Spectrum Analyzer FSP

FSP goes outback – tough test in Australia

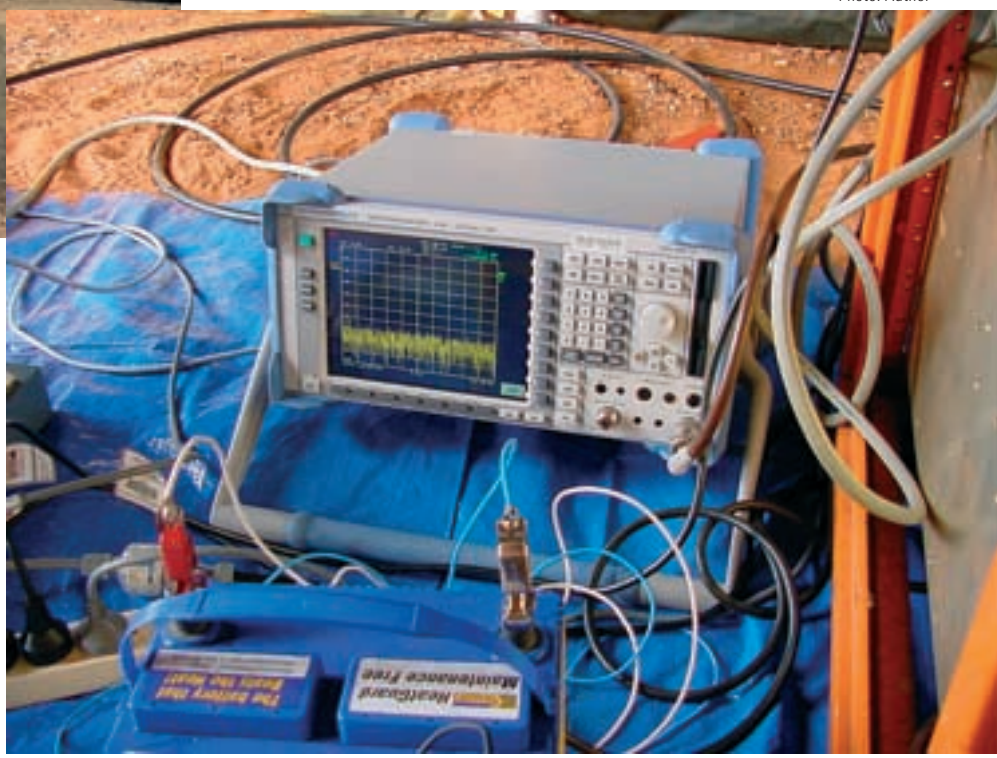
The global positioning system (GPS) provides precise navigation data and time information throughout the world. Unfortunately, however, the system is susceptible to electromagnetic interference. In large-scale trials recently carried out in the Australian outback, members of the US and Australian armed forces examined ways of locating sources of such interference in order to take counter-measures.

The global positioning system (GPS) is used in a very wide variety of applications, including air, sea, and land navigation, and intelligent transport systems, as well as in telephone or electrical power grid synchronization. However, GPS is highly susceptible to electromagnetic interference. GPS receivers can be rendered ineffective with simple, inexpensive pocket-size jammers, or by signals from TV antennas, radar, and communications towers, and this can seriously impair their functionality both in civil and military applications. It is therefore essential to find techniques to counteract intentional and unintentional GPS interference.

Photo: Author

Heat, sand, dust and rough terrain: a tough test, which the Spectrum Analyzer FSP passed with flying colours

Photo: Author



More than 30 US and Australian military and civilian personnel were involved in the GPS Jammer Locator (JLOC) trials in Woomera, South Australia, in March 2001. The trials were a joint demonstration between the United States Air Force Operational Test and Evaluation Center (AFOTEC), Australia's Aircraft Research and Development Unit (ARDU), the Defence Science and Technology Organisation (DSTO), and Air Services Australia (ASA).

The JLOC system, under development through a US Air Force Research Laboratory (AFRL) contract to the American company NAVSYS, is designed to locate GPS jamming or interference sources and provide data to assist tactical or strategic planners in minimizing the influence of such interference sources. At Woomera, the JLOC system was used to locate ground-based GPS interferers provided by the DSTO from a combination of ground and airborne platforms.

The trials demonstrated that GPS interferers can be located and identified, and interference prevented, thus making for more reliable and effective deployment of the GPS navigation system.

Thanks to its outstanding features, the Spectrum Analyzer FSP from Rohde&Schwarz played a key role in the trials. The compact dimensions of the FSP, its low weight, rugged design, high input sensitivity and ability to process data without an additional PC made it ideally suited to the tough conditions at the test site. As the DSTO's Chris Pitcher put it: "Environmental conditions in Woomera are testing for any instrumentation, with a combination of heat, dust and difficult terrain; the FSP took it all in its stride."

It is practically impossible to mount trials on this scale in the USA. Due to the effects on GPS-dependent civil infrastructures, there is simply no empty area large enough to support such an exercise.

At Woomera, however, there are virtually no GPS users within a 450 km radius. Moreover, the weather is clear, support facilities are good, and there is also an airfield, allowing several aircraft the freedom to fly around the Woomera region locating multiple interferers on the ground.

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The main characteristics of the FSP

- Resolution bandwidths from 1 Hz to 10 MHz
- Highly selective digital filters and FFT
- Quasi-peak detector and EMI bandwidths
- Interfaces: GPIB, Centronics, RS-232, LAN (optional)
- Automatic measurement routines for determining IP3, OBW, phase noise, ACP(R)
- Split screen with independent settings and up to three measurement traces per screen
- Editable limit lines including PASS/FAIL display
- Fast time domain measurement: minimum sweep time 1 µs
- Gated sweep for measurements on TDMA signals

Additionally, the FSP comes standard with:

- An RMS detector for quick and reproducible power measurement on digitally modulated signals in the frequency and time domain
- A statistical measurement function for determining the crest factor and CCDF (complementary cumulative distribution function)

More information and data sheet at www.rohde-schwarz.com (search word: FSP)

Data sheet FSP

Data sheet TV Trigger/RF Power Trigger for the FSP