

## RANGER MOBILE MATERIAL LIST

- 16 #6 1 1/4 zinc Phillips screw (attach belt, gussets,
- 8 1/8 x 1 1/2 Cotter Pins (wheel keepers)
- 10 1/2" washers (wheel bushings)
- 4 carriage bolts 1/4 3 1/4 (frame assembly)
- 6 carriage bolts 1/4 2 1/2 (seat bolts and rear frame assembly)
- 11 washers 5/16" 4 conduit straps 1/2" goes over the axles one screw each side.
- 6 5/16 lock washers (all nuts need a lock washer)
- 1 Machine bolt 3/8 4" (center pivot steering)
- 1 Machine bolt 3/8 5 1/4 (brake pivot bolt)
- 4 3/8" nuts, 4 3/8" lock washers, 8 3/8" flat washers
- 2 galv. 1/2" x 36" axles (Wheel axles)
- 4 10" lawn mower type wheels or pneumatic wheels see harbor freight.
- 1 rope 1/4 x 7' Nylon (Steering rope)
- 8 screws #6 2 1/2 zinc (steering limit blocks and seat 15 degree vertical post)
- 1 quart of Polyurethane Paint
- 1 quart Paint Thinner
- Sand Paper, 80, 120, 220
- 1 bike tire 11" x 1.5" long (brake pad)
- 2 2x4 x 8'
- 1 5/8 plywood 2'x6'
- 1 6' web seat belt (cut in half) or a web tool belt cost 2.99
- 6 1/4" flat washer
- 2 Black Bungees and 4 -1 .5" long screws and fender washers. .

Approx. Cost \$50.00 all items can be purchased from your local Lumber Yard. Sutherlands, Lowes. Ask your church to sponsor you.

### Ranger Mobile Ramp

- 1 3/4" 4x8' CDX Plywood (Deck)
- 1 1x12x8' Pine (Top Deck Assembly)
- 1 1x4x8' Pine (Gate hinge Assembly)
- 2 2x4x10' #3 (Support beams and braces and legs)
- 4 2x4x8' #3 (Support beams braces and legs)
- 24 #6 Zinc Screws 2 1/2" (2x4 joint connectors)
- 8 machine bolts 3/8x3" (Pivoting points)
- 18 flat washers 3/8"
- 8 3/8" hex nuts
- 8 3/8 lock washers
- 8' of piano hinges 1 1/2 x 8' long (gate hinge assembly)
- 1 lb #6 1 1/2 zinc screws (screws for deck)
- 1 quart of Green Polyurethane Paint
- 1 quart of paint thinner
- Sand paper 80, 120, 220 or (hook back round disks for power sander)

- [ ] 3 1x2x 8' pine (wheel keepers for edges and center on edge)
- [ ] 1/4" Nylon rope (Gate lever pull)
- [ ] 1 galv. self closing gate latch (Gate Keeper)
- [ ] 1 1 1/2" wide hinge (to attach to Gate keeper to deck)
- [ ] 3 1/4" 1" machine bolts (to attach hinge to pry bar)

## Ranger Mobile Assembly Directions

Take two axles and mark 6 hole locations.

1. 1/4", 2 3/8", 8 3/4" turn axle over and mark the other end. Now do same to the second axle.
2. Using a Vblock on a drill press drill the holes using a 1/8" bit. Be sure to clamp it down.
3. Clean all drilled holes with dremil grinder removing burrs and clean off any sticky tape with paint thinner.
4. Take one 8' 2x4 and cut 1 Center Frame 2x4x52" long. Cut a 31" frame axle from the remnant.
5. Take one 8' 2x4 and cut another 2x4x31" frame axle.
6. This step has been removed. Use 2 metal conduit straps with 4 screws much easier and faster and works better.
7. Position the 52" center frame in the center of the 31" frame axle (it will look like a T) and drill a 3/8" hole half way between the center and the edge of the 2x4 towards the back of the cart drilling through both pieces at the same time. This is your steering pivot. Put a 3/8" x 4" Machine bolt in this hole. Put 3/8 washer 1/2 washer 3/8 washer then through the axle frame then put on a flat 3/8 washer, nut, lock nut, nut.
8. On the back end of the cart put the other axle frame under the center frame (it will look like a T- use a Square) and drill two 1/4" holes through both pieces again. Stager the two holes at a 45 degree angle. Put on Washers lock nuts, and nuts.
9. Cut a 2x4 with a 15 degree angle on one end then cut it to length of 14 1/2" with a 15 degree cut on the other end as well. Both 15 degree angles run the same direction. Find the position of your seat by having your average driver sit on it and bend their legs like they were steering the cart. Mark the position of their back on the center frame and screw this 15 degree 2x4 end to the center frame. -----/-- It will look something like that. Keep it square!
10. Using the 5/8" 2'x6' plywood cut a 15"x43" seat and a 8 1/2" x 20" seat back.  
Drill 2 1/4" holes in these two boards centerline 2" from the edge for the carriage bolts.
11. Using the left over plywood sit it on edge and on top of the rear axle flush up to the 15 degree seat back support and using a pencil mark the position of the seat back support, the center frame support and the rear axle support. Then draw a straight line between the top to the back of the cart removing the waste. It will be a trapezoid each cart will vary depending on the position of the seat. Cut out your pattern and trace it on the scrap plywood thereby making two of this piece. Screw them in place placing 3 screws in each 2x4 along the edge. This really stiffens the seat and the cart.
12. Take your seat and seat back and position them on the cart and drill through the 2x4's and bolt them on using carriage 1/4 2 1/2" bolts, washers, lock washers, nuts. Boys love this work.
13. Take a 2x4 and cut it to 17 1/2" round one end. The other end cut a handle by removing all the stock except 1 1/4" by 4" to form a grip. Drill a 3/8" hole 8 1/2" from the round end centered in the 2x4. Take the 11" piece of tire and screw it using 4 screw and 4 washers to the bottom round section of the brake handle. Drill a 3/8" hole 4" in front of the Seat through the center frame support. Put the 3/8 x5 1/4 Machine bolt through this hole using 3/8 flat, 1/2 flat, 3/8 flat brake handle, 3/8 flat, nut, lock washer, nut.(I later drilled a countersink hole on the 3/8" hole to keep the bolt from sticking out.)
14. Drill two 3/8 holes, 2" from each end of the front axle support between the grove and the front of the 2x4. Put your steering rope in this using a Figure Eight stopper Knot.
15. The two axles are ready to put wheels on them. Do not use a hammer to tap them on. Sand the axle for a easy slide on/off. Put a cotter pin in the second hole from the end of the axle and bend it. Put a 1/2' flat washer on , put 10" wheel on, 1/2" flat washer, then cotter pin and bend it. The two other holes in the metal axle need to be drilled out just a bit to allow the 1 1/4" screws to go through them. These 2 screws lock the axle in place when it is put in the 1/2" x 1/2" slot and centered.
16. Cut two 2x4x4" blocks and place them on each side of the center frame support on the front axle support spacing 1/8 " from the edge of the 2x4. Using 4 of the 2 1/2" screws screw the blocks in place. (pre drill these as short boards can split) Now take the webbing and double it up on one end and place a screw with a flat washer just behind the seat in the Center Frame Gusset. Do the same on the other side. In the middle of the webbing cut it in half. That's your seat belt! Along with this block install one Black Bungee on each side of the Center Frame to the Front Axle 12" out and down install the other end of the Bungee to the Center Frame 12" down from inside edge of the front axle. (This will keep the cart running Straight)

- 17. Check all parts for tightness. Check brake. Let the boys ride it a bit and make sure all is ok.
- 18. If all is ok, disassemble the cart. Keeping your nuts and bolts and washers all handy. Take each piece and sand them on all edges. Prime and paint. Once dry reassemble the Ranger Mobile.

**Special Thanks to the Boy Scouts for foundational ideas and graphic input. I changed the axle design and width and added the Purchase list and Assembly Instructions.**

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**Dedicated to All Royal Rangers that are Ready for Anything!**

## Ranger Mobile Derby

Race Organizer..... \_\_\_\_\_

Registration: Paper for Racers Numbers and Registraion Sheet ..... \_\_\_\_\_

Registration Personal..... \_\_\_\_\_

Chairs for Audience..... \_\_\_\_\_

Concessions..... \_\_\_\_\_

Health and Safety First Aid \_\_\_\_\_

Safety Stop Baracades at lower end of Race Track..... \_\_\_\_\_

Two time keepers with Stop Watches at finish line to record times  
one with 2-way Radio and keeps race times with Start Line Raido \_\_\_\_\_

Two Gate Keepers to line up cars..... \_\_\_\_\_

Two Staging Area Men to get boys and cars ready for next heat..... \_\_\_\_\_

Have one Race Starter "READY SET GO" with Radio to start each heat  
race and is at Computer Table and keeps the race heat results with the  
Finish Line Radio Person..... \_\_\_\_\_

One Gate operator..... \_\_\_\_\_

1 judge from each Outpost Best Design Judges..... Chairman: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Race Announcer..... \_\_\_\_\_

Computer inputer.....

Pit Area.....

PA System .....

Track Setup and Lane maker and Starting Gate..... \_Chairman: .....

Heat Ribbons 1st and 2nd Place.....

Trophies.....

Radio or Media Contacted to advertise event.....

Devotion Speaker at start of race.....

Tools for Carts.....Aircompressor and tools.....

Electrical Cord ran out to Start Gate.....

Video Person.....

Photographer.....

Volunteers: .....

Volunteers: .....

Volunteers: .....

Mark Lanes with Chalk or Red Duck tape and rope off areas that need it.  
Have bales of hay at end of track to be sure mobiles stop.  
Report official times to Registration Team using 2 way radios if necessary.

The track should be a smooth surfaced parking lot or street with a gradual slope. Track length 150 to 500 feet plus stopping distance. Be sure to get prior approval to block off all traffic before setting up. The lanes should be marked with chalk or Red Duck tape. At no time the Ranger Mobile should be going faster than a 15 year old boy can run. Adjust the Track Accordingly. Crossing over from one lane to another will happen, especially with inexperienced drivers, but boys should be instructed to stay within their own lanes. Judges should observed the race for any short cuts. If a driver is fouled he/she should be assisted to continue the heat.  
Usually a ramp is used to start the cars. Ranger Mobiles start from a standstill, running down the ramp and the slope to the finish line.

**Racing Procedure**

The Derby is run in 2 to 3 heats. With races over 35 cars it is recomended to reduce the heats by 1.  
The average time determines the race outcome. The Racer with the lowest average racing time wins.

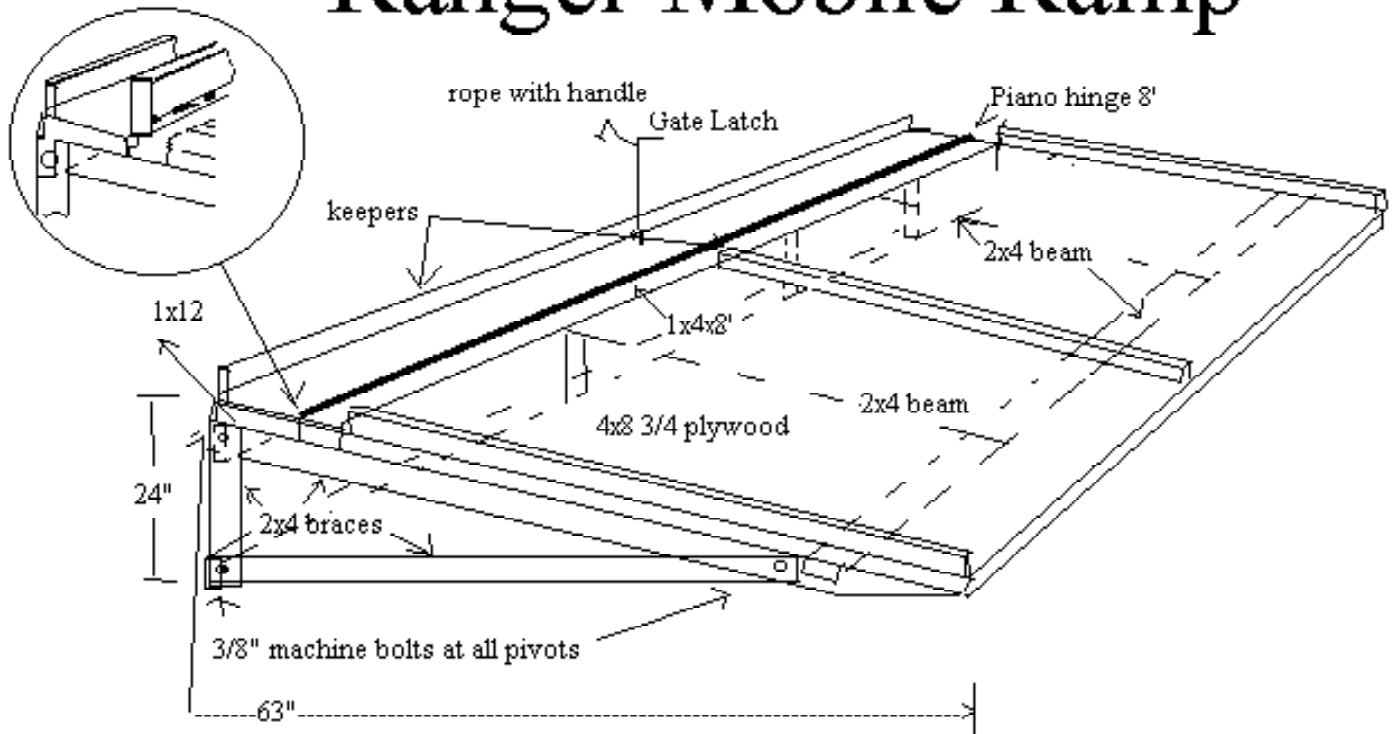
Bring the Ranger Mobile to the Pit Area where it is checked. Brake should be in good working order.  
The steering should not exceed \_\_\_\_\_ degrees. The Racers will need to go to the registration table and fill out a registration form. After the Racers are registered. A master list will be printed and roll call of the racers and at the same time a 2x4 Name tag will be stuck to their shirt pocket that displays their registration number and name.

If all Racers are accounted for a master list is printed and given to: Radio Operators at Start Gate and Finish Line and to the Staging Crew and one copy will be posted for the boys/girls to check when they will be racing. As the Racers name is called by the Race Announcer each Racer reports to the starting gate or Staging area and is helped into the Ranger Mobile and seat belt is fastened. All drivers must wear protective head gear such as football helmet, racing helmet, Long Sleeve Shirt, Long Pants, Elbow Pads and

Knee Pads. After driving the car the boy returns the car to the pit area and returns to the spectators section.

Each Racer will receive a 1st place or 2nd place heat ribbon. With Trophies or Plaque for the 1st, 2nd and 3rd, 4th place. Speed. Racing times. Also it is recommended a 1st, 2nd 3rd Overall place for Best n Show be given out as well.

# Ranger Mobile Ramp



## RANGER MOBILE FUNDRAISER FORM



Hi. This young man is asking for your help in raising funds for his Royal Ranger Outpost. Royal Rangers is basically Church Boys Scouts with a focus on Jesus, God's Son. He is asking for a donation from you to go towards the purchase of parts for a Ranger Mobile that he and 4 others will construct and participate in several races with other Royal Ranger Outposts in our area. If you would please help him to raise his funds as these carts are approximately \$50.00 Each giving a little makes a big difference. You will receive a STOCK Certificate indicating one share for each dollar you donate and a yearly prospectus on your investment in this Ministry. Take stock in your Local Royal Ranger Outpost.

Thank you for your time. This Rangers Name is: \_\_\_\_\_

Please contact: \_\_\_\_\_ if you have any questions.

Full Name: \_\_\_\_\_ Amount donated: \_\_\_\_\_

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Full Name: \_\_\_\_\_ Amount donated: \_\_\_\_\_

Issue Number \_\_\_\_\_

*This Certifies that \_\_\_\_\_ is the  
Registered Owner of \_\_\_\_\_ Shares of  
Outpost \_\_\_\_\_ stock.*

*This Certificate is issued on the \_\_\_\_\_ day of \_\_\_\_\_  
Year \_\_\_\_\_.*

*May God Bless you as you help us  
Reach, Teach and Keep boys for Jesus Christ*

# Specifications

Mobile can't exceed 50 pounds.

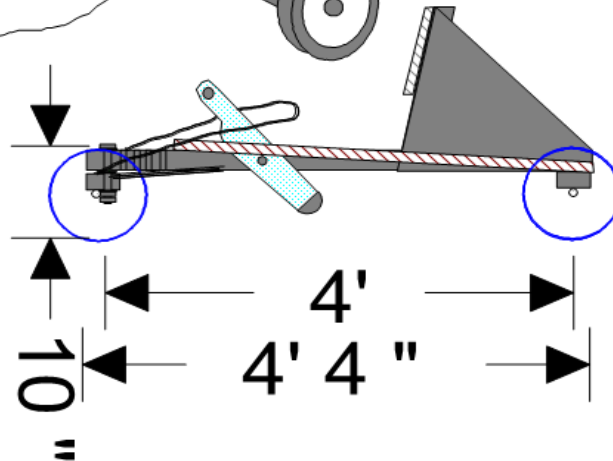
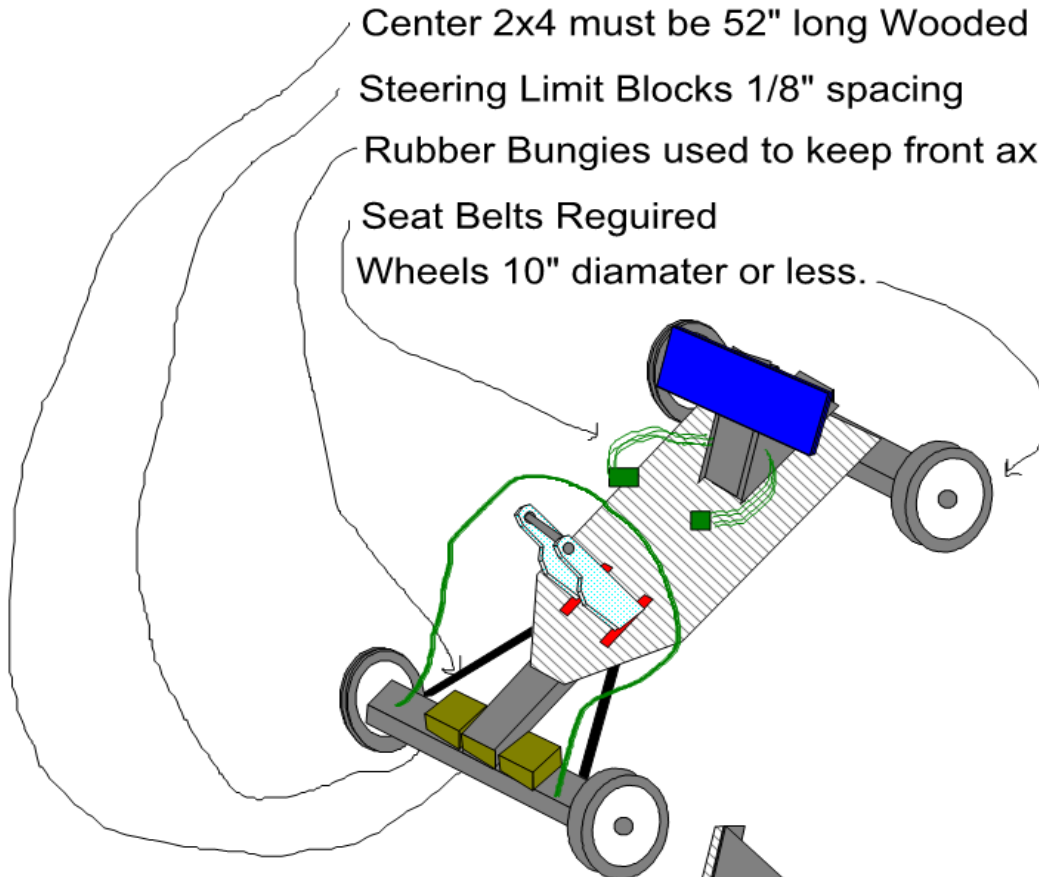
Center 2x4 must be 52" long Wooded Axles 31" Long.

Steering Limit Blocks 1/8" spacing

Rubber Bungies used to keep front axle straight

Seat Belts Required

Wheels 10" diameter or less.





Material List for 20 foot ramp

- 6 18' 2x4'
  - 5 4x8 wall pannels with 3/4 plywood on face.
  - 1 2x4 wall pannel with piano hinge all accross it for start gate.
  - 3 110" 2x4 cross braces
  - 5 8' 2x4 for verticle and front cross brace
  - 1 2x2 for transition for plywood to ground 3" screws and finder washers
- 2 10' 2x12, Sides for Ramp
- 2 12' 2x12
- 3" screws and finder washers

