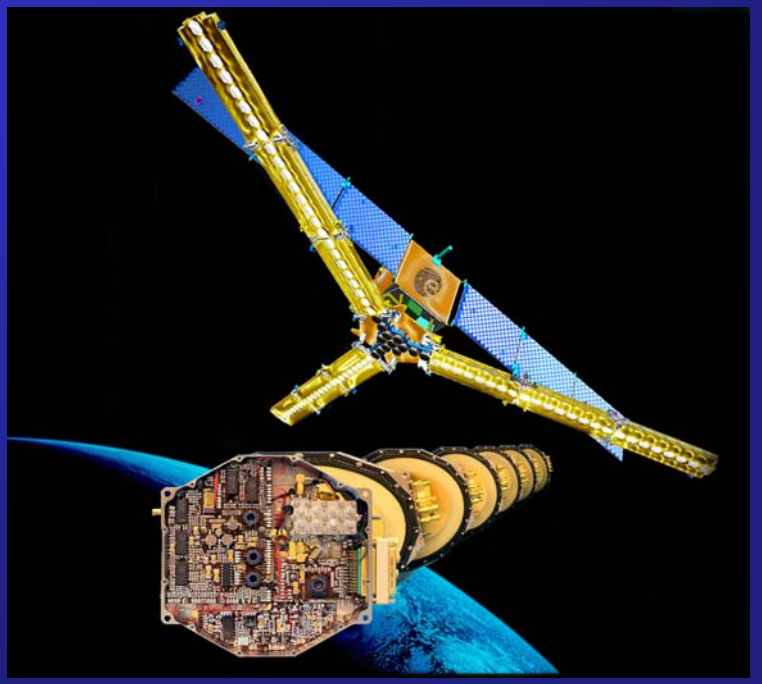
LICEF: The Eyes of SMOS



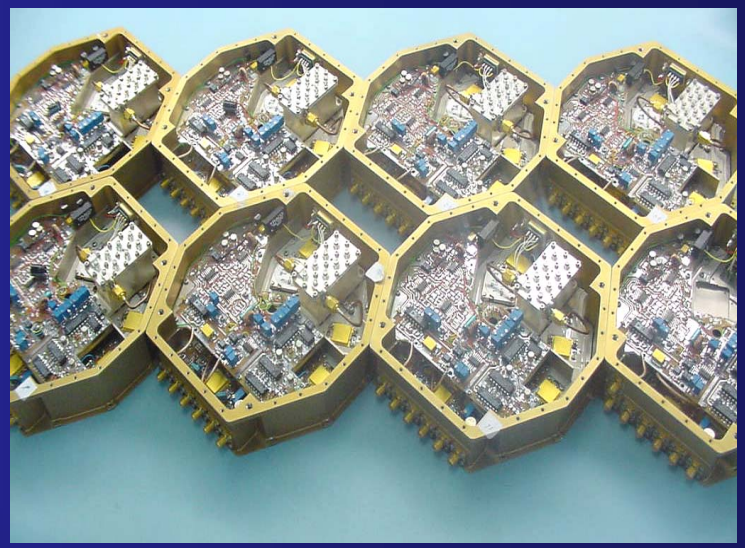
Implementació Industrial del sensor

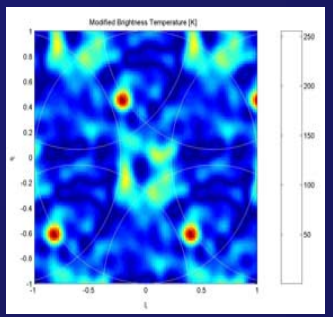
Mier Comunicaciones, S.A.

Dr. Lluís Sagués, LICEF Project Manager

SMOS Phases

- **PHASE A: Project viability analysis and system requirements definition**
  - **Theorethical analysis (MIER – UPC)**
  - **MIRAS Demonstrator Pilot Projects**
    - MDPP-1, Start Nov 98 ⇒ LICEF-1
    - MDPP-2, Start April 2001⇒ LICEF-2
    - SEPA, Start Sept. 2000
    - COSEPA, Start March 2002
- **PHASE B: Preliminary Design of the flight model**
    - Phase B, Start Novembre 2002 ⇒ LICEF-3
- **PHASE C/D: Qualification & Flight Production (2004-2005)**
    - **Elegant Breadboard (EBB)**
    - **Engineering Model (EM)**
    - **Engineering Qualification Model (EQM)**
    - **Flight Model (FM)**



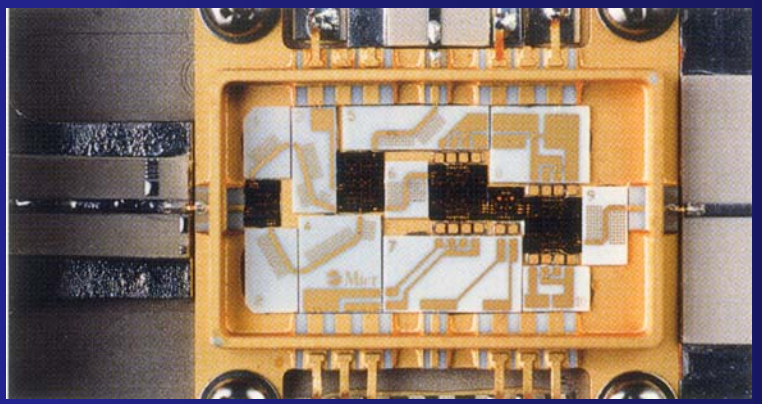


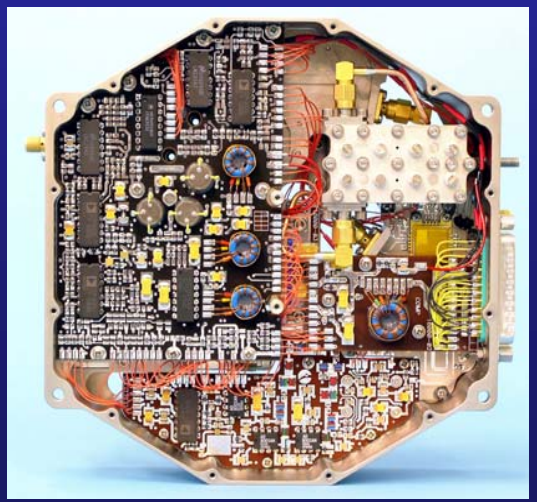
The Design & Engineering Challenge

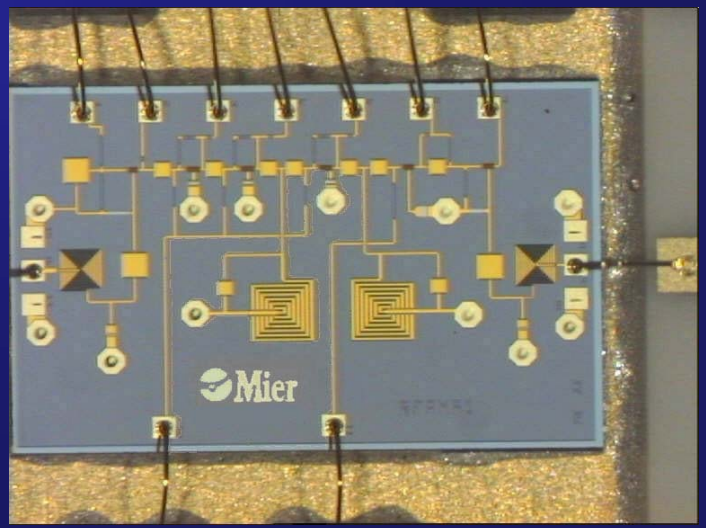
- Very high sensitivity L-band receiver
- High performance and similarity between receiver units
- Low weight, reduced size and low power consumption
- Completely conceived and designed by Mier Comunicaciones, S.A.
- Specifically designed for the SMOS mission

The Technological Challenge

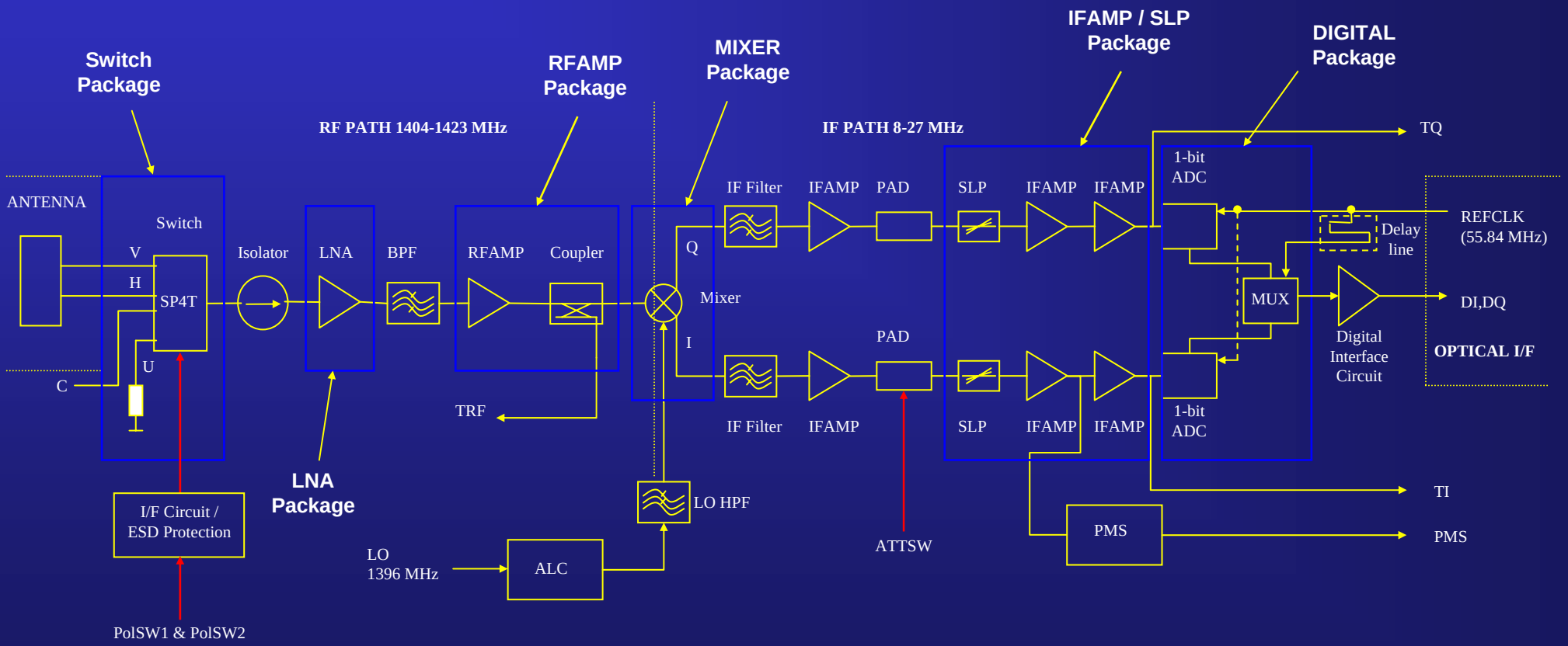
- Broad range of challenging space-qualified technologies used
- MMIC and MHIC technologies used for core functionality
- Successful use of these technologies allows design challenges come to reality







LICEF Block Diagram



The Industrial Challenge

- High number (75) of LICEF receivers required by the SMOS mission
- Clean room facility area nearly tripled
- Manufacturing and integration resources nearly tripled
- Test and verification resources nearly quadruplicated
- Production phase was started at full yield with flawless performance

The High Delivery Throughput Challenge

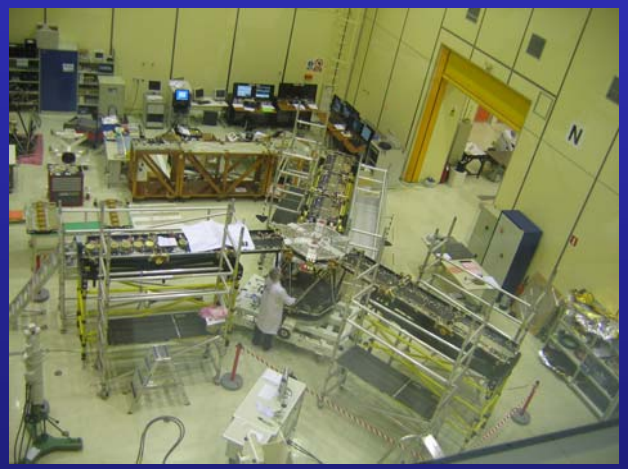
- High throughput from the overall chain (manufacturing + testing) is mandatory
- Industrial manufacturing capability alone is not enough for achieving success
- Highly automated ensemble of testing & tuning benches is required too
- Mier Comunicaciones, S.A. has successfully developed these capabilities and used them to meet the tight schedule of the project (less than 11 months)

The Benefits of Success

- High recurrence production capacity has been demonstrated
- New industrial capabilities and know-how have been acquired
- Functional blocks/subsystems of LICEF can be refurbished to win new contracts, as is the case of the S-band LNAs for the ICO system awarded by LORAL/SS
- A bright future of new markets, opportunities and challenges is open for Mier Comunicaciones, S.A.

The Future Challenges

- With further institutional support we are confident that this team will contribute with its excellence to success in future missions: earth observation satellites, operational SMOS, DESATCOM…



- Participation on other programs/applications based on this type of advanced radiometers

Mier
COMUNICACIONES

Thank you for your attention

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