

# GEC



## Attitude Control System

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# Assessment

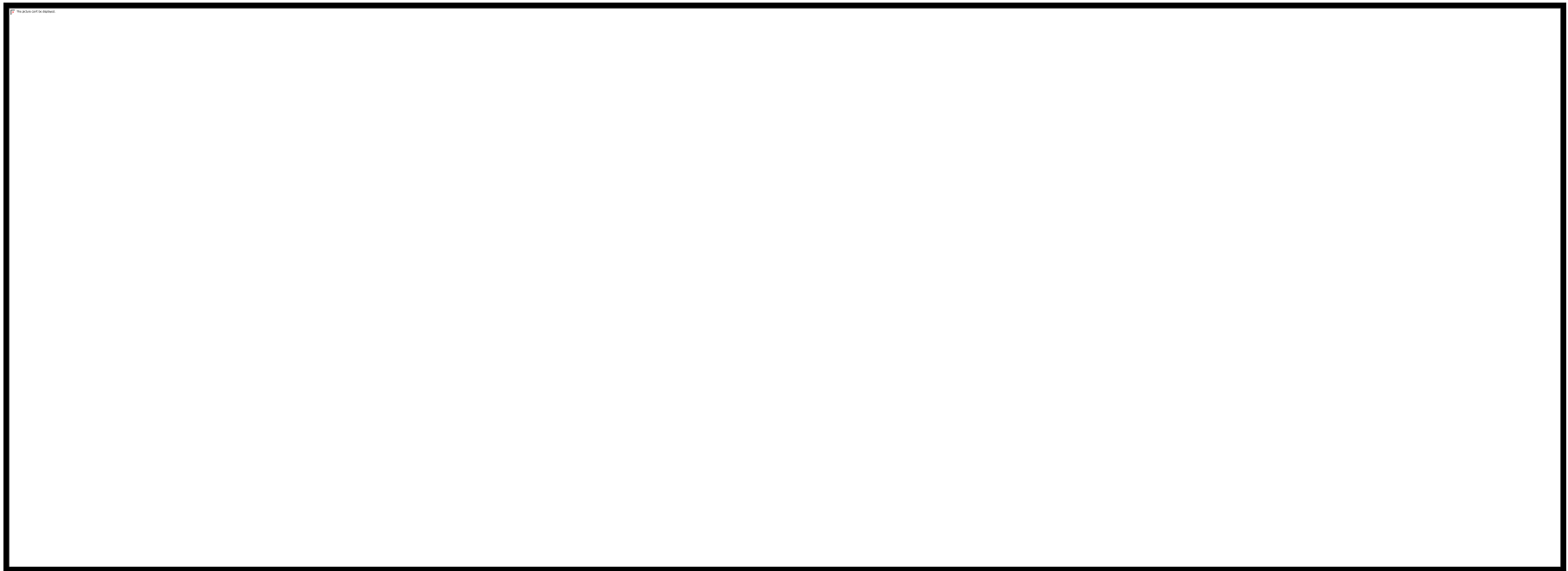
- ★ Requirements **can** be met for **all** considered scenarios:
  - Elimination of Fabry-Perot Interferometer
  - Elimination of UV Imager
  - 1.1m x 2.0m spacecraft
  - Elliptical spacecraft
  - 0.85 x 2.6m spacecraft
- ★ Review component & design recommendations
- ★ Review ACS mode recommendations

# Requirements/Assumptions

- ★ Attitude Control:  $\pm 5$  Degrees
- ★ Knowledge:  $\pm 0.01$  Degrees
- ★  $200 \times 2000$  Parking Orbit
- ★  $130 \times 2000$  Dipping Orbit
- ★  $6.669E-09$  Kg-m<sup>-3</sup>
- ★ 78 Degree Inclination
- ★ 2cm CPCG Offset



# Component Recommendations



# Design Recommendations

- ★ A **pitch momentum-biased** system with the wheel(s) sized to insure that the effect of aerodynamic torques does not cause any pointing violations.
  - **Single wheel** with spin axis along pitch axis
    - Will need approximately 100 Nms momentum capability for the 1.1x2m configuration and 80 Nms for the .85x2.6m configuration
  - **Two wheels** with spin axis canted 30 degrees from the pitch axis in the pitch-yaw plane
    - Will need approximately 56 Nms momentum capability per wheel for the 1.1x2m configuration and 45 Nms for the .85x2.6m configuration



# ACS Mode Recommendations

- ★ **Acquisition:** Acquire sun on the solar arrays & Null rates
- ★ **Science:** Track velocity vector & Maintain zenith pointing
- ★ **Delta-V:** Orbit adjust
- ★ **Delta-H:** Momentum unloading
- ★ **Slew:** 180° flip for retro burn
- ★ **Safe Hold:** Independent safe mode

# Bottom Line!

- ★ ACS is basically **stable**
- ★ A last minute note: With the perigee of the parking orbit changing from 350 to **200 Km**, IPACS power has changed from 20W to approximately **54W**