WD-7200

High-performance VHF/UHF quasi-coherent interferometer DF system

- Frequency range 100 MHz to 2000 MHz
- High accuracy circular radome antenna
- Rugged, low visibility antenna housing
- Correlative interferometer technology
- Rapid and simple deployment
- High sensitivity
- Effective against short duration signals
- Effective against digital signals such as DMR/Tetra
- Typical accuracy better than 2 degrees SD
- Common reference providing receiver coherency
- Uses wideband digital DDC based receivers
- Low power consumption
- Additional antennas to cover 2-100MHz
- Highly portable

Delivering a cost-effective yet robust and accurate DF solution for government, military, and law enforcement applications, the WiNRADiO WD-7200 direction finding system employs a sophisticated quasi-coherent multi-channel interferometer-based method, combined with statistical signal processing.

The system is small, lightweight and ruggedized. It is suitable for stationary, vehicle-mounted and portable deployment. It delivers unparalleled flexibility due to its SDR architecture. Excellent accuracy and sensitivity ensure it is capable of filling not only the role of a direction finding system, but also that of a highly capable VHF/UHF COMINT intercept receiver system.

Each WD-7200 system comprises of three main parts: antenna radome, twin coherent receivers, and processing computer.

The radome uses eight sense antennas in a circular array mounted within a weatherproof fiberglass housing. The sense antennas are specially designed dipoles. Also inside the radome is an accurate magneto resistive digital compass, ensuring that the antenna is referenced correctly to magnetic north at all times.

The receivers are a quasi-coherent variant of the well-proven WR-G39DDC SDR. The system is housed in a rugged portable pelicase-style enclosure.

The WD-7200 exploits a special technique of phase equalization that is both passive and dynamic, ensuring instantaneous optimum performance at all times.

A high-performance integrated laptop computer is used for interfacing with the system and for processing and analyzing received signals.

The WD-7200 can be deployed and working in a few minutes. The system's versatility and relatively lightweight design means it is ideal for static, vehicle-mounted or dismounted deployment.

Combining modular hardware design with innovative software, the WiNRADiO WD-7200 VHF/UHF direction finding system delivers unprecedented flexibility and performance.

This is the first time an interferometer-based VHF/UHF direction-finding system with such advanced specifications and capabilities has been made available in such an easy-to-use and cost-effective package. Radixon has achieved this by integrating the best of its WiNRADiO range of COTS software-defined receivers, software tools, and specialist antennas. Radixon supplies and supports thousands of government, military and professional customers worldwide.

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Hardware

The WiNRADiO WD-7200 DF system breaks new ground with its state-of-the-art capability and components. It uses a specially designed quasi-coherent version of the WR-G39DDC receiver together with an eight-element circular radome antenna.

The receiver system is mounted within a portable enclosure and can be powered either from AC mains or from automotive DC employing optional converters. This allows for stationary and transportable deployment.

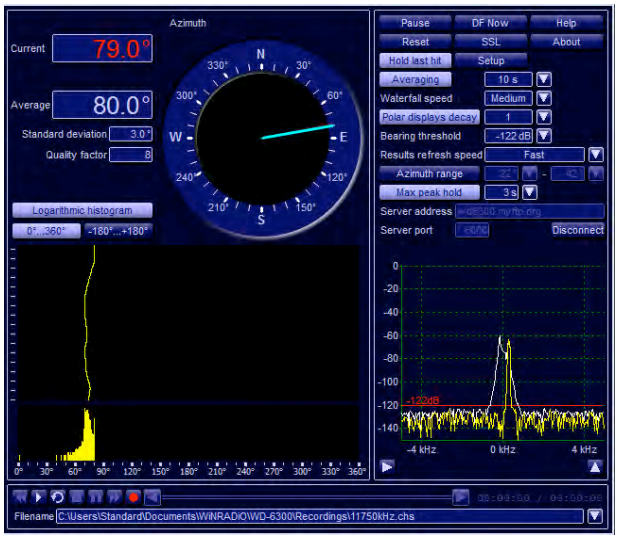
In deployments where portability is not a major requirement, the system may be operated with an additional (optional) monitor. This enables DF operations to be performed on one screen, with normal receiver operation via the additional monitor.

Software

At the heart of the WD-7200 system is its sophisticated digital signal processing software. In addition to the standard WR-G3xDDC-style graphical user interface, the system software executes all of the complex mathematical functions and associated processes.

The system is entirely software-defined, which means that additional features and modes can easily be added by means of simple software changes.

The azimuth displays are established against the North reference, and clearly show reflection and other effects. A dynamically adjustable buffer enables the user to average the bearing samples over time, effectively minimizing bearing degradation due to reflections. Histogram and waterfall displays greatly assist the operator. An integrated digital recorder enables instant recording and playback of received signal, both at IF and audio levels.



Example showing DF replay of historical FSK data recording.

Options

The system can be extended to include the following hardware and software options:

GPS receiver allowing position-stamped result logging.

Crossed loop HF antenna for operation in Watson Watt mode. Suitable for space-limited HF deployments.

Client-Server software for remote control of receiver and DF functions.

The Triangulation/Mapping option requires multiple DF stations linked by a suitable TCP/IP networking infrastructure. Bearing data from the DF stations is used for triangulation. The resulting position is displayed on a map overlay. Map source data is subject to separate licensing arrangements with the respective map provider.

Additional monitor for increased screen real-estate if portability is not a major concern.

Specifications

Receiver type	Wideband, digitally down-converting software-defined receiver with built-in up-converting 9kHz-3.5GHz tuner. (See G39DDC brochure)
DF frequency range	100 MHz to 2000 MHz
DF process	8-element correlative interferometer, utilizing quasi-coherent receivers, with dynamic, passive equalization.
Number of receive channels	Two, using one receiver permanently connected to reference antenna, and one receiver commutated between antenna elements.
Sensor elements	Elevated wideband dipole.
Antenna aperture	500mm diameter.
DF azimuth accuracy	Instrumental accuracy, < 0.5 degree following system calibration. Ground wave accuracy in typical deployment, < 2 degree SD
DF sensitivity	Typically signals greater than 3db above noise floor will show azimuth accuracy as above.
Signal duration	Typically a signal duration < 50ms duration will show azimuth accuracy as above.
DF modes	AM/SSB/CW/FM/PM/Data.
DF bandwidth	Within DDC2, variable from 1 Hz to 320kHz
Monitoring	Full receiver control available during DF operation
Interface	USB
Computer	Quad core I5 or better with Windows o/s
Physical size	Antenna radome: 355mm high x 405mm wide. Tripod: 2m high Receiver unit: portable enclosure 475 (W) x 375 (H) x 180 (D) mm
Power supply	115/230 V AC or automotive 12v DC with optional converters, 100 W max.
Weight	Case/receivers: 13kg. Antennas/tripod: 17kg.
Operating temp.	-10 °C to 50 °C

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