Gimbal Control Electronics

The high-reliability Gimbal Control Electronics System controls the motion of two or more motors, such as used in solar array actuators and antenna gimbals.
The Moog Broad Reach Gimbal Control Electronics (GCE) system controls and drives two types of dual axis redundant actuators. The system contains two primary and two redundant motor drive outputs. These motor drive outputs control and drive small, three phase Wye, six state, and permanent-magnet actuators. The GCE contains two primary and redundant incremental encoder interface circuits. The GCE communicates with the spacecraft via a dual redundant MIL-STD-1553B bus. The spacecraft provides the 31VDC nominal voltage and the side enable pulsed discretes. The GCE assembly consists of two identical Controllers circuit boards, two identical Motor Driver circuit boards, two identical DC to DC converters boards, two Backplane boards and the chassis.

The GCE implements programmable micro-stepping to reduce jitter in increments of 1, 2, 4, 8, 16, 32, or 64 micro-steps/cardinal-steps. Current in all phases driven as a sinusoid for smooth movement. Optical encoder feedback is provided but not required to command motor movements. Positional feedback, detection of skipped steps, and state of health (SOH) current for each motor along with 8 variable power settings per motor are implemented.