

Linker Logs Project

Have fun while learning to fabricate with plywood.

ALTHOUGH LINKER LOGS are made with the aid of a computer—once complete, they're a great way to get kids (and parents) off the computer for an afternoon of old-fashioned fort building and pretend. The techniques shown here—including pre-finishing the plywood, programming correct joint tolerances, arranging parts, locating hold-downs and placing tabs—can also be used for other plywood projects. The inspiration for making these building planks comes from a story titled "Plywood Play Planks" that appeared in the December 1953 issue of *Mechanix Illustrated* maga-

zine. The original designers used 3/4" plywood and a dado blade to cut the joints. That technique can still be used, but using a CNC provides more freedom when designing the shape of the planks. Bill Young (a ShopBot guru from Virginia) adapted the idea for the CNC by creating a wide variety of planks, all with a standard notch spacing. The playhouse shown below is similar to the original *Mechanix Illustrated* design—but I added the puppet theater window and marquee board. Also check out the Blanket Hut on page 18, with its custom barrel vault roof.





Start by finishing

A coat of shellac followed by a water-based topcoat provides a durable finish for Linker Logs—and most other plywood projects. Finishing a sheet of plywood is much easier than finishing dozens of individual pieces, so applying the finish first makes lots of sense. Shellac dries quickly and seals the wood so the water-based topcoat won't raise the grain, and gives the plywood a nice amber tone. See "Pre-finishing Plywood" (page 68) to learn more about finishing plywood.



Measure the plywood

The thickness of the plywood must be consistent so the cross-lap joints that fit properly. I recommend a tolerance between sheets of plus or minus .005". Most good-quality AC or AB sanded plywood will be consistently sized. The sheets of 1/2" plywood that I used to make this playhouse measured .47" thick. Measuring after applying the finish ensures the most accurate measurement.



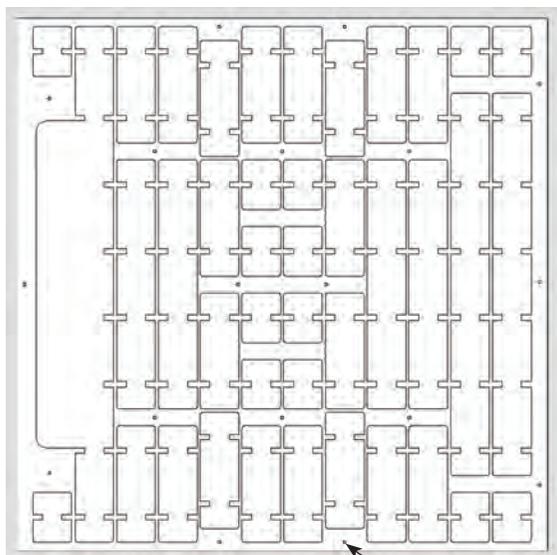
Cut a single part to test the joint

Rout a test part. When you test the fit in the next step, the width of the notch is the only thing that matters, so you can make the test part out of almost anything. I used 1/2" MDF. The test notch measured .48" wide, which should provide the desired .01" clearance when the cross-lap joint is assembled.



Check the joint's fit

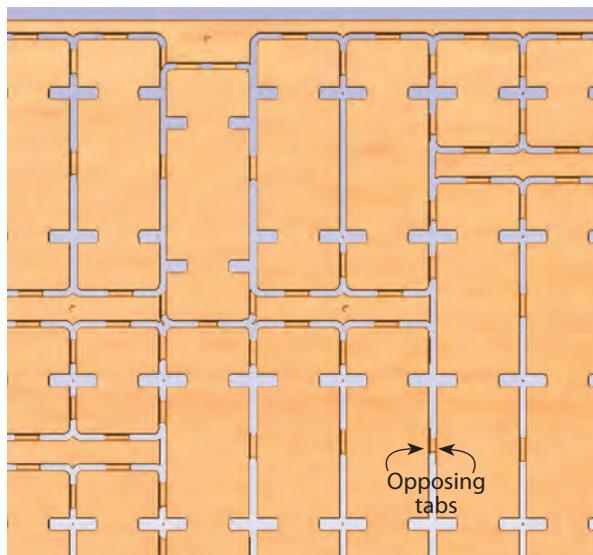
A mechanic's feeler gauge works well to measure the gap between the parts of the cross-lap joint. Ideally, this gap will be .01"; but anything from .005" to .015" is acceptable and will hold the Linker Logs together while still allowing them to be easily assembled and disassembled.



Screw location

Nest parts and locate screws

Most CNC design programs include a “parts nesting” feature that automatically fits multiple parts to the plywood. The Linker Log parts shown here are nested .27” inches apart—slightly larger than the 1/4” bit that will cut them out. Once the parts are nested you can still move them around to attain the exact layout you want. This allows you to safely locate the hold-down screws that secure the plywood sheet.



Add connecting tabs

The next step is to add tabs between the parts to keep them attached during routing. Since there is no waste material between most of the parts, tabs need to be added opposite of each other. The tabs added here measure .1” thick x 1” long. An alternative to adding tabs is to adjust the routing depth to leave a thin layer of material (a skin) at the bottom of the kerf. A skin of .05” would work fine for this project.



Secure the plywood with screws

Program the CNC to mark the location of each anchoring screw with a shallow plunge cut. Locating the screws in your drawing and transferring them to the plywood guarantees that the router bit won’t run into the screws while cutting the parts.



Use a down spiral bit

A down-cut spiral bit pushes the wood down while cutting, so it leaves a nice, clean edge at the top of the plywood. The bottom of the cut is also clean, because the spoil board under the plywood prevents blow-out.



Separate and roundover in one step

Remove the connecting tabs. A straight flush-trim bit works well for this, but I used an Amana 1/8" roundover bit (#MR0112) with a miniature bearing. This bit removed the tabs and rounded the sharp edges. It also allowed the joints to fit fully together, because the logs' rounded-over edges match the rounded inside corners of their CNC-routed notches. I left the edges and notches unfinished.



Blanket Hut

A twist on the blanket-over-a-table fort that all kids seem to enjoy, this design features rounded gable ends and half-planks for rafters. Vectric Aspire, .dxf, Autodesk 123D and SketchUp plans for the two playhouses shown in this article can be found at AmericanWoodworker.com/CNC. Additional plank designs that included angles and curves can be found at LinkerLogs.com. You supply the kids.



Alternate T-bone notch

If you want to keep the plywood edges square, use a "t-bone" notch design. Most CNC drawing programs have a built-in tool that lets you quickly add the right size "t-bone" to your joints. As you can see, this modification lets the plywood fully seat in the bottom of the notch.

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Want a set of Linker Logs, but don't own a CNC?

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