Aircraft Engine Characteristics Summary

**TURBO-JET...YJ67-W-3**

**TYPE**
- TJ32C5
- (YJ67-W-3/XR55-W-1)
- Wright Aero.
- Advanced Spec. AC-190
- 15 Oct 52
- (Not approved)

**FEATURES**
A turbo-jet engine to be used with the XRJ55-W-1 ram-jet to form a double cycle propulsion system for the XF-103 aircraft. The turbo-jet using the ram-jet as an afterburner powers the aircraft for take-off and speeds up to Mach 2.1. At this point the turbo-jet is bypassed and the ram-jet is utilized for higher flight performance. (SEE NOTE 1).

**AVAILABILITY**
- Engine Mock-up Inspection ....... Jun 1953
- Experimental Engine ............ Jul 1954
- Mock-up for Airplane .......... Mar 1953
- Installation Engine ............ Dec 1954
- 50 Hr. Preliminary Rating Test .. Oct 1954
- 150 Hr. Qualification Test .... Dec 1955

**PROCUREMENT**
NUMBER TO BE DELIVERED DURING FISCAL YEAR

**CONTRACTUAL**

<table>
<thead>
<tr>
<th>CONTRACT</th>
<th>FUNDS</th>
<th>FY</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF-9000</td>
<td>$25,000</td>
<td>1951</td>
</tr>
<tr>
<td>AF-8733</td>
<td>817,831</td>
<td>1952</td>
</tr>
<tr>
<td>AF-22980</td>
<td>4,609,141</td>
<td>1955</td>
</tr>
<tr>
<td>PR-89329</td>
<td>3,000,000</td>
<td>1953</td>
</tr>
<tr>
<td>PR-89330</td>
<td>250,000</td>
<td>1953</td>
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</tbody>
</table>

*Includes both YJ67-W-3 and XRJ55-W-1.

**STATUS**
Experimental, currently in design and development stage.

**GENERAL**
- Compressor: Axial, twin-spool, (one low pressure, 6-stage; one high pressure, 5-stage)
- Max Design Pressure Ratio/SLS: ... 10.5:1
- Turbine: (2) Axial, single-stage (one drives low pressure compressor; one drives high pressure compressor)
- Combustion Chamber: Single, annular with fuel nozzles
- Exhaust Nozzle: Variable area, convergent-divergent
- Max Rated Thr Turbine Inlet Temp: 1500°F
- Fuel: JP-4

**OIL**
- Synthetic

**Ignition**
- Igniter plugs

**Power Control**

**Max Rated Thrust Airflow**
- 225 lb/sec

**SIZE & WEIGHT**
- Length (overall w/ram-jet): .......... 534.0 in.
- Diameter (turbo-jet or ram-jet): .... 52.0 in.
- Weight (dry, incl ram-jet and accessories): ............ 6904 lb

**UTILIZATION**
One YJ67-W-3 planned for use with one XRJ55-W-1 to form a double cycle propulsion system for powering the XF-103 Aircraft.
Performance

Guaranteed Ratings at Static Sea Level Standard Conditions

<table>
<thead>
<tr>
<th>Rating</th>
<th>THRUST (lb)</th>
<th>RPM</th>
<th>SFC (lb/lb/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum (5 min)</td>
<td>22,350 (WAB)</td>
<td>6175/---</td>
<td>2.350 (WAB)**</td>
</tr>
<tr>
<td>Military (30 min)</td>
<td>12,950</td>
<td>6175/---</td>
<td>0.795</td>
</tr>
<tr>
<td>Normal (cont)</td>
<td>11,400</td>
<td>6175/---</td>
<td>---</td>
</tr>
<tr>
<td>90% normal thrust</td>
<td>10,260</td>
<td>6175/---</td>
<td>---</td>
</tr>
<tr>
<td>75% normal thrust</td>
<td>8650</td>
<td>5920/---</td>
<td>---</td>
</tr>
<tr>
<td>Idle</td>
<td>---</td>
<td>2500/---</td>
<td>---</td>
</tr>
</tbody>
</table>

Guaranteed Operating Limits

Absolute Alt. 75,000 ft. Operational Alt. 65,000 ft. Max Starting Alt. 35,000 ft.

Limiting Mach. Number at Sea Level Standard Conditions:

Estimated Performance at 35000 Feet and 100% Ram Efficiency

<table>
<thead>
<tr>
<th>Rating</th>
<th>AIRSPEED 1.5 MACH</th>
<th>MAX AIRSPEED 2.1 MACH</th>
</tr>
</thead>
<tbody>
<tr>
<td>THRUST (lb)</td>
<td>SFC (lb/lb/hr)</td>
<td>THRUST (lb)</td>
</tr>
<tr>
<td>Maximum (15 min)</td>
<td>20,000 (WAB)</td>
<td>2.15</td>
</tr>
<tr>
<td>Military (30 min)</td>
<td>6500</td>
<td>0.77</td>
</tr>
<tr>
<td>Normal (cont)</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

NACA Standard Temperature & Pressure

100% Ram Efficiency

NOTES

NOTE 1: The aircraft utilizing the turbo-jet, with ram-jet as afterburner, has a max operating speed of Mach 2.1 due to compressor air temperature limitations set by the engine manufacturer. These limitations are overcome by by-passing the turbo-jet and using the ram-jet to obtain higher thrust. Transition from turbo-jet to ram-jet operation occurs between 35,000 and 40,000 ft. At termination of ram-jet high performance requirement, return to turbo-jet operation is accomplished. For performance above MACH 2.1 see the XRJ75-W-1.

NOTE 2: Two figures of RPM are shown. The first figure represents RPM of the low pressure spool while the second figure indicates that of the high pressure spool.

YJ67-W-3

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