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# Galileo: A Unique Opportunity for European high-tech ventures

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# Septentrio (1/2)



Venture capital spin-off company of IMEC

IMEC =

Interuniversitair **M**icro-**E**lectronica **C**entrum

Europe's premier independent micro-electronics R&D center

Satellite Navigation R&D initiated at IMEC in 1996

Incorporated at Leuven, Belgium in January 2000

Two successful rounds of financing: over € 3 M raised

Investors driven by potential of satellite navigation

# Septentrio (2/2)

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## Mission statement :

*Design, Develop & Commercialize Products based upon the Company's proprietary satellite navigation technology .*

## Profile :

*A Unique European Original Equipment Manufacturer offering unique in-house developed hardware and software for satellite navigation systems.*



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# Our technology (1/5): PolaRx1 Evaluation Board



GPS/Glonass/EGNOS  
Dual frequency  
2 GReCo's : 24 channels  
possible extension to 48 channels  
PC-104 interfacing  
external clock possible  
Eurocard format  
GP IO's on connector  
4 complex / 8 real inputs  
Processing unit = commercial PC-board  
(or your PC)

PolaRx1 Evaluation Kit:  
first units sold Q4 2000

# Our technology (2/5): H/W

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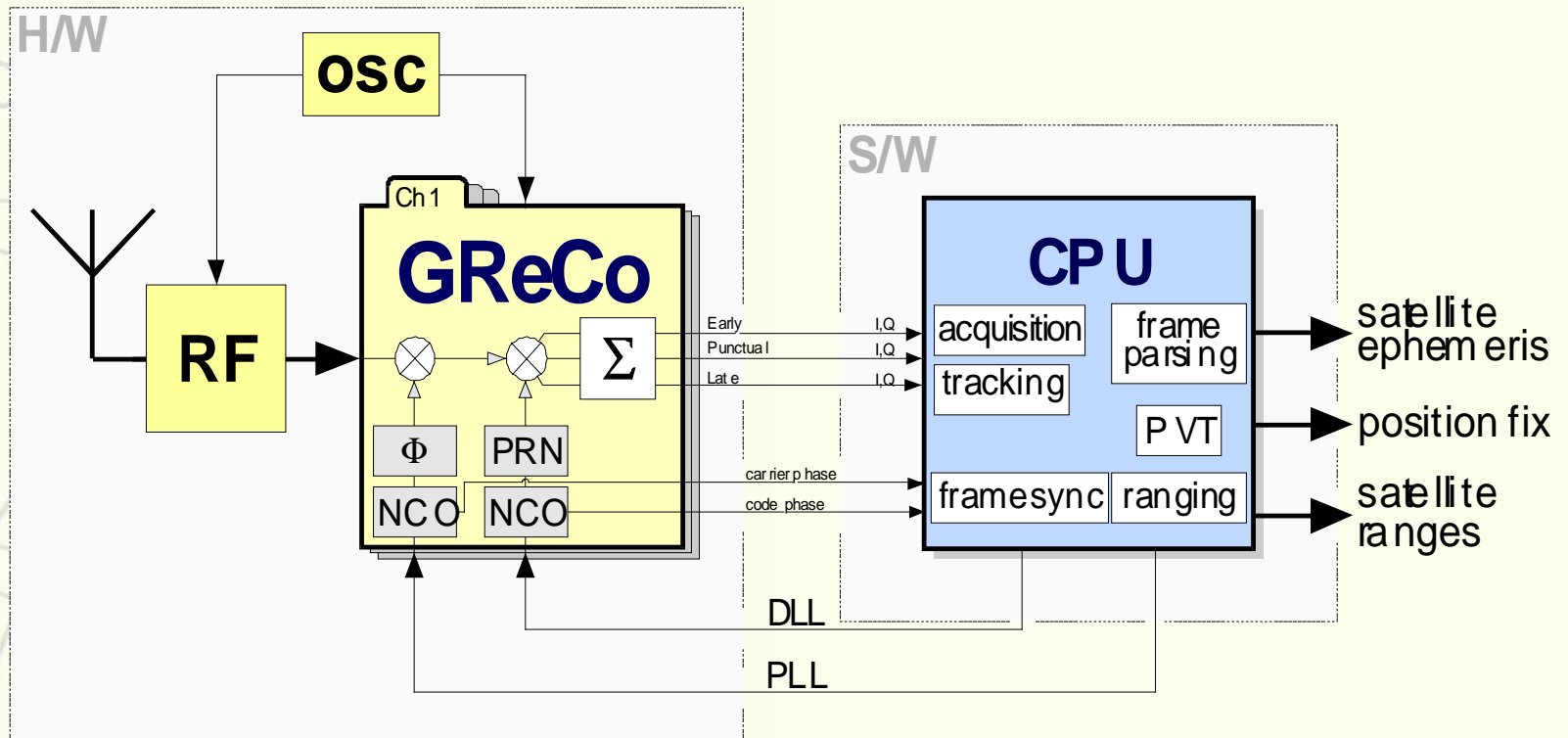


Based upon **GReCo<sup>®</sup>**  
**GNSS Receiver Core**  
digital baseband processor  
datasheet summary :

- Supports baseband processing for GPS, GLONASS and EGNOS, WAAS, MTSAT satellite systems
- Dual Frequency (L1 & L2)
- 12 parallel channels, individually enabled
- C/A, P(Y) -code tracking

- Fast acquisition
- 8 real or 4 complex inputs
- OnePPS output
- Antenna switch control capability
- General purpose I/O's
- Multipath mitigation
- Master-slave configurable

# Our technology (3/5): H/W – S/W interaction





# Our technology (4/5): EGNOS: a Unique Testbed

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EGNOS: included in Septentrio H/W from very start

Fall 1999: first tracking of EGNOS ranging signals

Septentrio participates in ESTB

EGNOS: a new dimension to satellite navigation:

More satellites => robustness and accuracy

Integrity

EGNOS:

A precursor to Galileo

A European system helping to bring better products to the customer

# Our technology (5/5): The Press

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## ✓ Aviation Daily (2001/02/02)

"European Firm Detects WAAS Signal Error;  
Undiscovered By FAA, Raytheon"

## ✓ Global Positioning & Navigation News (2001/02/07)

"Belgian Firm Pinpoints WAAS Message Glitch"



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# Ongoing developments (1/4)

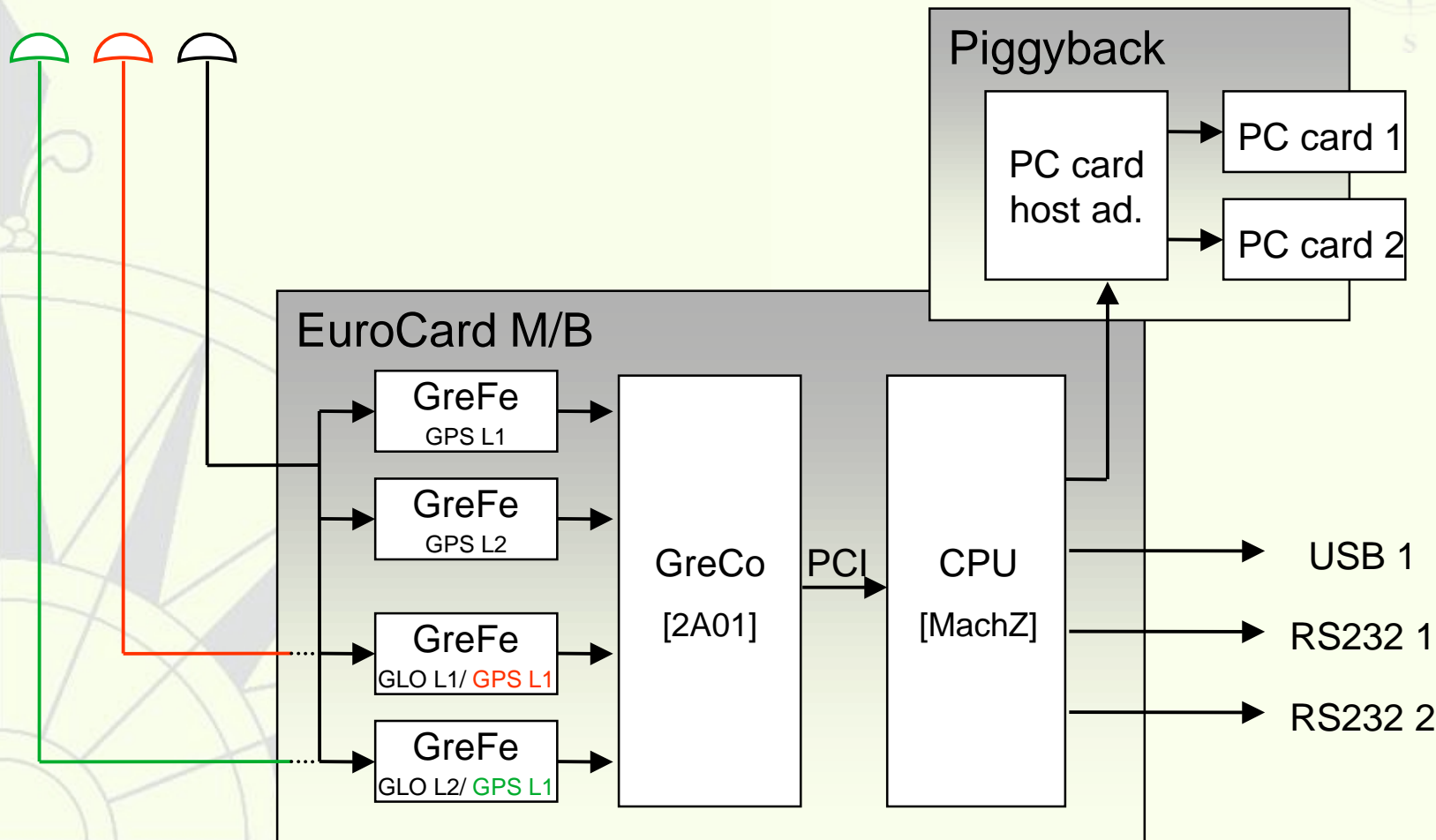
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At several levels:

- ▶ Single-board receiver
- ▶ 2<sup>nd</sup> generation GReCo
- ▶ Front-end integration
- ▶ Feasibility study 3<sup>rd</sup> generation GReCo

# Ongoing developments (2/4): Single-board receiver



# Ongoing developments (3/4): H/W Main Components

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## GNSS Receiver Front-end (GReFE):

One ASIC configurable for GPS or GLONASS / L1 or L2  
Min. external components

## GNSS Receiver Core 2A01 (GReCo):

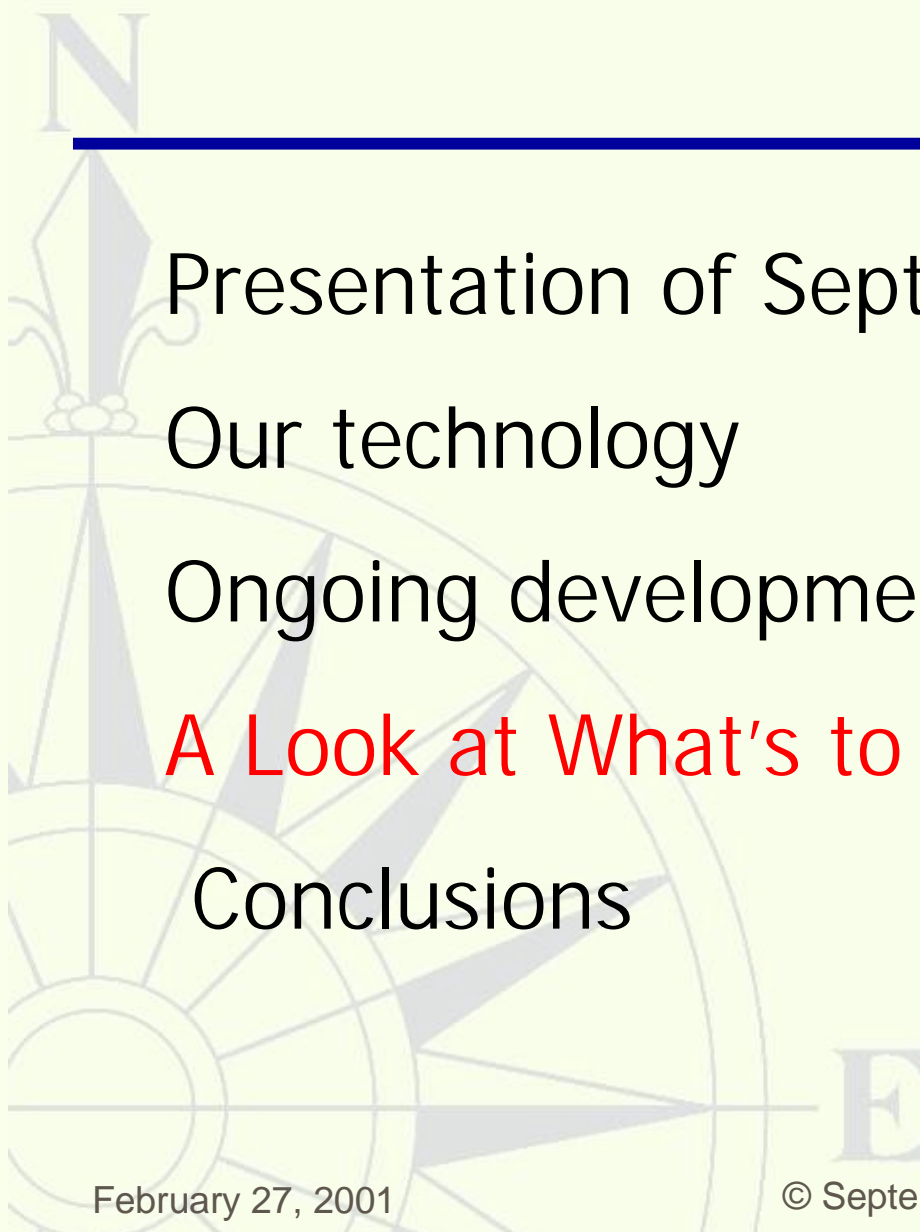
48-channel ASIC for GPS/GLONASS-L1/L2, incl. OnePPS in/out

## Commercial CPU (MachZ):

System-on-a-Chip based on i486+, max. 128 MHz, PCI, ser. Ports  
Min. external components: SDRAM, FlashRAM

## Optional PC card piggyback:

2 slots for Ethernet adaptor, additional Harddisk, etc.



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# Presentation of Septentrio

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## A Look at What's to Come (1/2)

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Complete receivers continue to shrink:

More performance: accuracy and integrity

New features, more channels (80 and more)

Galileo + GPS + ... in a package or as IP core

Galileo:

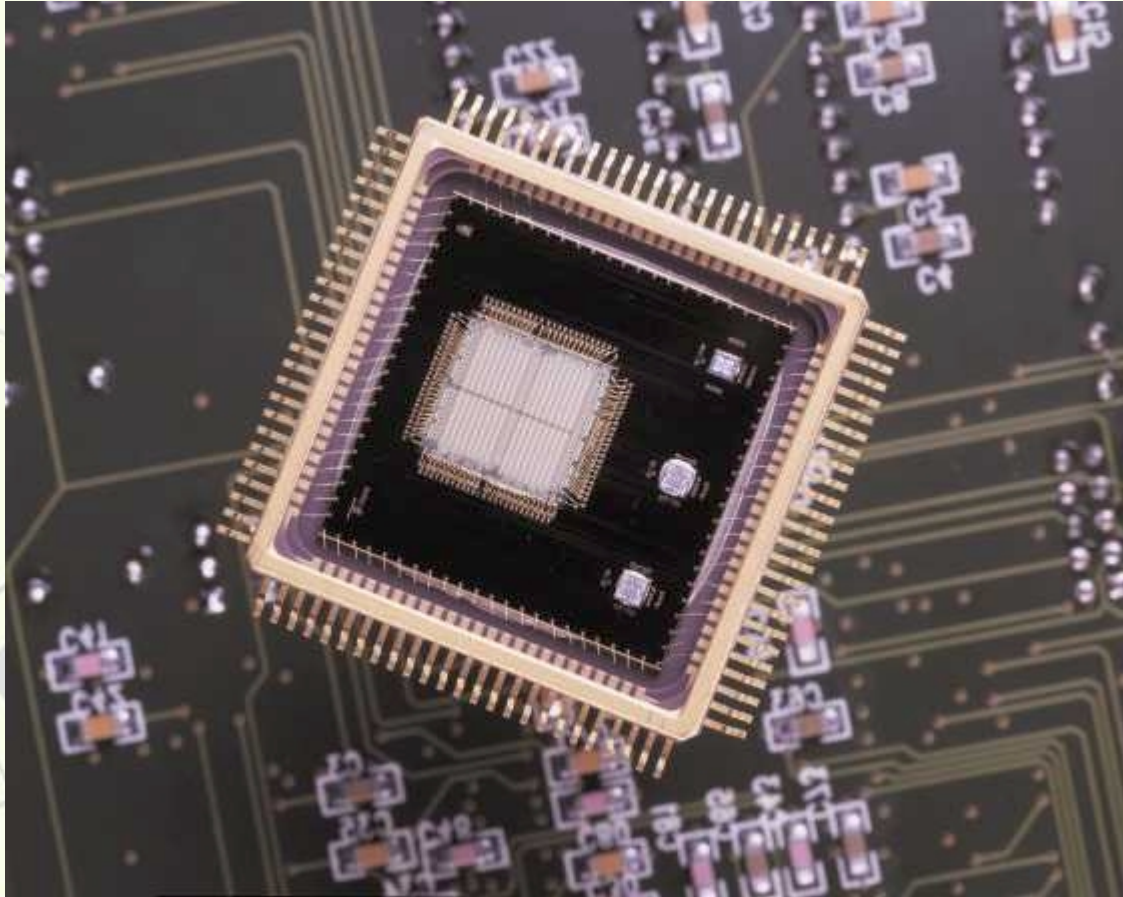
the driving force behind new generation of satellite navigation receivers

European high-tech ventures ideally positioned for mining growing market of GNSS receivers



# N A Look at What's to Come (2/2)

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# Conclusions

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Galileo: a new dimension to satellite navigation

- Driven by civilian needs
- New satellites with novel features
- More satellites => more accuracy and integrity

Galileo and European high-tech ventures: a win-win combination:

Promoting a new European Global System

Expanding market share for European ICT products

We look forward to building Galileo receivers