



GALILEO SERVICES

OREGIN Workshop

February 27, 2001

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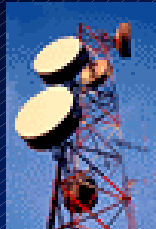
GALILEO OBJECTIVES



- **Critical Infrastructure are more and more relying on Pos./Tim. Techno.**

⇒ **need for confidence**

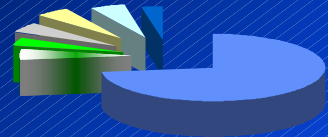
⇒ **need for redundancy and independence**



- **Pos./Tim. Techno. represent a tremendous market of equipment and services**

⇒ **the European Industry must be more involved**

⇒ **job creation**



- **Pos./Tim. Techno. can contribute to citizen's life**

⇒ **safety, automatisisation, comfort, leisure**

⇒ **need for better performances and reliability**



GALILEO SERVICE DEFINITION

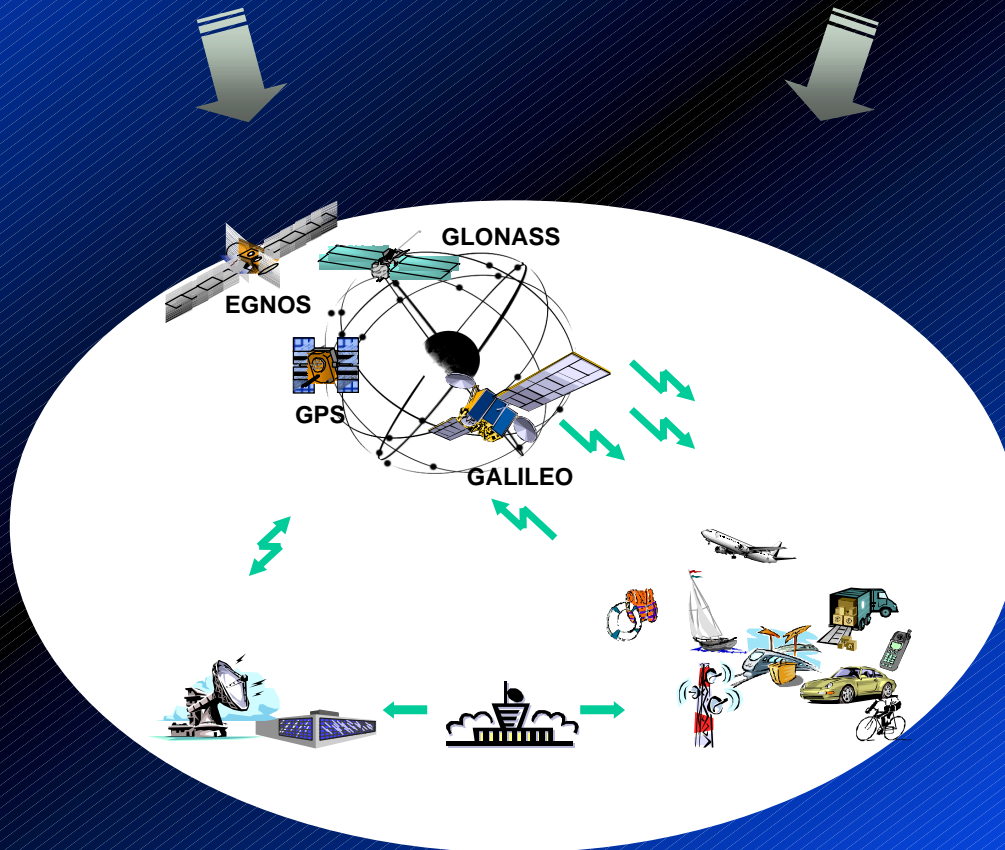


Current and future
Pos./Tim. techno.

Market
Potential

User Needs

Political
Interest



GALILEO SERVICES

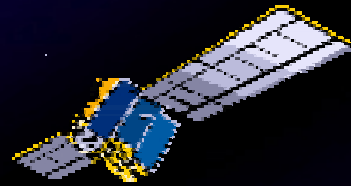


**Open
Service**

**Commercial
Service**



**Safety of Life
Service**



**Public
Regulated
Service**

**Search and
Rescue**

**Navigation
related
Communication**



Without forgetting the EGNOS Service



OPEN SERVICES



MASS MARKET

- Basically:
 - Worldwide
 - Free access
 - Performances similar to future GPS
(2 freq., accuracy 7m H 2D 95%, availability 99%)
- Limits:
 - No integrity at system level
 - No guarantee



Courtesy from Seiko



Courtesy from Siemens

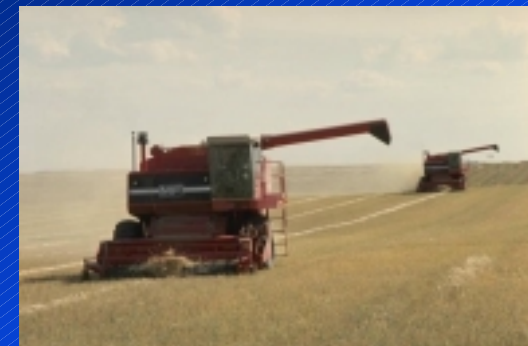
However, user equipment features (software, coupling), the interoperability with GPS and local Components can considerably increase performances at user level and confidence in the technology

COMMERCIAL SERVICES



PROFESSIONAL APPLICATIONS

- Basically:
 - Coverage and accuracy similar to Open Service
 - Third frequency (cm accuracy)
 - Global integrity warnings(10 s, 20 m)
 - Including GPS integrity information
 - Fees (data encryption)
 - Potential for specific geographic areas
- Local components:
 - improved accuracy (0.8 m 2D 95 %)
 - improved integrity (1 s, 2 m)
 - increased availability



SAFETY OF LIFE SERVICE



HIGH INTEGRITY NEEDS

- Basically:

- Better accuracy (4m 2D 95%)
- High integrity (risk $>2 \cdot 10^{-7}$ /h and $3.5 \cdot 10^{-7}$ /150s, alarm limit 11 m H)
- GPS integrity
- High availability ($>99.9\%$)
- Frequency in ARNS bands
- Signal robustness (data rate)
- Good performances in monofrequency (degraded modes)
- Encryption TBD (Aug 2001)
- No direct charges



PUBLIC REGULATED SERVICE



SECURITY

(police, customs, critical infrastructure, military,...)

- Basically:

- Dedicated frequencies
- Performances similar to Safety of Life Service
- Control of Access
- Service maintained when others could be denied

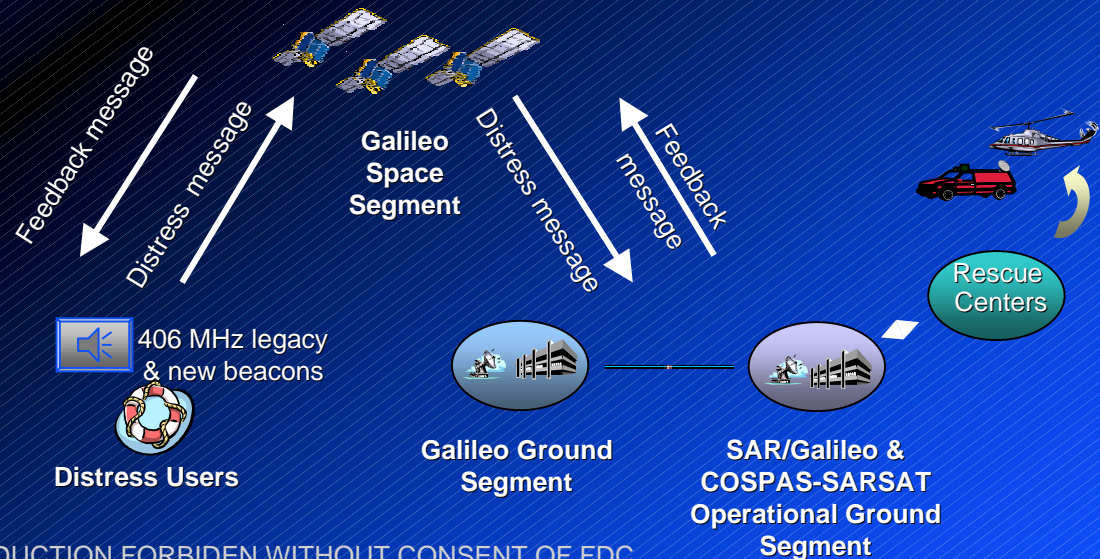


SEARCH AND RESCUE SERVICE



This SAR service will provide benefits such as:

- a faster alert and a more accurate information to the SAR rescue centre
- an acknowledgement from the SAR Mission Control Centre
- a remote triggering of a beacon allowing the location of someone reported missing or presumed in trouble
- the broadcasting of messages to alert other users in the vicinity of a distress situation



NAVIGATION RELATED SERVICE



Global and High Availability Communication

- **Quasi-instantaneous transmission of SMS from users to a service centre (and vice versa)**
- **Existing/planned space or terrestrial communications systems will be used**
- **Option to include a packet data payload on Galileo TBD (Aug 2001)**

COMMERCIAL ISSUES



- **GPS SPS is free**
- **EGNOS should provide integrity and increased accuracy for free**
- **Encryption of Safety of Life Service frightens some users (especially aviation)**
- **Too little delta utility of the Safety of Life Service over the Open Service**
- **But no encryption would affect Commercial Services**

CONCLUSIONS



- **Service definition is the basis of the programme and has to be fixed as soon as possible**

Service Definition → Programme Management → Funding/Revenues

- **It must be flexible enough to take into account of the evolution of**
 - **User needs**
 - **Other technologies**
 - **Market**
 - **Politics**