A Mounting Strategy For The Blimp Being Developed By Oblix

Mickey Horn

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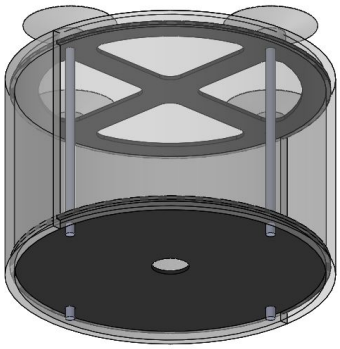
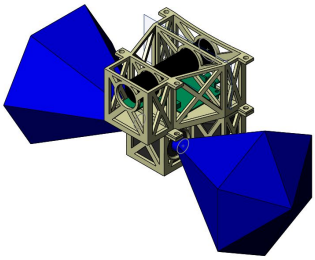
Oblix Mounting Bay

The mounting bay at the bottom of the Oblix blimp is relatively straightforward. It is a mostly hollow cylinder with walls made from EPP foam. There is a carbon fiber plate at the bottom that can be directly mounted to by cutting holes and screwing the mount into place. This plate has a 170mm diameter and is 2mm thick. It has a central hole in case any cabling needs to run into the cylinder. There are also 4 metal rods that run vertically inside the cylinder to add stability.



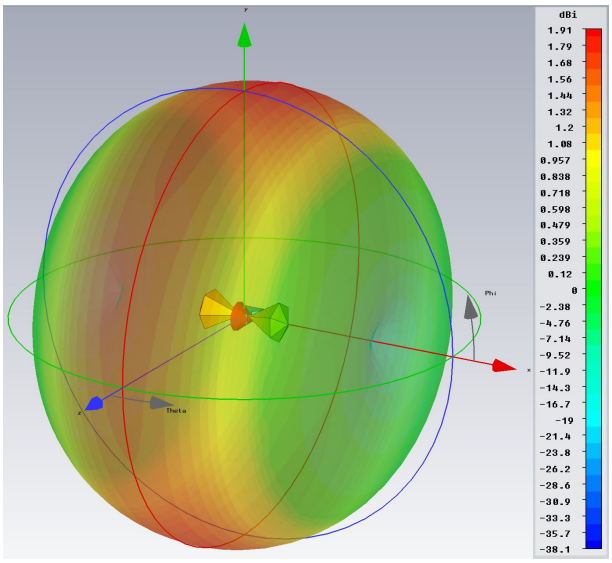
3D-Printed Mount and Payload Properties

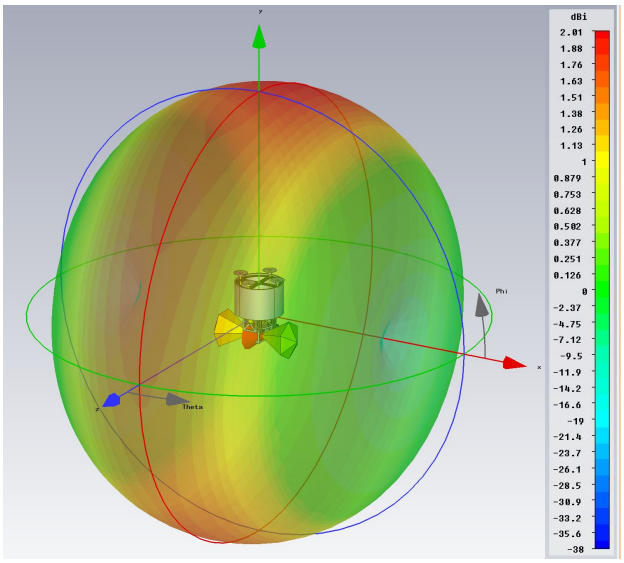
Our payload includes a BicoLOG antenna with 2 conical horns, a Valon synthesizer circuit board, and an anker battery. These are all held in place by a 3D-printed plastic cage. The cage has 4 open holes at the top so that plastic screws can hold it to the carbon fiber mounting plate. All together, our payload equipment weighs 193.7g and our mount weighs ~100g. This mount is still a work in progress, however the general strategy will still apply, and thus the mounting strategy and CST results will be relatively similar.



3D CST Views

Here are the CST results of the farfield measurements at 137.5 MHz. The picture on the left is the BicoLOG by itself (an otherwise unperturbed beam). The picture on the right is after it has been mounted to the Oblix Mounting Bay. It appears as though there is a negligible difference between the two setups from this view, which will be examined closer in the following slices.





Slice Plots

These plots slice the 3D shape along the E and H Planes. The E plane is along the XY axes of the CST plots and intersects both nulls (the horns). The H plane is along the YZ axes and doesn't intersect the nulls. The X axis is red, Y axis is green, and Z axis is blue in the CST plots. Here, Base is the BicoLOG antenna by itself and Test is mounted on the Oblix bay. Our slice plots confirm that there is a negligible difference in the beam caused by the Oblix mounting strategy. At the most, the beam is disrupted by ~0.2 dB.