

Howto Solder Track Connections



Finished Soldered Track Connections.

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Solving track conductivity issues

For those who run track power outdoors, and suffer through rough running due to power problems may find this useful. While there are many ways to connect two pieces of track, getting them to successfully conduct power along an entire length can be a challenge. Here's one method for improving track connectivity /conductivity. "

I've gained some useful practical knowledge in making things connect, electrically, and work well, while avoiding the dreaded cold-solder joint. *(More about that later)* Most of my efforts to join pieces of metal together using solder have involved small wires and finicky electronic parts that don't like too much heat. Working on bigger pieces of metal is quite different, all though the principles are the same.

Getting started

First you need a few supplies and a soldering gun. You can get resin-based paste and solder, such as is used in electronics, from Radio Shack, or whatever it's called, or a neat little store in Langley, SMI Industrial Electronics, 20120 64 Ave, a Club Commercial Affiliate



Resin-based Paste



140 and 260 watt guns

Limited success was achieved with my 260 watt Weller soldering gun. Using it as a soldering gun, *(uncut tip)* it just couldn't put enough heat into the rails to get a good join, resulting in... tada.. the dreaded cold-solder joint. I also recommend that you do not use a propane torch *(Again more about that later)*

A GVGRC Member Contribution.

- Works on flexible or sectional track.
- Simple and straight forward.
- No special skills needed

"The S P R R main line has about 350 feet and has been operated very successfully from one electrical input after improving the rail joints."



This technique can be used with just about any metal that can be soldered.

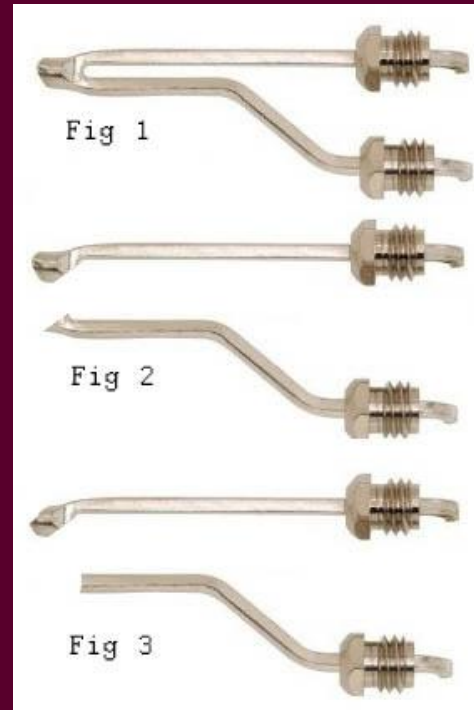
Preparing the soldering Tip

To use the 260 watt Weller gun for resistance soldering you need to prep the tip. Fig 1

Cut the tip on an angle as shown in Fig 2. Next file the upper leg for a nice fit in a standard rail joiner.

Install both the upper and lower tips in the soldering gun.

The last step is to trim the lower tip so that you are putting equal pressure on the top of the rail and the rail joiner as well as get as much tip as possible on the rail and joiner Fig 3 (*Approximately 3/8s of an inch*)



The three stages of the tip

Preparing the track and joiner

To make a good solder joint, one that electricity will like, requires having a good, tight physical joint. The pieces have to fit snugly together. You also need to have both of the pieces being joined:

1. **Clean** - use a small wire brush, the type you can get from most hardware stores that are used for cleaning small pieces;
2. **Prepared** - using solder paste on both pieces (resin-based paste).
3. **Hot** - this is the tricky part. Both pieces need to be hot enough to allow the solder to melt properly, 'flow', and adhere to both pieces to make the joint. Without these, you will not have a successful solder joint.



Heating the Joint

The heat has been applied and the solder has already been melted into the joint. The melted solder appears to be "sucked-in" when both pieces are hot enough for a good joint. You can tell by the discolouration of both the rail-joiner and the rail that both pieces are hot. This will be a good joint. It only needs a spray of water to cool the joint rapidly to finish the process.

A few Rail-Laying Notes



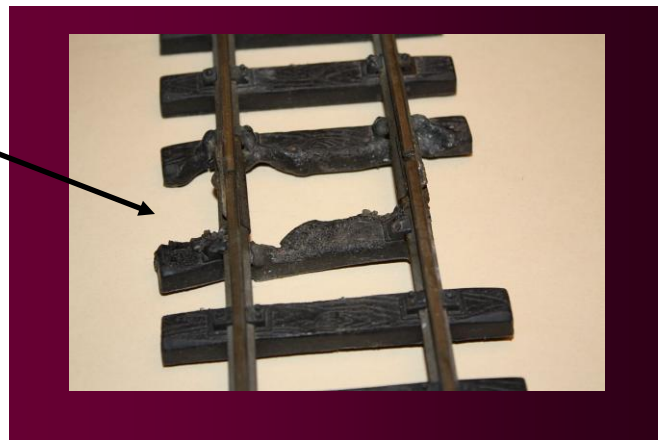
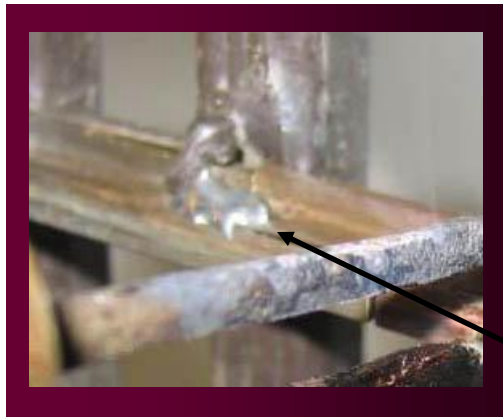
Installing Rail Clamps

When possible, I solder rail sections together in the shop, up to 15 feet (whatever in meters) long. Those sections are joined using over-the-rail rail clamps. (Usually available at good ol' Art Knapp's)

All switches (turnouts[US] points[UK]) are joined using rail clamps. In this way, should it be necessary to replace rail, it is fairly easy to lift a section and de-solder it using the same method to apply heat.

It's a little more work but the result is worth it.

Remember the propane torch? It is **not** a good idea. Lots of heat. WAY TOO MUCH HEAT. Wrecked the plastic ties, made a mess. Right idea but the wrong tool.



A 'bad' joint. The solder is on the surface, irregular and sharp edged. Not a joint that will last, either physically or electrically.

This rail has been previously soldered, but still has to be prepared by scraping it with a wire brush. Next, paste flux will be brushed on to further help clean the joint and promote the solder to flow when heat is applied.

Should it be necessary to replace rail, it is fairly easy to lift a section and de-solder it using the same method to apply heat.



If you have any questions you can contact me through the GVGR website. Enjoy!