GNSS & The European Vehicle Markets

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Where? When? What?....

- Driving the market
- Technology
- Applications & markets
- Case studies
Drivers

- Management Information
- Benefits
  - Productivity
  - Efficiency
  - Compliance
- Security
- Regulatory
Developing Technology
FirstGPS

**Flexible Integration Real-Time Software Tasks**

- Leaves Host CPU to calculate PVT
- Low power
- 8 or 12 channel continuous tracking
- Fast acquisition
  - <45 seconds warm start
  - <180 seconds cold start
- Re-acquisition <2secs after 15 seconds blockage
- Accuracy <10m (50% CEP)
Applications

- Engineering & Construction
- Agriculture
- Fleet & Asset Management
- GPS Components

GPS + Wireless Communication + Information Technology

Core GPS Component Technology
GPS CORE TECHNOLOGY

- GPS technology marketed through OEMS:
  - Modules
  - IC’s/Firmware
  - Licensing

- Applications by 2005 include:
  - Timing products >100 mu/yr
  - In-vehicle navigation systems > 25 mu/yr
  - Cellular phone handsets >200 mu/yr
  - Mobile network appliances >100 mu/yr

- Market opportunity $1B in 2005
Engineering & Construction

- Transforming the survey & construction process
- Interoperability of GPS, data collection mgt. and wireless communication
- Machine control and guidance
- Strategic Alliance: Caterpillar
- Market opportunity $1.5B in 2005
AGRICULTURE

- Agriculture & machine guidance
- Yield monitoring / improvement
- Modulated application of fertilizer/chemicals
- Data collection and management
- Strategic Alliance: Case
- Market opportunity >$1B in 2005
ASSET MANAGEMENT
Mobile & Stationary Assets

- Integrated wireless, GPS & information technology
- Asset tracking, fleet management, intelligent transportation systems, cargo tracking
- Public safety, long-haul trucking, distribution, shipping markets
- Productivity, operating cost, safety & security benefits
- Market opportunity $2.5B in 2005
GPS + Communications + IT

Improves….

• Productivity
• Efficiency
• Compliance
• Security
• Management
Information
Intelligent Mobiles

“Dumb mobiles”
- Little or no intelligence
- Report at intervals or when polled
- Base application base determines if a significant event has occurred
- Extensive communications required

“IQ Event Engine”
- On-board intelligence
- Recognizes the events
- Reports when event occurs or when polled
INTEROPERABILITY

In-Vehicle Platform
• Communications
• GPS
• Event monitoring
• Data logging

Customer Benefits
• Productivity
• Driver Compliance
• Safety/Security

Data/Reports
• Location
• Engine Hours
• Speed Violations
• Zones
• Low Battery
• Stops/duration

Wireless Communications

Data Center
• Web hosting
• 24x7
• Applications

Internet

Data/Reports
• Location
• Engine Hours
• Speed Violations
• Zones
• Low Battery
• Stops/duration

Customer Benefits
• Productivity
• Driver Compliance
• Safety/Security

Internet

Data Center
• Web hosting
• 24x7
• Applications
The Business Solution

Channels:
- Call centre
- Browser
- Off-line
- Wireless
- PDA
- Kiosk
- In-store
- More to come...

Core retail systems

Direct customer management

Scheduling

Communications

Payment Server

Warehousing & Logistics Fulfilment

Consumer

P.O.D
GNSS on the Road
Bus System – Portugal

GPS/GSM
“Smart” ticket machine

GS M
Radio Modem

Main Bus Depot

Remote Depot/s

ODB C Database

Main Bus Depot

Database Query & Filtering

Internet Map Gateway

City wide Information Screens
Summary

• Technology led
• Real, total business solutions
• Compact, integrated packages
• Cost effectiveness
• Flexibility
  – Upgradeable
  – Meeting future needs
• Accepted in the market
Moving on to meet tomorrow's challenges