

TJM ELECTRONIC ASSOCIATES

**Aerospace, Commercial, Medical, and Military
Electronic - Electromechanical
Manufacturing Services since 1989**

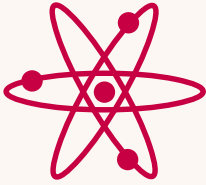


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TJM **ELECTRONIC
ASSOCIATES**

Mission Statement

The goal and focus of our entire organization is the success of our customers.

To achieve this end, we strive to provide responsiveness and accuracy by utilizing modern process methodology, real-time communication, employee empowerment and training.

Thomas J. McCarthy
President/CEO

WHO WE ARE

TJM Electronic Associates is a full service “Electronic Contract Manufacturer”, with expertise in electronic design, packaging and manufacturing.

TJM services go well beyond the traditional circuit board assembly, to include: engineering, design, system integration & test, and complete turnkey production.



TJM serves an ever growing array of prestigious companies including: Ametek, IBM, Intel, L-3, Lockheed Martin, Lucent Technologies, Motorola, Northrop, Raytheon, Sarnoff Research Center, etc.

TJM Electronics employs a highly skilled workforce of over 75 dedicated technical professionals with expertise in: electronic design, assembly and fabrication, surface mount technology, automated manufacturing machinery and most importantly, quality control.

Founded in 1989, our small family run business has experienced explosive growth from only \$66K in revenues in our first year to more than \$17,000,000 in 2000.



We take pride in our achievements, having been recently recognized:

Philly Top 100 Companies - The Philadelphia Business Journal

Fast Fifty Tech Company - Delloitte & Touche

Manufacturing Entrepreneur of the Year 2000 - Ernst & Young

TJM can handle virtually any requirement from engineering prototype to large production quantities. We provide our clients with engineering, procurement and materials control along with **unsurpassed service and quality.**

WHAT WE DO

TJM is recognized for our expertise in advanced manufacturing processes. We provide our customers with precise engineering data for unique solder printing and thermal reflow soldering.

TJM while working with large semiconductor manufacturers has developed solder stencil step and aperture processes for complex OFP devices.

TJM has engineered the processes and profiles for a large defense contractor on 18 x 15 " PCB's with over 4000 components that included 36 BGA's.

TJM lab technicians are equipped with 12-zone programmable reflow ovens, vision automated solder printers, X-Ray, ionic contamination testing, Hi-end rework station and a flying probe tester.

SPECIAL SERVICES

SENSORS

TJM can provide design engineering for custom applications for sensors, to include: accelerometers, clinometers, pressure transducers, IR, and temperature.

DEVICE TESTING

TJM can perform selective screening on semi-conductor devices to meet customers requirements. Full QCI is also available with our four environmental chambers.

SYSTEM TEST RACKS

TJM has over 20 years experience in the design, build and testing of boxes and enclosures to meet our customers specs. We can satisfy any requirement for custom wiring and cable harnesses. TJM has the resources and experience in custom burn-in-racks to include plumbing and water flow control along with data acquisition.

APPLICATION ENGINEERING

TJM has worked with major semiconductor and microprocessor manufacturers utilizing their components for their customers application. We provide full turnkey services to meet the small and medium run requirements.

OTHER SERVICES

TJM can provide packaging requirements for our customers products to include full function testing, conformal coating, encapsulation, marking, barcode tracking, and special shipping.

WHAT WE DO



CIRCUIT BOARD DESIGN

PROTOTYPE ASSEMBLY

**TURNKEY / PRODUCTION
ASSEMBLY**

**AREA ARRAY TECHNOLOGY
(BGA, CBGA, PGA, CGA)**

**SURFACE MOUNT ASSEMBLY
(FINE PITCH TO 15MIL)**

THRU-HOLE ASSEMBLY

IN-CIRCUIT TEST

FUNCTIONAL TEST

BURN-IN TESTING

CONFORMAL COATING

CHASSIS ASSEMBLY



POTTING / ENCAPSULATING

RETROFITS / UPGRADES

CABLING / WIRING

MODIFICATIONS

FIELD INSTALLATIONS



WHAT WE HAVE DONE

IBM - Triple Bay Test Rack
... water cycler for thermal cycling
90 mm multilayer ceramic modules



RCA Corp. - Broadcast Camera
... packaging of the first
CCD broadcast camera

AT&T - Laser Test Racks
... test rack and data acquisition
for optical data link devices -
incorporates card cages
and heat exchanger



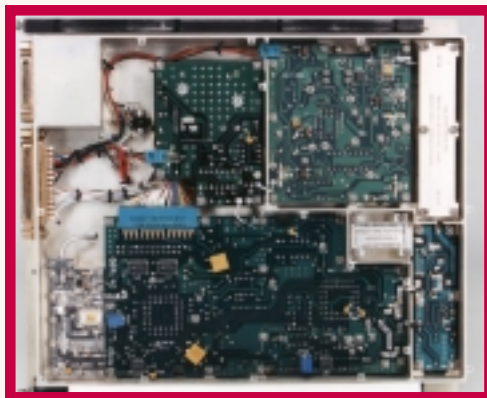
Bradley Tank Program
... developed, packaged and
fabricated more than 30
different assemblies



Power Panel



Signal Entry Panel



NATO Portable SAT Terminal
for Bosnia Field Commanders

QUALITY CERTIFICATIONS

TJM Electronic Associates personnel have been trained and certified to the following Industry Standards:

IPC-J-STD-001B
(Certified instructor)

IPC-610-B

MIL-STD-2000

MIL-I-45208

ISO-9002 KEMA certified
(certification # 11514-01)

MIL-STD-1686

GE Nuclear spec. (Pending)



TERADYNE Javelin™ 1004 Flying Prober

(Fixtureless in-circuit tester for loaded SMT printed circuit boards)

TJM is a certified Lockheed Martin Supplier SD6N00-Class 3 and was the first Mil-certified, automated surface mount company on the East Coast.



NICOLET REAL TIME X-RAY MACHINE

Copies of certifications and/or quality control documentation are available upon request.

EQUIPMENT WE USE



- 2 ZEMTECH PM 570 LASER - 5000CPH
- 2 MULTITRONICS 2000 SX LASER PLACER 2,000CPH
- 3 OK INDUSTRIES BGA PLACEMENT MACHINES
- 2 ZEVATECH 710 CHIP SHOOTER 9,000CPH
- 3 ZEVATECH PM560 3,000CPH W/ DISPENSER
- 6 ZEVATECH PM460'S 1500CPH

- 9 SOLDERPASTE SCREEN PRINTERS
- 3 - 5 ZONE CONV. REFLOW OVENS
- 2 ABW 1412 - 7 ZONE REFLOW OVEN
- 2 ELECTROVERT 16" WAVE SOLDER MACHINE
- 2 MPM-SPM DUAL VISION AUTO SCREEPRINTER
- 1 HOLLIS IN-LINE BOARD CLEANING SYSTEM
- 2 NICOLET REAL TIME X-RAY
- 1 BENCHMARK AV-100 COLOR CAMERA INSPECTION SYSTEM



- 1 TERADYNE FLYING PROBE TESTOR
- 1 ALPHA IONIC CONTAMINATION TESTOR
- 2 BLUE M ENVIRONMENTAL CHAMBERS
- 20 BAUSCH & LOMB STEREO 35X MICROSCOPES

- SPECTRUM ANALYZERS
- BIT ERROR RATE MONITORS
- RF GENERATORS, SCOPES
- MISCELLANEOUS PRECISION QC GAGES



WHO WE SERVE

(PARTIAL LIST)

3A International	Innovative Solutions	Princeton Scientific
ABB	Inrange Technologies	Princeton Technology
Accusort	Intel Corp.	Pyramid Vision
Agere	Interspec	Quadrangle
AHM Technologies	Innovative Solutions	Raytheon
Alcatel	Interdigital Comm. Corp.	RF Power Products
Ametek US Gauge	Kanson Electronics	Rieker Electronics Inc.
Analog Devices	L-3 Communications	Sarnoff Research Labs
Applied Products Inc.	L-3 Telemetry East	SASI
Aries Electronics	Litton Special Devices	Seimens
Artisan Electronics	Leading Edge Tech.	Sensors Unlimited
Automation Int'l	Liquality Inc.	Shriners Hospital
Bourns Integrated Tech.	Lockheed	Simco Electronics
Bruckner	Lucas Control Systems	Skyline Technology
C.T.D.I.	Lucent	Sonic Industries
Comtech	Motorola	SPD Technologies
Corby Industries	Microchip	Spectrasonics
Demtrix	Newghent Tech	Speedfam
EG & G Judson	Northrop	Staneco
Ecton Inc.	Ocean Power Techn	Synthesis Consulting
Edge Industries	Okidata	Technidyne
Exact Flow	On Semi	Techtrol
F & F Industrial	Oppenheimer Precision	Teleflex
Gatefield	Orbital Sciences	Telenex
General Atronics	Orthologic	Test Technology
GEC Marconi	Padcom	Three Five Systems
General Instruments	Panasonic	Tinus Olsen Testing
General Signal	Paradigm Computer	Total RF Marketing
Globespan	PECA	UGM Medical
Hale Products	Phillipsburg	Utilitek
Heimann Systems Corp.	Photuris	VEECO
Henschel	Piezo Crystal	Videotek
Honeywell Inc.	Praegitzer	Worldgate
IBM	Princeton Electronic Sys.	Z Media

WHAT CUSTOMERS SAY

"We recognize the extra effort that you and your staff have put in to meet our rigorous demands and wanted to inform you that your efforts are not only recognized but really appreciated."

Steven Strauss
Senior Design Engineer
Lucent Technologies Bell Labs

"Your constant on-time delivery performance, design support, commitment and dedication to producing a quality product has contributed to increasing our customer base and maintaining our cost objectives."

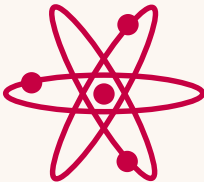
Dave McCaffrey
Litton Special Devices
Poly-Scientific Division

"With minimal support, TJM was able to reduce the entire (NATO portable satellite) program procurement material lead time from six months to two months. Your commitment to assemble and deliver these items on schedule was truly outstanding. Meeting this deadline was an absolute team effort. TJM was a major partner on this team and is to be commended."

Gregory Roberts
President
Lockheed Martin Communication Systems

"The partnership that has been formed between TJM and Sarnoff has allowed us to grow, meet cost objectives and focus on doing what we do best. We continue to look forward into the future with TJM as a loyal and well-respected partner."

Francis P. Pantuso
Director, Imaging Systems Laboratory
David Sarnoff Research Center



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