CARRIE De-orbit

22 January 2002

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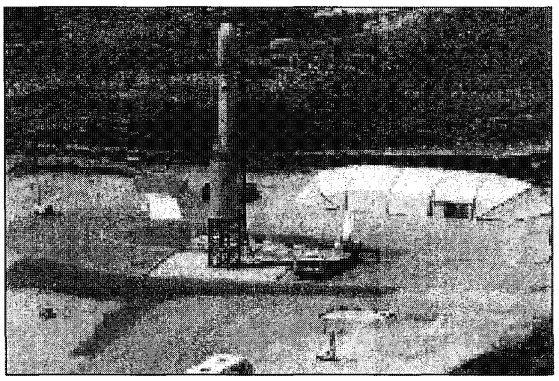
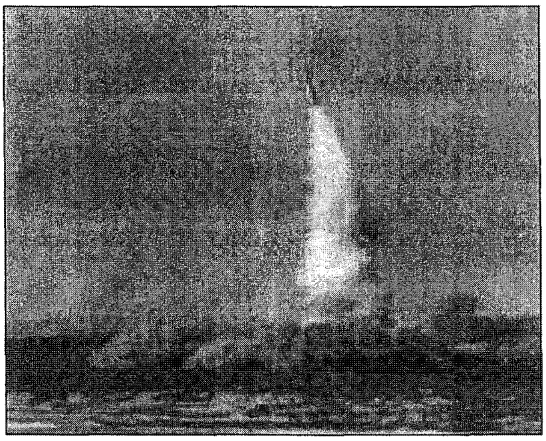
BACKGROUND

- **Launched 13 March 1994**
  - DARPA funded; NRO executed
- **Operational June 1994**
  - 1 year experiment; 3 year life
- **Health & Status: no loss of vehicle capabilities**





- **Program Objectives**
  - Address LEO COMINT
  - Show Tactical utility of a dedicated overhead SIGINT asset
  - Use minimum support infrastructure (QRC, low cost, rapid launch)
  - Demonstrate advanced technology

3443 Picture

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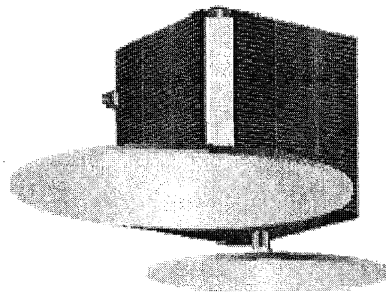
BACKGROUND
(continued)

- **Vehicle statistics**
  - Approximately 28.5" high x 28" wide x 28" deep => about the size of a clothes dryer
  - Mission antennas are 40" in diameter
  - Weight is approximately 439.7 lbs



- **Early (rev 84) orbital statistics**
  - Period: 95 min 38 sec / Period decay 0.0016 sec/rev
  - max/min Altitude: 573 km / 537 km
  - Orbital Inclination: 105 degrees
  - Predicted orbital life: 8.8 yrs (3248 days) @ drag 69 cm^2/kg
- **Spacecraft has no orbit-adjust capability**
  - Maneuvers to date are attitude adjustments using torque rods and precession magnet
- **Earth currently experiencing the peak of an 11 year Solar cycle**
  - Average drag for 2001: 150 cm^2/kg
  - Average drag for August/September: 123 cm^2/kg
  - **Average drag for October/November: 235 cm^2/kg**
  - **Average drag for 1-15 January 2002: 200 cm^2/kg**

3443 Picture

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PREDICTIONS

- **Caveats**
  - Predictions are based on then-current & estimates of future solar activity
  - Predictions are for orbital life; mission life may end ~ 1 month sooner
    - » Mission life is defined, in this case, as the satellite no longer being able to geolocate signals with any kind of reasonable or useable accuracy
    - » The ability to identify signals may still be available, depending on attitude of satellite
- **January 2001:**
  - Period: 94 min 16 sec
  - max/min altitude: 514 km / 478 km
  - Predicted orbital life: 2.1 years (758 days) @ drag 133 cm^2/kg
- **June 2001:**
  - Period 93 min 51 sec
  - max/min altitude: 492 km / 461 km
  - Predicted orbital life: 2.2 years (793 days) @ drag 79 cm^2/kg

PREDICTIONS

(continued)

- **September 2001:**
  - Period: 93 min 41 sec
  - max/min altitude: 477 km / 448 km
  - **Predicted life: 1.8 years (653 days) @ drag 101 cm²/kg**

- **29 November 2001:**
  - Period: 93 min 02 sec
  - max/min Altitude: 448 km / 419 km
  - **Predicted life: 0.6 years (209 days) @ drag 173 cm²/kg**

- **28 December 2001**
  - Period: 92 min 46 sec
  - max/min altitude: 431 km / 410 km
  - **Predicted life: 0.3 years (94 days) @ drag 234 cm²/kg**

- **15 January 2002**
  - Period: 92 min 35 sec
  - max/min altitude 424 km / 399 km
  - **Predicted life: 0.4 years (141 days) @ drag 199 cm2/kg**

As of 15 Jan 02, if drag returns to a nominal level (100 cm²/kg) re-entry is expected to move out to 8 Aug 02

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Reporting Requirements

From NROC/Flight Safety

- Initial report to Congress ~ 30 days before re-entry
  - Process for initial notification to Congress starts ~ 60 days before re-entry
    - » D/SI will be requested to coordinate on Congressional Notification message before Flight Safety begins this formal, NRO-wide coordination
  - Subsequent notifications made at 7 days, 2 days, and 1 day out
- **Cheyenne Mountain AS begins close track of vehicle beginning ~ 30 days before predicted re-entry**
  - CMAS orbital analysts (OAs) will coordinate with OD-4 OAs to ensure accurate prediction
- **NROC will include a paragraph in their Daily Status Report beginning ~ 30 days before re-entry**