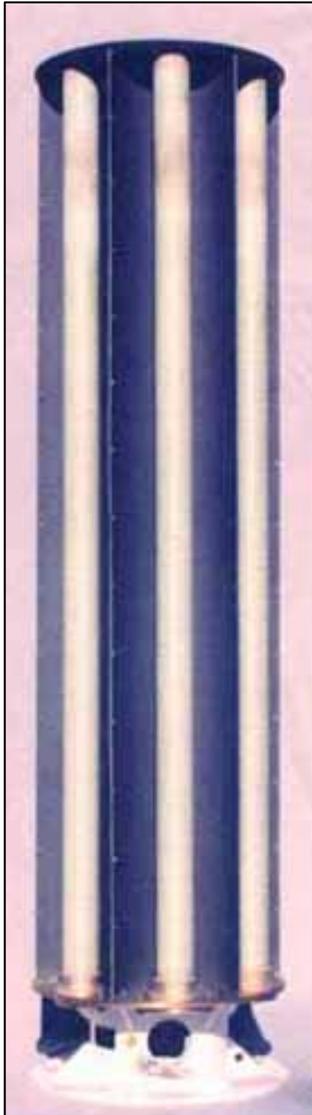


## SPECIFICATION SHEET

### GROUND STATION ANTENNA MODEL dBs 530, 6 Sector Squitter

**dBs PART NUMBER 530300-100**  
**APPROVED FOR USE BY FAA UNDER FAR PART 171**



The dBs 530 is a very high gain ( $> 16$  dBi), six-sector squitter (six beam) ground station antenna. It is used at each GPS squitter en route ground station in an ADS Air Traffic Control System. The system provides surveillance and data link services for all appropriately equipped aircraft within a 100 nmi (or greater) radius of the ground station.

The antenna provides full azimuth coverage using six nominally separate  $60^\circ$  sector beams in the azimuth plane. Breaking the coverage volume up in this way allows greater gain to be achieved and therefore greater range than would be provided in a single omni-directional antenna. It also may be used to reduce the interference environment by suppressing signals originating from aircraft in other sectors.

The antenna is vertically polarized and broadband. It is specifically designed to operate with Mode S signals operating at  $1030 \pm 5$  MHz and  $1090 \pm 5$  MHz. The antenna is broadband, however, and can be used at any of the DME frequencies between 960 to 1215 MHz. The antenna is comprised of six identical reflector antennas with each antenna covering a separate  $60^\circ$  sector of the full azimuth circle. Each separate antenna beam has its own input connector as well as its own RF monitor port, which couples incident RF power at a level 25 dB down from the input power level of each antenna beam.

The antenna requires no tuning or adjustments and utilizes a 12 element array. Peak power handling capability is up to at least 5 kW peak power at 3% duty cycle. Main lobe gain is  $> 16$  dBi, horizon gain is  $> 14$  dBi. Location of the main lobe is 3 to 4 degrees above the horizon. Type N female coaxial receptacles are used for all RF interfaces. RF input is  $50 \Omega$  and VSWR is less than 2.0:1. The entire antenna, including all six arrays, are enclosed in a protective fiberglass radome.

**dBs 530 with Marine Option (P/N: 500300-120):** The dBs 530 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.

# GROUND STATION ANTENNA

Model dBs 530, 6 Sector Squitter  
dBs PART NUMBER 530300-100

## SPECIFICATIONS/CHARACTERISTICS

**TYPE:** Six Beam, Directional

**AZIMUTH COVERAGE:** 60° Nominal HPBW each lobe. Gain > 13 dBi throughout 60° sector including edges. Gain >14 dBi over at least 70% of 60° sector. Mean gain < -21 dB relative to main beam peak outside of ±70° from the main azimuth beam. See Figure 3.

**FREQUENCY RANGE:** 1030 ± 5 MHz and 1090 ± 5 MHz (No adjustments or tuning required)

**ARRAY:** 12 radiator assemblies (85" tall)

**POLARIZATION:** Vertically Polarized

**GAIN, MAIN BEAM:** >16 dB/iso, main horizontal plane

**GAIN, HORIZON:** >14 dB/iso, main horizontal plane

**MAIN BEAM ELEVATION LOCATION:** 3.5° ± 1° above horizon

**SLOPE (VICINITY OF HORIZON):** 1 dB/° min

**POWER HANDLING CAPABILITY:** Up to at least 5 kW peak RF power at 3% duty cycle

**IMPEDANCE:** 50 Ω nominal

**VSWR:** Not greater than 2:1 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 6 degrees wide at the half-power points. The power gain at angles between 10 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 16 dB. The power gain at angles between 6 and 20 degrees above the horizon shall be greater than a level which is 16 dB below the power gain at the peak of the major lobe above the horizon. The power gain at angles between 20 and 45 degrees above the horizon shall be greater than a level which is 22 dB below the power gain at the peak of the major lobe above the horizon. Coverage provided to 55 degrees above the horizon.

**SIZE:** 97" L x 23.8" Dia

**WEIGHT:** 250 lbs. (excluding obstruction light, mounting fixtures, and other optional items).

**PHYSICAL DESIGN:** Six radiating arrays backed by six reflector elements. Each array physically held in individual filament wound radome. Entire RF portion protected by radome.

**WEATHER PROOFING:** Entire antenna weather proofed. Removal/replacement of subassemblies possible without sealing compounds.

**ANTENNA MOUNTING:** 6 each 0.5" bolts on 20.50" bolt circle.

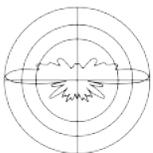
**WIND LOADING:** Withstands without damage 100 mph gusts

**MONITOR PORTS:** One coupling port for monitoring the signal radiated by each of the six antenna beams. Connector located at each plate/clamp. 50 Ω nominal impedance. Probe output level is 25 dB ± 1 dB below power level applied to main RF input connector.

**CONNECTORS RF:** Type N Female, 2 for each array (12 total)

### OPTIONAL ITEMS:

- **OBSTRUCTION LIGHT:** Optional, red dual lamp obstruction light fixture with two red globe covers. Connector is MS-3112E8-3P (P/N 510600-101: 9" H x 12" W x 5.5" D @ 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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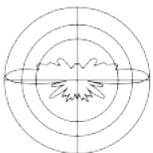
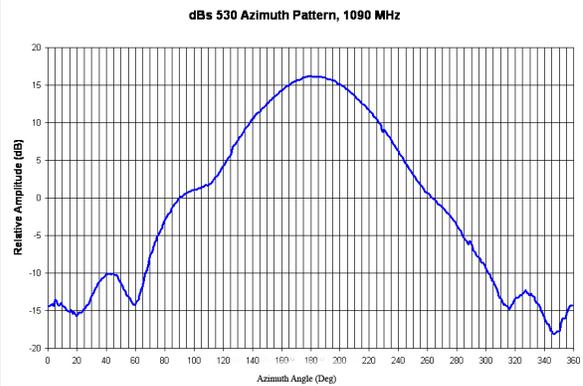
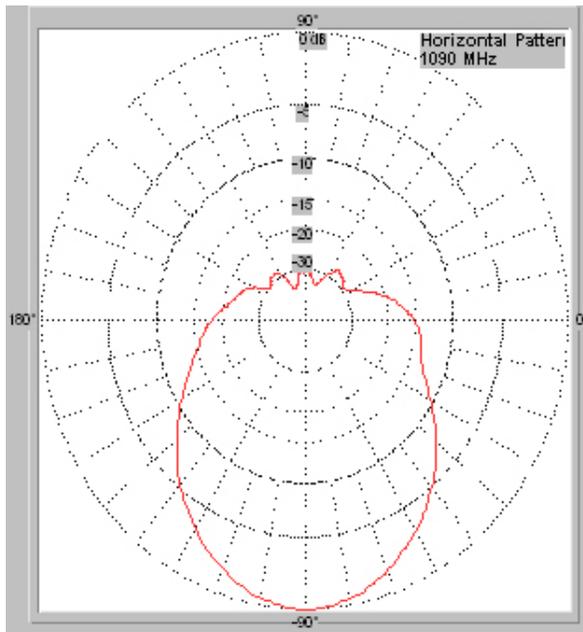
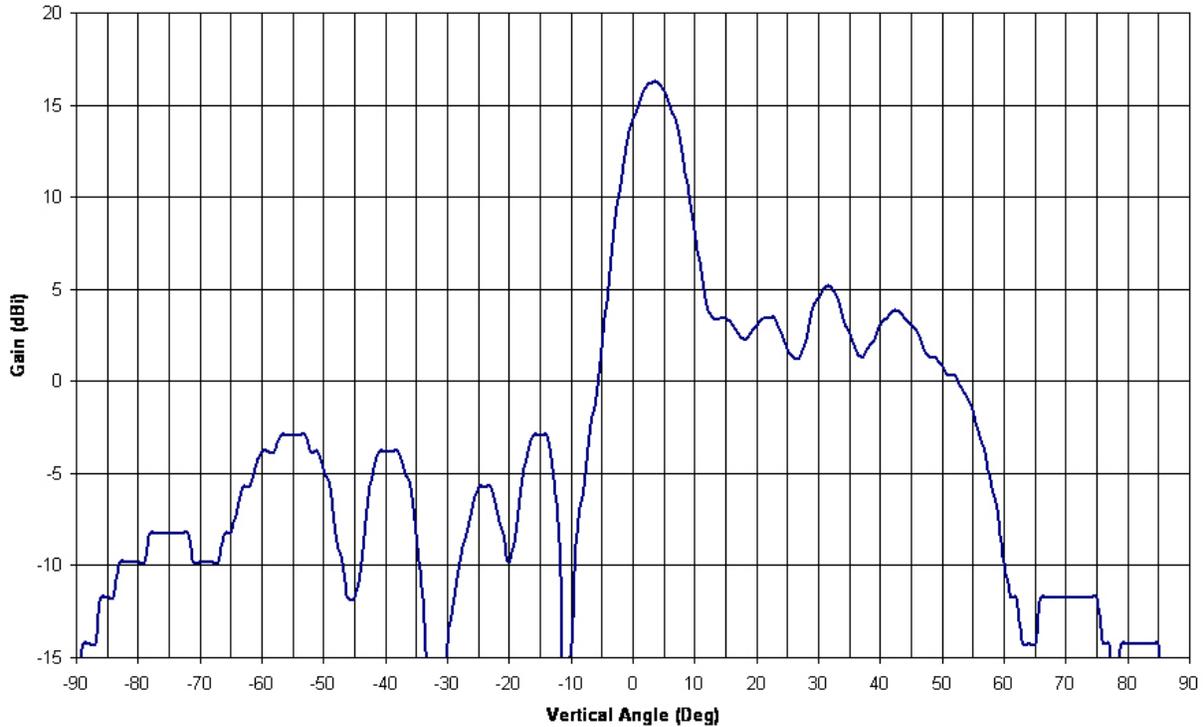
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# dBs 530 Vertical, Horizontal, & Azimuth Patterns

dBs 530 Vertical Pattern, 1090 MHz



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