# DIY CRT Projector Mounting System

Disclaimer: I'm not an engineer or any sort of expert, this advice is given without any warranty. If you choose to use one of the techniques mentioned you do so at your own risk.

Many CRT projector owners find themselves with the choice of buying a very expensive custom mount for their unit, or trying to figure out how to fabricate a mount. There are several simple techniques, one of the most popular being to use unistrut to create a mount.

Keep in mind that unistrut (http://www.unistrut.com) is a brand name, other brands exist such as powerstrut (http://www.powerstrut.com). If you find a similar product, check its specifications specifically for load bearing, but it will likely work. Traditionally these products are used to hang ductwork (usually in big offices, or warehouses -- look up next time your at a HomeDepot). Other uses would be in large computer server rooms to hang the cable trays, or to hold up electrical conduit. So this should give you a hint where you need to go to buy it: HomeDepot, Rona, or your generic builders warehouse may not carry this (some do). I had success at a plumbing supply store (Boone in Kanata http://www.boone.ca).

A picture is worth a thousand words, so here are a few examples of mounts people have done.
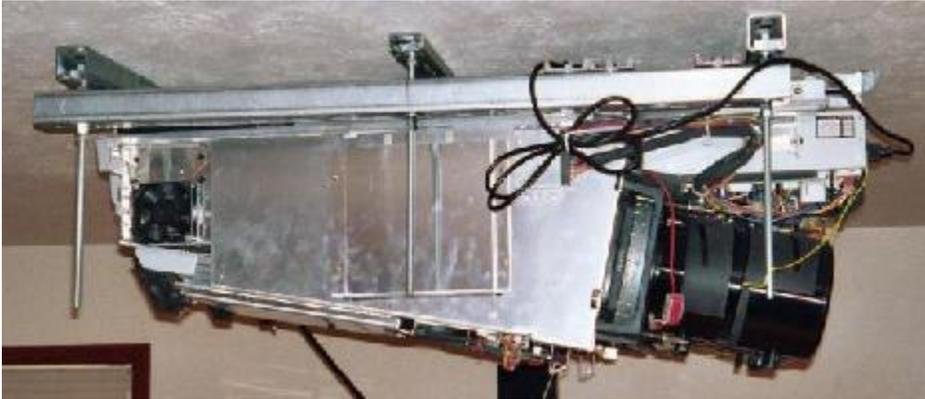
Pictured above is a Sony 1292, a 225lb projector. A few details on this can be found at http://www.poohsticks.org/drew/ht.html.

This is an Ampro 4000, which weighs in at 165lbs. Above the ceiling is attic space, so there are 2 more unistrut channels paired with the ones against the ceiling, the hidden struts sit across the top of 3 joists.

In this example you can more clearly see how the unistrut is attached to the joists above.

As you can see each mount is unique, so some thought is required. However, there are a few rules of thumb that are useful to follow:
- Span at least 3 joists. There is no requirement to be parallel or perpendicular, but you want to make sure the weight of the projector is spread across 3 joists.
- Use at least six 3/8" lag bolts that are 4 inches long. The point is to make certain you've got good, deep anchoring. This is likely overkill in the extreme, a single properly installed lag bolt should be able to hold the weight.
- Pre-drill the holes for the entire length of your lag bolts. The hole should be 60% to 75% the size of the bolt, so for a 3/8" bolt, use a 1/4" hole. Lubricate the bolts before installing them, use soap -- this will keep them from heating up, and save you some grunt work.
- When connecting the projector to the struts, and the struts to each other - use the correct fasteners. Double check your work, and make certain you satisfy yourself that its done correctly.

One of the nice features of using unistrut is that it offers great flexibility. If you design your mount correctly, you'll be able to "slide" the projector forwards and back or side to side (or both) along the channel. This allows for fine tuning. Additionally, if you've been careful you should be able to control the height of all 4 corners of the projector - giving you excellent mechanical setup.

Placements of the mount on the ceiling is critical. Measure this one more than once. You want the projector to be perpendicular to the screen - if you mount it crooked you may not be able to achieve an optimal picture. Using two strings of fixed length, if you draw an arc from the top corners of your screen you should get two X's on the ceiling. A line through those X's should be perpendicular to the screen wall. Of course CRT projectors have fixed throw distances as well, make sure that you know the correct throw distance for your projector (setting it up on the floor before hand is a good idea).

I would strongly advise that you work out your plan on paper, and discuss it in detail with someone before you implement it. Oh yeah, and please use common sense.

Above is my Ampro 4000G mounted on the ceiling.

The 2 rails mounted directly on the ceiling are perpendicular to the joists, I have three 5" long lag bolts in each rail, one for each joist that was crossed. To assure myself that the mount was strong enough I hung a loop of wire from the rail, and swung from it fairly forcefully -- I'm ~200lbs and the rail didn't move a bit. With the projector mounted, it spreads the weight evenly across both rails. My prime seating location is directly below the projector - I have no worries that it will ever come down accidentally.

Getting the projector on the ceiling was a brute force activity that 4 of my friends gave me a hand with. I would not recommend this as the best way, as we had a few tense moments.. but it was quick.

The bottom of the projector (bit closest to the ceiling) is painted flat black using Tremclad rust paint. It looks really sharp, and once I get a chance I'll paint the entire thing black. I will also cut the extra threaded rod lengths off.

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Web Resources:
http://www.myhometheater.homestead.com/CRTmount.html
http://www.poohsticks.org/drew/ht.html
http://archive.avsforum.com/avs-vb/showthread.php?s=&threadid=94420
http://www.midwinter.com/~koreth/gallery/construction?&page=7