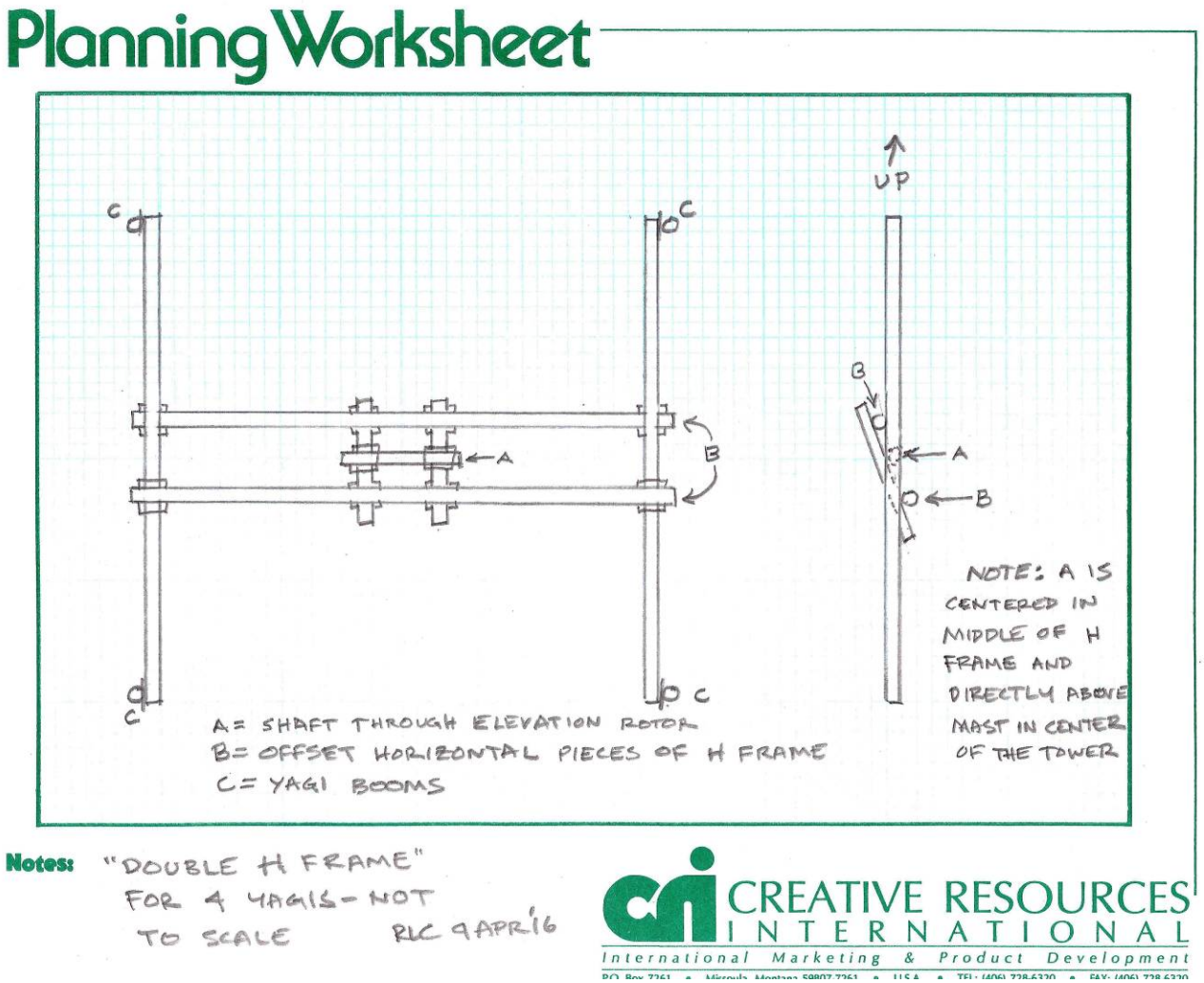
W7GJ SIMPLE ELEVATION MOUNT FOR DOUBLE H-FRAME

A simple way to mount four yagis is to build an "H FRAME" using aluminum tubing or aluminum pipe (which has heavier wall, comes in 21' lengths and is typically less expensive than tubing). If longer lengths are required, I have had good success extending the members by inserting tubing into the pipe. An example of how this can be done is shown on my 6m EME array construction web page under the H FRAME section: http://www.bigskyspaces.com/w7gj/6mEME.htm

I have had very good results constructing very sturdy 4 yagi arrays using the "Double H Frame" configuration shown in the drawing below. I have used this design for mounting four long 2m yagis, and also utilized the same concept, but used aluminum towers for the two cross booms in my 6m EME array. This design has the following appealing attributes:

1. The weight of the array can be centered over the mast
2. The vertical masts are prevented from rotating around a single horizontal cross boom
3. The bottom cross boom can be pushed out away from the mast for elevation
4. If needed, trussing can be added by extending the two middle vertical masts

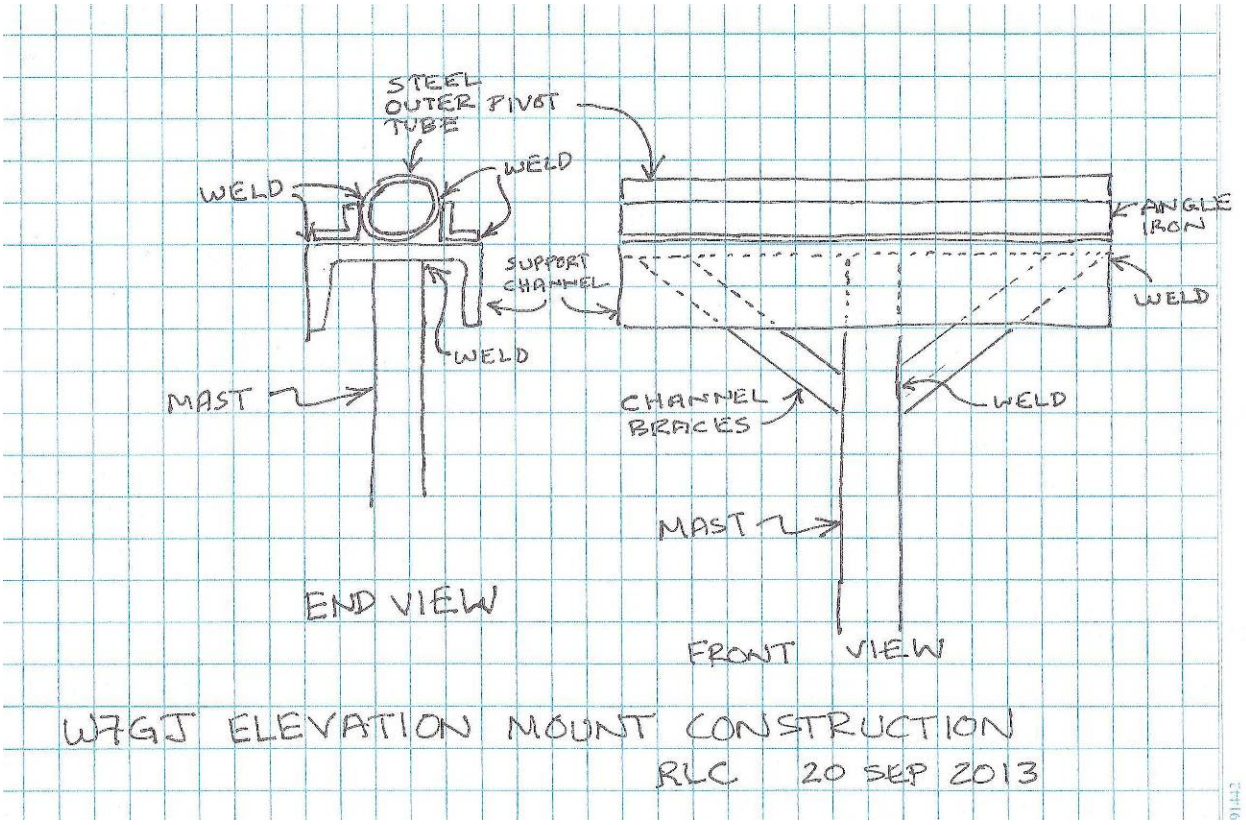


In my 6m EME array, I used aluminum towers for the two horizontal cross booms, as shown in the following photo.

By itself, the above configuration is quite sturdy and resists twisting. However, if trussing is required for larger arrays, the two inside masts can be extended upward, coupled with a rigid piece of aluminum, across top and truss lines can be attached there and run out to the points where the lower cross boom is attached to the vertical antenna masts. Below is a photo showing how this was done on my 6m EME array, using a piece of angle aluminum to tie the two central vertical masts together.

In the drawing on the previous page, "A" was shown as the central axis around which the array elevates. For smaller arrays, a simple mount with such an axis can be built by inserting 1.5" steel tubing inside a section of 1.5" schedule 40 steel pipe, and clamping the inner vertical masts to the ends of the steel tubing that extend out past the sleeve of steel pipe.

The pipe can be welded onto a piece of 5" wide steel channel, welded to the end of the mast, and braced with sections of 3" steel channel. On both my 6m and 2m EME arrays, I used this basic configuration with a mast of 1.5" schedule 40 steel pipe (1-7/8" OD) reinforced with a piece of 1.5" steel tubing welded up inside it. The masts on both arrays were left full length, so they extended well down inside the tower, to join the rotor where the tower is supported by steel pipes in a tripod configuration. This holds the rotor plate firmly in place and prevents tower twisting. In addition, by having 16" of the long mast sticking up above the tower, there is much less side stress put on the rotor. Note that all these steel parts are standard sizes available at any steel supply company and/or welding shop.



You may notice that for my 6m EME array, I used a solid 1-15/16" shaft welded to the top of the channel plate instead of the steel pipe. For that array, I mounted pillow blocks on both ends of the shaft and the inner vertical masts of the Double H Frame are bolted to those bearings.

You will find that a perfectly balanced array is quite achievable with this type of mounting system, and that it will require minimal power to elevate the array. A TVRO actuator or other type of device can easily elevate a well balanced array. Another benefit of well balanced array is that the wear on the mechanical parts will be minimized.

Good luck with your own array design and construction!