

Geodesic chook tractor: Freeman dome (long arc design)

Based on plans and formulas developed by Robert Freeman and illustrated at http://milkwood.net/2009/07/27/how_to_build_a_geodesic_chook_dome/

Radius (m)	Base circumference (m)	Area (m2)	Total length (m)	6m lengths	Long arc length (m) 5 required	Short arc length (m) 5 required	Blue-blue spacing (cm)	Blue-red spacing (cm)	Red-red spacing (cm)
1.00	6.28	3.14	31	6	2.78	2.17	27.00	32.00	34.00
1.50	9.42	7.07	47	8	4.18	3.26	41.00	48.00	51.00
1.75	11.00	9.62	54	10	4.87	3.81	47.00	56.00	59.00
2.00	12.57	12.57	62	11	5.57	4.35	54	64	68
2.25	14.14	15.90	70	12	6.27	4.89	61	72	76
2.50	15.71	19.64	78	13	6.96	5.44	68	81	85
2.75	17.28	23.76	85	15	7.66	5.98	74	89	93
3.00	18.85	28.27	93	16	8.35	6.52	81	97	102
3.50	21.99	38.48	109	19	9.75	7.61	95	113	119
4.00	25.13	50.27	124	21	11.14	8.70	108	129	136

Long arcs B-B-R-R-B-B-R-R-B-B

Short arcs R-B-B-R-R-B-B-R

Base B-R-R-B-B-R-R-B-B-R-R-B-B-R-R-B-B-R-R-B

Refer to the diagram below to see how the red and blue marks correspond to one another. *Important:* Remember to leave half the blue-blue spacing between the ends of the base and the first and last blue marks so that the ends can be joined together.

The smaller sizes of this design can be built with 15mm alkathene tubing, which is inexpensive and easy to work with. Start by cutting the required lengths and placing the red and blue marks. Next, join the ends of the base. I used a short piece of 20mm alkathene pipe as a sleeve and secured it with a couple of short wood screws. Lay the five long arcs flat so that the innermost blue marks form a pentagon, then fasten together at those points. Match the ends of the long arcs with the blue marks on the base and fasten together. Next, place the short arcs around the dome, matching the ends with the red marks on the base. Adjust for symmetry and fasten all remaining points. Choose a section for the hatch and cut lengths to fit, then fasten one side to the dome with either hinges, wire or zip ties. Cut and place netting over the structure and fasten with wire or zip ties. Be sure and peg the dome firmly to the ground, especially if you use a shade cloth or other covering which will catch the wind.

You could do a plastic-free version of this using willow or hazel rods, or bamboo.

Geodesic Chook Coop

Not to scale - use as construction aid only.

Solid = Long pieces

Dashed = Short pieces

