ROTO-LOK® CABLE DRIVE CARTRIDGE

RIEtech Global's patent pending Roto-Lok® Cable Drive Cartridge provides the anti-backlash and load bearing properties needed for maintaining positional accuracy and rigidity under wind load (Figure 1). The modularized and scalable cable drive assembly provides installation features that are designed for ease of long-term field serviceability while maintaining the features of low friction, high torque capacity, high torsional stiffness, minimum backlash, and hollow cartridge drum to allow for payload wiring routing.

Figure 1. Roto-Lok® Cable Drive Cartridge (Patent Pending)

Figure 2 shows the current mobile SATCOM package that is used as a baseline for customized antenna platforms. The cartridge can be used as part of a system that RIEtech Global develops or as a standalone final gear stage for a customer's development project.

Figure 2. RIEtech Commercial Mobile SATCOM Product Baseline

Figure 3 illustrates the ease of maintenance and serviceability of key components that the Roto-Lok® design provides. This design can be easily reconfigured to accommodate customer requirements.

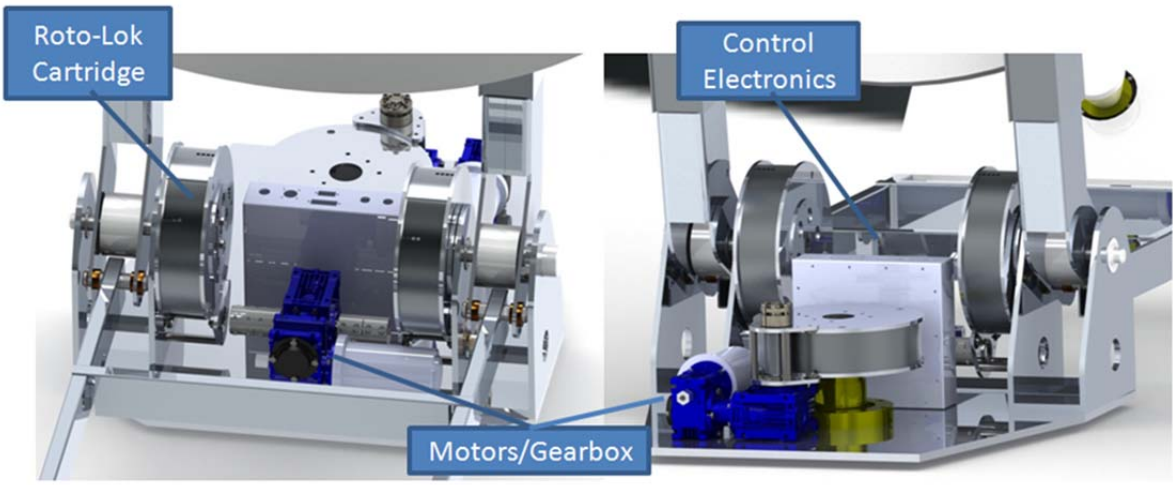

Figure 3. Pedestal Concept, Key Components, and Modularity

The boom is currently shown below the reflector to illuminate the main reflector from the bottom up. However, the backbone can be easily adapted to accommodate a reflector illuminating the main reflector from the top down. The Roto-Lok® drives are placed on the outside of the structure uprights in order to create clearance for the beam waveguide. The azimuth cartridge location also currently resides below the beam waveguide and baseplate. Figure 4 shows a cross section view of the beam waveguide. As illustrated in the figure, the Roto-Lok® can be configured with a large through hole in order to facilitate both the beam waveguide hardware and wire routing. The camera used for tracking and electronics boxes can be added to multiple locations, as there is adequate space behind the main reflector, behind the beam waveguide and on the boom.

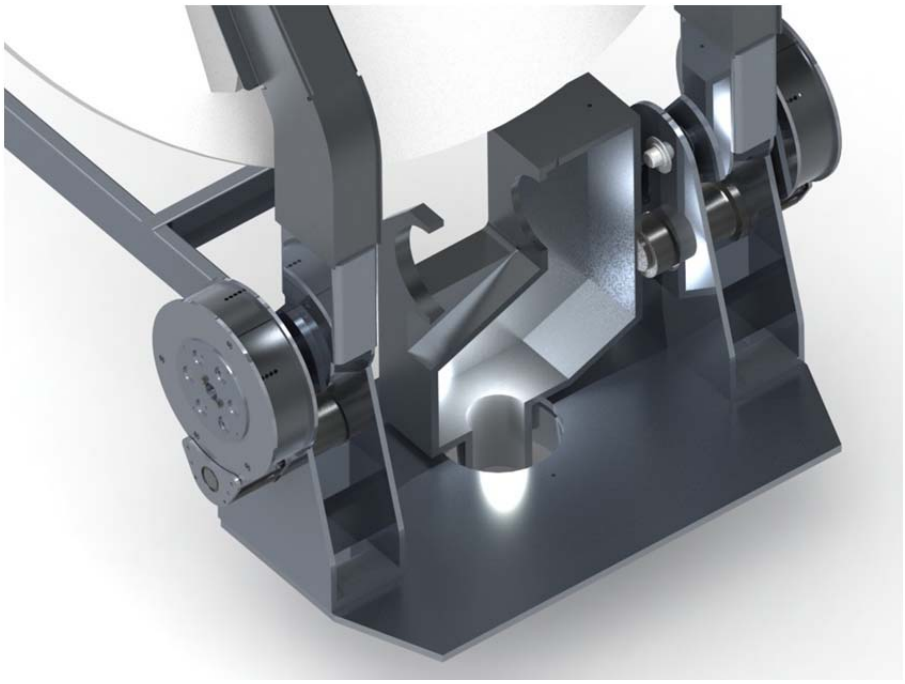

Figure 4. Beam Path

In addition, the feedback device can be placed on the input to the potential gear reducers/Roto-Lok® drive to increase feedback resolution and refined rate feedback at low cost.

The Range of Motion in elevation is currently set at 190º in order to account for a stow position and allow for the system to acquire communication satellites directly above the system.

RIEtech's pedestal concept can be refined to ensure adherence to the customer's system weight and structural stiffness requirements. The current platform has been designed with the first mechanical mode shown to be at ~11Hz side to side. This was accomplished with a payload weight of 110 lbs cantilevered on the boom portion of the assembly.

The current design was geometrically created to both minimize wind loads on reflector in stowed travel conditions and to support the antenna with minimal deflection under high wind loads. The current design will deflect less than 0.2º under operating wind loads of 45 mph. RIEtech Global offers a low design cycle cost and high fidelity through the use of computational fluid dynamics (CFD), which is one of our key capabilities. In addition, empirical data models from decades of field research in parabolic dish wind loading in atmospheric winds to ensure that wind load values are accurate and appropriate for use in design.