

Spherical Near-field Scanner

## Micro-Ant

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Founded in 2001, Micro-Ant designs, develops and manufactures custom antennas for land, maritime and aerospace applications operating within the Microwave Frequency Spectrum including UHF, L, S, C, X, Ku and Ka-bands

The design team has significant expertise in this field and holds strategic patents. Micro-Ant develops intellectual property for various applications, including 2-way SATCOM, COTM, aviation antennas, SDARS, DVB, and GPS. Products include phased arrays, patches, parabolic and flat panel antennas, and low profile active antennas.

Micro-Ant specializes in providing solutions to military and aerospace customers which demand performance in extreme environmental and mechanical conditions. All products are put through rigorous in-house Electrical, Mechanical, and Environmental testing. Compliance to specifications over temperature, shock, vibration, and other military and aerospace standards is demonstrated at Micro-Ant prior to shipping product. Antenna performance over environmental conditions is ensured for operational, survival, and storage requirements. From design specification to raw materials to final assembled and tested antenna, quality control per military and aerospace standards is our prime focus.

Our world-class engineering design, manufacturing facility is located in Jacksonville, Florida.



## Spherical Near-field Scanner

- AMETEK NSI-MI 700S-60 spherical near-field scanner
- Phi over Theta near-field and direct far field capability
- Frequencies from 1 GHz to 40 GHz
- Unit under test size up to 2 meters
- Full 360° X 360° pattern coverage for certification and compliance measurements

## Planar Near-field Scanner

- AMETEK NSI-MI PNF-XYV-1.5X1.5 planar near-field scanner
- X, Y and Z translation movement
- Frequencies up to 40 GHz
- Unit under test size up to 1 meter
- Fast pattern generation for production and design verification

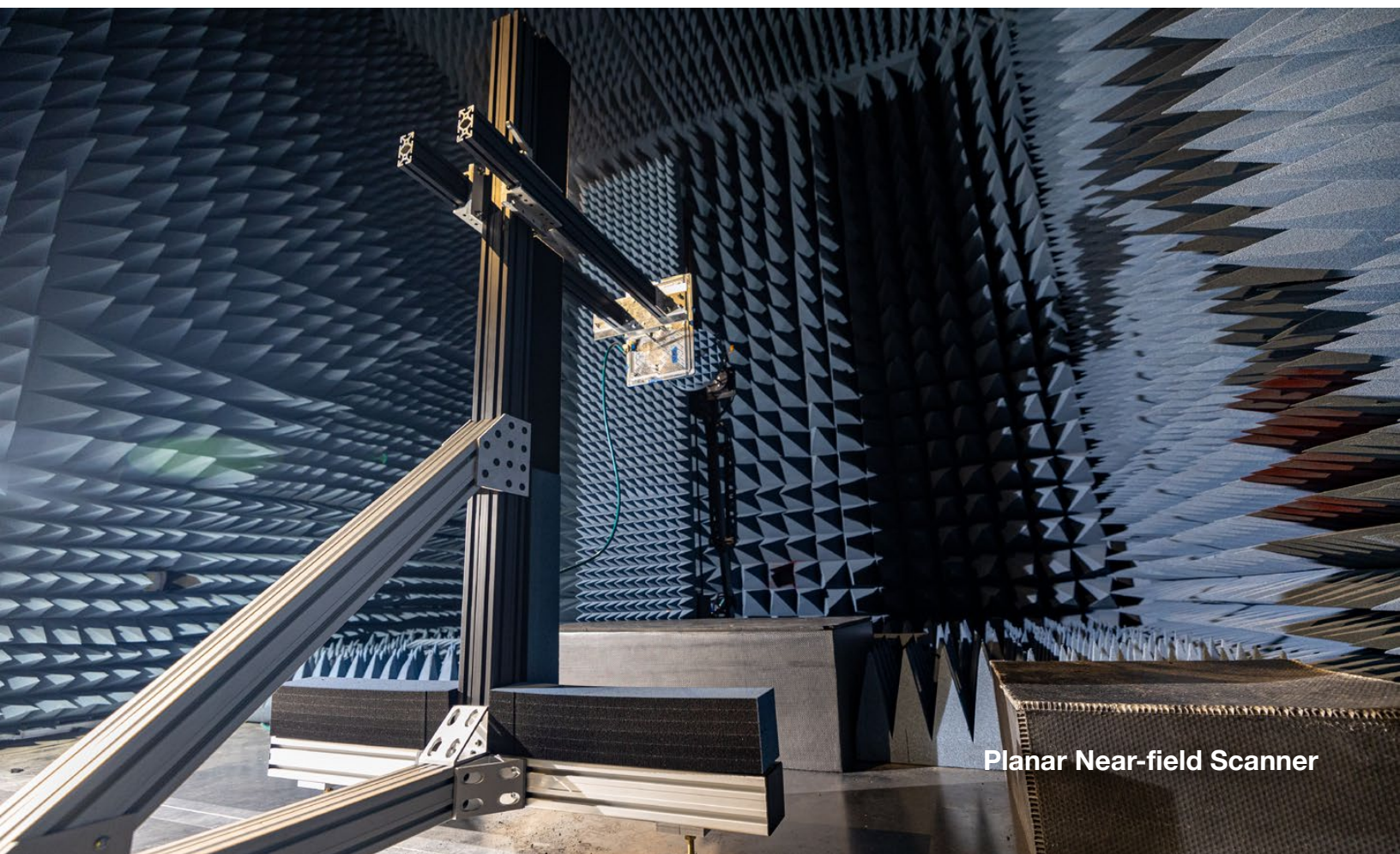
## In-Line Automated Production Test Capability

### Waveguide/Passive Products

- Multiple product line specific anechoic test chambers
- LabView based automated measurement systems
- Keysight 9300 series Streamline PNA data acquisition
- Each automated system is specifically designed and programmed for the most efficient and accurate measurement of the critical specifications of the product line

### Active Products

- Keysight MXA Signal Analyzer based, LabView controlled automated PCB test systems capable of measuring amplitude, phase, and noise figure through multiple active paths
- Production test systems for electronically steerable antennas that can verify accurate creation of hundreds of beam positions through element amplitude and phase measurements



Planar Near-field Scanner



## Mikron Machine Capability

The Mikron Machine Center line is a world-class Swiss-designed 5-axis solution for precision, high-volume, automated production, which perfectly combines dynamic control and thermal stability. Utilizing high-end programming software, the Mikron's Heidenhain Controller, and simulation tools, we achieve expedited part quality excellence in the most demanding of applications. Micro-Ant has developed proprietary processes for utilizing these cutting-edge machines, typically used only for medical-grade manufacturing and tolerances, to push to the boundaries of what is possible to the very limits of physics in RF solutions. Seamlessly integrating engineering with production manufacturing, we have pioneered a system for delivering high-performance, quality antennas from quantity 10 to 10,000 and beyond. The ability to control the quality of the product from customer specification development to design inception and validation through sales order delivery is a capability unrivaled in the antenna design industry. Here's an overview of our manufacturing capabilities.



### **MIKRON HPM 450U Machines** **MIKRON UCP 600 Vario Machines** **MIKRON HSM 400u Machines**

- < 0.0001" Micron tolerance capability in volume production with proprietary kinematic compensation
- Real time on-board digital and mechanical thermal compensation algorithms
- > 1.6m/s Direct Drive High Speed Manufacturing kinematics
- > 20k RPM High speed spindle capability
- 5-Axis live machining
- Precision lights out automation and custom high volume tombstone manufacturing
- In-machine part quality probing
- Metrology grade laser assisted tool and part compensation
- Scalable volume Machine Centers with multi-pallet changing capability

## Okuma Turning Centers

### LT2000

- Sub-Micron accuracy multi-axis mill turn capability
- Multi-turret multi-spindle simultaneous machining
- Robotic automation capability equipped
- > 12.0" large part turning

### LB3000EX

- Sub-Micron accuracy multi-axis mill turn capability
- Robotic automation capability equipped
- > 12.0" large part turning

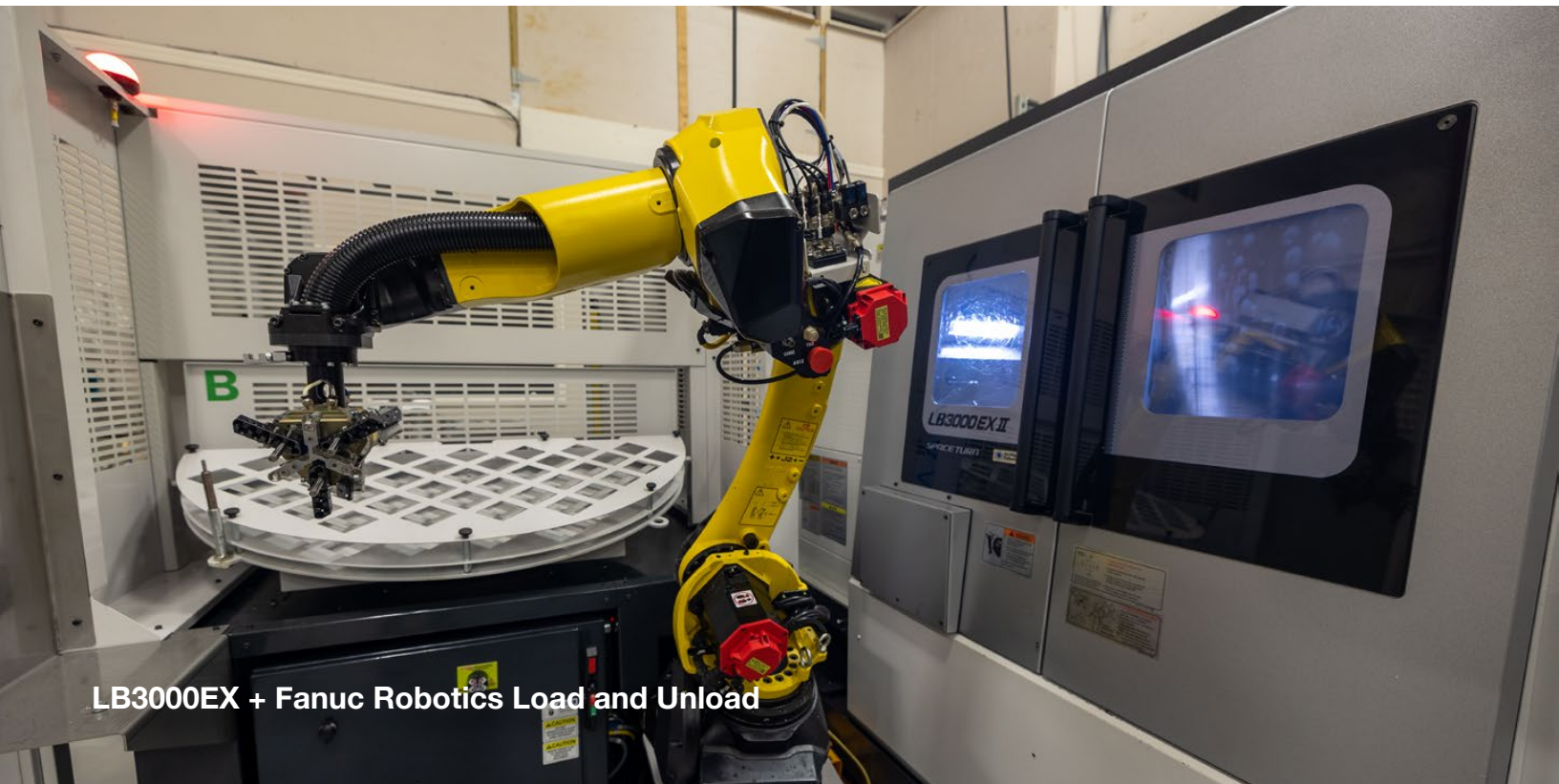
## Additional Multi-Axis Machining

### Kitamura HX250G MyCenter

- > 30k RPM High Speed Spindle capability
- Sub-micron positioning and repeatability
- High volume lights-out pallet changing equipped
- Metrology grade laser tool sensing

### Mazak Nexxus

- > 80k RPM spindle capability
- 4-Axis machining capability
- > 40.0" Precision work space capacity



LB3000EX + Fanuc Robotics Load and Unload

## Lights Out Automation

- Large capacity turning center Servo bar feeders
- Fanuc Controller large capacity (>20lb payload) autonomous robotics
  - Automated loading and unloading of parts
  - Precision repeatability and application flexibility
  - Proximity sensing safety and high speed options
- Multi-Part Pallet changing capability
- Tool breakage/quality sensing and replacement algorithms
- Part geometry check and digital thread logging of quality information framework
- Automated raw material cutting centers





MyCenter HX250G



Mikron XSM 400 U LP



LB3000EX + Automated Servo Material Loader



High Volume Automated Material Cutting



## World Class Enterprise Resource Planning (ERP)

- Custom developed Epicor ERP Environment
- Real time Methods of Manufacturing Tracking and Quality Management system
- Ensures AS9100 compliance and quality of product
- Proprietary scripting to support cutting edge RF technology and testing

## Ultrasonic Welding

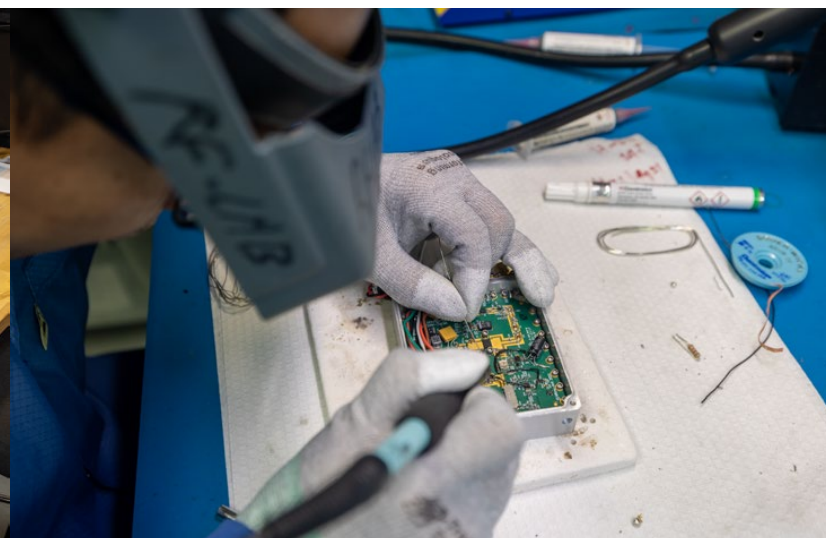
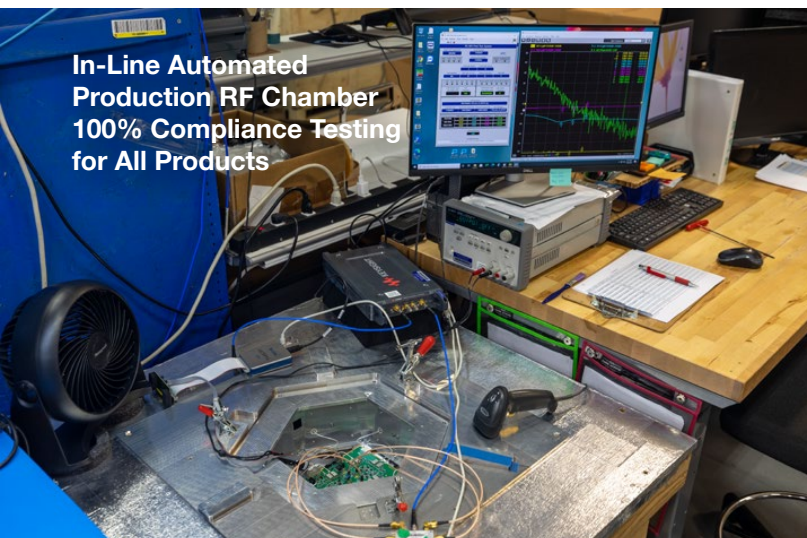
- Large part plastics welding >10.0" in diameter @ 15KHz
- < 2.0s cycle time on high volume precision welds
- 100% cycle quality data logging

## Environmental Chambers/Validation

- Cincinnati Sub Zero (CSZ) Humidity and Temperature Chamber
  - 100% Relative Humidity (RH), -45.0°C, +190.0°C
  - 100% Customer compliance matrix validation for Storage, Operating, and Survival conditions per Mil-Std, IEC, DO, etc.

## Induction Soldering

- < 1.0s cycle time on RF grade applications
- Fully customizable to any application
- Supports large volume production
- 100% cycle quality data logging



## 3-Axis Robotic Adhesive Dispensing

- 1 and 2-Part mixing and dispensing automated systems
- Fully customizable to any application
- 15.0" x 20.0" x 10.0" usable area with expansion options based on model

## Robotic Cable Assembly Line

- Fully automated cable lines supporting any RF cable size and connector type
- Robotic stripping machines
- Robotic crimping machines
- Induction soldering and forced convection capability
- In-Line DC/RF quality testing

## RF Grade Potting Equipment

- 1 and 2-part volume measured dispense equipment
- Large array of proprietary low dielectric constant (Dk) and Loss Tangent materials for high frequency applications

## Universal Robots (UR)

- Multi-Axis custom programmable UR robots
- Supports a wide array of applications based on demand
- Fitted per job with in-house fabricated custom end of arm tooling (EOAT)







## Coordinate Measuring Machine (CMM)

### Global S CMM

- Cutting edge environmental compensation system
- High Speed inspection capability
- <2.0 micron accuracy on hard probe measurements
- Fully automated production inspection
- Leitz HP-S-X1 scanning probe capability
- Universal fixturing system for large volume inspection

### Global Performance CMM

- <2.0 micron accuracy on hard probe measurements
- Fully automated production inspection
- Leitz HP-S-X1 scanning probe capability
- Universal fixturing system for large volume inspection

### FARO Portable Arm Inspection Equipment

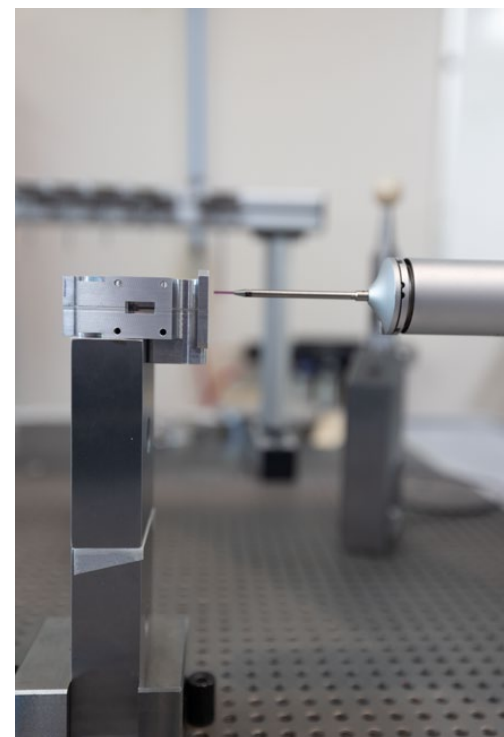
- Laser Scanning capability for > 1.0m Parts
- 3D CAD Generated Programming

## ERP Quality Module

- Customer returned material management and tracking
- Automatic Incoming material inspection routing
- Corrective action tracking capability
- MRB hold for suspect material
- DMR disposition hold for non-conforming material



### Global Performance CMM







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