

## SPECIFICATION SHEET

### ADS-B ANTENNA, UNI-DIRECTIONAL MODEL dBs 510A-D, 90° HPBW

**dBs PART NUMBER 510300-101**

**APPROVED FOR USE BY FAA UNDER FAR PART 171**



The dBs 510A-D, 90° HPBW is an 8 element, high performance, full service, all band, uni-directional Automatic Dependent Surveillance-Broadcast (ADS-B) antenna. This uni-directional antenna has 8 active elements and other components, which produce high main lobe and horizon gain with wide beam width. The antenna handles input power to 5,000 watts at standard ADS-B pulse duty cycle and operates over its entire frequency range with an input VSWR at 50  $\Omega$  of less than 2.5:1.

This antenna provides vertically polarized, uni-directional coverage with main beam of radiation tilted upward to minimize the effects of ground reflections. The array has two integral monitor probes which constantly sample the RF signal delivered to the antenna.

The array is enclosed and effectively weatherproofed within a lightweight, small diameter, filament wound, and ground smooth fiberglass radome for prolonged trouble-free use under severe environmental conditions. Mounting is made by means of an integral base flange with 6 each mounting bolt holes. All RF input/output ports are type N receptacles.

Obstruction light power is fed through the array and provision is made for mounting an obstruction light and/or lightning arrester at the top of the array. Lightning rod kit, obstruction light, pipe adapter (with or without cover), and plate adapter are available option items.

The model dBs 510A-D, 90° HPBW ADS-B antenna has been designed for ruggedness, lightweight, minimum size, long life, and in accordance with FAA-E-2754 and FAA-G-2100. It also exceeds the requirements of the UK CAA specification.

**dBs 510A-D, 90° HPBW with Marine Option (P/N 500300-121):** The dBs 510A-D, 90° HPBW Marine Version antenna is an optional upgrade as well. The RF transmission assembly is completely sealed and weatherproofed to protect in harsh environments such as salt water, extreme humidity, wind, sand, snow, and ice. Contact our factory for more details.

# ADS-B ANTENNA, UNI-DIRECTIONAL

Model dBs 510A-D, 90° HPBW  
dBs PART NUMBER 510300-101

## SPECIFICATIONS/CHARACTERISTICS

**TYPE:** Uni-directional

**CIRCULARITY (AZIMUTH PATTERN):** 90° Nominal HPBW, Nominal Front-to-Back Ratio > 10 dB, With less than 1 dB of pattern ripple

**FREQUENCY RANGE:** 960 through 1215 MHz (no adjustments or tuning required)

**ARRAY:** 8 radiator assemblies (77.8" tall)

**POLARIZATION:** Vertically Polarized

**GAIN, MAIN BEAM:** >12 dB/iso, minimum

**GAIN, HORIZON:** >10 dB/iso, minimum

**MAIN BEAM ELEVATION LOCATION:** Between 2° and 5° above horizon

**SLOPE (VICINITY OF HORIZON):** 0.44 dB/°, 0.05 v/v/°

**POWER HANDLING CAPABILITY:** Up to at least 10 kW peak RF power at 3% duty cycle

**IMPEDANCE:** 50 Ω nominal

**VSWR:** Not greater than 2.5:1 (960-1215 MHz) measured at end of low loss cable not exceeding 5 feet in length.

**VERTICAL FIELD PATTERN:** The radiation pattern of the antenna in the vertical plane has a lobe of energy not less than 10 degrees wide at the half-power points. The power gain at angles between 6 and 50 degrees below the horizon shall be lower than the power gain at the peak of the major lobe above the horizon by at least 8 dB. The power gain at angles between 6 and 15 degrees above the horizon shall be greater than a level which is 20 dB below the power gain at the peak of the major lobe above the horizon. The power gain at angles between 15 and 45 degrees above the horizon shall be greater than a level which is 30 dB below the power gain at the peak of the major lobe above the horizon.

**SIZE:** 77.8" long, 8 radiator assemblies (driven elements) plus a choke assembly at each end, 6 ¼" OD radome. Has top cap and base flange.

**WEIGHT:** 38 lbs. (excluding obstruction light, mounting fixtures, and other optional items)

**PHYSICAL DESIGN:** A metal tube, 1.5" O.D. x 1.43" I.D. (0.040" wall thickness) runs through center of antenna for full length. RF transmission line assembly and obstruction light power lines are located within this tube. Also used as lightning down conductor.

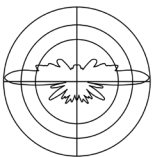
**WEATHER PROOFING:** Entire antenna, including all cable connectors, is weather proofed such that removal/replacement of radome is possible without sealing compounds. Antenna has a guarantee of water resistance IP5, so long as antenna is mounted vertically with Pipe Adapter and Stainless Steel Cover.

**ANTENNA MOUNTING:** The configuration of the antenna base is such that the antenna can be mounted directly or indirectly through use of optional adapter(s).

**WIND LOADING:** Withstands without damage 100 mph gusts.

**MONITOR PORTS:** Two coupling probes for monitoring the signal radiated by the antenna. Located within the radome. 50 Ω nominal impedance. Optional probe output level is 23 dB ± 5 dB for J2 and 30 dB ± 5 dB for J3 below power level applied to main RF input connector.

**CONNECTORS RF:** Type N Female, 3 each.



dB Systems Inc.

2501 S. Antenna Avenue  
Hurricane, Utah 84737 USA

Email: [sales@dbsant.com](mailto:sales@dbsant.com) | Phone: (435) 635-3352 | [www.dbsant.com](http://www.dbsant.com)

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# ADS-B ANTENNA, UNI-DIRECTIONAL

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## SPECIFICATIONS/CHARACTERISTICS

### ENVIRONMENTAL NON-OPERATING SPECIFICATIONS:

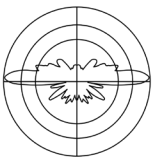
- **TEMPERATURE:** Withstands a temperature range of -50°C to +71°C.
- **ALTITUDE:** Withstands atmospheric pressure of 575 to 1025 mbar (equivalent to approximately 15,000 feet above sea level in a standard atmosphere down to approximately 300 feet below sea level).
- **VIBRATION:** Will not be damaged when subjected to the vibrations listed in Table 514.8C-I, Method 514.8 Annex C of MIL-STD-810, and the exposure durations provided in Annex C paragraph 2.1.4.
- **SHOCK:** Will not be damaged when subjected to the mechanically induced shock as specified in Method 516.8, Procedure II of MIL-STD-810.

### ENVIRONMENTAL OPERATING CONDITIONS:

- **OUTDOOR TEMPERATURE:** Operates in the temperature range of -50°C to +71°C.
- **RAIN:** Operates while exposed to wind-blown rain, at a rate of 1.7 mm/minute (4 inches/hour), and up to 18 m/s (40 mph) blowing wind.
- **ALTITUDE:** Operates over the atmospheric pressure range of 700 to 1025 mbar (equivalent to approximately 10,000 feet above sea level in a standard atmosphere down to approximately 300 feet below sea level).
- **ICE LOADING:** In operation, withstands without damage 100 mile per hour gusts and ice loading of up to 1/2" radial ice. In survival, withstands without damage wind bursts up to 140 mph, without frost or ice, and up to 120 mph with 1/2" radial ice or frost.
- **HUMIDITY:** Operates within a relative humidity range from 5% to 100% when the temperature is 40°C or less. Above 40°C, operates with a relative humidity based upon a dew point of 40°C.
- **FINE SAND (DUST):** Impervious to sand and dust intrusion. In operation, withstands sand/dust concentrations up to 1 g/m<sup>3</sup>, particle size up to 20 micrometers, max speed 20m/s.

### OPTIONAL ITEMS:

- **OBSTRUCTION LIGHT:** Optional, red dual lamp obstruction light fixture with two red globe covers. Connector is MS-3112E8-3P (P/N 510600-102: 9.38" H x 14.75" W x 4.62" D @ 4.6 LBS.)
- **LIGHTNING ROD ASSEMBLY:** Optional, air terminal and bracket, powder coat painted white, aluminum (P/N 510625-100: Rod 18" L x 0.5" Dia @ 6 oz. Bracket 4.5" L x 2.5" W x 0.75" H @ 1 lb.)
- **PIPE ADAPTER:** Optional, solid cast aluminum (A356-T6) Powder coat painted white. Adapts 4" O.D. pipe to antenna base (P/N 510500-100: 12" H x 8" Dia. @ 8.3 lbs.)
- **COVER FOR PIPE ADAPTER:** Optional, Stainless Steel, protects connector area from environment (P/N 510490-100: 25.5" L x 5" H @ 1.5 lbs.)
- **PLATE ADAPTER:** Optional, interfaces with pipe adapter for mounting antenna to building side, steel weldment, powder coat painted white (P/N 510460-100: 12" x 12" with 18" L, 4" O.D. pipe @ 37.5 lbs.)



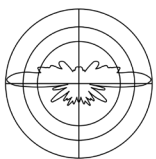
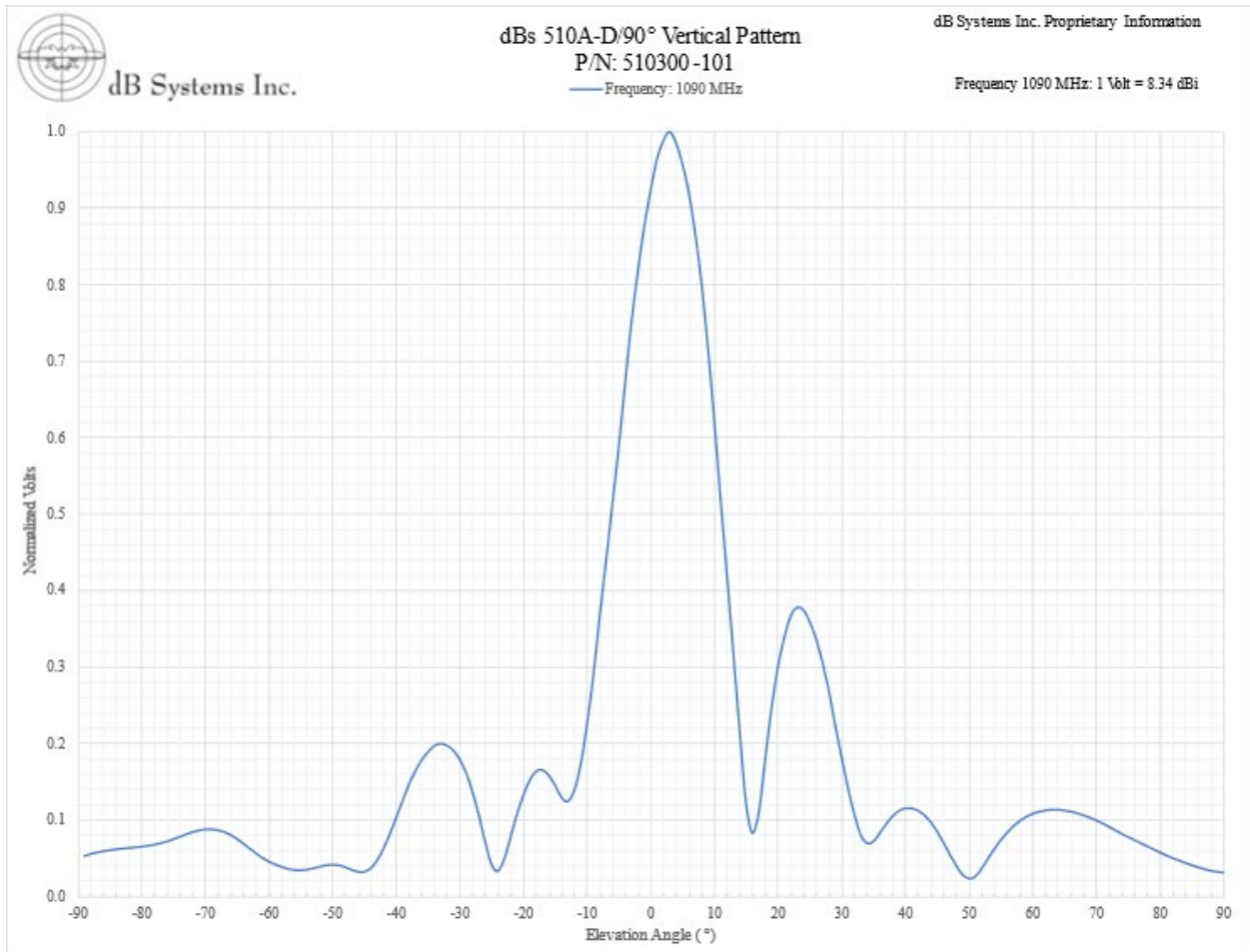
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# dBs 510A-D, 90° HPBW Vertical Pattern



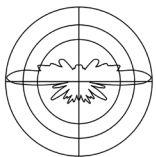
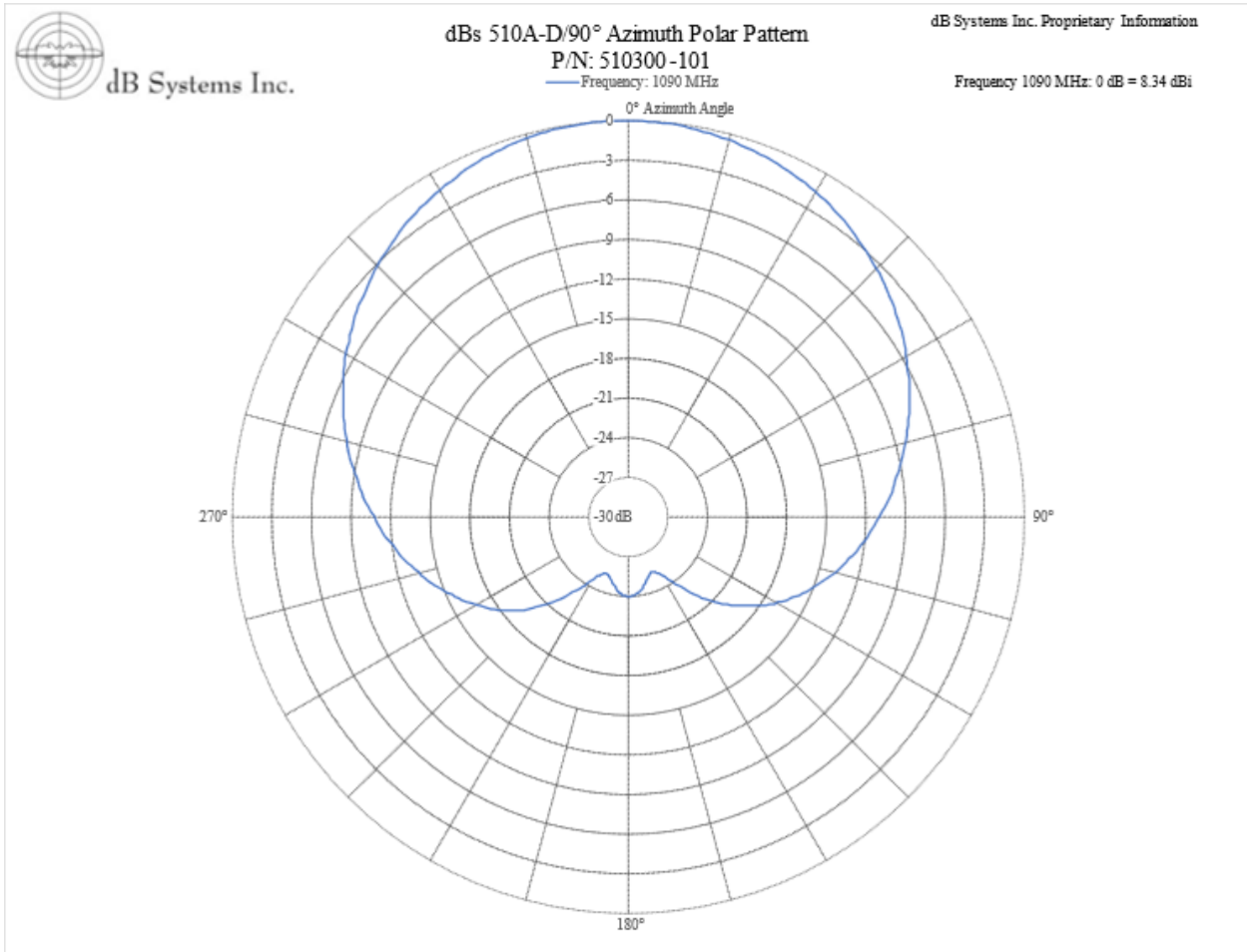
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# dBs 510A-D, 90° HPBW Horizontal Pattern



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