

## **Terrier-Improved Orion (41.XXX)**

### **General**

The Terrier-Orion rocket system is a two stage spin stabilized rocket system which utilizes a Terrier MK 12 Mod 1 or Mk70 for the first stage and an Improved Orion motor for the second stage. The Terrier motor is 18 inches in diameter and is configured with 2.5 ft<sup>2</sup> or 4.8 ft<sup>2</sup> fin panels arranged in a cruciform configuration. The Orion motor is 14 inches in diameter and 110 inches long. The vehicle is typically configured with spin motors and the total weight of this configuration, excluding the payload, is approximately 2,900 pounds.



**Figure F.8-1: Terrier Improved Orion Launch Vehicle**

### **Vehicle Performance**

The Improved Orion motor has a bi-phase propellant system (boost-sustain) that results in thrust levels of approximately 19,000 pounds during the first four seconds of motor burn then trailing off to approximately 3,000 pounds until burnout around 25 seconds. The fins are generally configured to provide a burn out spin rate of four cycles per second. The Orion motor utilizes a clamp-released/load-bearing tail can to interface with the Terrier motor. This is a rail-launched configuration that can be supported at most fixed and mobile launch ranges.

## Payloads

Payload configurations supported by this vehicle include 14 inch and bulbous 17.25 inch diameters. Payload weights ranging from 200 to 800 pounds can achieve altitudes of approximately 200 to 80 kilometers respectively.

Available support systems include the standard 14 inch Ignition Recovery Module Assembly (IRMA), ACS systems, and nose cones of various configurations. The complete cadre of 17.25 inch diameter support systems is available for use with the bulbous payloads. These include fixed and deployable nose cones; fine, course, rate control, and magnetic ACS systems; separation and despin systems; and forward and aft recovery systems.

## Performance Graph

The Terrier-Improved Orion launch vehicle configuration and apogee altitude and impact range at various launch elevation angles and payload weights are presented in Figures F.8-2 and F.8-3.

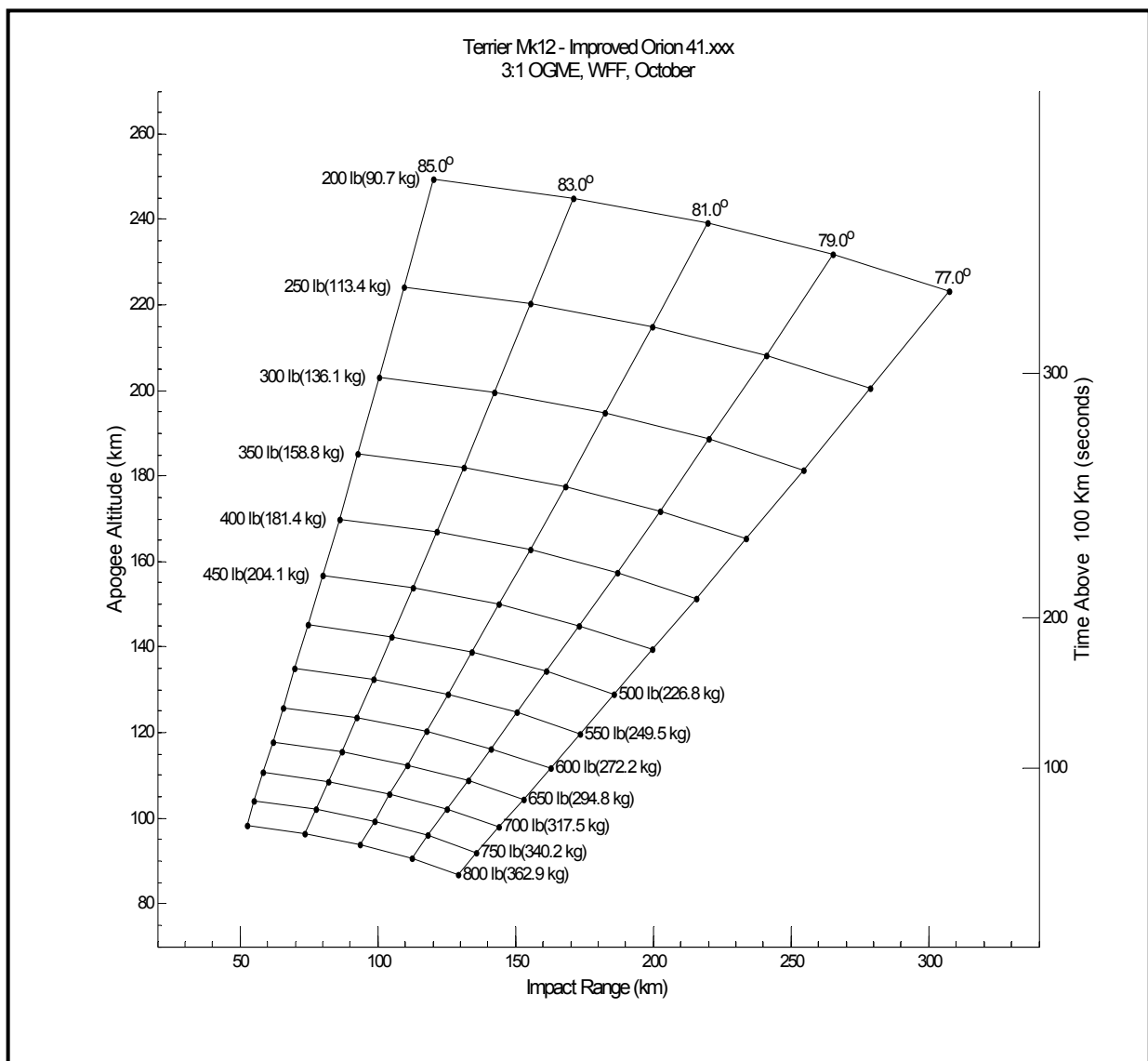
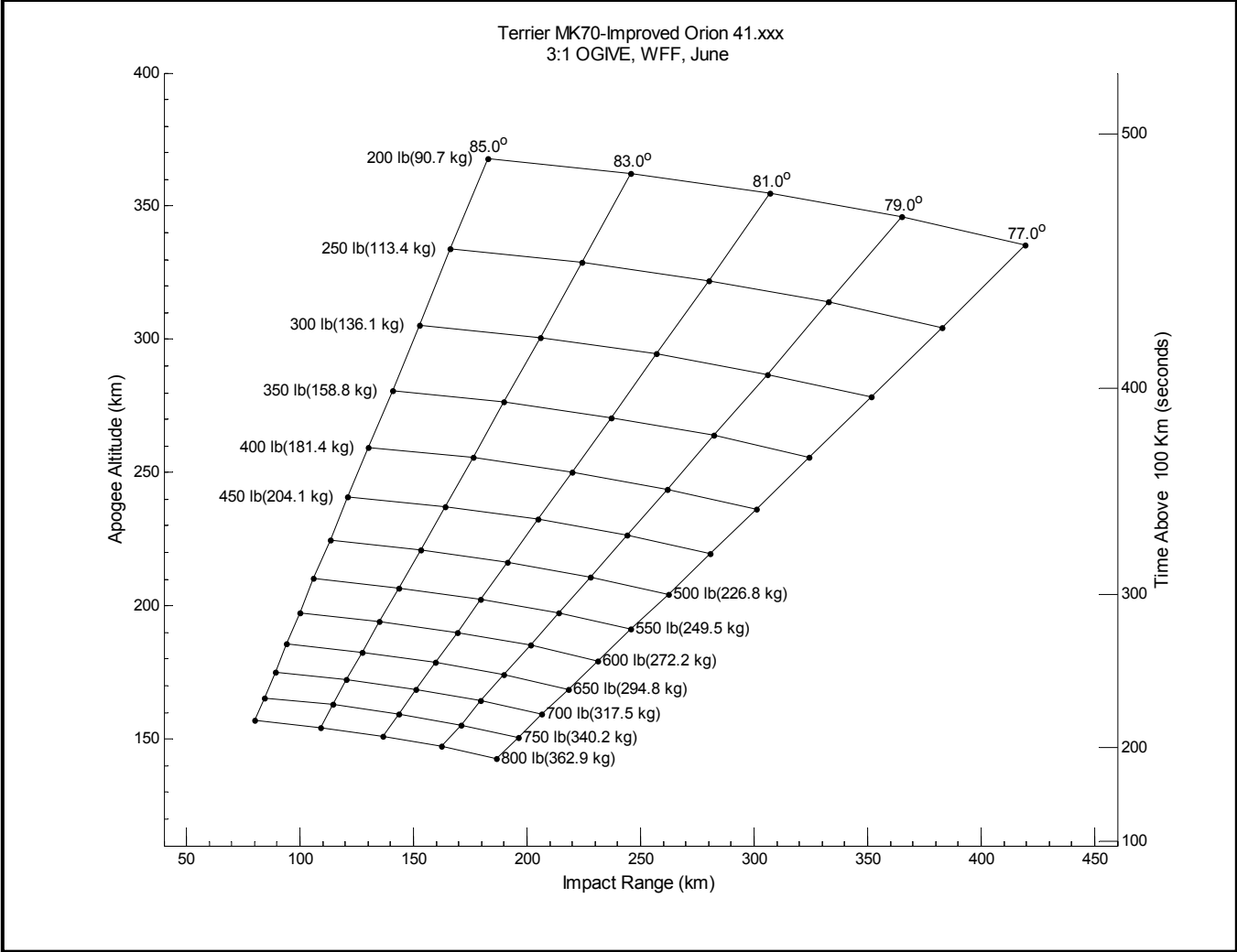


Figure F.8-2: Terrier MK12-Improved Orion Predicted Vehicle Performance



**Figure F.8-3: Terrier MK70-Improved Orion Predicted Vehicle Performance**