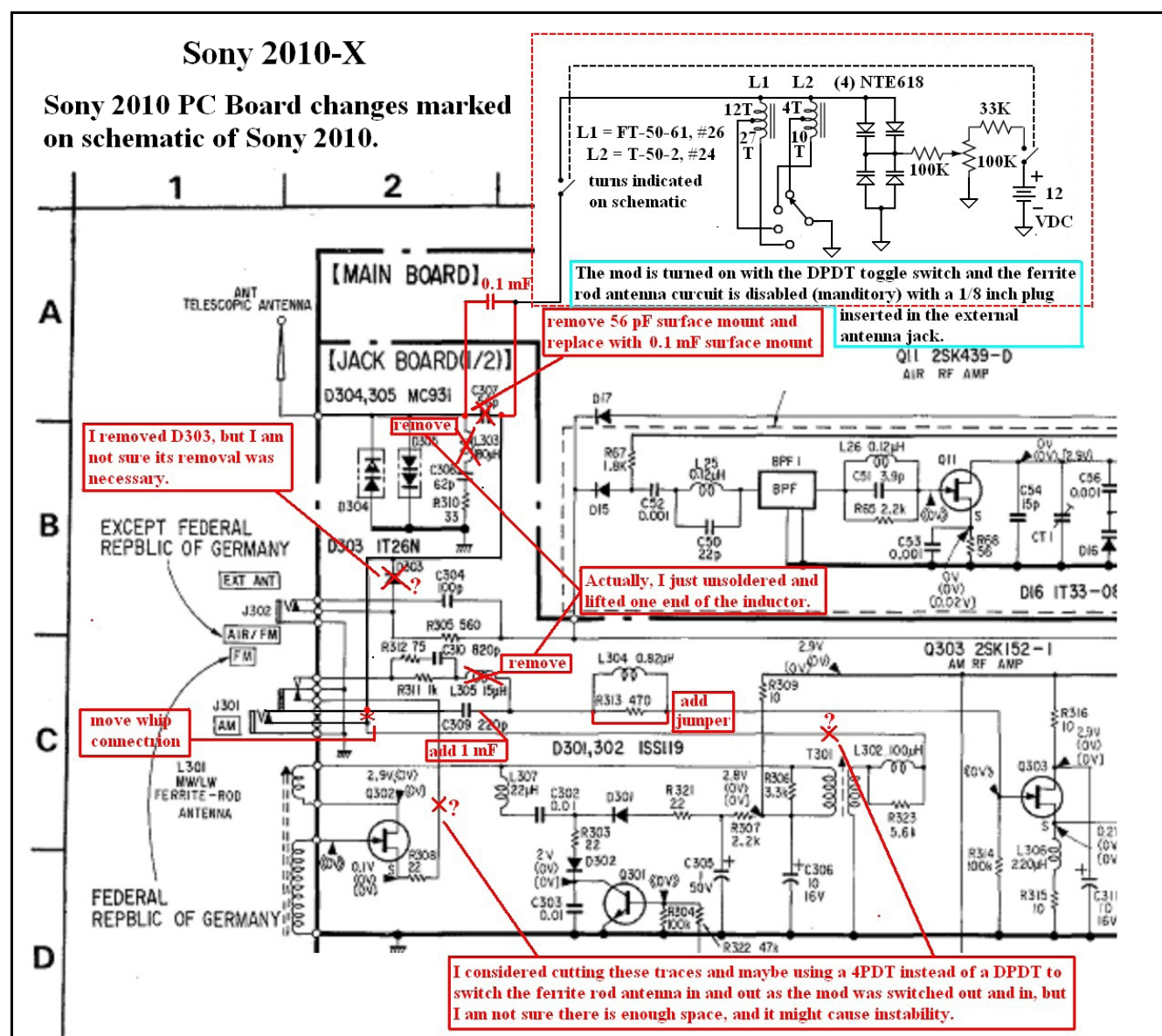


# Sony 2010-X (Corrected) And -XA (Tuned Whip Mods)

Dallas Lankford 12/2/06, rev. 4/4/07

When a friend gave me two well used Sony ICF 2010's I was quite disappointed with their insensitivity when using the whip antenna. My friend said, "That's normal. The 2010's are fine when connected to a good outside antenna." Well, yes, they were. But... portables need a good outside antenna? In my opinion portables shouldn't need an outside antenna, good or bad. Full size table top receivers need a good outside antenna. For many years until it "died" I used a DX400 which had excellent sensitivity with only its whip antenna. After studying the schematics I concluded that the 2010 has miserable whip sensitivity compared to the DX-400 because the 2010 whip is broadband, while the DX-400 whip is tuned with inductors and varactor diodes using a manual tuning knob on the front panel. So I decided to try to convert the 2010 front end to to something similar to the DX-400. The following summarizes what I did. It greatly improved the 2010 whip antenna sensitivity. Needless to say, this is a preliminary modification, and I may do some things differently the next time I do it. Nevertheless my first attempt seems satisfactory for RFI sniffing and for power outages which are the main things I use a portable for.



### Inside Top Rear View Of 2010-X Wiring

DL 12/2/06

DPDT Toggle Switch, Mouser # 611-7201-005

Tinned #18 solid wire were crimped and soldered to these toggle switch lugs to provide more solder lug space.

four ECG 618

100K

12V

to FET and whip

33K

100K Miniature Pot, Mouser # 594-657-0-0-104

to gnd on RF amp PC board

27T

12T

FT-50-61

10T

4T

T-50-2

EGG 618 bottom view

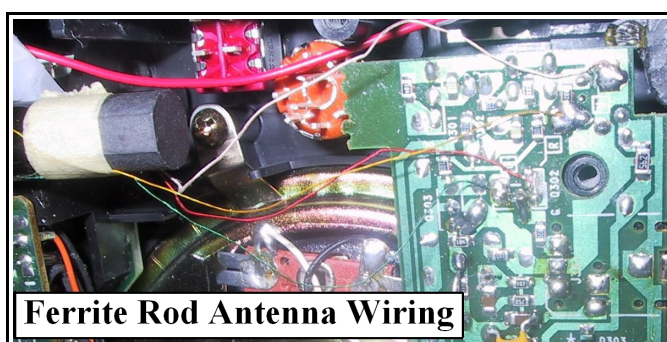
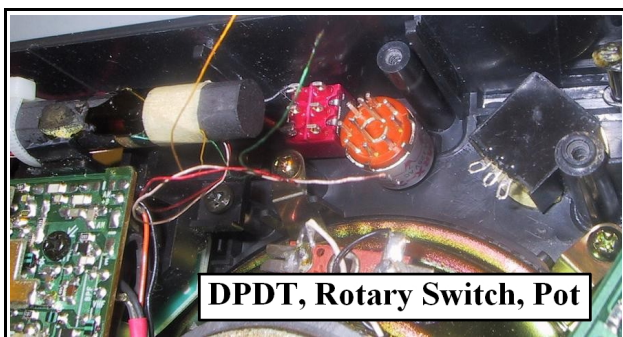
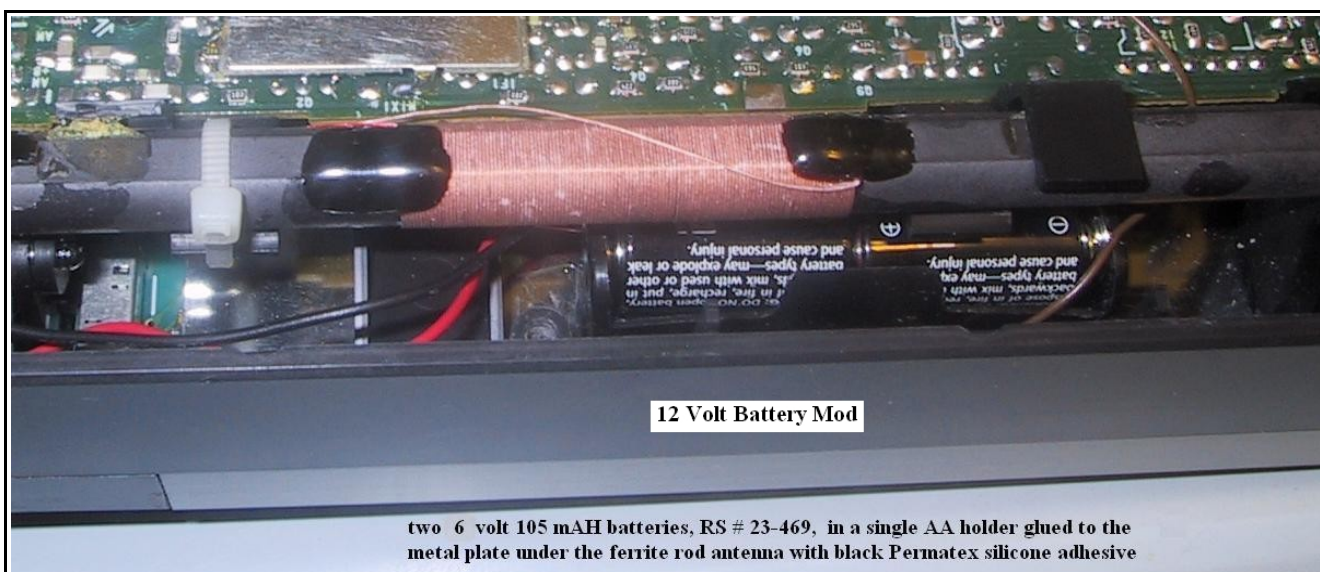
Mouser 526-NTE618

The ECG618 data sheet recommends 1-8 volts for tuning. I used 0-9 volts for slightly more tuning range.

NKK 4 Position DPDT Rotary Switch, Mouser # 633-MRX204A-RO

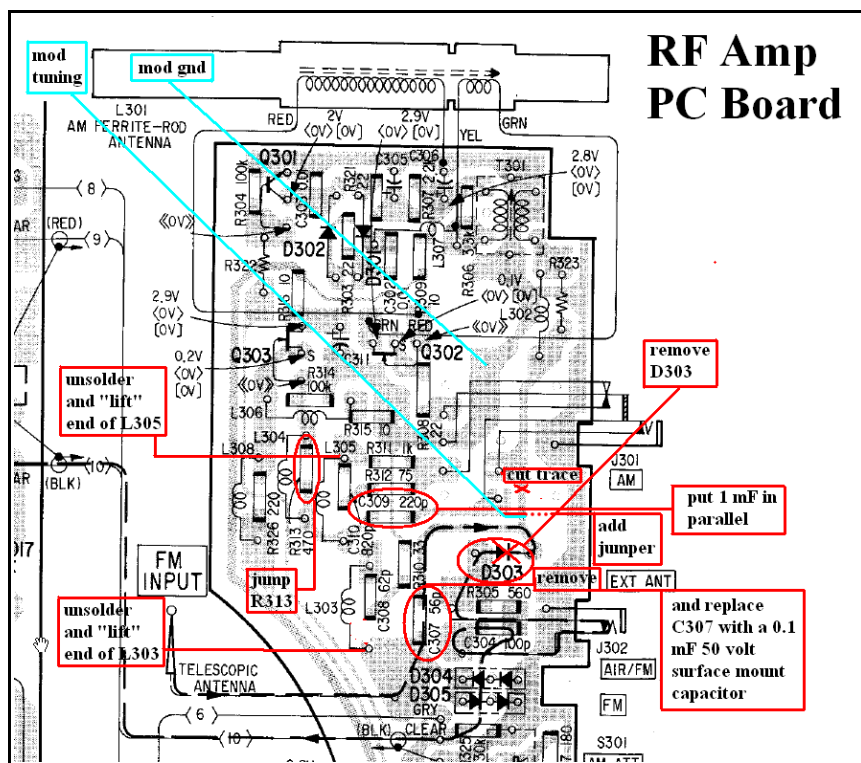
A photo below shows the three mechanical components of the mod, a DPDT toggle switch, a miniature 4 position rotary switch, and a miniature 100K pot. As you can see, there is not much space in which to do the mod. The 2010 PC board containing the RF amp and related circuits was moved to one side after unsoldering the four wires connecting it to the ferrite rod antenna to facilitate installing the mod. A photo below records where the tiny wires were soldered to the RF amp board.



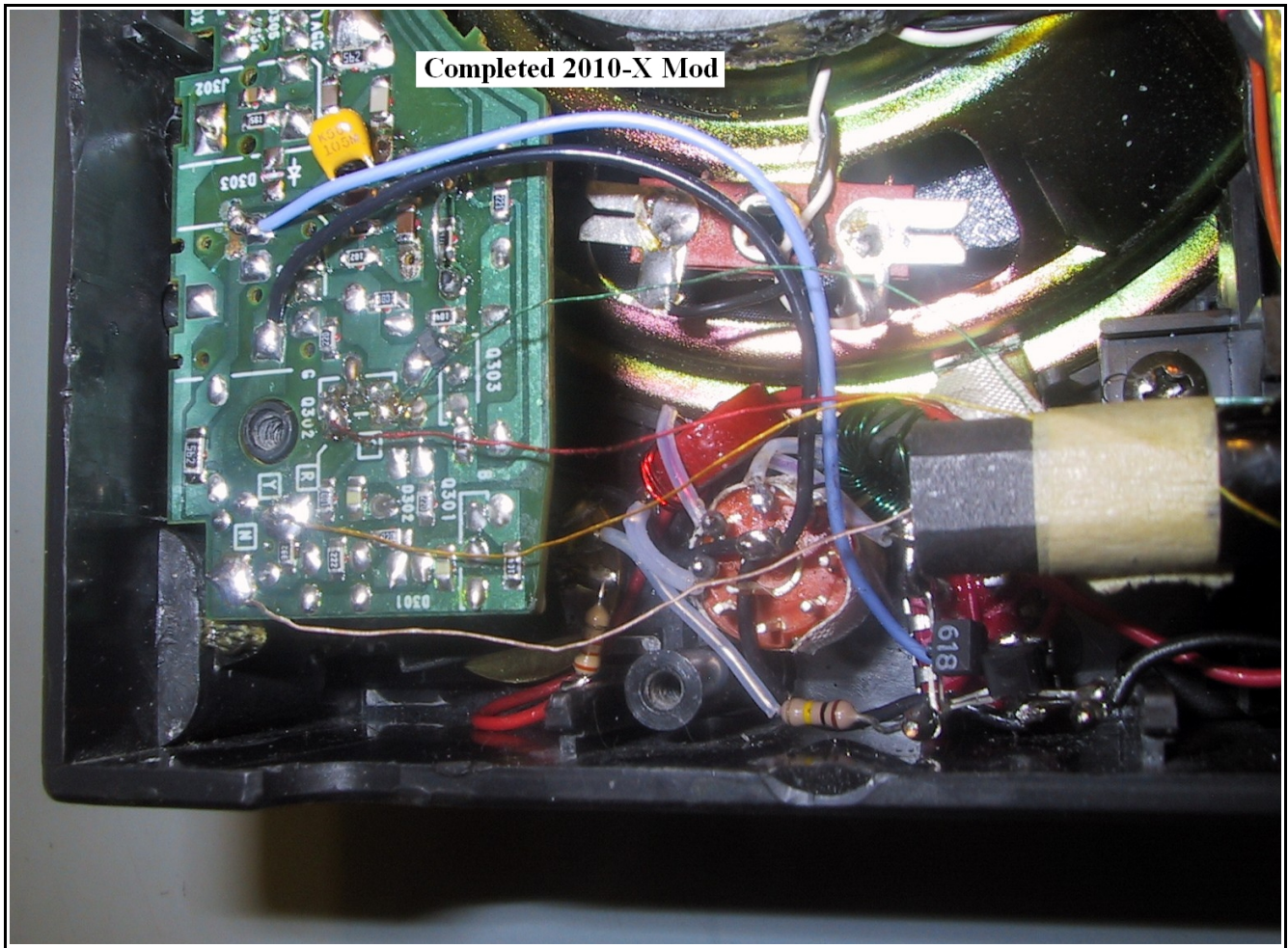


The diagram at right shows how the 2010 RF amp PC board was modified and how the antenna mod was connected to it. Photos of the completed mod are given below.

The finished mod works very well. The mod tunes about 520 kHz to 27 MHz in four bands. With an external ground using an 8 foot commercial ground rod, the tuned whip antenna provides nearly as good man made signal to noise ratio as an outdoor 45 foot noise reducing inverted L antenna. Without the external ground signal levels are somewhat lower, but much better than an unmodified 2010. As stated on the schematic above, a 1/8 mono plug must be inserted into the external antenna input to disable the ferrite rod antenna when using this tuned whip mod. The mod is turned on and off with the toggle switch.



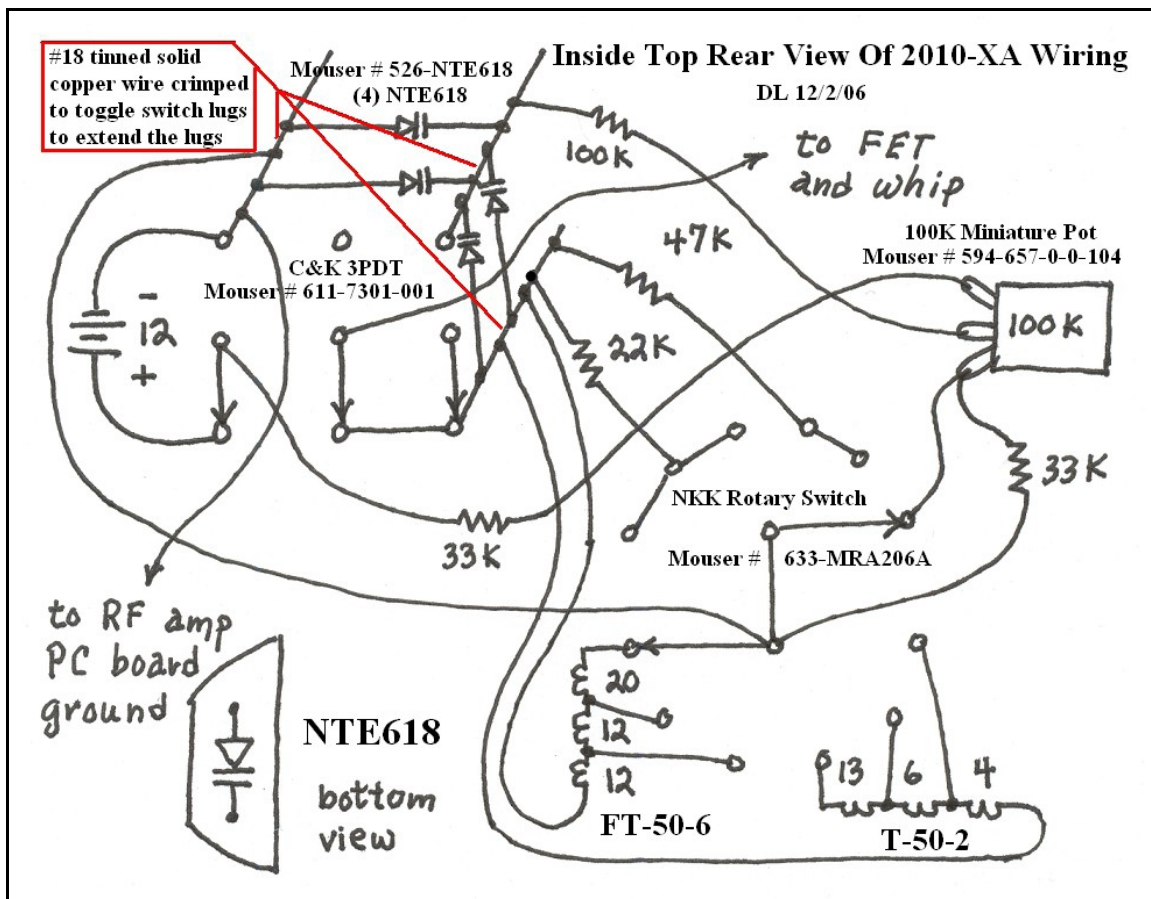
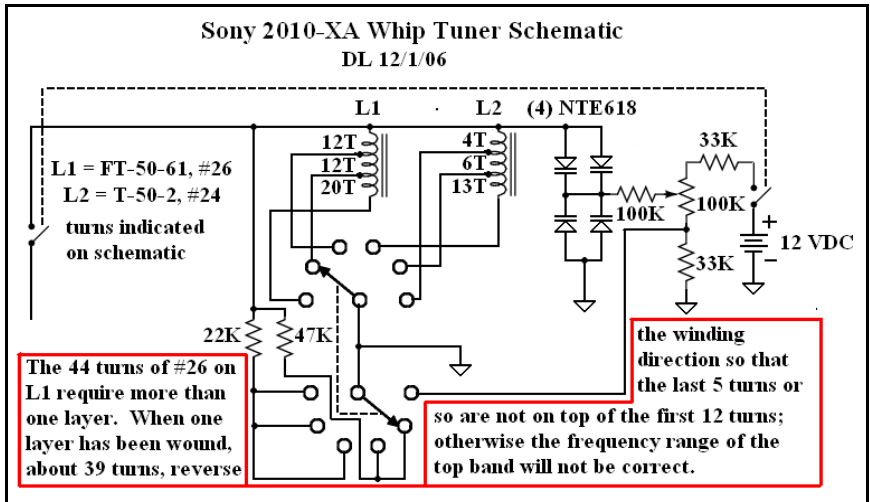




The photo above shows a front panel view of the finished tuned whip mod. The knobs are somewhat cramped, but then there is not much space for a DPDT toggle switch, a rotary switch, and potentiometer. The NKK MRX204A rotary switch knob came with the switch. The switch shaft was longer than necessary and was cut shorter with the cutting wheel of a Dremmel tool. The knob is a modified (small hole drilled and indicator line and hole painted white) black anodized Eagle (EPD) knob, Mouser # 450-6008.

## Sony 2010-XA

I am already working on an improved version of the whip mod, called the -XA, with -XA tuner schematic at right. The signal levels of the original -X mod tuner are not uniform within a band (tuning range), with higher signal levels (and hence better sensitivity) at the high frequency end of each band and lower signal levels (and hence worse sensitivity) at the low frequency end of each band. First, I added a 33K ohm resistor in the ground leg of the 100K ohm tuning pot, which eliminated the low frequency end insensitivity by eliminating that part of



the tuning range. Of course, this made more tuning ranges necessary. No problem. But for whatever reason, these changes caused the modified 2010 to become unstable at SW frequencies, with oscillations at many settings of the tuning pot; 22K and 47K ohm Q spoiling resistors in parallel with L1 and L2 respectively eliminated the oscillations while slightly reducing signal levels at the low frequency end of each tuning range, except for the MW band. Signal levels at the high frequency end of each tuning range were reduced more, but only to about the same levels as signal levels the low frequency end of each tuning range. How fortunate. For the MW band no Q spoiling resistor was used and maximum tuning range was used by bypassing the 33K ohm resistor in the ground leg of the tuning pot. The 2<sup>nd</sup> section of a DP6T rotary switch was used to implement these differences between the MW and SW bands. With the XA mod no ground rod is necessary for most frequencies unless man made noise levels are extremely low.

The middle pole of the 3PDT toggle switch of the 2010-XA mod connects and disconnects the tuning circuit from the line which connects the whip and FET when the toggle switch is turned "OFF." No components should be connected to the top lug of the middle pole. The wiring of the 2010-X mod as shown in the diagram near the beginning of these notes is incorrect because a DPDT toggle switch was used and the tuning circuit was not disconnected correctly when the toggle switch was turned "OFF." In order to have enough solder lug space to do these mods, some of the lugs must be lengthened (extended). I used # 18 tinned copper wire firmly (and I do mean firmly) crimped to the appropriate lugs before soldering them to the lugs. If these extensions are not firmly crimped before soldering, when leads are soldered to them later the solder at the lugs may flow and the extensions may move or even fall off the lugs. Some of the wiring to the toggle switch lugs and extensions was done before the switch was mounted, which facilitates assembly of the mod. It is probably a good idea to verify the tuning ranges of the inductors before installing them. This can be done by first modifying the 2010 RF amp PC board, breadboarding the tuning mod (with a "push-in lead" proto board), and using the breadboarded mod together with test lead clips, a 1/8 inch plug inserted into the external antenna jack, and a 3 foot piece of wire to simulate the mod.