

# PLAN #1

## Potato Gun

### **Introduction:**

In about May '03 I was considering building a potato gun (also know as a potato canon or spud launcher). I had witnessed one such canon at a family camp called Elim Lodge. Some guys went out on a boat, shot potatoes straight in the air with tremendous force and they'd land in the lake. It looked like lots of fun.

A friend of mine, informed me that he was going to be building one so I decided that now was a good time to start building.

**Note:** This is the 'story' of **Potato Gun I**. I found out what worked and what didn't then I created a much more powerful gun, Potato Gun II and created a *how - to - build* guide for that gun. If interested, check that out as well. Also, don't forget to check out the many other [projects](#) and [articles](#) on this site.

After doing some research I came up with a list of the basics:

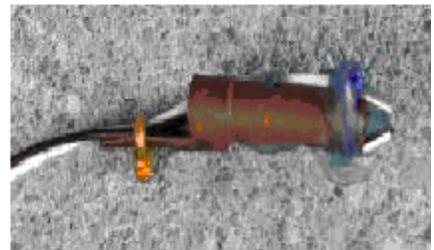
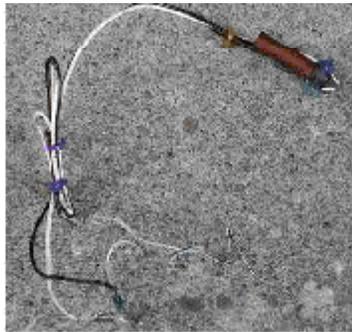
- Every gun has a wider, shorter section called the combustion chamber and then a longer, skinnier section for the barrel.
- Most guns are powered by WD40 or cheap hairspray.
- Most guns ignite the fuel using a BBQ igniter that creates a spark.

Basic Operation: Stick potato in top, push it down with a pole, unscrew cap, spray 3-6s worth of WD40. Screw back on the cap. AIM and FIRE.

**Caution:** I contacted my local police department and they informed me that it was fine to use the gun out in the country but did not recommend using it in the city. They are VERY loud and VERY powerful. My gun shoots a potato over 300yds. Noise is also an issue, so please don't use them in a residential neighbourhood.

### **The Igniter:**

I used a basic BBQ igniter. They can be found for less than \$20 at Home Hardware, Canadian Tire or Home Depot. I have bought 3 igniters so far because they keep wearing out on me. I'm currently looking for a battery powered model with no mechanical spark mechanism.



I took the cable they provided, used a couple of wire ties to keep it from being too long

and glued the ends close together. The ends need to be close together for the spark to travel from one wire to the other. Yes - that is a pen cap I used. It was the closest thing around when I was gluing everything and it's working well.

### **The Gun:**

The gun body can either be made of PVC or ABS piping. ABS is slightly more expensive, but is less corrosive and stronger so I've heard. I went with ABS because they sold it by the foot at Home Hardware and places around here only sold PVC pipe in 10ft sections. The piping itself is quite cheap (couple dollars / ft) but it's the fittings that raise the price of the project.



LEFT: This is the gun in its entirety. It has a barrel length of 4 ft and a combustion chamber length of 26". In total, the gun is over 6 feet long and weighs about 9lbs.

RIGHT: Here's a closer look at the combustion chamber. It goes from 4" to 2" using a 4"to3" bushing and then a 3"to2" bushing. Each bushing piece cost about \$6. The handle portion is a T-pipe

A closer look at the trigger section is below. I drilled a hole using a spade bit and the size required was coincidentally the same size as an RJ-45 network cable jack so I already had the correct spade for the job. The trigger is secured using hot glue. All of the pipes are held together using pipe glue (about \$3.00). Be careful when using the glue because it is corrosive. It joins the pipes by corroding a bit of the plastic and "melts" them together. One end of the T-pipe is threaded and I have a threaded cap that matches it. That is where the fuel is sprayed in.



**The Fuel:**

My first shot with the gun was in my backyard. Anything in an aerosol can should theoretically work. Take note: Lysol disinfective spray does not. I tried several times to fire it with the spray to no avail. When I was building I was wondering if it would really work and this seemed to confirm my fear that it would not. Next I tried hairspray. I pulled the trigger and heard a *thunk* as the potato hit the brick of the house. I had some fun with it that night with the hairspray. I shot it straight up in the air and it didn't come down until about 5 seconds later. I fired it at trees and other stationary objects and had lots of fun but I had no idea of the range or power capability. Later that week myself and my friend headed out to the country by a river to try them out. At first I was dissapointed by the range, but after a few trips we perfected the ammount of spray and the type of fuel to get the best results.

My fuel of choice: **WD40**

**Update: Upon Further Testing with POTATO GUN II, Right Guard Deoderant Spray is now my fuel of choice.**

It's a fair bit safer than propane, extremely cheap, doesn't leave a sticky residue (although it does leave an oily one) and it's extremely powerful. Using WD40 my gun can launch a standard potato about **300yds**. Now that's what I call fun! These guns are extremely powerful, so be careful. Hitting someone with one would surely hospitalize them.

**Cost of Project:**

<b>Item:</b>	<b>Cost:</b>
ABS Pipe	15.00
Fittings: joints, caps, bushing, glue	35.00
BBQ Igniter	15.00
<b>Total:</b>	<b>\$65.00</b>

# PLAN #2

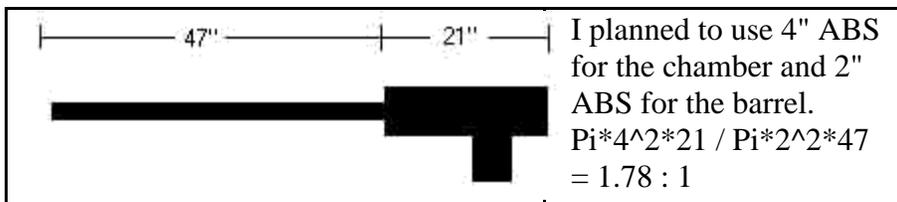
## How-To Build a Potato Gun

### Page 1: Design and Construction

This guide will show you exactly how to build a potato gun. These spud launchers are quite powerful and I take absolutely no responsibility for what you do with this information. In most places of the US it is legal to own these canons, and in my area of Canada they are legal as well - but check with your local authorities before building to make sure.

#### Step 1: Design and Planning

I really like the design of Spud Launcher I. I think it looks really cool, so I more or less duplicated the design for Spud Launcher II. This time around instead of blindly building I did a bit of research on the ideal combustion chamber volume to barrel volume ratio. Information on this is hard to come by but one source said 1.5:1 was ideal. I measured Spud Launcher I and it had a ratio of 2.1:1 and it was quite powerful. If I followed a 1.5:1 ratio the gun would totally loose the cool "canon" appearance so I decided to go with a ratio of 1.8 : 1. This means that the barrel is a bit longer and the chamber is a bit shorter than Potato Gun I.



#### Step 2: Shopping

If you've got a basic gun design in mind, you can keep this in mind when you go to the hardware store and see what's available. Here's a list of parts I bought for my gun:

- 13" of 4" ABS	- 3" to 2" Bushing	- 4" Threaded Plug
- 48" of 2" ABS	- 4" Threaded Adapter	- 3" Threaded Plug
- ABS Cement (the glue)	- 3" Threaded Adapter	- Electric BBQ
- Increaser 3 " to 4 "	- 4x4x3" ABS T-Pipe (the handle)	

I went to both Home Hardware and Home Depot, compared prices then bought what I needed. Most things were cheaper at Home Depot and they had better selection.

When doing your measurements, don't forget to include the length of the T-Pipe and anything else you include in your design. If I bought 21" of 4" ABS - my combustion chamber length would be closer to 3 ft.

#### Step 3: Getting Ready



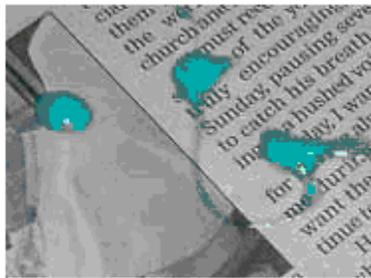
Here's all the parts I bought laid out - basically how they'll be put together.

Here's a list of tools you may need:

- Drill - Glue Gun - Tape Measure -File

#### Step 4: Assembly

Warning: the ABS cement is corrosive. It won't burn your skin, but it's not a good idea to spill it on your clothes. If you want to try something fun, the cement *does* eat through Styrofoam.



Use newspaper or something to cover where you're working. You don't want to get the glue on something important.



Take the glue and apply on the inside surface (less noticeable). Make sure you use lots of glue and get it ALL the way around.



Push the 2 pieces together, they should fit together easily.



The two pieces are joined, easy as pie. The glue only takes a few minutes to set, so try not to have to pull 2 pieces apart if you make a mistake.

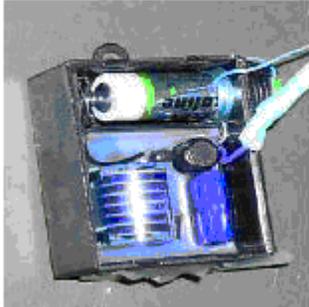
Construct the Handle and Chamber Portion of the gun using the same technique.

		<p>The glue and pipe are very easy to work with. The 3" threaded adapter is attached to the bottom of the T-Pipe "handle". The 4" threaded adapter is attached to the back of the T-Pipe. This will be unscrewed to put in the propellant.</p>
 <p>Potato Gun I (Top) &amp; Potato Gun II (Bottom)</p>	 <p>Chambre Partially Assembled</p>	 <p>Chambre Fully Assembled</p>

If you have all the parts, to assemble the gun takes about 20 mins (not counting ignition installation). Once you have the chamber assembled you should install the Ignition System. It's much easier to work with a 2ft gun than a 6ft gun when installing the ignition system.

### Ignition System:

In Spud Launcher I, I used a standard push-button BBQ Igniter. (About \$15cdn). I've replaced it 3 times - they wear out fairly quickly and do not guarantee a spark every time. This time around I went the more expensive but RELIABLE route of using an electric BBQ igniter (about \$25). These work with a battery and when the button is pushed, about 5 sparks / second are produced. Very effective.



The inside of the electric BBQ igniter. I replaced the standard push button it came with a push button switch with longer wires. That way I don't need to reach INTO the gun to push the ignition switch =>



The push button switch I'm planning to use is the black one in the bottom left of the picture. It's also the same switches I'm using in my Mame Project.

### Drilling and Filing:



Another reason I wanted to go with the electric BBQ igniter is that I could use a smaller switch rather than the large push button I was using before. This also minimizes the slight risk of the switch blowing out - literally.

A small hole is drilled. Easy as Pie. As Mr. Burns my Calculus teacher would say: "Done like dinner".



Assembling the gun took about 20 minutes - max. But getting this tiny switch to fit in that hole took more than an hour. I had to file and file and file some more to remove enough ABS to fit it in. Quite frustrating and time consuming. It took so long because of the awkward angle it was at. I got it in the end though. This was the most time consuming part of the project - aside from writing this article.

### Fitting the Ignition System:

The purpose of having the bottom of the handle be removable is because I wanted to place the BBQ igniter inside it and also be able to unscrew it to replace the battery when necessary. Also, by putting a threaded cap into the bottom - it creates a much sturdier fit than just gluing the cap in like I did in Potato Gun I. This became problematic after a fair bit of use.



The trigger is now installed. Looks great in my opinion. The ignition cable is glued inside the gun as shown (far left).



A little glue is all it takes.



2 of the wires go to the trigger switch. The other 2 go to the [ignition cable](#). It is the same one used in [Potato Gun I](#). The igniter came with the parts required to make another cable, but it's much easier to use one that's already made.

The 3" with the electric igniter is screwed in and the ignition system is installed. When you hit the switch you hear a "click-click-click..." of the spark going. Very nifty.

### Attaching the Barrel:

This is just another glue-n-push and the gun is complete.



**Project Cost:**

<b>Item:</b>	<b>Cost: (cdn)</b>
4" Threaded Adapter	5.98
3" Threaded Adapter	3.96
4" Threaded Plug	2.96
3" Threaded Plug	1.96
4x4x3" T-Pipe	11.86
3 to 2" Bushing	3.29
3 to 4" Increaser	5.99
13" of 4" ABS	2.68
48" of 2" ABS	3.56
ABS Pipe Cement (glue)	2.99
Electric BBQ Igniter	24.99
15% Tax (in Ontario)	10.52
<b>Total</b>	<b>\$80.75</b>

[www.jbprojects.net/projects](http://www.jbprojects.net/projects)

# PLAN #3

## **The Basics:**

### **Build a modular ignition system.**

We've found that most people don't want to buy another grill lighter for each gun they make so we've designed a modular ignition system. This allows you to easily use one grill lighter for all of your guns. (uses screw electrodes in the following plans)

What you need: 4" of 3/4" PVC pipe, 2 alligator clips, 4-8' of cable, one grill lighter, some electrical tape

Take the wire and cut it in half.

Connect an alligator clip to the end of each wire.

Tape the two wires together.

Connect the other ends to the grill lighter (connectors should be included)

Slip the 3/4" PVC over the clips and over the wire to the trigger (the PVC should fit perfectly around the trigger)

### **Build a modular ignition system Type 2.**

#### **INSTEAD of using the screws in the following gun plans use this setup!!**

Another way to use the modular ignition system, is to permanently glue the ends of the wires into a cap to use with all the guns.

What you need: 4" of 3/4" PVC pipe, a paper clip, 4-8' of cable, one grill lighter, some electrical tape, cap to use in all of your guns, Quick Steel glue, soldering equipment.

Take the wire and cut it in half.

Drill 2 tiny holes in the cap (on either side of the square deal).

Insert the wires in the cap.

Use Quick Steel to secure the wires in place.

Solder a paper clip to the end of one wire.

Bend the paper clip so that it almost touches the other wire end.

Tape the two wires together on the outside.

Slip the 3/4" PVC over the clips and over the wire.

Connect the other ends to the grill lighter (connectors should be included)

Slip the 3/4" PVC over the trigger (the PVC should fit perfectly around the trigger)

### **Build a spud-shell cutter**

*After making a gun you need an easy way to make the cylindrical shells that you fire out of your gun* What you'll need: 3" of PVC pipe (it should be the same size of the gun's barrel.)

Cut the piece of the barrel sized PVC  
Spend some quality time sharpening one end of the PVC  
To use the spud-shell cutter  
    Put a spud on the ground  
    Place the spud-shell cutter on top of the spud  
    Smack the top of the spud-shell cutter  
    Remove the shell form the spud-shell maker

Lock and load

### **Build a basic spud gun.**

*Refer to these instructions when build any of the other Spud Works designed guns below.*

What you'll need: 6-10" of 3" PVC pipe, 1' to 2' of 1.5" PVC pipe, a 1.5" to 3" reducer, a 3" female converter (goes on the 3" pipe and has threads), cap for the 3" female converter, PVC purple primer, PVC glue, one 2" screw, one 1.5" screw, and a modular ignition system

Cut all the pieces to length.

Purple prime all the areas which will require glue.

Put the female converter to the 3" pipe, then glue the 3" to 1.5" converter, then the 1.5" barrel to that. Only put glue on the pieces you are currently putting together.

Screw the 2" screw in to the center of the 3" pipe.

Screw the 1.5" screw in to the center of the 3" pipe a quarter turn.

LET IT DRY!

After you let it dry, let it dry some more.

Think about how glue fumes blow up, let it dry some more.

Take your new toy (ok, spud guns are not toys) outside.

Connect the modular ignition system (above) to the electrodes (those screws).

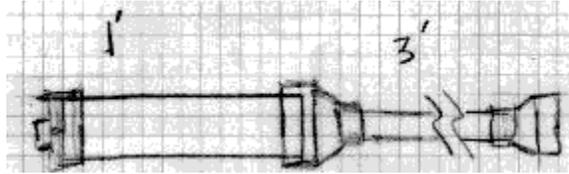
Have a friend stand 5 feet or so away from the gun and have him look in the **rear** *leave the cap off silly!*. Click the igniter. Did he see a spark?

If he did, do it again.

Isn't that fun? Do it again, if your friend is not giddy, **STOP**.

You now have a spud gun! To figure out how to fire these damn things look at the ["What the?"](#) pages.

## **Intermediate: Build The Spudinator**



What you'll need: 1' of 3" PVC pipe, 3' of 1.5" PVC pipe, two 1.5" to 3" reducers, a 3" female converter (goes on the 3" pipe and has threads), cap for the 3" female converter, PVC purple primer, PVC glue, one 2" screw, one 1.5" screw, and a modular ignition system

This gun is built the same way as the basic gun but its a lot bigger and has a bigger trajectory and a bigger boom. The second 1.5"-3" reducer goes on the end of the barrel and is just for looks.

### **Build The Big Burtha**

What you'll need: ~1' of 6" PVC pipe, 3' of 2" PVC pipe, a 6" to 2" reducer (you may need more than one reducer to do this job), a 6" female converter (goes on the 6" pipe and has threads), cap for the 6" female converter, PVC purple primer, PVC glue, two real long screws, and a modular ignition system

This gun is built the same way as the basic gun but its a lot lot lot bigger and has a insane trajectory and a bigger boom blast ka-boom. (We have not built one of these big suckers...yet. If you do decide to build this bastard, tell us your experience with it, what you blew away, etc.

### **Build The Zookenie (patent pending)**

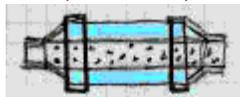
What you'll need: 6-8" of 3" PVC pipe, 1' of 3/4" PVC pipe, a 2" to 3/4" reducer (or series of reducers), a 2" female converter (goes on the 2" pipe and has threads), cap for the 2" female converter, PVC purple primer, PVC glue, 2 screws, and a modular ignition system

This gun is built the same way as the basic gun but its a lot smaller and is VERY portable.

## **More Advanced**

### **Build The Silencer**

**(untested)**



What you'll need: 6" of 3" PVC pipe, 8"-9" of 1 1/2" pipe, two 3" to 1 1/2" reducers, some foam rubber.

Take the 1.5" Pipe and drill 1/8" holes in it each about 1" from each other.

Take both of the reducers and file out the ridge that prevents the 1.5" pipe from going all the way through.

Slide the 1.5" through the reducer so that it looks like an umbrella

Glue the pipe to the reducer so that it leaves room for the silencer to be glued to the gun straight.

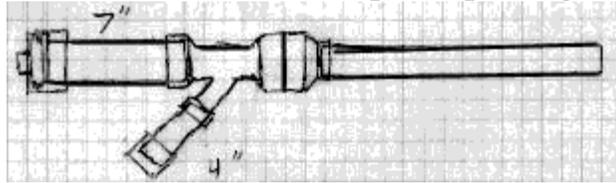
Glue the filed reducer, with the 1.5" pipe through it, to the end of the 3" pipe

Stuff the gap between the 1.5" and the inside of the 3" pipe with the foam rubber.

Glue the other reducer to the end of the 3" letting the 1.5" go through it

Glue it to the end of your gun

### **Build The Lil' Bastard (patent pending)**



What you'll need: 18", 4", & 1 1/2" sections of 1 1/2" PVC pipe, 6" section of 2" PVC pipe, a 2" X 2" X 1 1/2" 45 degree Tee, a 2" to 1 1/2" reducer, a 1 1/2" pipe cap, 2" female converter (goes on the 2" pipe and has threads), a 2" threaded cap, two screws for the electrodes.

The Lil' Bastard is a gun that a step ahead of the Zookenie. It still shoots a 1.5 inch, but it's very portable and, spite the size, packs a punch.

Start with the 45 degree Tee piece, glue the 4" 1.5" section to the protruding 1.5" 45 degree part.

Glue the 1.5" pipe cap to the 4" 1.5" section. This is your handle.

Hold the components you've glued together, so that the handle is pointing up and out to the side.

Glue the 6" 2" section to the top of the current components.

Glue the 2" female thread converter to the top of that.

Glue the 18" 1.5" section to the bottom of the current components.

Lastly install your electrodes.

You now have a Lil' Bastard (patent pending).

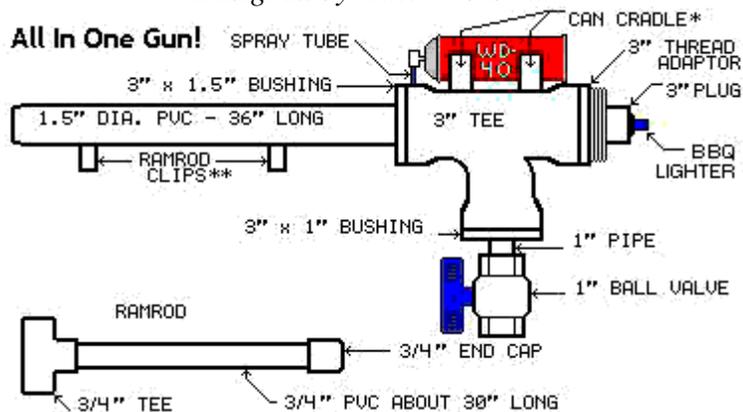
### **Build The Psycho Sniper**

*Still under development*

# Most Advanced

## Build the All in One Spud Gun

*Designed by: Allen Forsman*



Assemble all PVC parts as shown in drawing.

The igniter is your basic gas grill igniters.

Take a small nail or cut a short piece of stiff wire

Run from the ground connection near the base of the unit to the tip and epoxy in place with some 5 minute epoxy.

You want to leave about 1/16" to 1/8" between the tip of the wire and the tip of the sparker.

After the epoxy is hard you can adjust the gap to get the best spark.

Drill a hole in the PVC threaded plug and epoxy the spark unit into the plug.

Use enough epoxy on the inside to fill the square hole about half-way up.

For can and ramrod attachments, use PVC glue.

You can make the attachments a lot sturdier by saving the PVC "sawdust" from cutting the pieces and using it as filler around the gaps and soaking it with PVC glue.

### Can Cradle-

Cut 1" long pieces of 1.5" PVS in half.

Glue both pieces upside down to top of the 3" tee.

Use rubber bands to hold the WD-40 can in place.

You can use just about any flammable spray stuff that has a tube.

Drill a small hole in the top of the 3" cleanout just big enough to stick the tube into.

Cut the tube to leave about 1/2" inside the combustion chamber.

If you want you can seal around the spray tube with silicone or epoxy (the small size will not make a noticeable drop in pressure even if it leaks)

I used WD-40 because you can get it in small cans, but it tends to leave an oily residue.

Just about anything that uses butane or propane as a propellant will work.

If you use a big can of whatever, size your can cradles accordingly.

### Ram Rod Clips-

Use two 1" pieces of 1" pipe or 3/4" flared parts.  
Cut each piece a little more than half way around.  
Glue the pieces to the bottom of the barrel.  
The ramrod will clip into these when not in use.

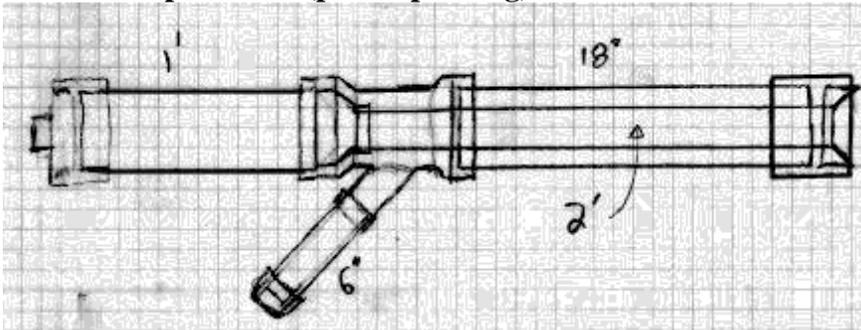
### A couple of notes:

Sharpen the inside of the tip of the barrel  
with a file or some heavy sandpaper  
to cut the potatoes cleanly and evenly.  
Also, cut the ramrod long enough to leave the potato about  
2 or 3 inches from the combustion chamber.

### To fire the gun simply:

Ram a potato into the gun as far as the ramrod will go.  
Close the ball valve and give a little shot from the spray can.  
(You may have to experiment a few times to find out just the right amount.)  
(Start with a very short squirt and work your way up.)  
Take aim and press the igniter button to fire the cannon.  
Whoop and holler. While this has absolutely no effect on the trajectory, it's really a lot of fun!  
Open the ball valve and blow lightly into the barrel a couple of times  
(like in the John Wayne movies). This forces fresh air into the combustion chamber.  
Go to step 1.

### Build The Spudzooka (patent pending)



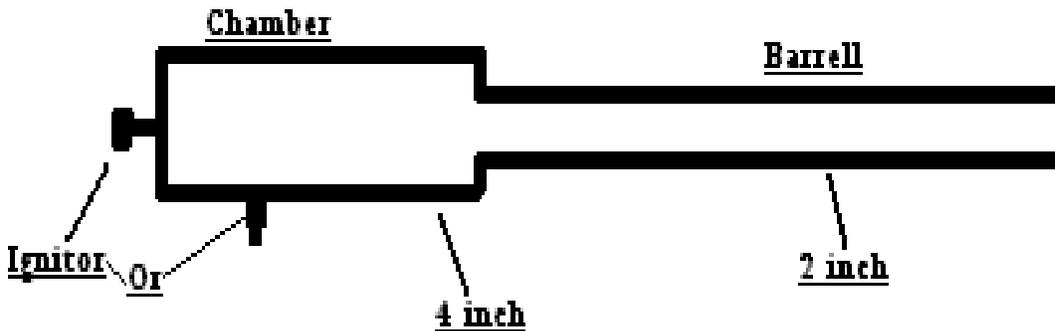
Bazooka type gun

*Plans still being written*

<http://www.capital.net/~anker/plans.htm>

## PLAN # 4

## Diagram



(I have my igniter in the end cap but it could be mounted on the side of the chamber to make it safer)

(I also have a thread join between the chamber and the barrel, only for portability)

## Parts

<u>Equipment</u>	<u>Specifications</u>	<u>Quantity</u>
2 inch pvc pipe (barrel)	36 inches long	1x
4 inch pvc pipe (chamber)	12 inches long	1x
4 inch – 2 inch reducer	-	1x
4 inch thread end for chamber	Male (end cap screws on to this)	1x
4 inch end cap	To screw on thread end	1x
Barbeque ignitor	Push button type	1x
PVC glue	Professional strong glue!	-

## Assembly

- 1. Cut all pieces to size.**
- 2. Use sand paper to roughen surfaces to be glued (creates stronger hold).**
- 3. Glue all pieces together as shown in the diagram.**
- 4. Drill hole for the ignitor, either in the end cap or on the side of the chamber. Make sure it fits tight.**
- 5. Leave over to dry (at least) before trying.**

## Operation

- 1. Slide a projectile down the barrel until it stops at the beginning of the chamber (make sure it is not tight, loose projectiles fire better).**
- 2. Open end cap, spray in something flammable (deodorant) for about 3**

seconds and quickly replace end cap.

**3. Press the ignitor button and hold tight.**

**If the gun is made correctly it should fire at least 400 meters. If something goes wrong, I will not be held responsible. You made the gun by your own choice.**

## **PLAN # 5**

Build Your Own Launcher

<http://www.spudtech.com/content.asp?id=5>

Alright, you want build your own potato launcher. These instructions will help you on your way to an effective yet simple spudgun that should provide hours of enjoyment for you, your friends, but probably not the old man down the street who gets mad when your car backfires!

COPY AND PASTE THIS ENTIRE PAGE INTO WORD AND PRINT IT. No need to keep running back to the computer while you are trying to build your launcher.

A few things to note before proceeding:

1. These instructions/procedures are provided as-is. No guarantee is made that this device will function as well or better as I have experienced, intend, or describe it to operate. In other words, your results may vary, and they may even be very undesirable results, possibly resulting in personal injury or property damage. Please review the site disclaimer for more information.
  2. The wording and statements/nomenclature pertaining to the construction and operation of this potato launcher are intended as such to help ensure one attempting to do this has a basic understanding of the equipment and materials involved. If some of the statements seem 'Greek' to you or you do not recognize some symbols or phrases, that is wholly my intent, and you should obtain assistance from a trusted source or not proceed at all.
  3. These instructions are intended for a beginner or someone that has never built a spudgun before. The procedure outlined below is not necessarily the method myself or another experienced spudgun builder uses. These instructions will help guide you in building a "sound" piece of launching hardware. As you gain experience, you may find that different things may work better for you....but start simple. Thanks, and happy spudding!
  4. The finished product should look something like the first picture on the "combustion spudgun" page of the site.
- Keep in mind that PVC pipe/fittings are not approved by the manufacturer to be used for the purpose of constructing spudguns.

Here they are, in the recommended order to check them out:

### **Step 1: Getting stuff to build it**

This materials list is to build a very simple starter model potato launcher, with the intent to get the most bang from your buck (so to speak). By no means is this the only way to build a launcher, or nearly the coolest, but still able to provide hours of fun.

#### **MATERIALS:**

Obtain the following items: (qty 1 unless so indicated in [])

10' of 4" SCH40 PVC water pipe (chamber body)

36" of 1 1/2" SCH40 PVC water pipe (barrel stock) Or get yourself a piece of SGTC rifled barrel stock.

4" PVC coupler

4" x 1.5" PVC bushing (if not available combine two, like 4x3 and 3x1.5)

4" PVC FSxFNPT adapter (clean-out adapter)

4" PVC MNPT threaded plug

PVC primer, one with dye in it if possible (purple, blue)

PVC pipe cement, medium body is best

[2] #8x2 1/2" flat or round head allthread machine screws, drive not important

Two feet of 16g or lower stranded insulated wire

Electrical and Duct tape (of course!)

Red button BBQ ignitor/striker, a replacement found near new BBQ's (find one for a grill w/side burner if possible)

#### **EQUIPMENT/TOOLS:**

Suggested tools for building the potato launcher:

Hand wood saw (or hacksaw, for cutting pipe, maybe you already got it cut at the store)

Pocket knife

Needle Nose Pliers

Soldering Iron w/PbSn or Pb free solder (or just use tape and hope it works)

Drill motor with bit 0.010" larger than machine screw shank

Appropriate driving tool for machine screw (probably Phillips)

Medium half round file for shaping pipe (or a lathe if you got one)

Rag for PVC cement clean up (disposable)

### **Step 2: Preparing the materials for assembly**

To make sure everything goes together properly and smoothly, proper conditioning and sizing of the materials is necessary. Pay particular attention to the shaping of the pipe ends, as this is a major factor in proper solvent welding with the fittings.

#### **PVC PIPE SIZING**

Cut the two pipes to size, 10" and 36" with the saw unless you already did so in the store. Using the file, take off the sharp corners on the inside AND outside of the pipe. Radiusing the inside helps reduce the amount of potato scud that can build up in the launcher, and breaking the outside corner ensures proper solvent welding, if this is not done leak paths may result. Cut ends should be as square as possible. To one end of the 1 1/2" pipe it is suggested that the inside be chamfered about 0.020" and the outside filed or turned down to almost meet the inner chamfer, creating a blunt knife to help size the potato. It will work without out this step, but a lot messier!

## PVC FITTINGS

Inspect the fitting for really bad weld lines or possible large dislocations that may result in premature failure. Remove all paper tags or labels by peeling, scraping, even using a bit of primer to clean off the last adhesive. File off any sharp sprues that may hamper your ability to grip the fittings firmly when assembling.

## IGNITION SYSTEM

Cut the wire into two equal lengths. Strip and twist each end about 3/4" back. Taking the BBQ igniter, upon inspection you should find a plug on the tail end (one electrode site) and close inspection should reveal a very fine wire embedded in the side body of the igniter, close to the button lip.(if you have a 2 pole ignitor -- side burner type -- this step will be much easier) This fine wire is attached to the igniter nearest the button, as the wire is just pressed into this slot which might be about 3/4" long. Carefully extract the other end of the wire with the knife, removing all but the last 1/4" or so from the slot. Carefully twist this wire to one end of one electrode wire stripped previously. Immediately solder this connection together taking care to not break or extricate the fine wire from the plunger body. Cool with spit (really!), dry, and tape this joint back against the body with electrical tape, using enough to immobilize the wire with gentle tension.

Take the wire supplied with the igniter, the one with the plug that fits on the base, and cut leaving about 2" from the plug end that will fit into the base of the igniter. Strip and twist this stub to the other electrode wire, soldering, and taping over the solder joint. You now have an igniter to make a 'remote' spark. Try it holding the two free electrode wire ends about 1/4" apart--don't touch them! (your BBQ igniter may be a bit different, the idea is to get both electrodes away from the igniter, so you don't make a big hole in the launcher combustion chamber.)

### **Step 3: Assembling the Launcher**

Now you get to stick all the stuff together, using pipe glue and tape and more solder if you like! Just don't breathe too much pipe glue solvent...it'll make you nuts!

I Chamber Assembly:

Prime both ends of the 4" pipe, also priming the 4" bushing, both 4" coupler sockets, and

4" slip on the adapter. DO NOT get any primer on the adapter threads! Immediately apply pipe cement to the three primed 4" fittings, then LIBERALLY to both ends of the 4" pipe. Start both the coupler and adapter fittings on the pipe, start the bushing in the coupler, then right the assembly with the threads up, pressing it together with body weight while twisting about 1/2 turn. Hold this position for at least 30 seconds. The pipe ends should bottom each about 1 1/2" inside the fitting socket. If they both do not bottom, either apply more force IMMEDIATELY somehow to get it to, or you are screwed and have to throw it out--start over with that. If the fittings and pipe are properly conditioned this should not be a problem. Wipe up any spilled glue with the rag, but leave a good bead at the external pipe/fittings line. If any glue got on the threads get it out of there as fast as possible! Any glue on your hands should just be left to dry and then peel it off. Using solvent to remove it will just increase your exposure to it.

## II Electrode Installation:

Wait about 10 minutes for the glue to set. Using the proper size drill bit, put two radial holes 90deg apart about 1/2" back from the front edge of the adapter fitting--the plastic here is about 1/2" thick as well. Drive in the two machine screws nearly all the way, leaving about 1/8" between the screw head base and the plastic. The ends may touch or be far apart--the electrode gap will be calibrated after the electrode wires are connected.

## III Barrel Introduction:

Prime one end of the barrel and the 1.5" socket on the bushing. If one end of the barrel was chamfered to a knife, prime the square 'regular' end of the pipe. Apply glue, liberally to the pipe, and press together, again using a 1/4 turn motion to bottom. Hold for 30+ seconds. After releasing place the unit upright for several minutes, to let the glue set a little more. Solvent welding is more of a curing than a drying process. Solvent is lost, hence the term drying, but the action of the solvent effectively cures all those individual plastic parts into one continuous physically joined piece of plastic. Properly done, solvent welds are always stronger than bulk pipe.

## IV Wire it Up:

Tin the two free ends of the electrode wires if possible. With each end bend it around the screw shank, just below the head, in a clockwise manner (you may need needle-nose pliers if the wire is heavy). After the wire is at least 3/4 turn around the shank, tighten the screw, pretty good, biting the wire into the plastic a little. Liberally apply electrical tape, rubber tape, or silicone RTV to the exposed metal areas, as they will shock you all day long if not insulated properly. Before taping tug on the wires a little to make sure they are firmly gripped by the screw head.

## V Electrode Calibration:

Setting the gap is next. The two screws may be in a variety of relative positions, depending on how straight and aligned the holes were drilled. Wearing leather gloves,

you now want to somehow create about a 1/4" gap between the screws. This gap does not have to be measured from the very tip of the screw, and the spark will find the shortest route possible. Bend only one screw if possible, and don't bend it around a whole bunch back and forth, or it will get work hardened and break sometime. DO NOT test the spark device yet, as there are still PVC solvent fumes all over the place. Just wind sufficient tape around the ignitor body to fully insulate all metal parts from your hand when you grip it. Lash it to the side of the chamber if you like with electrical or duct tape, just don't press the button yet!

#### **Step 4: All put together...now you wait**

IT IS HIGHLY RECOMMENDED THAT YOU WAIT AT LEAST 24 HOURS FOR THE GLUE TO FULLY CURE AND SOLVENT TO DISSIPATE.

Many of the unfortunate potato launching accidents occur due to over anxious constructors/operators getting a little trigger happy a little too early. Keep in mind that the solvent fumes are extremely flammable. A few notable events include people chemically/thermally removing a majority of the hair on their head, or rapidly separating the supposedly single piece of PVC plastic back into its purchased components (or even smaller pieces!) Just wait...it'll be worth it.

In the mean time this is a great opportunity to gather what you may need when you do start running this device. On the top of this list is certainly a bag (or two...or three...) of good fresh potatoes. Never use old sprouting, skunky potatoes, this is just bad form! Buy a bag for \$2 and relish in their crispness! Also a fuel, probably starting with hairspray, the old mainstay. Traditionally the 'Aqua-Net' brand has yielded to best results, but it will be mighty hard to find those folks who grew up on that. Once you get more experience you might graduate to propane...but wait a bit. A good location is also required...don't use this device in the middle of your subdivision out of your garage or you are guaranteeing that old grandpa down the way will call the cops!

#### **Step 5: Using the launcher**

Again, find a suitable location to deploy your potatoes, as the device can get quite loud with a good fuel load. Out in the sticks is best, but just not downtown!

1. After waiting the necessary time for the solvent vapors to dissipate, now you can test the ignition device. Depressing the plunger briskly should produce a good spark to jump across the screw threads. If all connections were made correctly and the gap is about 1/4" it should spark every time (or at least 9 times out of 10). If it doesn't check your connections, maybe set the gap a little closer (never less than 1/8") but get it to work, or potatoes are going nowhere (unless you throw them--boring!)
2. When a reliable spark is verified, test fit the threaded plug into the adapter. It should engage the threads at LEAST TWO TURNS. If not, check for crud in the threads, and if clear, obtain a 60deg triangle diamond file, and size down the plug threads a little. The threads are at a 60deg angle, so careful filing about the first few threads is ok.

3. With the cap off, load a potato! With the chamber on the ground, place a potato over the muzzle of the launcher, and press it down with your palm, shaving off the excess, creating a cylindrical potato plug. Make sure the potato contacts the wall firmly all around, or it will not fire or not that well. Loading the potato sideways is acceptable, as it creates a more stable projectile anyway. Ram the potato down to within 2" of the breech of the barrel, using a smaller diameter PVC pipe or broomstick. Don't push it too far or it will fall out into the chamber...and just be subject to a short baking cycle.
4. With the spud firmly seated in the breech, pick up the launcher and holding with one hand, dispense a few seconds of hairspray directly into the chamber. Don't use too much; it will just make a mess. Quickly close by screwing on the end cap hand tight, do not use a tool to tighten to two turns or you will likely never get it off again.
5. Call out "Fire in the hole!", point the launcher in a safe direction, and depress the BBQ plunger. That potato you rammed down there should exit at a quite rapid rate with a sizable report, and depending on where you aimed and at what angle you pointed, it went anywhere from 6 inches to ~200 yards from the muzzle. Pretty cool. If you clicked the ignitor a few times and it didn't work, you are not alone, check out my next section.
6. If it worked, great! Remove the end cap (this may require a tool), vent the spent gasses getting a fresh load of air, and repeat as necessary!

### **Step 6: Debugging the Launcher**

There are a lot of reasons why your launcher may not be working. First and foremost NEVER take off the cap and start clicking away at the igniter. This again has led to human fires and that chemical thermal hair removal thing again....

Hairspray in cold weather just does not go well. Too much of the burnable stuff in the spray condenses on the chamber walls, making it very difficult to burn. You might try warming the chamber by the fire if you are camping or graduate to a lighter, hotter fuel (propane....)

To 'defuse' a misfire you need to take off the cap, while pointing it in a safe direction. Allow the chamber to air out for several minutes, perhaps longer, to get the fuel load out. After you are certain the fuel has been vented, again verify the spark, just by turning the chamber enough so you can see where the spark should be. Never point the chamber bore directly at your face, or body, or anybody else. If it sparks then it is a fuel mixture problem.

One of the most common fuel problems leading to misfire is too much fuel! Not usually a problem with hairspray, other richer fuels can be overloaded above their UEL value, and they wont work. Always try less fuel rather than more fuel.

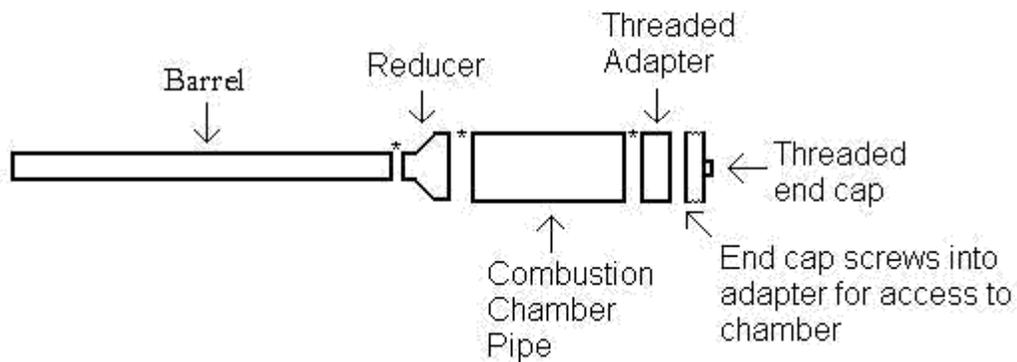
If you still can't get it to work I invite you to peruse the many other web sites that talk about how to troubleshoot your combustion launcher. Again I have made a partial list, and sadly just don't have the time to address every specific person to person launcher complication. I hope you do in fact figure it out and experience many hours of safe spudding.

# PLAN # 6

## How to build a basic potato gun

The simple instructions

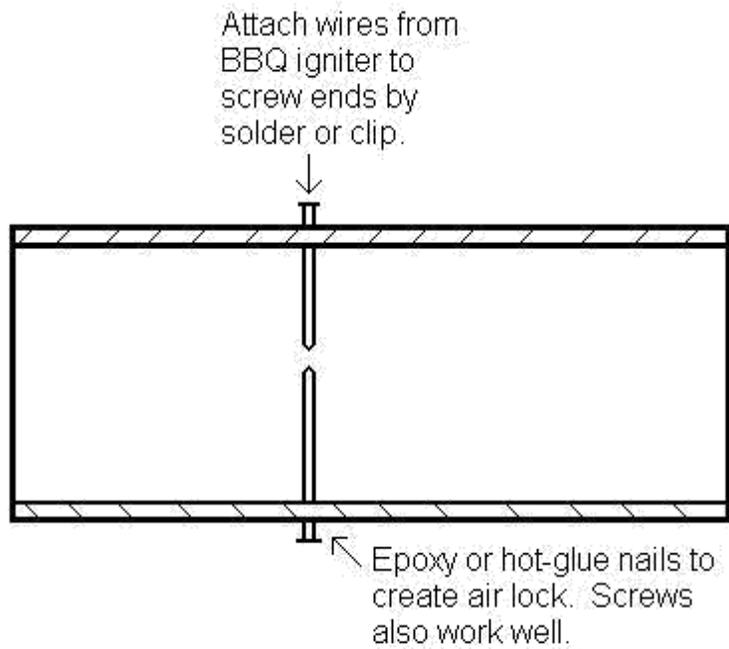
All PVC pipe



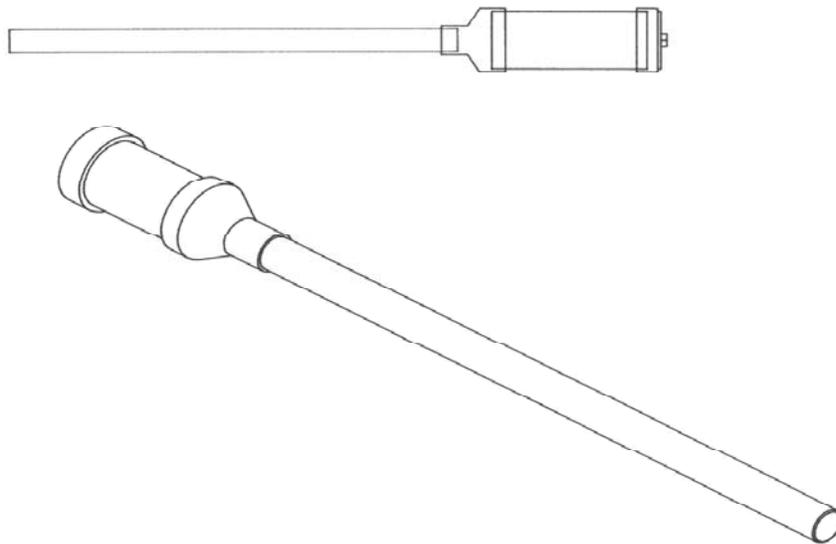
\* Glue at this joint

SCROLL DOWN

## Cross section of combustion chamber



Not exactly to scale



Like so many other potato gun sites have, I'm not going to tell you EXACTLY what kind of materials to get to make a potato gun. I will tell you though, what I have used, that will work for sure but really, just find the right sizes you want at your local hardware store. If you know what needs to fit into what, then put the stupid thing together at the store! I did.

All you need to do is:

- 1) Find the size end cap you want.
- 2) Find the same size adapter that fits into that end cap. (Both threaded of course.)
- 3) Find a short piece of PVC that fits into the adapter you found. Or you can just take a big piece home and cut it down to the right size you want. Then you can use the rest to make another one!
- 4) Find a reducer that fits into that PVC pipe and at the other end of the reducer, the size barrel you want to use fits into it.
- 5) Make sure the barrel fits into the reducer! Get it? Good!

Other materials and tools you need:

- 1) A saw for cutting the pieces of PVC.
- 2) PVC glue. Use the right stuff! Very important! And remember to sand wherever you use this glue!
- 3) Electric drill.
- 4) Electrical tape
- 5) Epoxy or hot glue.
- 6) Solder and iron, if you solder the wires to the screws.
- 7) Wires, speaker or phone wire works fine. Thinner the better, I think.

Instructions:

Now just take a look at the pictures I drew up at the top of the page and glue it together. Make sure you sand all the surfaces you glue together! If you don't [this](#) might happen to YOU!

What do I do with the BBQ ignitor??

This is what you need to do: Take the ignitor, do you see the metal tip on the very end of it? If you bought it new, you should have a little wire that came with it. It fits right onto that little metal tip on the end of the sparker. Now take some thin wire like speaker wire or maybe even telephone wire (two single strands) and tape or solder one piece of that wire to the end of the other wire that is stuck onto the metal tip thing on the ignitor, to make the whole thing as long as you need it. If you look at the side of the ignitor you will see a small hole with a copper piece of metal flush with the side running up to the top where the red push-button is. Now take the other piece of wire and tape and solder (make sure to use LOTS of tape because you can get shocked by it and then it will not fire) and stick it into the little hole so that it is touching that little copper strand inside it (just stick it in there and tape it down real good). So now you have two long pieces of wire hanging off this ignitor thing. If you put the two wires close to each other and click the red button on top, it should give you a nice big spark. If for some reason you don't get a spark and the wire ends are very very close to each other, you must have a bad connection somewhere or maybe the sparker is bad if you think you did everything right.

When you see that it works, this is what you need to do now. Screw two large screws (or if you only have nails, that's ok too) through the middle part of your

chamber so that the screw ends are very close to each other. Make sure you drill a small hole so that the screws fit snugly and stay strong. Now tape, solder, glue, whatever, the two wires from the ignitor to the end of those screws on the outside of the chamber. Now you will see that when you click the sparker, a blue spark will jump between the two screws. You may have to tinker with how far apart the screws are from each other to get the best possible spark. Once this is all done, you are ready to go! Just cram a potato down the barrel, spray about a second or two of hairspray into the chamber, screw the endcap on and click the button! Pow! You may have to experiment with how much hair spray you need to use because of the size of the gun. That should be about it!

Now how you make the trigger is simple. Since you connected the BBQ ignitor with wires going to the nails, you can put it just about anywhere. You could even do it from a distance! I tried for myself (I didn't shoot anything, I just put the BBQ ignitor to a long piece of wire), but you could use about 5-6 feet of wire and still get a spark. Probably not as strong as if it was shorter but it would still work probably. Or you could make a handle with a hole in it like I did for the 01 and taF models. And the easiest way yet is to do what we did with the 00 model and tatter tosser. Just take some electrical or duck tape and tape the ignitor to the barrel wherever it feels right. This gives you a real 'gun like' feeling and so that you don't rip the wires off by accident. That works great.

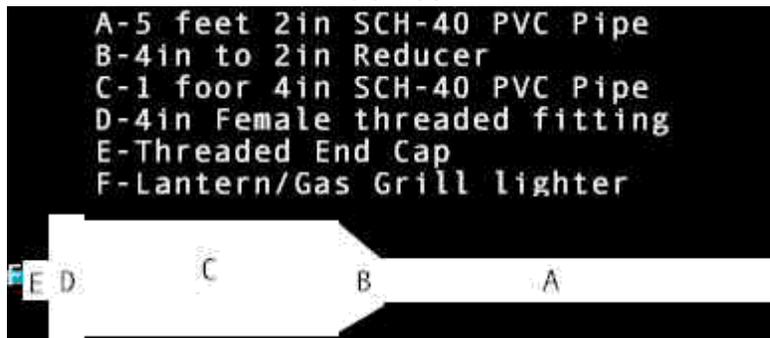
If you still need help with the directions, [e-mail me!](#)





# PLAN # 7

SG-200



Directions:

Start by gathering all materials. In addition to materials listed in the diagram you will also need a hack-saw (A power band saw will also work), drill, drill bits, PVC Cleaner, and PVC glue.

Step 1: Cut PVC to correct length. PVC comes in 5 and 10 foot chunks, so you may not need to cut the barrel.

Step 2: Drill holes. Drill small holes on top half of barrel. This helps to reduce pressure needed for launch (which will increase power) and keep accuracy at the same time. This is an optional step. You will also need a whole in the end of the end cap for the igniter.

Step 3: Glue connections. Begin on one end of the gun and work towards the other end. First apply the PVC Cleaner to the outside of the pipe and to inside of the fitting. Now apply the glue to the pipe and fittings.

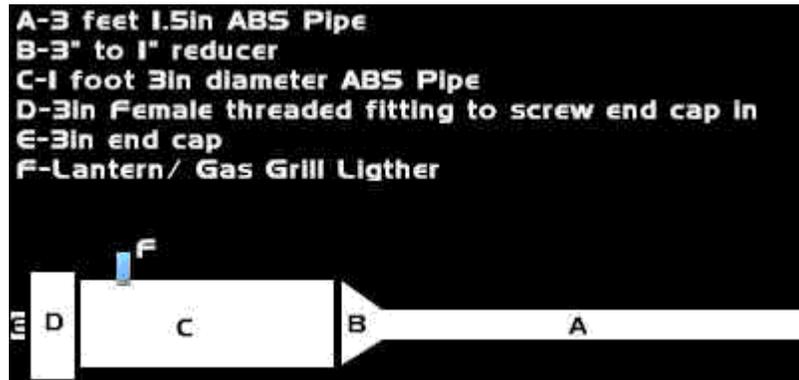
Step 4: Insert igniter into end cap.

Step 5: Watch the movie "Titanic " at least 4 times, or If you aren't a big Leo fan you can just let the glue dry for 12 hours and do what you want.

Step 6: Load Potato, load fuel, shoot. Laugh historically, repeat step 6.

# PLAN # 8

SG-100



Directions:

Start by gathering all supplies and cutting pieces to size. You can use a hack saw to cut the pipe. Be sure to use ABS pipe instead of PVC. This makes the gun last longer because hair spray and other chemicals do not eat away at ABS pipe. ABS is also not affected by heat.

Take the 1 foot piece of 3 inch diameter pipe and glue on the 3 inch to 1 inch reduction fitting with ABS or PVC glue (be sure the glue matches the type of pipe you are using). Now you should take the 3 foot piece of 1.5 inch pipe and glue it to fitting.

Now move on to the igniter. I recommend you go to wal-mart and get a lantern lighter from the camping supplies, they are about \$3.00. Drill the appropriate size whole, slip it in, and tighten the nuts. You may need to put some hot glue or caulk around it to make it air tight.

Next take the 3 in threaded female fitting (Is that what you call it) and glue it in place in the back of the gun. Let all the glue dry completely for at least 6 hours. (I recommend 24.)

The last step is shooting spuds! Take a potato and twist on the top of the barrel so the excess is beginning to be cut away. Now flip the gun upside down and ram it into the ground driving the potato into the barrel. Take a broom stick, golf club, or hockey stick and ram the potato 3 quarters of the way down the barrel. Take a bottle of hair spray (I recommend this for the first launch) and spray it into the combustion chamber for a few seconds. Replace the cap and now your gun is loaded. Be very careful! These guns are very powerful and could really hurt someone! Aim the gun into a large field, flick the lantern flint and laugh for hours.

Finished Product:

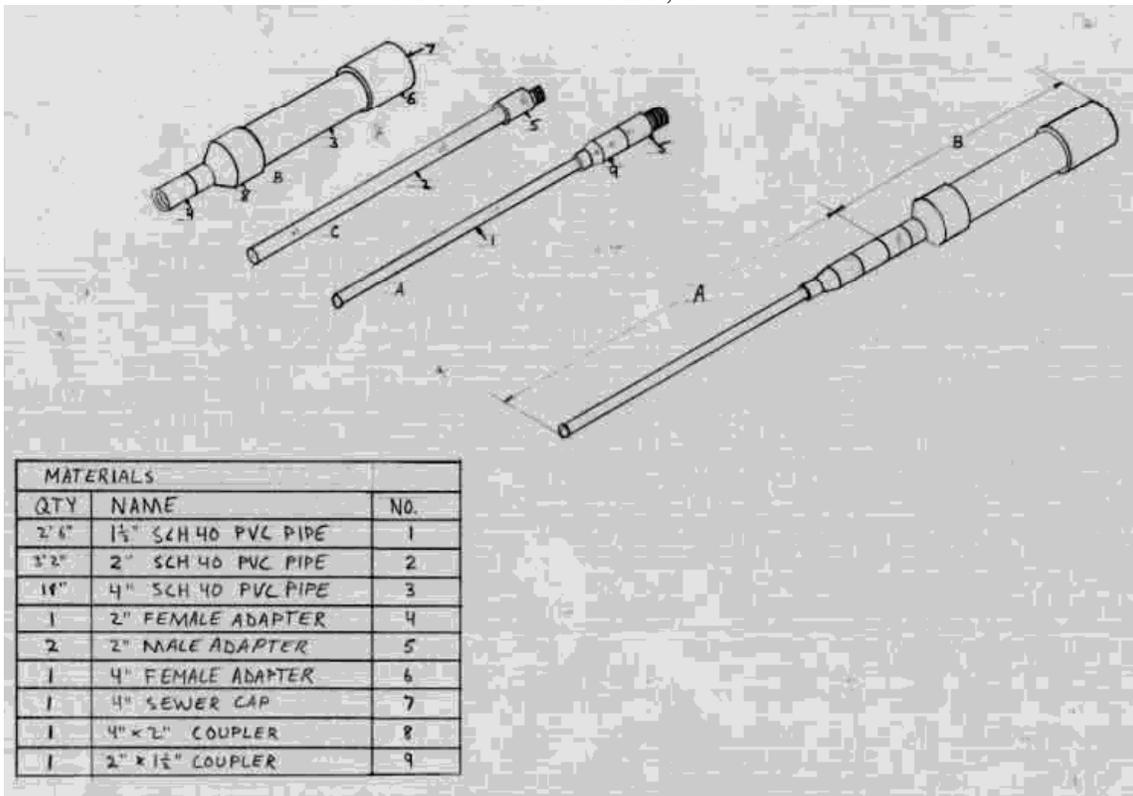


## PLAN # 9

<http://potatocannon.nodice.org/index.html>

POTATO CANNON V2

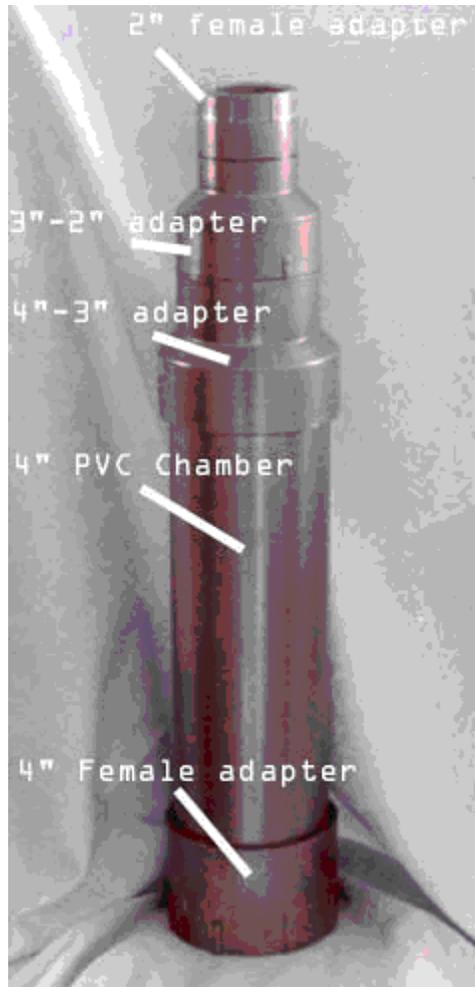
MUCH MORE COMPLICATED, BUT WORTH IT



MATERIALS		
QTY	NAME	NO.
2'6"	1½" SCH 40 PVC PIPE	1
3'2"	2" SCH 40 PVC PIPE	2
18"	4" SCH 40 PVC PIPE	3
1	2" FEMALE ADAPTER	4
2	2" MALE ADAPTER	5
1	4" FEMALE ADAPTER	6
1	4" SEWER CAP	7
1	4" x 2" COUPLER	8
1	2" x 1½" COUPLER	9

Here's a materials list for the chamber:

Part	Qty
2" PVC Pipe	~2 1/2'
3" PVC Pipe	~2"
4" PVC Pipe	~1 1/2'
2" - 3" PVC Adapter	1
3" - 4" Adapter	1
2" Female Cleanout Adapter	1
4" Female PVC Adapter	1
4" End Cap	1
Grill Ignitor	1
PVC Cement	1
PVC Primer	1
Hot glue	A few sticks



The Chamber of the cannon looks like this. As you can see I've painted it chrome to make it look cooler. Putting this together is a breeze. The [4" female adapter](#) fits on the end of the 4" PVC pipe. First prime both surfaces to be cemented with [PVC Purple Primer](#). Then place [PVC Cement](#) on both sides, put them together quickly (it sets fast) and hold until bond is set. On the other end you put the [4"-3" adapter](#), cementing it in a similar fashion. Between the [3"-2" adapter](#) you need to place a short (1"-2") piece of 3" PVC. Start by cementing the short piece to the 3" end of the [4"-3" adapter](#), then cement on the [3"-2" adapter](#). Cement the [2" female adapter](#) on the 3"-2" adapter. Before using make sure that all bonds are secure and set. Do this by tugging on each piece and checking for movement.

Here's a materials list for the barrels:

Part	Qty
<b>1 1/2" Barrel</b>	
1 1/2" PVC Pipe	~2 1/2'
2" PVC Pipe	~2"
1 1/2" - 2" Adapter	1
2" Male Adapter	1
<b>2" Barrel</b>	

2" PVC Pipe	~2 1/2'
2" Male Adapter	1

**3" Barrel**

2" PVC Pipe	~2"
3" PVC Pipe	~2 1/2'
2" - 3" Adapter	1
2" Male Adapter	1

**4" Barrel (not pictured)**

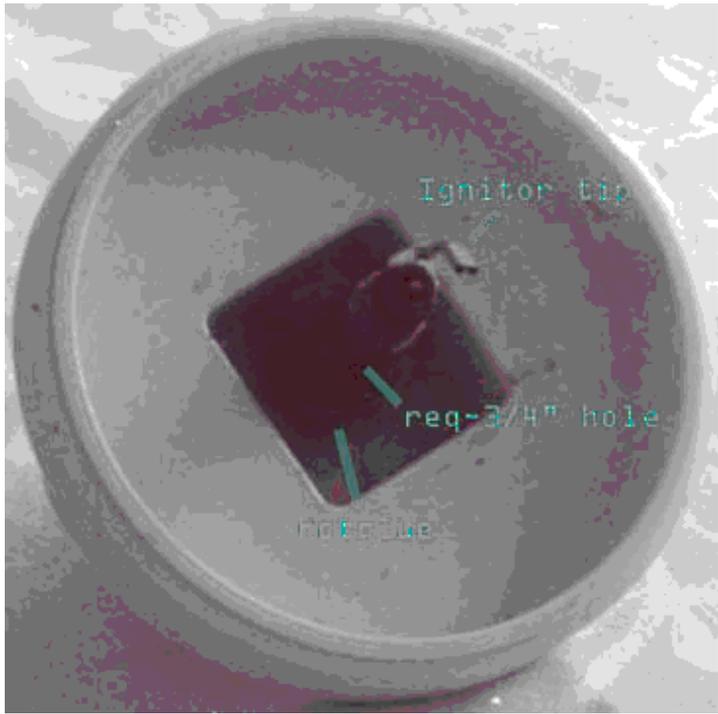
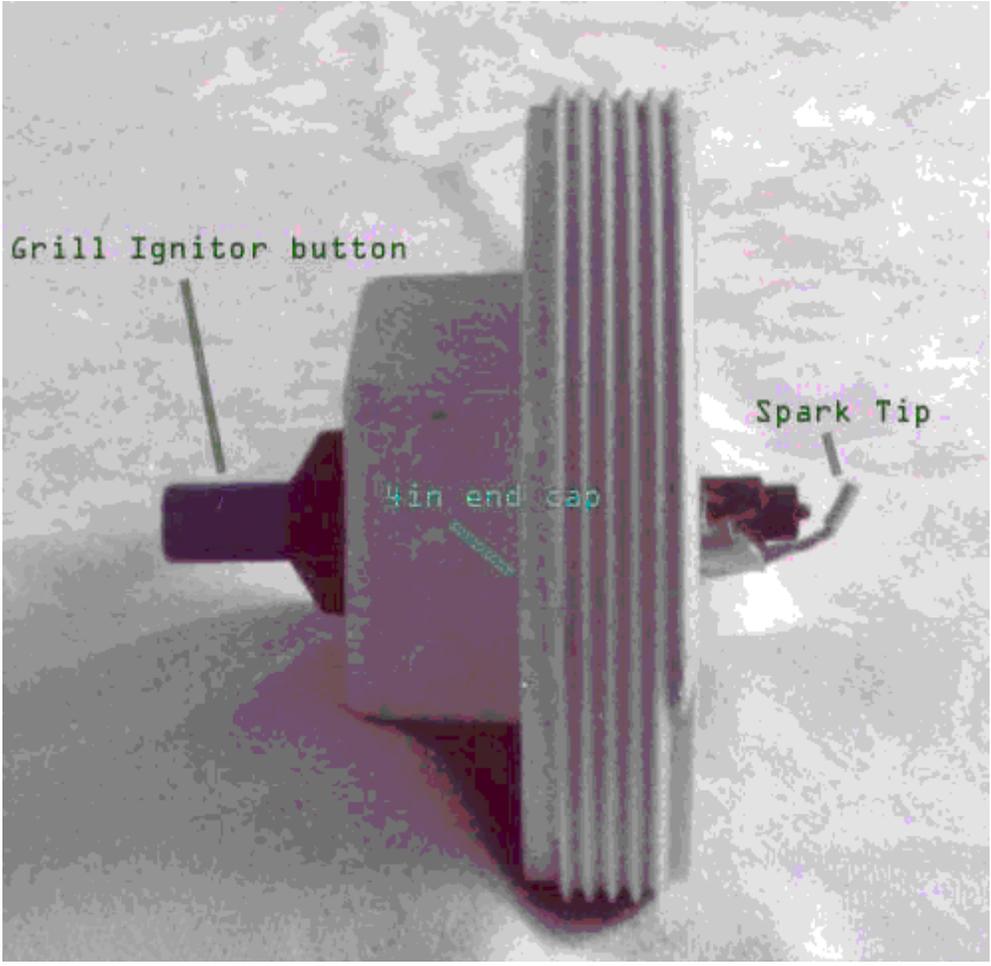
4" PVC Pipe	~2 1/2'
2" - 4" Flush Adapter	1
2" Male Cleanout Adapter*	1

\*-not in visual parts reference

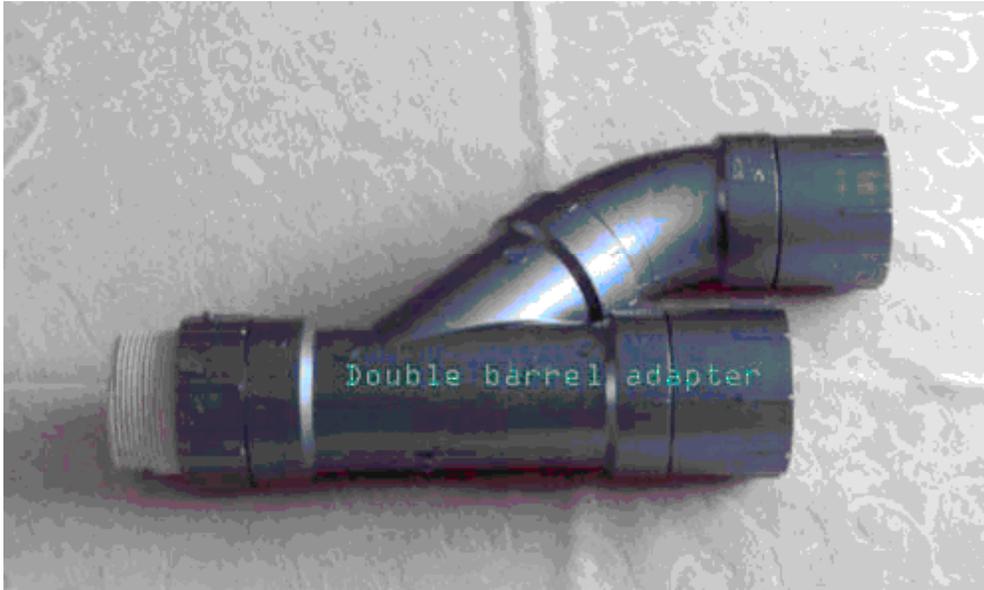


Once completed the set will look like this.

Now all you have left is the [end cap](#). The end cap contains the [ignitor](#).



This part is pretty self explanatory. You have to drill a 3/4" hole in the center of the end cap. The [ignitor](#) should be able to fit in the hole, you may have to file down the parts that are intended for mounting to a grill. You need to take the cord provided with the ignitor and cut it off and solder it to the wire along the side of the ignitor. Then hot glue the cord down so the exposed metal tip is close enough for a spark to jump across. Once the ignitor is prepared simply hot glue it into place. Let it set for a while before use. If you wish you may use silicon sealer instead of hot glue. Additionally you can make a Y-adapter (Double barrel) that will enable you to launch two potatoes at the same time.



All you need is a 2X2X2 45° y-junction pipe, a 45° elbow, two [2" female adapters](#), and a [2" male adapter](#). Follow the same cementing procedures as you did for the rest of the cannon.

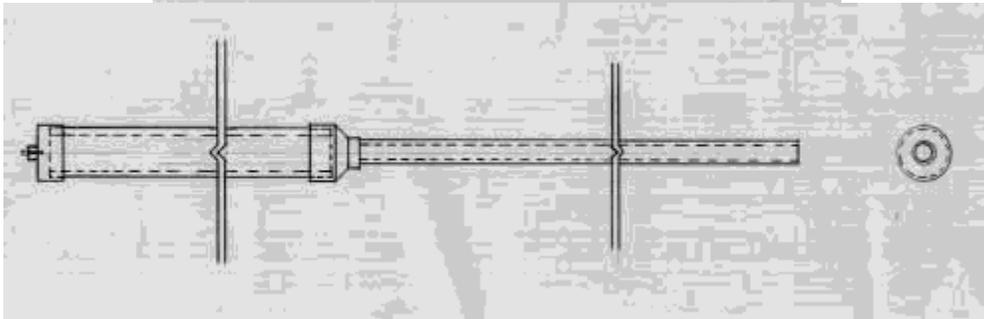
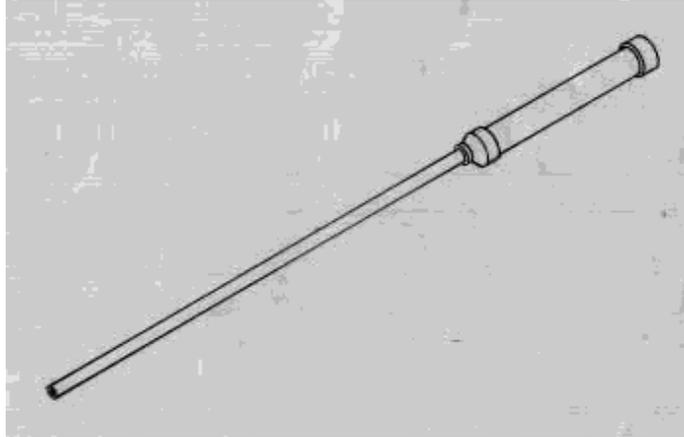
## **WARNINGS**

When using hairspray as a propellant avoid spraying it directly on the threads of the screws. The screws will stick together and may cause the barrel to break if you force it too much. If your barrel does get stuck DO NOT force it, instead you can use channel locks or a pipe grip which may be bought at a hardware store. These tools will give you much better leverage and will unscrew them with minimal force. Trust me, I learned from experience. You should also wash out your cannon when you're done, gunk tends to build up in it.

# PLAN# 10

## POTATO CANNON V1

This cannon is very simple to build and is cost effective for the beginning hobbyist.



It is very easy to build and costs about \$20 Here is a materials list:

<b>Part</b>	<b>Qty</b>
1-1/2" PVC Pipe	5'
3" PVC Pipe	2'
1-1/2" - 3" PVC Adapter	1
3" Female PVC Adapter	1
3" End Cap	1
Grill Ignitor	1
PVC Cement	1
PVC Primer	1
Hot glue	A few sticks

Once you get all the parts all you need to do is take the 1-1/2" pipe and cement one end

to the adapter and the 3" pipe to that. Then cement the female adapter to the end of the 3" pipe. The only part left is the ignitor. You will have to drill a hole in the end cap about the size of the ignitor. Then all you have to do is hot glue it into place, this will provide an adequate seal (A picture of this is in the works). Let everything set for a while before using.

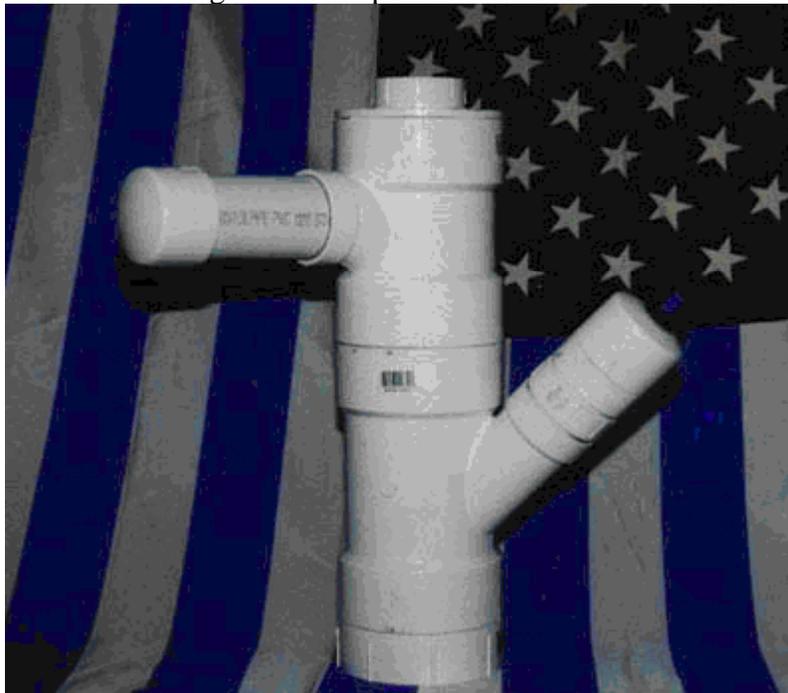
## **WARNING**

When using hairspray as propellant you should avoid spraying it on the threads of the screws. The hairspray may cause the end cap to stick and will be difficult to remove. If it does get stuck you can use channel-locks to remove it. When you are done using your cannon you should wash it out so gunk doesn't build up.

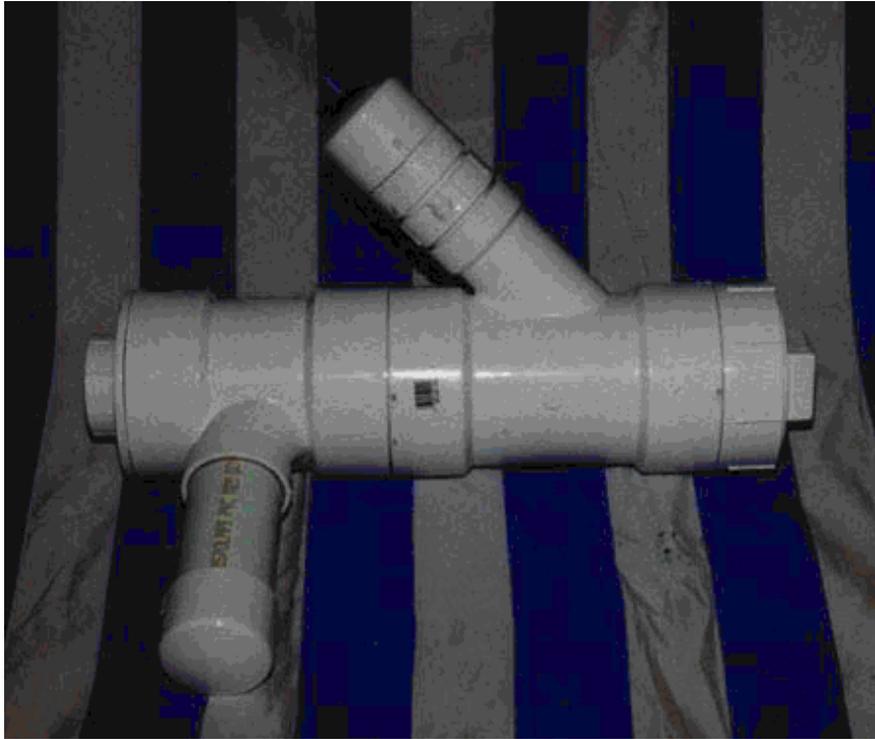
## **PLAN #11**

### **Potato Cannon - V3**

This is the best cannon I've come up with to date. Receiving some inspirado during a trip to the hardware store, this design was conceived on the spot, assembled and tested in about 3hrs. It takes the versatility of interchangeable barrels and adds an ergonomic design to the chamber. It also gets a better punch and takes less saw work to assemble.



A nice patriotic backdrop for the cannon.



Here's a materials list:

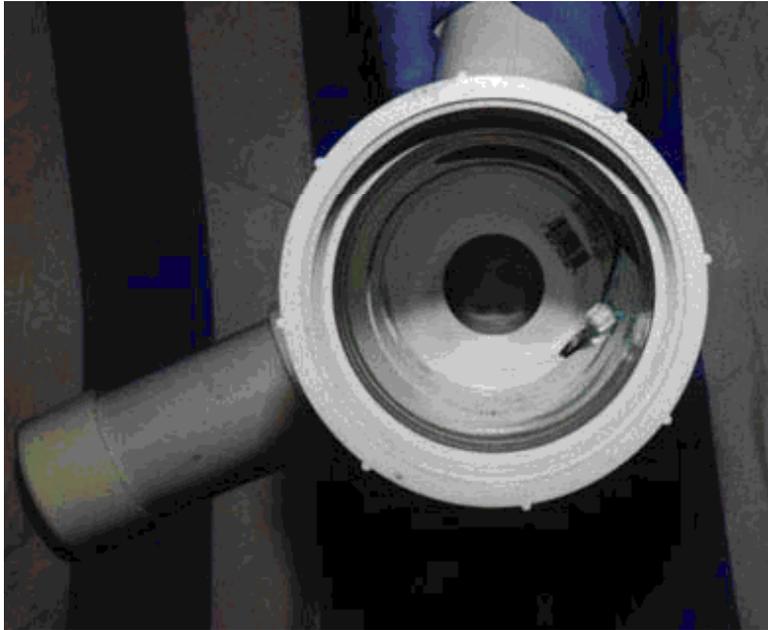
Part	Qty
2" PVC Pipe	~5"
4" PVC Pipe	~2"
2" Female Cleanout Adapter	2
4" Female Cleanout Adapter	1
4"x2" Flush Adapter	1
4" End Plug	1
2" End Cap	2
2" Male Adapter	1
4"x4"x2" Y-Adapter	1
4"x4"x2" T-Adapter	1
Grill Ignitor	1
PVC Cement	1
PVC Primer	1
Hot glue	A few sticks

As you can see, this cannon is not too much more difficult to construct than the previous model. In fact, it is in a few ways easier. The chamber is made of two primary pieces, the [4-2 inch y-adapter](#) sections. The one towards the end is a [45degree y-splitter](#). The one on top is a [4X4X2 T-adapter](#) (I don't remember the exact names from the hardware store,

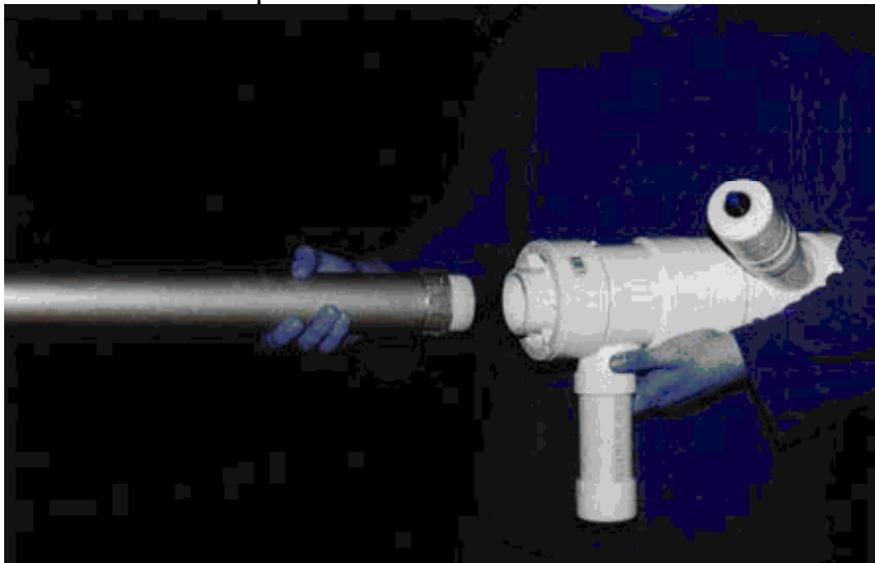
you'll know them when you see them.) These pieces are cemented together. Do some dry fitting before hand to get a comfortable angle for the handles. Notice that the handle with the ignitor points straight up when in use, and the handle on the side points downward slightly. This is the best angle we came up with. To find a good angle for you, put your right hand out in front of you as if you were holding the trigger assembly. Put your left hand out in front and act as if you were holding the handle. Figure out how your hand naturally rests when extended out and which angle is the most comfortable. When you figure out the angles, cement the two pieces together.

Next cement in the [4 inch female adapter](#) into the end of the chamber and the [4-2 inch flush adapter](#) into the top. Cement a [2 inch female adapter](#) into the [4-2 inch flush adapter](#). When that is complete, cut to length a piece of 2 inch pipe to be used for the handle (the exact length is not important, just make it a comfortable size for your hand.) Then cement that into place and cement a [2 inch end cap](#) on the end.

To make the igniter assembly (sorry there are not detail pictures of it, I may get some cross-sectional drawings up eventually) You need to get a [2 inch end cap](#) and a [2 inch male adapter](#). Drill a hole in the end cap to fit the [ignitor](#) as you would for the previous cannons. You need to do a little bit of jury-rigging on the ignitor. Get a couple of long wires and solder them onto the two wires coming from the ignitor. This will allow the sparker to reach into the chamber. Next, place the rigged ignitor assembly through the hole in the endcap. Hot glue it into place. This will be a little tricky, all you have to do is start squirting the hot glue down towards the hole. You don't have to get close to the hole, just be very liberal with your hot glue use, the more you use now, the less you'll have to use later if it comes loose. After the igniter is glued into place and the glue has cooled, you may cement on the [2 inch male adapter](#). Now you need to fix the end of the wires from the ignitor so that they stay apart so a spark may jump between. I used a cable staple to accomplish this. A cable staple is essentially a piece of plastic with two nails in it on opposite sides. I soldered the two wires to the two nails, then bent the nails so they were close enough to spark. After that, I hotglued it all in place so the nails wouldn't change position. After this, on the [45 degree y-adapter](#) piece, cement on the [2 inch female adapter](#) to the end, allowing a port to accept the igniter assembly. You can now feed the wires through the hole and screw the assembly into place.



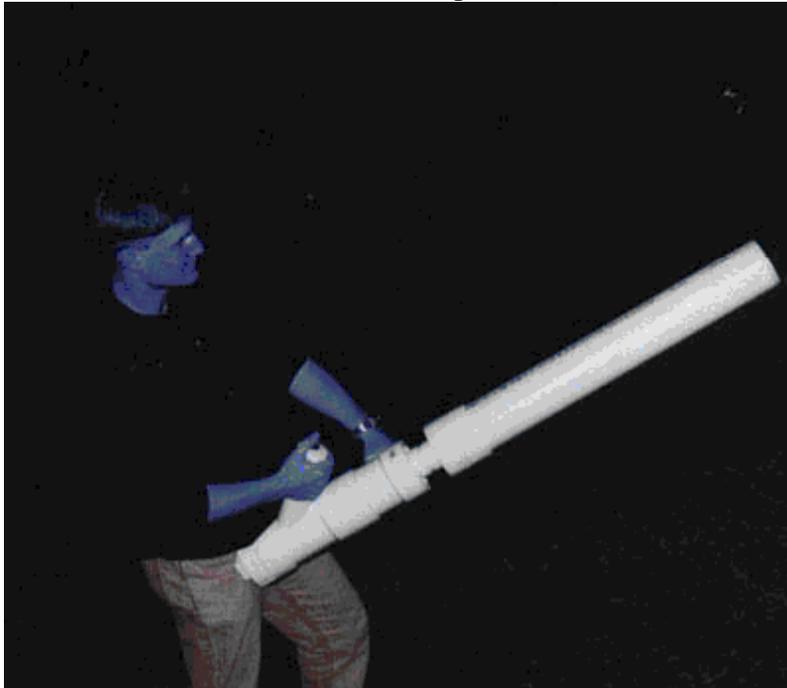
The wires should now hang down into the chamber. To prevent it from rattling around tape it down inside the chamber.



You can use the same barrels that you used for the previous model. They are all interchangeable because we're using a 2 inch standard. Load the cannon the same way. Put a potato or other ammunition into the barrel. Then screw the barrel into place.



Fuel this cannon the same way as the previous model as well. Load the fuel in through the end, screw the cap on, then...



... take aim and fire.



Here's a comparison shot with both the model version 2 and 3. You can see how version 3 is superior.

## **WARNINGS**

When using hairspray as a propellant avoid spraying it directly on the threads of the screws. The screws will stick together and may cause the barrel to break if you force it too much. If your barrel does get stuck DO NOT force it, instead you can use channel locks or a pipe grip which may be bought at a hardware store. These tools will give you much better leverage and will unscrew them with minimal force. Trust me, I learned from experience. You should also wash out your cannon when you're done, gunk tends to build up in it.