James Murphy stands under the lift-up section he built for his model railroad. Drawer glides from a home improvement store make for a stable, smoothly operating mechanism. Lou Sassi photo

BUILD A LIFT-UP SECTION that safely locks in place

A simple mechanism holds a lift span high enough to walk under

By James P. Murphy • Photos by the author except as noted

My layout design required the track to cross a door opening, so I needed an easy-to-use and safe way to get into the layout area. The device had to be convenient and reliable. My simple, easy-to-build lift-up does all this, and is fun to operate.

Why a lift-up section?

A traditional hinged swing-up section would limit scenery and structures. If the section didn't swing beyond 90 degrees, I'd need a brace to hold up the section. If the brace was bumped, the section could fall and someone could get hurt.

A well designed lift-up is safer, especially if it latches in place when raised, as mine does. It also allows for great scenic possibilities, as seen in **fig. 1** on the opposite page.

In order to keep the lift-up section from becoming an obstacle, it had to be simple and easy to use – easy enough for one hand. The latch is as simple as closing a door. You push it up, and the section stays up. You release the latch, and the section lowers back in place.

Safer, quicker, easier, versatile

I made my lift-up section to move on drawer glides, available at home improvement stores. Just 24" of travel is required for my 4-foot-high benchwork. That gives

me nearly 6 feet of clearance when the section is locked in the raised position.

I used metal rods, a spring, wire, locating pins, brass tubing, and screws to build the latching mechanism. The release lever is cut from a piece of plywood (see **fig. 2**). Tools required include a drill, screwdriver, a portable scroll or jig saw, a level, a carpenter's square, and wood glue to build the lift-up section and latching mechanism.

I cut the moving section pieces from seasoned wood and mounted the rails of the drawer glides vertically to the door frame at the layout entrance. Make sure you understand how the wheels mount into the track, following the package directions on your drawer glides.

Construction

I bought my lumber well in advance and left the materials in my layout room to season, allowing the moisture content of the room and benchwork to match. Any warping as the wood dries can be more easily dealt with during construction. Warping after the track is down is almost impossible to fix. Once the project was completed, I added a couple coats of polyurethane sealer to the wood pieces.

Build the benchwork inside your room to the edge of the door jamb, at the height of the rails less about 1½" to allow space for roadbed, subroadbed, lift-up section top, and shim washers, which are a must for final adjustment between the lift-up and the benchwork.

Note that the inside corners of the lift frame have a radius, seen in **figs. 2** and **3**. Not only are these inside corners easier to cut with a portable jigsaw, they're much less likely to crack with use.

I built the lift-up section, as pictured in **fig. 4** on the next page, from good-quality plywood and assembled with reinforcing strips of soft pine. Check that everything's square, get your clamps ready, then glue and screw the joints. Using carpenter's glue and screws assures a solid, smooth-operating unit. When finished, I marked centerlines on both sides of the plywood back panel.

My lift-up spans a doorway 36" wide. If your door isn't 36" wide, add or subtract for your door width. I mounted the drawer glide rails on the jamb opposite where the door swings open. I installed a few countersunk screws to hold the guide rails inside the door jamb, in front of the stop (see **figs. 3** and **5**, on the next page). I measured the exact distance between the inside of the drawer glide rails, and subtracted ⅛". The outside dimensions of the guide wheels must match this dimension.

Fig. 1 Scenery options. Jim built a bridge scene on his lift-up section. A lift-up allows more options for scenery than a tilt-up hinged section would.

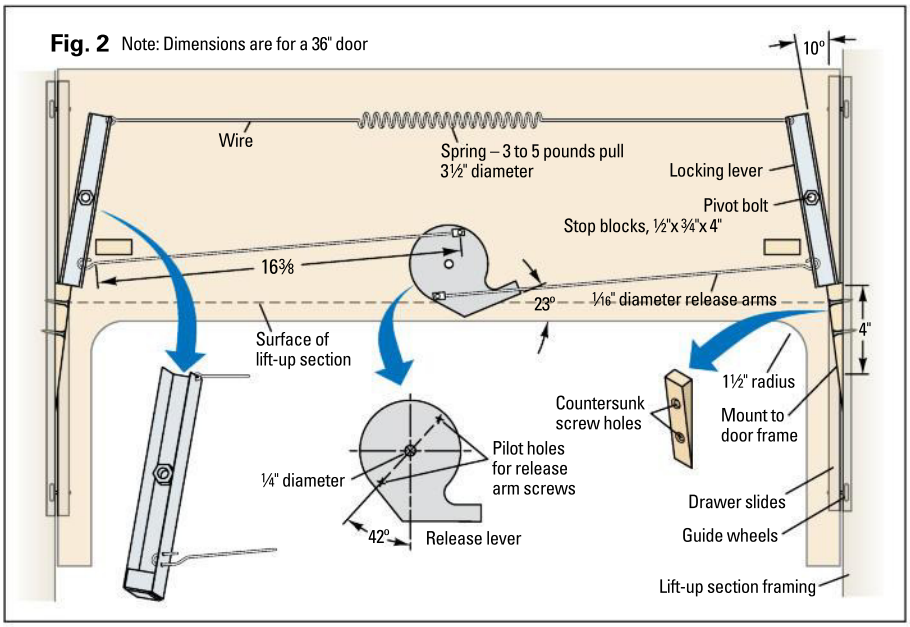

Fig. 2 Release mechanism. Parts are plywood, and hardware store items.

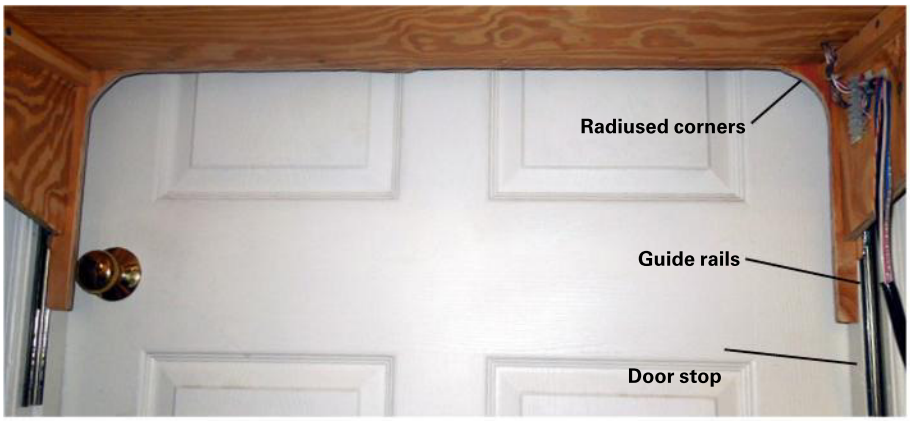

Fig. 3 Radiused corners and drawer glides. James cut the corners of the lift-up section as a curve to reduce cracks. The drawer glides are installed inside the jamb on the non-swing side of the door frame.

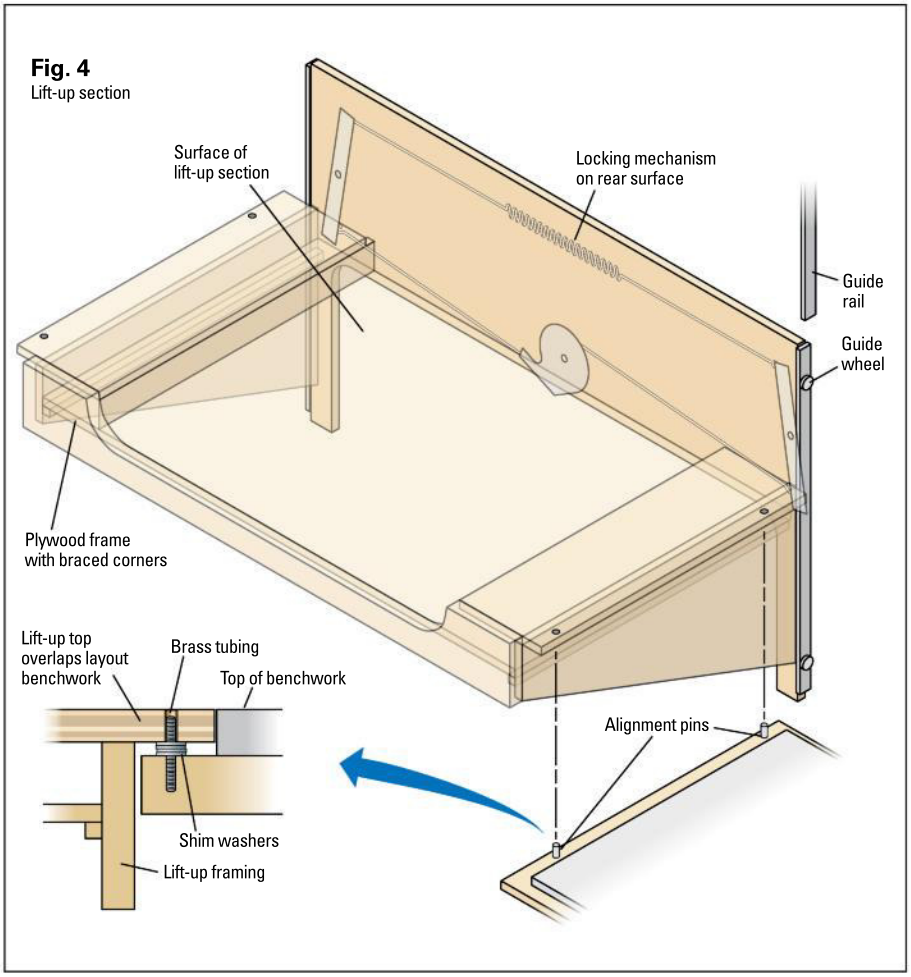

Fig. 4 Lift-up section. The lift-up section is assembled from plywood with 1 x 1 pine blocking in the corners. The parts are glued and screwed together to ensure a sturdy structure. Illustrations by Rick Johnson

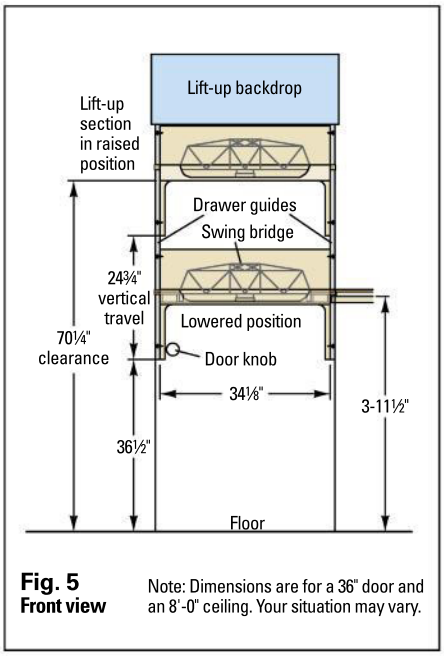

Fig. 5 Front view. The lift-up section rides in drawer glides attached to the door jamb. When it's lowered, it rests on the layout benchwork, and is located by metal pins.

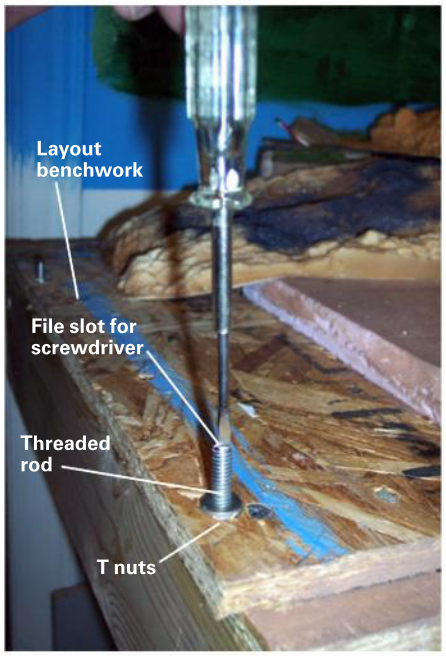

Fig. 6 Location, location. James used threaded rod, which was tapered and filed to fit tightly into the brass tubes he installed in the lift-up section, to locate the section precisely.

With the lift-up assembly complete, I mounted the guide wheels on the lift-up section sides to the above dimension, loosened the rails to install the wheels, and set the lift-up in the rails.

With the lift-up section resting on the layout benchwork, I drilled ¼" holes through the lift-up top on the four corners into the benchwork. I raised the section, and then drilled just the lift-up to press-fit a ½" length of tubing that slipped loosely over the locating pin. I made my locating pins from threaded rod, which was filed to precisely fit inside the tube guide I inserted in the lift-up.

I installed the pins in threaded T-nuts driven into the layout benchwork (see **fig. 6**). Only a metal-to-metal sliding lock will keep tracks in alignment and release easily as your house moves and twists with the seasons. Ask me how I know.

With the shelf in the lowered position, I shifted the guide rails to center the wheels and tightened all the countersunk screws on the guide rails. I raised the lift-up to within ¼" of the top of the door jamb, using a temporary shim taped in place to set the distance, and propped up the shelf. I drew a vertical line ⅝" away from and parallel to the door stop on the lift-up frame. This will be the vertical centerline for the locking levers.

I made the locking levers from hardware store metal channel with a smooth surface on the levers' ends where they rest in the catches. I drilled holes in the center of the levers for pivot bolts. There are also holes in each end for the release arms at the bottom and the return-spring rods at the top. The tapered stop blocks that hold the lift-up in the raised position are long, ¾"-thick hardwood wedges that push in the locking levers as the section goes up.

I held one locking lever in a vertical position with the pivot hole centered on the line I drew earlier, then marked the hole for the pivot bolt on the line. I marked the other bolt center the same distance down from the top of the door jamb, using a carpenter's level. Don't assume the door frame is square! It's probably not.

I drilled holes for the pivot bolts, then installed the locking levers using washers, bolts and self-locking nuts. I tightened them, then backed off a quarter turn to allow easy motion. The levers must move freely. I installed a spring between two rods at the top of the levers to pull the tops of the levers and push the bottoms into the door jamb. The levers should be leaning in at about 10 degrees, as seen in **fig. 2** on the previous page.

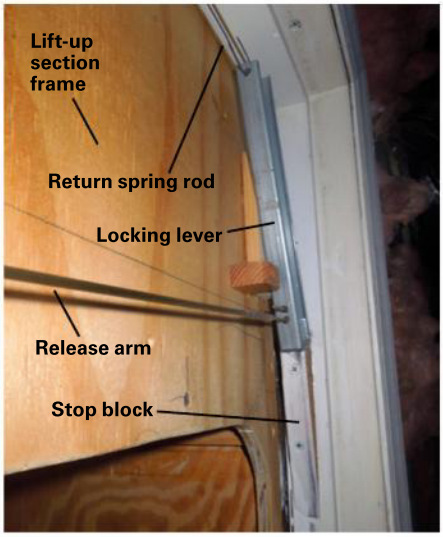

Fig. 7 Holding up. The key to James' system is the locking levers that engage the stop blocks.

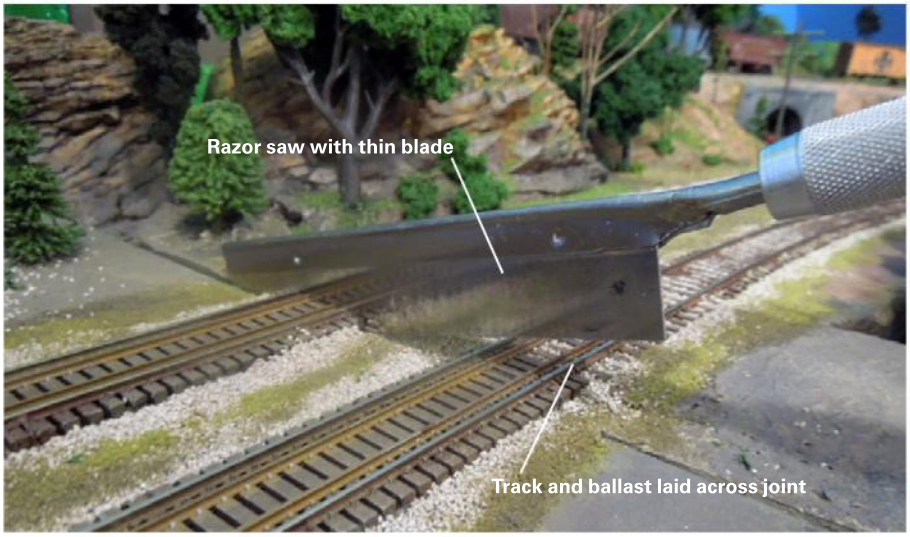

Fig. 8 Making the cut. James laid the track and glued the ballast in place before he cut through the track and roadbed to free the lift-up section from the benchwork. Plastic wrap between the sections made separating things easier.

I drew the release lever on a piece of ⅜" plywood, marking the center hole and the screw locations for the actuating rods as shown earlier in **fig. 2**. I drilled a ¼" diameter through hole for the center pivot, and 1/16" diameter pilot holes for the screws that will hold the locking lever rods. I cut out the release lever after drilling the holes.

On the rear panel of the lift-up section, I drew a line from locking lever to locking lever at the height of the release arm connection. Where that line crossed the centerline I'd already drawn on the rear panel, I drilled a ¼"-diameter hole for the release lever. I inserted a 1"-long bolt through the release lever and the rear panel with washers on both sides, then I installed a self-locking nut. I tightened the nut, then backed off a quarter-turn to allow free rotation.

I made release arms from thin brass rod, but you could also use heavy coat-hanger wire. The secret is the elongated loops at the ends of the rods that allow the levers to move outward freely, yet are retracted by rotating the release lever. Hardwood locking levers would work; just use a lag screw to restrain the elongated loop. I kept the mechanism thin, as the assembly must fit between the closed door and the lift-up section.

I made sure the lift section was still level and could be raised another ¼". Then I installed the tapered stop blocks with countersunk screws (see **fig. 7**). I lowered and raised the section and applied dry lubricant to ensure smooth operation.

With the lift-up section complete and installed, I built my bridge scene. The bridge needed to be of robust construction, as there is some flexing in the lift-up structure. Most important is plenty of support under the ends of track where the section meets the room benchwork. I didn't use any plastic bridge abutments here; solid foundations only.

The last step took patience. I put plastic wrap at the joint between the lift-up and the benchwork, then I laid track continuously across the joint, added ballast, and glued everything down thoroughly without getting ballast cement or scenery glue in the joint.

I added guardrails at the joint between the layout and the lift-up. After a few days of drying, I cut the rails at the joint. The cut must be square, vertical and thin, so I didn't use a rotary tool, but a thin razor saw over the end of the lift-up (see **fig. 8**). I passed a long, thin blade through the joint to cut the plastic and free the lift-up. I made sure all gaps were open before raising the section for the first time.

I soldered feeder wires to the tracks and made allowances for lighting on the lift-up section. Then I connected the wiring back to the layout with enough slack to allow for the lift-up to reach the raised position (see **fig. 9**). With the section in the up position, I installed a lightweight backdrop board to cover the door and painted it to match the layout room. I left at least ½" clearance between the backdrop and the ceiling when the section is raised.

Now for the reward for all the work. I lifted the section high enough to hear the locking levers snap into position. I held the shelf in one hand and released the lever, gently lowering the shelf. If your lift-up section feels heavy, a simple counterweight or spring can be added to help carry the load.

Walk tall for model railroading! MR

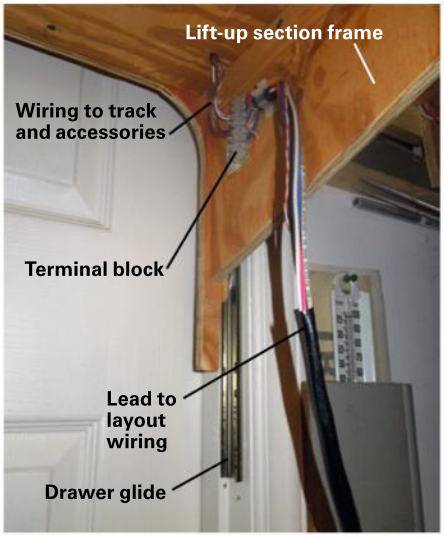

Fig. 9 Power connections. The lift-up section gets its power from the rest of the layout through a wiring lead long enough to reach the section in the raised position.

Meet Jim Murphy

Jim Murphy's Berkshire Short Line grew from a board under a bed to the current 18 x 29-foot layout. Detailed contest models, along with backdrops painted by his artist wife, Nancy, complete the scene.

In his career as a process engineer for a large construction company, Jim met modelers on six continents. To promote the hobby, Jim is an officer in his National Model Railroad Association division and a Boy Scout railroading merit badge counselor.