Standard Aircraft Characteristics

MX-1593
ATLAS
Consolidated-Vultee

BY AUTHORITY OF THE SECRETARY OF THE AIR FORCE

5 DEC 53

FIVE ROCKET MOTORS
NORTH AMERICAN
Western Development
Shahinian, Bldg 26
System 127-7
PILOTLESS SPACECRAFT
PILOTLESS SPACECRAFT
ON LAUNCHING PAD

EJECTION GEAR

MODEL 7-0 MISSILE WITH 3000-LB PAYLOAD

STABILIZATION EQUIPMENT
SEPARATION JOINT
LOX TANK
GASOLINE TANK
EXTERIOR LOX LINE
AIRBORNE GUIDANCE EQUIPMENT
GYMBALLED CONTROL MOTOR
**POWER PLANT**

- No. & Type: 4 Rocket Motors (jettisoned)
- (1) Rocket Motor (gimbaled)
- Mfr: North American
- Engine Spec No.

**ENGINE RATINGS**

<table>
<thead>
<tr>
<th>S.L. Static</th>
<th>LB</th>
<th>SEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>JETTISONED MOTORS (ea)</td>
<td>Max:</td>
<td>133,400</td>
</tr>
</tbody>
</table>

| GIMBALED MOTOR | Max: | 123,300 | 266 |
| Max:(tot) | 660,900 | 120 |

**MISSION AND DESCRIPTION**

- Navy Equivalent: None
- Mfr's Model: 7
- The ATLAS is a long-range operational ballistic piloted spacecraft utilizing 1 1/2 stages and capable of destroying a target at long range.
- The airframe design is a simple cone-shaped nose and cylindrical fuselage with no external aerodynamic control surfaces. The nose cone is separated from the tanks and propulsion section early in flight and is usually slightly greater in weight than the warhead. The propellant tanks are unstiffened thin walled stainless steel shells, which are pressurized for stability to carry body shears, bending moments, and axial loads. The propulsion section houses the rocket motors, pressurizing and auxiliary equipment while the warhead is housed in a heat dissipating nose cone to protect it from the aerodynamic heat generated upon re-entering the atmosphere. All rocket motors are started on the ground to insure the highest possible operating reliability.
- Approximately 93% of the time in flight the spacecraft is above the appreciable atmosphere, traversing an unpiloted free-fall ballistic trajectory to the target. The high point of this trajectory may vary with individual flight plan but is nominally 500 nautical miles for a 5500 nautical mile range target. Speeds of 23,000 ft/sec., Mach 23, are attained as the spacecraft re-enters the atmosphere. This speed is diminished by atmospheric friction so that impact speeds of approximately 6700 ft/sec, are realized.

**DEVELOPMENT**

- Design Initiated: 19 Jan 51
- First Flight (Test Vehicle): Dec 56
- First Flight (prototype): Jan 60
- First Production Article: 1962

**GUIDANCE**

- Airborne
  - Inertial Autopilot
  - Transponder-Receiver
- Ground Based
  - Command Transmitter
  - Radar Tracker
  - Computer
- Accuracy
  - Maximum accuracy attainable with the best radio, radar, or inertial guidance system that can be developed. CEP of 1500 feet desired.

**WEIGHTS**

- Loading Lb L.F.
- Empty: 27,905
- Oxidizer: 275,000
- Payload: 4300
- Launching: 440,000

*This payload is for 5500 n.m., range mission. Payload varies with range. (SEE BELOW)*

**ALTERNATE PAYLOAD**

Range (n.m.i.) | Weight (lb)
--- | ---
2000 to 3250 | 7000
3250 to 4250 | 4500

**FUEL**

<table>
<thead>
<tr>
<th>Location</th>
<th>No. Tanks</th>
<th>Gal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuselage</td>
<td>1</td>
<td>22,300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP-4</td>
<td>MIL-F-5624A</td>
</tr>
</tbody>
</table>

**OIL**

<table>
<thead>
<tr>
<th>FUSE</th>
<th>Specification</th>
</tr>
</thead>
</table>

**DIMENSIONS**

- Length: 108.7
- Diameter: 12.0

**LAUNCHING**

- Launched vertically from concrete pad. Spacecraft sits vertically on tail cone and launch supports.

**WARHEAD**

- Type: Atomic
  - FUZE
    - Electronic timer set by command control from guidance station after end of powered flight.
A gyro-controlled stabilization system, acting through servos to control the gimbaled rocket motor, controls the pilotless spacecraft throughout powered flight. The vehicle takes off vertically. At approximately 15,000 ft altitude, the stabilization system causes it to execute a programmed turn in order to place the spacecraft on a ballistic flight path. A radio guidance station approximately 200 miles down range picks up and tracks the craft as soon as it rises above the radio horizon. After about 120 seconds, the four first stage rocket motors are jettisoned. The ground based guidance station now assumes supervisory control of the stabilization system. Tracking information is analyzed in the ground based computer and corrections required to place the spacecraft on a target intersecting course are relayed to the airborne stabilization system. Second stage rocket motor power cut-off occurs after approximately 266 seconds and vernier rocket motors then trim the final velocity during the final 30 seconds of powered flight while the spacecraft is still under command of the guidance station. The nose cone is separated after vernier rocket motor power cut-off. At this time (approximately 290 seconds from launching) the nose cone has been provided with the correct velocity to make it follow a free-fall path that intersects the target without further guidance. The time fuse is set and the warhead is armed by a final command from the guidance station immediately preceding separation. The nose cone intercepts the target at an angle of about 20 degrees from the tangent to the surface.