

Simple Wooden Roadbed

There are several approaches to giving your trains a solid, weed-free track to run on, but the least expensive and most flexible solution for garden railroads of all kinds is a 2"x6" wooden roadbed made of ground-contact-rated lumber. Such a roadbed:



- Is relatively inexpensive,
- Virtually eliminates weeds rooting between the rails,
- Can be used with any kind of track,
- Minimizes unevenness or vertical kinks,
- Can be temporary or permanent,
- Helps protect your track from damage if stepped on.
- Can be ground-level or raised.

Simple Method, Common Tools - Many beginners who aren't used to working with lumber shy away from this because it seems complicated. But it's actually very simple, and the only tools you really need are a power saw, a power drill, and a template we provide in this article.

Long-Lasting Materials - Modern ground-contact-rated lumber will give you a railroad infrastructure that neither you nor your children, nor (probably) your grandchildren should ever have to upgrade or replace. Yet it can be taken up or moved easily if necessary.

Using with Raised Railroads - Hundreds, if not thousands, of successful garden railways have been built using this kind of roadbed, then supporting it on posts sunk deep into the ground, surrounding it with retaining walls, and backfilling with dirt.

By the time the hobbyist has backfilled, planted groundcovers, and ballasted the track, you can't see this infrastructure, but it's there just the same, keeping the right-of-way rock-steady in spite of nature's extremes or humans' clumsiness.

Using in Regions with Deep Frost Lines - If you live where the frost line is too deep to sink posts, you can use this method to build a "floating" roadbed with so much structural integrity that the right-of-way stays smooth even after frost heave has caused it to rise and fall all winter.

The photo on the first page shows an early iteration of a Fred Mills' IPP&W Railway in Ottawa, Canada, where frost heave is serious, and the frost line is too deep to practically sink posts. Fred's railroad has been expanded since, but it still relies on a "floating" wooden base.

Materials - Why do I choose 12' boards? Because the only waste in this method is at the ends of the boards, and if you use, say four 12' boards versus five 10' boards, you'll have less waste.

You need about half again as much board length as you'll have track (we explain that below). So if the railroad loop you plan to start with has, say 30' of track, you'll purchase at least four 12' boards.

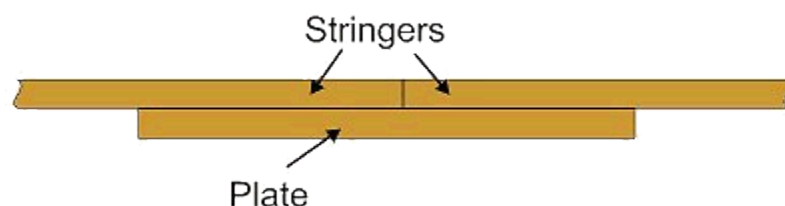
You'll also need enough screws to have ten screws per each track section and a few extra. Let's say in our example, you used 18 pieces of track; that's 180+ screws. A 5-pound box of #9 3" screws for pressure-treated wood should give you plenty of extras. I like to get the kind with the star heads. They're harder to strip out than the Philips-head screws, and most of them come with a star bit to fit into your power drill.

Fast Construction - We've "done the math" for you. Once you cut the first couple of pieces, you'll find that this goes very fast. I have done this several times for railroads with up to 60' of track, and I've never had trouble finishing the sawing and subassembly part of this in a few hours. Of course, if you have a complicated layout, with turnouts, etc., you'll have to do some of the math yourself. But it's not hard.

The templates in the appendix will guide you in cutting each piece.

How Much Lumber Will I Need?

The horizontal boards that support the track directly are called "stringers." The



boards that lay underneath and hold them together are called "plates."

In most of my projects, I've made the plates only 10"-12" long, no matter how long my stringers were, since I was fastening the roadbed to a sturdy infrastructure. However, if your roadbed is going to sit where it might be subject to frost heave or other shifting, you should consider making your plates as long as feasible to reduce vertical "wobble."

On the other hand, if you're only making this roadbed to sit on a wooden raised-platform railroad, you may be able to skip the plates altogether. Please see our article on "Building a Raised Platform Railroad" for more information.

Calculating Lengths of 2x6 Lumber - You will use 2x6s for the horizontal part of this structure, so how much you need depends on how much track you have, plus roughly 50% more to use for the plates and to compensate for waste at the end of each board.

If you are using preformed curves (and you remember what diameter track you bought), you can use "PI" to figure out how many linear feet of curved track you have. (I use 3.2 to compensate for waste.) And you can obviously figure out the straight ones with a tape measure. For example, One 5'-diameter circle of track will require about 16' feet of 2"x6" stringers ($5' \times 3.2$). Plus another 8' or so for plates and waste. So, two 12' boards.

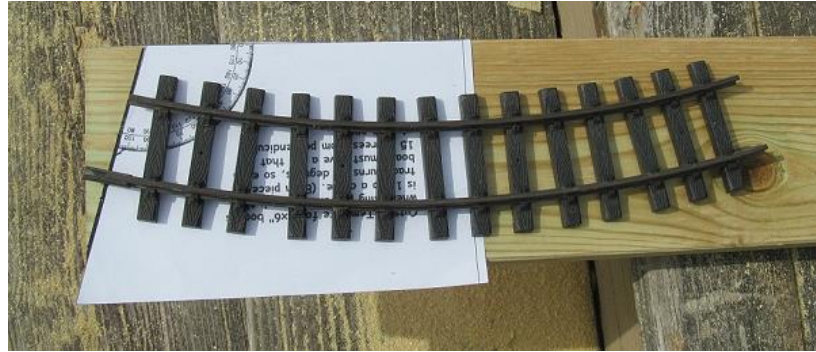
Measure and Cut the 2x6 Stringers

The stringers that support the curved pieces of track have to be cut at the correct angles. The angle you use depends on whether the track you are using comes 12 pieces to a circle, 16 pieces to a circle or, in a few cases, 8 to a circle. (By the way, Lionel's "Ready-to-Play" track comes 24 to a circle. To use with this method, put two pieces together and treat them as one piece of 12-to-a-circle track.)

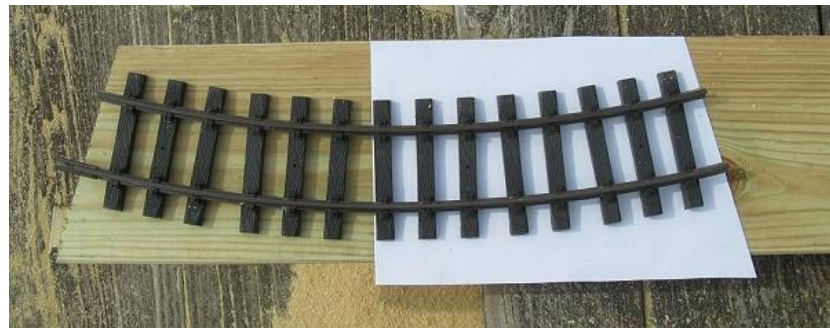
Once you're sure how many pieces of your track make a circle, download and print the appropriate template from the appendix. That will help you cut your roadbed appropriately. Do not resize or allow your software to resize the template, as the angle must stay the same to be accurate.

Using a curved piece of track and the template you printed, measure and cut the horizontal pieces you need from the 2"x6"s. The examples shown below use the curves that make a 60" track circle. Like the curves that make a 48" track circle, they are twelve to a circle. However the principle applies to any track circle, as long as you are using the correct template.

The photo to the right shows me using my template for 30-degree curves to mark the first cut.



The next photo shows the template "flopped over" to the other end to mark the second cut.



Though this example uses a 5'-diameter curve piece, it works for ANY 12-to-a-circle track, including 4' and 10'-diameter (even Aristocraft's old 20'-diameter pieces). The 30-degree angle stays the same.

The next photo shows the first stringer as cut out.



If you're certain the first stringer is very precise, there's no reason you can't just flop it over and mark the next section of the board to cut. But use the *same* stringer for a template every time. If you use the next stringer as a template, then the next stringer, and so on, your stringers will keep getting longer or shorter, depending on how fat your marker is or how much material your saw blade converts to sawdust.

Be sure to:

- Check each stringer against the one you just cut to make certain it's not far off.
- Line up a few pieces of track over the first few stringers to make certain they're "close enough" to support the track properly. They won't be perfect, but you don't want them so far "off" you need to cut more pieces or some such.

The photo to the right shows the stringers in a circle when I'm done. Of course, there will be some straight pieces to cut, but those are easy.

You'll notice that some of the track pieces don't align exactly in the center when you install them.



That's okay, the important thing is that they're supported.

Determine the "bottom" of each stringer.

Look at one end of each piece of 2x6 you have cut. If the grain of the piece simply looks like a series of parallel lines, simply label the least attractive side "B" or some similar indicator that means something to you. On the

other hand, if the grain makes a "bowl" pattern on one or both ends of the board, you want to make certain that, in the final installation, the pattern resembles an upturned bowl instead of a right-side-up bowl.



Incorrect: grain will capture and hold rainfall



Correct: grain will divert rainfall

That way the grain of the wood will shed moisture instead of capturing it and increasing the risk of damage from freezing. Again, once you've decided which side needs to be on the bottom, mark it clearly. Why do we mark the bottom and not the top? Because in the final assembly, the top will be visible, but the bottom will not.

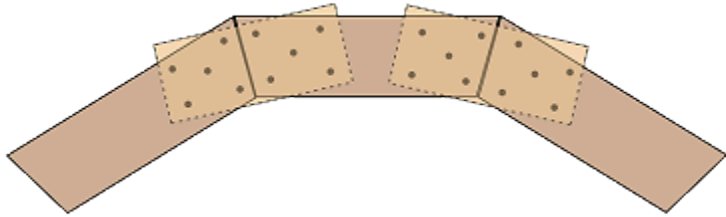
Prepare Subassemblies

For most people, it works better if they fasten a few pieces together at a time and install them in sections.

This helps you make certain your roadbed is going together as planned. To start this process on a segment with curved sections, lay 2 to 4 cut pieces of 2x6" together on a flat, hard surface like a driveway or patio. Then fasten a few curved pieces of track together and lay them on top.



When you are satisfied with the position of the stringers, center your plates under the junction between the pieces, then remove the track. Holding the pieces you are working on carefully in place, use the 3" screws to fasten the plates to the stringers. I recommend ten screws per plate to minimize vertical "wobble" of the finished roadbed.



Each set of five screws is driven in an "X" pattern.

As you continue to put your subassemblies together, you may wish to fasten a plate to one end of each subassembly before you move it into position. This will reduce the amount of screwing you have to do when the whole thing comes together.

The photo to the right shows two subassemblies for a demonstration railroad that would use 10'-diameter curves. It uses 5/4" decking boards since it was for temporary use only.



Since this roadbed was going onto a solid, firm

base, I didn't make the stringers very long. If it was going to go on the ground or something else that might be unstable, I would make the stringers much longer.

Assembling - Once you've made your subassemblies, move them to the place you need them and fasten them together.

The photo to the right shows 12 stringers fastened to plates to support a 48" circle of track. Again, it's a demo that uses 5/4" decking instead of 2"x6" boards, but you get the idea.



For a very small railroad such as this, 5/4" boards would work, if you could get ground-contact-rated ones. But I would have to travel 120 miles to get those, so I only use them for demo and temporary railroads that will never touch the ground.

Install

If you're going to be laying your roadbed on the ground, put any weed barrier down first. If you are going to be setting your roadbed on posts, concrete blocks, or some such, put those in place.

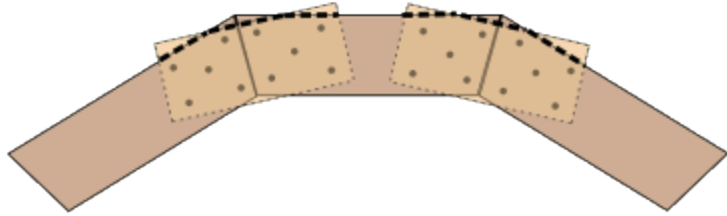
Then move your subassemblies where they need to be, and screw them together by connecting their plates. Lay and connect your track pieces on the boards to make certain they follow your track plan, and make any adjustments necessary.



The photo to the right shows NOGRS members George Kuznar and Allen Nickels bringing the subassemblies to the assembly point on a 2007 demonstration railroad at Holden Arboretum, in northeast Ohio.

Trimming the Corners -

Once your roadbed is installed, or at least in the shape you know you want, you can dress it up by using your circular



saw to cut off all of the outside corners. The dark dotted lines in the picture to the right show the corners I'm talking about. The inside edges aren't a problem, since they don't really show.

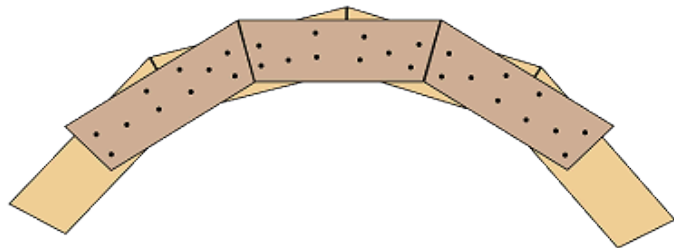
From this point on, you can add dirt, mulch, structures, plants, ballast, whatever you want, knowing that the most critical part of your infrastructure is established.

A "Step Up"

As with any method for building garden railroads, countless variations have been tried, some with great success, some not so great. Paul Busse, who was one of the pioneers of the method described in this article, went on to create a version that is slightly more attractive.

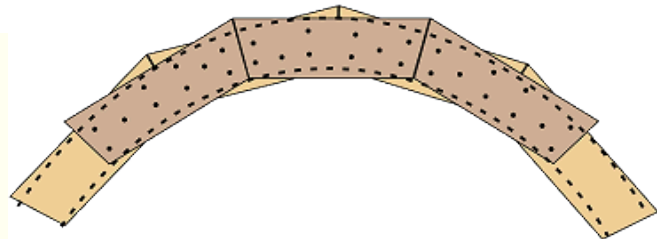
The company Paul founded is called Applied Imagination. Today they install seasonal display railroads in botanical gardens and other public places all over the United States.

The roadbed they were using the last time I saw one of their railroads uses plates that are as long as the stringers, so that the roadbed is essentially laminated. They also use 5/4" decking boards instead of 2"x6"s.

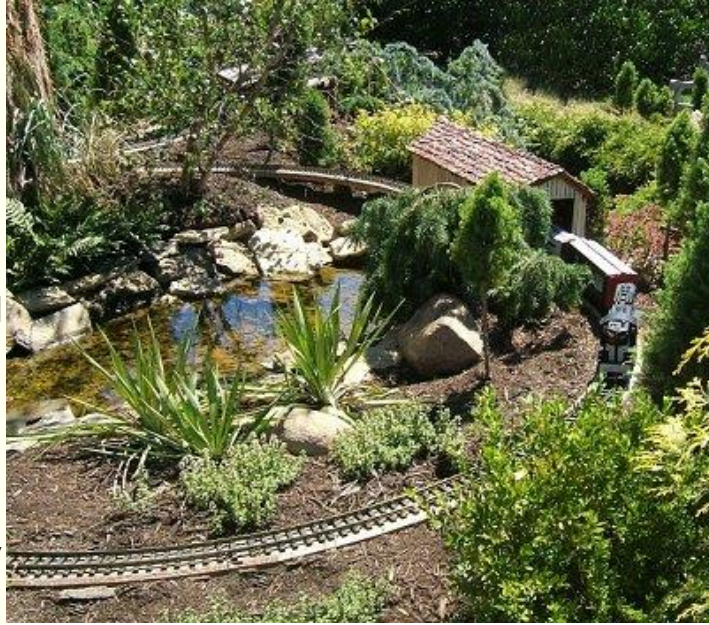


(If you want to try that yourself, you'll have to track down ground-rated decking boards, which are unavailable in many parts of the country.)

Then, using saws that cost much more than mine, they cut both layers into curves so that the outside edge is a smooth curve.



The photo to the right shows part of a 2007 Applied Imagination installation at Holden Arboretum, in northeastern Ohio. Though it looks like the roadbed is resting in the soil, it is actually braced on supports and backfilled.



When the edge of their roadbed is exposed, say, on bridges and trestles, they "dress up" the edge by fastening bark over it to provide an "organic" look.

Conclusion

Needless to say, there are countless possible variations. We've presented the simplest, most common methods to "kickstart" your outdoor railroading hobby by giving your trains a safe place to run.

We're hoping this vastly reduces the time you have to spend weeding and re-leveling your track in the future, and that it gives you far, far more time to enjoy your trains with your family and friends.

Appendix: Angles and Templates

The following pages include templates for cutting your roadbed.

To do the math yourself:

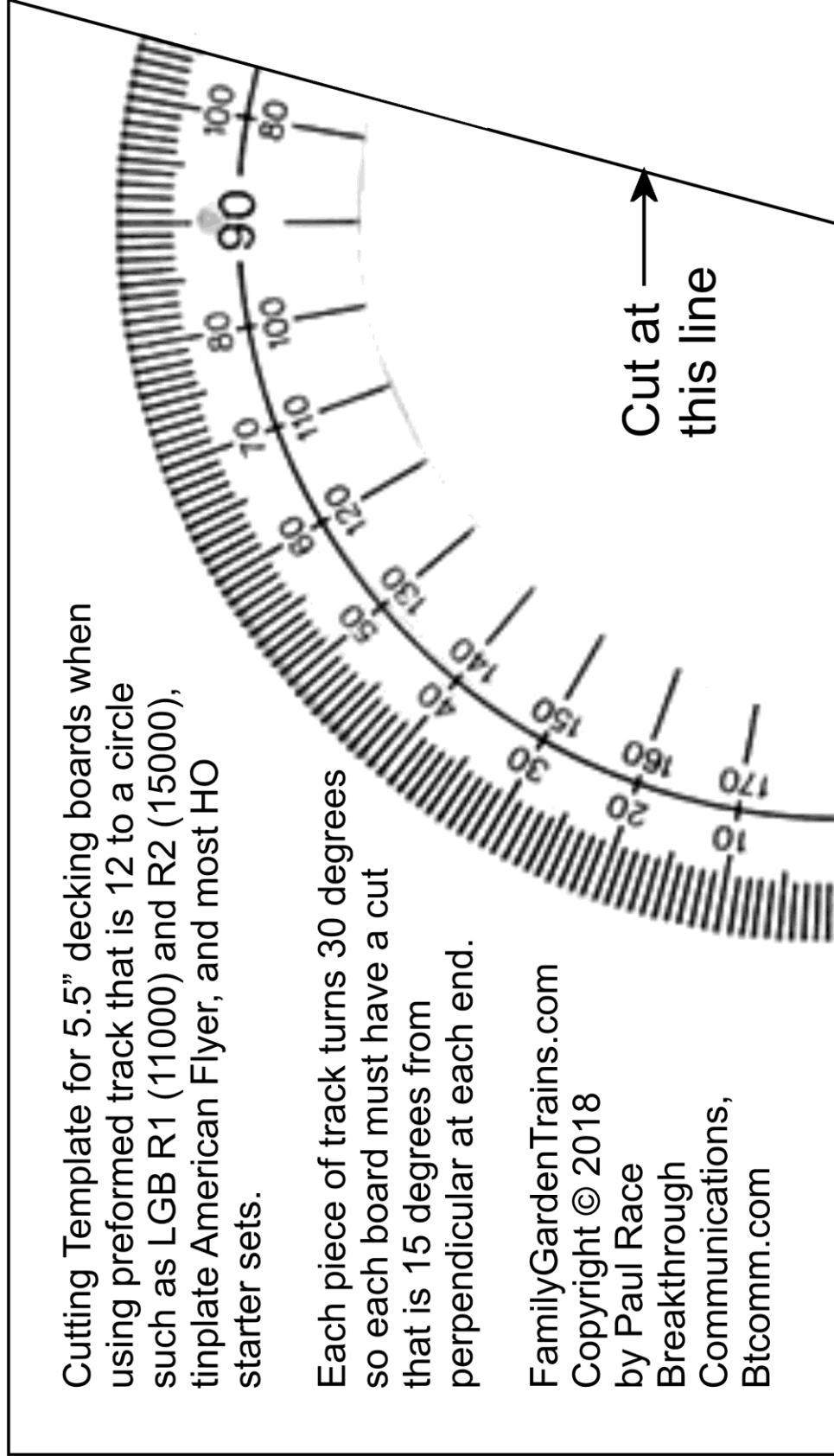
1. Divide the number of pieces of track that make up a circle into 360 degrees. That gives you the amount of curve in each piece of track. So each piece of 12-to-a-circle track turns 30 degrees.
2. Divide the figure you come up with by two. This will give you the number of degrees from perpendicular that you need to make each cut. For 12-to-a-circle track, the board needs to be cut to a 105-degree angle (or a 75-degree angle, depending on which way your protractor is turned).

If Your Track is 12 to a circle, use this one:

Cutting Template for 5.5" decking boards when using preformed track that is 12 to a circle such as LGB R1 (11000) and R2 (15000), tinplate American Flyer, and most HO starter sets.

Each piece of track turns 30 degrees so each board must have a cut that is 15 degrees from perpendicular at each end.

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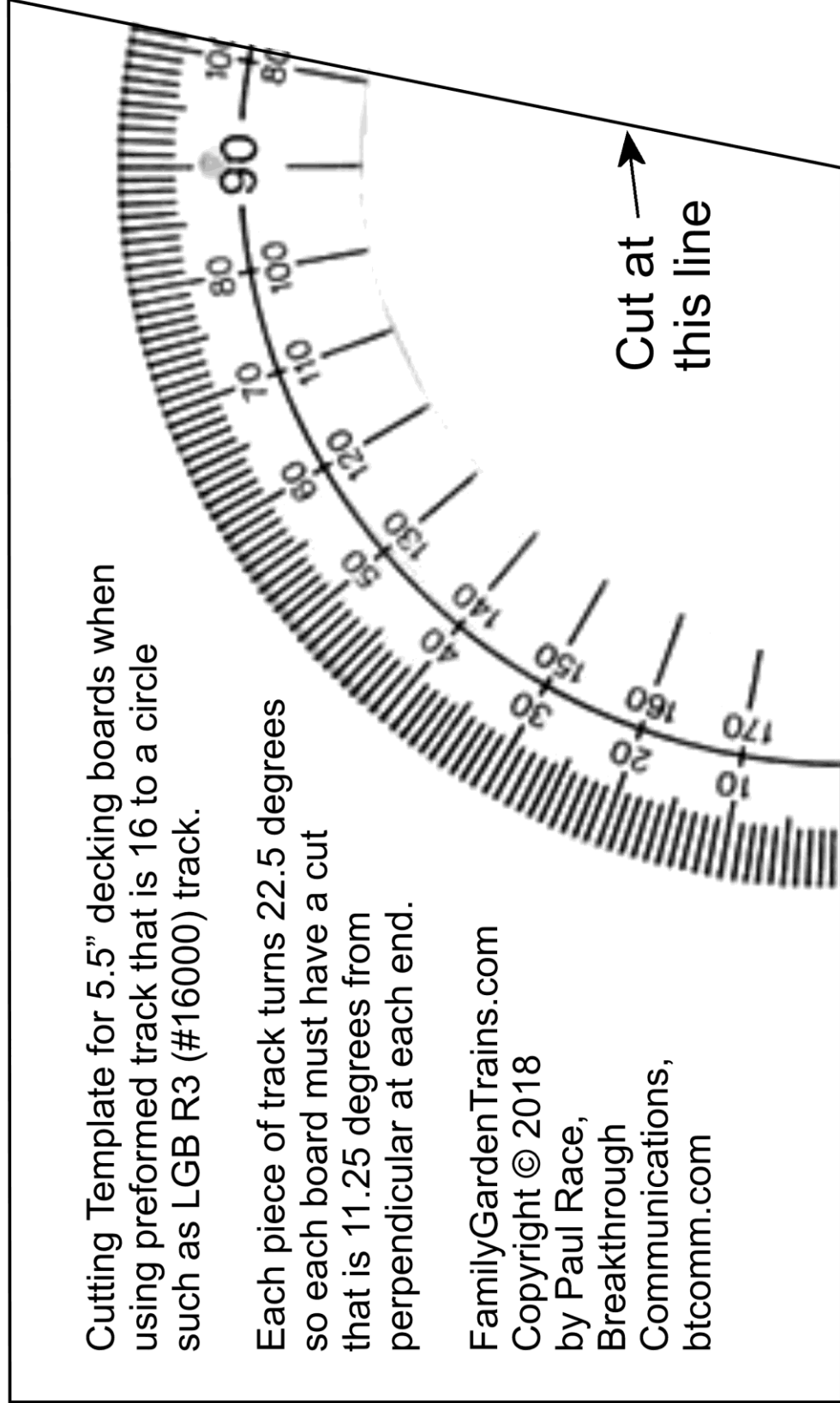


If Your Track is 16 to a circle, use this one:

Cutting Template for 5.5" decking boards when using preformed track that is 16 to a circle such as LGB R3 (#16000) track.

Each piece of track turns 22.5 degrees so each board must have a cut that is 11.25 degrees from perpendicular at each end.

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If Your Track is 8 to a circle, use this one:

Cutting Template for 5.5" decking boards when using preformed track that is 8 to a circle such as most Lionel track.

Each piece of track turns 45 degrees so each board must have a cut that is 22.5 degrees from perpendicular at each end.

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