GLENDALE, CALIFORNIA Complete vertical integration of manufacturing resources—at home in Southern California since 1956



Glenair operates the largest precision machining facility in the high-performance interconnect industry, allowing us to support both small and large-volume interconnect requirements—from one piece to 100,000













Glenair's massive investment in composite thermoplastic injection molding capabilities— the largest in the high-reliability interconnect industry—includes machinery, tooling, and most importantly, professional operators



GLENDALE, CALIFORNIA Complete vertical integration of manufacturing resources—at home in Southern California since 1956





Glenair design, engineering, and fabrication capabilities extend to both electrical as well as optical connectors, cables, and complex integrated assemblies—all under one roof and one worldwide quality system





ENDALE



## NASA ESA, JAXA SCREENED

Glenair's family of space mechanisms are manufactured in certified cleanrooms. Full qualification test reports are available for every device type. NASA/ESA outgas processing and screening completed on-site. All operations are managed under a single certified quality system with unprecedented levels of performance.

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## But don't take it from us... take it from NASA

#### December 5, 2016

Good afternoon Mr. Christopher J. Toomey...and to the Glenair Family

On behalf of the NASA Launch Services Program (LSP) and the Safety and Mission Assurance Division (SMA), I would like to express sincere appreciation for the hospitality afforded our NASA team... last week. It is obvious that your company takes pride and recognizes the value in meeting and even exceeding the intents of the Aerospace Standard AS9100. We came away with a positive sense in the partnership.... You have a remarkable campus facility and a remarkable employee team there in Glendale, and I am sure, throughout your vast network of offices and facilities around the world as well. The Quality leadership has done an outstanding job implementing a working Quality Management System around your successful business model. Thank you for recognizing the importance of this particular supplier audit to NASA..., as we seek crucial information relative to the NASA Certification....

... I would like to express some of the other very positive comments that our team came away with regarding this audit. All of your employee team should take pride in the quality of your finished product line for your customers. To that end, here is a listing of but a few of our team's observations during the audit process:

- 1. Welcoming hospitality to customers
- 2. Informative Corporate Overview Presentation
- 3. Positive Employee Attitudes about the workplace
- 4. Informative and thorough process walk-downs
- 5. Informative and thorough production facility walk-downs
- 6. Processing area cleanliness and 5S organization

- 7. Timely Corrective Action and effective Preventive Action plans
- 8. Top Management involvement and participation in the QMS AS9100 processes
- 9. Expertise of the employee team members
- 10....and the ability of a randomly selected employee to express the Quality Policy and what it means to him in his position with the company

A formal compilation report is in work, and should reflect the over arching positive note, which recognizes that the audit at Glenair had no Major and no Minor findings whatsoever. Please forward to any appropriate team members who have contributed to this successful audit.

Respectfully, Paul Cloues, NASA Quality Engineer NASA Launch Services Program Safety and Mission Assurance, SA-D Analysis Planning and Test (APT) Research

Chris Towney

Glenair's Complex Cable Group (CCG) has delivered creative engineering, high-quality workmanship, fast response, and on-time delivery to countless cable harness and ruggedized interconnect assembly customers for over 60 years—including countless space-grade and space flight applications. The operation—from cable design through fabrication, test, and delivery—is fully integrated into Glenair's Glendale campus, ISO 9001 and AS9100 quality system, and high-availability business model.

> Multibranch assembly with lightweight ArmorLite<sup>™</sup> microfilament EMI/ RFI overbraid

High-speed production overmolding

Commander Ed White's "Golden Umbilical," with space-grade radiation shielding

Continuity testing standard on all cable circuits



Glenair's engineering team in Glendale is augmented by regional teams worldwide, and we love to travel. Our place or yours? We work at our customers' convenience.



# Glenair. The Glenair Culture

## COMMITTED TO QUALITY AND CUSTOMER SERVICE SINCE 1956

Glenair is proud of the quality and reliability we build into our broad range of mission-critical interconnect solutions—from discrete connectors to complex cable assemblies and embedded systems. Glenair is the biggest "made in the USA" interconnect supplier in the high-reliability industry, but we also operate factories in the UK, Italy, and Germany to serve the unique requirements of those markets. Glenair's Worldwide Quality System is ISO 9001 and AS9100 certified and registered. We also hold many discrete product and operations certifications for specialty, high-performance markets including space, nuclear power, and rail. In addition to world-class quality, we are laser-focused on customer service



and committed to being the easiest manufacturer in our industry to do business with. Here are just some of our key customer service principles:



Lightning-fast turnarounds on quotes and special orders

Huge same-day shipment inventory

Worldwide sales and technical support in every major market







Mission-Critical Interconnect Solutions

Full-spectrum, "no gap" product lines



Generous NRE, RMA, and sample request policies



Abundant engineering and technical support

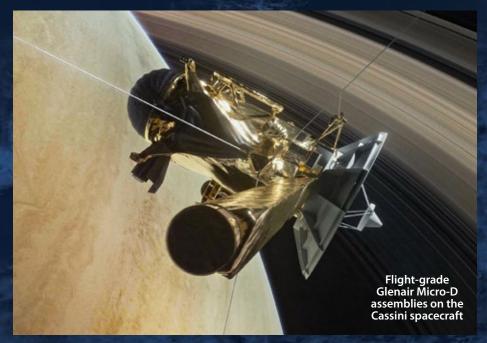
No attitudinal constraints when it comes to customer convenience and service





## MANSFIELD, ENGLAND

Mission-critical interconnect technologies for the UK and European markets with a special focus on micro and nanominiature flex assemblies



Glenair UK is Glenair's Centre of Excellence for the design, build and qualification of its extensive Micro-D and Nano connector product portfolio for the European and global space market. Glenair UK have more than 30 years of experience in the manufacture of MIL-DTL-83513 Micro-D and MIL-DTL-32139 Nano compliant connectors.

From standard flying-lead and PCB mount connectors to complex screened cable assemblies, Glenair production staff are trained and qualified to the exacting standards of IPC WHMA-A-620 and ESA soldering and crimping process standards: ECSS-Q-ST-70-08 & ECSS-Q-ST-70-26.

Certified to ISO/IEC 17025, Glenair's in-house independent test laboratory is capable of running all industry standard qualification programs for its space flight customers—from outgassing to full qualification programs (ESA and NASA).

ESCC series Micro connectors for ESA space and other UK and EU markets

#### GLENAIR UK QUALITY STANDARDS AND APPROVALS

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- ISO Class 8 Clean Room IAW FED STD 209E class 100,000
- Quality Management System certified according to AS9100 and ISO 9001
- Independent Test Laboratory Certified to ISO/IEC 17025 IECQ 01 and IECQ 03-6

**MICRO AND NANOMINIATURE HARNESS AND FLEX ASSEMBLIES** 



Complex multibranch flexi and rigid flexi assembly with Glenair Micro and Nano interconnects

Micro and Nano wired harnesses and pigtails

The Glenair Mansfield machine shop houses a full complement of CNC milling, turning, measurement, and mechanical inspection equipment

Micro-D and Nanominiature harnessing is completed in our AS9100 / ISO 9001 certified facility





The Glenair Mansfield clean room assembly area is used for fabrication of laser, space, and satellite assemblies IAW ISO Class 8 -100,000 PPM





Glenair UK operates an independently accredited BS9000:CECC:IECQ test lab for both internal as well as third-party product development / design verification and connector qualification

## BOLOGNA, ITALY

Glenair Italia serves harsh-environment military, nuclear, rail, and industrial markets with power, high-speed Ethernet, hazardous-zone interconnects and more.



Total vertical integration includes in-house contact fabrication



In-house injection molding (far left) and resilient insert processing (left) provides Glenair Italia with all the resources required to fabricate interconnect technologies from scratch without dependence on outside suppliers



In-house test lab with capabilities for both high voltage as well as high speed signal product qualification

Glenair Italia hosts the most modern and comprehensive interconnect plating facility in Europe



## SALEM, GERMANY

Space-grade interconnect harnesses and ESGE test rack systems for satellite applications—ESA certified





Glenair Space Systems: a mission-critical space-grade harness, test, production, and integration operation. ESA-certified assembly staff plus value-added Engineering Base and 3D SolidWorks design, prototyping, and clean-room facilities.

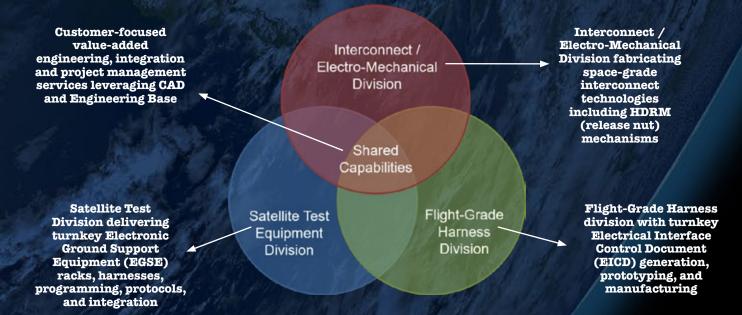
### THE POWER OF GSS VALUE-ADDED ENGINEERING AND MANUFACTURING

A turnkey design and fabrication operation: from documentation (1), to prototype (2), to production (3), to integration (4).



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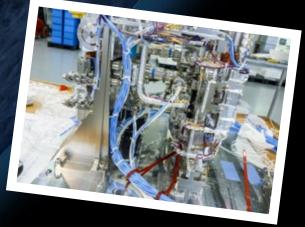
#### **GLENAIR SPACE SYSTEMS CORE CAPABILITIES AND TECHNICAL TEAMS**



#### **GLENAIR SPACE SYSTEMS IN-HOUSE PRODUCTION AND ASSEMBLY CAPABILITIES**

Glenair Space Systems is a growing operation with an over 600 m<sup>2</sup> production floor. The facility also features 300 m<sup>2</sup> ISO 8 and ISO 6 clean rooms, ISO 5 flow chamber (certified to ESD Standard 61340-5-1), a large precision machining center, and ample clean room accommodation for large mock-up and integration projects.





Integration of production harnessesin-house or at customer facility

ESA-certified engineering and production staff

3D mockup design, fabrication, and harness integration including in-house generation of all engineering and production files using Engineering Base





Turnkey satellite test harnesses and Electronic Ground Support Equipment racks