



# DELEGATION SHEET



Build a person-powered cardboard boat that is capable of completing one trip around a 200-foot course. Much of this information was gleaned from the Web and my personal experience.

Along the way, you will enjoy encountering and dealing with many small details. But look ahead to the satisfaction of knowing you accomplished something that most people won't even try -- building a boat made of corrugated cardboard.

First things first . . . start with some objective in mind. Maybe you want to build the fastest boat at the Regatta. Perhaps you are more interested in one of the Judges Awards for design or eye appeal. Maybe you want to win the Best-Dressed Team Award or the Team Spirit Award. Perhaps you want to get on television or be the featured photo in the newspaper. Or just maybe you want to take home the Titanic Award for the most spectacular sinking.

Next . . . start with a design idea, a vision of what you want your cardboard creation to look like. But consider this first -- it doesn't have to be a boat at all! It can be any design you like or want to try out. We've had jeeps, exotic cars, full-scale pickup trucks, school busses, fire trucks, and other vehicles. We've seen space shuttles, Elvis on his guitar, beds, foldout soft drink cans, personal computers (with a mouse that trailed in the water), a raft with a trailing shark fin, a floating outhouse, a taco, a bratwurst, a giant Tootsie Roll, Tessie the Loch Ness Monster, Deidra the Dragonfly, the Statue of Liberty hand (from "Planet of the Apes"), and so much more. Oh, sure, we've had lots of boats too: submarines, aircraft carriers, PT boats, lake freighters, pirate ships, the Exxon Valdez (with simulated oil slick), and so on.

Try this to save time . . . build a model using a manila folder or other heavy paper or lightweight cardboard. That way, you can fold, re-fold, and fold again to your heart's content. You can cut it up, glue it together, and try out your design idea in small scale before working on a full-sized creation. Or you can throw out an idea that sounded great, but just won't work, then try something else before you have wasted any cardboard.

How about a little science? If you want, you can toss in a little physics or other sciences. Maybe you will choose to calculate the displacement of your design idea so that you will have some certainty about the buoyancy of your design. Here's the basic number: a cubic foot of water weighs about 62 pounds. That means that a 180-pound man will float in a boat that is 1 foot by 1 foot by 3 feet -- of course, that could be a bit uncomfortable! But at least you would know just how much boat you will need for you (and your crew) so you don't overdesign it and add unnecessary weight.



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Then again, how about some art? Perhaps you have a really creative idea, maybe something that nobody has done before. Unless you get your kicks from putting in lots of hours and making discoveries along the way -- hey, sometimes that can be great fun -- you may want to at least try out that unique or innovative idea in model form. If you want to put a palm tree in the middle of your "desert island," be sure you won't make the whole thing top-heavy -- unless, of course, you are trying for the Titanic Award.

Now, go full-scale . . . but first, think about this: make sure your creation will be able to get out the door of wherever you choose to build it. We have many tales of woe about boats that had to be dismantled -- or even trashed and rebuilt -- just because no one thought about the size of the boat and the size of the door.

Hmmm, where to get cardboard? At some Regatta sites, the local organizers bring in a truckload of cardboard so that boat builders can buy it. You might get cardboard from appliance stores. The shipping boxes for refrigerators and big freezers can be good possibilities. Maybe you can get boxes for TVs, bedding, bookcases, or other furniture. Of course, you can also use smaller sheets and glue them or fasten them together.

Creative problem-solving is the name of the game. Whether you get your creative insights from methodical effort or from wide-ranging trail-and-error, building a cardboard boat can be -- no, make that, will be -- both fun and challenging.

FYI -- there are no plans, no pre-set designs, no step-by-step instructions here . . . no recipe cards, no fill-in-the-blank formats. The first ingredient in cardboard boat-building is creativity. The second important ingredient is problem-solving. Then there is cardboard, of course -- and it has to be corrugated.

Hey, maybe you are more the "wing it" type -- okay, get some cardboard, fold it a little, cut out any excess here and there, add a little glue or duct tape, maybe some paint or water sealant, and presto-chango, you have a boat for the Regatta.

Let's see, other materials . . . you can use glue and tape. You can use paint and water sealant and other stuff. But first, take a look at "The Rules" to find a short list of substances that are not to be used. We're not trying to make it tough on you, but we are steering you away from stuff that is toxic, either for you or for the environment. There is also a difference in the materials that are allowed in the Class II cardboard creations, so be sure to check out that section of "The Rules."



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Handling cardboard -- you will find it easier and more fun if you keep in mind a few tips.

You can have strength and still keep your boat light if you laminate layers of cardboard. In fact, try placing one layer so that the corrugations run in one direction, then placing the second layer so that the corrugations run at a 90-degree angle to the first layer.

To fold cardboard across the corrugations, consider scoring the line of the fold with the butt end of your utility knife or other rounded edge of a tool. Handle on a small Crescent Wrench is great as well.

Don't step on your cardboard! If you break the corrugations -- well, think about it. Make up some 12"x12" laminated squares of cardboard to stand on for hard to reach center work.

To keep your cardboard dry, don't forget to seal the edges. Wrapping the boat with brown wrapping paper just before waterproofing. If water gets into your corrugations, you can have great fun watching it get drawn through the corrugation just like in a drinking straw. That may be okay when you have time to do something about it, but if you see this happen in the middle of a race . . . !!

Here's a bunch of other items to think about.

A flat bottom is recommended. A V-shaped bottom is likely to tip over unless the V is very gentle.

The lowest center of gravity is the most stable; sitting high or standing will cause you to tip over.

Longer boats go faster, but they are harder to turn. Boats shorter than 10 feet are difficult to steer.

For height, allow about 18 inches for you to sit and paddle effectively without the edge of your boat blocking your arms.

For width, figure about 18 inches for a kayak, about 23-24 inches for a canoe. Figure about 30 inches maximum for 1 person, 48 inches for two people.

Paint all the surfaces before gluing, caulk the edges, then glue. 2"x12"x12" concrete pavers from Lowe's make great clamps for this type of work. (Sealing your cardboard



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and edges will make your boat go the distance with out that it will delimitate when wet.)

Avoid oil-based stains, caulk, and glue because the oil soaks into the cardboard, may never dry, and this weakens the cardboard.

Duct tape shrinks when it is painted.

Clear tape melts when it is painted.

Reinforced paper tape works well over caulked edges and seams.

Forget about "glue guns" because that type of glue melts on hot days. Yet the can be used with other glues to tack things while the other glue sets up.

Hey, some of the fun is in the discovery. So that's it for tips. Now go for it! Keep in mind the other lessons you learn along the way. That will make building your next boat just that much easier.

Have fun! Be creative! If you can dream it, you can do it!

Possible materials and tools. (Working with boys I suggest water cleanup sealers, caulking and paints. While not as waterproof they clean up fast and easy)

Sharpie Marker 5 pack school special

Staples Gum Tape Much better than other tapes.

Farm and Home Strap Ratchet 27' to secure the load while in transit.

Big Plastic Tarp to cover the boat when bad weather hits before the race.

Gloves for paper cuts and for painting and gluing.

Lowe's Contractor Paper Roll 36" long

Gallon of Titebond III Glue Lowe's

Liquid Nails Latex caulk Adhesive

Dollar Tree Paint Set roller tray and brush

Lowe's Thompsons Water Seal gal (water cleanup)

Lowe's Paver Stones 2" x 12" x 12"

Polyurethane water base water proofer gal sand between coats (never used)

Latex House Paint (water cleanup) gal color

Oilbase House Paint (hard cleanup) gal color

Rollers Paint Brushes

Tape Measure

3" and 4" 8' long 1/2 plywood straight edges great for bending cardboard as well.



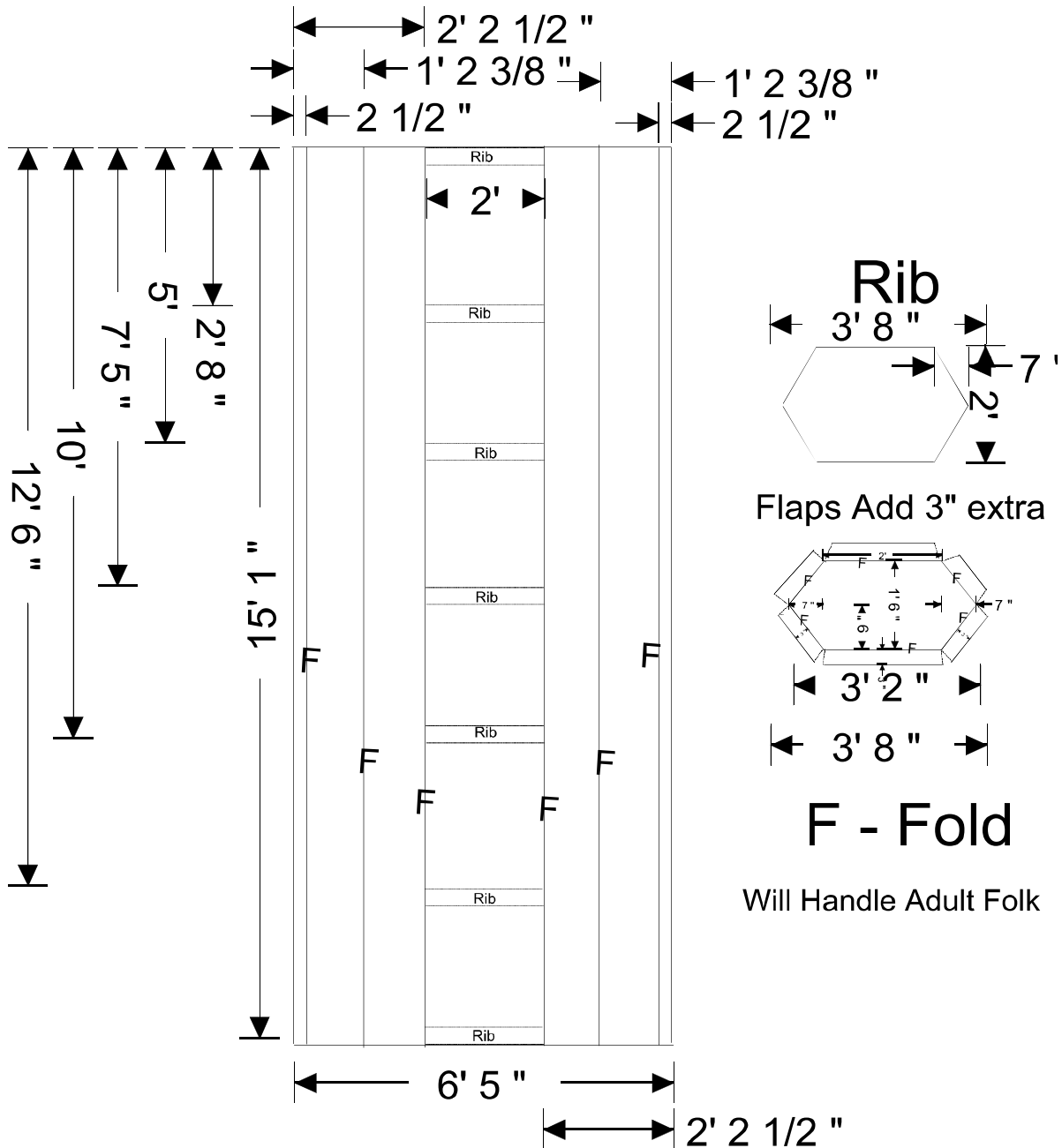
# DELEGATION SHEET



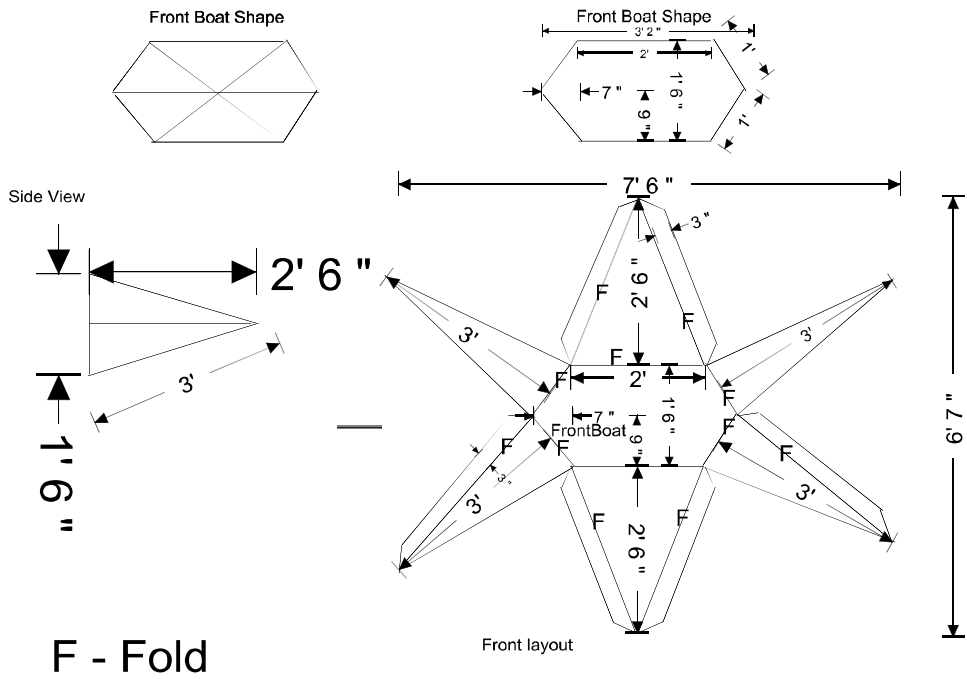
Fine thread Drywall Screws 1" long (becareful not to leave any in the boat)  
DAP Acrylic Latex silicon caulk (water cleanup)  
Tsquare drywall square saves time in layout.  
masking tape roll used as clamping  
Painters Tape roll painting decals  
Cordless Drills and drivers (star head deck screws don't strip out as easy)  
Utility Knife plastic cheapo with breakoff ends is best tool from my experience.  
Card Board Sheets laid down on floor for protection of boat and knees.  
small Crescent Wrench 4"  
Detail drawing of boat  
Manila folders for model boat folding it (Doing this will save you hours of mistakes)  
4" long slices cardboard to go over seams  
Titebond wood glue not waterproof for above water art.  
3" slices of cardboard for inside cavities to give support for inner walls.  
90 degree 6" wide pieces of cardboard to reinforce bends and 90 degree ends  
Tarp for Floors and work areas.  
Small Rags for cleanup (Old t-shirts make great rags)  
Bucket of water for cleanup  
Small Bowl of water for paper tape  
Trash Container  
Sisors for tape  
I keep one pair of clothes I change into when building boats otherwise you will have many pairs of ruined shorts and shirts. I keep this pair handy near the door when I go into the shop



# Alienator1 Cardboard Boat Layout



# Cardboard Boat Layout Alienator1 Front of Boat



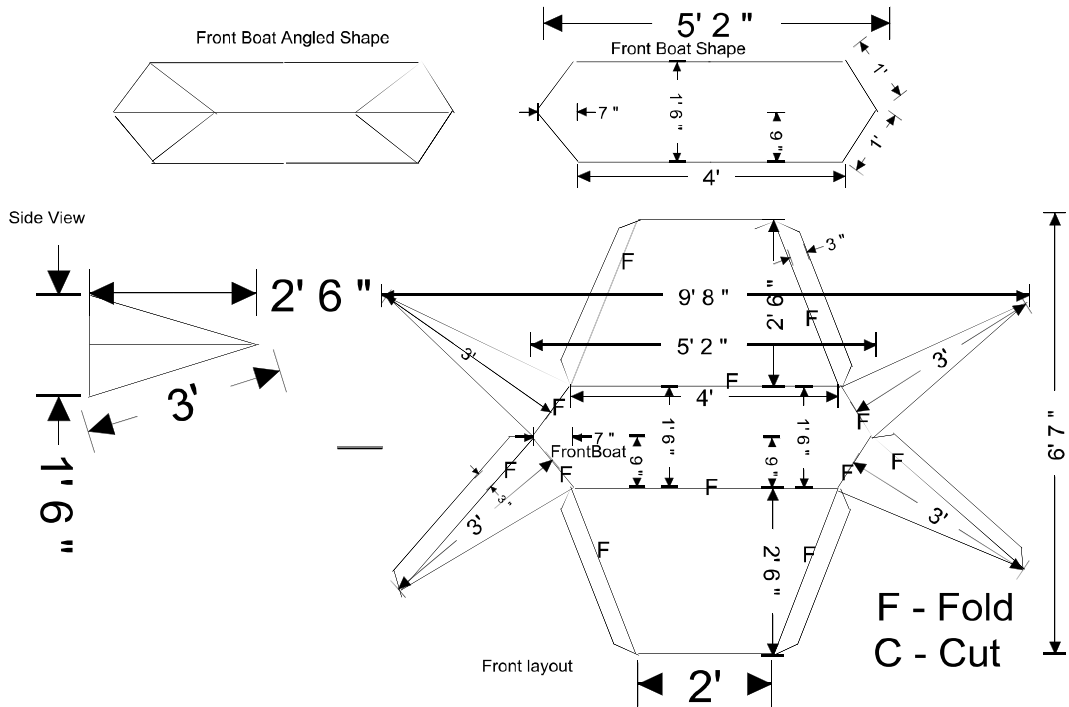




# Cardboard Boat Wide Layout

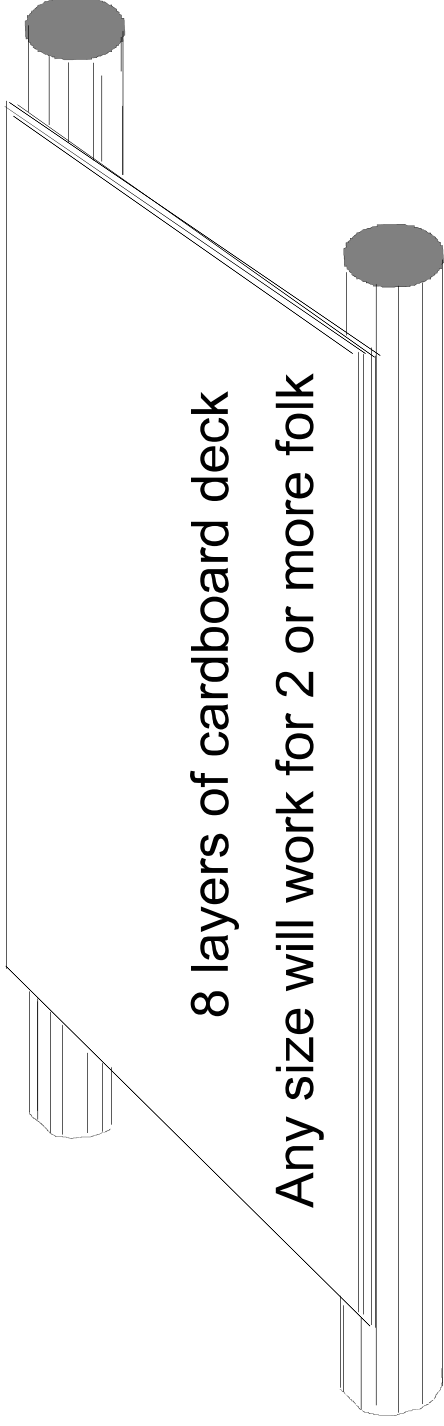
## Alienator2

### Front of Boat



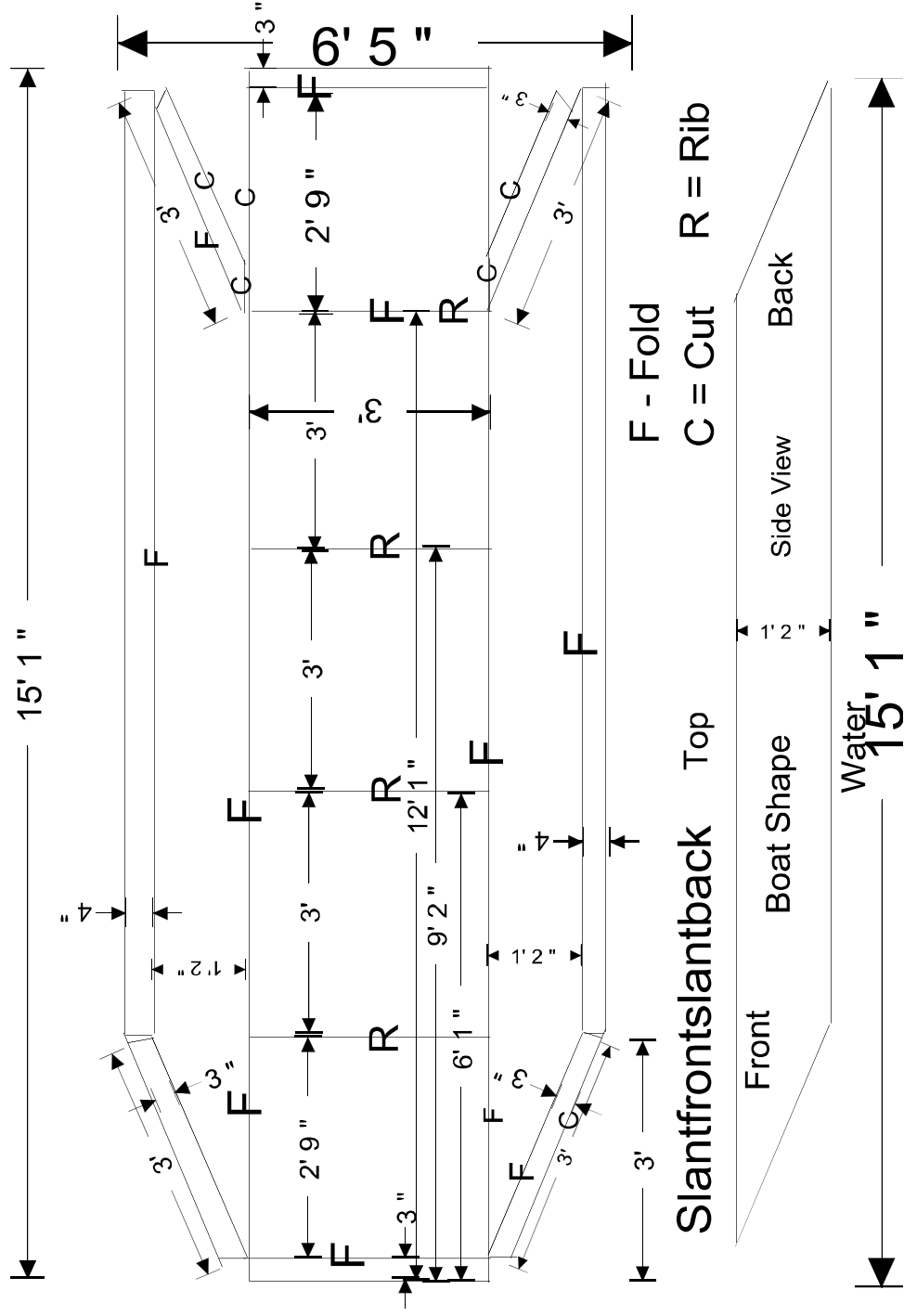
# Pontoon1

## Carpet Tubing NO FOAM Sealants



C

# Cut 2 of these and turn one around and fit over the other one



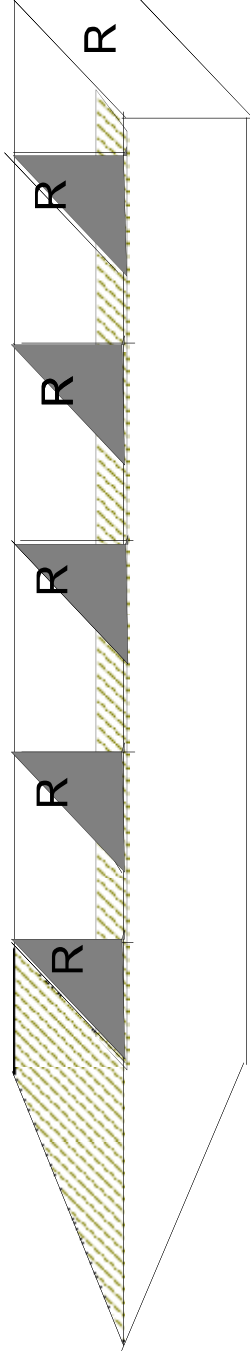
**F Cut Base to fit inside of boat F**

Glue in before Assembly

2' 11"

One End Slanted  
Make as long as you want

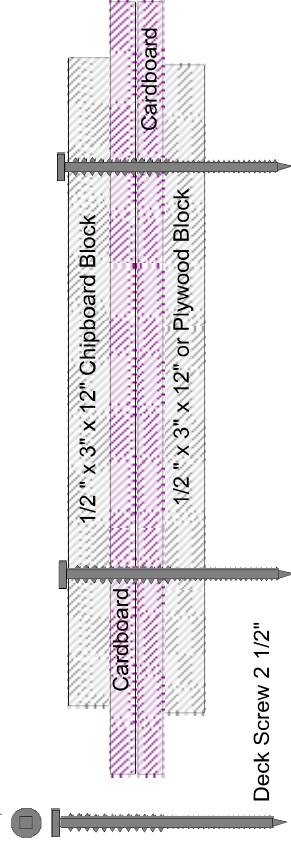
Top



R = Rib  
C = Cut

Deck Screw with 2 different threads pull the plywood blocks together drawing the cardboard up tight to form a good clamping pressure.

Using the square socket screws with a self tapping end and a cordless drill makes fast work  
Boys may need help applying enough pressure to keep the square driver from spinning in the socket rounding the head out wasting the screw

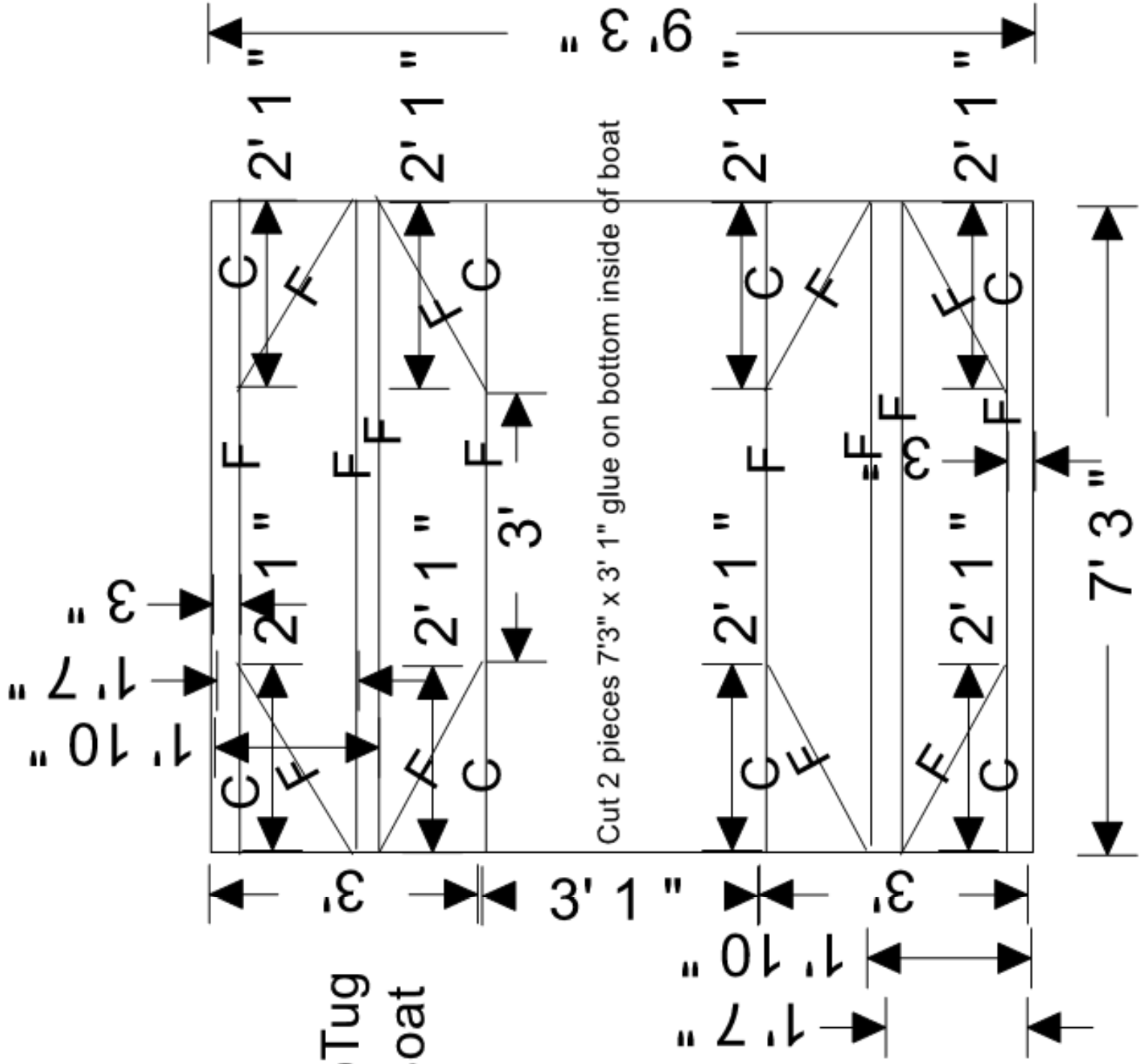






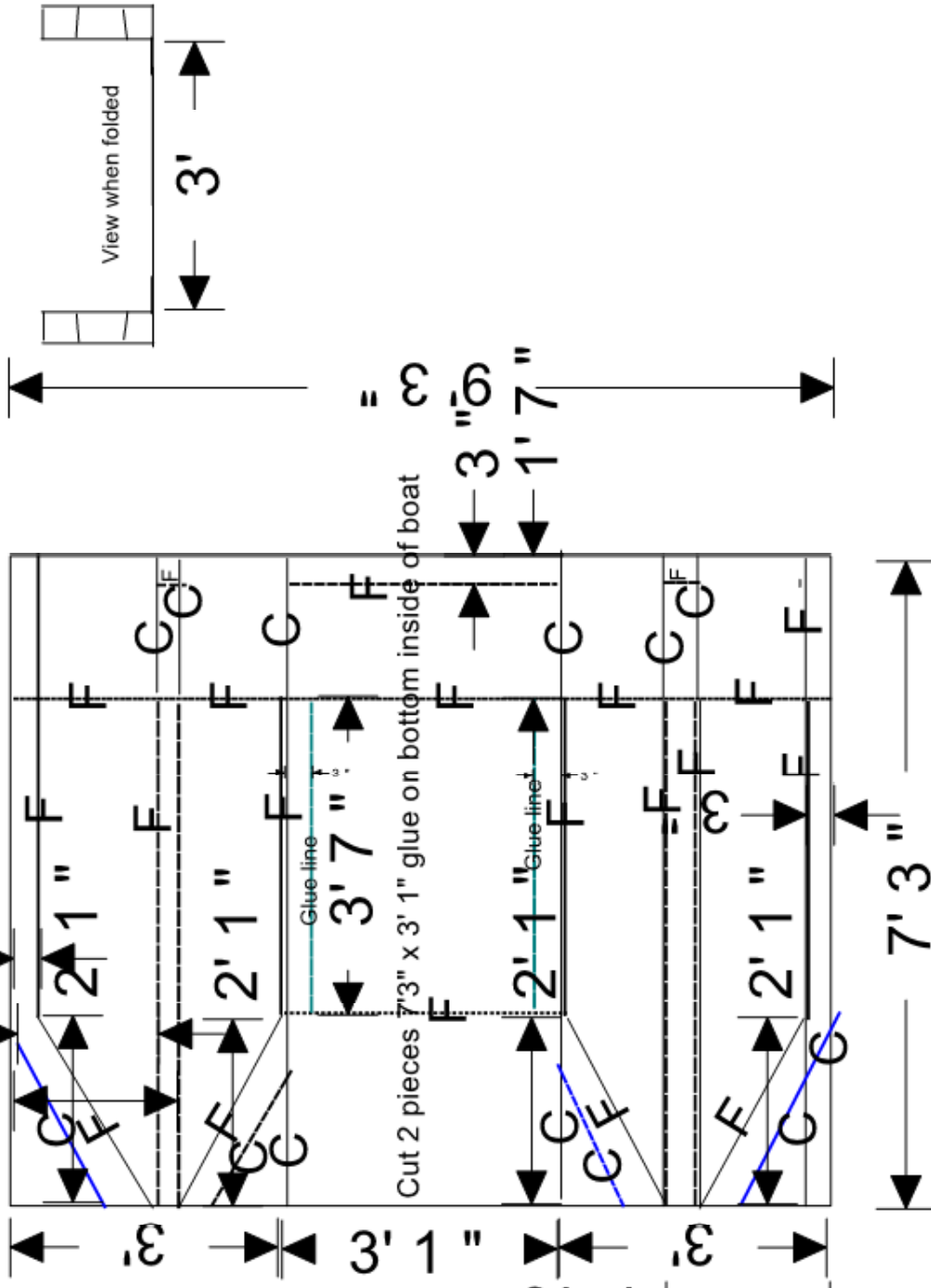
Discovery TwoTug  
 2 Person Boat  
 88" x 112"

C = cut  
 F = Fold



Recommend to print this out on manila Folder and fold it  
 Cut 3" wide pieces for inner wall support

cut one more sheet 3' x 10' for the bottom inside and over the front bow.



Discovery TwoTug Straight Back  
 2 Person Boat  
 88" x 112"

C = cut  
 F = Fold





# EVENT RULES



## **SW DIVISION ROYAL RANGER Wet n' Wild CARDBOARD BOAT REGATTA**

### THE CHALLENGE

Each team is to design and build a 2 or more person powered corrugated cardboard boat capable of completing a racing course while being under attack of water balloon launching. **(You are responsible to salvage/remove all cardboard and take all that you brought back home with you.)**

If you want to come down Friday night and camp through to Saturday afternoon we have the cove reserved. Other Church folk females, moms and friends that want to camp and watch the race will have a special campsite or will need to make their own arrangements with the Park Office. I still need to know if you are attending. Bring your own food, drink and gear.

**Entry Fee: \$10.00 per boat. Other Pow Wow Fee to be announced later.**

(THE RULES (Well, most of them anyway. I also reserve the right to change as needed as this is the 14th year of our doing this.)

A. We would like each team to build a boat and remember, the idea is to explore the inherent characteristics of corrugated cardboard. (Team/Outpost must provide their own cardboard) Judges will disqualify boats which contain: any other foreign materials which significantly contribute to the structural rigidity of the boat (2 by 4's, metal tubing, plastic tubing, etc.). Hard Card Board carpet tubes are accepted as cardboard.

B. The boats will have to be powered by at least two boys AND **NO MORE THAN ONE LEADER/PARENT per boat.** More boys/girls is a lot more fun. Ranger Kids may have one Adult in the boat.

C. The entire boat - including hull, superstructure, and seating - must be made entirely of cardboard. Any thickness is permissible: however corrugated cardboard bonded to other substances (like vinyl) may not be used. (3 layers is recommended)

### **No Foam Products Allowed!**

D. All crews must consist of friendly and reasonably warm-blooded characters (Boys/girls ) that must wear life jackets while in the water. Outpost are responsible to provide their own life jackets.

E. The hull may be water proofed with any paintable one-part substance. That means no epoxy glue, fiberglass resins or other two part varnishes, or paints. These two part finishes normally require the addition of a catalyst or hardener. **The hull may not be wrapped in plastic, shrink wrap, duct tape, or anything else paper products only.** Only seams or joints may be taped, not the whole boat. Absolutely no use of tar based substances will be allowed. A cordless drill and a dozen sets of 5/8x4"x12" plywood and some deck screws make a great set of clamps for surface gluing and or weights.

F. Propulsion/steering systems - While the propulsion and steering systems may be made of materials other than corrugated cardboard, they may not in any way



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significantly contribute to the structure rigidity of the boat. Therefore, any long, rigid, triangulated, or otherwise stiff member may not be used in conjunction with the propulsion or steering system. Materials other than cardboard may not connect the propulsion, seating, and steering systems to one another. Use of Wooden oars/paddles is accepted

G. Your boat must be easy to get in and out of, should it become an unintentional submarine, be free of sharp pointy objects and edges or anything else that could be a menace to you. Crews will be asked to fix sharp edges before they will be allowed to race.

H. Some safety matters - All human occupants of the boat must wear shoes or other footwear with a substantial sole; flipflops are a waste of time. Individual occupants or entire boat crews may be disqualified if their ability to perform safely in the water is impaired. **NO ROCK THROWING PIEROD!**

I. The various Regatta mates will lob water balloons at the racing boats while the boats is making way through the course.

**Materials: Cardboard, Duct Tape, Paper Gummed Tape, Elmer's interior/exterior glue you will get a lot more coverage if you thin it 30%, Paraffin Wax, Paint, Rope, String, Thompsons Water Sealer or like product, Package Wrapping Paper Card board carpet Tubing.**

The Course is at Stockton Lake. Preregistration is required. Contact Mark Jones, 417-343-0463 leave me a message how many entries, name and number or E-mail me at [markjonesranger@hotmail.com](mailto:markjonesranger@hotmail.com)

Registration opens at 9:00 a.m. on Saturday morning with the event to get under way at 10:0 am. A short devotion and we will have a Card Board pontoon council fire to light and burn for this service... I hope I got those two boxes sealed up good.....blub. blub...blub..might be a titanic council fire...hum...anyway at registration we will interview the captains of the boats to briefly explain their boat and introduce their crew mates.

Two or more boats will be lined up at the waters edge. With a red cone back up on the shore 15 feet. A Ready Set Go will sound and the boats are to be launched by the crew mates while one mate runs to a cone touches it then they paddle the boats across the cove about 300 feet where the boat is piloted to with in 15 feet along the shore of the cone then one mate leaves the boat and touches the cone and then gets back in the boat and paddles back across the cove around the water balloon gauntlet returns back to the starting point may leave the boat only with in 15 feet of the tarped shore line and must then touch the cone. Time stops when the cone is touched.

Walking of boats along shore will cost a one minute penalty to be added to the over all time for that boat. For example if a boat misses the staging area 15 feet from the



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cone and they push the boat along the shore to get back to the staging area then a penalty will apply.

No one will be allowed to jump from the front of a boat. Always exit from the side as a moving boat will run over anyone in front of the boat.

## **All cardboard and balloons and trash must be picked up and put away before ribbons and trophies are given out**

Each of these groups RK-DR, AR-ER will be awarded the following awards.

Speed

**First, Second, Third** place awarded to the top three finishers in each age group with the least time to complete the course. (*Assuming that we have three finishers*)

Extreme Design 1st-2nd

The most spectacular looking boat, **taking into account creative design** and best use of cardboard.

Titanic Award 1st-2nd

Most spectacular sinking. You must do a salvage of the remains

Team Award 1st-2nd

Most spirited and best-organized outpost. Looks don't count here!