

# RETRONIX

A JABIL COMPANY

# Built on a solid foundation

1993

FOUNDED

TOP TIER

ELECTRONICS  
SERVICES PROVIDER

150M+

DEVICES  
REBALLED/RETINNED



TENURED  
MANAGEMENT TEAM

150+

DEDICATED  
EMPLOYEES

400+

CUSTOMERS ACROSS  
DIVERSE MARKETS

3

PRODUCTION  
SITES

70M+

DEVICES RECOVERED  
FOR RE- USE

2M+

DEVICES TESTED  
FOR AUTHENTICITY

# Highest standards of quality & expertise

17

PROFESSIONALS TRAINED &  
CERTIFIED IN J-STD-001

6

MEMBERS TRAINED & CERTIFIED IN  
7711/7721

7

EXPERTS TRAINED AND CERTIFIED  
IN IPC A-610

- AS9100 REVISION D
- IPC-A-610
- IPC-7711/7721
- CONFORM TO GEIA 0006 STANDARD



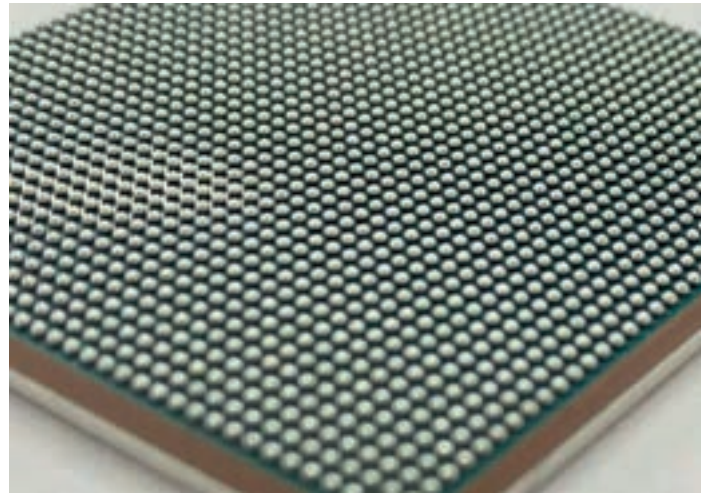
# SERVICE OFFERINGS

## Reballing Service

Reballing involves the removal and replacement of solder spheres on a Ball Grid Array (BGA) component, ensuring secure electrical connections and preventing failures. Retronix provides a unique Laser Reballing service, which mitigates the need for an additional reflow, thus protecting the device.

### Why Reball

- Components have been removed from existing printed circuit boards for internal re-use
- Components have missing solder spheres due to handling, packaging or transit damage
- Components have been reclaimed from existing printed circuit boards for liquidation purposes
- Customer cannot source original components with required alloy due to obsolescence or component shortages
- Customer has a requirement to convert new parts to a specific alloy – in line with the regulation



### DEVICE TYPES FOR REBALL | BGAs, GPUs, CPUs, MEMORY DEVICES

### INDUSTRY APPLICATIONS



AEROSPACE  
DEFENSE  
SPACE



AUTOMOTIVE



CONSUMER  
ELECTRONICS



CLOUD/  
HARDWARE  
ELECTRONICS



INDUSTRIAL  
ELECTRONICS

### RETRONIX VALUE

200+ customers

3 REBALLING PROCESSES:  
LASER REBALLING, REFLOW REBALL  
& PROJECT SPECIFIC

50M+

DEVICES REBALLED

\$150M+

ECONOMIC VALUE  
RECOVERED

## Circular Economy Solutions

Component recovery in electronics refers to the process of extracting high value and hard to find components from electronic devices and circuit boards for re-use. It promotes sustainability by reducing e-waste and recovering value, thereby contributing to a circular economy in the electronics industry.

### Why recover components?

- Reduce total scrap costs.
- Provides a source for hard to find obsolete parts
- Re-use components in production.
- Creates a channel for spare parts for repairs.
- Provides an opportunity to generate a revenue stream through component liquidation.
- Introduces sustainability in design & production.
- Obsolescence solutions.



**DEVICE TYPES FOR RECOVERY** | ALMOST ALL DEVICE TYPES CAN BE RECLAIMED FOR RE-USE

### INDUSTRY APPLICATIONS



**AEROSPACE  
DEFENSE  
SPACE**



**AUTOMOTIVE  
ELECTRONICS**



**CONSUMER  
ELECTRONICS**



**CLOUD/  
HARDWARE  
ELECTRONICS**



**INDUSTRIAL  
ELECTRONICS**

### RETRONIX VALUE

**200+ Customers**

COMPONENT RECOVERY OFFERINGS:  
AUTOMATED NO REFLOW PROCESS &  
MASS HARVEST PROCESS

**70M+**

DEVICES RECOVERED

**\$250M+**

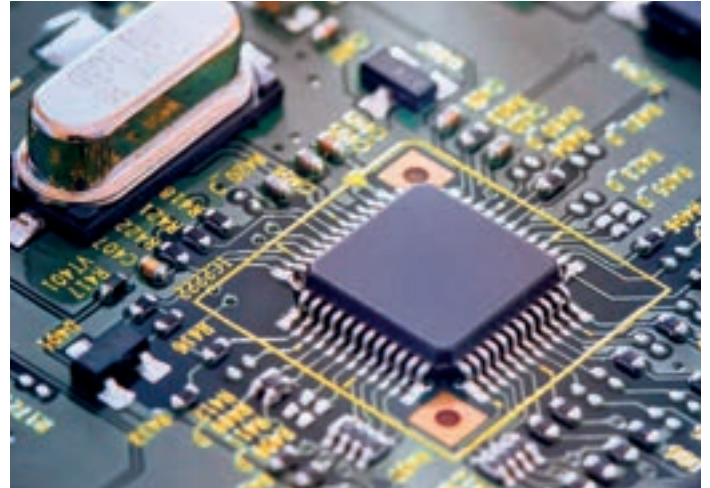
ECONOMIC VALUE  
RECOVERED THROUGH  
RE-USE

## Retinning Services

Retinning is the process of removing old, oxidized solder and applying a fresh layer of solder to component leads. It is also used to convert alloy on devices.

### Why Retin

- Components have oxidised leads due to storage and aging of parts (old Date Codes)
- Components have damaged leads due to handling, packaging or transit damage.
- Components have been removed from existing printed circuit boards for internal re-use.
- Customer cannot source original components in the required alloy due to obsolescence or component shortages
- Customer has a requirement to convert new parts to a specific alloy – tin whisker mitigation



**DEVICE TYPES FOR RETIN** | QFPs, TSOPs, TSSOPs, CHIP CAPACITORS, CONNECTORS, ANY DEVICE WITH LEADS (LEGS)

### INDUSTRY APPLICATIONS



**AEROSPACE  
DEFENSE  
SPACE**



**AUTOMOTIVE  
ELECTRONICS**



**CONSUMER  
ELECTRONICS**



**CLOUD/  
HARDWARE  
ELECTRONICS**



**INDUSTRIAL  
ELECTRONICS**

### RETRONIX VALUE

**200+ Customers**

RETINNING PROCESSES:  
AUTOMATED PROCESS, COBOT  
TECHNOLOGY & MANUAL PROCESS

**80M+**

DEVICES RETINDED

**\$150M+**

ECONOMIC VALUE  
RECOVERED THROUGH  
RE-USE

## De-gold Electronic Components

Mitigate Gold Embrittlement Issues

### Why de-gold?

Gold is commonly used in electronics manufacturing due to its good electrical conductivity and high resistance to oxidation and corrosion. However, gold can weaken the integrity of solder joints during the soldering process. The gold reacts with the solder, forming brittle intermetallics. This can lead to gold embrittlement, a well-known failure mechanism. To eliminate this risk, the safest option is to remove the gold before assembly.



#### WHY RETRONIX |



CIRCULAR  
ECONOMY



AUTOMATED  
ALLOY CONVERSION



COMPONENT  
LIQUIDATION

#### RETRONIX BENEFITS |

- **Mitigates Gold Embrittlement:** Eliminates brittle connections in solder joints.
- **Enhances Longevity & Reliability:** Extends the life of electronic components.
- **Tin Whisker Mitigation:** Reduces risks in electronic assemblies.
- **Versatility in Alloy Conversion:** Accommodates a wide range of device types.
- **Quality Assurance:** Ensures high-reliability outcomes.
- **Cost Efficiency:** Extends component life, reducing replacement costs.
- **Sustainability:** Promotes reuse of components, minimizing e-waste.

#### RETRONIX VALUE

6M+

DEVICES PROCESSED  
LAST YEAR

\$50M+

ECONOMIC VALUE RECOVERED  
THROUGH RETRONIX SERVICES

50+

DEVICE TYPES PROCESSED  
AND GROWING

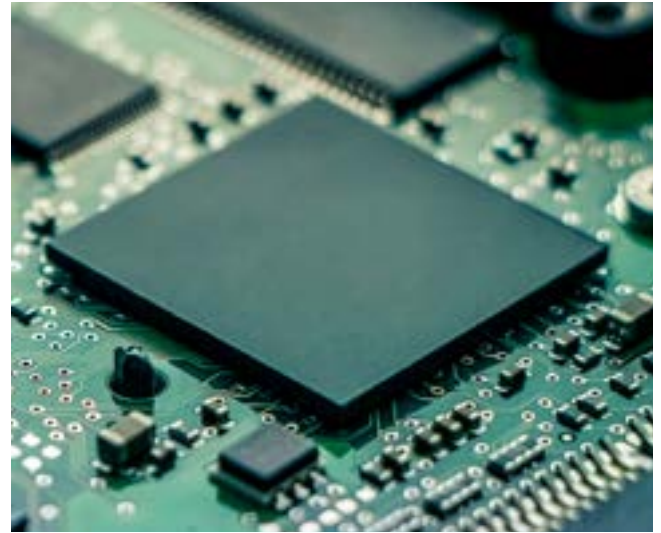
# Coefficient of Thermal Expansion Failure Mitigation

QFN, LGA Devices

## What are the issues?

QFN type packages are susceptible to Coefficient of Thermal Expansion (CTE) mismatch issues. The QFN package typically contains a relatively large volume fraction of silicon, which creates a significant CTE mismatch between the QFN and the board.

This mismatch can lead to solder joint failures due to thermal cycling. The solder joint height in QFN packages is minimal, resulting in increased stiffness of the solder joints. This can lead to substantial stress in the solder joints which can result in fractures.



### WHY RETRONIX |



CIRCULAR  
ECONOMY



AUTOMATED  
ALLOY CONVERSION



COMPONENT  
LIQUIDATION

### RETRONIX BENEFITS |

- **Mitigating CTE Mismatch:** Balling QFN packages helps reduce issues caused by differences in thermal expansion of materials used in PCB and packages.
- **Improving Thermal Cycling Behavior:** Balling enhances the thermal cycling behavior of QFNs by improving the mechanical properties of the solder joint.
- **Enhancing Reliability:** The reliability of QFNs can be further enhanced by adding spheres or “balling”.
- **Reducing Solder Joint Strain:** Balling contributes to methods like underfilling, edge bonds, and corner staking, and voids helping to reduce solder joint strain.

### RETRONIX VALUE

6M+

DEVICES PROCESSED  
LAST YEAR

\$8M+

ECONOMIC VALUE RECOVERED  
THROUGH RETRONIX SERVICES

50+

DEVICE TYPES PROCESSED  
AND GROWING



# Component Authenticity Testing & Services

Electronic component testing offers numerous benefits that are integral to maintaining the quality, efficiency, and reliability of electronic components. It aids in identifying defects, and reducing potential failures and risks.

## Why Test

- Validation & Certification of parts from unknown sources
- Risk mitigation
- Quality assurance: tests ensure that components meet the relevant quality standards
- Failure Analysis
- Device upscreening (Temperature Testing)



**DEVICE TYPES FOR TESTING** | ALMOST ALL DEVICE TYPES CAN BE TESTED

## INDUSTRY APPLICATIONS



**AEROSPACE  
DEFENSE  
SPACE**



**AUTOMOTIVE  
ELECTRONICS**



**CONSUMER  
ELECTRONICS**



**CLOUD/  
HARDWARE  
ELECTRONICS**



**INDUSTRIAL  
ELECTRONICS**

## RETRONIX VALUE

**10+**

DIFFERENT TESTS  
OFFERED & PROFESSIONAL  
REPORTS ISSUED

**2M+**

DEVICES TESTED

**30**

YEARS ELECTRONICS  
INDUSTRY EXPERIENCE

## PCB Services

Printed circuit board (PCB) repair is the process of fixing a damaged or malfunctioning board. PCBs can be damaged by a variety of factors, including physical damage, electrical damage, and corrosion. Retronix offers component-level rework on PCBs.

### Why PCB Services

- Scrap or inventory bone-pile issue inside the factory/warehouse
- Manufacturing fallout solution: reduce financial write offs and increase yield values
- Specialist turnkey rework solutions carried out to IPC and JEDEC standards
- Customized solutions such as adding wire mods and intricate rework



**BOARD-LEVEL SERVICES** | PCB SERVICES ARE NOT DEVICE-SPECIFIC. EACH REPAIR IS ASSESSED ON A CASE-BY-CASE BASIS.

### INDUSTRY APPLICATIONS



AEROSPACE  
DEFENSE  
SPACE



AUTOMOTIVE  
ELECTRONICS



CONSUMER  
ELECTRONICS



CLOUD/  
HARDWARE  
ELECTRONICS



INDUSTRIAL  
ELECTRONICS

### RETRONIX VALUE

30

YEARS ELECTRONICS  
INDUSTRY EXPERIENCE

500K+

BOARDS REPAIRED

25+

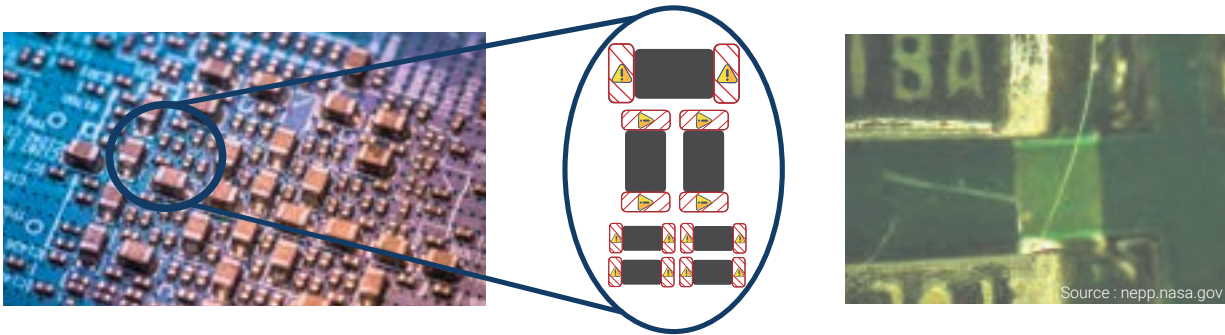
COUNTRIES WHERE WE'VE  
PROVIDED VALUE

# Retronix Unveils Comprehensive Tinning Service: Full BoM Conversion to GEIA Standards

Retronix announces a significant expansion of their tinning service - now offering **Full BoM Conversion to GEIA standards, covering chip components and SOT's**. This development comes as an answer to the industry's ongoing concerns about tin whisker growth.

It is known that a whisker grows from its base and that the tin around the base does not thin as the whisker grows, they can easily short two connections damaging the chip and causing the PCB to fail.

Failure is not an option in the high reliability sectors of space, avionics and defence.



## INFLUENCING FACTORS

- Extreme temperatures, humidity, pressure, vibration, G forces, radiation exposure etc
- Material factors like composition, thickness, crystal structure of the tin etc.

## RETRONIX SOLUTION

- An automated process for all component types, offering a unique opportunity for full BoM (bill-of-material) tinning.
- A specialised robotic arm can hold multiple devices at a time.
- Automated system ensures the tinning is precise and consistent to the GEIA 0006 Standard.

## CONFORMAL COATING DOES NOT PREVENT TIN WHISKERS

NASA Study<sup>(1)</sup>: NASA found that conformal coating does not prevent tin whisker formation. They observed that a tin whisker grew through an area of conformal coating that was approximately 0.25 mil thick.

## GEIA STANDARD TINNING PROCESS

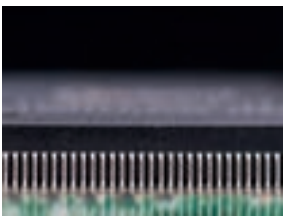
Unlike conformal coating, which merely provides a protective layer, the Retronix auto tinning process to the GEIA standard fundamentally fixes the tin whisker problem, thus offering a more robust solution against tin whiskers and a guaranteed mitigation approach.

## RETRONIX BENEFITS

The Retronix auto tinning process has achieved a significant breakthrough in the electronics industry, particularly in chip component tinning to GEIA standards. Previously, due to their small size, components like capacitors and resistors were not suitable for auto tinning as they were too challenging to process.

This puts Retronix in a unique position where they can process all components from lead-free to tin/lead in compliance with the GEIA standard, offering a comprehensive solution to their customers.

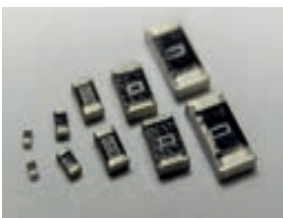
## QFP / TSOP & OTHER LEADED DEVICES



- ✓ Automatic tinning, wash and coplanarity checks
- ✓ Convert from Pb Free to Pb and vice versa
- ✓ Combination of Alloys - SAC, Ag, Tin, Pb

The fully automated system ensures that the devices are not exposed to excessive heat or abrasion. This meets the stringent high reliability standards of the GEIA-STD-0006.

## CHIP CAPACITORS, RESISTORS AND MICRO DEVICES



- ✓ Fully automated process that covers the side and top of the device terminations.
- ✓ Convert from Pb Free to Pb and vice versa.
- ✓ Combination of Alloys - SAC, Ag, Tin, Pb

A unique offering by Retronix to tin micro components such as 0402's, 0603's, SOT's to GEIA standards. The industry now has a comprehensive all-inclusive solution.

## BGA TYPE DEVICES



Retronix offers a sophisticated BGA (Ball Grid Array) laser rebalbing service that utilizes a laser to rebal BGA's without a reflow cycle, and without the laser touching the component.

- ✓ Unique laser rebalbing
- ✓ Automated process
- ✓ AS9100D Certified

10M+

DEVICES PROCESSED

40+

COUNTRIES SERVED

50+

DEVICE TYPES PROCESSED  
AND GROWING



[contact@retronix.com](mailto:contact@retronix.com)

UK: Retronix, North Caldeen Road, Coatbridge, Scotland, UK, ML5 4EF

USA: Retronix Global Inc, 1007 S Heatherwilde Blvd, Ste.300, Pflugerville, TX, 78660

USA: Retronix, 10560 DR M.L.K. Jr St N, St.Petersburg, FL, 33716

[retronix.com](http://retronix.com)