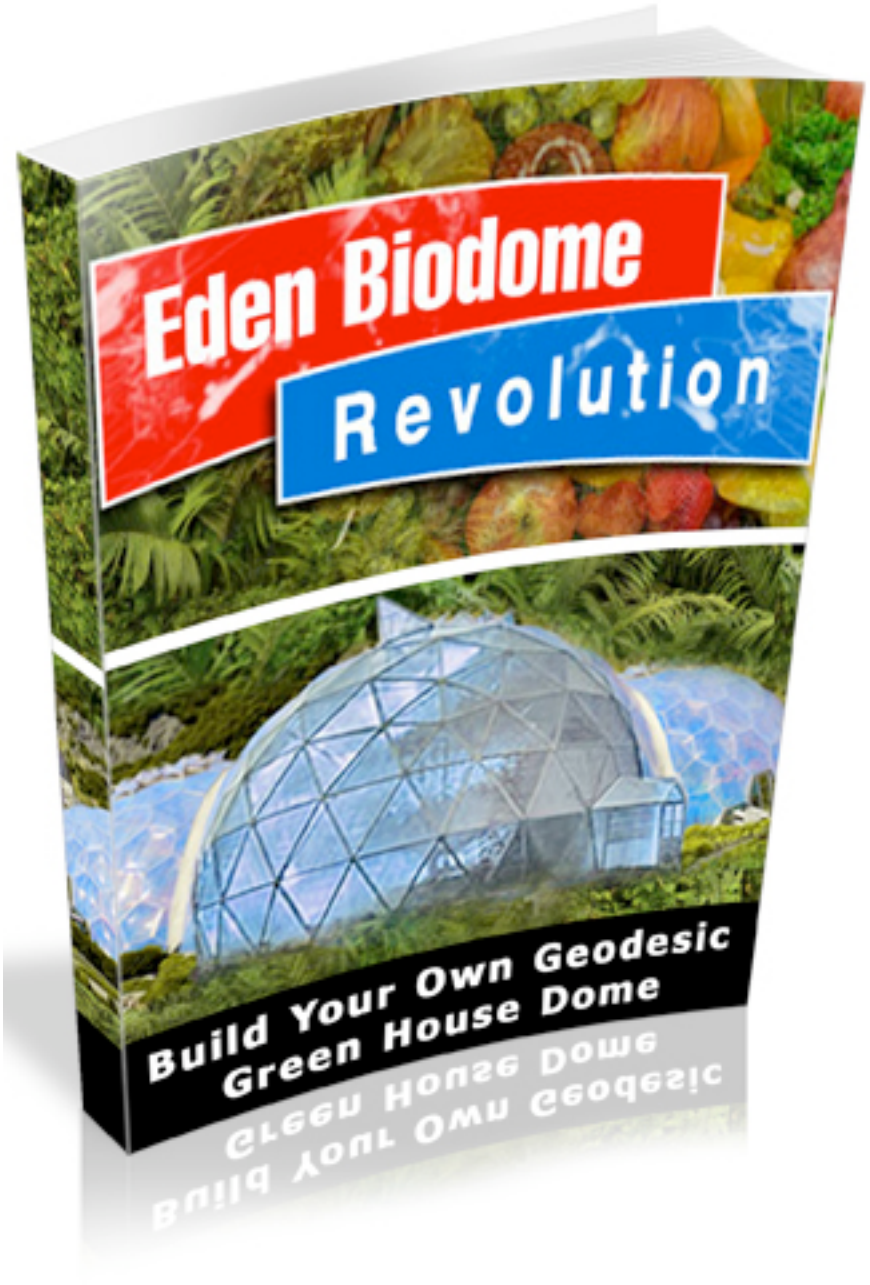
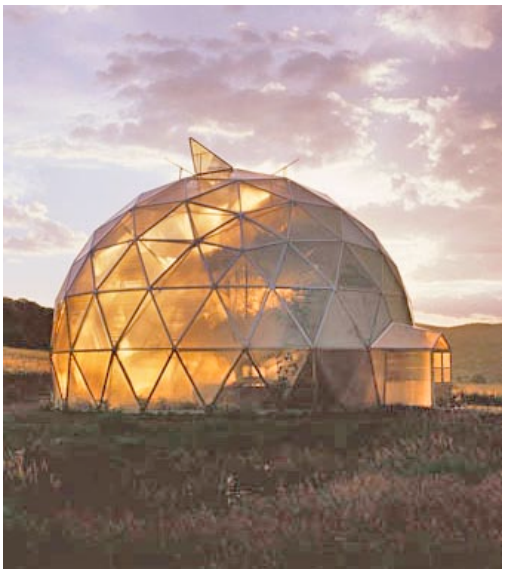



# The Eden Biodome Revolution

by Kacper Postawski

# How to Create Your Own Geodesic *Biodynamic* Dome To Provide Incredible Food Year Round For You and Your Family

It's Easy To Create a Massive Geodesic Biodome Greenhouse That Produces Food For You And Your Family *Year-Round.* And Best Of All, You Can Do It For Next To Nothing!



# Dear Reader,

This book is not just a how to “do it yourself” guide for building a dome, it’s much more. The first few chapters I talk about the philosophy that inspired me to build these domes, which I hope inspires you too. The second part is the how to and details guide. You can skip to that section if you like, but I recommend reading the whole book, Enjoy!

~ Kacper

# INTRODUCTION

## A Conversation With My Daughter From The Future...

I am explaining to my 4 year-old daughter the fundamental problem with the condition of humanity up until this point in history, not because I'm some know-it-all guru, but because she asked. The rule of thumb is if a 4 year-old asks her daddy a question, he must obviously know the answer, so you better start talking or your gig as the all-knowing father is over fast.

She just visited some "normal" people, and has a mind full of questions.

"So other people don't know about how to grow food? They don't know how to catch their own water and their homes don't give them food and don't take care of them?", she asks, looking cute as a button.

"No *most* people don't know this honey."

She has a quizzical look on her face. I prepare the answer for the next most obvious question I am now so used to.

"Why daddy?"

"Well, because that's the old age way of living. The new age is different."

I explain to her the difference between the old age homes, where people lived in giant ticky-tacky boxes which were once seemingly worth millions of dollars, but didn't provide people with one shred of nourishment, and didn't sustain their lives in anyway besides shelter from rain. And the new-age domes we live in that nourish and sustain our lives, which are in harmony with nature and are as part of our lives as much as the foundation is a part of their structure.

"But why did the people live in boxes daddy?"

I sigh and breathe, reaching into the depths of my being and asking for an answer my 4 year-old daughter will comprehend. Not an easy task, but one parents of such children must do on a routine basis, I'm a pro, I've had lots of experience by this point.

"Well honey, you know how plants grow in our green-house, they start very small as baby plants, and then they get bigger and bigger?"

“Yup”

“Well its kind of like that with people, except it happens in their brains.”

“What happens in their brains? Is there something growing in their brains?” she points her finger at her forehead.

“Yes, but it happens with their thoughts, with mistakes. People can make mistakes you see. Big mistakes are easy and they’re the ones you want to happen, because when they happen you can see them right away, and you probably won’t do them again. Like when you ran and tripped yesterday, you probably will be more careful next time won’t you?”

She nods, I continue...

“The challenge comes with small mistakes, mistakes you cannot see or feel right away. If you make small mistakes and you’re not paying enough attention, if you’re not awake enough, you can go to sleep to them... and they grow and grow and grow until they’re huge problems. This is what has happened with people in the old age, somewhere along the line people made some mistakes, and they grew and grew until people become completely separated from nature and didn’t even know it.”

“Why did they not know it?”

I can see my rambling isn’t really having an impact here, it’s time for a game.

“Here let me show you with a little game, you get to run in this game.”

She lights up immediately, we might as well have named this child ‘Run’ from the beginning, that’s her magic word.

I continue, “Okay, so you see that tree over there, run to the tree, but with your eyes closed.”

“Like this!?”, she covers her face with her hands.

“Yes, and no cheating!”

Chloe runs with her eyes closed, and slows down immediately then walks a few steps in the completely wrong direction, she walks a little more and stops.

“Am I going the right way daddy? I can’t see the tree!”

“That’s how people lived in the old age honey, that’s why they lived in life-less boxes.”

She turns at me and laughs.

“They had their eyeses closed the whole time!?”

“No they stopped asking themselves which way they were going. They stopped caring. That’s how small mistakes grow into very big ones. You must never stop asking that question Chloe.”

# Why On Earth Build A Geodesic Greenhouse Biodome?

Wow... how do I answer that? It's a great question.

The reasons and benefits are many(which I'll list below), However, besides it being a clear and obvious throughout my whole being, *my* practical reasons were more immediate.

At the time of this writing it is February 2011, and things are getting very interesting on our planet. After doing mountains of research and talking to many friends who feel the same, It's become evident that if you do not prepare your family for the coming changes, if you cannot provide for your family with your own **renewable** food supply, then you're in for great hardship in the coming years.

The time has come when everyone awake enough to see what's happening must take action on learning how to return to the land, and regain a lost **relationship with nature and mother earth.**

I don't see it as my job to educate people on what's happening in this book, after all, it's a book about Bio-Dome construction, Permaculture and Aquaponics. However, for me, the two go hand in hand like a horse and carriage

If you wish to educate yourself about what is happening with the economy, the looming hyper inflation and inevitable food

shortages as commodity prices skyrocket, you can check out a short video I made at this link:

http://kacperpostawski.com/blog/2010/12/15/how-to-survive-thrive-during-the-coming-collapse/

or Google “zeitgeist movie”, “U.S dollar crash”, and “2012 Earth Changes”

Or heck, even a better idea, just turn on the news! And see what is happening, planet Earth is going haywire. A few months ago it rained so hard in Australia they had to add salt to the SEAWATER they were pumping in to one of the Aquariums. That’s crazy stuff, and it’s just the beginning. In the coming years planet Earth is going to show us the real power of nature and its affect on mankind.

2 days before I sat down to write this book, we got news that food prices here locally are going up 50% to 100% in the next few weeks, because crops in Mexico FROZE last month. No more tomatoes, avocados, strawberries, etc.

I had to buy tomatoes at $7 per pound and they were imported from guess where?

## Israel!

This is how reliant we have become upon the ridiculous “food pipe-line” that brings food to North America. It’s a long and thin pipe-line, and contrary to popular belief, it’s extremely fragile. One little change and prices go up 50% to 100%

That's the effect of simple FROST... now imagine the effect of the oil price catapulting 300%-700% when the U.S dollar collapses. Need I say more?

There is a new way of life possible, a way of life where we don't live hopelessly dependent on outside sources for our food.

A way of life that is in harmony with nature, a way of life that gives you more free time with your family, drastically improved health and a peace beyond understanding.  This is the way of life I'd like to inspire you to live

# Your Very Own Eden...

The way I see it, you're not just building a Biodome, you're building and investing into a whole new life-style.

Imagine waking up in the morning, knowing one thing:

Today, you do not need to worry, or be fearful about anything related to your survival. Everything is taken care of by nature, for you, so you can do whatever you want to do with your time. If you want to work today, that's up to you. If you want to paint a picture or go for a walk, you can do it. If you want to simply sit and do nothing, you can do this too.

Your home provides everything for you. Water, Food, Shelter, Comfort, Warmth, and it even Spiritually nourishes your soul.

You do not need to do anything.

Take a moment to close your eyes and ponder that thought and it's massive implications on your life.

Indulge me while I expand on this, because it's life-changing, and if you really get it, then your life will never be the same.

When you think about how most people live their lives today... 99.99% of their time and energy is spent on survival, and just scraping by.

We live in a world that has been tarnished by the *real* "terrorists": the banking cartel, it has been designed to turn most of us into laboring slaves to pay off an imaginary debt which can never be repaid, and the system has become extremely efficient at hiding the truth from the people to turn them into hypnotized working zombies

Most of us wake up, and from the moment we do, we start laboring. Most people work their butts off to pay for the insanely overvalued "home"(if you could call it that) they live in, pay the bills, and pay for groceries.

We don't stop until it's late at night, we don't even have time to breathe or BE with our children.

Most mothers have to abandon their babies with strangers for 8 to 10 hours per day just so they can drive to their job through a maze of polluted highways miles away.

And all this hard work is for what? **Survival**. If you look at it in its most **basic** from, it all translates to having shelter to live in, having water to drink and food to eat.

Yet how much of **your** energy, **your** life-force do you put in just to have these most basic needs met?

An ***insanely large*** amount of your personal energy.

How much does it pay back?

This life-style is non-sustainable, and non-nourishing because you have to be ***constantly*** running, ***constantly*** "just scraping

by" just so you can make enough "energy"(money) to pay for this life-style...

All this, JUST so so you can **survive!**

**And survive for <u>WHAT</u>?** For the sake of *MORE* **<u>mere</u> survival!?**

If like me, you feel tired in your soul of this way of life, and you have an inkling inside, a knowing, that "there *must* be a better way to live", then perhaps together we can take the first steps towards a truly free humanity and a radically different way of life, in harmony with nature, full of love, peace, and creativity.

# The Challenge of Change

## You Really Can Live in Eden!

The reality I described in the first section of the previous chapter, where you wake up and your home is taking care of you, is not only a possibility, people are already living it.

Anna Edey, author of "Solviva - How to Grow $500,000 on One Acre and Peace on Earth" was one of my earliest inspirations, she proved that you could grow tons incredible food year round, even in below freezing conditions.

Architect Michael Reynolds is another great example, who builds sustainable communities and monolithic dome homes out of recycled material in Arizona.

(Watch this incredibly inspiring documentary about Michael, called the "Garbage Warrior" here: http://www.youtube.com/watch?v=b1cUa4yWQp4 )

The only reason why life continues to be the way it has so far and why this life-style prevails, is because it has become habitual, "normal", and it has enormous momentum, and a level of illusory convenience, but it is quickly crumbling all around us, both because of

economic reasons, but also because more and more people are waking up to the fact that it simply doesn't work, and isn't sustainable.

In the humorous words of Dmitry Orlov, a foremost authority on the collapse of North American society:

*"We have lived in a time where most of us have been pre-occupied working at jobs selling stuff made in China. When our Chinese stuff broke we outsourced the customer support to India. And we payed for it all by flipping houses, seemingly worth millions, but really made of worthless ticky-tacky.*

A different way of life is possible, but as wonderful and motivating of a vision as it is, and as exciting as the prospect of "your very own eden" is, it a daunting and great challenge.

It could be compared to a caterpillar being transformed into a butterfly, the process of the butterfly leaving the cocoon is extremely tiresome, but absolutely necessary, as the strain exerted on the butterflies wings as it tares through the cocoon pump vital fluids into the wings, without which, the butterfly will be unable to fly.

With that said, there is WORK required in creating this new life-style, and there is definitely work required in

building your bio-dome and setting up your eden garden and setting up your life-giving systems.

Some people are simply not ready for this, psychologically it's a bit scary... after all, if you really were taken care of 100% by your home, then...

Why would you even bother having a job?

Why on Earth would you live in a city or a suburb? Why not start a wonderful community and move out into nature.

What would you do with your spare time?

What would you do with all the excess energy and joy in your life when you finally have time to breathe and focus on what's really important in your life?

All very great questions.  To some people they're *scary* questions and they don't want to think or look at them, and they're content continuing they're way of living.
Anyhow... Perhaps your "Eden" looks different than mine.  Perhaps you still want to keep some of the "Old way of living" elements in your life, and that's

perfectly fine, we all have different desires for our lives.

Personally, I want to get as far the hell away from “civilization” as possible, surrounded by some of our best and most aware friends, and build a sustainable dome community.  In the next few years I will be building several massive living domes and massive greenhouse domes with biodynamic gardening and Aquaponics systems, and moving deep into the country.  But that’s just me.

Whatever you dream is, if you’d like to live more sustainably and feel the similar pull that I do to a life-style in harmony with nature, with your own nourishing food supply, building your first bio-dome is one of the first steps!

So lets begin and start getting into the practical zen meditation of dome construction!

# The Awesome Benefits Of Geodesic Domes!

1. The "**Umph**" Factor

The geodesic dome, popularized by Scientist Buckminster Fuller in the Mid 20th century, is the **strongest structure known to mankind.**

You can literally slap together a few 2x4 from Home Depot into a geodesic dome, and if you do it right, your structure will be capable of withstanding Earthquakes, Tornadoes, and Hurricane force winds.

Compare that with a plywood square home built for $100,000 and watch it blow away or crumble in the next natural disaster (which there seems to be a lot more of lately with the climate and planetary changes)

When you combine that with all the other factors below, you'll get even more excited...

**2. They're friggen cheap to construct!**

They are extremely cheap to construct. Whether you're building a simple green-house dome, or a living dome, it is astonishing how cheap they are.

The cost of lumber for our 40' Foot Diameter Green-House dome which has 1,200 sq feet of growing space, cost only $500.00

The cost of the insulation for the green-house dome can range between $200, and $3,000. Depending on where you are and what materials you use.

Compare that with the cost of professional green-houses on the market which range in the tens of thousands of dollars, even hundreds of thousands.

Pre-fabricated domes of this size cost between $10,000 and $20,000 - by building it yourself you can save yourself $16,000 to $19,000.

When you factor all of this into the cost of building a living dome, the price savings compound exponentially.

I haven't yet built a living dome, but I calculate that to build a 50' Diameter Living Dome with 2,000 sq feet of living space(thats on the base floor only) it

would cost you less than $50,000, that's IF you build it with all the bells and whistles and use construction methods of modern day housing.

If you built it really simply, you could do it for under $10,000

Now compare that with the cost of building a normal 2,000 square foot home. Out here in Canada the cost is a minimum of $170,000 in present day currency.

Now factor in the fact that all of these figures I've been talking about are using standard building materials. Wood, 2x4s from Home Depot, plywood, etc.

People like Michael Reynolds (The architect whom I spoke of earlier and the star of the Documentary "the Garbage Warrior") are using free recycled material, which they're getting for **free.**

And they're building monolithic sustainable **mansions!**

Locally here a couple of my friends are making bricks out of hemp and are considering using that as

building material! The possibilities are endless and extremely exciting.

Films like the “Garbage Warrior” prove that everyone in the world can afford to do this, it doesn’t matter whether you’ve got thousands of dollars to invest or if you live in a third world country, you’ve just got to open your mind to the possibilities.

What I’ve realized is that these kind of cost savings aren’t just because these domes are special, it’s because they’re in harmony with nature geometrically, and these cost savings are relative to this one main factor..

**Simplicity + Harmony = Least Effort.**

**Least Effort = Least Energy Used.**

In “real world terms” that translates to **least money used.**

## 2. The Simplicity

**Geodesic domes are simple.** The least you need is a saw from Home Depot and some 2x4s, and you can build one.

## 3. The Portability Factor

If all of a sudden you have to move, you can disassemble your dome and move. It's not a permanent structure.

This is true for green-house domes as well as for living domes.

If you want to build a living dome, you can just assemble a platform on some concrete slabs, and erect your living dome. **All you need is a piece of land.** Water and Power is a separate issue, but it's also simple and I talk about it in later sections.

These days there are more and more incredible self sustaining materials coming out which make the "living dome" even more exciting!

Industrial Hemp is now being used instead of brick and mortar. **You can use hemp to make a material that is 10 times stronger than steel, and 1/6th the weight of concrete.**

Hemp is also more insulating than any other material on the market, and it's carbon neutral, it actually ABSORBS CARBON DIOXIDE!

You can spray this material into the geodesic dome triangles and instantly have a home that will withstand hurricane winds, earthquakes, and keep your family warm and safe. You can have a beautiful home for the price of 20 regular homes!

I'll tell you more about hemp construction later...

Also, because the dome is a "temporary structure", you most likely will not need some fancy expensive permit to build one on your property. My philosophy is **"Don't ask, Don't Tell"** with that part.

And if someone does start poking you for a permit, just tell them its a temporary structure.

If you're building in a suburban area with a lot of anal neighbors living nearby, then I suggest you scale your dome in a way so that it doesn't attract too much attention. (Tall enough to allow lots of space, but not tall enough to tower over the back-

yard fence and cast a monolithic shadow on your neighbors Sunday BBQ party)

Or build two smaller domes and connect them.

## 4. Heating

**Geodesic domes are the most efficient spaces to heat.**

Because the space inside is essentially a sphere, the air moves fluidly all around. The warm air rises in the center of the dome, either initiated through solar heating or a heat source, and falls in a vorticular motion around the walls. It's incredible.

Heating and Insulation are the greatest topics of debate these days with modern housing and also the largest cost with housing design. It can be the deciding factor whether a design gets built or scrapped.

Most spaces are grossly inefficient in heating due to the factor that everything is boxes and squares. Air doesn't like to move in boxes or squares, nature doesn't do that. **It likes cricles, and it likes flow.**

**This is why it is such an ideal structure for growing plants and using it as a green-house bio dome!**

## 4. **Esthetics**

The Geodesic dome living and growing space is just amazing to be in. There's something about being inside a circular space that simply opens your mind, your heart, and allows you to breathe a sigh of relief.

If used as a living space you can design your geodesic space as one giant open studio, or you can put in sections and rooms like in the pictures below form PacificDomes.com

[put PD pictures here]

As a green-house, the geodesic dome is incredible.

There's something oddly "sterile" about being in a traditional rectangular green-house, there's no personality and no sense of homeyness. When you step into a geodesic green-house, you simply don't want to leave.

## 5. It Nurtures The Body & Soul

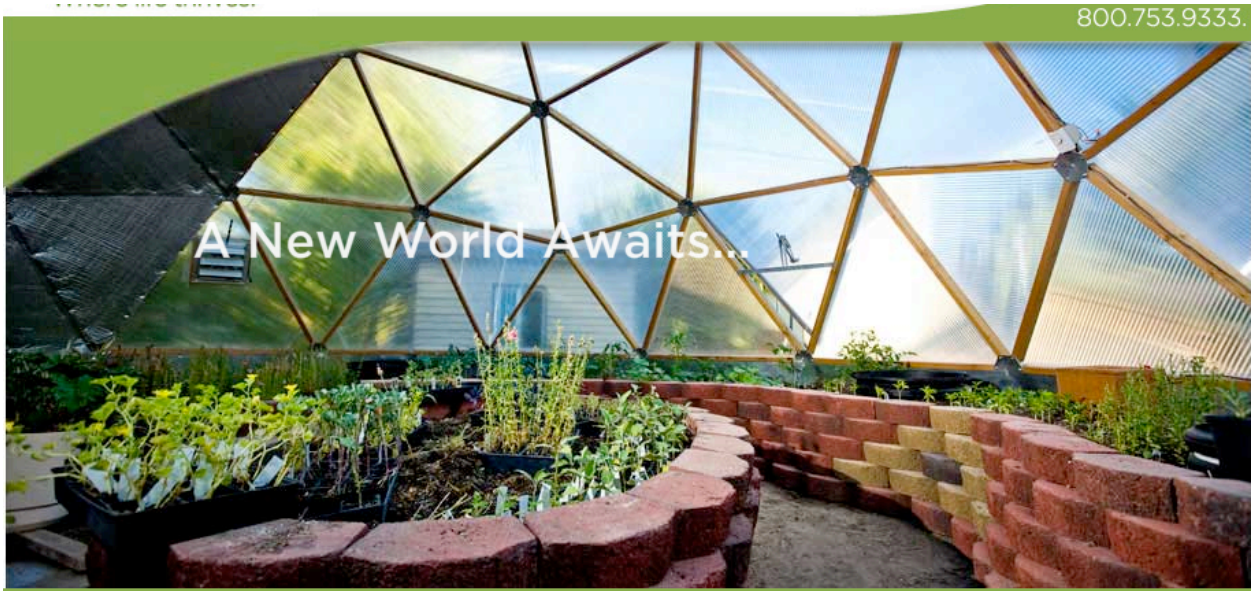
This might be too “woo woo” for most people, but I’ll say it anyway because I’ve just had so many confirmations in my own life experience that everything about this is true.

There is divine geometry in nature, it’s why nature feels so right, its why we’re all drawn to being outdoors, the ocean, the forest, etc.

Our human spirit loves resonance, and there is something about being inside a Geodesic Dome space that profoundly resonates with your soul.

I cannot convince you of this until you step in one, you just have to do it!

Just take a look at this picture below from GrowingSpaces.com (A great dome supplier), isn’t that simply mind-blowingly beautiful?




**So if you're truly excited now about Geodesic dome green-houses, lets go ahead and build one!**

*Turn the page!...*

# Step-by-Step Geodesic Biodome Construction

## The End Goal - Food 24/7/365!

Your end goal is to have a beautiful geodesic biodome green-house that supplies you and your family with amazingly nourishing food year-round, no matter whether you live in beautiful sunny California, or freezing Alaska.

This step-by-step guide will walk you through the whole process of constructing the dome, and the critical systems inside to allow you to have this end result.

**There are only a few steps involved here:**

1. **Designing the dome.** (Pick the size and frequency)

2. **Getting the amount of materials(2x4s) based on your design**

3. **Manufacturing the Dome Struts**

4. **Choosing and Constructing the Foundation**

5. **Assembling the Dome**

6. **Putting in the essential biodome systems(water tank, etc)**

Obviously, after the dome is build, your next step will be to start growing incredible food in there, putting in biodynamic gardening and all of the great goodies, I will not be talking about that in this book, that's another guide-book all together!

Lets get into step 1.

# Step 1. Designing Your Dome

Designing the dome is extremely simple.  There are no complicated architectural drawings and no complex issues to solve.  Everything is done for you through the magic of geometry and a few internet applications that will print out all the easy plans for you automatically, and for free.

Of course, there is a learning curve with how to create the dome struts, but that you can skip all together and learn from my mistakes and use my techniques in this guide-book.

# Choosing the Size and "Frequency"

The first thing you need to decide is how big you'd like your dome to be in.  You just need to know the diameter of the dome.

The dome is essentially a big half sphere, and the base is just a circle.

Go out to whatever space you're planning on putting our dome on and decide how wide you'd like the dome to be.

## Keep Height in Mind!

Whatever the width you decide on, divide that by two, that's how tall your dome will be.

A 50' diameter dome will be 25' tall.  You're going to need tall scaffolding to assemble the top.  Good to keep in mind.

Most people chose a diameter of around 30' feet for their first dome, as it means the ceiling will only be 15', and most scaffolding can reach 15' pretty easily.

This is really quite a tough decision, because price really isn't an issue here. Remember, these domes are ridiculously cheap to construct.

Going from 30' to 40' may means only a fractional change in cost, but a HUGE change in square footage. Because you're expanding the circle, the area expands exponentially.

A 30' Diameter dome has a square footage of 706 square feet. Whereas a 40' Diameter dome has a square footage **of 1,256 square feet!**

That's almost **double** the space for only a quarter of more diameter.

And guess what? The amount of building material increases by less than 10% in this case.

So this means you can grow nearly twice the amount of food, for a marginal increase in cost and building material.

This is some serious food for thought, pun intended :)

Ponder this for a while before you commit to building your dome.

The biggest cost in constructing your dome is the green-house insulation, and this is a big factor which may decide how big you go with the dome.

If you live in a warm climate, you can probably go as big as you like and just use cheap green-house polyethylene coating from Home Depot, that stuff goes for $100 for a gigantic roll.

If you live somewhere colder, like myself, in Canada, you will want to use something else, which gets more expensive. (I'll tell you all about the amazing material I have found in a later section)

Once you start playing with the dome calculator I'll show in a second, things will make more sense and you will probably make up your mind quickly.

# Choosing Your Dome's "Frequency"

When we refer to the "frequency" of the dome, we are referring to the amount of triangles inside the dome.

There are **many** types of Domes. The most popular dome is the one we're talking about here: the Geodesic dome. Popularized by Buckminster Fuller, a genius way ahead of his time.

The Geodesic Dome is based on the shape of the "icosahedron", which is a really an odd shape and doesn't resemble anything of a structure.

However, when you start putting triangles into the icosahedron, then it starts looking like a dome, and it

becomes the most rigid and strongest structure man can build.

The most basic dome you can build is the 2V Frequency dome. And it looks like this when you have a little girl playing in it:

This is the first “test” dome I built.

The next dome you can build is a 3V frequency dome.  It’s the same dome, it just has more triangles.

The 3V looks like this:

The next dome you can build is a 4V frequency dome, it has even more triangles, and looks like this:

This goes on forever, you can add an infinite amount of triangles to the dome.

## Which frequency should you choose for your dome and why is this important?

The **frequency** you chose depends completely upon the **size** of dome you go with.

If you chose a 50' Diameter dome, you cannot build it using a 2V frequency dome, because the triangles will be ENORMOUS. The wooden struts will be over 15' in length. Imagine trying to cary 15' struts over your shoulder and assembling them, your windows would be gigantic and you wouldn't be able to cover them up.

Also, at a certain point, wood has some limitations, and its best not to test it for safety reasons.

For that reason, the bigger your dome gets, the higher the frequency you want to go with.

Here's the frequency you should use according to size(diameter) of your dome:

**15' and Under - Use 2V Frequency**
**35' and Under - Use 3V Frequency ***

**35'-60' and Over - Use 4V Frequency**

** the 3V dome is a little harder to build, as it doesn't have a flat base, make sure to keep this in mind when assembling it!*

Once you get into 60'+, I think that's the limit of green-house domes, you could do it, but at that point you're building enormous 30' tall structures and you'd probably use the 5V frequency, and that is really quite complex. The higher the frequency, the more different struts there are, and the more work there is involved in manufacturing the dome, etc.

Really large domes, like the ones used in planetariums and huge bio-sphere parks, use dome frequencies of 9V and up, and steel bars.

With your green-house, you will most likely use the 3V or 4V frequency. If you want to make your first project easy to get the hang of this, I'd build a small 15' starter 2V green-house, and then build a larger one like I did.

My 40' Greenhouse Dome is a 4V frequency.

# Getting Your Dome Plans - Using the Dome Calculator:

Getting your plans is easy, click on this link to this web-page from SimplyDifferent.org:

http://www.simplydifferently.org/Geodesic_Dome_Notes?page=3#4V%20Icosahedron%20Dome

This is the most incredible dome calculator tool I've ever found online, it simply rocks.

It has dome calculators for all the different frequencies, you simply enter your diameter, and it immediately gives you all the data you need to build your dome, it even creates a 3D image of your dome with a life-size scale of a person inside so you can see how big it will be, and it gives you the layout plan for assembling the dome.

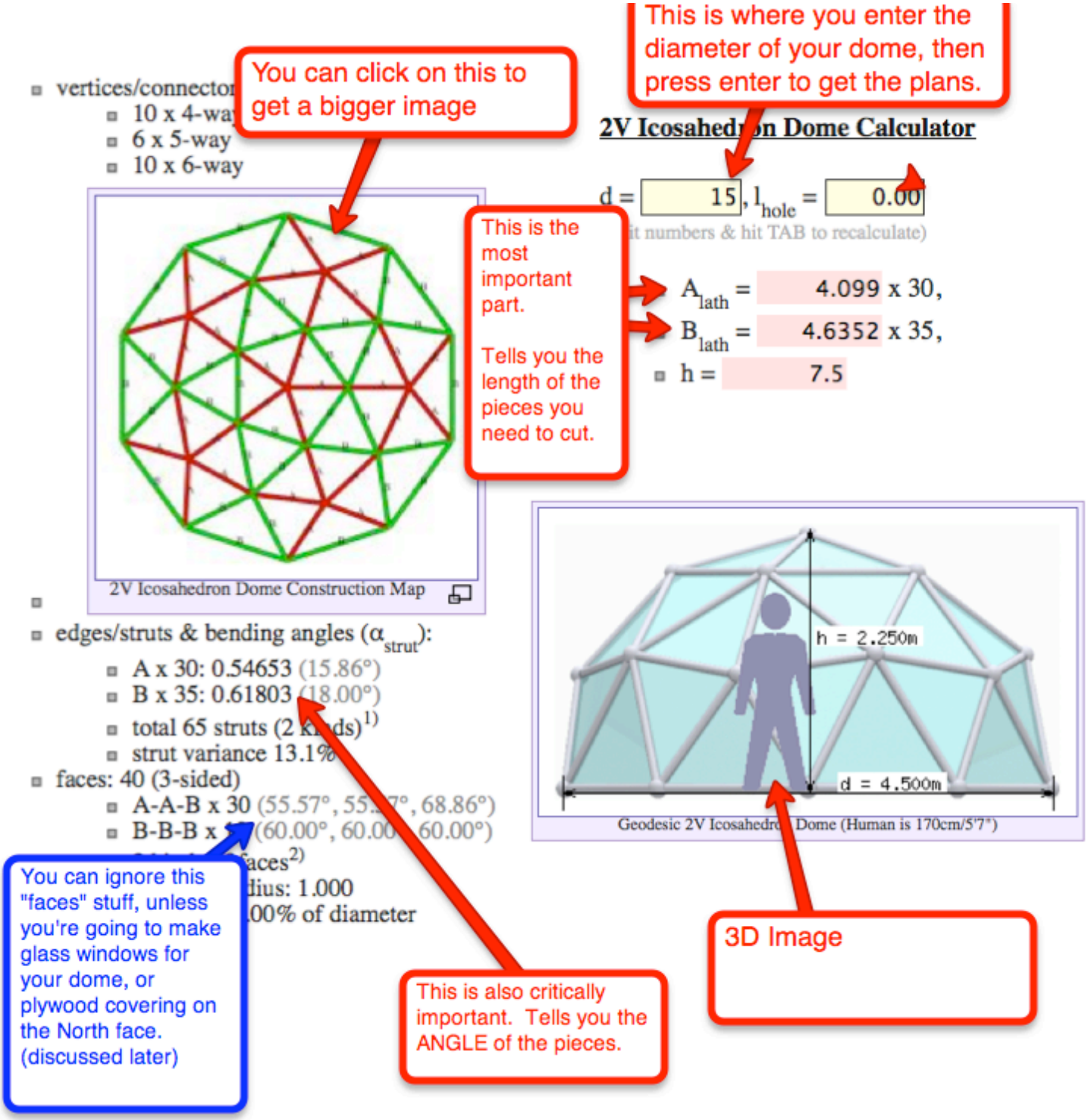
Go to the webpage and play with the calculators, you'll see how it all works and get a feel for the dome.

On the next page is an example of a 15' Diameter 2V Dome Plan from SimplyDifferent.org

***IMPORTANT:*** The 3D picture tool works in the metric system, so if you're using feet, the 3D image will obviously not be accurate, don't be alarmed.  I have tweaked the images here into meters just to show you the respective size, but the data is in feet. Once you play with it you'll know what I mean:

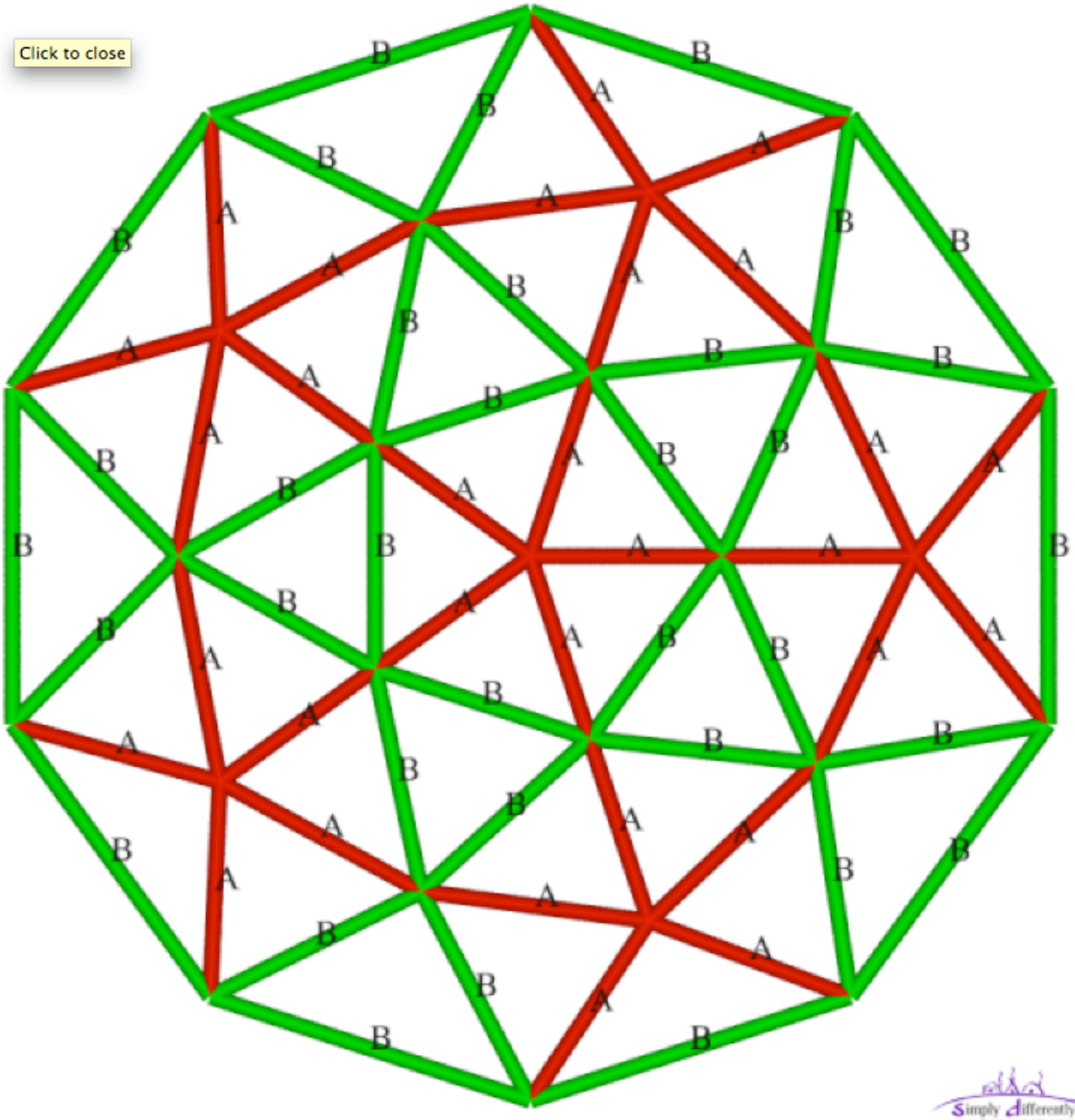
# Example 15’ Diameter 2V Dome Plan from SimplyDifferent.org

The 2V dome is the most simple you can build. It has only 2 struts, A and B. You enter the diameter and the calculator gives you all you need to start building:



# Larger Image of 2V Assembly Plan

Assembling the dome is easy, once your struts are cut, all you do is follow this plan from SimplyDifferent.org and screw your struts together.



# Dome Calculator Video

If you'd like to see a video of the dome calculator and how I use it, click on the link below

Click here to see dome calculator video.(Rendering!)

Don't be overwhelmed if this looks extremely complicated, it just looks it, in fact, it's **extremely simple.** I'll show you why in the pages to come. Turn the page to the next section: Getting the Materials

# Step 2 - Getting The Right Materials And Tools

There are many different ways to build domes. In this book we're going to focus on how to build it with wood, mainly using 2x4s.

This is the most popular way of building green-house domes because it has many advantages.

## Why Wood?

It's affordable, it's **easy(**anyone can do it), and it looks beautiful. There's something about having the nature of wood around your plants that adds to the beauty and resonance of your garden. You won't get the same effect from using steel.

You could use steel to build a dome too, but this method requires welding, steel presses, and a whole other slew of things out of reach for the ordinary person.

**So with that said, here's all you'll need to build your dome:**

You Will Need:

## 1. The Lumber

Standard construction 2x4s will supply you with all the structural strength you'll need for the dome. The beauty about the dome is that it's the shape and geometry which gives it it's strength. All the pressure is evenly dispersed among all the joints, the dome is virtually indestructible. Combine that with the vertical compression strength of 2x4s and you have something really solid.

If you're building a smaller 2V dome, you could even go with 2x3s or 2x2s. Anything above 15' feet I would use 2x4s

To calculate the amount of wood you'll need, multiply the amount of struts in your plan by the length and add it all together. For the 2V plan in the above example you would need 30 A struts(4.099 feet long) and 35 B struts (4.6 feet long), this adds up to **283 feet of wood.**

**2V Icosahedron Dome Calculator**

$d =$ 15, $l_{hole} =$ 0.00

(Edit numbers & hit TAB to recalculate)

- $A_{lath} =$ 4.099 x 30,
- $B_{lath} =$ 4.6352 x 35,
- $h =$ 7.5

Sounds like a lot, but that's only 28 10 foot long 2x4s, I can fit that lumber in my Mazda hatchback, and the cost is less than $60. This equals out to $0.30 cents per square foot of growing space... **not bad!**

**IMPORTANT!!! : DO NOT** buy the pressure treated wood. You will kill yourself inhaling fumes from the saw dust, this wood has cancer causing chemicals in it. Get normal untreated wood, any type will do, the cheaper the better, you'll be staining it later anyway to protect it from rot.

# 2. A Dual Angle Miter Saw

**You will need a dual angle miter saw to cut the wood.** It has to have **AT LEAST a 60 degree angle capability,** and the blade as to be able to tilt at least 20 degrees. This is non negotiable, if it can't do this, you can't build the dome.

I don't recommend using a really cheap $100ish saw... it will be hard. Get something more beefy.

Good saws like this aren't cheap, I invested $800 in my Milwaukee saw with a digital read-out angle with accuracy within 0.1 of a degree, and it was one of the best darned investments I made in a while! I love that saw.

If you don't have one of these saws, don't sweat, you can easily rent one from a tool shop for pretty cheap. (Although this will put pressure on you to finish the dome quicker)

What I'd recommend is that you simply buy one, the cost of renting one really ads up and you could have a beautiful saw if you pitch in a few extra bucks.

This is an investment in your future and your family, don't cheap out and not build your dome because you don't want to buy a saw.

Lastly, simply borrow one from a friend if you can.  But it does have to be a **dual angle miter saw.**

# 3. Large Pad of Red Ink

This is critical.  I'll explain later :)  Get a pad of red ink, the same you'd use for stamps.

That's all you need!  Now lets start manufacturing your dome struts.

# Step 3 - Manufacturing Your Dome

This is really easy, it's just really repetitive, and gets a little boring after a while, but it is worth the work.

There are many ways to cut the struts when manufacturing the wooden biodome. The one I will teach you here is the one I am using, as I think it's the best structurally, and most esthetic way of doing this. It is a little bit more labor intensive in the manufacturing process, but it **speeds up the dome assembly BIG time.**

I'll tell you one thing, with building these domes, I have deeply learned the meaning of "a stitch in time saves nine" Don't speed through this process and don't try to take shortcuts.

Different dome assembly methods, like some of the ones I will show you below for comparison speed up manufacturing time of the struts, but they SLOOOWWWW down your assembly process, and your dome will not be as accurate, not nearly as strong, and not nearly as beautiful.

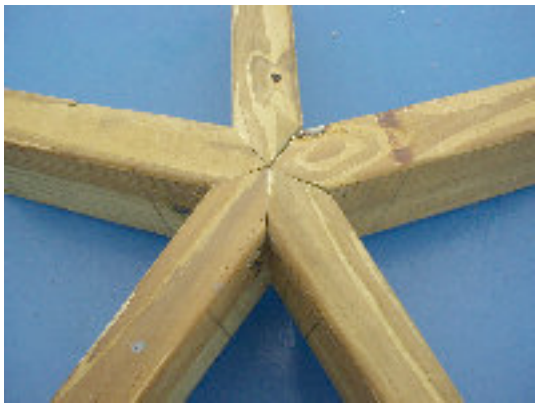
Let me show you some images below , so you can see the big picture of what you'll be doing and get the whole idea...

Go to this web-site right now, click on the link below and look at all the pictures and read the text next to them:

http://www.domekits.info/preview_006.htm

We'll be using that compound connection angle technique. That guy on domekits.info has been building domes for years and its the technique he's using and swears by it. I copied it and it truly is the best and most beautiful. Here's the images again for review:

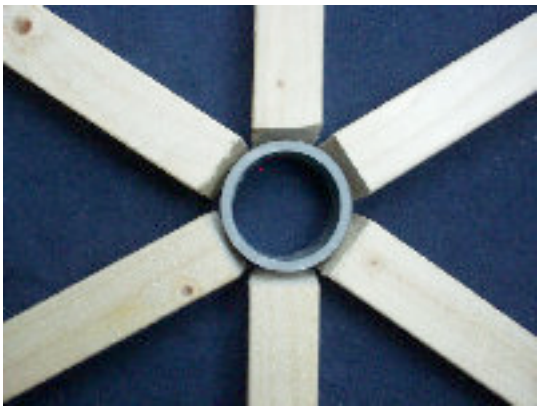
**This is the "Compound Connection Angle" Technique You'll Be Using To Manufacture / Assemble Your Dome...**

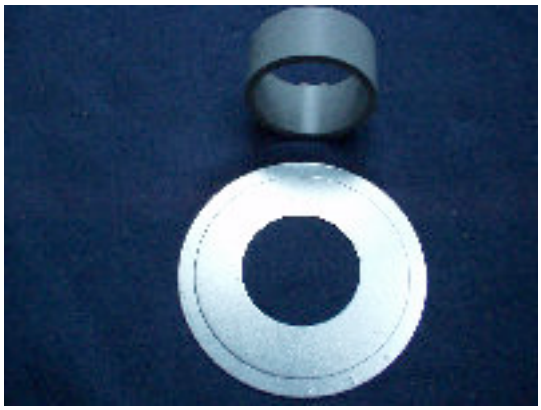


Pretty amazing eh? I just love the simplicity and beauty of it all, when the pieces just come together like that it looks really pretty.

It's also the most structurally strong, as all the pieces are held together by the pressure of the structure, and the screws.

Other techniques which you might find online, use connections like this:





This involves just cutting one angle at the end of the wood, then using a cylindrical pieces of tubing in the center, and then screwing the wood down with straps or the Simpson Strong Tie Gazebo steel joint.

I don't recommend this as all the wood is then held together only by the screws.  It's also a lot more complicated in terms of assembly, and

a lot harder to get the angles on the dome right.  You'll spend days out there trying to put it all together.

The slightest change in angle at the base of the dome compounds dramatically towards the top, as you get to the top in assembly you might find that you no longer even have a circle, and you have to start over.  And it's simply not nearly as pretty :)

The technique I will be showing you is far more labor intensive in manufacturing, but it saves you tons of time in construction, and looks really really good!

If you looked at the site I referenced above: http://www.domekits.info/preview_006.htm

The guy says the only way to make these cuts is with a special saw he has, but I have figured out how to easily do this with a dual angle miter saw, and I'll show you exactly how to do it, step by step.

# Your Master Checklist

There are only 3 steps involved in the manufacturing process, write these down and make them into a checklist.

**Step 1. Cut all the wood struts to the right length.**
**Step 2. Cut the base flat angle on the ends.**
**Step 3. Cut the "arrow-head" angles.**

With our 15' 2V Diameter example, based on this plan below, your check-list would look like the following:

## 2V Icosahedron Dome Calculator

d = 15, $l_{hole}$ = 0.00

(Edit numbers & hit TAB to recalculate)

- $A_{lath}$ = 4.099 x 30,
- $B_{lath}$ = 4.6352 x 35,
- h = 7.5

- edges/struts & bending angles ($\alpha_{strut}$):
  - A x 30: 0.54653 (15.86°)
  - B x 35: 0.61803 (18.00°)

# 2V Dome Manufacturing Master Checklist

1. Cut All 30 A Struts to length.
2. Cut All 35 B Struts to length.

3. Cut angles all A strut edges at 15.9 degrees(round off to tenth of degree)
4. Cut angles all B strut edges at 18.0 degrees.

5. Cut Arrow head angles on A struts.
6. Cut Arrow head angles on B struts.

**WARNING: If you're getting the inkling to just skip this guide and go buy some wood and start hacking away at this, DO NOT DO IT. READ CRITICAL INSTRUCTIONS IN THE COMING PAGES! There is vitally important information on how to cut the arrow head angles properly :)**

Make sure to make your master-check list for the project, I find it really helpful and it keeps me on track, because, as you'll find, things can get really confusing when you start cutting all these struts.

I will now walk you through all 3 of these manufacturing steps with pictures, step-by-step.

For the purpose of this book, I'm going to walk you through all of the examples as if we were building a 2V 15' Diameter dome together, but you can use these steps and techniques

whether you're building a 2V, 3V, or 4V dome, it doesn't matter, they're universal.

# Manufacturing - Step 1 Cutting Struts To Length

This is really the easiest part.

However.... accuracy is of uttermost importance.

Whether your strut connections look beautiful or like shit depends on how malicious you are about perfect measuring and cutting.

If you've never cut a piece of wood before or used a saw before, don't worry. When I built my first dome I was a complete newbie. I am not a carpenter and I've never had any wood working experience besides Grade 8 woodshop. If I can do it, you can do this too.

When all your wood arrives in your garage, or wherever you're cutting it, take the first pieces of lumber and measure them exactly.

If you're using inches and feet, round of the measurements within one quarter of an inch, and you should be "fine", but I'd go more accurate. For larger structures I prefer to use the metric systems, as it's just so much easier to measure millimeters, at least for me.

If you're using the metric system, try to be accurate within 1 millimeter. There's patience and zen required here, but it will pay of.

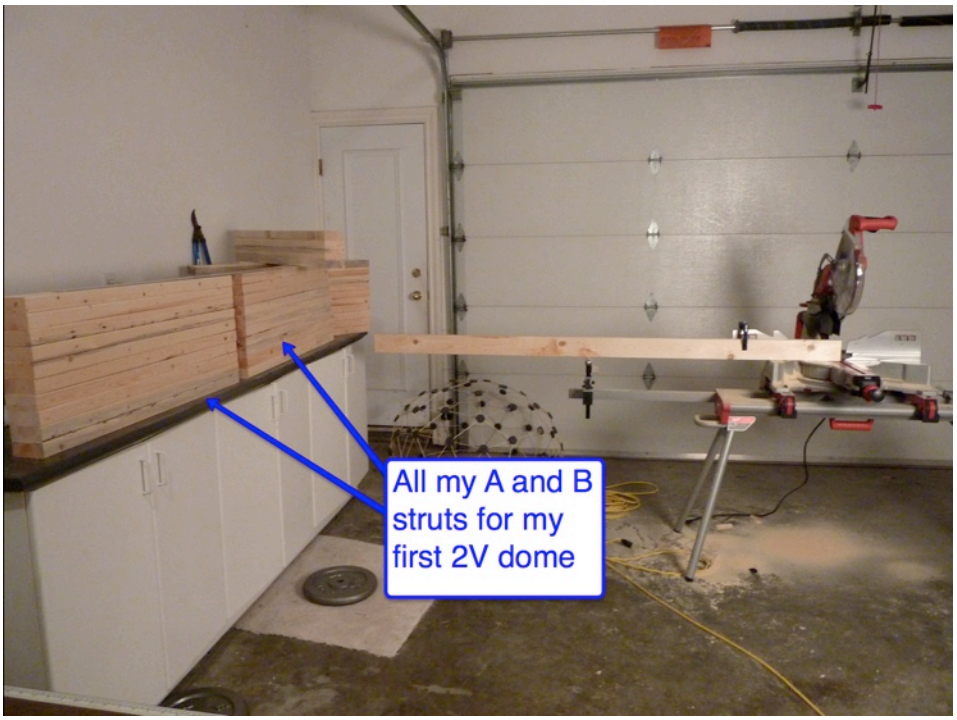
Cut your first master pieces for each strut length, then use a pencil to measure the other pieces of exactly to the same length as the master piece.

**Key Tip on Pencil :** When using the pencil/pen to mark off the measurements of all the struts, if you're not careful, you can easily make mistakes of up to 3 millimeters(1/16th of an inch) - make sure to have a sharp pencil with a really pointy tip to pencil the edge off exactly, otherwise it will be off.

**Make sure to mark your struts! Use a sharpie or pen to mark what type they are (A, B, C, etc)** If you disorganize your struts, you're going to accidentally angle the wrong struts and you're in for a lot of pain as you're going to have to buy more wood and re-do them. (Learn from my experience!!

Once you cut all your struts to length, your space should start looking more and more like this, with piles of neatly stacked and organized struts waiting for the next stage...

**Here's what my garage looked like after I cut all 65 pieces for my 2V dome:**



**Another critical note on accuracy:** When cutting the wood, you want to make sure to always be cutting with the **edge of the blade.**

Your blade is about 1/16th of an inch. If you mark a line with a pencil and then just cut right down the middle of that line, you're shaving your wood and making it shorter than it should be.

I know this doesn't seem like much, but trust me, these mistakes will add up, one mistake here, another there, and you can accidentally be off by 1/8th of an inch. You'll still be able to finish your dome, but the connections will look terrible.

**Make sure you're cutting with the edge of the blade and don't shave the wood.**

Once you have all your struts cut to the right length. Move on to step 2, angling the edges to the proper angles, *turn the page!*

# Manufacturing - Step 2 Cutting the Basic Angles

This part is also easy, and fairly simple.

What you're going to be doing now is putting angles on the edges, along the height of the wood.

Like this picture below:

In the case of our dome example, with the 2V dome you'd be angling all the A struts to 15.9 Degrees, and all the B struts to 18.0 Degrees.

- edges/struts & bending angles ($\alpha_{strut}$):
  - A x 30: 0.54653 (15.86°)
  - B x 35: 0.61803 (18.00°)

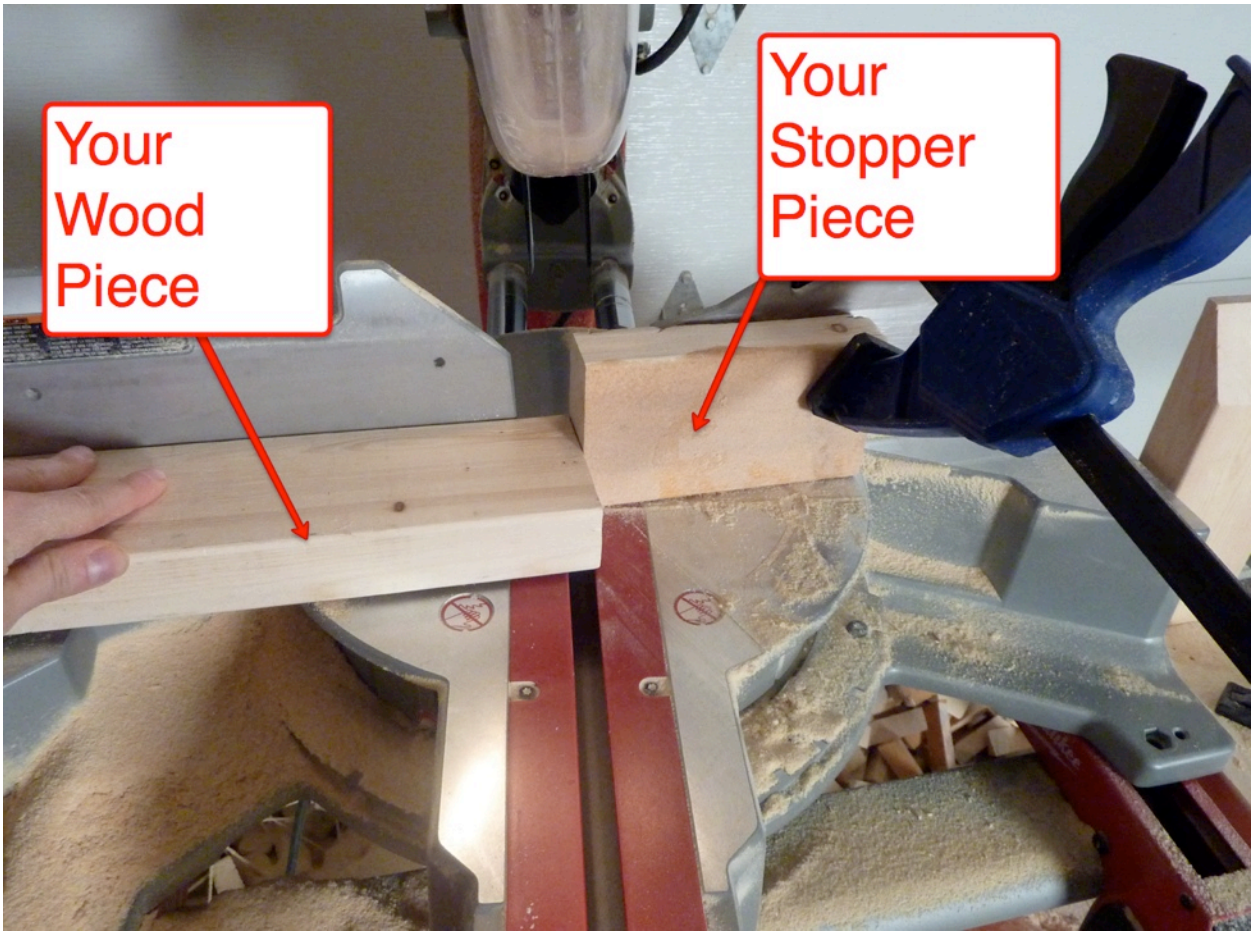
Follow the plan SimplyDifferently.org gives you for whatever size and frequency you chose.

Unless you have a really high tech saw like mine, you won't be able to be 100% accurate to the 0.1 of each degree, but as long as you're accurate enough within a quarter of a degree, you should be good. Do your best to have it as close as possible to the angle.

Don't get a saw that has a very poor angle measuring system, most miter saws come with a pretty good arc ruler on the saw and you can get the angle within a quarter of the degree, which is great.

**Cutting The Wood**

To cut the angles is very simple, simply angle the saw to the right angle, and cut the 2x4 pieces flat like in the picture below. There is some important things you should know about this, regarding the "stopper", I'll tell you about it in a moment.




**Setting Up Your Stops and "Cranking" The Wood Out**

You want to **systemize** everything you do with your cutting. This is key and very important for accuracy. Because you'll be doing each cut again, and again, and again, and again, and again, and again...

You want to take the human element out of what you're doing as much as possible, so you don't make any errors.

To do this, once you create the first perfect cut, set up a "stopper" on your saw table:

If you've never cut wood before, like me, then you may not know what I'm talking about.

A stopper is just a peace of wood that you fix to your table with a C clamp(you can buy cheap ones at Home Depot or any tool shop).

The stopper is there so that you can cut exactly identical cuts rapidly. You simply bring your desired piece to cut to the table, align it with the stopper, and cut. Then do this again and again with the the other pieces until you're finished.

**IMPORTANT TIP ON ALIGNING YOUR STOPPER:**

Again, with cutting the wood, you DO NOT want to be shaving any of the length of with the blade. You want to cut in such a way that the wood always remains the same length, otherwise you'll end up with shorter pieces and it will be difficult to assemble your dome.

When setting up your stopper, you want to set it up in such a way so that when the angled blade leaves the cut, it never cuts any length of the blade.

**To do this, simply follow these steps I use for setting up my BASE ANGLE cuts.**

1. Bring your saw blade all the way down(powered off)

2. Bring a piece of wood so that it's flush with the blade.

3. Raise the blade, but keep the pieces of wood in the exact same position. You now know exactly where the edge of the blade is.

4. Now bring another piece of wood gently to meet your first piece of wood exactly.

5. Clamp this piece of wood down with a C clamp, and you now have the perfect stopper, If you align wood with it, the blade will always exit the cut EXACTLY at the end of your struts, without shortening the pieces, but you're not finished yet.

**Whatever you do, don't power up the saw and bring the blade down, because you'll just shave a bit off of the stopper and it's pointless.**

What you want to do now is step 6....

6. Angle the saw to whatever angle you need to cut, ie: 18.00 degrees

**You've done it!** Now whenever you cut your 18.00 angle on the strut, the blade will exit the cut without cutting the strut's length down.

It will cut a tiny piece of the stopper off, but this won't matter, because you'll still be able to use it on all the other cuts.

The main point is so that you can quickly and constantly bring the wood to the right location with the help of the stopper to "**crank**" your struts out, instead of spending days doing this, it can be done in minutes.

Repeat these steps for all the other struts and angles you need to do, once you're done doing the basic angles for all the struts, you're ready to move on to step two, *the arrow-head angles!*

# Manufacturing - Step 3
# Cutting The Arrow-Head Angles

This is the final step, cutting the joint angles, or as I call them the “arrow-head” angles.

I spent days trying to figure out how to do this right and wasted a lot of wood, learn from my mistakes.  I finally figured out how to do this in a really simple and easy way, and it was one of those “DUUHHHH” moments.  I wish I knew this earlier.

In this part you’re going to have to pay particular attention to detail as it’s where you can really mess up your pieces, but if you follow my directions precisely, you should be fine.

**Step 1 - Make a Center Marker**

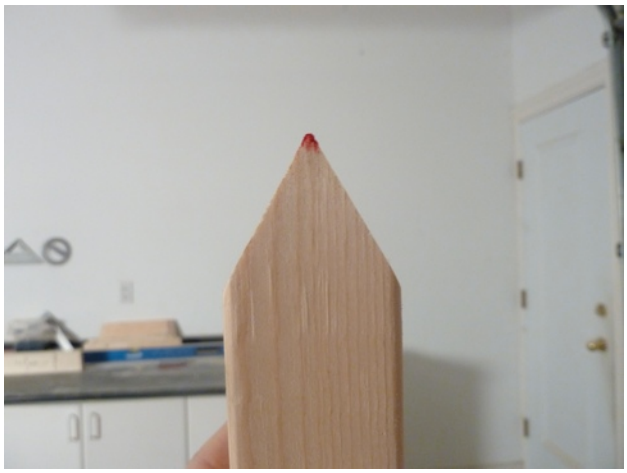
This is where the ink pad comes in, get your red or blue ink pad.

Before you cut arrow head angles on any of your struts, you're going to need to figure out where the EXACT center of the 2x4 is. This sounds easy, why not just grab a ruler and do it?

Try to do it, and you'll see where the challenge lies. It's not as easy as it sounds. If you use a ruler to try to figure out where the center is, it will take forever, and it will be highly inaccurate, mostly due to the fact that the width of the 2x4 is actually NOT 2 inches. It's called a 2x4, but it 's actually a 1.5" by 3.5" - this is due to the nature of how it comes out of the lumber yard and the processing they do to it.

Even if you could, it would take forever to mark each piece exactly at the center.

I've developed a lightening fast zen way of finding the center. It's called the center marker. Here's how it looks:

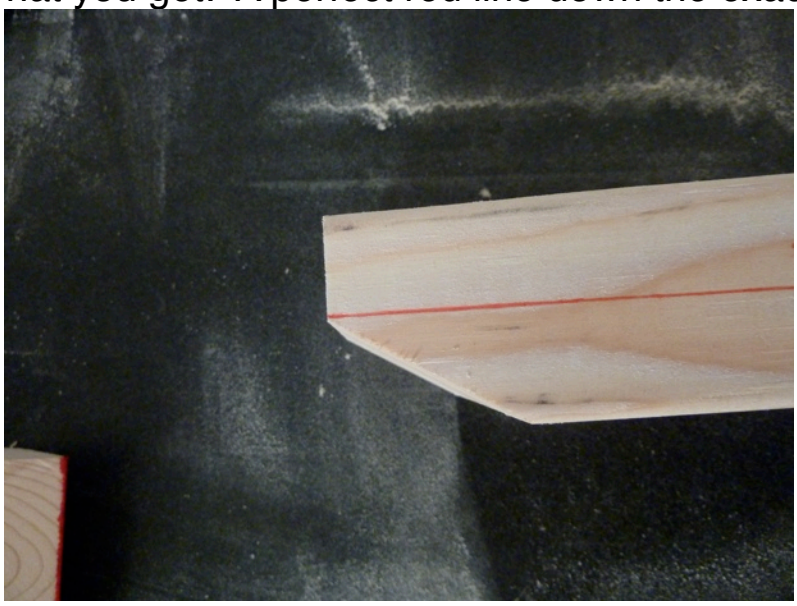


The **center marker** piece is simply a piece with two 45 degree angles cut at exactly the same position on each side of the piece of 2x4. This makes the tip of the “arrow-head” exactly at the center of the wood.

To find the **exact** center of each of your pieces of wood, all you have to do now is dip your “**center marker**” piece in some ink like this:

**On a flat surface** put the stopper piece down flat along side the wood you want to mark, and lightly press it into the wood, make sure the wood too is flat against the surface, like this:

And here's what you get:  A perfect red line down the exact middle:



** This photo shows a 50% completed arrow head strut. Perfectly down the middle with the help of this technique.*

I know you might be thinking... “Why do you need a line down the center? Can you just use the same technique you used to make the **center marker** to cut the arrow-heads on all your struts?

Remember, you’ve already put base angles on your struts, you’re not going to be cutting just straight arrow head angles with the saw, you’re going to have to **tilt the saw blade** to make these cuts.

If you just tried to cut into the wood without tilting the blade, you would get something that looks like a big flat V in the wood, it doesn’t work. You can experiment yourself and see

Because you’re cutting with a tilted saw blade, this changes everything. So it all starts with this **center marketer** piece, it’s critical

**How To Make a Center Marker Piece**

A. Make sure your blade is totally at the 0 degree angle both on the blade bevel and the main angle bevel.

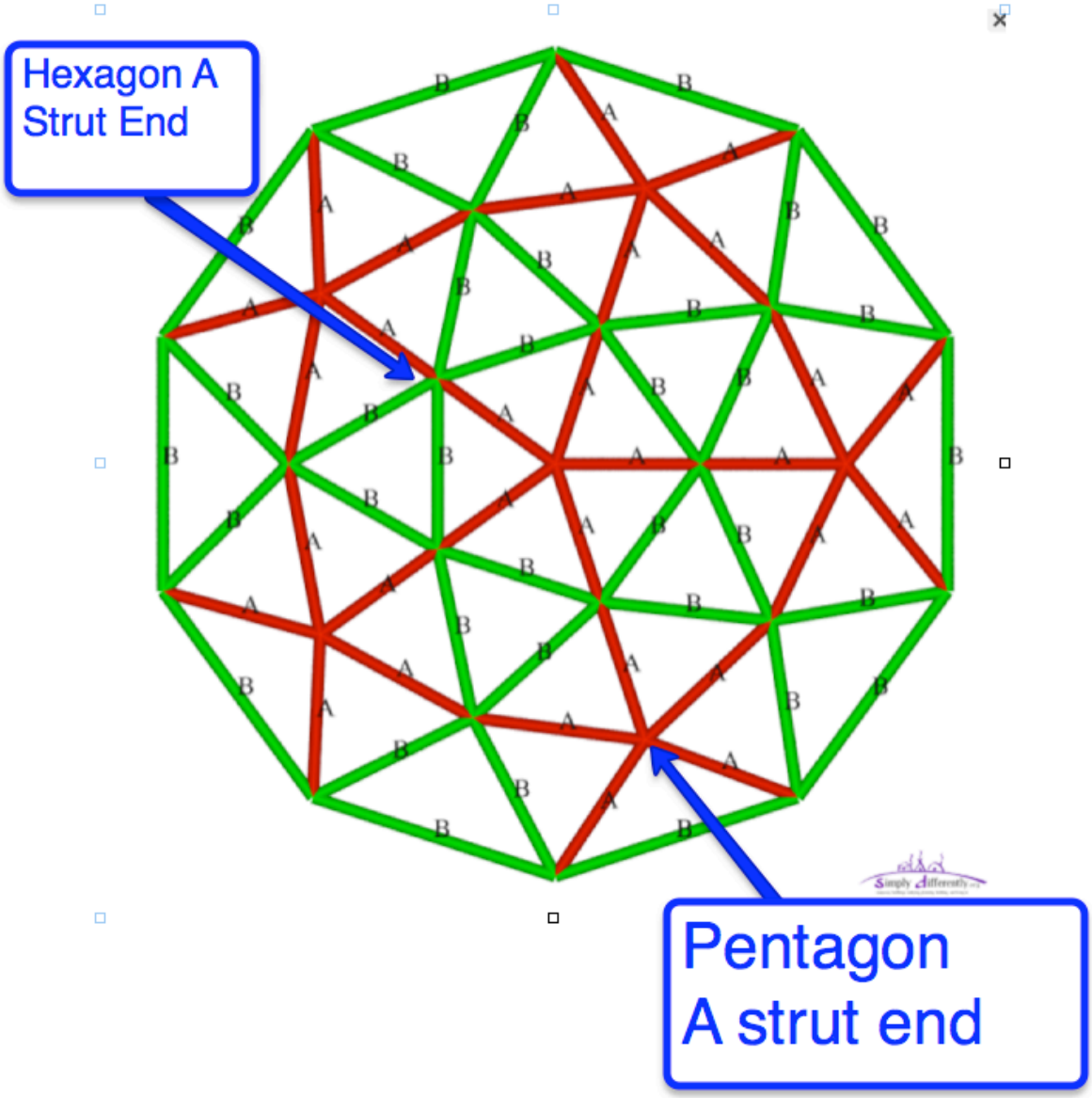
1 - Set up a stopper about 12 inches from your blade, clamp it down.
2 - Set your blade angle to 45 degrees.
3 - Put in a good flat piece of wood in, and cut one side
4 - Flip the wood around to the other-side, and cut the other side.

Always making sure you’re right flush with the stopper piece so the **center marker** piece is perfect!

You’re done! Now we can move on to the next step, **figuring out your angles:**

# Step 2 - Figuring Out Your Angles

Before we do any cutting, you need to take a look at your pan, and realize which struts get cut how.




The Geodesic Dome consists of all the struts connected in hexagon and pentagon connections.

A **Hexagon** connection has 6 struts connected in a center point.

A **Pentagon** connection has 5 struts connected in a center point.

In this 2V example, **all the B struts are involved in hexagon connections only,** so the arrow head angles will need to be 60 degrees. To do this, you cut 60 degrees on each side of the piece, leaving you with a 60 degree angle.

*Since 180 degrees minus 60, minus another 60 = 60.*

However, all the A struts are involved in a **hexagon connection one side, and a pentagon connection on another side.**

Because of this, all the A struts will need a 60 degree arrow-head angle on one side, and a 72 degree arrow-head angle on the other side. 72 Degrees x 5 = 360

To cut the **72 degree arrow-head angle, you'll need to cut 54 degrees off each side of the piece to get 72.**

*180 degrees minus 54, minus another 54 = 72*

So in summary, in this example we have:

35 x B struts all angled at 60 degrees

30 x A struts, all have 60 degrees on one end, and 72 degrees on the other end

Once you've gotten clear on this, make sure to write it down so you don't forget, and you can move on to the cutting itself.

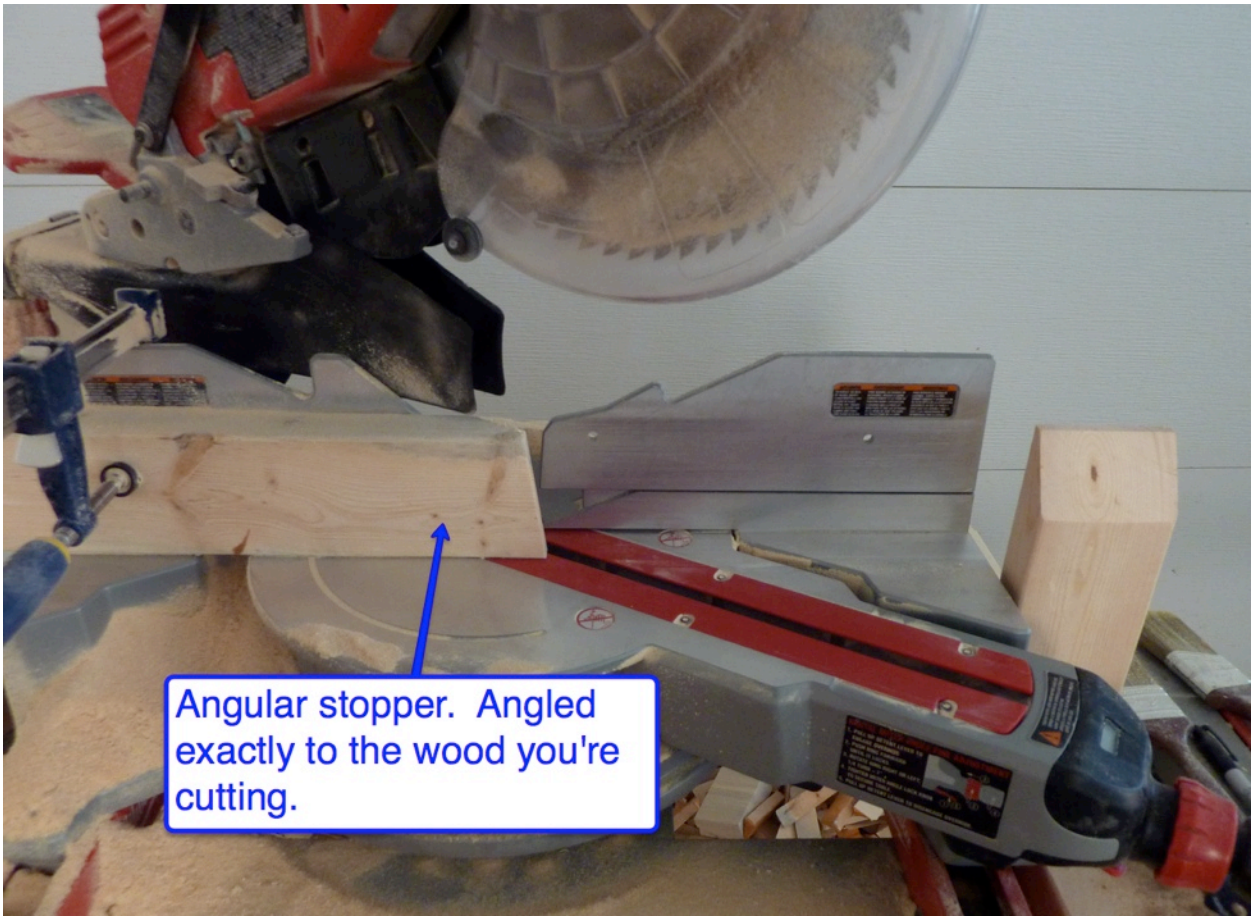
# Cutting The Arrow-Head Angles

I will explain this as best as I can in writing, but please look at the pictures, and the video I provide below.

**1.** The first step is to make yourself an **angular stopper** for each type of strut you're cutting.

This really helps with accuracy and you'll see exactly why, when you begin this process.

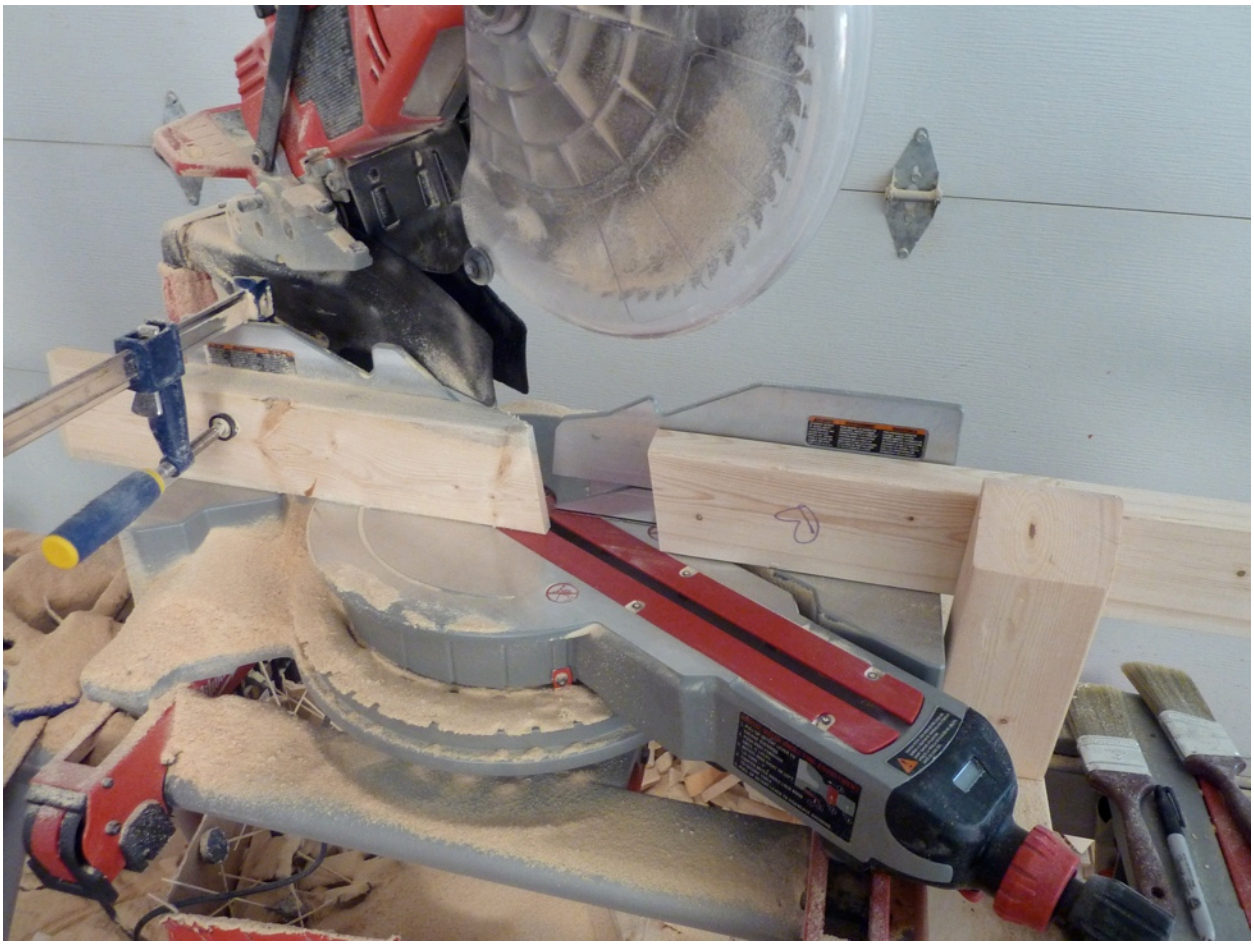
Here's what it looks like below:



It's just a piece of 2x4 with the same mirror angle that your base angle is. So if you're cutting the A struts in this example, you'd use a scrap piece of wood and angle it at 15.9 degrees and make that your stopper. If it's the B strut, then make a 18 degree stopper:

**2. Set The Lateral Angle of the Saw.**

With your stopper made, you don't do anything with it yet. First set the saw to the correct angle. It's always either 60 degrees or 54 degrees, in the picture below the saw is at 60 degrees.



**3. Calibrating the "Tilt" Angle of the Blade *Critical Step: Pay Attention!***

Put a piece on the saw and bring it close to the blade, like in the picture above.  This piece so far only has a base angle on it that you made in step 2.

Now bring the blade all the way down(powered off), and lock it in position if your saw has that option.

With the saw locked in position look at the blade at the angle seen in the picture below, and slowly bring your wooden strut up to the blade.

You'll find that the angle obviously doesn't match yet.

**Do you notice that huge gap between the saw and the angle**?

What you need to do is tilt the blade until it is completely flush with the angle of the wood to close that gap.

When angled perfectly, the saw will be flush with the base angle on the wood, like in this picture below:


Notice how there is no more gap, the angle of the blade matches the angle of the wood base angle and is perfectly flush with the blade.

You then lock the blade in position, and you're ready to cut!

**Remember to repeat this step when setting up every new angle for the different types of struts!** First finish one type, ie: A, and then move on to another type, B, etc, etc.

# Watch My Two Videos On This Step:

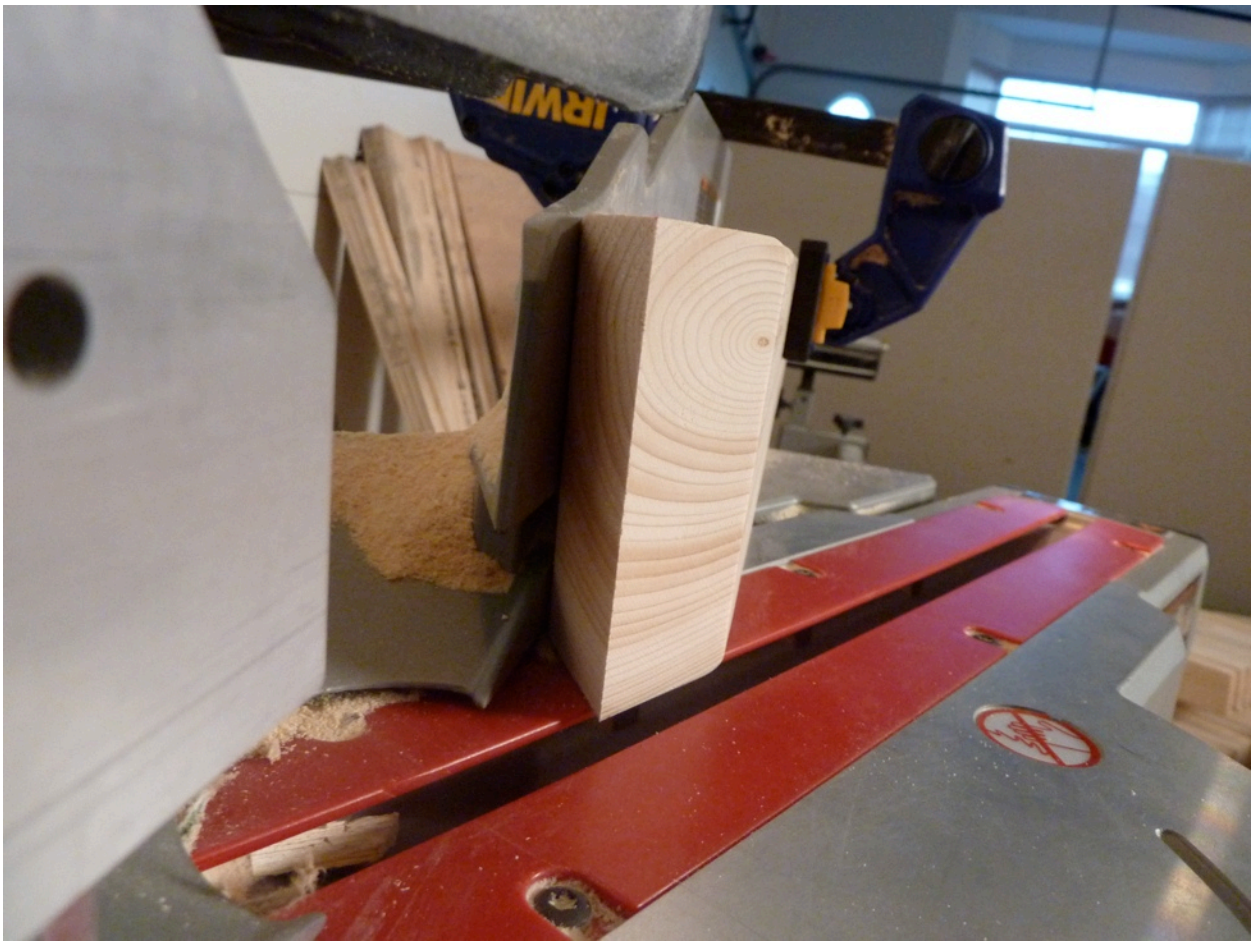
I made two videos on the above step of angling the saw to add clarity of understanding for you, please watch them now right here in this order(simply click on the links)

**Video 1:**
http://www.BiodomeRevolution.com/arrowangleA.MOV

**Video 2:**
http://www.BiodomeRevolution.com/arrowangleB.MOV

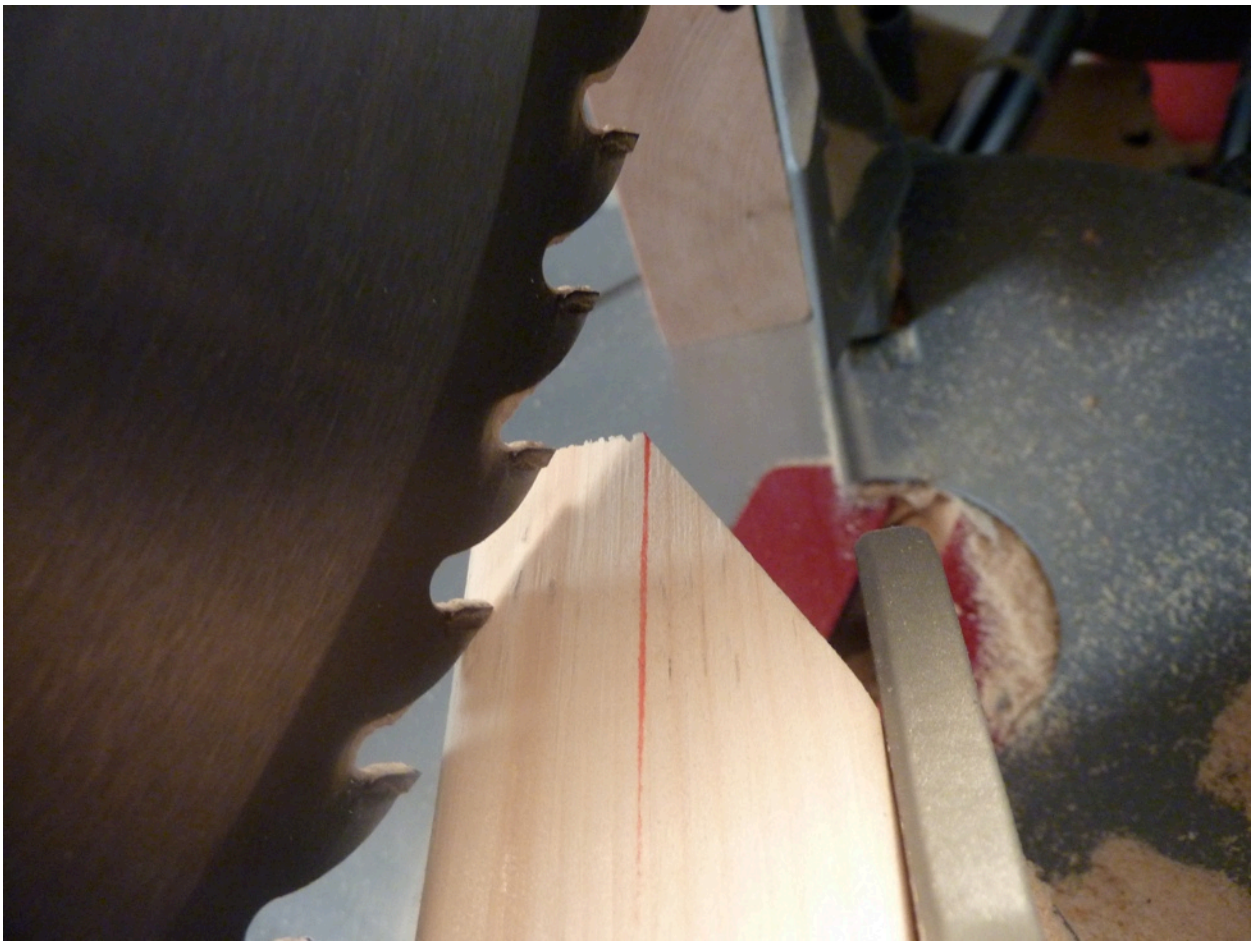
You'll find that you will only be able to finish 50% of the job with this angle(1 cut on each end of your struts), to finish the other sides of the struts, you will need to repeat this step but **do it in the opposite direction. To do this, simply flip the wood upside down and tilt the saw again, this time in the opposite direction.**

**4.** With the blade and angle properly set up, you're now ready to start cutting your arrow-head angles!



## But not so fast!

This is why you made the ink **center marker...,** so you can cut the piece exactly at the center at the “magic spot.”



This is perfection :-)

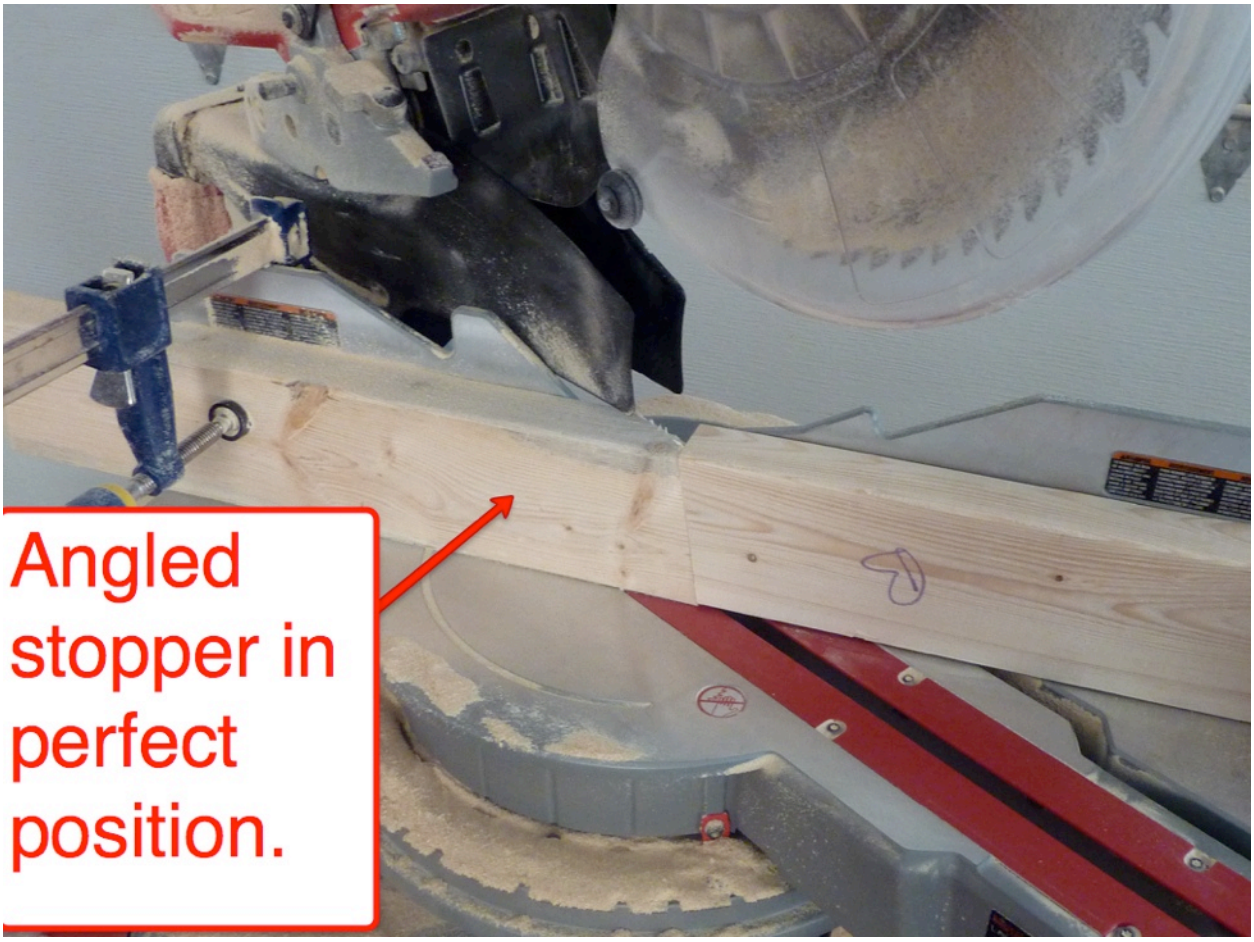
So now that you have that beautiful red line at the center, the hardest part is getting your first cut, because you're not using your stopper yet.

Using the thin red line, find the exact perfect place to enter the cut, you can do this with the saw not spinning yet, you can look down it like the barrel of a gun and line it up with the end of the red line.

Once you feel it's the perfect angle, go ahead and cut.

**IMPORTANT: After the angle is cut, bring the saw up, but don't move your piece. If the cut looks perfect, then bring your angled stopper into exactly the place where your wood is now, and clamp it down!**

Now you should have your angled stopper exactly in the right place, and you can now go ahead and “crank” out all the other pieces and angles like in a factory, without having to use the thin red line every time to measure.

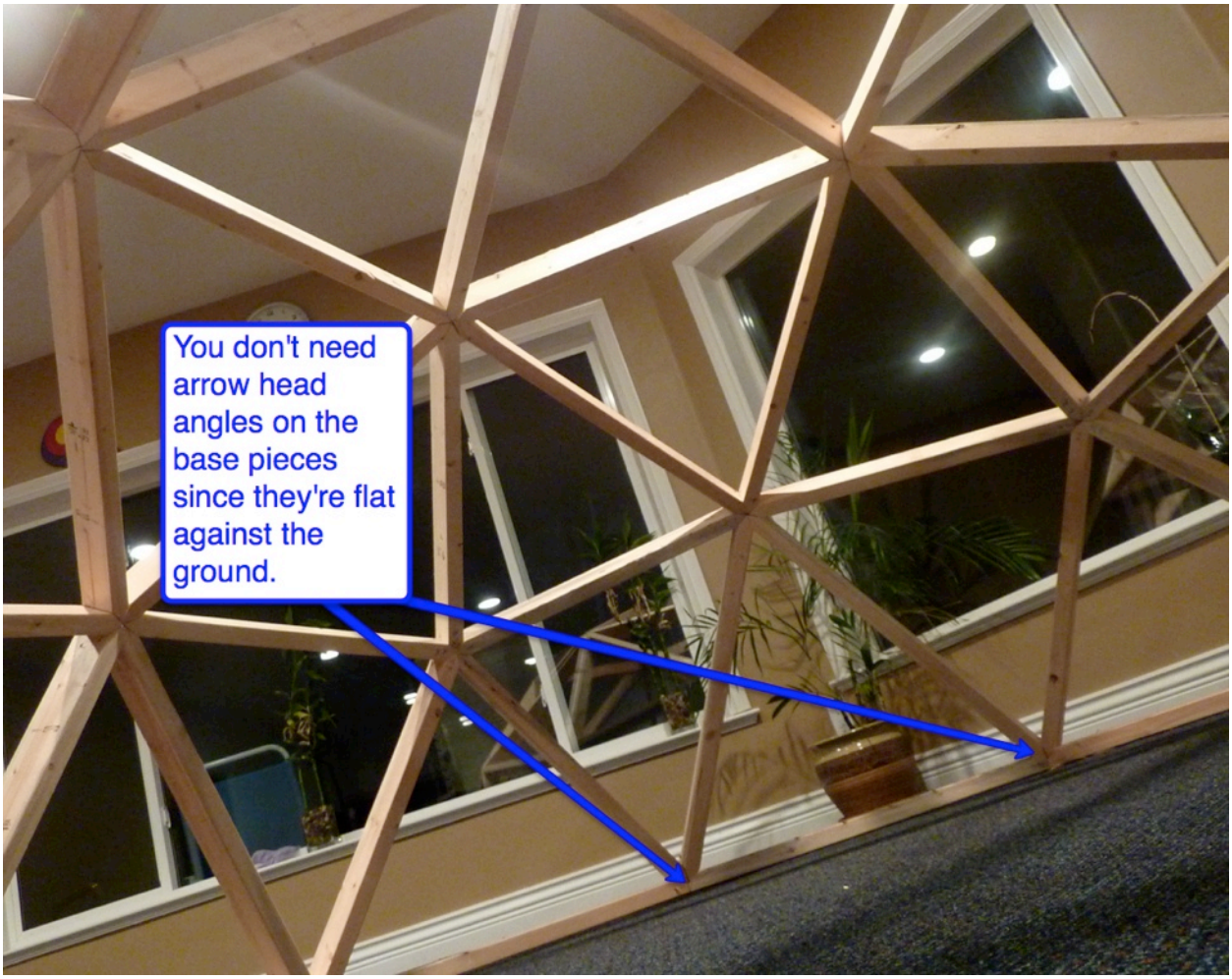



Using this technique you’ll be able to quickly pump out perfect looking arrow head cuts like in the pictures below.  Check the first few cuts to make sure they’re perfect using the **center marker**, if there are some flaws you can correct by re-adjusting the stopper by even just 1/32 of an inch.

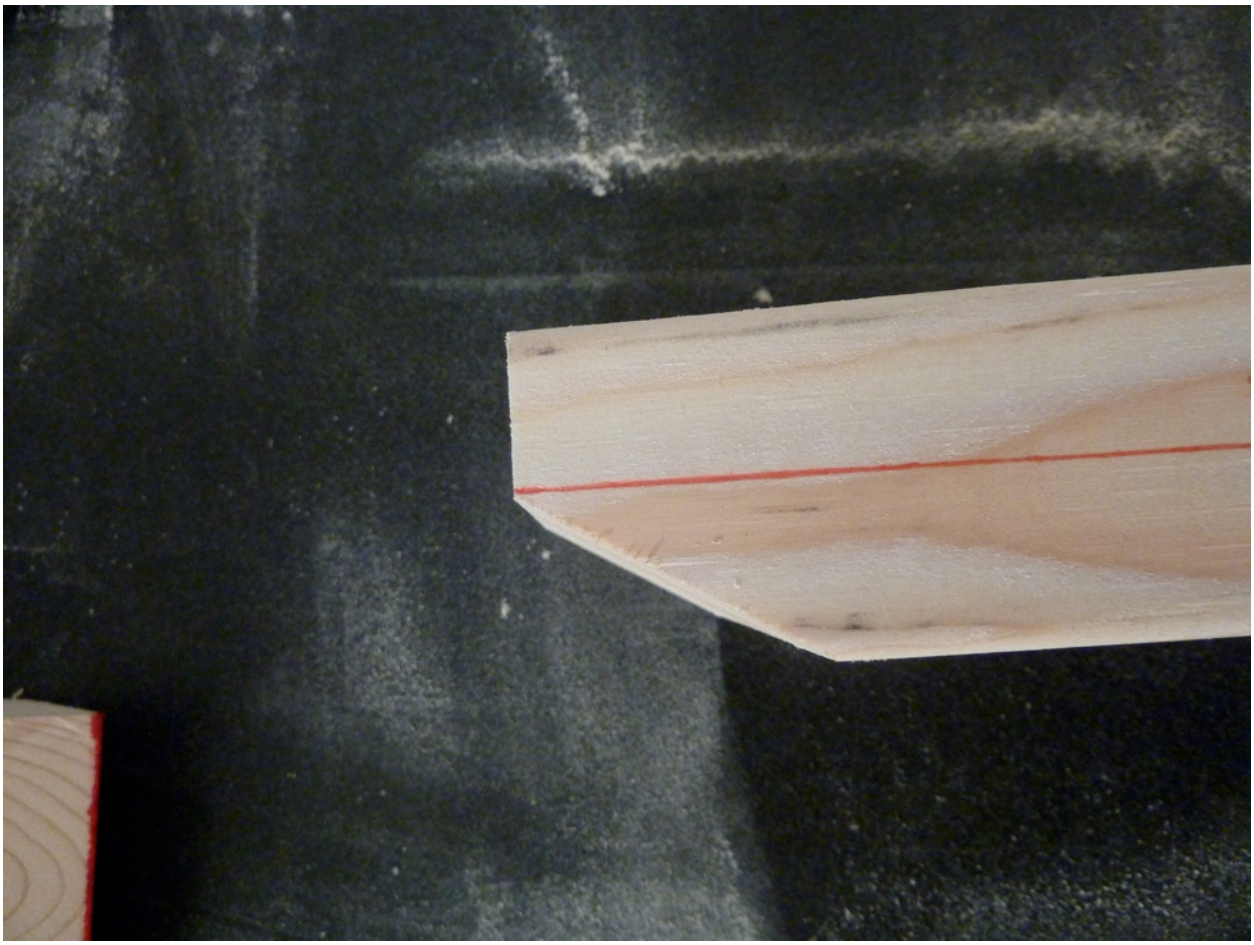
It won't be long before you can raise your arm in conquest of all the wooden struts, and **you're ready for construction!**

# Quick Note on Base Pieces

Because the base pieces are not connecting to anything on the other side, you obviously don't need arrow head angles on it, just one angle, exactly at the middle.



Your base pieces should just look like an unfinished arrow-head cut:



# Staining The Wood

The wood will not be getting rained on, as you will be covering it with your green-house material of choice, however it will still be exposed to dampness from the ground(depending on foundation choice), and most definitely water vapor and humidity.

Therefore, it's wise to put at least 1 coat of stain on the wood to protect against rot.  You want to build your biodome to last.  My intention for our bio-dome is for it to last at least 20 years, so I put 2 coats of stain.

I'm not an expert on this, so I just got the first best stain from Home Depot and went to down on our wood.  Here's a picture of us staining 1,000 square feet of wood surface:

Depending on your dome, it can be A LOT of wood to stain, so **use a roller** to stain the wood, **don't use a brush, you'll break your back!**

Here are our beautifully stained pieces ready for construction:

Besides the water protection, stain makes your green-house look even more beautiful on the inside when it's finished.

I really enjoyed the staining process as it was much more meditative than the wood cutting process.

# Choosing the Foundation

This is really up to you, and up to where you build your dome. Personally, here in British Columbia, Canada, it's wet very often, and damp.

If I just slapped the structure on the ground, it would rot, so I wanted to get it off the ground.

So we used **this much concrete:**

To make 20 posts like this, each posts directly underneath the connections of the base pieces:

We used this technique because the ground was not level and was sloped by quite a bit, as you can see the posts behind me are getting taller towards the left.

I don't recommend this technique, avoid it if you can as it is very labour intensive to drill all the holes and form all the posts, unless you have a lot of friends that can help you get it done in a couple days, then do it.

**What I Suggest You Do:**

If you have a level surface to work with, simply lay down concrete slabs and anchor the wood to the concrete.

An alternative is you can lay down gravel around the perimeter and build a “riser wall” on top of that about a couple feet tall, and then place the dome on top of that.

You can get really creative. I’m not an expert on foundation, but somehow we figured it out and made it work! If you know any friends who work in construction, ask them for a few tips on foundation and they’ll most likely be eager to help.

If you live in a dry area you could even go foundation-less, just lay a tarp down on the perimeter and put the whole structure down on it, and just weigh it down with concrete. I’ve seen pictures of people doing this.

(above) If you do go the “concrete post” route” make sure to sit a 2 year-old on every post to test it. *(just kidding :) )*

This is a critical part of the process.

Whatever you chose for the foundation, it’s usually inexpensive to do it, and a lot of fun knowing your dome is almost finished.

The domes are relatively light since they’re just 2x4s and the weight is distributed evenly. So you don’t have to worry about the ground settling underneath it. Each base connection point is receiving only 5-50 lb. of pressure depending on how big your dome is. **2x4s only weight about 10lbs each!**

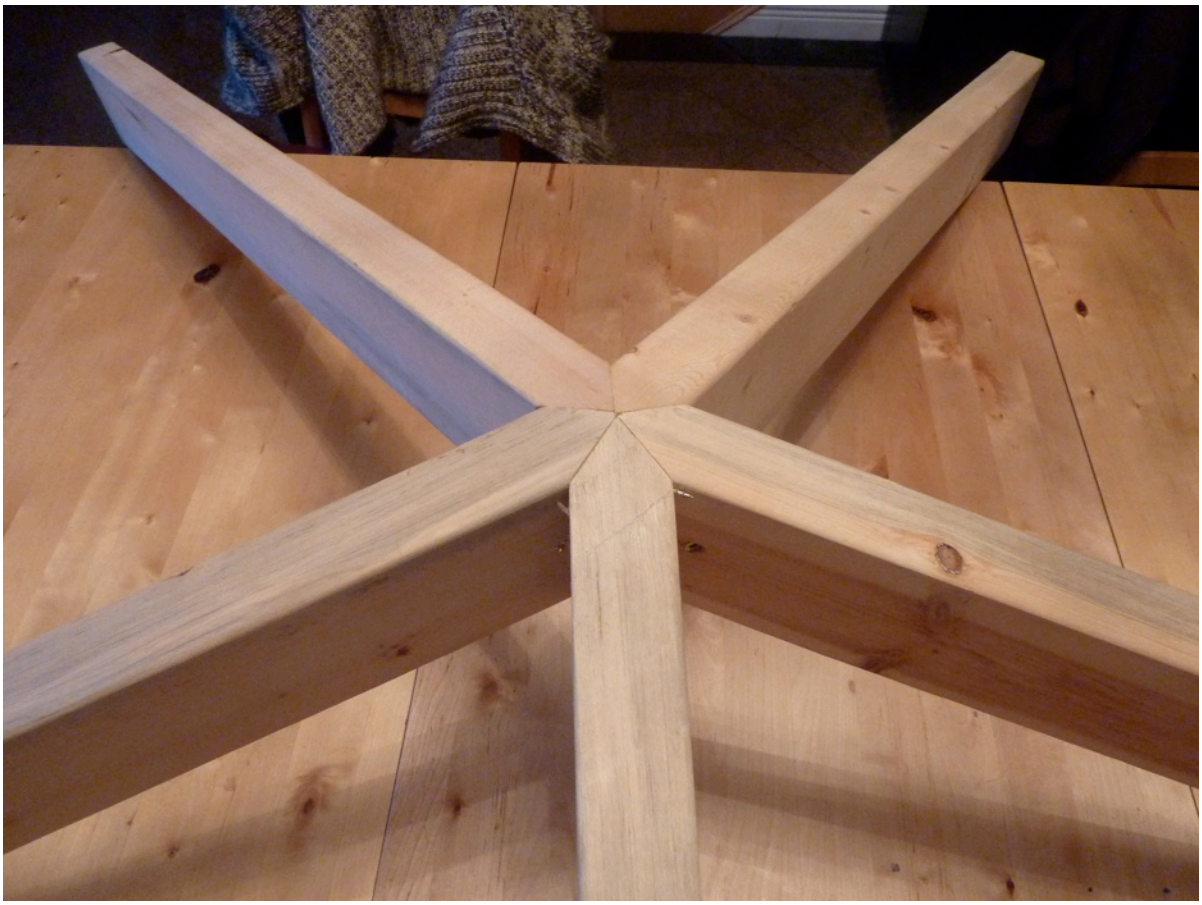
# Assembling Your Dome!

Now time for the really fun part :)

Because you did the “hard” work and cut your struts using the compound connection angles, assembling your dome is as easy as putting together furniture from IKEA.  You simply slap all the pieces together according to the plan, making sure to keep track which ends are the **hexagons** and which ends are the **pentagons**.

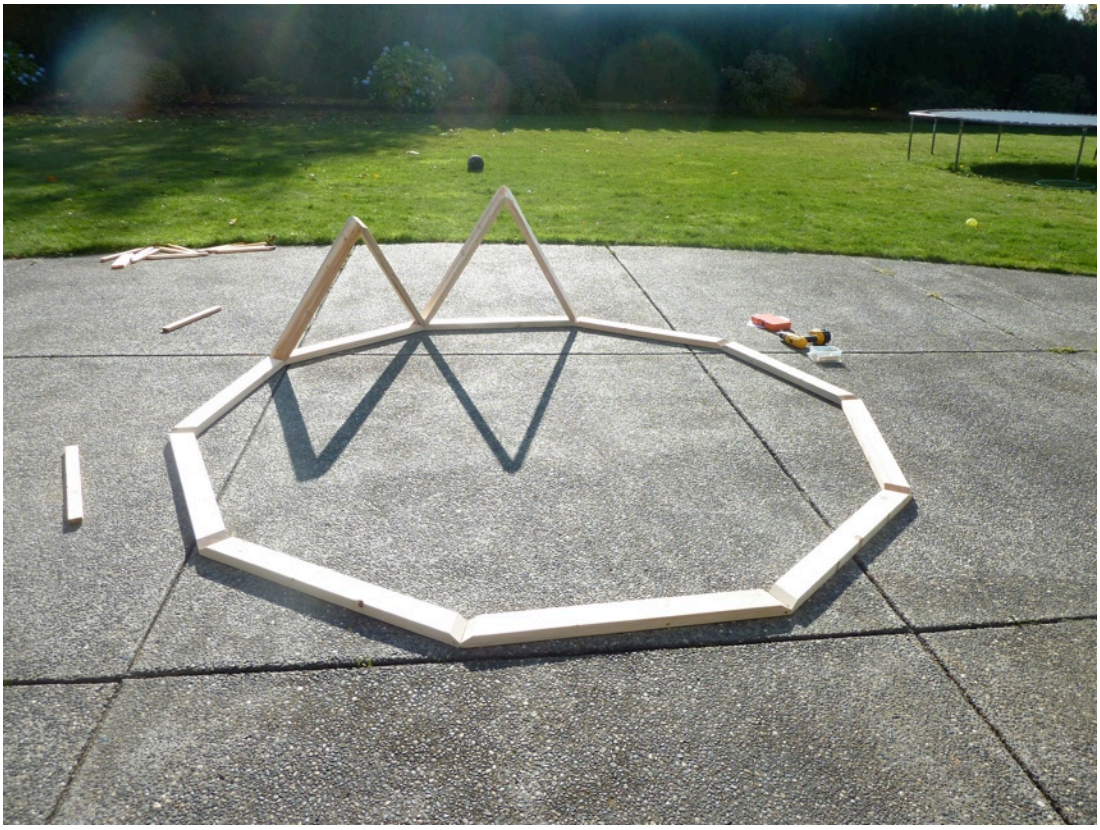
Use screws like in this picture to screw the pieces together:

You want to use a minimum of 2 screws per connection.  Use a good drill and use proper treated deck screws to avoid rust and rot. If you cut everything perfectly like I’ve shown you, your connections should look beautiful like this picture below:



# Looks beautiful!

Now it's time to call up some good friends, grab some beers, and have a "work party" to assemble your dome from the bottom up, below is the process in pictures, it's really simple, fun, and easy.



Those were the pictures from our small 2V dome construction. I will update you with pictures of our 40' construction soon, I am just in the middle of that project RIGHT NOW, and don't have time to upload all the pictures yet.

**Note on added stability:**

For larger domes you want to use steel straps on the base pieces, as that is where the dome is experiencing the most stress from the weight of the structure. Check out this web-site: http://www.DomeKits.info and click on "compound

connection angles” and look at this demo pictures, you can use steel straps like that for added stability.

With a few friends you should have no problem assembling your dome in 1 or 2 days.  Have fun!

# Choosing the Covering Material

Now that your green house is complete, you have to chose what to cover it to make it into a green-house, instead of just a timber frame.

Remember, our goal here is for you to have constant year round food production... The dome will achieve this already by being a dome...

The nature of the dome will be to heat up very well and keep heat very well too, but you'll be doing additional things to preserve heat at the same time.

All this really depends on where you are on the planet too, if you live in a warm sunny part of our Earth, chances are you can just cover your dome with simple 6mil poly from Home Depot for $100 and be done with it.

We are not so lucky here in Vancouver.

If you live in a colder climate like myself, what you cover your dome with will depend on your wallet.

If you're doing this totally on a budget, then just get the 6 mil polyethylene from Home Depot (or buy it online) and put on as many layers as you can.

You can attach it in a variety of different ways, nail it down, staple gun it down, or use a piece of wood on each strut to hold it down into place.

If you're going to nail it down, use a sealer so you don't get any leaks inside.

If you're going to spend some money on this, like I am, then I would get this: **Poly Keder.**

Poly Keder is this amazing material made in Germany that's now distributed in the U.S (through a private company, I'll provide the contact below)

**How good is Poly Keder?**

Farmers are using it in Canada in -30C conditions (-22F) in their green-houses and they're picking strawberries in the dead of winter with T-shirts on. It's a revolutionary material. It's not sold in stores you have to get it from the distributor, I'll provide the contact at the end of this section.

Here's a great article on Poly Keder:
http://specialtyfabricsreview.com/articles/1010_sw3_greenhouse_film.html

Contact them and they'll send you a free sample of the material. It's quite amazing!

**What else can you use?**

You can use glass obviously, but it's expensive, and outrageously heavy. It would cost me $7,000+ to cover my 4V 40 footer with glass.

You can also use Acrylic paneling, like the paneling on office lights. IT works really well and the guys at GrowingSpaces.com seem to be using it, but I checked into it and it's really expensive as well. Only marginally cheaper than glass.

However... Poly Keder seems to provide a better R value and better heat retention than acrylic anyway, and it's 50% the cost! That's why I'm raving about it :)

The Poly Keder stuff retains 60% to 95% of your interior heat, and because of the bubbles in the material it disperses the light, so your plants are getting light from all directions, **and they grow straight up!**

A common problem in the winter is plants growing side-ways(especially seedlings) because of the low winter sun. Not with this stuff.

Here's my contact for Poly Keder, he's in Canada but should forward you to the US distributor if you ask nicely:

Email Roger at: haynesr@xplornet.ca

Ask for Poly Keder and mention I sent you!

# Critical Systems: Water Tank + Vents + Reflectix

## Black Water Tank

The water tank in your dome is the “heart”. It allows you to grow food year round, no matter where you are.

How does it work?

You position a big plastic or metal water tank in the North Most portion of your dome. When the sun hits the water and the black plastic during the day, the water absorbs heat.

At night, when the sun goes down, the water begins to emit this heat back into the green house in an ambient manner, and makes a huge difference in the temperature of the dome.

Besides this purposes, you can use the tank for many other things. You can turn it into a pond and grow pond plants, or like myself, use it for aquaponics purposes. Some people make them into “nature baths”. Use your imagination :-)

**Automatic Vents**

**Ventilation is very important during the warmer times, otherwise your plants will cook!**

Regardless of how good you are at remembering things, you have to set this up so that it's automatic and take yourself out of the equation.

If you forget to open the vents one day on a hot day for a few hours, you can kill every plant inside, it will be a gigantic solar oven.


(above) To automate your vents, use these really cool automatic "wax pistons" to open your windows inside the dome.

To create your windows simply turn some of the triangles at the base of your domes into openable shutter type windows on hinges, and attach the pistons to the window.

When the temperature gets warm, the wax inside the piston expands causing the window to open.

When it gets colder, the wax contracts and the window simply shuts. It's magic!

You can find these online in a few places, here's one supplier:

http://www.johnnyseeds.com/p-8137-univent-automatic-vent-and-window-opener.aspx

## Reflectix

Reflectix is a material you can find at any Home Depot or Lowes, and most hardware stores. It's just a giant thermal reflecting sheet.

What you want to do is line the entire northern wall of your dome with reflectix, above your water tank and all around the north side.

The north side of your dome is not actually getting any sun, so you want to insulate that wall as much as possible.

The reflectix provides additional sunlight to the plants during the day as it acts as a giant mirror of light and heat. It also adds additional heat to the water tank.

At night, the reflectix material does the opposite, since its positioned above the water tank, it reflects the heat stored during the day in the tank back into the green-house!

**It's really cool!** And if you use the material like the Poly Keder, which keeps in 60% to 95% of the heat, you're going to be picking strawberries even when the ice-age hits.

# Thank You!

Thank you for reading this book and making a bold step in the right direction.

If all the steps in this guide seem slightly overwhelming, don't worry, just follow them one at a time, and you'll have a dome very quickly. It took me just 1 month to put together our giant 4V 40' Dome, and I was only working a few hours a week on it. I did most of the wood cutting by myself, and had friends help me with the foundation, the staining of the wood, and the assembly.

If I missed something in this guide, I will find out soon enough from readers and update the book.

I wanted to get this book out really quickly so I didn't' bother making it "perfect", that would take forever to get to you.

I will be updating it with new techniques and discoveries as they come along.

There are some amazing breakthroughs lately in construction, like with the use of Industrial Hemp, currently I'm heavily underway of researching the use of hemp for constructing **living domes** for very cheap, and will most likely publish that material soon!

Make sure to sign up for my newsletter at KacperPostawski.com for updates on everything cool I create for your benefit.

Enjoy your dome, please go out and build it, and be an example of what life on Earth can be like when you have your own **Eden Biodome!**

**~ Sincerely, Kacper**