How to build a better First Layout

Part #5 Track

Good track is one of the most important things in making a model railroad reliable, and fun to operate. You can have high quality locomotives and cars, nice scenery, good looking structures, Etc. However all those things aren't going to be much use if you have poor track. Low quality track, or poorly laid track, can cause derailments, surprise uncouplings, and plenty of frustration! Good quality track, properly laid, will work reliably and give you years of enjoyment instead of headaches.

Commercial model railroad track comes in three basic types. They are roadbed track, sectional track, and flex track.

Roadbed track is a particular type of sectional track that comes with a plastic roadbed piece fastened to the bottom. This roadbed is supposed to resemble the crushed rock ballast found under real railroad track. Roadbed track locks together firmly and is very handy for temporary layouts like one set up around a Christmas tree. Many modelers like roadbed track so well that they prefer to use it on their permanent model railroads. Examples are Kato "Unitrack" and Bachman "EZ-track. Roadbed track is the most expensive of the three types. Also, like sectional track, roadbed track comes in a limited selection of curves and shapes. Different brands of roadbed track are not made to connect to each other, or to sectional, or flex, track. It is possible to adapt the various brands and types of track so that they can be connected to each other though.

Sectional track is essentially roadbed track without the roadbed piece under it. Like roadbed track, sectional track comes in a limited variety of shapes and the track sections are rigid and can't be flexed into different shapes. Different brands of sectional track typically can be easily connected to one another and to flex track without adaptation. Sectional track is also cheaper than roadbed track. Sectional, and flex track are usually laid on top of cork, or foam, commercial roadbed.

Flex track is, as you would expect, flexible. It comes in 30"-36"long pieces that can be used as straight track, or bent to any desired radius curve. Flex track is the most economical of the three track types. It is the favorite track type of most experienced model railroaders and I strongly recommend you use flex track right from the start.

Track is also available in different "codes" like code 100, code 83, code 55, etc. The code number is simply the height of the rail in thousandths of an inch. Smaller rail looks more realistic than the bigger code version, but they all work well. The rail codes are simply about appearance.

However, some wheels have deep flanges, and won't work on some brand/code combinations. For instance, Atlas brand code 55 N-scale track has oversize spike detail which the older, deep flanged, "pizza cutter" N-scale wheels will not work on. The deep flanges hit the oversized spikes and rattle along them. The solution is to change out the old deep flanged wheels for newer wheels with shallow flanges. Atlas also sells code 80 flex, and

sectional, track that work with either deep, or shallow, wheel flanges. However this code 80 track does not look as realistic as the Atlas code 55 track.

Micro Engineering makes beautifully detailed, very realistic-looking, flex track. The spike detail on Micro Engineering's code 55 flex track is small enough that either shallow, or deep, flanged wheels will roll smoothly on it and not hit the spikes.

Peco also makes high quality flex track in several scales and rail codes.

Another very important kind of track is the "turnout" or track switch. Like other track pieces, there are several brands available.

Atlas is probably the brand of turnout most new modelers buy. Actually, Atlas makes two different lines of turnouts, "Snap Switches, and "Custom Line" numbered turnouts.*

The HO-scale, Atlas Snap switch is, in my opinion, and that of many experienced modelers, one of the worst designed and poorly made turnouts on the market. I strongly recommend not using them.

The Atlas Custom Line numbered* turnouts are a good deal better than the "Snap Switches", but there are better brands available. Peco, Walthers, and Micro Engineering turnouts are all much higher quality than Atlas. They cost more, but are well

worth the price difference because of their reliability. Turnouts, and the machines that operate them**,** are one of the most expensive purchases for any model railroader. But since they are so critical to reliable operation, this is no place to skimp on cost.

Peco turnouts have a well-earned reputation for not causing derailments and that makes it a favorite with experienced model railroaders. I highly recommend them.

- Notice the “numbered turnouts” designation. It refers to turnouts with a “frog number”, which is normally printed on the packaging. For instance a Custom Line #4 or a Custom Line #6. These are Atlas’s better turnouts. Be aware however that the Custom Line also includes turnouts that are identical to the geometry of the Atlas “Snap Switches.” If you elect to buy Atlas Custom Line turnouts, make sure they have a frog number.

- So, just what is a frog number anyway? The frog number shows how sharply the diverging route (often to a siding) separates sideways from the main (mainline) route. The lower the frog# is, the sharper the split between main and diverging routes will be. The number states how many units (mm for example) a wheel will travel forward to diverge one unit sideways. A #4 frog will move the wheel

one unit sideways from the mainline route; for each four units of forward travel. A # 6 frog will move the wheel the same one unit sideways but take six units of forward travel to do it. On a practical level, frog numbers smaller than six may not work well with long cars or large locomotives. Number six and larger frogs will handle just about any model car or locomotive.

So, now that you have your track, your track plan, and your roadbed, you are thinking of laying some track.

Hang on. First, make sure you have a solid, rigid, "sub-roadbed" on which to lay the roadbed and track. The sub-roadbed is going to get quite wet. Ballast, and other scenery materials, are attached with white (Elmer's) glue, thinned with a lot of water. Then it gets sprayed with more water. Natural moisture, from the humidity in the air, also adds to the general wetness. Since sub-roadbed is nearly always wood, the water is going to get into the wood, and sooner or later, cause it to warp. Rigid construction, and painting all the wood, will help prevent warping. Video shot at my old club, shows trains bobbing up and down like boats on waves as they rolled along. They hadn't taken precautions against warping, and it certainly showed.

Plywood is a common choice for sub-roadbed. Some modelers use very heavy, ¾" thick plywood in order to minimize warping. I prefer to use thinner, lighter, ¼" thick Luan plywood. To keep

it from warping; I glue 1”x1/4” strips of white pine lumber along the bottom of both sides of my sub-roadbed. This “mini-L-girder” or “continuous deck girder bridge”, construction is very rigid and highly resistant to warping. I strongly recommend using this method. I also paint all the wood with dirt brown latex house paint. This helps seal out moisture, and also helps disguise the wood as earth.

Sub-roadbed needs to be a smooth and flat as you can make it. Any dips or bumps in it will affect the track. “Flat” doesn’t mean you can’t have grades, just that the sub-roadbed should not show any high or low spots when you lay a long level, or other straightedge, along it.

When you have finished building and painting the sub-roadbed, the next thing to do is to install the roadbed of your choice. Most modelers use either cork, or foam, commercial roadbed strips. Both types work well; the foam type holds a curve better than the cork. I use 1/8” Luan plywood, cut into straight and curved strips, sanded, and tapered at the sides for my roadbed. Some modelers use “Homabed” a commercial model train roadbed made from “Homosote” (a pressed-paper insulation material.)

Whichever roadbed you favor should be glued down to the sub-roadbed. Use yellow, waterproof, carpenter’s glue, or latex

caulk for this, so that the roadbed and sub-roadbed stay bonded together when water is applied later.

Once the roadbed is securely attached to the sub roadbed, we need to check it for flatness. Lay a long level, or other long straightedge, along the top surface of the roadbed. Get your eye down low, and look at the bottom of the straightedge. Check for any dips, or high spots. We want the roadbed to be as perfectly flat as we can make it. Sand down any high spots and fill any dips with wood filler in order to get a dead flat surface. This is one advantage of my favorite roadbed material, Luan plywood. It is flat and firm, and provides a very stable surface on which to lay track. As with the sub-roadbed, the roadbed should also be painted to seal out moisture.

Next, we finally get to lay some track! Latex caulk works well to bond the track to the roadbed. A small dab of caulk near each end, and more dabs at approximately 6” spacing along the flex track, will be enough caulk to do the job.

Some prefer to nail their track down with tiny nails through the holes in the center of Atlas track ties. I prefer not to use nails since they show, and don’t look realistic. Nails driven in a bit too far can also deform the track and bring the rails too close together. This means the track is now “out of gauge” and that can cause serious problems, including derailments. This “nails too tight scenario is particularly likely if you use foam roadbed,

but also quite possible with cork. Most experienced modelers prefer to glue, rather than nail their track down. The track can be temporarily held in place with pins, or weights, until the glue sets up. Latex caulk is often used as the glue.

Start your track laying with the most complicated pieces of track, the turnouts. If you have a rail yard, or other spot with several attached turnouts, start there. This complex trackwork is where wheels are most likely to derail so do it first, while you're fresh, and can take your time. Get everything lined up as straight and smooth as you can possibly make it. Lay the first turnout in place and fasten it to the second one with the rail joiners. Some turnouts, like Peco Electrofrogs, need plastic insulated rail joiners on the two short rails that come out of the frog in the center of the turnout. I suggest doing this regardless of the brand of turnout you use. If it should later prove necessary, a jumper wire can always be connected under the layout to circumvent the insulated joiners. It's a lot harder to take up the turnouts, and replace metal rail joiners with plastic ones, after the turnouts have been fastened in place.

Use a steel straightedge, like a scale ruler, to line up all the straight rails of mating turnouts in a perfectly straight line. We definitely do not want kinked rail joints anywhere on the railroad, but especially here in this complex, and sensitive, area.

Another important consideration, when laying turnouts, is to provide the necessary holes for connecting the switch machines that will later operate the turnouts. The size and shape of hole required will vary with the type of switch machine you plan to use. The popular Tortoise switch machine uses a large diameter circular hole, drilled directly under the turnout's throwbar. It can also work with a series of smaller diameter holes connected into a side-to-side slot directly under the throwbar. The Peco twin-coil switch machine uses a larger rectangular hole that lets the switch machine be snapped directly onto the bottom of the turnout. I use a bent wire inside a tube linkage to operate my turnouts. This uses a small 1/16" hole drilled beside the throwbar. Whatever system your favorite turnout requires, make sure the necessary hole is in place before laying the turnout. With the exception of the linkage method I mentioned last, it can be difficult/impossible to make the hole after the turnout is attached to the layout.

Once you have the turnouts in place, work outward from the turnouts laying flex track to form the mainline of your railroad. When you encounter another turnout location, add the turnout with the appropriate provision for a switch machine. Sidings and spurs can be added in the same way. Take your time. Work carefully in short sessions. If you push yourself to get it all done in a hurry, you are very likely to build in mistakes that will cause problems later.

If your layout will be controlled by traditional DC, then you will also need to take into account the points where block boundaries will be. These will need insulated rail joiners, and drop/feeder wires installed, as you lay the track.

When you have the track laid for one section of your railroad, try running a locomotive on it, both for fun, and to check your work. Cycle any turnouts in that section, and let your locomotive back a few cars through both of each turnout's routes. Before moving on to the next section, you need to check every single inch of track on this section with an NMRA standards gauge. This includes turnouts. Check each of the many areas of each turnout as outlined in the direction sheet of the NMRA gauge.

If everything works correctly, you may want to paint, and ballast the track on this section before moving on to the next. Painting track makes it look more realistic, by killing the shiny plastic and metal look of commercial track. One simple, but effective method is to very lightly spray the entire track, rails and ties, with a flat, rust brown color of spray paint. Do the spray painting outdoors or in a well-ventilated room. I hand brush paint my track in two stages. First I paint the ties, and then the rails. I also add ink-wash and chalk weathering as a final touch.

Ballasting model track adds a lot to its realistic appearance. The model ballast simulates the crushed rock ballast used under prototype track. I use a 5oz. Dixie cup bent into a spout shape, to apply a string of loose ballast between the rails of my track. Then I drag an old toothbrush along the track to spread the ballast out to the sides. Further brushing makes sure that the ballast is between the ties, not on top of them; and that no ballast is in the web of the rails. White (Elmer's) glue, diluted with a 5:1 ratio with water and one part of alcohol is very lightly sprayed onto the ballast with a household trigger sprayer, from a distance of 12-18" above the track. This first wetting is just to slightly dampen the ballast, without moving any of it out of place. Later wettings will be heavier, but not heavy enough to flood, and "erode" the ballast to the point of moving it. Let the ballast dry overnight. It should be hard, and held firmly in place after drying. Whenever you paint, or ballast track, the rail tops will need to be cleaned thoroughly before you can run a train on it. I use a commercial track cleaning block called a "Brite Boy." Fine grit 400-600gt. Sandpaper can also be used. Another option is to use a rag lightly wetted with the thinner for the paint you used on your track. I'm not fond of this method since the paint thinner may drip on the plastic tie strip and damage it. Even if that doesn't happen, the thinner could erase some of your paint from areas where you don't want it to. Once the

paint is removed from the rail tops, your normal, regular, track cleaning can be done with a rag wetted with alcohol.

Regards;

Traction Fan