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"Woman Owned Small Business"

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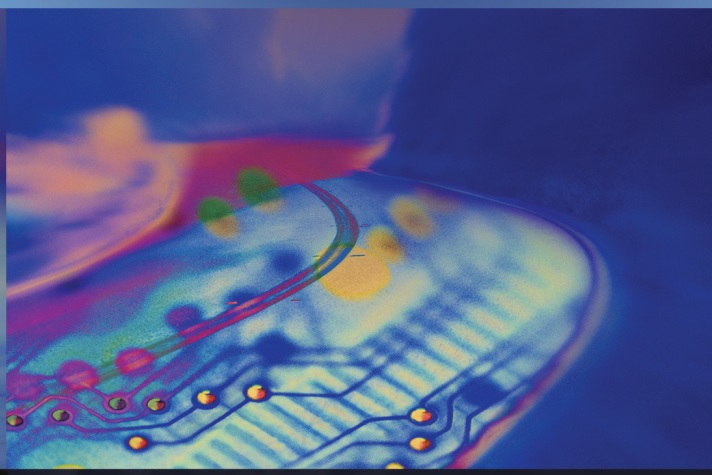


inside this issue:

Dave's World

It has been another interesting summer at STI.

STI employees continue to amaze me as STI has managed to grow through the recession. That's not to say it hasn't been tough or even a little scary but thanks to loyal customers and smart, adaptable employees, we've made it this far and continue to expand capabilities in all divisions. We made the INC 5000 list for the 4th time (twice in top 500) as one of the fastest growing private companies in the United States.

Our manufacturing and prototype lab has added a new inline cleaner this summer and has a flying probe tester on order. The cleaner will greatly improve our efficiency and the tester will add a much needed line to our capabilities. The flying probe tester should arrive the first of October. The flying probe tester is a fixtureless, in-circuit tester which allows us to verify individual component values as well as sub-circuit verification. It will have boundary scan as well as the ability to power up the electronic assemblies for those circuit cards that have controlled voltage inputs. This is a great addition to STI's contract manufacturing capability and will further enhance our ability to serve our clients with the latest and greatest in equipment capability.

Our distribution department continues to add vendor managed supply cabinets in customer's facilities. This reduces ordering costs and locks in pricing for a defined period for our customers. It also keeps high usage items on hand and almost guarantees the customer will never run out of consumable supplies.

Our training department is quite simply the best around and continues to offer IPC, NASA, and commercial training on a variety of topics. We are in the process of adding an additional instructor to the department to enable some additional course offerings in 2010.

Because of all these great employees, I was able to take 2 ½ weeks off this summer and go on a Mediterranean Cruise and make my first visits to Italy, Greece, and Turkey. Pompeii, Rome, and Ephesus were probably my favorites although climbing the Leaning Tower of Pisa was fun. (It seemed that many towns in Italy had leaning towers but apparently didn't have the marketing department that Pisa did.) Venice was a very interesting city and different from anywhere I've ever been. We spent my daughter's 12th birthday on Mykonos. There are many happy memories from the trip and I want to thank all who made the trip possible.

Jim spent his birthday (and the week before) in the hospital recovering from some heart issues. While there, he had his 9th stent added which his cardiologist says is his personal record. Technology is a wonderful thing. He is doing much better and back in the office each day although his 40 yard dash time isn't quite as fast as it used to be. Thanks to all who sent messages, good wishes, and prayers. He is planning to be in our booth as well as present a paper on Imbedded Component/Die Technology at SMTAI in San Diego in October. Please stop by and chat if you can.

I now have a Twitter account. I'm new at Twitter so I'm not sure exactly how it is going to work but I plan to use it for STI announcements and to get you some inside information on STI as it occurs. It won't replace our press releases and the marketing done by Megan, Diana, and Pat. You can sign up to follow at: www.twitter.com/daveraby I'm not expecting a million followers like some actors and sports stars but my total of 6 right now seems a little weak. In fairness to me, it could be much higher if I'd quit rejecting the very nice ladies that keep offering to send me photos of themselves.

Thank you for your continued support and please let me know how STI can better serve you.

David E. Raby

President/CEO
draby@stielectronicsinc.com

P.S. I would like to wish a special Happy Birthday to my great aunt Cecil Carroll on her 107th Birthday!

Training Services: Back to the Basics & 620A and 620 AS Training

By Pat Scott, Director of Training Services

Over the past 6 months, I have waited patiently to see how the down turn in the economy would affect training. Suprisingly enough we've seen very little slow down in the number of classes we're teaching. Companies are still requiring training and we are ready to help.

Our customers know that we provide quality training at a very competitive price. If you survey some of the other training centers, you will find that we are equal to or lower than most.

Keep in mind that we can also bring the training to you. We spend a good portion of our time traveling to companies to provide a variety of training classes (ESD, Basic Soldering, Wave Soldering, Solder Fountain Soldering, J-STD-001, IPC-A-610, IPC/WHMA-A-620, IPC-7711/7721, etc.). If you have a specialized process that you require training on we have the capability to develop curriculum and deliver that training in a timely manner.

There may be times that you have someone who is new to your workforce with very little experience. To put them in a certification course without the basics may not be the best thing to do. The nice thing about our Basic Soldering Course is that it is modularized and can be tailored to fit your needs. Here is a list of the modules:

- Module 1: Component Identification (Through-Hole and SMT)
- Module 2: Electrostatic Discharge (ESD)
- Module 3: Tools & Equipment (Use and Care)
- Module 4: Materials (Flux, Solder, Cleaning etc.)
- Module 5: Preparing to Solder (Solderability, Fundamental requirements for a good solder connection, Materials Selection,Etc.)
- Module 6: Wires and Terminals (Including hands-on)
- Module 7: Through-Hole Soldering (Including hands-on)
- Module 8: SMT Soldering (Including hands-on
- Module 9: Cleaning
- Module 10: Basic Through-Hole and SMT Rework (Including hands-on)

In the last newsletter I said i was going to give you more detail on the 620A and 620AS training meetings that I attended at Apex 2009.

Let's start with the 620A Training Meeting. During this meeting the optional Hands-on workmanship forms were handed out for review. Here is a brief desciption of the projects:

Project 1: Soldered Terminals Workmanship.
(stripping, tinning and terminal/splice soldering)

Project 2: Crimped Terminal Workmanship.
(Insulated Ring Lugs, Non-Insulated Ring Lugs, Stamped Crimp, Machine Crimp & Crimped Splice)

Project 3a: Coaxial Connector 9Clamped Ground Ring Workmanship.

Project 3b: Coaxial Connector 9Crimped Ground Ferrule Workmanship.

Project 4a: IDC Mass Termination Workmanship.

Project 4b: IPC Modular Connections (RJ-11 or RJ-45) Workmanship

Project 5: Cable Bundle Securing Workmanship

Demonstration guidelines were also distributed. The committee chair asked for volunteers to review and format. These have since been completed and will be discussed further at the Midwest meeting this month.

Now the 620 AS Training Meeting. Alan Young from JPL gave a comprehensive review of the course content. Since APEX he has continued the development and I should have more information for you after the Midwest meeting.

If you would like a more detailed outline for the Basic Soldering course or if you have any questions just contact me at 256-705-5528 or email at pscott@stielectronicsinc.com.

Training Services 2009: October/November Schedule

Madison, Alabama

Date	Course
October 05-08	IPC/WHMA-A-620 Certified IPC Trainer (CIT) Certification
October 05-09	IPC Rework/Repair and Modification CIT Certification
October 19-20	IPC-A-610 CIT Recertification
October 21-22	IPC J-STD-001 CIT Recertification
October 23	J-STD-001DS Update, Space Addendum to J-STD-001D
October 26-30	MSFC/NASA-STD-8739.4
November 02-03	IPC Rework/Repair and Modification Certified IPC Trainer (CIT) Recertification
November 02-05	IPC-A-610 CIT Certification
November 04-05	IPC/WHMA-A-620 Certified IPC Trainer (CIT) Recertification
November 16-19	NASA-STD-8739.1 Staking and Conformal Coating Certification
November 16-20	IPC J-STD-001 CIT Certification Program

To register for a course or for additional information go to www.stielectronicsinc.com or e-mail us at training@stielectronicsinc.com.

Training Materials: Certification Training Kits

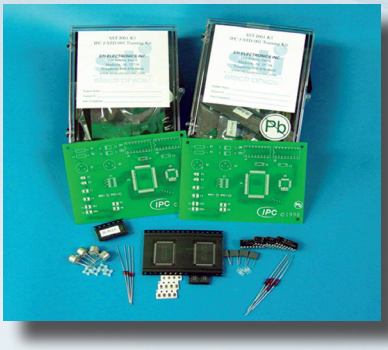
Mel Parrish

STI has Certification Training Project Kits for J-STD-001 training. The J-STD kit is the most widely used solder training kit and can be used for CIT and CIS level training courses. STI also offers kits designed for the IPC-7711/7721 Rework and Repair Training and Certification course as well as the IPC-A-620 Cable and Harness Training and Certification program. Getting your certification materials and references from a Training Provider and Designer has advantage in consistent, thorough and effective training projects. In addition, STI is heavily involved in the industry standards as well as the curriculum design. You can call on us when you need a trainer's perspective for the intent and insight of the technical or even training and certification details.

Our feature kit for this Newsletter edition is the very popular Solder Training Certification Training Kit for IPC J-STD-001. It is available with either Tin Lead or Lead Free materials. The kits can also be customized to your specification if desired.

Mention this article and receive a discount of 10% even for your volume purchases. As always, kits ship same day for orders less than 100. Larger orders will ship out the next day.

To place an order, please contact our customer service department at (800) 858-0604 or sales@stielectronicsinc.com. We look forward to hearing from you.



Engineering Services: Imbedded Component/Die Technology (IC/DT) - Is it Robust?

By Mark McMeen, VP of Engineering

Recently, I was asked at a show if IC/DT was robust and environmentally a sound choice for fielded hardware as compared to standard Surface Mount Technology (SMT) designs used today. I have always told people, "Absolutely!" IC/DT utilizes the same wire bond technologies used today in SMT components with an added feature of improved thermal management. IC/DT can also survive harsher environments ie – G-forces. Interested parties then inquire about the reliability of wire bonding and the tests STI has performed to validate this claim. I always answer by telling them about the successful live test shot utilitizing the technology that shows a TR-8 readiness level by having a live firing off a Navy vessel at a real and moving target. That little bit of information is a huge confidence factor for new technologies as well as passing all the safety and readiness reviews which is required before one can perform a live firing test on a Navy vessel. People always forget that there are months of testing and validation before one can even have a new technology placed onto a Navy vessel for live demonstration testing. Second of all there was the 5000 plus hours of thermal shock testing at various temperature ranges but most were conducted at -55° to 125° C to demonstrate the overall robustness of the electrical interconnections. The TABLE 1 (below) showing of the thermal cycle data illustrates and demonstrates how robust this technology is to thermal shock test cycling. A standard bell curve extrapolation of the raw test data shows a 6000 plus hour average distribution to failure utilizing a -55° to 125° C test protocol for thermal shock testing.

See the test protocol and results table for thermal shock testing for 5600 hours.

Thermal cycling fatigue or overstress failures are detected through alternating exposure of the assembly to extreme temperatures with short transition times between extremes. The test vehicle was placed in a thermal shock chamber to evaluate the resistance to temperature excursions of the assembly materials and process parameters used to manufacture the test vehicle. The assembly was placed on a tray that transitions from a cold chamber to a hot chamber (air-to-air) within a specified time. Test conditions were changed periodically during the thermal shock test. Test conditions included: 1000 cycles from -55°C to 85°C, 250 cycles from -55°C to 125°C, 200 cycles from -55°C to 85°C, followed by 4200 cycles from -55°C to 125°C. The test vehicle was subjected to over 175 days of thermal shock cycling. Critical materials evaluated during this analysis included the following.

Critical Packaging Materials

- Die Attach Adhesive - determine effect of stress-related cracking of silicon die due to mismatch in CTE of die and laminate/copper core
- Conformal Coating – determine aging characteristics of Parylene after repeated exposure to extreme temperatures
- Encapsulant – determine warpage and stress due to modulus and CTE differential of encapsulant and assembly (silicon die, laminate substrate, metal core, aluminum wire bonds)

Continuity testing was performed prior to cycling to establish a baseline resistance for each of the daisy-chains and at periodic intervals to monitor resistance fluctuations. Five daisy-chain die were imbedded within the test coupon thus providing 30 daisy-chains, equivalent to 60 wires (120 bonds), for monitoring. A 3.0 Ω increase in resistance constituted a failure with the cycles-to-failure data noted in Table 1. The first failure/high resistance bond occurred after exposure to 3000 cycles with a lapse of 1500 cycles till the second noted failure. Only 23% of the wires had failed after 5500 cycles when the test coupon was pulled from cycling.

Continued on Next Page...

Engineering Services: Imbedded Component/Die Technology (IC/DT) - Is it Robust? (Cont.)

By Mark McMeen, VP of Engineering

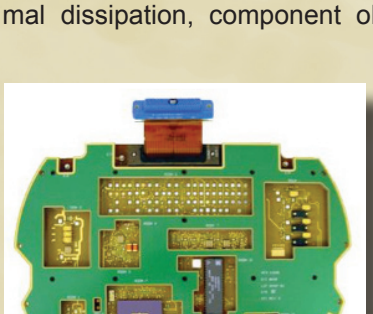
Table 1. Thermal shock failure data for the daisy-chain test vehicles with imbedded die.

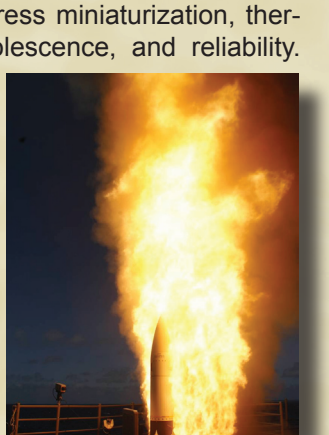
Daisy Chain Wire Group	Cycles	Wire Group	Cycles
1	3,057	16	none
2	4,507	17	none
3	4,507	18	none
4	4,947	19	none
5	5,102	20	none
6	5,656	21	none
7	5,656	22	none
8	none	23	none
9	none	24	none
10	none	25	none
11	none	26	none
12	none	27	none
13	none	28	none
14	none	29	none
15	none	30	none

The failure data gathered from this test vehicle is indicative that the material properties selected will provide the long-term reliability solution for critical military electronics hardware. Compliant die attach adhesive enables stress relief from thermal induced stress in the silicon die-to-substrate interface while the wire bonds, coupled with a compliant encapsulant, provide the stress relief from environmental induced stress (thermal movement, mechanical shock, and vibration). This material set for packaging electronics, in conjunction with the IC/DT® design guidelines, enables the manufacturing of robust, reliable electronics assemblies.

Test Vehicle 2 – Actual Test Board

A mixed-signal test vehicle (Figure 4) was designed and assembled to serve as a technology demonstration for the Navy's Standard Missile-2 (SM-2) program. The Navy's SM Program Office used this prototype in a flight test to support a technology demonstration of the Imbedded Component/Die Technology, validating the electrical and mechanical performance of this new and innovative electronics-packaging concept. An IC/DT® prototype was designed with a mix of analog and RF circuitry using imbedded design practices with wire bondable devices. The prototype circuit design was selected to demonstrate the IC/DT® packaging technology's capability to address miniaturization, thermal dissipation, component obsolescence, and reliability.





These 2 examples above clearly show a robust technology that is ready for main stream adoption in those programs where the environment is extremely harsh. If you need to meet SWAP – SIZE / WEIGHT / POWER REQUIREMENTS, then you need to consider IC/DT for those programs that need to meet the smallest form factors possible. Please email or call if you have any questions. Mark McMeen - VP of Engineering 256-705-5515, mmcmeen@stielectronicsinc.com.

Electronic Sales & Distribution: STI Electronics Introduces The Mighty Scope Digital Microscope from Aven

By Sissie Eckstein, Sales Manager

Sissie Eckstein

STI Electronics, Inc. is proud to introduce the Mighty Scope Portable Digital Microscope from Aven!

The amazingly easy to use, high resolution, highly portable digital microscope that's available at your fingertips for detailed examination of any object you choose! The Mighty Scope includes a compact lens with adjustable magnification (10X - 200X), six LEDs that can be turned on or off, or adjusted for brightness, and a Microtouch shutter trigger that lets you conveniently capture images. For ultimate portability, the Mighty Scope can be used in hand-held mode, or you can mount it on an optional stand. The Mighty Scope is available in a UV version consisting of 6 UV LED lights operating at 405 nm. The Mighty Scope also comes with software for easy capture of images or videos (measurement function included) and adjustable stand. It's ideal for inspection of conformal coatings, welds, solder joints, flux and hairline stress cracks, and more. To place an order please contact the sales department at 800-858-0604 or email at sales@stielectronicsinc.com.

Specifications	Digital Mighty Scope	500X Mighty Scope	UV Mighty Scope
Image Sensor	1/4" Color CMOS	1/4" Coor CMOS	1/4" Coor CMOS
Effective Pixels (HxV)	1280 x 1024	1280 x 1024	1280 x 1024
Signal Output	USB 2.0	USB 2.0	USB 2.0
Video Output	X	X	X
Magnification	10X to 200X	500X	10X to 200X
Gain Control	Auto Gain Control	Auto Gain Control	Auto Gain Control
Snap Shot Mode	Hardware & Software Controllable	Hardware & Software Controllable	Hardware & Software Controllable
White Balance	Automatic	Automatic	Automatic
Power Source	5 VDC Though USB Port	5 VDC Though USB Port	5 VDC Though USB Port
O/S	Windows XP SP2 & Vista	Windows XP SP2 & Vista	Windows XP SP2 & Vista
Power Consumption	110mA (AVG)	110mA (AVG)	110mA (AVG)
LED Light Type	6 White LEDs	6 White LEDs	UV Operating at 405 nm
Working Distance	10X: 150mm, 20X: 95mm, 50X: 13mm	X	10X: 150mm, 20X: 95mm, 50X: 13mm

Industrial Sales & Distribution: PANASONIC Power Tools

Ryan Kirk
Industrial Sales Mgr.

With the demand of power tools rising in today's manufacturing environment , STI has added a quality range of new cordless battery tools, PANASONIC Industrial Power Tools . All Panasonic Cordless Power Tools are carefully constructed based on four primary principles: cordless capability, power, lightweight, and ergonomic design. Since our tools are all cordless, they can be used almost anywhere the professional requires. Successfully combining technology with durability, these lightweight tools are full of convenient features that help ensure the quality of your projects. As a result, you can easily see why STI has added the Panasonic line of battery tools to our already extensive product line.

EY7411LA1S Driver

Clutch Lock Cover

Features:
3.6V Li-ion Battery
Screw Count Function
Double Tightening Counting Prevention Function
Count Record Function
Auto Stop Function
3 Buzzer Sounds

Batch Count Feature

Li- Ion Battery Pack

Charger

You'll be able to keep track of the screws you want to drive and prevent screw driving mistakes with the screw count function. Its auto stop function counts the number of times screws are driven and notifies you with a buzzer sound when the set number of screws is reached. It automatically resets after reaching the set number of screws.

If interested in learning more about this tool or other tools offered , please feel free to email or call us to request literature, quote info , or a demonstration. You can reach me at rkirk@stielectronicsinc.com or 800-858-0604. We look forward to hearing from you.

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Jim's Corner

By: Jim D. Raby, PE, Technical Director

I now know how it feels to be old. I just turned 75 and on my birthday I was in the hospital with another heart failure. This one really took the steam out of me. It was like being down graded from a V8 to a 4 cylinder engine. Sometimes one feels as if it is time to just cave in and go on to something different, but what would that be. This is all I have ever known and besides that, all the friends that I have left in the world are in this industry. So guess I'll try to stay somewhat active in it as long as my family will let me.

STI has changed so much since it was originally pulled together and has accomplished a lot in regards to advancement of technology and establishing the "State-of-the-Art" in many areas of this industry.

My Son David has brought together a group of people such as Diana Bradford and Mark McMeen both Vice Presidents and responsible for lots of things and lots of people that all make up the body and soul of STI. They are all very positive people with a can-do attitude and that, in my humble opinion, is what it takes to get to the top. STI capabilities have improved tremendously under the leadership of the above with the help of all others.

STI is very fortunate to have the above organization and again David Raby, my son of whom I am very proud, to lead the way.

So as this summer draws to a close without even one fishing trip, I think that September and October will see me on the lake several times. My guide, Mr. Tee Kitchens has retired since I have been out so guess I'll spend some time breaking in a new one. My wife, Ellen, does not fish so fishing gets me out of her way, and I think she likes that.

Well, I must tell you one thing on a different subject. My friend Burrell Hays who was on a 4 month trip around the country visiting National Parks of Civil War battlefields and his wife stopped by and spent a nice evening with us. In October we plan to visit Ridgecrest, Ca, his home for a dinner at Indian Wells Valley Lodge. You remember, the restaurant on the side of highway 14 just past Inyokern. I will tell you about it in the next newsletter.

Thank you to a great industry for letting us serve you over the years and please hang in with us during this economic slow down, and we will survive it together.

Jim D. Raby, Technical Director
jraby@stielectronicsinc.com