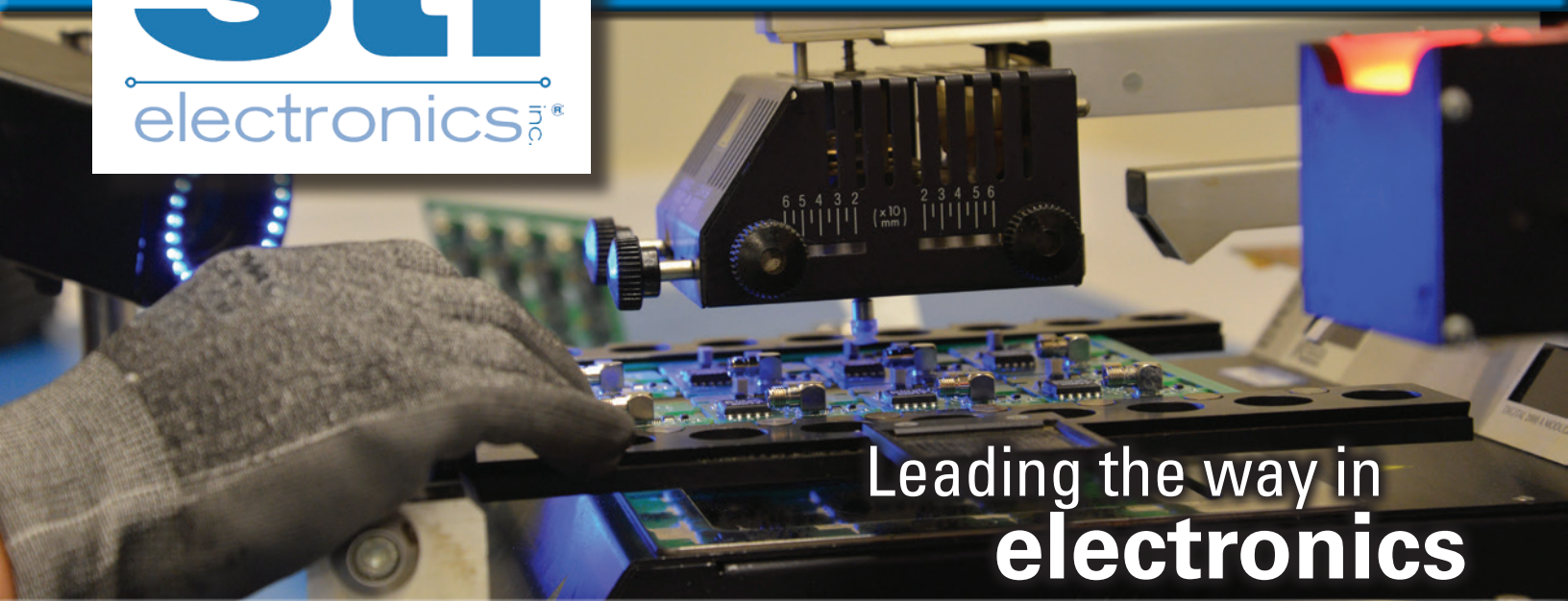




NEWS

Volume 15 • Issue 1 • April, 2017



Leading the way in
electronics



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DAVE'S WORLD

By: David Raby

March, 2017

I'm happy to say that the beginning of the year has been very busy here at STI. Business is good (THANKYOU!) and the first quarter travel season has gone well so far. Of course, the Pan Pacific Microelectronics Symposium (Pan Pac) was a great way to start the year and, as usual, it provided an eye opener for what we'll be working on for the next decade or more. APEX is the place (at least the North American place) to see the latest and greatest equipment that will get us through some of the things we learned about at Pan Pac. I do have to say that over the past few years as STI's manufacturing business has grown, APEX has become more like Disneyworld to me as I'm always seeing something new and magical around every corner and I sometimes swear that I can feel my credit card getting warm just walking down some of the aisles. APEX is also the home to many IPC committee meetings and as usual, STI was represented at several. I'm sure Pat Scott will bring you up to date on some of the changes and their impact from the

training point of view. I stayed on the management and government side of the meetings and they are always well worth my time.

As you might guess, the government portion is particularly interesting right now. IPC's Washington team has spent several years trying to help our industry by educating lawmakers and fighting regulations that would harm us. Some good things have happened, but there has been a lot of playing defense. As I'm sure you've heard, whether you like it or not, things are different in Washington now and after a lot of work in the past planting seeds, lawmakers and agencies are now calling IPC as their subject matter expert and asking "how can we help you?" or "when we change this, what would you like for it to say?" I don't know how it will end up but it is definitely an exciting time to be participating. I am really looking forward to being there for personal visits with key people the first week of May for IPC's IMPACT. I usually don't know a day ahead of time what the topic of my newsletter column is about, but I'm already fairly confident that the next one will be about those few days in Washington. If you are an



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owner or executive at your company, I strongly urge you to join me there to help make sure the changes that will be made affecting our industry's future are good changes. I promise, you will be glad you did. <http://events.ipc.org>

On one of my recent flights, I sat by an older Japanese lady that didn't speak much English, but her English was much better than my Japanese. As we talked during the flight, she explained that she was traveling with her daughter and going on a long anticipated vacation for a few days. I said I was actually travelling for work and would only be in town for one night and then had a similar schedule in a city across the country the next day. She thought for a while and then asked "your company pays for you to travel?" and shook her head and asked it again.

I know I am very fortunate to do what I do but I appreciate this lady reminding me just how lucky I am that I do get to go places, meet people, and learn things and call it my job.

The greatest thing about my job is the opportunity I get to meet and work with people from all over the world and form new friendships. Unfortunately, I lost three of those friends over a very short period of time recently.

Jahnson Stone was from Huntsville and was a natural salesman who never met a stranger. He actually worked for STI a couple of years and was well known by everyone in the area. It was fun to go on a sales call with Jahnson because we'd stand back and look at 20 operators working on a line and he'd point to the first one and state "I went to high school with her. The next one is my cousin. The next one is my best friend's sister. That one's my aunt." And he could go down the whole line that way and then we'd go to another company and it was the same thing.

Belle Ribauda was from New Jersey but I knew her for 40+ years in Southern California where she and her husband Ross were well known and

respected sales reps. Belle was always the inside person and always a delight to talk with or see anywhere. If for no other reason, California visits were always worthwhile for her Italian dinners. She was a huge sports fan (New York Giants and Yankees and Indiana University basketball until she broke up with them over the Bobby Knight fiasco) and we went to several football (usually LA Rams vs Giants) and baseball (Angels vs Yankees) games together when I lived in California. One of my favorite weekends was with Belle, her son Ross, Jr, and my cousin Dan at the Final Four in Minneapolis where I don't remember much about the basketball but the dog track and the rental car and many other events are etched in my memory. Ross and Belle visited us in Alabama a few years ago and we were able to let her experience an SEC football game on a beautiful day in Auburn.

Donal McDonald actually passed away at APEX. I had only met Donal briefly and didn't really get to know him until 2009 when he came from Ireland for the STI open house at the time we moved into our current building. We began travelling (with Donal's partner Ann) in some of the

same circles and I came to appreciate what a wonderful and sincere person he was. Like I mentioned about Jahnson, Donal never met a stranger. Whether an event was supposed to be serious or fun, Donal was always smiling and always made sure everyone else was too. I also believe Donal was the only real live ninja I ever met.

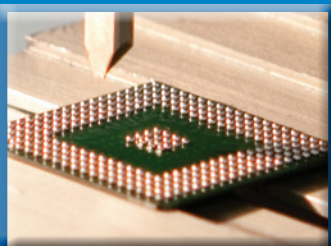
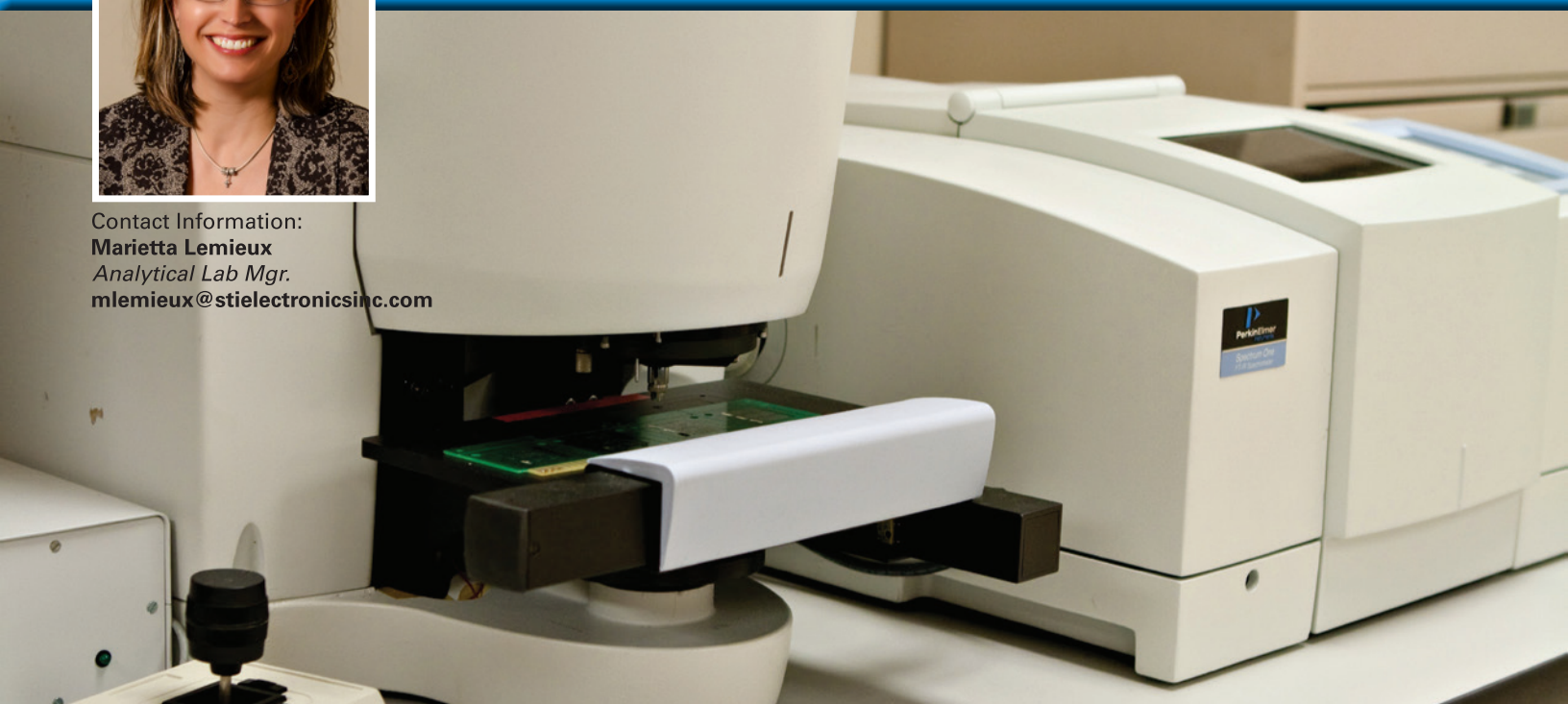
Dr. Suess said "Don't cry because it is over, smile because it happened." I'm sad that we lost these three people and I hurt for the people they left behind, but I'm thankful they all made the world a better place with their deeds and their memories. I'm lucky to have known them.





ENGINEERING SERVICES

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NEW FACES ANALYTICAL LAB



"Unfortunately, we are saying goodbye to Debi Bonkoski." Debi has been with the Analytical Lab at STI Electronics, Inc. for six years and has been a great analyst/chemist and co-worker. Over the years she has worked faithfully to resolve electronic related problems for many of our customers, and I am sure that she will be missed by all of us. Debi is leaving the industry and pursuing a completely different career path. We wish Debi the very best on this next adventure!

On an exciting note we are pleased to announce our newest STI analytical lab addition Brittany Turner to assume Debi's duties and responsibilities. Brittany Turner has a B.S. in chemistry and a M.S. in atmospheric chemistry. Brittany describes her journey in becoming a chemist with a master's degree in atmospheric chemistry in her own words.

I graduated cum laude from the University of West Alabama with a B.S. in chemistry. Because of my love of analytical chemistry, I subsequently entered graduate study at Texas A&M University. After a year of "soul searching," I discovered that I had a talent for atmospheric chemistry, and a desire to apply my analytical chemistry background to solve real world problems. This lead to obtaining a master's degree in atmospheric science (atmospheric chemistry track).

Atmospheric chemistry is one of three branches of atmospheric science that simply pertains to chemistry in the atmosphere. Topics of atmospheric chemistry can range from the study of air quality on local scales (air pollution caused by anthropogenic activity, such as automobiles, industrial processes, animal husbandry, etc.) to climate on global scales (stratospheric ozone depletion, rising CO2 levels, and aerosol formation that

influences the earth's ability to absorb or reflect incoming solar radiation, affecting heating and cooling). During graduate study, I performed an analytical laboratory investigation pertaining to the atmospheric reactions leading to the formation and growth of secondary organic aerosols (SOAs) to better understand the implications of these atmospheric particles on visibility degradation, human health, and climate.

Atmospheric chemistry is highly relevant to all in that atmospheric air quality has been found to affect human health by exacerbating existing health conditions (primarily respiratory) and even correlating to adverse fetal development and high mortality rates according to some studies. The electronics manufacturing industry should also show interest in ambient air quality since high acidic content can have adverse effects on the long-term reliability of hardware.



Joining the electronics manufacturing industry after studying atmospheric science has been an interesting change in focus, but thus far, becoming a member of the analytical laboratory has been a very gratifying experience. I have already learned so much from STI's experienced laboratory personnel, and I look forward to learning even more as I work to become a valuable asset to the STI Electronics team.

We are excited to welcome Brittany into the STI family and we wish Debi the very best in her new endeavors. Should you have any questions or would like more information on STI analytical lab or engineering and manufacturing services please feel free to call Mark McMeen (256-705-5515) or Marietta Lemieux (256-705-5531).



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TRAINING MATERIALS

Way back in the “good ole days” of soldering training (WS-6536), we always taught our students that the proper way to solder gold cups for the best reliability was to pre-fill the cup with solder, apply heat and wait for solder melt and then insert the wire. After observing complete wetting of the solder to the wire, the heat source would be removed and the connection would be allowed to cool. The logic of this particular operation is that it would result in fewer pockets of entrapped air, flux and volatiles. This procedure was fairly easy to accomplish in a classroom training environment with the gold cup terminal held in a terminal block allowing lots of room to manipulate the iron, solder and wire (see Figure 1). Real-life applications with very small gold cup contacts that are injection molded into partially wired connectors adds quite a bit of difficulty to this procedure (see Figure 2). These real-life applications result in the individual having to place the wire in the cup and add solder after heat has been applied. Let’s take a quick look at the effects of either process on the gold cup connections.



Figure 1, Large training gold cup with no adjacent cups.

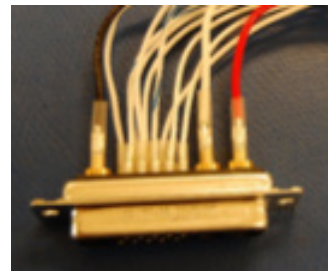


Figure 2, Small and large gold cups in a connector with little clearance.

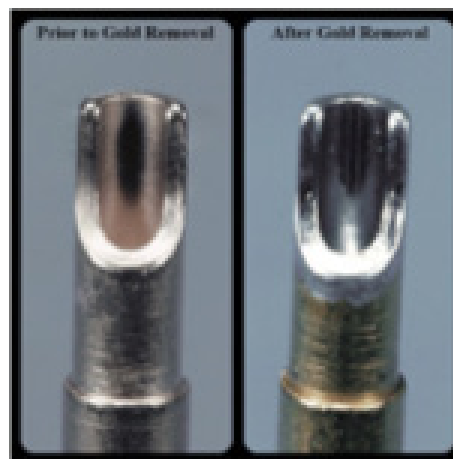


Figure 3, Gold cups prior to and after the gold removal process.

Sample Prep

Two identical gold cups were used for the testing. Each gold cup was prepared by a standard gold removal process which involved a double-tinning of the cavity of the gold cup. The gold removal was done to provide each gold cup (see Figure 3) with a solder coated inner surface to improve solder wetting (nothing solders like solder). One of STI’s most highly skilled Master Instructors, Frank Honyotski, performed all the preparation and soldering of the gold cups. Sample 1 had the solder flowed into the connection and Sample 2 had the gold cup prefilled with solder first.

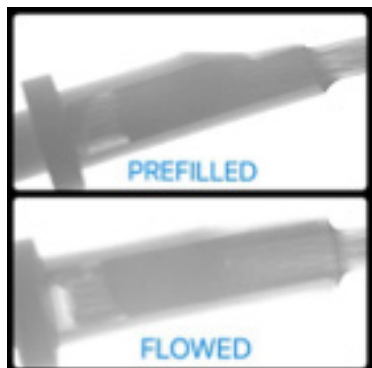


Figure 4, X-Ray images displaying voids at the bottom of the cavity.

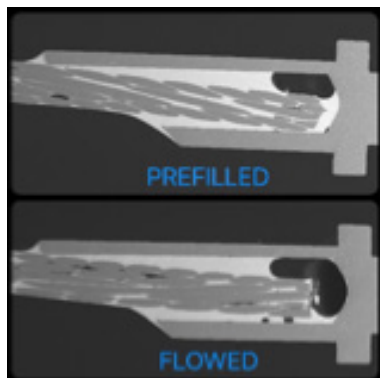


Figure 5, SEM images of microsections.

Evaluation

After the samples were prepared, they were evaluated for the presence of voids using transmissive X-Ray. As seen in Figure 4, both samples exhibited approximately 10% solder voiding in the same location at the bottom of the cup. The samples were then longitudinally cross-sectioned and then inspected with a Scanning Electron Microscope (SEM). The SEM evaluation confirmed the presence of voids in the same locations (see Figure 5).

Conclusion

It appears that two things can be determined from this evaluation. Both gold cups exhibited areas where there were no AuSn intermetallics. Despite having been tinned twice, there were areas at the bottom of the cavity where the solder did not wet to the gold plated surface. It also appears that there is no significant difference in the formation of the solder connections with regards to a solder prefill or having the solder flowed into the connection. The presence of the voids could be related to the viscosity of the molten solder and the high aspect ratio of the gold cup cavity with a wire inserted. This makes it very difficult

to allow the voids to escape during the soldering process. Do these voids represent a reliability issue? Probably not, but we didn't perform any reliability testing.

Would you like to do your own testing and see if your results match ours? Get your own Wire Terminal Kit from our Training Materials group and give it a try.

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WIRE TERMINAL KIT

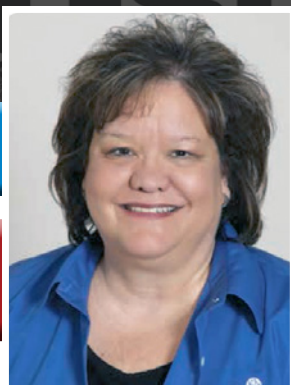
Terminal and Wire Kits are available in varying combinations of terminal types and quantities as well as wire sizes to support certification and training requirements. The standard terminal types are Turret, Gold Cup, Pierced, Bifurcate, and Hook. The wires are all stranded and the wire sizes are easily identified by color. All of the materials are available in Lead Free as well as Tin Lead finish and they can be purchased individually or in kit form.



Kit Contents

| Tin Lead Part No. | Lead Free Part No. | Description | SST-WTK2 | SST-WT-Kit | J001-OTK | J001-ITK |
|-------------------|--------------------|---------------|----------|------------|----------|----------|
| 405-2413 | 405-2413 | 20AWG-O | 5' | 5' | 5' | 5' |
| 405-2421 | 405-2421 | 26AWG-B | 5' | 5' | 0' | 0' |
| 405-2418 | 405-2418 | 22AWG-W | 5' | 5' | 5' | 5' |
| 405-1053 | 405-1053 | GCI Gold Cups | 15 | 5 | 5 | 5 |
| 405-1055 | 405-1063 | BT1 Biturcate | 15 | 5 | 5 | 0 |
| 405-1054 | 405-1062 | TT1 Turret | 15 | 5 | 5 | 5 |
| 405-1056 | 405-1064 | HT1 Hook | 15 | 5 | 5 | 0 |
| 405-1057 | 405-1065 | PT1 Pierced | 15 | 5 | 5 | 0 |

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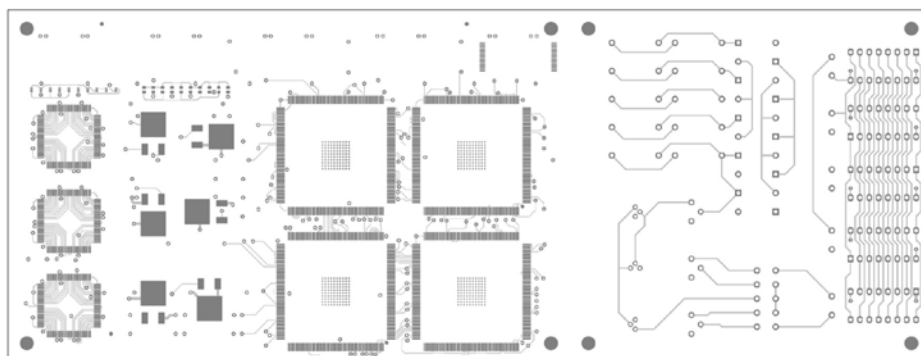
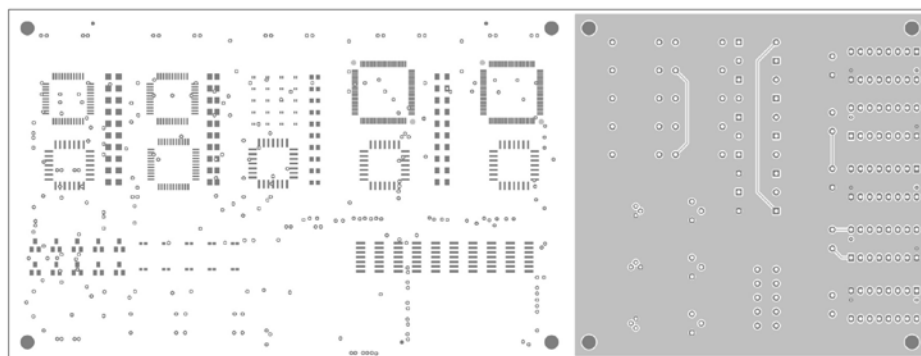
TRAINING SERVICES

IPC Apex 2017 Highlights

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Having recently attended the Apex 2017 Task Group meetings for J-STD-001G, IPC-A-610G, J-STD-001G Space as well as the IPC General Training committee meeting and the Technical Training committee meetings for 001G and 610G, I thought this would be a great opportunity to pass on some of this information to our readers. Here are the highlights:

Both the J-STD-001G and IPC-A-610G Task Groups have been working at a fast pace to get both of these documents published by August 2017. Beta classes will be held in early July with updated curriculum being ready shortly after the release of the documents.



IPC-7711C/7721C

The 7711C/7721C document and the curriculum are now available. The board used for this training has changed to include D-Packs, 0402, 0201 and BGA's (Optional). In addition, a ground plane has been added to the through-hole component section of the board.

No separate Instructor Guide is available for this course

(Hard Copy or Electronic).

All information (Instructor notes, text from standard, etc.) will be found in the pdf files (Presenter View). All updated courses will follow this model.

The IPC/WHMA-A-620C standard and curriculum are now available.

Optional Hands-On Modules have been added to both the

CIT and CIS programs. They include the following:

H1 – Prep

Cable Preparation includes Measuring, Marking, Securing, and Continuity Testing.

H2 – Crimp

Crimp Terminations (Section 5) includes Machine Crimp Connector Contacts, Stamped or Formed Open Barrel Contacts, Stamped or Formed Closed Barrel Contacts. IDC is optional based on documented company material and process.

H3 – Soldered

Solder Terminations (Section 4) includes Solder Cup Gold Removal, Wire Installation to Solder Cup, and Heat Shrink Tubing Installation.

H4 – Connector

Connectorization (Section 9) includes Connector Contact

Insertion, Retention Test of Contact Insertion, Harness/Cable Electrical Shielding and Securing (Optional), Cable/Wire Harness Protective Covering (Required if not performing metal shield installation), Over-Molding/Potting (Optional/per company instructions)

H5 – Splice

Splices (Section 8) includes Lap Splice, Lash Splice, Heat Shrink Tubing Installation.

H6 – Coax

Coaxial and Biaxial Cable Assemblies (Section 13) includes insulation Removal, Dielectric Stripping, Cable Preparation – Shield, Crimping, Soldering, and Final Inspection.

These modules will be listed on the new IPC certificate and the instructor will sign off on those hands-on modules that are successfully completed. Currently the CIS course is 24 hours and the CIT course is 32 hours. The addition of

the hands-on modules for the CIS will require longer course hours based on the modules taken. The CIT's will have to complete all optional modules in order to teach these modules to CIS's. Keep in mind that this is all optional.

I hope you found this information helpful. Please let me know if you have any questions regarding this article.



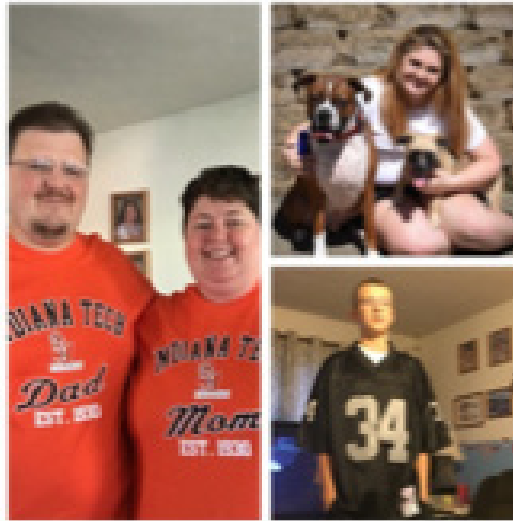
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Employee

Spotlight

Meet:

TRAVIS



MASTER INSTRUCTOR

WORK

I have been working at STI two years in June 2017. I worked for a company in Bloomington, IN called ModusLink (previously known as PTS Electronics) for almost 19 years. While there I started in shipping/receiving then moved into a production role as a technician on the line, we mainly worked on TV's and Cell Phones. I progressed from the line into a training role conducting IPC training in 7711/7721, 610, and J-STD. From there I was moved into the training coordinator role and was over the entire training program for new employees, safety training, HR training, technician training, and solder training.

FAMILY

I have been married to my wife Amanda for 21 years in June. We have 2 kids. Our daughter McKinzie is 18 and will be starting her freshman year in college this fall. Our son Brett, 14 will be starting his freshman year in High School this fall. We have 3 cats Nala, Sarabi, and Kiara as well as 2 dogs Cado and Jackson. Amanda, as some of you may know, is currently undergoing treatment for cancer and will hopefully be finished with treatments Spring 2017 and then we keep our fingers crossed.

INTERESTS

Softball (we like to joke it's more of a drinking team with a softball problem but we still have fun).

FUN FACT ABOUT SELF

I took getting married right out of school literally. I graduated High School at 9:00 am Saturday June 1st 1996, and was married at 2:30 pm Saturday June 1st 1996. As noted above we are still together so it seems to have worked.

ORDER NOW!

New Staking and Conformal Coating Board for Hands-On Training *No Assembly Required*

STI'S Training services department is constantly looking for ways to improve the training process. This past year we have developed the J-STD-001/IPC-A-610 Inspection Kit, and the IPC-A-600 Process Sequence Kit. STI is pleased to unveil its new Staking and Conformal Coating Board for Hands-On Training.

The Kit Contents Include:

- Staking
 - Axial Leaded Resistors, Diodes and Capacitors
 - Radial Leaded Capacitors/Transistors
 - Terminal/Jumper Wire
 - Dual In-line Package (DIP)
 - Quad Flat Pack (QFP)
 - Crystal
- Bonding
 - Radial Leaded Capacitor
- Underfill
 - Ball Grid Array
- Torque (Witness) Stripe
 - Hardware

If you're looking for a standardized training kit to use when teaching staking, bonding and conformal coating this board is the answer.

This fully assembled board comes ready for component staking, bonding, underfill, torque (witness) stripe and conformal coating. Use this kit for training programs such as J-STD-001, IPC-A-610, NASA-STD-8739.1 or company specific standards. Evaluate your student's proficiency using actual hardware.

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