

GALILEO – secure positioning

14th PSCE Biannual Conference

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AGENDA - IDEAS

GALILEO IS NOT a telecommunication system

AGENDA - IDEAS

- Telecom and geo localization
- Threats on traditional GNSS (GPS)
- Improvement thanks to Galileo & PMR
- Benefits for PPDR organizations
- The PRS4PMR project

Telecom and geo localization

PPDR organizations use:

- telecommunications
- geo localization.

Thanks to PMR

telecom are operational and secured.

Thanks to legacy GNSS (GPS)

Geo localization are operational but not secured

Telecom and geo localization

geo localization for PPDR organizations

Use case

- Operational
- Tactical

Telecom and geo localization

Display Manage units Synthetic view

Find precinct city, town street, road, square Locate unit Geofencing profile

Monitored units Operational groups Incidents

Extended Views

Screen shot of an actual tactical management position

Unit	Status	Zone	Radio	GPS
Unité 15-29				
Patrouille				
Vélo				
Unité 15-3				
Patrouille				
Patrouille				
Véhicule				
Unité 15-61				
Officier swat 1	UNKNOWN	service	NR	>10min
Officier swat 2	UNKNOWN		NR	<1min
Officier swat 3	Start o.		?	>10min
Officier swat 4	Start o.		ON	<1min
Officier swat 5	Start o.		NR	>10min
Officier swat 6	UNKNOWN		NR	>10min
Véhicule 999	Start o.		ON	<1min
Unité 27-1				
Patrouilleur 1	UNKNOWN		NR	<1min
Patrouilleur 2	Start o.		?	>10min
vehicule 27-1	Start o.		NR	>10min
Unité 27-21				
Patrouilleur 3	urg Cal.		?	
Véhicule 27-4	Start o.		ON	<1min
Unité 27-81				
Superviseur 201	Start o.		ON	<1min
Véhicule 27-39	Start o.		NR	>10min

The map displays a tactical management position with several units and vehicles. Key elements include:

- Véhicule 27-4** (Unité 27-21): A blue car icon.
- Patrouilleur 12** (Policier): A police officer icon.
- Patrouilleur 2** (Policier): A police officer icon.
- Véhicule 999** (Unité 15-61): A white ambulance icon.
- Superviseur**: A supervisor icon.
- Officier swat 4** (Officier swat): A SWAT officer icon.

Map labels include: Moulin, PAAJ Clément ADER, Centre paroissial Saint-Pierre, Rue Jules Ladoumègue, Rue de Prague, Allée Toscane, Allée Bavière, Rue Marcel Dassault, Avenue Marcel Dassault, Rue Alain Colas, Rue Eric Tabarly, Rue René Lacoste, Rue Michel Jazy, Rue Maurice Trintignant, Rue Jacques Auriol, Transformateur Axel, D 58, Collège de La Clef Saint-Pierre, Lancer de Poids, Saut en City Park Longueur, sportif Europe, Mail de l'Europe, Rue de Dublin, Avenue Mar...

Scale: 100 m, 200 ft. Coordinates: 6239577N, 218728E

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Threats on traditional GNSS (GPS)

Some defects and some new threats affects traditional GNSS (GPS)

- bad reception conditions
- intentional jamming - “new” threat
- signal spoofing – “new” threat

Threats on traditional GNSS (GPS)

Two samples of intentional jamming in France

**Localization and seizure
of a GSM / GPS jammer
In Montélimar - France**

**Civil Aviation
Near Lyon-Bron airport
(France)
In flight perturbation of
the GNSS system on GPS
frequency 1575,42 MHz**

Threats on traditional GNSS (GPS)

The jammer tool is

- Very simple to use
- Very cheap
- Difficult to detect



18€
d'économie

brouilleur voiture mini-GPS et chargeur de voiture

Gps Auto | Lutte contre positionnement GPS de voiture Jammer caractéristiques
Une garde efficace contre suivi GPS de pos...

~~39,99~~
21€08

Ajouter au panier

Vendu et expédié par **Keenpower**
Livraison Gratuite^(*)

Improvement thanks to Galileo

=> Those threats may be mitigated thanks to Galileo technical solution

Galileo plans to propose 3 services levels

Open Channel - OC

Commercial service - CS

Public Regulated Service - PRS

Improvement thanks to Galileo

=> Those threats may be mitigated thanks to Galileo technical solution

Galileo proposes 3 different services

Open Channel Service - OCS

Commercial Service - CS

Public Regulated Service - PRS

Both services will use Galileo and GPS satellites.

Galileo uses 3 frequencies bands.

PRS implements an authentication mechanism.

Improvement thanks to Galileo

The GSA (GNSS Security Agency) declares: (see <http://www.gsa.europa.eu/security/prs>)

PRS is an encrypted navigation service more resistant to 'jamming', involuntary interference and 'spoofing'. Similar to other services, but some important differences:

- Ensures continuity of service to authorized users when access to other navigation services is denied.
- In cases of malicious interference, the PRS increases the likelihood of continuous availability of the Signal-in-Space.

Who is it for?

The PRS is primarily intended for use by EU Member State government agencies, including emergency services and police. Access to the PRS will be controlled through an encryption key system approved by Member States' governments.

PRS will be accessible to clearly identified categories of users authorized by the EU and participating States.

The PRS can provide support for a range of European public safety and emergency services as well as law enforcement, internal security and customs authorities:

PMR4PRS an implementation of Galileo PRS

A proof of concept has been specified, designed and developed, showing:

- The feasibility (a global architecture has been designed)
 - Synergy between PMR and PRS
 - Definition of Use Cases relevant for current PMR users
 - Complete Security Study of the proposed solution
 - Cost Benefit Analysis (CBA) study
 - Proposals for Draft Standards
 - Performance Metrics Comparison between PRS alone and PRS+PMR
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- The reliable PMR networks are able to ensure secure data transmission from/to the PRS receiver and a PRS Server, making it faster.
 - The PMR users take benefit from the PRS geo localization advantages