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“We’re Going to Need a Bigger Box”

Scaling up your box jumps? Matt Blankenship builds a DIY extender to turn a 30-inch box into a 40.

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All images: Matt Blankenship

Many CrossFit gyms use the Games-style 20 x 30 x 24 plyo boxes that are constructed to allow for 20-, 24- or 30-inch box jumps depending on how they’re set up. Smaller boxes are readily available and see plenty of use, but what do you do when you want to go higher than 30 inches?

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Most of the time, the answer is to try to stack bumper plates on top of the box to achieve the desired height. While this can be an effective solution, it can also pose problems including the following:

- It weakens the box. To get much of a height increase, you might have to stack several hundred pounds of weights on top of a wooden box.
- It makes the box unstable. Stacking plates will immediately shift the center of gravity of the box and make it extremely top heavy. Also, the plates can move and shift.
- It changes the shape of the box. The jumper is forced to aim for a smaller, circular target. This forces you to move your feet into a narrower, less stable position.

It's possible that all these factors can be dealt with when going for single high jumps, but what about repeated jumps for practice or in a WOD? There is a better way, and it is safe, cost effective and relatively simple: an extension for the box.

I first built some of these extensions for a gym that wanted a solution for the problems mentioned above. These extensions use an existing plyo box and raise it up a set number of inches. The plyo box fits inside the extension and rests on a raised shelf. This method has many benefits over stacking bumper plates on top of a box.

- This does not weaken the box. The only thing going on top of the box is the athlete.
- The extension actually makes the box more stable. The weight of the extension lowers the center of gravity of the box.
- You get to use the same large platform to jump on that you would when going for 30-inch box jumps.

This is not a difficult project by any means and can be handled by almost anyone with some knowledge of woodworking and basic tools.

The first thing that you'll need to decide is how tall an extension you want to make. In this article, I'll be making a 10-inch extension so I'll be able to do 40-inch box jumps. The only item in the materials list that you will need to vary depending on your desired height is the one 10-foot piece of lumber. Because I will be making a 10-inch extension, I will be using a 2 x 10. If you only wanted to make a 6-inch extension, then you would use a 10-foot-long 2 x 6. I'm sure everyone can see the pattern here.



Which looks more appealing for a WOD including 30 high box jumps in a row?

Materials Needed

- 1 3/4-inch 4 x 8-foot piece of birch plywood*
- 1 10-foot 2 x 10 board
- 1 lb. 1 5/8-inch coarse-thread drywall screws**
- 1 lb. 3-inch No. 8 wood screws**
- 1 bottle wood glue (at least 4 ounces)**

*You will only need half a sheet, so if you can buy a 4 x 4 piece, do so.

**All items are much cheaper when bought in large quantities.

Tools Needed

- Circular saw
- Drill
- Phillips bit
- 1/8-inch-diameter drill bit
- Measuring tape
- Long straightedge
- Sandpaper



Fairly basic tools will do.

If you have a wider selection of tools at your disposal, then by all means use them. Throughout the instructions, I will provide tool options for each task. Some additional tools I will be using include a power miter saw, rotary sander, router, speed square and drywall T-square.

You can find all the needed materials at most all hardware stores. When buying wood, it is always a good idea to check for straightness, cracks and any other defects. You will almost never want to buy the top piece of wood in a pile. This is a bit difficult when getting the plywood, so having a helper is always nice.



Supplies are minimal: lumber, screws and glue.



The required tools.



These tools are optional but will reduce time.



If you measure correctly, you won't waste much wood.



Measure twice, cut once.

Once you get everything back home, to the gym or wherever your workspace is, you can lay everything out and start marking your cuts.

Here are the dimensions for cutting the plywood:

1 piece 21.75 x 25.75 inches (top)

2 pieces 16 x 21.75 inches (A)

2 pieces 16 x 24.25 inches (B)

Make all your marks on the bad side of the plywood and your finished product will come out looking much better. When marking wood, I prefer to use a marker rather than a pencil. It will give you a larger, darker mark that will be much more visible once sawdust starts flying. It's not required, but a drywall T-square is a great tool for marking plywood. It gives you a long, straight edge, makes sure all your marks are square and lets you measure all at once. It's also a great tool for cutting rubber mats when needed.

Once you have all your plywood marked, go ahead and mark your 2 x 10 with the following dimensions using your speed square or straightedge:

2 pieces—24 inches

4 pieces—17 inches

Now it's time to make your cuts. You'll need to use your circular saw to cut the plywood. A power miter saw will make cutting your 2 x 10 much easier, but a normal circular saw will also work just fine. Make sure to take your time when cutting and make all your cuts as straight as possible. Doing so will make assembly much easier. Whenever I am cutting wood, I always use a kettlebell as a counterweight. Their large weight and small footprint make them well suited to the task.

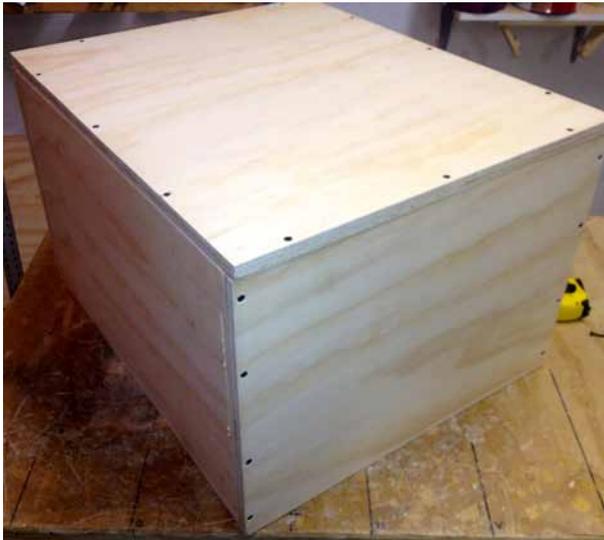
Begin by gluing and screwing together your smaller pieces of plywood marked A and B. The A pieces will go on the outside, and your B pieces will go on the inside. Using a flat tabletop will help keep everything straight and square. Put a line of glue on the connecting edge of piece B and use your drill to drive drywall screws through the front of Piece A and into the edge of Piece B. Use at least 4 screws per joint. Use a damp cloth or rag to wipe away any excess glue.



Glue, then screw.



Pre-drilling a few holes can make this step easier.



When screwing the top down, use only one screw per side until you're sure the edges are lined up.

Now, glue and screw the top onto the open box you've just made. Using the same method as above, lay down a line of glue onto the top edge of all smaller pieces, then set the top on and screw it into place. Start by only putting one screw on each side until all your edges are lined up, then go back and add another 2 or 3 screws per edge.

Now it is time to move on to building the inside of the box. Begin by pre-drilling 2 holes at the edge of each side of the long pieces of 2 x 10 using your drill and 1/8-inch

drill bit. These holes should be about $\frac{3}{4}$ of an inch from the end of the wood and about 2 inches from the top and bottom. These are where some of your wood screws will go. Pre-drilling on the ends is especially important because the wood is much more likely to crack here when putting in screws. You can also pre-drill the holes for the two middle pieces, but it is not necessary. The two middle pieces are centered at about 8 and 16 inches.

Using your drill and wood screws, drive 2 screws through the outside of the long piece of 2 x 10 into the end of each of the shorter pieces of 2 x 10. Do this with both long pieces of 2 x 10. Make sure all your screws go all the way into the wood and sit flush with the outside. You should have 8 screws going into each long 2 x 10 piece, and it should look like the frame in the picture above.

Now that you have completed the 2 x 10 frame, you'll want to go back and make sure that the outsides and the corners are smooth so that it will easily slide into the plywood box. Turn the plywood box upside down so that you are looking into the hollow inside. Put down wood glue in the plywood box on the corners, sides and at any point where the 2x10s will be touching the plywood. This is the last time that you will be using the glue for this project, so feel free to lay it on thick. Slowly guide the 2 x 10 frame into the bottom of the box, making sure it sits flush at the bottom.



If you measured and cut carefully, you'll be rewarded with a snug fit here.



Sanding the box and its edges is a nice touch that can save shins in the long run.



Drive several screws through the plywood and inside the inner frame to secure it.

Now that you've put the frame inside the plywood box, you'll need to get it screwed in. While looking from above your box, drill a wood screw through the side of the plywood box into the 2 x 10 frame and into the middle of one of the center cross sections. Repeat this once more on the same side, putting a screw into the other cross section. Do the same thing on the other side of the box so that you have two wood screws on each side holding in the frame. Now use another 4 or 5 drywall screws on each side to further secure the frame into the box. After that, flip the box over so that you are looking at the top and drive a few drywall screws through the top of the box and into the cross sections of the frame. The cross sections are at about 9 inches from the outside edge of the top of your box.

The final step in this process is finishing. You'll want to sand down all exterior edges and corners for safety. Also, sand down the inside edges and faces of the plywood when the box is turned upside down. This makes inserting and removing a plyo box much smoother.

I use a router with a 3/8-inch round-over bit on all the edges and then go back with a power sander to finish out the edges and any flat sides. Although this can be accomplished with a sheet of sandpaper and some hard work, I highly recommend trying to find a power sander to use.

You now have a completed plyo-box extender. Simply flip the extender upside down and put a 20 x 24 x 30-inch box into the hollow part. The frame on the inside boosts the box up and the plywood sides hug the box to keep it seated. Not all plyo boxes are created equal, and you might find that you'll need to further sand down some of the inside of the extension to get the desired fit. The flat top of the extender can also double as a stand-alone box roughly 17 inches tall.

With these dimensions, I do not recommend making anything higher than a 12-inch extension (using 2 x 12 lumber). If you did want to make a taller extension, the only measurements that would need to change would be to make the 16-inch-tall plywood sides taller. Always make sure that you have at least 4 inches of plywood above the frame to adequately hold the inserted plyo box. For example, if you wanted to make a 20-inch extension, then the 16-inch measurement on the plywood cuts should be increased to at least 24 inches.



About the Author

Matt Blankenship lives and works in Fort Worth, Texas. He is a full-time special-education teacher. He is also the owner/operator of Legion Athletics, a small business providing training gear to gyms and individuals in the Dallas Fort Worth area and across the U.S. He trains in his garage gym and at CrossFit Iron Horse and someday hopes to open his own gym. He also has an amazing wife and two wonderful children.



The completed project provides a strong, sturdy base for a 40-inch plyo box.