



Low-Profile, Ultrawide Band Antenna

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WARF: P130215US01

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing the smallest-known antenna of its kind for ultrawide band applications like military vehicles and wireless communications.

Overview

Monopole antennas are a type of radio antenna consisting of a straight, rod-shaped conductor often mounted perpendicularly over a conductive surface (a 'ground plane') such as the earth. This type of antenna radiates equal power in all azimuthal directions and is ideal for many applications.

However, size is a problem. This is because monopole antennas must be tall enough, compared to the wavelength, to receive radio waves efficiently. At low frequencies, this presents a challenge since the wavelength of radio waves can be very large. Such bulky antennas can protrude up to 40 feet from the top of a military vehicle or a ship and are very conspicuous. There is a real demand for new designs that are more compact but achieve the same performance.

The Invention

UW-Madison researchers have developed an electrically small ultrawide band antenna that radiates in every direction like a monopole. The unique structure of the antenna relies on the placement and shape of the arms and slot. It is composed of a top-loaded, multifolded planar structure placed vertically on a ground plane. The structure is loaded with a top hat conductor that is short circuited to the ground plane at two locations.

Applications

- Military-based applications including military vehicles, ships and aircrafts
- Mobile wireless communication devices
- Base station antennas for consumer wireless applications

Key Benefits

- Improves upon the 'gold standard' Goubau design
- Eliminates security issues associated with large antennas on military vehicles
- Improves antenna performance at a significantly smaller size requirement
- Reduces manufacturing cost of the antenna

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Related Technologies

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- [WARF reference number P100168US01 describes a compact, ultrawide band design that uses a differential mode antenna and operates in a more narrow frequency band.](#)

Tech Fields

- [Information Technology : Networking & telecommunications](#)

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