Spectrum Analyzers R 3132 and R 3162

New allrounders in the middle class

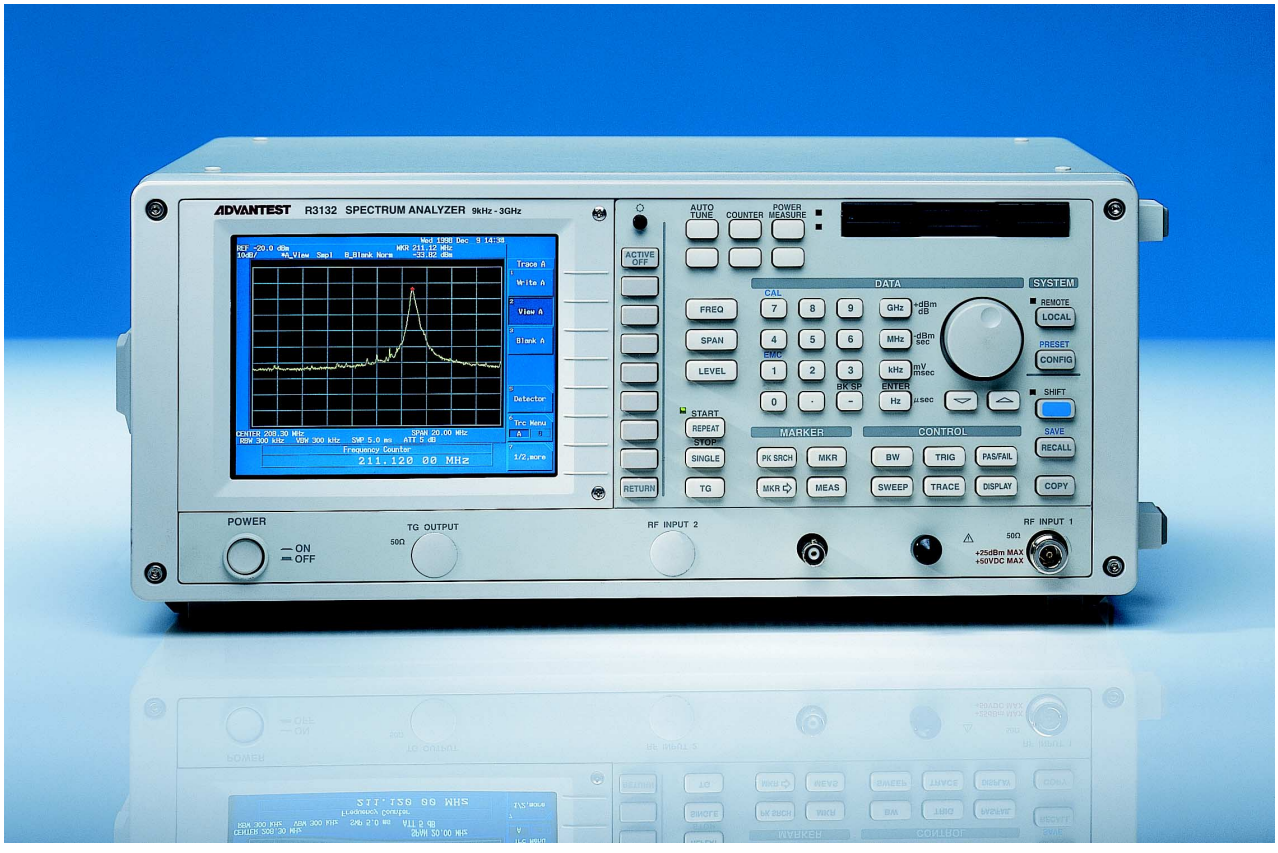
Mobile phones, trunked radio and digital broadcasting – the growing importance of radio systems makes increasing demands on spectrum analyzers. Advantest is now presenting its latest, powerful middle-class analyzers, two universal units in synthesizer technology designed for manual operation as well as integration into automatic test systems in development, production and service. The two Advantest instruments are ideal vertical additions to the Rohde & Schwarz product line. For this reason they are marketed by Rohde & Schwarz in Europe and in many other countries as part of a successful cooperation between the two companies.

Analyzers R 3132 (up to 3 GHz, FIG 1) and R 3162 (up to 8 GHz) are of modular design, ie they comprise a basic unit and **various extensions**. So customized solutions can be configured, which are tailored to the user's requirements, and costs reduced at the same time. Options can be retrofitted any time. User friendliness and a clear layout are also evident features.

The instruments have a resolution bandwidth of 1 kHz as standard. Resolution bandwidths of 30 Hz, 100 Hz and 300 Hz are optionally available to improve S/N ratio. A **preamplifier** is also **integrated** in the basic unit (max. 3.2 GHz). So even very weak signals can be measured. The permissible input level is +30 dBm and an RF attenuator with maximum attenuation of 50 dB (R 3132) or 75 dB (R 3162) is fitted for high-power signals. Attenuation can be varied in 5 dB steps permitting optimization of the intermodulation-free dynamic range.

The new models feature considerably **better RF characteristics** than the leaner R 3131 [1]. They have inherent noise of –118 dBm at 1 kHz resolution bandwidth, –132 dBm at 30 Hz and even –146 dBm with the preamplifier switched on. The dynamic range was also extended: the range free of 2nd order harmonics and 3rd order intermodulation products is at >80 dBc (with –30 dBm mixer level), the 1 dB compression point >0 dBm. Thanks to direct digital synthesis, the frequency span error is only 1%, while the maximum total

FIG 1
New Spectrum Analyzer R 3132 from Advantest, a universal measuring instrument up to 3 GHz for diverse applications in development, production and service



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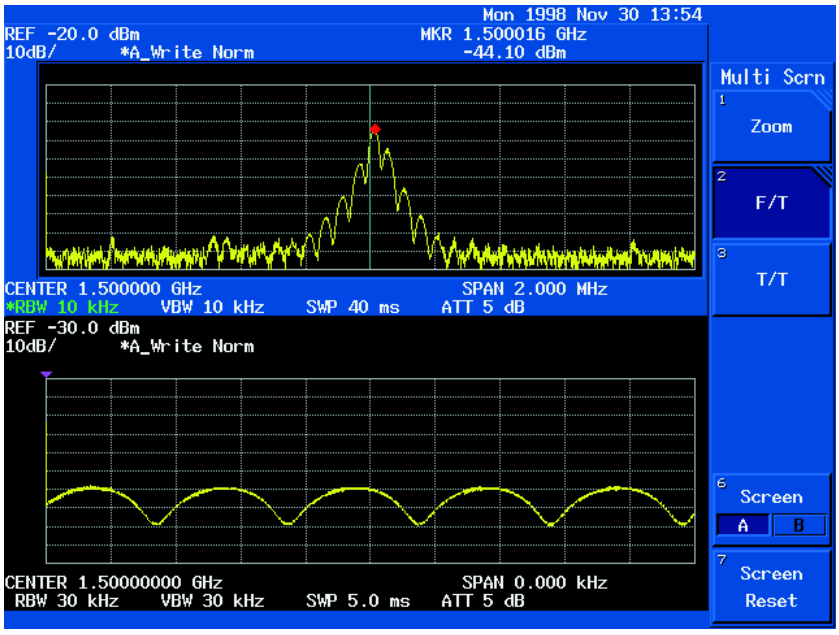

FIG 2
With the multi-screen function selected, two signal windows are displayed

amplitude error is reduced to ±1.5 dB through internal calibration.

The analyzers excel in a **very short sweep time** of 20 ms and can display 20 traces/s – a high refresh rate unrivalled by measuring instruments of this price class. As a result waveform variations are perceived in an almost analog way. With mobile communications standards such as GSM, an even shorter sweep time is needed in the time domain for burst display. To meet this requirement an option with a sweep time of only 50 µs is available.

Basically the instruments are equipped with a number of other useful functions such as gated sweep and delayed sweep for measurements in line with different mobile radio standards. In the gated sweep mode, TDMA signals can be examined in the frequency domain, while with delayed sweep detailed analysis of the rising and falling edges of a single burst can be made.

Thanks to their universal characteristics, the spectrum analyzers can easily be integrated into production lines. Fast data transmission via the IEC/IEEE bus is of great advantage for automatic in-production measurements.

Another highlight is the large **TFT colour screen** with a diagonal of 16.5 cm. Its features include a multi-screen function (FIG 2), high resolution (1001 horizontal pixels) and a logarithmic display range of 100 dB. Large level differences can thus easily be determined. The picture content can also be viewed on an external monitor via the VGA output.

Their versatile capabilities also make the analyzers suitable for **TV applications**. Noteworthy is the trigger on vertical and horizontal TV lines, which is standard in all basic units. A model with input impedance of 75 Ω is available for cable TV measurements.

The **EMC functions integrated** in the analyzers allow precompliance EMC measurements using different detectors. For the quasi-peak detector, 6 dB resolution bandwidths of 9 kHz, 120 kHz and 1 MHz are provided in the basic unit. A resolution filter of 200 Hz is optional.

Other **major measurements and functions** can be performed at the press of a button:

- various power measurements,
- noise measurement,
- adjacent-channel power,
- occupied bandwidth,
- limit lines with pass/fail verdict,
- full-range search for highest signal level (autotune),
- frequency counter with 1 Hz resolution,
- determination of AM depth (% AM).

Just as with almost all spectrum analyzers from Advantest, a tracking generator (up to 3 GHz) is available as an option. This allows various transmission parameters to be measured, eg cable loss or filter frequency response. With the aid of an additional SWR bridge, matching characteristics can also be measured.

Measured data, parameters and traces can be stored on diskette in three different formats. When saved in binary format, the data can be reloaded any time in the analyzer. In CSV format, the individual pixels are stored as numeric values permitting subsequent use in spreadsheets and

thus data editing by PC. The whole screen content can be stored as a monochrome or colour bitmap, which is very useful for the documentation of results.

The analyzers are provided with a Centronics interface in addition to an IEC/IEEE bus and a serial interface. So test results can be output direct to a printer (ESC/P and PCL standard) or plotter (via IEC/IEEE bus).

With these instruments Advantest sets new standards in the middle class. Users will find these universal spectrum analyzers to be the ideal tool for everyday measurements.

Patricio Dueñas

Condensed data of Spectrum Analyzers R3132 and R3162

Frequency range	9 kHz to 3/8 GHz
Sideband noise	<–100 dBc/Hz (at 10 kHz offset)
Resolution bandwidths	1 kHz to 3 MHz (30 Hz optional)
Sweep time	20 ms to 1000 s (optional 50 µs in time domain)
Data storage	binary, CSV and bitmap
Interfaces	Centronics, IEC/IEEE bus and RS-232-C
Display	16.5 cm TFT colour screen
Weight	15 kg
Dimensions (W x H x D)	424 mm x 177 mm x 300 mm

Reader service card 162/04

REFERENCES

[1] Wollmann, P.: Spectrum Analyzer R3131, the allrounder for the small budget. News from Rohde & Schwarz (1998) No. 159, p 32