr.

15. ACCUM. COST: $ 2100 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: AMF P/N 359-60001

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Structures and Mechanics Division
Phone: (Area Code 713) 483-4446

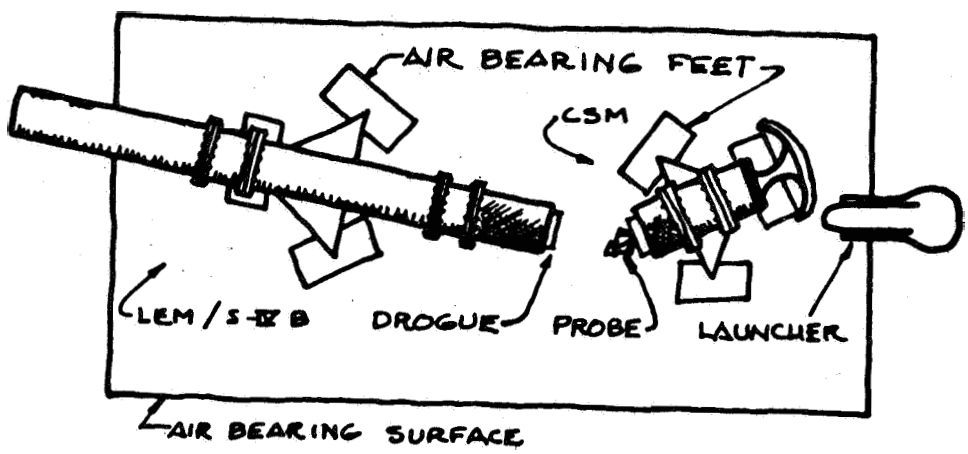
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-66-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: One-Third Scale Apollo Dock

3. LOCATION ***(if other than in 1. pbove):***



ONE-THIRD SCALE APOLLO DOCK — TOP VIEW

4. FUNCTIONAL NAME: Docking Test Facility, One-Third Scale Apollo

5. TECHNOLOGICAL AREAS SUPPORTED: Model simulation of vehicle dynamic responses to probe and drogue impact.

6. **NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:**

The one-third scale Apollo Dock consists of a model docking probe and drogue attached to dynamic models of the Apollo Command Service Module and Lunar Module or Lunar Module/Saturn-IVB. The vehicle models consist of iron pipe of the proper weight and size to give the correct scaled yaw-plane moment of inertia and mass. The model CSM and LEM/S-IVB units are supported by air bearings. Each vehicle has three degrees of freedom associated with planar motion. The unit moves on a precision plaster floor. Support equipment includes a control console, optical alignment device, spring-powered launcher and data recorder. Data from the load cells of the third scale probe will be correlated with the mathematical model associated with the full scale Apollo Docking Test Device.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Could be used to study the dynamics of future docking systems and spacecraft by physically modifying the centers of gravity and moments of inertia of the models and constructing a scaled docking system.

a. PLANS: A gravity-compensating servo-mechanism is being tested to allow each docking vehicle model all degrees of freedom except **roll.**

9. BLDG. NO. 13 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320 50

12. INITIAL COST: $ 100 K 13. NASA B.O.D. 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ 100 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Landing and Docking Mechanics Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Landing & Docking Mechanics Branch
Phone: (Area Code 713) 483-2076

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-67-00

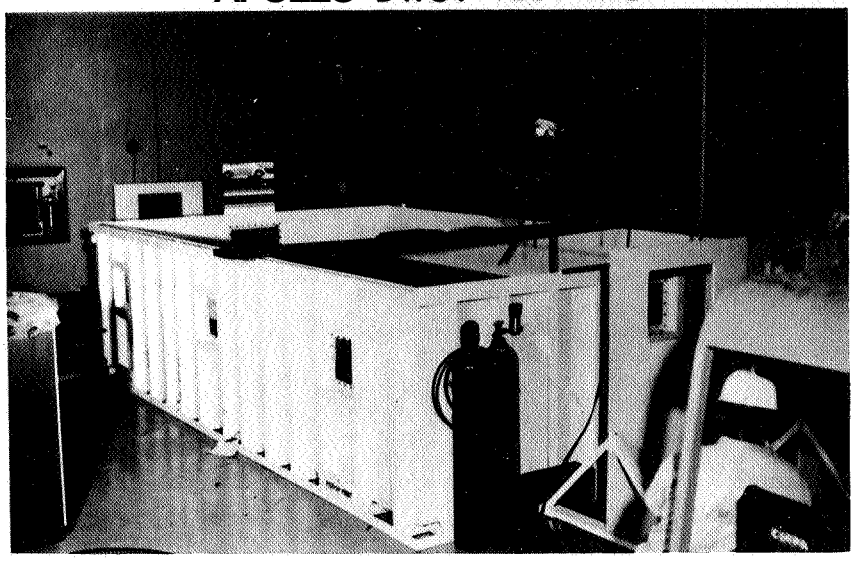
1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: One-Sixth Scale Lunar Module Model Drop Facility

3. LOCATION *(if other than in 1. above):*

NASA.S.66-4409 MAY 6

APOLLO DROP TEST RIG



4. FUNCTIONAL NAME: Drop Test Facility, One-Sixth Scale Lunar Module

5. TECHNOLOGICAL AREAS SUPPORTED: Investigation of Lunar Module landing dynamics by dropping instrumented models on a landing surface.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is capable of dropping a model weighing up to 200 pounds onto a landing surface which is currently made of wood or masonite. Model yaw can be varied 360 degrees. Vertical and horizontal velocities, each, can be varied from 0 to 20 feet per second. The landing surface can be slanted up to 14 degrees. Instrumentation is not a part of the permanent facility. Model pitch and roll can be varied 180 degrees.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO. 13

10. YR. BUILT: 1964

11. FAC. CAT. CODE: 320 50

12. INITIAL COST: $ 6 K

13. NASA B.O.D. 1964

14. STATUS CODE: Active

15. ACCUM. COST: $ 6 K

16. LIFE EXPECT. Indef.

17. OWNER CODE: NASA

18. OPER. CODE: NASA

19. CONTRACTOR NAME *(if contr. oper.):*
Brown and Root - Northrup

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures and Mechanics Division
Landing and Docking Mechanics Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Landing and Docking Mechanics Branch (ES8)
Phone: (Area Code 713) 483-2076

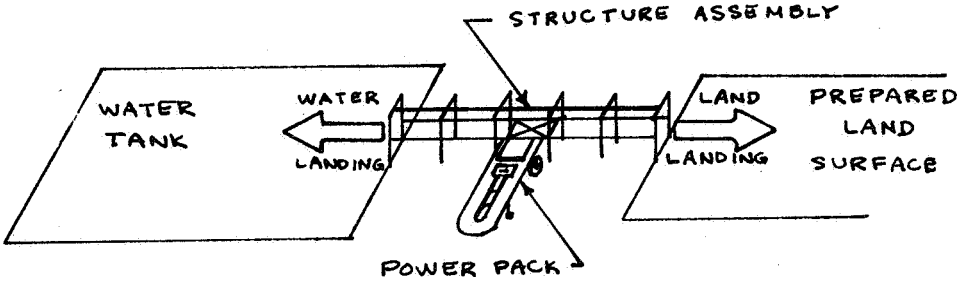
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-68-00

1 REPORTING INSTALLATION: Nanned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Water-Land Impact Test Facility

3. LOCATION *(if other than in 1. pbove):*



4. FUNCTIONAL NAME: Impact Test Facility, Water-Land Landing Simulator

5. TECHNOLOGICAL AREAS SUPPORTED: Spacecraft landing impacts in water and on land.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Horizontal and vertical velocities for both water and land landings are imparted to spacecraft by this facility through a pneumatic power system. The test vehicle is pushed down a guide rail, from which it is suspended, while it is accelerated to the desired test velocity. It is released at the end of the rail to impact either in the water tank or on the ground surface. Horizontal velocities are determined by the pressure in the air receiver of the pneumatic power pack; maximum pressure is 3,000 psi. Height of the craft within the facility is adjusted for various vertical velocities. Using an Apollo Command Module boilerplate for the test vehicle, ,the engineer can obtain horizontal velocities in the range of 0-65 fps and. vertical vel-ocities in the range of 0-40 fps. The water tank is 159 x 128 feet and about 20 feet deep. Two sides are surfaced with

6. NARRATIVE DESCRIPTION

with concrete riprap, and the other two sides are faced with polyethylene film. The prepared land surface is 100 x 120 feet. The structure of the facility is designed for a vehicle no larger than 12,000 pounds.

7. POTENTIAL: 12,000 pound. capacity.

8. PLANS: None

9. BLDG. NO. N/A

10. YR. BUILT: 1966

11. FAC. CAT. CODE: 320 10

12. INITIAL COST: $ Unknown K

13. NASA B.O.D. 1966

14. STATUS CODE: Constr.

15. ACCUM. COST: $ 51 K

16. LIFE EXPECT. Indef.

17. OWNER CODE: NASA

18. OPER. CODE: NASA

19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

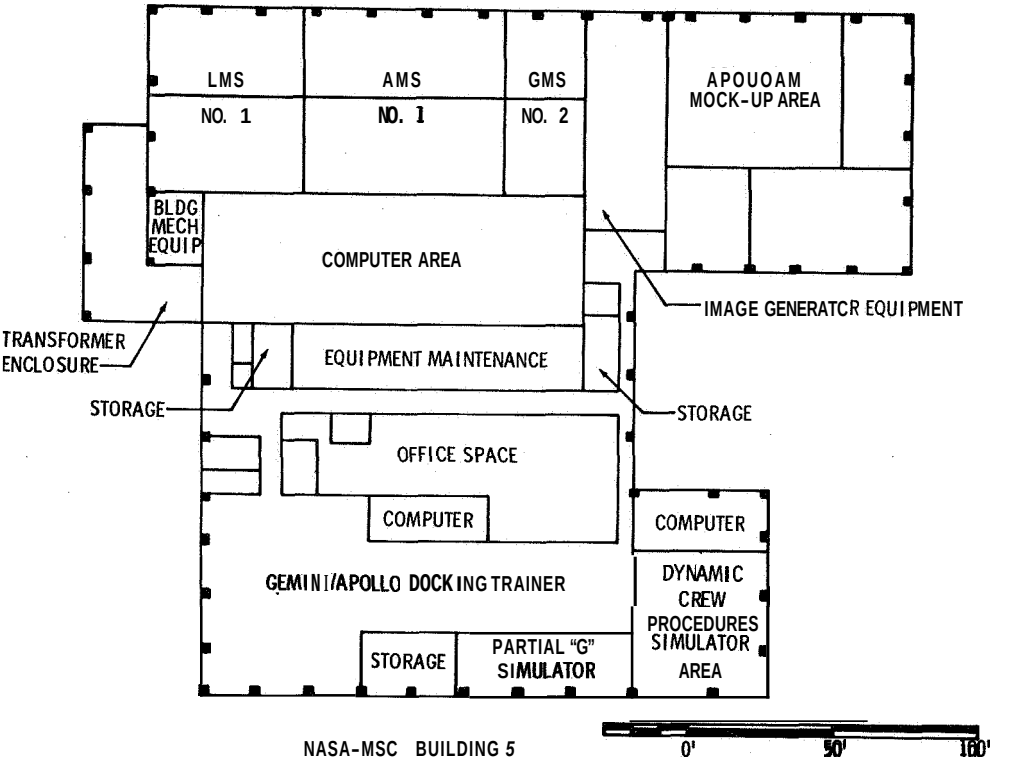
21. COGNIZANT ORGANIZATIONAL COMPONENT: Structures & Mechanics Division
Landing and Docking Mechanics Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Landing & Docking Mechanics Branch (ES8)
Phone: (Area Code 713) 483-2076

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Mission Simulation and Training Facility

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flight Simulation and Training Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Operation, maintenance and modification of space-flight simulators for flight crew and ground crew training.

6. **NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:**

This facility is a three-story standard steel-framed construction, permanent type office-laboratory complex containing 64,600 square feet of floor space. A 50 foot high bay area (13,410 square feet;) houses the Gemini/Apollo Translation and Docking Simulator and the Dynamic Crew Procedures Simulator complex. In addition, a 30 foot high bay area houses two Apollo Mission Simulator Complexes, a Gemini Mission Simulator Complex, and an Apollo/LM Mockup area. Computer flooring totals 10,258 square feet and office space, 11,000 square feet. The remaining area is storage and building mechanical equipment. Facility is completely air conditioned.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: This building will be fully utilized throughout the Apollo program. Based on present space flight schedules, further expansion is not anticipated.

8. PLANS: None

9. BLDG. NO.	5	10. YR. BUILT:	1963	11. FAC. CAT. CODE:	171 00
12. INITIAL COST: $	2,500 K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	2,700 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Drawings: (a) Original - "Plans for Construction of the Mission Simulation and Training Facility at the Manned Spacecraft Center; (b) Preliminary Drawings - MSC No. A-5-0855, A-5A-0957, and (c) "Mod. to Bldg. 5 Spacecraft Mockup Facilities"

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division
Simulation Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, **1966**
FACILITY NO: **11-00-70-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Gemini Mission Simulator No, 2

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Gemini No. 2)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew space flight training.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Consists of a Gemini Crew Station two-man cockpit mounted on a static base structure; visual display systems for two windows; operator-instructor station console, and a computer complex with appropriate linkage equipment to effect real time computer control of the simulation system.

Total area reauired for the entire simulator complex is approximately 12,000 square feet. A ceiling height of 30 feet is required for 1500 square feet of this area.

The complex simulates earth orbital space flight and is used for flight crew and ground crew training.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: This facility will be used throughout the Gemini program, Based on present space flight schedules, expansion of this simulator is not anticipated.

8. PLANS: None

9. BLDG. NO. 5 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 179 00

12. INITIAL COST: $ 8,000 K 13. NASA B.O.D. 1964 14. STATUS CODE: Active

15. ACCUM. COST: $ 9,000 K 16. LIFE EXPECT. 8 yrs. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: GMS Detail Equipment Specification *8978*

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

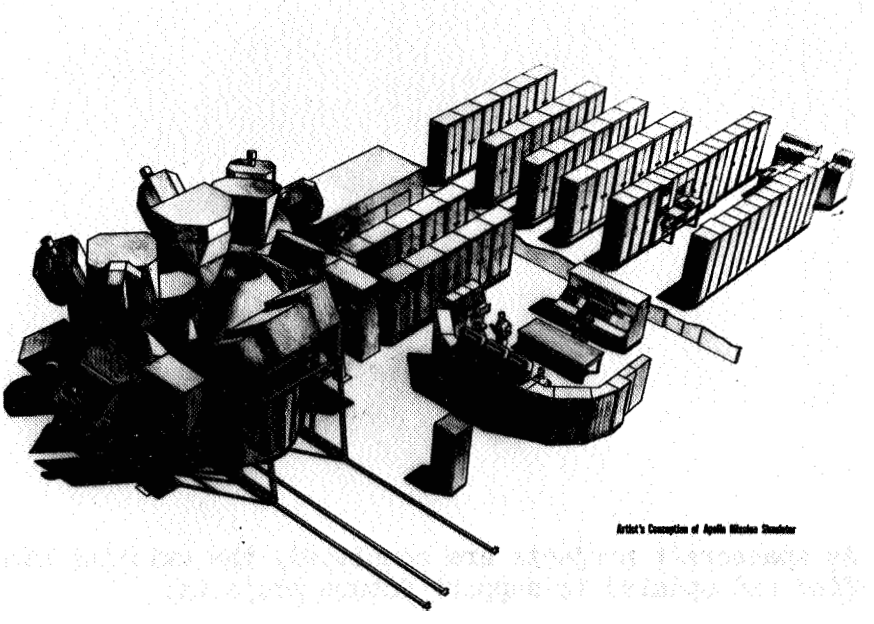
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-71-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Apollo Mission Simulator (AMS) No. 1

3. LOCATION *(if other than in 1. above):*



Artist's Conception of Apollo Mission Simulator

4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Apollo No. 1)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility includes crew station area containing a spacecraft command module, visual display equipment, instructor station and operator console, a telemetry console, recorders and plotters. A computer area containing necessary computers, consoles, printers, card readers, tape synchronizer, etc,, is located in a room adjacent to the command module,

Total floor space required for each simulator complex is approximately 15,000 square feet. The ceiling above the crew station area (2800 square feet) is 35 feet high.

This facility simulates space flight from earth launch to lunar landing and return,

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulators will be modified and updated to support future projects.

8. PLANS: None

9. BLDG. NO.	5	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	179 00
12. INITIALCOST: $	20,000 K	13. NASA B.O.D.	1966	14. STATUSCODE:	Active
15. ACCUM. COST: $	20,000 K	16. LIFE EXPECT.	8 yrs.	17. OWNERCODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Ekecutive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

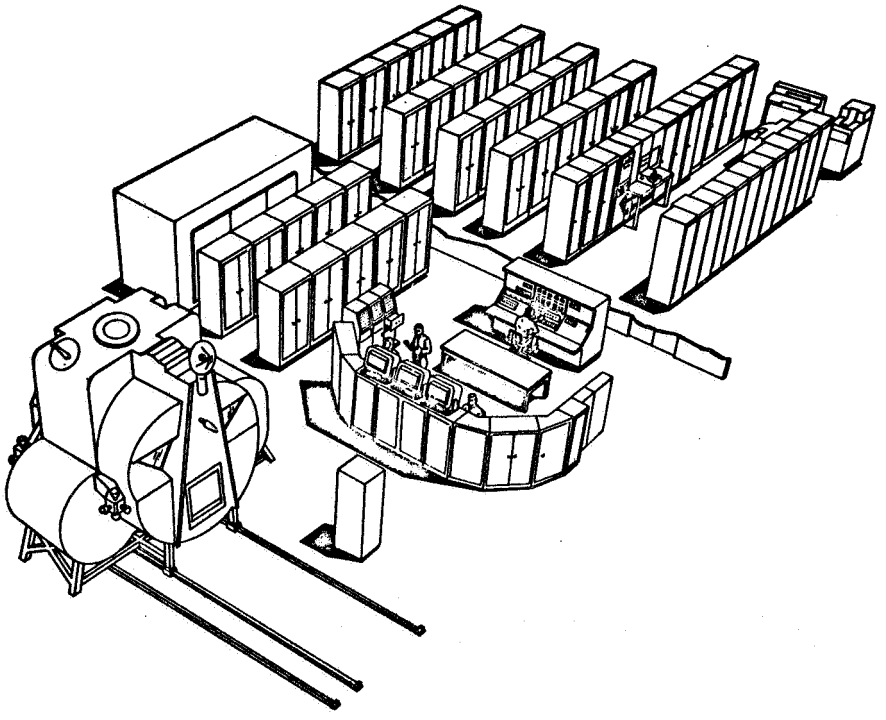
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-72-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Lunar Mission Simulator (LMS) No. 1

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flight Simulator and Training Facility (Lunar)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Consists of crew station area with full size lunar module, visual window displays, an instructor's station area with console, telemetry console, recorders, plotters, etc. A computer area is also part of the complex.

Total floor space required for entire simulator complex is approximately 13,000 square feet. Ceiling above the crew station area (2000 square feet) is 35 feet.

This facility simulates mission operation and landing and take-off from the lunar surface.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulator will be modified and updated to support future projects.

8. PLANS: None

9. BLDG. NO.	5	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	179 00
12. INITIAL COST: $	12,000 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Const.
15. ACCUM. COST: $	12.000 K	16. LIFE EXPECT.	8 yrs.	17. OWNERCODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Specification: LSP 440-4300B - Simulator, LEM Mission, Design Control for

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

TECHNICAL FACILITIES RESUME

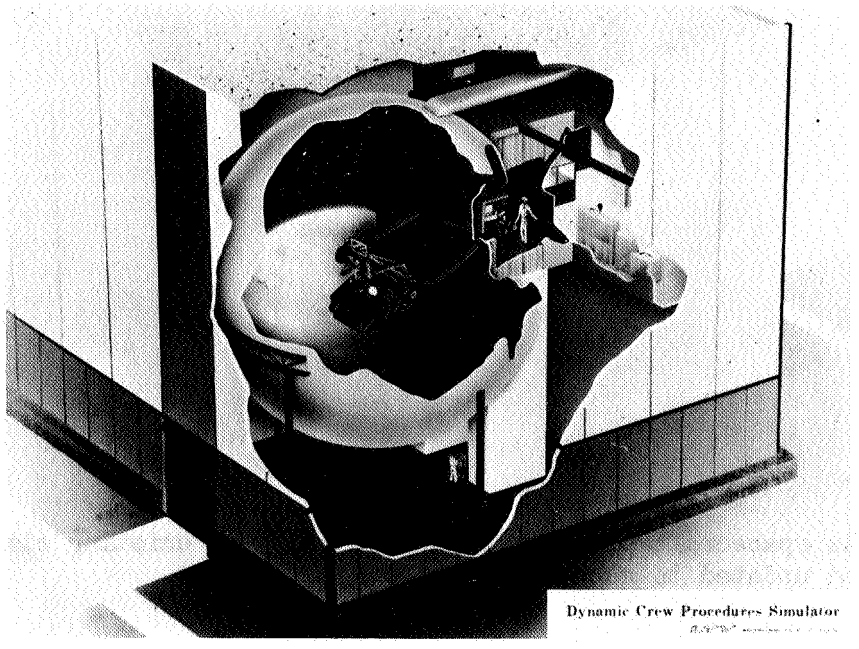
DATE OF RESUME: July 15, 1966

FACILITY NO: 11-00-73-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Dynamic Crew Procedures Simulator

3. LOCATION *(if other than in 1. above):*



Dynamic Crew Procedures Simulator

4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Dynamic)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training,

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is a Gemini spacecraft crew station mounted between two large support arms and connected by a series of moveable gimbals and beams. It is housed inside a partial sphere that is capable of simulating space-like surroundings of stars, clouds, earth scenes, etc., by means of special lighting and projected scene equipment, Due to its dynamic action and environment, astronauts receive procedures development through both kinesthetic cues and simulated motion.

The simulator complex also includes an instructor's station and a series of computers, The area required is approximately 2250 square feet with a 50 foot high bay, Low bay support area required is 1750 square feet resulting in 4000 square feet for the entire complex,

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulator will be modified and updated to support future projects,

8. PLANS: None

9. BLDG. NO. 5

10. YR. BUILT: 1965

11. FAC. CAT. CODE: 179 00

12. INITIALCOST: $ 1,100 K

13. NASA B.O.D. 1965

14. STATUS CODE: Active

15. ACCUM. COST: $ 1,200 K

16. LIFE EXPECT. 4 yrs.

17. OWNERCODE: NASA

18. OPER. CODE: NASA

19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: NASA, MSC Dynamic Crew Procedures Simulator, Sept.9,1965, FCSD, Brochure

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Ekecutive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) *488-5261*

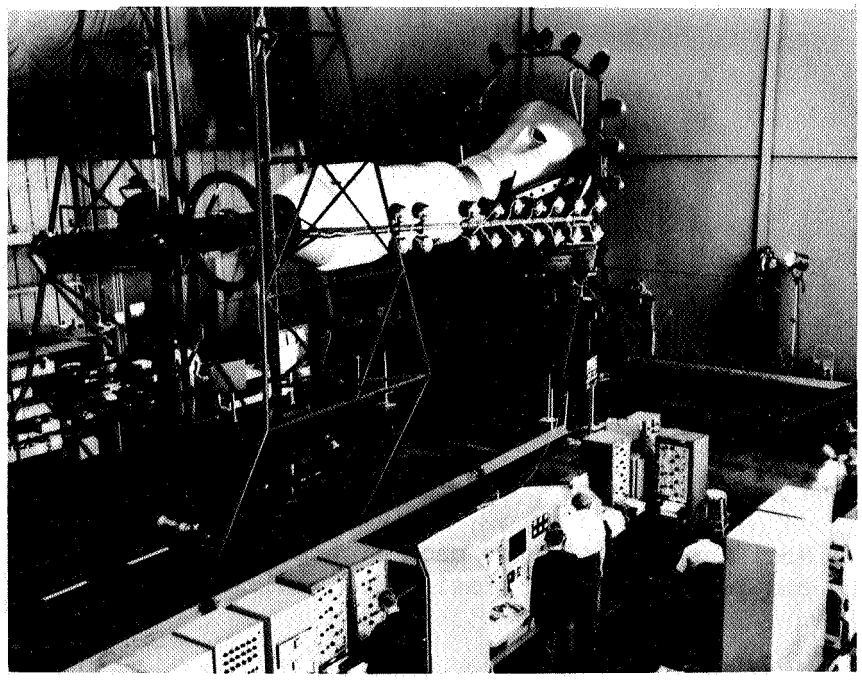
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-74-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Gemini/Apollo Translation and Docking Simulator Complex

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flight Simulation and Training Facility Rendezvous and Docking)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of full size Gemini capsule and a portion of the Agena docking target; both are mounted separately on special framework that rides on air bearings, Simulator also includes operator–instructor console and a computer complex with appropriate linkage equipment to effect real time computer control of the simulation system,

Total area required for the complex is approximately 7200 square feet. A 50 foot high bay is required for the capsule and docking target area (6600 square feet).

This facility simulates the rendezvous and docking of space vehicles during flight. It is used to train astronauts in manual control and to develop docking procedures.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Modifications will be made from time to time to update various parts of the complex to support mission and vehicle changes,

8. PLANS: None

9. BLDG. NO.	5	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	179 00
12. INITIAL COST: $	1,200 K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	1,800 K	16. LIFE EXPECT.	4 yrs.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

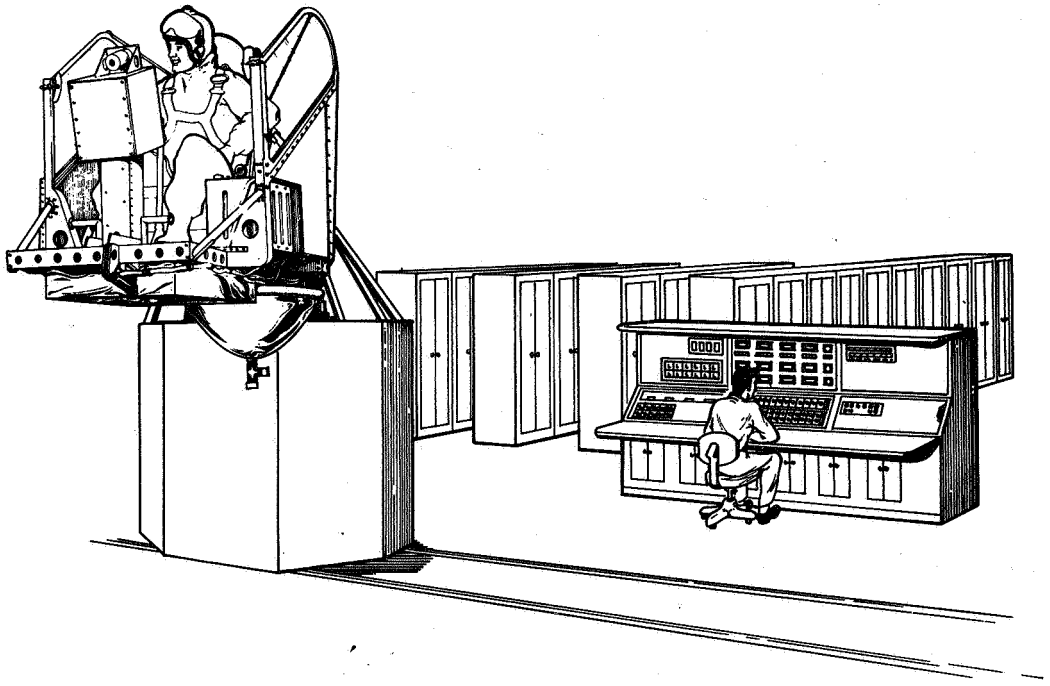
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-75-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Lunar Landing Training Vehicle (LLTV)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Lunar Approach)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training,

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Simulator complex includes a crew station cockpit mounted on a fixed base; operator-instructor's console; and a computer facility with appropriate linkage equipment to effect real time computer control of the simulation system,

The LLTV is actually a crew station portion of the Lunar Landing Research Vehicle and is designed primarily to train flight crews in flight techniques associated with the final approach to the lunar surface and include simulation of the handling qualities of the Lunar Module. The LLTV to be delivered in November 1967 will provide more extensive lunar landing training as required for astronaut training.

6. NARRATIVE DESCRIPTION

A visual display system will provide out–the–window terrain recognition similar to that which will be experienced with the Lunar Module in lunar operation. Total area required for the complex is approximately 8000 square feet.

7. POTENTIAL: As spacecraft projects are completed, the existing simulator will be modified and updated to support future projects,

8. PLANS: None

9. BLDG. NO.	35	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	179 00
12. INITIAL COST: $	900 K	13. NASA B.O.D.	1967	14. STATUS CODE:	Auth,
15. ACCUM. COST: $	900 K	16. LIFE EXPECT.	8 yrs.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Lunar Landing Research Vehicle and Lunar Landing Training Vehicle Program Plan,!' March 18, *1966,* FCSD.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO' Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code *713)* 488–5261

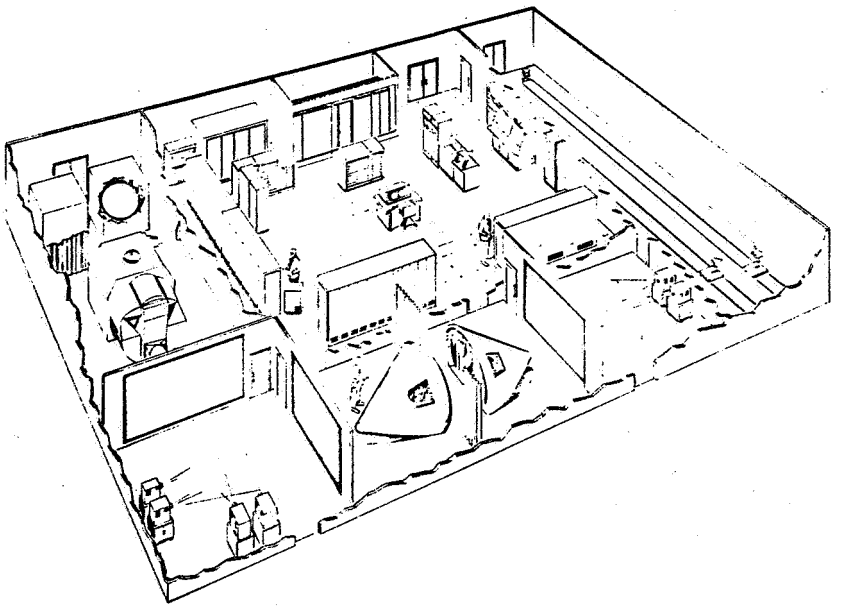
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-76-00

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Space Flight Mission Simulator Complex

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Guidance and Navigation)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew space flight training

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility complex is a combination of an Apollo Crew Station, a modified Gemini Mission Simulator Crew Station, and a Lunar Module Crew Station. Included in the complex will be operator-instructor consoles for each crew station, projection equipment for visual displays, and a computer complex with appropriate linkage facilities to effect real time computer control of the simulator system.

This simulated crew station complex will be used to develop operational procedures and train astronauts in spacecraft manual control procedures.

Total area required will be approximately 18,000 square feet of which 9,000 square feet must be 30 foot high bay ceiling.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulators will be modified and updated to support future projects.

8. PLANS: None

9. BLDG. NO. 35 10. YR. BUILT: 1967 11. FAC. CAT. CODE: 179 00

12 INITIALCOST: $ 12,000 K 13. NASA B.O.D. 1968 14. STATUSCODE: Auth

15. ACCUM. COST: $ 12,000 K 16. LIFE EXPECT. 8 yrs 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TOCONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

TECHNICAL FACILITIES RESUME

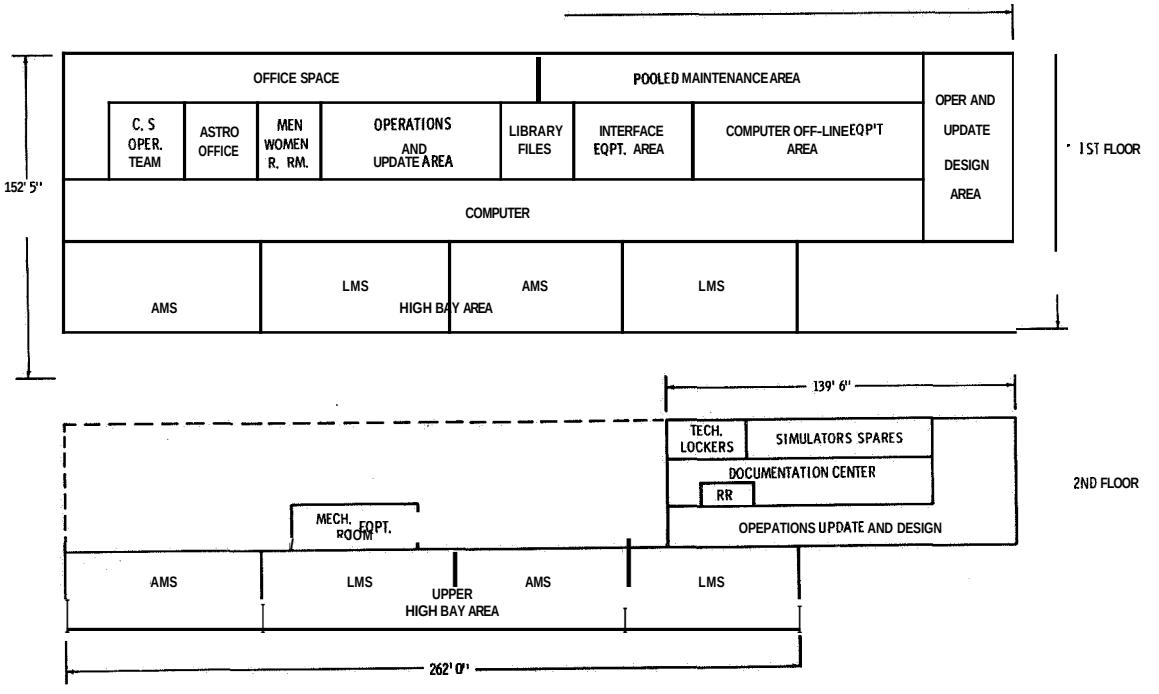
DATE OF RESUME: July 15, 1966

FACILITY NO: **11-00-77-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Flight Crew Training Building

3. LOCATION ***(if other than in 1. above):*** Kennedy Space Center, Merritt Island, Florida



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Kennedy)

5. TECHNOLOGICAL AREAS SUPPORTED: Operation, maintenance, and modification of space-flight simulators for flight crew and ground crew training.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is a two-story, standard steel-framed construction, permanent type office-laboratory complex containing 67,000 square feet including 14,000 square feet of high bay area for simulator hardware (30 feet high). The facility is completely air-conditioned and provides outside parking for 200 vehicles. The building consists of necessary space, utilities, and environment for two Apollo Mission **Simulator** areas, and two Lunar Excursion Module Simulator areas; including a crew station area, an instructor's station, a computer complex for each simulator and an off-line computer complex. It also provides space for simulator maintenance, off-line support equipment, a **film** graphics library, a card' tape library, an engineering drawing library, a flight crew suit room, a debriefing room, and a special experiments training equipment area.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: This building will be fully utilized throughout the Apollo program. Based on present space flight schedules, further expansion is not anticipated.

8. PLANS: None

9. BLDG. NO.	M7-409	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	171 00
12. INITIAL COST: $	1,559 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	2,834 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: NASA, KSC Drawing Nr. 203-252.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division
Flight Crew Operations Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-00-78-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Gemini Mission Simulator No. 1

3. LOCATION *(if other than in 1. above):* Kennedy Space Center, Merritt Island, Florida



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Gemini No. 1)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Consists of a Gemini Crew Station two-man cockpit mounted on a static base structure; visual display systems for two windows; operator-instructor station console, and a computer complex (not shown in attached picture) with appropriate linkage equipment to effect real time computer control of the simulation system.

Total area required for the entire **simulator** complex is approximately 12,000 square feet. A ceiling height of 30 feet is required for 1500 square feet of this area.

The complex simulates earth orbital space flight and is used for flight crew and ground crew training.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: This facility will be used throughout the Gemini program. It may be modified for use in the Apollo Program.

8. PLANS: Transfer to MSC in June 1967

9. BLDG. NO. MT-... 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 179 00

12. INITIALCOST: $ 8,000 K 13. NASA B.O.D. 1963 14. STATUS CODE: Active

15. ACCUM. COST: $ 9,000 K 16. LIFE EXPECT. 8 yrs. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*:

20. OTHER SOURCES OF INFO: GMS Detail Equipment Specification 8978

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

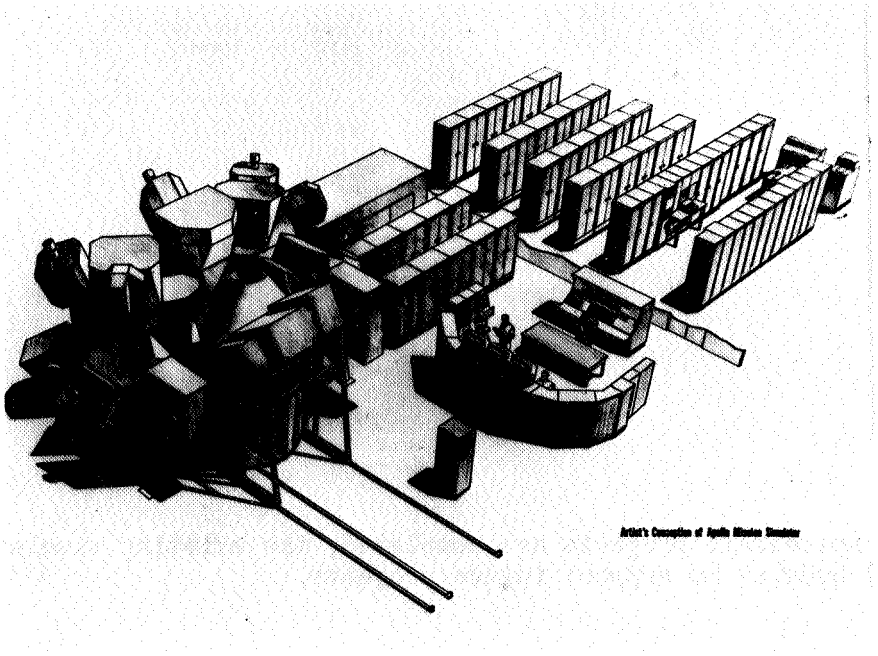
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-79-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Apollo Mission Simulator (AMS) No. 2

3. LOCATION *(if other than in 1. above):* Kennedy Space Center, Merritt Island, Florida



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Apollo No. 2)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility includes crew station area containing a spacecraft command module, visual display equipment, instructor station and operator console, a telemetry console, recorders and plotters. A computer area containing necessary computers, consoles, printers, card readers, tape synchronizer, etc,, is located in a room adjacent to the command module.

Total floor space required for each simulator complex is approximately 15,000 square feet. The ceiling above the crew station area (2800 square feet) is 35 feet high.

This facility simulates space flight from earth launch to lunar landing and return.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulators will be modified and updated to support future projects,

8. PLANS: None

9. BLDG. NO.	M7-409	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	179 00
12. INITIAL COST: $	20,000 K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	20,000 K	16. LIFE EXPECT.	8 yrs.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

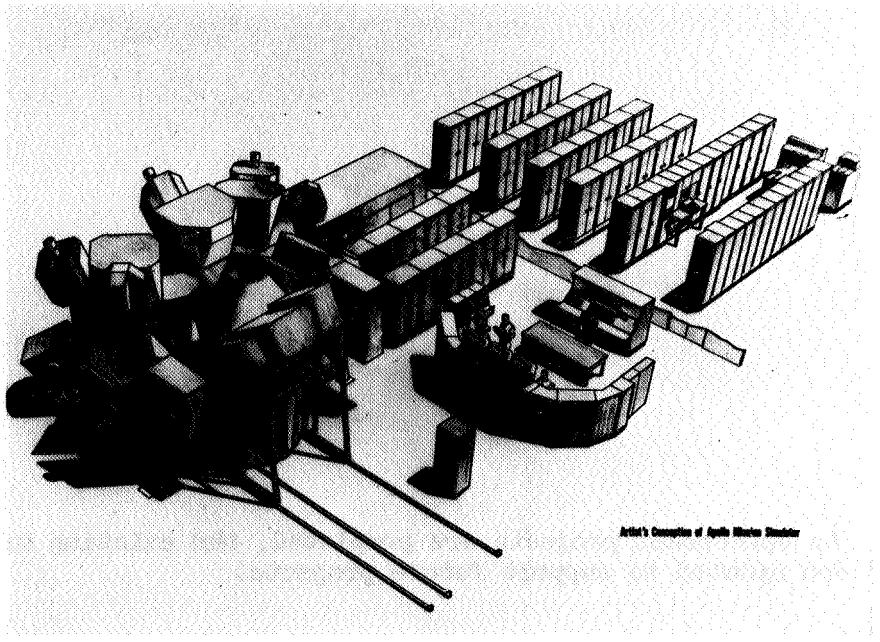
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-80-00

1 REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Apollo Mission Simulator (AMS) No. 3

3 LOCATION *(if other than in 1. above):* Kennedy Space Center, Merritt Island, Florida



4 FUNCTIONAL NAME: Flight Simulation and Training Facility (Apollo No. 3)

5 TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training

6 NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Includes crew station area containing a spacecraft command module, visual display equipment, instructor station and operator console, a telemetry console, recorders, and plotters. A computer area containing necessary computers, consoles, printers, card readers, tape synchronizer, etc., is located in a room adjacent to the command module.

Total floor space required for each simulator complex is approximately 15,000 square feet. The ceiling above the crew station area (2800 square feet) is 35 feet high.

This facility simulates space flight from earth launch to lunar landing and return.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulator will be modified and updated to support future projects.

8. PLANS: None

9. BLDG. NO. M7-409 10. YR. BUILT: 1967 11. FAC. CAT. CODE: 179 00

12. INITIAL COST: $ 14,000 K 13. NASA B.O.D. 1967 14. STATUS CODE: Const.

15. ACCUM. COST: $ 14,000 K 16. LIFE EXPECT. 8 yrs. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

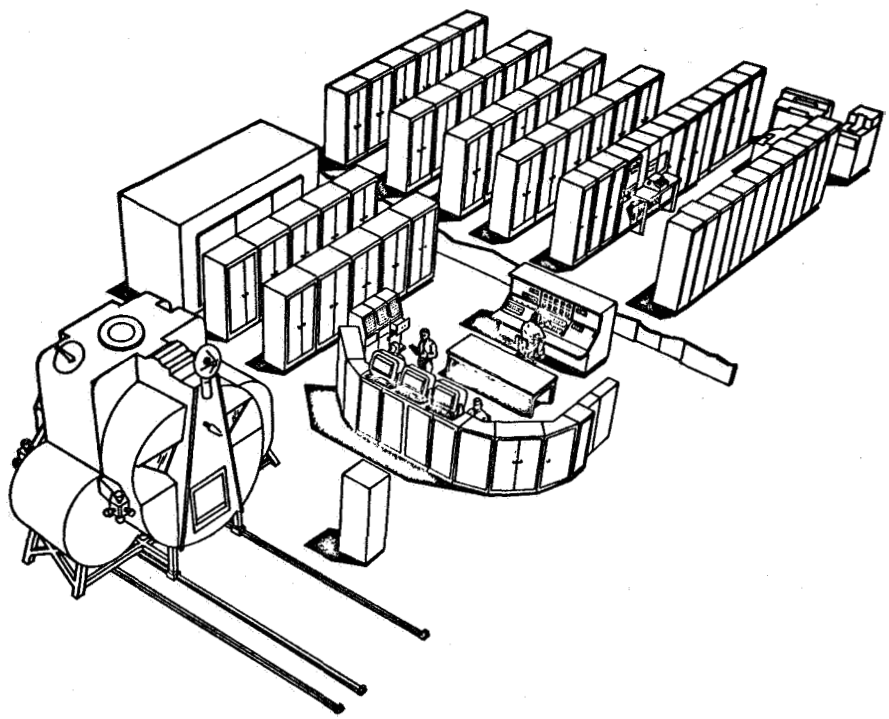
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Executive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

TECHNICAL FACILITIES RESUME DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-81-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Lunar Mission Simulator (LMS) No. 2

3. LOCATION *(if other than in 1. above):* Kennedy Space Center, Merritt Island, Florida



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Lunar No. 2)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Consists of crew station area with full size lunar module, visual window displays, an instructor's station area with console, telemetry console, recorders, plotters, etc. A computer area is also part of the complex.

Total floor space required for entire simulator complex is approximately 13,000 square feet. Ceiling above the crew station area (2000 square feet) is 35 feet.

This facility simulates mission operation and landing and take-off from the lunar surface.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulator will be modified and updated to support future projects.

8. PLANS: None

9. BLDG. NO.	M7-409	10. YR. BUILT:	1966	11. FAC. CAT. CODE:	179 00
12. INITIAL COST: $	12,000 K	13. NASA B.O.D.	1967	14. STATUSCODE:	Auth,
15. ACCUM. COST: $	12,000 K	16. LIFE EXPECT.	8 yrs.	17. OWNERCODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Specification: LSP 440-4300B - Simulator, LEM Mission, Design Control For

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Ekecutive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

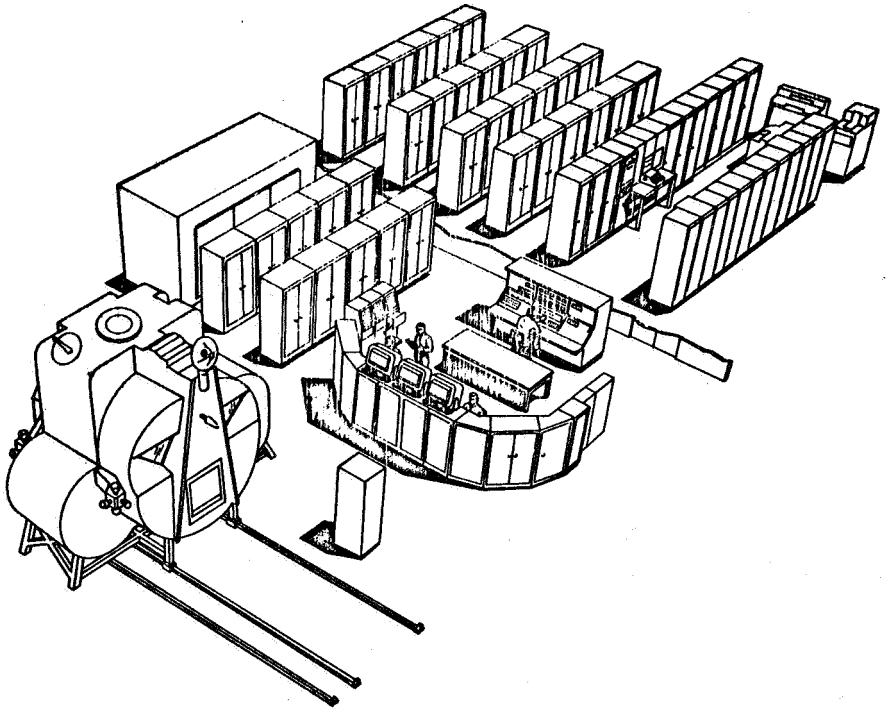
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-82-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Lunar Mission Simulator (LMS) No. 3

3. LOCATION *(if other than in 1. above):* Kennedy Space Center, Merritt Island, Florida



4. FUNCTIONAL NAME: Flight Simulation and Training Facility (Lunar No. 3)

5. TECHNOLOGICAL AREAS SUPPORTED: Flight crew and ground crew spaceflight training.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Consists of crew station area with full size lunar module, visual window displays, an instructor's station area with console, telemetry console, recorders, plotters, etc. A computer area is also part of the complex.

Total floor space required for the entire simulator complex is approximately 13,000 square feet, Ceiling above the crew station area (2000 square feet) is 35 feet.

This facility simulates mission operation and landing and take-off from the lunar surface.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: As spacecraft projects are completed, the existing simulator will be modified and updated to support future projects.

8. PLANS: None

9. BLDG. NO.	M7-409	10. YR. BUILT:	1967	11. FAC. CAT. CODE:	179 00
12. INITIAL COST: $	7,000 K	13. NASA B.O.D.	1967	14. STATUS CODE:	Auth.
15. ACCUM. COST: $	7,000 K	16. LIFEEXPECT.	8 yrs.	17. OWNERCODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Specification: LSP 440-4300B - Simulator, LEM Mission, Design Control For

21. COGNIZANT ORGANIZATIONAL COMPONENT: Flight Crew Support Division

22, LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Ekecutive Assistant, Flight Crew Support Division (CF)
Phone: (Area Code 713) 488-5261

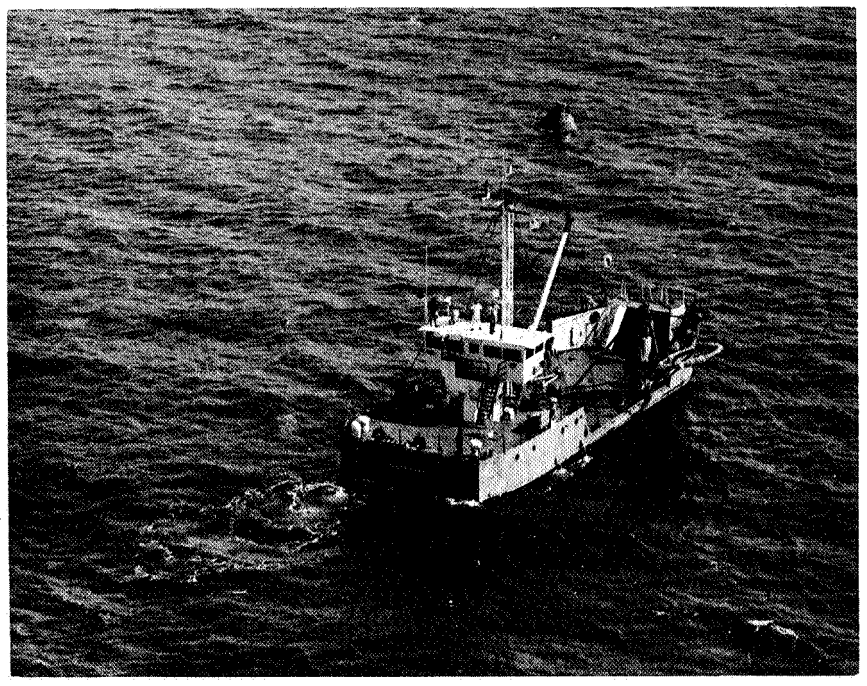
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-00-**83-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Test Operations Ship (Motor Vessel, "Retriever")

3. LOCATION ***(if other than in 1. above):*** Docks at Seabrook, Texas



4. FUNCTIONAL NAME: Range Operations Ship (NASA Retriever)

5. TECHNOLOGICAL AREAS SUPPORTED: Operational and developmental testing of spacecraft postlanding systems and spacecraft recovery equipment. Development of postlanding procedures and techniques for flight crews and recovery personnel.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The NASA Motor Vessel "Retriever" is a modified Army, Landing Craft Utility, 115 ft in length with a 34 ft. beam and a 5 ft. draft. It carries a crew of four with space for sixteen passengers and can operate at sea for up to seven days. In addition to the equipment normally installed aboard a ship of this size it has the following:

a. A ten ton capacity ship's boom crane.

b. A NASA recovery davit crane (designed for recovery of Gemini and Apollo spacecraft).

c. A portable data acquisition van capable of processing standard IRIG proportional bandwidth FM/FM/PAM telemetry. 16 channels of

6. NARRATIVE DESCRIPTION

analog data can be displayed on Brush recorders and 24 channels of analog data can be displayed on meters.

A digital computer, which has a 4096 word memory, can convert analog data to engineering units.

The Data Acquisition Van also has IRIG FM tone command capability of 20 channels.

d. HF (AM and SSB), VHF and UHF communications.

7. POTENTIAL:, Undefined

8. PLANS: None

9. BLDG. NO.	N/A	10. YR. BUILT:	1954	11. FAC. CAT. CODE:	390 00
12. INITIAL COST: $	50 K	13. NASA B.O.D.	1963	14. STATUS CODE:	Active
15. ACCUM. COST: $	75 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE	Army
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Landing and Recovery Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Landing and Recovery Division (FL)
Phone: (Area Code 713) 483-3126

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-10-01-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Apollo Rendezvous and Landing Radar Flight Test Facility

3. LOCATION *(if other than in 1.* **above):** White Sands Missile Range, New Mexico



4. FUNCTIONAL NAME: Radar Flight Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Flight testing of spacecraft rendezvous and landing radars.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Apollo Rendezvous and Landing Radar systems **will** be evaluated by actual flight test of portions of the dynamic characteristics of the radars. They are to be flown in specially instrumented aircraft over lunar-like terrain and over a mockup of the Lunar Module.

A structure simulating the descent portion of the Lunar Module was built and **will** support the mockup of the ascent stage. The structure houses equipment required to support the Lunar Module Rendezvous operation. Additional equipment such as recorders and a format generator are housed in a van placed 1200 feet from the radar and connected with coaxial cables. The area for a radius of 1200 feet around the mockup location is cleared of vegetation, leveled and restored. The area is surrounded by a cinetheodolite

6. NARRATIVE DESCRIPTION

system that provides accurate optical tracking information for comparison with radar data to determine radar error.

7. POTENTIAL: Capability for evaluating other electromagnetic or optical devices and non-cooperative and side-looking radar systems.

8. PLANS: Future radars planned for evaluation include non-cooperative and side-looking radar systems.

9. BLDG. NO. N/A 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 320 60

12. INITIAL COST: $ 42 K 13. NASA B.O.D. Aug 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ 335 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Flight test control document for Project Apollo Lunar Excursion Module Radar Systems Boresight and Flight Test

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation & Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division
Phone: (Area Code 713) 483-2871

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1965
FACILITY NO: 11-10-02-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Laser Field Communication Facility

3. LOCATION *(if other than in 1. above):* White Sands Missile Range, New Mexico (C-Station, adjacent to R-I 13 Radar)

4. FUNCTIONAL NAME: Laser Field Communications Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Analysis of laser radars, high data rate laser communication systems, infrared detectors and trackers.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of two portable skid-mounted buildings, one modified NIKE/AJAX pedestal with telescope, one AJAX van, two electrical converters, and two searchlights with two power supplies. The function of the facility is to transmit, receive and analyze laser communication energy. Fundamental to the field measurements are a 30-inch telescope and correlation analysis equipment. The equipment is located at the White Sands Missile Range, an area allowing extremely good transmission characteristics. Acquisition and tracking of moving targets is made possible by the slaving to an FPS-16 radar. Long static patterns of optical communication are possible to various mountain sites. The equipment has been used to test out laser communicators from aircraft fly-over testing.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Undefined

8. PLANS: None

9. BLDG. NO.	N/A	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	320 60
12. INITIAL COST: $	LO K	13. NASA B.O.D.	1966	14. STATUS CODE:	Active
15. ACCUM. COST: $	200 K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: *MSC-4* Experimental Submission

21. COGNIZANT ORGANIZATIONAL COMPONENT: Instrumentation and Electronic Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Instrumentation & Electronic Systems Division
Phone: (Area Code *713) 483-2871*

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966

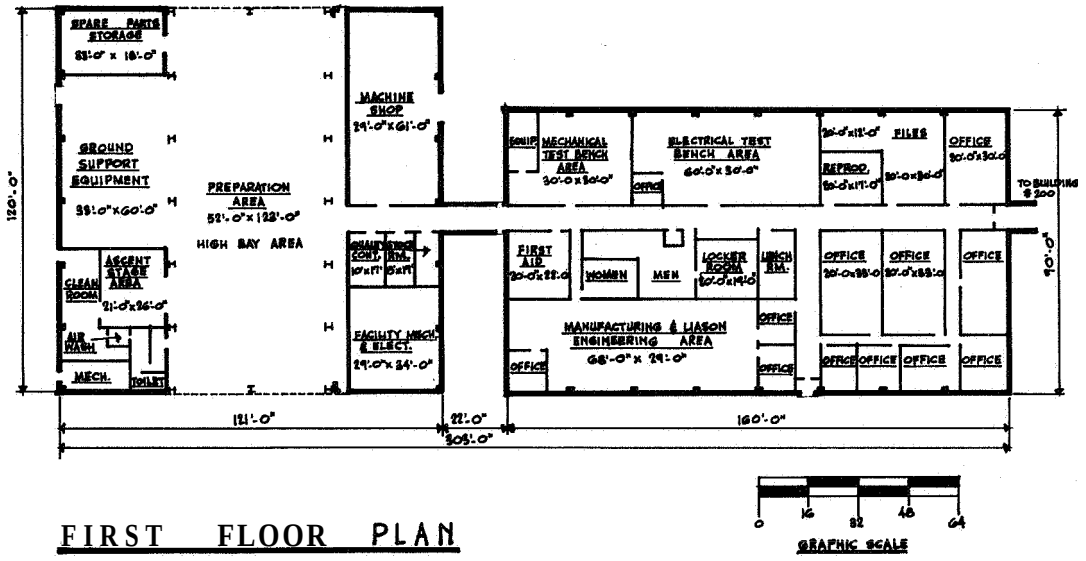
FACILITY NO: 11-10-03-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Lunar Excursion Module Preparation Building

3. LOCATION *(if other than in 1. above):*

White Sands Test Facility, Las Cruces, New Mexico



FIRST FLOOR PLAN

4. FUNCTIONAL NAME: Spacecraft Checkout and Test Facility (LEM)

5. TECHNOLOGICAL AREAS SUPPORTED: Pre-fire testing and functional checking on spacecraft components and associated ground support equipment.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This permanent structure is essentially two buildings connected by an enclosed corridor and has a total gross area of 28,649 sq. ft. One building is a concrete masonry structure of 14,400 sq. ft. providing offices and laboratories.

The other building consists of a steel frame insulated metal siding high-bay structure to house the test item flanked by two low-bay areas of concrete masonry construction. These low-bay areas house fabricating, check-out and repair shops; test fixtures and equipment storage; and a class 10,000 clean room area for assembly and checkout of test item and facility components.

This portion of the building is also equipped with bridge cranes and test item access doors identical to those in the high-bay portion of the CSM Preparation Building, 200. The building is attached to NASA Laboratory

6. NARRATIVE DESCRIPTION

203, and by an enclosed passageway, to the CSM Preparation Building 200.

Utilities and services available in this building include industrial hot and cold water, deionized water system, nitrogen and helium piping systems, compressed air piping, AC and DC electrical distribution systems, vapor exhaust hood systems, environmental systems, and a public address system.

7. POTENTIAL: Undefined.

8. PLANS: Indefinite.

9. BLDG. NO. 201 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 340-40

12. INITIAL COST: $ 1,189 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):*
Grumman Aircraft Engineering Corporation

20. OTHER SOURCES OF INFO:
Facilities Master Plan - White Sands Test Facility - MSC
Design Criteria for LEM Preparation Building
W. C. Kruger and Associates

21. COGNIZANT ORGANIZATIONAL COMPONENT:
Operations Support Office - Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Facilities Branch (RH2)
(AC 505) 524-5682

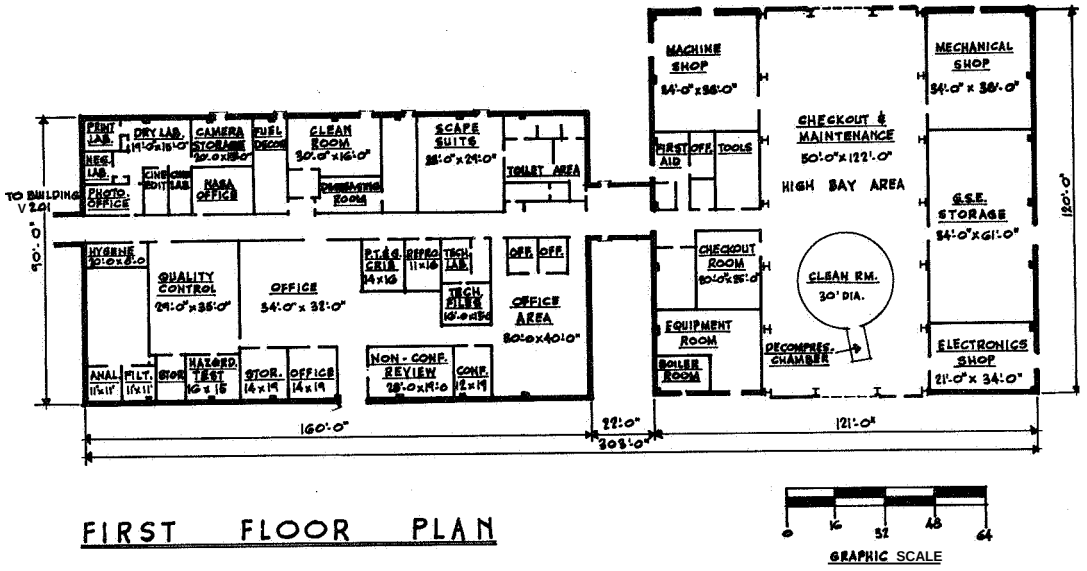
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-10-04-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Command and Service Module Preparation Building

3. LOCATION (if *other than in 1. above):*
White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Spacecraft Checkout and Test Facility (CSM)

5. TECHNOLOGICAL AREAS SUPPORTED: Pre-fire testing and functional checking on components of spacecraft modules and associated ground support equipment.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:
This permanent structure is essentially two buildings connected by an enclosed corridor and has a total *gross* area of 28,635 sq. ft. One building is a low-bay concrete masonry structure of 14,400 sq. ft. providing offices, facilities for cleaning, maintenance, photographic and chemical laboratories, and presently contains a parts decontamination and cleam room facility.

The other building consists of a steel frame, insulated metal siding high-bay portion to house the test item, flanked by two low-bay areas. These low-bay areas house fabricating, checkout and repair shops, and test fixtures and equipment storage. This portion of the building is equipped with two overhead cranes. One is a general service, chain operated bridge crane having a capacity of 2 tons and hook lift height of 12.5 ft. The

6. NARRATIVE DESCRIPTION

other, located in the high-bay portion of the building is a 15 ton capacity, electrically operated bridge crane with a hook lift height of 45 feet. Test item access to the interior of the high-bay portion is provided by 20-foot wide by 45-foot high, electric motor operated rolling doors in each end of the building.

Within the high-bay portion of the building there is a 30 ft. diameter, 32 ft. high, wooden structure, providing a particulate controlled environment corresponding to a class 100,000 clean roam, as defined by Federal Standard 209. The chamber is constructed of 8-foot wide by 16-foot high panel sections, fastened together so as to be easily assembled and disassembled. Ventilation and humidification equipment are skid mounted for portability.

Utilities and services available in this building include industrial hot and cold water, deionized water system, nitrogen and helium piping systems, compressed air piping, AC & DC electrical distribution systems, vapor exhaust hood systems, environmental systems, a public address system, and an acid drain system.

7. POTENTIAL: Upon completion of North American Aviation, Inc. test program on the Command and Service Module for Apollo, there are no future plans for this facility.

8. PLANS: See Item 7.

9. BLDG. NO.	200	**10. YR. BUILT:**	1963	**11. FAC. CAT. CODE:**	340-40
12. INITIAL COST: $	1,390 K	**13. NASA B.O.D.**	1963	**14. STATUS CODE:**	Active
15. ACCUM. COST: $	Unknown K	**16. LIFEEXPECT.**	Indef.	**17. OWNER CODE:**	NASA
18. OPER. CODE:	Contr.	**19. CONTRACTOR NAME** *(if contr. oper.):*	North American Aviation, Inc.		

20. OTHER SOURCES OF INFO: Facilities Master Plan - White Sands Test Facility - MSC
Design Criteria Test Complex II - Ralph M. Parsons Co.

21. COGNIZANT ORGANIZATIONAL COMPONENT:
Operations Support Office - Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Facilities Branch (RH2)
(AC 505) 524-5682

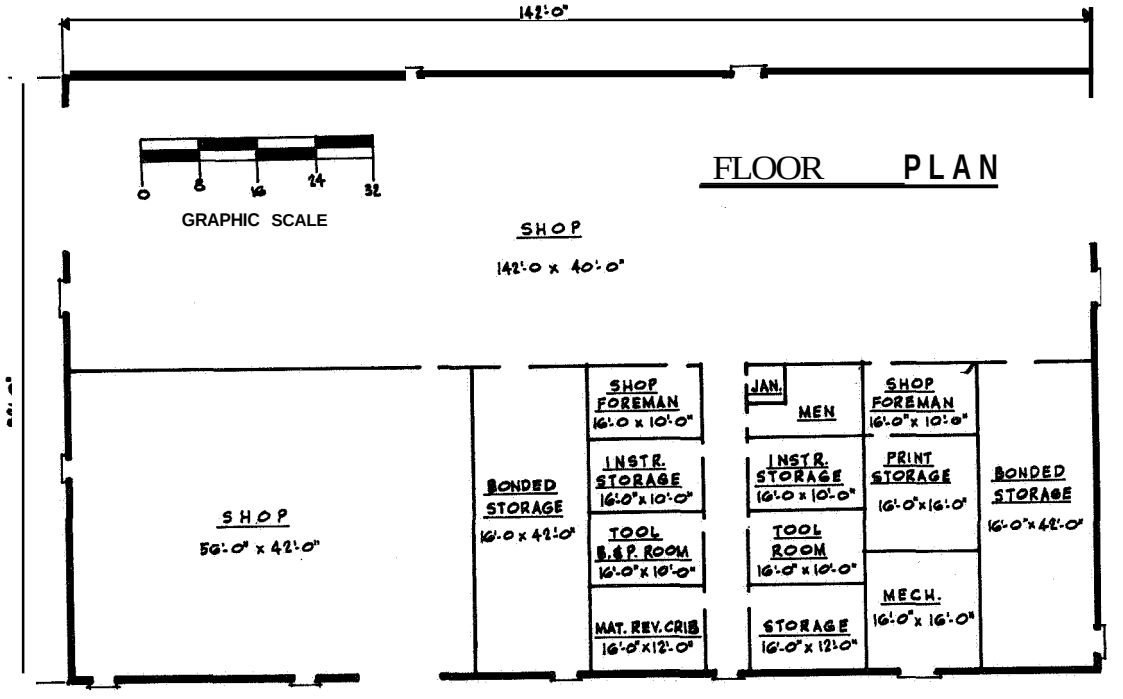
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-10-05-**00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Vehicle Assembly Building

3. LOCATION *(if other than in 1. above):* Launch Complex 36 - White Sands Missile Range,



4. FUNCTIONAL NAME: Spacecraft Assembly Facility (LC-**36)**

5. TECHNOLOGICAL AREAS SUPPORTED: Assembly of spacecraft vehicles; Prefire testing and functional checking on launch vehicles and associated ground support equipment.

6. NARRATIVE DESCRIPTION **OF** FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of a structural steel and sheet metal structure with approximately 11,700 square feet gross area. **It** contains a high bay area with a hook height of 55 feet; a low bay area with a hool height of 30 feet; and a bay for checkout and conditioning of solid fuel booster .motors. Utilities and services in the building include AC and DC electrical distribution system, compressed air piping system, intercom and paging system and heating and air conditioning systems,

6. NARRATIVE DESCRIPTION

7. POTENTIAL: This building will be used for the Aerobee 350 Project as a prefire checkout and test area.

8. PLANS: Modifications to the building are being designed.

9. BLDG. NO. 23358 10. YR. BUILT: 1963 11. FAC. CAT. CODE: 381 40

12. INITIALCOST: $ 366.52 K 13. NASA B.O.D. 1963 14. STATUS CODE: Standby

15. ACCUM. COST: $ Unknown K 16. LIFEEXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Design Analysis - Vehicle Assembly Building
Kenneth S. Clark, Architect

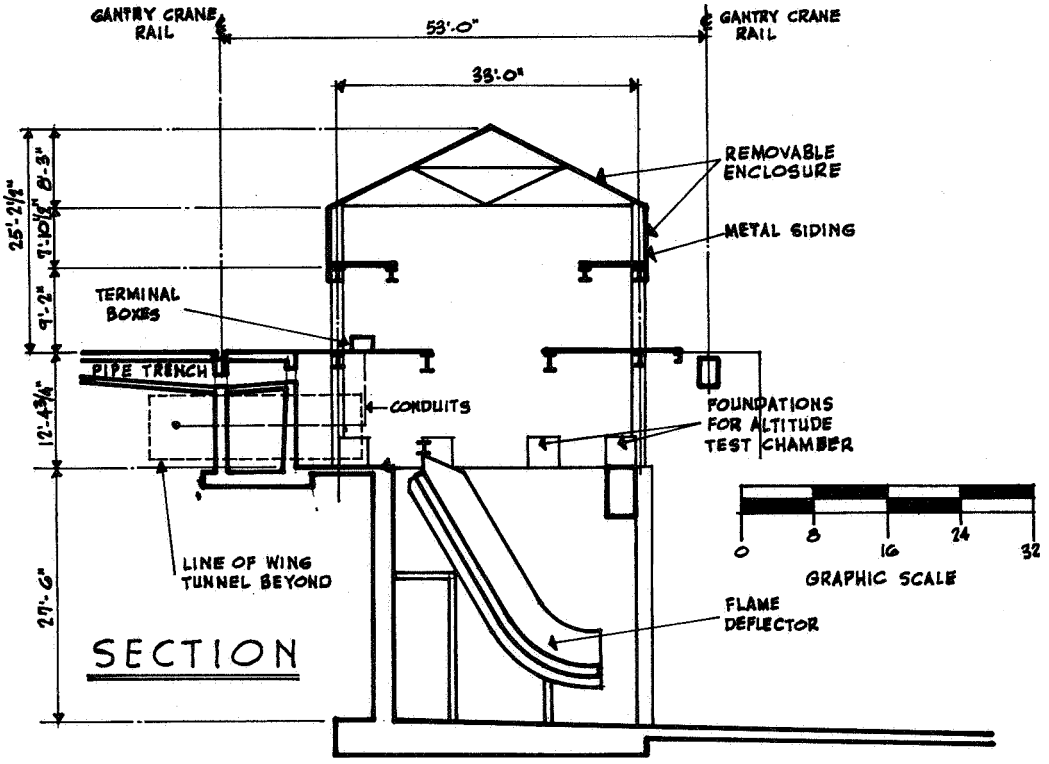
21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office - Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief- Facilities Branch (RH2)
Phone : (Area Code 505) 524-5682

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: LEM Atmospheric Test Stand

3. LOCATION *(if other than in 1. above):* White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand (LEM)

5. TECHNOLOGICAL AREAS SUPPORTED: Static test firing of multi-propellant, gimballed, rocket engines.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This vertical dawn-firing atmospheric static test stand is capable of accommodating a propulsion stage or module of up to 10,000 lb. thrust. A 20 ton electric powered mobile stiff leg gantry crane with 60 ft. hook height is provided for top loading and positioning of test items and equipment at the stand.

A dry surface, back side water cooled flame deflecton and cooling water system is utilized at this test stand. The flame deflector pit is designed to accommodate the future installation of an altitude simulation chamber diffuser, and ejector system. The ejector system could utilize the existing steam generator and steam header,

6. NARRATIVE DESCRIPTION

Utilities and services for the test stand include fuel-and oxidizer transfer piping water deluge system, closed circuit TV and cine-camera systems, AC and DC electrical power systems, propellant dump tanks, a data acquisition system including signal conditioning and recording equipment, diesel-generator systems for emergency and uninterrupted power, intercommunications and paging systems, propellant holding and neutralizing ponds, and area warning system.

The test stand is 33 ft. sq. and 36 ft. high. The upper 24 ft. of the stand is covered with corrugated aluminum with a 17 ft. by 7 ft. roll-up door on the south side.

7. POTENTIAL: Upon completion of Contractor test program, on the LEM for Apollo, there are no future plans for this facility.

8. PLANS: See Item 7

9. BLDG. NO.	402	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	340 10
12. INITIAL COST: $	1,312 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.):*	Grumman Aircraft Engineering Corporation		

20. OTHER SOURCES OF INFO: Facilities Master Plan - White Sands Test Facility, MSC
Design Criteria - LEM Test Facilities
LED 2-2B&C (Confidential) Grumman Aircraft Engineering Corp.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office - Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Facilities Branch (RH2)
Phone: (Area Code 505) 524-5682

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966

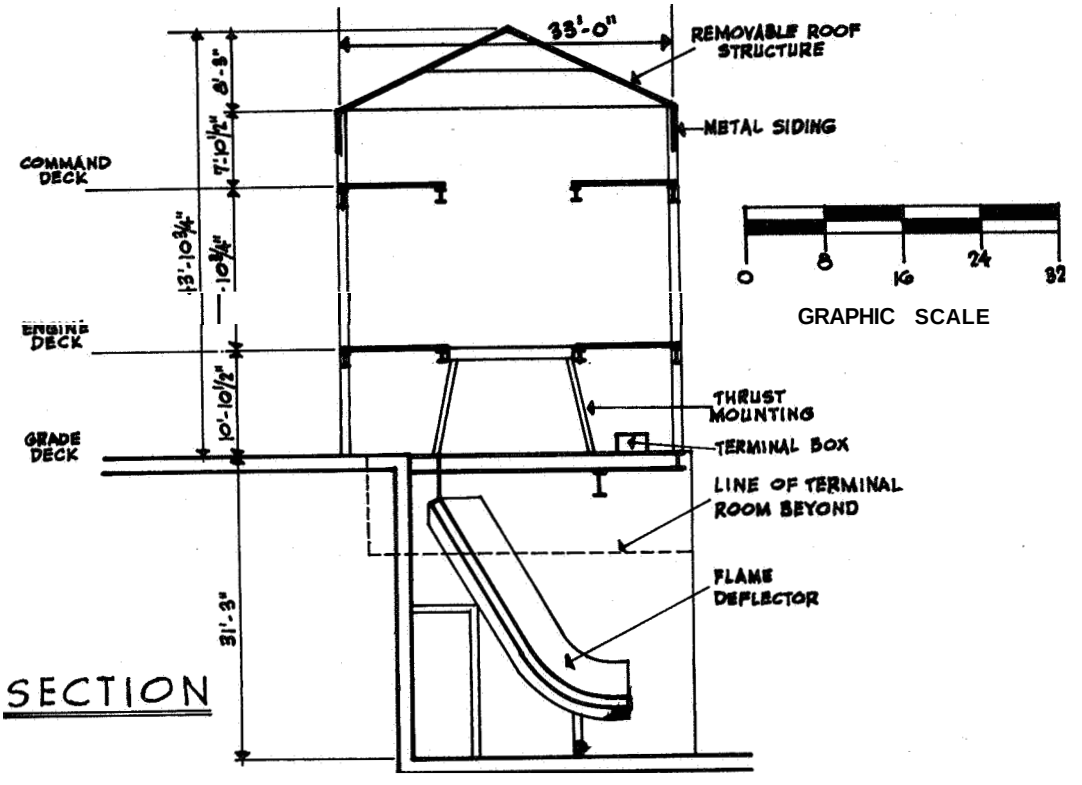
FACILITY NO: 11-10-07-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: CSM Test Stand 301

3. LOCATION *(if other thun in 1. **above**):*

White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand (CSM 301)

5. TECHNOLOGICAL AREAS SUPPORTED: Static test firing of multi-propellant, gimballed, rocket engines.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This test stand is a single-position, vertical, down-firing, atmospheric static test stand capable of accommodating a vehicle with a gimballed, multi-propellant engine. The stand is designed for side loading of a test item with the following characteristics:

Test Item dead load	27,500 pounds
Propellant Weight	42,250 pounds
Upward thrust 25,000 x 2 (D.L.F.)	50,000 pounds
Downward rebound	25,000 pounds
Horizontal thrust	12,500 pounds
Forward gimbal angle	12-½ degrees
Aft gimbal angle	4-½ degrees
Port & starboard gimbal angle	6 degrees

6. NARRATIVE DESCRIPTION

Rocket engine exhaust deflecting from the vertical to the horizontal is accomplished by a dry surface, steel, back side water cooled flame deflector. Utilities and services for the test stand include fuel and oxidizer transfer piping, nitrogen and helium piping, fire protection (water deluge) system, closed circuit TV system, cine-camera system, AC and DC electrical power systems, propellant dump tanks, a data acquisition system including signal conditioning and recording equipment, diesel-generator system for emergency power, intercommunications and paging system, propellant holding and neutralizing ponds, area warning system, and an 1800 square foot Ground Support Equipment shelter.

The test stand is 33 feet square and 44 feet high. There are two work platforms within the test stand approximately 11 feet and 28 feet above grade level. At the present time, the stand will accommodate a test vehicle 13'-2" in diameter. The stand is covered with corrugated aluminum siding and has a removable roof. The top of the flame deflector is approximately 4'-6" below grade.

7. POTENTIAL: Upon completion of North American Aviation, Inc. test program on the Command and Service Module for Apollo, there are no future plans for this facility.

8. PLANS: See Item 7.

9. BLDG. NO.	301	**10. YR. BUILT:**	1963	**11. FAC. CAT. CODE:**	340-10
12. INITIAL COST: $	1,492 K	**13. NASA B.O.D.**	1963	**14. STATUS CODE:**	Standby
15. ACCUM. COST: $	Unknown K	**16. LIFE EXPECT.**	Indef.	**17. OWNER CODE:**	NASA
18. OPER. CODE:	Contr.	**19. CONTRACTOR NAME** *(if contr. oper.):*	North American Aviation, Inc.		

20. OTHER SOURCES OF INFO:

Facilities Master Plan - White Sands Test Facility - MSC
Design Criteria - Test Complex I
Ralph M. Parsons Co.

21. COGNIZANT ORGANIZATIONAL COMPONENT:

Operations Support Office - Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Facilities Branch (RH2)
(AC 505) 524-5682

TECHNICAL FACILITIES RESUME

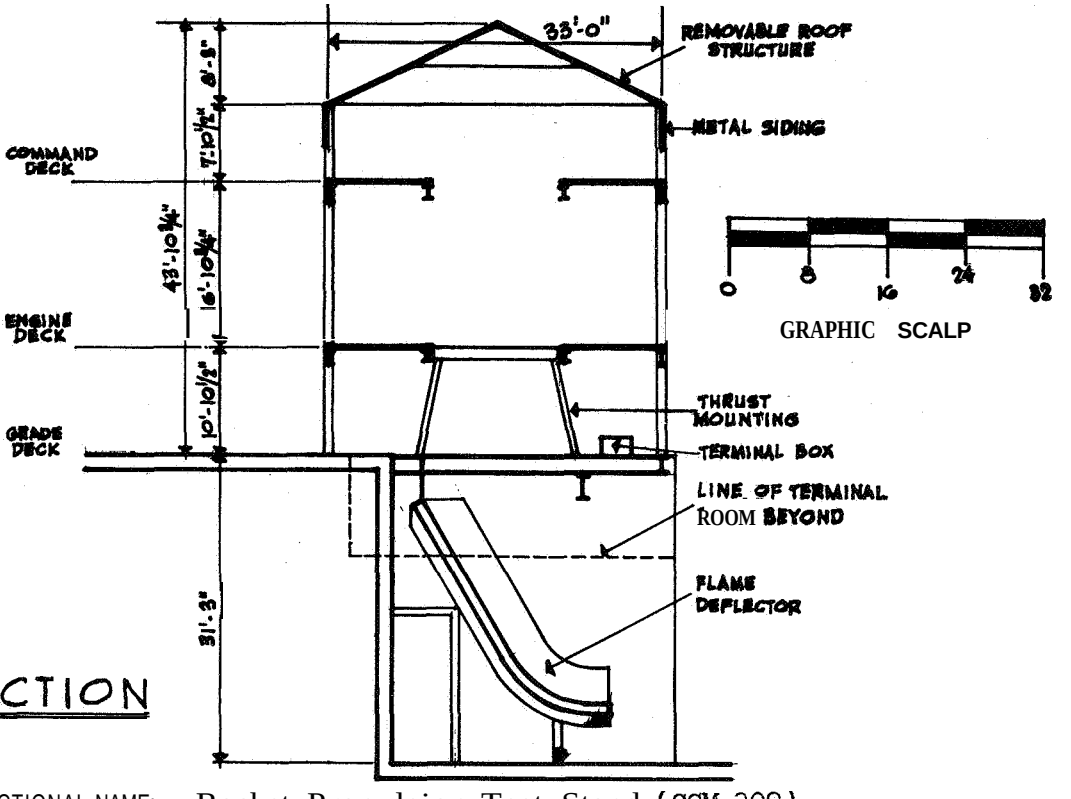
DATE OF RESUME: July 15, 1966
FACILITY NO: 11-10-08-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: CSM Test Stand 302

3. LOCATION *(if other than in 1. above):*

White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand (CSM 302)

5. TECHNOLOGICAL AREAS SUPPORTED: Static test firing of vertical, multi-propellant gimballed rocket engines.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This test stand is a single-position, vertical, down-firing, atmospheric static test stand capable of accommodating a vehicle with a gimballed, multi-propellant engine. The stand is designed for side loading of a test item with the following characteristics:

Test Item dead load	27,500 pounds
Propellant Weight	45,250 pounds
Upward thrust 25,000 X 2(D.L.F.)	50,000 pounds
Downward rebound	25,000 pounds
Horizontal thrust	12,500 pounds
Forward gimbal angle	12-½ degrees
Aft gimbal angle	4-½ degrees
Port & starboard gimbal angle	6 degrees

6. NARRATIVE DESCRIPTION

Rocket engine exhaust deflection from the vertical to the horizontal is accomplished by a dry surfaced, steel, back side water cooled flame deflector. Utilities and services for the test stand include fuel and exidizer transfer piping, nitrogen and helium piping, fire protection (water deluge) system, closed circuit TV system, cine-camera system, AC and DC electrical power systems, propellant dump tanks, a data acquisition system including signal conditioning and recording equipment, diesel-generator system for emergency power, intercommunications and paging system, propellant holding and neutralizing ponds, area warning system, and an 1800 square foot Ground Support Equipment shelter.

The test stand is 33 feet square and 44 feet high. There are two work platforms within the test stand approximately 11 feet and 28 feet above grade level. At the present time, the stand will accommodate a test vehicle 13'-2" in diameter. "he stand is covered with corrugated aluminum siding and has a removable roof. The top of the flame deflector is approximately 4'-6" below grade.

7. POTENTIAL: Upon completion of North American Aviation, Inc. test program on the Command and Service Module for Apollo, there are no future plans for this facility.

8. PLANS: See Item 7.

9. BLDG. NO.	302	**10. YR. BUILT:**	1964	**11. FAC. CAT. CODE:**	340-10
12. INITIAL COST: $	1,492 K	**13. NASA B.O.D.**	1964	**14. STATUS CODE:**	Active
15. ACCUM. COST: $	Unknown K	**16. LIFE EXPECT.**	Indef.	**17. OWNER CODE:**	NASA
18. OPER. CODE:	Contr.	**19. CONTRACTOR NAME** *(if contr. oper.):*	North American Aviation, Inc.		

20. OTHER SOURCES OF INFO:

Facilities Master Plan - White Sands Test Facility - MSC
Design Criteria - Test Comples II - Ralph M. Parsons Co.

21. COGNIZANT ORGANIZATIONAL COMPONENT:

Operations Support Office - Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Facilities Branch (RH2)
(AC 505) 524-5682

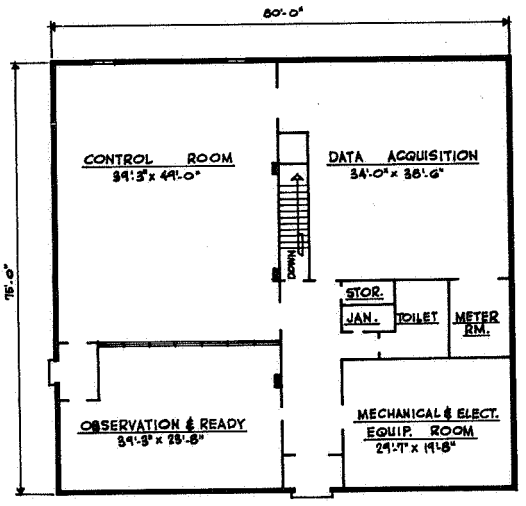
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-10-09-00

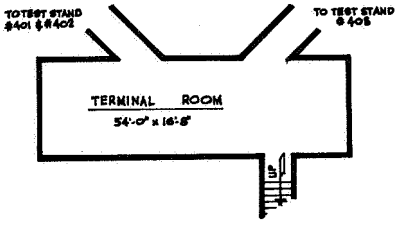
1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: LEM Control Center

3. LOCATION *(if other than in 1. above):* White Sands Test Facility, Las Cruces, New Mexico



FIRST FLOOR PLAN



BASEMENT FLOOR PLAN



GRAPHIC SCALE

4. FUNCTIONAL NAME: Rocket Propulsion Control Center (LEM)

5. TECHNOLOGICAL AREAS SUPPORTED: Controlling the operation and test firing of an atmospheric test stand and altitude test chambers with associated altitude simulation system.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This permanent reinforced concrete structure contains 6,615 square feet including a below-ground terminal room. The building houses the control, data acquisition and monitoring equipment necessaryto monitor and control all operations in the (LEM) test arec. The structure is normally occupied during test periods by approximately 50 people. The building is connected to the test stand support buildings by reinforced concrete tunnels. The structure was designed to withstand an overpressure of 1.6 psi with a duration of .031 seconds. The structure was also designed to attenuate rocket exhaust system noise to a maximum acoustic level inside the structure corresponding to NC-50. The building is maintained under positive pressure during period of excessive air pollution. Air leakage is made-up from compressed air bottle racks.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Upon completion of Grumman Aircraft Engineering Corporation test program on the Lunar Excursion Module for Apollo, there are no future plans for this facility.

8. PLANS: See Item 7

9. BLDG. NO.	400	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	340 20
12. INITIALCOST: $	2,950 K	13. NASA B.O.D.	1964	14. STATUSCODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNERCODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.)*:	Grumman Aircraft Engineering Corp.		

20. OTHER SOURCES OF INFO: Facilities Master Plan - White Sands Test Facility - MSC Design Criteria - LEM Test Facilities - Burns & Roe, Inc.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office - Facilities Branch

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Chief, Facilities Branch (RH2)
F'hone: (Area Code 505 524-5682

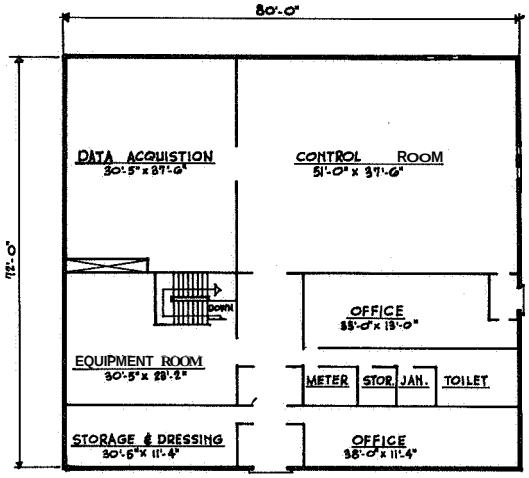
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: **11-10-10-00**

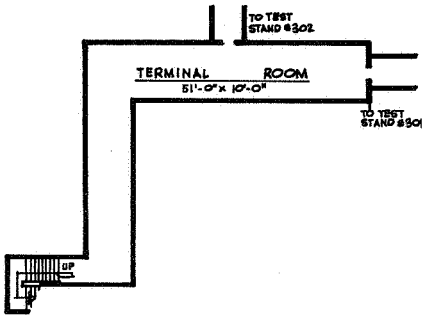
1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: CSM Test Control Center

3. LOCATION *(if other than in 1. above):* White Sands Test Facility, Las Cruces, New Mexico



FIRST FLOOR PLAN



BASEMENT FLOOR PLAN



GRAPHIC SCALE

4. FUNCTIONAL NAME: Rocket Propulsion Control Center (CSM)

5. TECHNOLOGICAL AREAS SUPPORTED: Controlling the operation and test firing of atmospheric test stands.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This permanent reinforced concrete structure contains 6,037 square feet including a below-ground terminal room. The building houses the control, data acquisition, and monitoring equipment necessaryto monitor and control all operations in the CSM test area. The structure is normally occupied during test periods by approximately 45 people. The structural shell of this building was designed to safely sustain the pulse overpressure (2.6 psi side on, 5.6 psi reflected, at 46 milliseconds duration) resulting from an explosion equivalent to 2,714 pounds of TNT at either of the CSM test area test stands. In addition, the building was designed to sustain the impact of a fragment approximating a 50-caliber bullet traveling at 2,700 FPS and attenuate the rocket exhaust noise from either test stand, calculated as approximately 120 decibels in the third, fourth, and fifth octave incident on the structure, to an NCA level within the

6. NARRATIVE DESCRIPTION

structure. The building is capable of being sealed and maintained under positive pressure during periods of excessive air pollution. Air revitalization is accomplished by an activated charcoal filter and leakage is made-up from compressed air bottle racks. The building is connected to the two test stands by reinforced concrete tunnels.

7. POTENTIAL: Upon completion of North American Aviation, Inc., test program on the Command and Service Module, there are no future plans for this facility.

8. PLANS: See Item 7

9. BLDG. NO.	300	10. YR. BUILT:	1963	11. FAC. CAT. CODE:	350 20
12. INITIAL COST: $	3,300 K	13. NASA B.O.D.	1963	14. STATUS CODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.):*	North American Aviation, Inc.		

20. OTHER SOURCES OF INFO: Facilities Master Plan - White Sands Test Facility - MSC Design Criteria - Test Complex I, Ralph M. Parsons Co.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office - Facilities Branch

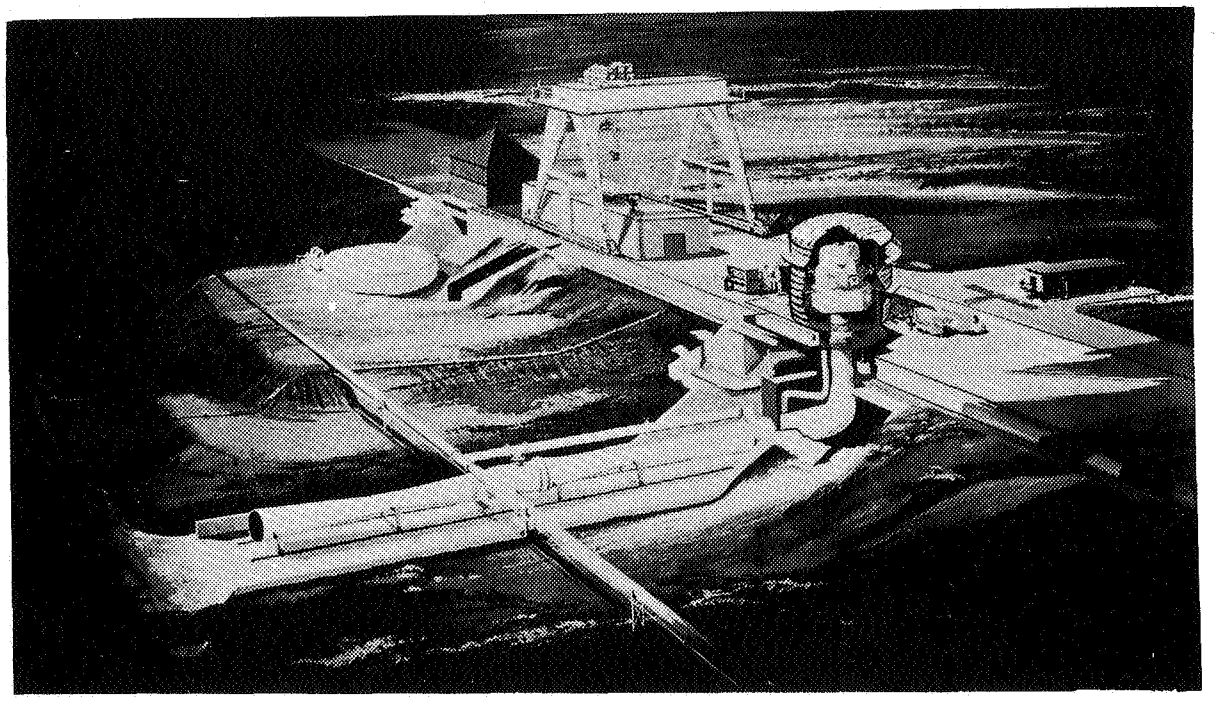
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Facilities Branch (RH2)
Phone: (Area Code 505) 524-5682

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 15, 1966
	FACILITY NO:	11-10-11-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: LEM Altitude Test Chamber

3. LOCATION *(if other than in 1. above):*
White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Rocket Propulsion Altitude Test Chamber

5. TECHNOLOGICAL AREAS SUPPORTED: Static test firing of multi-propellant gimballed rocket engines at a simulated altitude of up to 105,000 ft., or other tests up to a simulated altitude of 250,000 ft.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:
This altitude simulation, vertical down-firing, static test stand is designed for testing a gimballed rocket engine in a propulsion stage or module, in the 10,000 lb. thrust class at simulated altitudes. An electric powered mobile stiff leg 20-ton gantry with a 60 ft. hook height is provided for removing the altitude chamber lid and for top loading and positioning test items and equipment. The chamber 32 ft. in diameter and 24-½ft. high is fabricated from carbon steel with three work platforms in the chamber. The chamber is used for performing hot firing static testing of an engine under simulated pressure conditions equivalent to 105,000 feet altitude. The chamber is designed to resist an external pressure of 14.7 psi and a blast impulse of 3.1 psi for 0.03 seconds resulting from an explosion at an adjacent test stand.

6. NARRATIVE DESCRIPTION

Pressure recovery for the propulsion system exhaust gases is accomplished by a water cooled center body type diffuser and two stage tandem steam jet ejector system. Steam is provided by an instantaneous chemical steam generator of the water injection type designed to burn isopropyl alcohol and liquid oxygen. It supplies approximately 540 lbs per sec of dry saturated steam to the steam jet ejectors at 300 psig inlet nozzle pressure. The ejectors are isolated from the chamber by a 9' vacuum gate valve. An emergency isolation device capable of closing in 75 milliseconds is provided between the chamber and gate valve which will prevent damage to the test vehicle upon loss of steam pressure.

A mechanical vacuum system, consisting of a positive displacement, lobe-type blower for the high vacuum stage and a cam and piston-type roughing pump, is provided. This system will evacuate the altitude chamber, diffuser and elbow upsteam of the gate valve to a pressure of $16x10^{-3}$ torr with a leakage rate into the chamber of -80 SCFM or .1. torr with a leakage rate of 4 SCFM.

Utilities and services for the chamber include fuel and oxidizer transfer piping, nitrogen and helium piping, water deluge system, closed circuit TV and cine-camera systems, AC & DC electrical power systems, propellant dump tanks, a data acquisition system including signal conditioning and recording equipment, intercommunication and paging systems, propellant holding and neutralizing ponds, area warning system, vacuum indicating recording, and controlling systems, and an air conditioning/purge system. A second stand with similar capability also exists at WSTF.

7. POTENTIAL: Upon completion of contractor test program on LEM for Apollo, there are no future plans for this facility.

8. PLANS: See Item 7.

9. BLDG. NO.	403	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	350-10
12. INITIALCOST: $	4,100 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAMC (*if contr. oper.*):	Grumman Aircraft Engineering Corp.		

20. OTHER SOURCES OF INFO:

Facilities Master Plan - White Sands Test Facility,. MSC
Design Criteria - LEM Test Facilities
LED 2-2BC (Confidential) Grumman Aircraft Engineering Corp.

21. COGNIZANT ORGANIZATIONAL COMPONENT:

Operations Support Office
Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, RH2-Facilities Branch
(AC 505) 524-5682

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966

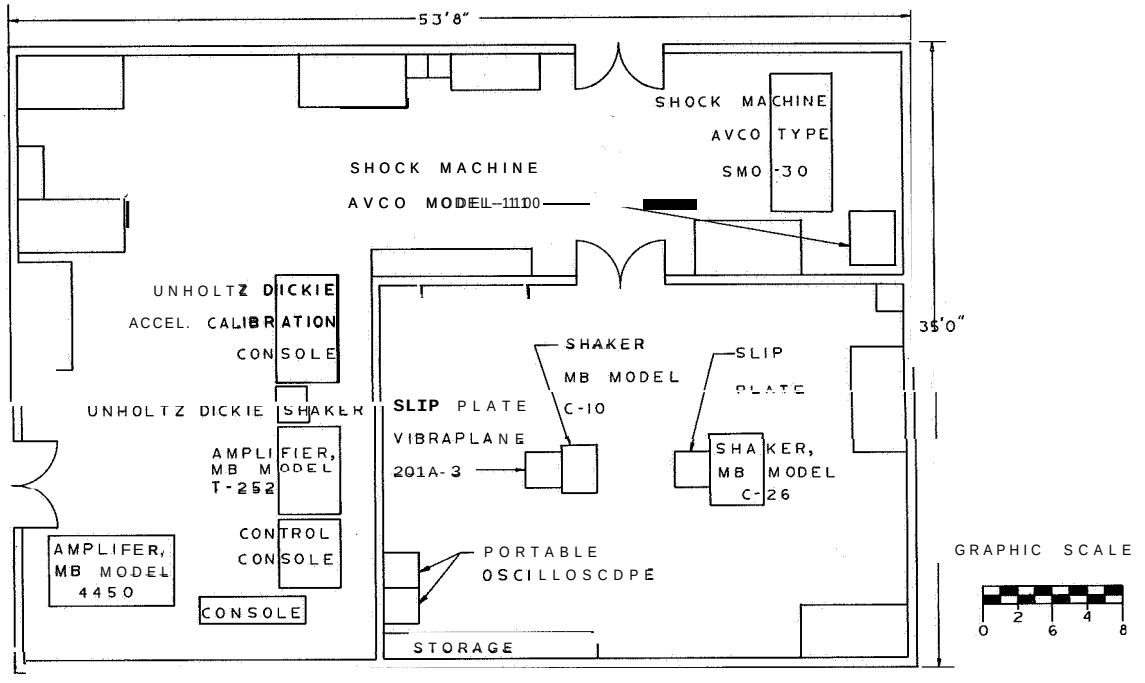
FACILITY NO: 11-10-12-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Shock and Vibration Laboratory

3. LOCATION (if *other than in 1. above):*

White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Shock and Vibration Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: General vibration and shock investigation

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility includes two large shakers with sinusoidal and random vibration capabilities, two small shaker systems to calibrate vibration transducers, and two shock machines as described below:

Shock Test Machines

Model	Avco Corp. 0-30-1	Avco Corp. SN-110
Max. Capacity	500 lb.	150 lb.
Shock Pulse Range	5 to 500 g	5 to 4000 g
Max. Specimen Size	3' x 3'	16" x 16"
Max Drop Height	72" (22" high specimen)	18"
Max. Terminal Vel.	180 ips @ height	300 ips
Cycling		4 cpm

6. NARRATIVE DESCRIPTION

Vibration Exciter

Model	MB Elect. Co. C-10	MB Elect. Co. C-126
Max. Specimen Size	12" x 12" x 12"	24" x 24" x 24"
Power Amplifier	6 KVA	45.KVA
Freq. Range	5 to 3000 cps hertz	5 to 3000 cps hertz
Max. Accel.	68 g	96 g
Vector Force Output	1200 lb.	10,000 lb.
Continuous Sine	1200 lb.	10,000 lb.
Random Peak	2550 lb.	24,000 lb.

The small portable 25 pound capacity vibration system suitable for field calibration of transducers and other small components has a frequency range of 5 to 8000 cps at 60 "g"s peak (maximum) with the table unloaded.

In addition, the facility contains two "g" accelerators and a rate of turn table. The larger "g" accelerator with a radius of gyration ranging up to 54 inches is rated to 200 "g"s, limited to 15,000 g-lbs. The speed range is 0 to 400 RPM; the maximum test specimen envelope is 24" X 24" X 24". The smaller "g" accelerator has a radius of gyration of up to 33 inches and is rated to 250 "g"s, limited to 15,000 g-lbs. The speed range on this accelerator is o to 600 RPM; it will accept up to an 18" X 18" X 18" test specimen envelope. The rate of turn table rotates at a constant rate within .1% of the set rate ranging from .01 to 1200 deg/sec. The table diameter is 20 inches and will support a maximum weight of 100 lbs.

7. POTENTIAL: The laboratory is capable of advanced spacecraft materials research and is investigating plans to perform testing for Apollo Applications.

E. PLANS: See Item 7.

9. BLDG. NO. 203 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320-10

12. INITIAL COST: $ 257** K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Operations support Office (RH)
(AC 505) 524-5357

**Equipment only.

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966

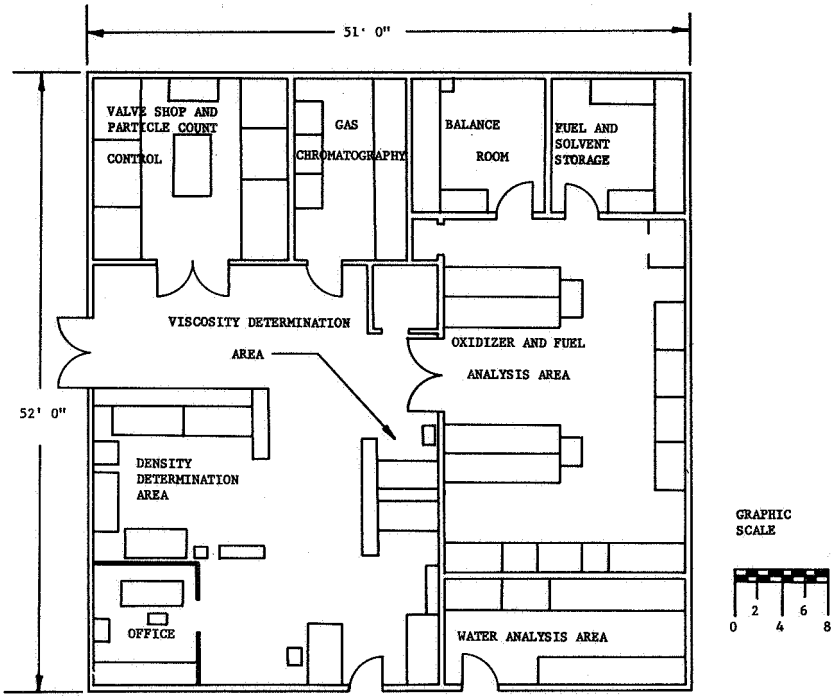
FACILITY NO: 11-10-13-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Chemistry Laboratory

3. LOCATION *(if other than in 1. above):*

White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Chemistry Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Analysis of liquids and gases, determination of chemical properties, performance of systems cleanliness tests, & performance of chemical compatibility studies.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The chemistry laboratory is one of the few laboratories in the country currently capable of analyzing fuel cell grade cryogens to the stringent requirements of specifications MSFC-399 (liquid oxygen, grade A, type II) and MSFC-356 (liquid hydrogen) on a routine basis. Also, using the methods developed by this laboratory, density and viscosity determinations of fluids are performed with an accuracy and reproducibility exceeding those of any other governmental or industrial laboratory.

This laboratory is further equipped to provide for contamination monitoring of clean areas and clean parts in support of a Federal Standard 209, Class 100 clean room, and for contamination monitoring of hydraulic fluids.

6. NARRATIVE DESCRIPTION

The laboratory is capable of analyzing nitrogen tetroxide, water, gases (e.g. gaseous nitrogen, oxygen, helium, argon and hydrogen) and Aerozine-50, isopropyl alcohol, freons, methanol, and associated liquids. Other areas of activity include wet analysis of alloys, identification of unknown materials, corrosion and contamination analysis, and determination of standard chemical properties: density, viscosity, flash point, boiling point, melting point, etc.

7. POTENTIAL: The laboratory is capable of advanced spacecraft materials research a d is investigating plans to perform testing for Apollo Applications.

8. PLANS: See Item 7

9. BLDG. NO.	200	10. YR. BUILT:	1964	11. FAC. CAT. CODE:	320-22
12. INITIAL COST: $	179** K	13. NASA B.O.D.	1964	14. STATUS CODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Operations Support Office (RH)
(AC 505) 524-5357

*Equipment only.

TECHNICAL FACILITIES RESUME

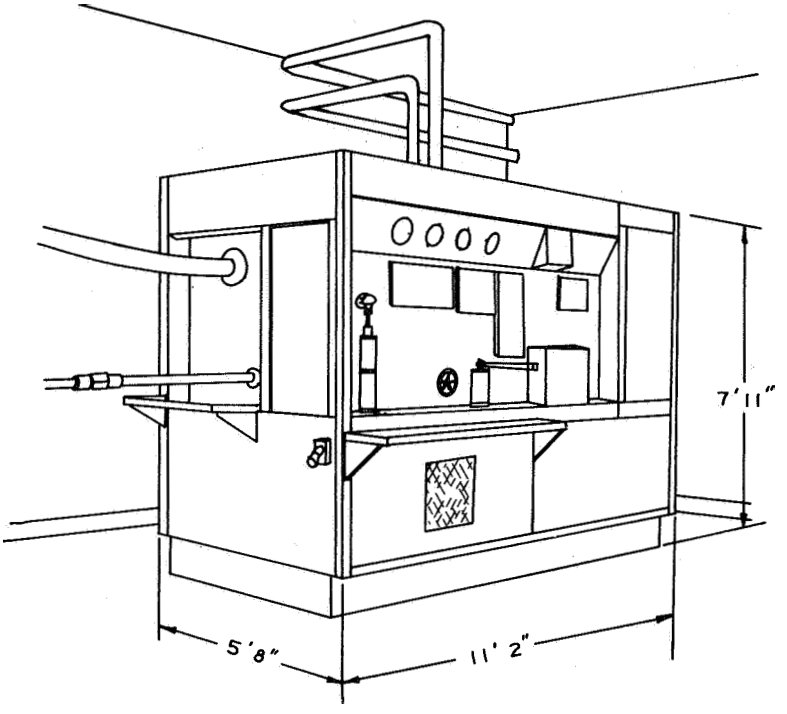
DATE OF RESUME: July 15, 1966

FACILITY NO: 11-10-14-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Flowmeter Calibration Laboratory

3. LOCATION *(if other than in 1. above):* White Sands Test Facility, Las Cruces, New Mexico



4. FUNCTIONAL NAME: Flowmeter Calibration Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Measuring liquid flow; calibrating liquid flowmeters.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The primary flowmeter calibrator, a Cox Instruments Co. model 311 AHT, measures liquid flow from 5 to 150,000 pounds per hour with an accuracy of 0.10% of the actual reading. The unit rapidly and accurately calibrates flowmeters by the direct dynamic weight-time method. Distilled water is used as the calibration fluid and the calibrator is correlated to the National Bureau of Standards with a plus or minus .10% accuracy through a flow rate range of 5 to 150,000 pounds per hour. Accessories include a portable secondary flow standard unit capable of measuring from 0.05 to 250 gallons per minute. Other accessories are a model 630 flowmeter comparison, a model *82976* cold package assembly used for maintaining flow media temperature at a desired set point, and a portable filter cart pumping station.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: The laboratory is capable of advanced spacecraft research and is investigating plans to perform testing for Apollo Applications.

8. PLANS: See Item 7.

9. BLDG. NO. 203 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320 22

12. INITIAL COST: $ 104** K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Manufacturer's Catalogs

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Operations Support Office (RH)
Phone: (Area Code 505) 524-5357

**Equipment only

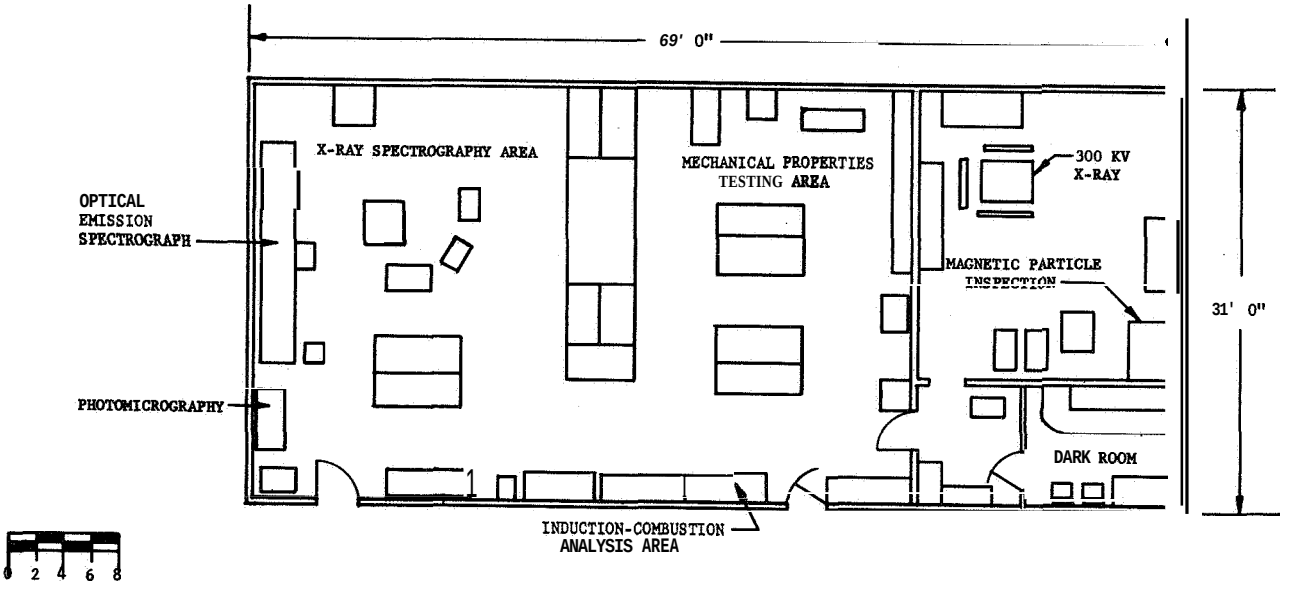
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 15, 1966
FACILITY NO: 11-10-15-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Metallurgy–Radiography Laboratory

3. LOCATION *(if other than in 1. above):* White Sands Test Facility. Las Cruces, New Mexico



4. FUNCTIONAL NAME: Metallurgy - Radiography Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Determination of mechanical properties of materials, spectrographic analysis, radiographic inspection of metals, determination of carbon and sulfur present in metals, and conduction of failure analysis.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

"his facility is equipped for spectrographically analyzing metals and alloys containing fractional contents of less than 1% to nearly 100% for all elements heavier than sodium except for the halogens and phosphorous. The amounts of carbon and sulfur in metals to an accuracy of 2% of the amount present can be determined by the method of induction combustion.

X-ray diffraction studies can be conducted on both solid pieces and powders by the film and goniometer methods. Metallographic samples can be prepared, examined, and photographed at magnifications from 25x to 1500x. The laboratory is equipped for radiographically inspecting metals equivalent to six inches of steel with a sensitivity of two per cent, ultrasonically inspecting metals up to 20 feet in length, ultrasonically measuring the thickness of metals, and conducting magnetic particle inspections of magnetic materials.

6. NARRATIVE DESCRIPTION

Standard and superficial Rockwell hardness tests can be conducted as well as micro-hardness tests at loads from 1 to 1000 grams using the Knoop or DPH indentors. Tension, compression, or bending loads to 60,000 pounds with better than one per cent accuracy can be applied to test bars. These tests can be performed at ambient and cryogenic temperatures and if necessary at elevated temperatures.

The laboratory is supported by a Federal Standard 209, Class 100 clean room, physical measurements laboratories, instrumentation calibration laboratories, and electronic and mechanical fabrication shops.

7. POTENTIAL: The laboratory is capable of advanced spacecraft materials research and is investigating plans to perform testing for Apollo Applications.

8. PLANS: See Item 7

9. BLDG. NO.	203	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	320 50
12. INITIAL COST: $	128** K	13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $	Unknown K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.)*:			

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Operations Support Office (RH)
Phone: (Area Code 505) 524-5357

** Equipment only

TECHNICAL FACILITIES RESUME

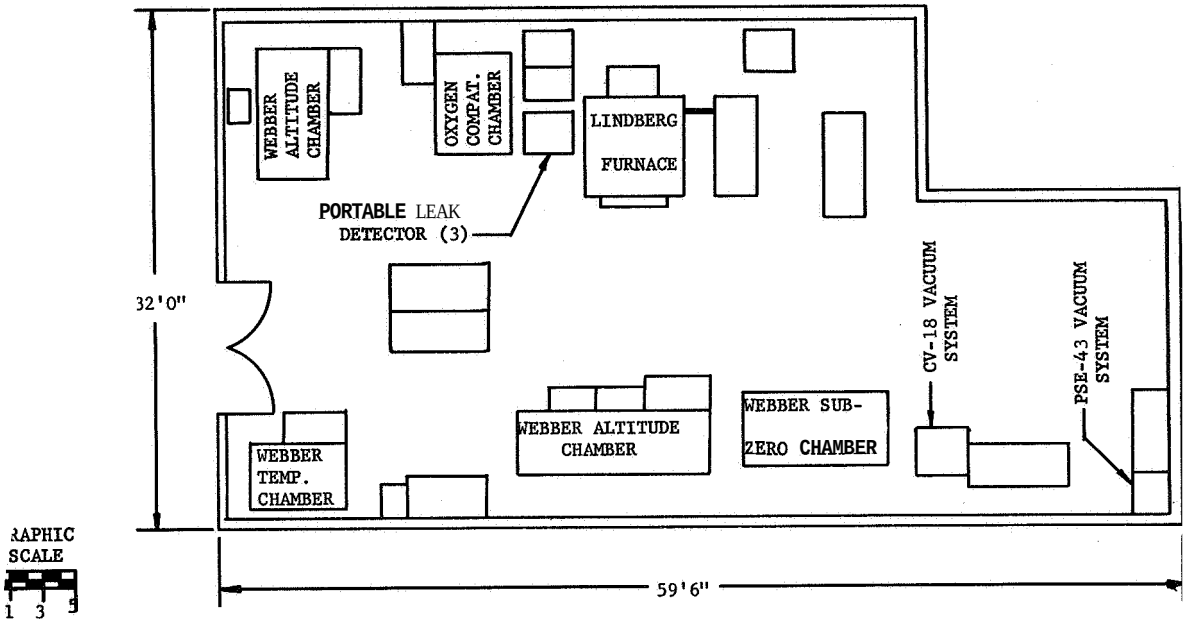
DATE OF RESUME: July 15, 1966
FACILITY NO: 11-10-16-00

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2 FACILITY NAME: Chamber Laboratory

3. LOCATION *(if other than in 1. above):*

White Sands Test Facility, Las Cruces, New Mexico



1 FUNCTIONAL NAME: Environmental Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Capabilities for temperature, humidity and altitude-simulation (vacuum) environments.

5. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The chamber laboratory incorporates the capabilities for the control of temperature, humidity, and altitude simulation (vacuum) environments. The major chambers in the laboratory are listed on the following page.

Support equipnent for this laboratory includes mass spectrometer lead detectors, mechanical vacuum pumps, vacuum gages, and temperatures recorders. This laboratory is further supported by a class 100 clean room, physical measurements laboratories, instrumentation calibration laboratories and electrical and mechanical fabrication shops.

6. NARRATIVE DESCRIPTION

Major chambers

Name	Test Section	Control	Remarks
Sub-Zero Temp. Chamber	3'X3'x4'	-320° - 150° ± 3°F	Mech. Refrigeration ± LN_2 system
Temperature - Humidity Chamber	3'x3'x4'	-100° - 350°F± 3°F Humidity Control ± 3%	
Temperature - Altitude Chamber	3'x3'x4'	-100° - 350°F±3°F Ambient Pr. to 250,000	Indv. or Comb. Temp.- Altitude Control
Temperature - Altitude Chamber	3'x3'x4'	-100° - 350°F±3°F Ambient Pr. to 250,000	Oxygen Compatible
High Temperature Furnace	3'x3'x4'	Ambient Temp. to 2000°F ± 5°F	Atmospheric Pressure
High Vacuum System	24" Diameter x 30"	Vacuum Pressures to 10-8 Torr.	Stainless Steel Bell Jar
	18" Diameter X 30"		Glass Bell Jar
High Vacuum system	20" Base Plate x 18" Bell Jar	10-9 Torr.	

7. POTENTIAL: The laboratory is capable of advanced spacecraft materials research and is investigating plans to perform testing for Apollo Applications.

8. PLANS: See Item 7

9. BLDG. NO. 203 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 320-10

12. INITIAL COST: $ 216** K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ Unknown K 16. LIFE EXPECT. 10-12yrs 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Operations support Office (RH) (AC 505) 524-5357

TECHNICAL FACILITIES RESUME

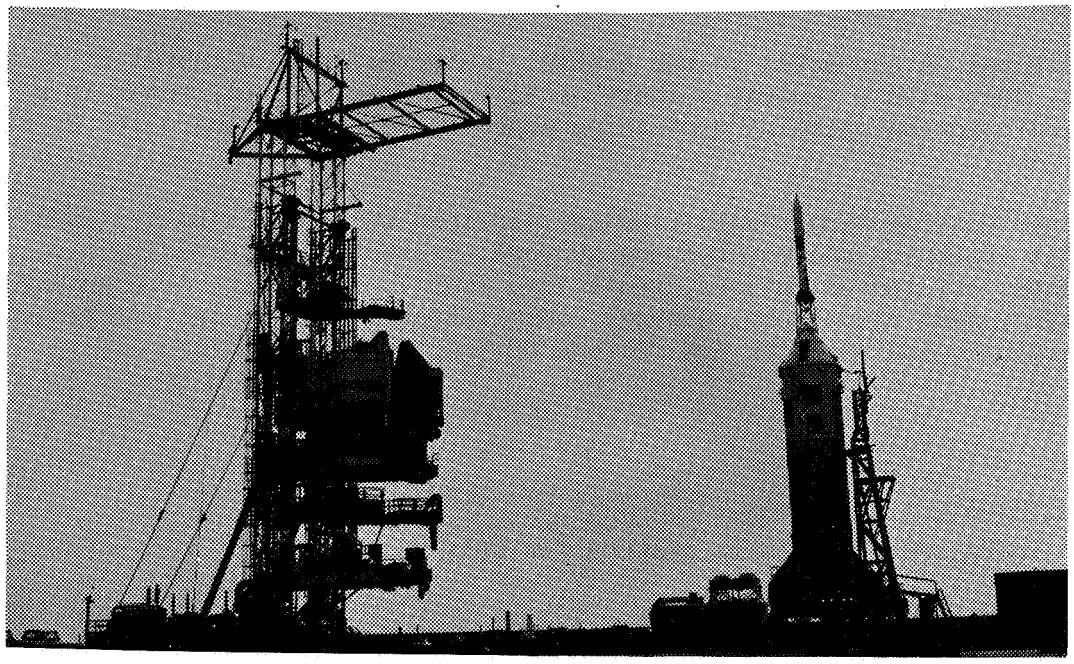
DATE OF RESUME: July 15, 1966

FACILITY NO: **11-10-17-00**

1. REPORTING INSTALLATION: Manned Spacecraft Center, Houston, Texas

2. FACILITY NAME: Little Joe II Launch Facility

3. LOCATION *(if other than in 1. above):* Launch Complex 36 - White Sands Missile Range, New Mexico



4. FUNCTIONAL NAME: Missile Launch Complex (Little Joe II)

5. TECHNOLOGICAL AREAS SUPPORTED: Launch facilities for testing pad abort, launch escape system, earth landing systems, and structural system of (Apollo) spacecraft.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of the launch pad mobile service structure, data and control systems building, and a launch control center. The launch pad is designed for a solid fuel booster vehicle capable of developing approximately 750,000 pounds of thrust, and the **(Apollo)** spacecraft with jettison capability. The launch pad is approximately 130 ft. by 150 ft. and is located 1100 ft. from the control center.

The service tower is 130 ft. high with a 15 ton overhead crane. There are six work platforms which are located in height above the ground as **follows:**

6. NARRATIVE DESCRIPTION

Platform 1	fixed at 22 ft.
Platform 2	fixed at 36'-9"
Platform 3	adjustable 43 ft to 62'-4"
Platform 4	adjustable 53'-3" to 71'-3"
Platform 5	adjustable 65'-3" to 83'-4"
Platform 6	adjustable 74'-6" to 105'-8"

An environmental enclosure is provided between the fourth and fifth work platforms. The tower is capable of being moved on rails to the vicinity of the control center. An air compressor is provided for pneumatic controls and a diesel generator provides emergency electrical power. An elevator is provided for access to the work platforms up to a maximum height of 100 ft.

The launch pad is connected to the control center by a cable tunnel 6 ft. wide and 6 ft. deep with a removable sheet metal top. The control center is a reinforced concrete building containing approximately 3850 square ft. of floor space.

White Sands Missile Range facilities and services which could be utilized include facilities operation and maintenance support, telemetry, meterology, support instrumentation, communications, geodetics, real time support, documentary photography, data reduction, recovery, computations, surface and air transportation support, and transfer and storage of propellants.

7. POTENTIAL: There are no projects planned for this facility.

8. PLANS: See Item 7

9. BLDG. NO. 23355, 23350 & 23356 10. YR. BUILT: 1958 11. FAC. CAT. CODE: 381 10

12. INITIALCOST: $ 1,400 K 13. NASA B.O.D. 1963 14. STATUS CODE: Standby

15. ACCUM. COST: $ 2,204.15 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: Army

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*:

20. OTHER SOURCES OF INFO: Unknown

21. COGNIZANT ORGANIZATIONAL COMPONENT: Operations Support Office - Facilities Branch

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Chief, Facilities Branch (RH2)
Phone: (Area Code 505) 524-5682

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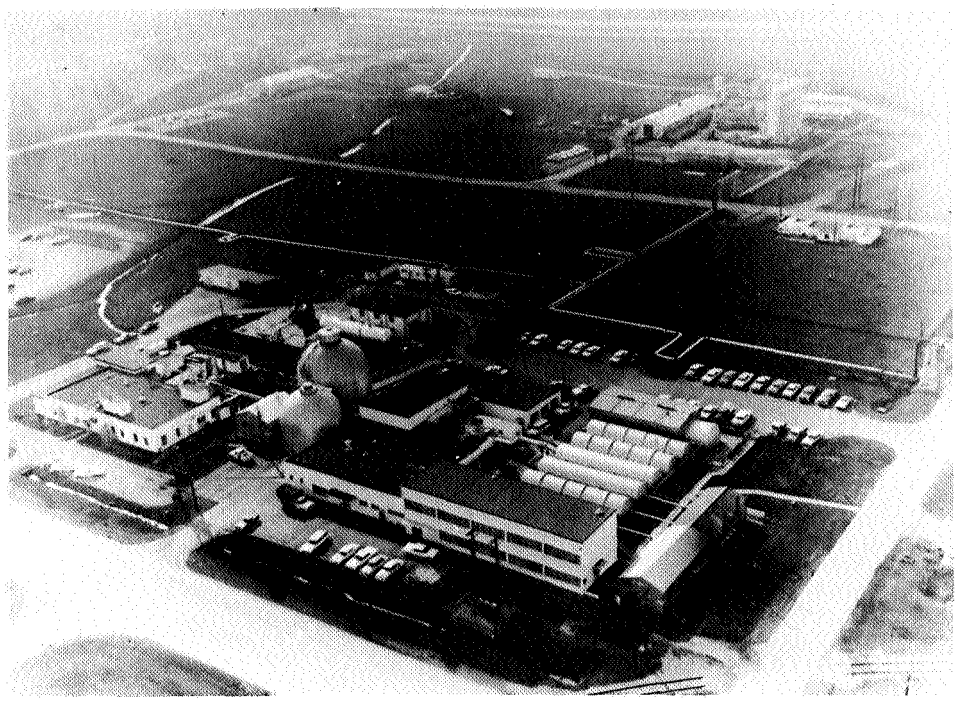
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966
FACILITY NO: 12-00-01-00

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Aero-Astrodynamics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Gas Dynamics Research Facility (Aero-Astrodynamics)

5. TECHNOLOGICAL AREAS SUPPORTED: Launch Vehicle Fluid Mechanics

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Aero-Astrodynamics Laboratory, with the exception of some metero-logical studies, is devoted to fluid mechanics studies. Although the facilities are labeled "backyard," the quality of performance is not compromised and great versatility is a primary asset. Obtainable flow conditions range from free molecule to continuum flow, with the latter emphasized.

The laboratory has the potential for nonaerodynamic experiments. Precise measurements of static and dynamic force, pressure, temperature and other physical characteristics can be made under adverse conditions. This capability provides an excellent environment for the performance of scale model or other experiments of a nonaerodynamic nature, such as docking, landing dynamics, kinematics, motion studies, etc.

6. NARRATIVE OESCRIPTION

For the purpose of this catalog, the Aero-Astrodynamics Laboratory has been divided into five sub-facility items as indicated on the following pages. This division has been made primarily according to capability and physical location rather than acquisition history. For this reason and because there is extensive interconnection and common usage of support systems by the sub-facilities, the fiscal and historical blanks have not been completed. It is estimated that the total investment in facilities and equipment in Aero-Astrodynamics Lab is between four and five million dollars.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ 4.143 K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16, LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Aero-Astrodynamics Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Mr. C. D. Bean, Deputy Chief,
(Area Code 205) 876-1510

AERO-ASTRODYNAMICS SUB-FACILITY ITEMS

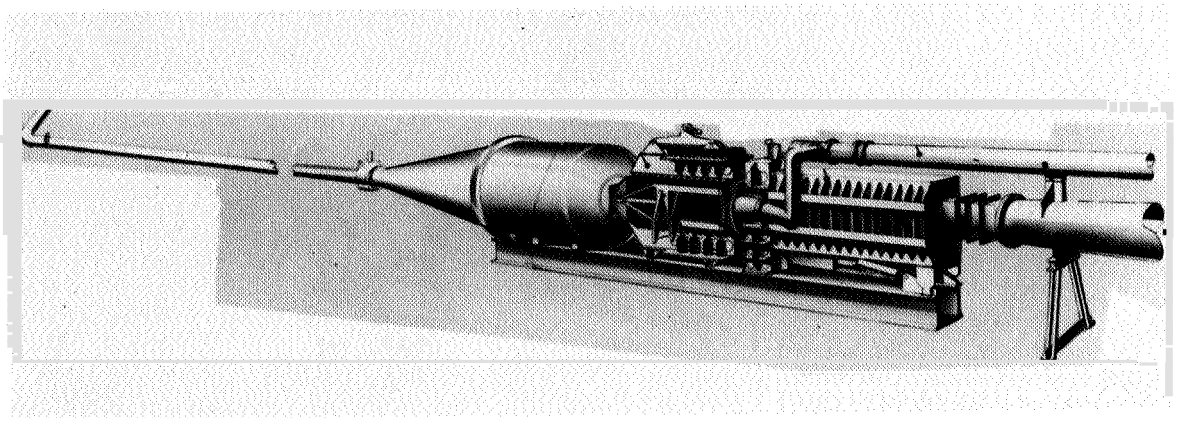
1. Long Duration Aerodynamic Testing Laboratory - Wind Tunnels
2. Short Duration Testing Laboratory
3. Base Flow Investigations Laboratory
4. Vacuum Technology Laboratory
5. Rarefied Gas Dynamics Laboratory

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 14, 1966
	FACILITY NO:	12-00-01-01

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Aero-Astrodynamics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Wind Tunnel, Long Duration Aerodynamic

5. TECHNOLOGICAL AREAS SUPPORTED: Continuum Flow Investigations

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Long duration experiments in the continuum flow regime are conducted in a trisonic tunnel, a supersonic tunnel and a jet flow facility.

The 14 x 14-inch trisonic wind tunnel is of the blowdown pressure type and is used for subsonic, transonic and supersonic testing up to Mach 5. The tunnel has interchangeable test sections for a wide range of requirements.

The 7 x 7-inch supersonic wind tunnel operates on the atmospheric supply blowdown principle. Low subsonic and supersonic flow testing from Mach 1.5 to Mach 5 are possible.

The jet flow facility operates from a 3000 PSI supply, cold or hot (600°F),

6. NARRATIVE DESCRIPTION

and discharges to the atmosphere. The facility is used for impingement and nozzle studies, jet mixing investigations, and noise and turbulence experiments.

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Aero-Astrodynamics Laboratory

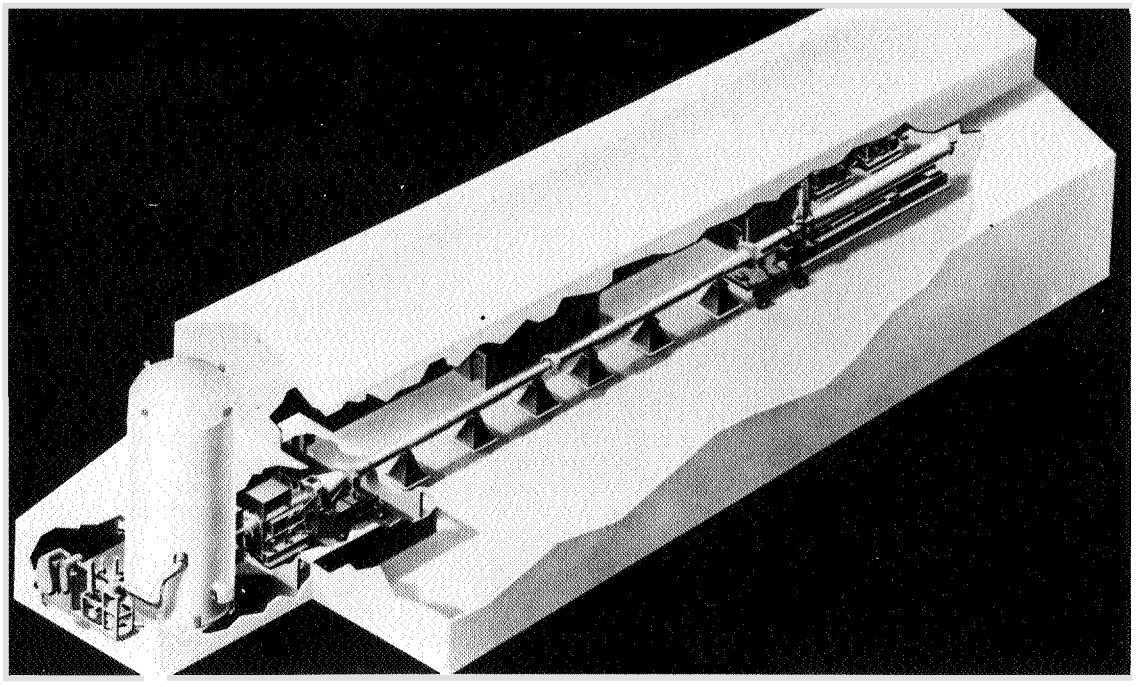
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 14, 1966
	FACILITY NO:	12-00-01-02

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Aero-Astrodynamics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Shock Tunnel, Hypersonic

5. TECHNOLOGICAL AREAS SUPPORTED: Pressure investigation, heat transfer, and force testing with helium as the test medium

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

A hypersonic shock tunnel provides for experiments in fluid mechanics and heat transfer in the continuum flow regime using short duration techniques. The tunnel is of the reflected shock type and is helium driven with high stagnation pressure The test nozzle exit is 24 inches in diameter. Capability range is Mach 6 to Mach 15. A high speed, on-line, 32-channel digital data system with a sampling rate of 160 kilocycles per second is provided.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Aero-Astrodynamics Laboratory

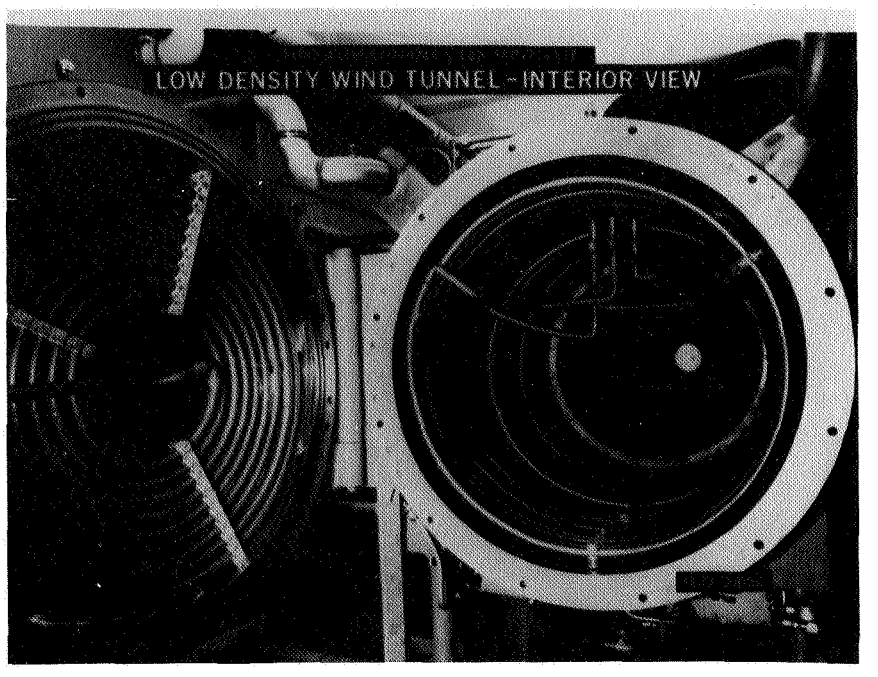
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 14, 1966
	FACILITY NO:	12-00-01-03

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Aero-Astrodynamics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Gasdynamics Laboratory, Rarefied

5. TECHNOLOGICAL AREAS SUPPORTED: Transitional and free molecule flow investigations, and extreme altutide jet pluming investigations

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Transitional and free molecule flow, jet pluming and flow discharge at extreme altitudes are investigated in a low density wind tunnel. The tunnel has a cryogenically pumped receiver 3.5 feet in diameter and 14 feet long; the flow medium is CO_2. Maximum flow rate is 5 gram/sec at 5×10^{-4} Torr static pressure.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: **"Technical Facilities and Equipment Digest" Dec. 1965**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Aero-Astrodynamics Laboratory**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

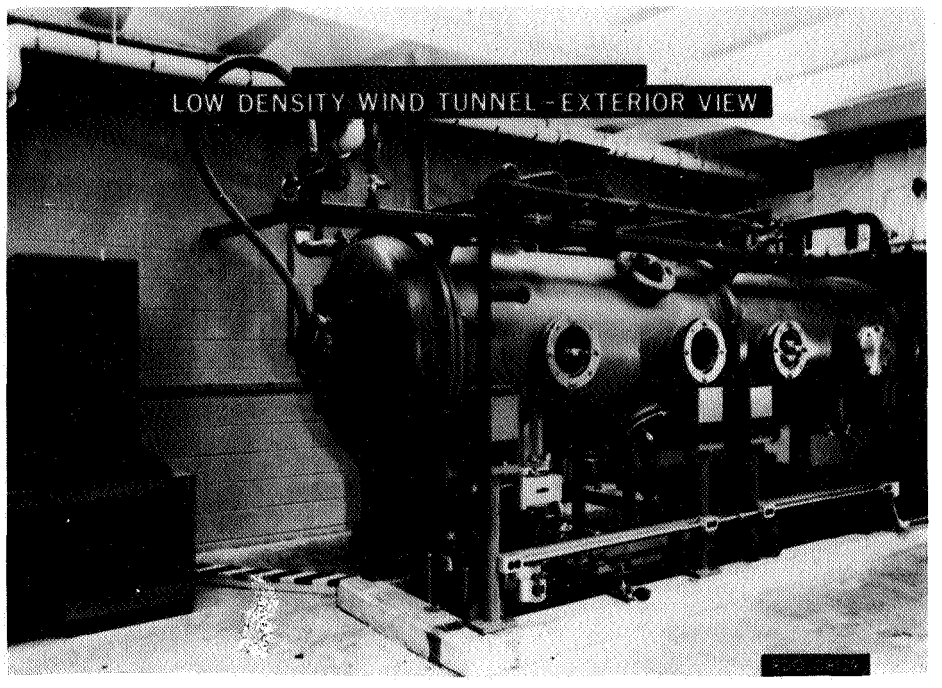
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966
FACILITY NO: 12-00-01-04

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Aero-Astrodynamics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Vacuum Technology Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: High Vacuum to 10^{-7} Torr

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The high vacuum chamber, 3.5 feet in diameter and 14 feet in length, has a pressure range from ambient to 10^{-7} Torr. Vacuum measurement has state of the art accuracy to 10^{-8} Torr. To provide for studies of outgassing, calibration and research in extreme vacuum technology, the laboratory is equipped with a low density chamber, test and calibration bench and bell jars.

Vacuum tanks and peripheral equipment provide capability for scale model experiments under medium range vacuum conditions. The horizontal tank is 18 feet in diameter and 26 feet long; the vertical tank is 12 feet in diameter with a 35-foot length. Mechanical and oil diffusion pumps evacuate these tanks to 10^{-4} Torr.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: 'Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Aero-Astrodynamics Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

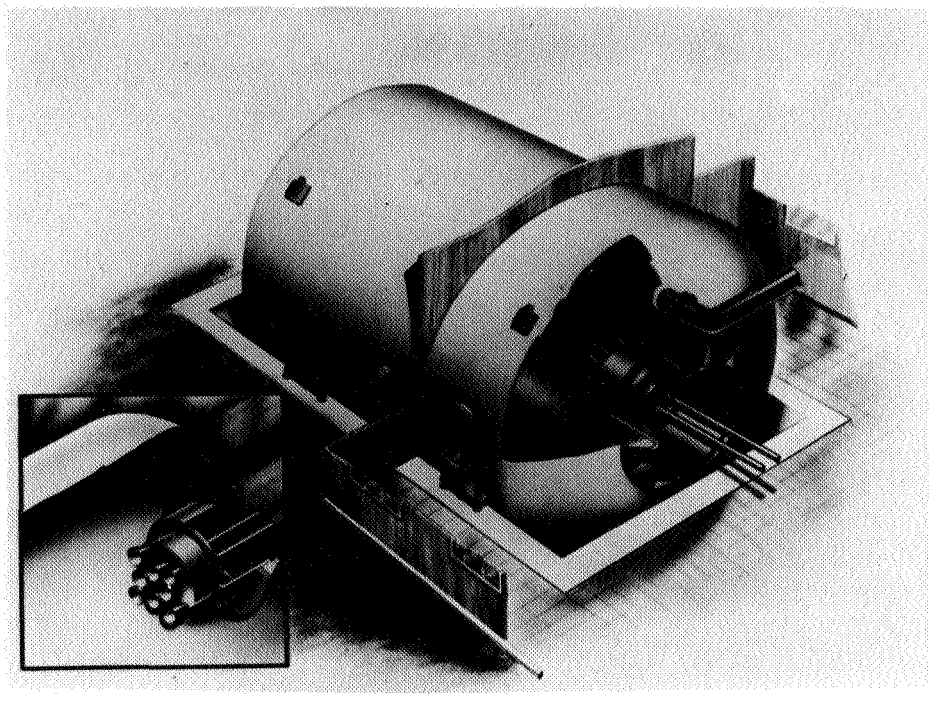
DATE OF RESUME: July 14, 1966

FACILITY NO: 12-00-01-05

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Aero-Astrodynamics Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flow Research Facility, Astrodynamic

5. TECHNOLOGICAL AREAS SUPPORTED: Impulse base flow and heat transfer studies

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The impulse base flow facility is used for studies of jet pluming and impingement at high altitudes, induced flow between multiple jets and heat transfer. Weight flows up to 30 lbs/sec at 6000°R and 1000 psi can be produced. The receiver tank is 18 feet in diameter and 26 feet long. Altitude simulation can be carried to 10^{-4} Torr. There is no external flow.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: **"Technical Facilities and Equipment Digest" Dec. 1965**

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Aero-Astrodynamics Laboratory**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

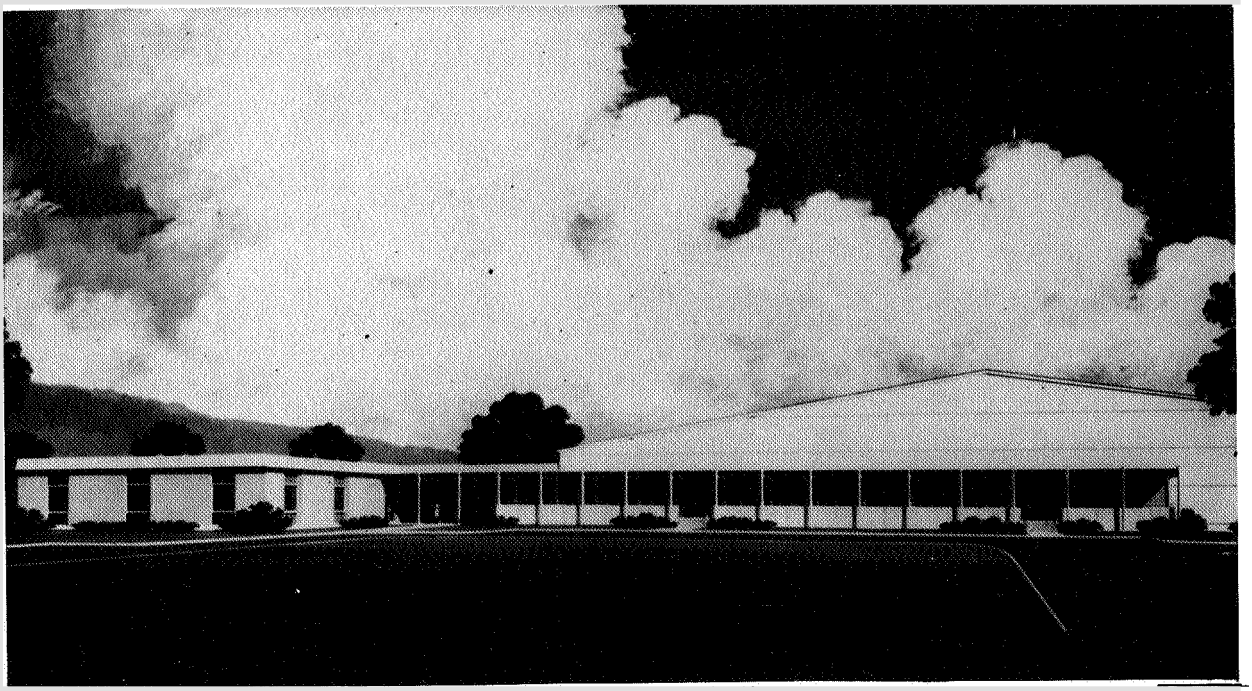
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-02-00

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Physics Research Laboratory (Research Projects)

5. TECHNOLOGICAL AREAS SUPPORTED: Applied research in physics, astrophysics, space environment, nuclear and plasma physics.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Research Projects Laboratory provides a capability for applied research in the fields of physics and astrophysics, space environment, nuclear and plasma physics, space thermodynamics, meteoroid measurements and advanced systems and instrumentation.

The laboratory is characterized by the flexible multi-use combinations of space and sensitive equipment. The majority of equipment is of a "plug in" nature, portable and semi-portable, requiring minimum special utilities. The experimental set-ups are not permanent and are modified and replaced as required.

For the purpose of this catalogue, the Research Projects Laboratory has been

6. NARRATIVE DESCRIPTION

divided into eleven sub-facility items as indicated on the following pages. The division has been made primarily according to capability and physical location rather than acquisition history. For this reason and because there is extensive interconnection and common usage of support systems by the sub-facilities, the fiscal and historical blanks have not been completed. It is estimated that the total investment in facilities and equipment in Research Projects Laboratory is between two and three million dollars.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO.		10. YR. BUILT:		11. FAC. CAT. CODE:	
12. INITIAL COST: $	K	13. NASA B.O.D.		14. STATUS CODE:	Active
15. ACCUM. COST: $	2,683 K	16. LIFE EXPECT.	Indef	17. OWNER CODE:	NASA
18. OPER. CODE:	NASA	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Mr. James A. Mathis, (Area Code 205) 876-1881

RESEARCH PROJECTS SUB-FACILITY ITEMS

1. Radiative & Conductive Physics Laboratory
2. Meteoroid Physics Laboratory
3. Geology and Geophysics Laboratory
4. Field Measurement Physics Laboratory
5. Radiation Physics Laboratory
6. Optical Physics Laboratory
7. Thermal Environment Physics Laboratory
8. Reaction Kinetics Laboratory
9. Plasma Physics Laboratory
10. Surface Physics Laboratory
11. Scientific Instrument Analysis Laboratory

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966

FACILITY NO: 12-00-02-01

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Radiative and Conductive Physics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Thermal Conductivity of Solid Particles

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Activity in this field is housed in a 900 square-foot area containing ultra high vacuum system with 18-inch diameter by 24-inch diameter, 4-inch oil diffusion vacuum system, thermal conductivity calorimeter, line heat source thermal conductivity apparatus, thermal conductivity probe, SG-4 grating spectrophotometer, and infrared radiometer. Thermal conductivity of solid particulars and foamy or forthy materials can be measured over a temperature range from 40K to 400°K and pressure range from atmospheric to 10^{-13} Torr. In addition, laboratory facilities can measure both total radiation from samples at temperatures near or below 100°K and spectral radiation from heated samples over the wave-length range from 5 to 25 microns.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16, LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER **INFO:**

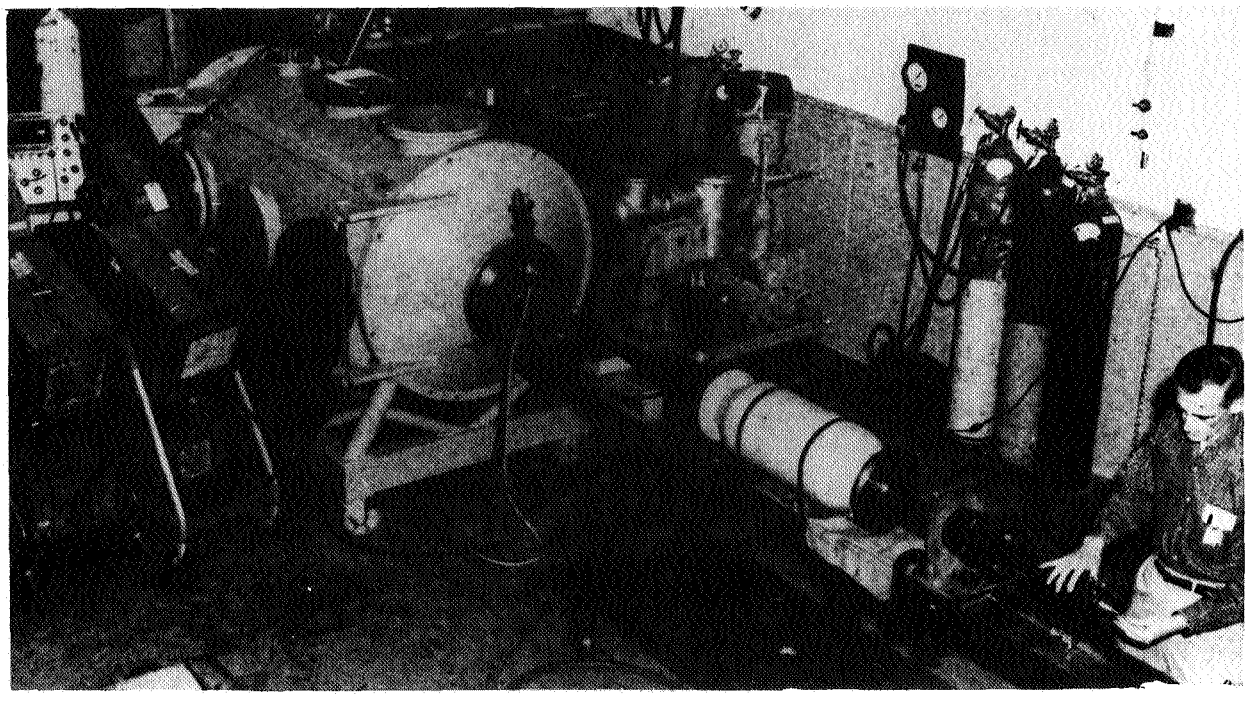
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966
FACILITY NO: 12-00-02-02

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Meteoroid Physics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Production of High Velocity? High Density Plasmas, and Calibration of Meteoroid Detectors

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Contained in 900 square feet of floor space are 250 kilojoule - 1 megajoule fast capacitor bank and associated equipment? discrete particle accelerator? large vacuum containment tank, diagnostic equipment, framing camera, image converter cameras, spectrograph? and timing devices, etc.

Within the scope of its capabilities for meteoroid physics research the laboratory produces high velocity, high density plasmas for particle acceleration and develops and calibrates meteoroid detectors. Meteroid simulation can be conducted with projectiles ranging in diameter from 50 to 1000 microns at velocities exceeding 10 kilometers per second. Penetration and cratering mechanics, electromagnetic radiation and charge liberation of particles during impact are studies as well as the

6. NARRATIVE DESCRIPTION

behavior of material in a state of high internal density subjected to extremely high pressure.

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

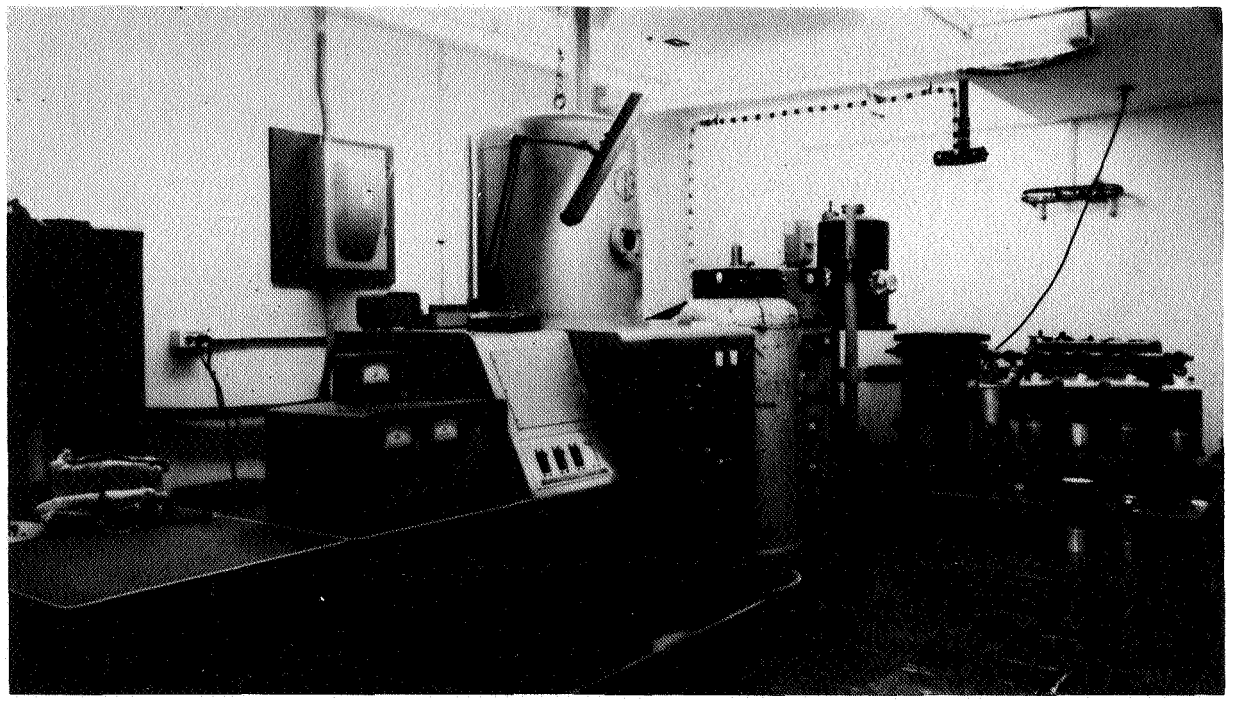
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July **14,** 1966
FACILITY NO: 12-00-02-03

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Geology and Geophysics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Secondary Impact Effects in Vacuum Upon Non-Metallic "Rock!' Materials

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Equipment located in the 1800 square feet is devoted to geophysics studies in an ultra-high vacuum system (10^{-2} Torr), a high vacuum system (10^{-7} Torr) and a particle accelerator is used for investigations in a range up to lunar escape velocity. Facilities of the laboratory provide for studies of secondary impacts on non-metallic "rock" materials and effects of vacuum on mechanical properties of these materials.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13, NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966

FACILITY **NO:** 12-00-02-04

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Magnetic Field Measurement Physics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Evaluates Electric and Magnetic Field Meters

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory segment includes small vacuum chamber, magnetometer, electrometers, electronic test instruments, and shop and laboratory equipment.

Facilities provide for measurements of electrical and magnetic field strengths, exploration of new electric and magnetic field measuring techniques applicable to the development of field measuring instruments, and performance evaluations of electric and magnetic field meters. The laboratory has a space simulation capability of 10^{-8} Torr.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWRERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

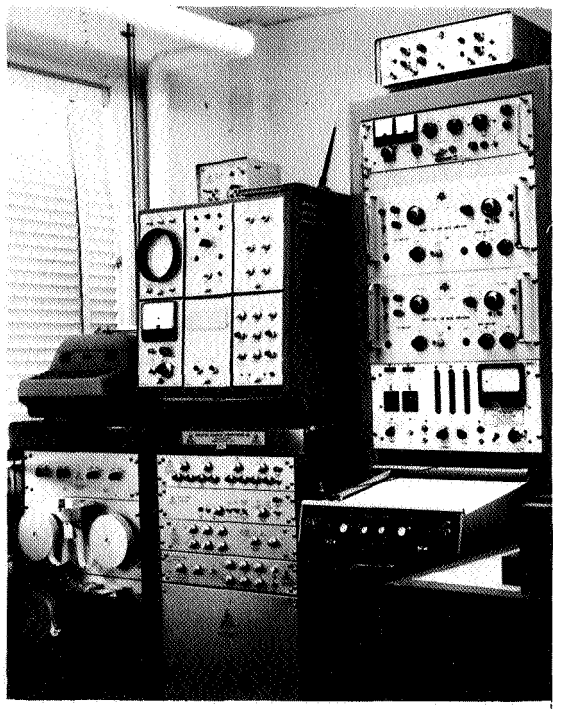
DATE OF RESUME: July 14, 1966

FACILITY NO: 12-00-02-05

1. REPORTING INSTALLATION: Marshall Space Flight Center
Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION



4. FUNCTIONAL NAME: Radiation Physics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Space Vehicle Radiation Shielding

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This function occupies a working area of 500 square feet and houses multi-channel radiation analyzer, ultra-fast coincidence system, solid state and scintillation detectors, ultra-high vacuum system, and radioactive sources.

The laboratory has provisions for studies of space vehicle radiation shielding, basic radioactive decay schemes, cosmic ray telescope advanced detection systems and space radiation environments.

6. NARRATIVE DESCRIPTION:

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest"

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

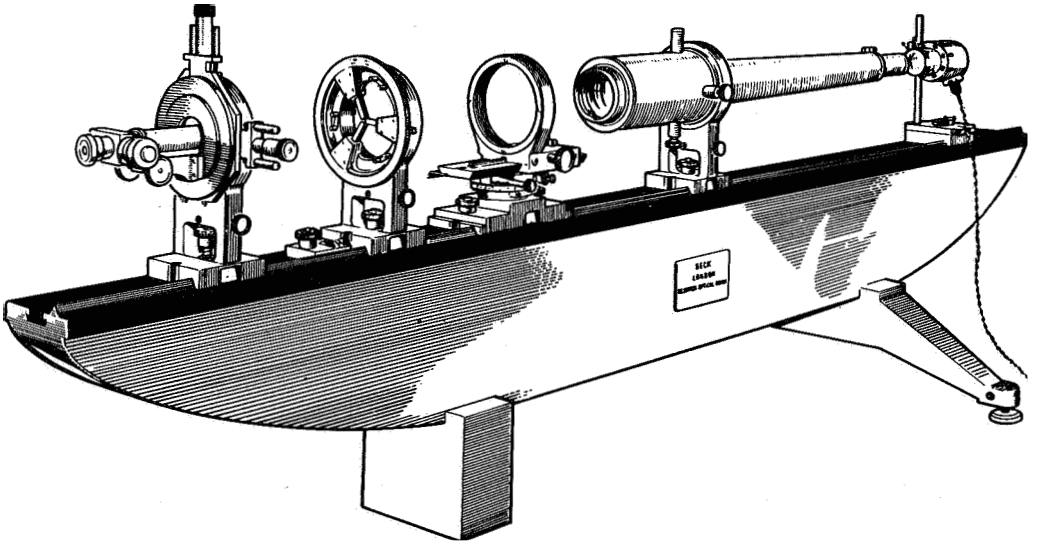
DATE OF RESUME: July 14, 1966

FACILITY NO: 12-00-02-06

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



22-990 RESEARCH OPTICAL BENCH
Illustration of Bench incorporating some of the *Carriers and Accessories available*

4. FUNCTIONAL NAME: Optical Physics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket Combustion Products Research in Simulated Planetary Atmosphere

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

A 1600 square-foot area houses a horizontal vacuum chamber 30 inches by 48 inches long with quartz window, bakeout heaters, and LN_2 shroud. Pressure level attainable is lower than 10^{-10} Torr. Associated laboratory and field instrumentation include leak detector, 4-channel instrumentation magnetic tape recorder, portable scanning spectrophotometer, 35-mm cine-pulsed boresight data camera, 2 modified MK 51 gun director mounts, 2 cine-spectral polarization recorders, Questar telescope with 35-mm camera, and oscilloscopes.

This laboratory carries out experimental research in simulated tenuous earth and planetary atmospheres. Emissions from combustion products simulating rocket exhausts and the interaction with these atmospheres

6. NARRATIVE DESCRIPTION

are investigated. Optical properties of simulated lunar and planetary materials under high vacuum, from ultraviolet through infrared wavelengths, can be studied.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWHERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO.:

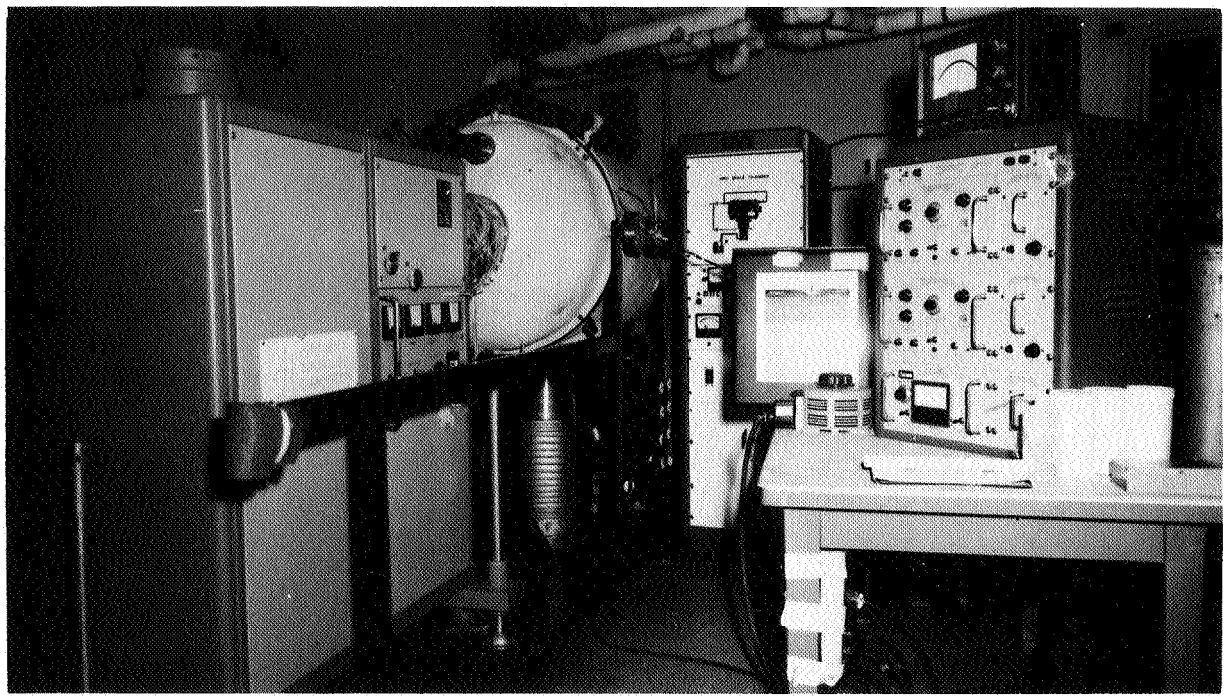
TECHNICAL FACILITIES RESUME DATE OF RESUME: July 14, 1966

FACILITY NO: 12-00-02-07

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION (if *other than in 1. above):*



4. FUNCTIONAL NAME: Thermal Environment Physics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Space Environmental Effects on Radiometric Characteristics

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory, comprising a 2000 square-foot area, houses a small space simulation chamber, 3 feet in diameter by 4 feet long, with a solar simulator, vacuum chambers and high precision laboratory radiometric equipment, portable radiometric equipment for in-sites measurements, ultraviolet irradiation lamps, electron paramagnetic resonance equipment, magnetic susceptibility equipment, and calorimeters.

The laboratory is equipped to measure directional spectral reflectance and emittance from 0.25 to 50.0 microns and to calibrate radiometric equipment. Research projects can be conducted in simulated space or lunar environments to 10^{-8} Torr to study space environmental effects on the radiometric characteristics of surfaces, performance of active and semi-active thermal

6. NARRATIVE DESCRIPTION

control devices and in support of developing thermophysical flight experiments.

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

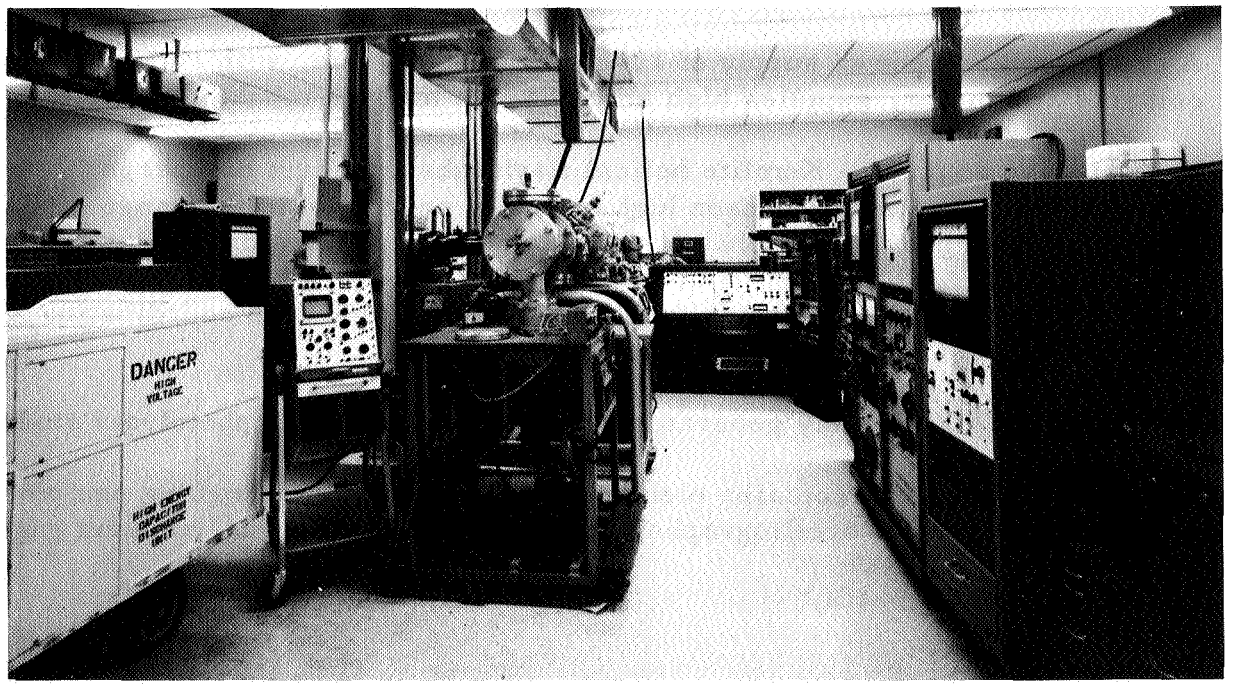
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966
FACILITY NO: 12-00-02-08

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Reaction Kinetics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Launch Vehicle Gases and Vapors Analysis

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The facilities and major equipment of the Reaction Kinetics Laboratory, incorporated in a 1600 square-foot area, have the following capability:

Times of Flight Mass Spectrometer, Bendix Model 3015, is used for analysis of gases and vapors, partial pressures and free radicals and for studies of reaction kinetics.

Residual gas analyzer CVC model 31-C13 performs analyses of gaseous mixtures leak detection.

Vacuum ultraviolet scanning monochrometer Jarrell-Ash model 78-751 makes spectroscopic measurements in vacuum UV to 500 A source of

6. NARRATIVE DESCRIPTION

monochrometer radiation in vacuum UV.

Spectrum line measuring comparator (Grant Instruments) measures intensites and compares line spectra obtained from spectrometers and spectragraphs.

A reaction chamber, constructed of stainless steel with 6- and 9-inch diffusion pumps, LN_2 baffles, gages, viewing ports and feedthroughs, simulates high altitudes. UV radiation molecular beam techniques are used for flash photolysis and spectral absorption studies.

A capacitor bank power supply of 10-20kV, 18,000 joule, with rectifier, controls and meter, supplies high energy pulse to flash tubes, lasers, etc.

UV radiation sources - Kemlite helical flash tubes, helium discharge sources, Jarrell-Ash Wilkensen high intensity sources - in the range of 500A to visible provide for photolysis and spectral absorption studies.

An STL trigger delay generator is used for optical pickup in coordinating electronic measurements with flash photolysis.

An Abtronics signal delay generator delays signals in flash photolysis studies.

In addition the laboratory contains electronic measuring and recording equipment, oscilloscopes and plug-in oscillographs, trace recording cameras, vacuum gages and Cooke recording gages.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17, OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

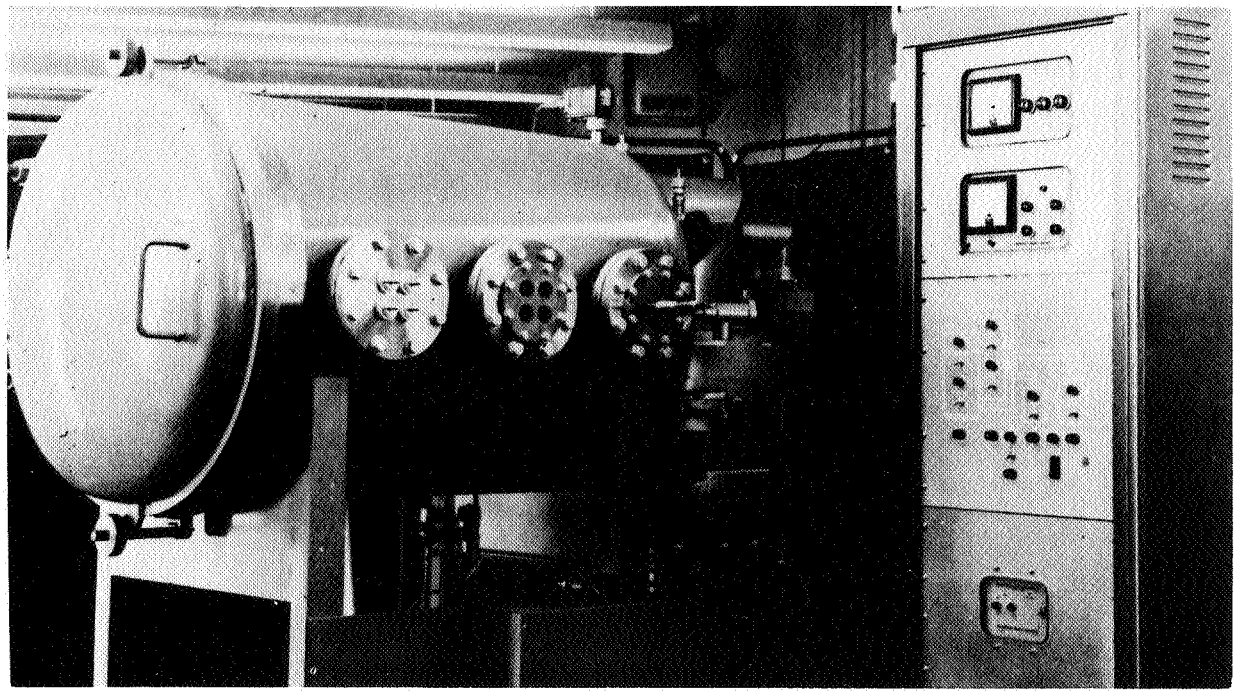
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966
FACILITY NO: 12-00-02-09

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Plasma Physics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Space Plasma Studies

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

A partial listing of equipment for this laboratory includes small vacuum chamber, plasma probes, oscilloscopes, dewar for LN_2 and HE and an on-line computer arrangement for real-time reduction and interpretation of data.

Space plasmas can be simulated to measure plasma probe voltage, potentials on satellites and other space plasma phenomena. Theoretical calculations of space plasma phenomena can be evaluated with an AMTRAN computer system at vastly increased speeds.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME (*if* **contr.** oper.):

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

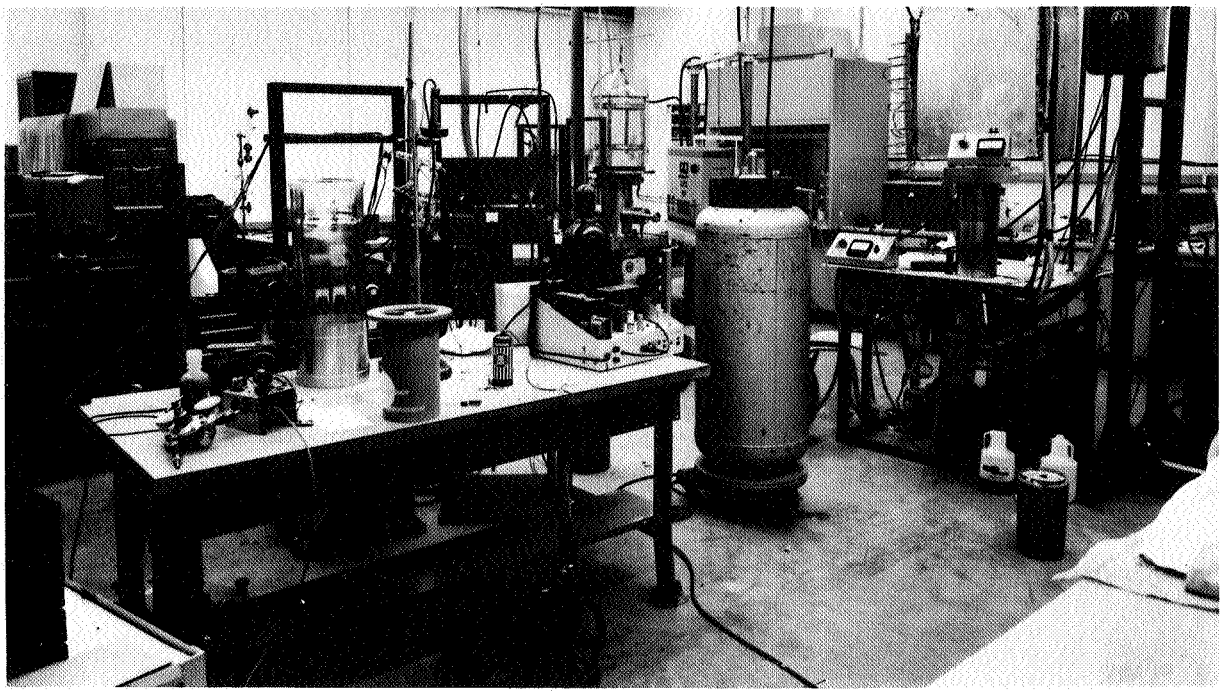
TECHNICAL FACILITIES **RESUME**

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-02-10

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Surface Physics Laboratory, Space Vehicle

5. TECHNOLOGICAL AREAS SUPPORTED: Space Environment Interactions with the Surface of Space Vehicles

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The laboratory equipment includes various forms of field emission microscope (FEM), field ion microscope (FIM), and surface ionization microscope systems; a low energy electron diffraction system; (LEED) and two special vacuum processing stations. This laboratory contains shop facilities for glass, metal, and ceramic fabrication.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

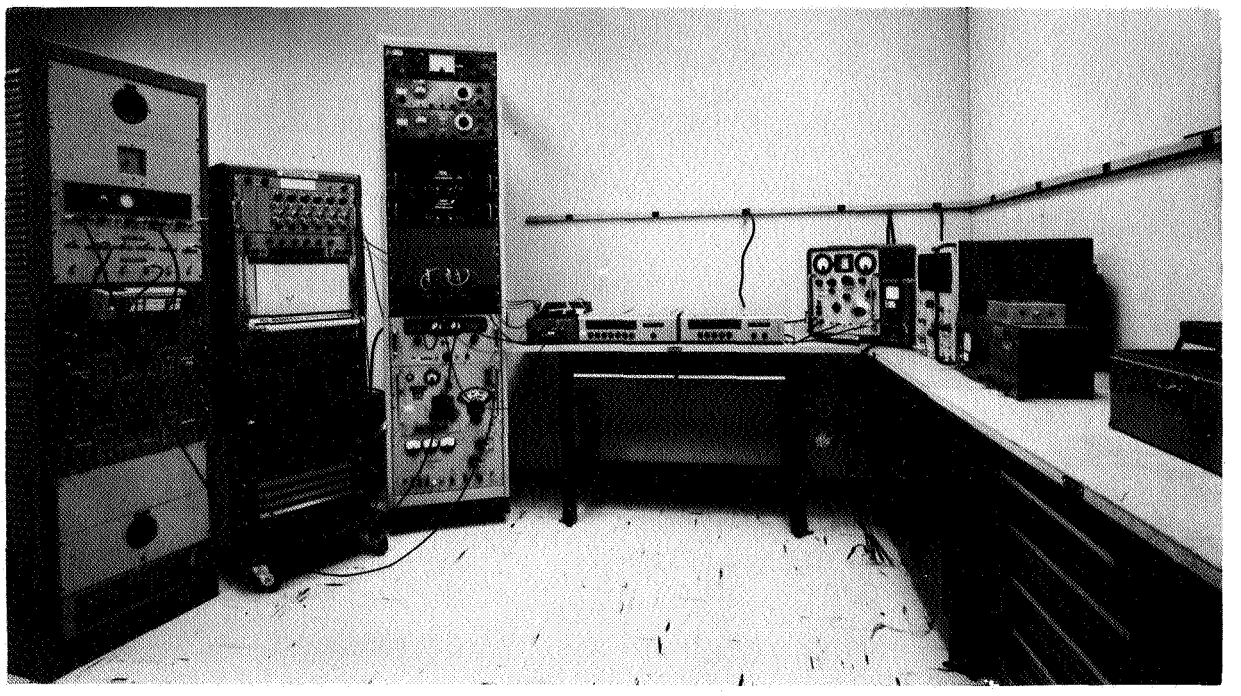
DATE OF RESUME: August 5, 1966

FACILITY NO: 12-00-02-11

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Research Projects Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Computer Techniques Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED:

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

In 2000 square feet of floor space are contained a Burroughs 5000 terminal with card reader/punch line printer; 4 AMTRAN terminals with Tektronix cathode ray storage scopes, keyboards, scientific flexwriters, stylus input and paper tape reader punches; a Calcomp on-line incremental plotter; an optical character recognition device; electronics logic-module breadboard equipment; oscilloscopes; and one IBM 1130 computer.

The equipment in this laboratory is applied to the development and execution of advanced methods of data analysis and translation. Typical efforts are the development of greatly increased speeds in scientific computations and design drafting; the solution of problems in vector and tensor calculus symbolically; improvements in the manipulation of algebraic expressions; and a reduction in

6. NARRATIVE DESCRIPTION

the time required to type and edit scientific papers.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. — — 10. YR. BUILT: ____ 11. FAC. CAT. CODE: ____

12. INITIAL COST: $ ____ K 13. NASA B.O.D. ____ 14. STATUSCODE: Active

15. ACCUM. COST: $ ____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Research Projects Laboratory

22. **LOCAL** OFFICE TO CONTACT FOR FURTHER INFO:

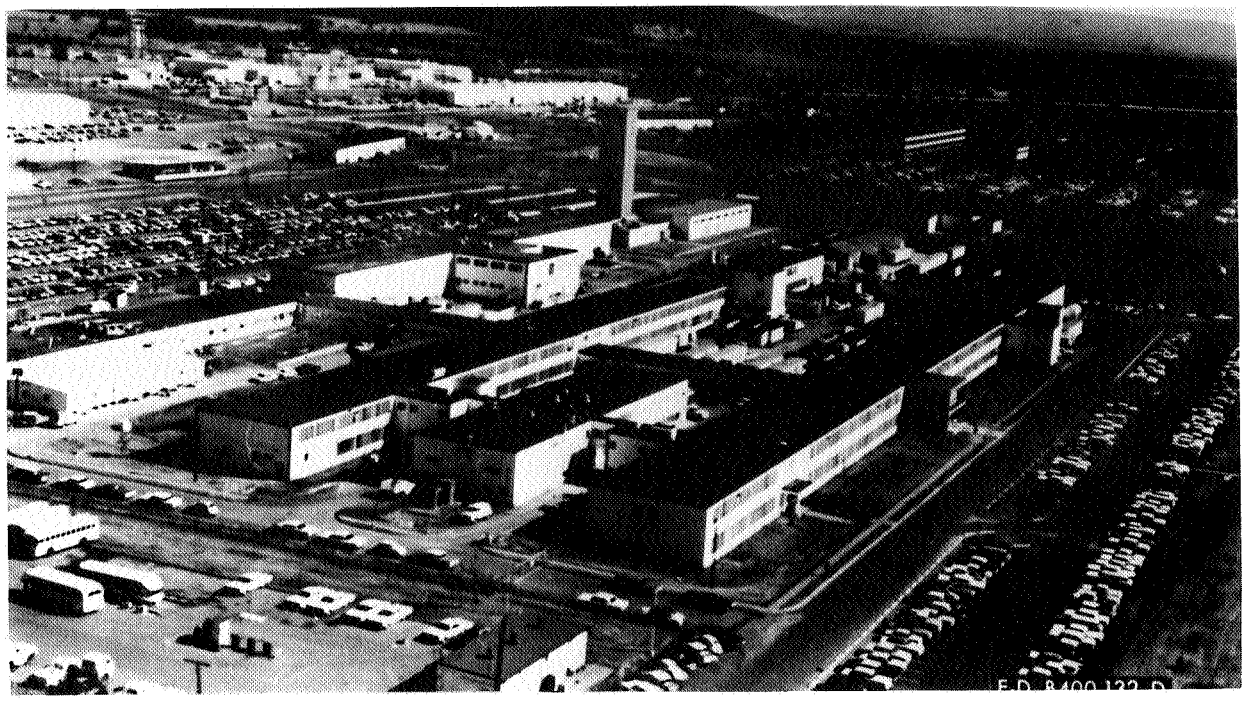
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, **1966**
FACILITY NO: 12-00-03-00

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Astrionics

3. LOCATION *(if other than in 1. above):*



4. .FUNCTIONAL NAME: Astrionics Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Aerospace communications and launch vehicle guidance and control

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Astrionics Laboratory is a complex of buildings, structures and equipment providing a broad capability for developing and evaluating components and systems involved in aerospace communications, guidance and control, air-borne and ground instrumentation, vehicle and ground power, and electrical integration systems.

In addition to the substantial investment in standard bench equipment, such as oscilloscopes, meters, power supplies, etc., the laboratory has a very large inventory of special equipment. The combination of these facilities and equipment together with the specialized manpower skills provides a total complex having a unique over-all capability.

6. NARRATIVE DESCRIPTION

For purpose of this catalog, the Astrionics Laboratory has been divided into four sub-facility items as indicated on the following pages. This division has been made primarily according to capability and physical location rather than acquisition history. For this reason and because there is extensive interconnection and common usage of support systems by the sub-facilities, the fiscal and historical blanks have not been completed. It is estimated that the total investment in facilities and equipment in Astrionics Laboratory is between 26 and 27 million dollars.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ 26,609 K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if **contr.** oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities & Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Astrionics Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Phone: 876-6871

ASTRIONICS SUB-FACILITY ITEMS

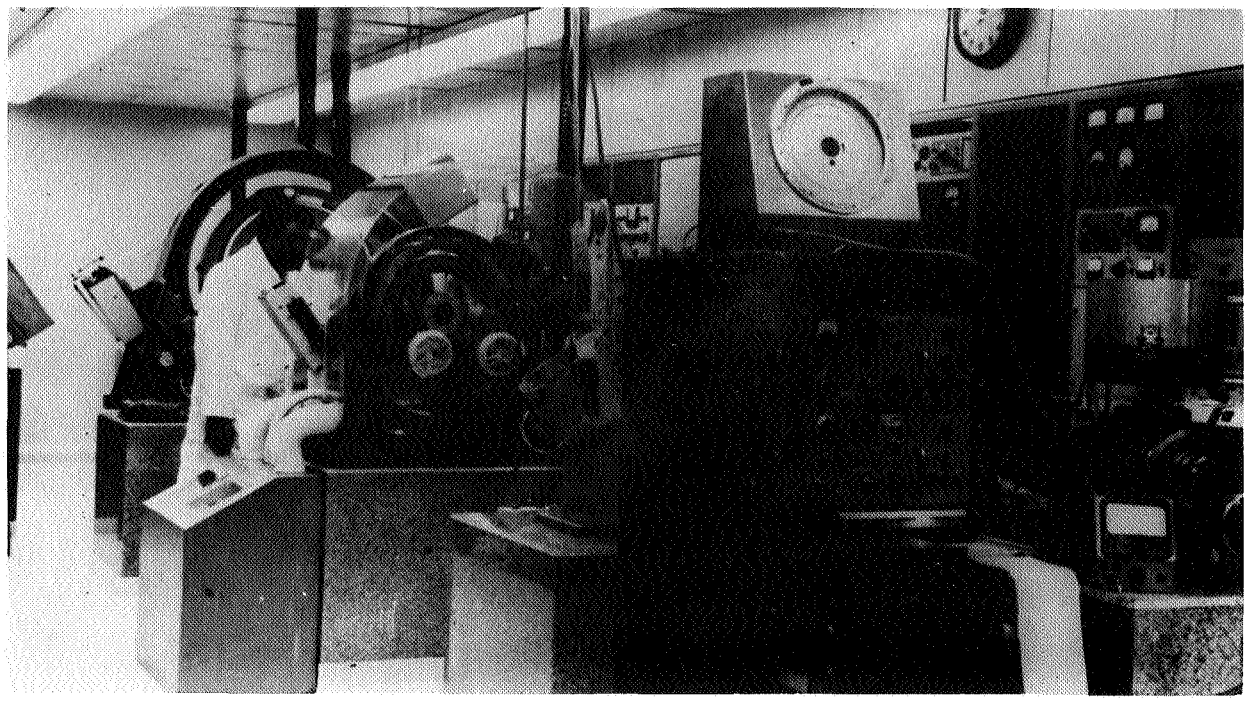
1. Inertial Sensor and Stabilizer Development Laboratory
2. Applied Research and Environmental Testing Laboratory
3. Guidance and Control Systems and Components Development Laboratory
4. Instrumentation and Communications Development Laboratory

TECHNICAL FACILITIES RESUME | **DATE OF RESUME:** August 5, 1966 | **FACILITY NO:** 12-00-03-01

1. REPORTING INSTALLATION: Marshall Space Flight Center; Huntsville, Alabama

2. FACILITY NAME: Astrionics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Inertial Sensor and Stabilizer Development Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Missile technology, space technology, guidance, navigation

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Inertial Sensor and Stabilizer Development Laboratory occupies 18,000 square feet of working space. Electronic research and development is accomplished utilizing general test equipment, oscilloscopes, meters, power supplies, etc. Comprehensive electromechanical research and development of internal sensors utilizes centrifuges, vibration tables and temperature cabinets. Inertial platform prototype equipment, including complete systems, sensitive gyroscopes and accelerometers, can be tested utilizing special test fixtures, temperature controlled enclosures and rooms, vibration isolation pads and versatile power supplies. Flight components and systems are tested in a semi-clean production test area and celestial seeking systems are tested in a dark room, 250 square feet in area, containing power supplies, sun sources, star sources, and an isolation pad. High quality clean rooms,

6. NARRATIVE DESCRIPTION

totaling 1500 square feet, provide the correct environment for disassembly, assembly, evaluation and testing of gyroscopes and accelerometers, platform systems and components. Equipment for these functions includes dynamic balancing machines, special assembly tools and precision ball bearing evaluation fixtures, A full complement of data collecting and recording equipment, design and drafting space, etc. , supports engineering design and evaluation. Inspection and repair functions, including inspection and minor repair of inertial platform systems, test equipment and components, are carried out with special fixtures and tools.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Astrionics Laboratory

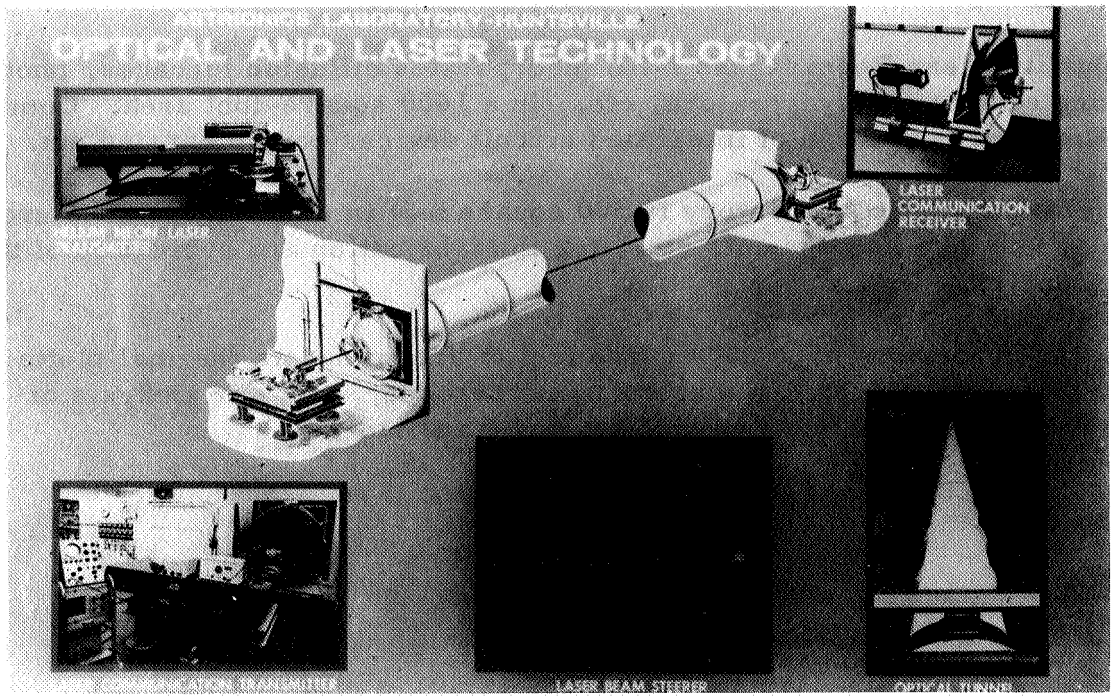
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME: August 5, 1966
	FACILITY NO: 12-00-03-02

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Astrionics

3. LOCATION *(if other than in 1 above)*:



4. FUNCTIONAL NAME: Guidance Technology Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Applied Missile Technology, Space Technology, to Guidance

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Applied Research and Environmental Testing Laboratory is divided into the following laboratories, and functional areas:

Optical Laboratory, 1080 square feet in area, is equipped with optical benches, lasers, optical and laser components, etc., for experiments and construction of lasers, optical systems and their components, etc.

Spectographic Laboratory, 600 square feet in area, is used for spectrographic experimentation. It contains high quality spectographic and spectrophotometric equipment.

Optical Tunnel is 100 meters long and evacuable with 20-foot by 20-foot

6. NARRATIVE DESCRIPTION

access rooms at either end, Laser and optical systems can be evaluated.

Two astro-domes are used for field testing of electro-optical and laser systems and testing of advanced laser and optical launch tracking systems. The domes are 12 feet and 14 feet respectively in diameter, are air conditioned and have isolation pads in their bases.

Environmental Test Area, comprising 14,000 square feet, contains vibration and acceleration tables, vacuum equipment, a linear accelerator and acoustic equipment. Developmental and environmental testing is conducted.

High-Quality Clean Room (Class I-III) incorporates diffusion furnaces, photo-engraving equipment, evaporators, etc., in a 1000 square-foot area. Complete fabrication and evaluation of integrated circuit devices can be carried out.

Non-Linear Magnetic Laboratory is 500 square feet in size. It includes evaporators, Kerr magneto-optic equipment, etc., for the fabrication and evaluation of thin film memories.

Diagnostic Laboratory uses 500 square feet to accommodate thermal plotters, X-ray equipment, a scanning electronic microscope, etc., for analysis of failure mechanics in integrated circuits and transistors.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT **ORGANIZATIONAL'COMPONENT:** Astrionics Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

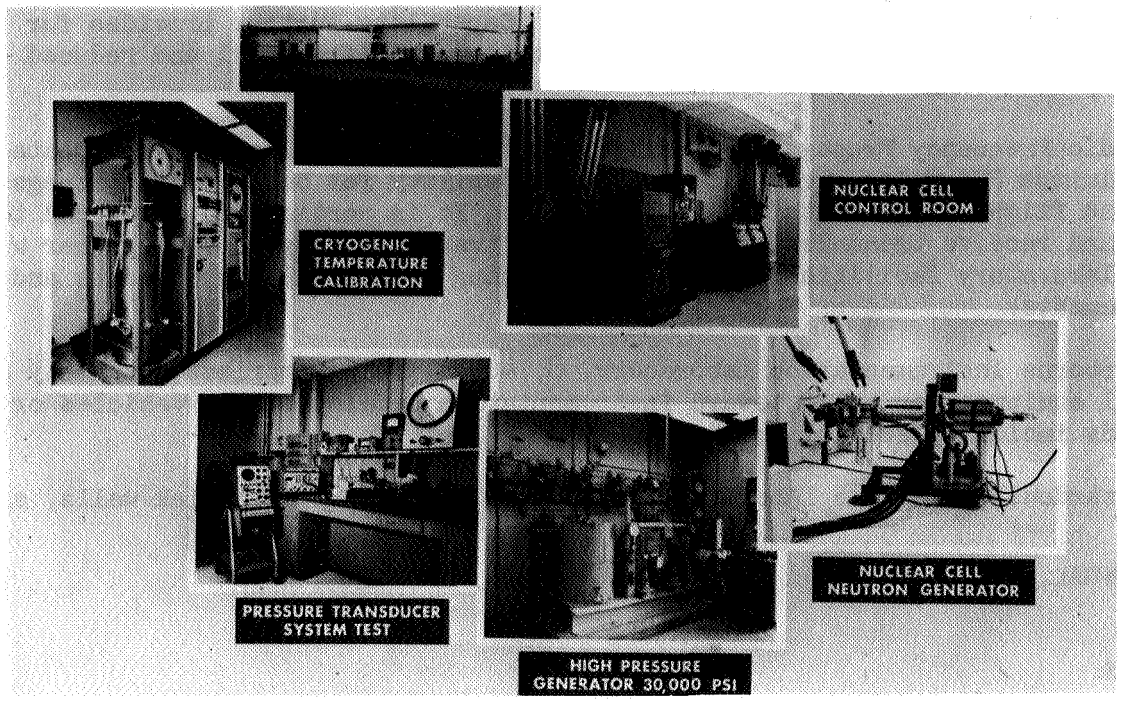
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-03-03

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Astrionics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Instrumentation and Communication Development Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Missile Technology, Space Technology, Guidance and Control

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Instrumentation and Communications Development Laboratory is divided into the following laboratories and functional areas:

Advanced Telemetry Lab, 7000 sq, ft. , includes a telemetry analyzer, check-out coneoles for evaluation of subcarrier oscillators and mixer amplifiers and a checkout console for evaluation of time division multiplexers. This equipment provides capability for complete telemetry systems analysis, for performing experiments and measurements, for performing data reduction of telemetry laboratory and flight experimets, and for hardware development in the field of advanced telemetry techniques.

The Mobile Telemetry Ground Station, 800 sq. ft., is used for studies of

6. NARRATIVE DESCRIPTION:

flight systems to determine optimum data acquisition and selection of transmission techniques.

The Radio Frequency Laboratory, 8,000 sq. ft., is for conducting studies, experimentation and hardware development in the fields of radio frequency communications, techniques, tracking devices and systems; in TV space flight technology; and for digital data systems. A mobile RF lab and a TV lab provide additional communications capability.

The Radio Frequency Test Area, 2,400 sq. ft., is a remote area of low RFI. The lab includes an anechoic chamber (33' x 33' x 120'), three outdoor pattern ranges and impedance measuring facilities. Capability further provides for measuring and recording pattern and polarization data from full and reduced scale space vehicle antenna systems,

The Radio Frequency Propagation Facility, 1,600 sq. ft., is specially located in a minimum RFI noise area, It provides capability for both ground propagation and flight experiments andmeasurements, It is particularly equipped to track and receive transmission from vehicles traveling in space. Together with other laboratory facilities, it is used for long baseline RF experiments and measurements.

The Airborne Instrumentation Laboratory, 8,740 sq. ft., comprises a variety of special equipment oriented toward instrumentation development on vehicles or payloads including special equipnent,

The Hazardous Operations Laboratory, 6,600 sq, ft,, has 5-ft. thick walls, a plug

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest"

21. COGNIZANT ORGANIZATIONAL COMPONENT: Astrionics Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Instrumentation and Communications Development Laboratory (Continued)

door, a manipulator, etc. For handling LN_2, LOX and cryogenic materials, the cells have special safety instrumentation, explosion-proof wiring, etc. A reinforced concrete cell has bullet proof windows for high pressure testing.

The Fluid Test Facility Laboratory, 4500 sq. ft., is used to develop slosh sensor instrumentation, flow calibrations of instrument and unit flowmeters.

The Airborne Motion Picture Support area is 500 square feet; it is used for airborne photography and recording.

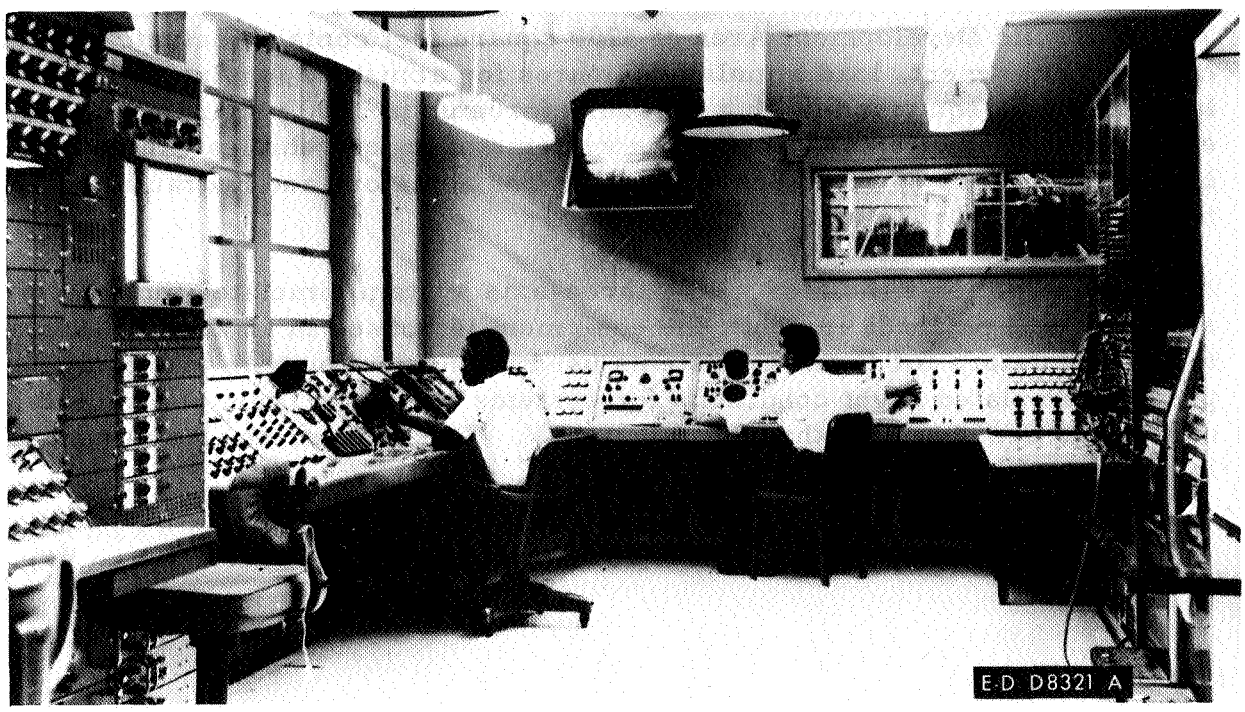
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-03-04

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Astrionics

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Guidance and Control Systems and Components Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Missile Technology, Space Technology, Guidance and Control

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Guidance and Control Systems and Components Development Laboratory is divided into the following functional areas:

The Checkout Laboratory, 800 square feet in area, utilizes an aerospace test and evaluation console for checkout of the launch data adapter and digital computer.

A 1250 square-foot laboratory contains an RCA-110A computer with Saturn V display for computing program and ground systems tests.

The Control Sensor Laboratory is 500 square feet in area and contains specialized equipment for checkout of rate gyros and control accelerometers,

6. NARRATIVE DESCRIPTION

and for acceptance testing and qualification checks of control sensors for flight equipment.

The Applied Dynamics Laboratory provides analog computers for solution of guidance and control problems.

The General Laboratory and support area comprises 1500 square feet, Circuits and subassemblies can be built and an area is provided for their testing; bread-board circuits are also constructed.

The Hydraulic Development Area of 3700 square feet contains actuator test and checkout equipment, load simulator fixtures for actuators (engine simulators), large pumping equipment with a pressure force up to 3000 psi and accessary equipment. Actuation and gimballing systems of space vehicles can be developed, loading conditions of actuators simulated, and actuators and hydraulic equipment tested.

An altitude motion simulator with a three-axis system simulates motions of satellites and payloads in orbit; the equipment is housed in an area of 1000 square feet. Simulators for G and C systems used in conjunction with test equipment provide simulated flight conditions for systems testing of flight components; operations are observed through remote TV. This equipment also is contained in an area of 1000 square feet.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Astrionics Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

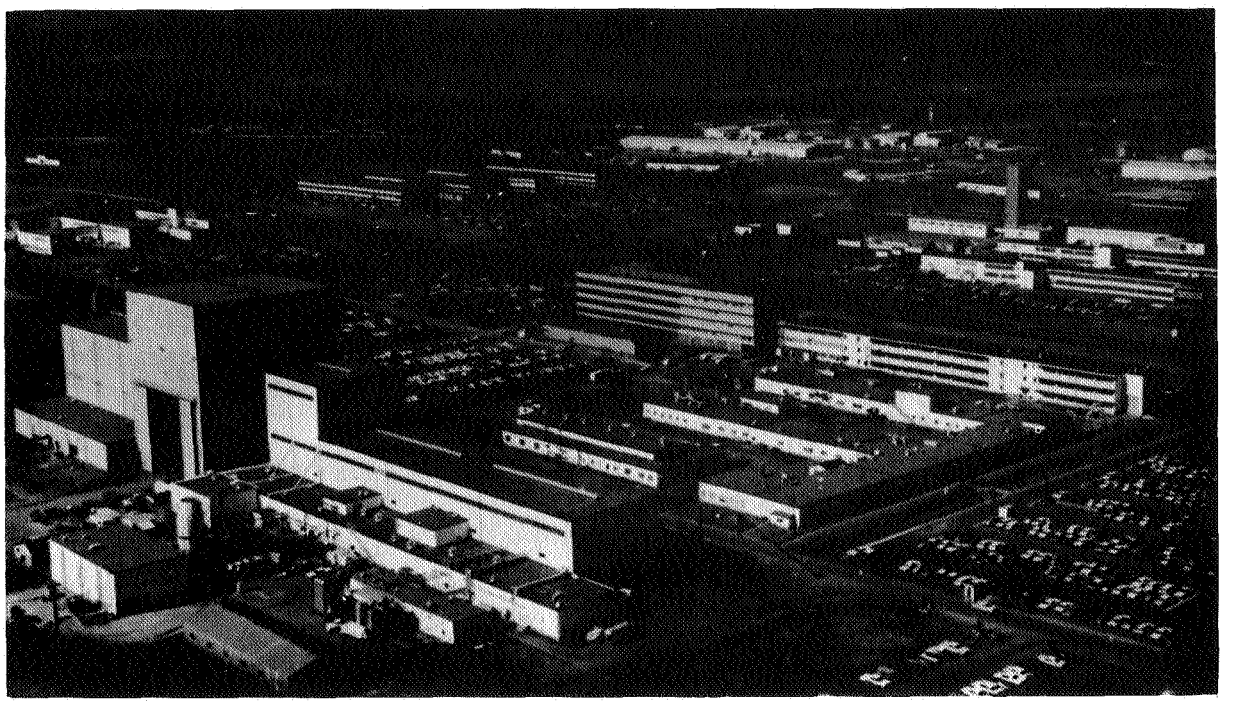
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TECHNICAL FACILITIES RESUME	DATE OF RESUME: August 5, 1966
	FACILITY NO: 12-00-04-00

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2 FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Systems Development Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Launch Vehicle and Space Transportation Systems Research, Development and Testing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Propulsion and Vehicle Engineering Laboratory is a complex of five buildings providing capability for research, development and testing in the fields of structures, mechanics, propulsion, and materials for launch and space vehicles and their payloads. The complex includes equipment for providing various test environments, chemical and photographic analysis, heat transfer studies, complete structural testing to **30** million pounds, flow testing, dynamic testing, radiation exposure and analysis, acoustic testing, etc.

For the purpose of this catalogue, the Propulsion and. Vehicle Engineering Laboratory has been divided into eight sub-facility items as indicated on the following pages. This division has been made primarily according to

6. NARRATIVE DESCRIPTION

capability and physical location rather than acquisition history. For this reason and because there is extensive interconnection and common usage of support systems by the sub-facilities, the fiscal and historical blanks have not been completed. It is estimated that the total investment in facilities and equipment in P & VE Laboratory is between 25 and **26** million dollars.

7. POTENTIAL:

8. PLANS:

9. BLCG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K, 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ 25,125 K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities & Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: P&VE Laboratory

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO: Mr. Charles Brizerdine , 876-4402

P&VE SUB-FACILITY ITEMS

1. Structural Static Testing
2. Vibration Testing
3. Shock and Acceleration Testing
4. Acoustic Testing
5. High Temp Testing and Heat Transfer Study
6. Hydraulic Research, Development, and Test
7. Pneumatic, Cryogenic and General Test
8. Materials Development, Evaluation, and Fabrication Laboratories

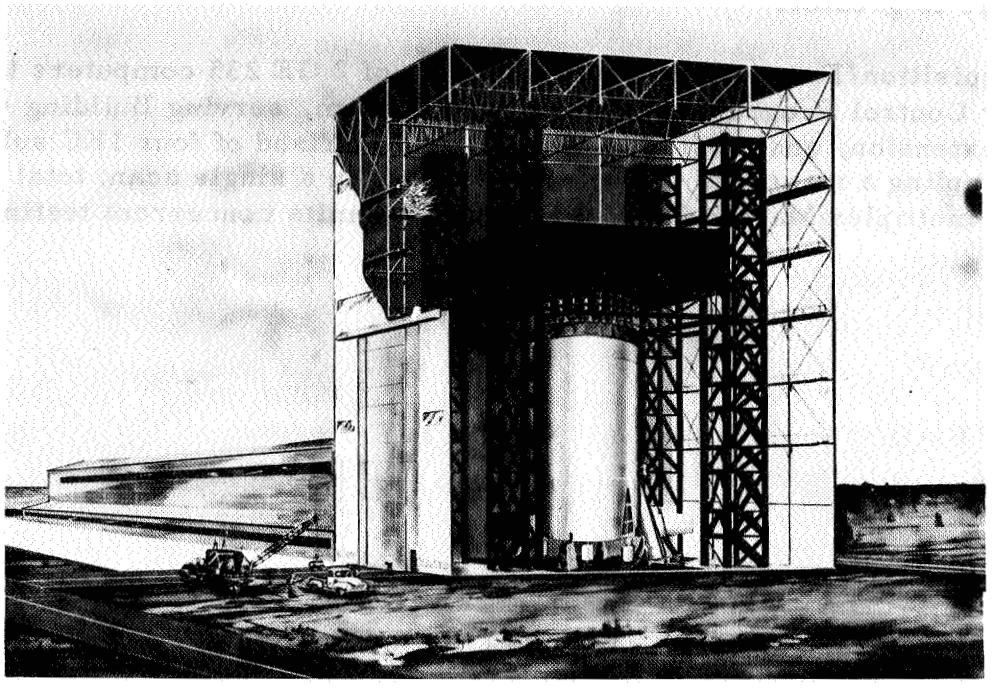
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-04-01

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1. above)*:



4. FUNCTIONAL NAME: Structural Static Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and component structural checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Structural Static Test Tower has a test floor area of 86 x 48 feet. Specimens up to 35 feet high by 21.5 feet in diameter can be tested in this tower. Two 10-ton cranes 42 feet high and one 20-ton crane 80 feet high, serve this area. Small tensile testing machines with capability up to 400,000 pounds serve this area.

The Load Test Annex has 15,000 square feet of area. The test tower has a crosshead height of 115 feet and a 30-million pound capacity. The tower can accept a pre-assembled article 54 feet in diameter or an article 65 feet in diameter if assembled in the tower. Two 30-ton bridge cranes with a hook height of 106 feet serves the tower.

6. NARRATIVE DESCRIPTION

The LTA Extension has a total area of 37,587 square feet. The 20,000 square feet. of high bay area has a concrete test bed with 500K anchor points 10 feet c. c. Two 20-ton bridge cranes with an 80-foot hook height serves this high bay area. Also located in the high bay area is a 3-million pound universal, hydraulic, testing machine,, Articles 10 feet in diameter by 25 feet in length can be tested in this machine up to 2 million pounds shock loading and 3 million pounds non-shock loading. Loads can be cycled from one million pounds tension to one million pounds compression at a rate of one cycle per minute. The machine has an accuracy of 0.1 percent of actual load or 0.1 percent of scale range in use, whichever is greater.

The Data Acquisition/Processing System consists of 2 GE 235 computers together with a Master Control Program. The computer system, serving Building 4619, LTA and its extension, and outside test pads, is comprised of four 1KC subsystems capable of sampling a maximum of 3072 transducers in a single scan; total capacity is 8000. The multiplex Master Control Program permits concurrent testing.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4619 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

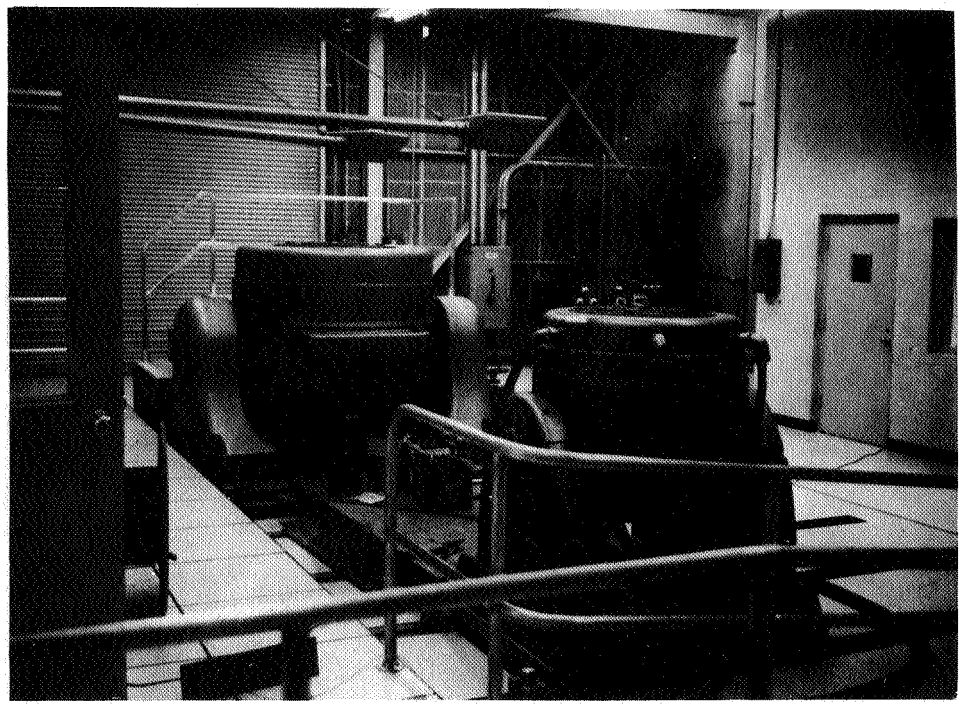
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 6, 1966
FACILITY NO: 12-00-04-02

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1.* ***above):***



4. FUNCTIONAL NAME: Vibration Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and component structural checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Over *20* vibration exciters of various types and capabilities exist for vibration testing. The small shakers for system calibration consist of long-stroke electrodynamic, long-stroke hydraulic, and 8000 force-pound. One large shaker of 28,000 force-pound is for component testing. Electronic control equipment is available to perform sine and random tests. These shakers can be used singly or in groups to perform vibration testing. Elevated temperature-vibration testing can also be conducted, Almost any kind of vibration testing desired can be performed and analyzed.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4619 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

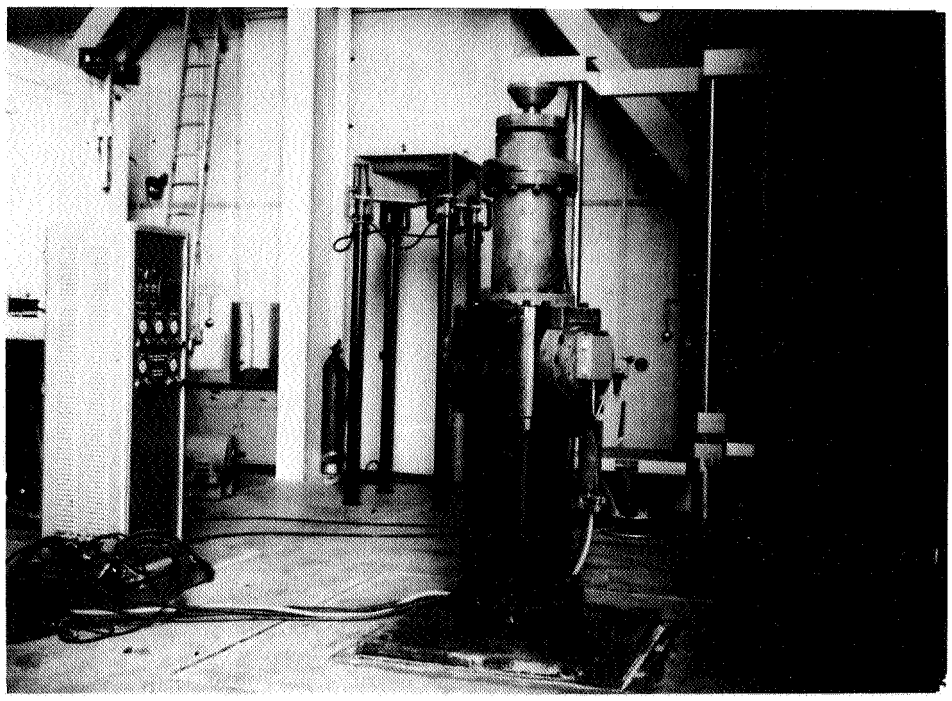
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	July 6, 1966
	FACILITY NO:	12-00-04-03

1. **REPORTING INSTALLATION:** Marshall Space Flight Center, Huntsville, Alabama

2. **FACILITY NAME:** Propulsion and Vehicle Engineering Laboratory

3. **LOCATION** *(if other than in 1. above):*



4. **FUNCTIONAL NAME:** Shock and Acceleration Test Facility

5. **TECHNOLOGICAL AREAS SUPPORTED:** Stage and component structural checkout

6. **NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:**

Shock testing is accomplished by a drop test shock machine with a 3-foot square table of 1000 pound capacity, a pneumatic shock machine of 100,000-pound capacity, and a small, 150-pound capacity shock machine with terminal velocities up to 300 inches per second,, Limited shock testing can be performed by certain shakers by use of a wave form synthesizer. **A** centrifuge, with an 8-foot radius of gyration, can provide acceleration of 100 g maximum on **500** pounds per arm.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4619 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

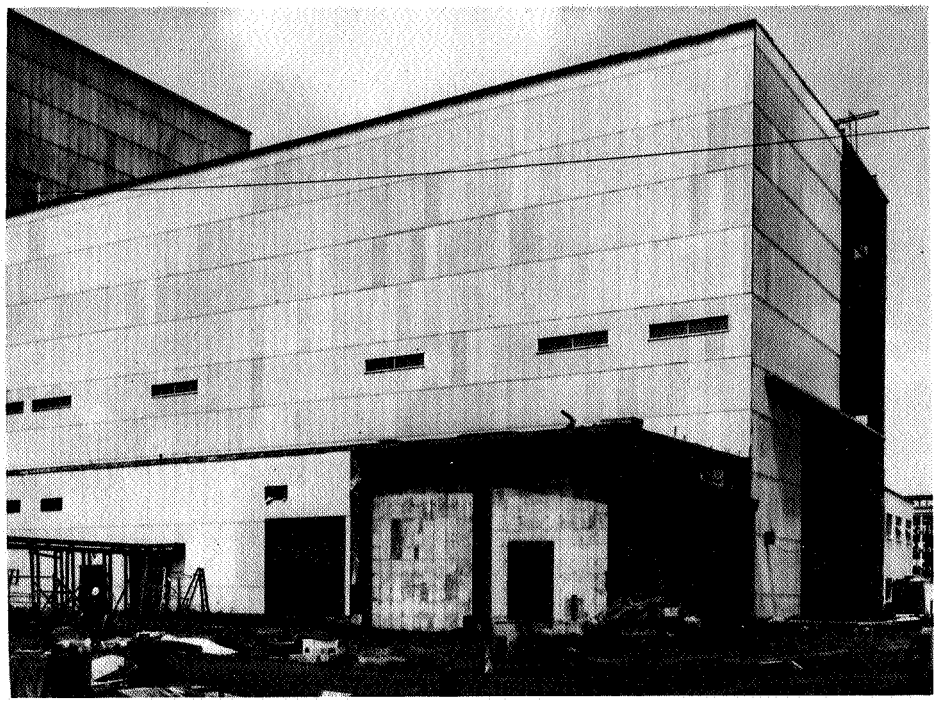
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-04-04

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Acoustic Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and component structural checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Acoustic Testing Facility consists of a 4846 cubic foot reverbration room and a 1500 cubic foot anechoic room. The rooms are air cushioned with a test section between them that will hold panels up to 6 feet square for sound transmission studies. Grazing incidence tests on 5-foot by 5-foot panels can be performed in the progressive wave test section. The major random noise source provides 40,000 acoustic watts (166 db, PWL Re 10^{-12} dynes per square cm.) to the reverbration room. Maximum continuous test time is **30** minutes at maximum power. Closed circuit television is available for instrumentation coverage for the acoustic test areas as well as the vibration areas.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4619 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec, 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

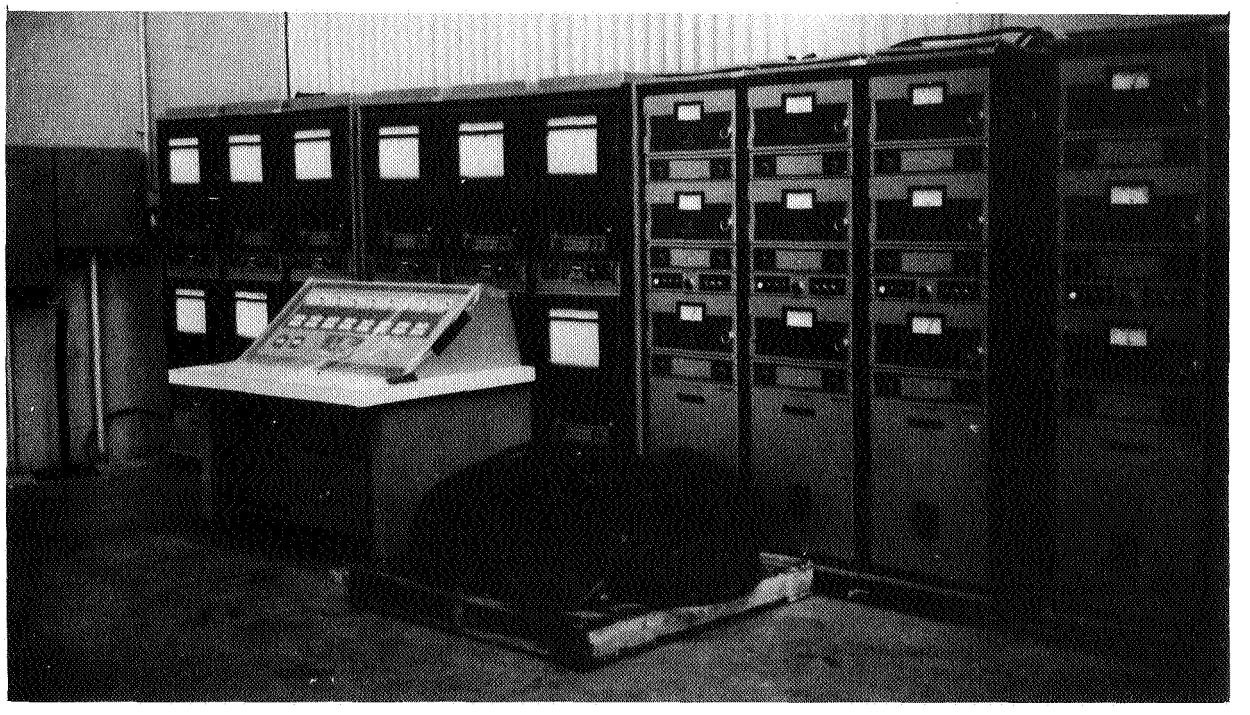
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-04-05

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Heat Transfer Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and component structural checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Two systems provide power to banks of radiant heating elements which are built into special reflector configurations for each test setup. The upper limit of temperature is 10000 C and of heat flux is 100 $Btu/ft^2/sec$. One sytem has 3000 KVA dividend into 6 chennels for power control with 4 power outlets for each channel. The entire system is analog-controlled and recorded. The other system has 3750 KVA divided into 18 channels for power control with multiple power outlets for each channel. This system includes a highly flexible control and recording system whereby the same data acquisition and processing system used for static load testing can be used to compute and tabulate results. Heat transfer studies performed in test set-ups employ sealed down models to investigate heat transfer in propellant systems, two-phase flow systems (liquid vapor),

6. NARRATIVE DESCRIPTION

insulation schems for cryogenic tanks, and calorimeter development for heat radiation measurements. Existing capability provides for investigation of present problems; however, models and facilities can easily be modified as required.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4619 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: M S F C 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

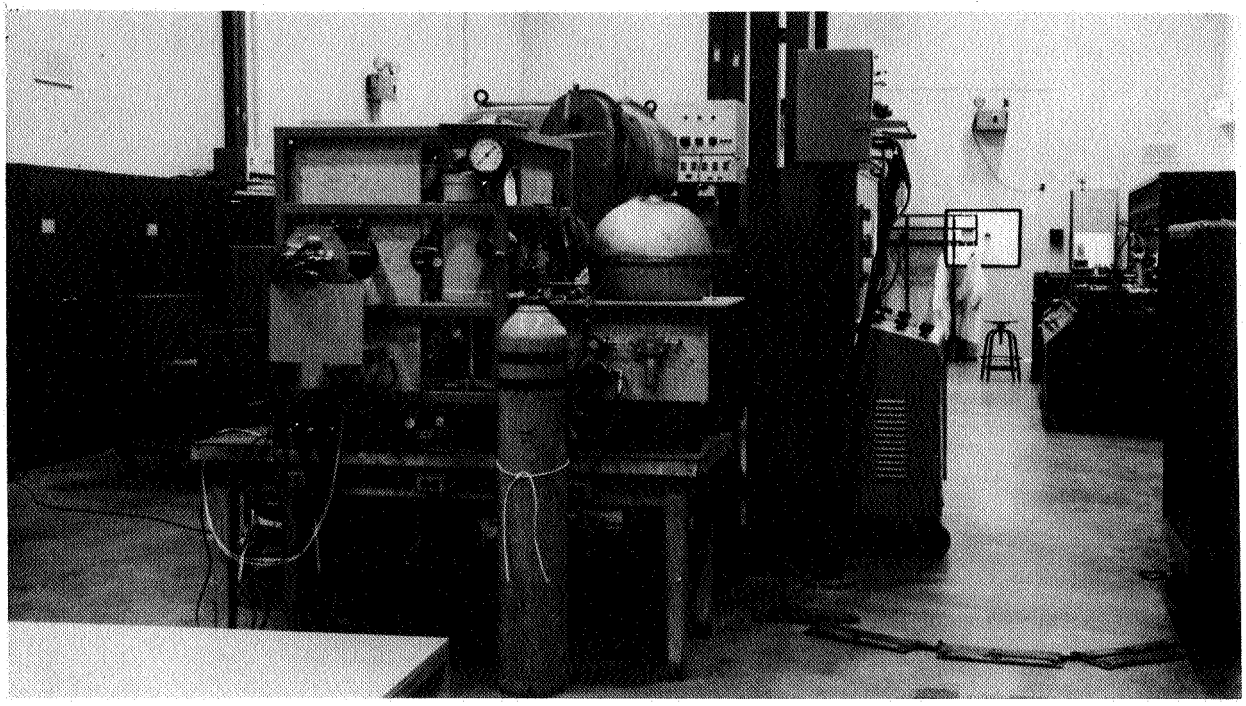
DATE OF RESUME: August 5, 1966

FACILITY NO: 12-00-04-06

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2 FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Hydraulics Research Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and component structural checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility consists of 25,000 square feet area which includes a 600 square foot, Class III Clean Room for processing of flight test components and systems. Four hydraulic fluid and RPI flow stands have a capacity up to 400 gpm and 5000 psi. A hydraulic impulse of 0-400 psig in 15 milliseconds can be provided on an impulse test stand. The pump test stand has a capacity of 100 HP and 30,000 RPM. Equipment up to the size of the F-1 Engine can be tested on the engine gimbal test stands.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4619 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

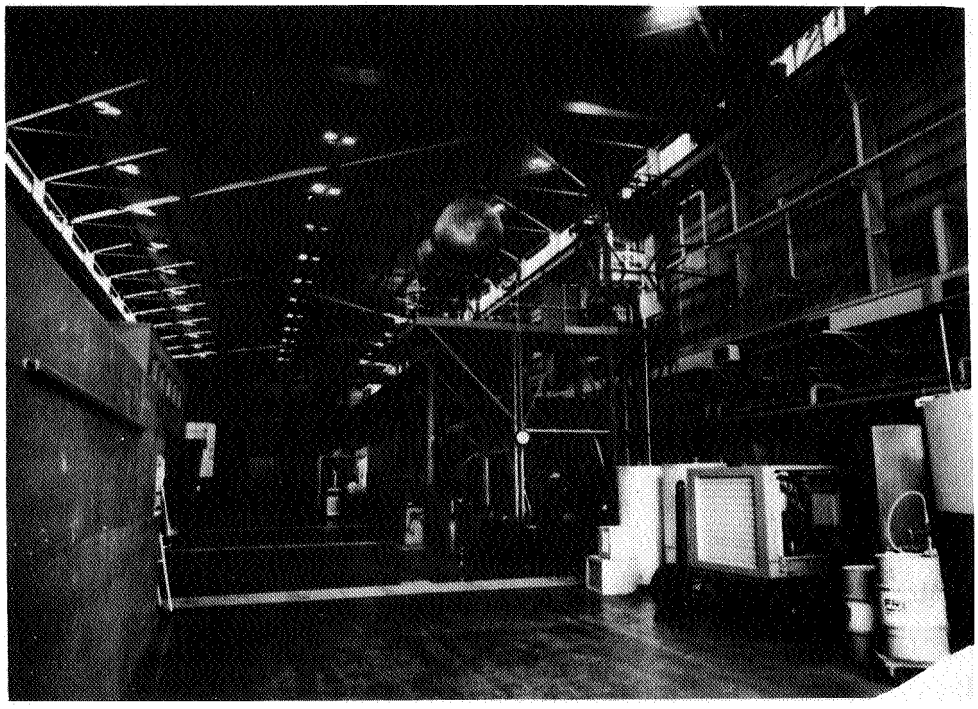
DATE OF RESUME: August 5, 1966

FACILITY NO: 12-00-04-07

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Pneumatic & Cryogenic Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and component structural checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Pneumatic Test Facilities consist of 8 pressure test cells with 600 feet of floor area, zero leakage testing equipment occupying 400 square feet, and miscellaneous facilities for testing valves, regulators, pressure switches, ejection systems, etc. All pressure cells are supplied with air at 3000 psi and GN^2 at 5000 psi. A LOX-LH_2 high pressure test stand with a working pressure up to 1000 psi and a capacity of 150 pounds of LOX or LH_2 is used for cryogenic studies. LN_2 test stands have a dewar capacity up to 40 tons. Flow test stands provide for studies of vortex, terminal drainage, surge pressure, stratification, bubble dynamics, and gysering in turbulent fluid flow. Metal and plexiglass tanks can be rotated; pressurized, vibrated, and drained, Model studies are conducted as well as similarity and two phase flow investigations.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4619 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: **"Technical Facilities and Equipment Digest" Dec. 1965**

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

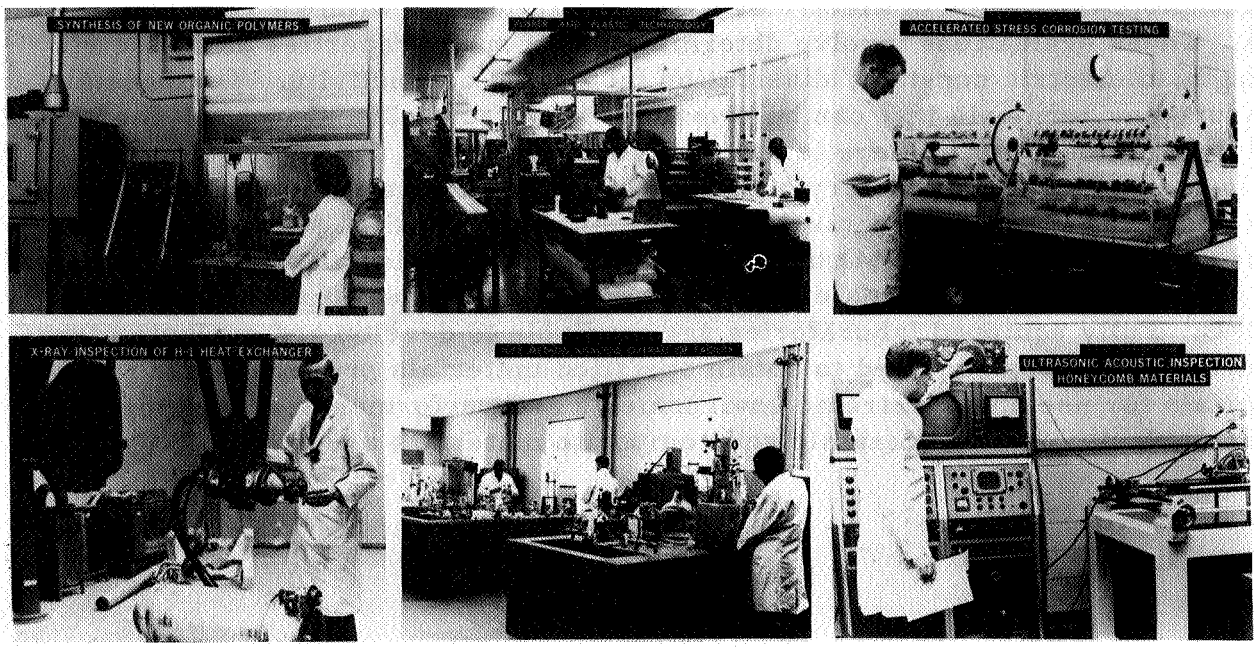
TECHNICAL FACILITIES RESUME **DATE OF RESUME:** July 6, 1966

FACILITY NO: 12-00-04-08

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Propulsion and Vehicle Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Materials Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and component structural checkout

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: Floor Area devoted to laboratory activity in the materials research and development field is approximately 23,000 square feet. An additional 4000 square feet contains a completely equipped machine shop to produce small detailed parts when necessary and otherwise support the development activities. Laboratory support also exists in a capability for filament winding components up to 12 inches diameter by 20 inches long and for vapor deposition of coatings (including refractory materials) to both metallic and non-metallic substrates up to 25 square inches in size. Twelve vacuum systems and associated small chambers are used to determine compatibility of materials with combined vacuum and temperature environments of 1 atmosphere to 10^{-10} Torr and -200°C to +500°C. Radiation effects on the useful properties (mechanical strength, physical properties, and chemical properties) of materials, especially when combined with other environmental

6. NARRATIVE DESCRIPTION

parameters such as temperature and vacuum, are investigated in a 2400 square-foot area. A 2 MEV Van de Graaff accelerator and radioisotopic, ultraviolet and X-ray sources are employed. A complete spectrum of non-destructive testing equipment is contained in a laboratory area of 4000 square feet. The facility carries out feasibility studies and development programs of techniques for nondestructive materials and components. These methods utilize X-rays, isotopes, ultrasonic techniques, infrared radiation, eddy current and magnetic particles. An 800 square-foot area is equipped to determine the effects of hypervelocity impact on materials. The velocity range is 20,000 to 100,000 feet per second for particles with mass between 0.0005 and 0.5 gram. Methods are determined for minimizing the detrimental effects of hypervelocity impact. Equipment for complete evaluation of electrical materials is located within a 1200 square-foot area. These evaluations involve determination of such properties as dielectric strength, dielectric constant, dissipation factor and conductivity. Temperature and pressure environments that can be provided range from -253°C to +300°C and 10-10 Torr to 1 atmosphere. There is capability for evaluation and/or development of lubricants for both low and very high bearing loads under a variety of operating conditions including space environments. Mechanical and physical testing occupies 2500 square feet of floor space. Equipment exists for measuring all important mechanical and physical properties of materials from -269°C to temperatures in excess of 1000°C. Fully equipped laboratories are available to develop and evaluate manufacturing processes required to obtain specified materials properties and to adapt materials for use under extreme environments and performance requirements. Rubber, plastic, metal, ceramic and composite materials are involved,

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT, FOR FURTHER INFO:

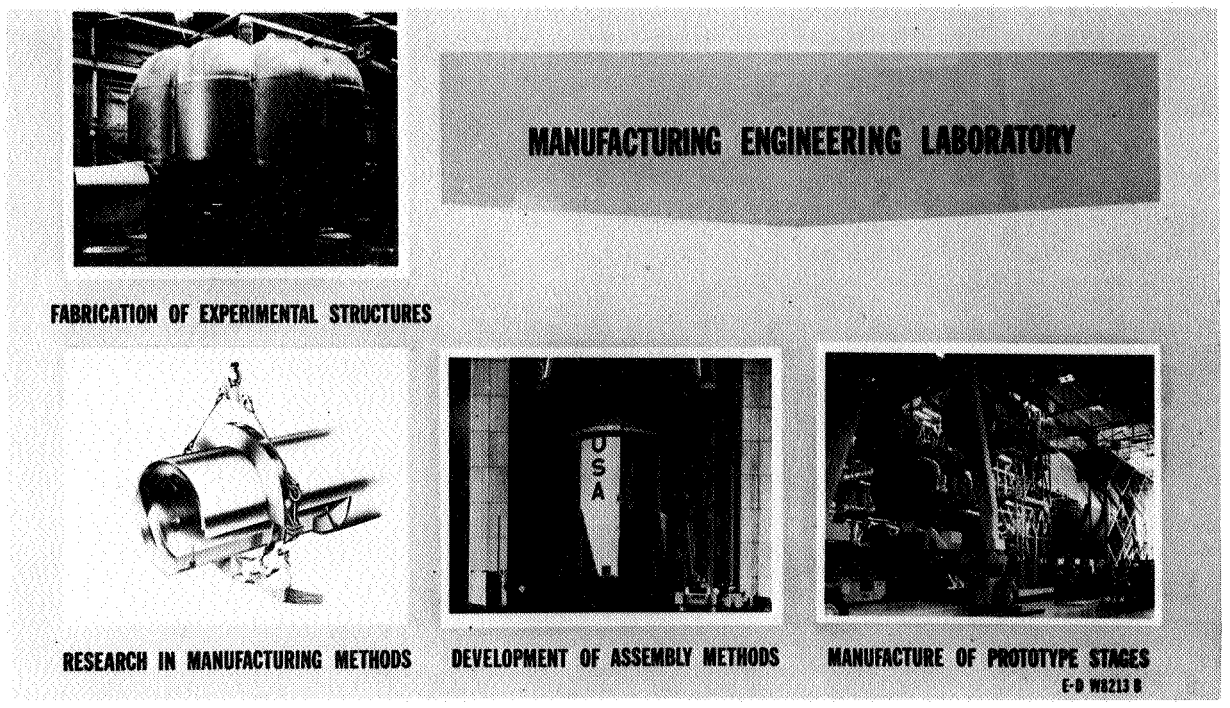
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: **12-00-05-00**

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Manufacturing Engineering Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Prototype fabrication, assembly, and refurbishing of large aerospace launch vehicles and hardware systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Manufacturing Engineering Laboratory has large fabrication and assembly facilities with high bay areas, associated cranes, large access doors, machine shops, .metal forming shops, clean rooms, and specialized equipment necessary for producing and refurbishing prototypes of large aerospace hardware systems. It includes equipment for research and development in advanced manufacturing techniques, methods and tooling for structural, surface treatments, and pressure vessel applications.

For the purpose of this catalogue, the Manufacturing Engineering Laboratory has been divided into ten sub-facility items as indicated on the following pages. This division has been made primarily according to capability and physical location rather than acquisition history. For this reason and because

6. NARRATIVE DESCRIPTION

there is extensive interconnection and common usage of support systems by sub-facilities, the fiscal and historical blanks have not been completed. It is estimated that the total investment in facilities and equipment in ME Lab is between **23** and **24** million dollars.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: _____ 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ 23,238 K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities & Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: ME Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Plant Engineering Branch of ME Lab
876-4914

ME SUB-FACILITY ITEMS

1. High Bay Fabrication and Assembly Facilities
2. Machine Shop and Precision Machining Shop
3. Tube and Component Cleaning Facility
4. Valve Clinic
5. Surface Treatment Facility
6. Metal Forming and Fabrication Shop
7. Composite Structure Fabrication Facility
8. Welding Development Facility
9. Methods Development Facility
10. Experimental Electronic Development Facility

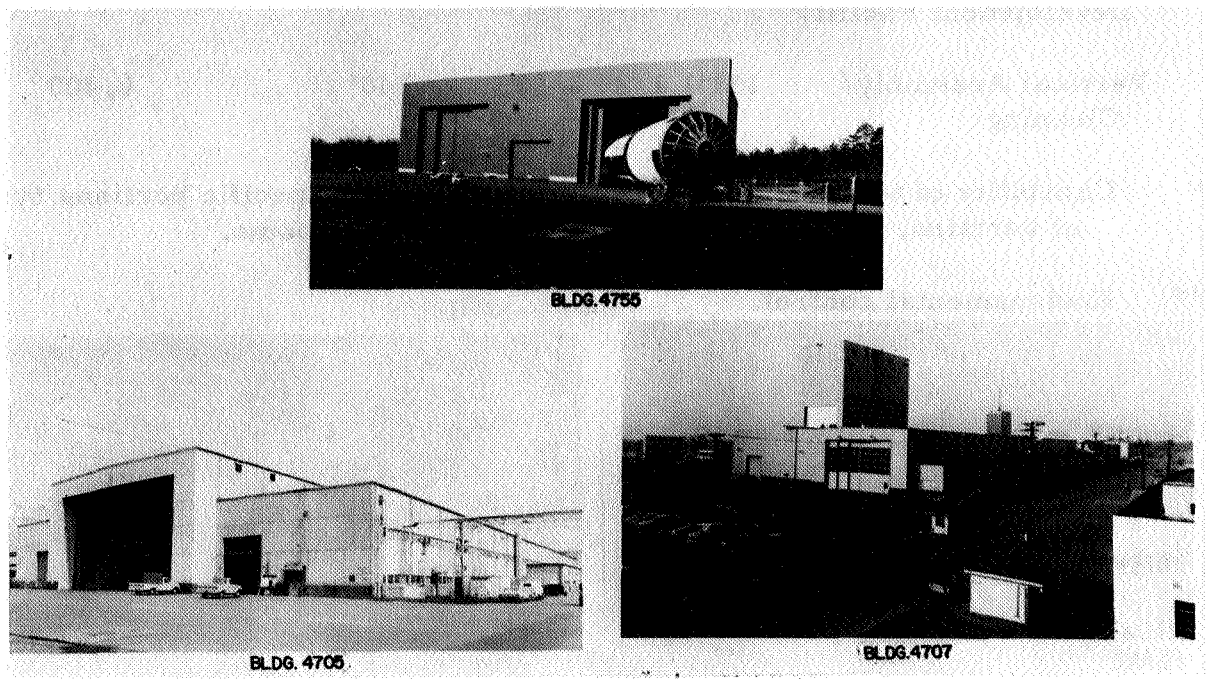
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-05-01

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Fabrication and Assembly Engineering Facility (High Bay)

5. TECHNOLOGICAL AREAS SUPPORTED: Launch Vehicle and Large Components Fabrication and Assembly

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The High Bay Fabrication and Assembly Facilities are located in three different buildings having a truss clearance equal to or greater than 30 feet. These facilities are used for prototype fabrication and assembly of large hardware components, sub-assemblies, and assemblies. The spaces having 30 feet or greater truss clearance are as follows:

Building 4705	Truss Clearance	Cranes No. & Tons	Cranes Hook Ht.	Sq. Ft.
Component Development Facility	43'9"	2-10	35'3"	45,200*
	30'	1-5	22'11"	5,400**
	30'	1-5	22'11"	8,500*

6. NARRATIVE DESCRIPTION

Building S-4755	Truss Clearance	Cranes No, & Tons	Hook Ht,	Sq. Ft.
Multipurpose Technology Facility	86'	2-90	70'	45,000**
Building 4707				
Composite Structures Development Facility	34'0"	2-20	25'	38,000*
Vertical Assembly/ Cleaning	151'1 1/2"	1-60	140'	6,400

* Capability of temporary environmental control of specific portions by use of curtains, portable A/C and plastic enclosed rooms.

** Environmental control.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4705, 4707, & 4755 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966

FACILITY NO: 12-00-05-02

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. **above):***



MACHINE SHOP



PRECISION MACHINING SHOP

4. FUNCTIONAL NAME: Machine Shop Engineering Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Precision Machining as well as Large Component Machining

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Machine Shop, located in Building 4705, encompassing a 33,800 square-foot area, is capable of both general machine shop functions as well as special operations. A Class I environmental room, 5,700 square feet, contains a Precision Machining Shop with a capability of working to tolerances of .0001 inches. The Machine Shop is supported by two 20-ton cranes with a hook height of 25 feet. In addition to the standard lathes, milling machines, planers, radial drills, grinders, etc., the shop contains the following equipment:

numerically controlled machines
six-position turret drill
vertical die mill (16 inches by 24 inches)
horizontal die mill (48 inches by 120 inches)

6. NARRATIVE DESCRIPTION

machine lathe (14 inches by 96 inches)
skin mill (with table 12 feet, 3 inches by 36 feet)
vertical boring mill (12 feet)
radial drill (8 feet)
engine lathe (34 1/2 inches by 132 inches)
planer (6 feet by 14 feet)

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4705 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest!' Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

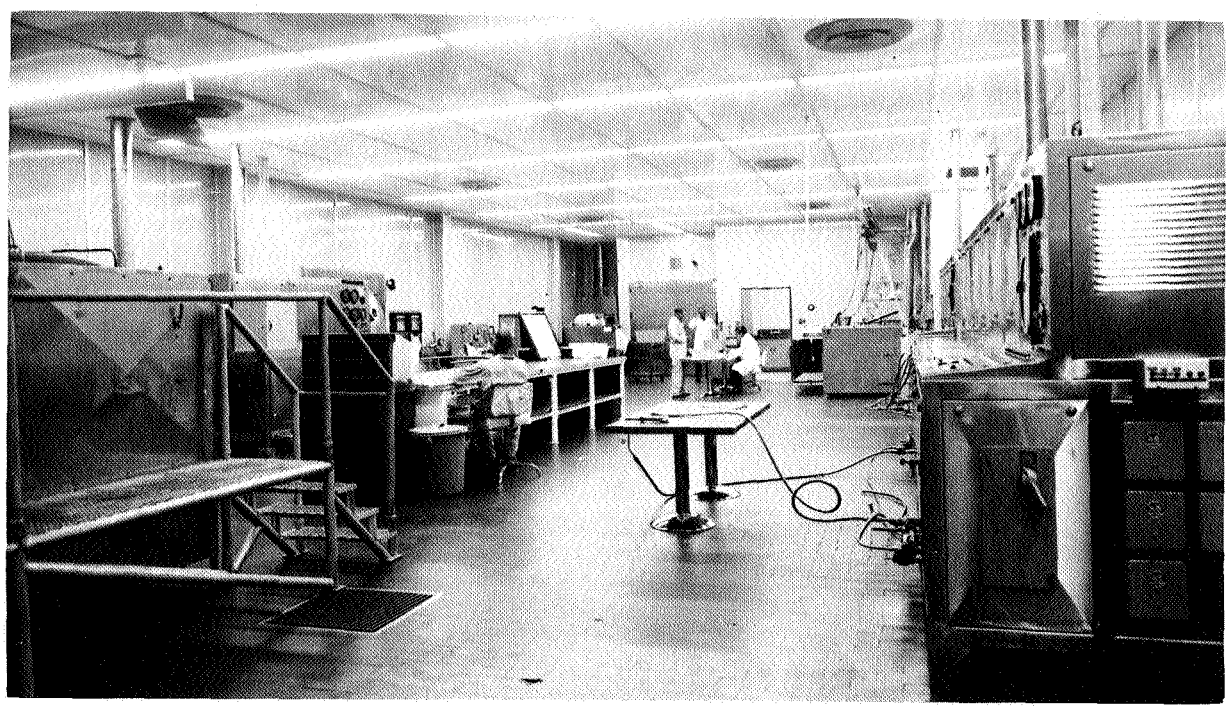
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-05-03

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Tube Cleaning Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Tube cleaning up to 3'' diameter and 60' long.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Tube Cleaning Facility is a Class II clean room, located in Bldg. 4705 and equipped with solution tanks of 30-gallon capacity. Automatic process control consoles are employed as well as equipment for ultrasonic cleaning, vapor degreasing, vacuum drying and packaging. Aluminum, stainless steel and Hastelloy tubes up to 3 inches in diameter and 60 feet in length can be cleaned. Cleanliness is evaluated by particle count. The cleaning area is *3,600* square feet.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4705 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

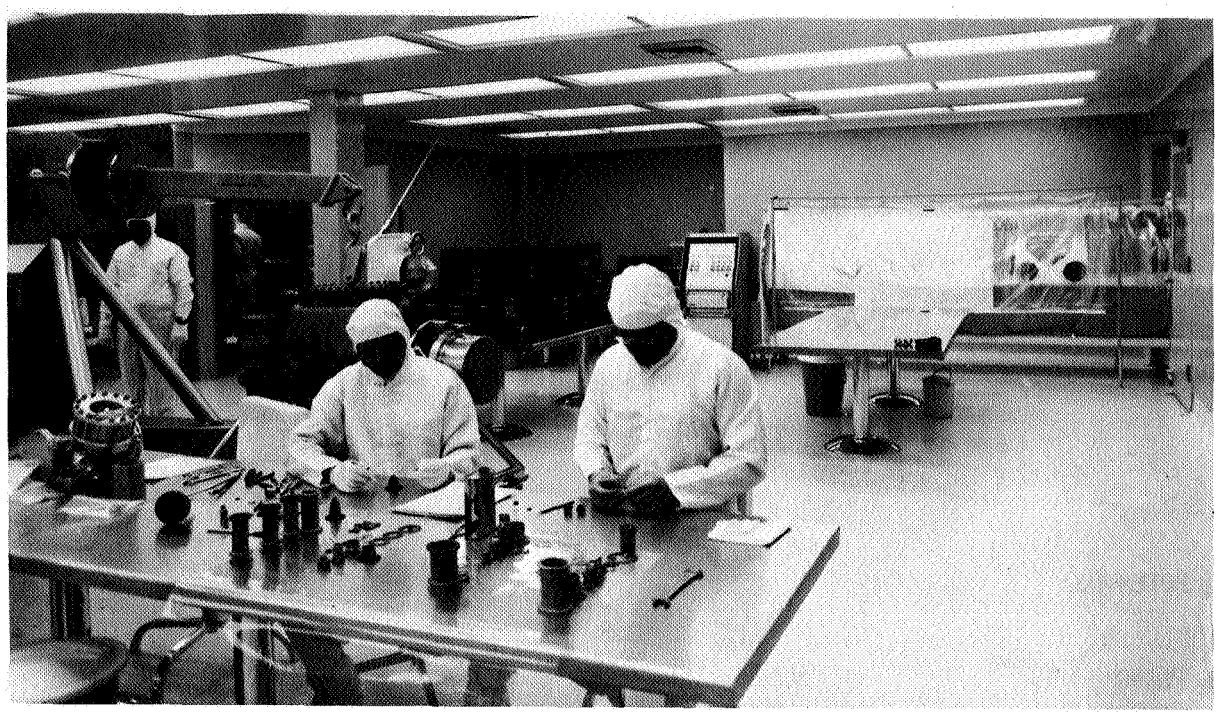
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-05-04

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Valve** Clinic Facility, Propellant

5. TECHNOLOGICAL AREAS SUPPORTED: Propellant valve disassembly, cleaning , and assembly

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Located in Building 4705, the Valve Clinic has a Class III clean room which includes a receiving-disassembly room, assembly room and packaging area, all equipped with Whitfield benches of Class IV clean room specifications. An evaluation laboratory, change room and air locks are part of the clinic; 3000 psi clean air, nitrogen and helium are available.

The clinic is capable of disassembly, inspection, repair, modification, cleaning, cold check pressure and flow testing to 50 scfm., evaluation of valves and similar subassemblies and packaging these to **40** cubic-inch envelope size. The clinic occupies an area of **5,340** square feet.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4705 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: _____ 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ -_____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME (if *contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICETO CONTACT FOR FURTHER INFO:

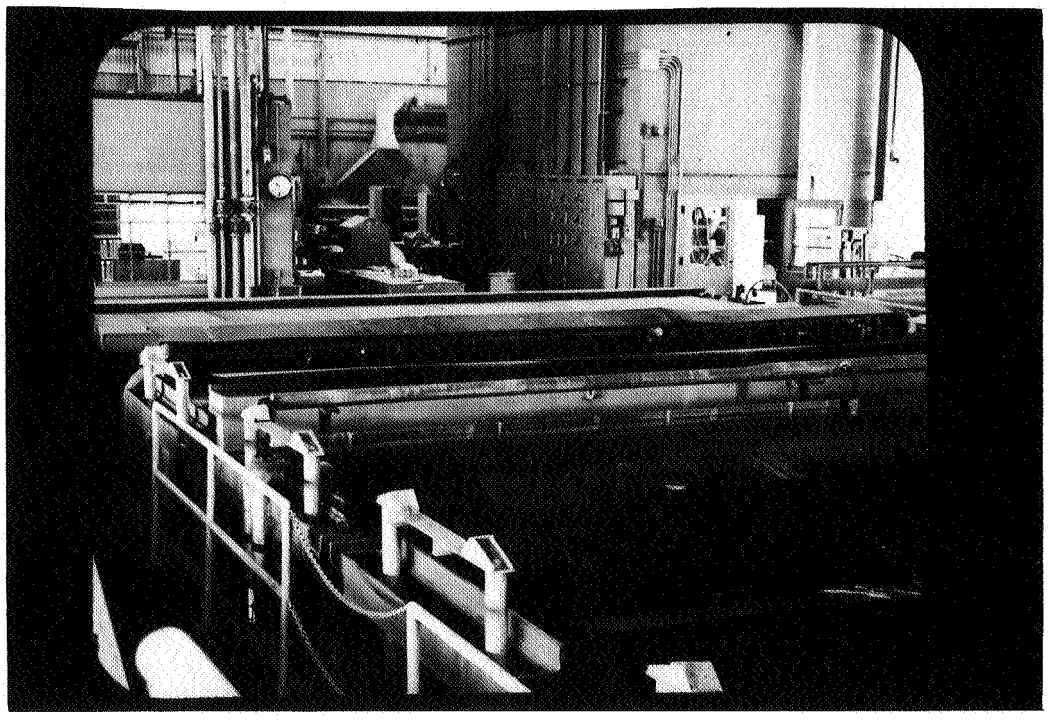
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-05-05

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if **other than** in **1. above**):*



4. FUNCTIONAL NAME: Surface Treatment Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Surface Treatment Facility

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Surface Treatment Facility, located in Building 4760, occupies an area of 23,500 square feet and includes

23 cleaning tanks (5 feet by 24 feet by 10 feet)
2 trichlorethylene vapor cleaners (5 feet by 24 feet by 10 feet)
2 drying ovens (5 feet by 24 feet by 10 feet)
1 paint booth (20 feet by ***60*** feet)
80 cleaning and electroplating tanks **(3** 1/2 feet by **3** 1/2 feet by **3** 1/2 feet)

which enable high quality chemical and mechanical cleaning, electropolishing, painting, anodizing, chemical milling, pickling, passivating and metal plating.

6. NARRATIVE DESCRIPTION

An instrument surface finish room with 18 plating units has a capability for developing processes in nickel, copper, silver, rhodium, chrome, anodized, black oxide and electro-polished finishes,

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. 4760 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

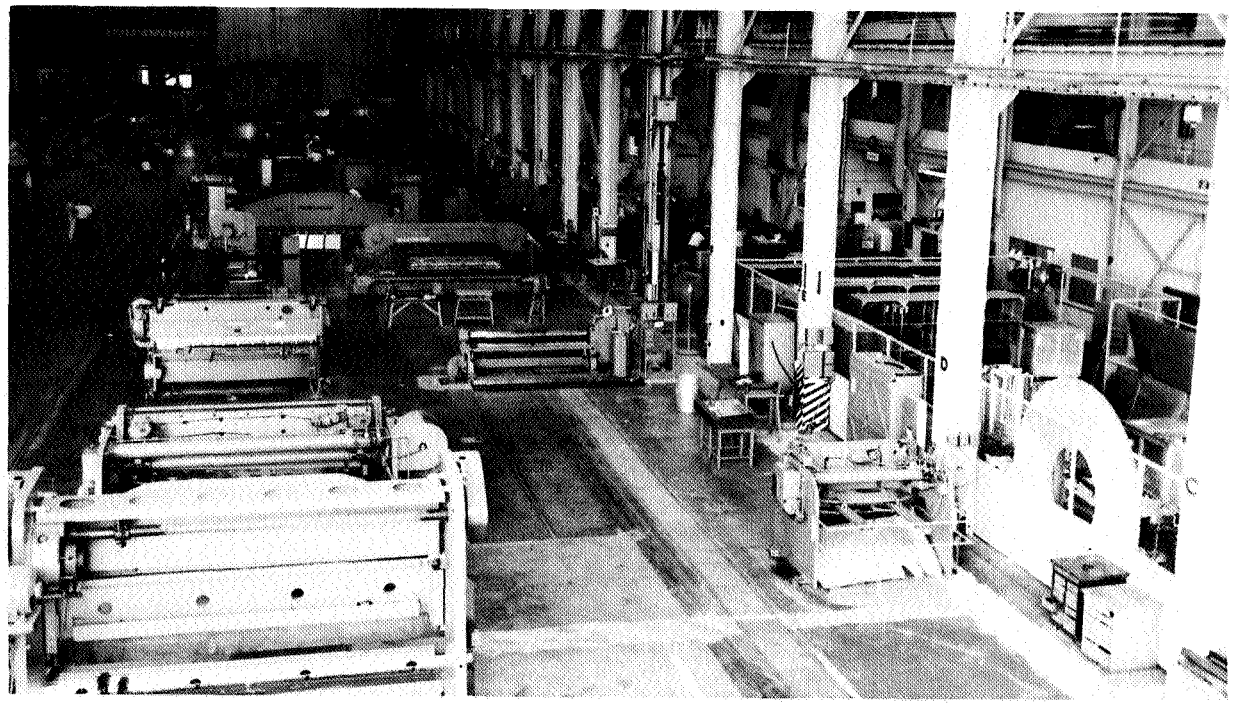
DATE OF RESUME: August 5, 1966

FACILITY NO: 12-00-05-06

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Metal Forming and Fabrication Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Metal Forming and Joining of Large Vehicle Sections

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Located in Building 4705, the equipment in this 17,500 square foot area has complete capability for forming and joining large pieces of sheet metal. Stainless steel high alloy plates up to 120 inch widths and 3/8 inch thickness are processed. Equipment includes a 10-ton crane with 35-foot hook height as well as roll forming machines, brakes, automatic and manual welding equipment, flame cutting equipment and radiographic inspection equipment. Specialized tools and equipment are available to manufacture steel and aluminum tubes and hoses for custom-fit to vehicle systems.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4705 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if **contr.** oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

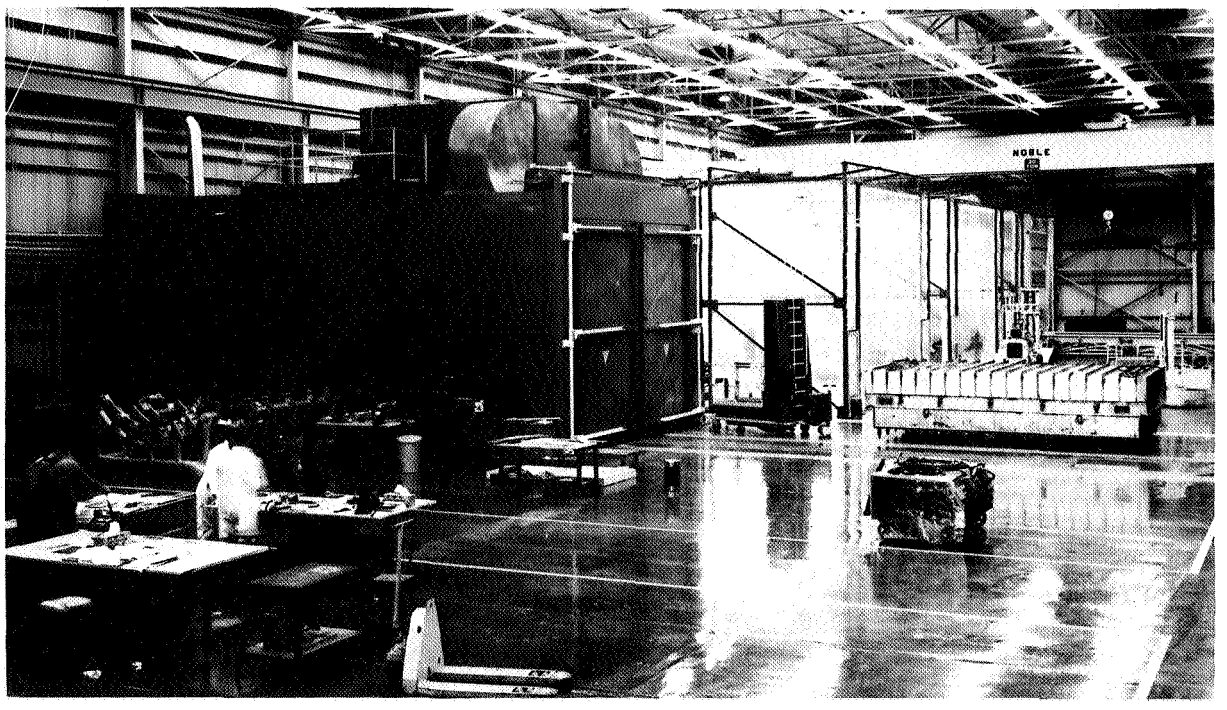
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-05-07

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Composite Structure Fabrication Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Fabrication of large composite structure panels

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Composite Structure Fabrication Facility in Building 4707 occupies an area of 44,900 square feet, consists of three environmentally controlled lay up rooms, cleaning tanks, spray booth, pre-fit lay up tables, drills and saws. The 20-ton crane service has a hook height of 25 feet. The drying oven heats to 250°F.

There are two autoclaves: The larger (16-foot diameter by 32 feet) has a maximum temperature of 750°F, maximum pressure of 110 psi and minimum pressure of 25 Torr. The smaller (10-foot diameter by 14 feet) has 250°F maximum temperature; pressure range is from 30 Torr to 150 psi.

Composite structure panels can be fabricated in steel, steel alloys, or

6. NARRATIVE DESCRIPTION

aluminum either in flat plates or curved shapes up to 16 feet wide, 30 feet long and any practical thickness.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4707 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

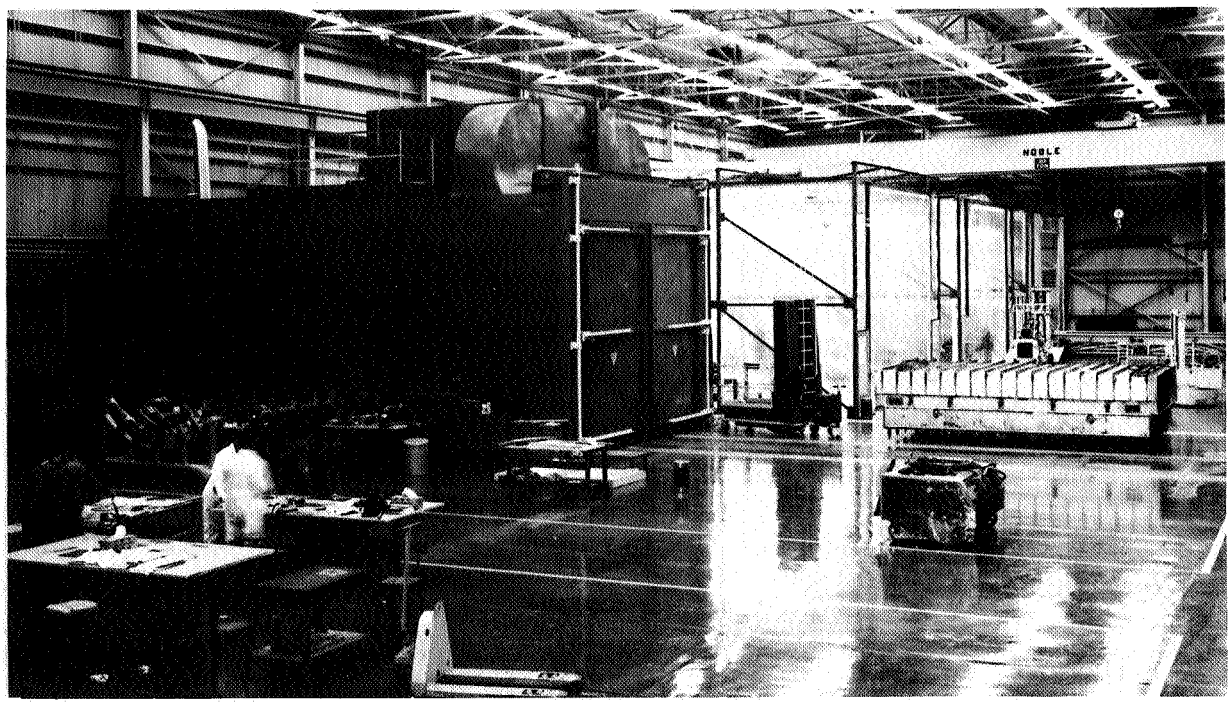
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: **12-00-05-08**

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Welding Development Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Precision and Speciality Welding

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Welding Development Laboratory, located in Building 4707, has provisions for conventional and electron beam welding in addition to its plasma arc and induction brazing equipment. The area, including high vacuum welding chambers, is 8,500 square feet. Basic and applied research and development is conducted as related to the fabrication of stainless steel alloys, aluminum, "exotic" alloys and refractory metals.

Material Evaluation Support scope of capability includes metallurgical analysis and testing and evaluation of material specimens including composite structures. Operations utilize tensile, compression, fatigue, hardness and creep test equipment; film processing and X-ray equipment; a micro-electron probe spectrograph; and a metallograph. Floor area is

6. NARRATIVE DESCRIPTION
4270 square feet.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4707 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

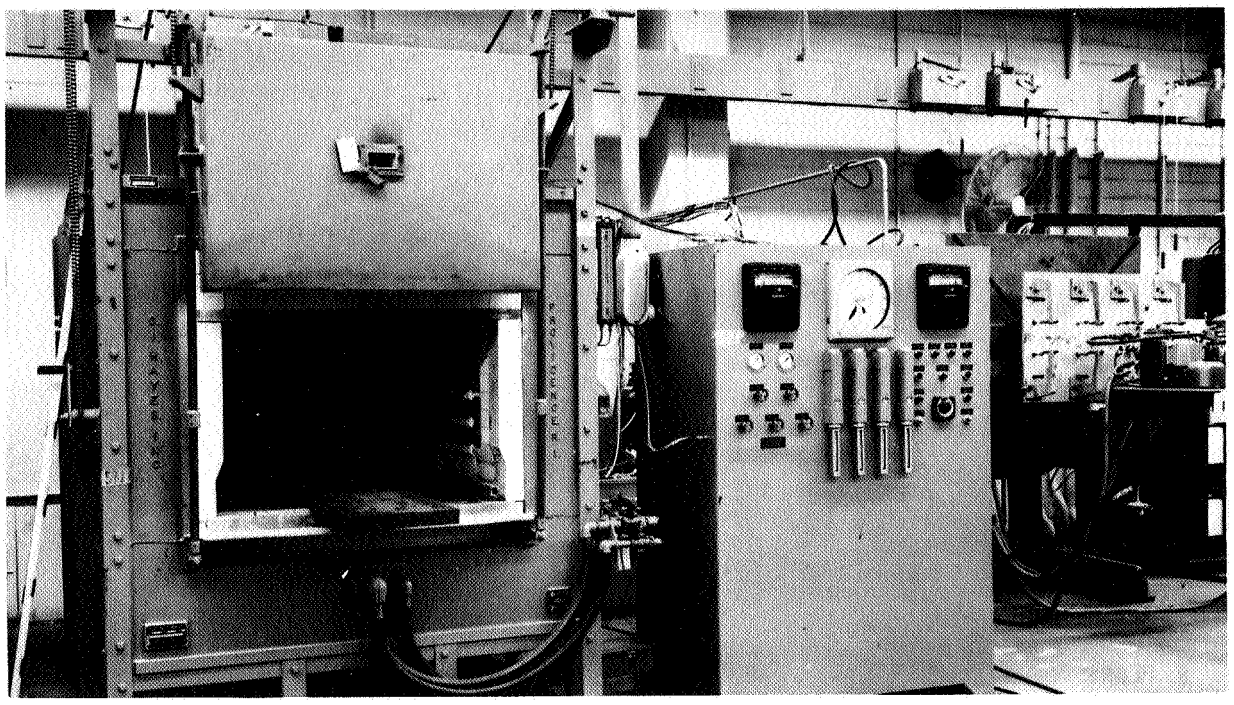
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	August 5, 1966
	FACILITY NO:	12-00-05-09

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Manufacturing Methods Development Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Development of mechanical manufacturing processes and methods

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Methods Development Facility, located in Buildings 4707, 4705, and 4714, occupies a floor area of 4,000 square feet. The facility is designed for development and testing of new processes, techniques, mechanical manufacturing devices and materials as related to fabrication and assembly.

Examples of specific work areas are explosive forming, corrosion control, composite structure fabrication, plastics and adhesives, heat treating, mechanical connections, and new materials application.

Equipment for these functions include temperature-controlled forming presses; a tempering induction furnace with temperature variance from 2500°F to 3000°F; beryllium machining equipment; precision measuring

6. NARRATIVE DESCRIPTION

instruments such as a Talyrond, profilometer, **INDI-RON** and shadowgraph; a Royco particle nephelometer; a spectrophotometer; gas chromatograph; and a sterilization facility.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. Various bldgs and structures 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.)*:

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

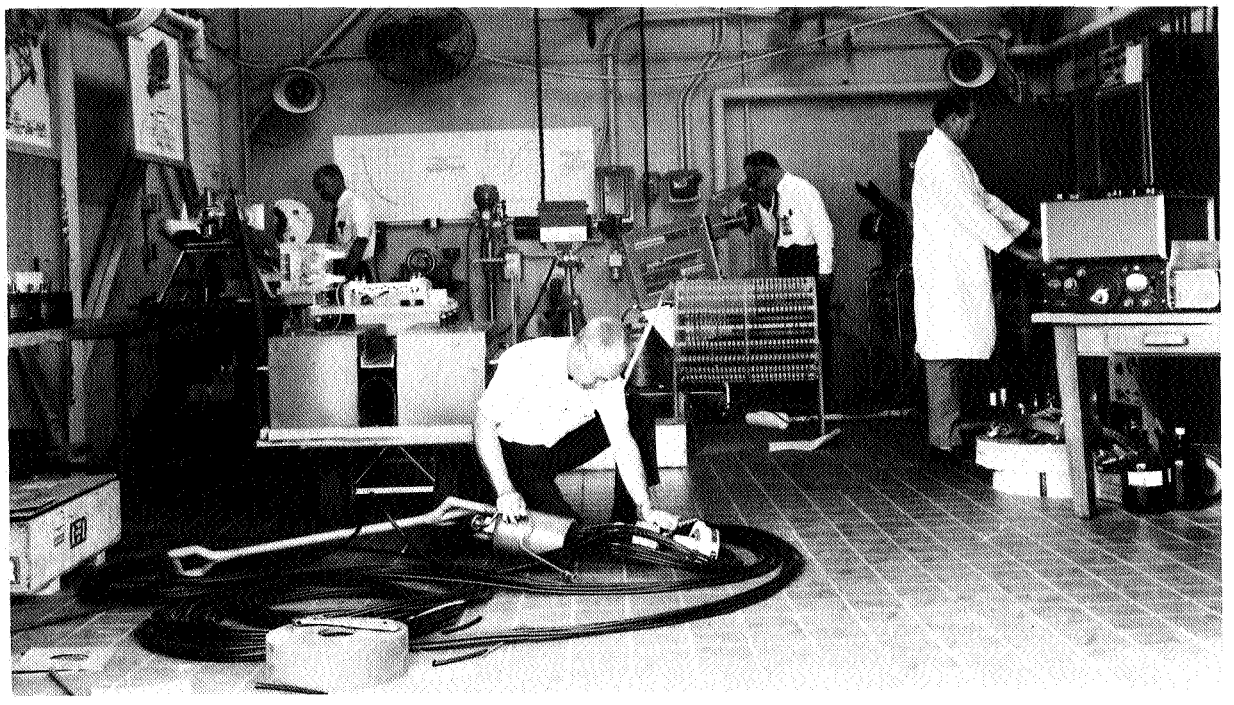
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 5, 1966
FACILITY NO: 12-00-05-10

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Manufacturing Engineering Laboratory

3. LOCATION *(if other than in 1, above)*:



4. FUNCTIONAL NAME:
Manufacturing Techniques Development
Facility Electronics

5. TECHNOLOGICAL AREAS SUPPORTED: Adaptation of advanced scientific discoveries to manufacturing techniques.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Experimental Electronics Development Facility, which is located in Buildings 4705, 4715, 4728 and 4767, conducts research and development in the application of electronics, electromechanics and physics to the following areas as they relate to fabrication and assembly processes:

physical and thermal measurement
magnetic and electro-hydraulic forming
infrared photography
laser technology
instrument development
neutral buoyancy research

6. NARRATIVE DESCRIPTION

The facility occupies 5,800 square feet of **work** area and contains high intensity magnetic forming coils, computers, electronic monitors, X-ray "Vidicon," fiber optics, closed circuit TV, equipment for vacuum measurements and calibrations, ultra-high speed Laser, cameras and a 240,000 Joule capacitor bank.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. Various Bldgs and Structures 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: MSFC 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

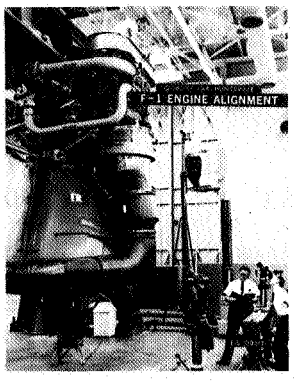
TECHNICAL FACILITIES RESUME

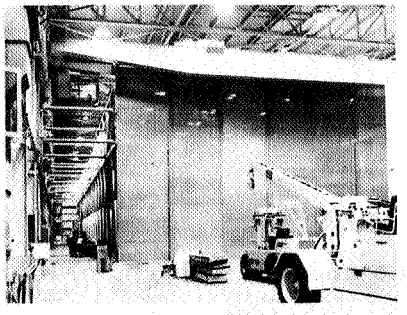
DATE OF RESUME: July 22, 1966
FACILITY NO: 12-00-06-00

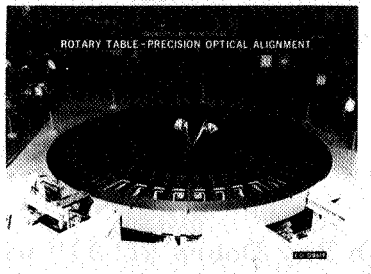
1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

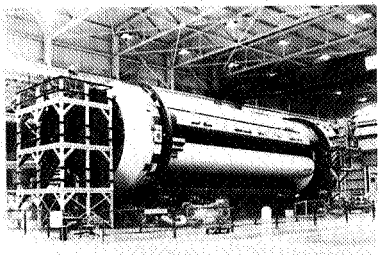
2. FACILITY NAME: Quality and Reliability Assurance Laboratory

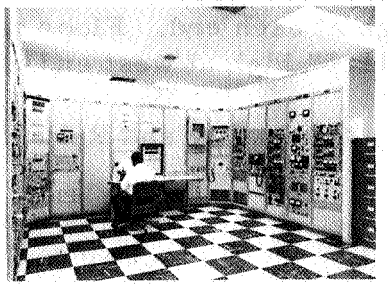
3. LOCATION *(if other than in 1. above):*

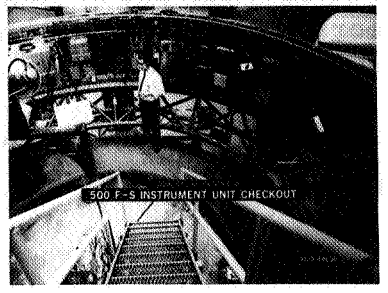












4. FUNCTIONAL NAME: Quality & Reliability Assurance Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Aerospace launch vehicles systems and material independent testing for quality and reliability assurance

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Quality and Reliability Assurance Laboratory has the equipment and facilities to perform the following functions.

Quality and reliability assurance program for launch vehicle systems and material during the developmental, manufacturing and assembly phases and to assure that material accepted meets established quality and reliability levels.

Analysis, tests and checkout of launch vehicle systems, their subsystems, components and related support equipment to assure satisfactory performance under the conditions and purposes for which designed.

6. NARRATIVE DESCRIPTION

Quality and reliability assurance technical capability in depth, which will ensure the technical adequacy and performance of industry in the manufacture, delivery, test and launch of space vehicles.

High Bay Space. The following chart summarizes the space in Quality and Reliability Assurance Laboratory with truss and crane clearance greater than 30 feet for accommodation of large hardware items.

Building	Truss Clearance	Cranes No. & Tons	Hook Ht.	Sq. Ft.
4708*	43'9"	2 - 10	33'9"	51,700
4708** (Pressure Cell)	35'	None		7,800
4752***	65'	1 - 20	53'	21,700
4705****	35'	None		7,722

* High Bay Doors 92' 11" wide and 43' 9" high. Floor capacity 2000 lb/ft^2.

** Door 32' wide and 36' high at east end.

*** Doors 60' wide and 65' high at each end, Floor capacity 2000 lb/ft^2.

**** Door 32' 5" wide and 34' 11.5" high at west end of area.

For the purpose of this catalog, the Quality and Reliability Assurance Laboratory

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ 16,051 K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Quality and Reliability Assurance Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Mr. Paul E. Drinnon (Area Code 205) 877-2360

Quality and Reliability Assurance Laboratory (Cont'd)

has been divided into four sub-facility items as indicated on the following pages. This division has been made primarily according to capability and physical location rather than acquisition history. For this reason and because there is extensive interconnection and common usage of support systems by the sub-facilities, the fiscal and historical blanks have not been completed. It is estimated that the total investment in facilities and equipment in Quality and Reliability Assurance Laboratory is between 16 and 17 million dollars.

QUALITY AND RELIABILITY ASSURANCE SUB-FACILITY ITEMS

1. Dimensional Laboratory
2. Physical Laboratory
3. Electrical/Electronics Laboratory
4. Environmental Test Laboratory

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 22, 1966
FACILITY NO: 12-00-06-01

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Quality and Reliability Assurance Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Uirnensional Laboratory

4. Functional Name: Dimensional Laboratory, Quality Assurance

5. TECHNOLOGICAL AREAS SUPPORTED: Length, threads, optics, angles, roundness, hardness and flatness tests

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Calibration tests are performed for length, threads, optics, angles, roundness, hardness and flatness. Dimensions are traceable to specifications of the Bureau of Standards through gage blocks certified to a few millionths of an inch. The area involved is 1000 square feet and a temperature of 68° Ft 1° is maintained.

Standard measuring machine has a range of 0 to 80 inches with a t .000030-inch accuracy.

Internal comparator has an internal range from 125 to 10 inches; external range is 9 inches.

6. NARRATIVE DESCRIPTION

Auto-collimator has an accuracy of ± 1 second within a range up to 100 seconds for surface plates.

Clinometer range is 0 to 360° and accuracy is 1 second of an arc.

Contour projectors for calibration of threads, straight and tapered, are accurate to 2 minutes in a range up to 80 to 1.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT, Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr.* oper.):

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Quality and Reliability Assurance Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

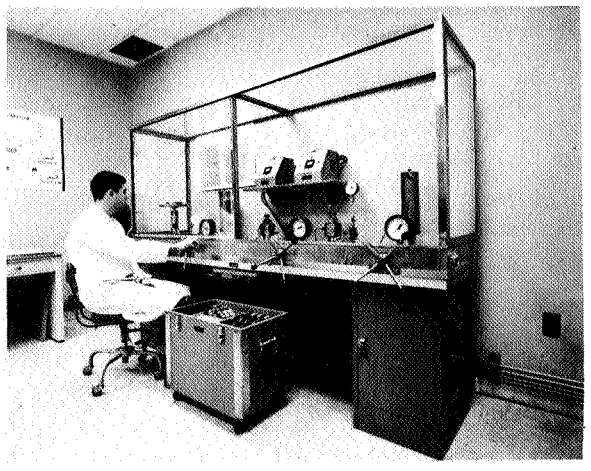
TECHNICAL FACILITIES RESUME

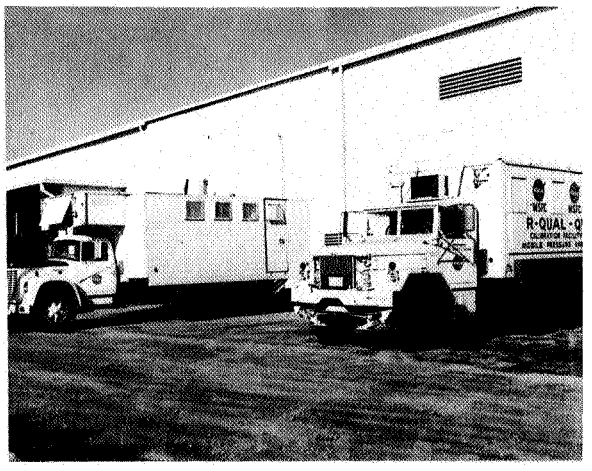
DATE OF RESUME: July 22, 1966
FACILITY NO: 12-00-06-02

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Quality and Reliability Assurance Laboratory

3. LOCATION *(if other than in 1. above):*





4. FUNCTIONAL NAME: Physical Laboratory, Quality Assurance

5. TECHNOLOGICAL AREAS SUPPORTED: Pressure, mass, torque and force acceleration tests

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This laboratory occupies 1600 square feet. Temperature and humidity are maintained at 73°F ± 2° and 50 percent respectively. High pressure gas and vacuum are provided and certification for pressure measurement is based on high accuracy dead weight standards up to 40,000 psi. Facilities include a mobile field calibration unit, mass three mettler balances with 0 to 1000 gm range and 1×10^{-6} gm resolution, torque calibrators with a 0 - 4000 ft/lb range and a force accelerometer calibrator covering a range up to 100 G and 10 kHz frequency with ±.2 percent peak accuracy.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Quality and Reliability Assurance Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

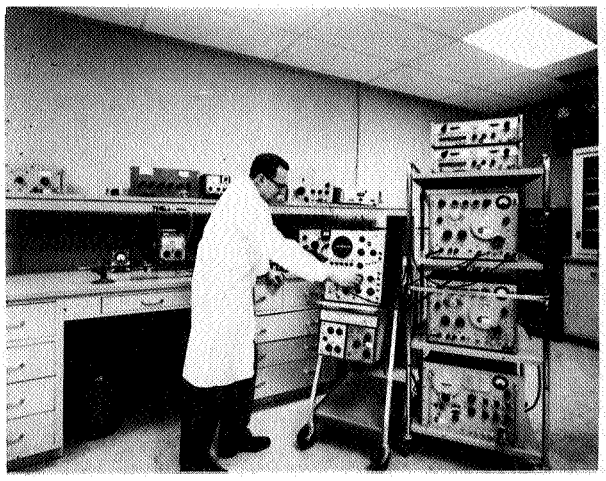
TECHNICAL FACILITIES RESUME

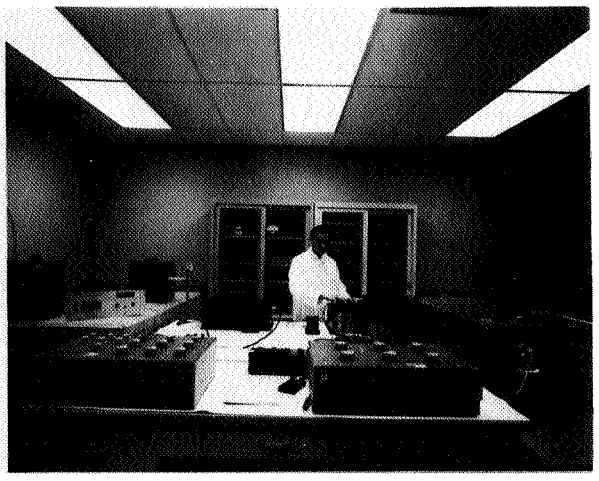
DATE OF RESUME: July 22, 1966
FACILITY NO: 12-00-06-03

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2 FACILITY NAME: Quality and Reliability Assurance Laboratory

3, LOCATION *(if other than in 1. above):*





4. FUNCTIONAL NAME: Electrical/Electronics Laboratory, Quality Assurance

5. TECHNOLOGICAL AREAS SUPPORTED: Voltage, resistance, current and frequency tests

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Calibrations are conducted in voltage, resistance, current and frequency. A virtually complete secondary calibration is possible from dc to radio frequencies including microwave frequencies to 18 GHz. An RF screen room, 192 square feet in area, provides 60 dB attenuation for RF measurements.

Total laboratory area is 2500 square feet. A voltage standard is maintained by two banks of saturated standard cells in constant temperature air baths. Resistance standards are kept immersed in a thermally regulated oil bath. Standards for current are derived from the resistance and voltage standards. A thermocouple element, certified against a dc reference voltage, provides traceability in ac voltage and current.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWWERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME (if contr. oper.):

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Quality and Reliability Assurance Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 22, 1966

FACILITY NO: 12-00-06-04

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Quality and Reliability Assurance Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Laboratory, Quality Assurance

5. TECHNOLOGICAL AREAS SUPPORTED: Force application and environmental qualification testing of flight components

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This laboratory occupies 11,590 square feet of high bay space and contains both force application and environmental equipment to perform qualification tests on flight components. Specific capabilities of the primary equipment are listed below.

Vibration testing - a 5000-lb force table driven by a 50 kw amplifier. The table permits 0.5 inch double displacement at 5 Hz and can accelerate 25-pound specimens to 50 G at 200 Hz. Maximum rating is 30 G.

Centrifugal acceleration - centrifuge has a gyration radius of 18 ft. and can accelerate a 300-pound mass to 100 G; the c-159 centrifuge is rated at 75 G/load rating of 2000 pounds; the smallest is rated up to 800 G at 1000 pounds.

6. NARRATIVE DESCRIPTION

Mechanical shock - a 3-inch Consolidated Electrodynamics Hyge Shock test machine can produce a shock of variable magnitude up to 8000 pounds force; the wave can be altered.

Environmental Chambers - Twelve chambers ranging in size up to 35 cu. ft. with extreme environments, e. g. 20,000 psi, vacuum to 5 x 10-9 Torr, temperature from -300°F to +535°F, humidity, salt spray and explosion. Combined environments that can be produced in a controlled manner are altitude-temperature-humidity, altitude-explosion, salt spray-temperature and vibration-temperature.

Other capabilities for component evaluation, methods developments, servicing and support of the Quality and Reliability Assurance function exist.

Complete and thorough testing can be conducted for leakage, resistance, polarity, resolution, impedance and voltage drop.

A 34-foot diameter Century-Detroit Rotary Table is used for inspection alignment & checkout of large components where close tolerance and precision angular measurements must be determined. It has axial eccentricity total indicator reading in inches and .0005 planar wobble of ± one-half second.

The Hydrostatic Line and Valve Testing complex, 5000 sq. ft., contains a 5-ton overhead bridge crane. The pneumatic components test stand has a pressure range of 3200 to 10,000 psi; a fuel test panel operates up to 2800 psi with flow rate of 19 gpm; two LN_2 test towers with a fuel control panel operate at 150 and 250 psia. A vacuum dry oven, 3 feet in diameter by 12 feet, operates at .5 psia and 160 F.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Quality and Reliability Assurance Laboratory

22. **LOCAL** OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

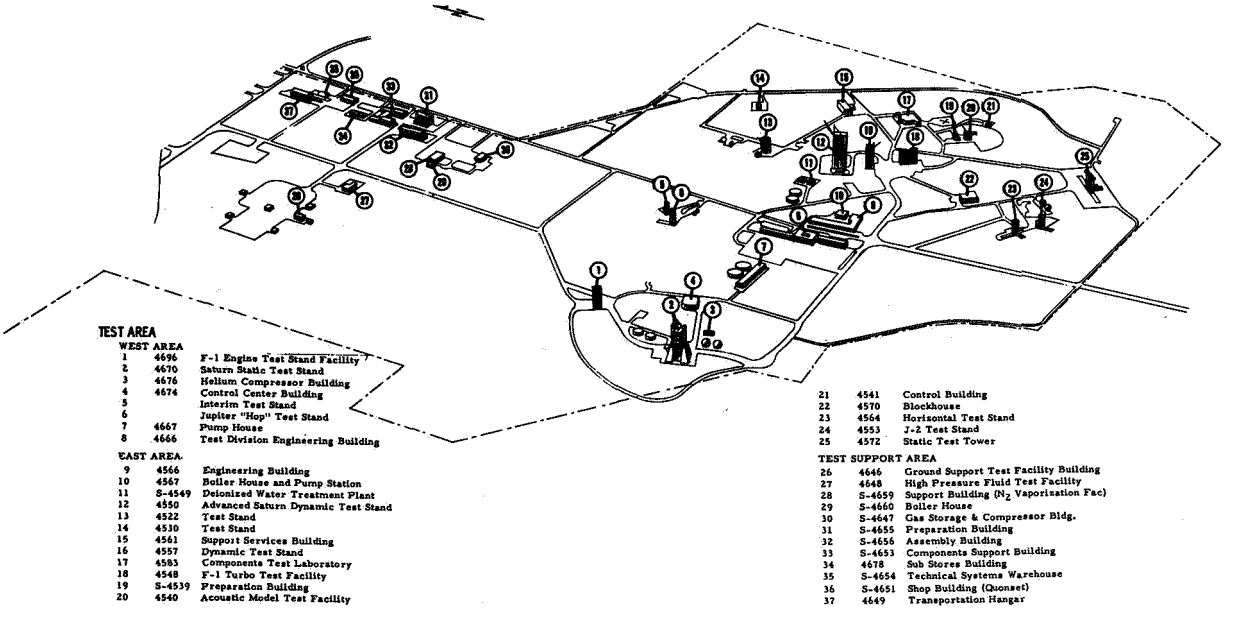
DATE OF RESUME: June 10, 1965

FACILITY NO: 12-00-07-00

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Test Laboratory

3. LOCATION *(if other than in 1. above):*



TEST AREA

WEST AREA

1	4696	F-1 Engine Test Stand Facility
2	4670	Saturn Static Test Stand
3	4676	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
14	4530	Test Stand
15	4561	Support Services Building
16	4557	Dynamic Test Stand
17	4583	Components Test Laboratory
18	4548	F-1 Turbo Test Facility
19	S-4539	Preparation Building
20	4540	Acoustic Model Test Facility
21	4541	Control Building
22	4570	Blockhouse
23	4564	Horizontal Test Stand
24	4553	J-2 Test Stand
25	4572	Static Test Tower

TEST SUPPORT AREA

26	4646	Ground Support Test Facility Building
27	4648	High Pressure Fluid Test Facility
28	S-4659	Support Building (N_2 Vaporization Fac)
29	S-4660	Boiler House
30	S-4647	Gas Storage & Compressor Bldg.
31	S-4655	Preparation Building
32	S-4656	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

4. FUNCTIONAL NAME: Rocket Propulsion Test Complex

5. TECHNOLOGICAL AREAS SUPPORTED: Launch vehicle and space transportation systems research, development and testing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Test Laboratory is a complex of Rocket Static Firing Test Stands, Vehicle Dynamic Test Stands, Ground Support Equipment (GSE) Testing Facilities, Rocket Component and Subsystem Testing Cells, and Environmental Chambers. Included are blockhouse control and data collection centers, data reduction equipment, model engine test positions, cooling water systems, instrument development laboratory, shops, gas generation plants, gas and propellant storage and distribution systems, administrative areas, large stage land transporters, and other auxiliary equipment and systems.

For purposes of this catalog, the Test Laboratory has been divided into 28 sub-facility items as indicated on the following pages. This division

6. NARRATIVE DESCRIPTION

has been made primarily according to capability and physical location rather than acquisition history. For this reason and because there is extensive interconnection and common usage of support systems by the separate sub-facility items, no attempt has been made to fill in the fiscal and historical blanks. It is estimated that the total investment in facilities and equipment at Test Laboratory is between 100 and 110 million dollars.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ 107,408 K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME (if *contr. oper.):*

20. OTHER SOURCES OF INFO: "Test Laboratory Facilities and Capabilities," Jan. 1, 1966
"Technical Facilities & Equipment Digest," Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Mr. John B. Carrington, Chief, Facilities Planning Office, Phone: (Area Code 205) 876-3405,

A. Test Laboratory
Rocket Systems Development and Testing Facilities

1. S-IC Static Test Stand (4670)
   Rocket Propulsion Test Stand RP1-Lox Stages

2. F-1 Engine Test Stand (4696)
   Rocket Propulsion Test Stand RP1-Lox Engines

3. S-IVB Test Stand (4514)
   Rocket Propulsion Test Stand, LH_2- Lox Stages

4. S-IB Static Test Stand (4572)
   Rocket Propulsion Test Stand, RP-1-Lox Engines/ Stages

5. H1 Power Plant Test Stand (4564)
   Rocket Propulsion Test Stand, RP-1-Lox Engines

6. Interim (Redstone) Test Stand (4665)
   Rocket Propulsion Test Stand, RP1-Lox Stages

7. Sound Supressor Test Stand
   Rocket Propulsion Test Stand, RP1-Lox, multi-purpose

8. RL10 Engine Test Facility (4710)
   Rocket Propulsion Test Stand, LH_2-Lox, altitude

9. Storable Propellant Test Facility (4753)
   Rocket Propulsion Test Stand, Storable Propellants, altitude

10. Cold Calibration Test Stand (4588)
    Propellant Systems Test Stand, Cold Flow

11. F-1 Turbopump Facility (4548)
    Propellant System Component Test Stand, Cold Flow

12. S-IB Dynamic Test Stand (4557)
    Vibration Effects Test Stand, Rocket Stages/propellants

13. S-V Dynamic Test Stand (4550)
    Vibration Effects Test Stand, Rocket Stages

14. Low Gravity Test Facility (4550)
    Drop tower, Reduced G Effects

15. Ultra High Vacuum Facility (at 4748)
    Space Simulation Chamber, Thermal-vacuum

16. Test Facility Building 4750
    Rocket systems, altitude ignition and launch methods testing facility

17. Test Positions 100 thru 108 (4583)
    Rocket component explosion proof testing cells

18. Test Position 112 (4583)
    Altitude Test Cell

19. Test Positions 113, 114 & 117 (at 4583)
    Rocket model and component testing stands, hot firing

20. Test Position 115 (at 4583)
    Rocket combustion and component testing stand

21. Test Position 116 (at 4540)
    Rocket acoustic effects test stand

22, Test Positions 301 and 302 (4530)
    Rocket component test stand, RP1 - Lox

23. Test Position 500 (dual 501 & 502) (4522)
    Rocket component test stand, cold flow, Hydrogen-Lox

24. Saturn V GSE Test Fawility (at 4646)
    Launch Simulation Facility, Saturn V

25. Swing Arm Test Facility (at 4583)
    Lift-off simulator

26. High Pressure Fluid Test Facility (4648)
    Component Flow and Pressure Test Facility

27. Instrument Laboratory (4650)
    Instrument Development, Test and Calibration Facility, Ground Support & Test Instrumentation.

28. Far-field Noise Propagation and Measurement System (4565)
    Acoustic Investigations Facility, Low Frequency, Atmospheric Effects.

TECHNICAL FACILITIES RESUME

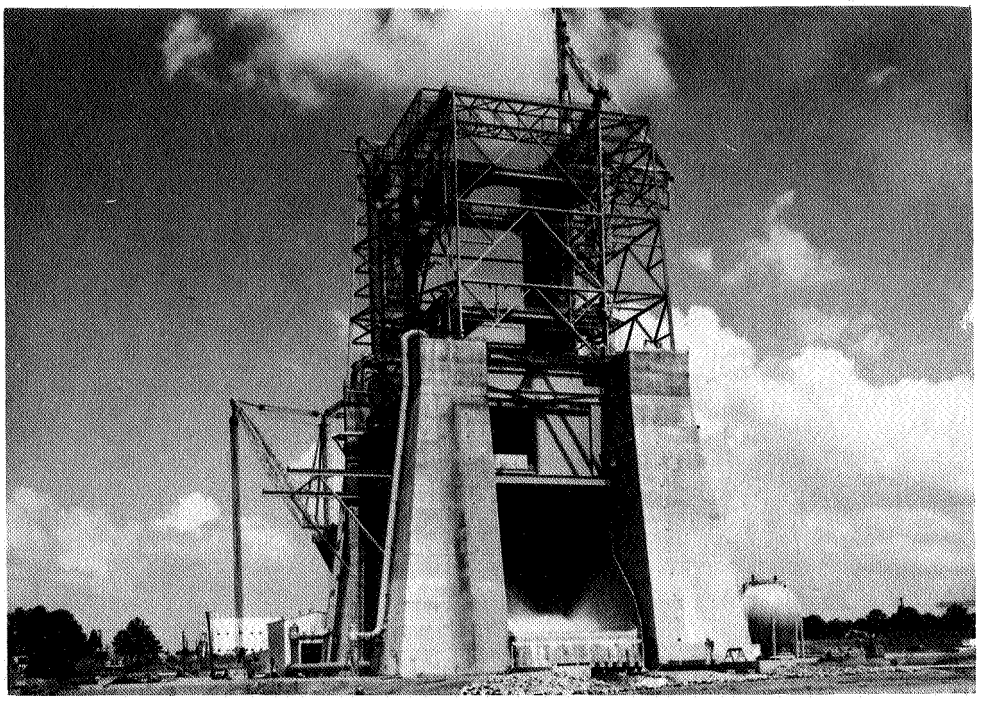
DATE OF RESUME: June 10, 1966

FACILITY NO: 12-00-07-01

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: S-IC Static Test Stand (4670)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand, (S-IC 46%)

5. TECHNOLOGICAL AREAS SUPPORTED: Stage checkout and acceptance firing, propulsion systems development.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The vertical S-IC Static Test Stand is 405 feet in height, including the derrick boom and superstructure; the superstructure is 267 feet high and 162 square feet at the base. The foundation of the stand is keyed into bedrock approximately 45 feet below grade.

Capability is provided for static firing 7.5 million pound thrust stages for 150 seconds duration.

6. NARRATIVE DESCRIPTION

Incorporated into the test stand complex are the following facilities: a 200-ton overhead derrick and 150-ton lower derrick, a water cooled deflector with 320,000-gpm flow rate, 450,000-gallon **LOX** storage and 312,000-gallon RP1 storage, 10,000-gpm LOX **flow** rate **to** stand and 2000-gpm RP1 **flow** rate to stand, 5000-psi GN_2 (6250 cubic feet) and GHe (2500 cubic feet) service, analog tape units (112 channels), oscillograph recorders (296 channels), digital systems (375 channels) and strip chart recorders (117 channels).

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4670 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if **contr.** oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

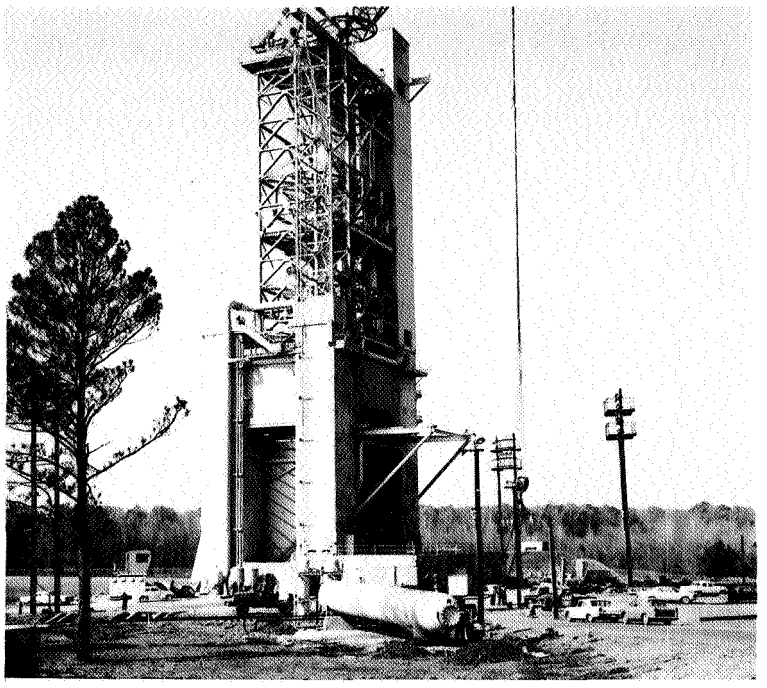
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-02

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: F-1 Engine Test Stand (4696)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand (F-146%)

5. TECHNOLOGICAL AREAS SUPPORTED: Engine Propulsion and Functional Testing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The F-1 Engine Test Stand is a vertical engine static firing test stand, 239 feet high and 4560 square feet in area at the base. The foundation is keyed into bedrock approximately 40 feet below grade. The shop and terminal room comprise 2652 square feet of area.

At present the stand can static fire 1.5 million pound thrust RP1 and LOX engines for 180 seconds duration. Equipment includes a water cooled deflector with 135,000-gpm flow rate and 500-psi GN and He service. Propellants are supplied through lines from-the 450,800-gallon LOX storage facility and 312,000-gallon fuel storage facility which serves the west test area.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4696 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: _____ 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

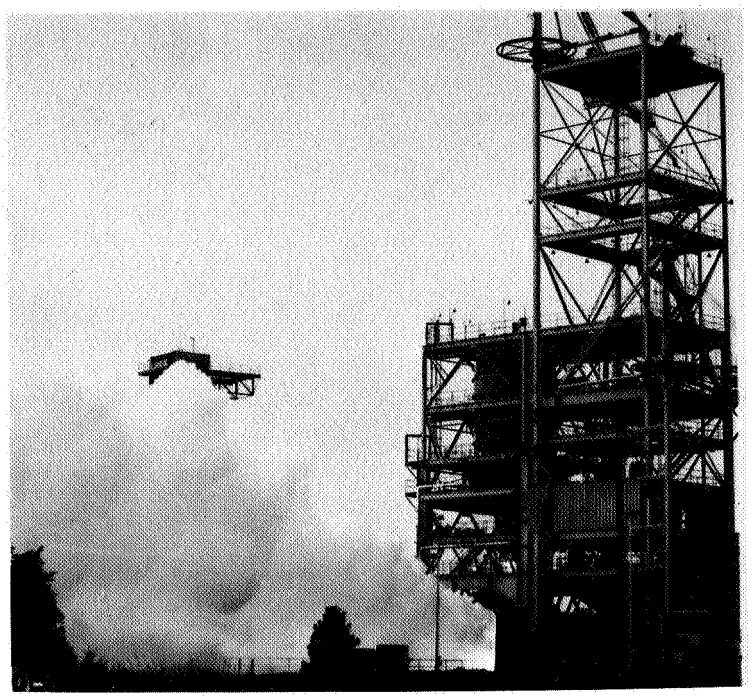
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-03

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: S-IVB Test Stand (4514)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand (S-IVB 4514)

5. TECHNOLOGICAL AREAS SUPPORTED: Stage Integration Testing, R&D Propulsion System Testing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The S-IVB Test Stand is a single-position LOX/hydrogen vertical static firing test stand. The superstructure of one position is 156 feet high and the other is 88 feet; the area of the two stands at the base is 2448 square feet. The shop and terminal room adjacent to the stand have an area of 3200 square feet. The stand can accept stages 60 feet long by 22 feet in diameter and can static fire 300,000 pound thrust stages or engines for 500 seconds duration. The superstructure is designed to withstand 300,000 pounds thrust.

6. NARRATIVE DESCRIPTION

The complex includes a 75-ton overhead derrick, 56,000-gallon LOX storage and 150,000-gallon hydrogen storage, 5000-psi GN_2, GHe and GH_2 service, 1400 cubic-foot H_2O volume, 5000-psi GH_2 storage and a water cooled deflector (25,000-gpm flow rate).

The run tanks now on the stand hold 77,000 gallons of LH_2 and 20,000 gallons of LOX. Instrumentation includes 132 pressure channels, 72 temperature channels, 72 vibration channels, and 120 event recorder channels.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4514 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

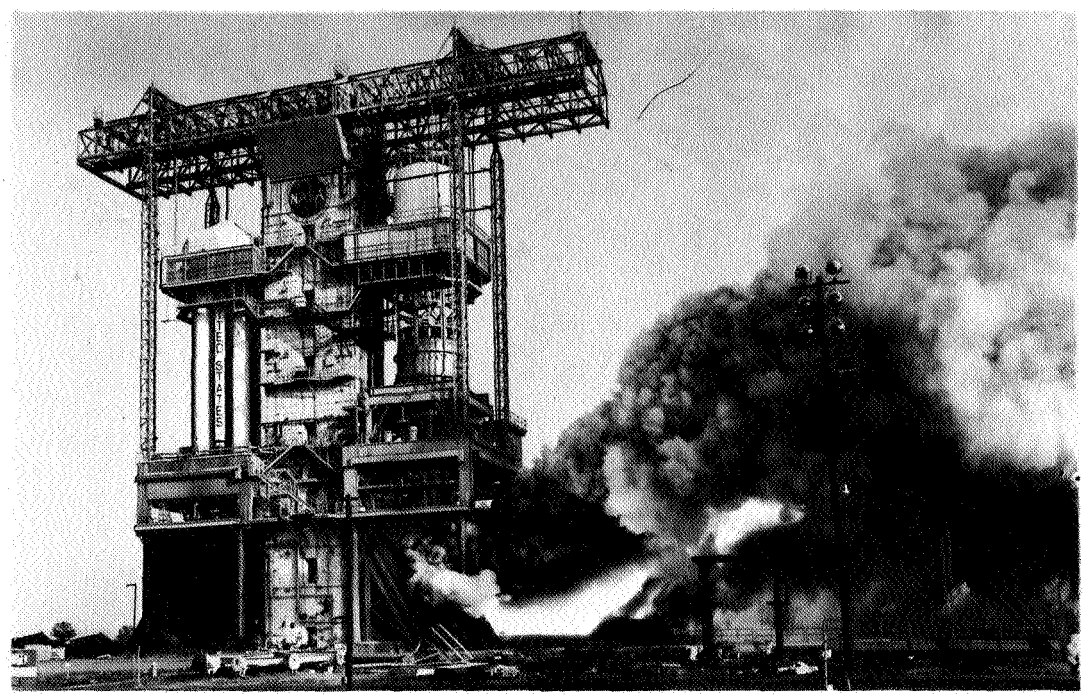
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-04

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Static Test Stand (4572)

3. LOCATION ***(if other than in 1. above):***



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand (4572)

5. TECHNOLOGICAL AREAS SUPPORTED: Stage and Engine Functional and Acceptance Testing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Static Test Tower is a two-position test stand, approximately 175 feet high and 600 square feet at the base. The support shop, office space and terminal room utilize 13,360 square feet of area. Each position of the tower can static fire 1.6 million pound thrust stages or engines utilizing LOX/kerosene propellants and accommodates stages 82 feet long and 22 feet in diameter. A 100-ton overhead crane and a 45-ton gantry crane serve the facility. Each position has water cooled deflector (50,000-gpm flow rate), 100,000-gallon LOX storage, 50,000-gallon RP1 storage, 5000-psi GN_2 and GHe service, and 1100 data channels wired into blockhouse.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4572 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

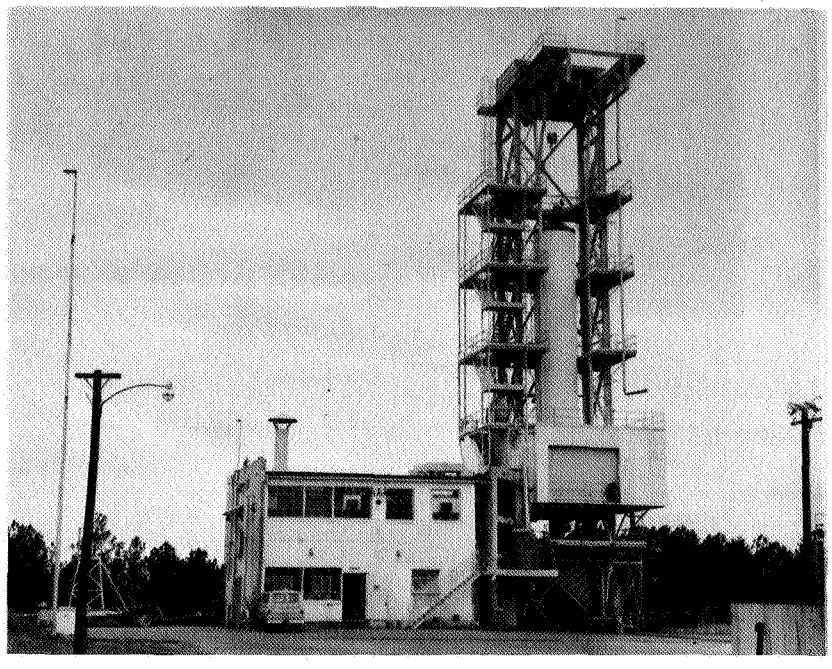
DATE OF RESUME: June 10, 1966

FACILITY NO: 12-00-07-05

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: H-1 Power Plant Test Stand **(4564)**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand, (H-1 4564)

5. TECHNOLOGICAL AREAS SUPPORTED: Stage Integration R&D Propulsion System Testing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The H-1 Power Plant Test Stand has two vertical static firing engine positions, each approximately 110 feet high; base areas are 480 and 216 square feet. Capability provides for static firing 225,000 pound thrust LOX/RP1 engines for 150 seconds duration. The stand has a 25-ton overhead bridge crane, 5000-psi GN_2 and GHe service and a water cooled deflector with 15,000-gpm flow rate. LOX is supplied from **S-IVB** stand storage (56,000 gallons) and RP1, from underground lines.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. 4564 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

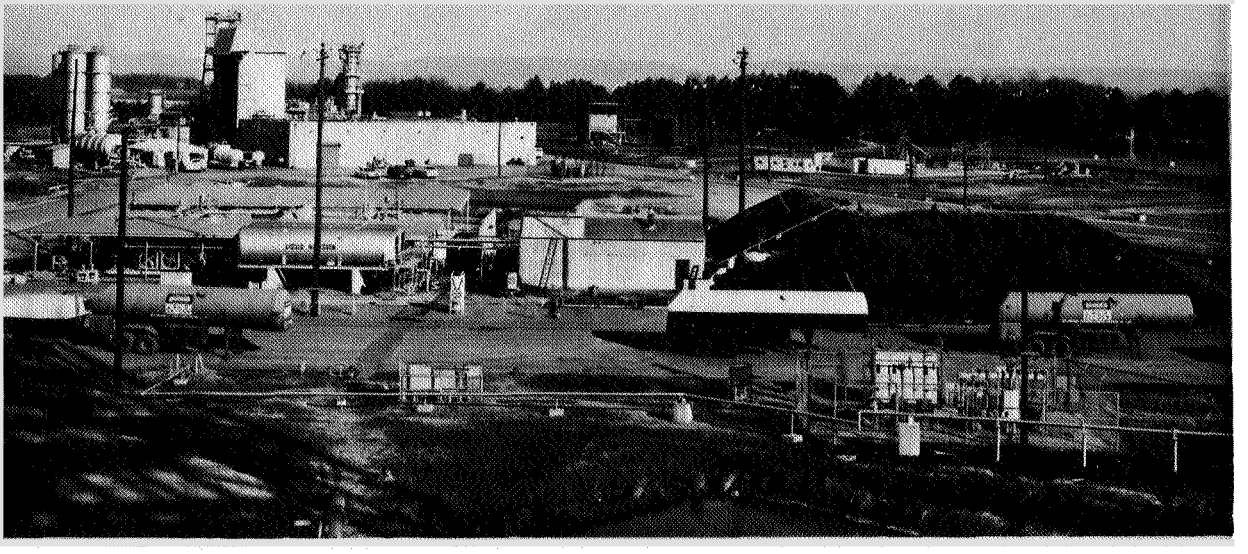
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-06

1 REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Interim (Redstone) Test Stand (4665 Area)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand, (Redstone 4665)

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket Propulsion

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Interim (Redstone) Test Stand has a superstructure 65 fee, high and 225 square feet at the base. The stand can static fire stages with 100,000 pounds thrust. Instrumentation includes 66 strip chart recorders, 90 oscillograph channels, 7 analog tape channels, 55 transmission cables (934 conductors) and a water cooled flame deflector (7000 gpm flow rate).

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4665 10. YR. BUILT: _____ **11.** FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K **13.** NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ **19.** CONTRACTOR NAME *(if* ***contr.*** *oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

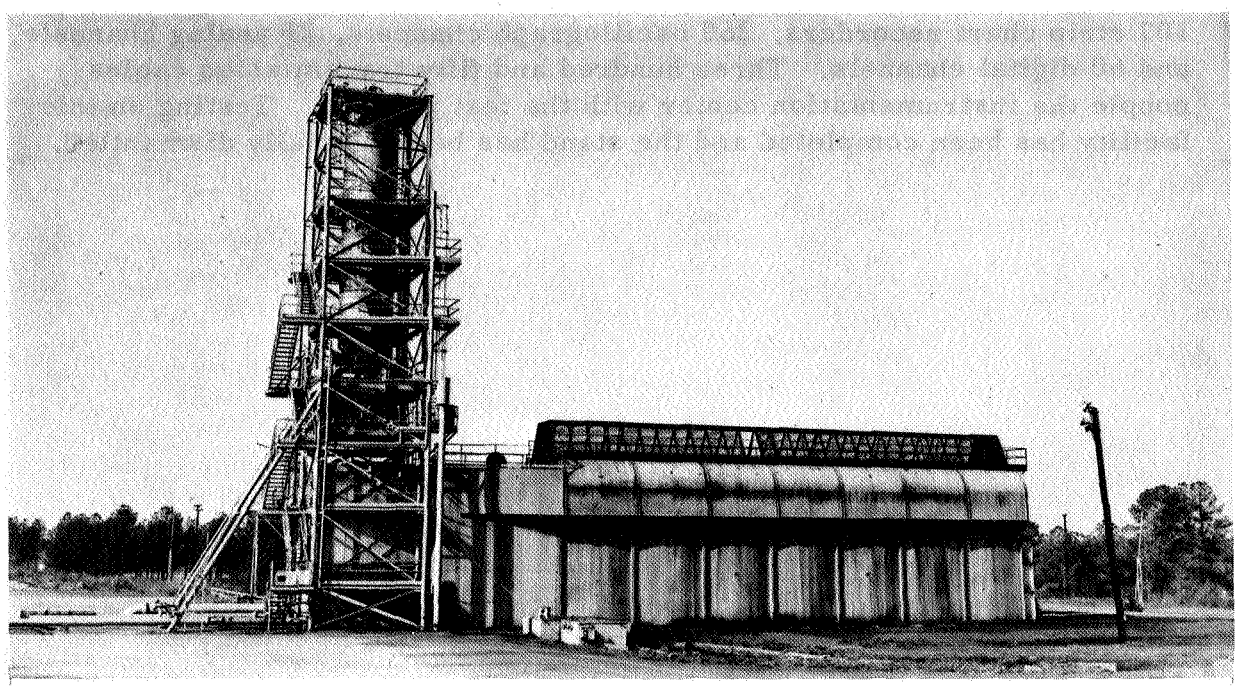
DATE OF RESUME: June 10, 1966

FACILITY NO: 12-00-07-07

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Sound Suppressor Test Stand (4665 Area)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Exhaust Effects Test Stand (4665 Area)

5. TECHNOLOGICAL AREAS SUPPORTED: Sound suppression

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Using the H-1 engine as a model, the Sound Suppressor Test Stand was constructed at the site of the existing Jupiter "Hop Test" stand.

In the initial test phase, tests were made to optimize suppression of rocket engine noise and air-propagated vibration. The suppressor was constructed so that the exhaust duct is surrounded by a water jacket formed by hollow walls and roof. The rocket exhaust was directed through a diffusor which acts as a jet pump, sucking water from the surrounding jacket into the exhaust system, and circulating it for reuse. The 165,000 pound thrust H-1 engine was used as a sound generator in

6. NARRATIVE DESCRIPTION

these tests. The suppressor is 21 feet high, 20 feet wide, and 130 feet long, with a water capacity of approximately 150,000 gallons. Sound level was reduced by 20 to 25 decibels in these tests.

As a second phase, five vanguard chambers (thrust equals 30K each) manifolded to one Mark 111-H-1 turbopump were used to simulate S-IC configuration at a 1-9 scale with the remaining suppressor as above at first. The suppressor was later modified to different configurations. Test data was recorded at the measuring center in the Interim Test area. The measuring capability was expanded for the phase of testing to include 107 strip chart recorders, 260 oscillograph channels, 21 analog channels, and 60 digital channels. Three hundred and fifty transmission cables couple the instrumentation center with the test position. Testing on this facility has been completed and the stand has been partially dismantled.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4665 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Standby

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

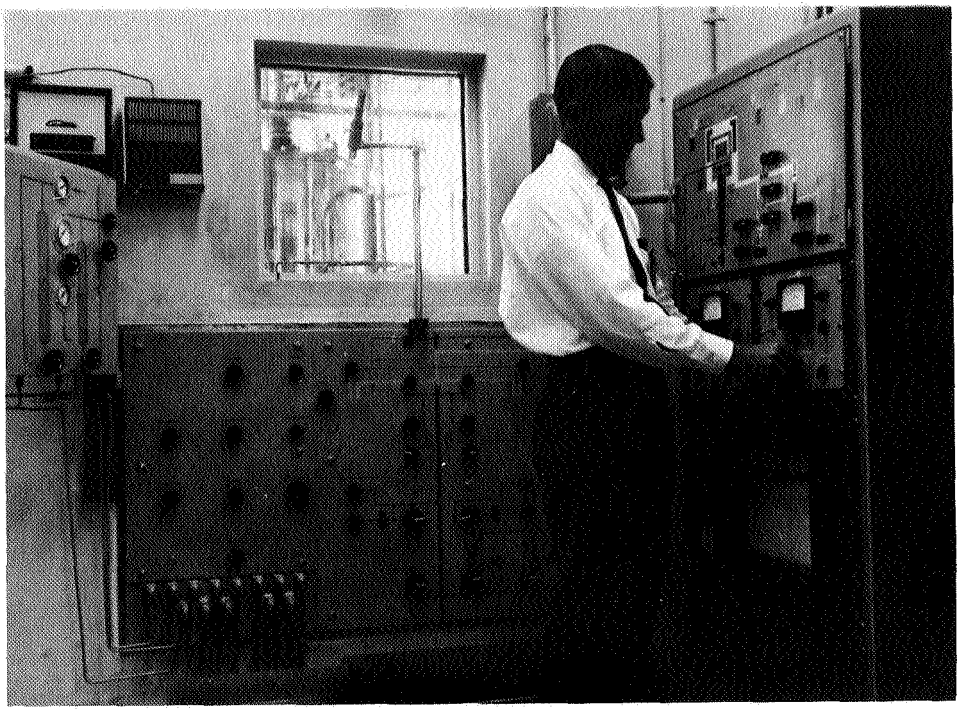
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	June 10, 1966
	FACILITY NO:	12-00-07-08

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Liquid Hydrogen Familiarization Facility (4710)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Altitude Test Stand (4710)

5. TECHNOLOGICAL AREAS SUPPORTED: Hydrogen fueled engines

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Liquid Hydrogen Familiarization Facility comprises a horizontal LOX/hydrogen engine static firing test stand with propellant tankage and flow measuring equipment. The engine test position has a supersonic diffuser, a steam accumulator and a steam eductor. The stand can static fire 15,000 pound thrust LOX/hydrogen engines for 180 seconds duration at a simulated altitude.

The facility has a 7500-gpm water supply for cooling and firing. The fuel tank holds 2000 gallons; the LOX tank contains 600 gallons and is supplemented with 1000 gallons from the LOX trailer for a total of

6. NARRATIVE DESCRIPTION

1600 gallons. The instrurnentation center contains 110 strip chart recorders, 60 oscillograph channels and 19 analog tape channels,, The stand has 5000-psi GN_2 and 3500-psi air service; He and GH_2 are furnished by trailers.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. ~~4710~~ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Test Laboratory**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

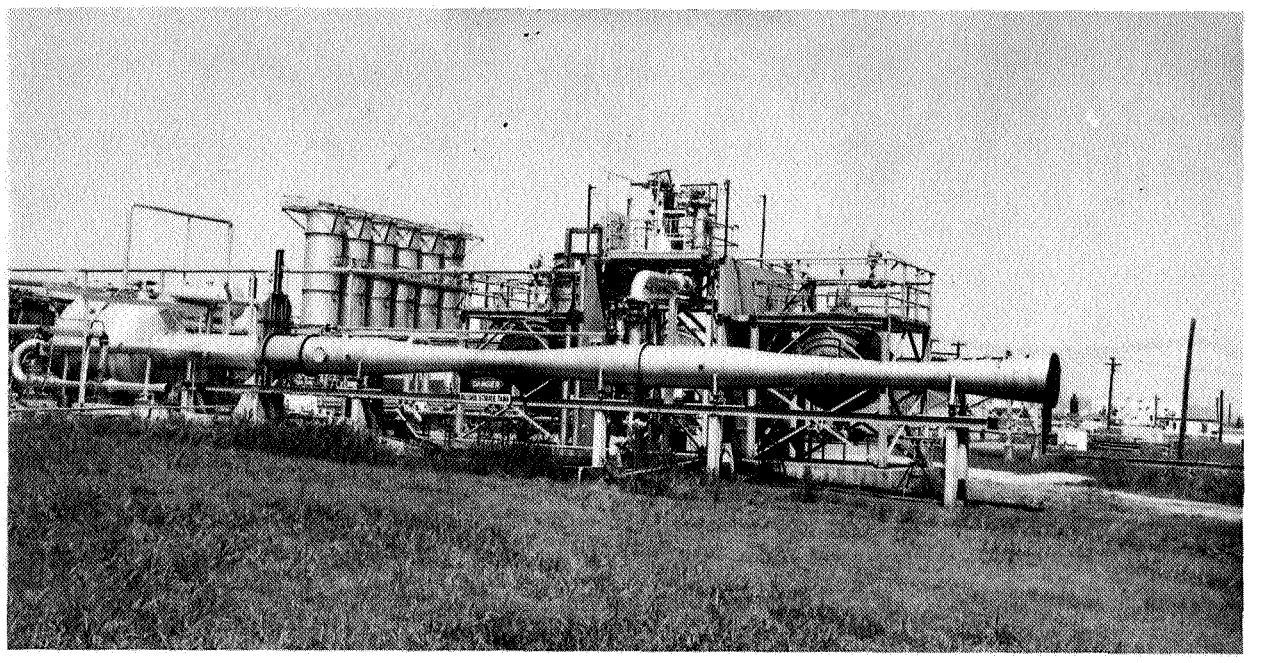
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-09

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Storable Propellant Test Facility (4753)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Altitude Test Cell (4753)

5. TECHNOLOGICAL AREAS SUPPORTED: Storable Propellant Engines, Altitude Firing

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Storable Propellant Test Facility has two positions capable of static firing storable propellant engines under simulated altitude conditions. Each consists of a steam ejector and altitude cell. The small cell (3-foot diameter by 4 feet) has the capability of firing single engines up to 150 pounds thrust. The large chamber (12-foot diameter by 15 feet) will accommodate the S-IVB Auxiliary Propulsion System Module. Each chamber will operate at an altitude of 120,000 feet. There are approximately 150 channels of instrumentation.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4753 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CORE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

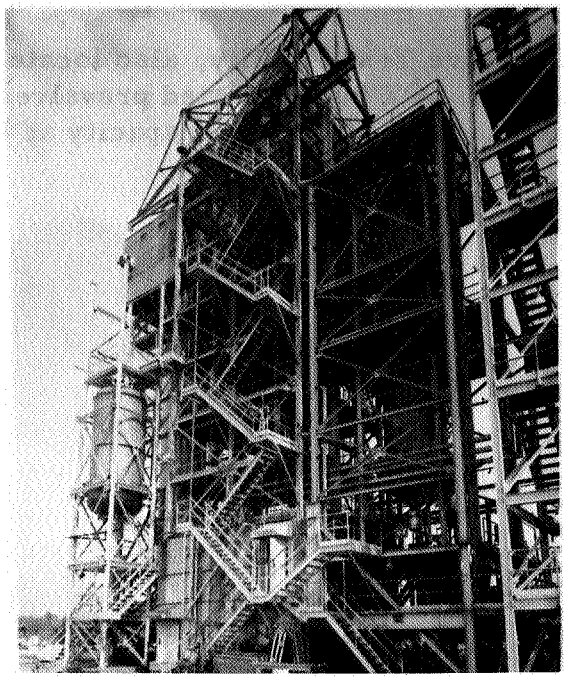
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	June 10, 1966
	FACILITY NO:	12-00-07-10

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Cold Calibration Test Stand (4588)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Propellant Systems Test Stand, Cold Flow (4588)

5. TECHNOLOGICAL AREAS SUPPORTED: Propellant systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The basic structure is 24 feet by 68 feet at the base, with a height of 84 feet. The three distinct test sections are described below.

The H-1 Turbopump Test Facility, located in the south side, utilizes a gas generator driven S-IB 200K H-1 turbopump to provide capability for performing checkout, calibration, qualification, research and development tests on the S-IB/H-1 turbopump and propellant feed systems. The gas generator is fed LOX from a 500-gallon capacity, 3000-psig pressure rated tank; fuel is pumped from the F-1 turbopump GG fuel run tank (reference F-1 Turbopump Test Facility). The H-1 turbopump is mounted on the H-1 bobtail engine with S-IB suction lines from simulated S-IB

6. NARRATIVE DESCRIPTION

tank sumps. The main LOX and fuel run tanks are each rated at 10,000 gallons and 150 psig. The facility utilizes a 12,500-gallon fuel catch tank. The F-1 turbopump LOX storage tanks are utilized as LOX catch tanks. There are approximately 180 instrumentation channels,

The 40,000-gpm Flow Bench, located at the north side, enables calibrations of large flowmeters in water. The tank holds 30,000 gallons of water and has 45-psig pressure rating. The two water pumps are each rated at 20,000 gpm and are driven by two 800-HP, 4160-Volt, three-phase motors,

The Tank Mounted Prevalve Test Facility, also located at the north side, provides for tests of S-IC LOX tank mounted prevalves under water flow conditions. The tank has a 10,000-gallon capacity at 150 psig.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4588 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

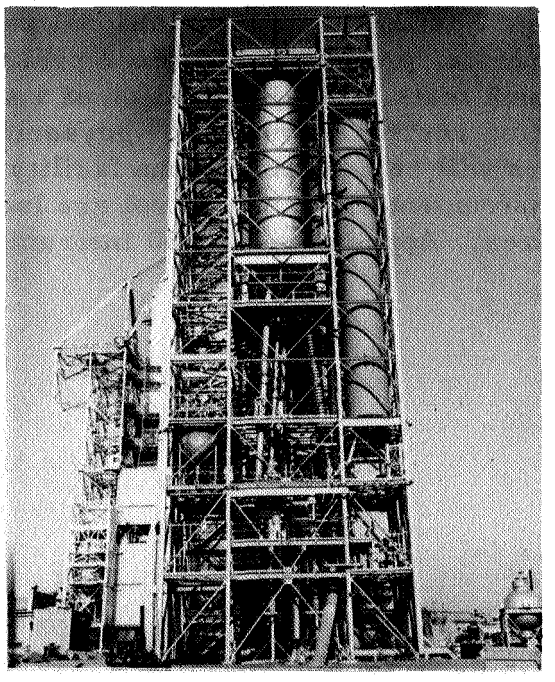
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-11

1 REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: F-1 Turbopump Facility (4548)

3 LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Propellant Systems Test Stand Cold Flow (4548)

5. TECHNOLOGICAL AREAS SUPPORTED: Propellant Feed Systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The F-1 Turbopump Facility is located adjacent to and south of the H-1 Cold Calibration Test Facility. The test stand is 156 feet high on a base that is 36 feet by 51 feet. The facility has a gas generator driven F-1 turbopump attached to an F-1 bobtail engine.

The facility provides the capability to perform checkout, calibration, qualification, and research and development tests on the S-IC/F-1 turbopump and propellant feed systems. The gas generator (GG) can be bootstrapped or operated with propellants supplied from auxiliary run tanks. S-IC fuel and LOX suction lines, separate from those supplying the F-1 turbopump, may be utilized to conduct PVC, prevalve and suction line qualification, and checkout and calibration tests. The run tank pressurization system

6. NARRATIVE DESCRIPTION

is designed so that flight simulated NPSH can be provided.

Tank capacities, when bootstrapping, provide for a maximum run time of 150 seconds at nominal operating conditions. The auxiliary GG feed systems allow testing with liquids other than F-1 propellants in the main pumping system and is designed to provide propellants to the GG for a maximum run time of 150 seconds. Capacity and pressure rating for the tanks are as follows: Main fuel run tank - 46,000 gal. at 100 psig; Main LOX run tank - 46,000 gal. at 150 psig; GG fuel tank -3,000 gal. at 2200 psig; GG LOX tank - 3,000 gal. at 1800 psig.

The F-1 Turbopump Test Facility provides additional capabilities for studies such as heat exchanger tests, prapellant container pressurization tests, filter and other component tests. The installation of a second LOX suction line provides the capability for recirculation and/or geysering tests. High pressure fuel for gimbal actuators will be available in the facility from normal engine source or GSE unit. Instrumentation and control are located in the main block-house of the east test area. Approximately 450 instrumentation channels are available.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO 4548 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Test Laboratory

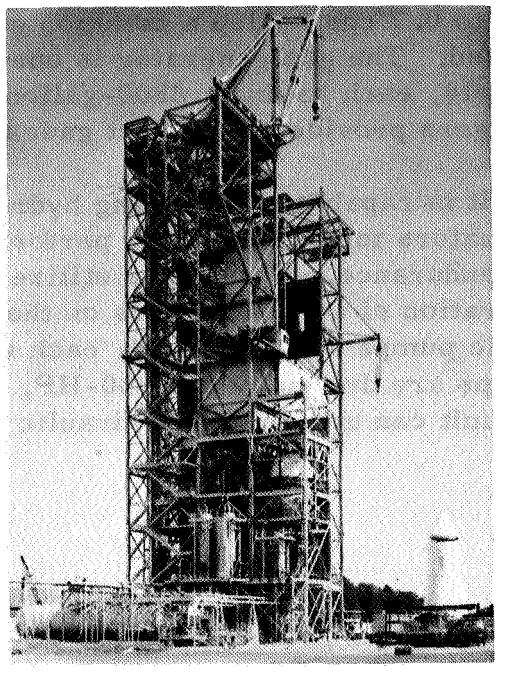
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-12

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: S-IB Dynamic Test Stand (4557)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Vibration Effects Test Stand, Rocket (4557)

5. TECHNOLOGICAL AREAS SUPPORTED: Structural Dynamics and Propellant tankage

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The basic structure of the facility has a base of 100 feet by 60 feet and is 204 feet in height, not including a 50-foot stiff leg derrick. The major facility is comprised of four parts: Dynamic Testing, **LOX** Slosh Test Facility, LH_2 Slosh Test Facility, and AMF Hydraulic Unit.

The Dynamic Test Facility provides the capability to dynamically test the entire Saturn IB vehicle and separate flight configurations. Vibration loads can be induced in the pitch, yaw, roll or longitudinal axis to obtain resonance frequencies and bending modes. The main derrick has a 75-ton hook with 50-foot radius and a 10-ton auxiliary hook of 60-foot radius. The jib hoist can accommodate up to 60 tons.

6. NARRATIVE DESCRIPTION

The LOX Slosh Facility is located in a bay of the basic structure and the LH_2 Slosh Facility is in a 24' x 24', 96' high extension. These Slosh test facilities are used for studying tank pressurization, propellant geysering, stratification, sloshing, pump recirculation and tanking phenomena. Approximately 250 instrumentation channels are available. The LOX slosh tank is a model of the S-IC LOX tank with 23,000-gallon, 60-psig rating and 5 LOX suction lines. The LH_2 slosh tank is an S-IV Battleship with a 32,000-gallon, 35-psig LH_2 tank and a 9500-gal., 45-psig LOX compartment, separated by a common bulkhead. The LOX compartment allows testing in an ellipsoidal tank. The s osh tanks are oscillated by a common hydraulic drive with a frequency range of 0.0 to 0.7 cps. Also a common gas generator-heat exchanger system is used. The gas generator is operated with propellants supplied from two vessels, each having a 2800-gallon, 1500-psig rating. Two H-1 engine heat exchangers provide pressurant gases.

The AMF Hydraulic Unit is capable of supplying hydraulic fluids for operation of F-1 engine servoactuators to evaluate their performance, capabilities, gimbal properties and endurance, The unit is utilized for the calibration of the servovalve and operation of servoactuators on the Saturn V Dynamic vehicle, Four hydraulic pumps are employed, each with a rating of 110 gpm at 3500 psig. The pumps are driven by two 350-HP, 4160-volt, 3-phase electric motors, The unit can utilize 5606 hydraulic oil, JP1 or RP1 fluid.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4557 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

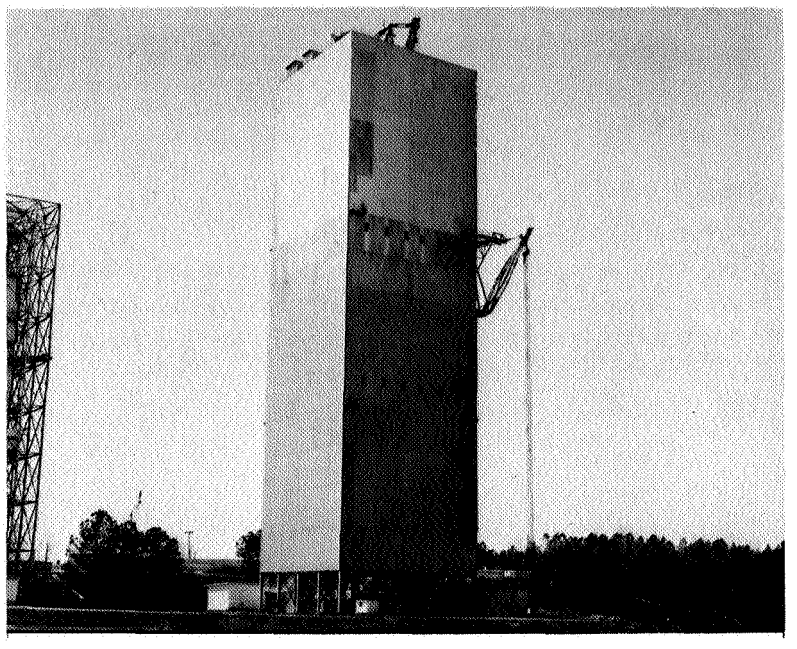
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-13

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: S-V Dynamic Test Stand (4550)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Vibration Effects Test Stand, Rocket (4550)

5. TECHNOLOGICAL AREAS SUPPORTED: Structural Dynamics

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This test installationconsists of a Dynamic Testing Facility with a base area 98 feet by 98 feet and 360 feet high, excluding the 64-foot stiff leg derrick. Dynamic tests on the entire Saturn V vehicle as well as on separate flight configurations are conducted in this facility. Vibration loads are induced in the pitch, yaw, roll and longitudinal axis to obtain resonance frequencies and bending modes. The main derrick has a 200-ton hook with 70-foot radius and an auxiliary 40-ton hook with radius of 100 feet; the secondary derrick has a 175-ton hook with 50-foot radius,

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4550 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20, OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

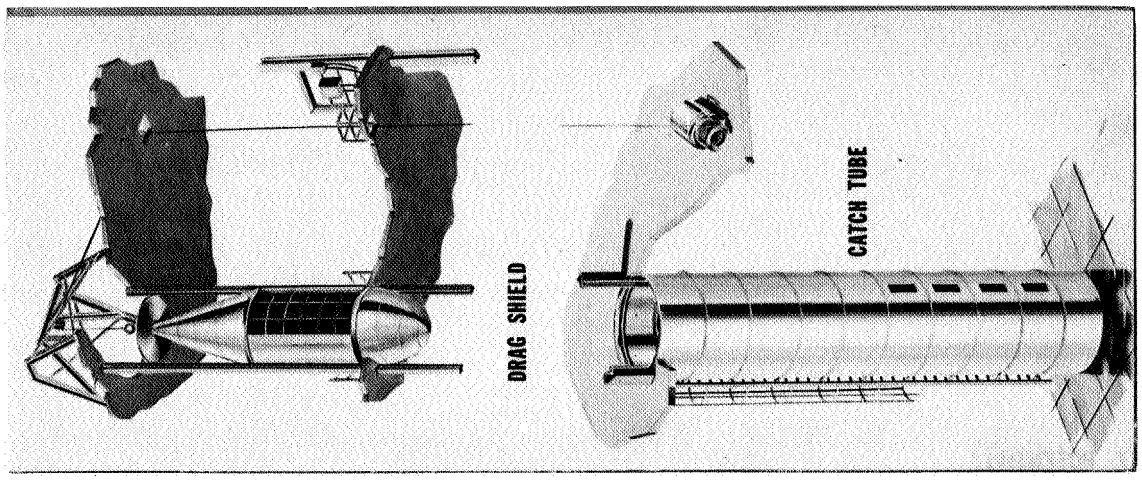
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 10, 1966
FACILITY NO: 12-00-07-14

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Low Gravity Test Facility (4550)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Drop Tower, Reduced Gravity Effects (4550)

5. TECHNOLOGICAL AREAS SUPPORTED: Low Gravity Physical Phenomena

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Low Gravity Test Facility, located in a bay of the Dynamic Test Facility, provides a free fall height of 296 feet with maximum drop weight of 4000 pounds at a 25 g deceleration. The test package envelopes used are 3 feet in diameter by 4 feet long with a weight of 400 pounds and deceleration range of 15 to 25 g's. The test environment can achieve a maximum of 2.5×10^{-2} g down to a minimum of 10^{-5} g. Studies of low gravity fluid mechanics and thermodynamics phenomena are performed, calibrations of accelerometers are made and flight instrumentation can be subjected to low gravity conditions.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4550 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

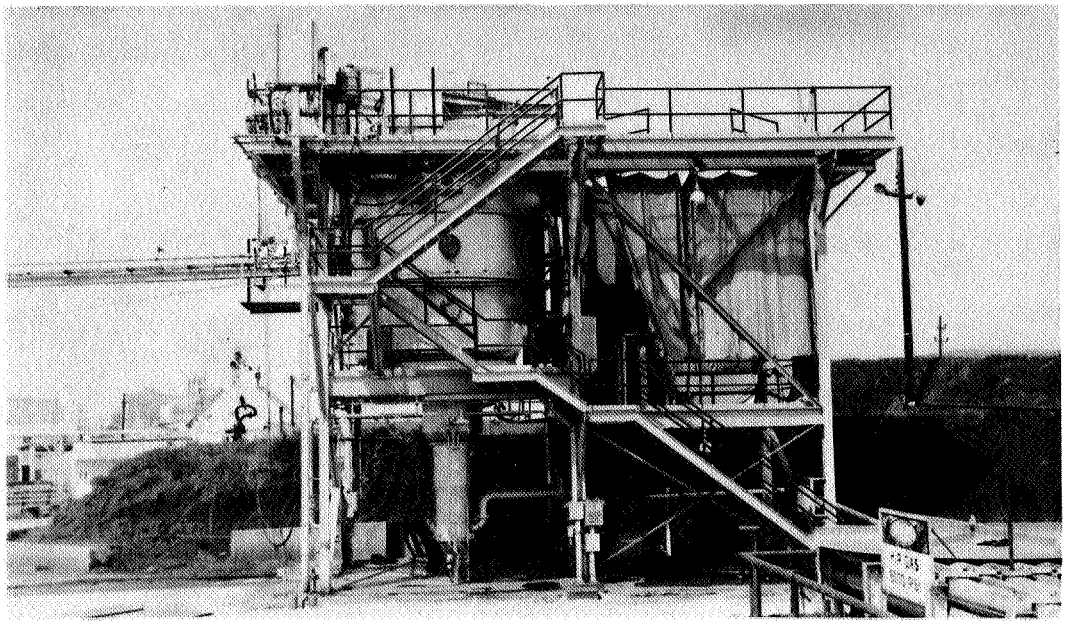
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-15

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Ultra High Vacuum Facility (at **4748)**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility (4748)

5. TECHNOLOGICAL AREAS SUPPORTED: Space Environment Effects , Propellant Systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is designed to test under simulated altitude conditions super insulated tanks containing LH_2. The vacuum chamber is 15 feet diameter by 20 feet high and is constructed entirely of stainless steel. The chamber utilizes two 59,000 liter-per-second diffusion pumps. A cold shroud and cryopumping array is being added to the chamber.

Capability enables conducting hazardous tests at a simulated pressure altitude of 1×10^{-6} Torr. With the addition of the cold shroud, the pressure obtainable will be 1×10^{-9} Torr. The heat sink of space will be simulated by the liquid nitrogen cold shroud. The instrumentation capability at this facility is approximately 150 channels of information.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4748 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if **contr. oper.**):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

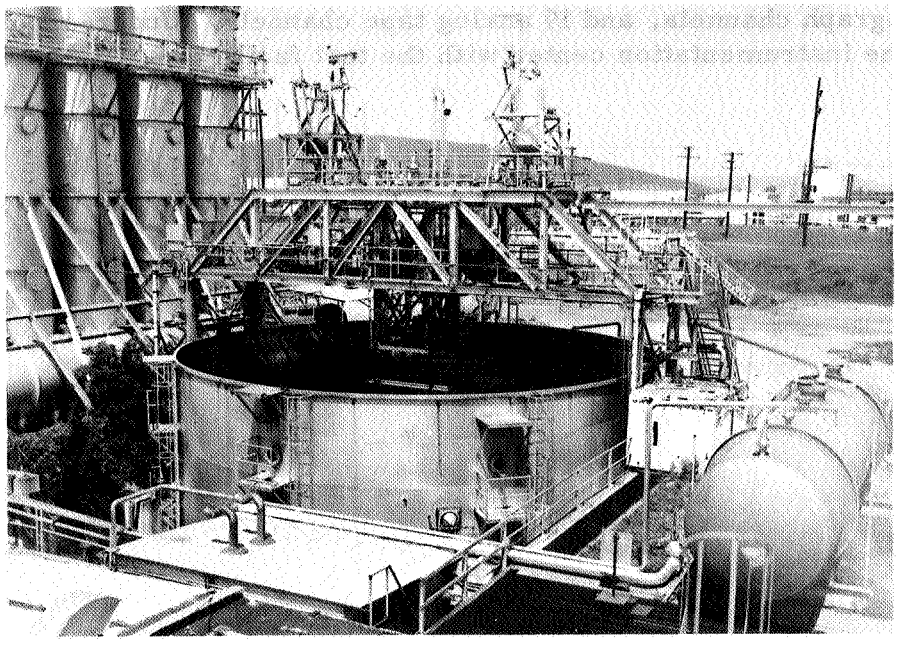
22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME	DATE OF RESUME:	June 13, 1966
	FACILITY NO:	12-00-07-16

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Test Facility Building 4750

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Environmental Test Facility, Rocket Systems (4750)

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket Systems altitude ignition and launch methods.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This facility is equipped for conducting various test programs involving hot firing of small rocket systems, environmental studies, and high altitude ignition. A 15,000 cubic foot vacuum drying chamber is available for items up to 105 inches in diameter. The chamber has provisions for steam heating and can be evacuated to an absolute pressure equivalent to four millimeters of mercury.

For high altitude ignition testing of small rockets, there is a vacuum facility with a volume of 42,000 cubic feet. The system can be evacuated to an absolute pressure equivalent to four millimeters of mercury.

6. NARRATIVE DESCRIPTION

Tests at the Over Water Launch Facility determine splash effects, jet penetration depths, and the effects of under water deflectors when firing rockets into water,

The "Y" Manifold Test Facility has been used with water flow to calibrate orifice sizes in ducts. It has been modified to study interstage temperature extremes, and other environmental effects.

Instrumentation to all the above facilities is provided by a central location in the West end of Building 4746 and furnishes 110 channels of strip chart recorders, 60 oscillograph channels, and 19 analog tape channels. Under-ground cables connect the instrumentation center with the test facility,

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4750 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

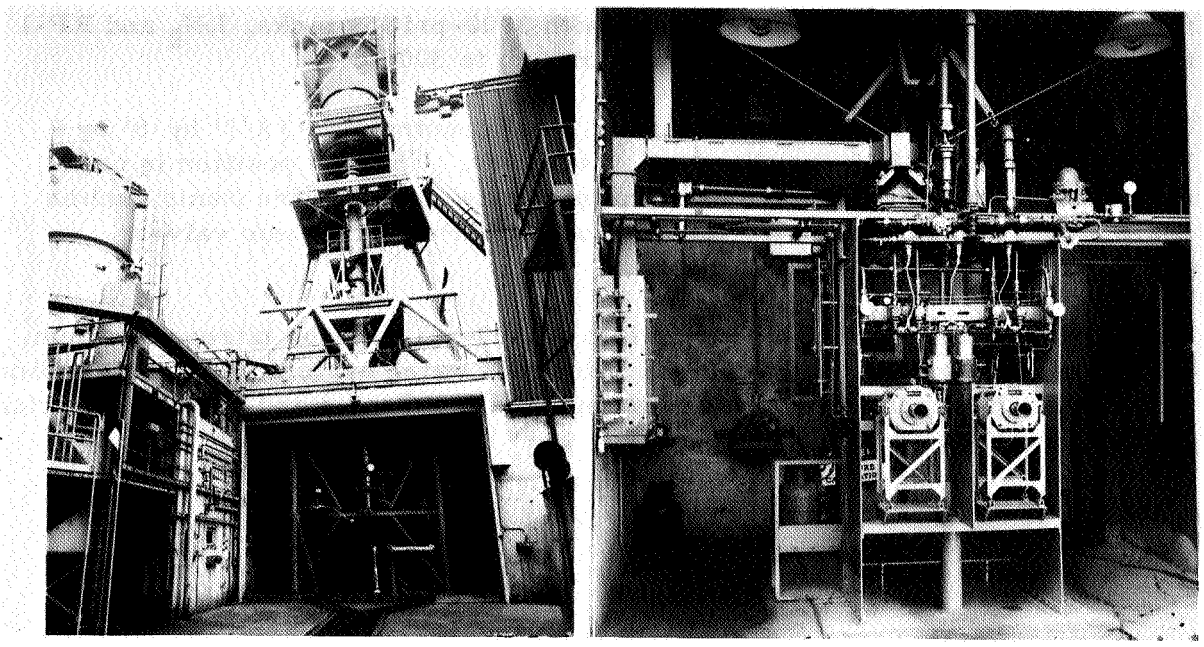
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-17

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville,. Alabama

2. FACILITY NAME: Test Positions 100 thru 108 (4583)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Component Hazardous Test Cells (4583)

5. TECHNOLOGICAL AREAS SUPPORTED: Propellant flow and combustion, nozzles and component hardware

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Test Position 100 is an outdoor test cell of explosion proof construction, 26' square and approx. 60' high. The test position is used for hazardous testing of cryogenic centrifugal pumps or other rotating equipment. The test units are mounted on 6' by 16' steel bed in the floor. A 1200 hp variable speed DC motor, delivering a shaft speed of 0 to 15,000 rpm through gear boxes to the test cell to drive rotary test items, is capable of developing 2400 hp for a few minutes. The upper part of the test cell contains an 1800-gal. lox tank and a 5000-gal. 50-psi lox tank. The test cell has direct connection to adjacent 28,000 gal. catch and storage lox tank.

Test Position 101 is an outdoor test cell, 26' square and 20' high, of explosion proof concrete construction, open at one end with viewing windows at opposite

6. NARRATIVE DESCRIPTION

end. This test cell is suitable for test of hardware such as cryogenic thermal pumping systems, cryogenic pumps and valves, and cryogenic materials evaluation. The cell is connected to a 10,000 gal. 50-psi lox tank, and a 500-gal., 300-psi lox tank.

Test Positions 102 thru 108 are outdoor test cells of explosion proof construction, open at one end with viewing windows at the opposite end. They are 15 ft. deep by 12 ft. high. Cells 102, 103 and 104 are 12 ft. wide. The others are 16 ft. wide. They are suitable for research and development performance tests on hardware items such as scale model combustors, cryogenic valves, gas generator combustors, heat exchangers, pneumatic-hydraulic equipment and for flow studies. The cells are connected with 3000-psi lox tanks, LN_2 and RP-1 tanks and water tanks of varying pressures up to 3000 psi.

Test Position 105B is an open structural steel construction 3 1/3' by 6' by 8 1/2' high, located 30' from observation windows. The test position is used for research and development performance tests, on hardware items such as scale model combustors using lox/GN_2 or lox/RP-1, cryogenic valves pneumatic equipment, and water flow.

Each of these test positions is tied into a 5000-psi gaseous nitrogen system, a 3500-psi air system, and a 150-psi industrial water system. Instrumentation is accomplished from a Recording Instrumentation Center and remote electrical control consoles.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO.	4583	10. YR. BUILT:		11. FAC. CAT. CODE:	
12. INITIAL COST: $	K	13. NASA B.O.D.		14. STATUS CODE:	Active
15. ACCUM. COST: $	K	16. LIFE EXPECT.	Indef.	17. OWNER CODE:	NASA
18. OPER. CODE:		19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

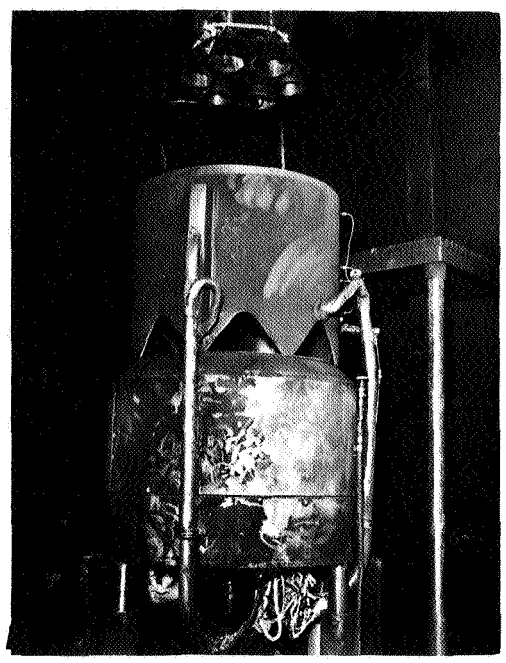
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-18

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Test Position 112 (4583)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Altitude Test Cell (4583)

5. TECHNOLOGICAL AREAS SUPPORTED: Altitude Environment

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Test Position 112 is an altitude test facility consisting of a test cell 8 feet in diameter by 37 feet high connected to four 55-foot tall tanks by a large diameter manifold. The total internal volume is 19,900 cubic feet. Vacuum is drawn by mechanical pumps and the maximum vacuum available is 29.29 inches of mercury or the equivalent of 135,200 feet altitude.

This test position conducts altitude studies such as materials tests, ignition problems, scaled vehicle studies such as separation of upper stages, lunar surface studies, attitude control motors and jet plume behavior.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4583 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

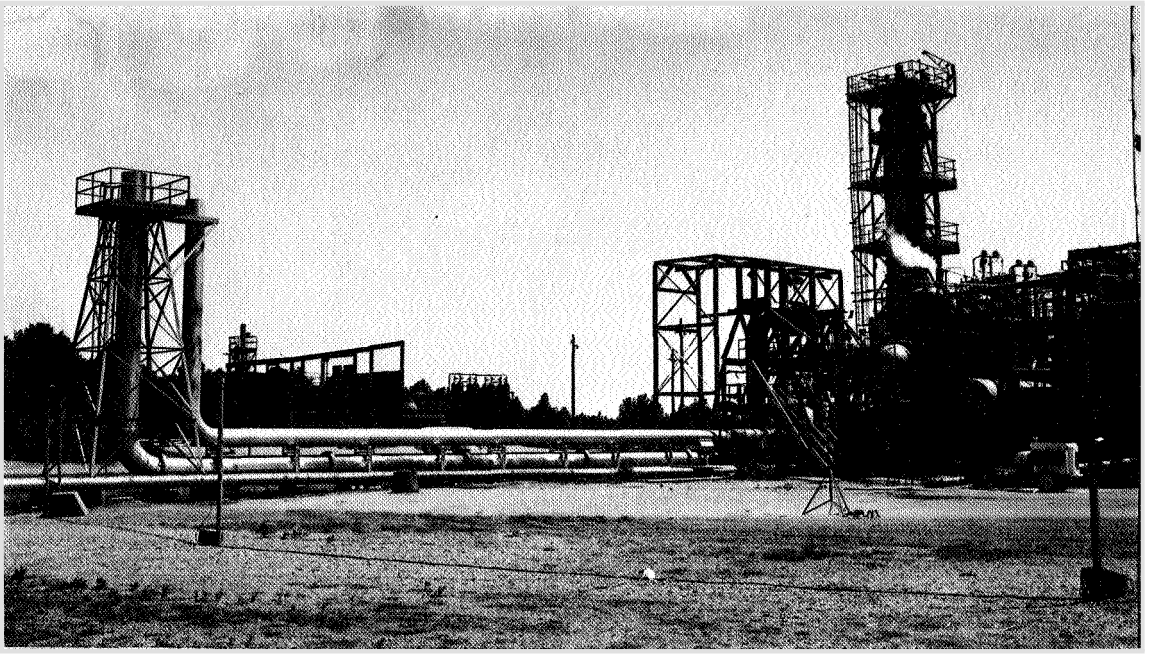
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-19

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Test Positions 113, 114 and 117 (at 4583)

3. LOCATION **(if *other* than in *1.* above):**



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand, Model & Componet (4583)

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket combustion and component hardware.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The open structural steel structure, located 30 feet from the Control and Service Center, Building 4583, is connected to 2800-gallon, 1500-psi LOX, RP1 and water tanks, a 10,000-gallon, 50-psi LOX tank, 500-gallon, 500-psi RP1 tank, 5000-psi gaseous nitrogen supply, 3500-psi air supply and 150-psi industrial water system. It is serviced by the recording instrumentation center and electrical control consoles in Building 4583.

The test position is rated at 50,000 pounds thrust and is suited for research and development performance tests on hardware, including clusters of scale model combustors, flame deflectors, gas generator combustors, heat exchangers, exhaust ducting, cryogenic valves, gas pressurization systems,

6. NARRATIVE DESCRIPTION *(continued from* pg. *1)*

water flow and pneumatic-hydraulic equipment.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4583 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: **NASA**

18. OPER. CODE: _____ 19. CONTRACTOR NAME (if *contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

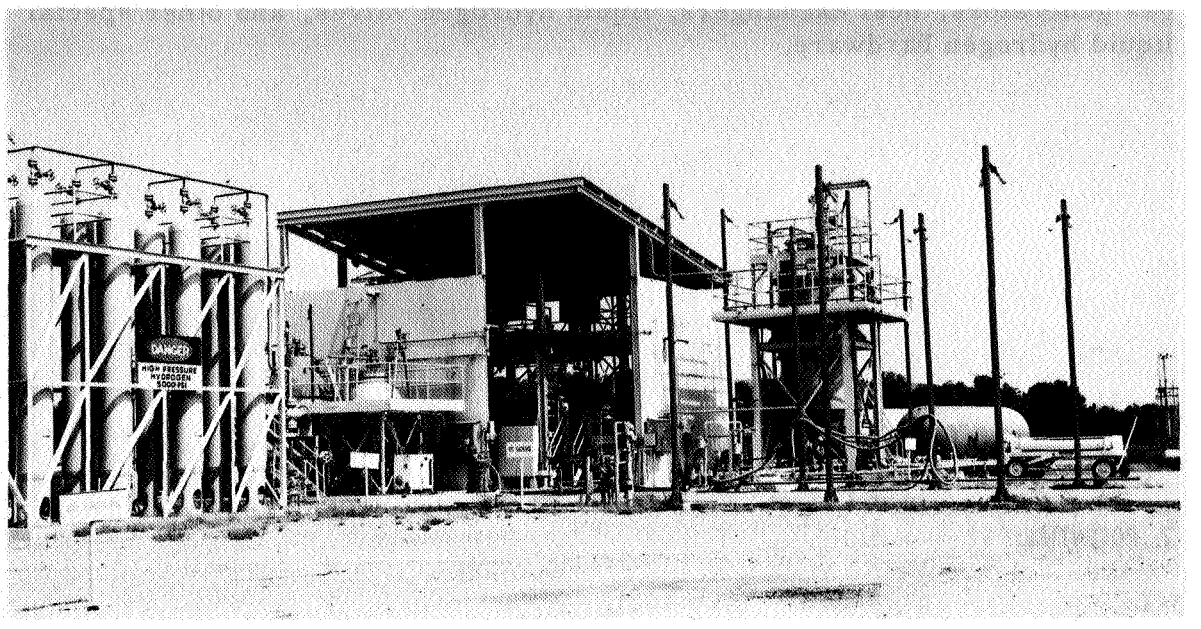
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-20

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Test Position 115 (at 4583)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Test Stand (4583)

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket combustion, He and LH_2

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Test Position 115 is an outdoor, open steel structure with a roof. The test stand has two 25-foot square grating-covered working areas approximately four feet above the ground capable of handling thrusts up to 50,000 pounds,

The test position has a 2200 gallon, 1500 psi LH_2 tank; 500 gallon, 5000 psi lox tank; 500 gallon, 1000 psi water tank; a 5000 psi GH_2 supply; 250-cubic foot, 5000 psi GN_2 supply; and a 150 psi industrial water supply. Burn stacks for **hydrogen** disposal are provided. Instrumentation is accomplished by the Recording Instrumentation Center and by remote electrical control consoles.

6. NARRATIVE DESCRIPTION

An observation bunker for four people is provided to conduct tests. The stand has two test positions, 115A and 115B:

Test Position 115A: Research and development high response instrumented combustor for combustion stability studies of lox/GHe with chamber pressures up to 3000 psi, Lox/LH_2 tests to simulate lox-rich preburner conditions and other hot gas lox/He studies are readily adaptable to this facility.

Test Position 115B: A lox/LH_2 hot gas setup with a separate burn stack for disposal of gas generator products. ,It is readily adaptable to such items as gas generators, heat exchangers, liquid hydrogen valves, and other special liquid hydrogen hardware,

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4583 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. .OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

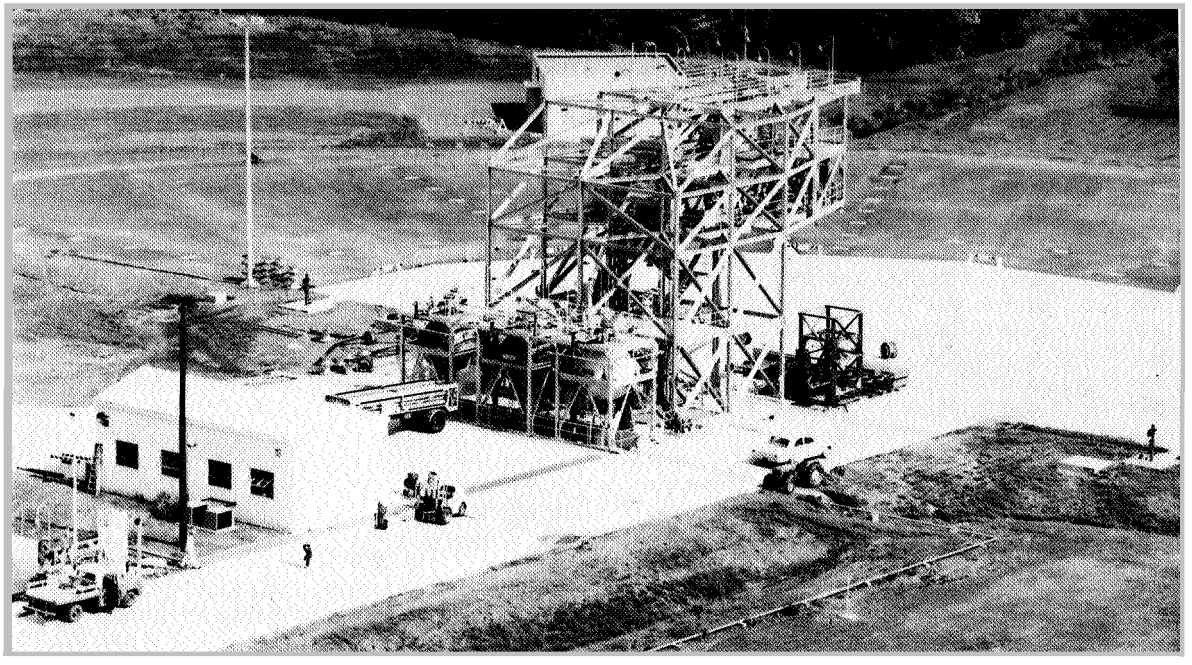
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-21

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Test Position 116 (at 4540)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Acoustic Effects Test Stand (4540)

5. TECHNOLOGICAL AREAS SUPPORTED: Dynamic Pressure Effects, Low Frequency Noise

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Test Position 116 at Building 4540 is an open structural steel construction incorporating a cantilevered section for mounting test items. There is no support structure within 22 feet from the centerline of the cantilevered tower framework. The structure is designed for 70K vertical thrust at cantilevered centerline. There is a five-ton bridge crane on the top (50-ft.) level. A 20-ft. by 20-ft. by 3-ft. deep heavy reinforced concrete pad with embedded anchorage system is symetrically aligned below the cantilevered centerline. It is designed for 70K horizontal thrust 10 feet above the pit floor.

This facility provides a unique capability providing acoustically clean environment and instrumentation for studies of dynamic pressures generated by noise sources. It can readily be adapted for checkout tests of rocket

6. NARRATIVE DESCRIPTION

engines, cryogenic valves, etc. Isolated location and direction of firing would accommodate exotic propellant.tests,

One hundred and forty-eight (148) acoustic measuring stations are strategically spaced on 10-degree intervals covering 180 degrees on a 250-ft. radius hardstand area with its center being the cantilevered center. Acoustic instrumentation is ducted to the Control Building 4541.

The test position has a 14,000-gallon, 50 psig lox storage tank; 3000-gallon, 2000 psig lox and RP-1 tank; 3000-gallon, 1000 psi water tank; and is connected to a 5000 psi gaseous helium supply, a 5000 psig gaseous nitrogen supply, and a 150 psi industrial water supply.

Instrumentation goes underground to the Instrumentation Center at Building 4583. The electrical control and acoustical instrumentation is ducted underground to the Control Building 4541, which is explosion proof with observation windows,

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4540 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr oper.)*:

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

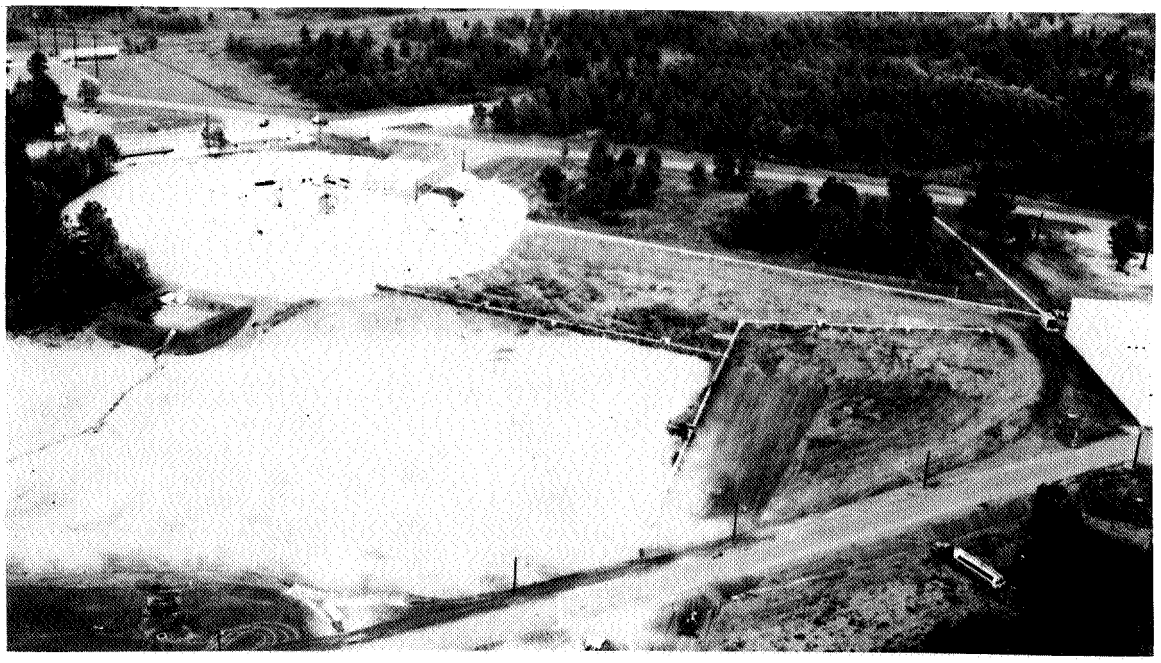
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-22

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Test Positions 301 and **302** (4530)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Component Test Stand (4530)

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket Hardware

6. NARRATIVE DESCRIPTION **OF** FACILITY CAPABILITIES & FUNCTIONS:

This test position has two open concrete pads, **32** feet wide, **32** feet long, with 1-beams embedded. Pads are separated by a reinforced concrete building which serves as a termination center for instrumentation and control cables.

This stand is suitable for research and development tests on hardware items such as full scale combustors, gas generators, heat exchangers, exhaust ducts, pressurization systems, water flow tests, cryogenic valves and pumps, cryogenic materials evaluation, and pneumatic-hydraulic equipment.

This test position is equipped with **3000** gallons, 5000 psi lox and RP-1 run-tanks; 10,000 gallon, 50 psi lox tank for flow and pressurization tests; **28,000** gallon lox supply tank; 20,000 gallon RP-1 storage tank; 5000 psi

6. NARRATIVE DESCRIPTION

gaseous nitrogen supply; **3500** psi air supply; 150 psi industrial water system. Instrumentation is accomplished from the Recording Instrumentation Center, located in Building **4583,** and by electrical control consoles. This position has a rated thrust of 200,000 pounds in the horizontal or vertical direction.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4530 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

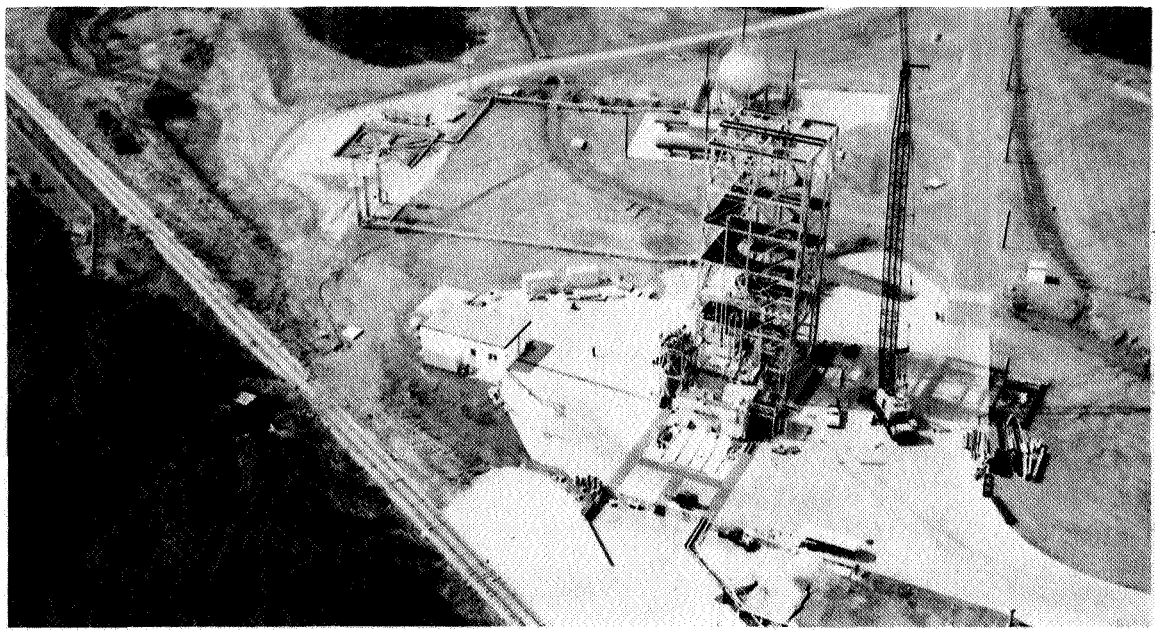
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 13, 1966
FACILITY NO: 12-00-07-23

1. REPORTING INSTALLATION: Marshall Space Flight. Center, Huntsville, Alabama

2. FACILITY NAME: Test Position 500 (dual 501 and 502) (4522)

3. LOCATION *(if other than in I. above):*



4. FUNCTIONAL NAME: Rocket Component Test Stand, LOX/H Cold Flow (4522)

5. TECHNOLOGICAL AREAS SUPPORTED: Propellant Systems

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The test stand has dual positions. Side 501 has a steel superstructure which will contain a 65-psi LH tank of approximately 65,000 gallons and an 18,000 gallon, 65-psi LOX tank? The 502 side is arranged with I-beams embedded in a 31.5 foot square concrete pad and has no superstructure. The 501 side is capable of tests on LOX/hydrogen turbopumps where pump discharge fluids are returned to storage, or tests on items with similar requirements. The 502 side will handle nearly any LOX/hydrogen component or vehicle subsystem test.

Additional facility tanks situated at the stand are a 5000-gallon, 2000-psi LH_2 tank and a 3000-gallon, 2000-psi LOX tank. Adjacent to the stand is a 110,000-gallon LH_2 storage sphere, a 13,000-gallon LN_2 storage tank,

6. NARRATIVE DESCRIPTION

a 28,000-gallon LOX storage tank, two 5000-psi, 700 cubic-foot gaseous hydrogen tanks, a 350 cubic-foot 5000-psi helium tank and a hydrogen converter for re-charging the 5000-psi containers. 5000-psi GN_2 and 3500-psi air are available at the stand.

Piping systems have been provided to facilitate transferring LH_2 and **LOX** from storage to the stand and back and burn stacks and a burn pond handle hydrogen disposal. The stand is served by the recording instrumentation center in Building 4583 and by electrical remote control consoles in Building 4561.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4522 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 14, 1966
FACILITY NO: 12-00-07-24

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Saturn V GSE Test Facility (at 4646)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Launch Simulation Facility, Saturn V (4646)

5. TECHNOLOGICAL AREAS SUPPORTED: Launch Pad Equipment

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

This Ground Support Equipment (GSE) Test Facility occupies a paved area of over ten acres. The GSE Assembly Building, S-4656, is located one-fourth mile to the East. This is the first place where components are mated together to make a complete item of GSE. Operational and development type testing of umbilical tower service arms, launcher (holddown) arms, tail service masts and their associated equipment such as electrical control consoles and handling equipment is carried on in the test area. All tests are made under launch simulated conditions. Vehicle life-off, rain, wind, vehicle random motion due to wind, are conditions imposed upon the equipment under test, Compressed gases and propellants, including cryogenics, are available as required. This facility also includes a blockhouse for instrumentation and control, five support buildings for operating personnel, and a pumphouse to house the central

6. NARRATIVE DESCRIPTION

hydraulic system for the swing arm random lateral motion simulators. Checkout, assembly, and modification type operations are performed in the assembly building prior to and after testing in the GSE facility. Engineering office space is available in this building for all test engineers (instrumentation, control, and mechanical) concerned with GSE.

Sufficient positions are provided in the GSE Test Facility to test ten umbilical tower service arms with eight vehicle simulators and ten simulated umbilical towers. This includes provision for one Saturn 1B Access Arm and a complete set of service arms for one LC-39 Mobile Launcher, The tower simulators on which the arms are mounted are identical to that portion of the umbilical tower on the Mobile Launcher where they are mounted. The vehicle simulators have the capability of simulating the random lateral motion of the vehicle with relation to the umbilical tower under various conditions (mostly wind). Lift-off capabilities at the same acceleration as the vehicle are provided for those arms with this requirement. Wind machines are used to produce hurricane-force winds, and remote controlled water nozzles provide the rain needed to duplicate actual launch pad conditions. Cryogenics and compressed gases are available as required. Tests are performed under severe launch conditions in order that reliable equipment can be provided which will require a minimum of modification once installed into a launch complex.

A Tail Service Mast (Dickie Bird) Test Position in the GSE Test Facility is capable of testing three Saturn V tail service masts simultsneously. A vehicle simulator is provided which has the same skin panel and umbilical connectors and will lift-off at the same acceleration as the vehicle, A tank system is provided which will flow 2,000 gallons per minute of water.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4646 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr, oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

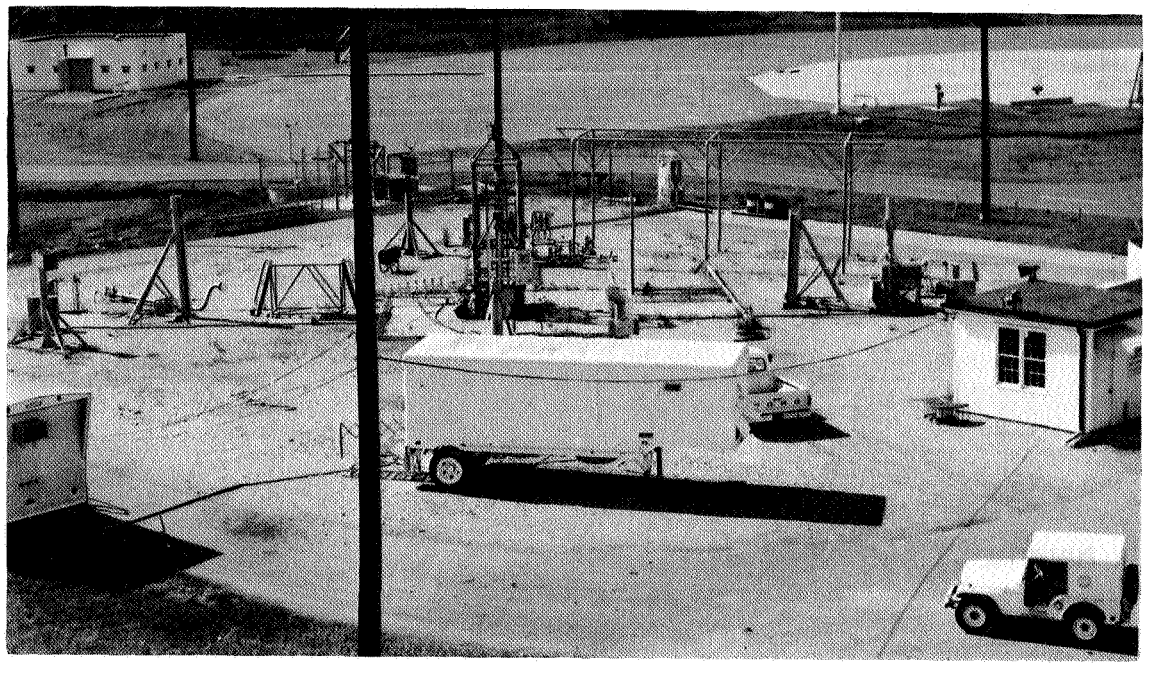
TECHNICAL FACILITIES RESUME -

DATE OF RESUME: June 14, 1966
FACILITY NO: 12-00-07-25

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Swing Arm Test Facility (at **4583)**

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Missile Lift-off Simulator Facility (45**83)**

5. TECHNOLOGICAL AREAS SUPPORTED: Launch

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Swing Arm Test Facility is located in the main Test Laboratory East Area near Building 4583. This facility can test four swing arms simultaneously using mounting provisions the same as those used on the umbilical tower. **A** vehicle lift-off simulator provides eight feet of vertical travel at the approximate acceleration of the vehicle being simulated. Cryogenic fluids (liquid hydrogen and liquid nitrogen) and compressed gases are used to checkout servicing lines and umbilical connectors under launch conditions.

Again it should be noted that actual launch conditions are duplicated to the maximum extent in order that all defects can be corrected prior to shipment and installation at Cape Kennedy.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4583 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Test Laboratory**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

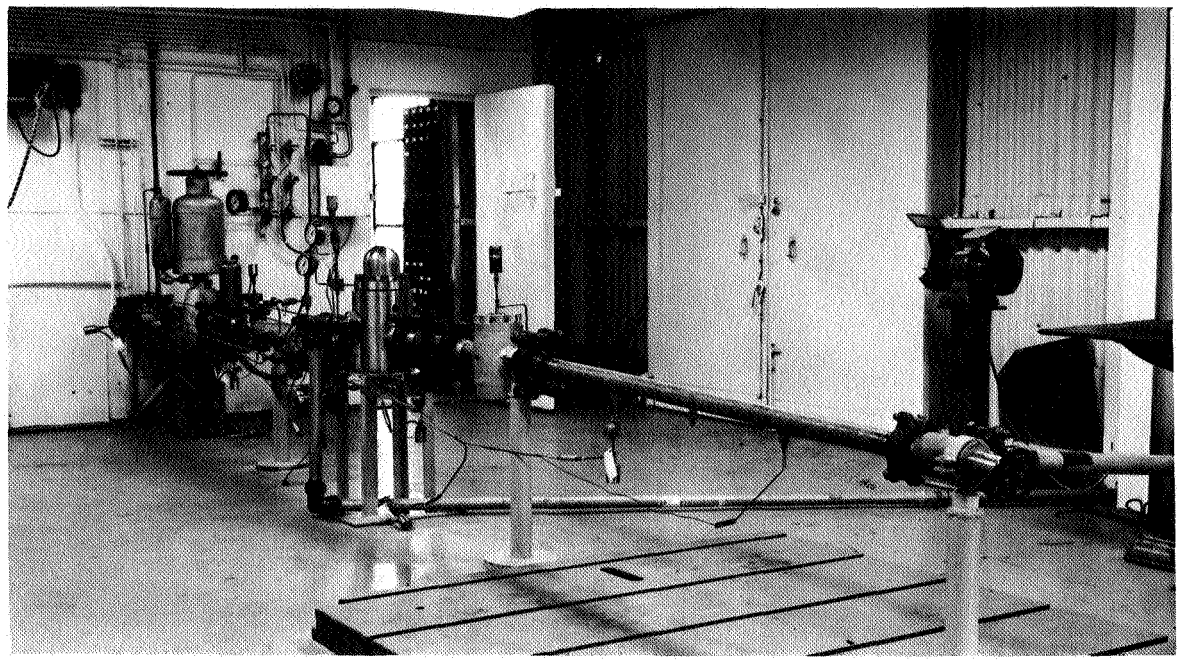
DATE OF RESUME: June 14, 1966

FACILITY NO: 12-00-07-26

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: High Pressure Fluid Test Facility (4648)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Fluid Flow and Pressure Test Facility (4648)

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket Fluid Systems, Ground Support Equipment

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Compressors, storage tanks, vaporizers, distribution systems, instrumentation, etc. are housed in a 7200-sq. ft. area with protective concrete construction around four high pressure test areas. The facility is capable of running flow tests at 15,000 psi with GN_2 and 10,000 psi helium at flow-rates up to 540,000 scfm and 200,000 scfm, respectively. Leak, burst and proof tests at gas pressures up to 25,000 psi and hydrostatic pressures up to 100,000 psi. The two LN_2 vaporizers have a capability of 1000 scfm at 15,000 psi. Storage systems include two 2600-gallon LN_2 vacuum insulated tanks and eight 12-cu. ft. and six 10,000 psi helium gas storage bottles and six 100 cu. ft., 15,000 psi nitrogen storage bottles.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4648 10. YR. BUILT: 1965 11. FAC. CAT. CODE: _____

12. INITIALCOST: $ _____ K 13. NASA B.O.D. 1966 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: **Test Laboratory**

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 14, 1966
FACILITY NO: 12-00-07-27

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Instrument Laboratory (4650)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Instrument Laboratory (4650)

5. TECHNOLOGICAL AREAS SUPPORTED: Ground support and test instrumentation

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Approximately 19,200 sq. ft. of Bldg. 4650 houses this instrument laboratory, supporting shop, and office space. Included is an anechoic chamber of 750 cu. ft. working volume suitable for microphone calibration and evaluations or audible frequency investigations. There is equipment for pressure calibration of microphones with a frequency range from 2 to 10,000 cps and sound pressure level range from 120 to 170 db. There is a shielded room containing standards for electrical and electronic quantities. High accuracy measuring systems for voltage, current, impedance, frequencies, etc. are included, Accelerometer calibration and evaluation systems and special shakers cover a frequency range from 10 Hz to 50 kHz. Liquid flow calibration facilities include high precision volume-time calibration systems covering a range of 125 to 3,000 gpm with discrete liquid level gages in 27 foot high cylindrical

6. NARRATIVE DESCRIPTION

tanks as standards, For routine flowmeter calibration there is a self-contained commercial calibration system using the time-weight principle. This calibrator has the capability of controlling the temperature of the fluid within ± 1 degree F between 50°F and 150°F with a capacity up to 300 gpm and accuracy of ± 0.1 percent. Large flowmeters are calibrated in the Cold Calibration Test Stand (4588). For gas calibration there are two small prover tanks with .42 cubic feet and 5 cubic feet volume for flowrates of. 00035 cubic feet per minute (cfm) to 8.8 cfm and a 200 cubic feet prover for flowrates up to 350 cfm. A special gas calibration system in a sound and explosion proof room provides calibrations up to 5000 cfm at 3500 psi pressure. Critical flow nozzles are used as standards and additional measurements are provided by turbine type gas flowmeters, pressure-volume-temperature (PVT) measurement in the supply tanks, and a, water displacement method. The accuracy of the prover tank systems is better than 0.25 percent. The large gas calibration facility is for air, nitrogen, and helium. An ultra-high vacuum system has a capability down to 10^{-10} Torr for testing vacuum instrumentation; the high pressure systems for calibrating pressure instrumentation have a range up to 120,000 psi; and the high capacity load cell, dead weight calibrators have a capacity of 5 million pounds with a 0.006 percent accuracy up to 500,000 pounds and .02 per cent accuracy above 500,000 pounds. An altitude-temperature humidity chamber has a range of -450°F to +500°F and 20 to 95 percent relative humidity with altitude simulation up to 150.000 feet. The laboratory also contains freezing point standards covering the range of 3000 to 1800°F with an accuracy of .1°F; automatic thermocouple calibration equipment covering an ambient to 2500°F with an accuracy of 1°F below 1500°F; a precision gravity meter with repeatability of .0001 cm/sec^2; equipment for

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4650 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Instrument Laboratory (Continued)

linear acceleration testing and shock testing to 1000 g; a heat flux calibration facility for radiometers and calorimeters including a black body source for primary calibration and grey body for comparison' in a range of 0 to 200 BTU/ft^2 sec with repeatability of ± 3 percent; a humidity generator used in calibration of water vapor monitors over the range of -100^oF to 72^oF dewpoint temperature; bridges for calibration of platinum resistance thermometers; electronic instruments for nuclear measurements and a room especially prepared for storage of radioactive sources.

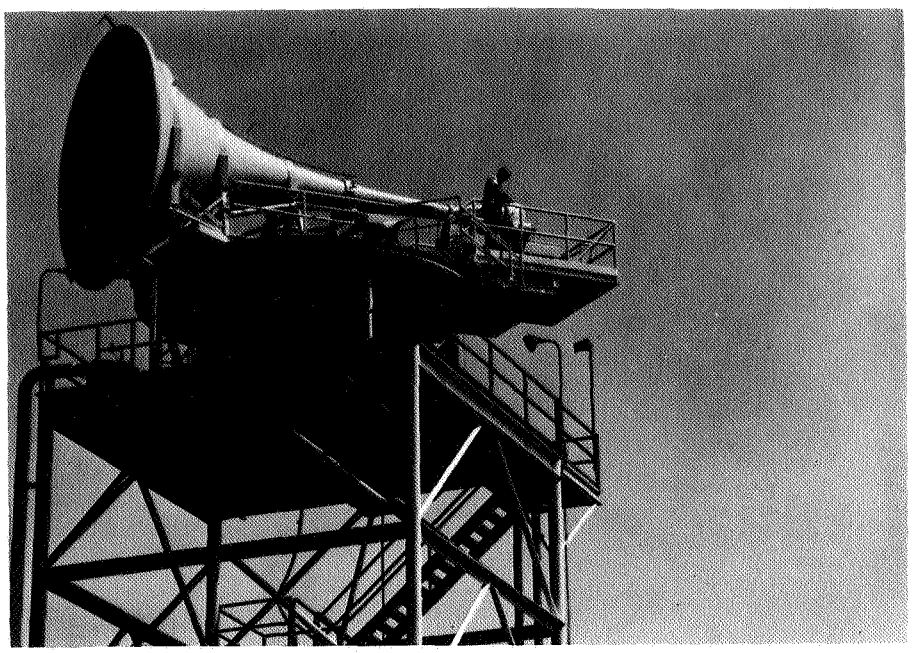
TECHNICAL FACILITIES RESUME

DATE OF RESUME: June 14, 1966
FACILITY NO: 12-00-07-28

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Noise Source For The Far Field Noise Propagation and Measurement System (4565)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Acoustic Investigation Facility, (4565)

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket Noise Measurements

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

A catenoidal horn mounted on a tower over 70 feet high produces 150,000 acoustic watts in a ***3600*** azimuth. A monitoring system of land line field units, telemetry units and portable data acquisition equipment, can acquire noise level information within 25 miles from the Test Laboratory.

A large catenoidal horn is used in conjunction with an air modulated siren producing sound that can be directed and propagaged into far-field areas surrounding the test site. Sound Pressure Levels are measured at various monitoring locations in the far-field area. Using these measurements, various horn parameters, and meteorological data (acquired by AERO Laboratory) studies are conducted to determine the effect various temperature and wind conditions have on far-field sound propagation. The catenoidal

6. NARRATIVE DESCRIPTION

horn can produce approximately 150,000 acoustic watts of low frequency sound, thus allowing a cornparision to be made between the relative loudness of the horn and that expected by a static test of large rocket engines under the same wind and temperature conditions.

The base station and computer are located in the Acoustical Control and Communications Center in Building 4566.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4565 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: _____ 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Test Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

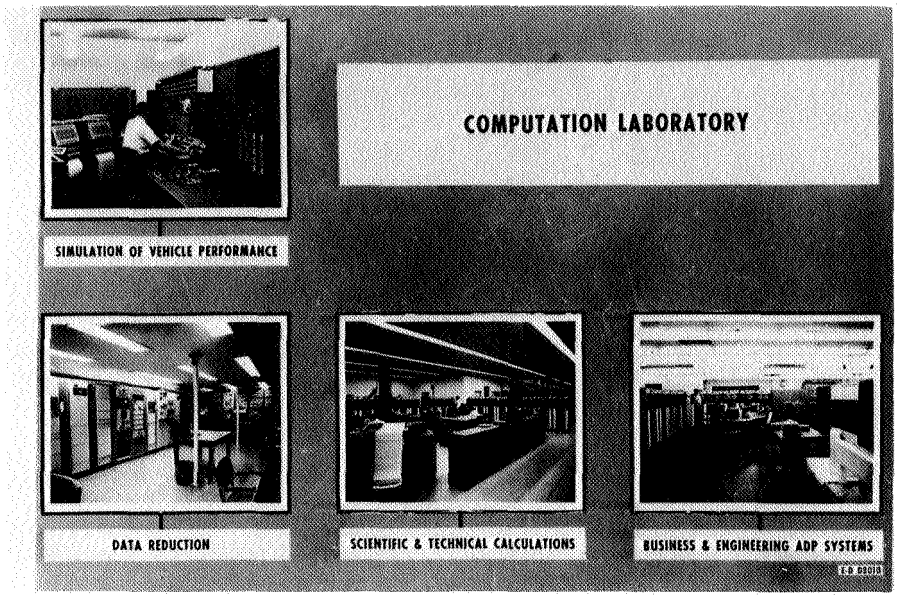
TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 14, 1966
FACILITY NO: 12-00-08-00

1. REPORTING INSTALLATION: Marshall Space Flight Center, Huntsville, Alabama

2. FACILITY NAME: Computation Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Computation Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Analog, hybrid and high-speed digital computers for space vehicle research and development analysis

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Computation Laboratory has a wide variety of analog, hybrid and high speed digital computers, providing MSFC with the computation potential necessary in research and development of space vehicles and in efficient administrative management of the Center.

In late 1966 the Computation Laboratory will acquire a large scale, centralized, third-generation computer. The new computer will permit the phase out of most presently installed digital computer equipment and will provide greatly increased computation capacity at lower cost. It will, furthermore, add a new dimension to the scope of MSFC operations by providing effective real time capacity and furnishing management with direct access to information through visual display devices. The modularity

6. NARRATIVE DESCRIPTION

of the computer will permit the expansion of its capacity to meet any increased computation requirements in the future.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. _____ 10. YR. BUILT: _____ 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ 21,908 K 13. NASA B.O.D. _____ 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.)*:

20. OTHER SOURCES OF INFO: "Technical Facilities and Equipment Digest" Dec. 1965

21. COGNIZANT ORGANIZATIONAL COMPONENT: Computation Laboratory

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Mr. Ivan M. Wiley, R-COMP-MF, 876-1274

TECHNICAL FACILITIES RESUME

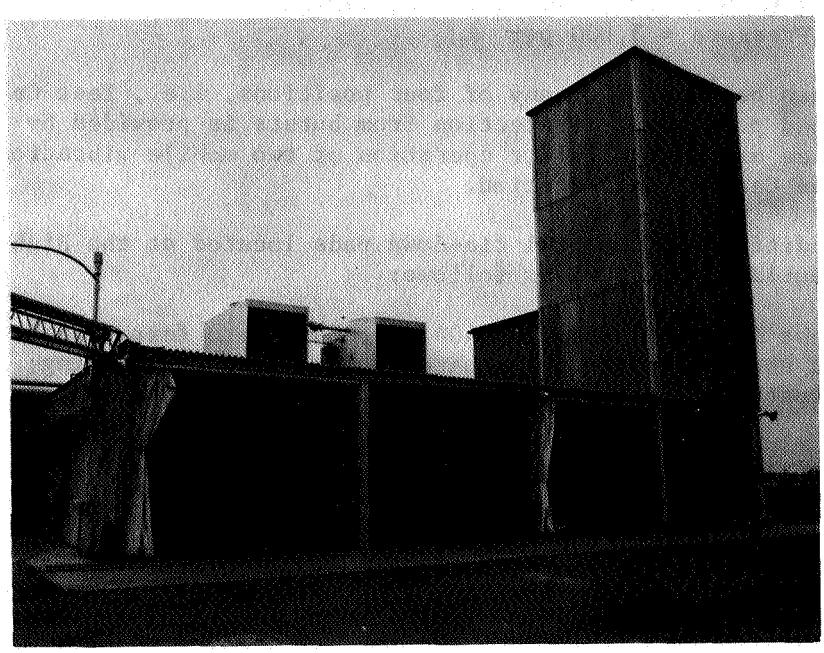
DATE OF RESUME: August *30,* 1966

FACILITY NO: 12-05-01-00

1. REPORTING INSTALLATION: Michoud Assembly Facility

2. FACILITY NAME: High Pressure Test

3 LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Flow Test Facility, High Pressure **Gas**

5. TECHNOLOGICAL AREAS SUPPORTED: Michoud Assembly Facility

6. NARRATIVE DESCRIPTION **OF** FACILITY CAPABILITIES & FUNCTIONS:

Gas flow testing is accomplished at the subject facility, which is unique in its capability of dynamic and steady-state gas flow testing under extreme pressure, temperature and flow conditions.

Helium and nitrogen gases are stored in separate vessels at 7,000 psi. Line pressure is regulated at 3,800 psi by means of Annin control valves at the storage vessels. Temperature pre-conditioning is attained by means of heat exchangers supplied by Dowtherm for heating to a gas temperature of approximately 560°F, and by liquid nitrogen for cooling the gas to -280°F. The flow rate and temperature of the gas flowing into the test specimen are controlled by a dynamic valve situated on a movable cart adjacent to the test pad. The characteristics of this valve are complemented by the characteristics of the electronic programmer which controls the overall system operation.

6. NARRATIVE DESCRIPTION

Gas characteristics can be preprogrammed for steady-rate or dynamic response within the following parameters:

Nitrogen - Flow Rate = 90 lbs./sec. maximum
Temperature = 280 to +560 degrees F.
Time Duration = 69 secs. at maximum flow
Pressure = 3,800 psi

Helium - Flow Rate = 5 lbs./sec. maximum
Temperature = -280 to +560 degrees F.
Time Duration = 100 secs. at maximum flow
Pressure = 3,800 psi

Test specimens can be located in any of four positions, i.e., Test Cell 103 and three tie-down pad positions. Protection from bursts is provided by blast walls. Facilities are available fbr operation of two mobile vibration systems and for tie-in to the Central Data Station.

There are two additional structural tie-down pads located at the High Pressure Test Facility (Building No. 404) as follows:

High Pressure Test Area, Building No. 404: 3,200 square feet; 5,000 pounds per foot of rail and 200 pounds per square foot of slab for loading; utilities consisting of electrical, water, high pressure GN_2 and instrumentation.

7. POTENTIAL:

8. PLANS: Vector Corp. (A/E) -- Gurtler - Hebert (Contr.)

9. BLDG. NO. 404 10. YR. BUILT: 1964 11. FAC. CAT. CODE: 31021

12. INITIALCOST: $ 140,458 K 13. NASA B.O.D. 11/63 14. STATUSCODE: Active

15. ACCUM. COST: $ 377,457 K 16. LIFE EXPECT. 25 yrs. 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):* Boeing Company

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Michoud Assembly Facility

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Michoud Assembly Facility
Mr. Jensen, 504-255-2583

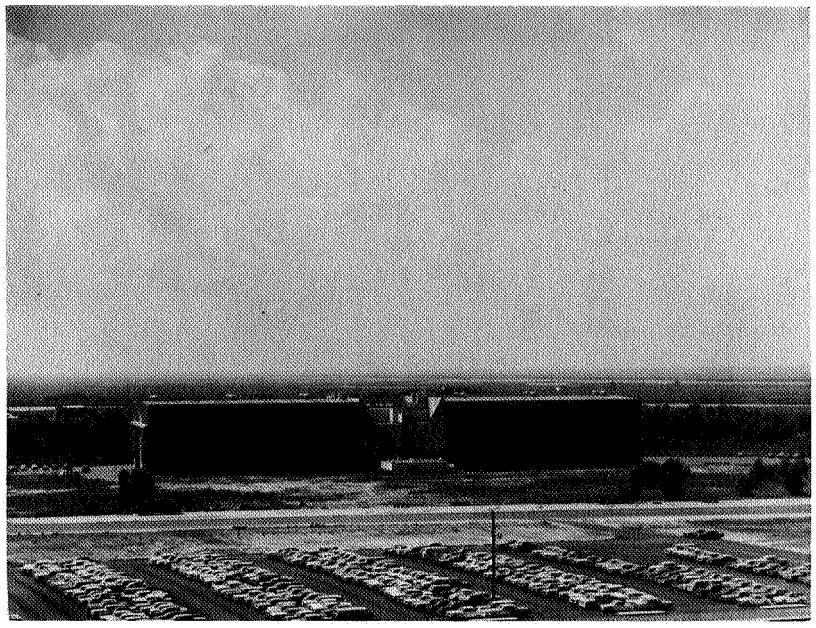
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 30, 1966
FACILITY NO: 12-05-02-00

1. REPORTING INSTALLATION: Michoud Assembly Facility

2. FACILITY NAME: Stage Test Position

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Stage Test Position Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Michoud Assembly Facility

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Stage Test Facility is a hazardous test complex, located one-half mile south of the Main Manufacturing Building No. 103. It is built specifically for systems checkout of the S-1C booster prior and after static test firing. This complex consists of two pairs of test cells separated by a Test Support area. Each cell is 190 feet long, 80 feet wide and 51 feet high to a one-ton bridge crane which services the entire cell. Special foundations are provided to support the booster on its transporter during the checkout and for weight and center of gravity determinations. Each cell is air conditioned to provide a maximum of 83°F and 60% relative humidity at the 40-foot level. Blast resistant walls separate adjacent test cells and the cells from the Support Building area. The outer wall and 55-foot wide by 51-foot high door in each cell are designed to be blown out in case of explosion or over-pressurization in the cell.

6. NARRATIVE DESCRIPTION

The Support Building area is a four-story structure with offices, equipment cribs and stores on the ground level, test and checkout facilities on the second and third floors, and test support facilities such as pneumatic supply units and regulated power supplies on a partial fourth level.

The test and checkout stations located on the second and third floors present a totally integrated test control center including a control and monitor position; an integrated elementry ground station; a computer for automatic and semi-automatic checkout and all of the related facility considerations, such as air conditioning and cable tunnels, which are vital to operation of this equipment.

7. POTENTIAL:

8. PLANS: deLaureal & Moses (A/E) -- Mark K. Eby Construction Company (Contr.)

9. BLDG. NO. 420 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 310-21

12. INITIAL COST: $ 1,809,738 K 13. NASA B.O.D. 10/64 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,889,518 K 16. LIFE EXPECT. 25 yrs 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT:

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Michoud Assembly Facility
Mr. Jensen, 504-255-2583

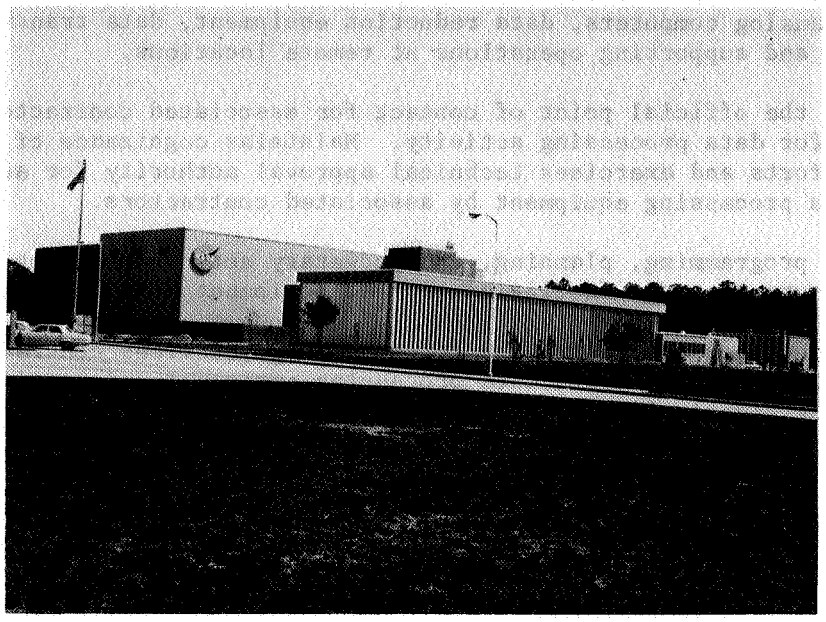
TECHNICAL FACILITIES RESUME

DATE OF RESUME: August 30, 1966
FACILITY NO: 12-05-03-00

1. REPORTING INSTALLATION: Michoud Assembly Facility

2. FACILITY NAME: Computer Operations Office

3. LOCATION *(if other than in 1. above):* Slidell, Louisiana



4. FUNCTIONAL NAME: Computer Operations Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Michoud Assembly Facility, New Orleans, La. and Mississippi Test Facility, Pearlington, Mississippi.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The Computer Operations Office complex is located on a 14-acre tract of land just outside the corporate limits of Slidell, Louisiana, on East Hall Avenue and between Slidell and the new Interstate Highway 10. The complex contains three separate buildings. A main building containing 81,540 square feet of floor space (three floors including a basement) is utilized primarily to house the personnel and computing equipment. A second building of 7,363 square feet of floor space is a one-story structure and is used for computer supply.storage, garage, and maintenance shops. Third building, also a one-story structure, contains 288 gross square feet of floor space is a guardhouse located at the main entrance on East Hall Avenue. Parking areas to accommodate 238 automobiles serves the facility.

6. NARRATIVE DESCRIPTION

The computer facility is operated with the centralized concept of central NASA management, open shop programming, standardized computer languages and the computation services are provided by a computer specialist contractor; and is under the direct management of the Computer Operations Office, a staff element of the Michoud Assembly Facility, who are assigned the NASA management responsibility for MAF computation activities including the remote central facility at Slidell. NASA management is accomplished through the performance of defined functions of the Computer Operations Office as outlined below:

a. Maintains and manages a centralized data processing facility to meet the needs of MSFC and associated contractors in support of MAF and the MTF. Provides centralized computer data processing capability defined to include digital computers of various types, analog computers, data reduction equipment, data transmission, auxiliary services and supporting operations at remote locations,

b. Serves as the official point of contact for associated contractors in the MAF and MTF areas for data processing activity. Maintains cognizance of contractor data processing efforts and exercises technical approval authority for acquisition and use of any data processing equipment by associated contractors.

c. Initiates programming, planning, and budgetary actions relating to the COO installation to insure adequate facilities to meet equipment and personnel requirements.

d. Provides contract administration for a computer services contractor who will operate, schedule, and maintain data processing equipment and provide specialized computer programming technical capability as directed.

(Cont'd on attached sheet)

7. POTENTIAL:

8. PLANS: 1962 Phase I Vector Corp. (A/E) Pittman Constr. Company (Contr.)
1963 Phase II Vector Corp. (A/E) Quinn Constr. Company (Contr.)
1965 Alter & Extensions, Claude Hooton (A/E) Quinn Constr. Company (Contr.)

9. BLDG. NO. 902 10. YR. BUILT: 1962 11. FAC. CAT. CODE: 61090

12. INITIAL COST: $ 2,182,223 K 13. NASA B.O.D. 3/63 14. STATUS CODE: Active

15. ACCUM. COST: $ 4,108,599 K 16. LIFE EXPECT. 30 years 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr oper.)*: LTV Aerospace Corp.
(Ling-Temco-Vought)
Range Systems Division

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Industrial Operations

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Michoud Assembly Facility
Mr. Jensen, 504-255-2583

6. **NARRATIVE** DESCRIPTION (Continued)

e. Directs, develops, and implements improved methods for furnishing the required data processing services. Performs reviews and studies to determine number and types of data processing and transmission equipment required to provide on an interim and long-range basis for the data processing needs of MAF and MTF. Provides technical support in the selection and procurement of data processing equipment. Devises and establishes specifications for improved equipment, components, and systems. Coordinates with manufacturers of computer and other equipment, **MSFC** elements, and associated contractors to accomplish necessary training of data processing personnel and to keep informed of the state-of-the-art and the most advanced data processing techniques.

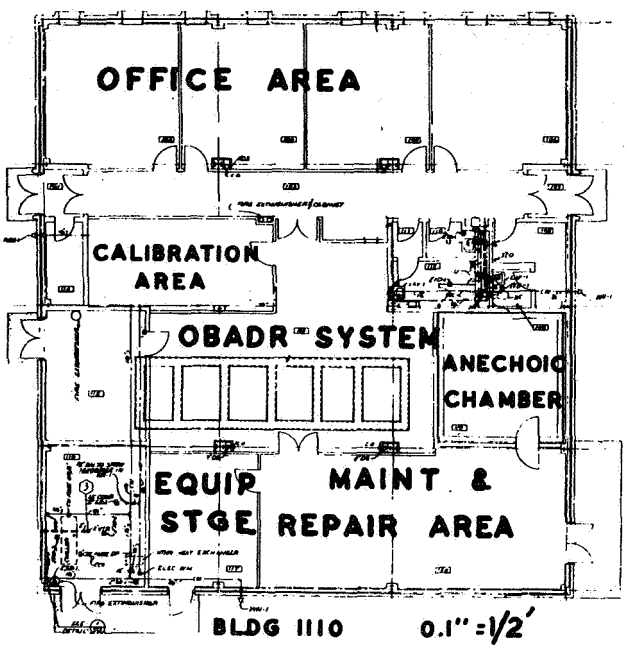
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY NO: 12-06-01-00

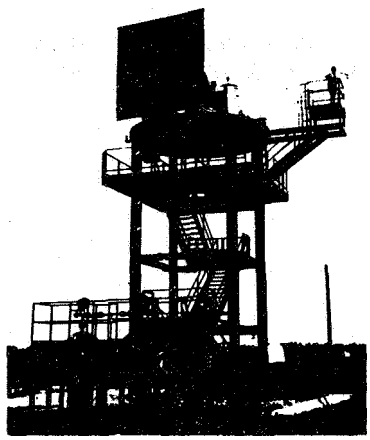
1. REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. FACILITY NAME: Acoustics Laboratory (including the Exponential Horn and the Horn Control Building)

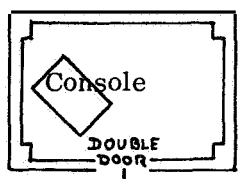
3. LOCATION *(if other than in 1. above):*



ACOUSTICS LABORATORY



Exponential Horn (8210)



1/16" = 1'

Horn Contrbl Building (8212)

4. FUNCTIONAL NAME: Acoustic Laboratory, All Purpose

5. TECHNOLOGICAL AREAS SUPPORTED: Far-field, Mid-field, Near-field, and special purpose acoustics data collection. Calibration, maintenance, and repair of acoustic devices.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: ACOUSTICS OPERATIONS.
Acoustical operations at MTF are primarily concerned with the prediction, measurement, and analysis of acoustic effects resulting from the static test firing of rocket engines. The prediction of noise propagation into the surrounding areas is verified by the measurements using the high intensity exponential horn (power level 174 decibels re 10^{-13} watts, frequency'range 40 to 500 cps), and three (3) mobile acoustics vans. A daily prediction and verification is made to compile a statistical correlation between weather conditions and sound propagation.

Acoustical data are also compiled during static engine firings to determine the noise environment of the vehicle, its acoustic power, characteristics, and efficiency. Additional measurements are made in the Far-field and surrounding communities.

(Continued on the next page)

6. NARRATIVE DESCRIPTION

The following systems are operated by acoustics personnel:

a. The Community Monitoring System consists of six (6) remote monitoring stations located in communities surrounding the test facility. Data from these stations are transmitted to a central recorder station in the Acoustics Laboratory via telephone lines, to record sound intensity levels in the surrounding areas during test periods.

b. The Mid-field microphone array consists of microphones and associated equipment located within a 2500 foot radius of the engine or engines being tested. Data from these microphones is transmitted to recorders in the Data Acquisition Facility by hard line.

c. The Near-field microphone array consists of microphones and associated equipment mounted at strategic locations within each test stand.

Acoustical data, recorded during tests, are analyzed in the Acoustics Laboratory with the Octave Band Automatic Data Reduction System. The system is capable of analyzing octave ranges from 1 H_Z to 8 KH_Z, and transfers data analyzed to key-punch cards. Near-field and Mid-field data are transmitted for recording to the Data Acquisition Facility via wire. Other data is recorded on remote recorders and is analyzed by the Acoustics Laboratory. Detailed analysis of the data is obtained from spectral analysis equipment in the Data Handling Center.

ACOUSTICS SERVICES. The Acoustics Laboratory, in addition to performing the research and development type of operations mentioned previously, offers the following services to all site users:

a. Acoustics engineering support for the design, modification, test, mechanization, and installation of acoustical systems or equipment.

b. Technical support for the operation, calibration, troubleshooting, maintenance, and repair of acoustical systems or equipment.

(Continued on the next page)

7. POTENTIAL:

8. PLANS.

9. BLDG. NO	1110 (8210) (8212)	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	390+100
12. INITIAL COST: $ ____ K		13. NASA B.O.D.	1965	14. STATUS CODE:	Active
15. ACCUM. COST: $ ____ K		16. LIFE EXPECT.	Indef.	17. OWNERCODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr oper.)*:	General Electric Company		

20. OTHER SOURCES OF INFO:

USERS' MANUAL (a local publication)

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: **Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone (Area Code 601) 658-4361.**

A partial listing of equipment peculiar to and maintained by Acoustics follows:

ACOUSTICS LABORATORY EQUIPMENT

EQUIPMENT NAME	FUNCTION	OPERATING CHARACTERISTICS	REMARKS
Automatic Octave Band Data Reduction System, Technical Products Corp. TP - 700	Octave Band Analysis of short time Acoustics Data.	1 H_Z thru 8 KH_Z octave band capacity.	Provides graphic or key-punch card readout.
Octave Band Noise Analyzer, General Radio Type 1558 - A	Octave Band Analysis of continuous noise.	Frequency: 10 H_Z to 20 KH_Z	Provides analysis in 10 octave bands including 75 H_Z lowpass band.
Sound & Vibration Analyzer, General Radio Type 1564 - A	Narrow Band Analysis of continuous noise.	Frequency: Continuously tuneable from 2.5 H_Z to 25 KH_Z in four decade bands. Constant percentage bandwidth.	
Frequency Analyzer, Bruel & Kjaer Type 2107	Narrow Band Analysis of continuous noise.	Frequency: Performs frequency and distortion measurements from 2 H_Z to 20 KH_Z.	
Distortion Analyzer, Hewlett - Packard 330 B/C/D	Audio frequency and distortion measurements.	Range: Capable of measuring distortion at any fundamental frequency from 20 H_Z to 20 KH_Z.	
Pistonphone Microphone Calibrator, Bolt Beranek and Newman Model 901 D	Calibrate Microphones	0.1 H_Z to 200 H_Z from 110 to 160 decibels in 10 decibel steps.	
Anechoic Chamber	Acoustic Free Field Work Area.	200 H_Z and above.	11'X11'X8'

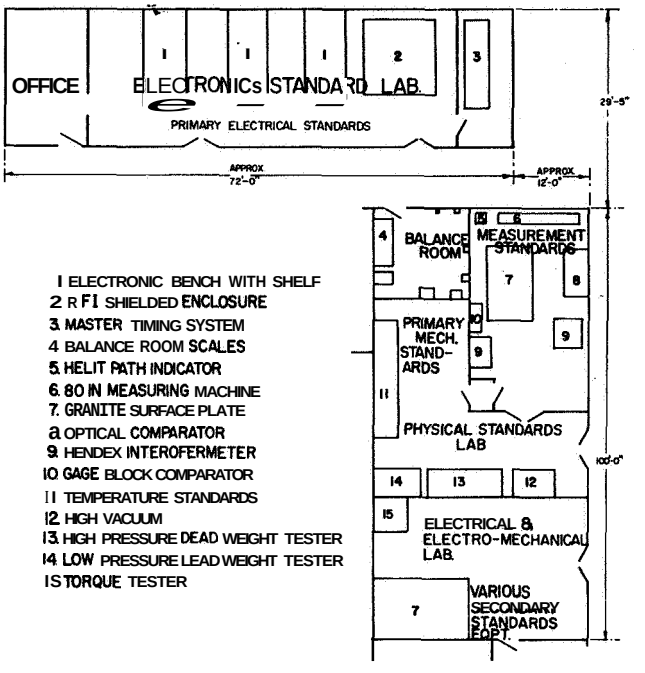
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY, *NO:* 12-06-02-00

1. REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi *39520*

2. FACILITY NAME: Measurement Standards Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Measurement Standards Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Primary Standards in support of the various EI&M Labs and Secondary Standards for Site-wide support.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The Measurement Standards Laboratory which forms a part of the EI&M Facility consists of a Physical Standards Laboratory and Electronics Standards Laboratory. The Physical Standards Laboratory maintains mass, length, pressure and temperature standards and provides calibrations services utilizing these parameters. The Electronics Standards Laboratory provides standards for the electrical and electronic areas and includes a master timing system. These standards are used to perform calibration services.

1. Physical Standards Laboratory
   a. Provides standards in the parameters of mass, length, pressure, and temperature.
   b. Provides Physical Measurement equipment calibration service for precision tools, gages and components. These items are used in such areas as the Technical Services Laboratory, Transducer Laboratory, MIF machine shop, fabrication and assembly facilities.

6. NARRATIVE DESCRIPTION

2. Electronic Standards Laboratory
   a. Provides standards for the electrical and electronic area including a Master Timing System.
   b. Provides electrical and electronic equipment calibration services to the Technical Services Laboratory and to the Transducer Laboratory.
   c. Provides special calibration on measurements requiring the high accuracy of standards type equipment.

3. The Master Timing System provides time of day information (in ten different formats) and various reference signals, all of which are accuracy to within ±2 X 10 −8%per day.

   Four of these time of day outputs are transmitted (via hard line) to the Data Acquisition Facility and the Data Handling Center. Other time of day outputs are used to modulate various carriers which, in turn, are broadcast at a freq, of 226.5 MHz. The remaining time of day outputs are at the present un−used but may be patched in to provide hard line or broadcast outputs should the need arise.

   Various sine wave, square wave, and pulse signals are routed from this system throughout the EI&M Laboratory for use in equipment maintenance and calibration.

The following is a list of measurement parameter capabilities:

PARAMETERS	ACCURACY
Mass	At least 3 ppm from 1 mg. to 50 lbs.
Temperature	± 0.01 degree C from (-) 190 degrees C to + degrees C. ± 0.5 degree C from ambient to + 1800 degrees C.

7. POTENTIAL:
Expansion for post−Saturn static testing.

8. PLANS:

9. BLDG. NO. 1105 **10. YR. BUILT:** 1965 **11. FAC. CAT. CODE:** 219−11

12. INITIAL COST: $ _____ K **13. NASA B.O.D.** 1965 **14. STATUSCODE:** Active

15. ACCUM. COST: $ _____ K **16. LIFE EXPECT.** Indef. **17. OWNERCODE:** NASA

18. OPER. CODE: Contr. **19. CONTRACTOR NAME** *(if contr. oper.):* General Electric Co.

20. OTHER SOURCES OF INFO: Capability Document, EI&M Laboratory, MIF 2/18/66 - Users' Manual, MTF 7/4/66.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MIF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code ,601) 688−4361.

PARAMETERS	ACCURACY
Pressure	At least ± 20% from 10^{-7} to 10 mm Hg.
	± 0.02% of F.S. from 0.01 mm to 800 mm Hg.
	At least ± 0.015% from 0.2 psi to 12140 psi.
Length	At least ± 10 microinches from 0 to 80 inches.
Threat measurement	At least ± 25 microinches deviation from desired path.
	Roundness at least to 0.0001 inches.
Optical angle	At least ± 2 arc sec. from 0 degree to 360 degrees.
Dc voltage	At least ± 0.004% up to 1500 vdc.
Ac voltage	At least ± 0.20% up to 500 kHz. (0.5 - 1000vrms).
Dc current	± 0.005% from 1 ma. to 50 amps.
Ac current	At least ± 0.1%, 5 Hz to 100 kHz. (3.3 ma - 10 amps).
Dc resistance	Fixed resistors (± 0.001% accuracy) from 0.001 ohm to 100 k ohms.
	At least 0.2%, 0.01 micro ohms to 110 million megohms.
Capacitance	Fixed capacitors (at least ± 0.1% accuracy) from 0.001 pf to 1 mocrofarad.
	10 micro pf to 1.111 mocrofarad, ± 0.01% accuracy.
Inductance	Fixed inductors (± 0.1%) from microhenries to 10 henries
	111 microhenries to 1111 henries (± 0.1%)
Phase angle	At least ± 0.05 degree from 50 Hz to 3 kHz.
Rf voltage	At least ± 1.5% from 1 MHz to 50 MHz (0.5-50v).
	± 1% from 10 MHz to 1 MHz (1-300v).
	At least ± 6% from 5 MHz to 500 MHz (27 uv - 2220 uv).
Attenuation	± 0.02 db. from 1 to 52 db.
Rf power	At least ± 3% from dc to 12.4 MHz.

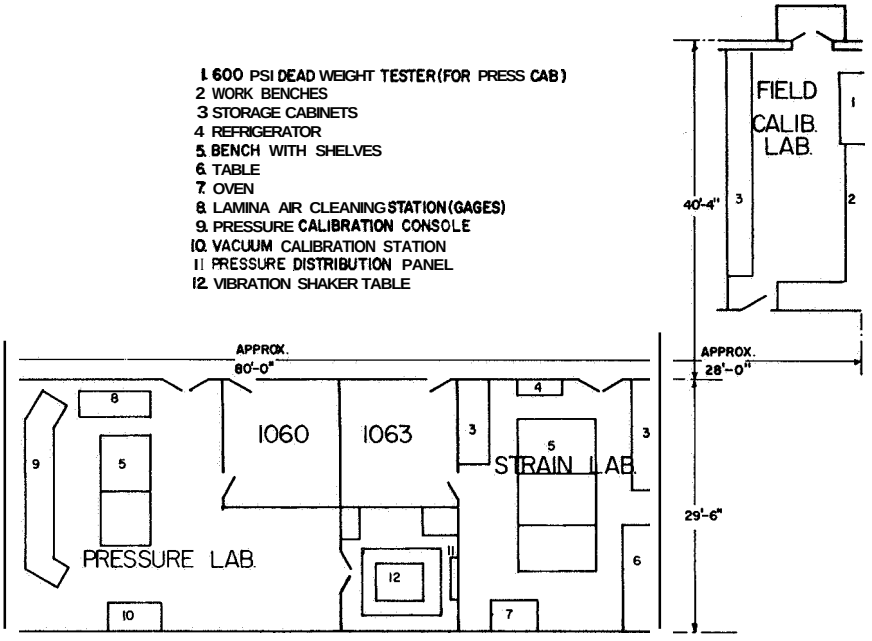
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY NO: **12-06-03-00**

1. REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. FACILITY NAME: Pressure & Strain Laboratory

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: **Pressure** and Strain Calibration Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Site-wide pressure and strain calibration support.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The Pressure and Strain Laboratory provides personnel and equipment for:

1. Calibration of test equipment, primarily that associated with transducer data acquisition.
2. Performing acceptance test for new test equipment.
3. Performing analysis of systems when required.

The Pressure and Strain Laboratory consists of the following seven laboratories:

1. Electronics Laboratory
   a. Provides calibration of transducer conditioning and measuring equipment, and all other electronic equipment.
   b. Provides acceptance testing for electronic test equipment.
2. Pressure Laboratory
   a. Provides calibration and testing service for pneumatic and hydraulic transducers, sensors and gages.
   b. Provides acceptance testing and evaluations for new pressure systems and components.

6. NARRATIVE DESCRIPTION

3. Vibration Laboratory
   a. Provides calibration for all vibration sensors.
4. Strain Laboratory
   a. Provides calibration for all strain sensitive elements.
   b. Provides specialty mechanical measurements utilizing strain transducers.
   c. Provides calibration for mechanical devices such as linear and angular potentiometers, differential transformers, and encoders.
5. Flow Laboratory
   a. Provides calibration for all liquid and gas flow indicating devices.
   b. Provides acceptance testing of new flow devices.
6. Temperature Laboratory
   a. Provides calibration for temperature sensors such as thermocouples and resistance temperature bulbs.
   b. Provides acceptance testing of new temperature sensors.
7. Instrumentation Cleaning Laboratory
   a. Precision cleaning of instrumentation to LOX clean standards.

A partial equipment capability of the Pressure and Strain Laboratory is as follows:

Equipment	Range	Purpose/Use
A to D Converter		Converter
Vacuum calibrator	Atmos. to 10^{-5} mm Hg	Vacuum-gauge calibration
Barometer	800 mm Hg	
Manometer	0-800 mm Hg	
Gauges	0 to 410 mm Hg	
Dead weight Gauge (air)	0.2 to 12, 140 psi	
Pneumatic Pressure Balance	50 *to* 5999 psi	
Electro Manometer	0-10, 000 psid	

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 1105 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 219-11

12. INITIAL COST: $ _____ K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):* Seneral Electric Co,

20. OTHER SOURCES OF INFO: 'Capability Document, EI&M Laboratory, MTF 2/18/66 - Users' Manual, MTF 7/4/66.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code 601) 688-4361.

TECHNICAL FACILITIES RESUME

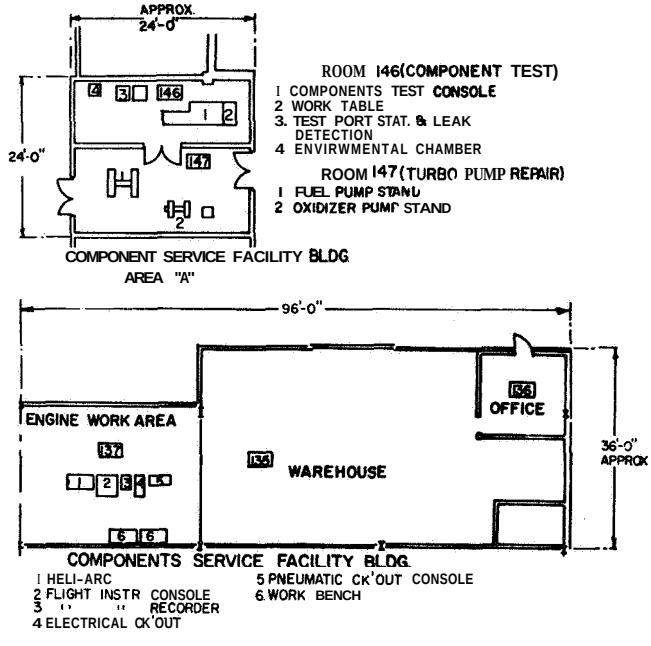
DATE OF RESUME: 9/1/66

FACILITY NO: 12-06-04-00

1. **REPORTING INSTALLATION:** Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. **FACILITY NAME:** Component Service Facility

3. **LOCATION** *(if other than in 1. above):*



4. **FUNCTIONAL NAME:** Rocket Components Service Facility

5. **TECHNOLOGICAL AREAS SUPPORTED:** The J-2 Engine Component Repair and Testing areas will be used for all on-site repair, servicing and test operations on Saturn V, Stage S-II J-2 Engines.

6. **NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:**
The Component Repair and testing area will be fully equipped to disassemble, repair, assemble, and test J-2 engine assemblies and components. A total of **9,350** square feet of floor space within the Component Service Facility (CSF) will be assigned for this purpose, The Engine Work and Warehouse areas are located in the high bay section of the CSF building. The Engine Turbo Pump Repair 2nd Component Test Areas which are controlled environmental clean rooms are located in another part of the CSF adjacent to, and opening into, a large class 100 (Federal Standard 209) laminar flow clean room. A list of the equipment contained in each functional area including capabilities and planned activities is contained on Page 3.

6. NARRATIVE DESCRIPTION

7. POTENTIAL: Although specifically staffed and equipped for 5–2 engine activities, the areas are readily adaptable to the same operations, as described in paragraph 6 on other liquid fueled rocket engines.

8. PLANS:

9. BLDG. NO. 8100 10. YR. BUILT: 1966 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. FY '67 14. STATUS CODE: Const.

15. ACCUM. COST: $ - _____ K 16. LIFE EXPECT. _____ 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.)*:* Rocketdyne Div. of NAA.

20. OTHER SOURCES OF INFO: Refer to (a) Corps of Engineers Contract No. DA–01–076–ENG. (NASA) –2900 and drawings No. MDO–MTF–6132, 6134, 6141, 6143.
(b) Rocketdyne Maintenance Plan for Rocket Engine Model 5–2, R 5101 C.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code 601) 688–4361.

AREA	CAPABILITIES/ACTIVITIES	EQUIPMENT CURRENTLY AVAILABLE	AREA SQ. FT.)
Engine Work Area (Room 137)	-Unloading, transferring, handling, receiving and storing engine assemblies. -Disassembly, repair, assembly and leak and function testing of engine assemblies and components. -Special tubing preparation and welding operations in the removal and installation of engine components. -Checkout of the Engine Flight Instrumentation and Electrical Control Packages. -Performance of engine and component modifications and failure analysis.	-Heliarc Welding Unit Rocketdyne G3128 -Special Single Head Tool Kit Rocketdyne G3127 -Flight Instrument Console Rocketdyne G1035 -Flight Instrument Recorder Rocketdyne G3121 -Electrical Checkout Console Rocketdyne G1037 -Engine Pneumatic Checkout Console Rocketdyne G3106 -One 15-ton and one 5-ton traveling cranes	6210
Warehouse (Room 135)	-Controlled access storage nd issuance of engine and GSE spare c ponents and parts.	-Various tables, storage cabinets and shelves, and material pallets normal to warehousing operations. -One 5000 lb. capacity fork lift truck and one 700 lb. capacity hand lift truck.	1920
Engine Turbo Pump Repair (Room 157)	-Turbo pump and component disassembly and assembly under special controlled environment. -Failure Analysis	-Fuel Pump Stand Assembly Rocketdyne G4061 -Oxidizer Pump Stand Assembly Rocketdyne G4062	480
Engine Component Test Area	-Special component leak and function testing under special controlled environment with or without GN2, LN2, and GHe. -Failure Analysis	-Components Test Console Rocketdyne G3107 -Test Port Station and Leak Detector -Environmental Chamber	334

The overall capabilities are extended beyond the above listed activities through the following support capabilities of the CSF:

a. Cleaning facilities capable of cleaning components parts to any of all levels defined in NASA specification MSFC-SPEC-164.
b. Low, medium, and high pressure ambient and cryogenic test facilities
c. Multichannel Test Recording System.
d. Hydraulic Component Repair and Test Area.
e Metal Fabricating and Machine Shop.

CRYOGENIC CALIBRATION SYSTEM

EQUIPMENT	RANGE	ACCURACY	MFG	MODEL
Mueller Bridge	.000001 to 422. 11111 ohms	.002% of Reading	L&N	G-4
Mueller Bridge	.00001 to 422. 1111 ohms	.002% of Reading	L&N	G-3
Null Detector	Sensitivity .02 Microvolts		L&N	
Potentiometer	0 to 1.6110 Volts	Low Range .01% of reading +.5 Microvolts High Range .005% of reading +20 Microvolts	L&N	K-3
Null Detector	Sensitivity .2 Microvolts		L&N	9834
Eppley Standard Cell	Nominal 1.0190		L&N	7308
Constant Voltage Supply	Nominal 3.0 Volts DC		L&N	99034
Standard RTB	25 ohms at ice point	Calibrated by NBS	Rosemount	162D

CRYOGENIC TEST SYSTEM - 3 each

Fluid	Flow			Pressure			
	Path	Quantity	Measurement	Range	Regulation	Gauges	Remarks
GN_2	1	N/A-Charge & Purge of LN_2	N/A	0-100 psi	0-100 psi upstream regulator	0-150 psi transducer & read out gauge	Accuracy of 1% of full scale reading
GN_2 or GHe	2	Non Flow	N/A	0-200 psi	0-200 psi upstream regulator	0-2000 psi transducer & read out gauge 2 ea.	Accuracy of 1% of full scale reading
LN_2	3	Non Flow	None	0-2000	Pneumatic pressure from Path 2	0-2000 psi	Accuracy of 1% of full scale reading
GN_2	4	Non Flow	None	0-100	Pneumatic pressure from Path 1	0-2000 psi transducer & read out gauge 2 ea.	Accuracy of 1% of full scale reading
GN_2	--	--	0-1000 SCCM 0-15 SCFM	Atm.	--	--	Leakage easurements

Components are tested and/or actuated electrically with the following circuits:

1. 120 V/60 cy, ac/15 amp service feeds two circuits, each variable voltage control, voltmeter and ammeter.
2. 120 V/400 cy, ac/10 amp service feeds two circuits, each variable voltage control, voltmeter and ammeter.
3. 28 V, dc, 15 amp service feeds two circuits, each variable voltage control, voltmeter and ammeter.
4. 56 V, dc, 30 amp service.

Each console is also equipped with a millisecond timer and a megohmmeter.

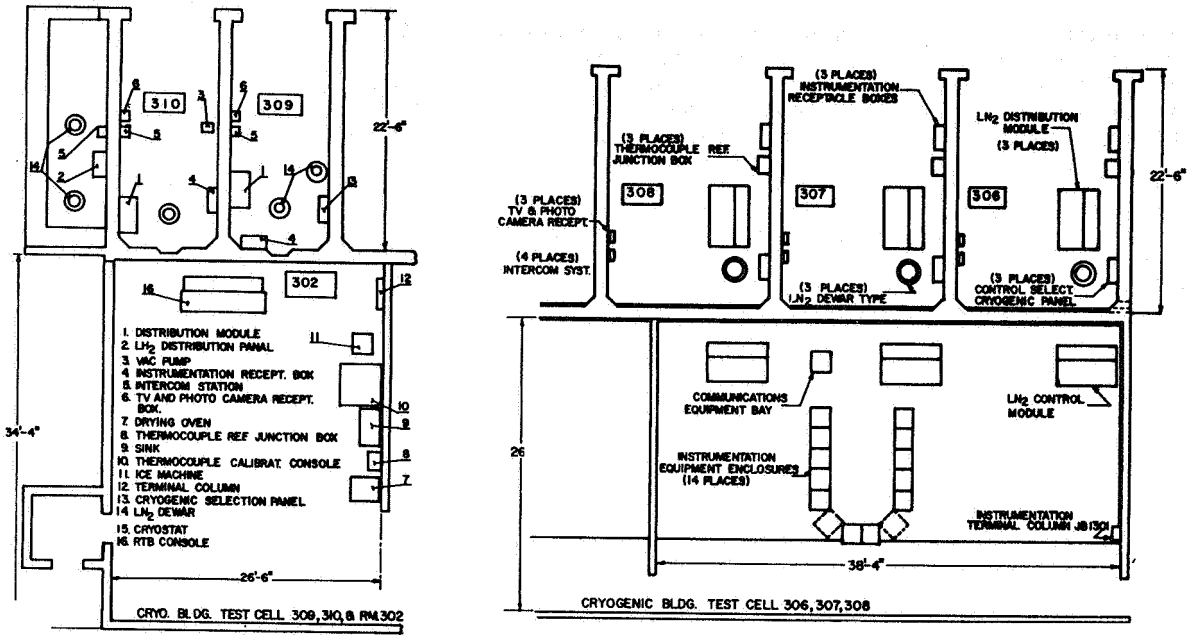
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY NO: 12-06-05-00

1. REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. FACILITY NAME: Component Service Facility (CSF)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Cryogenic Component Test Facility

5. TECHNOLOGICAL AREAS SUPPORTED: The Facility will be used to perform all cryogenic testing of components required at MTF. Activities will include Functional Testing and Malfunction Analysis of all types of components.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The Cryogenic Test Facility is a part of, but isolated from the CSF. It consists of two separate test areas within one building; one which is devoted to precision calibration of temperature probes and the other which is devoted to all other cryogenic testing of components. Test resources are provided on the attached table.

CALIBRATION AREA

This area consists of two isolated test cells (rooms 309 and 310) and a Calibration Monitoring and Control (room 302). The temperature probes, consisting of Resistance Temperature Bulbs (RTBs) and Thermocouples (TCs), are calibrated by comparison with NBS standards at selected temperatures from 14°K to 100°K.

The test environment is provided by the RTB and TC Calibration System using liquid hydrogen (LH_2)/liquid nitrogen (LN_2) cryostats located in the test cells which are supplied by two (2) 175 liter LH_2 Dewars or the 5200 gal. LN_2 Storage Tank located outside the Building. Control Modules, located in the Control Room, control and maintain the Cryostat temperatures by pressure control

6. NARRATIVE DESCRIPTION of cryogenic fluids and/or heaters on the Calibration Blocks. Accuracies of the Cryogenic Calibration Systems are as follows:

R.T.B. calib. accuracy ± 0.002°K except at nitrogen NBP
R.T.B. calib. accuracy @ nitrogen NBP ± 0.005°K
T.C. calib. accuracy ± 0.1°K

COMPONENT FUNCTIONAL TEST AREA

This area consists of three isolated Test Cells (rooms 306, 307 and 308) and a Test Monitoring and Control Room (room 301). Complete test monitoring is available for temperature and pressure measurements through a precision, high speed Test Recording System, Closed Circuit TV Monitoring System and a Remote Camera Operating System. Facilities include high order leak tightness measurement with a Mass Spectrometer.

Cryogenic testing is accomplished through the use of three (3) Cryogenic Test Systems, one for each test cell. Each system is composed of a Distribution Module and a Control Module used in conjunction with a liquid nitrogen Dewar. The Distribution Modules and LN_2 Dewars are housed in Test Cells, rooms 306, 307 and 308. The Control Modules are located in the Control Room, room 301. The Test Systems are capable of establishing cryogenic temperatures of the component under test by immersion Tank 8r by passing LN2 through the component from the LN2 Storage Tank or from the LN_2 Dewars. The system is capable of pressurizing the LN_2 with gaseous nitrogen or gaseous helium up to pressures of 1000 psi. The components can be subjected to internal and external pneumatic leak tests while at cryogenic conditions.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 8110 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 219-11

12. INITIALCOST: $ _____ K 13. NASA B.O.D. _____ 14. STATUSCODE: Const.

15. ACCUM. COST: $ 9 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):* General Electric Company

20. OTHER SOURCES OF INFO: Refer to: (a) Corps of Engineers Contract No. DA-01-076-ENG (NASA) 2900 and drawings no. MDO-MTF-6100, 6101, 6102 and 6103.
(b) NASA Contract NASw-410, Amendment 29 dated 11/11/65 with drawings no. MT-17-5007-810, 811.

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code 601) 688-4361,

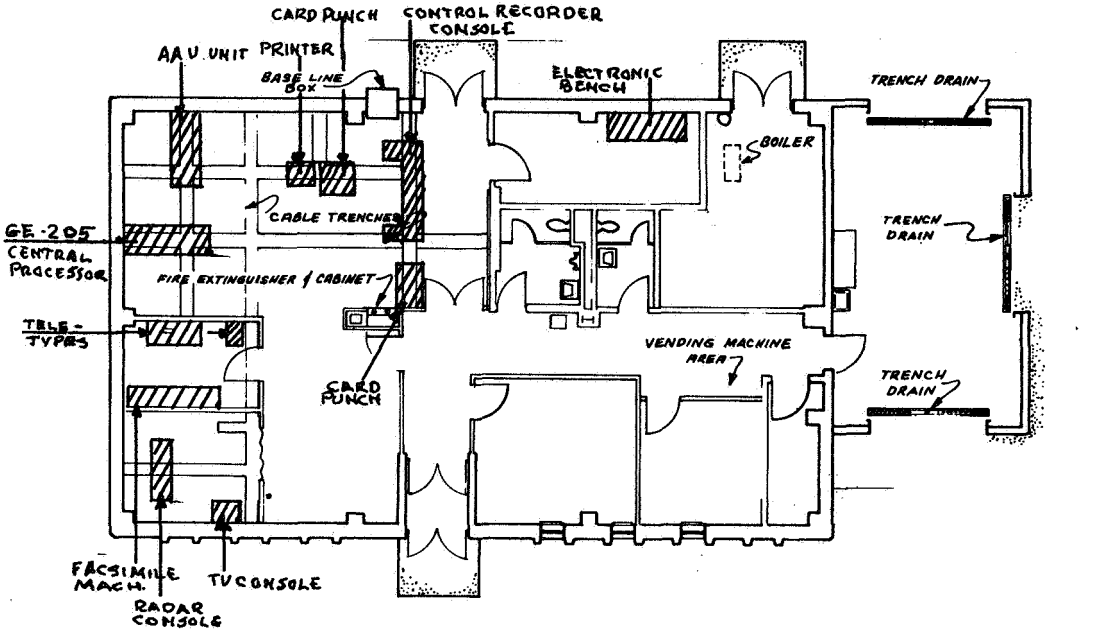
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY NO: **12-06-06-00**

1 REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2 FACILITY NAME: Meteorology Building

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Atmospheric Laboratory

5. TECHNOLOGICAL AREAS SUPPORTED: Provides atmospheric observations and predictions in support of acoustic propogation predictions. Provides severe weather warning service.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The Atmospheric Laboratory is equipped with dual GMD-2 Rowin Sets, Radio-sonde Automatic Data Processing System, and a GE 205 computer system for observing and processing atmospheric data; complete surface meteorological measuring instrumentaticn for observing surface data; AN/CPS-9 Weather Radar €or observing thunderstorm activity; and facsimile and teletype equipment for receiving weather and atmospheric data from nation wide weather services.

The Atmospheric Laboratory provides routine weather forecasts, severe weather warnings and atmospheric predictions in support of acoustic propogation predictions.

The Atmospheric Laboratory will be included in the MIF site-wide closed circuit TV systems.

6. NARRATIVE DESCRIPTION

7. POTENTIAL:

a. PLANS:

9. BLDG. NO. 8201 10. YR. BUILT: 1965 11. FAC. CAT. CODE: _____

12. INITIAL COST: $ _____ K 13. NASA B.O.D. 1965 14. STATUSCODE: Active

15. ACCUM. COST: $ _____ K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: NASA 19. CONTRACTOR NAME *(if contr. oper.):*

20. OTHER SOURCES OF INFO:

21. 'COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code 601) 688-4361.

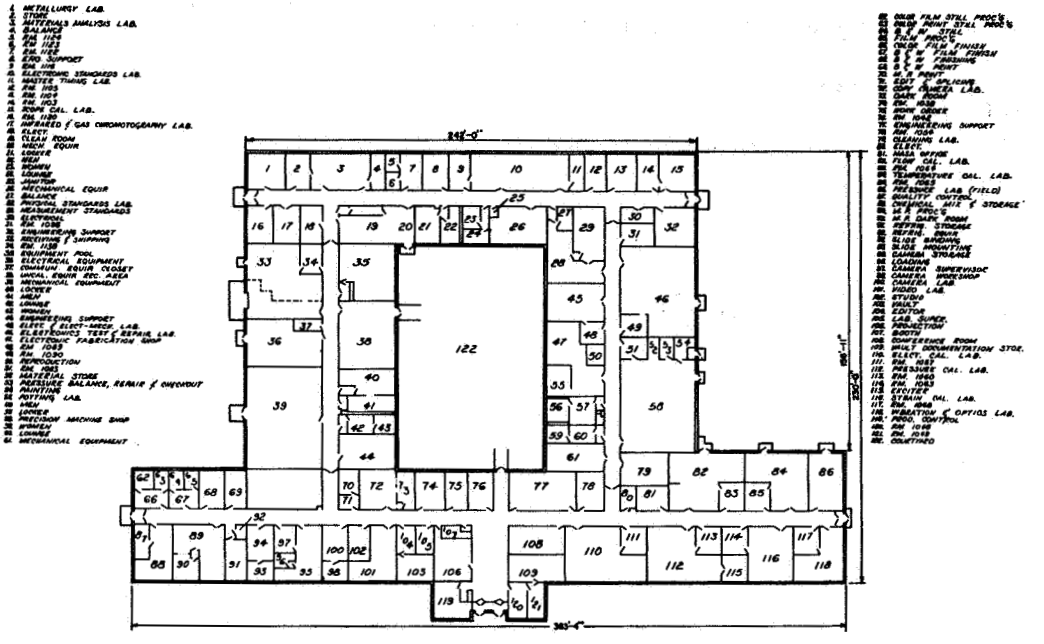
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY NO: 12-06-07-00

1. **REPORTING INSTALLATION:** Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. **FACILITY NAME:** Electronics, Instrumentation & Materials Laboratory (EI&M Lab)

3. **LOCATION** *(if other than in 1. above):*



4. **FUNCTIONAL NAME:** Electronics Instrumentation and Materials Laboratory

5. **TECHNOLOGICAL AREAS SUPPORTED:** Materials Analysis, Measurement Standards, Photographic, Pressure & Strain, Temperature & Flow, and Field Support.

6. **NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:** The EI&M Laboratory occupies an area of 56,600 square feet and was designed and constructed specifically to provide laboratory support at MTF. It is composed of the following technical functions:

1. Material Analysis Laboratory -
This laboratory provides facilities and personnel for the functional testing and analysis of materials, fuels (hydrocarbon and petroleum), gases, and fluids (LN_2, LH_2, LA, LOX, etc.). It is further broken down into sub-functions of a metallurgy laboratory, chemical laboratory, balance laboratory and a chemical instrumentation laboratory. There is also available a class 100 Clean Room for testing in an environment of atmospheric control and dust exclusion.

6. NARRATIVE DESCRIPTION

2. Measurement Standards Laboratory -
This laboratory provides a chain of calibration reference from test equipment in line use to the National Bureau of Standards. It is composed of a physical standards laboratory to provide standards in the parameters of mass, length, pressure, and temperature; and also an electronic standards laboratory to provide standards and calibration service for the electric and electronic areas. It also provides the Master Timing System for MTF.

3. Photographic Laboratory -
This laboratory provides personnel and equipment for still and motion picture photography at MTF. It has the capabilityto process film, modify, repair and maintain cameras and all photographic equipment, and also provides archive facilities for film storage. There is a projection room which seats 40 people and has equipment for screening 16mm motion picture film and various size slides.

4. Pressure and Strain Laboratory -
This laboratory has the capability to provide calibration and testing services for pneumatic and hydraulic transducers, sensors, and gauges, and testing and evaluation for procurement and acceptance of new pressure systems and components. It also applies strain sensitive elements, supplies experimental stress analysis service, and provides calibration for mechanical devices such as linear and angular potentiometers, differential transformers and encoders. It includes a laboratory to LOX clean and certify instrumentation to be used in various mechanical and technical systems at MTF.

5. Temperature and Flow Laboratory -
This laboratory is composed of a vibration laboratory to perform calibration of all vibration and shock transducers, and to test and evaluate vibration shock and velocity pickups for usage at MTF. An environmental laboratory €or testing and evaluation of transducers and components under vibration,

7. **POTENTIAL:** Expansion for post-Saturn static testing.

8. **PLANS:** None.

9. **BLDG. NO.** 1105 10. **YR. BUILT:** 1965 11. **FAC. CAT. CODE:** 219-11

12. **INITIAL COST: $** 2027 K 13. **NASA B.O.D.** 1965 14. **STATUS CODE:** Active

15. **ACCUM. COST: $** 2047 K 16. **LIFE EXPECT.** Indef. 17. **OWNERCODE:** NASA

18. **OPER. CODE:** Contr. 19. **CONTRACTOR NAME** *(if contr. oper.):* General Electric Co.

20. **OTHER SOURCES OF INFO:** Capability Document, EI&M Laboratory, MTF 2/18/66
Users Manual, MTF 1966

21. **COGNIZANT ORGANIZATIONAL COMPONENT:** Site Support Office, MTF.

22. **LOCAL OFFICE TO CONTACT FOR FURTHER INFO:** Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code 601) 688-4361.

shock, static acceleration, humidity and temperature conditions. A flow laboratory to perform calibration of all flow devices indicating liquid and gas flow, and of all leveling devices. A temperature laboratory to provide calibration of temperature and humidity transducers, and evaluate resistance temperature detectors, thermocouples, electrolytic cells, etc.

6. Field Support Unit -
This group provides the personnel and equipment required to perform installation, maintenance, field calibration, acceptance testing, modification, and systems analysis of all site-wide alarm facilities such as fire, test warning, operational intercom, utilities monitoring, oral warning, canal level indicating, complex sferics systems, technical systems cabling; and also the electromechanical control technical systems such as special power, operational recorders, countdown and display systems, deluge water systems, and detection and fluid transfer systems.

7. Technical Services Unit -
This group provides facilities and personnel for the fabrication of prototypes, and the capability of complete test and repair of all inline electronic equipment, modules, and sub-assemblies. It provides for the operation and maintenance capability of a complete closed circuit television system for the monitoring of static test firings, and includes a precision machining laboratory and an electro-mechanical repair laboratory.

TECHNICAL FACILITIES RESUME

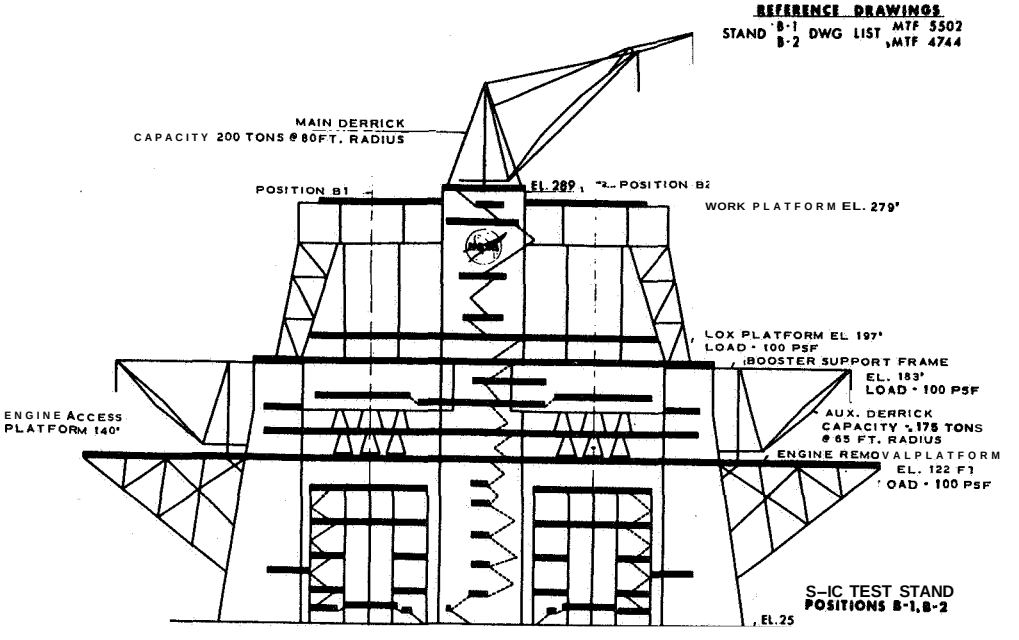
DATE OF RESUME: 9/1/66

FACILITY NO: 12-06-08-00

1. REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. FACILITY NAME: S-IC Test Stand

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Rocket Propulsion Test Complex, **Saturn** IC

5. TECHNOLOGICAL AREAS SUPPORTED:

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The S-IC Test Stand is a dual positioned stand for supporting and servicing the S-IC Stage (Dia.33 ft. - length 138 ft.) during static firing (7.5 million pounds of thrust). The stand consists of the following major items:

1. Flame deflector: cooling flow rate of *290,000* gpm during static firing.
2. Aspirator: live load of 100 psf on upper platform level. The aspirator minimizes the amount of exhaust gases and steam that rise from flame deflector.
3. Elevator: capacity - *2* @ *9,000* pounds.
4. Derricks: see figure
5. Platforms: see figure
6. Booster Support Frame: see figure

6. NARRATIVE DESCRIPTION "he stand is also supported by various systems and facilities. These systems and/or facilities and their capabilities are shown below:

1. Electrical System:
   a. Primary voltage - 13.8 KV.
   b. Feed - Dual 500 MCM cable feeders from MH #27 of the underground system.
   c. Short circuit capability - 250,000 KVA.
2. Deluge System: flow rate of 123,080 gpm during static firing.
3. High Pressure Industrial Plant: delivery rate of 290,000 gpm to stand during static firing.
4. Gas Systems:
   a. Nitrogen: tanks - 3 @ 1,500 cu. ft. and 1@ 1,375 cu. ft.; flow to stand - 150,000 & 50,000 SCFM; pressure drop - 100 psi @ 3,200 psig and 90° F.
   b. Helium: 1 tank @ 1,068 cu. ft.; flow to stand - 30,000 SCFM; pressure drop - 100 psi @ 3,200 psig and 90° F.
   c. Air: flow to stand - 5,000 SCFM; pressure drop - 400 psi @ 1,500 psig and 90° F.
5. Liquid Oxygen System: barges - 5 @ 95,000 gal.; filling rate - 10,000 gpm @ 75 psig.
6. LOX Dump Pit: capacity - 340,000 gal.
7. RP-1 Propellant System: 1 tank @ 300,000 gal.; filling rate - 2 pumps @ 1,000 gpm each.
8. RP-1 Burnoff Pit: capacity - 3,950 gal. with 1.5 freeboard.
9. Data Acquisition Facility: Vehicle testing data is transmitted to DAF for conditioning and recording.
10. Test Control Center: Strip chart recorders, remote indicators, tabulators and digital display equipment ("Redline" instmentation) are installed in TCC for support of static firings.
11. Video Viewing System: The closed loop video viewing system provides monitors and camera controls in the TCC. The system receives picture signals from selected cameras mounted at field located camera stations.

7. POTENTIAL: With minor modifications the S-IC Test Stand is capable of *accepting a flight vehicle up to 179.5 ft. in length and has a growth capability up to 10 million lbs. of thrust. A study to determine what modifications would be needed to accept a vehicle of diameter longer than 33 ft. has not been made.

8. PLANS

9. BLDG. NO.	4220	10. YR. BUILT:	1965	11. FAC. CAT. CODE:	350-10
12. INITIAL COST: $	1993 K	13. NASA B.O.D.	1965	14. STATUS CODE:	Const.
15. ACCUM. COST: $	2091 K	16. LIFE EXPECT.	Indef.	17. OWNERCODE:	NASA
18. OPER. CODE:	Contr.	19. CONTRACTOR NAME *(if contr. oper.):*			

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO
Facility Engineering Branch, Site Support Office
MTF - I-MT-SS/F&U
(AC 601) 688-4361

12. Transmission Cables: Special multi-conductor and coaxial cables are divided between the DAF, TCC, and test stand for test instrumentation, test item control, and test support systems.
13. Instrumentation Tunnels: These tunnels provide an underground passage for cables between test stand, TCC, and DAF.
14. Observation Bunkers: The bunkers are blast-proof enclosures from which personnel can visually observe test firings at close range.
15. S-1C Booster Storage Building: This building is used for storage, service, modification, and repair of S-1C stage.

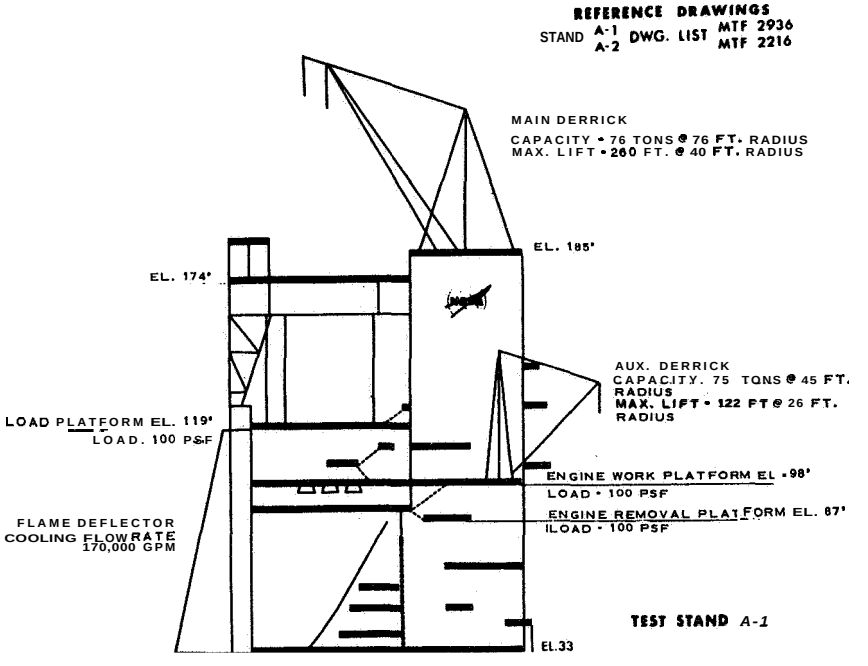
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY NO: **12-06-09-00**

1. REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. FACILITY NAME: S-II 4-2 Test Stand (A-1 is similar)

3. LOCATION *(if other than in 1, above):*



4. FUNCTIONAL NAME: S-II A-2 Test Stand

5. TECHNOLOGICAL AREAS SUPPORTED:

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: The S-II A-2 is a single position stand for supporting and servicing the S-II stage (Dia. 33 ft, length 81.6 ft.) during static firing (1 million pounds of thrust). The stand consists of the following major items:

1. Flame Deflector: cooling flow rate of 170,000 gpm during static firing.
2. Aspirator: capacity - live load of 100 psf on upper platform level. The aspirator minimizes the amount of exhaust gases and steam that rise from flame deflector.
3. Elevator: capacity - 9,000 pounds.
4. Derricks: see figure.
5. Engine Work and Engine Removal Platforms: see figure.
6. Installation Inspection Platforms: capacity - 500 pounds.
7. Monorail Hoist: capacity - 3 ton; maximum height of lift - 60 ft.

6. NARRATIVE DESCRIPTION The stand is supported by various systems and facilities. These systems and/or facilities and their capabilities are shown below:

1. Electrical System:
   a. Primary voltage - 13.8 KV.
   b. Feed - Dual 500 MCM cable feeders from MH #27 of underground system.
   c. Short circuit capacity - 250,000 KVA.
2. Deluge System: flow rate of 74,250 gpm to stand during static firing.
3. High Pressure Industrial Water Plant: delivery rate of 170,000 gpm, to stand during static firing.
4. Gas Systems:
   a. Nitrogen: tanks - 6 @ 15-0 cu. ft.; flow to stand-80,000 SCFM and 40,000 SCFM; pressure drop-100 psi @ 3,200 psig and 90° F.
   b. Hydrogen: tanks - 3 @ 1375 cu. ft.; flow to stand - 12,000 SCFM; pressure drop - 100 psi @ 3,200 psig and 1300 F.
   c. Helium: tanks - 1 @ 1,065 cu.ft.; flow to stand-40,000 SCFM; pressure drop - 100 psi @ 3,200 psig and 90° F.
   d. Air: flow to stand-4,000 SCFM; pressure drop-200 psi @ 1,600 psig and 90° F.
5. Liquid Oxygen System: barges - 2 @ 95,000 gal.; filling rate-5,000 gpm @ 53 psig.
6. LOX dump pit: capacity - 150,000 gal.
7. Liquid Hydrogen Propellant System: barges-2 @ 246,000 gal.; filling rate-10,000 gpm @ 40 psig.
8. Liquid Hydrogen Propellant Emergency System: 1 tank @ 150,000 gal.
9. Data Acquisition Facility: Vehicle testing data is transmitted to DAF for conditioning and recording. The Data Acquisition Facility is capable of receiving a total of 2500 separate pieces of test data, per firing, from the S-II A-2 Test Stand.
10. Test Control Center: Strip chart recorders, remote indicators, tabulators and digital display equipment ("Redline" instrumentation) are installed in TCC for support of static firings. The Test Control Center is capable of receiving a total of 760 separate pieces of test data, per firing, from the S-II A-2 Test Stand.

7. POTENTIAL: With minor modifications the S-II A-2 Test Stand is capable of accepting a flight vehicle up to 97.1 feet in length. A study to determine what modifications would be necessary to accept a flight vehicle of a diameter larger than 33 feet has not been made.

8. PLANS:

3. BLCG. NO. 4122 | 10. YR. BUILT: 1965 | 11. FAC. CAT. CODE: 350-10

12. INITIAL COST: $ 1,195 K | 13. NASA B.O.D. 1965 | 14. STATUS CODE: Active

15. ACCUM. COST: $ 1,571 K | 16. LIFE EXPECT. Indef. | 17. OWNER CODE: NASA

18. OPER. CODE: Contr. | 19. CONTRACTOR NAME (if *contr. oper.*): Space and Information Division, North American Aviation

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone (Area Code 601) 688-4361.

11. Video Viewing System: The closed loop video viewing system provides monitors and camera controls in the TCC. The system receives picture signals from selected cameras mounted at field located camera stations.
12. Transmission Cables: Special.multi-conductor and coaxial cables are divided between the DAP, TCC, and test stand for test instrumentation, test item control, and test support systems.
13. Instrumentation Tunnels: These tunnels provide an underground passage for cables between test stand, TCC, and DAF.
14. Observation Bunkers: The bunkers are blast-proof enclosures from which personnel can visually observe test firings at close range.

TECHNICAL FACILITIES RESUME

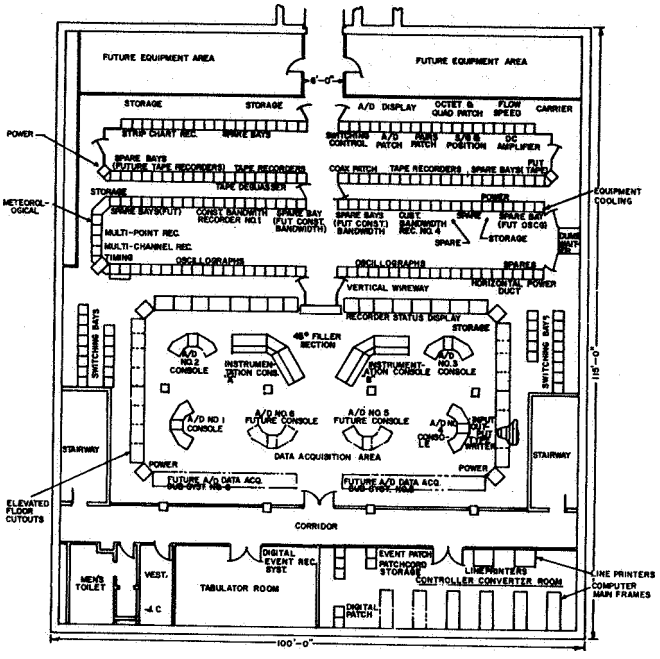
DATE OF RESUME: 9/1/66

FACILITY NO: **12-06-10-00**

1. REPORTING INSTALLATION: Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. FACILITY NAME: Data Acquisition Facility (DAF)

3. LOCATION *(if other than in 1. above):*



4. FUNCTIONAL NAME: Data Acquisition Facility

5. TECHNOLOGICAL AREAS SUPPORTED: Acquires and records data signals transmitted, via land lines, from test vehicles, flight vehicles, and the facilities necessary to support static tests within the Saturn V Complex.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

The DAF contains the following primary systems:

1. The Instrumentation Recorder Control System
   a. Consists of two recorder control consoles, a status display panel, and local recorder control panels.
2. The Calibration Control System
   a. Consists of the means for local and remote calibration of various data conditioning systems at the DAF and the systems at the test stands.
3. The Analog/Digital Data Acquisition Subsystem
   a. Consists of four independent data acquisition systems. These subsystems share a number of common displays and printout devices which are used mainly for calibration and checkout purposes. The A/D subsystems are essentially "amplifier per channel" 210 systems, with a computer for on-or-off line conversion of the data from the raw

6. NARRATIVE DESCRIPTION

acquired form to engineering units and a magnetic tape output.

4. The Digital Event Recording System
   a. The Digital Event Recording System accepts 893 nominal 24-volt input signals in 47 blocks of 19 channels, each block having its own associated common signal return, a parallel BCD time-of-day input (in hours, minutes, seconds, and milliseconds) and clock pulse signals synchronized to the updating time of the parallel BCD time-of-day channel.
5. The Analog Magnetic Tape Recording System
   a. The Analog System has ten analog tape recorders, each capable of recording 15 channels of information.
6. The DAF Oscillograph Recorder System
   a. The DAF has 20 (Model 1612) Minneapolis Honneywell Visicorder oscillographs.
7. The DAF Strip Chart Recorder System
   a. These single-channel, two-speed, null-balance strip chart recorders are used for the recording of millivolt level instrumentation data in the band of frequencies from zero to 5 cps.
8. Other major systems in the DAF are as follows
   a. Signal Conditioning Module provides a means of converting the output of variable resistance transducers to a controlled and calibrated millivolt signal.
   b. Position Signal Conditioning Module provides a means of converting the output of variable resistance transducers (position indicating potentiometers) to a controlled and calibrated signal).
   c. Carrier Signal Conditioning - The 3KC, AM carrier facilitates calibration, excitation and conditioning for reluctance type pressure transducers.
   d. Flow and Speed Signal Conditioning - Converts transducer outputs.

7. POTENTIAL:

8. PLANS:

9. BLDG. NO. 4995 10. YR. BUILT: 1966 11. FAC. CAT. CODE: 140-15

12. INITIAL COST: $ 932 K 13. NASA B.O.D. 1966 14. STATUSCODE: ACTIVE

15. ACCUM. COST: $ 9490 K 16. LIFE EXPECT. Indef. 17. OWNERCODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.)*: General Electric Co.

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code 601) 688-4361.

e. Master Timing System -
Consists of three independent time code generators, a transfer network, and line drivers.

f. Meteorological System - Supplies a visual indication and a continuous record of meteorological data.

g. Constand Bandwidth System - Accepts analog data signals and reproduces original data signals.

h. Oscillograph Processor System - A Kodak Ektaline 200 processor, Model 1 M used for processing permanent records on photographic papers and fixing direct writing papers.

i. Video Tape Recorder System - There are two Ampex 660B Video tape recorders in the DAF. They are rack mounted, fully transistorized and record and playback both video and audio signals.

j. Multipoint-Multirange Recorder - Provides a convenient readout for the Thermocouple Systems from all test stands, thus to aid in checkout, troubleshooting, and test preparation for these systems.

k. Eight-Channel Direct-Writing Recording Systems -
Is used for a variety of systems for checkout, troubleshooting and test preparation. Its sensitivity and frequency response enables recording of any anticipated signal level.

1. Switching System - Consists of switching modules, the switching control panel, and the status display panel. The switching module is used to switch various DAF recorders to any test position.

m. Patching System - Facilitates the transfer of test data from the test stands to the Conditioning and/or Recording Equipment in the DAF by the use of movable patchcords.

n. Mobile Instrumentation Unit - A portable van containing a complete operable instrumentation and control system.

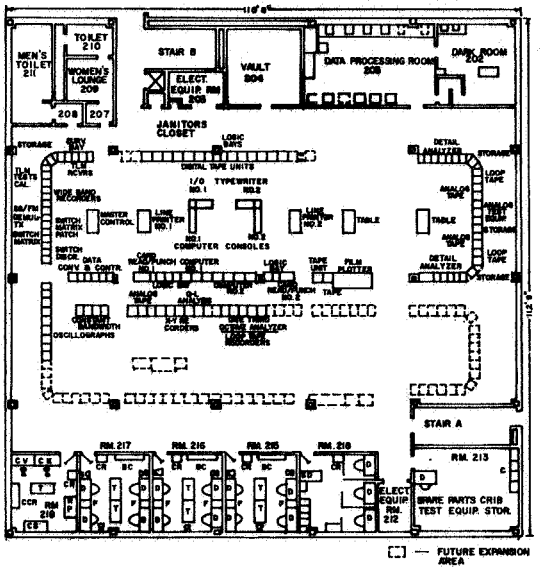
TECHNICAL FACILITIES RESUME

DATE OF RESUME: 9/1/66
FACILITY NO: 12-06-11-00

1. **REPORTING INSTALLATION:** Mississippi Test Facility
Bay St. Louis, Mississippi 39520

2. **FACILITY NAME:** Data Handling Center

3. **LOCATION** *(if other than in 1, above):*



4. **FUNCTIONAL NAME:** Data Handling Facility

5. **TECHNOLOGICAL AREAS SUPPORTED:** The Data Handling Center provides on-site data reduction capability (digital and analog) for the Data Acquisition Facility and all other test elements at MTF requiring technical data processing support

6. **NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:** The Data Handling Center provides facilities and equipments for receiving, recording, reducing, processing, and presenting digital and analog data from either RF Telemetry or hardline sources in support of test operations for Mississippi Test Facility users. The DHC is oriented toward an automatic, pre-programmed, computer controlled data reduction system capable of automatic setup and checkout of its own equipment.

The primary functions of this facility are divided as follows for this description: Data Handling System, Analog System, and Data Processing Equipments.

Data Handling System -
The primary function of the Data Handling System is the conversion and recording of PAM, PCM, and continuous analog telemetry data for user evaluation. Data Processing may be accomplished in real-time from telemetry receivers, or in pseudo real-time using computer-controlled play-back of wide band telemetry tapes. This data handling system is also used to provide quick-look outputs of vibration data obtained from playback of

6. NARRATIVE DESCRIPTION

SS/FM analog tape or Data Acquisition Facility analog tape containing hardline data. To perform these functions, the Data Handling System includes:

1. Two SDS-930 special purpose computers and peripheral equipment for simultaneous and independent data reduction on a priority (interrupt) basis.
2. A data conversion and control subsystem for converting incoming PAM or continuous analog data to parallel digital form. The various data types which can be processed include: FM/FM (continuous analog), PAM/FM/FM, PCM/FM, and SS/FM.
3. A computer output select and display panel for manual program selection of data words for on-line decommutation, conversion, and outputting by either computer. The converted data outputs primarily used for quick look purposes, may be selected, changed or deleted.
4. Various data processing outputs are available including: digital tape recorders with tape formats compatible with IBM 729 II or IV magnetic tape systems; line printers; IRM 72 series input/output typewriters; and IBM 1442 Model 2 Card Read/Punch machines; and a control console for control of the central processor. A paper tape read/punch unit is also available for each computer.
5. An operation software package, card punch/sort equipment and card testers.

Analog System -

The analog system equipments are used to receive, record and analyze RF telemetry and hardline data. Included is a complete ground telemetry station used to receive and record RF telemetry data on wideband magnetic tapes. These tapes are reduced for analysis in pseudo-real time by analog analysis equipment and the special purpose computers through the data conversion and control subsystem. The analog analysis equipments include both quick-look and detailed vibration analyzers used to perform vibration data analysis and reduction for site users. Other equipments include a constant bandwidth system, various tape recording devices, and a one-third octave analyzer system. Analog data routing capabilities include FM/FM, PAM/FM/FM, Vibration SS/FM, and Vibration CBW/FM. Specifically, the equipments include:

7. POTENTIAL: Installation of a hi-volume remote computer terminal for direct contact with the Univac System at the NASA Computer Center in Slidell, Louisiana is in the planning stage. This terminal will include a 1004 Univac subsystem and associated peripheral equipment.

8. PLANS:

Completion of this project is tentatively scheduled for FY 67.

9. BLDG. NO. 1000 10. YR. BUILT: 1965 11. FAC. CAT. CODE: 310-60

12. INITIAL COST: $ 653 K 13. NASA B.O.D. 1965 14. STATUS CODE: Active

15. ACCUM. COST: $ 2879 K 16. LIFE EXPECT. Indef 17. OWNER CODE: NASA

18. OPER. CODE: Contr. 19. CONTRACTOR NAME *(if contr. oper.):* General Electric Co.

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Site Support Office, MTF.

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO: Facility Engineering Branch, Site Support Office, MTF. I-MT-SS/F&U. Phone: (Area Code 601) 688-4361.

1. A complete telemetry ground station including thirteen telemetry receivers and a single sideband demodulator for simultaneous signal processing. The received data consists of FM/FM, PAM/FM/FM, PCM/FM, and SS/FM information which is recorded on wide band magnetic tapes. Twelve RF data channels and one RF surveillance channel are available.
2. Constant bandwidth equipment which accepts pre-recorded magnetic tape containing multi-track multiplexed data. This equipment is capable of simultaneously demultiplexing twenty analog data channels.
3. Vibration analysis equipments which accept vibration data and perform both quick-look and detailed analysis of the data. The quick-look equipment can provide a spectral analysis of transient, random, periodic, and combination random-periodic signals, one channel at a time, on either amplitude spectrum, square of the amplitude spectrum, and power spectral density modes. Analog outputs can be used on oscillographs, oscilloscopes, and X-Y plotters. The output can be digitized and channelled to the computer for a plot tape preparation operation.

   The detailed vibratidn analyzer is capable of plotting amplitude spectral density, power spectral density, transmissability ratio, transfer function and cross power spectrum analyses simultaneously on several channels. Also, the capability for performing probability density functions, Rayleigh distributions, level crossing, number of maxima, joint probability and cumulative distribution are available. Plots are available on both linear and logarithmic scales.
4. A one-third octave analyzer which is a parallel filter, broad-band analyzer that divides complex data into narrow bands, detects all bands simultaneously, and plots a graph of frequency versus amplitude. The equipment is used for acoustical and vibration measurements.
5. Various recording equipment including: Mincom Ticor II wide band tape recorders used for pre-detection recording of telemetry signals; an Ampex FR 1600 magnetic tape recorder; Precision Instrument PI 4100 analog tape recorders used with the quick look and detailed vibration equipment, Sangamo 4742 loop tape recorders used with the detailed vibration analyzer and one-third octave analyzer; Mosely Model 135 and Electro Instruments, Incorporated, Model 320T-1586 X-Y plotters; and Honeywell oscillograph recorders.

Data Processing Equipments -

A variety of processing equipments is available within the DHC to provide the user with either film or hard copy. These equipments include:

1. Stromberg-Carlson Film Plotter, SC 4020, which receives digitized tape inputs from the computer. Outputs from the plotter are either 35MM film or hard copy paper. Outputs include annotated point plots of amplitude versus frequency for vibration, annotated point plots of data as a function of time or of data from another channel, and alpha-numeric tabs as a function of time.
2. Viewlex oscillogram processors,.
3. Oscillogram fanfolders,
4. Diazo reproducer.
5. Fulton film processor.
6. Fanfold microfilmers and Recordak film unit.
7. Recordak Magnaprint reader.
8. Xerox 24C continuous printer.
9. Kalvar Model 400 Multimode reproducer.

CENTER	CATALOG PAGE NO.	FUNCTIONAL NAME	DIMENSIONS	ACCESS
JPL	8-26	CLIMATIC ENVIRONMENTS TESTING LABORATORY	1' X 1' X 1'	–
JPL	8-26	CLIMATIC ENVIRONMENTS TESTING LABORATORY	2' X 1' X 1'	–
GSFC	7-55	ENVIRONMENTAL TEST FACILITY	2' DIA X 2' D	–
JPL	8-26	CLIMATIC ENVIRONMENTS TESTING LABORATORY	3' X 3' X 3'	–
JPL	8-26	CLIMATIC ENVIRONMENTS TESTING LABORATORY	3' X 3' X 3'	–
JPL	8-26	CLIMATIC ENVIRONMENTS TESTING LABORATORY	3' X 31 X 31	–
JPL	8-26	CLIMATIC ENVIRONMENTS TESTING LABORATORY	3' X 31 X 3'	–
MSFC	12-31	THERMAL ENVIRONMENTAL PHYSICS LABORATORY	3' DIA X 41 L	–
MSC	11-208	ENVIRONMENTAL TEST FACILITY	3' X 3' X 4'	–
MSC	11-208	ENVIRONMENTAL TEST FACILITY	3' X 3' X 4'	–
MSC	11-208	ENVIRONMENTAL TEST FACILITY	3' X 31 X 4'	–
MSC	11-208	ENVIRONMENTAL TEST FACILITY	3' X 3' X 4'	–
MSFC	12-11	VACUUM TECHNOLOGY LABORATORY	3.5' DIA X 14' L	–
LRC	4-31	SPACE VACUUM FACILITY	41-81 DIA X 6'-12' L	–
JPL	8-26	CLIMATIC ENVIRONMENTS TESTING LABORATORY	6' X 31 X 3'	–
LRC	4-60	DYNAMICS RESEARCH LABORATORY	6' DIA X 8' L	4' DIA
GSFC	7-57	ENVIRONMENTAL TEST FACILITY	7' DIA X 8' L	–
MSC	11-21	ENVIRONMENTAL TEST FACILITY (CHAMBER E)	7' DIA X 13' L	–
JPL	8-27	ENVIRONMENTAL TEST FACILITY	7' DIA X 14' L	–
ARC	1-13	SPACE ENVIRONMENT RESEARCH FACILITY	8' X 11'	–
MSC	11-11	ENVIRONMENTAL TEST FACILITY (8 FT)	8' DIA X 20' L	–
MSFC	12-149	ALTITUDE TEST CELL (4583)	8' DIA X 371 H	–
MSC	11-19	ENVIRONMENTAL TEST FACILITY (CHAMBER D)	9' DIA X 18' H	–
GSFC	7-59	ENVIRONMENTAL TEST FACILITY	10' DIA X 15' H	–
GSFC	7-31	THERMAL VACUUM SOLAR SIMULATION FACILITY	10' DIA X 30' L	–
JPL	8-41	ENVIRONMENTAL TEST FACILITY	10' DIA X 45' H	–
GSFC	7-61	ENVIRONMENTAL TEST FACILITY	12' X 12' X 20' H	–
MSFC	12-11	VACUUM TECHNOLOGY LABORATORY	12' DIA X 35' H	–
MSC	11-9	ENVIRONMENTAL TEST FACILITY	13' DIA SPHERE	9' DIA
MSFC	12-143	ENVIRONMENTAL TEST FACILITY (4748)	15' DIA X 20' H	–
MSFC	12-11	VACUUM TECHNOLOGY LABORATORY	18' DIA X 26' L	–

ENVIRONMENTAL TEST CHAMBER SUMMARY CHART

ESSURE TITUDE)	TEMPERATURE	NO. IN USE	OTHER ENVIRONMENTS SIMULATED	COMMENTS
–	--100° TO +600° F	1	–	–
–	--100° TO +600° F	1	–	–
10^{-7} TORR	--196°C TO +100° C	1	SOLAR RADIATION	IRRADIATION OF 130 WATTS PER SQ. FT.
–	--100' TO t 350' F	1	20% TO 95% RELATIVE HUMIDITY	–
–	--100' TO +250° F	1	–	–
–	--100° TO +300° F	1	20% TO 95% RELATIVE HUMIDITY	–
–	--300' TO t 250° F	1	20% TO 95% RELATIVE HUMIDITY	–
10^{-8} TORR	–	1	SOLAR RADIATION	–
–	-320' TO +150° F	1	–	–
–	-100' TO +350° F	1	HUMIDITY	–
150,000 FT	-100' TO +350° F	2	–	–
–	AMBIENT TO 2000' F	1	–	–
10^{-7} TORR	–	1	–	–
10^{-12} TORR	5° K	1	2-1/2 SOLAR CONSTANTS RADIANT HEAT FLUX	–
–	-100' TO + 300' F	1	29% TO 95% RELATIVE HUMIDITY	–
10^{-8} MM HG	-300° F	1	SOLAR RADIATION, VIBRATION	–
10^{-7} TORR	-196°C TO +100° C	1	SOLAR RADIATION	CARBON ARC SOLAR SOURCE 130 WATTS PER SQ. FT.
TORR	20° K	1	SOLAR RADIATION	
10^{-8} TORR	-300° TO +200° F	1	–	–
10^{-10} TORR	SPACE TEMP	ASSORTED	SOLAR, ELECTROMAGNETIC, AND PROTON RADIATION, MICRO – METEOROID BOMBARDMENT	FACILITY CONTAINS VARIOUS VACUUM CHAMBERS, LARGEST IS SHOWN.
125,000 FT	–	1	–	OBSERVED AIR LOCK
135,200 FT	–	1	–	–
10^{-12} TORR	14° K	1	SOLAR RADIATION	CLEAN ROOM ADJACENT
10^{-9} MM HG	-196° C TO +100° C	1	–	CHAMBER CONTAMINANTS MONITORING BY MASS SPECTROMETER
10^{-9} TORR	LN_2 BAFFLE	1	SOLAR RADIATION	SEE CATALOG FOR DETAILS OF SOLAR SIMULATOR
10^{-6} TORR	-290' F	1	SOLAR RADIATION	300 WATTS PER SQ FT SOLAR IRRADIATION. RAPID PUMP DOWN
–	-65' C TO +150° C	1	HUMIDITY CONTROL 5% TO 85% RELATIVE	PERSONNEL ENTRY LOCK
10^{-4} TORR	–	1	–	–
10^{-5} TORR	-320' TO +300° F	1	–	–
10^{-9} TORR	LN_2 SHROUD	1	–	–
10^{-4} TORR	–	1	–	–

CENTER	CATALOG PAGE NO.	FUNCTIONAL NAME	DIMENSIONS	ACCESS	
MSC	11–13	ENVIRONMENTAL TEST FACILITY (20 FT)	20' DIA X 22' H	10' DIA	
JPL	8–43	ENVIRONMENTAL TEST FACILITY	25' DIA X 90' H	–	5
JPL	8–29	ENVIRONMENTAL TEST FACILITY	25.5" DIA X 38" L	–	2
JPL	8–29	ENVIRONMENTAL TEST FACILITY	26" DIA X 40" L	–	2
GSFC	7–63	ENVIRONMENTAL TEST FACILITY	27.51 DIA X 40' H	–	10
JPL	8–29	ENVIRONMENTAL TEST FACILITY	29.5" DIA X 55" L	–	2
LERC	5–1	ENVIRONMENTAL TEST FACILITY	30' DIA X 100' L	20' DIA	2
GSFC	7–67	ENVIRONMENTAL TEST FACILITY	33.5' DIA X 59' L	–	10
MSC	11–17	ENVIRONMENTAL TEST FACILITY (CHAMBER B)	35' DIA X 43' H	–	2
LERC	5–2	ENVIRONMENTAL TEST FACILITY	50' DIA X 121' L	–	10
LRC	4–59	DYNAMICS RESEARCH LABORATORY	55' DIA X 55' H	20' X 20'	10
LRC	4–57	FREEBODY DYNAMICS FACILITY	60' DIA SPHERE	–	0
MSC	11–15	ENVIRONMENTAL TEST FACILITY (CHAMBER A)	65' DIA X 120' H	40' DIA	6
MSC	11–7	ENVIRONMENTAL TEST FACILITY	–	–	10

ENVIRONMENTAL TEST CHAMBER SUMMARY CHART

:SSURE TITUDE)	TEMPERATURE	NO. IN USE	OTHER ENVIRONMENTS SIMULATED	COMMENTS
;,000 FT	–	1	–	MAN– RATED
TORR	–290° F	1	SOLAR RADIATION, VIBRATION TO 30,000 FORCE– LB	130 WATTS PER SQ FT SOLAR IRRADIATION
TORR	–300° TO +275° F	1	–	–
TORR	–300° TO +275° F	1	–	–
ORR	15° K	1	SOLAR RADIATION, EARTH RE– FLECTED AND EMITTED HEAT FLUX, ORBITAL CYCLING	130 WATTS PER SQ FT ACROSS 17.51 DIA
TORR	–300° TO t275° F	1	–	–
TORR	LN BAFFLE	1	–	22–1/27 DOME ADDED TO TOP OF CHAMBER
HG	–	1	–	SPIN AND BALANCING
TORR	80° TO 400° K	1	OLAR RADIATION	MAN– RATED
	–	1	–	–
RR	–	1	CCELERATION TO 50,000 G– LB	MAN–RATED
HG	–	1	OLAR AND PLANETARY TARGETS	PRIMARILY FOR ATTITUDE CONTROL SYSTEM TESTING
TORR	80° K	1	OLAR RADIATION TOP AND SIDES	–
RR	–300° TO +500° F	–	CCELERATION 100G–200 LB; SHOCK 80G–300 LB; VIBRATION 10,000 FORCE– LB; EXPLOSIVE ATMOS– PHERE; SALT FOG	COMBINED ENVIRONMENTS OF TEMPERATURE–ALTITUDE AND TEMPERATURE–PRESSURE– HUMIDITY ARE ALSO AVAILABLI

SENTER	CATALOG PAGE NO.	FUNCTIONAL NAME	TEST MEDIUM	TEST SECTION SIZE	ACCESS	MACH NO. RANGE
JPL	8–67	WIND TUNNEL, LOW TURBULENCE	AIR	2' X 2' X 9'L	–	0.0 TO 80 FPS
JPL	8–69	GAS DYNAMICS FACIL–ITY, LOW DENSITY (LOGDF)	–	–	–	–
LRC	4–77	WIND TUNNEL, VERTI–CAL SPIN	AIR	12 SIDED 20' ACROS FLATS X 25'H	–	0.0 TO 90 FPS
LRC	4–75	WIND TUNNEL. FULL SCALE	AIR	30'H X 60'W X 56'L	–	0.0 TO 0.14
ARC	1–23	WIND TUNNEL, 40 FT BY 80 FT	AIR	40'H X 80'W X 80'L	OP: 491 X 80'	0.0 TO 200 KTS CONTINUOUSLY VARIABLE
ARC	1–17	WIND TUNNEL NO. 1, 7 FT BY 10 FT	AIR	7'H X 10'W X 16'L	IDE: 6,3' H X 10,0W OP: 4,8' DIA. IAN: 6,4'H X 2,5'W	CONTINUOUSLY VARIABLE UP TO 250 MPH (220 KTS)
ARC	1–19	WIND TUNNEL NO. 2, 7 FT BY 10 FT	AIR	71H X 10'W X 16'L	IDE: 6,3'H X 10,0'W OP: 4.61 X 5,0'	CONTINUOUSLY VARIABLE UP TO 250 MPH (220 KTS)
LRC	4–73	WIND TUNNEL, 7 FT BY 10 FT	AIR	71 BY 10'	–	0.0 TO 300 MPH
LRC	4–7	WIND TUNNEL, LOW TURBULENCE PRESSURE	AIR	31W X 7,5'H	–	0.1 TO 0.4
LERC	5–19	WIND TUNNEL, SUB–SONIC ICING	AIR	6' X 9' X 20'L	–	300 MPH
ARC	1–21	WIND TUNNEL, PRES–SURE 12 FT	AIR	11,3'H X 11,3'W X 18'L	OP: 5'W X 11'L	0.0 TO 0.98 CONTIN. UOUSLY VARIABLE
ARC	1–25	WIND TUNNEL. TRAN–SONIC 2 FT BY 2 FT	AIR	2'H X 2'W X 5'L	IDE: 2'W X 5'L	0.6 TO 1.4 CONTIN–UOUSLY VARIABLE
ARC	1–27	WIND TUNNEL, TRAN–SONIC 14 FT	AIR	13,5'H X 13,7'W UP–STREAM TO 13,9'W DOWNSTREAM X 33.7511	(DE; 6,7'H X 8'W OTH SIDES	0.6 TO 1.2 CONTIN–UOUSLY VARIABLE
ARC	1–33	WIND TUNNEL TRAN–SONIC (UNITARY) 11 FT BY 11 FT	AIR	11'H X 11'W X 22'L	OP: 7'W X 22'L	0.7 TO 1.4 CONTIN–UOUSLY VARIABLE
LRC	4–79	WIND TUNNEL TRAN–SONIC BLOWDOWN 26–INCH	AIR	OCTAGONAL SLOTTED 26" ACROSS FLATS	–	0.6 TO 1.45
LRC	4–81	WIND TUNNEL, TRAN–SONIC PRESSURE	AIR	7,1'W X 7,1'H	–	0.2 TO 1.3 CONTIN–UOUSLY VARIABLE
LRC	4–83	WIND TUNNEL, HIGH SPEED 7 FT BY 10 FT	AIR	79"H X 120"L	–	UP TO 1.2
LRC	4–85	WIND TUNNEL TRAN–SONIC 16 FT	HYDROGEN PEROXIDE OR AIR	–	–	0.2 TO 1.3
LRC	4–87	WIND TUNNEL, TRAN–SONIC DYNAMICS	AIR OR FREON 12	16'W X 16'H X 30'L	–	0.0 TO 1.2
LERC	5–21	WIND TUNNEL, TRAN–SONIC 8 FT BY 6 FT	AIR	8' X 6' X 39'L	–	0.4 TO 2.0

RUNNING TIME	STAGNATION TEMPERATURE	STAGNATION PRESSURE	REYNOLDS NO. RANGE	DYNAMIC PRESSURE	COMMENTS
–	–	–	–	–	TURBULENCE OF 0.05%
–	–	–	–	–	SEE CATALOG FOR DETAILED PARAMETERS
–	–	ATMOSPHERIC	0.0 TO 0.62 X 10^6	–	ACCELERATION TO 15 FT/SEC/SEC, DECELERATION TO 25 FT/SEC/SEC, TURBULENCE FACTOR OF 2
–	AMBIENT	ATMOSPHERIC	0.0 TO 1 X 10^6	0.0 TO 30 PSF	
–	AMBIENT TO 600° R	1.0 ATM	0.0 TO 2.1 X 10^6	–	SUBSONIC CLOSED– THROAT– FACILITY SIX 6,000 H.P. MOTORS WITH SIX 40' DIA. FANS
–	NET CONTROLLED, DEPENDENT ON AMBIENT (ABOUT 580° R MAX.)	1.0 ATM	2.3 X 10^6 MAX.	–	CLOSED CIRCUIT LOW SPEED ATMOSPHERIC FACILITY TWO– AND THREE–DIMENSIONAL MODELS 1800 H.P. MOTOR WITH FIXED– PITCH FAN
–	NET CONTROLLED, DEPENDENT ON AMBIENT (ABOUT 580° R MAX.)	1.0 ATM	2.3 X 10^6 MAX.	–	CLOSED CIRCUIT, LOW SPEED ATMOSPHERIC FACILITY TWO– AND THREE–DIMENSIONAL MODELS 1800 H.P. MOTOR WITH FIXED– PITCH FAN
–	AMBIENT	ATMOSPHERIC	0.0 TO 2.5 X 10^6	–	THE FACILITY ALSO CONTAINS A 17'W X 15.8'H, 0 TO 70 MPH TEST SECTION WITH REYNOLDS NO. RANGE FROM 0.0 TO 0.7 X 10^6
–	520° TO 560° R	10 TO 150 PSIA	2 X 10^6 TO 15 X 10^6	23 TO 785 PSF	SINGLE– RETURN, CLOSED– THROAT
–	–	–	–	–	4160 HP MOTOR, 5 MILLION BTU/HR HEATING 2100 TONS COOLING, WATER SPRAY. SINGLE– RETURN, CLOSED– THROAT FACILITY
–	500° R TO 625° R, GENERALLY 560° R	0.17 TO 5.0 ATM	0.0 TO 9 X 10^6	–	SUBSONIC, VARIABLE DENSITY, EXCEPTIONALLY LOW TURBULENCE FACILITY 12,000 H.P. DRIVE WITH TWO STAGE AXIAL FLOW FAN
–	580° R	0.16 TO 3.0 ATM	1 X 10^6 TO 8.7 X 10^6	–	CLOSED RETURN, VARIABLE– DENSITY, SLOTTED TEST TEST SECTION FACILITY. 4,800 HP DRIVE WITH TWO– STAGE, AXIAL FLOW COMPRESSOR
–	ABOUT 640° R	1.0 ATM	2.8 X 10^6 TO 4.2 X 10^6	–	CLOSED CIRCUIT FACILITY EXCEPT FOR AIR EXCHANGER IN LOW– SPEED SECTION TO CONTROL AIR TEMP. 110,000 HP MOTOR (132,000 HP FOR ONE HOUR) WITH THREE–STAGE AXIAL– FLOW COMPRESSOR
–	580° R	0.5 TO 2.25 ATM	1.7 X 10^6 TO 9.4 X 10^6	–	CLOSED CIRCUIT VARIABLE DENSITY FACILITY 180,000 HP MOTORS (216,000 HP FOR ONE HOUR) WITH THREE–STAGE AXIAL FLOW COMPRESSOR
) TO 50 SEC	510° TO 550° R	20 TO 75 PSIA	2 X 10^6 TO 27 X 10^6	–	
–	580° R	0.25 TO 2.0 ATM	0.3 X 10^6 TO 7 X 10^6	14 TO 1333 PSF	SINGLE– RETURN, CLOSED– CIRCUIT
–	–	ATMOSPHERIC	4 X 10^6 TO 4.2 X 16^6	–	MACH 0.9 UNDER NORMAL OPERATION. MACH 1.2 BY USE OF PERFORATED SLOTS AND AUXILIARY AIR REMOVAL
–	510° TO 560° R	ATMOSPHERIC	1.2 X 10^6 TO 3.7 X 10^6	58 TO 900 PSF	
–	AMBIENT TO 600° R	0.1 TO 14.7 PSIA	8.5 TO 10^6 FREON 12 3.5 TO 10^6 AIR	420 PSF FREON 12 360 PSF AIR	20.000 HP DRIVE
–	132° TO 205° F	2400 TO 3700 PSFA	–	–	87,000 HP DRIVE, 1,800,000 C.F.M. AIR

CENTER	CATALOG PAGE NO	FUNCTIONAL NAME	TEST MEDIUM	TEST SECTION SIZE	ACCESS	MACH NO. RANGE
ARC	1–31	WIND TUNNEL, SUPERSONIC 6 FT BY 6 FT	AIR	FH X 61W X 14.4FL	IDE: 5F X 5F BOTH IDES	F.25 AND 0.6 TO 2.2 CONTINUOUSLY VARIABLE
ARC	1–37	WIND TUNNEL, SUPERSONIC 9 FT BY 7 FT	AIR	FH X 9FW X 18FL	IDE: 31W X 6.5FH OR: 6FW X 9FL	F.55 TO 2.5 CONTINJOUSLY VARIABLE
LRC	4–93	WIND TUNNEL SUPERSONIC PRESSURE 4 FT 3Y 4 FT	AIR	.5F X 4.51 X 7FL	–	F.25 TO 2.6
ARC	1–39	WIND TUNNEL SUPERSONIC FREE FLIGHT	AIR	.5F X 1.7F X 27FL	–	F OR 3
LRC	4–95	WIND TUNNEL, THERMAL STRUCTURES 9 FT BY 3 FT	HEATED AIR	F X 10511	–	F
ARC	1–35	WIND TUNNEL, SUPERSONIC 8 FT BY 7 FT	AIR	FH X 71W X 16FL	IDE: 81H X 10FL OR: 21W X 4.5FL	F.45 TO 3.5, CONTINJOUSLY VARIABLE
LERC	5–25	WIND TUNNEL, SUPERSONIC 10 FT	AIR	0F X 10F X 40F	–	F TO 3.5 CONTINUOUS VARIABLE
LRC	4–137	WIND TUNNEL, HIGH INTHALPY ARC	AIR OR OTHER GA	F, 4.6F, AND 7.64F DIA.	–	F.5, 3.5, 4.0
LRC	4–89	WIND TUNNEL SUPERSONIC VARIABLE 20–INCH	HEATED AIR	0FW X 20FH	–	F.0 TO 4.5
LRC	4–91	WIND TUNNEL, UNITARY FLAN	AIR	F X 41 X 7FL (TWO)	–	F.47 TO 2.86 (NO. 1) F.29 TO 4.63 (NO. 2)
JPL	8–73	WIND TUNNEL, SUPERSONIC 20–INCH	CO_2–AIR MIXTURES	–	–	F.4, 2, 3, 4, 5
MSFC	12–5	WIND TUNNEL, LONG JURATION AERODYNAMIC	AIR	4F X 14F AND F X 7F	–	1.5 TO 5
ARC	1–29	WIND TUNNEL, SUPERSONIC 1 FT BY 3 FT	AIR	.25F TO 2.8FH X FW X 5.5FL	IDE: 2F DIA. BOTH IDES AND 2FH X 5FW DOWNSTREAM	1.4 TO 0.9 AND 1.4 TO 6.0
LRC	4–131	WIND TUNNEL, CERAMIC HEATED 11–INCH	AIR NITROGEN	1F DIA.	–	F, 4, 6
LRC	4–117	WIND TUNNEL, HYPERSONIC 2 FT	HEATED AIR	FH X 2FW X 4.5FL	–	F, 4, 5, 6
LRC	4–109	WIND TUNNEL, HYPERSONIC 20–INCH	HEATED AIR	on X 20F	–	6
LRC	4–127	WIND TUNNEL, TEMPERATURE STRUCTURES E FT HIGH	SEE COMMENT	F DIA.	–	6.8. 7.7
LRC	4–105	WIND TUNNEL, HYPERSONIC VARIABLE DENSITY MACH 8	HEATED AIR	8F DIA.	–	7.5 TO 8
LRC	4–113	WIND TUNNEL, HYPERSONIC 20–INCH	HEATED AIR	1F DIA.	–	8.5
LRC	4–111	WIND TUNNEL, HYPERSONIC ARC–HEATED 20–INCH	HEATED AIR OR NITROGEN	on DIA.	–	3, 4, 6, 10
LRC	4–103	WIND TUNNEL, HYPERSONIC FLOW APPARATUS	HEATED AIR	5F DIA.	–	10.03
JPL	8–75	WIND TUNNEL, HYPERSONIC 21–INCH	CO_2–AIR MIXTURES	–	–	4 TO 11
LRC	4–99	WIND TUNNEL, HYPERSONIC, ARC 1–FT	HEATED AIR	F DIA.	–	12
LRC	4–125	WIND TUNNEL HYPERSONIC CONTINUOUS FLOW	HEATED AIR	1F X 31F	–	10, 12
ARC	1–41	SHOCK TUNNEL, 1 FT	AIR	F H X 1FW	–	4.5 TO 14
ARC	1–45	WIND TUNNEL, HYPERSONIC 3.5 FT	–	–	–	5 TO 15 1 TO 4 M 35 MIN RECYCLE

WIND TUNNEL SUMMARY CHART

RUNNING TIME	STAGNATION TEMPERATURE	STAGNATION PRESSURE	REYNOLDS NO, RANGE	DYNAMIC PRESSURE	COMMENTS
–	580° R MAX.	0.3 TO 1.0 ATM	X 10^6 TO 5 X 10^6	–	CLOSED CIRCUIT SINGLE RETURN FACILITY 60,000 HP DRIVE WITH EIGHT STAGE, AXIAL FLOW COMPRESSOR
–	580° R	0.3 TO 2.0 ATM	.5 X 10^6 TO 6.5 X 1(	–	CLOSED CIRCUIT VARIABLE DENSITY FACILITY 180,000 HP DRIVE (216,000 HP FOR ONE HOUR) WITH 11–STAGE AXIAL FLOW COMPRESSOR
–	570° R	4 TO 30 PSIA	.4 X 10^6 TO 6.6 X 1(	250 TO 1368 PSF	
–	–	–	0 X 10^6		A PRESSURIZED BALLISTIC RANGE WITH SEVERAL GUNS. 13,000 FT/SEC MODEL SPEED, 2,000 FT SEC AIRSPEED
TO 75 SEC	760° TO 1120° R	50 TO 200 PSIA	.9 X 10^6 TO 18.4 X 10^6	230 TO 4940 PSF	METALLIC MASS HEAT EXCHANGER
–	580° R	0.3 TO 2.0 ATM	X 10^6 TO 5 X 10^6	–	CLOSED CIRCUIT, VARIABLE DENSITY FACILITY 180,000 HP DRIVE (216,000 HP FOR ONE HOUR) WITH ELEVEN STAGE, AXIAL FLOW COMPRESSOR
–	100° TO 300° F	200 TO 5000 PSFA	–	–	100,000 HP AND 150,000 HP COMPRESSORS, 1,350,000 AND 4,635,000 CFM AIR, COOLING OF 1,880 AND 2,670 LB/SEC
–	–	1 TO 4 ATM	–	–	ELECTRIC ARC HEATER
TO 30 SEC	520° TO 660° R	25 TO 130 PSIA	.5 X 10^6 TO 20.5 X 10^6	–	ELECTRICAL RESISTANCE HEAT EXCHANGERS ENTHALPHY OF 124 TO 157 BTU/LB,
–	–	4 TO 50.9 PSIA (1) 4 TO 142 PSIA (2)	.56 X 10^6 TO 7.83 X 10^6 (1) .76 X 10^6 TO 7.78 X 10^6 (2)	10 TO 1860 PSF (1) 5 TO 1260 PSF (2)	TWO TEST SECTIONS, 150 F NORMAL OPERATING TEMPERATURE WITH BURSTS 400 F FOR HEAT TRANSFER STUDIES
–	–	0.06 TO 66 PSIA	.01 X 10^6 TO 0.6 X 10^6	–	PNEUMATIC LAUNCH FOR FREE FLIGHT STUDIES
–	–	–	–	–	
–	520° R TO 600° R	0.13 TO 4.0 ATM	.5 X 10^6 TO 12 X 10^6	–	CLOSED CIRCUIT, VARIABLE DRIVE FACILITY
–	2400° TO 4000° R	115 TO 1200 PSIA	–	–	ZIRCONIA PEBBLE BED HEAT EXCHANGER
ONTINUOUS	530° TO 960° R	2.94 TO 54.4 PSIA	.1 X 10^6 TO 2.4 X 10^6	5 TO 360 PSF	ELECTRICAL RESISTANCE HEATER
MIN.	1000° R	220 TO 550 PSIA	X 10^6 TO 10.5 X 10^6	–	BOILER HEAT EXCHANGER
TO 220 SEC	2500° TO 4500° R	200 AND 4,000 PSIA	.06 X 10^6 TO 3.7 X 10^6	03.5 AND 2075 PSF	TEST MEDIUM IS HYDROCARBON FUEL–AIR COMBUSTION GASES, OXYGEN ENRICHMENT
TO 600 SEC	1160° TO 1510° R	15 TO 2930 PSIA	.1 X 10^6 TO 14 X 10^6	–	COMBINATION BOILER AND ELECTRICAL RESISTANCE HEAT EXCHANGERS. VACUUM OR ATMOSPHERIC EXHAUST
MIN	1500° R	1600 TO 2500 PSIA	.8 X 10^6 TO 7.5 X 10^6	–	ELECTRICAL RESISTANCE HEATER
0 SEC	–	100 TO 600 PSIA	–	–	2 MEGAWATT ARC HEATER
0 SEC	1500° TO 1760° R	800 TO 1200 PSIA	.3 X 10^6 TO 2 X 10^6	–	2,000 KVA DC HEAT EXCHANGER
–	–	14.7 TO 700 PSIA	.014 X 10^6 TO 0.32 X 10^6	–	PNEUMATIC LAUNCH FOR FREE FLIGHT STUDIES
TO 900 SEC	7000° R	220 TO 400 PSIA	.01 X 10^6 TO 0.02 X 10^6	–	ELECTRIC ARC HEATER WITH 1.5 MEGAWATT DC SUPPLY
–	–	–	–	–	CLOSED CIRCUIT VACUUM STARTING. SEE CATALOG FOR DETAILED PARAMETERS
0 MILLISEC, HR. RECYCLE	–	200 TO 300	X 10^4 TO 1 X 10^6	) TO 10^4 PSF	
60 R MAX.	3 TO 135		X 10^6 TO 6.9 X 10^6	32 TO 2250 PSF	MODEL SIZE 24" SPAN, 40"L, AND 10" DIA. ALUMINA PEBBLE BED HEATER

CENTER	CATALOG PAGE NO.	FUNCTIONAL NAME	TEST MEDIUM	TEST SECTION SIZE	ACCESS	MACH NO. RANGE
ARC	1–47	GAS DYNAMICS LABORATORY	CO N AND MIXTURES	MODEL SIZES UP TO 6" DIA.	–	VARIABLE UP TO 17
LRC	4–YO1	WIND TUNNEL, HYPERSONIC 11–INCH	HELIUM AIR	–	–	6.8, 9.6 (AIR) 10.5, 18.0 (HELIUM)
LRC	4–107	WIND TUNNEL, HYPERSONIC NITROGEN	NITROGEN	19" DIA.	–	18
LRC	4–123	WIND TUNNEL, HYPERSONIC ARC 4 FT	HEATED AIR	24" AND 48" DIA.	–	TO 18
ARC	1–43	WIND TUNNEL, HYPERSONIC HELIUM	HELIUM	20" DIA.	–	8, 15, 20, 26
LRC	4–119	WIND TUNNEL, HYPERSONIC AEROELASTICITY	HEATED HELIUM	37" DIA (MACH 10) 60" DIA (MACH 20)	–	10, 20
LRC	4–115	WIND TUNNEL, HELIUM 22–INCH	HEATED HELIUM	22.5" DIA.	–	18, 22, 26
ARC	1–49	WIND TUNNEL, HELIUM MACH 50	HELIUM	2–1 2" DIA X 8"L MODEL SIZE	–	30, 35, 40, 50
LRC	4–121	WIND TUNNEL, HOTSHOT	–	24" DIA	–	12 TO 28 (NITROGEN) TO 60 WITH HELIUM
LRC	4–97	HOT GAS RADIATION RESEARCH FACILITY	HELIUM, HYDROGEN	–	–	SEE COMMENTS
JPL	8–77	SHOCK TUBE, ARC HEATED 6–INCH	–	–	–	33,000 FPS
JPL	8–81	SHOCK TUNNEL, 43 INCH	HELIUM	–	–	12
MSFC	12–7	SHOCK TUNNEL. HYPERSONIC	HELIUM	–	–	6 TO 15
MSC	11–119	ARC JET FACILITY, SUBSONIC 1.0 MEGAWATT	AIR, HE, AR, OR MIXTURES	–	–	–
LRC	4–129	EXPANSION TUBE (PILOT MODEL)	HYDROGEN HELIUM AIR	–	–	2 TO 3 (SHOCK TUBE) 15 TO 30 (EXPAN. TUB
MSC	11–117	ARC TUNNEL, 1.5 MEGAWATT	–	–	–	–
JPL	8–79	SHOCK TUBE, FREE PISTON 12 INCH	–	–	–	30
LRC	4–133	WIND TUNNEL. ARC POWERED 5 MEGAWATT	AIR NITROGEN	6' DIA.	–	2 TO 3.4
LRC	4–135	WIND TUNNEL, ARC POWERED 10 MEGAWATT	SEE COMMENTS	35" X 35"	–	2 TO 7
ARC	1–51	FREE FLIGHT FACILITY HYPERVELOCITY (PILOT MODEL)	ANY APPROPRIATE NON–TOXIC GAS	2' DIA X 40'L	–	–
ARC	1–53	FREE FLIGHT FACILITY HYPERVELOCITY	ANY APPROPRIATE NON–TOXIC GAS	SEE COMMENTS	–	–
ARC	1–55	BALLISTIC RANGE, HYPERVELOCITY	–	SEE COMMENTS	–	–
ARC	1–57	BALLISTIC RANGE, PRESSURIZED	AIR	1.5' TO 5' DIA. X 20.3'L	–	–
JPL	8–71	LIQUID SODIUM TUNNEL	–	2" DIA.	–	3 TO 40 FPS

JNNING TIME	STAGNATION TEMPERATURE	STAGNATION PRESSURE	REYNOLDS NO. RANGE	DYNAMIC PRESSURE	COMMENTS
TO 10 MIN	–	SEE COMMENTS	–	–	TWO ARC HEATED HYPERSONIC WIND TUNNEL LEGS WITH 15 MW DC SUPPLY AND COMMON VACUUM SYSTEM STAGNATION PRESSURE AERODYNAMICS LEG 0.25 TO 100 MM STAGNATION PRESSURE HEAT TRANSFER LEG 0.01 TO 9.0 ATM.
O 100 SEC (AIR) O 14 SEC LIUM)	–	70 TO 700 PSI (AIR) 200 TO 1600 PSI (HELIUM)	(1.3 TO 4 X 10^6 (AIR) 1.2 TO 10 X 10^6 (HELIUM)	–	AIR RUNS HEATED BY ELECTRICAL RESISTANCE HEATER. TWO AND THREE DIMENSIONAL NOZZLES
IIN	4000°R MAX.	15,000 PSIA MAX.	(1.155 X 10^6 TO 0.785 X 10^6	–	TUNGSTEN GRID RESISTANCE HEATER
–	–	250 TO 1500 PSIA	0.001 X 10^6 TO 0.1 X 10^6	–	10 TO 20 MEGAWATT DC ARC HEATER
IN, 2 HR RECYCLE	610°R MAX	24 TO 285	7 X 10^6 TO 13 X 10^6	260 TO 1960 PSF	
EC	–	540 TO 1100 R	0.6 X 10^6 TO 57 X 10^6 (M10) 1 X 10^6 TO 18 X 10^6 (M20)	200 TO 6900 PSF (M10) 100 TO 920 PSF (M20)	TWO–LEG TUNNEL. GAS–FIRED STORAGE TYPE HEATER
O 60 SEC	–	500 TO 3600 PSIA	3 X 10^6 TO 15 X 10^6	–	ELECTRICAL RESISTANCE HEATING TO 400 F
IN R RECYCLE	2000°R	UP TO 680	–	144 TO 274 PSF	
O 120 MILLISEC	5400°R (NITROGEN)	15,000 PSIA (NITROGEN)	0.01 X 10^6 TO 1 X 10^6 (NITROGEN)	–	2 X 10^6 JOULE CAPACITOR/ELECTRODE HEATER
–	–	–	–	–	FACILITY CONSISTS OF AN EXPANSION TUNNEL AND OF A SHOCK TUBE. SEE CATALOG FOR DETAILED OPERATING PARAMETERS
–	–	–	–	–	290,000 JOULE CAPICATOR, HELIUM DRIVER
ILLISEC	–	–	–	–	SEE CATALOG FOR DETAILED PARAMETERS
–	–	–	–	–	
–	–	–	–	–	
TO 500 MICROSEC O 400 MICROSEC	–	–	1 X 10^4 TO 5 X 10^6 1 X 10^5 TO 1 X 10^6	–	2.5 MEGAJOULE HEATER. SEE CATALOG FOR MORE DETAILED PARAMETERS
–	–	0.01 TO 3 ATM	–	–	
–	–	–	–	–	SEE CATALOG FOR DETAILED PARAMETERS
IN	–	–	0.05 X 10^6 TO 2 X 10^6	300 TO 3000 PSF	
3 60 MIN 3 6 TESTS/DAY	–	–	5 X 10^4 TO 5 X 10^5	50 TO 4000 PSF	TEST MEDIUM IS AIR, NITROGEN, CARBON DIOXIDE OR A COMBINATION OF ANY TWO; DATA GIVEN IS FOR AIR
–	–	–	80 X 10^6	–	A PRESSURIZED BALLISTIC RANGE WITH 12 MM MAX. GUN 28,000 FT/SEC MODEL SPEED, 15,000 FT/SEC GAS SPEED
–	–	–	80 X 10^6	–	THREE GUN RANGE COMBINATIONS: (1) AERODYNAMIC GUN DEVELOPMENT AND RADIATION FREE FLIGHT FACILITIES SEE CATALOG FOR DETAILED PARAMETERS
–	–	–	–	–	FOUR LIGHT–GAS–GUN AND FLIGHT RANGE COMBINATIONS. SEE CATALOG FOR DETAILED PARAMETERS
–	–	–	300 X 10^6	–	11,000 FT/SEC MODEL SPEED
–	–	–	–	–	AXIAL MAGNETIC FIELD IN TEST SECTION

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March 17, 1967

TECHNICAL FACILITIES CATALOG

Preface

This Technical Facilities Catalog has been developed in response to an increasing demand for general and specific information on NASA technical facilities. The Catalog is intended to:

a. Provide NASA management, facilities managers, program and project managers, individual research engineers and scientists, and other agencies of the Government with knowledge of existing NASA research, development, test and evaluation facilities.

b. Provide the reader with a basic concept of the capabilities and functions of the wide variety of NASA technical facilities and the technological areas they support.

The Catalog, arranged in two volumes for ease of handling, groups the technical facilities under the cognizant NASA installation. In each volume, the facilities are indexed alphabetically by functional name and keyword descriptor, NASA-wide and by individual field installation.

Each facility resume provides a brief technical description, capability information, and an illustration of the facility. Additional sources of information are referenced for those requiring more detailed information.

The Catalog also contains summary charts of existing wind tunnels and environmental chambers which provide detailed capability data on each such facility.

Some variations in the methods of description will be noted in this first edition of the Catalog. This reflects the fact that each NASA installation prepared the technical facilities resumes for the facilities under its cognizance.

It is proposed to collect similar information on the NASA-controlled facilities located at contractor plants. This information will subsequently be published as a supplement to the Catalog.

Ralph E. Cushman
Director
Facilities Management Office

Distribution:
SDL-Special