

MISSION-CRITICAL
INTERCONNECT
SOLUTIONS



Glenair
SIGNATURE SERIES

Integrated PCB / Flex Circuit Assemblies



Turnkey Flex/PCB Interconnect Solution: Connectors, Flex, and Assembly All Under One Roof

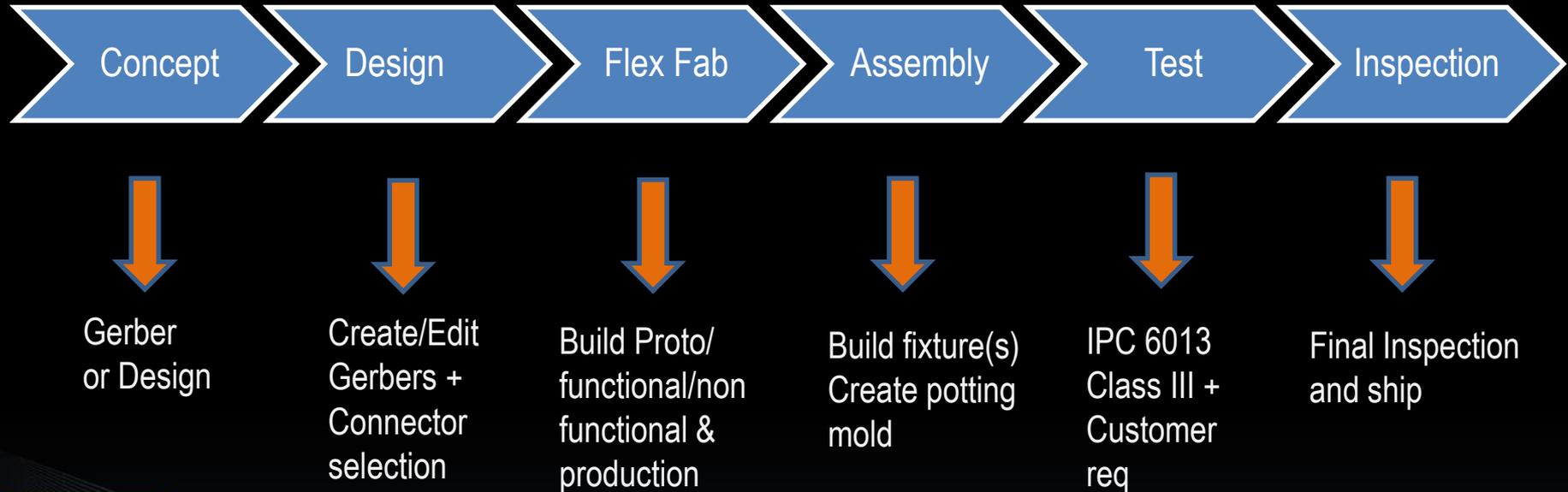


- Vertically-integrated mil / aero / space-grade PCB connector manufacturer
- In-house board and flex design and fabrication

Flex/PCB Assembly Process Flow



All under one roof



Design and Fabrication Capabilities

Connectorized Flex Assemblies

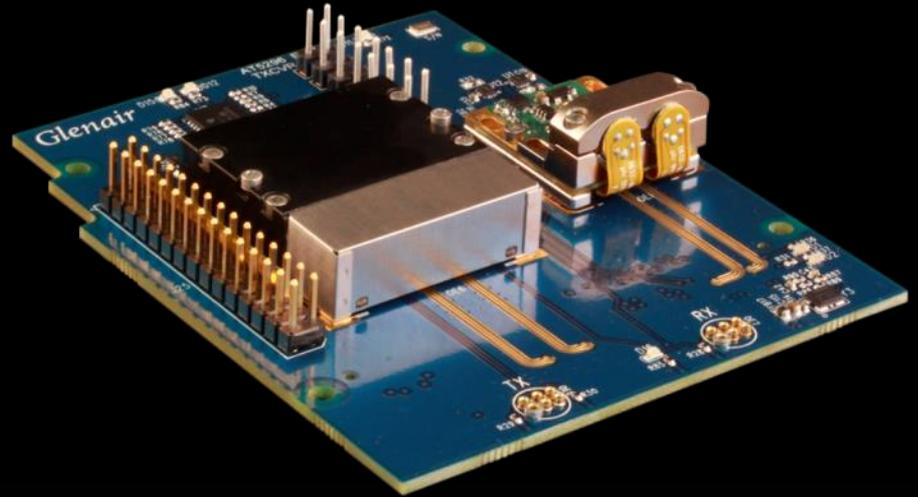
- Point-to-point or multibranch connectorized jumpers
- Flexible, repeatable routing for complex 3-dimensional installations
- Save size, weight, and improve density compared to wire bundles
- Broadest range of high-performance I/O and board connectors
- Optimized reliability: high-speed, high temp, high shock and vibrate



Design and Fabrication Capabilities

Rigid Board Assemblies

- Rigid substrate assemblies for rugged durability and performance
- Hard-mount points for connectors and surface-mount components
- Ideally suited for double-sided component mounting
- Superior performance in high shock and vibrate applications



Design and Fabrication Capabilities

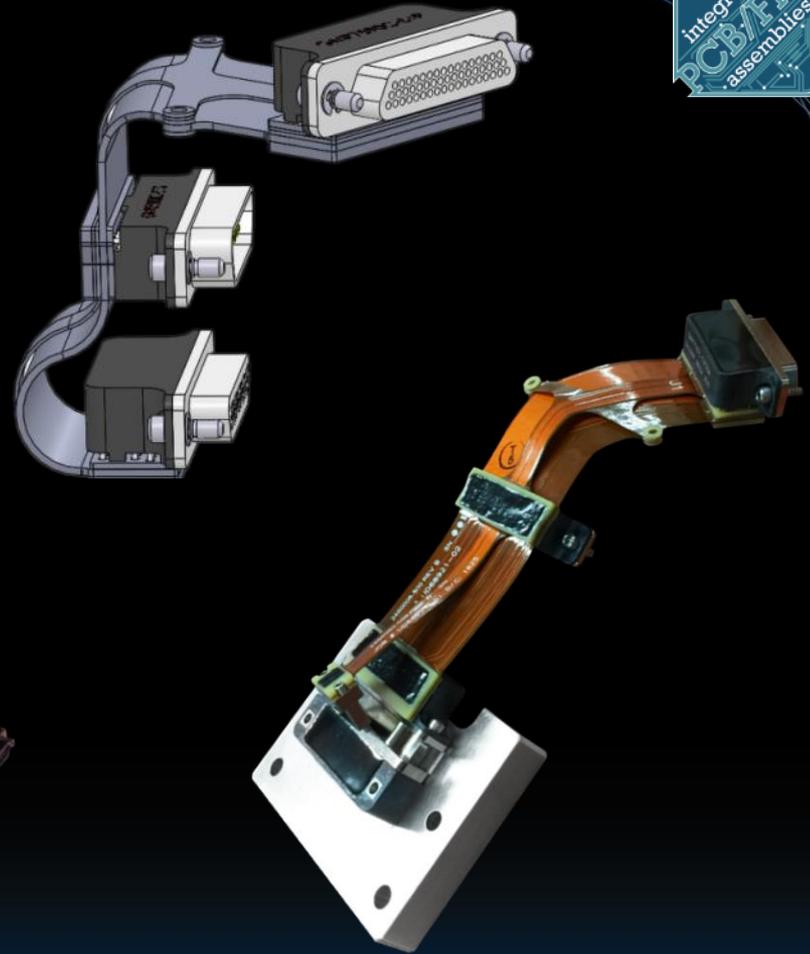
Rigid Flex Assemblies

- “Best of both worlds” combines durable rigid-board architecture with flex circuitry for double-sided component mounting and easy/flexible circuit routing
- 3-D vibration-resistant flex routing advantage plus hard mount points and stiffeners as required
- Integration of active componentry with flex circuitry



Rapid Prototyping

- 3D printed connectors
- Laser cut “Paper Dolls” with copper clad Kapton to simulate actual flexibility
- Mechanical fit check for system



Circular and Rectangular Glenair Connectors with PC Tails



SuperNine
COTS

SuperNine
Special

SuperNine
Hermetic

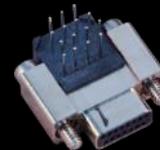
MIL-DTL-
38999
QPL
Hermetic

HiPer-D
24308
straight

HiPer-D
24308
right angle

HiPer-D
Combo
straight

HiPer-D
Combo
right angle



Series 80
Mighty
Mouse

Series 88
SuperFly

SuperSeal
RJ45/USB

Nanominiature
Circular

Series 79
Micro-Crimp

MWDM
Micro-D

Series 89
Nanominiature

Hermetic

Rigid Flex Assembly Specification Standards

Design Formats	PADS • PADS PRO • Pro E / Creo • SolidWorks • Autodesk Inventor • CAM 350 • Altium • Valor • POLAR • XPedition
Manufacturing Formats	DXF • Gerber • ODB++ • IPC 2581
Max Panel Thickness	Range of thicknesses from .010" to as thick as .250"
Layer Count	27 +
Via Technology	Blind, buried • Thru hole • Filled (conductive and non-conductive)
Conductor Width/Space	Lines: .003" • Spacing: .003" (dependent on copper weight)
Materials / Tg	Substrate: Nelco 4000, Rogers, Megtron, Polyimide, and more
Surface Finish	ENIG • HASL • Immersion Tin and Silver • Soft and Hard Gold
Specs and Quality Management	IPC-6013 Class I, II, III, type 4 • ISO 9001, AS 9100, J-STD-001 Space

PCB/Flex Specs and Quality Management

IPC-6012/6013 Class I, II, III, types 1-4



Test Report No. PR051543

 **NTS** 

STRUCTURAL INTEGRITY & SOLDERABILITY
IPC-6013C & J-STD-003C
THERMAL STRESS & THERMAL SHOCK & SOLDERABILITY

Manufacturer: GLENAIR INC Attention of: Young Lim Address: 1211 Aza Way Glennair CA, 91201 USA Phone: 818-247-6000 Purchase Order: D162146	Job No.: 1608-100 Report Date: 9/9/2016
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Sample Submission Identification

The following sample(s) were submitted and received in a suitable condition for testing in accordance with the indicated test method and/or specification(s) indicated in the following section(s) of this test report:

DATE RECEIVED: 9/2/2016
PART NUMBER: 692-CB009-PCB REV: 1
SERIAL NUMBER(S): NTS#1, NTS#2

TEST RESULTS SUMMARY:

Serial Number		NTS#1	NTS#2
IPC-6013C, Class 3 AS IS	Accept	X	X
	Reject		
IPC-6013C, Class 3 after Thermal Stress	Accept	X	X
	Reject		
IPC-6013C, Class 3 after Thermal Shock	Accept	X	X
	Reject		
Solderability: surface per J-STD-003C	Accept	X	X
	Reject		
Solderability: P.T.H per J-STD-003C	Accept	X	X
	Reject		

Report Signatories(s) and Approval

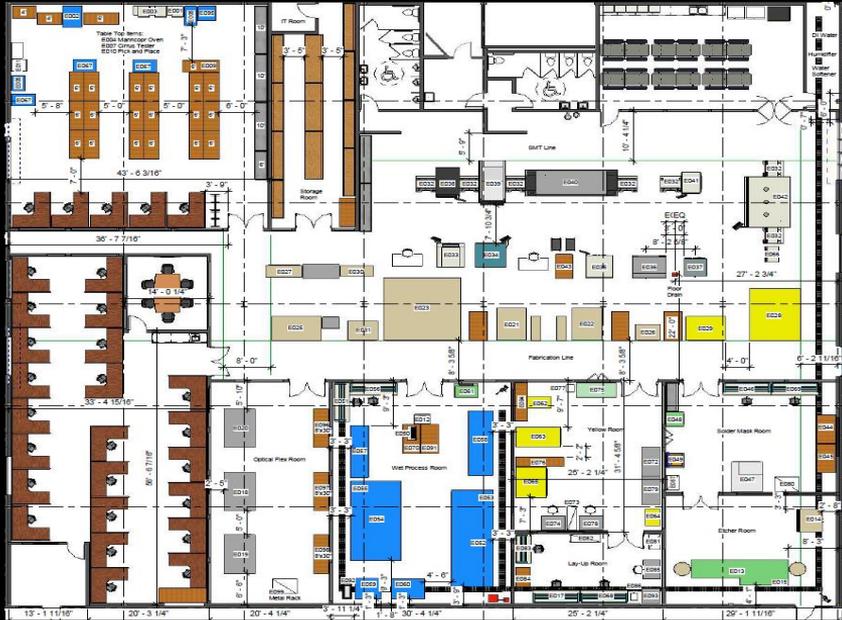
 Digitally signed by Son Duong
DN: cn=Son Duong, o=NTS-Anahaim, ou=Deputy Operation Manager, email=son-duong@nts.com, c=US
Date: 2016.09.09 09:52:07-0700

Son Duong

This report and the information contained herein represents the results of testing of only those articles/products identified in this document and selected by the client. The tests were performed to specifications and/or procedures approved by the client. National Technical Systems (NTS) makes no representations expressed or implied that such testing fully demonstrates efficiency, performance, reliability, or any other characteristics of the articles being tested, or similar products. This report should not be relied upon as an endorsement or certification by NTS of the equipment tested, nor does it present any guarantee whatsoever as to the mechanical integrity or fitness of the test article or similar products for a particular purpose. This document shall not be reproduced except in full without written approval from NTS.

REPORT NUMBER: PR051543 (Page 1 of 17)
NTS#692-CB009-PCB-01-CL10-061W
YD: 111-2016

New Integrated Board Assemblies Facility



Total 17K Sq Ft

- Board Fab : 10K Sq Ft
- SMT: 2K Sq Ft
- Optical Flex: 1K Sq Ft
- Insp/Test: 1.5K Sq Ft
- Materials: 500 Sq Ft
- Office: 2k Sq Ft

In House Processes: Drilling, Routing, Lamination



Pluritech
X-Ray Drill



Via Fill

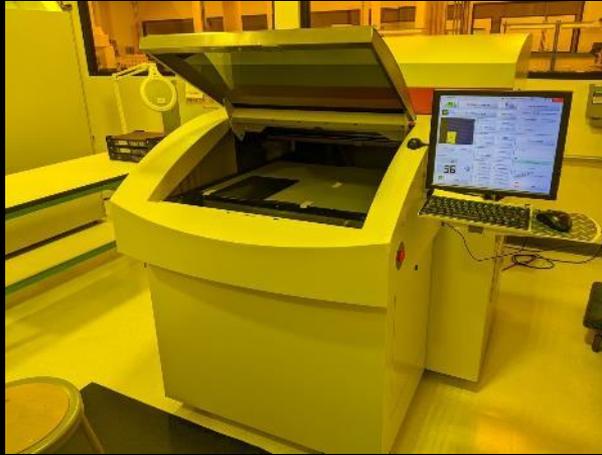


TMP Lamination
Press
6 Opening Oil
Heated



Planarization

In House Processes: Photo



Laser Direct Imaging



Collimated UV Expose



Hot Roll Lamination

In House Wet Processes



Etching
(Alkaline
and Cubric)



Developing

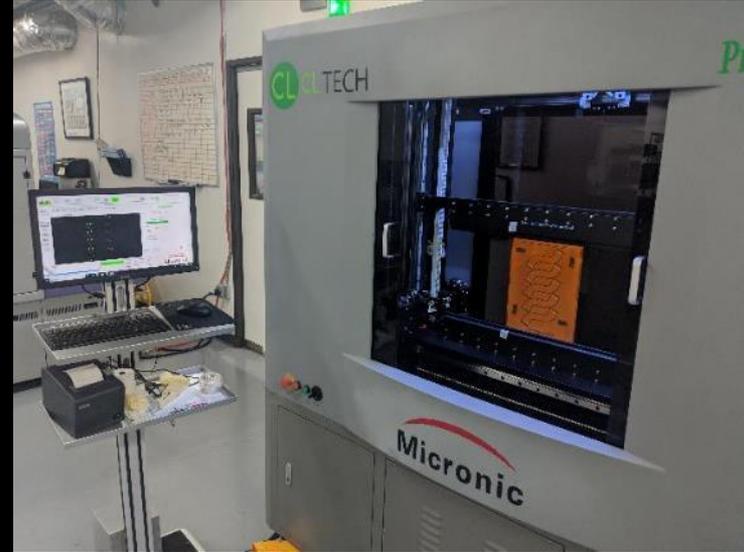


Cobra
Bond

Optical and Electrical Inspection



- Reduces Inspection Time and Scrap Rate
- Optically verifies minimum trace width and spacing requirements
- Improves board repeatability with batch consistency



- 4 independent probes test for continuity on all bare board circuits
- 3,000 + Circuits tested per minute
- 100% in process testing

SMT

- ESD Reducing Conductive Floor
- Ekra Serio 4000 Printer
- Fuji AIMEX III Chip Placement
- Heller 9 Zone Reflow Oven
- Pillarhouse Selective Solder
- Yestech AOI
- PCB SuperSwash III Board Cleaner
- Cencorp Router
- Dage X-Ray Inspection
- Takaya Flying Probe



PCB and Ruggedized Flex Circuit Assembly

IAW established standards

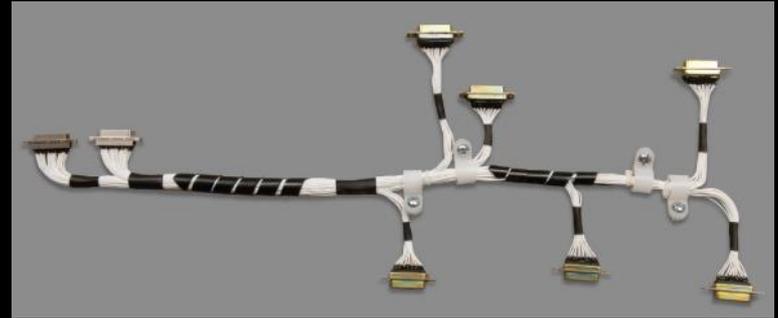


- 200+ certified assemblers
- IPC 620, NASA J-STD, IPC 610 certified
- Testing stations with DWV/IR, continuity, etc.
- Overmolding with multiple materials, including Hysol for PCB terminations

Why Choose Flex?

Flex assembly vs. round wire assemblies

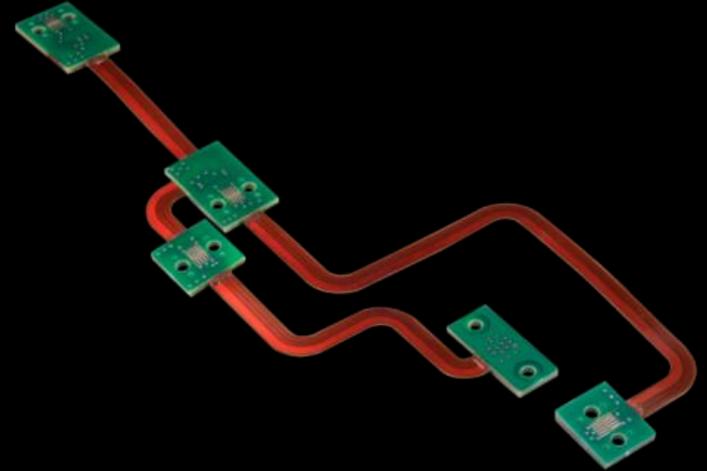
1. Less weight and bulk
2. Virtually eliminates wiring errors
3. Total installed cost is less
4. Tightly assembled electronic packages
5. Dynamic (Flex in application)
6. Direct in 3 different axis



Glenair Flex Assemblies Made for Space

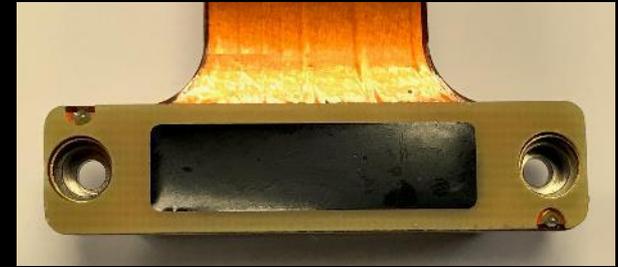
Space-Grade Materials and Connector Content

- Low Outgassing Kapton Substrates in both Adhesive and Adhesiveless Varieties
- Constantin Trace Capability
- EEE-INST-002 Connector and Bare Board Screening



Methods for 360 Degree Shielding

- Solid or cross hatched copper with stitching vias along length of flex. Not permissible in bend regions. Via pitch determined by signal frequency.
- Shielding tied into connector body with ground pins or exposed pads which interface with ground springs in backshell.
- Flex can also be wrapped in copper foil.



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