Toroid Guidelines

Source: http://www.wb5rvz.com/sdr/common/Common_Component_Mounting.htm

Toroid Coils

Toroids

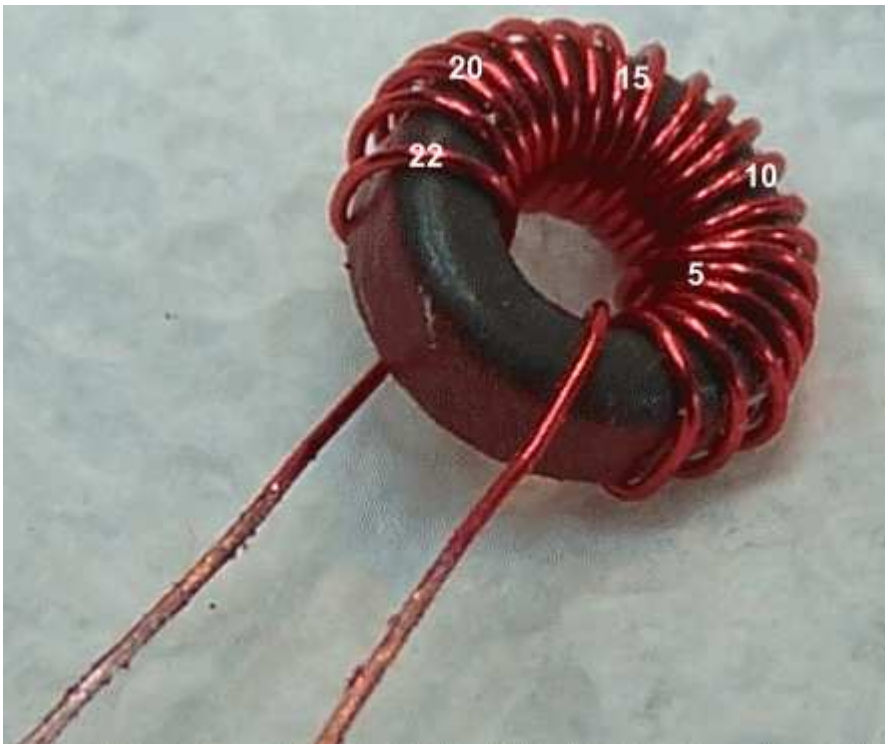
Identifying the toroids becomes simple once you figure out the coding. The toroids are designated using the pattern "T-NN-M". The critical pieces are the "NN", representing the outside diameter of the "donut" in hundredths of an inch, and the "M", representing the type of material used to make the core. Tony uses the following toroids in his kits:

- T30-2 (red)
- T37-2 (red)
- T25-2 (red)
- T25-6 (yellow)
- T30-6 (yellow)

Toroids are used in single-winding coils and multi-winding transformers. In either case, the number of turns must be counted. Any pass through the center of the Toroid is counted as a "turn" (see below).

Coils

The winding of a single-winding toroidal inductor is fairly straight-forward. Each turn counts as a turn. The windings should be spaced evenly around the circumfrence of the toroid, ideally leaving about a 15 degree "wedge" between the beginning and ending of the winding. The image below is of a 22 turn coil wound on a toroid.



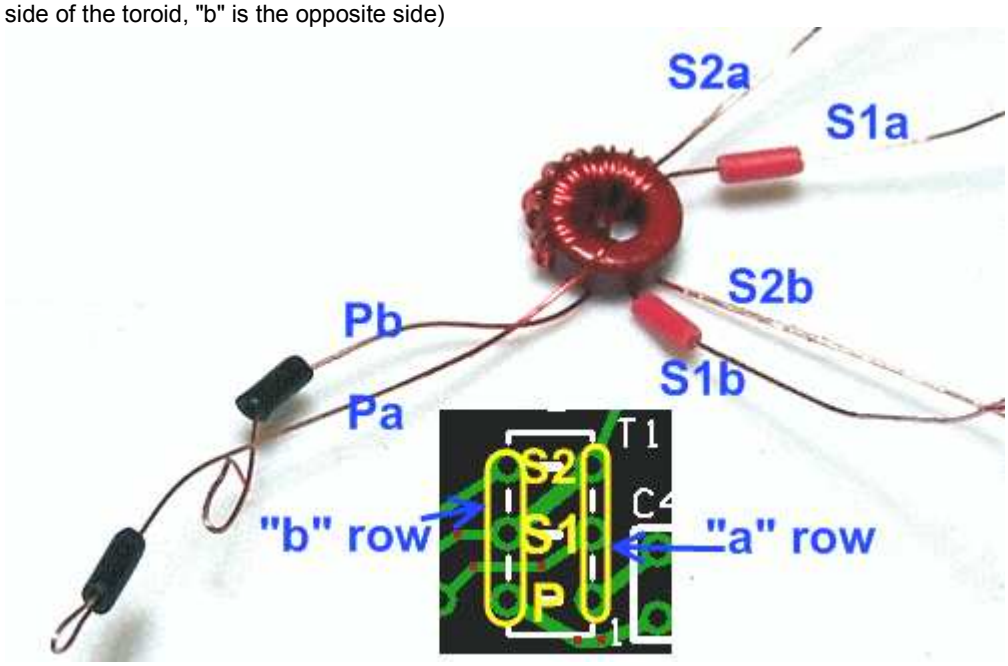
Occasionally, you may find that there is not enough room on the toroid toplace all of the windings without having to go back and add a layer of winding. Tony Parks suggests that you overlap some turns as you put on windings around the circumference of the core so that all turns are on the core by the time you get back to the start end of the winding. This should have negligible effect on the coil's performance in the radio.

Leonard, KC0WOX, has an excellent (if large - 183 Mb!) video showing the winding of a 26 turn coil on a T-37 core. While the turns andcore size in the video are not used in any of the Softrock kits, the technique is essentially the same. The actual process of winding the core begins at about 8.5 minutes into the video.

Transformers

Winding toroidal transformers usually involves 2 to 3 windings on the same core. The most common is a transformer with a single winding (primary or secondary) over which two "bifilar" windings are superimposed (two secondaries or primaries). See the Toroid Winding Hints from the Experts for good tips on how to wind a toroidal transformer.

When you have finished winding, stripping, and tinning the toroidal transformer's windings, you will two leads for each winding. Each lead will come out on a different side of the toroid. For example, consider a three-winding transformer with one primary ("P") and two secondary windings ("S1" and "S2"). It will have a total of six leads, three on one side of the toroid and three on the opposite side:

- The two primary leads, "Pa" and "Pb" ("P" stands for primary; "a" is one side of the toroid, "b" is the opposite side)
- The two leads for the 1st secondary winding, "S1a" and "S1b" ("S1" stands for the 1st secondary winding; "a" is one side of the toroid, "b" is the opposite side)
- The two leads for the 2nd secondary winding, "S2a" and "S2b" ("S2" stands for the 2nd secondary winding; "a" is one side of the toroid, "b" is the opposite side)
- 

To mount the transformer you insert the leads into the holes annotated on the board as "P", "S1", and "S2". The holes may also be annotated as to the "row" ("a" row or "b" row) which corresponds to the leads on the "a" side or the "b" side of the toroid.

the builder should start with the single winding, inserting its two leads into the appropriate holes and then do the same with the first of the two bifilar windings, and finally do the same with the second of the two bifilar windings

After inserting the leads, the builder should pull each lead pair through the holesuntil the transformer is snug to the board. Soldering the leads completes the process.

Leonard, KC0WOX, has an excellent (large - 100+ Mb!) video showing the winding and mounting of a bifilar transformer on an earlier Softrock (transceiver) kit. He also has a 2 minute video clarifying how bifilar transformers are mounted on Softrock boards.