Most of the action on my site is now in my blog and my tumblelog. I invite you to visit!

The Kaleidome Project

Burning Man 1999

By Robert McNally

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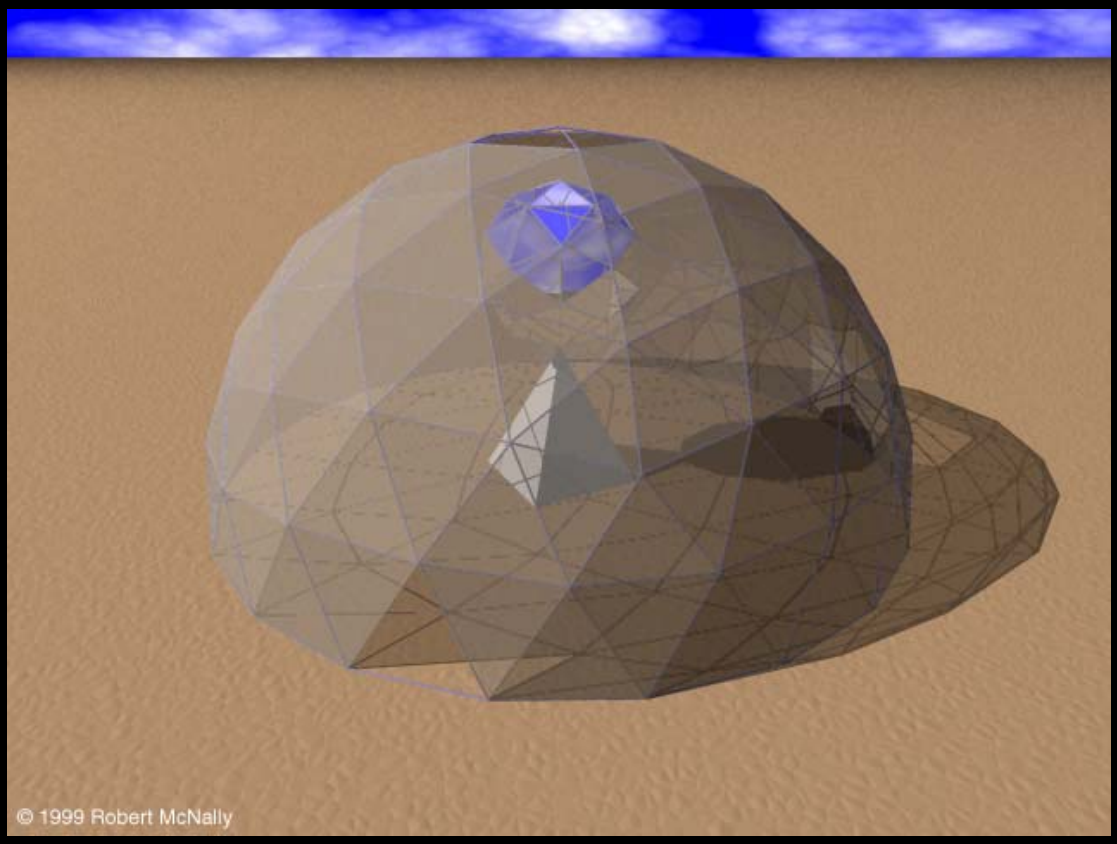
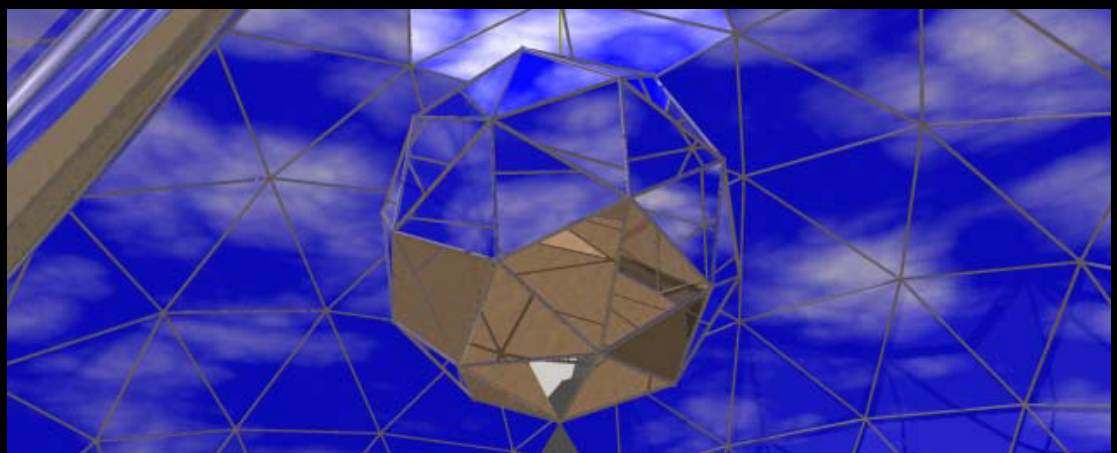
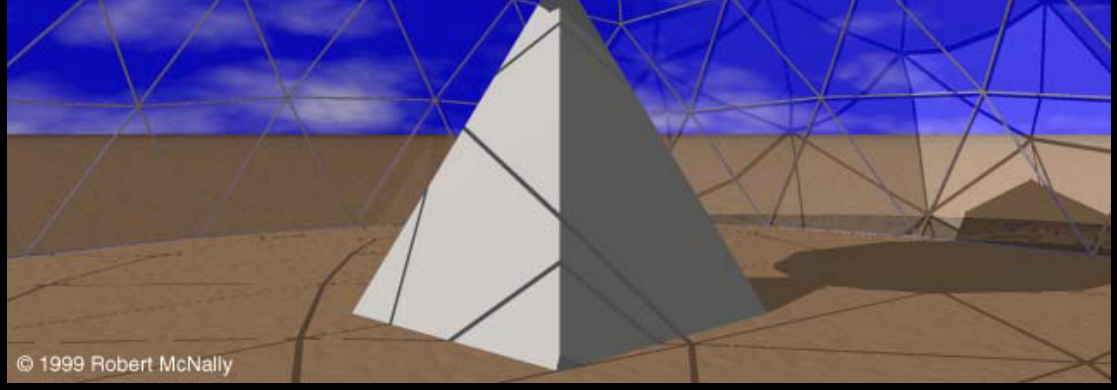
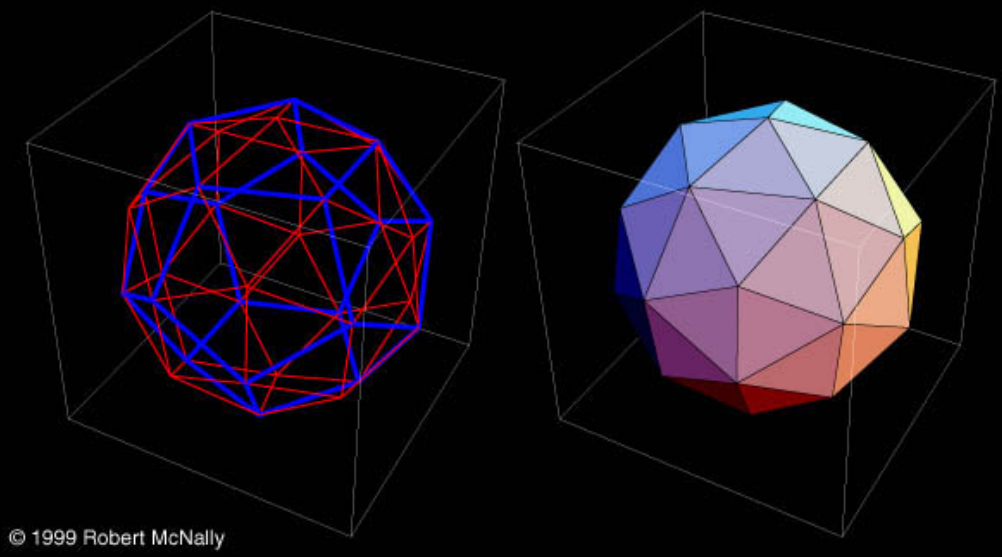


For this year's Burning Man, we decided we'd build a geodesic dome-- a big one. Sixty feet in diameter and thirty feet tall. We'd cover it in some sort of translucent skin and shine lights from the inside. And suspended from the ceiling of the dome, almost as if balanced on the tip of the pyramid, a geodesic sphere 14-feet in diameter, covered with mylar, like a giant mirrored ball.

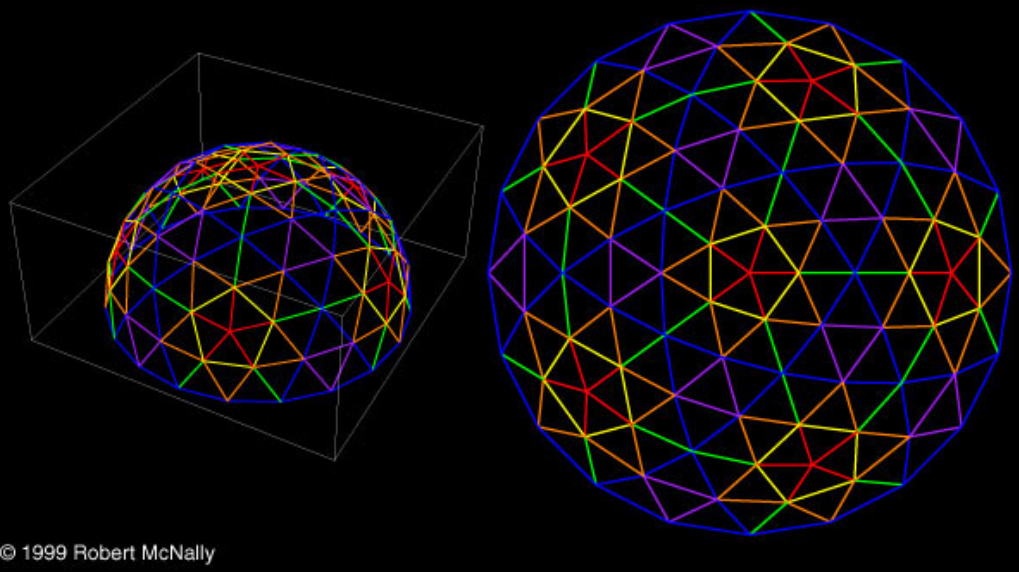




Also on the inside would be an interactive sound pyramid which would respond to people drumming on it with various sounds.



I decided to use 1/2" electrical metal tubing (EMT) for the sphere and dome. The hubs would use bolts, washers and nuts. The sphere, by the way, is a "stellated dodecahedron," an homage to Mike Maung and Max Bunshaft, creators of the Sphere of Influence at Burning Man in 1997.



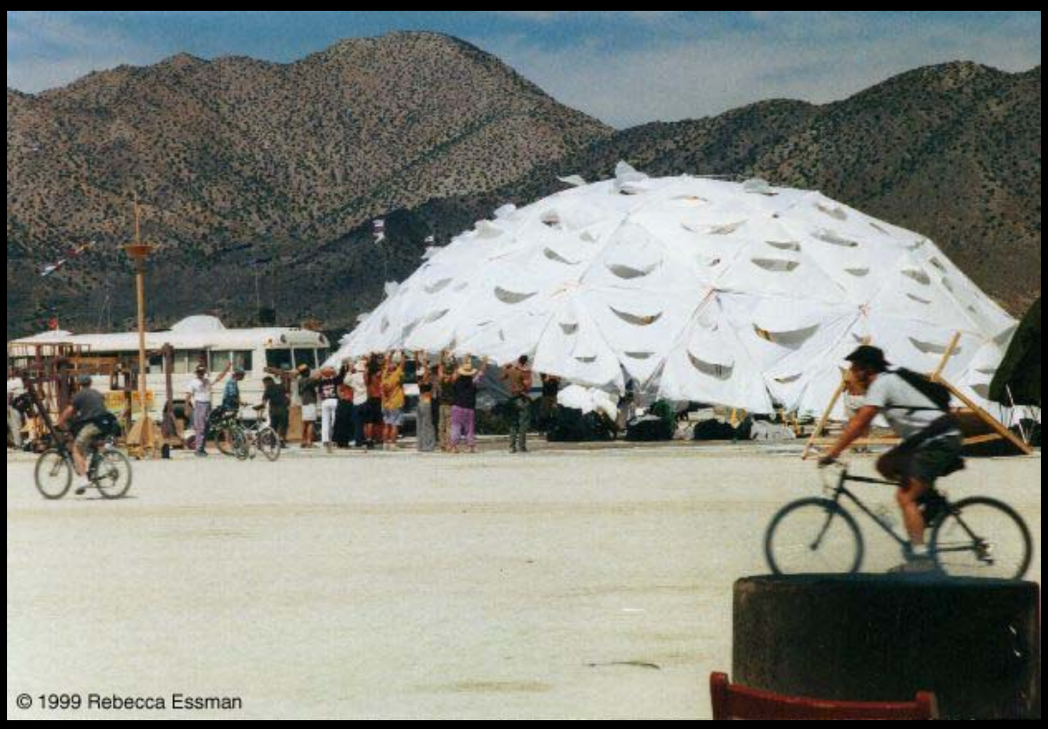
Since this was my first dome, I decided to just jump in, build it as big as possible and see what happens. Since EMT comes in 10' long pieces, my calculations indicated that a 30' radius was about as big as could practically be constructed using one piece per strut. Although many people think all the struts in a geodesic dome are the same length, it turns out that several lengths must be used-- two for the sphere, and six for the dome, shown here color coded.

So how do you build something that big in the desert? Well, you could lay out the large circle of the base of the dome and then build each layer of triangles on top of it, "bottom up." That would require a 30-foot high scaffold. But we decided that a "top down" build would be a more practical, and possibly more fun way to go. Burning Man this year started out surprisingly cold and extremely windy (note the dust blowing in the background.) Here I have put together the first layer and have the second layer laid out around it.

The first three layers of triangles. So much for the easy part. At this point we have to start putting on the nylon skin, because as the dome rises, we won't be able to reach the top any more.

We started skinning the dome, and before long the wind came up and popped one of the struts inward. Time for plan B. We replaced the bent struts and then started cutting semicircular holes in the skin, allowing the wind to blow through. Several times each day people drop out of the sky.

Now the participatory part. As we finish skinning the layer, we lay out the next layer of struts and make as many connections between them as we can. Then we gathered a few people from neighboring camps to lift the dome up while we make the attachments.



About to add layer five.

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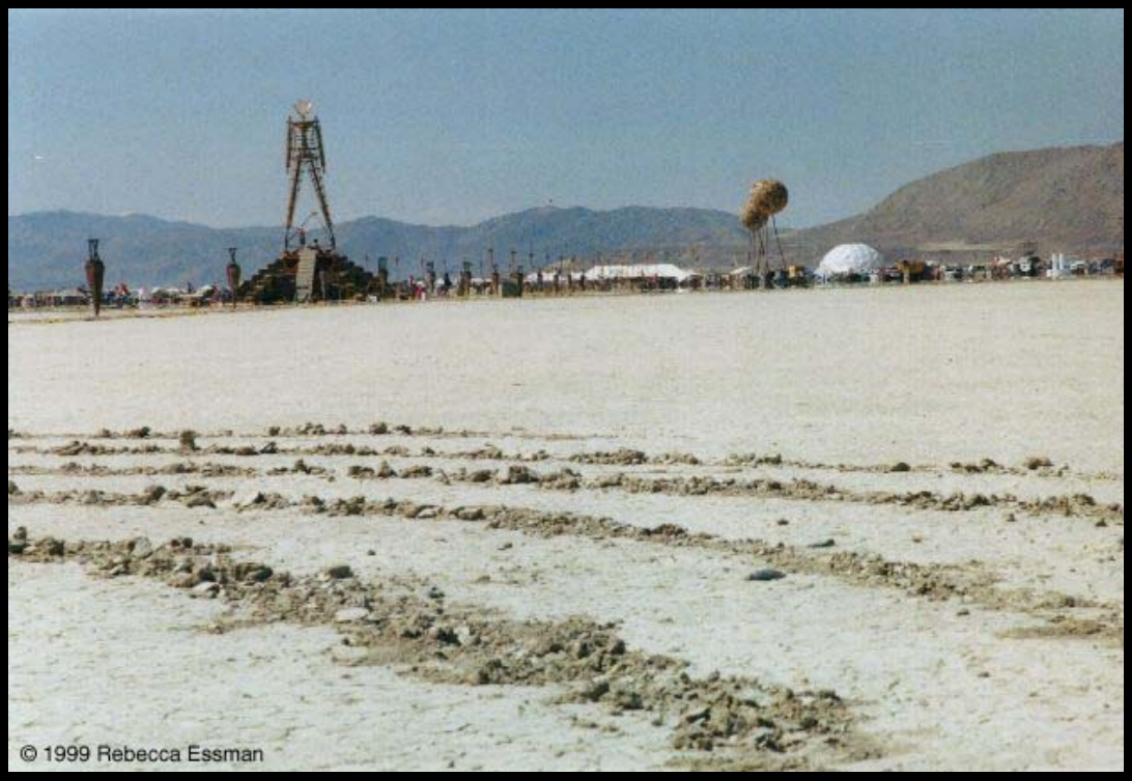
Layer six is up!

In all its glory.



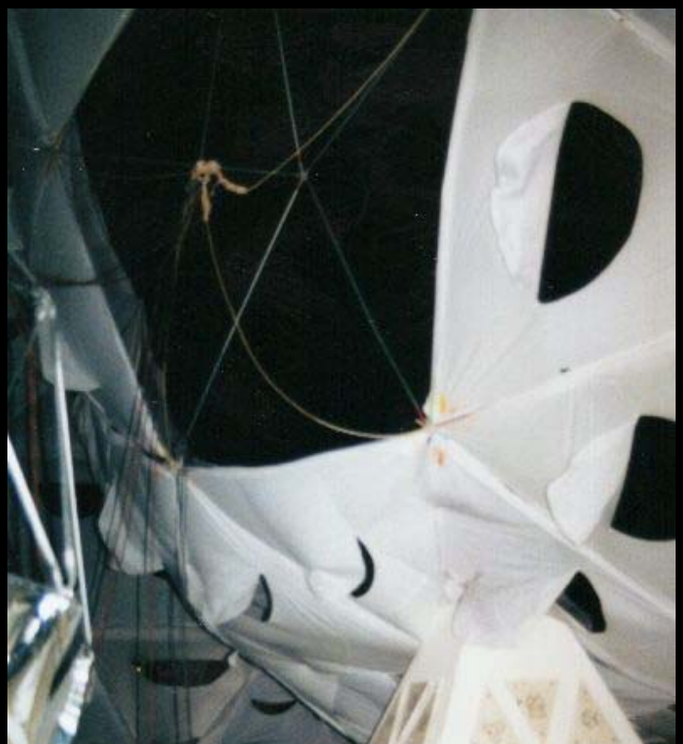
A few people said they could see the dome all the way from the nearest small town, Gerlach.

Looking up at the ceiling.

Building the sphere. It quickly became apparent that the roof of the dome would not, in fact, hold the suspended weight of the sphere. So we went to plan C: we would cover the sphere with mylar as planned, but balance it on top of the pyramid.

That night, disaster. The dome had stood complete for about a day and a half when the wind came up once again, and this time the dome was toast.

The "good" side of the dome after the collapse.



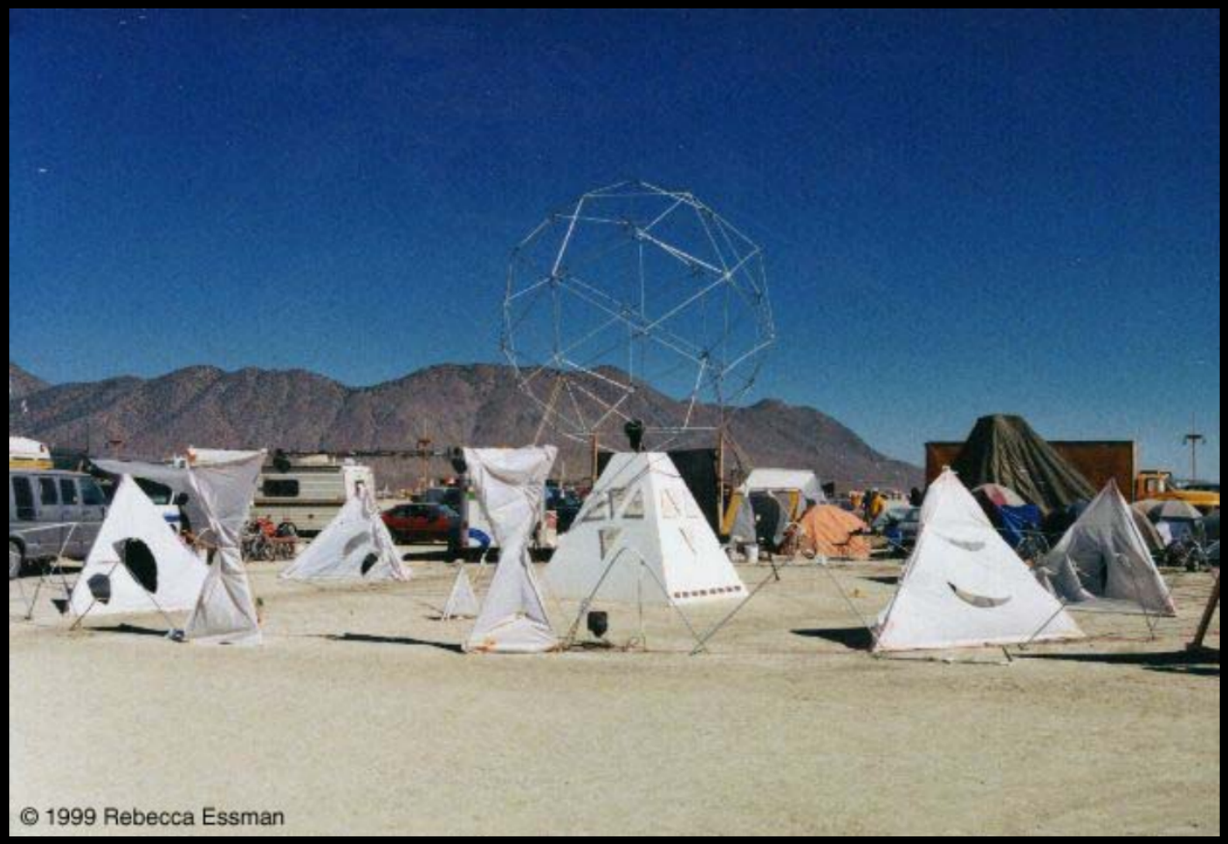
I was standing inside the dome when it collapsed, looking right at the point that started collapsing. I ran to the front of the dome telling people to evacuate, and crouched down beside the plywood pyramid. The falling side of the dome wrapped itself around the pyramid, but no-one was hurt.

The wind was still quite strong, so we immediately started removing all the skin we could reach, to try to keep the dome from collapsing further.

"Oh, well."

The next morning, takedown effort underway.

The dome did in fact collapse more the night before, wrapping itself around the sphere.



Plan D: The Kaleidocircle.