FRANÇAIS ENGLISH

RESCUE DRONE

SMARTPHONE LOCATION TECHNOLOGY FOR MOUNTAIN RESCUE

WHAT IS RESCUE DRONE?

Developed at CEA-Leti, the RESCUE DRONE technology offers an additional tool for mountain rescuers to help them locate avalanche victims.
It can locate a smartphone using the third dimension via a drone flying over the search area. Based on an antenna specifically designed to precisely estimate the direction of reception of a radio signal, it can be deployed outside of mobile network coverage. In snowy environments, the solution aims to supplement existing resources (RECCO, avalanche rescue dogs) for locating victims not equipped with avalanche beacon.

An RF beamforming circuit detects the radio signal from the victim's smartphone and uses a microprocessor to estimate its angle of arrival and range. As the drone moves closer to the victim, the precision of the location improves.

APPLICATIONS

- Searching for avalanche victims
- Searching for people in difficulty

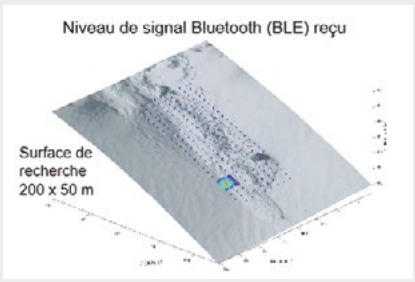
WHAT'S NEW?

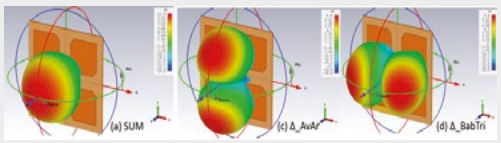
The use of drones for mountain rescue purposes is still in its infancy. Several startups are now offering solutions based on a combination of drones and avalanche transceivers. This is the first approach to locating a cooperative smartphone (e.g. using Bluetooth) or a non-cooperative smartphone via GSM signals to increase detection range and thus search speed.

The first demonstrator involves a collaborative scenario in which Bluetooth is activated on the smartphone. Ranges of over ten meters with levels of angle precision below 10° have been achieved in the laboratory.

Avalanche rescue scenario

Localization time simulation with Bluetooth technology

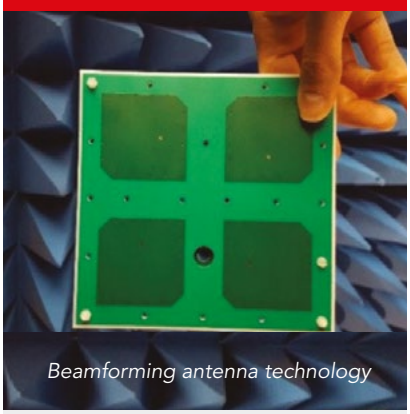




Radiating antenna diagram simulation

KEY FACTS

- A patent application has been submitted
- Publication: S.Bories, K.Allabouche, N.Daniele, "Recent Development on Search of Avalanches Victims with Monopulse Antenna mounted on a small UAV", 13th European Conference on antenna and Propagation (EuCAP), Krakow, Poland, April 2019



Beamforming antenna technology

WHAT'S NEXT?

CEA-Leti's experts are aiming for an initial flight demonstration using Bluetooth by 2021.
A second scenario being considered involves locating a smartphone with no network coverage in normal operation, i.e. with at least one GSM communication mode activated.

INTERESTED IN THIS TECHNOLOGY?

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