

# Verify your avionics navigation equipment

Rohde & Schwarz offers unique one-box solutions for reliable testing of air navigation systems such as ILS, VOR and DME.



Reliable operation of air navigation systems is essential for public safety and military mission success.

## Your task

Air navigation systems are vital in international civil and military aviation. Pilots depend on the accurate operation of terrestrial navigation systems, such as VHF omnidirectional radio range (VOR), instrument landing system (ILS), distance measuring equipment (DME) and marker beacons (MKR BCN), to get reliable information on their actual position, direction and distance, as well as for safe landing.

Air navigation systems are subject to highest safety requirements. To ensure accurate operation and worldwide compatibility, the International Civil Aviation Organization has standardized the critical parameters for such radio navigation aids in ICAO Annex 10, Volume 1. Flight inspection organizations regularly control, calibrate and certify these analog navigation systems to ensure compliance with specifications, which is essential for public safety and military mission success.

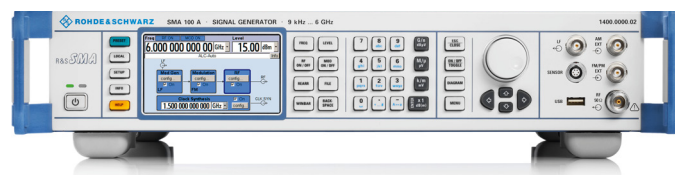
Terrestrial navigation systems – ground-based transmitter stations and corresponding receivers in the aircraft – demand highly reliable test equipment that fulfills their diverse range of high requirements in all areas, from R&D to production, from calibration to installation and maintenance.

## T & M solution

Rohde & Schwarz test solutions for avionics navigation equipment combine versatility and ease of use with utmost precision and reliability.

For testing air navigation receivers during R&D, production and maintenance, and for calibrating test equipment, the R&S®SMA100A signal generator delivers high-precision navigation signals, such as VOR, ILS, MKR BCN, DME and ADF, in line with ICAO standards. Outstanding accuracy, stability and linearity combined with highest spectral purity ensure that the test instrument itself does not influence measurements on the device under test.

Connecting the R&S®NRP-Z81 wideband power sensor to the analog signal generator provides the most convenient solution for DME transponder testing, without any need for RF detectors or oscilloscopes. Important ground station parameters such as reply delay, reply efficiency, pulse repetition rate or peak level can be measured automatically. This setup also makes DME pulse analysis easy.



R&S®SMA100A signal generator.

From R&D to production of ground-based ILS/VOR infrastructures, the R&S®FSU spectrum analyzer and the R&S®FSQ signal analyzer with the R&S®FS-K15 VOR/ILS measurement demodulator option are the ideal solution. Navigation signals are accurately analyzed and clearly displayed. In addition, a wide range of options are available, from noise figure and phase noise measurements to the analysis of digitally modulated signals.

The R&S®EVS300 ILS/VOR analyzer is tailor-made for field testing and meets the demands for ground tests and flight inspection of ILS/VOR and marker beacon infrastructures. Maximum precision combined with high measurement speed and synchronization capability via GPS, trigger and remote interfaces make the R&S®EVS300 ideal for integration into flight inspection systems. They enable direct correlation of ground- and air-based signal analysis in line with ICAO 8071 standards.

In addition, the R&S®NRP-Z81 power sensor can be connected to the analyzer for accurate DME signal analysis with minimum effort.

The R&S®EVS300 offers FFT, frequency scan and oscilloscope options for signal analysis in the time and frequency domains in a single box. There is no need to carry along additional test equipment. An integrated data logger continuously records all signal parameters, which can be graphically presented on a large color display. The rechargeable battery and robust design make this portable analyzer the ideal choice for mobile, mains-independent measurements in the field.

The R&S®FSMR measuring receiver with the R&S®FS-K15 VOR/ILS measurement option provides a single-box solution for the calibration of ILS/VOR signal generators.



The R&S®FSMR combined with the R&S®NRP-Z37 enables minimum power measurement uncertainty down to lowest signal levels.



The R&S®EVS300 ILS/VOR analyzer has been designed to enable reliable glide path measurements in the field.

When the R&S®FSMR is used together with the R&S®NRP-Z37, minimum power measurement uncertainty is ensured, even at lowest signal levels. In addition, the integrated modulation and audio analyzer can be extended to analyze digitally modulated signals. Adding the R&S®SMA100A and some peripherals results in an automatic test system perfectly suited for calibration and adjustment of the R&S®EVS300 analyzer.

From R&D to production, from calibration to installation and maintenance – the reliable, high-precision instruments from Rohde & Schwarz are ideal for testing aeronautical navigation systems.

#### See also:

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