Black Brant X Launch Vehicle (35.XXX)

General

The Black Brant X rocket system is a three-stage system; unique because the third stage motor is ignited once the vehicle system reaches exoatmospheric conditions. The motors and the finless third stage is the Nihka rocket motor, Figure F.4-1 shows the Black Brant X vehicle.

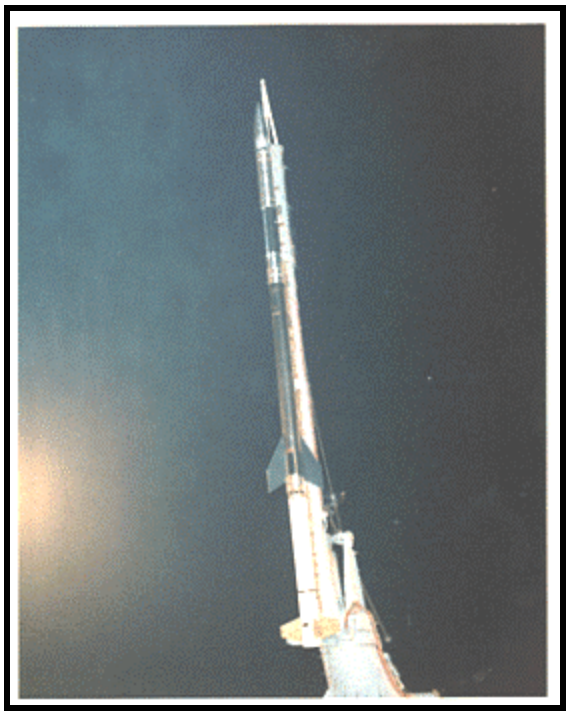

Figure F.4-1: Black Brant X Launch Vehicle

Vehicle Performance

The first stage booster consists of a Terrier MK 12 Mod 1 rocket motor with four 340 square inch fin panels arranged in a cruciform configuration. The Terrier booster has an overall diameter of 18 inches.

The 26 KS 20,000 Black Brant V rocket motor produces an average thrust level of 17,025 pounds with an action time of 26.9 seconds. The primary diameter of the Black Brant V is 17.26 inches and it is 210 inches long. Loaded weight of the motor including hardware is 2,789 pounds which includes 2,198 pounds of propellant. The Nihka rocket motor was developed specifically for the Black Brant X rocket system by Bristol Aerospace. The average thrust is 12,000 lbs. with a total impulse of 193,500 lb-sec. The primary diameter is 17.26 inches and the length is 76 inches. The Nihka motor weighs 894 lbs. including 756 lbs. of propellant.

Payload

The standard payload configuration for the Black Brant X vehicle is 17.26 inches in diameter with a 3:1 ogive nose shape. Payload length and weight limits for the Black Brant X are not defined as they are for the Black Brant V and specific limitations for this system are determined as the situation warrants.

Standard hardware systems that are available for Black Brant V motors include aft recovery systems, payload separation systems (including High Velocity Separation System) and despin systems. These units are modular "stackable" so that a great deal of flexibility exists in meeting experiment requirements.

Performance Graph

The Black Brant X launch vehicle configuration and apogee altitude and impact range at various launch elevation angles and payload weights are presented in Figure F.4-2.

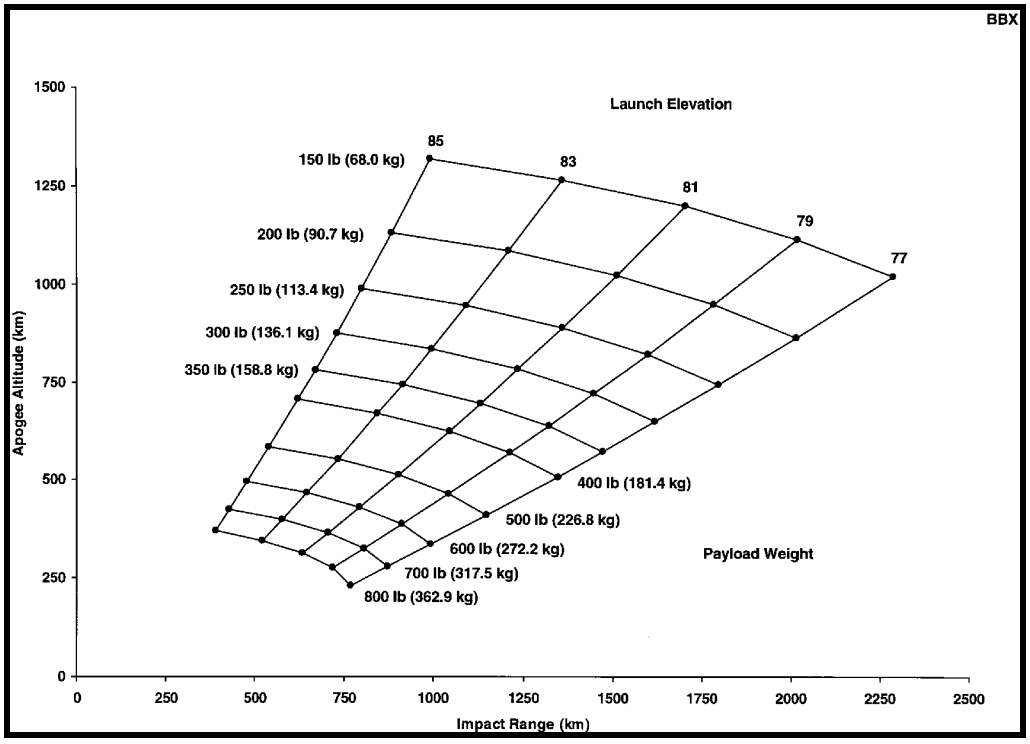

Figure F.4-2: Black Brant X Launch Vehicle Performance