BIRD ATTITUTDE DETERMINATION AND CONTROL SYSTEM

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BIRD is a small satellite for Earth observation. It has a mass of 90 kg and approximately 4 kg m_ moments of inertia. The altitude will be of about 600 km. The launch is expected in May 2001.

The satellite attitude will be most of the time sun pointing. In Earth observation mode it is nadir pointing. For some special purposes the attitude can be inertial pointing or pointing to a defined target on ground. A transition from one pointing mode to another one will be performed by one single axis slew maneuver. The pointing accuracy is required as 7 arc minutes attitude bias (1σ) and jitter amplitude of 5 arc minutes (1σ) for most of the target pointing modes. The attitude can be commanded always with a rate and an orientation bias, if required.

The available sensors are:

- 2 star cameras,
- 3 ring laser gyros,
- 2 4π sun sensor systems,
- 1 3-axis magnetometer,
- 1 GPS receiver.

Based on the GPS measurements an on board estimation of WGS 84 position, velocity and a nominal local geomagnetic field vector is available.

The actuators are 4 reaction wheels in tetraedric mounting configuration as primary actuators and 3 pairs of orthogonal air coil pairs (magnetic torque).