TECHNICAL FACILITIES RESUME

DATE OF RESUME: July 1, 1966
FACILITY NO: 04-00-20-00

1. REPORTING INSTALLATION: Langley Research Center Hampton, Virginia

2. FACILITY NAME: 20-Megawatt Linear Plasma Accelerator

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

4. FUNCTIONAL NAME: Plasma Accelerator (20 Megawatt)

5. TECHNOLOGICAL AREAS SUPPORTED: Magnetoplasmadynamic studies and reentry technology

6. NARRATIVE DESCRIPTION OF FACILITY CAPABILITIES & FUNCTIONS:

Provide power sources, equipment and instrumentation for magnetoplasmadynamic including the following major items:

(a) Ten megawatt D.C. power supply.
(b) Transmission line for additional 10 megawatts D.C.
(c) Resistor bank.
(d) Cooling water systems and steam ejector vacuum pump.
(e) Plasma generator.
(f) Plasma accelerator.
6. NARRATIVE DESCRIPTION

Its principal use is for the expansion and improvement of plasma sources of higher enthalpy and greater mass flow and to accelerate plasmas to high velocity by the use of electric and magnetic fields; the purpose of which is for simulating reentry, and conducting experimental studies of propulsion and power generation techniques.

Application - Space    Category - Fluid Flow and Plasmodynamics

7. POTENTIAL:

8. PLANS:

15. ACCUM. COST: $2,000 ** K  16. LIFE EXPECT. Indef.  17. OWNER CODE: NASA
18. OPER. CODE: NASA  19. CONTRACTOR NAME (if contr. oper.):

** This apparatus only

20. OTHER SOURCES OF INFO:

21. COGNIZANT ORGANIZATIONAL COMPONENT: Aero-Physics Division

22. LOCAL OFFICE TO CONTACT FOR FURTHER INFO:
Chief, Research Models and Facilities Division (Code 56.000)
Phone: (Area Code 703) 722-7961, extension 4745

4-40
TWENTY-INCH HYPERSONIC TUNNEL (MACH 8.5)

Tunnel - 20 inch diameter test section
Mach 8.5 fixed nozzle blocks
Adjustable second minimum, and subsonic diffuser
Schlieren system
7 minute running time
Heat transfer, pressure, and force testing

Models and Model Supports - Sting support

Data
Speed: Mach 8.5
Stagnation pressure (Psia): 3000 max.
Stagnation temperature: 1050°F.
Reynolds No. (millions/foot): 9

Began operation - March 1961

Cost -

<table>
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<th>S &amp; E</th>
<th>C of F</th>
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TWENTY-INCH HYPersonic TUNNEL (MACH 6)

Tunnel - 20 x 20 inch test section size (nominal)
Pressure control, temperature control, adjustable second minimum, and subsonic diffuser
Schlieren system
Fifteen (15) minute running time
Heat transfer, pressure, and force testing

Models and Model Supports - Sting Support

Data

Speed (Mach No.) 6
Stagnation Pressure (Psia) 550 max.
Stagnation Temperature (°F) 550 max.
Reynolds No. (Millions/foot) 4 to 10

Operational - September 1958

Cost

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Description - Provides power sources, equipment and instrumentation for magnetoplasmadynamic studies, including the following major items:

(a) Ten megawatt D.C. power supply.
(b) Transmission line for additional 10 megawatts D.C.
(c) Resistor bank.
(d) Cooling water systems and steam ejector vacuum pump.
(e) Plasma generator.
(f) Plasma accelerator.

Principle Use - For the expansion and improvement of plasma sources of higher enthalpy and greater mass flow and to accelerate plasmas to high velocity by the use of electric and magnetic fields; the purpose of which is for simulating reentry, and conducting experimental studies of propulsion and power generation techniques.

Anticipated completion - June, 1966

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Description - Provides energy storage, transmission to experiment, transfer to plasma in microseconds, and instrumentation for studying plasma. Includes the following major items:

(a) One-megajoule capacitor bank
(b) Collector plate
(c) Instrumentation

Principal Use - To generate a multi-million degree plasma for simulation of the solar corona and for studying the processes that produce highly-ionized atoms in the corona.

Operational - August, 1965

Cost

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