dB Systems Inc.

2501 S. Antenna Avenue
Hurricane, Utah 84737 USA

SPECIFICATION SHEET

TACAN ANTENNA, MEDIUM APERTURE
MODEL dBs 950ET

dBs PART NUMBER 950300-100

- Vertical gain pattern (typically > 8 dBi) optimized for distant aircraft
- Kevlar with Rohacell foam core composite radome structure provides superior strength while maintaining light weight
- Unique modulation technique provides unusually high efficiency
- Innovative mechanical design supports easy field maintenance
- COTS FAA flight-tested technology
- Lightweight, low cube, and ruggedized design supports easy deployment and transportability with a weight under 100 lbs.
- The 950ET electronically scanned TACAN antenna is a state-of-the-art design that features high efficiency (low internal RF loss), high gain at low elevation angles, and very low gain below the horizon, resulting in exceptional coverage performance at sites with long cable runs or difficult terrain.

Designed as a tactical, transportable, deployable version of the dBs 900E (the FAA flight tested antenna chosen by the United States Air Force to replace the existing 120 USAF TACAN installations worldwide), the dBs 950ET offers many of the advantages of a tall aperture antenna in a lightweight package. The 950ET TACAN Antenna offers improved reliability, ease of field maintenance, and required substantially less power to operate than previous TACAN Antennas. In addition, the dBs 950ET is an all-frequency antenna. Meaning, the dBs 950ET operates on all DME/TACAN channels without tuning or adjustment.

Built in Test (BIT) assures the user that all antenna electronics are fully functional (which by itself is an excellent indicator of the overall RF pattern health of the antenna). The 950ET antenna has been sold to various international customers and has been used in both Fixed-Base and Mobile/Tactical installations.

TACAN ANTENNA, MEDIUM APERTURE

Model dBs 950ET
dBs PART NUMBER 950300-100

SPECIFICATIONS/CHARACTERISTICS

TYPE: TACAN, Medium Vertical Aperture

FREQUENCY RANGE: 1X through 126X; 1Y through 126Y; 962 MHz - 1213 MHz (no adjustments or tuning required)

ARRAY, CENTRAL, RF: 10 Element, Collinear, Cylindrical Dipole Array

MODES OF OPERATION: TACAN or DME Only

SCANNING: Electronically Scanned Using Ultra High Efficiency Modulation Technique

SCANNING SPEED: 900 RPM ± 0.015%, Crystal Controlled

ROTATION DIRECTION: Clockwise, looking down on the antenna

POLARIZATION: Vertically Polarized

GAIN, MAIN BEAM: ≥ 7 dB/iso peak gain, typically >8 dBi

GAIN, HORIZON: ≥ 1 dB/iso peak gain

MAIN BEAM ELEVATION LOCATION: 3° ± 1° above horizon

OPTIONAL ALTERNATE MAIN BEAM LOCATION FOR MULTIPATH SENSITIVE SITES: 7° ± 1° above horizon

SLOPE (VICINITY OF HORIZON): ≥ 0.2 V/V/° (normalized to value at horizon)

POWER HANDLING CAPABILITY: Up to at least 5 kW peak RF power at 4% duty cycle (200 watts average)

VSWR: ≤2.0:1 (960-1215 MHz) measured at end of low loss cable not exceeding 5 feet in length.

GAIN BELOW THE HORIZON: The gain at angles between 10 and 50 degrees below the horizon shall be lower than the gain at the peak of the major lobe above the horizon by at least 12 dB. The energy radiated below the horizon shall not exceed 20% of the total energy radiated.

GAIN ABOVE THE HORIZON: 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 6 and 40 degrees above the horizon shall not pass under a straight line joining the points of co-ordinates (+6°, -15 dB) and (+40°, -25 dB) with values referenced to the peak of the major lobe above the horizon.

HARMONIC CONTENT:

- RSS of 30 & 45 Hz ≤ 25% of 15 Hz
- RSS of 270 & 405 Hz ≤ 25% of 135 Hz
- RSS of 105, 120, 150 &165 Hz ≤ 25% of 15 Hz

IMPEDANCE: 50 Ω nominal

15 HZ MODULATION: From -2° to +45° vertical angle the 15 Hz percent modulation is 21% ± 9%.

135 HZ MODULATION: From -2° to +20° vertical angle the 135 Hz percent modulation is 21% ± 9%. From +20° to +45° the modulation performance specification varies depending on channel of operation.

HORIZONTALLY POLARIZED COMPONENT: The horizontally polarized component ≥ 26 dB below the vertically polarized component.

CROSS POLARIZATION ERROR FOR 45° HORN TILT:
15 Hz RMS Error ≤ ±3°
135 Hz RMS Error ≤ ±1°

AZIMUTH ACCURACY:

- 15 Hz RMS Error ≤ ±3°
- 15 Hz Peak Error ≤ ±8°
- 135 Hz RMS Error ≤ ±0.8°
- 135 Hz Peak Error ≤ ±2.0°

WARM-UP TIME: ≤ 5 Seconds

AC POWER: 95 to 260 VAC, 1 Phase, 47 to 63 Hz

DC POWER: +22 to +58 VDC

POWER CONSUMPTION: AC < 75 Watts; DC < 75 Watts

SIZE: Antenna: 70" H x 31.5" Dia. (33" Dia. at top cap); ACU: 12.25" H x 19" W x 16.5" D

WEIGHT: Antenna: 98.6 lbs.; ACU: 20.0 lbs.

TEMPERATURE:
Antenna: -50° C to +70° C
ACU: -10° C to +50° C

RELATIVE HUMIDITY: 0% to 100%

ALTITUDE: 10,000 feet above sea level, maximum

ICING: 4.5 lbs./sq. ft. on exposed antenna surface, maximum

WIND LOADING: 100 mph, maximum

LIGHTNING PROTECTION: Optional lightning protection (P/N: 510300-106) provided via RF transparent lightning down conductor. Typically located on shelter roof.

INTEGRAL MONITOR: Provides BIT to LRU level. Issues antenna shutdown or maintenance alert depending on failure mode. Optional azimuth monitor available to monitor azimuth, RF power output, pulse trains, etc.

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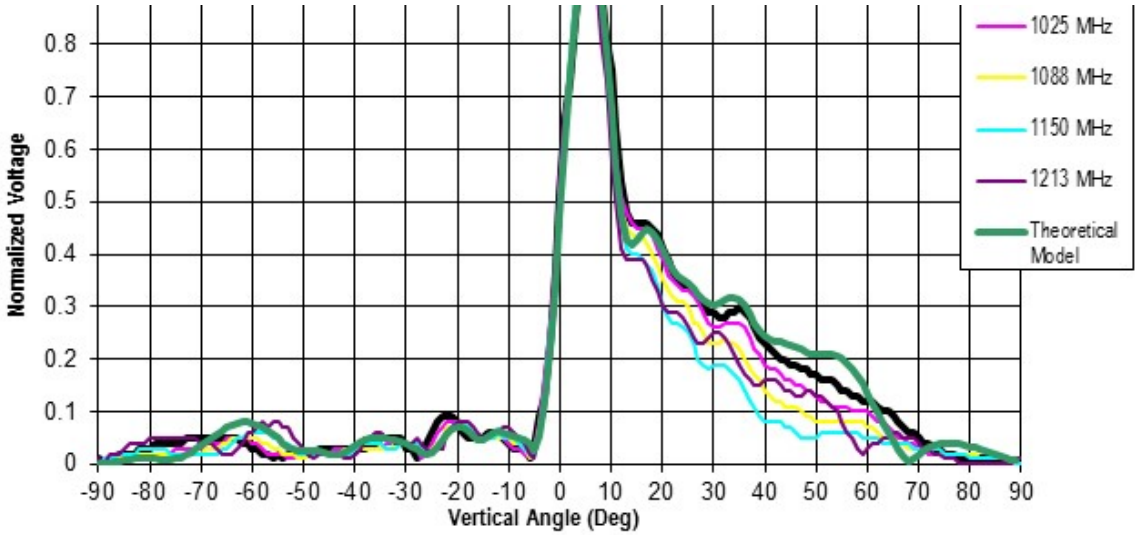
Email: **sales@dbsant.com** | Phone: **(435) 635-3352** | **www.dbsant.com**

dBs 950ET Vertical Pattern

950ET Typical Carrier Pattern across the TACAN Band compared against the Theoretical Model - Graph shown in Nornmalized Volts vs. Vertical Angle - Maximum Gain = 8.4 dBi



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