Wind profiling is an important activity in meteorological and climatological research, aviation, air quality monitoring and research, defense operations and land resource management. Pictured a LAP®-3000 System at Kennedy Space Center.

Vaisala LAP® Digital-IF

Providing Superior Wind Profiler Data

The digital IF receiver will be a standard component of LAP® deliveries after October 2002 or an upgrade to the existing LAP® wind profiler product family (LAP®-3000, LAP®-8000, LAP®-12000 and LAP®-16000). The upgrade is for current LAP® owners who wish to improve the signal processing and performance of their wind profilers. This product gives better performance at operating locations with interfering ground clutter and offers superior data quality at any site.

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Product Manager
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USA

The Digital IF is offered as an integral part of wind profilers or as an upgrade to fielded systems. It also comes with the Vaisala Service Contract level 1, which includes software upgrades for a year after delivery. The first Digital IF delivery was to DWD (the German Weather Service) to be used in their LAP®-16000. Since then NOAA, the UK Met Office, and other wind profiler users have placed orders with Vaisala.

Enhancing system performance

The LAP® Digital IF receiver is a hardware and software enhancement to the LAP® family of radar wind profilers. The analog-to-digital signal conversion takes place at the intermediate frequency (IF) element of the receiver. The new hardware and topology enables improved signal processing techniques that reduce the effects of interference and ground clutter. This allows a more accurate automatic selection of the atmospheric signal.

The signal processor, radar control, and IF/Modulator functions are replaced with new designs that are implemented using modern components and techniques, including PCI format boards for the digital signal processor and radar controller. The sampling, matched filtering and digital signal processing board is called PIRAQ III (PC Integrated Radar Acquisition board – version 3). PIRAQ III was developed at the National Center for Atmospheric Research (NCAR).

New algorithms

New algorithms are incorporated into the LAP® wind profiler signal processing software, LAP-XM®. Among the real-time processing improvements are modules and algorithms that provide Wavelet clutter reduction, multiple spectral peak picking, running averages of wind consensus values, structure function parameter for the index of refraction (C_n2) data, WMO BUFR output format data, and quality control (using the Weber-Wuertz method) of the final output. This upgrade modernizes the LAP® systems and adds new functionality and flexibility in processing profiler radar signals into atmospheric measurements.

For more details of the algorithms please use the web based search engine "Google". Suggested words for an advanced search are Wind Profiler and the name of the algorithm. ●