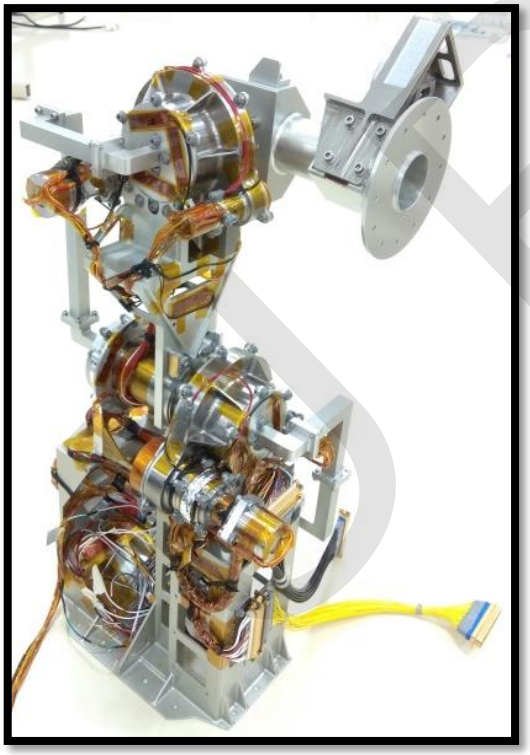
Dual Axis Antenna Pointing Mechanism (DAPM)

U R Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) has developed Dual Axis Antenna Pointing Mechanism (DAPM) for space application. The mechanism can be used for near real time data transmission for space as well as interplanetary mission. It is configured with off axis mounted stepper motor to facilitate large central hole for accommodating the RF rotary joints for high data rate based payload data transmission. The zero backlash motion transmission chain ensures high pointing accuracy while providing agility to the mechanism.

In order to rigidly hold the mechanism during the launch, a non-explosive hold down mechanism has been incorporated. The mechanism resists vibration loads along the three orthogonal axis and ensures positive release after actuation in orbit.



Salient Features

- Space qualified dual axis drive mechanism for precise pointing of antenna.
- Configured with non-contact waveguide type of X Band and Ka Band RF Rotary Joints. Either of the two can used based on RF requirements.
- High output torque and High Pointing accuracy based mechanism.
- Provides hemispherical coverage for near real time data download.
- Single launch lock using Frangi bolt/split nut mechanism.

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Major Specifications

Sl No.	Description	Values
1)	DM1 Angular Rotation (Bottom drive)	$\pm 130.5^0$ (with hard stopper)
2)	DM2 Angular Rotation (Top Drive)	$\pm 90.5^0$ (with hard stopper)
3)	Motor and Gears type	Permanent Magnet Stepper Motor with Harmonic Drive and Spur gear
4)	Output step size	0.04^0
5)	Output Rotation rate(max)	6 deg/s
6)	Pointing accuracy	$\leq \pm 0.1^0$
7)	Output Torque capability	5 Nm
8)	Un-powered Holding Torque	7 Nm
9)	Operative Voltage (maximum)	28 V
10)	Power	15 W (maximum)
11)	Total weight	5 kg

Technology Transfer

URSC-ISRO offers to transfer this technology of Dual Axis Antenna Pointing Mechanism developed by URSC to industries in India with adequate experience and facilities. Industries interested in obtaining knowhow may write giving details of their present activities, infrastructure and facilities.

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