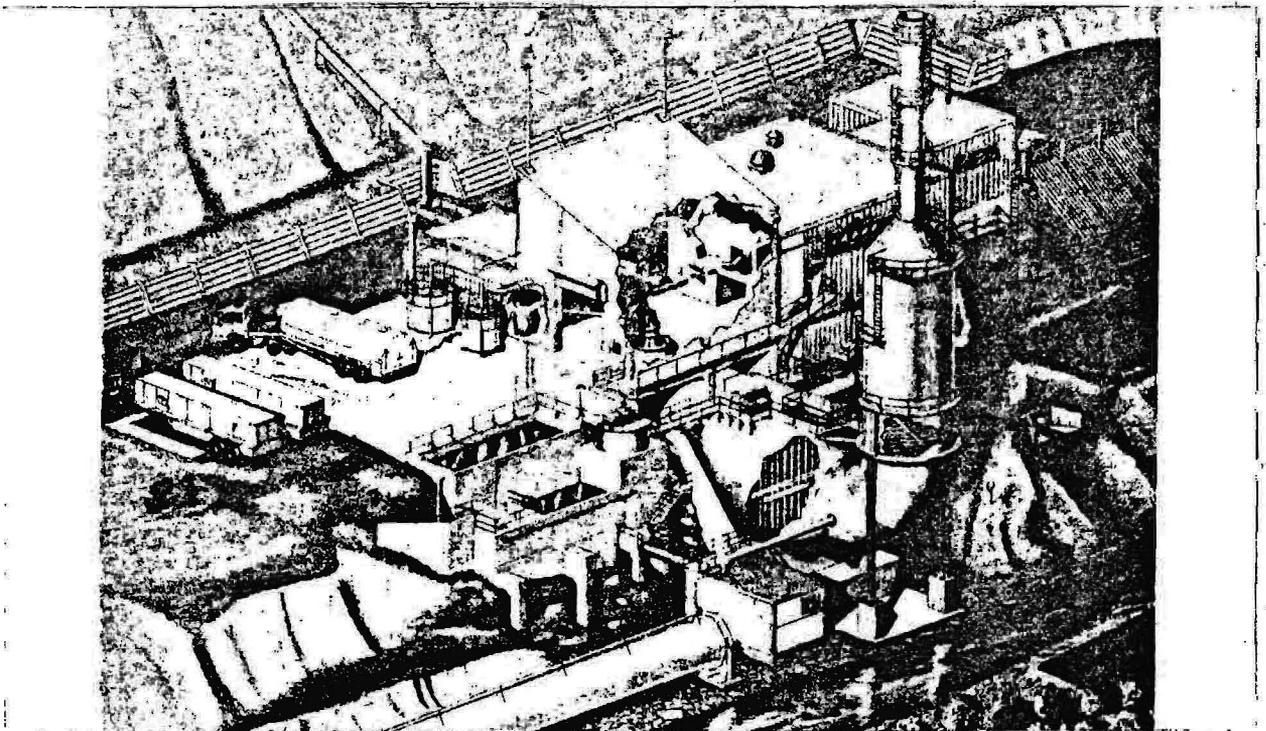

TECHNICAL FACILITIES RESUME

DATE OF RESUME:

FACILITY NO:

LEOPOLD

1. REPORTING INSTALLATION: Lewis Research Center
Cleveland, Ohio
2. FACILITY NAME: Rocket Engine Test Facility
3. LOCATION (if other than in 1. above): Same as 1



4. FUNCTIONAL NAME: Same as 2

5. TECHNOLOGICAL AREAS SUPPORTED: Rocket cooling and combustion, performance and stability studies.

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS: This facility is designed for sea level testing of vertically mounted rocket engines into an exhaust gas muffler and scrubber for high energy and toxic propellants.

At the present time, the facility is running $\text{LH}_2 - \text{LO}_2$ at 20K and 300°P_c. Chamber pressures up to 1100 psia and thrust levels up to 30K have been run with the present facility plumbing.

The propellant tanks being used are a 175 ft³ vacuum jacketed LH_2 tank and a 55 ft³ LO_2 oxygen tank in a LN_2 bath. Other tanks that are available at the facility are a 75 ft³ vacuum jacketed tank designed for LH_2 , a second 55 ft³ oxidant tank that has been used for storable and cryogenic oxidizers, and two 55 ft³ stainless steel clad tanks that were designed for storable fuels. The working pressure of all the propellant tanks is 1500 psig.

6. NARRATIVE DESCRIPTION (continued from pg. 1)

At the facility, there is a LN₂ storage area. The LH₂ is brought down to the facility in roadable Dewars and transferred into the propellant run tank.

At the facility, there is permanent gas storage available for pressurizing the propellant tanks. Presently, there is 126,000 SCF of GH₂ at 2400 psi, 176,500 SCF of GH₂ at 2400 psig, 50,500 SCF of GN₂ at 2400 psig, and 260,000 SCF of GN₂ at 3600 psig.

A water storage tank of 450,000 gallons is available for the scrubber and muffler, and also is used as a source of water for two pumps (650 gpm at 450 psi and 1350 gpm at 450 psi).

There are 200 channels of high speed digitizer lines that are tied into the central data handling system, 14 channels of analog that can be recorded at the facility control room, 24 Bristols strip charts that are used to record mainly facility functions, and 3 Visicorders of 36 channels each available at the control room.

The facility is operated from a remote control room located about 1/4 mile from the firing area.

7. POTENTIAL: Facility could be modified to perform similar testing at higher combustion chamber pressures.

8. PLANS: To increase combustion chamber pressures to 2000 psia. New run tanks and new gas storage systems will be required.

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|----------------------|-----------------|---|---------------|---------------------|--------------------------------|
| 9. BLDG. NO. | <u>202</u> | 10. YR. BUILT: | <u>1956</u> | 11. FAC. CAT. CODE: | <u>310-22</u> <u>320-22</u> |
| 12. INITIAL COST: \$ | <u>2,397.</u> K | 13. NASA B.O.D. | <u>1956</u> | 14. STATUS CODE: | <u>Active</u> |
| 15. ACCUM COST: \$ | <u>2,438.</u> K | 16. LIFE EXPECT. | <u>Indef.</u> | 17. OWNER CODE: | <u>NASA</u> |
| 18. OPER. CODE: | <u>NASA</u> | 19. CONTRACTOR NAME (if contr. oper.):* | | | |

20. OTHER SOURCES OF INFO: NASA TN D-3373.

21. COGNIZANT ORGANIZATIONAL COMPONENT:

Chemical Rocket Systems Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:

Chief, Chemical Rocket Systems Division

Phone: Area Code: 216-433-4000 ext. 6850

*LEAVE BLANK IF NOT APPLICABLE

SECTIONAL VIEW OF HIGH-ENERGY ROCKET TEST FACILITY

