

The most important thing we build is trust



Developing and qualifying parts using third party libraries and manufacturing services

Cobham Gaisler AB
March, 2016

Presenter: Sandi Habinc
Managing Director
Cobham Gaisler AB



Aviation Services

Outsourced aviation services for military and civil customers worldwide through military training, special mission flight operations, outsourced commercial aviation and aircraft engineering

- Air Traffic Display Systems
- Electronic Warfare Training
- Fly-In Fly-Out Services for the Natural Resource Industry
- Helicopter Services
- Maritime Surveillance and Border Protection
- Regional Airline Services for Qantas



Mission Systems

Provides safety and survival systems for extreme environments, nose-to-tail refuelling systems and wing-tip to wing-tip mission systems for jets, transport aircraft and rotor craft, and remote controlled robots and fully-equipped bomb disposal vehicles for homeland security and military applications

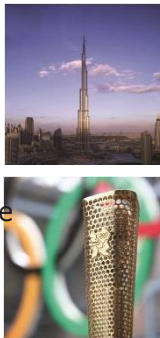
- Advanced Restraint Systems
- Air-to-Air Refuelling Systems
- On Board Inert Gas Generation Systems
- On Board Oxygen Generation Systems
- Unmanned Systems
- Weapons Carriage and Release



Communications & Connectivity

End-to-end avionics; law enforcement and national security solutions; wireless communication and test equipment for public safety and building infrastructure; and satellite communication equipment for land, sea and air applications

- Antenna Systems for Communication, Navigation, Electronic Warfare and Radar
- Cockpit and Cabin Communications
- Composite Technologies
- Public Safety and Wireless Communications for Infrastructure
- Satcom Equipment for Aerospace, Land and Maritime
- Wireless Surveillance Technology
- Wireless and Radio Test Solutions



Advanced Electronic Solutions

Provides mission critical, differentiated components and systems that protect and enhance lives, specializing in radio frequency and microwave electronics for defense and commercial applications

- AESA Sensors
- Avionics and Radar Technology
- Data Link Systems
- Electronic Warfare Systems
- High-reliability Microelectronics
- **Integrated Circuit Design and Assembly**
- Radiation Test Services



Cobham Gaisler AB

Official name since 10 December 2014

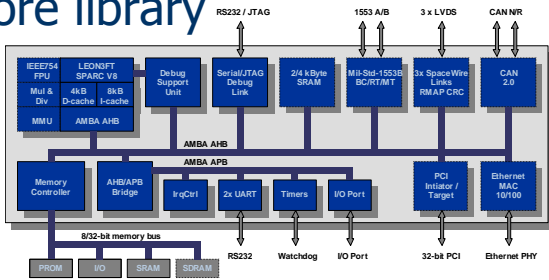
- Located in Gothenburg, Sweden
- Fully owned subsidiary of Cobham plc
- Management team with 50 years combined experience in the space sector:
 - Sandi Habinc: Managing Director
 - Per Danielsson: Senior Advisor
 - Jan Andersson: Director of Engineering
- 23 employees with expertise within electronics, ASIC and software design
- Complete design facilities in-house for ASIC and FPGA design



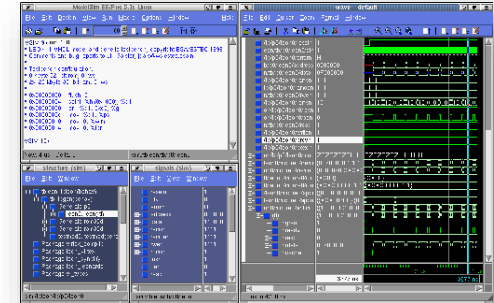
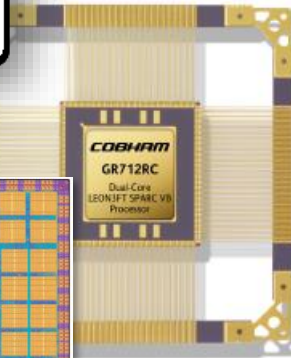
Cobham Gaisler - processing solutions

One-Stop-Shop supplier

LEON compatible IP core library

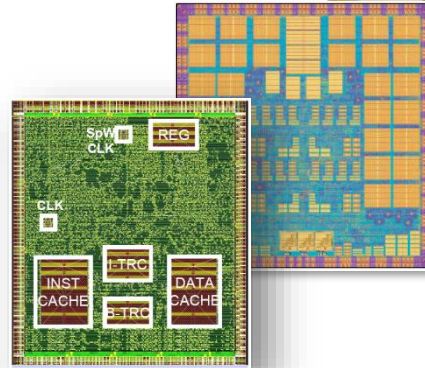
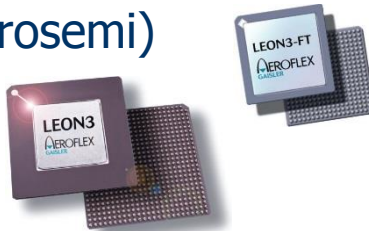


- TSIM and GRSIM: LEON simulators
- GRMON: LEON debug monitor
- RTOS: VxWorks, RTEMS, Linux...

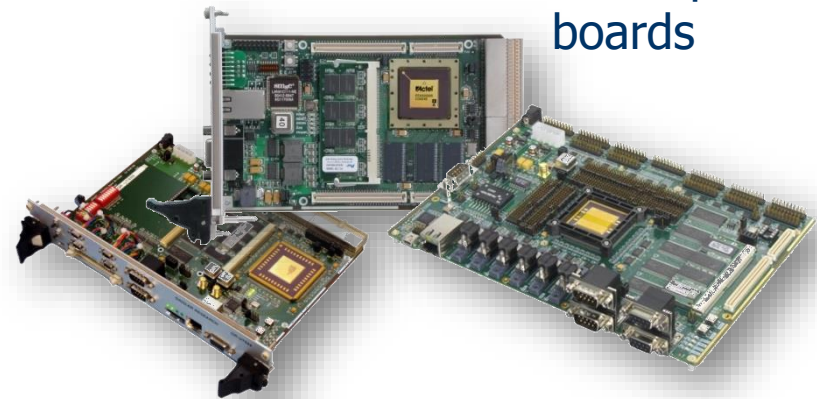


- LEON development boards

- FT FPGA Processors (Microsemi)



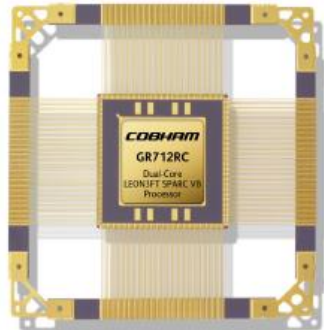
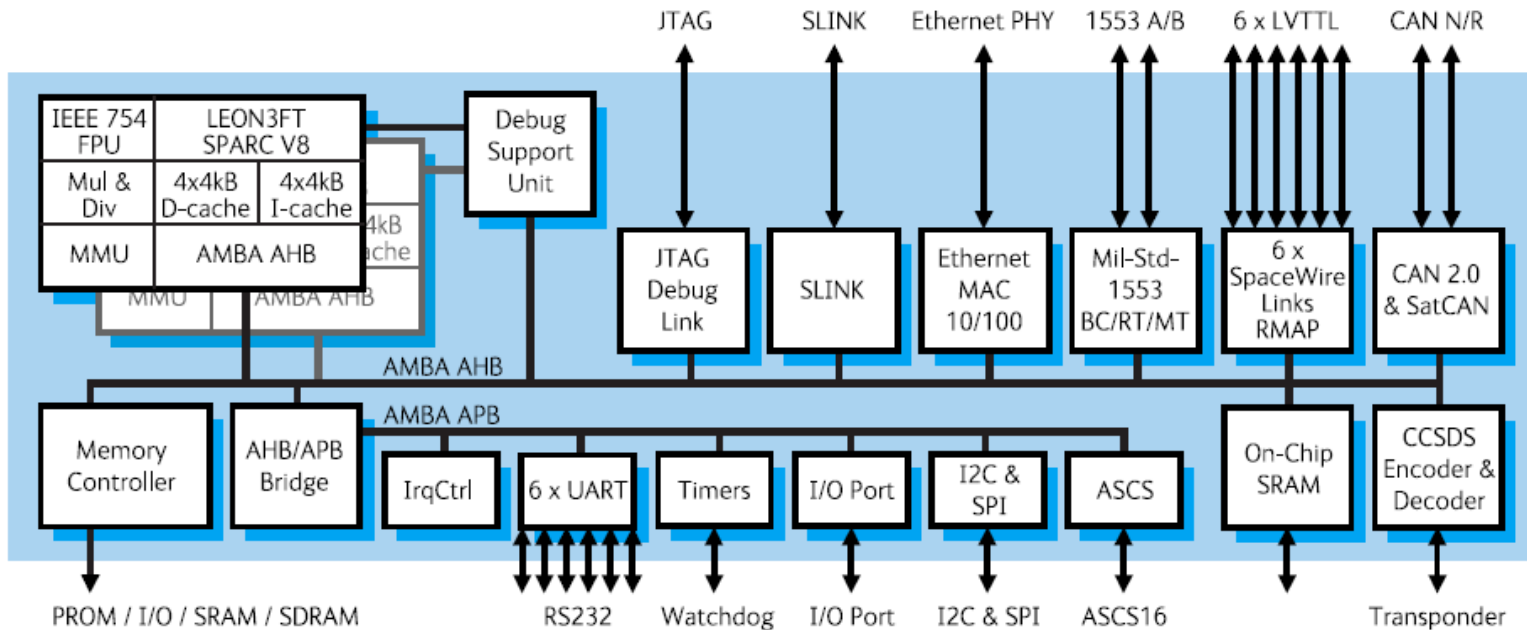
- LEON3/LEON4 processors



- System Testbeds

- Commercial foundries, third party libraries
 - IHP 250 nm – IHP internal
 - TowerJazz 180 nm - Ramon Chips RadSafe
 - UMC 180 nm – imec DARE, ICSense, Arquimea
 - XFAB 180 nm – imec DARE (future)
 - TSMC 250 nm, 130 nm – Aeroflex (for US products)
 - IBM 90 nm – Aeroflex (for US products)
 - ST Microelectronics 65 nm – C65SPACE
- Assembly and test services, packages
 - HCM - Microtest / imec - MASER / imec
 - SERMA - HIREX - e2v
 - Presto - Micross - TRAD
 - Kyocera - NTK - Aeroflex RAD Europe
- Sales channels
 - Direct - Dimac Red (rep) - Alter/Tesat (CPPA)

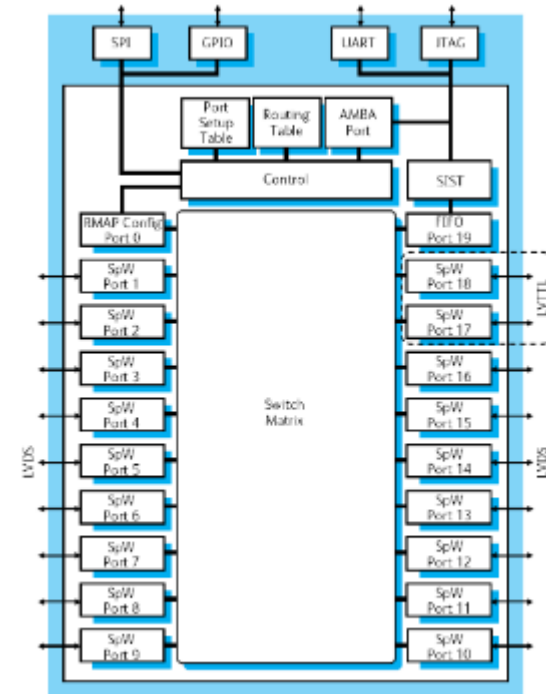
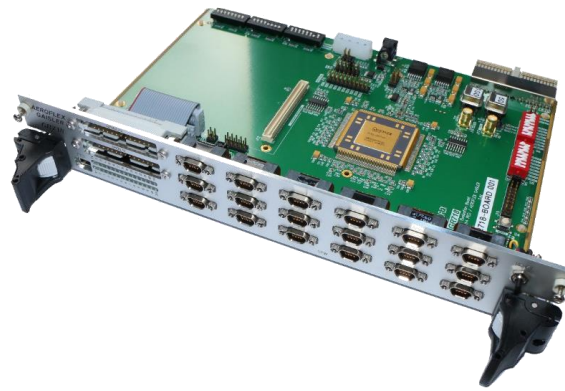
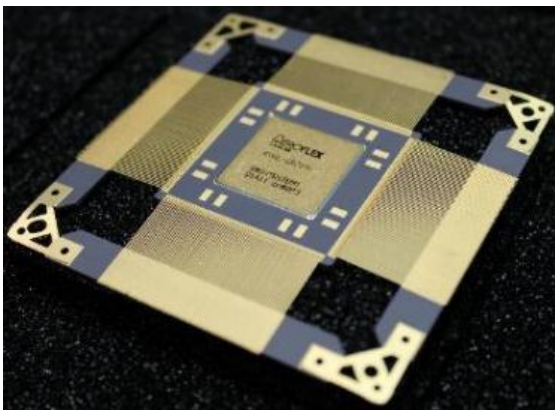
- Mil-Std - Class S – vendor specific flow
- ESCC 9000 – lot validation / EPPL
 - One wafer lot for lifetime of product
 - One assembly lot for validation
 - How to repeat assembly lot validation
- QPL – future?
- QML-V – alternative?
- Cobham Gaisler's role
 - Product specification
 - Digital/Analogue design
 - Subcontractor management and follow-up
 - Contractual obligation versus customer - full responsibility
 - Customer support



- Dual Core LEON3FT Fault-tolerant processor (SMP)
- TowerJazz 180nm, Ramon Chips RadSafe library
- CQFP240, 0.5 mm pitch, 32x32 mm, hermetically sealed
- Class-S, vendor specific flow, Cobham controlled
- Sold to vendor specific product specification
- Flight heritage

GR718 - 18-port SpaceWire Router

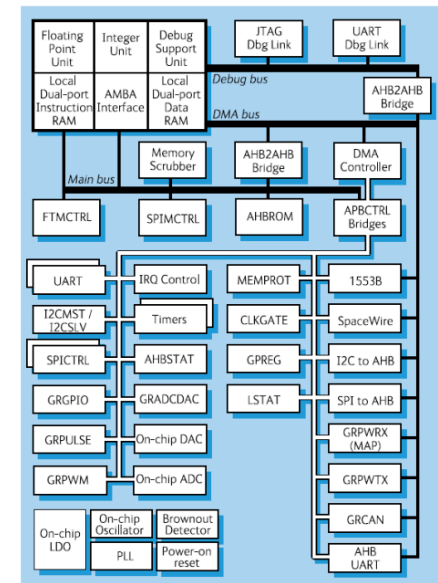
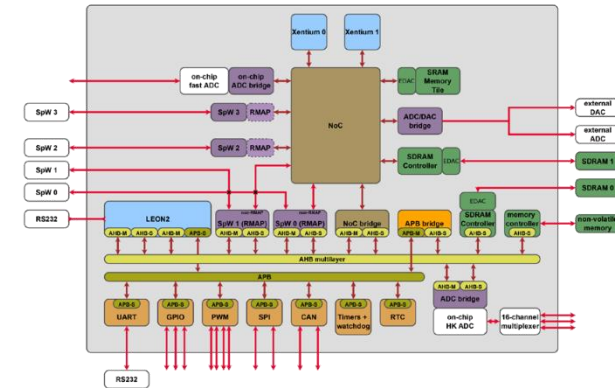
- Router implements 18 external SpaceWire ports
 - 16 with on-chip LVDS transceivers
 - 2 with LVCMOS to off-chip LVDS transceivers
- 180nm UMC , DARE180+ library from imec
- ESCC 9000 lot validation, through subs
- Cobham controlled
- Super-set of ECSS 9000, Class S and QML



Other developments

ESA prototyping/qualification activities

- **ESA Scalable Sensor Data Processor (SSDP)**
 - Thales Alenia Space prime
 - Cobham Gaisler to commercialize device
 - 2x Xentium DSP cores & 1x LEON3FT CPU
 - CQ352 package, imec DARE180+, UMC
 - ESCC 9000 qualification 2017, through imec
- **ESA Microcontroller**
 - LEON3FT with 16-bit instruction set (REX)
 - CQ132 package, imec DARE180+, UMC
 - Prototypes only at this stage
- **ESA LVDS**
 - Dual transmitter/receiver, 049 type
 - imec DARE180+/custom, UMC
 - ESCC 9000 qualification 2017, through subs



ESA's AMICSA & DSP event

Joint event in Gothenburg 2016

- Cobham Gaisler is hosting ESA's:
 - 6th International Workshop on Analogue and Mixed-Signal Integrated Circuits for Space Applications
 - 3rd Workshop on Digital Signal Processing for Space Applications
- Web site open:
<http://amicsa.esa.int/2016>

The poster features a blue background with a stylized satellite and signal waves at the top. The event title 'AMICSA & DSP 2016' is prominently displayed in white and yellow. Below the title, the dates '12th - 16th of June 2016' and location 'Gothenburg, Sweden' are listed. The poster is divided into two main sections: 'ESA's AMICSA' and 'ESA's DSP Day'. The AMICSA section describes the 6th International Workshop on Analogue and Mixed-Signal Integrated Circuits for Space Applications, held from June 12th to 15th, 2016, at the Radisson Blu Scandinavia Hotel. It is organized in collaboration with ESA and Cobham Gaisler. The DSP Day section describes the 3rd ESA workshop on Digital Signal Processing for Space Applications, held from June 15th to 16th, 2016. It is organized in conjunction with AMICSA. Both sections provide detailed descriptions of the workshops and lists of topics to be discussed. The poster also includes a call for papers section with deadlines for abstracts, paper acceptance notifications, and full paper submissions. At the bottom, there is a grid of logos for sponsors and partners, including COBHAM, imec, AIRBUS DEFENCE & SPACE, TESAT SPACECOM, micross components, Atmel, RECORE, OHB, RUAG, iCsense, RAMONchips, and JSD. A footer at the very bottom provides contact information for updates and further information.

AMICSA & DSP 2016
12th - 16th of June 2016
Gothenburg, Sweden
Radisson Blu Scandinavia Hotel

Call for Papers - 8 December 2015
Abstract Deadline - 15 January 2016
Paper Acceptance Notification - 15 March 2016
Full Paper Submission - 16 May 2016

ESA's AMICSA
6th International Workshop on Analogue and Mixed-Signal Integrated Circuits for Space Applications
12th - 15th June 2016

Organized in collaboration with ESA and Cobham Gaisler, provides an international forum for the presentation and discussion of recent advances in analogue and mixed-signal VLSI design techniques and technologies for space applications.

- Radiation effects on analogue and mixed-signal ICs
- Methodologies for radiation-hardening on analogue circuits at cell-, circuit- and system design level
- Radiation-hardened technologies for analogue ICs
- Radiation tests of analogue and mixed-signal ICs
- Qualifying and quantifying radiation-hardness of analogue circuits
- Space applications for analogue and mixed-signal ICs
- Analogue intellectual property and reusability of analogue circuits in space
- Needs and requirements for analogue and mixed-signal ICs in future space missions
- In-orbit experiences and flight heritage of analogue and mixed-signal ICs

ESA's DSP Day
3rd ESA workshop on Digital Signal Processing for Space Applications
15th - 16th June 2016

Organized this year in conjunction with AMICSA, provides an overview on relevant development roadmaps, updates on Digital Signal Processing technology for space applications, and the results of contractual activities for the development of DSP radiation-hardened components, related equipment, IP cores and software.

- DSP IP cores and related IP for future SoC designs
- Space qualified DSP components
- COTS DSP components for space applications
- DSP boards, software development environments, libraries and related software
- Test, verification and qualification of DSP chips
- Status and results of DSP related ESA contracts
- DSP and FPGA: synergy, competition, and future integration
- Requirements and needs for future space DSPs

COBHAM **imec** **AIRBUS DEFENCE & SPACE**
TESAT SPACECOM **micross components** **Atmel**
RECORE **OHB** **RUAG** **iCsense** **RAMONchips** **JSD**

Please follow the conference and workshop web site for updates and further information for authors, exhibitors and sponsors:
<http://amicsa.esa.int/2016>

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Roland Trautner, European Space Agency
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