

Abstract for Low Cost/High Reliability Rotary Actuator for Space Satellites

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Honeywell is nearing completion of the development program for the antenna positioning rotary actuators to be used on the Iridium® Space Vehicle. The program's goal has been to develop and qualify, within a relatively short period of time, a set of low cost, high performance and highly reliable rotary actuators which can be produced efficiently in large quantities. These actuators will be utilized to point communication antennas but could also be used to point cameras or turn and position solar arrays.

Four configurations of rotary actuators were designed and space qualified within twelve months of contract award. Life testing was successfully completed five

months later. Honeywell has delivered a total of thirty-two actuators, and an additional sixty production level actuators are currently in the assembly and test process. The next phase of the program, expected to be awarded very soon, calls for delivery of nine hundred actuators at a rate of sixty per month.

The rotary actuators use stepper motors coupled to harmonic drives to provide a nominal output step angle of 0.046875 degrees with feedback of each motor step provided by an incremental encoder zero provides a unique actuator zero position.

The critical technical parameters of the devices are as follows:

<u>Parameter</u>	<u>Azimuth Type 1</u>	<u>Azimuth Type 2</u>	<u>Elevation Type 1</u>	<u>Elevation Type 2</u>
Range of Motion	±180°	±60°	±32°	±10.25°
Max Speed	15/deg/sec	15 deg/sec	6 deg/sec	6 deg/sec
Integral RF Waveguide/ Through Hole	Yes/0.47 in	Yes/0.44 in	No	No
Envelope	9.0 in x 4.5 in	6.0 in x 4.5 in	3.2 in x 3.2 in	3.2 in x 4.9 in
Weight	5.1 lbs	4.1 lbs	1.6 lbs	1.6 lbs