Scuttlebutt

February 2013 **Issue 219**

Next Meeting-
Saturday, February 2nd - Noon till 5PM
Holiday Inn, Enfield-Springfield
1 Bright Meadow Boulevard (off Route 5)
Enfield, Connecticut

Captain's Cabin

Tony Brock-Fisher, K1KP

By all calculations (and Scorekeeper Alec has checked them more than twice), we are in excellent position to win the CQWW Club competition for 2012, with an apparent commanding lead in claimed scores. Of course, we will have to wait for the anorexically-challenged mezzo-soprano's aria – but that should come much sooner, thanks to Randy, K5ZD's new deadlines! Thanks and congratulations to all members who submitted scores for this contest – it appears your efforts produced terrific results, of which you should all be proud!

Looking forward, we have the second half of the season ahead of us, in the ARRL DX contests. We must not rest on our laurels or count our chickens – it will take another great effort to pull off a repeat of last year's triumph. Operators, find your seats! Multi-op coordinators, fill your chairs! Solar conditions continue to be stormy with high numbers in between during periods of quiet magnetic activity – so there is a good chance the conditions, combined with high activity levels on the bands, will make for an unforgettable pair of contest weekends!

Before the contests, we have lots of great club activities lined up to get your head in the game! First, our next meeting is set for Saturday, February 2 at the Holiday Inn in Enfield, CT. We had a great turnout at this venue last year, and we're hoping for a good showing again. On the program will be a larger number of shorter presentations. This should fit well with the today's tendency towards ADHD induced by intentionally distracting web-page advertisements!

The program includes:
-Wind Torque Balancing of Antennas
-Operating a Remote Contest Station
-Installing a Backup Generator
-Soldering SMT Components
-A WRTC2014 update

Also, we hope to air our first VST or Video Station Tour – a new program feature that we hope will be of general interest and catch on.

Next on the calendar is the final Contest University of the season, to be held on February 13 at ARRL Headquarters, from 6:30-9:30 pm. Don't miss this chance to learn from the masters or our sport how to increase your contesting fun and scores!

Yankee Clipper Contest Club

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DIRECTIONS to YCCC General Meeting:

Holiday Inn, Enfield-Springfield
1 Bright Meadow Boulevard (off Route 5)
Enfield, CT

From the East: Take Mass Pike (I-90) West to exit 6. After toll booth, take a left on 291 To Interstate 91 South. Take exit 49 (the first exit in Connecticut). Take a left at the lights at the end of the ramp. Go through one set of lights. Take a right at the next set of lights onto Bright Meadow Blvd. The hotel will be on your left.

From the South: Take Interstate 91 North to exit 49. Bear right at the end of the ramp, take your immediate right onto Bright Meadow Blvd. The hotel will be on your left.

From the North: Take Interstate 91 South. Take exit 49 (first exit in Connecticut). Take a left at the lights at the end of the ramp. Go through one set of lights. Take a right at the next set of lights onto Bright Meadow Blvd. The hotel will be on your left.

Possible Constitution and Bylaw Changes !!

The Officers of YCCC, especially the Secretary and Treasurer, have recognized that there are issues with the dues and membership definitions of the current Constitution and Bylaws. We are currently composing some amendments to the Constitution and Bylaws to address these issues and simplify the system for all involved. Before we publish the proposed amendments, we wanted to make the members aware of the background for the changes. The explanation on the facing page (page 3), written by Treasurer Chet, N8RA, expresses the situation excellantly. We invite your comments – please respond directly to the Officers.

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The editorial deadline for the Scuttlebutt is the 10th of every odd month.

Member Dues, Active Roster and Score Eligibility Conundrums

Chet Slabinski, N8RA – YCCC Treasurer

The Problem

Brian and I encounter a fair number of ambiguities when someone has gotten behind in dues and makes a payment via mail or PayPal or local meeting. Approximately 10-15% of the time the member pays an incorrect amount or does not specify what he is intending the payment to cover. Sometimes we follow up and request clarification or additional payment, and sometimes we make a judgment call for the good of the club. Occasionally a member will request some guidance on this before paying, and then fail to remit any dues. We see it all.

Some examples:

A member who is in the grace period just sends in dues for 1 year. Is he meaning to catch up? If so, he is still behind.

A member who is behind past the grace period simply sends in dues for 2 years. Is he meaning to catch up on past years? If so, he is still behind since his second year only took him to last March.

What if the member above took the discount for 2 years? If catching up, he was not entitled to that. If paying for the current year and the next, he is.

Do we require members past the grace period to fill out a new application and stand before the club to be re-elected and put back on the "active roster"? How about if a high scoring member at a meeting pays the past dues for another high scoring member who is not at the meeting? (this just happened in Sturbridge)

Do we revise contest results or pull back a club award if someone gets too far behind in dues?

The Solution

We believe there are 2 issues at the root of this confusion.

The first is that currently the "active roster" is based solely upon having dues current; that then also requires a separate club member aggregate score eligibility list to be maintained. But what "active" means references only awards and newsletter receipt.

The solution we propose is to broaden the definition of the "active roster" to be any person already accepted into the club who contributes positively to the club, be it dues, scores, running a project or committee, etc. Any of those is sufficient to make the list. The "active roster" then becomes the club aggregate eligibility list. Article VI of our constitution even states that "Payment of dues shall not be a precondition for submission of member scores to the YCCC Club aggregate in competitions." This is not to say we do not want or need to collect dues.

This active roster would be easy to generate: e.g. every contest year the club score keeper compiles a list of who contributed scores during the past tbd years, the treasurer compiles a list of who has paid dues in the last tbd years, other executive officers submits a short list of other worthy project and committee members, and the secretary simply merges those lists.

The second problem is our current tax structure. It is complicated and a bit inconsistent as it now stands. We propose:

1-have only a yearly dues rate depending simply if full/student/friend/family and eButt or paper

2-eliminate multi year discounts (the table is inconsistent and they do the club no good anymore)

3-change the "dues year" to be the calendar year. (Then if the roster shows 2012, then it means current for 2012)

Reference

Here is what other clubs require of members:

FRC- must attend 1 meeting/yr and participate in 2 major contests; a policy committee generates the list of active members every July; there is a 1 year grace period; dues are voluntary

PVRC- no monetary annual dues but does gratefully accept monetary contributions; active members are expected to participate and submit logs for at least two Club Competition contests per year.

NCCC-just be within the 175 mile circle and apply; dues are voluntary, but required for awards ($24 for full member this year)

Mad River- participation and/or contribution to club activities and a yearly dues assessment ($10 this year)

CCO-only requires an Amateur Radio license and an interest in contesting; no dues, contributions requested annually at the club BBQ meeting

Yankee Clipper Contest Club Meeting Minutes
Auburn, MA December 2, 2012

President Tony K1KP called the Holiday meeting of the YCCC to order at 12:30 pm.

Tony then asked for a roll call of the 48 members, and guests which was followed by the Treasurers report by Chet N8RA, and Secretary's Report by Brian NJ1F. A motion was made by K1KP and Seconded by K0TV to accept the reports which carried.

President Tony asked if there was any old or unfinished business. There was none.

President Tony K1KP asked if there are any announcements.

Dennis W1UE announced that the CAC is looking at changing the rules of the ARRL 160 and 10 Meters contests to include a Single Op Assisted category. Currently those using any type of assistance are classified as a Mult Single. Dennis asked if anyone has feelings pro or con to contact him.

Dennis W1UE announced that the YCCC SO2R box has over 300 units in use around the globe. The only continent lacking a confirmed user of the SO2R box is Antarctica. The SO2R box project was not intended to make a profit, however because of the overwhelming demand they were able to take advantage of quantity discount pricing on some materials. This resulted in the SO2R project being able to give a check for $750 towards the YCCC Scholarship fund.

Dennis W1UE gave an update on the Multi Antenna Switch project which is currently being Beta tested at Dennis's QTH.

Tony K1KP gave an update on the 9 circle receive antenna which is currently on hold. There are lawyers involved in discussions hoping to reach a deal involving intellectual property.

Jack W1WEF brought a show and tell item that had caused interference to his station. It was a faulty high voltage fuse assembly which after prompting, Connecticut Power and Light replaced and gave the defective one to Jack.

KV1J Eric gave an update on the W1 QSL Bureau since Art W1RZF became a Silent Key. Eric and Dennis W1UE are co-managers of the Bureau. If you have questions, issues, or if you would like to help the Bureau, send both KV1J and W1UE and email. They are also working on a PayPal interface.

Tony said that several members had asked to consider a different day, time for the December meeting due to the fact that it falls on the Sunday of the ARRL 160 meter contest. Tony asked for a show of hands of those members present that operated in the ARRL 160 contest. The majority in attendance did operate in the contest. Tony and the Officers are open to suggestions about the December meeting.

Alec W2JU gave an update on the CQWW contests and it looks like the YCCC has a 90 million point lead before log checking.

Break for Holiday Buffet

Tony K1KP introduced Randy K5ZD at 1:45 who gave a presentation on the CQWW history and the future.

A few highlights:

In 2011 the majority of the 7500 CQWW SSB and 6500 CQWW CW were submitted electronically.

There was desire to have results of CQWW announced faster, therefore the CQWW committee changed the log deadline to 5 days after the end of the contest. This change will allow the results of the CQWW SSB and CW contest to be announced in April and May.

For CQWW SSB there were over 8000 logs submitted before the deadline. These logs were then merged and resulted in over 100,000 unique call signs. After cross checking and doing a one off analysis there were over 30,000 confirmed stations active in CQWW SSB.

New Rule 13 C-3 deals with post contest log cleaning and post contest changes. Keep the contest on the Radio.

If you are going to miss the log entry deadline send an extension request to questions@cqww.com before the deadline.

Next K1KP announced the kickoff off the 2013 YCCC scholarship raffle. We are again raffling a K-3. He introduced two of the previous winners Les KD1G and Bob W1EQ. Both told the group how the K-3 has enhanced their stations and added to their contesting enjoyment.

Break

Tony Introduced Paul K1XM who gave a presentation on his and Charlotte's DX expedition to 6Y for CQWW SSB and the impact of Hurricane Sandy.

Brian NJ1F conducted the always fun Yankee Swap.

Tony then introduced Jerry K0TV who gave a knot tying demonstration with all attendees having hands on practice on tying several handy knots for Hams.

A motion was made by K1XM to adjourn the meeting which was seconded by W1WEF and the motion carried. Meeting adjourned 4:15

Submitted
Brian NJ1F
YCCC Secretary

Soldering SMT Circuits: It's Simple & Easy

Jim Ussailis, W1EQO

Tony asked for speakers for the Feb, 2013 meeting & I volunteered (the Army taught me better, but...). So in order to have a demo along with some other volunteers to do actual soldering, I thought an explanation about what is involved ought to be in the offing. You will not be the first bunch that I have shown all this to. However you will be among those who helps get this tome correct, then it might be published somewhere.

Should a few of you have a circuit & would like to try SMT assembly, please bring the circuit to the meeting. And if you don't have components, let me know. I probably have some of what you need.

1. Component Sizes.

The first stumbling block is the plethora of new component size information. Terms like SOT-23, SSOP, 0805, and 1008 should be very unfamiliar unless you have had a meeting with this stuff. Component size is important as that is what is first selected from a list in the circuit board layout program before a component is placed. In the SMT world components are first described by their size, unlike those for thru-hole or point-to-point construction, where a value or description proceeds all else. For example an eight watt, 510 Ohm resistor becomes an 0805, 510 Ohm resistor, a ceramic .01 uFd capacitor becomes, perhaps, an 0603, .01 uFd capacitor. In SMT size matters. Capacitors, resistors, inductors, and some ferrite 'beads.' Almost all of these components are initially described by a four numbers. This group is the size of the component in thousands of an inch. An 0805 resistor is 80 X 50 thousandths. For even those components you might find in a Japanese catalog, the given metric sizes are an approximate conversion from inch measurement. Of course component size dictates the available heat dissipation. In this case 1/8 watt.

Typical resistor sizes are 1206, 0805, 0603, 0402, 0201, with the last two being almost impossible to attach without experience or a machine. My limit is 0402, and that is with eyestrain. There are some other sizes, for example 1210, 1218, and so forth which have their place in some power amplifier circuits. Some manufacturers even advertise resistors smaller then 0201. As a rule all resistors 0603, or larger, have their value marked on them.

Capacitors share sizes with resistors as well as some unusual sizes specifically designed for electrolytic and tantalum capacitors. There are also some special sizes for porcelain capacitors that are used in microwave circuits and perhaps in the PA circuit of your transceiver. Good sources for these are Johansson and ATC. Generally ceramic capacitors are unmarked, while porcelain, electrolytic and tantalum caps are marked.

Inductors also have some unusual component sizes: 1008 is a good example. The purpose of this size is to allow an inductor wound with enamel copper wire, thereby raising Q and self-resonant frequency as compared to other varieties in standard packages. Coilcraft and Delevan make these for RF applications.

Transistors and some diodes come in a 3-lead package. A common size is SOT-23, which breaks with physical size representation. Larger transistors come in a SOT-89 package. 2N2222s are available in both sizes.

IC packages come in a large variety of sizes, attachment methods, and lead pitch. Some of these are represented by LM741CM op-amp in an 8 lead SOP package. Then there are larger arrays which YOU can easily place on a circuit board. Typical is an 80 pin microcontroller from the Microchip PIC18F87J10 family in a plastic film thin quad flat pack (TQFP).

Finally we get to "ball" devices. These are chips that have solder balls attached to the underside of an IC. Both massive and very simple circuits come in a ball device package. I have never found a successful method to attach these devices to a circuit board In the 2005/6 time frame Lenovo also had a difficult time with these chips. Anybody want a T43 laptop? It only needs a minor solder repair.

2. A Note About SMT Solder Paste and Olde Solder Paste.

Do I have client meeting problems with this one. You bet I do! In the jargon of SMT assembly solder paste IS NOT what your father used to "sweat" pipes. He probably used an acid flux, (i.e. Nokorode Soldering Paste ™). DO NOT use the stuff anywhere near your circuit. It works well on water pipes, will destroy an electronic circuit. The SMT version of solder paste is a mixture of finely ground solder and rosin flux placed in a 10 ml hypodermic syringe, or small plastic tub. How the paste is applied depends on the amount of flux mixed into the paste. Dispensed from the syringe the mixture is usually 15% flux, 85% solder. Dispensing can take several forms, from a paste dispenser machine, a plunger & syringe with one of various sizes of needles, or from a tub, squeegeed on a circuit thru a stainless steel "paste mask." The 10 ml syringe method is preferable for home or small shop use as the "paste mask" is relativity expensive, designed for higher volume use, and certainly a bad investment if you made an error in your layout. The components of solder paste separate. So the tube will have a 6 month expiration date. Be careful. One tube I bought expired three days after delivery. I have been successful keeping solder paste from separating for several years by storing it in a refrigerator or even better, a freezer. Stock rotation helps; once a year or so, physically rotate the tube. *Sources: Hub Materials Co., Digi-key*

3. Methods of SMT Assembly;

Once we have acquired our components and PCB, it's time to assemble. First, I think it is best to place the small components (resistors, capacitors, some inductors, some beads) first. There are several methods:

Toothpick & Fine Solder. A section of solder is unrolled, but left on the roll. The roll is then placed so that a drop of solder can be picked up with an iron. Next, a single component is placed on its pads, held down with a toothpick (or opened out paperclip, or an office (Xacto) knife). That solder drop is then placed at one component junction between the component & PCB pad. Often a toothpick drop, or less, of rosin flux is used at the junction to ensure a good joint. The PCB is rotated by 180 degrees and the other joint is soldered.

Kate's method. A drop of solder is placed on each pad for a component. The component is then placed on the pads. Two irons (one in each hand)[i] are placed at the pad-solder drop junction. The solder melts and the component self-centers between the pads

Tweezers & iron. Solder paste anyone? Method 1: Replace wire solder in the above procedure with a drop of solder paste, applied before the iron is placed on the joint. Method 2: Apply a drop of solder paste on each joint. Place the part: Method 2a. Hold the part with a pointy tool and solder each side. Method 2b; Apply heat to both joints with two soldering irons. Slowly pull irons away & watch component self-center between pads. Method 2b is the method of choice at National Wireless, Inc. And, how else do you think a component is removed? Read below.

Pick & place machine: Here there are two types of machines, hand operated and robots. I have seen several hand operated machines. Typically a potential client is trying to impress me with his expense. I've never seen one of these machines in operation, but have seen lots of dust. Robot machines are the real pick & place machines. Operation is easy. Have a heavy checkbook. First you will need to have a stainless paste stencil made, then pay to have the machine programmed from a copy of your layout (Gerber) file. Next you will need all of your components on reels. No single parts, or half-empty reels, please. The operator loads the reels on 'feeders,' places the parts feeders on the machine, places a pasted circuit panel in the machine, and all is ready. Finally the machine will place components faster than the eye can see. The operator (or machine) will place the stuffed PCB in a solder "reflow[ii]" machine, and out will come your board ready for inspection and re-placement of components that have "tombstoned.[iii]"

From this you can understand where some of the business for National Wireless comes from. We can stuff a small quantity of prototype PCBs faster and cheaper than a machine. There are others that also do this.

4. Physics of Heat & Temperature.

There is a lot of information out there about controlling soldering iron temperature, and almost nothing on the energy (heat) requirements to acquire a good solder joint. Furthermore, a problem for us is the presence of an RF ground plane, or should I say "a heat sink." Many circuit boards are made from double sided FR-4 material, a fiberglass & resin substrate with 2 (or more) layers of copper plating. In the RF world there should be both a topside and bottomside ground plane with a great many 'stitching' vias between them These vias ensure a low inductance, low resistance path between the ground planes. This, in turn, makes for a stable (non-oscillating) circuit. Obviously soldering to a double sided FR-4 board requires more than a 25 watt soldering iron. Then what do we need?

Although 'heat' and 'hot' are almost synonymous terms in colloquial English, I use them differently here. Heat is a measure of energy contained within a substance, while 'hot' refers to the temperature of that substance. This difference might not be obvious for us depending on background and experience. For an example let's consider a fair sized white-hot chunk of scrap cast iron. An old coal boiler door comes to mind. Obviously we won't touch it, We would expect that it would destroy any circuit board coming in contact with it. Next let's throw the scrap iron piece in a full backyard swimming pool. After a reasonable amount of time, watching the generation of lots of steam & fizzing, could we touch the iron block? Probably. And would we expect disaster if we placed the scrap in contact (after drying, of course) with our circuit board? Probably not as the iron scrap would be relatively cool. So what happened to the temperature? It was reduced by the water. Then what happened to the heat? It was not lost, but driven into the water by the difference in temperatures between the white-hot iron and cool pool water. The energy is still there, at a lower temperature, of course. So temperature (hot) and heat (energy) are different 'substances.' Temperature difference controls the flow of heat energy (in the example, from the iron block into the pool).This is important to attaining a good solder joint in SMT assembly. Heat at a proper temperature is required to melt the solder and secure a joint. Unfortunately most of the soldering iron's heat is lost in the process.

There are several paths where heat is lost before solder at the joint is melted: 1. Radiation, conduction and convection from the iron and iron tip, and 2. conduction into the circuit board. Each of these paths transfer heat away from the joint by the temperature difference between the iron and surroundings. Radiation from the tip might provide the most loss as it varies as the temperature difference to the forth power. Heat conduction from the iron body to the tip of the tip is also inefficient. Coupled with this loss is typically a double sided FR-4 PCB that drinks heat like a sponge drinks water. You will find that those 30 to 35 watt irons just won't do the job unless you are working with a low quality single sided PCB. And you will also find that those fancy digital readout, calibrated, irons are completely unnecessary as they do not measure temperature at the tip. Rather they measure temperature at the base of the iron proper, before all the heat loss associated with the tip.

The object in all this is to apply enough heat, fast enough to solder a joint before the heat has time to damage the components being soldered. A good quality high temperature, higher wattage iron is necessary to do the job. Typically 60 to 65 watt Pace or Weller irons are used in industry, and are available at the flea markets. Metcals also makes a series of very fine, but expensive, soldering stations.

5. Useful Solder Sizes.

Over the years I have found that .015" solder works best if "paste" is not an option. Occasionally I will use .020", .025", or .032" diameter solder, but anything larger is a waste. Worse it can make a mess. All of these diameters can be found inexpensively at most of the larger flea markets. There will be many at Dayton. One word of caution: many so-called 'no-clean' solders often do not have enough flux to properly clean the joint. An example is Kester with "245" flux. This stuff is

readily available at many fleas, and very popular at Dayton. You may be disappointed if you try it.

6. Appropriate Tools for the Hobbyist and Small Shop:

Two Irons. Yes TWO, else how do you propose to remove components? This is the trick that keeps many away from SMT. How is a component removed for a repair or should the wrong part be placed in the wrong place? Simple, for resistors, capacitors, etc., a hot iron is placed on each joint of the component. When the solder melts, lift the component off with both irons. Wipe the component off on the solder station sponge.

Review Kate's attachment method, above. Component removal is the reverse operation. Many manufactures make a "tweezers" iron handle for component removal. The only one that I have ever used that worked was a Metcals. And it worked very well. All the rest felt like I was trying to remove components with vice grips. Use the two iron trick. More than once we have replaced 49 components on our TV transmitter board in about 20 minutes using two irons. Spend extra time cleaning the old solder, with solder wick, from the pads before replacing the component. A cleaned joint is much easier to work with. And waste a component? When resistors cost 5000 for twenty bucks, or less, you can afford it.

As mentioned above, soldering irons for SMT work must be 60 Watt or greater. There is a commonly sold small iron on a colorful (typically red or blue) plastic stand available. It will not melt solder for components placed on a double sided RF PCB, and is marginal, at best, on low quality single sided PCBs. Mine is labeled as a 40 watt Weller WLC100. Save your money. Good, workable, irons are available at Dayton.

Tip Sizes. This is a personal preference. I like a 1/8" or 3/16" chisel tip on one iron, a fine pencil tip on the other. With this I can easily remove SOT-23 sized transistors & diodes. These are also available at Dayton. I also have a few tips that allow the removal of 8 to 20 lead ICs. Occasionally handy.

Tray Sizes. Tray? What tray? What's a tray for? Let's suppose you are down in the shack & just started building an SMT circuit board. You opened a bag of components and...whoops...dropped an 0603 size capacitor on a tile floor. No cracks in the tile. Now find the component. Good luck!

Next time get a tray to build in. One that works very well is an aluminum "half sheet pan." A sheet pan is an 18" X 26" tray used in the baking industry. It has roughly 1" high, slightly slanted, sides with edges rolled over a steel wire, allowing a magnet to stick to it. While this pan is a bit large for most, an 18" X 13" half sheet pan is available. Cost is around $7 for a half sheet pan. This tray is very useful to collect dropped components and a great place to hold components before you place them on the PCB. I find the tray very useful for many other tasks. It does a very good job of collecting small tools and 2-56 screws. A small sheet of cardboard is useful to place your work on, otherwise the tray will remove much of the heat from those 60 watt irons. *(One Western MA Source: Kitteridge Kitchen Supply, Agawam, MA)*

Tweezer Choice; Tweezers are certainly a personal thing. What I like, you will probably hate. So the issue is how to find what you like. A good step is to go to an electronics trade show. There will be a company or two that has a gazillion tweezers, on a table, with a chair or two, so you can try. Take a circuit and a couple components along. Typical prices for Swiss stainless tweezers are $35.

A less expensive choice is to go to your friendly mega drug store. Pick up a few pair, take them home and file them to what you like. The only problem is they are usually made from magnetic steel. They will hold a magnetic charge, as will the end caps of many components, which are also steel. This can be a problem when you try to place components. I use three sets of Swiss tweezers and a couple from Rite-Aid.

Paste Dispense Methods. Dispensers range from a plunger in that syringe to an air compressor driven dispenser to an automatic placement dispenser. The plunger is a cost effective solution, but places demands on your thumb. You will also find that larger dispenser needles are required with manual dispensing. A foot-operated, power dispenser is available from Kahnectics. I paid about $300. Add to this a simple air compressor. You only need 30 to 40 lbs pressure, and not much volume. I use a compressor from Costco. A step-up from this is a bench dispenser with a foot switch. Cost is about $1K. Again a compressor is required.

So, you think this is beyond you? HA! One day at Hosstraders (Hopkinton, NH) a surplus seller took one from his truck, and was ready to throw it. I quickly yelled "How Much?" For $30 I became the owner of a hardly used $1K bench dispenser.

The next step-up is an automatic dispenser that places paste on every land in your layout before components are placed. This costs bucks and requires programming.

Other hand tools: Fine wire cutters and small needle-nose pliers are useful, as with most electronics projects.

If you plan "power" projects an IR thermometer is a good investment.

Tools: Summary. The plan has been to show that anyone can get involved in SMT assembly for a reasonable amount. Certainly a paste dispenser is not required for infrequent work. And the reader probably already has one soldering iron that will do the job, IF the wattage is high enough and a small tip is available. So acquire another iron. What remains is some practice.

Notes:
1. The two-iron trick was given to me by an engineer at RFM. Unfortunately I can not remember his name.
2. I assume this is called 'reflow' because the paste flowed first during the paste application stage.
3. The component picks itself up on one pad, so that it looks like a mini tombstone.

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My 9 QSO Contest Operation

Barry Whittemore, NF1O

9 QSOs in a contest does not sound like a lot but I was very happy to get 9.

A while back I stumbled upon Steve (VE7SL) web page about a 1929 TNT transmitter.

http://members.shaw.ca/ve7sl/tnt.html

I was intrigued and with a little more research I found out about the AWA Bruce Kelley QSO party. The BK is a contest done over 2 weekends in early Dec., Same weekends as 160 and 10 meter contests. The contest is played on 160, 80 and 40 only and points are given only for working other 29 or older designed TXs. Any RX can be used but the TX has to be made from 1929 or older design and with parts that were available in 1929. In the process I learned old time acronyms like TNT, (Tuned, not tuned) MOPA, (Master oscillator, power amp) TPTG, (Tuned plate, tuned grid) and gained a lot of respect for the hams of old.

After finding the components to build my own 1929 transmitter, (I got them from Nearfest folks as well as from some friends that had needed parts.) I decided on the Hartley style due to a slightly easier design. I also decided to use a UY-227 vs. the Type 45 tube due to easier design as the 27 has a separate cathode. I also chose it due to the present day value of the different tubes. The 45 is a much more expensive tube so I figured I would do the experiments with the cheaper tube. Both were available in 1929 so qualified.

I built my TX and PS in the old Breadboard style as they would have done in the 1920s.

For the contest, I hooked up a temporary dipole for 40 (I built my TX for 40 only) and set it up on the dining table for operating. As any RX could be used, I built a neophyte RX from a kit I picked up a few years ago to use. I got on the first weekend and could hear several obvious 29ers (They do not have the perfect tone that my K3 has) and called several. I got no replies what so ever and even changed to my IC706 for RX due to being able to tell that both were on the same freq. (neophyte is a bit wide)

After the first week I had no QSOs and was disappointed. I sent off an email to the folks on the AWA group and was told that the coupling coil would need series capacitance in order to match well to modern coax fed antennas. I grabbed a dual 365 from my junk box and kludged it in. I used a small lamp to check for actual RF going out (2-3 watts)

Before the contest, I set up a sked with a friend (K1KXN) a few miles away to see if it worked. He said I was hard to copy because he wasn't used to copying chirpy signals but he was hearing me. So the weekend came and I took some breaks from the 10 meter contest and got on with the 29er and the 706 and was very happy when my first QSO was NC (K4JYS), after which I worked 8 more contacts. (Everyone that I heard.)

I believe that the top finisher had about 70 QSOs and since that was 3 bands over two weekends and I really only had QSOs on 1 weekend and one band. I was very happy with my 9 QSOs.

For a QRP contest with very tight restrictions, I had a great time building, testing and contesting with a rig that was around the year that my father was born. I did it all the old way, I used an old 20s straight key and yes, I even used a paper log. (I scanned it in and emailed to contest sponsor though.)

Though I did not break any records, I had a very enjoyable time with this one and would encourage all to give it a try. Info can be found here. http://www.antiquewireless.org/pdf/AWA_2012-2013_Event_Schedule.pdf

My Ameritron AL1500 Workhorse

Jack Schuster, W1WEF

It was October 26, 1999 when my Dentron MLA2500 gave up the ghost for the last time. I had nursed 4 different MLA2500's to health so many times that there was hardly a single part that I hadn't replaced at one time or another. Now I couldn't even buy a replacement 8875 final tube if I wanted to. I was really looking forward to CQWW CW and decided it was time to bite the bullet and buy a new amp.

I called the only dealer within driving range, hoping they had an Ameritron AL1200 in stock, but no luck. The contest was two days away, and I didn't want to take a chance having an amp shipped at the last minute, so I picked up the one amp they did have, the AL1500. It seems as though it's been longer than 13 years, but we've done a lot of contests together. I still feel that the AL1500 is a great value for the price, and would buy another one today if I had to. I also like the fact that it's made in the USA!

Our time together hasn't been maintenance free, but I've been able to resolve every problem I ever had by myself. It's a straight-forward manually tuned amp, but premarked dials hold settings surprisingly well, and I have found it easy to troubleshoot and repair when necessary. I thought some of my experiences with it might be helpful to others, so here they are:

Symptom: Meter lamps burn out... I replaced all of the incandescent lamps with LED's in series with a resistor, before Ameritron started offering LED replacements. New amps no doubt have LEDs; no more lamp problems.

Symptom: On receive, signals would be down but one tap of the key and back to normal. Burnishing antenna relay contacts and eventually replacing the relay took care of this. I found Ameritron to be good at supplying replacement parts quickly at reasonable prices.

Symptom: Antenna relay would not pull in. What I found was a failed STBY/OPR switch. In STBY the 12VDC to the antenna relay is cut off.

Symptom: Load adjustment on amp had almost no effect on grid current as it normally had. It was taking 150ma or so grid drive to get 1500W out, instead of the normal 50 or 60 ma. This happened at the same time a lightning storm took out my modem. Replacing a shorted diode between "B-" and ground on the filter board resolved the problem. I posted the solution and three other guys in the club found they had the same shorted diode!

Symptom: No High Voltage, sometimes initiated with a bang that sounds like a gunshot! I think I've had this happen a couple times, but not sure because I repaired a couple other 1500's with the same failure. The bang is usually an electrolytic capacitor letting go, and possibly taking HV rectifier diodes or bleeder resistors with it. CAUTION Be sure to unplug the 220VAC wall plug and DISCHARGE the high voltage even after unplugging.(you can short the HV at the bottom of the plate choke to ground with a screwdriver). If the bleeder chain opens up, there could still be enough charge left to throw you across the room. RESPECT HV! Note that the 15a fuses usually blow with this failure.

You can buy individual components from Ameritron or elsewhere, but consider a whole replacement board for almost the same cost. It's easy to isolate a shorted rectifier or open bleeder resistor , but when one or two electrolytics go I feel better replacing them all.

Another cause of the “gunshot effect” that I experienced was when the disk ceramic bypass capacitor at the base of the plate choke broke down.

Symptom: No Output This could be caused by many things, but I recall once when the multimeter indicated HV was OK, there was no voltage on the plate because the plate choke opened. That was in a friend's amp that I repaired, and had opened because the tube shorted. By the way, that rugged looking silver plated jacket around the tube is the plate, and has high voltage on it! Be careful!

Symptom: The paint on top of the cabinet started smelling and blistering! The blower had failed because of a broken wire to the fan motor so there was no cooling. Although the blower is not quiet, while operating with headphones I didn't notice how quiet it had gotten!

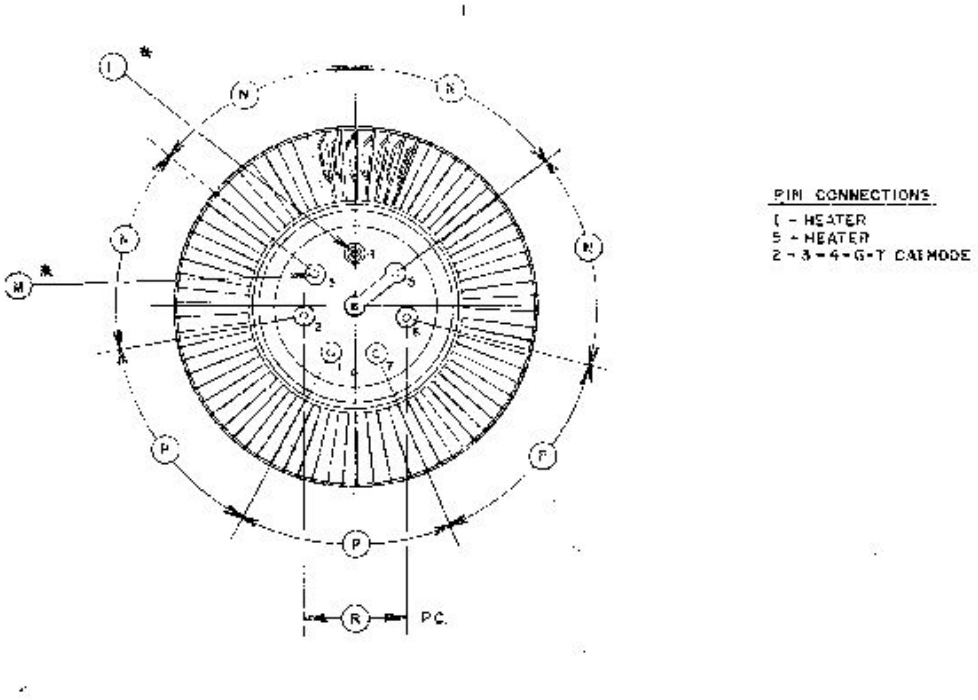
Symptom: The timer circuit wasn't working. Normally there is a three minute warmup time before the HV comes on. When the timer failed I isolated the cause to the socketed IC on the timer board.

Symptom: Normal output on all bands but 160. Plate voltage normal, plate current pegged. Cause was the tank was not tuned to 160 because the wiper on the bandswitch that switches in a capacitor on 160 was fried. Replacing the bandswitch is not an easy job, but for me was a better decision than sending the whole amp back and possibly being without it for a long time. If you do it, replace the wafers, not the mechanical portion.

After 13 years I'm still getting full output with about 65 watts drive. If I forget that I was operating barefoot yesterday and drive it with 200W, the fast acting protective circuitry saves the final and shuts it down (knock on wood!).

If it sounds like I've had a lot of failures, bear in mind I use the amp at 1500W output in every contest or when chasing DX (unless I work it before the three minute timer activates). I feel the documentation leaves a lot to be desired, because the overall schematic has several empty “boxes” with wires going to them, and you have to look at a separate page for what's in the box. In fact, one board in my amp isn't documented at all.

One last tip. If you are tracing RF input circuitry, don't be fooled as I was. The schematic shows coax feeding coupling caps going to the cathode but all I found (I thought) was a single conductor wire. Well, it turned out that wire WAS the smallest diameter coax I ever saw, and the circuit made sense once I realized that it was coax. I should mention though that the drive circuit was not as documented; the grid pins were not grounded as shown but tied to the cathode and one side of the filament. Oh...if you try to find the pin layout of the tube, even on line in Eimac spec sheets, good luck. The fat pin is pin 4, and the filament is pins 1&5 (see below).



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YCCC 2013 Winter Contest University

Wednesday February 13th, 2013
6:30-9:30 pm
ARRL Headquarters
225 Main St.
Newington, CT

This will be the ONLY Contest University held this winter. We will have top contesters on hand as ‘Professors’ to share their tips, secrets, and words of wisdom on Contesting! Learn the winning strategies from the winners! This will also be a Local Meeting; New Members may apply for membership and join YCCC at this time. Newbie or Barnacle-encrusted, come one, come all and join us for a great evening of contest discussion!

We will gather for dinner around 5pm at Yanni's restaurant (www.yannispizzarestaurant.com)

Yanni's Pizza Restaraunt
296 Main Street
Newington, CT 06111

FCC to Consolidate 1st & 2nd Class Radiotelegraph Certificates

On 08 January 2013, the FCC issued a report and order approving consolidation of the First and Second Class Commercial Radiotelegraph Certificates into one "Radiotelegraph Operator License" that requires no renewal for the life of the holder.

The Third Class Certificate is replaced by a "Marine Radio Operator Permit".

So, if you always were planning on getting a Commercial Radiotelegraph licence and have delayed, now is your last opportunity to qualify for a 2nd or 3rd class Radiotelegraph license. If you're a pre-April 15, 2000 Amateur Extra Class licensee you're half way there already; you ham ticket gives you credit for the Telegraphy portion of the exam..

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Reminder! - YCCC Youth Scholarship Raffle

$25 per ticket
Grand Prize: Elecraft K3/100 Kit!

Tickets ONLY sold at meetings - remember to bring cash or check for your tickets at the next meeting!

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YCCC MEETING SCHEDULE - 2013		
Day	**Date**	**Location**
Saturday	**February 2, 2013**	**General Meeting Enfield, CT**
Saturday	**April 6, 2013**	**General Meeting & Elections Sturbridge, MA**

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http://www.cafepress.com/shopdash/8546499

YCCC CLUB RESOURCE INFORMATION

DUES AND MEMBERSHIP STUFF Dues are payable as of the April election meeting, which begins our club "contest year". The YCCC has adopted a multi-tiered membership format as follows: Please note that payment of dues IS NOT a prerequisite for contributing scores to the Club aggregate, but IS for the various YCCC Awards Programs

Full Member - $20 ($35/2 yr) (Eligible for YCCC awards programs and paper delivery of Club newsletter)

Full Member - $15 ($25/2 yr) (Eligible for YCCC awards programs and electronic "Ebutt" delivery of Club newsletter)

Family Member - $0 (Grants full membership to all amateurs residing at one domicile on payment of one member's "Full Member" annual dues and entitlement to one Club Newsletter sent to one domicile or email address. All members of said family are eligible for YCCC awards programs.)

Student Member - $10 (Grants full membership to students at a reduced level. Eligible for YCCC awards programs and paper or electronic delivery of the Club Newsletter.)

Subscription - $** (A "friend of YCCC" - not a member but a possible candidate for future membership. Receives club newsletter only in paper or electronic form. Fee basis is $20 for overseas paper delivery, $15 for domestic paper delivery and $10 for electronic "Ebutt" delivery domestically or overseas.)

Club members who move out of club territory and so are not eligible to contribute to club aggregate scores automatically become subscribers. New members who join at the February meeting are credited with dues for the year beginning the following April. You can tell if you owe dues by checking your 'Butt mailing label. **Mail your dues to the club treasurer, Chet Slabinski, N8RA, 462 W. Hill Rd, New Hartford, CT 06057.**

SCUTTLEBUTT ARTICLES should be sent to the Scuttlebutt editor, Steve Rodowicz N1SR, preferably by E-mail at **n1sr@arrl.net** or on 3½" disk (in MS-Word format or text file) by snail mail to Steve Rodowicz, 809 Pendleton Avenue, Chicopee, MA 01020. The deadline for each issue is the 10th of the preceding month..

Scuttlebutt Advertising: Nominal Business Card sized ad, $50 per year (6 appearances)

CONTEST SCORES should be sent to the club scorekeeper, Dave Hoaglin, K1HT, preferably by E-mail at **scores@yccc.org**. Please include details such as numbers of QSOs, QSO points (if appropriate), and multipliers (all types); entry category; and power.

CLUB GOODIES

BADGES YCCC badges are available from Tony, K1KP. Send $3, name and call desired on the badge, and your mailing address to Tony.

APPAREL Contact Richie, W1STT. Email: **richd1313@aol.com**

YCCC LOGO ITEMS http://www.cafepress.com/n1ik

QSL CARDS are ordered through Dennis Egan, W1UE. To order, send Dennis an email at **egan.dennis88@gmail.com**, detailing card information per "QSL Request" form available at http://www.yccc.org/members/yccc_qsl.htm. You will receive a proof by email. Approve the proof, making any corrections, and return to Dennis *with payment* (make checks out to Dennis, not YCCC). Current price is $50 (delivered) for 1,000 cards. Also available is the glossy version for $70/1000.

MEMBERSHIP ROSTER is posed on the YCCC website. Updates are published in 'Movers and Shakers' when members move or change callsigns.

COMPUTER STUFF *INTERNET REFLECTOR* There is an Internet mailing list for YCCC members. To subscribe, send mail to yccc-REQUEST@yccc.org. Insert only the word "subscribe " in the subject of the mail message. (Do not send messages to the reflector that have file attachments, HTML formatting, use boldface or other fancy fonts, etc.)

WWW HOME PAGE Come visit us at http://www.yccc.org Our Webmaster is Lyn Glagowski, WB1CCL.

ADMINISTRATIVE STUFF *The W1 QSL BUREAU* is sponsored by the YCCC. Keep your account up to date by sending a check, or pay via Paypal. Stamps are sold at face value, envelopes are 20 cents each. Address: W1 QSL Bureau, PO Box 7388, Milford, MA 01757-7388. Email address: **w1qsl@yccc.org**. (See: http://www.yccc.org/Resources/w1qslburo.htm)

ARRL COMMITTEE REPS are**:**

CAC: New England Dennis Egan, W1UE **Hudson** George Wilner, K2ONP **Atlantic** Michael Gilmer, N2MG

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