



Building SeaChar.org's Estufa Finca 5 Gallon BioChar Farm Stove

*Alpha 0.4 Release
for
Antioch
BioChar Stove Building Workshop*

Photos & Workbook
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Larry James (Wulf Design)
Photo journal workbook © 2012
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Alpha 0.4 Release (for Antioch University Seattle)

a special thanks to Art Donnelly at SeaChar.org for development of the Estufa Finca 5 Gallon Farm Stove design.

this photo instruction manual is for SeaChar.org's Estufa Finca 5 Gallon Farm Stove.

Please visit SeaChar.org and make a charitable donation for their efforts in developing and deploying this stove worldwide. I personally recommend a *minimum* of 10% or \$10 per stove (whichever is greater) to SeaChar.org organization directly on their website at <http://seachar.org>.

as for me...

I'm doing an experiment in "crowd funding" my outreach work in providing instruction and support in building these and similar stoves as well as others wanting to put on their own workshops.

if you have found this photo instruction manual useful please send \$1 CASH per stove to the address on my blog page. <http://wulfdesign.blogspot.com/2012/11/biocharstovebuild.html>

You can use these instructions to teach a class, workshop, etc. please send \$1 per stove built or kit provided.

You may print up a physical copy of this document please support the effort it took to get it into a printable form with a \$5 donation per printed book.

Regards,

Larry James
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<http://wulfdesign.blogspot.com/2012/11/biocharstovebuild.html>

As with all things fire...

use caution when dealing with it. have a way to put it out with either a large bucket of water, a charged hose, or better yet both.

we hold no responsibility if you end up burning your house and/or neighborhood down.

provide plenty of clearance around your stove clear free from flammable material. (as well as no trees/structure above)

it should go without saying, but only use **OUTDOORS**.

there are other operational and stove build safety tips that will be addressed during the workshop.

other than that, this is a great way to make biochar as well as replacing your backyard BBQ and having a virtually smokeless fire pit.

this is a evolving document that is currently in Alpha 0.4 release so please forgive typos, a few missing pictures, and instructions.

however you should still find it a extremely useful resource especially if you haven't built a stove yet or are trying to teach in a group setting.

there will be additional resources links available on my blog page. (workshop outline and setup, instructions for instructors, tools and materials lists and spreadsheets, etc.)

Check out the Estufa Finca BioChar Farm Stove Users Group at <http://groups.google.com/group/biochar-farm-stove-users-group> to hook up with others whom have built the stove.



5 Gallon Metal Bucket



with Lid



Wear Gloves



Ouch!



Remove Gasket



Stove Lid Cutout Template



Scribed Lid Cutout Pattern

More lid cutting
pics here

Cutout Lid to look as follows

[More Lid Cutting Picts here](#)



Pre-Prepped Lid - Cut along Lines



Lid Cut out - Done



1/2 #10 Tin



Lid with #10 Tin for size



Use Lid tab tool (or Linesman Pliers)



Bend Tab to a little more than 90 deg.



Lid Cutout w/tabs Bent



Lid w/Tin - outside view



Lid w/Tin - inside view



Drill Tin Lid Rivet Hole



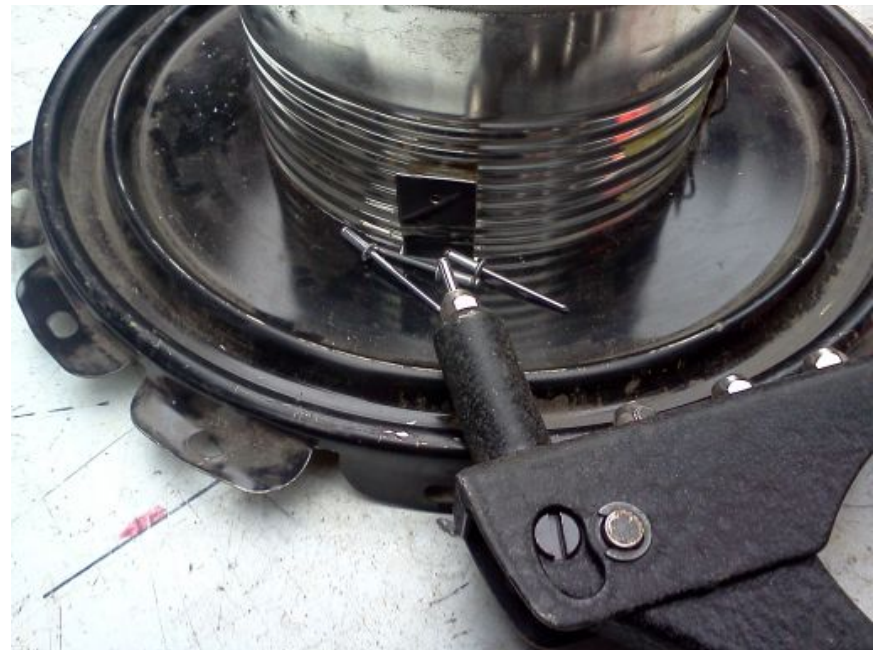
Rivet & Gun



Insert Rivet into Gun



Inserted Rivet into Gun



Position Tab Rivet



Align Rivet & Push



Rivet Tab to Tin



3 clicks to Rivet



Lid Rivets Complete - outside view



Lid Rivets Complete - inside view



Stove Lid w/half #10 Attached



Lid Handle Length 14in.



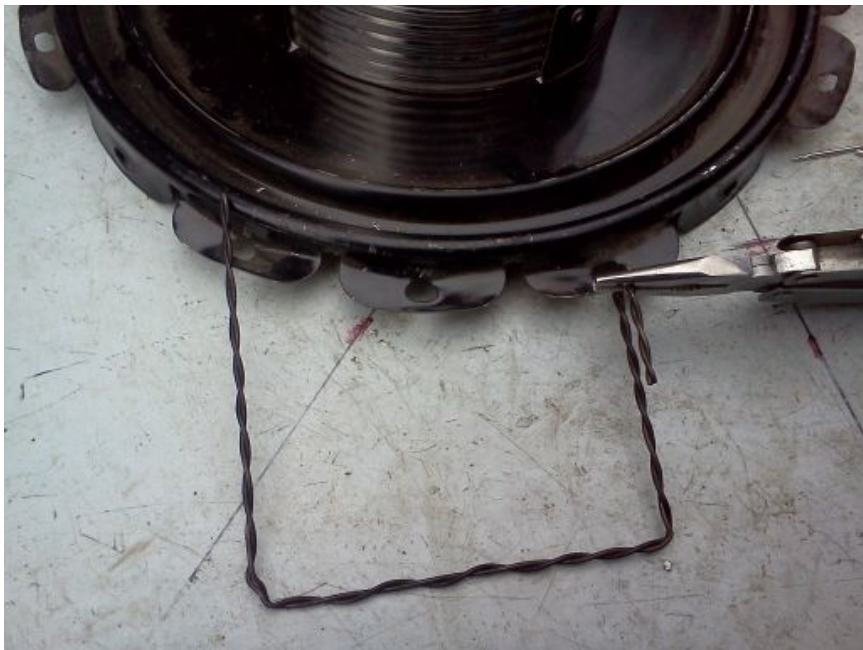
Bend to Match 3 Tabs Across



Lid Handle Bend Length



Lid Handle Bend



Use Needle Nose to Gap



Bend Both Sides to Wrap w Thinner wire



Bend Both Sides



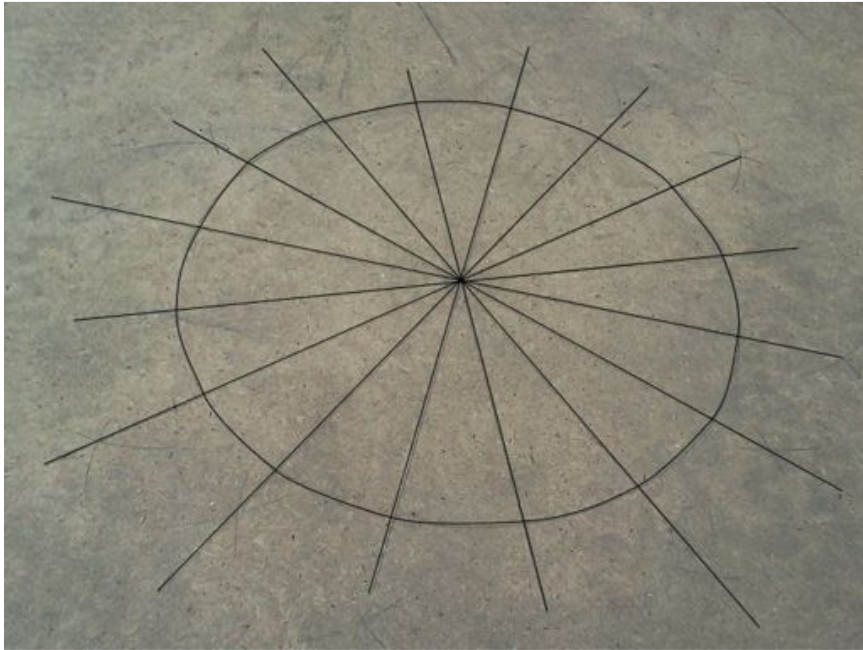
Bend Handle to Lid & Wrap wThinner wire



Handle Spot Weld Removal



Second Spot Weld Removal



Stove and Cook Top 16x Hole Pattern



Wrong Side!



Use Right Angle to Scribe hole pattern
This is also a good time to remove
any labeling on the outside of the bucket



Secondary Air Holes Scribed



Drilling Stove Secondary Air Holes



Sharp Burrs on Back of Holes



De-Burring Tool Set - Full goggles are better



De-Burred Holes



Inside Edges Still Sharp - Use Round Rasp



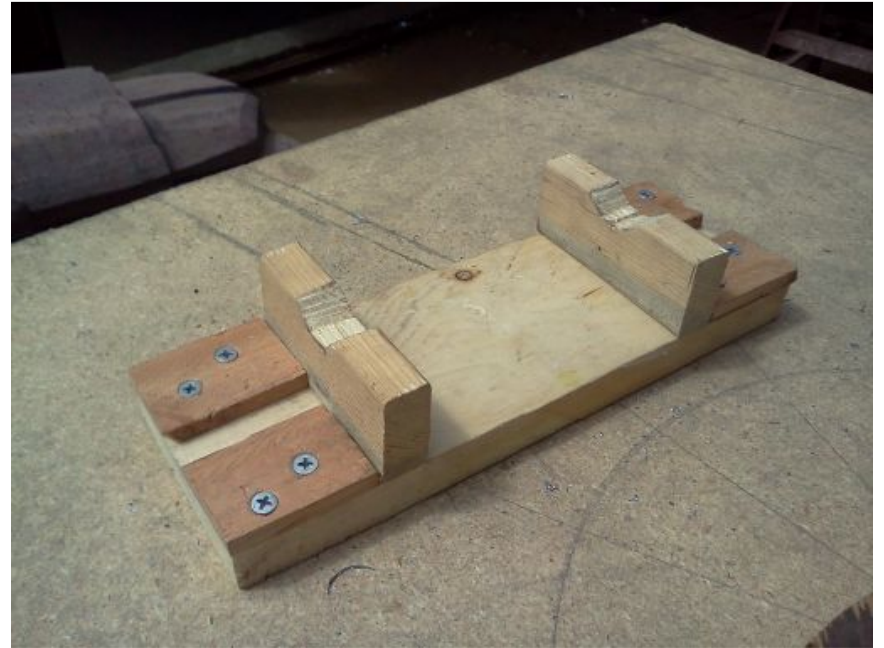
Primary Air Hole Tools



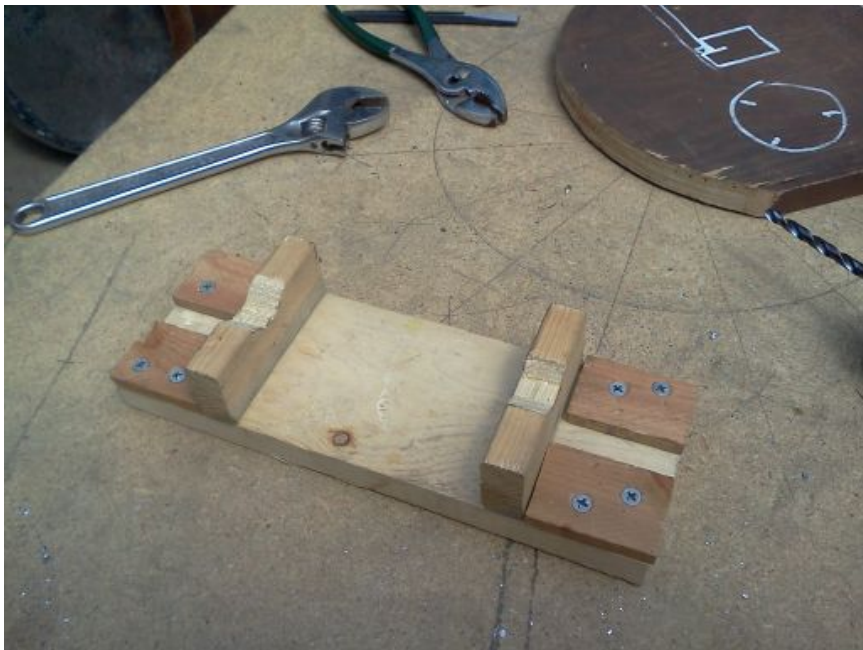
Chisel Primary Air Holes



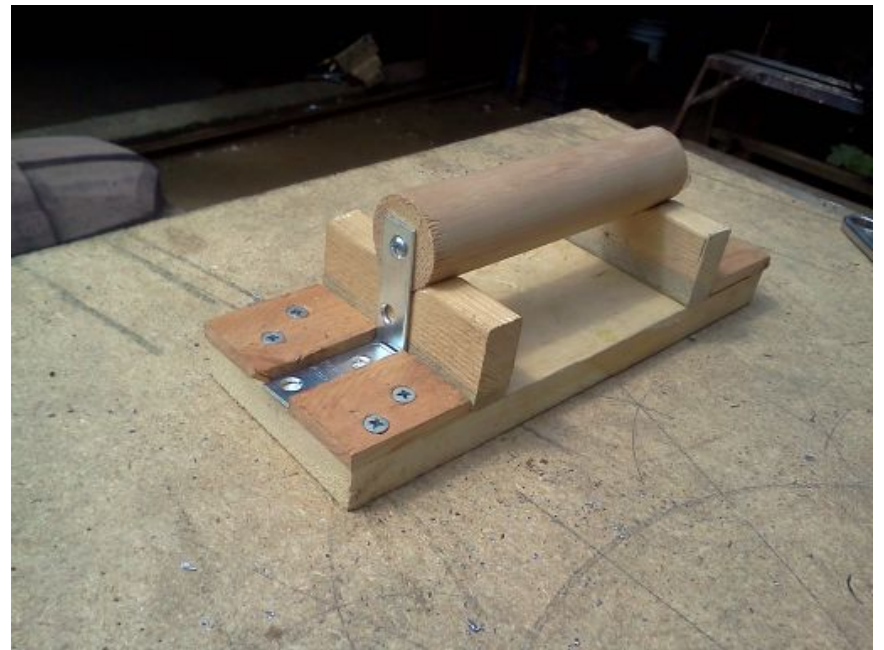
Evenly Space 32x - 34x - Primary Air Done



Stove Handle Jig - not needed but handy



Stove Handle Jig Too



Stove Handle finished in Jig



Stove Handle w/Jig



Stove Handle



Test 4 size 1st!- lap ~1in w/new shrouds



Use Vice Grips to clamp ends (not shown)



Drill & Rivet ends & center in turn



Make sure at least 1 side is aligned even



w/o vice grips you can hold w/2 people



Just Make sure the holes stay aligned



Align large and small shroud pieces



Vice Grip together, Drill, and Rivet



Lap Shoud around Bucket and mark



Use Wires to hold - better yet use Vice Grips



Use 2nd Wire (or Vice Grip)
Mark w/sharpie for alignment
Remove Bucket and Spacer from Shroud



Position to drill through center of both shrouds



Use Vice Grips - Drill & Rivet in Turn



TIP! - Test to make sure your handles L bracket holes will not interfere with the shroud holes you are about to drill.



Align to Line and Drill Shroud End
Should center adjoining pieces
and be flush on one side



Drill Shroud End



Rivet Shroud End



Align & Drill other Shroud End



Rivet other Shroud End



Drill Center



Rivet Center



Install Handle as shown
Drill and Rivet Ends of L Bracket first
Then Center. Should go through center
of both joined shroud pieces.



Roof Flashing on stove body



3/4in Jig for Correct Height



1/4in nuts and bolts 1-3/4in up



Better Yet - Clamp Shroud to Stove Body



Clamp Shroud to Stove body then Drill



Fasten on back side - should be centered in rim



3x Bolts Equidistant ~ 5 Valleys Apart



Ready to Light - Pallets on End w/kindling on Top



Lighted - I put lid on early to help funnel flames



Gout of Flame - Maybe Too Much Wood



First Burnout Paint Smoke - Really BAD for you!



Keep up Wind - Smells Until Burns Paint Off



Biochar Stove Works!



Nice First Burn!



Workshop Built Biochar Stove



Art Explaining the finer points...



Handle Spot Weld Removal



Second Spot Weld Removal



Stove and Cook Top 16x Hole Pattern



Use Right Angle to Scribe hole pattern



Secondary Air Holes Scribed



Drilling Stove Secondary Air Holes



Burrs on Back of Holes



De-Burring Tool Set



De-Burred Holes



Inside Edges Still Sharp - Use Round Rasp



Measure 4in down



Mark Cut line (Scribe works best)



Should be a level 4in all way around



AirBase and Chickens



Prep just like the stove body before you cut



Measure for re-bar install



5in across and Centered



Notice gloves that should be worn



Drill centered re-bar pilot hole - use smaller bit



Should be centered between top and ridge



Finish up with Step Drill
(make hole only as big as needed)



Measure for size (too big a hole is no good)



CookTop Holes same as Stove body (+re-bar)



Re-bar holes sized, centered, and installed



CookTop Pattern Closeup - rebar holes to be 3/8in



Drilling Cook Top handle holes



Drilling 2nd Cook Top Handle Holes



Stove Handle Sizing - (cook top as well)



Cook Top Handle Install

More AirBase Build
pics here

[AirBase Picts Here](#)



Stove w/cooktop & Hydro grill



Biochar Making BBQ



Veggies & Corn



Boiling water in 3-5 min



Bratwurst & Corn



Stove at Night - Fin