

LA/OC SMTA CHAPTER NEWS

October 2003 EDITION

DATE

October 16th, 2003

AGENDA

8:00am, Check - In
9:00am to 4:30pm Presentation

MEETING FEES

\$160/person SMTA members
\$220/person Non-SMTA-members

Location

Skyworks Solutions, Inc.
5221 California Avenue
Irvine, CA 92612
949.231.4993

See Page 7 for further Details!



Los Angeles & Orange County Chapter



"The Surface Mount Technology Association membership is a network of professionals who build skills by sharing practical experiences and developing solutions in electronic assembly technologies and related business operations."

LA/OC SMTA CHAPTER IS PROUD TO PRESENT...

CHAPTER TRAINING PROGRAM

Presented By:

Rob Rowland

Process Engineering Manager, RadiSys Corp.

UP COMING EVENT

LA/OC SMTA is proud to Present...

November 2003 Presentation & Dinner Meeting

Featuring:

SIPAD - Solid Solder Deposit

Presented By:

Matt Kehoe
President

SIPAD Systems Inc.
(SMTA Atlanta Chapter Secretary)

Date

November 20th, 2003

Time

6:00PM, Social Hour
7:00PM, Dinner/Presentation

Location

Embassy Suites
3100 East Frontera
Anaheim, CA



Cost

\$20, Members
\$25, Nonmembers

Reservations

Call: MaskTek
(714) 557-3383

NO SHOWS WILL BE INVOICED

If you can not attend, please cancel your reservation by 12 Noon on Wednesday, prior to the meeting. See you there!

PRESENTATION ABSTRACT

Low volume surface mount assembly processes are unique and challenging. This workshop identifies and examines the critical success factors associated with low to medium volume, high mix surface mount assembly. Participants will examine low volume assembly from multiple viewpoints including assembly processes, process control, manufacturing operations and related industry standards. When these topics converge successfully a robust low volume assembly operation has been established.

The morning session is devoted to semi-automated and automated equipment and processes related to standard, fine pitch and ball grid array components on simple and complex single or double-sided mixed technology assemblies. The following printed circuit board assembly (PCBA) processes will be covered: printing, dispensing, placement, reflow soldering, wave soldering, selective soldering and cleaning. A four step approach, which includes theory of operation, recommended operating parameters, process control and related industry standards, will be used to explain each assembly process. Subject matter related to adhesive, solder, flux, solder paste and stencil design will also be covered in detail. The afternoon session covers printed circuit board (PCB) surface finishes and moisture sensitive components and their impact on the assembly process. The discussion continues with an overview of manufacturing operations related topics including assembly line design, continuous flow assembly, lot size considerations, inspection methods (optical and x-ray) and performance measurement. A critical subject will be rapid setup and changeover methods, which includes a case study example. A list of assembly equipment suppliers is also included with the course material.

SPEAKER PROFILE

Rob is currently the Process and Supplier Engineering Manager at RadiSys Corporation in Hillsboro, Oregon. Rob has focused on surface mount and through-hole mount manufacturing technology for the past 20 years. He is an active member of the Surface Mount Technology Association (SMTA), where he served 2 terms as a chapter president and 4 terms as technical director of SMTA International. In 1999 he received the Founders Award from the SMTA. He was also an active member of the Surface Mount Council (SMC) where he served as editor of the Status of the Technology, Industry Activities and Action Plan. Rob is a frequent author and speaker at industry trade events. He also writes a monthly manufacturing column for SMT Magazine in addition to serving on the editorial advisory board. Rob is the co-author of the book Applied Surface Mount Assembly. He received a Bachelor of Science Degree in Manufacturing Engineering from Weber State University.

What's Inside this Months News Letter...

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CHAPTER OFFICERS***President***

Scott Penin, CSMTPE
Paradigm Manufacturing LLC
3304 W. MacArthur Blvd
Santa Ana, Ca. 92704
TEL: 714.438.0822
FAX: 714.438.0028

E-mail: spenin@paradigmmanufacturing.com

Vice- President of Technical Programs

Atul Mehta
Jet Propulsion Laboratory
Pasadena, CA
TEL: 818.393.2962
FAX: 818.393.5055

E-mail: acmehta@jpl.nasa.gov

***Vice-President of Education
&******Secretary***

Kathy Palumbo
Production Analysis & Learning Services, LLC
Trabuco Canyon, CA
TEL: 949.713.7229
FAX: 949.713.7229

E-mail: palsrvs@palsrvs.com

***Vice-President of Membership
&******Vendor Advertisement Chairman***

Michelle Ogihara
Seika Machinery, Inc.
3528 Torrance Blvd., Suite 100
Torrance, CA
TEL: 310.540.7310

E-mail: michelle-o@jp.seika.com

Treasurer

Riki Brown
Golden West Technology
Fullerton, CA
TEL: 714.738.3775
FAX: 714.738.7727

E-mail: rikigb@earthlink.net

Golf Tournament Chairman

Frank Kurisu
SolderMask, Inc.
17905 Metzler Lane
Huntington Beach., Ca. 92647
TEL: 714.842.1987

Email: fkurisu@msn.com

Presidents Message**By: Scott Penin**

SMTA international in Chicago is behind us now. It was a good show with excellent technical sessions. The attendance was good considering the economy and there were a lot of great exhibitors both large and small. We were represented at the Chapter Officers Meetings and SMTA Luncheon by Myself and Michelle Ogihara where we received **First place for Chapter of the Year.**

Well its that time of year again for elections for our chapter offices. We have Pres., Vice President, Secretary and Treasurer open for nominations. If you would like to be nominated for any of these positions please call me or any of the board members. Being an officer is a little work and requires you to attend a board meeting once a month plus our chapter meeting or event. LA/Orange County has one of the best SMTA chapters in National. Our board is dedicated to the mission of SMTA and is an outstanding leadership team. If you would like to be part of this dynamic group we welcome you. The rewards and benefits are great. The deadline for nominations is Oct. 31, 2003. You also will be helping plan the year for 2004.

We have our chapter training by Rob Rowland coming up this month on OCT. 16th. We need your support in attending this great and worth while training seminar **Low Volume Surface Mount Assembly.** Cost is only \$160 for members and \$220 for non-members but includes a one year membership in SMTA. Rob is a great speaker and very knowledgeable in his field. Please check out our web site at www.laocsmta.org for details and the link to the National web site for registration. This year it will be held at Skyworks Solutions in Irvine, CA located at 5221 California Avenue.

We will have two more meetings after our chapter training. One in November and one in December, which will wrap up another year for our chapter. Our November 20th meeting is on SIPAD at the Embassy Suites in Anaheim. On December 12th we will have a combined non-technical Christmas Party with the San Diego SMTA chapter at **Sarducci's Capistrano Depot** (by the AMTRAK Train Station) in Downtown San Juan Capistrano, where we will have a great dinner, social hour, and entertainment for all. For those who would like accommodations within walking distance of the venue, we have secured a 20% discount at the Mission Inn. Many folks are talking the train, which departs right at Sarducci's. This should be a fun event and a great way to wrap up the year. You can bring your significant other for a great date night so mark your calendars. Tickets are limited for this so make your reservations early.

SEPTEMBER 2003 MEETING REVIEW

BY: ATUL MEHTA

LA/OC chapter SMTA meeting for the month of September was held on Thursday the 18th at the Embassy Suites in Anaheim.

Scott Wischoffer from Fuji America Corp conducted the presentation. The topic was "Pick and Place Equipment Selection".

In light of changing face of electronic manufacturing in North America, it is important to learn what is being done to address the changes in manufacturing equipment and mindsets. In recent times, things have changed significantly. The high volume customers are going to the Far East, leaving low to medium volume assembly in the USA. With the high cost of labor, time to market pressures and substantial investment in capital equipment, assembly houses and equipment manufacturers are facing tremendous challenge to find a solution. Several equipment manufacturers have come up with a modular assembly line approach as a possible solution, which was discussed in the presentation.

Four Types of Assembly Lines

- 1) *Conventional production line* - consists of a typical chip shooter capable of placing 50 to 60 K components per hour followed by one or more flexible placement equipment.
- 2) *Modular Base Equipment line* - consists of Machines that are the same size and shape but have different and specific functions.
- 3) *Modular Scalable equipment line* - Machines that utilize the same base and robotics, but may be quickly and significantly altered to accommodate a variety of different tasks by interchanging components of the machine. These are the new generation equipment that are emerging in the market.
- 4) *All in one equipment line* - consists of the equipment built in combination of both chip shooter and flexible placement machines.

Pros and Cons of Conventional Lines

Pro's

1. Best in class equipment for both chip place and flexible place components
2. Excellent for low-mix / high-volume applications
3. Large blocks of production capacity

Con's

1. Individual training requirements for each production machine.
2. Separate spare parts stock for each vendor
3. Separate programming requirements for each vendor
4. Variable equipment footprint

Pros and Cons of Modular Base Equipment

Pro's

1. Single source for both chip place & flexible place components.
2. Good for high mix / low volume applications.
3. Production capacity can be added in small blocks and usually lower cost.
4. Simplified training requirements due to equipment similarities.
5. Spares that overlap from a single vendor.
6. One data handling system for all placement machines.
7. Consistent machine footprint.

Con's

1. Load time and Fiducial read is repeated at each module
2. More moving parts

According to Scott, new generation of the machines called "The Modular Scalable Equipment" offers advantage over the other two by providing the ability to adapt quickly and precisely to the product or group of products that are currently ready for production.

Scalability Offers Key Benefits

- Ability to adjust to the SMT assembly line to Match current production requirements
- Better Utilization, Efficiency and Up-Time of the Equipment
- Better Line Balancing
- Less Down Time for Maintenance & Repairs

Our new reality of an ever changing environment in the U.S. electronic manufacturing industry is "producing high mix low volume".

When searching for equipment that can meet the necessary "high mix low volume" demands one must consider the following:

- Ability to changeover and component supply
- Availability of Intelligent feeders
- Able to Set-up (Kitting) Off-Line
- Smooth & accurate component delivery and mounting
- Shock free board handling & automatic backup pin positioning
- Low utility cost
- Low profile and operator friendly design
- Improved safety features

The presentation was excellent and quite enlightening. It offered a good insight into what is upcoming in the area of new pick and place equipment.

The LA/OC SMTA board would like to thank Scott for a wonderful presentation. It was enjoyed by all.

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TECHNICAL EXCHANGE

The Importance of PCB and Panelization Fabrication Notes

BY: Kathy Palumbo

One of the most critical aspects for any CCA (Circuit Card Assembly) manufacturer is PCB's and PCB array panels. When these are not fabricated correctly the monetary losses can be in the hundreds of thousands of dollars. In a Just In Time environment, improperly manufactured PCB's and PCB panels have the potential of shutting an electronic manufacturing line down; not to mention the bottleneck it causes in your rework area. As the old saying goes, "Garbage In is Garbage Out".

Typically Root Cause Failure Analysis unveils the true issue of improperly fabricated PCB's and PCB panels, and 9 out of 10 times one of the leading root causes is improperly written PCB and PCB Panelization Fabrication notes.

Considering the fact that the only thing that takes precedence over your Master Drawing in the event of a dispute is your purchase order notes, I would say that the Fabrication Notes on any PCB or PCB Panelization drawing should be carefully considered. Those who don't take the time or pay careful attention to these notes may find themselves in a world of hurt when they are unable to meet delivery dates due to improperly fabricated PCB's and PCB array panels.

Over the years we have found that a standard set of PCB and PCB Panelization fabrication notes, which are developed by a cross functional team of engineers works best. One must consider all manufacturing equipment capabilities for both the PCB fab and the CCA house while developing these notes; hence the need for a cross functional team. Typically a team consisting of a PCB Designer, CCA Manufacturing Engineer, and PCB Fabrication Engineer (both Domestic and Over Seas) yields the best and fastest results. When working together these individuals can develop a standardized set of notes that will satisfy everyone's needs.

The notes should be clear, concise, and succinct. State exactly what is needed, and by all means vague wording should be avoided at all costs. Some of the areas that should be addressed in PCB Fabrication notes are (but are not limited to):

- ⇒ Dimension and tolerance standard requirements
- ⇒ Workmanship standard and Performance Class requirements (IPC-600 Class 2)
- ⇒ Standard the PCB conforms to (IPC-2200 Series)
- ⇒ Shape and Conductor / Non-Conductor Patterns reference
- ⇒ Panelization Fabrication Drawing reference
- ⇒ Schematic Drawing Reference
- ⇒ Gerber File Reference
- ⇒ Technology Level of Design (Should determine who can fabricate your design)
- ⇒ PCB Material Requirements
- ⇒ UL Rating (when applicable)
- ⇒ Conductor Width Requirements
- ⇒ Conductor Spacing Requirements
- ⇒ Impedance & Impedance Coupon Requirements
- ⇒ Minimum Annular Ring Requirements
- ⇒ Layer to Layer Registration Requirements
- ⇒ Bow & Twist Requirements
- ⇒ Final Finish Requirements (Don't forget Solderability testing when using HASL as a final finish)

- ⇒ Edge Connector and Tie Bar Requirements
- ⇒ Repair and Weld Requirements (if you don't specify No repairs or welds, then more than likely your PCB's are seeing a lot of these rework processes)
- ⇒ Solder Mask & Via Capping Requirements
- ⇒ Surface Mount Pad Symmetry & NSMD/SMD Requirements
- ⇒ Silk Screen Requirements
- ⇒ Vendor ID/Traceability/Date Code Requirements
- ⇒ Electrical Test Requirements

Some of the areas that should be addressed in PCB Panelization Fabrication notes are (but are not limited to):

- ⇒ Dimension and tolerance standard requirements
- ⇒ Workmanship standard and Performance Class requirements (IPC-600 Class 2)
- ⇒ Tooling Hole Sizes and Location Requirements
- ⇒ Fiducial Sizes/Locations/Mask Clearance Requirements
- ⇒ Rail Corner Radius Requirements
- ⇒ Score Location Requirements
- ⇒ Break Away and Routing Requirements
- ⇒ Bow & Twist Requirements
- ⇒ Solder mask coverage/clearance requirements
- ⇒ PCB Fabricator Process Identifier Requirements
- ⇒ X-Out Marking & Quantity Requirements
- ⇒ Score Depth/Angle/Web Requirements
- ⇒ PCB & Panel Fabrication Number/Revision Level Marking Requirements
- ⇒ Image Step and Repeat Tolerances and Requirements
- ⇒ Packaging Requirements (Remember if your boards are coming from overseas then they will see a lot of moisture before they arrive. Clearly specifying this ensures that the desiccant is packaged inside with the PCB's rather than outside of the packaging.)

Many folks have asked, "Why should we specify all of this? Can't we just call out the IPC-A-600 document?", and the answer is plain and simple...No. The IPC-A-600 document is an acceptability document and many of the areas typically covered in the PCB and Panelization Fabrication notes are not specified in the IPC-A-600 document. In addition, the Master Drawing Fab notes takes precedence over the IPC-A-600 document.

Over the years we have had the opportunity of working with many board shops and they all say the same thing..."If it's not on your fab notes it's not going to happen. If you want your PCB fabricated to meet your needs then you have to tell us what your needs are, and the best way to communicate this to us is through your PCB & PCB Panelization Fabrication notes. Your Fabrication drawing follows your board layers through the shop and is what is referred to as your PCB is fabricated. Incorrect notes lead to your PCB being fabricated incorrectly and since fab notes are one of the main controlling documents in the event of a conflict, we can't be held liable."

So, how important are PCB & PCB Panelization Fabrication notes...Pretty darn important! Just ask someone who has suffered a monetary loss due to improperly fabricated PCB's and PCB panels.

LA/OC SMTA is Proud to Present October's Chapter Training Program... Low Volume Surface Mount Assembly

Presented By: Rob Rowland
Process Engineering Manager, RadiSys Corp.

What You Will Learn: Low volume surface mount assembly processes are unique and challenging. This workshop identifies and examines the critical success factors associated with low to medium volume, high mix surface mount assembly. Participants will examine low volume assembly from multiple viewpoints including assembly processes, process control, manufacturing operations and related industry standards. When these topics converge successfully a robust low volume assembly operation has been established.

The morning session is devoted to semi-automated and automated equipment and processes related to standard, fine pitch and ball grid array components on simple and complex single or double-sided mixed technology assemblies. The following printed circuit board assembly (PCBA) processes will be covered: printing, dispensing, placement, reflow soldering, wave soldering, selective soldering and cleaning. A four step approach, which includes theory of operation, recommended operating parameters, process control and related industry standards, will be used to explain each assembly process. Subject matter related to adhesive, solder, flux, solder paste and stencil design will also be covered in detail. The afternoon session covers printed circuit board (PCB) surface finishes and moisture sensitive components and their impact on the assembly process. The discussion continues with an overview of manufacturing operations related topics including assembly line design, continuous flow assembly, lot size considerations, inspection methods (optical and x-ray) and performance measurement. A critical subject will be rapid setup and changeover methods, which includes a case study example. A list of assembly equipment suppliers is also included with the course material.

Who Should Attend: This workshop is intended for individuals who are starting a new surface mount assembly operation or individuals who are interested in fine tuning their existing surface mount assembly operations. The information presented in this workshop will be beneficial to anyone involved with surface mount assembly including manufacturing, process and quality engineers, engineering and manufacturing managers or supervisors, and equipment operators. Some basic knowledge of surface mount technology is helpful but not essential.

Topics: Low volume assembly processes and equipment, Adhesive and solder paste application, Component placement, including BGA, Reflow, wave and selective soldering, Adhesive, solder, flux and solder paste Cleaning and no-clean applications, PCB surface finish and moisture sensitive devices, Assembly line layout and material handling, Visual factory management techniques, Optical and x-ray inspection methods, Process control and process quality planning, Rapid setup and changeover methods, Related industry standards (IPC, EIA, SMEMA)

About The Instructor: Rob is currently the Process and Supplier Engineering Manager at RadiSys Corporation in Hillsboro, Oregon. Rob has focused on surface mount and through-hole mount manufacturing technology for the past 20 years. He is an active member of the Surface Mount Technology Association (SMTA), where he served 2 terms as a chapter president and 4 terms as technical director of SMTA International. In 1999 he received the Founders Award from the SMTA. He was also an active member of the Surface Mount Council (SMC) where he served as editor of the Status of the Technology, Industry Activities and Action Plan. Rob is a frequent author and speaker at industry trade events. He also writes a monthly manufacturing column for SMT Magazine in addition to serving on the editorial advisory board. Rob is the co-author of the book Applied Surface Mount Assembly. He received a Bachelor of Science Degree in Manufacturing Engineering from Weber State University.

COST: \$160.00 Members / \$220 Non-Members

LOCATION: Skyworks Solutions, Inc., 5221 California Avenue, Irvine, CA 92612, 949.231.4993

CHECK-IN: 8am

CLASS HOURS: 9AM -4:30pm

DATE: October 16th, 2003

TRAINING INCLUDES: Lunch, Coffee & Handouts

REGISTRATION: 952.920.7682 or On-Line at

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Schedule

Ads should be submitted at least one week prior to the end of the month preceding the first month of desired publication.

Vendor Tables

Display your products and literature at a Chapter Meeting for a fee of \$100, and receive a bonus of one free 1/4 page AD for one month.

Contact

Scott Penin

Call: (714) 403-1874 / E-Mail: info@paradigmmanufacturing.com

Don't Forget....

December is Time to PARTY!

Come Join the FUN at our...

2003 Annual LA/OC & San Diego SMTA Chapter

Christmas Party

Location: Sarducci's Capistrano Depot / <http://www.capistranodepot.com>

By the AMTRAK Train Station in Downtown San Juan Capistrano

Featuring: An Award Winning 3 Piece Band / Talent Show (Participants Wanted)

Date: Friday, December 12th, 2003

Time: 6pm to 11pm

Cost: \$25 members / \$35 non-members

Menu: TBD

Accommodations: Mission Inn will grant a 20% discount to anyone who mentions the SMTA upon booking.