Trolley Tip - **Hanging Overhead Wire** - by William Brandt

I model primarily in O Scale, so what I say here pertains primarily to that scale. Some of these ideas will work in other scales too; try them. In particular, one of these techniques was given to me by an HO scaler - more when we get there.

Hanging overhead is not difficult. It is a skill that anyone can learn with a little practice, I feel. The tools are simple: wire cutters, soldering iron and solder, small pliers, CA glue, etc. I'm not going to cover the entire subject, but talk about how and why I do a few things. Lets start:

Insulators (in other than contact wire):

Use plain perf board, available from Radio Shack® or similar electronics parts stores. Get it without any lands or copper, and with holes on a .1 inch centers. Use pliers to break off a strip through a set of holes the full length of the board such that the strip has one set of complete holes. From this strip break off segments that have two complete holes each; each of these will become one insulator. Use side or end cutters to trim the corners, sides, and ends as much as possible leaving some solid material around the two holes, especially at the ends.

Install the insulator by putting both wires through their separate holes but from the same side of the board. Turn the wires back over the end and wind them about three times around the straight wire. (I usually hold both parts of the one wire to the perf board with a pair of pliers.) Do the winding close to the insulator and with the turns as close together as possible. This should cause the insulator to be part of a straight line with the two wires.

This gives an insulator that is small, cheap, and strong. It does not look like a compression insulator, but you can't have everything.

Insulators (in contact wire):

(See photos for example). Again use a piece of the perf board. This time use a piece with only one complete hole. Before breaking it out into a separate piece, drill out the hole so that it is about .060 diameter. This is important since we will be putting two wires through the same hole, and they need enough space so that they do not come into contact. Trim the four corners off of the piece, but don't trim too much more; we need to be able to hold the piece.

Bend about ½ inch of each piece of contact wire at 90 degrees straight up. About 1/8 inch up, bend the wires back at about 30 to 60 degrees. Prepare a flat (NOT round) toothpick so that the large flat end will enter the hole; you will probably need to shave the sides down some. Do this for about a quarter the length of the toothpick (figure a new toothpick for each insulator).

Put both wires through the piece of perf board, and hold them roughly in place. Shove the toothpick into the hole from the bottom between the two wires. Push it up as far as it will go. Now you should have a mechanically strong assembly. Line the wires up; twisting the perf board will cause the ends of the wire to change alignment. The toothpick should be separating the wires and extending above and below them. Make sure that the perf board is down to the top of the wires (both of them). Use a mirror to look at the assembly from below - so that you see what the trolley pole will see. When it all is lined up, put a drop or two of fairly fresh CA glue on the top of the perf board so that it soaks into the toothpick and goes down besides the wires. Let it get hard. Add a little more until the top is full and hard.

Use end cutters to shorten the toothpick on the bottom even with the bottom of the wire. Then take a small file and file away the wood on the sides of the wire. You want to leave some toothpick below the perf board to form a filler between the wires, but it should have the same cross-section as the wires. Trim the top toothpick and the wires as desired.

This technique as used in HO was told to me by Dave Cooper. Thank you, Dave - it works great and is easy to do.

Alignment is easy to do; the dead space is minimized; and there is a smooth path between the two wires.

Junction between two contact wires:

At times it is necessary to splice two pieces of contact wire together end to end. For this I use an 00-90 brass washer. These are available from Walthers® at $2.50 to $3.00 for 16. It is a lot of money for such a small piece of metal, but you don't end up using too many. Heat up the soldering iron, and get ready.

Bend about 1/8 to 1/4 inch of the contact wires straight up to a little over 90 degrees. Insert both contact wires in the washer. Hold it all in line with pliers and solder the wires to the washer from the top. Use a mirror to check that the wires are in line from the bottom and provide a smooth path for the pole. If wires are not in line, touch again with the soldering iron and get them straight. Then file off any excess solder on the bottom to get a smooth path. Trim the wire ends as desired but not into the solder too far.

Junctions made this way will work even on curves if the path under the washer is smooth.

Section or module breaks:

(See photos for examples). I run the contact wire past the last pole where there is a regular wire hanger. Where the wire ends, I use a variation of the junction above. Bend the wire up, and solder on the 00-90 washer. Make sure that the wire gets soldered on, but that the hole is NOT filled up. You can hold the washer in proper position with a small pair of pliers. After soldering look at the underside and make sure that things are smooth. The washer must be even on both sides of the wire so that the remaining hole is in proper line with the wire. Remove excess solder with a file.

The connecting piece of wire goes into the hole to join the two sections or modules.

Comments re EPTC standards:

I use these techniques to create a module end that does not quite follow EPTC standards. I put an insulator in the proper wire near the end of the wire, and the modified junction provides a place to hook the connecting wire. The connecting wire is not as long, and probably not as consistent in length as if the EPTC standard were used. But I have found that these connecting wires need to be accurate to about 1/8 inch, and so would be unique to every different setup, whether using these techniques or the ones specified in the standard. By using the standard techniques of cutting connecting wires at a show, modules using these techniques will work with EPTC standard ones. Since my set of modules are used in the same configuration most of the time, I save the connecting wires. The two wires from a joint are put in an ordinary envelope labeled for the particular two modules involved. The same end of a module might be represented by more than one envelope (and set of wires) if it gets joined to more than one different other module. Since the wires usually end up being of (slightly) different lengths, I have started writing on the envelope whether the long wire goes over the front (or back) track, looking from the audience side. *I hope that these ideas are of use to you.*