Pyramid Supports for Large Blade Dipoles

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I'll briefly review some aspects of the costs and of the time required for the construction of large blade dipoles using my pyramid design, and I'll mention some of the further work that needs to be done. First of all, I'm discussing the type of supports illustrated in Figure 1.

Figure 1. Two of the large blade dipoles and pyramidal supports used for cross-coupling measurements at the GSFC Observatory.

Construction:

The supports are constructed of 2" PVC pipe obtained from retail suppliers. The first such system took me about a day of trial and measurement to construct on Bruny Island. The next one, built at NRL required two of us working about ½ day. With the procedures and measurements worked out, the next two took ~2 hours each.

When assembling or disassembling the structure a temporary wooden post is inserted under the balun plate in order to support it until construction is completed. Assembly takes only ~10 minutes.

I made no attempt to obtain weather-resistant plastic pipe. This matter needs to be investigated by consulting experts on the properties of plastics and by obtaining samples of readily-available plastic pipes and exposing them to the weather at the VLA site. Presumably, pipes used for irrigation or outdoor electrical conduit should stand up to outdoor conditions but this needs to be proven. Pipes of various types should be placed at the VLA site to start exposure as soon as possible.

Costs:

I purchased the pipes and fittings needed for the three NRL dipole stands for a total of $289.26 or $96.42 at retail prices. This agrees well with the $110, again at retail prices, that I spent on the parts for the stand that I built at Bruny Island, excluding bolts and nuts for the assembly. .

The plastic plate for mounting the balun cost about $10. However, for convenience I used Plexiglas that probably is not the best choice for weather resistance. This matter also needs to be investigated.

The blades themselves, as fabricated at NRL were quite expensive, about $300 for a set of four. This cost could probably be greatly reduced through the use of much thinner material riveted to pieces of Aluminum angle for strength. Again, ideas such as this need investigation.

Figure 2. Emil has prepared this dimensioned sketch for the construction of the blade supports. All are from 2 inch plastic pipe and fittings. The pipes and fittings are glued together except for the ends of pipes “F”. For these first test structures they are only pinned for disassembly and transportation. The blades are bolted on to the pipes “C”.