Angelfire Flight Data

Event: LDRS 26
Date: July 13, 2007
Location: Jean Dry Lake, Nevada
Elevation: 2776 feet MSL
Temp: Approx 90F
%RH: Low
Wind: Very low

Motor: Aerotech M1419W
LO weight: 51.9 lbs
Motor:  Aerotech M1419W
Missile Works Mach delay set to 12 sec
Main chute set to deploy at 1500 ft
Backup charge for main set at 1000 ft
Liftoff: 15:56:19.8 UTC

Comments: Looked to be a pretty good and mostly vertical boost.
Main chule deployment looked clean and was quick to inflate.
Ejection charges were wired to both Missile Works altimeters & ARTS altimeter.

Flight Event Timeline

<table>
<thead>
<tr>
<th>Time (Sec)</th>
<th>Event</th>
<th>Altitude</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>Motor Ignition</td>
<td>0 ft</td>
<td>0 ft/sec</td>
</tr>
<tr>
<td>2.4</td>
<td>Peak Acceleration = 5.8 G's</td>
<td>265 ft</td>
<td>367 ft/sec</td>
</tr>
<tr>
<td>4.2</td>
<td>Altitude = 1,000 feet</td>
<td>1,000 ft</td>
<td>638 ft/sec</td>
</tr>
<tr>
<td>6.2</td>
<td>Peak Velocity = 511 mph</td>
<td>2,287 ft</td>
<td>750 ft/sec</td>
</tr>
<tr>
<td>6.2</td>
<td>Acceleration drops to zero.</td>
<td>2,287 ft</td>
<td>749 ft/sec</td>
</tr>
<tr>
<td>7.0</td>
<td>Motor burnout</td>
<td>2,869 ft</td>
<td>734 ft/sec</td>
</tr>
<tr>
<td>21.5</td>
<td>Altitude = 10,000 feet</td>
<td>10,000 ft</td>
<td>233 ft/sec</td>
</tr>
<tr>
<td>24.6</td>
<td>Drogue chute ejection charge fires</td>
<td>9,423 ft</td>
<td>158 ft/sec</td>
</tr>
<tr>
<td>27.1</td>
<td>Barometric apogee detection</td>
<td>9,574 ft</td>
<td>80 ft/sec</td>
</tr>
<tr>
<td>29.7</td>
<td>Accelerometer apogee detection</td>
<td>11,002 ft</td>
<td>1 ft/sec</td>
</tr>
<tr>
<td>118.0</td>
<td>Main chule ejection charge fires</td>
<td>1,605 ft</td>
<td>675 ft/sec</td>
</tr>
<tr>
<td>187.8</td>
<td>Booster section touch down</td>
<td>0 ft</td>
<td>0 ft/sec</td>
</tr>
<tr>
<td>190.0</td>
<td>Body tube section touch down</td>
<td>0 ft</td>
<td>0 ft/sec</td>
</tr>
<tr>
<td>190.7</td>
<td>All parts at rest on ground</td>
<td>0 ft</td>
<td>0 ft/sec</td>
</tr>
</tbody>
</table>

Drogue chute sink rate 91.0 ft/sec
Main chute sink rate 21.2 ft/sec
Time to apogee 27.1 sec 0.45 minutes
Time on drogue 93.4 sec 1.56 minutes
Time on main 72.7 sec 1.21 minutes
Total flight time 190.7 sec 3.18 minutes

MissileWorks Altimeter #1: 10,172 feet
MissileWorks Altimeter #2: 10,404 feet
Avg: 10,288 feet
Angelfire Acceleration       July 13, 2007       M1419 motor

- Peak acceleration = 5.8 G's (filtered)
- Point of zero acceleration
- Drogue ejection charge fired
- Motor burn-out (approx)

Max Acc Alt 11,002 feet
Max Baro Alt 9,574 feet

Angelfire Altitude       July 13, 2007       M1419 motor

- Accelerometer Data
- Barometric Data
- Drogue ejection charge marker

Max Baro Alt 9,574 feet
Max Acc Alt 11,002 feet
Drogue ejection charge fires at 158 feet/sec

Peak Velocity = 750 feet/sec (511 MPH)
Calculation of drogue parachute descent rate:
- 9,047 feet at 35 sec
- 3,135 feet at 100 sec
Descent rate = 91.0 feet/sec

Calculation of main parachute descent rate:
- 1,353 feet at 125 sec
- 506 feet at 165 sec
Descent rate = 21.2 feet/sec

Main chute deployment charge was set for 1,500 feet. This shows it fired at 1,600 feet.
**Angelfire Acceleration**  
July 13, 2007  
M1419 motor

- **Peek Acceleration = 5.8 G's (averaged value)**
- **Accel = 0 G's**
- **Motor Burnout Marker**
- **Averaged Acceleration**

**AeroTech M1419 Nominal Thrust Curve**

- **Motor Burnout (Approx)**

Time in Seconds

Thrust in pounds