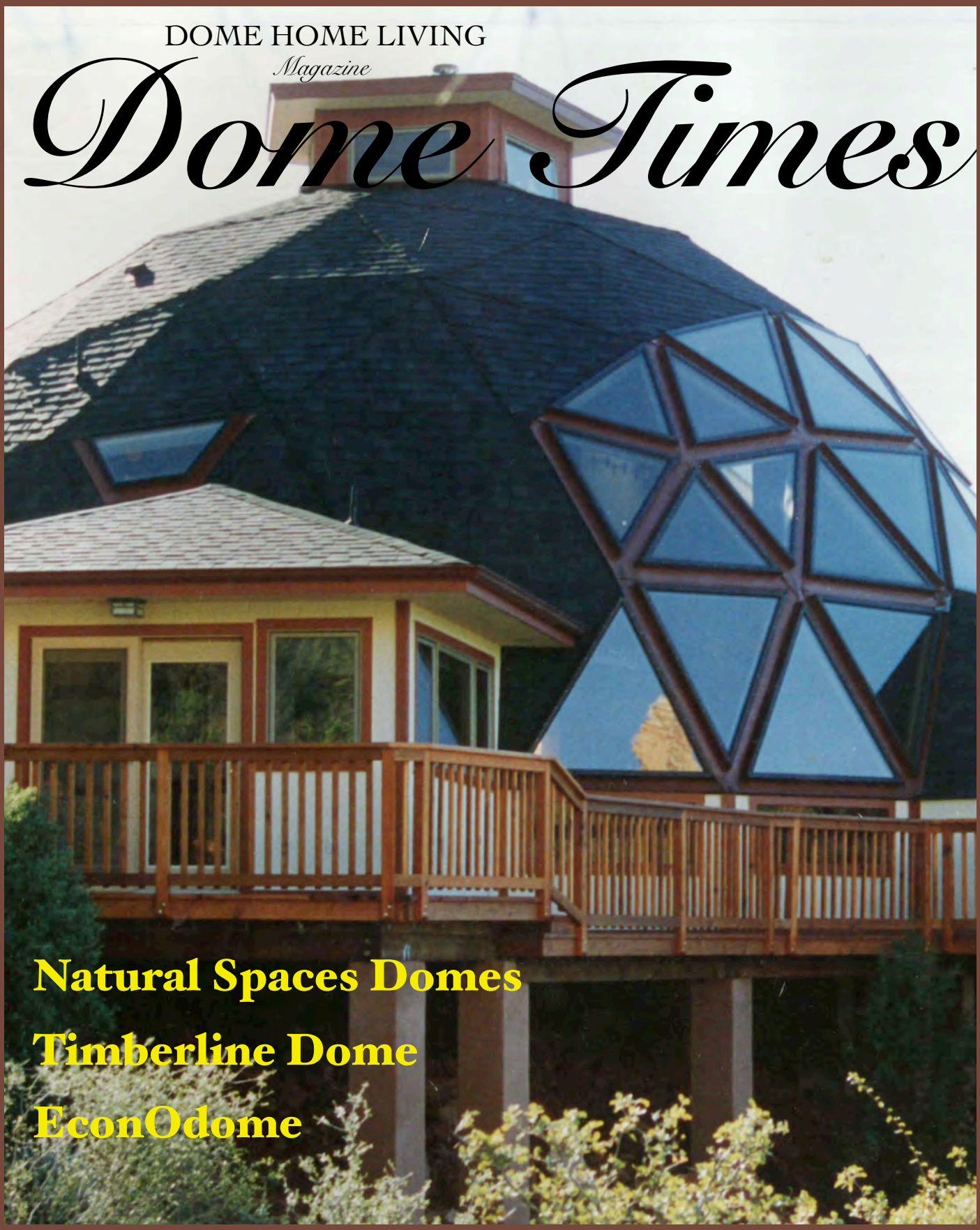
DOME HOME LIVING

Magazine

Dome Times



Natural Spaces Domes

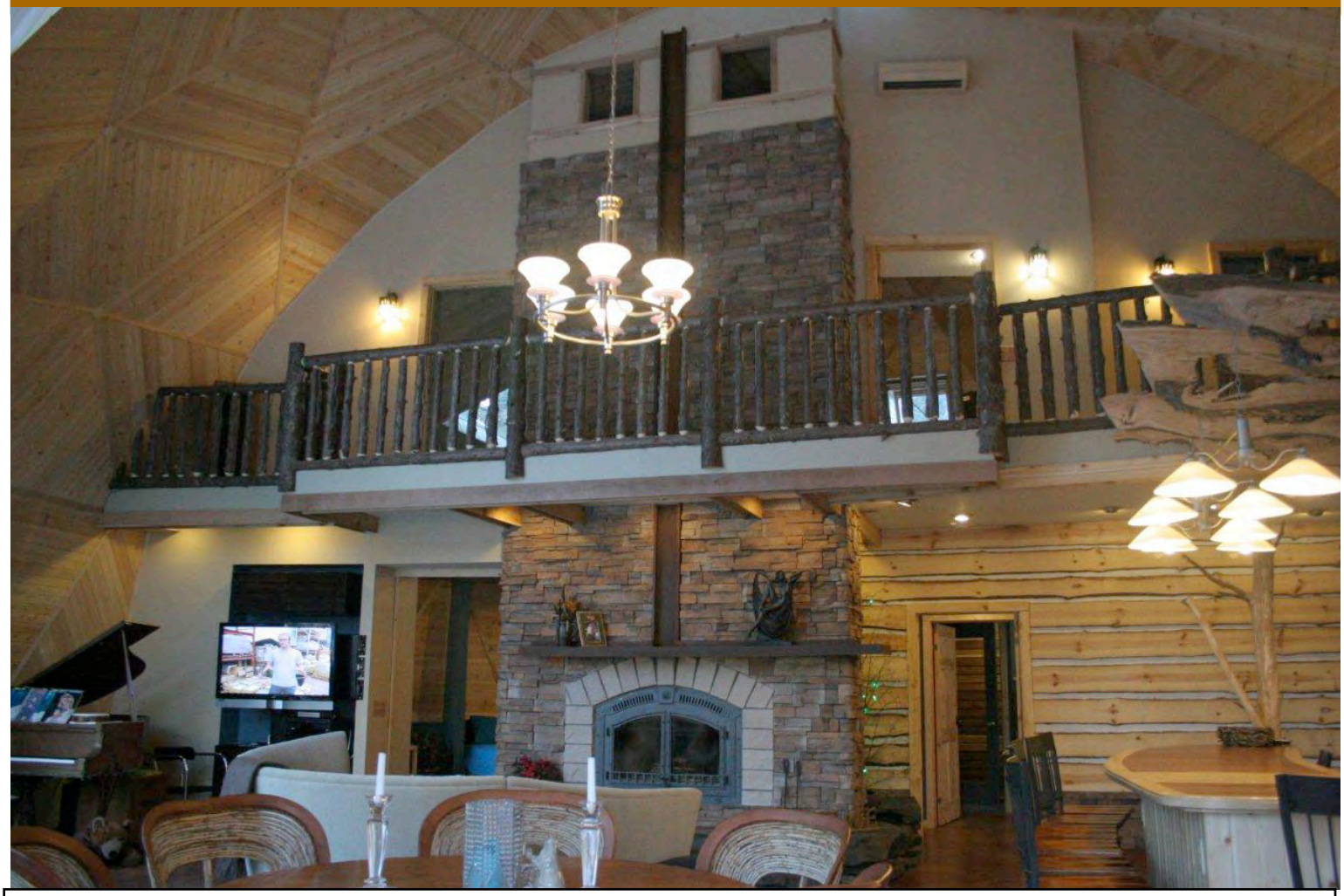
Timberline Dome

EconOdome

People should think things out fresh and not just accept conventional terms and the conventional way of doing things. --R. Buckminster Fuller

Issue II

Natural Spaces Domes by William Koonce



I recently had an opportunity to visit Dennis and Tessa

And see their home during this year's Natural Spaces Domes tour. As hosts, Dennis and Tessa are as gracious as their domes are beautiful. At their home in North Branch, MN, all things appear to be as they should; beautiful and picturesque dome exterior, stunning dome interior (see pictures in this article). Even the sizzling neon Natural Spaces sign at the entrance to one of their business domes beckons a visitor to stop, examine, then enter a new world that only a dome can offer.

I asked Dennis, Natural Spaces Domes owner, several questions for Dome Times Readers.

Dome Students & Master

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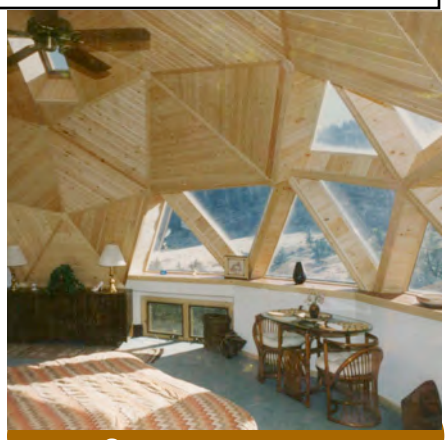

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From Their Dome Home to Your Dome Home

How did you get interested in domes and what is your dome history?

I worked for 10 years as an architectural designer for a firm in Los Angeles and Minneapolis during the 1960's. I read about and visited domes in the late 60's. I drew up plans and built a few models up to 16' diameter in my backyard. With a carpenter friend, we started to build and sell small domes.

We began selling dome kits from Dome East (New York) and Domes and Homes (New Jersey). My late wife, Janet, and I formed The Big Outdoors People (TBOP) in 1971 and then opened The Dome Store in 1972 in Minneapolis.

We met Bucky Fuller after we were contracted to help set up his traveling exhibit that came to Minneapolis in 1974. This included driving (really just steering) his Dymaxion car and setting up a tensegrity structure.

We created our own dome building system, selling over 350 domes before we sold the company in 1978 to partners we had added. The day after we sold TBOP, we formed Natural Spaces Domes. We redesigned the connectors, eliminating early problems and updated the building system and materials.

What about the "green" and sustainable aspects of your domes?

We built a 33' diameter dome as a display model for the Minnesota State Fair in 1973. That's where we started selling solar-collectors, wind and methane generators, composting toilets, solar cookers and everything else related to alternative energy systems.

Natural Spaces Domes got into green and healthy building in the early 1980's. We learned how formaldehyde and other building material chemicals detrimentally affected our family and, consequently, sought out clean, green materials, building techniques and mechanical systems.

We increased R-values, offering insulation levels of R-50 to R-80. We eliminated OSB/chipboard, and thus avoided its formaldehyde attribute and inherent tendency to lose structural strength when wet, as our triangle panel material, switching to ¾" plywood. We used 90% of our 4' x 8' panel cutoffs in making our Super-Wal double strut dome frame, offering 12", 15", 18", 21" and 24" frame thicknesses (all for the same price). We ventilated our fiberglass insulation systems, eliminating condensation problems.

Natural Spaces Domes uses FSC certified Select Structural Southern Yellow Pine as our structural frame to which we attach our unique Super-Lok or Ultra-Lok metal connection hardware. To further eliminate interior chemicals, we use 1x8 T&G spruce to make one-piece interior triangles in leu of sheetrock. These panels do not need to have any finishes or sealers added. This eliminates sheetrock, taping, sanding, priming and painting along with having to redo or repair sheetrock.

FROM AUTHOR: *I have studied Natural Spaces double-strut system for many years. In my* opinion, *the*

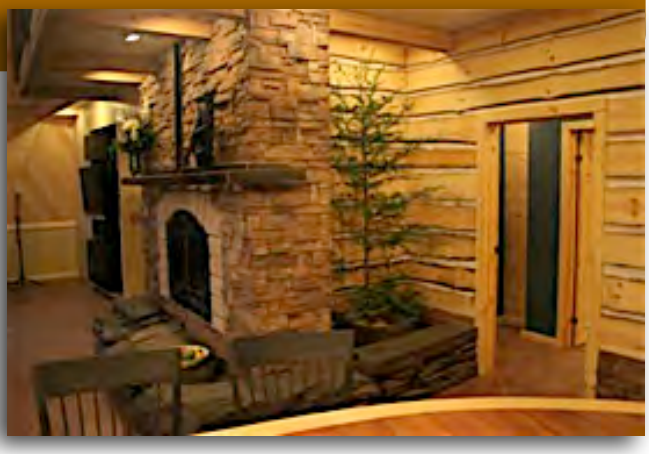
Seamless w/Nature

Open Spaces

Dennis and Tessa open their house to all participating in the semi-annual extravaganza dome home tour

Natural Spaces Domes

Natural Spaces Domes Interior



interior floating wall is not conducive to sheetrock; however, I have personally examined over 35 Natural Spaces domes and can attest to the most striking and beautiful interior ceiling -walls as a result of Natural Spaces Domes one-piece interior triangles.

BACK TO DENNIS' RESPONSE:

Our dome building system is extremely resource efficient. We have tried to utilize the synergy of the geodesic dome, learning from meetings and discussions with Bucky Fuller in the mid 70's. Working with our engineers over the years, we eliminated unnecessary framing and bracing, saving hundreds of lineal feet of lumber.

How do your domes stand up to the elements?

We have had our domes go through tornados, hurricanes and earthquakes, along with supporting severe snow loads and fallen trees. For over 25 years, we have had a dome north of the Arctic Circle – a 74' diameter. dome for the city hall/community center of Point Hope, Alaska. 20 years ago we built a 52' diam. dome as the main building on the 10,500'/3200m summit of Greenland where they drilled through the ice cap to research 250,000 years of climate. To our horror, they left the building there to be buried by their 3' of snow per year. Oh well, our name is painted all over it with our phone number, waiting for that call when some future expedition uncovers it.

Our newest Natural Spaces Dome was assembled the first week of September, 2010, on top of Mt Elbrus in Southern Russia at 17,000'/5300m. It is a 22' diameter emergency survival shelter dome for the hundreds who climb to the summit each year.

We had 4 domes survive hurricane Katrina with no structural or skylight damage. Just recently, one of our domes was in the Chilean earthquake, in an area that measured 7.5 magnitude. Again, no damage, including skylights.

We have a 12 year-old dome on the beach in southern North Carolina that is 48' high. It has weathered Class 2 & 3 hurricanes just fine, including a brush with one last week. Our Beach Dome #1 was there for 12 years before 1996 hurricanes Fran and Bertha took away the dunes and sand around the 40+ pilings, moving the dome shell intact, back 75' into the street and the property across the street. Our web site elaborates on that story.

What does your company offer to owner builders?

Although we've done many commercial, industrial, institutional and religious dome structures, our dome building system is also geared to the owner builder. We start with hundreds of standard plans (over 100 on our web site) that can be altered to fit many different family's needs and building sites. We offer custom planning services that rely on my over 45 years of designing homes to fit each client's specific requests and circumstances. Our plans, dome system and engineering can guarantee an owner builder they will get building code approval.

We can provide the owner builder with a complete dome home package including foundations, risers, pre-fabricated dome shells, cupolas, extensions, interior panels, insulation, Natural Spaces skylights, Velux skylights, Marvin windows, 3 types of roofing systems and several other items. However, if they prefer, owner builders can purchase just our Super-Lok metal connection system. Following our extensive construction manual and DVD, they can build all of the dome components themselves. Either way, they end up with a dome meeting all building codes and current building techniques.

The Natural Spaces Dome School offers the owner builder the experience to start their own dome project. Some owners even bring or send their contractors. My first dome school was offered in 1974 and I've been doing them ever since. Our current 3-day school is offered twice a year in our shop and outside. We put up a large section of a dome using real dome components built by the students. The Dome School takes place at our 8 dome headquarters in North Branch, MN., allowing attendees to see and explore finished domes. People from all over the world have attended.

Natural Spaces Domes' Patented Connectors Mean Strength and Ease of Construction

Almost all of our owner builders erect their own domes. We usually set up a dome raising weekend with the owner where we send an email notice out to our Dome Raising list and anyone can come help build a dome. However, some of our owners choose a local contractor. Even though inexperienced, these contractors have no problem putting up our dome system. Natural Spaces does offer supervision services and contractor services. We offer all day, 7-day phone and Internet contact so that any questions during the building process can be answered immediately.

We look forward to viewing and sharing owner's photos of their completed domes. We try to stay in contact with our many dome owners and enjoy actually visiting their domes.

What has been your experience living in a dome?

Natural Spaces Patented Connector

I have been happily living in a dome home for 35 years. Janet and I designed and owner built my first dome, a 44' diameter split truncation (one half was 6/12, one half was 5/12), 4-frequency, 2x6 shell with foam insulation. The three floors and the dome step down the hillside site. Attached to that was a 26' diam. ½ truncation, 2-frequency dome that had two 12' diameter icosahedron dome kid's bedrooms bolted to and suspended from the pentagons.

We took two pre-teen girls from their friends and schools in the city and moved to the country to live in a very strange home. By the time they graduated from high school, they were asking if there was any way they could take their domes with them.

We made several major changes to that dome over the years, removing the formaldehyde insulation and enlarging the dome shell to 15" thick, using fiberglass insulation to get an R-44, and rearranging the entire interior plan. We eventually tore down the attached 26' dome and erected a 36' high profile (5/9), 3-frequency dome office with a full basement.

After my wife Janet passed away in 1999, I met Tessa. She runs a non-profit called Kids for Saving Earth. Tessa and I eventually decided to build a new dome incorporating all of our green, environmentally friendly building ideas and techniques. Bear Creek Dome was finished 2 days before we were married inside with 125 guests in October 2007.

Dome Construction School

Bear Creek Dome is a 49' diameter. ½ truncation, 4-frequency, 18" shell using fiberglass insulation with an R-57. The dome is heated with radiant water tubes in the 2100 sq ft main floor slab. This also radiantly heats the 1100 sq ft upper floor. Heating costs in our 9000 heating degree-day climate were 25¢ per square foot for the year (September thru May). We also have a test with 5 different types of under slab insulation – you can see the results online.

Our cooling cost for the first 2 summers was $0! We never had to turn on the AC, as it never got any warmer than 74 degrees inside even though it was 95+ outside. In the evening, we were able to open the upper cupola windows and the lower riser wall windows and cool down the house. In the morning, we would close up everything and it would stay cool all day. The house is occupied all day because Tessa's office is in the dome.

We have two high efficiency (16 SEER) Friedrich mini-split AC units, one 18,000 BTU unit in the open part and one 9,000 BTU in the master bedroom. This summer, because of the high humidity and heat, we've had to turn on the master bedroom unit when the evening outside temperatures stayed above 72 degrees. Nevertheless, we cooled the whole house with the 9,000 BTU units.

Our dome has been a joy in which to live and entertain. Would we change anything? Probably – but not for a while. I'll continue to design, manufacture and build domes, changing, improving and listening to our customers. I'm looking forward to what the next 40 years will bring.