
This portable dual-channel unit performs propagation analysis, CW testing, site verification, and signal-strength analysis.

Receiver Speeds Base-Station Siting For PCS

By Robert Keenan

Site planning is essential to the development of wireless networks that provide the best coverage using the fewest base stations. One example of this is the roll out of personal-communications-services (PCS) systems. Due to tight time-to-market deadlines, PCS test systems should allow site planners to quickly find the most optimal base-station locations. The Companion developed by Berkeley Varitronics Systems, Inc. (Metuchen, NJ) enables PCS designers to accomplish this goal.

The Companion (see figure) is a portable, dual-channel receiver system that performs signal strength measurement on two independent receivers simultaneously—each equipped with its own antenna. The unit is engineered to perform propagation analysis, continuous-wave (CW) testing, signal strength analysis, signal-performance measurement, and site verification. The receiver covers the 1850-to-1910-MHz and 1930-to-1995 MHz PCS frequencies; 145-to-165-MHz, 450-to-465-MHz, and 928-to-941-MHz paging frequencies; O-V-LU-870-MHz land-mobile-radio (LMR) frequencies; the 900-to-931-MHz and 2.4 to 2.485 GHz industrial-scientific-medical (ISM) bands; the 824-to-848 MHz and 869-to-894-MHz Advanced Mobile Phone Service (AMPS) frequencies; as well as the 872-to-905 MHz and 915-to-950-MHz Extended Total Access Communication System (ETACS) frequencies. In each band, the receiver supports a 20-to-60 MHz tuning range.

One of the main advantages of this unit is the dual-channel setup. Base-station testing has been slowed by



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slowed by systems that offer single-channel receiver systems. In order to switch bands, an engineer who used a single-channel receiver would have to discontinue current tests and start a new testing procedure. By using The Companion, system designers can simultaneously run multiple tests on the base-station and mobile-station receive frequency of a PCS system or the base-station receive frequencies of multiple systems such as PCS and paging.

Each channel supports 15 ms/channel received-signal-strength-indicator (RSSI) measurement, 50-chart/s RSSI measurement, 15 ms/channel fast scan of the receive band, and 66-chart/s fast scan of the receive scan of the receive band, and 66-chart/s fast scan of the receive band.

Sensitivity is also a major concern for base-station applications. This re-

ceiver sports a -118 to -30 dB + -dB dynamic range at a 10 kHz bandwidth and better than -50 dB adjacent-channel rejection at 30 kHz. The Companion also provides + 2.5 PPM stability and less than -80 dBc/Hz phase noise at 1 kHz.

In order to promote portability, in the unit is housed in a water-resistant 10 lbs. (4.55-kg) package that measures 6 X 10 X 8 in. (15.26 x 25.4 X 203.32 cm). It is equipped with a black-vinyl foam-lined carrying case with a shoulder strap. It can be plugged into a car's cigarette lighter through an adapter. When hooked to the lighter, The Companion runs from +12- to +16- VDC supplies consuming 1-A current. It can also be powered through an external wall-mount DC power supply. In this setup, the unit consumes 1-A current from a +16 VDC supply.

The Companion accurately determines base-station position through its internal 8-channel differential Global Positioning System (GPS). All measurements and locations are displayed on a 64 x 240-pixel graphic supertwist liquid-crystal display (LCD). Recorded information can be directly downloaded to a laptop computer connected through the unit's RS-232 port for real-time evaluation.

The unit is available with a choice of 4-, 10-, 25-, or 30- kHz intermediate-frequency (IF) bandwidth. It supports dual scan conversion with 83 MHz to the first IF and 455 kHz to the second IF.

The Companion dual-channel receiver also has an optional bit-error-rate (BER) demodulation mode for bit/byte packet and burst-error counts.