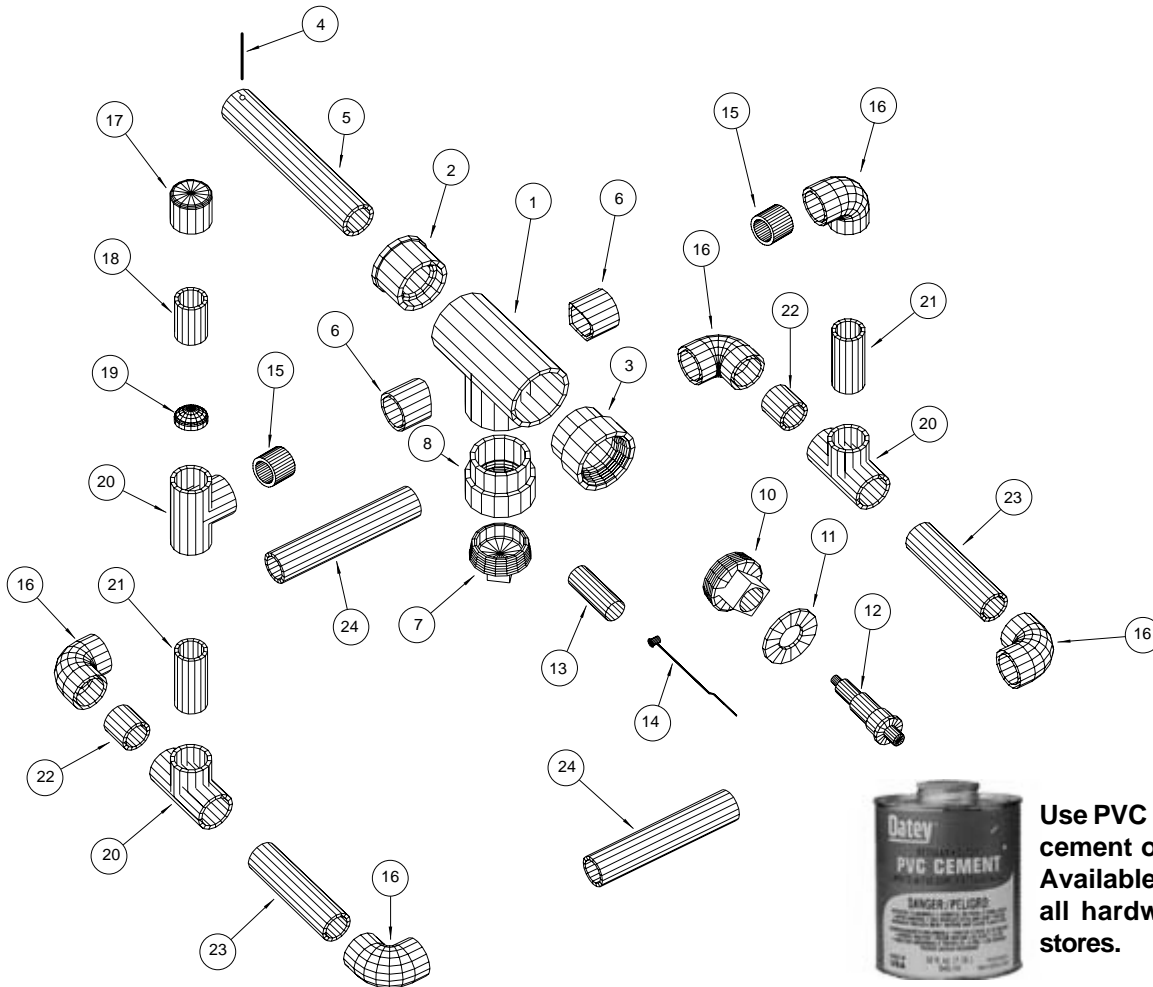


PLEASE READ THIS FIRST!

- USE THE BILL OF MATERIALS AND CHECK THAT YOU HAVE ALL THE PARTS BEFORE YOU BEGIN.
- PARTS ARE EASIER TO SMOOTH AND SAND BEFORE THEY ARE GLUED TOGETHER.
- YOU SHOULD ASSEMBLE THE GUN WITHOUT GLUE ONE TIME TO BE SURE YOU HAVE IT RIGHT. THE GLUE SETS VERY FAST AND YOU WILL NOT GET A SECOND CHANCE.
- IF TUBING IS TOO TIGHT, SAND IT DOWN SO YOU GET AT LEAST 1/2" ENGAGEMENT IN THE SOCKETS.

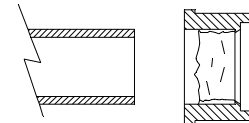


BILL OF MATERIALS

NO.	QUAN'T	DESCRIPTION
1	1	BODY - 1 1/2 TEE
2	1	1 1/2 TO 1" BUSHING
3	1	BREECH ADAPTOR
4	1	STOP - 1/8 X 1 1/4 BRASS ROD
5	1	BARREL - 1" PIPE X 6 1/2
6	2	TRUNIONS - 1" PIPE X 1" (MITER TO FIT)
7	1	SUMP - 1 1/2 PLUG
8	1	SUMP ADAPTOR
10	1	BREECH (TAP FOR PIEZO DEVICE)
11	1	WASHER, HEAVY FLAT 3/4 ID 1 1/2 OD
12	1	PIEZO DEVICE
13	1	SHRINK TUBE 3/4 X 2"
14	1	CARBIDE MEASURE (.22 short case)
15	2	BEARINGS - 3/4 PIPE TURN DOWN ONE END
16	5	3/4 ELL
17	1	3/4 CAP
18	1	MAGAZINE - 3/4 PIPE X 1 1/2
19	1	WOOD PLUG
20	3	3/4 TEE
21	2	3/4 PIPE X 2 1/4
22	2	3/4 PIPE X 1"
23	2	3/4 PIPE X 4"
24	2	3/4 PIPE X 5 1/4

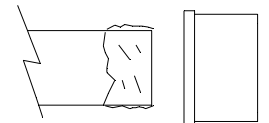
HOW TO MAKE NEAT GLUE JOINTS

DO PUT GLUE ON
INSIDE DIAMETERS.



NICE!

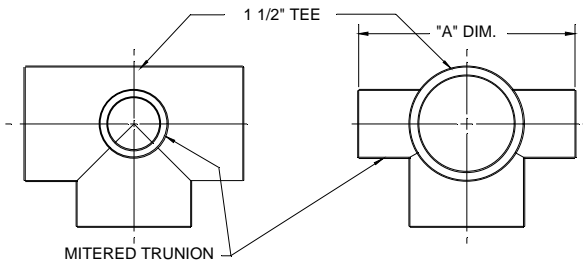
DO NOT PUT GLUE
ON OUTSIDE DIAMETERS.



YUCK!



Use PVC
cement only.
Available at
all hardware
stores.

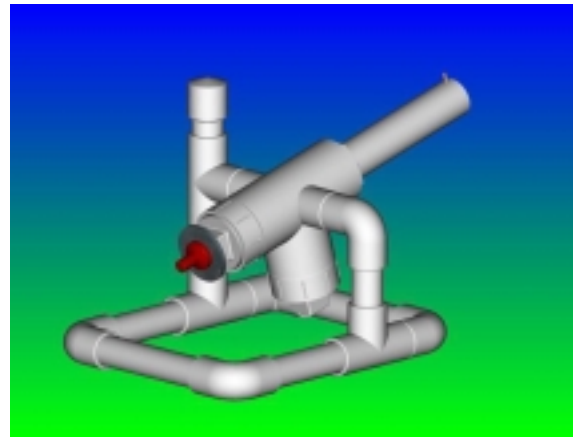


Step 1 - Mounting the Trunions

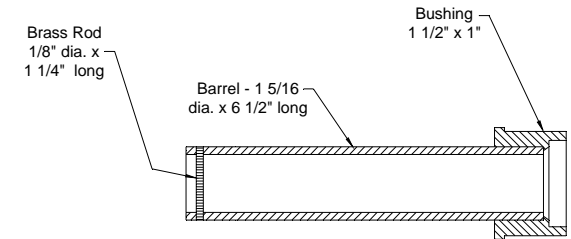
Locate the 1 1/2" TEE, it is the biggest fitting. Locate the trunions, they are 1 5/16" OD, 1" long and are machined to fit the tee.

Place the trunion on the tee and check for a good fit. Mark the tee lightly with pencil where the trunion is to go.

Put a 1/16" bead of glue on the mitered trunion surface, careful not to get glue near the square cut end as this is where the bearing is, then place the trunion on the tee and align with the pencil marks. Let dry for one hour before doing the other side, then let it sit overnight.



The MkII-B was designed and perfected in the summer of 1992 by Ray Brandes, Toy Cannon Nut #1 and author of "BIG-BANG CANNONS, The Carbide Cannon - A Unique American Toy."



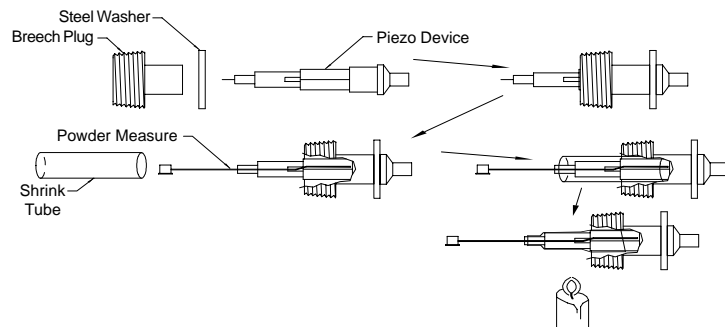
STEP 2 - BARREL ASSEMBLY

1 - Place brass rod in holes through the barrel. The purpose of the rod is to keep children from putting projectiles in the barrel. If you reverse the barrel and put the pin in the bushing end, it will keep projectiles from falling into the sump.

2 - Swab glue in small hole in bushing.

3 - Push end of barrel with brass rod into bushing as far as it will go.

4 - Set aside to dry.

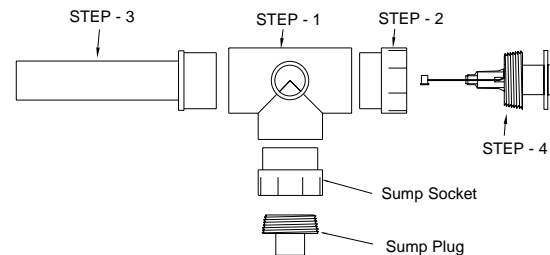


STEP 3 - BREECH BLOCK

1 - Slip steel washer on piezo device and thread into the breech plug. Use a wrenches to tighten. Steel washer must not slip. If too tight piezo may not click. If so then loosen a little.

2 - Put kink of powder shank against thin wire in rectangular cavity on side of piezo. Slip shrink tube over shank and piezo.

3 - Shrink tube to hold powder measure on piezo using a candle. Heat about 1" over a candle flame to shrink all around. Let cool, add second shrink tube if desired.



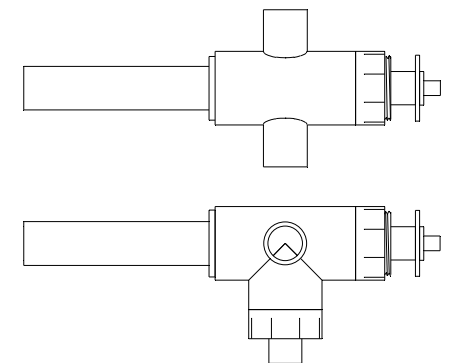
STEP 4 - GUN ASSEMBLY

1 - Glue the Barrel into the tee.

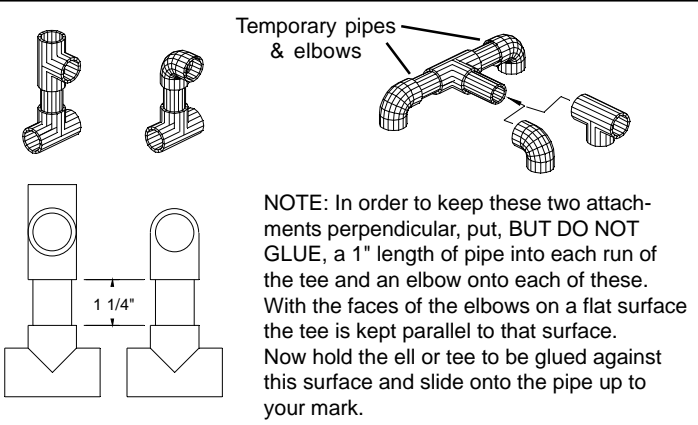
2 - Glue the breech socket into the tee.

3 - Glue the sump socket into the tee.

4 - **SAFETY ALERT! Only when the glue has dried over night is it safe to insert the breech block. Glue fumes will ignite! Never look down the barrel and fire the cannon.**



MkII-B CARBIDE CANNON 1992
TOY ORDNANCE - HIGHLAND PARK, NJ

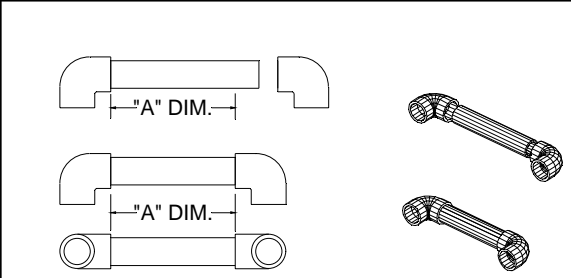


Temporary pipes & elbows

NOTE: In order to keep these two attachments perpendicular, put, BUT DO NOT GLUE, a 1" length of pipe into each run of the tee and an elbow onto each of these. With the faces of the elbows on a flat surface the tee is kept parallel to that surface. Now hold the ell or tee to be glued against this surface and slide onto the pipe up to your mark.

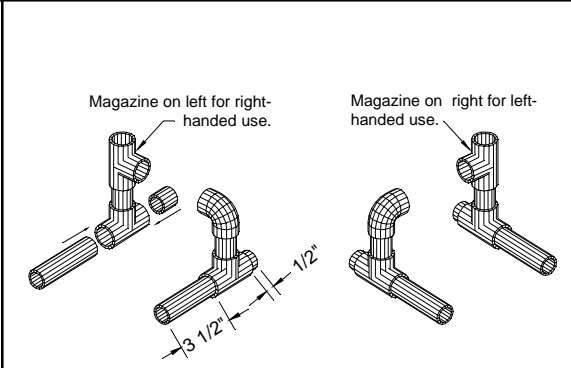
STEP - 5 LEFT AND RIGHT UPRIGHTS

- 1 - Glue the two 2 1/4" long 3/4" pipes 1/2" into the bull of two tees.
- 2 - Mark the pipes 1 1/4" from the face of the tee.
- 3 - Glue onto one the run of a 3/4" tee.
- 4 - Glue onto the other a 3/4" ellbow.



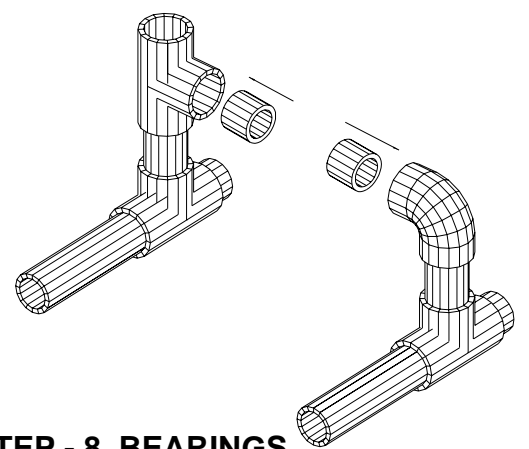
STEP - 6 CROSS PIECES (MAKE 2)

- 1 - Mark 1/2" from end of 5 1/4" long 3/4" tube. Glue into elbow up to this line.
 - 2 - From the face of that elbow mark the tube at the "A" dimension. Prepare one socket on another elbow. Place the unused sockets of both elbows on a flat surface and slide the pipe into the prepared elbow. This keeps the elbows aligned.
- "NOTE: A" dimension should be about 3 7/8"



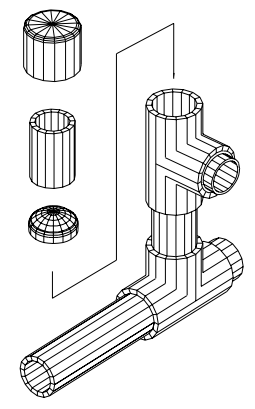
STEP - 7 LONGERONS

- 1 - Depending on wether you are right-handed or left-handed determines the magazine location. Righties will use the right hand to service the breech block and the left to open the magazine. Opposite for lefties. Refer to the above drawing when gluing in the 1" and 4" 3/4" pipe longerons.



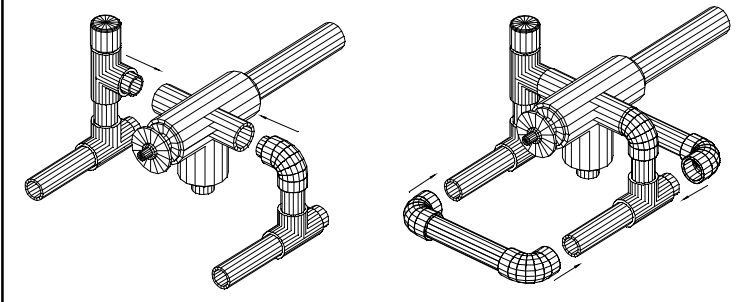
STEP - 8 BEARINGS

- The bearings will be shipped fitted in the trunnions. Their job is to provide enough friction to keep the barrel from tilting by itself.
- 1 - Glue the round end of the bearings into the tee and the ell.
- Be sure to put glue in the sockets only and push the bearings until only about 1/2" of the machined surface protrudes.



STEP - 9 MAGAZINE

- 1 - Put the metal plug into the end of the tee socket. You can put it in with the cup side facing upwards, but don't push it past the end of the socket.
- 2 - Glue the magazine into the upright tee leaving about 3/4" protruding to allow a snug fit of the magazine cap.



STEP - 10 FINAL ASSEMBLY

- 1 - Put the left and right upright onto the barrel. Check that the trunnions are snug but not too tight for elevating the barrel.
- 2 - Without gluing, put the rear cross piece lightly in place and press down, to align the frame, on a flat surface.
- 3 - Glue up the front cross piece and again using a flat surface as a guide tap it home against the tees.
- 4 - Let the glue set at least 5 minutes before removing the rear cross piece.
- 5 - Mark the rear longerons 3" from the face of the tee. Glue up the rear cross piece and tap in place up the lines.
- 6 - Spray paint works well on pvc. I like Krylon. Paint your cannon if you wish!

Safety:

- **Never** look into the barrel of a carbide cannon when firing.
- **Never** shoot a carbide cannon at anybody or anything.
- **Never** put a projectile in the barrel of a carbide cannon.
- **Never** fire a carbide cannon close to anyone's ears.
- **Never** get carbide on wet skin or eyes or mouth.

Carbide cannon preparation:

1. Rotate barrel assembly so the barrel extends over the short end of the base.
2. Fill the threaded pipe plug with water and screw (finger tight only!) into the bottom of the barrel assembly (rinse and refill with fresh water every 20 - 50 shots).
3. Fill the magazine about 1/2 to 3/4 full of Bangsite®. The magazine is the open vertical tube to the left of the barrel assembly. Cover the magazine with the pipe cap provided. Keep the magazine covered except when dipping out Bangsite.

The Drill:

1. Open the magazine.
2. Dip the powder measure into the Bangsite. With fresh Bangsite about half a measure will give the loudest report. When Bangsite gets chalky looking you will need to use more.
3. Close the magazine.
4. Place the breech block into the breech and screw (finger tight only) all the way in. Rotating the breech dumps the Bangsite into the water in the sump and generates acetylene which mixes with the air in the cannon creating a small, localized explosive atmosphere.
5. When you are ready to fire, push the button. **Caution! If your cannon fails to fire do not look down the barrel and push the button to see if there is a spark!** Wait a few seconds then try again. If cannon still fails to fire, got to step 6.
6. Remove the breech block. Leave the breech block off between firings. To fire immediate, blow into the breech to force out gasses and replace the air. Repeat steps 1 - 6.

Clean Up:

Caution: The lime water that comes out of the cannon will leave a cement like stain if it is allowed to dry wherever it is dumped, but it is good for lawns!

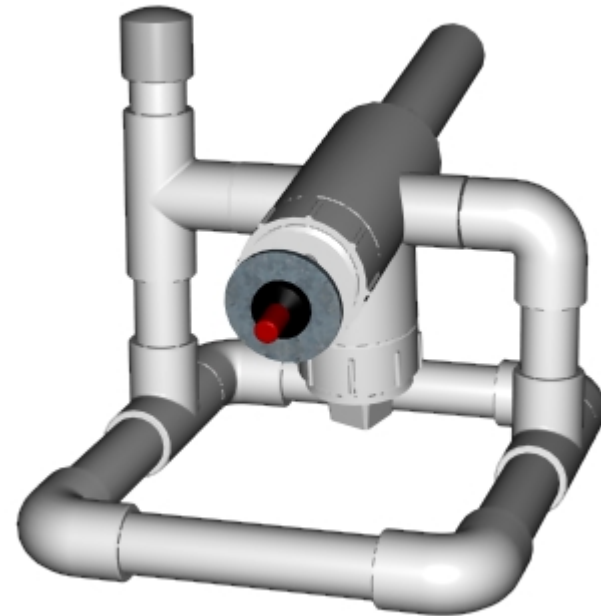
1. When finished shooting, remove the breech block and the sump plug. Rinse the sump plug and barrel assembly thoroughly with clean water. Wipe excess carbon from the breech block with a paper towel.
2. Allow all parts to dry before re-assembly.

Calcium carbide (CaC_2) reacts with water (H_2O) to produce acetylene (C_2O_2) and lime (CaO). When ignited, the results of the reaction are two parts carbon dioxide (CO_2) and one part water (H_2O). There are no harmful by-products from this operation.

Bangsite is powered calcium carbide.

Ray-Vin Publishing Co.
1844 Mt Cello Rd
Marianna, FL 32448

Or visit us on the World Wide Web at <http://www.ray-vin.com>



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