

# WELCOME TO PIONEER CIRCUITS

WORLDWIDE LEADER FOR TURNKEY FLEX AND RIGID FLEX PWB PRODUCTION





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## INTRODUCTION

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Founded in 1981, Pioneer Circuits is the worldwide leader in flex and rigid flex printed wiring board manufacturing. We work with leading customers in the military, aerospace and medical sectors who need extremely reliable parts for their end use applications.

With over 35 years of experience, we are focused on delivering professional quality printed wiring boards of the highest performance and reliability, and are on a continuous journey to perfect our craft.

Pioneer Circuits seeks the most innovative approaches to solving our customers' problems, mirroring the flexibility of our printed circuits in our comprehensive services, and offers turnkey solutions that are ready to adapt and serve the ever-changing needs and expectations of our valued customers.



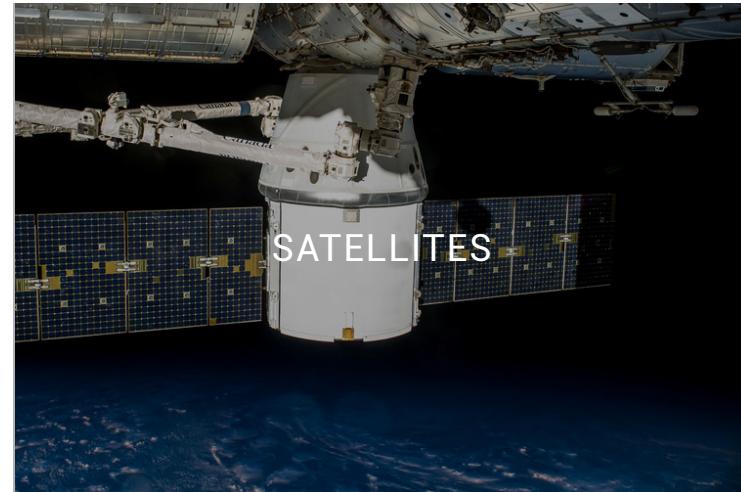
## MARKETS SERVED

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SPACE EXPLORATION



SATELLITES



AVIONICS



MISSILES

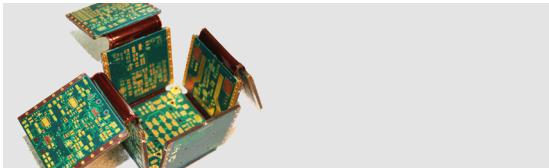
## OUR CUSTOMERS

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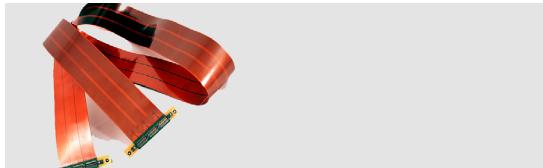
## SPECIAL CAPABILITIES

Pioneer Circuits has perfected our craft to be able to accomplish more than the standard capabilities of the printed wiring industry. Our special capabilities can be utilized to fit your specific project needs; saving you time, lowering your costs, and providing the highest performance pwb technology for your end-use application.



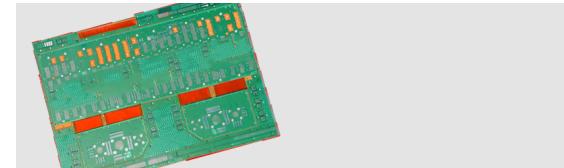
### BOOK BINDER TECHNOLOGY

Staggered flex lengths are created to accommodate the necessary bend radius. With the book binder, efficient use of space enables stress-free installation. Book binders also enable 3D form factor with high layer rigid-flex.



### EXTENDED LENGTH FLEX

Pioneer Circuits has the capability to manufacture multilayer extended length flex circuit boards that are over 10M in length. These extended length flex boards use custom splice interconnects and offer controlled impedance.



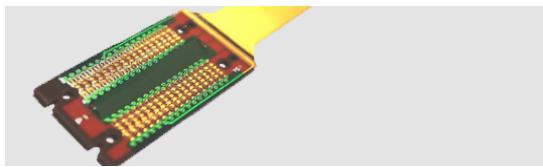
### LARGE PANEL RIGID-FLEX

Our large panel rigid-flex boards make longer profiles possible to meet our customers engineering and design needs. Pioneer Circuits has the capability to manufacture large panel rigid-flex boards with profiles of over 80 inches.



### ALTERNATIVE SHIELDING

With Pioneer Circuits, you are able to pick the best option of alternative shielding to suit your project. Two of our recommended alternative shielding options are Silver Epoxy, and Sputtered (Thin) Nickel-Gold.



### THERMAL MANAGEMENT

Constantan is a nickel-copper-alloy with thermo-characteristics that can be used in place of copper for applications such as infrared imaging. Pioneer Circuits has extensive experience with manufacturing pwb's with constantan.



### HIGH LAYER / SUB LAMINATE COUNT

Pioneer Circuits has the capability to produce printed wiring boards with over 40 layers and up to 8 sub-laminate layers which can be extremely complex to manufacture and is more than any other company in the industry.

## SERVICES OVERVIEW

As the worldwide leader in flex and rigid flex pwb manufacturing, Pioneer Circuits works to not only deliver the most superior products, but to provide our customers with the comprehensive services that will ensure optimal results as well.

The most successful projects have Pioneer Circuits' involvement early on in the design process. Therefore, we provide our Concurrent Engineering service along with free technical training seminars to help anticipate and eliminate issues before manufacturing.

Furthermore, Pioneer Circuits provides additional value by offering our assembly services. Our assembly team consists of certified assembly personnel who are well-versed in the art of flex and rigid-flex assembly.

Finally, Pioneer Circuits also offers free mechanical mock ups. These mock ups allow you to optimize your design without incurring the costs and time of an actual build.

Together, our services provide a truly turnkey solution for your projects and programs.



## CONCURRENT ENGINEERING

Pioneer Circuits' Concurrent Engineering is a design service in which our team of experienced engineers collaborate with our customers to achieve pcb solutions with product reliability, guaranteed producibility, and reduced cycle time.



### TECHNICAL TRAINING SEMINARS

Our free technical training seminars are offered as lunch-and-learn sessions, and can be conducted on your site or in Pioneer Circuits' Learning Center Building. Webinars will also be available upon customer request.



### UPFRONT CUSTOMER SUPPORT

A dedicated applications engineer works with you early on in the concurrent engineering process to prevent expensive mistakes or mismatches in the stages to follow.



### MATERIAL SELECTIONS

Our decades of experience has given us insight on the highest quality materials, and we continually use what has been successfully tested for long term reliability.

**CONTACT US ABOUT CONCURRENT ENGINEERING FOR YOUR PROJECT**

## MOCK UPS

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Pioneer Circuits' free mechanical mock up services allow you to optimize your design without incurring the costs and time of an actual build. Finished mock ups verify the fit and feel of Pioneer Circuit's flex and rigid flex circuitry within your finished application and provide a high fidelity method of evaluating your project's mechanical characteristics.



### HOW TO REQUEST A FREE MOCK UP FROM PIONEER CIRCUITS

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Preliminary Material/Layer Stack Up (With Plane and Signal Layers Identified)

Impedance Requirements Including Type of Impedance Controls Identified. X-Hatch Planes must be Identified

Gerber Profile With Rigid and Flex Areas Defined. Hole Locations Defined in Gerber Data

A Flattened (2D) dxf file @1.1 is an Acceptable Alternate to Gerber

Artwork Files are Not Required - But Include if Available - Even if Preliminary

Impedance Requirements Including Type of Impedance Controls Identified. X-Hatch Planes must be Identified

To request a mock up, simply provide the information listed above, along with the technical contacts from your team in case we have any questions about your mock up.

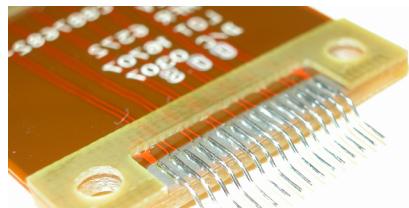
Typically, we etch off or leave copper on specific flex layers based on the copper's expected impact to the part flexibility, and we do not create plated-through holes or connected nets. However, we will be happy to accommodate special request mock ups.

## ASSEMBLY

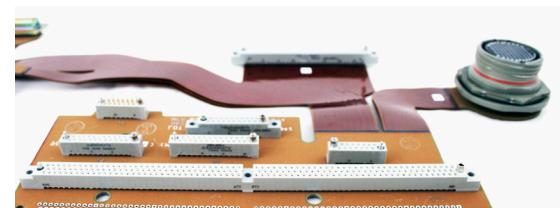
With 20+ years of experience in assembly, Pioneer offers NASA-certified, hand and automated soldering, crimping, and conformal coating. We also offer automated SMT placement and manual inspections coupled with real-time x-ray and AOI.



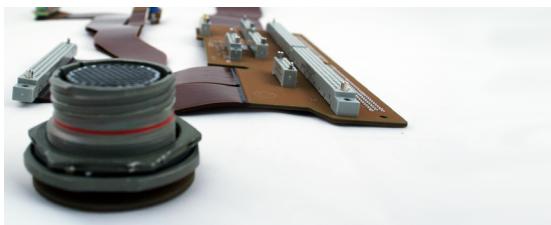
SMT ASSEMBLY



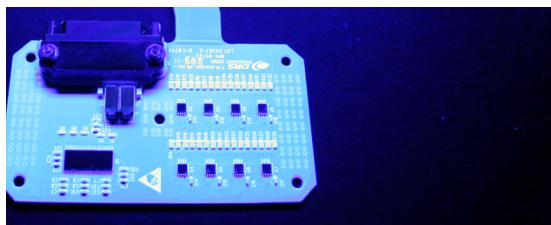
FORMED LEADS



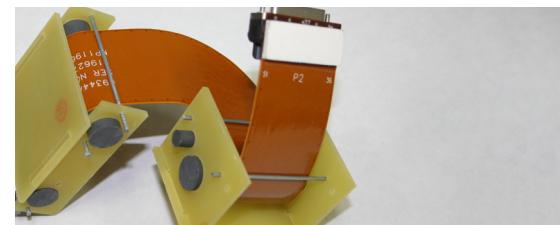
"CONNECTORIZED" ASSEMBLIES



CONNECTOR POTTING



CONFORMAL COATING



CUSTOM FORM FIXTURES

While we certify leaded solder for our aerospace customers, ROHS compliant lead free solder is also available for our European trading partners. Pioneer Circuits provides both small quantity engineering and space application quantities up to intermediate and high quantities for production runs.

## PROVEN RELIABILITY

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Our products have proven their reliability by being able to withstand even the harshest conditions of the Mars Environment. In fact, all generations of Mars Rovers utilize Pioneer Circuits' flex products throughout their assembly.



“ Congratulations! Pioneer Circuits has demonstrated to be a quality supplier for the NASA robotic space programs, like the Mars Exploration Rover program. We would like to recognize your efforts of sustaining effective quality controls throughout your organization. ”

FROM: Arvin Llamzon, JPL Supplier Outreach & Process Control Assurance | February 13, 2016

## CERTIFICATIONS

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Pioneer Circuits' parts, services, and systems are all certified, ensuring that the printed circuit boards that you receive from us are guaranteed to perform up to standard. Furthermore, we also make sure that we follow each of our customers specific standards as needed.



### MILITARY QUALIFICATIONS

- MIL-PRF-31032/1
- MIL-PRF-31032/2
- MIL-PRF-31032/3
- MIL-PRF-31032/4
- MIL-P-50884
- MIL-PRF-55110F

### ASSEMBLY

- J-STD-001 Class 3/IPC-A-610
- NASA 8739.3
- NASA 8739.2

### IPC PERFORMANCE SPECIFICATIONS

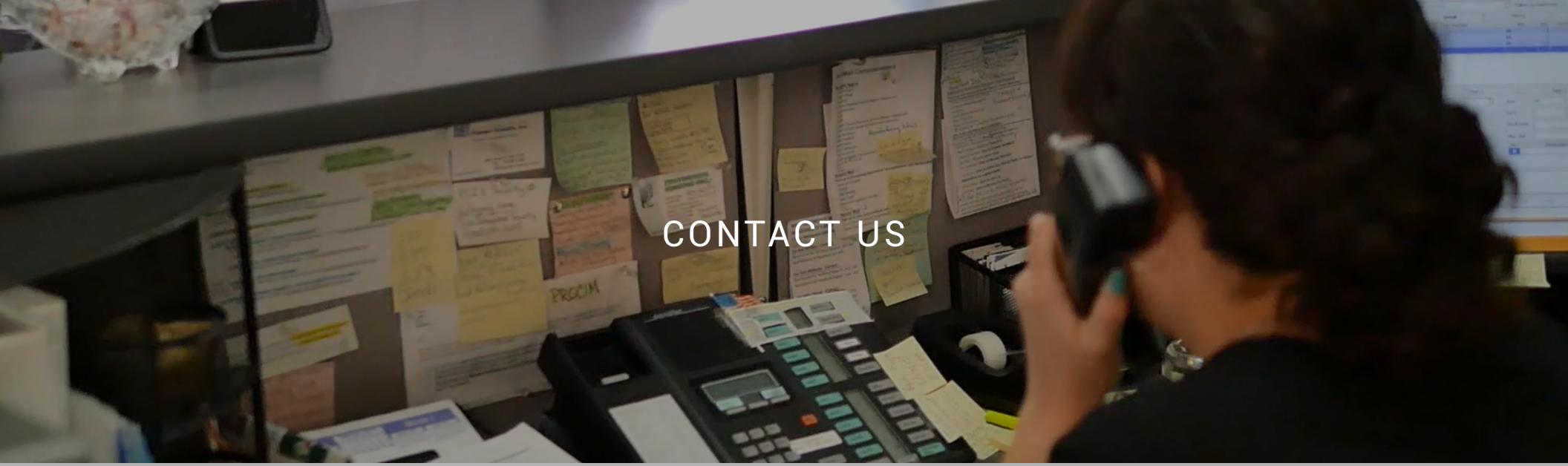
- IPC 6013
- IPC 6012
- IPC-A-600

### QUALITY MANAGEMENT SYSTEM

- AS-9100
- ISO 9001-2000

### ITAR REGISTRATION

- DTC 120613582



## **LET US HELP MAKE YOU MORE SUCCESSFUL**

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**WE VALUE YOUR OPINION. PLEASE SEND US YOUR FEEDBACK ON THIS BOOKLET AT**

<http://pioneercircuits.com/wbfeedback>