CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
Alex C. Radovan

Project Number
J0930

Project Title
Can You Hear Me Now?

Abstract

Objectives/Goals
The objective of my experiment was to see how different materials affected Bluetooth transmission distances. I think the reduction in transmission distance will be proportional to the specific density of the material.

Methods/Materials
MATERIALS:Sheetrock,Sheet Steel and Sheet Aluminum,Plywood,Cloth,Carpet,String,Bluetooth Headset,Bluetooth capable phone,Rokenbok connectors,Tape Measure 100',Hot Glue Gun and glue,Tape.
PROCEDURE:
1.Build Each Box. 2.Glue materials to the outside of the boxes. 3.Place phone inside box. 4.Put lid on box. 5.Lay Tape Measure Out. 6.Call the phone. 7.Start to walk away from the phone with Bluetooth headset. 8.Record distance when the person on the other side of the phones voice becomes static. 9.Record distance when you can#t understand the person on the other side of the phone. 10.Record distance when the headset disconnects

Results
RESULTS: My results were very interesting and were not exactly what I expected. The sheet aluminum constantly had the worst average performance. It made the voice static at 18 ft.(AVG), inaudible at 35 ft.(AVG), and made the headset disconnect at 66 ft.(AVG). The 2-Ply sheetrock had the best average performance even better than the control. The 2-Ply sheetrock made the voice static at 52 ft.(AVG), inaudible at 102 ft.(AVG), and made the headset disconnect at 100+ ft. every time. A lot of the tests made the headset disconnect at 100+ ft.

Conclusions/Discussion
CONCLUSION: My hypothesis was partially correct. The denser materials did affect the transmission distances more than the less dense materials. However on average the densest material effected the transmission distances less than the second densest. The 2-Ply sheetrock affects the transmission distances less than the single layer of sheetrock. I am not sure why this happened. I thought it was because the amount of interference around us might have changed. In order to rule this out I tested the sheet steel once immediately after I got the strange results with the 2-Ply sheetrock. I got the same results that I had gotten earlier with the sheet steel so I knew that my data was accurate. The order of effect that materials had on the headset is not the same order of the Specific Density of the materials. Specific Density is the density of a material times the thickness of the material.

Summary Statement
I tested how various materials affected the distances at which a Bluetooth headset disconnected, as well as the distances at which a call became static and inaudible.

Help Received
Dad helped build boxes and talked on the phone for my tests; Mom helped gather the materials needed for my experiment.