
Date: Tue, 30 Apr 1996 10:15:03 -0600
From: bfollett@ditell.com
To: qrp-l@Lehigh.EDU
Cc: jparker@fix.net
Subject: [7902] Revised St Louis Tuner Manual Errata --VERY LONG
Message-ID: <199604301615.KAA28356@orion.ditell.com>

Gang:

-----REVISED April 30, 1996-----

I finished the St. Louis Tuner, and it works great! The case is a piece of art. Everything fits perfectly! Thanks Doug, an outstanding effort.

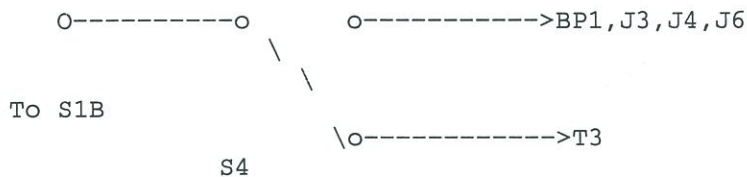
Now, My Revised, Final Manual Changes, with input from Doug, Chuck and Bob Kellogg, separated into Errors, Omissions, and Hints:

ERRORS:

1. Page 5, fifth line: D1 and D2 banded ends are towards C1 & C2, NOT the resistors.

>From Chuck:

2. S4 is not correct. It is used to switch between the Balun OR the BP1,J3-6 outputs. Both can not be active as wired. So the schematic should look like



3. From Doug Hendricks: "Dave Gauding, NF0R who was on the design team for the St. Louis tuner has discovered an error in the St. Louis Tuner Manual. The balun on the back panel should be wound with 12 turns, not 10 as specified in the manual. That was my error and I apologize for any inconvenience and all that stuff. Dave says it makes a big difference, so don't forget to change it..."

4. The schematic is missing the two ground connections on S2. The center position of the switch and the bottom of the inductor (lug 12) are both grounded (in the original St Louis Tuner design) . Mark your schematic, because the step-by-step procedures are wrong, in my opinion.

5. Page 7, 2nd column, third paragraph: "Cut a piece of wire that is 8" long" -- Don't waste wire, 6" is more than enough.

5. Same as 4, end of paragraph: "solder a #18 tinned bus wire 4" long to the first lug (the one that has the 1st tap on it). ALSO ADD:, solder a 4" long bus wire to the 12th lug, then connect and solder the other end to a convenient point on the previously installed 6" (Ground) wire coming off the center lug of the same switch. Reference # 3 above, why we are doing this.

6. Page 8, Step 2: This is in error, in my opinion. If you expect the tuner to work/look the same on the front panel as a commercial tuner, You want the inductor switch to start at the 9:00 o'clock position (tap 1, NO inductance) with small changes in inductance, ie., three turn taps, and end up with larger degrees of change, as you turn the knob CW, at the final switch positions at maximum inductance. This means lug 1, not lug 12, is connected to the capacitor

frames. The 4" bus wire is ALREADY soldered to Lug one, so just shape it right, and connect & solder to the wire between the two caps. you just installed in Step 1. (You already fixed lug 12 in # 5, above).

OMISSIONS:

1. As Chuck pointed out, the K binding post (Red), is missing from figure 3, page 5.
2. Note that the F binding post (blk), needs a ground lug. Use one that came with the BNC connectors, and position the solder point at 12 o'clock.
3. Add the missing Step 19 to the manual: "Connect the bus wire from Switch 1, lug B to the center position of S-4, the Balanced/Unbalanced selection switch on the rear panel."

HINTS:

1. LABELING: Page 6 bottom diagram shows labeling for the 3-way Out, Tuner, Dummy Load spread across about 160 degrees. This switch only has a range of about 30 degrees. Therefore, I suggest you place all three labels on the left side of the knob, relatively close together, one over the next (Vertical alignment). The supplied knobs are so big, there is little room for calibration marks for the inductor and two vari-caps, so I left them all blank. You could use smaller knobs and then put numbers and alphabet on the panel. (If anyone wants, I'll e-mail my front and rear layouts in either native Coreldrw format, or .GIF. However, your e-mail must support MIME attachments!)
2. I mounted my PC board on the Left side with the dummy load resistors facing the front panel. That is one of many positions you could use, but it worked for me, and left a large area on the right side for ten big battery cells, should I feel the urge.
3. When soldering the bus wire to the rear panel connectors, use a high wattage iron! These are big heat sinks.
4. As Bob Kellogg pointed out, when winding the Main Coil, L1, page 4, make sure you wind it in a clockwise direction, as viewed from the 12 position s/w it will be eventually mounted to. The idea is to make sure that what becomes position 1 on the switch is the 1, 3, 6 turn/tap end, and position 12 is the 60 turn end. That way, the switch will function in a normal clockwise direction from no inductance to maximum inductance.

Don't twist the tap loops too tight, or they may break after you untwist, strip, re-twist and solder. (I didn't try to insert the taps into the switch lugs. It was much easier to keep them straight and lay them along side the length of the lugs, and solder)

5. Quoted from Chuck:

"Helpful hint on installation of the two caps and the nylon washers and screws. Place a cap on the desk with the shaft up. Place the three nylon washers over each of the three threaded holes. Now with all the eye-hand coordination you can muster lower the front panel over the cap and align the holes before the panel contacts the washers. Then with a free hand install each of the three nylon screws. If things shift a little, a small screwdriver gently can be used to align the washers back to where they belong."

"After you GENTLY tighten the screws you'll find, as Doug mentions, that the screws coming out of the bracket of the cap will obstruct the rotation of the plates."

"Here is what I did. I hate putting any sharp object between rotating plates and the front panel. The potential for me to mess something up is too great. So, note how much of the screw extends into the cap area. Remove ONE screw and

using either an Exacto Knife (my favorite) or a single edged razor blade (kids and razor blades and sometimes adults don't mix) remove just a little bit of the screw and put it back in. Check your work. Now do another ONE. Don't get in a hurry and do only one at a time. Make sure that the washer does not move or drop out during this procedure. Worked for me, and worked well, if I do say so myself..." (Test your final work with an ohmmeter. The cap frames sh/be isolated from the front panel... Bob)

6. I ran out of # 18 bus wire using the suggested lengths in the manual. I then substituted #18 stranded/insulated wire, and found it was superior to use for connections to the front switches from the PC since, as Doug pointed out, it is difficult to make the two switch connections when both the front panel and PC board are in place. (It helps if you don't screw in the front panel, but rather, put it into the case and tilt it forward while soldering).

7. Quoted from Chuck Adams: "Now, this is just my idea and all you antenna wizards, and ATU (antenna tuning unit) gurus can tell me if I'm wrong.

C5,C6,C7, and C8 are the four sections of the two dual-gang variable caps. C6 and C8 being the 15-73pF small sections and C5 and C7 being the 17-165pF caps. As marked in schematic on page 10 of the manual.

My preference would be to have the smaller sections in all the time and the larger sections switched out. My logic behind this is that with only the smaller sections in I have a greater control over small variations with larger angular movement in the dials and the smallest value would be 15pF. With the smaller sections in place of (now labeled C5 and C7) the inline at all times sections then I can have 15-73pF on the single section inline vs. 17-165pF with having the larger sections inline and the smaller sections switched in/out".

(I, Bob, have used the tuner on a balanced 1/8th wave DCTL loop, a end-fed random, and unbalanced 40M horz. loop, and find the "normal" switched arrangement works well for what I have encountered so far--We will have to wait for a report from Chuck or someone else who tries his suggested arrangement).

8. Note that while the manual only refers to 4 lugs on the two vari-caps, there are really eight. The important thing to remember on page 8, steps 3 to 6, is that A & B (the larger variable plates) are the lower/closest to the front panel lugs, and there are also two more lugs under the one's labeled C & D in Fig. 7. You can connect the switch wires to either set. The same goes for the upper (away from the front panel) four lugs labeled C & D.

If the above seems confusing, look closely at one of the vari. caps, and you will see that the fixed plates have insulated lugs at each end of the frame. (the frame is connected to the rotating plates) There are two sets of fixed plates, one with fewer plates than the other. The larger set is, when mounted to the front panel, closest to the front panel.

9. Note that in step 13, you are connecting BOTH Point A and Lug 12 of Switch 2 to the ground lug on the rear panel. (Big wattage iron again). Yes, the tuner will work without grounding either/both, but "normal tuner convention" is to ground both to keep RF under control. According to our qrp-1 tuner authority, LB Cebik, at QRO levels, arcing can occur if both points are not grounded.

THAT's IT -- This list will be updated if any other changes/enhancements are discovered.

This document can also be found on the NorCal Web Page thanks to Jerry Parker, WA6OWR.

73, Bob

Bob Follett WA7FCU, QRP-L # 129, NorCal, ARCI, 10-10
2861 Estates Dr. VOICE: 801.649.6457
Park City, UT 84060 Home Office E-mail: bfollett.ditell.com

Date: Fri, 17 May 1996 10:43:20 -0400
From: DYARNES@aol.com
To: qrp-l@Lehigh.EDU
Subject: [8655] St. Louis Tuner Construction Tips
Message-ID: <960517104318_115579219@emout14.mail.aol.com>

Hi Gang,

SLT #96 is up and running. This is a very spiffy little project! It's another winner for Doug and Jim. I've got tuners all over the place around here, but I certainly am glad I put in for this one.

I'm sure not a construction pro like many of you are, but I do have a few suggestions from my experience. I thought I would pass them on.

First of all, this thing goes together very nicely. Just be sure you proceed carefully so that you don't skip a step. I suggest you read the instructions several times before starting and use a hi-liter for steps you think are more critical or easy to skip over accidentally.

Be SURE you pull WA7FCU's updates to the instructions off the NorCal page on the internet. This will save you considerable time and confusion. I marked the updates in Doug's instruction and cross referenced them.

I don't know about you, but I was a little unsure about where to drill the holes for the PC board. I waited until I had installed most of the parts on both the front and back panels, then I temporarily put those panels in place on the chassis so I could get some perspective about the PC board placement.

This worked well for me. By the way, in WA7FCU's updates it is suggested that you mount the board on the left. I agree with this, but you still need to be careful not to crowd the front or back panels.

I had some problems with a couple of the 5 way binding posts. The nuts were not exactly right or something. Even though I tried to be very careful about not stripping the threads, the nuts seemed to want to do just that. Anyway, I found some nylon nuts at Ace Hardware which actually worked better than the metal nuts that come with the binding posts. I almost wish I had used these nuts on all the posts (except possibly the one that requires a ground lug).

They were nice and fat and easy to work with using your fingers.

BEFORE you mount the PC board to the chassis, make sure you have made connections to all the holes on the board. Because the instructions are not in steps you check off, it is easy to miss some of the short steps like "Repeat for M2". I missed that one with my hi-liter and had to take the board back off.

There has been a lot of discussion about how to mount the variables. I didn't have that much trouble mounting them, although it does take a little finger work. Holding the panel with the outside facing down, I put the nylon screws in the holes and held them in place with my fingers. Then I put the nylon washers on the inside over the screws. Then CAREFULLY rotate the panel almost 90 degrees so that you are holding it sideways but don't let the washers fall off. Now bring the variable to meet the screws (you should be

able to "feel" when the screws are in or near the holes) and then turn the panel over a little further so that you have the inside facing more downward.

Gravity then becomes your third hand. You should be able to carefully rest the panel against the variable and free up one hand. This should be the hand you use to manipulate screwdrivers! You should then be able to tighten the screws if you just don't get too anxious to start the threads.

L1 is a chore, but you should do fine if you are careful. At least mine works (I think)! However, several things are left unsaid in the instructions for L1 that dummies like me need to have spelled out. For example, turn 60 is the last turn. It doesn't say that here, but it does on the schematic.

Also, the BEGINNING of turn one is connected to lug one, not the first tap (which is at turn 3). This will probably be obvious to most of you, but confusion like this goes on in my shack all the time! You're probably wondering how I ever find the light switch! Some times I even amaze myself!

Good luck to those of you still working on this great kit. You are gonna love it!

72 de David W5RMZ

Date: Tue, 21 May 1996 00:41:17 GMT
From: harry.bump@hamdata.leba.net (Harry Bump)
To: qrp-1@Lehigh.EDU
Subject: [8756] Saint Louis Tuner
Message-ID: <832639277@hamdata.leba.net>

Hey Gang,

Saint Louie Tuner #139 is complete! Here's my thanks to those of Norcal and the Saint Louis QRP Society that made the project possible.

Now fer my notes (hope this isn't too much re-hash):

Had some trouble with L1 at first. Wound the coil once and got only 56 turns on it and it didn't look good. Tried to clean up one of the 'taps' with no luck; time to re-think. I cut the wire from the core and went to my wire spool for more. With the second attempt, I wound the coil to the first tap, then used my trusty propane torch to burn the enamel from the wire for about two inches. Very carefully, starting about two inches from the core and moving the flame towards it. The enamel burns from the heat before the flame gets there so there's no need to take the flame close to the core (yes, I re-lit the torch twelve times). Rubbing with a bit of steel wool yields a couple inches of wire without insulation. Then I folded the uninsulated part in half, bringing the working end of the wire back to the core. Grab both wires there with a hemostat or needlenose pliers and give the bare wires a twist or two as close to the core as you can. Squeeze the parallel wires together and solder. Then you can continue to wind to the next tap. Doing it this way I got my 60 turns and had a bit of room left over!

Oh, someone had asked the group about the 'flat edge' of the core. That is the part that's on the table when you lay the core on the table, as opposed to the 'outside edge' which is the outside curve of the 'donut'. The goal is to get the taps sticking out of one flat edge (or side) so that when the core is positioned behind the switch the taps line up with the twelve switch tabs.

Before installing the coil, solder a wire on point 'A' of the twelve position switch and connect it through point '12'. This is the ground wire that was missing on the schematic and later will be

connected to ground.

Also have a note about page 8 step 11, where the RF wires from the pc board are to connect to the front panel switch #1. Get the front panel and board mounted to the bottom shell half, then position the two wires that go to point 'A' and point '1'. Just get the wire lengths right, don't worry about trying to connect the wires or wedge a soldering iron and solder in there. Then remove both the board and front panel from the shell. It's now much easier to position those wires alongside the switch tabs and solder them! If you cut the wires right it will go back together easily. I also added a piece of insulation to cover the wire to position '1' (the one that goes UNDER the board).

It looks good and works great!

73,

Harry, KM3D

Date: Wed, 05 Jun 1996 10:57:09 -0600
From: lvel@inel.gov (Larry V East)
To: qrp-1@Lehigh.EDU
Subject: [9425] St. Louis Tuner Notes
Message-ID: <2.2.16.19960605165709.25af4504@eloi>

The following probably belongs under "in case anyone is interested"...

For what its worth, the 200 Ohm film resistors supplied with the kit will work just fine for a dummy load -- with no indication of reflected power -- PROVIDED they are NOT mounted on the PC board but rather grounded directly to the case. I suspect that those who switched to carbon composition resistors and found that they no longer got an indication of reflected power did NOT mount them on the PC board because of their large size. Anyway, there is no need to scrounge the country-side looking for 2W carbon composition resistors to use for the internal dummy load.

I suspect that board mounted resistors will work OK if a simple mod is made to the PC board to improve grounding. Looking at the large PC board layout drawing in the manual, notice that the ground trace makes a right-angle turn at the upper right-hand corner of the board, just above where the dummy load resistors attach to it. Solder a piece of solder braid or tinned wire (use smaller gauge than the stuff supplied with the kit) to the ground trace at this point and loop it around the mounting hole in the upper right-hand corner. Also make sure any paint is removed from the (inside of the) case where the metal standoff attaching to this hole is mounted. This will provide a more direct grounding path for the dummy load resistors and may well solve the problem. If someone tries this, please report the results back to the group. (Enquiring minds wanta know...)

A few simple mods that I made to my tuner (in addition to what are essentially corrections already posted by others) that may be of interest (geezzz, I can't build anything without making a FEW changes!):

1. I configured the OUT/TUNER/DL switch so that the antenna is grounded when the dummy load is switched in. This is just for my convenience so that I don't have to always disconnect and ground the antenna when not in use. Note that if both "coax" and "balanced" antennas are in use, the rear panel switch determines which one gets grounded. -->IMPORTANT<-- do ****not**** rely on this mod to "save your butt" during a thunderstorm -- ALWAYS disconnect and ground antennas when thunderstorms are a possibility!
2. I added 20K 1W "bleed" resistors from the three five-way binding posts for "wire" and "balanced" antennas to ground. Any size resistors above 10K

should be OK, and 1/2W should be OK as well. You might want to use 100K or so if you expect to use really high impedance (>1000 Ohm) antennas. I add such resistors to all of my tuners and rigs; the purpose is to "bleed" any static build-up on the antenna (from blowing dust or what-ever) to ground. You folks living in wet climates may never have experienced static build-up on antennas... it can be a "real shocker"!

3. Instead of connecting contact #1 of the inductor switch directly to the junction of the two tuning caps, I put an inductor consisting of 5T of #22 wire on a T37-2 (a yellow one -- think its a #2) to give about 0.15 mH between the switch and the caps. This is just so a little inductance is in the circuit when all of the turns of L1 are shorted by the switch -- I figured that 0 (or close to 0) inductance to ground wouldn't be too useful.

4. I used RG-174 coax from the PC board to the OUT/TUNER/DL switch and from this switch to the toggle switch on the rear panel; shield braid grounded at both ends. This resulted in a "deeper" null when tuning and antenna (no difference when internal dummy load is used); probably eliminated some pickup by the PC board components when bare wire was used between the front and rear panels. I didn't use coax to connect to the dummy load or from the input connectors to the PC board as these runs are very short and don't pass over the PC board (my PC board is mounted on the left-hand side of the case toward the back and the dummy load resistors are mounted to the right of the board toward the front).

All mods performed based on my input are at your own risk -- I take no responsibility for your foul-ups!

The tuner works great; even tunes my 160M antenna (which is pretty close to 50 Ohms; probably does not have much range on 160M due to the size of the tuning caps).

Summer has finally arrived in SE Idaho, so I plan to occupy myself with yard work, camping, etc. (and hopefully occasional operating). You therefore won't have to put up with many more of my "random ramblings" about mods, etc. until next winter!

Hope to work ya on field day -- if it ain't too hot and the winds ain't too strong and I don't drink too much beer!

72, Larry W1HUE (Idaho)

Date: Thu, 18 Jul 1996 20:53:50 -0600
From: bfollett@ditell.com
To: qrp-l@Lehigh.EDU
Subject: [1252] St Louis Tuner Schematic
Message-ID: <199607190253.UAA31952@orion.ditell.com>
MIME-Version: 1.0
Content-Type: text/plain
Content-Transfer-Encoding: 7bit

Gang:

Cameron wrote:

<<Just a small correction to the schematic on page 10,
of the manual.

According to assembly procedures, switches S3A and
S3B would be on the outer lines of C5, C6 and C7, C8,
respectively, not on the inner lines, which is actually the
capacitor frames.

Please confirm this.>>

Good catch Cameron. The wiring instructions are correct, but somehow
the schematic got the vari-caps turned around. Look at the QRPP, March
96, article on the St Louis Tuner, original St Louis Club version, for
the correct schematic.

73, Bob

Bob Follett WA7FCU, QRP-L # 129, NorCal, ARCI, 10-10, ARS
2861 Estates Dr. VOICE: 801.649.6457
Park City, UT 84060 E-mail: bfollett.ditell.com

