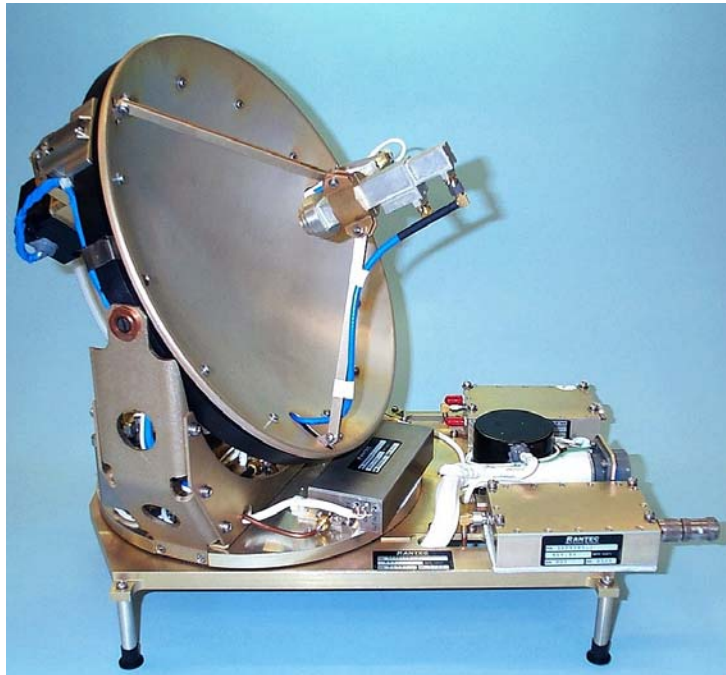




QUALITY SINCE 1957



The Rantec Microwave Systems Ku-band Mobile Satellite Antenna Subsystem (MSAS), working in conjunction with a compatible satellite receiver, provides full Internet access and television via DBS and FSS satellites to a variety of platforms. The MSAS is capable of providing transmit/receive Ku-band data from stationary or mobile platforms and can be easily scaled for Ka-band requirements.

CURRENT APPLICATIONS

- Airborne Tailmount Antenna Subsystem (ATAS)
- Shipboard Antenna Subsystem (SAS)
- Ground Vehicle Antenna Subsystem (GVAS)

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Mobile Satellite Antenna

Ku-Band Transmit/Receive Antenna Subsystem

Basic Specifications

Transmit

FREQUENCY	14 to 14.5 GHz
POLARIZATION	Rotating Linear
EIRP	To customer requirements
IF FREQUENCY	950 to 1450 MHz

Receive

FREQUENCY	11.7 to 12.75 GHz
POLARIZATION	Rotating Linear or Left-hand Circular or Right-hand Circular
G/T	8 dB/K minimum (11.5-in. reflector) 11.5 dB/K min (18-in. reflector) 14 dB/K min (24-in. reflector)
IF FREQUENCY	950 to 1450 MHz

Tracking Coverage

ELEVATION COVERAGE	10° to 85° above the horizon
AZIMUTH COVERAGE	Continuous (Rotary Joint)

Mechanical/Environmental

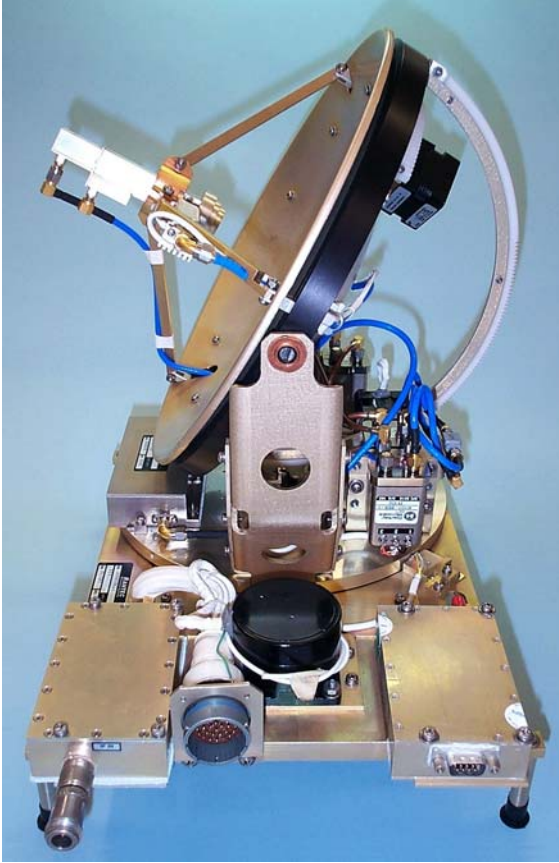
	<i>Reflector</i>	<i>Height</i>
DIMENSIONS	11.5-inch diameter	13.1 inches
	18-inch diameter	20 inches
	24-inch diameter	26 inches
WEIGHT	15 pounds, 22.5 pounds, 30 pounds, respectively	
ENVIRONMENT	RTCA/DO-160D	

Antenna Control Unit (ACU)

INPUTS	ARINC 429 bus from IRS Satellite Ephemeris Data 28 VDC, 80 Watts
WEIGHT	6 pounds
ENVIRONMENT	RTCA/DO-160D

Ku-Band Transmit/Receive Antenna Subsystem

TECHNICAL DESCRIPTION



Rantec's MSAS is designed to receive linearly polarized microwave signals from an FSS satellite operating in the 11.7 to 12.2 GHz frequency band or circularly polarized signals from a DBS satellite in the 12.2 to 12.75 GHz frequency band. It transmits linearly polarized microwave energy in the 14.0 to 14.5 GHz frequency band. The antenna assembly consists of a front-fed 11.5-inch diameter parabolic reflector mounted on an elevation-over-azimuth gimbal providing elevation tracking in the sector between 10° and 85° above the horizon and continuous azimuth motion. Polarization alignment with the satellite (to ensure minimum interference from orthogonal satellite signals) is achieved via parabolic reflector rotation.

Maximum G/T is achieved with an LNA mounted directly on the antenna feed followed by a multi-regional phase-locked-loop LNB mounted beneath the axis of rotation. The LNB converts the 11.7 to 12.75 GHz received microwave signals to the 950 to 1,450 MHz IF band to be further processed by a compatible satellite receiver. Microwave signal transmission is achieved by up-conversion of the IF band to 14.0 to 14.5 GHz using a phase-locked-loop TXB and a high power amplifier.

High reliability of the antenna assembly is achieved with the use of environmentally-protected stepper motors driving the three axes of rotation. With this type of motor, axis location is always known by counting motor steps, obviating the need for synchros, encoders, or resolvers of any kind. A simple Hall-effect magnetic sensor provides a single reference location for each axis of motion. The antenna is designed to operate in temperatures from -55°C to 70°C.

Included with each antenna assembly is an Antenna Control Unit (ACU), which enables the antenna to lock on and track the satellite, even during platform maneuvers. The ACU supplies primary power, electronic drivers for the motors, a "computer-on-a-chip" CPU for antenna pointing and polarization alignment, an ARINC 429 bus for receiving aircraft position and attitude information, and an Ethernet communication port for downloading satellite ephemeris data, and serves as the communication link to a compatible satellite receiver. Automatic acquisition and reacquisition of a satellite occurs at power-up or during momentary signal outages.