

Galileo Receiver Pre-Developments

User Receivers and Ground Reference Receivers are on the critical path of the Galileo schedule. This is in particular true as Galileo has more carriers, larger bandwidth and new signal structures (codes, multiplexing and modulation), for which little experience exists in Europe.

Pre-developments have already been started with three companies to investigate the most critical receiver issues.



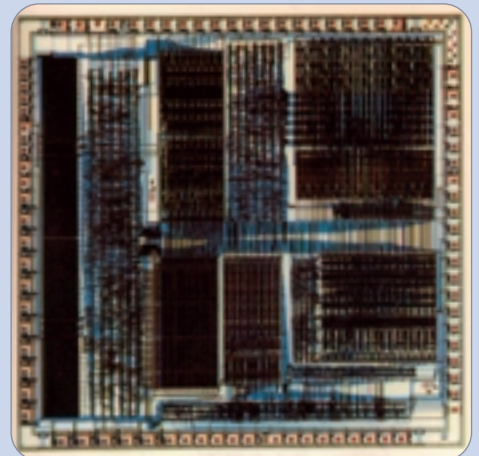
Dual frequency high performance GNSS Rx Board (Courtesy: Septentrio)



Critical Receiver Issues to be investigated:

- Carrier and Code Acquisition and Tracking
- Multipath Detection and Mitigation
- Interference Detection and Mitigation
- Carrier Cycle Slip Detection and Correction.

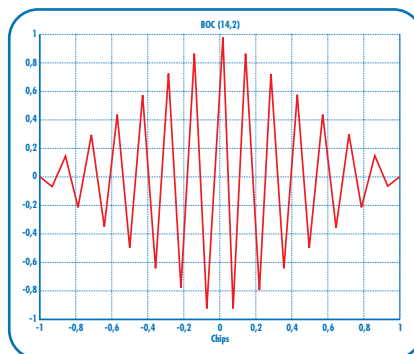
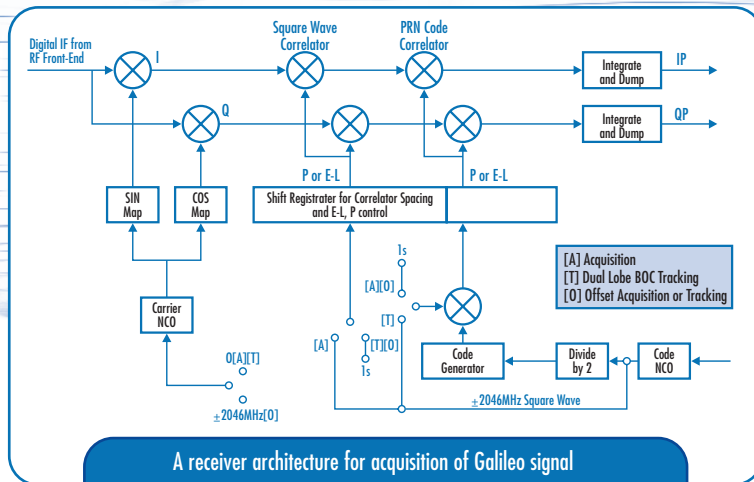
A Receiver Simulator is being developed in parallel.



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Comparison Galileo vs. GPS Receiver:

- Higher number of signals: increase of hardware complexity and processor load
- new modulation and multiplexing schemes, little know how in terms of processing
- Signal Acquisition: Codes ~10x longer / Codes higher rate (BW) / demand to acquire very weak (indoor) signals
- Multipath Mitigation: intrinsically better performance (larger BW, BOC) / however danger of false acquisition and tracking
- Signal Tracking: Bump jumping / Pilot (improved sensitivity)
- SW / HW Boundary: large number of channels / Higher data rates / Viterbi decoding / Deinterleaver, leads to very high burst CPU load, complicates SW, multi-processor systems and/or dedicated HW required



Development Milestones:

- K.O. Oct 2002
- Preliminary Requirement Review Jan 2003
- Preliminary Architecture Design Review Mar 2003
- Receiver Performance Analysis and Specification Review Aug 03
- DDVP and Cost Review Sep 2003
- Final Review of Activity Oct 2003

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