FOR PRIVATE INSPECTION ONLY

6 Burns Street
Forest Hills 75, N.Y.
May 9, 1955

Mr. X, President
X Aircraft Company
X, X

Dear Mr. X:

You may recall my name as the designer of the Fuller House which we built with the aid of Beech Aircraft in the middle forties.

I am enclosing items to identify my work of the last ten years. As you may read in enclosure #1 to General Watson, we are at present producing structures weighing 1/12th as much per cu.ft. as did the Fuller House which was in itself a breakthrough to 1/16th the weight of comparable conventional structures. Ergo: our present structures are 1/192nd the weight of equivalent conventional structures.

The Encyclopaedia Britannica's Book of the Year, 1955 edition, - see enclosure #2 - lists as the Number One 1954 accomplishment of the United States Marine Corps its employment of my Geodesic domes and the air-lifting of them into advanced base position by helicopters.

In building the Geodesic Dome for the Ford Motor Company's Rotunda at Dearborn, Michigan, for their 50th Anniversary Celebration - enclosure #3 - I could have installed the whole structure with 20 subassembly lifts by a helicopter - had it been available - for the whole 93 ft. diameter, permanent Geodesic dome weighs only 17,000 pounds.

I am writing you now because we have developed an even more exciting structure than was last year's. It is described in enclosure #4. It is being developed and constructed by the students of the School of Architecture of Washington University, St. Louis, Missouri, within my original generalized design and patents. The magnesium for the structuring was contributed by Dow, the Orlon skins by DuPont, and the one thousand hours of machining by industrialists of St. Louis. When completed and tested, the Geodesic dome will be - as the letters indicate - taken to Sweden and installed at the Halsingborg 1955 Exposition. One modification in the plans has been made and that is: the dome will go by steamship rather than by air-freight in order to give a little more latitude to the closing date of its manufacture and testing - not allowed by air bookings.

Arrived in Sweden it is planned that it will be flown to the Exposition site - if possible by helicopter - and installed there. I enclose (#5) a clipping from the St. Louis Post-Dispatch which shows the wooden mock-up of the Swedish Geodesic dome in full dimension of the final magnesium-framed dome. It covers 1,300 sq. ft. of floor space and encloses 20,000 cu. ft. This space is comparable to that of a large two-story one family residence. Completed with its outwardly stretched, hyperbolic parabola, non-fluttering, double skins spaced two feet apart and including all articulating mechanisms, the Washington University-Fuller Geodesic Dome will weigh less than 700 pounds.

The dome consists of 30 inwardly foldable tripod strut assemblies. These are restrained at their open "limit" position by a triangular network of lightweight aircraft cabling interconnecting the tripods' "feet" where the inner set of the dome's structural joints occur. These tripod "foot" joints are universal ball-bearings adjusting for torque while the dome is folding (which required the industrial machine shop "hours" contribution). When all the tripods are folded and in parallel pack including the inner and outer Orlon skins, the package will be cylindrical shaped and approximately 9 feet long by 4 feet in diameter - which is 113 cu. ft., or 1/178th the open cube of 20,000 cu. ft.

Dean Buford Pickens of the School of Architecture, Washington University, advises me that they have secured a large crane with which to lift the packaged dome aloft when it is completed within the next two or three weeks. While held aloft, 30 fist-sized high pressure gas flasks inwardly attached to each of the tripod vertexes will be valved by a light-weight linkage mechanism. The released pressures will actuate small plunger masts in each tripod vertex, which are in turn attached - at their outer ends - to light-weight cables leading radially to their respective tripod's feet which cables - as the masts plunge outwardly - pull the tripod legs to the full open dome position. These mechanisms have been thoroughly developed and proved by the Washington University students as has also the coordinating triggering mechanism. When the mast plungers are outwardly thrust they rotate automatically into a locked position. They may be twist-released for refolding the dome.

After the dome's opening function has been successfully demonstrated a number of times while suspended to the large crane, the Washington University student team would like to have it carried aloft once more in its compact, 700 lbs., - low drag - state, by helicopter and opened by controls from the helicopter and lowered into a prescribed installation position and tied down by Clevett's Universal Ground Anchors - contributed by Laconia Maleable Iron Company.

Because the Marine Corps has practical interest in my research investigation at the Universities - see enclosure #6, Schedule of University Engagements - and the U.S. Marine Corps "Light-Weight Shelter Study, August 1954" - enclosure #7 - it is possible that they might wish to make the lift.

However, I am writing to you first regarding this because I would like to see the operation done this time through private individual initiative by an industrial organization and with the kind of helicopter that I am convinced is suitable for private operation in making straight-line delivery of structures from jig-assembled "shipyard"-like launchings - see enclosure #8. We know that the Sikorsky Marine Corps "Workhorse" can do the job because they have already carried our Geodesic domes of twice this weight - and in their opened high-drag condition - even then cruising at 60 knots - see enclosure #9.

The grand news of your new helicopter and its performance characteristics coincided with the development of our above-stated need. Because St. Louis is not much of a hop from your company's factory and because a ship could be refueled at St. Louis with enough gas to make the experiment - and allowing for the pilot - without exceeding service lift capacity, I am writing to ask whether you would consider it a favorable experiment and demonstration for your ship.

I, of course, agree that you need no finer promotion than has already occurred by virtue of the unique "performance" accomplished by your company. That is the real news. This airlift would, however, demonstrate to the world that what they probably tend to think of as only a <u>light passenger</u> helicopter could perform not only a number of useful external lift functions, but also that this could even include <u>delivery of houses</u> - therefore lesser tasks obviously could be accomplished.

Faithfully yours,

R. Buckminster Fuller

(Editor's note to subsequent mimeograph:
Mr. X informed us that because the C.A.B. had not tested the new helicopter it would not be permissible to undertake the proposed demonstration.
The St. Louis dome was not completed in time to participate at Halsingborg 1955 - a summer Exposition.)