

# Efficient performance check for DME and TACAN ground stations

The new, versatile R&S®EDST300 TACAN / DME station tester is ideal for installing and servicing DME and TACAN systems. As a specialist system for ground measurements, it complements the R&S®EDS300 model that is mainly used for flight inspection.

Efficient planning of flight routes and corridors as well as accurate navigation are prerequisites for smooth procedures in the increasingly dense global air traffic. Even if the introduction of performance based navigation (PBN) makes global navigation satellite systems (GNSS) more important for en-route navigation in the future, terrestrial systems such as DME and TACAN remain essential and will continue to be enhanced. Rohde&Schwarz has developed the modular R&S®EDST300 TACAN/DME station tester for continuous monitoring and servicing of DME and TACAN stations (Fig. 1).

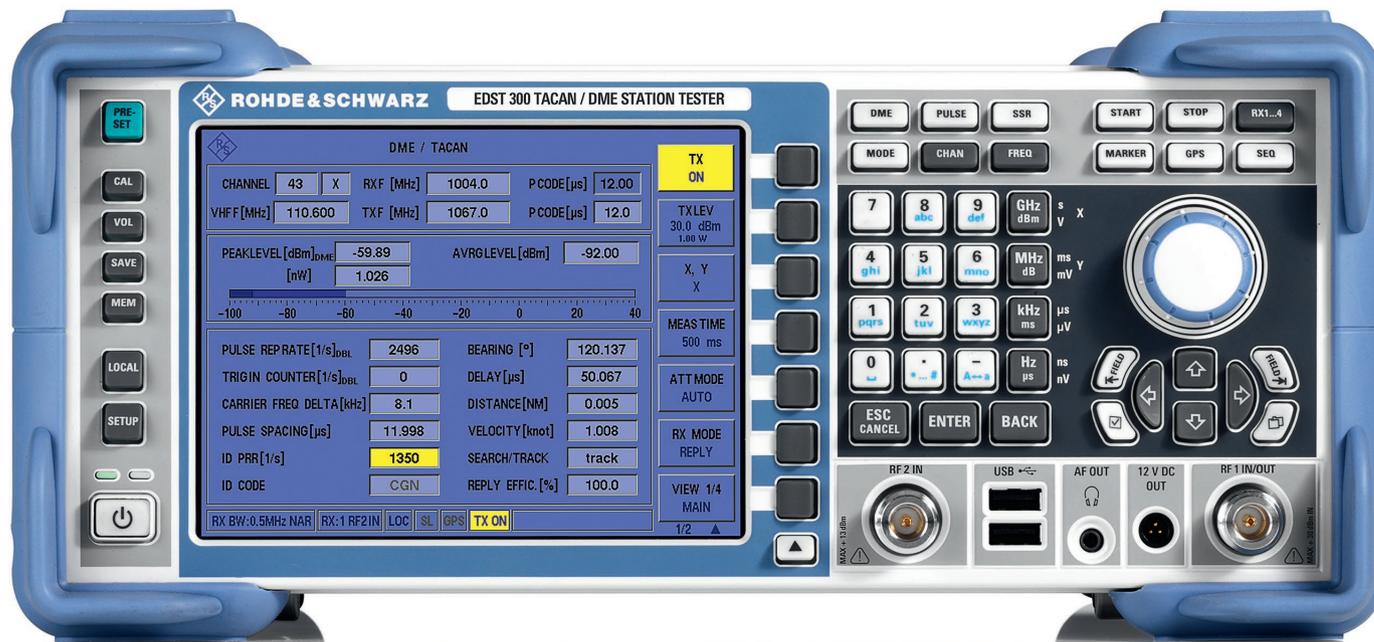
The R&S®EDST-B2 interrogator option with an adjustable output power of -80 dBm to +30 dBm is available for receiver measurements. An optional battery and a special test antenna make the analyzer fit for field measurements. Its flat menu structure and task-specific measurements displayed on the

easy-to-read (even in sunlight) 6.5" TFT color screen ensure optimal user-friendliness no matter where it is used. All results can be retrieved via the remote control interfaces or be stored on a USB data logger.

## Regular maintenance of DME and TACAN ground stations

The R&S®EDST300 provides high-precision stimulus and analysis functions for terrestrial pulsed navigation signals in the 960 MHz to 1215 MHz frequency range. It determines essential system parameters such as peak power, main delay and reply efficiency. It analyzes the identifier and efficiently and accurately performs the conducted tests required for DME and TACAN systems in line with the relevant civil and military standards (e. g. on-channel sensitivity and decoder rejection).

Fig. 1: The compact R&S®EDST300 controls all measurements necessary for the maintenance and servicing of DME and TACAN stations and is suitable for conducted and radiated signals.



The R&S®EDST300 can also be used for numerous in-depth analyses. In addition to special tests such as interrogation loading, reply delay variation and adjacent channel measurements, it also offers time domain analysis (R&S®EDST-K2 option) with automated determination of pulse rise and decay times, pulse duration and pulse spacing, eliminating the need for an external oscilloscope.

### Measurement of conducted signals for servicing TACAN systems

Equipped with the R&S®EDST-K1 option, the R&S®EDST300 analyzes the performance of TACAN systems. In addition to the measurements that are identical to those for DME systems, it is possible to analyze, for example TACAN bursts (MRB and ARB) using a directional coupler to determine their pulse repetition rate, pulse count and pulse spacing (Fig. 2).

### Everything you need for field measurements

The integrated battery (R&S®EDST-B3 option) ensures autonomy in the field. Charged using the standard power supply, the battery supplies the analyzer with enough power for up to two and a half hours of operation.

Thanks to its low noise figure, the R&S®EDST300 offers an excellent input sensitivity of  $-100$  dBm (RF input 2). This allows highly accurate measurements even at large distances from the TACAN/DME ground station. The R&S®EDST-Z1 test antenna is used to perform extremely accurate field measurements on TACAN systems, for example modulation depth, modulation frequency and phase relationships of the 15 Hz and 135 Hz signal components, and also the TACAN bearing. The test antenna's excellent front-to-back ratio suppresses unwanted reflections. The antenna can be used to determine the range accuracy and many other system parameters of both TACAN and DME systems under realistic conditions in the field, including signal strength in space, pulse spacing and reply efficiency.

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### Special characteristics of the R&S®EDST300

- High-precision TX/RX measurements on DME and TACAN systems (in line with ICAO Doc. 8071, ICAO Annex 10, STANAG 5034 and MIL-STD-291C)
- Dynamic range of 110 dB and precise peak power measurement
- Precise measurement of characteristic TACAN/DME parameters (main delay uncertainty < 50 ns, bearing uncertainty < 0.2°)
- Detailed, automated time domain analysis
- Compact design with internal battery
- LAN interface for remote controlling all functions and outputting measurement data
- Weight: 7.3 kg; high mechanical stability
- USB port for easy data export and software updates

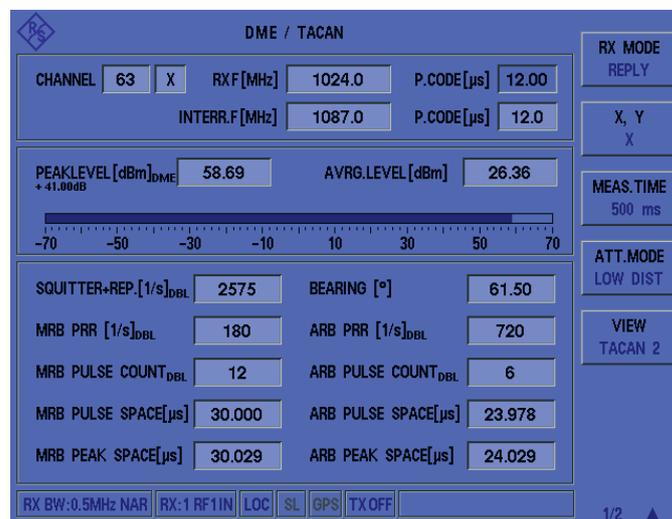


Fig. 2: Analysis of MRB and ARB.

### The most important abbreviations

ARB	auxiliary reference burst
DME	distance measurement equipment: distance measurement method in aviation
ICAO	International Civil Aviation Organization: international authority that defines civil navigation standards
MRB	main reference burst
TACAN	tactical air navigation: military DME variant that additionally allows azimuth direction finding