Fresnel Lens Gamma Ray Telescope (FL Gamma Ray)

Launch Vehicle Information

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Launch Vehicle Options

- Projected Launch July 2012
- FL Gamma Ray S/C weight: 3000 kg Dry Mass

  7500kg Wet Mass (Lift-off weight)
- Orbit Alt L1 or Earth leading/trailing at 1 AU or 'drift away or retrograde year period earth orbit. (To minimize gravity gradients to keep thruster requirements to minimum.)
- Launch Vehicle Case Study:

  Ariane 4, Ariane 5,

  Atlas IIIB (DEC) Atlas V (501, 531, 551)

  Delta II (2920-10, 2925-10) ('4 M Faring)

  Delta III 3940-11,Delta IV (4040-12, 4240-12, 4450-14)

Launch Vehicle Options

- **Ariane 4,**
- **Performance: (C3=0 Escape Mission NA). Payload: 3,465 kg. to a: Geo-synchronous transfer, 7 deg inclination trajectory.**

  Liftoff Thrust: 571,300 kgf. Total Mass: 358,000 kg.

  Core Diameter: 3.8 m. Total Length: 58.4 m.

  Launch Price Est. Cost (FY'00) price dollars. $XX

- **Ariane 5 (Dual Launch Interface 937V Short faring / SPELTRA)**
- **Performance: (C3=0 Escape Mission NA). Payload: 6,800 kg.to a: Geo-synchronous transfer, 7 deg inclination trajectory.**

  Liftoff Thrust: 1,160,000 kgf.Total Mass: 737,000 kg.

  Core Diameter: 5.4 m. Total Length: 54.1 m.
- **Launch Price $: XXX in FY'2000 price dollars.**

Note: All prices are estimated in FY 2000 dollars based on current contracts or publicly disclosed information. Actual prices may vary based on market conditions, competitive negotiations and mission unique requirements. Escalation figures for out years (2001-2003) are approximately 4% cumulative. For budget planning purposes for AO/Future Studies.

Launch Vehicle Options

- **Atlas V-501 with 5.4m-Dia. by 20.7 Length (std.) Faring Bisector, Sandwich Construction with Epoxy Face Sheets & Aluminum Honeycomb Core (Dual Manifest Capability NA)**
- **Performance: C3=0 km2/s2 3,765 kg (sec) single engine centaur Est. Cost (FY'01) $XXX**

- **Atlas V 531 with 5.4m-Dia. by 20.7 Length (std.) Faring Bisector, Sandwich Construction with Epoxy Face Sheets & Aluminum Honeycomb Core (Dual Manifest Capability NA)**
- **Performance: C3=0 km2/s2 5,210 kg (sec) single engine centaur Est. Cost (FY'01) $XXX**

Note: All prices are estimated in FY 2001 dollars based on current contracts or publicly disclosed information. Actual prices may vary based on market conditions, competitive negotiations and mission unique requirements. Figures do not include efforts to support flying Dual Payload Configurations, major modification cost or Western Range Launches. Escalation figures for out years (2002-2003) are approximately 4% cumulative. For budget planning purposes for AO/Future Studies.

Launch Vehicle Options

- **Atlas V (551) with 5.4m-Dia. by 20.7 Length (std.) Faring Bisector, Sandwich Construction with Epoxy Face Sheets & Aluminum Honeycomb Core (Dual Manifest Capability NA)**
- **Performance: (C3=0 km2/s2) 6,330 kg (sec) single engine centaur Est. Cost (FY'01) $XXX**

- **Delta III (3940-11) 4m Dia.Composite Fairing Payload Envelope (Dual Manifest Capability NA)**
- **Performance: (C3=0 km2/s2) 2,625 kg Generic performance Est. Cost (Fy'01) $XXX**

- **Delta IV-M (4040-12) with 4m-Dia. by 14.3m (Length) Composite Fairing Payload Envelope (Dual Manifest Capability NA)**
- **Performance: (C3=0 km2/s2) 2,735 kg Generic performance Est. Cost (FY'01) $XXX (First Launch April 2002)**

Note: All prices are estimated in FY 2001 dollars based on current contracts or publicly disclosed information. Actual prices may vary based on market conditions, competitive negotiations and mission unique requirements. Figures do not include efforts to support flying Dual Payload Configurations, major modification cost or Western Range Launches. Escalation figures for out years (2002-2003) are approximately 4% cumulative. For budget planning purposes for AO/Future Studies.

Launch Vehicle Options

- Delta IV-M+ (4240-12) with 5m-Dia. by 14.3m (Length) Composite Fairing Payload Envelope (Dual Manifest Capability NA)
- Performance: (C3=0 km2/s2) 4,075 kg Generic performance
  Est. Cost (FY'01) $XXX (First Launch NA)

- Delta IV-M+ (4450-14) with 5m-Dia. by 14.3m (Length) Composite Fairing Payload Envelope (Dual Manifest Capability NA)
- Performance: (C3=0 km2/s2) 4,580 kg Generic performance
  Est. Cost (FY'01) $XXX (First Launch NA)

- Delta IV-H (4050-H) with 5m-Dia. By 19.1m (Length) Composite (Dual Manifest Capability) Fairing Payload Envelope
- Performance: (C3=0 km2/s2) 9,306 kg Generic performance
  Est. Cost (FY'01) $XXX (First Launch NA)

Note: All prices are estimated in FY 2001 dollars based on current contracts or publicly disclosed information. Actual prices may vary based on market conditions, competitive negotiations and mission unique requirements. Figures do not include efforts to support flying Dual Payload Configurations, major modification cost or Western Range Launches. Escalation figures for out years (2002-2003) are approximately 4% cumulative. For budget planning purposes for AO/Future Studies.

Launch Vehicle Options

- **Delta IV-H (4050-H) with 5m-Dia. by 22.4m (Length) Composite (Dual- Manifest Capability) Fairing Payload Envelope**
- **Performance: (C3=0 km2/s2) est. 8,800 kg Generic performance (no performance for 22.4m faring available)**

Est. Cost (FY'01) $XXX (First Launch NA)

Note: All prices are estimated in FY 2001 dollars based on current contracts or publicly disclosed information. Actual prices may vary based on market conditions, competitive negotiations and mission unique requirements. Figures do not include efforts to support flying Dual Payload Configurations, major modification cost or Western Range Launches. Escalation figures for out years (2002-2003) are approximately 4% cumulative. For budget planning purposes for AO/Future Studies.

Launch Vehicle Baseline

- **Delta IV-H (4050-H)**
- **Faring: 5m-Dia. by 19.1m (Length) Composite (Dual Manifest Capability) Fairing Payload Envelope**
- **Performance: (C3=0 km2/s2) 9,306 kg Generic performance**
  See associated performance charts for launch vehicle comparisons.
- **Est. Cost (FY'01) $XXX (First Launch NA)**

Note: All prices are estimated in FY 2001 dollars based on current contracts or publicly disclosed information. Actual prices may vary based on market conditions, competitive negotiations and mission unique requirements. Figures do not include efforts to support flying Dual Payload Configurations, major modification cost or Western Range Launches. Escalation figures for out years (2002-2003) are approximately 4% cumulative. For budget planning purposes for AO/Future Studies.

Delta IV-H (4050-H)

Dual-Manifest Separation Sequence

HB01685REU0

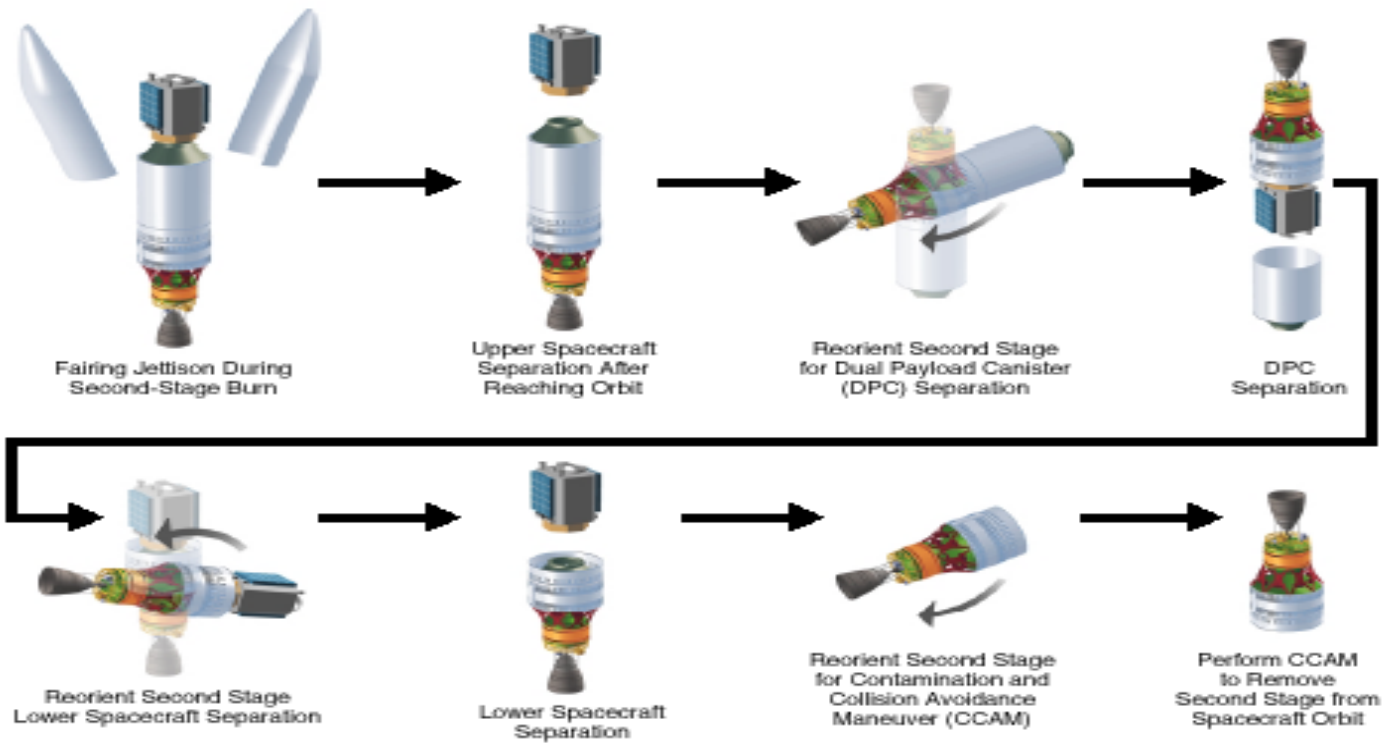
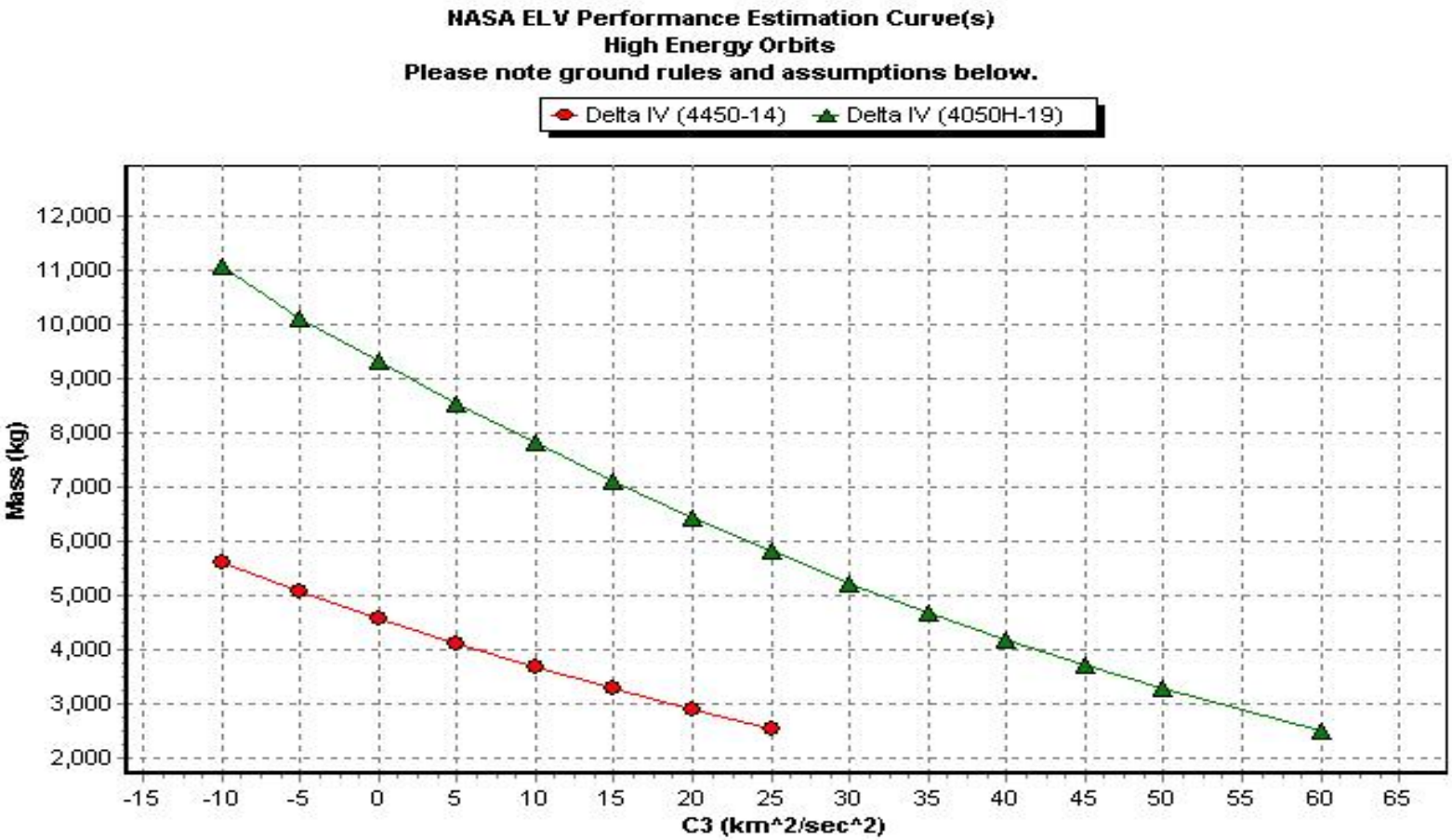
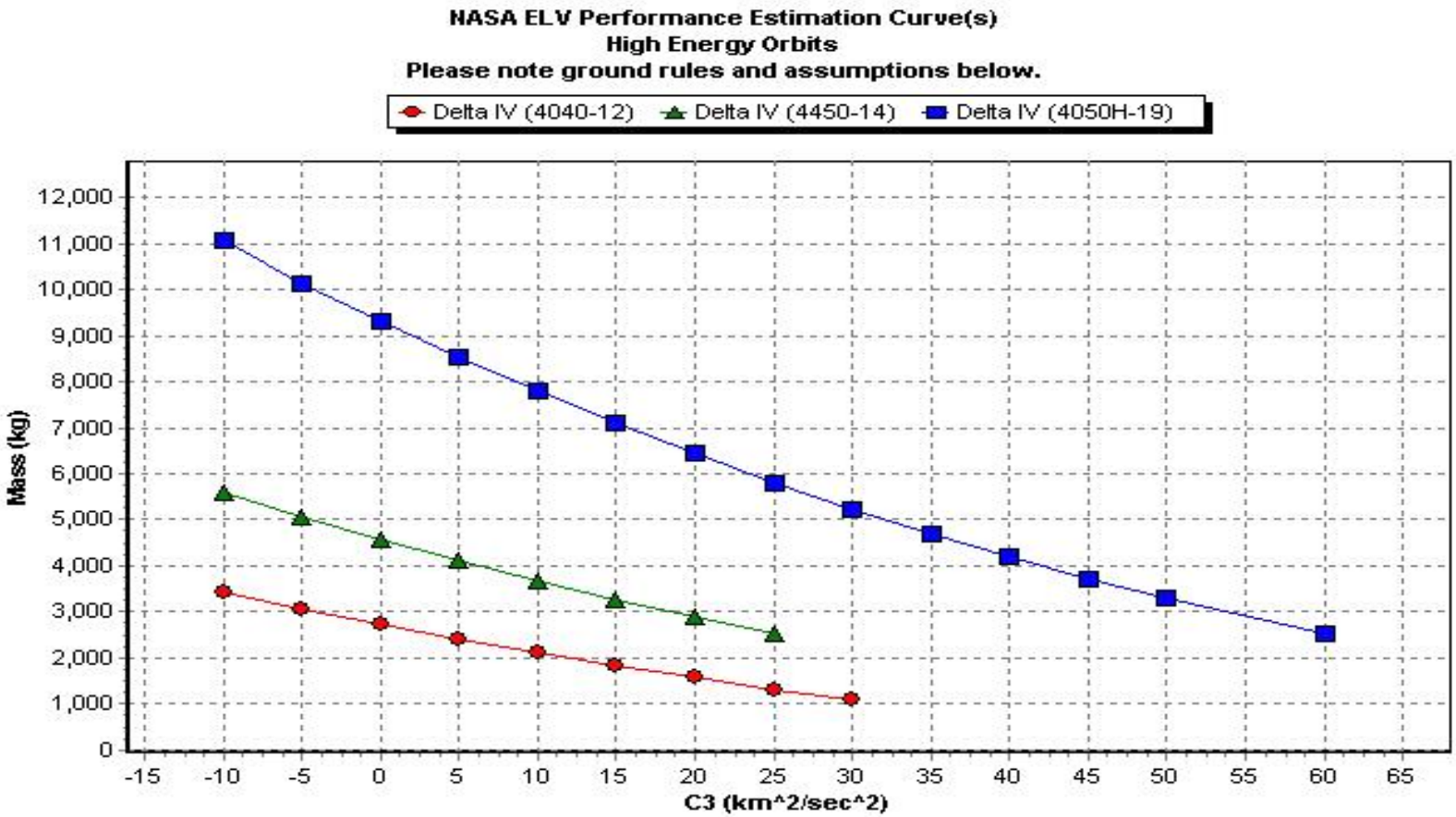


Figure 2-8. Baseline Dual-Manifest Separation Sequence of Events

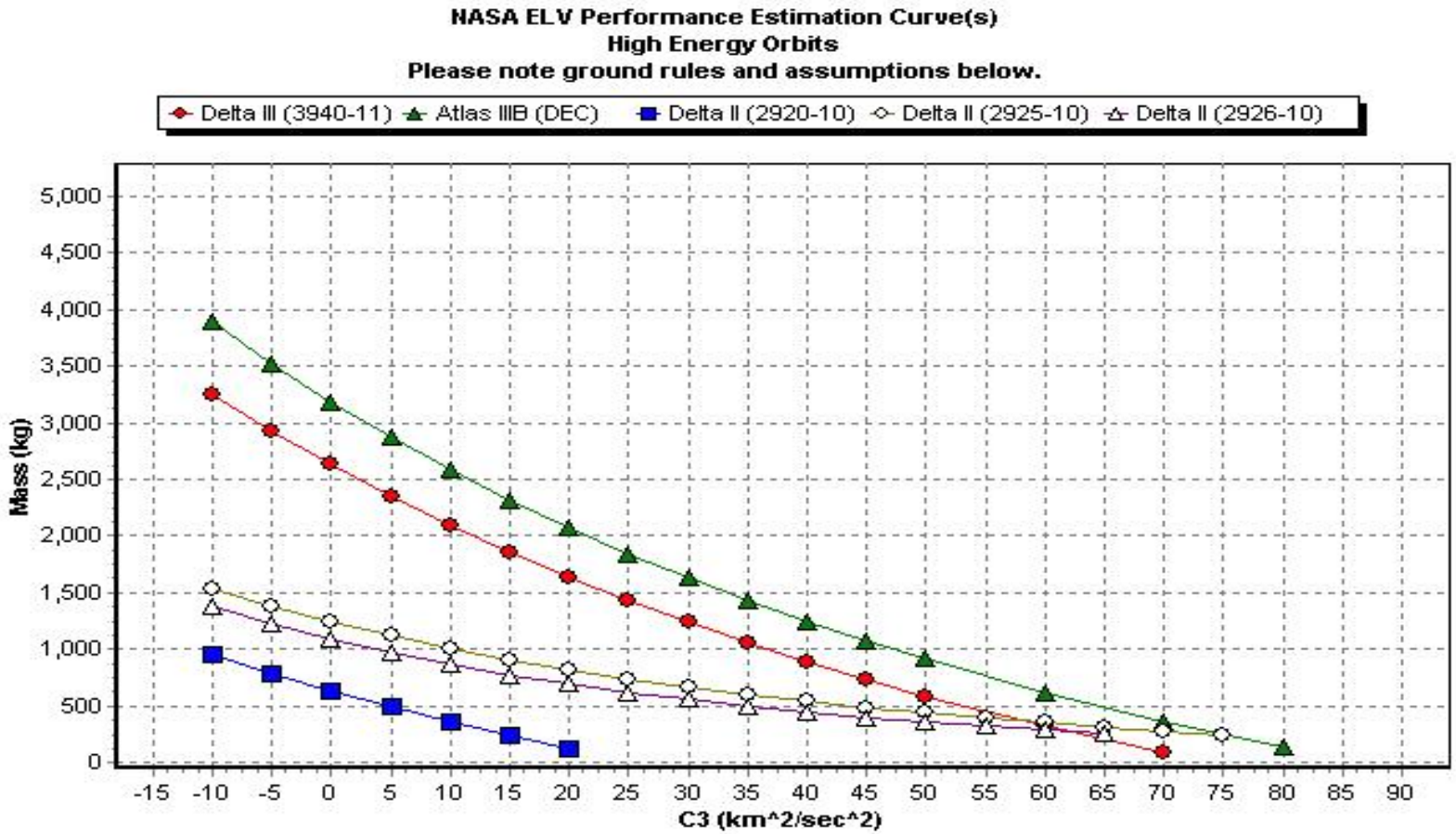
Delta IV-H Capability for the FL Gamma Ray Telescope



Delta IV-H Capability for the FL Gamma Ray Telescope



Atlas V / Delta II-III Capability
FL Gamma Ray Telescope



Atlas V / Delta IV Capability FL Gamma Ray Mission Telescope