



We at APSM/JIT take great pride in our Engineering Department and their technical capabilities; this ensures the highest quality to meet our customers' standards. And it's not done single-handedly; each team puts every job through a detailed process to ensure every product meets a paragon standard.

- First, Engineering works closely with the customer to define and develop the assembly instruction requirements.
- Secondly, the Engineering Department uses engineering tools and techniques such as DOEs, SPC and new product qualification processes to ensure the processes are stable, tight and in control.
- As part of our continuous improvement plan, our Engineering and Quality departments analyze historical data to continuously improve quality. This ultimately reduces the cost of material and labor to current and future customers.

Today, APSM/JIT Electronic Engineering Department offers a host of services including PCB layout and Design For Manufacturability (DFM). Another service we hold in high esteem is the continuous review and improvement of our processes to ensure ease of manufacturing to reduce assembly costs toward the finished product. Our technical ability combined with our development assembly programs, including electrical test design, allows us to offer other services such as standard through-hole to surface mount technology, which includes 15-mil fine pitch and micro BGA processes. APSM/JIT's Engineering team works closely with our customers to review existing processes and implement new ones to meet the ever-changing technology, as we know it today.

Electronics Assembly

Electronic assembly for both surface mount and through-hole circuit boards consists of:

- 1) Applying surface mount parts
- 2) Inserting through-hole parts
- 3) Performing an Automated Optical Inspection
- 4) Push Line for connector insertion
- 5) Wave Soldering
- 6) Washing
- 7) Post Soldering
- 8) Functional Testing
- 9) Product inspection - Phase I
- 10) ICT Testing
- 11) Product inspection - Phase II
- 12) Cable and Harness
- 13) Final Assembly
- 14) Marking/Labeling
- 15) Final product inspection



1. ISO PROGRAM

- ISO9002 Certified
- Internal Audit Team
 - ✓ Members comprised of personnel from all departments.
 - ✓ Members are trained to perform internal audits.
 - ✓ Audits are performed on all procedures to ensure departmental compliance.

2. ELECTRONICS TRAINING

- IPC Certified Trainer and training class room.
- Potential employees are interviewed, tested and trained to hire.
- All electronics employees are trained to full IPC standards annually.
- Multiple classes pertinent to various departments include:
 - ✓ Component ID
 - ✓ Intensified solder training
 - ✓ Rework and repair
 - ✓ ESD training
 - ✓ First article training

3. ESD CONTROLS

- All employees are trained per the IPC ESD handling practices.
- All employees wear ESD approved smocks, wrist straps, and heel grounding straps.
- ESD waxed flooring.
- Heel and wrist strap testing is required daily.
- Work areas are grounded and checked regularly.

4. QUALITY SYSTEM

- MRP database containing all approved part numbers and manufactures for each customer.
- Incoming Inspection & Kit Auditing Verify:
 - ✓ Manufacturer
 - ✓ Part Numbers
 - ✓ Part polarities
 - ✓ Package Media
 - ✓ Damage
- Intranet paperless access to set-up information includes:
 - ✓ SMT screen printer settings, program numbers and squeegee tooling numbers.
 - ✓ SMT machine program numbers and set-up sheets.
 - ✓ SMT oven profile program numbers and temperature settings.
 - ✓ BOM sheets for SMT first articles.
- SMT Quality Process:
 - ✓ Perform First Article prior to wave.
 - ✓ Arrow all inspection points stipulated by the Intranet Quality Bulletins.
 - ✓ Run first article through the AOI.
 - ✓ Feeder change-overs verified prior to loading on the machine, first board placement and AOI.

- ✓ Minimum of every 5th array for each job checked on AOI.

- Departmental first article process includes:
 - ✓ Printing departmental instructions and BOM from intranet.
 - ✓ Performing assembly instructions.
 - ✓ Verifying first article per the BOM and all instructions for each operator.
 - ✓ Signing and stamping the first article sheet and recording pertinent operator numbers.
- In-processing inspection and analysis:
 - ✓ In-processing inspection occurs after post soldering to ensure all SMT, Thru-hole, and Post Solder operations have been performed per the documentation and IPC workmanship standards.
 - ✓ SPC database inspection defects information is entered real time.
 - ✓ Quality analysts assigned to each department. Responsibilities include:
 - Defect data collection within their respective departments.
 - Identify root causes of defects.
 - Defect reduction.
 - Posting quality bulletins and action items.
 - Final inspection.
 - ✓ Perform first article.
 - ✓ Print all pertinent information and verify product.
 - ✓ Verify Certificates of Conformance, if applicable.
 - ✓ Verify product compliance with IPC standards.

5. Quality Review

- Quality manager performs monthly review of data with quality analysts.
- Action items are assigned to quality analysts for process improvements.
- Analyst assignment is due at the end of each month.

6. Control of Customer Returns and Corrective Actions

- RMA is issued.
- CAR is written for each DMR and logged in CAR database.
- Material is received, serialized and routed to locked MRB cage for disposition.
- Disposition is tested to trouble shoot and repair.
- Unit is tagged with confirmed defect.
- Defect information is entered in SPC database.
- CAR and DMR are filled out and DMR is returned to the customer.

7. Quality Data

- JIT External Quality 99.82
- JIT Internal Quality 99.54



SMT:

Screen Printing

1- DEK 265GSX

1- DEK 265GS

1- DEK ELA

1- MPM semi-automatic

Pick and Place

2- Philips Orions (8 heads full vision)

2- Philips Eclipse IIs (2 heads full vision)

1- Philips Topaz (8 heads full vision)

1- Philips Emerald (2 heads full vision)

3- Philips LCS tray component handlers

2- Philips CSM84s

Reflow Ovens

1- Conceptronics 9469-102 series (7 zone)

1- Conceptronics 9469-70 series (5 zone)

1- BTU VIP98A (7 zone)

1- Vitronics (10 zone)

Through Hole Insertion:

1- Universal 6772C DIP insertion machine

1- Universal 6241C axial insertion machine with 40-station sequencer

1- Universal 6360C radial insertion machine with 40-station sequencer

PCB Prep/Manual Insertion:

Extensive tabletop IC, axial, and radial lead formers

2- Automatic mask dispensers

Slide lines

Wave Soldering:

1- Yokota YSM890N dual wave

1- NU-ERA dual wave solder

Post Solder:

1- Air Vac DRS 13 full visions QFP/BGA rework station

1- Air Vac PCBRM-12 solder fountain

40- Edsyn dual-hand soldering stations

1- Weller rework station

3- Metcal rework stations

PCB Cleaning:

1- Autotech pass through (closed loop) D.I. was

1- Alpha metals 500M ionograph

PCB Test:

2 Teradyne Z1890 in circuit test platforms

Oscilloscopes, meters, power supplies, PCs, etc.

PCB Inspection:

1- CR technologies RTI6500 automated optical inspection

6- 45X Microscopes

Cable and Harness:

Shinmaywa TR20 automatic wire cut, strip, and terminate

Eubanks automatic cut and strip

Various Amp and Molex semi automatic terminating machines

Extensive tooling for semi-automatic terminating

Sensitek cable tester



APSM/JIT is justly proud of our Engineering Department. They work closely with clients and utilize the latest technology to accomplish daily tasks. The engineering team consists of industrial, manufacturing, and quality engineers.

At APSM/JIT we incorporate and support the latest technologies. Some of our latest and most widely used CAD/CAM/CAE packages and 2D/3D Modeling technologies include the following:

- SolidWorks
- ProEngineer
- AutoCad
- Cadkey
- Merry Mechanization CAD/CAM
- Amada CAD/CAM
- Global Shop Solutions

Our services include but are not limited to: design for manufacturability, engineering for cost reduction of metal fabrication and finishes, as well as mechanical assembly.

Nesting parts is a large part of our process to ensure the best of material utilization. Another manufacturing process we incorporate is Cellular Manufacturing. This is a vital step toward continuous improvement by significantly increasing efficiency. By taking five basic operations within the manufacturing cell, for example, punching, forming, hardware insertion, spot welding and finish, the travel time and distance between operations is greatly reduced. Machinery can be added or deducted as customer product cycles evolve, making the cells more flexible than the conventional manufacturing methods.

By working with our customers and utilizing customer-supplied models, we reduce costs and ensure quality products. We also take special measures to analyze each product design prior to the manufacturing process to eliminate any potential defects.

Our Quality Policy is as follows:

It is the policy of APSM/JIT to consistently meet or exceed our internal and external customers' expectations.

Management will encourage an environment that requires quality excellence by reviewing work processes and implementing effective corrective action. Emphasis will continue to be placed upon preventative techniques and continuous improvement.

Quality Metrics

- Posted chart for all levels
- External quality (weekly)
- Internal quality (weekly)
- Scrap and rework (monthly)
- Internal audit (semi-annual)
- Cellular paretos (monthly)
- MRB findings critical quantities (weekly)

Continuous High Level Quality

- FMEA planning
- SPC data
- Recorded first piece buy-off (inspection record) for all operations
- AQL sampling at final inspection

Sheet Metal Fabrication

Sheet metal fabrication steps consist of:

- 1) Punching
- 2) Automated Laser Cutting
- 3) Scanned for Precision Placement and Matched to the Plans
- 4) Hardware Insertion - Robotic/Manual
- 5) Robotic Brake Process
- 6) Robotic / Hand Welding Process
- 7) Stud Welding Process
- 8) Mechanical Assembly
- 9) Masking
- 10) Wet Paint or Powder Coat

Sheet Metal Equipment List



CNC Punch Turrets	5 2	AMADA PEGA 345 KING W / MANIPULATOR AMADA VIPROS 358 KING W / MANIPULATOR	Max part size .250" 39"x 100" Max part size .125" 50"x 157"
CNC Laser	1	AMADA LASMAC LC1212-d	Max part size .375" 50"x 100"
CNC Punch/Laser Combo	1	AMADA APELIO III 357	Max part size .125" 50"x 144"
Press Brake/Punch Press	7 5 1 1 5 4 1	DI-ACRO / CELLMATE PRESS BRAKES AMADA RG PRESS BRAKES AMADA FBD-8025M ROBOTIC PRESS BRAKE WYSONG PHP 100-120 RACE ROBOTIC AMADA FBD PRESS BRAKES AMADA HFB PRESS BRAKES KOMATSU PUNCH PRESS	17 tons max / 36" max bend length 88 tons max / 98" max bend length 88 tons max / 98" max bend length 100 tons max / 108" max bend length 110 tons max / 122" max bend length 138 tons max / 150" max bend length 88 Ton max / 24" x 24" bed
Shears	3	POWER SHEARS - 14 GAGE TO 3/16 CAPACITY	Max mat'l thk. .187 / Max mat'l width 120"
Roll Forming	3	DI-ACRO	Max mat'l thk. .075 / Max mat'l width 20"
Hardware Installation	12 1	HAEGER INSERTERS W / FEEDERS AMADA FIM 1000 ROBOT	
Welding MIG / TIG	6 11	L-TEC TIG MILLERMATIC MIG	250 amps 480V 300 amps 480V
Robotic Welding	2 1 1	PANA-ROBO VR-008P-2 PA175 PANA-ROBO VR-005C-2 PA52 ABB ROBOT IRB 1400-1130	6 axis w / rotating table 6 axis w / 2 stationary tables 6 axis w / 2 stationary tables
Spotwelding	1 14	JANDA MULTI-HEAD M6012 JANDA 150KVA 480V	90KVA 208V 12 heads
Pull Test	1	SOUTHWARK SW TESTER	Pull up to 2000 lbs.
CD Stud Welding	2 2	SOYER HAND HELD UNITS SOYER CNC ROBOTIC STUD WELDERS	
Machine / Model Shop		Full service machine and model shop for tooling, forming, punching and prototype development.	



Electronics Engineering Manager

Dan Roberts *droberts@apsm-jit.com* (623) 516-3771

APSM/JIT uses many formats of software packages. When possible, files sent should be zipped using WinZip. Because of changing work schedules, we ask that you follow up with a phone call to ensure that immediate attention is given to your electronic files. Listed below are the current software packages we support:

- Cadence/Valid
- Generic Cad
- Pads
- Power PCB 2.0, 2.1, 3.0
- Mentor
- Zuken-Redac
- SolidWorks thru v2001+
- Pro Engineer thru v2001
- IGES
- Accel
- Tango, Tango Pro
- Cam 350
- Mentor
- Protel
- AutoCad thru version 2002
- Cadkey thru version 7
- HPGL

Sheet Metal Engineering Manager

Ted Brown *ted@apsm-jit.com* (623) 516-3791
tedb@primenet.com

Because of changing technology, if your software is not listed please contact Dan Roberts or Ted Brown so we may make the necessary additions to our software list.

APSM/JIT uses other software packages to develop documentation used on the manufacturing floor..

- MS-Office
- Adobe
- Graphics(any)
- DXF
- DWG

If you have any questions or problems, please don't hesitate to call.

APSM/JIT
2140 W. Pinnacle Peak Rd.
Phoenix, AZ 85027

Phone: 623-516-3700
Fax: 623-516-3701
Engineering Fax: 623-516-3738