MAXIMIZE RESULTS IN SEARCH AND RESCUE MISSIONS

LIFESSEKER

Borovets, Bulgaria

October 2016
AERONAUTICAL MISSION SYSTEMS

Fly with a purpose
MOUNTAIN TRAGEDY

Two hikers lost in weekend storms found dead in Castellón

Third missing man survives to lead emergency services to his companions

IGNACIO ZAFRA
Valencia 29 FEB 2016 - 10:37 CET
CURRENT SEARCH MISSIONS

HELICOPTER
CURRENT SEARCH MISSIONS

IMAGE SENSORS

[Images of different sensor applications]
Mobile phones are the most extended radio beacons in the world.
NEW SEARCHING PARADIGM

New Capabilities

Detection

Communication

Identification

Geo-location

Visual Searching → Instrumental Searching
NEW SEARCHING PARADIGM

Main advantages of the Instrumental Searching

- Search under **Low or No Visibility**, including **Night** flights

- Radio of detection of several **Kilometers**:
  - Reducing **Sweep Time** of the searching area
  - Reducing **Operating Cost**

- Detection under **Rubble** (earthquakes), under **Foliage** (forest areas), under **Snow** etc.
LifeSeeker

New Searching Paradigm

Software defined radio (SDR)
Aerospace standards (DO - 160)
Reduced SWaP
LifeSeeker – Key Features

Maximum Success in Search & Rescue Missions

Functionality

- **Locates missing people** through their mobile phone
- **With no collaboration** of the missing person
- Works in areas *with / without coverage*
- Acts as a *communication relay*

Detection  Geo-location  Communication
LifeSeeker includes **two subsystems**:

### Onboard sensor
- Detects and locates **GSM transmissions**
- Sends **geographic coordinates** of the transmission to the control station

### Control station
- Provides **system intelligence** and operational control
- **Easily adapted** to mission needs
Features

Maximize User Experience

History mission record

Mission Simulator - Trainings

HTML5 (multi-OS, multi-devices)

Visual Event Notifications for the operator

LIFESEEKER – CONTROL STATION

centum
research & technology
LIFE SEEKER CONOPS

1. EMERGENCY ALERT
   - Rescue team receives the alert

2. PLANNING
   - Mission planning through system specific tools

3. MISSION CONTROL
   - The H/C flies over the search area
   - LifeSeeker provides GSM coverage
   - The operator controls the mission from the control station

4. DETECTION
   - LifeSeeker detects the mobile phone of the missing person
   - IMSI number is filtered and registered
   - No collaborative detection. No interaction required for the missing person

5. GEO-LOCATION
   - Mobile phone is located: latitude and longitude sent

6. COMMUNICATIONS
   - Text message exchange between search & rescue team and victim
   - Situation assessment: risks, medical services needed, etc.

7. RESCUE MISSION
   - LifeSeeker sends missing person position and status to the rescue team

SEARCH

RESCUE

PLANNING & CONTROL

CENTUM

Research & Technology
Distance: 141km  Mission Time: 14.5min  Location Error: 26.5m
Need to implement or modify certain operating processes

1. New conditions to consider in flight planning:
   - Visibility
   - Altitude

2. Flight pattern to follow to maximize probability of detection by Instrumental Search

3. New operative procedure might need to be develop (IMSI)
LIFSEEKER is a great complement to the current technologies and procedures able to maximize search mission success

Some benefits:

- Searching Time
- Operational Cost
- Risk
CONCLUSIONS

MOUNTAIN TRAGEDY

Two hikers lost in weekend storms found dead in Castellón

Third missing man survives to lead emergency services to his companions

IGNACIO ZAFRA

Valencia 29 FEB 2016 - 10:37 CET
Two hikers lost in weekend storms found in good condition in Castellón

Third missing man survives to lead emergency services to his companions
LIFESEEKER – FURTHER INFORMATION

KEY FEATURES
- CDMA (both digital circuits)
- Narrowband (SCDMA) and wideband (CDMA 2000)
- Cognitive radio techniques for dynamic spectrum utilization
- Advanced Uplink Multi-CRBS (U-MCRBS) user technology for very variable and upgradable
- Secure GPS positioning for protected mobile phones
- Conduction cooling
- Silicon-hybrid VLSI technology
- Mission Planning Software
- IP multi-protocol connectivity
- GSM enhancement functionality

LIFESEEKER
All inclusive Base Transceiver & Geo-localization System

LIFESEEKER is an innovative on-board system capable of locating mobile phones in emergency and without network coverage, which provides: Base Transceiver Station (BTS) services 24 hours a day, even under adverse weather conditions.

PRODUCT OVERVIEW
LIFESEEKER is a state-of-the-art system designed to locate missing persons under extremely adverse conditions, reducing rescue times to the persons in danger.

LIFESEEKER also acts as an communication relay for remote rescue and monitoring services between the missing party and the rescue teams.

LIFESEEKER comprises a base station unit and an Embedded control unit. The unit is designed to be integrated into existing rescue operations, providing analog antenna to create the source of the transmission. The geographic coordinates of the signal source are communicated to the rescue team.

The embedded software serves as the operational and control center, from where the mission operator can coordinate LIFESEEKER operations.

LIFESEEKER supports both single phone and multi-phone detection modes.
CENTUM research & technology
Where Technology addresses Market
www.centum-rt.com