

# The Internet Guide to Spudgunning



*Under Pressure!*

## Air Cannon Plans "Build-it-Yourself"

**WARNING: No Liability Is Assumed By The Developers Of This Website and All Literature Is Provided Second Hand, Use It At Your Own Risk!**

## Table of Contents *(Chapter names and page numbers are clickable)*

<a href="#">Introduction</a>	<a href="#">5</a>
<a href="#">Disclaimer</a>	<a href="#">6</a>
<a href="#">Safety</a>	<a href="#">7</a>
<a href="#">Spudgun Plans</a>	<a href="#">10</a>
<a href="#">Build Your Own Launcher</a>	<a href="#">11</a>
<a href="#">Spud Buster</a>	<a href="#">18</a>
<a href="#">Mini T-Rex</a>	<a href="#">19</a>
<a href="#">The Green Hornet</a>	<a href="#">21</a>
<a href="#">Micro Spudder</a>	<a href="#">26</a>
<a href="#">Basic Plans</a>	<a href="#">31</a>
<a href="#">How to Build a Spudgun</a>	<a href="#">33</a>
<a href="#">Big Spudgun</a>	<a href="#">37</a>
<a href="#">Noisy Cricket</a>	<a href="#">41</a>
<a href="#">Econo Spudgun</a>	<a href="#">44</a>
<a href="#">Spudzooka</a>	<a href="#">47</a>
<a href="#">BL Series</a>	<a href="#">49</a>
<a href="#">Spudgun Enhancements</a>	<a href="#">53</a>
<a href="#">Barrel Mods</a>	<a href="#">54</a>
<a href="#">Burst Disk</a>	<a href="#">56</a>
<a href="#">Chamber Fan</a>	<a href="#">58</a>
<a href="#">Fan Controller</a>	<a href="#">61</a>
<a href="#">Check Valve</a>	<a href="#">65</a>
<a href="#">Better Ignition</a>	<a href="#">68</a>
<a href="#">Easier Loading</a>	<a href="#">69</a>
<a href="#">Ramrod Holder</a>	<a href="#">70</a>
<a href="#">Spud Blocker</a>	<a href="#">70</a>
<a href="#">Fuel Injection</a>	<a href="#">70</a>
<a href="#">Cheaper Ignition</a>	<a href="#">71</a>
<a href="#">Combustion Chamber Changes</a>	<a href="#">71</a>
<a href="#">Ignition Inquiries</a>	<a href="#">72</a>
<a href="#">Fuel Facts</a>	<a href="#">73</a>
<a href="#">Combustion Chamber Construction</a>	<a href="#">73</a>
<a href="#">Spud Trimmer</a>	<a href="#">74</a>
<a href="#">Pressure Release</a>	<a href="#">74</a>
<a href="#">Easy Load</a>	<a href="#">74</a>
<a href="#">Noisy Cricket Improvement</a>	<a href="#">75</a>
<a href="#">Nitrous Oxide</a>	<a href="#">76</a>
<a href="#">Laser Sight</a>	<a href="#">76</a>
<a href="#">Easy Refueling</a>	<a href="#">76</a>

## Table of Contents (cont.)

Spudgun Enhancements (cont.)	
Cheap Ignition	76
Assorted Ideas	76
Pressurizing the chamber	76
Shortening the Gun	77
Ammo Holder	77
Propane Meter & Injection	78
Silencer	80
Guano Grip	83
Laser Guidance	85
Pacific Grip	87
Pass-Thru Barrel	91
Slug Cutter	94
Spudgun Ammo	96
PVC Rockets	97
Concrete Balls	105
Spud-A-Chute	110
Advanced Spudgun Ignition	111
Flint-Type Lantern Ignition	112
Multiple Sparks	114
Spark Strip	116
Stun Gun Ignition	118
General Information	121
PVC Solvent Welding	122
Painting Techniques	123
Spudgun Fuels	125

## Introduction

The purpose of The Internet Guide to Spudgunning is to take the best information on the web concerning spudguns and to consolidate it into one location. The IGS came about through extensive research on the internet to find the best resources to help the average person build and improve spudguns. All plans that are included within these pages are not for everyone. But, there should be something for every level of spudgun enthusiast in here. There are plans to build basic guns and very advanced guns. I think you will be please with the amount of information and how easy it is to build your own spudgun.

If you have information you think would be beneficial to other spudgun enthusiasts, let me know and I'll include it in future revisions of The Internet Guide to Spudgunning. Alternately, if you are the owner of any information included within and would like it to be removed; you can let me know that as well.

James Strickland

## The IGS disclaimer.

As with most cool and/or dangerous stuff, here we go. I'm not a lawyer, but take heed:

**You view and interpret material from this ebook SOLELY AT YOUR OWN RISK.**

You release ALL ENTITIES IN THE UNIVERSE, save yourself, from liability from any occurrence as a direct or indirect result from material or merchandise viewed, attempted, communicated, purchased, or otherwise interpreted from this ebook. The communicative material within this ebook is presented primarily for educational and entertainment purposes only.

**It should also be understood that the use of plastic water pipe (PVC, ABS, or any other) for spudguns is one of the MOST WRONG things you can do with the pipe.**

## Potato gun and general gun safety

1. Make sure you know if the gun is loaded or not. Treat the gun as if it is loaded, at all times. Do not point it at people or animals, always point it in a safe direction when using or loading. Potato guns can be dangerous, or even deadly when improperly handled. Never store or transport a loaded potato gun. Don't load a potato gun unless you intend to shoot it immediately.
2. Do not put your finger on the firing mechanism unless the gun is pointed at the intended target. Simple: on target means on trigger, off target means off trigger.
3. Be sure of your target and what is beyond it. You must always launch spuds in a safe location. This means NEVER point or fire at anything that (1) you cannot clearly and easily identify as a target, and (2) that would pose a danger to anyone were your ammo to stray, or ricochet. This means always knowing where your ammo has the potential to go. Never point the gun or pull the trigger at a close-range target without a backstop that will STOP your fire.
4. A very important, but often overlooked rule, never hand a gun to anyone that doesn't understand and abide by these rules. Once they are holding the gun, it is their, not your, responsibility to handle it safely, but you will be putting your life and property as well as the life and property of everyone else on the line if you do so.

### Guidelines for potato guns

Don't use spud guns in extremely cold or extremely hot weather, PVC is a good material, but it does have its limits. PVC may become brittle in extreme temperatures.

Never go beyond 100 PSI with a PVC spud gun. Also remember to use only pressure rated pipe. The pipe will say XXXPSI, such as 330PSI, this means it is pressure rated, as PSI is a pressure rating. Never use non pressure rated

PVC or cellular core PVC. Also remember your spud gun is only as strong as it's weakest component.

## Gluing Pipe

Always make sure the glue you use is compatible with the pipe. If it is the wrong type you will not get a good solvent weld. Also do not mix ABS and PVC. They will not glue together properly.

Plastic pipe joints are connected with glue that actually melts the pieces together. The joints for both PVC and ABS are glued the same way, but the types aren't interchangeable and only a special fitting can connect them together.

## Some common potato gun mistakes:

1. Looking down the barrel or into the combustion chamber when testing the spark. This seems like common sense, but it has happened before, expelling flames and hot gasses at the onlooker's face. Don't do this! Also note that PVC glue and solvents build up flammable gasses and could cause the gun to fire before you actually spray fuel into your gun. This is a common mistake after building a gun.
2. Proper and careful construction is the key to spud gun safety. Properly primer and glue your spud gun.
3. Make sure the end cap is screwed on all the way. You risk blowing the end cap off if it is not screwed in all the way.
4. Some plans tell you to mount the igniter in an end cap of the potato gun. Don't do this! Two reasons: (1) it drastically weakens the end cap and (2) you can accidentally fire the gun if you set it on the ground end cap first.

5. Do not use high powered fuels such as acetylene, hydrogen or oxygen. PVC is nowhere capable of withstanding the extreme power of these fuels, and will explode with much PVC shrapnel.
6. Don't look down the barrel of a spud gun, either a loaded one or an unloaded one. If you pay attention to any rules here, this is one of the most important!

When used improperly, spudguns can be dangerous, but remember they are safe and a lot of fun when used properly. Potato guns are enjoyed by many, many people of all ages without any problems.

Remember to use common sense and have fun.



# Spudgun Plans

## Build Your Own Launcher

**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!

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 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 I 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. **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 igniter/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. Removing sharp corners on 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 spurs 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 igniter -- 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 igniter 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 RECCOMENDED 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, stinky 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 igniter a few times and it didn't work, you are not alone, check out the 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.

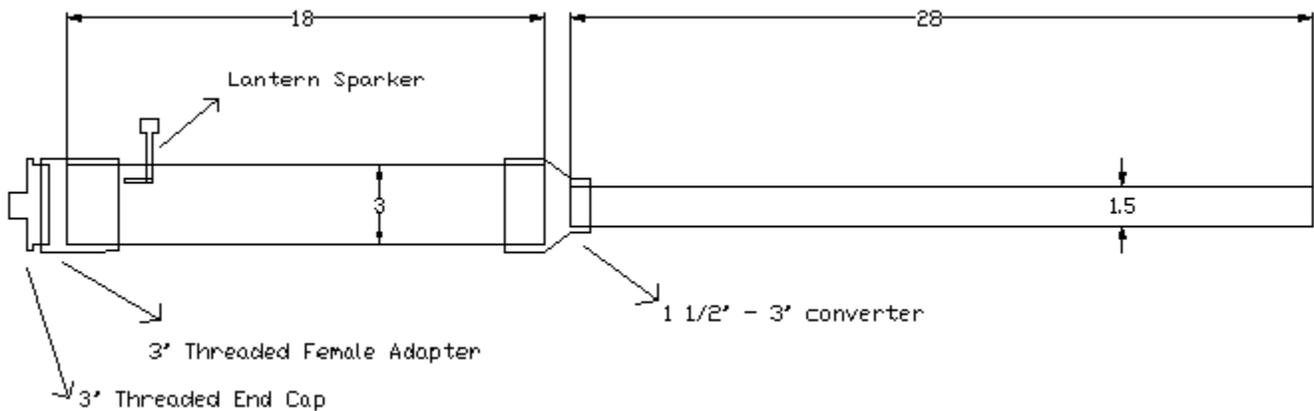
One of the most common fuel problems leading to misfire is too much fuel! Not usually a problem with hairspray, other richer fuels can be overloaded above their UEL value, and they won't work. Always try less fuel rather than more fuel.



The **Spud Buster** is a simple modification of my first potato gun. I made the barrel slightly shorter and the expansion chamber bigger. There is not too much going on with this gun that other guns can't do. This is a no-fail gun. I made one that lasted for 2 or 3 years until I "dropped it." This is definitely an old school gun, designs like this have been floating around for a while!

### Materials

Item	Length	Where to buy	Approximate Price
<u>Lantern Sparker</u>	N/A	Camping Section of Store	\$2.00
3" Schedule 40 PVC **	18"	Hardware Store	\$1.50
1 1/2" Schedule 40 PVC	28"	Hardware Store	\$1.50
1 1/2" to 3" Converter	N/A	Hardware Store	\$3.00
3" Threaded Female Adapter	N/A	Hardware Store	\$2.00
3" Threaded Male End Cap	N/A	Hardware Store	\$1.50
PVC Primer	N/A	Hardware Store	\$2.50
PVC Glue	N/A	Hardware Store	\$2.50



**\*\* All PVC, including fittings, Must be pressure rated Schedule 40.**



The **Mini T-Rex** was my first potato gun I designed totally by myself. It has a 3 inch expansion chamber with a 3/4 inch barrel. Needless to say this gun is awesome! The best three things about the mini-rex are: it shoots just as far as a big spud gun, you can get 6 shots per potato (vs. 1 or 2 for big ones), and it is quieter. Don't get me wrong, I like big BOOMS, but sometimes a smaller sound is less risky. This gun will not disappoint.

<b>Materials</b>			
Item	Length	Where to buy	Approximate Price
<u>Lantern Sparker</u>	N/A	Camping Section of Store	\$2.00
3" Schedule 40 PVC **	4"	Hardware Store	\$.50
1 1/2" Schedule 40 PVC	2"	Hardware Store	\$.25
3/4" Schedule 40 PVC	16"	Hardware Store	\$2.00
3" Schedule 40 PVC **	4"	Hardware Store	\$.50
1 1/2" Schedule 40 PVC	2"	Hardware Store	\$.25
3/4" Schedule 40 PVC	16"	Hardware Store	\$1.00
1 1/2" to 3" Converter	N/A	Hardware Store	\$3.00
1 1/2" to 3/4" Converter	N/A	Hardware Store	\$2.00
1 1/2" Coupler	N/A	Hardware Store	\$1.00
3" Threaded Female Adapter	N/A	Hardware Store	\$2.00
3" Threaded Male End Cap	N/A	Hardware Store	\$1.50
PVC Primer	N/A	Hardware Store	\$2.50
PVC Glue	N/A	Hardware Store	\$2.50



\*\* All PVC, including fittings, Must be pressure rated Schedule 40.

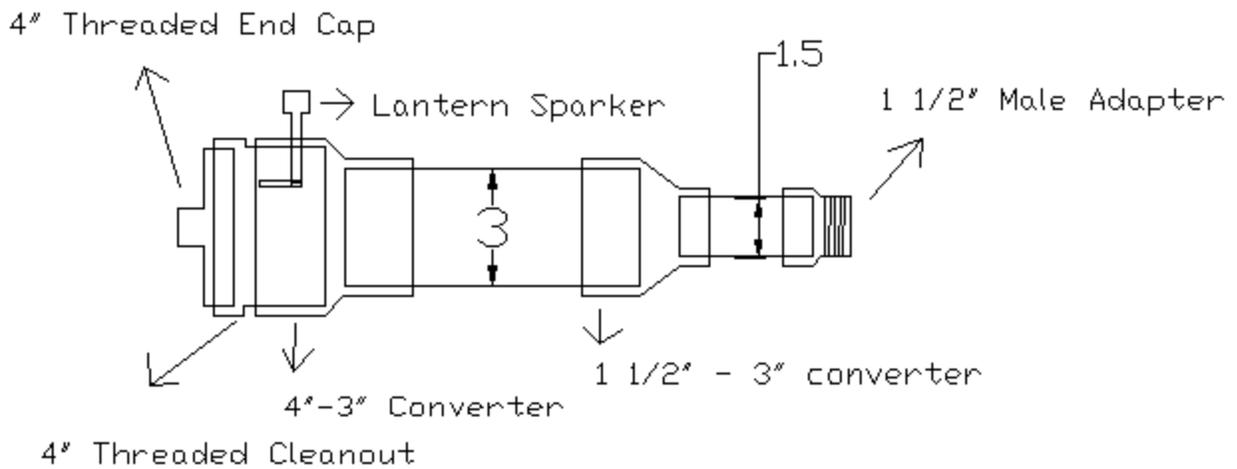
## THE GREEN HORNET

**The Green Hornet** is one of the best Potato Guns I had ever used up to the point when I made it. It shoots 75 yards farther than any Spud Gun I had used! One great feature is the interchangeable barrels. With the gun made this way, you can shoot any size barrel using the same body. This saves BIG \$\$\$!

Remember to see my section on how to make the barrels.

<b>Materials</b>			
<b>Item</b>	<b>Length</b>	<b>Where to buy</b>	<b>Approximate Price</b>
<b><u>Lantern Sparker</u></b>	<b>N/A</b>	<b>Camping Section of Store</b>	<b>\$2.00</b>
<b>3" Schedule 40 PVC **</b>	<b>7 1/2"</b>	<b>Hardware Store</b>	<b>\$.50</b>
<b>1 1/2" Schedule 40 PVC</b>	<b>3"</b>	<b>Hardware Store</b>	<b>\$.25</b>
<b>1 1/2" Male Adapter</b>	<b>N/A</b>	<b>Hardware Store</b>	<b>\$.80</b>
<b>1 1/2" to 3" Converter</b>	<b>N/A</b>	<b>Hardware Store</b>	<b>\$3.00</b>
<b>4" to 3" Converter</b>	<b>N/A</b>	<b>Hardware Store</b>	<b>\$5.00</b>
<b>4" Threaded Cleanout</b>	<b>N/A</b>	<b>Hardware Store</b>	<b>\$3.50</b>
<b>4" Threaded End Cap</b>	<b>N/A</b>	<b>Hardware Store</b>	<b>\$1.50</b>
<b>PVC Primer</b>	<b>N/A</b>	<b>Hardware Store</b>	<b>\$2.50</b>
<b>PVC Glue</b>	<b>N/A</b>	<b>Hardware Store</b>	<b>\$2.50</b>

**\*\* All PVC, including fittings, Must be pressure rated Schedule 40.**



All measurements appear in inches

### Interchangeable Barrels

This is based on 1.5" male thread on your gun. I am not going to explain any other sizes, as it is pretty self explanatory. If your gun is built with a solid barrel, just chop it off and put a threaded adapter on it.

1 1/2" PVC Barrel

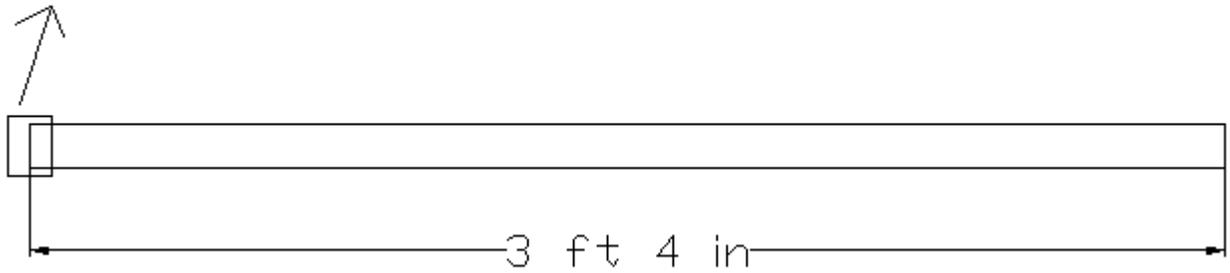
This barrel seems to deliver the most distance and the loudest boom.

#### Materials

- (1) 3 ft 4 in piece of 1 1/2" SCH 40 PVC
- (2) 1 1/2" Threaded Female Adapter.

**Total Cost = about \$2.50**

1 1/2" Threaded Female Adapter



### 1 1/4" PVC Barrel

Same as above only smaller.

#### Materials

- (1) 3 ft 4 in piece of 1 1/4" SCH 40 PVC
- (2) 1 1/2" Threaded Female Adapter.
- (3) 1 1/2" to 1 1/4" reducer bushing

**Total Cost = about \$3.50**

### 1" PVC Barrel

Same as above only smaller.

#### Materials

- (1) 3 ft 4 in piece of 1" SCH 40 PVC
- (2) 1 1/2" Threaded Female Adapter.
- (3) 1 1/2" to 1 1/4" reducer bushing
- (4) 1 1/4" to 1" reducer bushing

**Total Cost = about \$4.00**

### **3/4" PVC Barrel**

Same as above only smaller.

#### **Materials**

- (1) 3 ft 4 in piece of 3/4" SCH 40 PVC
- (2) 1 1/2" Threaded Female Adapter.
- (3) 1 1/2" to 1 1/4" reducer bushing
- (4) 1 1/4" to 1" reducer bushing
- (5) 1" to 3/4" reducer bushing

**Total Cost = about \$4.50**

### **1/2" PVC Barrel**

Same as above only extremely small.

#### **Materials**

- (1) 3 ft 4 in piece of 1/2" SCH 40 PVC
- (2) 1 1/2" Threaded Female Adapter.
- (3) 1 1/2" to 1 1/4" reducer bushing
- (4) 1 1/4" to 1" reducer bushing
- (5) 1" to 3/4" reducer bushing
- (6) 3/4" to 1/2" reducer bushing

**Total Cost = about \$4.75**

**\*The reason cost goes up as barrel size goes down is there are more fittings.**

\*To attach the barrels to the Green Hornet, just screw them on.

## Hornet Sparker

If using a lantern lighter this tip comes in handy. I suggest straying away from BBQ igniters on any gun.

This tip is for installing the sparker. This tip is necessary on the Green Hornet, since the sparker is installed through a double layer of PVC fittings. This tip may also be needed on other potato guns. The problem originates from the nut on the lantern lighter being too short. The way to overcome this obstacle is to take the nut off the sparker. Next drill a hole slightly smaller than the sparker. Now screw the sparker into the gun from the inside. The sparker will tap it's own threads into the PVC, resulting in no leaks, and no way for the sparker to come out.

If any mistakes are made and there is a leak, you can use an epoxy such as JB-Weld around the threads of the lantern lighter.

## MICRO SPUDDER

The **Micro Spudder** is a totally different potato gun. It is a mini potato gun, and so small it can fit into the palm of your hand. It isn't as powerful as bigger guns, but this gun is awesome, and can even be shot safely indoors, such as in a garage! Mini spudgun.

Materials			
Item	Length	Where to buy	Approximate Price
"Long Nosed" Lighter	N/A	Grill Section/Lighter Section of store	\$3.00
Travel Size Tylenol	N/A	Gas Station/Pharmacy	\$2.50
Electrical/Black Tape	N/A	Dept./Hardware Store	\$2.00
Ink Pen	N/A	Almost Any Store	\$.25
2 Thumb Tacks	N/A	Almost Any Store	\$.25

## Instructions

### Preparing The Parts

These steps need to be done before the gun can be assembled:

1. "Long Nosed" Lighter Disassembly
2. Tylenol Bottle Modification
3. Ink Pen Modification

### "Long Nosed" Lighter Disassembly

Ignition for mini potato gun (these are also called Piezo Igniters)

This is a picture of the type of grill lighter needed:



Ready to begin



1. Take the top casing off



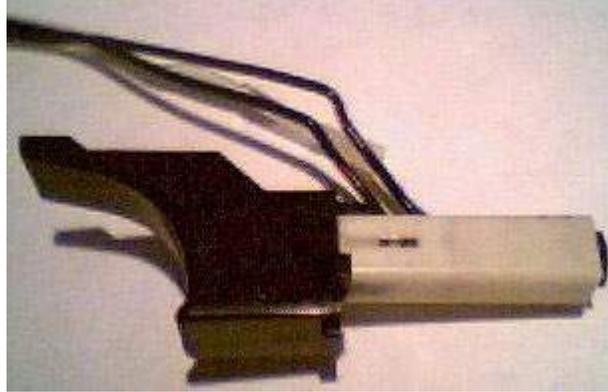
2. Take the rest of the casing off



3. Next take the butane tank off.



4. Remove the trigger assembly



5. The white piece on the right is the part you will need (Piezo), so you can discard the other parts. Make sure you leave the wires on the igniter.

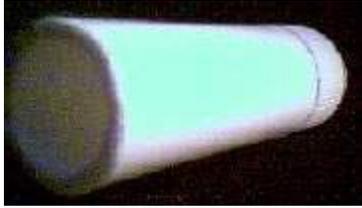
## Tylenol Bottle Modification

Chamber for mini potato gun

This is the Tylenol you need. :



Throw away or keep the Tylenol, peel off the wrapper, then cut off the end like this:



## Ink Pen Modification

Barrel for mini spudgun

Take the ink pen apart like this:



The barrel of the pen is all that is needed. Discard the rest.



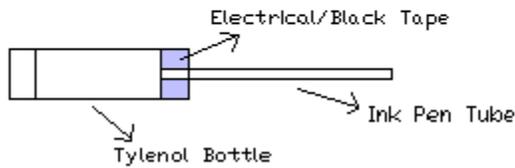
**Now that all that is done here's what to do:**

1. Take the Electrical Tape and wrap it around the pen until it makes a snug fit into the cut off end of the Tylenol bottle.
2. Stick the pen into the Tylenol bottle and tape around it really good, so it is a strong, air tight seal.
3. Push the Thumb Tacks through the Tylenol bottle, like in the diagram below. Be careful, this is relatively hard to do.
4. Grab the two wires that are attached to the Piezo Igniter (white thing from the "Long Nosed" lighter), and attach one wire to each Thumb Tack. It is not important which wire goes where.

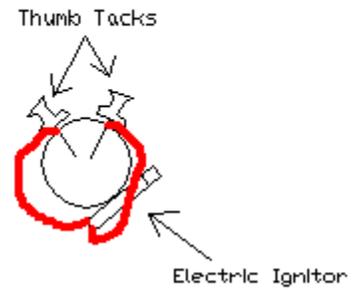
- 5. You are almost done. Now tape the igniter onto the side of the Tylenol bottle.

Push the button on the igniter and you should see a spark inside the gun. To use it simply stab it in a potato, to make a potato slug, then spray in a super tiny amount of propellant, put the lid on and push the button.

Side View



End View



Pic of finished gun

**A little fuel advice for miniature potato guns:** Good fuels are Binnaca breath spray, Right Guard, or any other spudgun fuel. **Mini spudguns are rather picky on fueling. The chamber is so small that you almost always get too much fuel.** I have come up with a process to remedy this. Squirt a very small amount of your fuel in. Now slowly wave the spudgun back and forth about 2-3 times. Now cap the gun and it should fire. If not, either try less fuel, maybe more fuel (unlikely), or varying the times you "wave" the gun. It will work, I promise! **A side note: Make sure nothing is in your line of fire while waving the mini spudgun.**

## Basic Plans

### SHOPPING LIST:

- (1) 10' 3 inch SCH 40 PVC
- (1) 10' 2 inch SCH 40 PVC
- (1) 3 inch to 2 inch reducer fitting (SCH 40 PVC)
- (1) 3 inch cleanout adapter w/ plug (SCH 40 PVC)
- (1) piezoelectric barbeque ignitor (red button kind)
- (2) Drywall screws
- (1) PVC primer (purple is best\*)
- (1) PVC glue (blue is best\*\*)

\*using purple primer allows you to visually check if you've cleaned the pipe properly or not

\*\*using blue glue makes it easier to see if you've used enough glue or not

### DIRECTIONS:

1. Cut about 1 foot of the 3 inch pipe. this piece will become the combustion chamber.
2. Cut about 3 1/2 feet of the 2 inch pipe. this piece will become the barrel.
3. Bevel one end of the barrel, making it sharp, this will cut the potatoes to size when you load them.(see figure A)
4. Glue the 3 inch to 2 inch reducer to one end of the 3 inch pipe.
5. Glue the cleanout adapter to the other end of the 3 inch pipe.
6. Glue one end of the 2 inch pipe into the 3 inch to 2 inch reducer.
7. Wait over night for the glue to dry.
8. After letting the glue dry, screw the 2 drywall screws into the cleanout adapter end of the chamber, make sure they line up. (see figure B)
9. Hook up the barbeque igniter to the drywall screws.
10. Push the red button (it is EXTREMELY important to make sure all the glue fumes are gone before you do this)
11. If you see a blue spark jump across the screws, you've hooked it up correctly.(see figure C)



Figure A

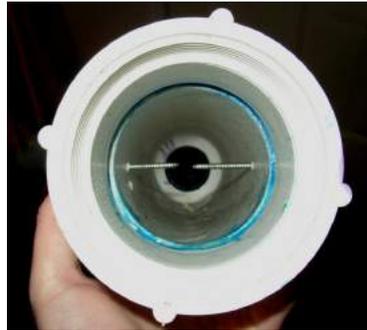


Figure B



Figure C

# How To Build A Spudgun

I'm sure you have already read the disclaimer. If not, then I suggest you read it. Even if you have read it, let me remind you that the information presented here can be harmful if misused. A spudgun can easily kill or seriously injure someone. Even though it may seem otherwise, airborne vegetables are not a very safe thing. You must be careful where you use this device. Remember that it is entirely possible for a spud to travel 2000 feet. With that said, lets get down to business.

## Parts:

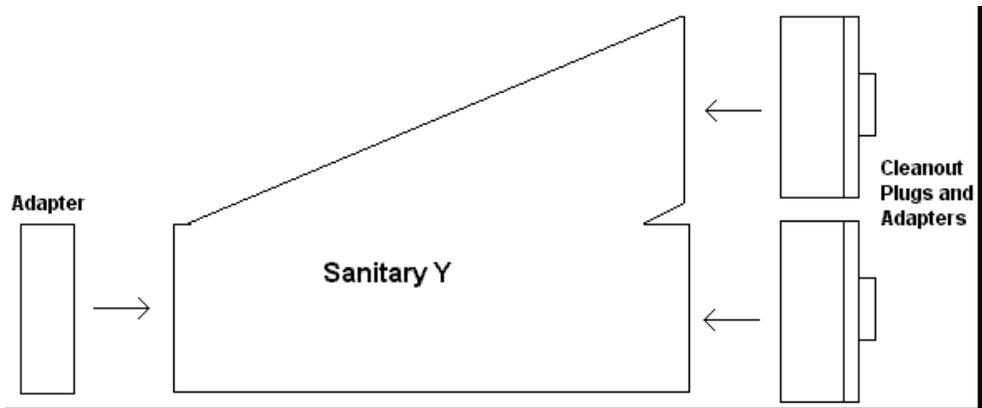
- One section (3-4 feet long) of 1 1/2 inch ABS pipe
- One 3 inch ABS sanitary Y
- Two 3 inch threaded ABS cleanout adapters with plugs
- One ABS 3 inch to 1 1/2 inch adapter
- One spark plug and push button BBQ igniter (and wires)
- Other: ABS glue, duct tape

You may want to use PVC pipe. That is fine. Just remember to get the right type of glue and primer. Personally, I think that PVC is more brittle and weaker then ABS, plus it takes more time to glue. Because of this, I recommend ABS over PVC.

## Construction:

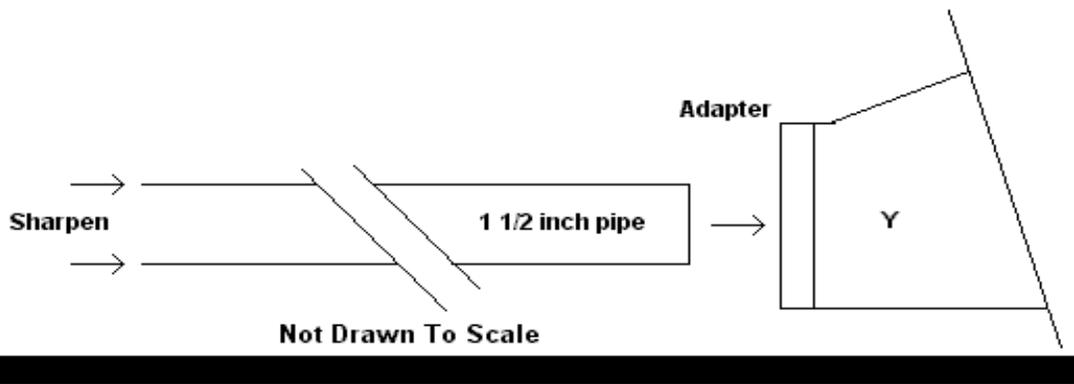
### Step 1:

**Assemble the Y section.** Glue one cleanout adapter to each branch of the Y. To do this, spread glue on the joints of the adapter and Y, then push the parts together and give them a slight twist. Now, glue the 3 inch to 1 1/2 inch adapter to the remaining branch of the Y. Do not glue the cleanout plugs into the cleanout adapters. You will need to be able to remove them in order to shoot the spudgun.



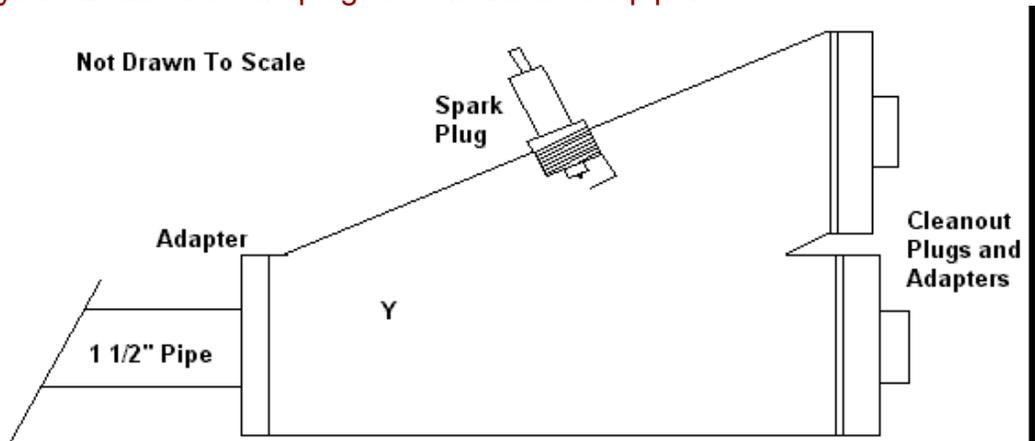
**Step 2:**

**Prepare and attach the barrel.** Using a file or bench grinder, sharpen one end of the 1 1/2 inch pipe. This serves to automatically cut the spud to fit the barrel when it is inserted. Now glue the other end into the 3 inch to 1 1/2 inch adapter.



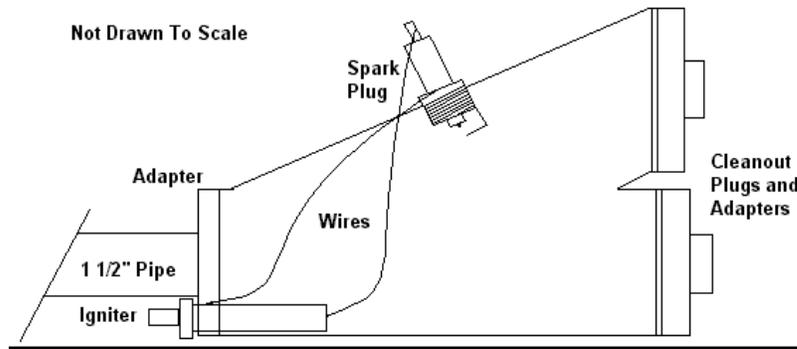
**Step 3:**

**Install spark plug.** Drill a hole for the spark plug somewhere in the side of the Y. It doesn't really matter where, just make sure to put it somewhere you will not be zapped while holding the spudgun. You can see the location I prefer in the diagram below. Drill the hole slightly too small so that you can thread the spark plug directly into the plastic pipe. If you wish, you can also bolt the plug on from inside the pipe.



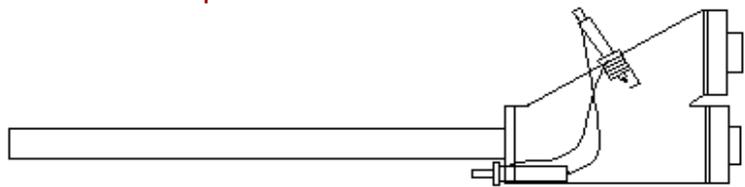
**Step 4:**

**Install the BBQ igniter.** Connect a wire to the metal base of the spark plug. You can solder it, or just wrap it around a few times. Obviously, soldering provides a better connection. This wire becomes the ground wire. Attach another wire to the top terminal of the spark plug. On some plugs, the terminal actually unscrews. If this is the case with yours, then just unscrew the terminal, wrap the wire around the screw and tighten it back down. If your terminal does not unscrew, then you will need to solder the wire on. This wire is your high voltage lead. Attach the ground wire to the BBQ igniter. The wire usually plugs or gets soldered onto a small metal tab on the side of the igniter. Now, attach the high voltage lead. This almost always connects to a small recessed post on the bottom of the igniter. Tape (or glue...) the igniter to a convenient spot on the Y. You will need to be able to easily push this in order to fire the gun.



**Step 5:**

**Watch the glue dry.** The glue needs 24 hours to dry completely, so you will have to wait at least that long before you can fire the gun. Do not attempt to shoot the spudgun unless the glue is dry or it could blow up. Trust me, I know from experience.



There. You now have your very own spudgun. Now onto the testing.

**Testing:**

For the first firing you will use potato as the projectile and either spray deodorant or hair spray as the propellant. Both work, but the deodorant seems to work better.

1. Open one of the cleanout plugs. Shove a good sized potato down the 1 1/2 inch pipe until it reaches the 1 1/2 inch to 3 inch adapter. You will need

something to ram the spud down the pipe. I use an old tent pole with a rubber tip on it.

2. Squirt a bit of deodorant into the Y. I usually use three short blasts that total to about 1 second of deodorant flow. Close the cleanout plug quickly.

3. Aim the spudgun away from other people and press the BBQ igniter. If all is well, you should hear the loud bang and feel the recoil.

4. Congratulations. You now have a working spudgun.

# How To Build A Big Spudgun

When you are done with the basic spudgun and crave something more exciting, it is time to build the Big One. Measuring about 12 feet long, this spud chucker is sure to impress. I have not yet measured the total distance that this can fire because of space limitations, but it definitely blows the basic spudgun away.

## Parts:

- Two sections 4 feet long of 1 1/2 inch ABS pipe (may be replaced with one 8 foot section)
- One 4 inch ABS combination T/cleanout with plug
- Two 1 foot 4 inch sections of ABS pipe
- One ABS 3 inch to 1 1/2 inch reducer
- One ABS 4 inch to 3 inch reducer
- One ABS 1 1/2 to 1 1/2 inch coupling (not needed if one piece of 1 1/2 is used)
- One ABS 1 1/2 inch male and female screw in adapter
- One ABS 4 inch end cap (not a test cap!)
- Two 3 inch bolts (most any reasonable thickness) and two nuts to match
- One angel iron (see step 5)
- One push button BBQ igniter (and wires) or HV generator
- Other: ABS glue, duct tape

You may want to use PVC pipe. That is fine. Just remember to get the right type of glue and primer. Personally, I think that PVC is more brittle and weaker than ABS, plus it takes more time to glue. Because of this, I recommend ABS over PVC.

## Construction:

### Step 1:

**Assemble the T section.** Glue one of the sections of 4 inch pipe to one of the branches of the T. To do this, spread glue on the joints of the pipe and T, then push the parts together and give them a slight twist.



**Step 2:**

**Prepare and attach the 3 inch pipe.** Glue the 4 to 3 inch reducer to one end of the 3 inch. Now glue the 3" to 1.5" reducer to the other end and glue the female part of the 1.5" threaded adapter to the 1.5" section of the reducer. Then, glue the reducer to the piece of 4 inch that is attached to the T.



**Step 3:**

**Prepare and attach the other section of 4 inch.** Glue the end cap to the other section of 4 inch. Now glue that to the remaining branch of the T. *Do not use a test cap!*



**Step 4:**

**Prepare the barrel.** Sharpen one end of a section of 1 1/2 inch. This will automatically cut the spud to size when it is loaded. Next, glue the 1 1/2 inch coupling to the non sharpened end of the 1 1/2 inch pipe. Note that this coupling is not needed when using one section of 1 1/2 inch. Now, glue the other section of 1 1/2 inch to the other end of the coupler. Again, this is not necessary when using one piece of 1 1/2 inch. Glue the non sharpened end of this now longer pipe to the male part of the screw in adapter. Before you do this, remember to separate the male and female parts (stop laughing).



**Step 5:**

**Attach the handle to the cleanout plug.** Bolt the angel iron to the top of the cleanout plug. Use a washer and lock washer on each side.



**Step 5:**

**Install the electrodes.** Drill two holes and install the two three inch bolts so that there is about a 1/4 inch gap between them inside the pipe. This is where your ignition spark will jump across. You should be able to adjust that distance by turning the bolts.



**Step 6:**

**Install the BBQ igniter.** Connect a wire to one of the bolts. You can solder it, or just wrap it around a few times. Obviously, soldering provides a better connection. Attach another wire to the other bolt. Attach one wire to the BBQ igniter. The wire usually plugs or gets soldered onto a small metal tab on the side of the igniter. Now, attach what will become the high voltage lead. This almost always connects to a small recessed post on the bottom of the igniter. Tape (or glue...) the igniter to a convenient spot on the T. You will need to be able to easily push this in order to fire the gun. Note that for this gun I very highly recommend using a high voltage generator to supply the ignition spark.

**Step 7:**

**Watch the glue dry.** The glue needs 24 hours to dry completely, so you will have to wait at least that long before you can fire the gun. Do not

attempt to shoot the spudgun unless the glue is dry or it could blow up. Trust me, I know from experience.



## Firing:

To fire this biggun', I would suggest you have two people. One presses the igniter, while the other one holds the middle of the barrel and aims.

1. Open the cleanout plug. Shove a good sized potato down the 1 1/2 inch pipe until it reaches the 1 1/2 inch to 3 inch adapter. You will need something to ram the spud down the pipe. I use an old tent pole with a rubber tip on it.

2. Squirt a bit of deodorant into the T. A four or five second blast usually works. For optimum performance, use butane. Or, even better, use a mixture of liquid oxygen and propane.

3. Aim the spudgun away from other people and press the BBQ igniter. If all is well, you should hear a very loud bang and feel the recoil.

4. Congratulations. You now have a working, and really big, spudgun.



# How To Build A "Noisy Cricket" Spudgun

The basic spudgun and big spudgun are fun, but what if you require a more compact design? This is your answer. This little spudgun is made of all 1 1/2 inch pipe and is less than 3 feet long. It can fire about 100 to 200 yards. Those of you who have seen Men In Black will understand the reference to the "Noisy Cricket".

## Parts:

- One section (1 1/2 to 2 feet) of 1 1/2 inch ABS pipe
- Two sections (4-5 inches) of 1 1/2 inch ABS pipe
- One ABS 1 1/2 inch T adapter
- One 1 1/2 inch threaded ABS cleanout adapter with plug
- One ABS 1 1/2 inch end cap (not a test cap)
- One push button BBQ igniter (and wires)
- Two 1 inch bolts (any reasonable thickness) and two nuts to match
- Other: ABS glue, duct tape

You may want to use PVC pipe. That is fine. Just remember to get the right type of glue and primer. Personally, I think that PVC is more brittle and weaker than ABS, plus it takes more time to glue. Because of this, I recommend ABS over PVC.

## Construction:

### Step 1:

**Assemble the handle and loading sections.** Glue the cleanout adapter to one of the 3-4 inch pieces of pipe. Now glue the end cap to the other section. You may want to remove the cleanout plug while gluing.



### Step 2:

**Assemble the T section.** Glue the pieces from step 1 to the T. The handle goes to the "trunk" of the T and the loading section goes to one of the branches.



### Step 3:

**Prepare and attach the barrel.** Sharpen one end of the 1 1/2 to 2 foot section of pipe. This will automatically cut the spud to size when it is inserted. Now glue the unsharpened end to the remaining branch of the T.



### Step 4:

**Install the BBQ igniter and electrodes.** Drill two holes through the middle of the T slightly smaller than the bolts. Attach the bolts using the nuts and set the gap to about 1/4 inch. Connect a wire to the metal one of the bolt heads. You can solder it, or just wrap it around a few times. Obviously, soldering provides a better connection. This wire becomes the ground wire. Attach another wire to the other bolt head. This wire is your high voltage lead. Attach the ground wire to the BBQ igniter. The wire usually plugs or gets soldered onto a small metal tab on the side of the igniter. Now, attach the high voltage lead. This almost always connects to a small recessed post on the bottom of the igniter. Tape (or glue...) the igniter to a convenient spot on the handle. You will need to be able to easily push this in order to fire the gun.

### Step 5:

**Watch the glue dry.** The glue needs 24 hours to dry completely, so you will have to wait at least that long before you can fire the gun. Do not attempt to shoot the spudgun unless the glue is dry or it could blow up. Trust me, I know from experience.

Your noisy cricket is now complete.

### Firing:

For the first firing you will use potato as the projectile and either spray deodorant or hair spray as the propellant. Both work, but the deodorant seems to work better.

1. Open the cleanout plug. Shove a good sized potato down the 1 1/2 inch pipe until it reaches the T. You will need something to ram the spud down the pipe. I use an old tent pole with a rubber tip on it.

2. Squirt a bit of deodorant into the T. This small gun takes very little. Close the cleanout plug quickly.
3. Aim the spudgun away from other people and press the BBQ igniter. If all is well, you should hear the loud bang and feel the recoil.
4. Congratulations. You now have a working noisy cricket.

# How To Build An Econo Spudgun

This Spudgun is extremely easy and cheap to make, yet performs very well. It can be built for nearly nothing, considering it uses only 4 pipes/fittings and a flint-type lantern igniter for ignition. Assembly should take no more than about half an hour, not counting the 24 hours required for the glue to dry.

## Parts:

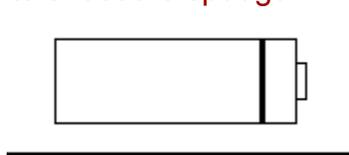
- One section (3 feet long) of 1 1/2 inch ABS pipe
- One section (8 inch long) of 3 inch ABS pipe
- One 3 inch threaded ABS cleanout adapter with plug
- One ABS 3 inch to 1 1/2 inch adapter
- One flint type lantern igniter
- Other: ABS glue

You may want to use PVC pipe. That is fine. Just remember to get the right type of glue and primer. Personally, I think that PVC is more brittle and weaker than ABS. Plus it takes more time to glue. Because of this, I recommend ABS over PVC.

## Construction:

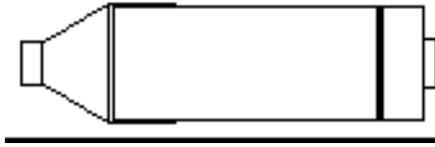
### Step 1:

**Attach the cleanout.** Glue the cleanout adapter to one end of the 3 inch section. First make sure to remove the cleanout plug. Do not glue the cleanout plug into the cleanout adapter. You will need to be able to remove the plug in order to shoot the spudgun.



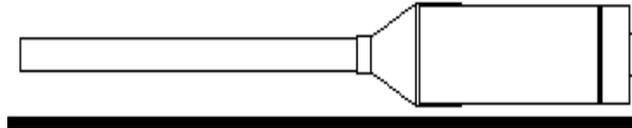
### Step 2:

**Attach the adapter.** Now glue in the 3" to 1.5" adapter into the other end of the 8" section. Be sure that it is seated all the way down or it will pop off the first time the gun is shot.



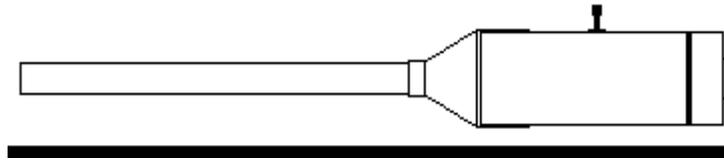
### Step 3:

**Attach the barrel.** First take a file or bench grinder and sharpen the edges of one end of the 3 foot section of 1.5" ABS. This will automatically cut the spud to the proper size to ensure a good seal. Now glue the other end (the non-sharp one!) to the 1.5" end of the 3" to 1.5" adapter.



### Step 4:

**Install the igniter.** Drill a hole in the 3" pipe just large enough to fit the igniter through. This hole should be in a spot that is easily reachable when you are holding the gun. After you have drilled the hole, simply bolt the igniter in. If you wish, you can seal around the hole with silicon, although this is not really necessary.



### Step 5:

**Watch the glue dry.** The glue needs 24 hours to dry completely, so you will have to wait at least that long before you can fire the gun. Do not attempt to shoot the spudgun unless the glue is dry or it could blow up. Trust me, I know from experience.

### Testing:

For the first firing you will use potato as the projectile and either spray deodorant or hair spray as the propellant. Both work, but the deodorant seems to work better.

1. Open the cleanout plug. Shove a good sized potato down the 1 1/2 inch pipe until it reaches the 1 1/2 inch to 3 inch adapter. You will need something to ram the spud down the pipe. I use an old tent pole with a rubber tip on it.

2. Squirt a bit of deodorant in through the cleanout. I usually use three short blasts that total to about 1 second of deodorant flow. Close the cleanout plug quickly.

3. Aim the spudgun away from other people and give the igniter a twist. If all is well, you should hear the loud bang and feel the recoil.

4. Congratulations. You now have a working spudgun.

## Spudzooka - Hairspray Potato Cannon

This is your standard potato gun. Aka spudzooka, spudgun, potato cannon, hairspray cannon, vegetable masher. This homemade fun agent is what started it all, and what will bring the revolution.

This is perhaps one of the cheapest and simplest launchers to make. Consisting of 6 parts, it can be built in many designs or forms, but they all follow the same basic form as follows.

### THEORY OF OPERATION.

A projectile (usually a potato) is rammed down a long barrel. A flammable agent (usually hairspray or like propellant) is then sprayed into a large combustion chamber made of PVC Pipe. This is the sealed. An ignition source (usually flint or piezo-electric) causes the gases inside the chamber to ignite and expand. The resultant explosion propels the projectile (potato) from the barrel at great speed and with great amusement.

### MATERIALS.

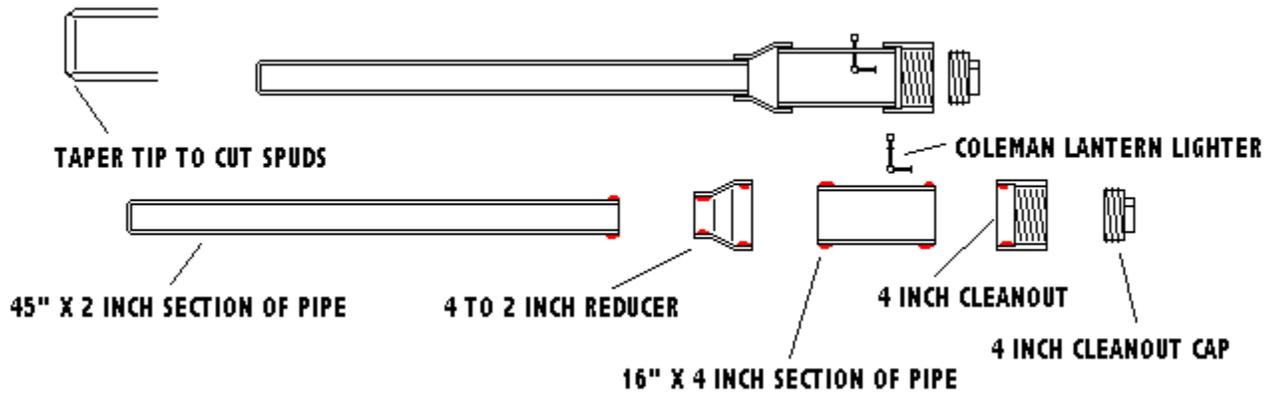
2" x 4' pipe  
4" x 16" pipe  
4" to 2" bell reducer  
4" cleanout and cap  
Coleman lantern lighter

**ALL PIPE IS SCH 40!**

**DO NOT USE DWV PIPE!**

This potato cannon has a four foot barrel of two inch pipe. The combustion chamber is 16 inches long and is four inch diameter pipe. The Coleman lantern lighter can be found at Gander Mountain. All PVC pieces are schedule (SCH) 40 pipe. First cut all pieces to length and clean the ends to be glued. Drill a hole for the lantern lighter and install it in the 4 inch pipe, toward the rear end. Make sure it fits right, you may have to countersink it. Taper the front end of the barrel to a point to help shave the spuds. Glue all the red areas with PVC glue only. Obviously, don't glue the cleanout cap. Let the assembly sit overnight.

**WARNING:** Don't spark the igniter while the glue is fresh or the fumes could ignite.



This spud cannon is cheap and easy to build. This one cost around \$20. \$15 for pipe and fittings, \$5 for sparker. Don't forget to get glue and primer, about \$7 extra.

This potato gun fires great. I used Dr. Scholls, but I've been told Aqua-Net hairspray is the best. Hairspray leaves sticky residue though. I was able to lob potatoes about 100 yards.

## BL Series

These are the BL Series launchers, BL standing for Breech Loading. They are pretty straightforward launchers, offering great fun at a reasonable price. I would highly recommend them for a first launcher, they are not too high tech, but offer breech loading, a very nice feature for any launcher. Don't be fooled by their looks, they pack a punch! Best of all, the entire gun, including igniter, can be built for under \$15!

I would highly recommend the BL series for anyone just getting into spudgunning, its cost and ease of construction makes it a great launcher. It is also fairly easy to upgrade for once you start wanting more power! It is also recommended to anyone, whether you are a spudgun beginner, or a seasoned veteran, you will love its reliability and ease of use.

At the heart of the BL series is the breech loading system. See *Method Two: Pass Through* from the [breech loading](#) page.

### Plans:

The launcher is assembled as follows (listed rear to muzzle):

3" Female adapter with cleanout cap >>> 12" of 3" sch40 PVC pipe >>> 3" coupler >>> 3" to 2" reducer bushing (spigot x slip) >>> **Either: A:** 2" FPT Adapter (spig x FPT) or **B:** 2.5" section of 2" sch40 PVC pipe >>> Female Adapter (slip x FPT).

Next you will have your pass through barrel which will be 51" of 1.5" sch40 PVC to give you a 1:1 ratio (don't believe all the old 1.5:1 ratio stuff, for this **chamber**, a 1:1 ratio will outperform a 1.5:1 ratio.) Feel free to adjust the barrel length to suit your needs. The barrel will have a 2" MPT adapter as well as a 2" to 1.5" bushing on it. Looking at the [breech loading](#) page will make the barrel plans much clearer.

Now for the ignition. Do whatever you wish, but I would suggest a lantern lighter. The chrome thing on the launcher near the end cap is a lantern lighter with a knob that I fit on it. Also, keep the lantern lighter towards the back of the launcher, this way it is possible to change flints without removing the whole assembly.

That, in a nutshell is how to build a BL series launcher.



BL Series with a black and red paintjob



This one I built for a friend.



Lantern Lighter installed



Breech Loading Detail

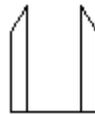


# Spudgun Enhancements

## Barrel Mods

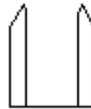
### Barrel Mod 1

The first tip is to do with how the potato fits in the barrel. This setup is often called a spud cutter. A tight fit is desired to achieve maximum distance. The way to get a tighter fit is simple. When making a normal potato gun you sharpen the end of the barrel like this:



This acts as a "cookie cutter" and cuts the potato to the correct size of the barrel. The best way to do this is with a grinder.

What I have found is that if you sharpen the inside of the barrel like this:



you get a tighter fit. The only concern is you need to sharpen it at a very slight angle or the potato will fit in too tightly. The best way to sharpen the inside is to use a dremmel tool, or secondly to use a rounded file.

### Barrel Mod 2

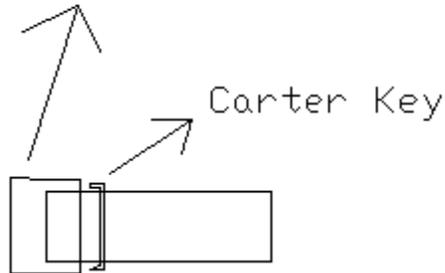
The second tip is to insert a stopper into your barrel so the potato will not fall into the expansion chamber. This is very easy to do and saves you a lot of trouble in the long run.

First drill a small hole in your barrel as close as possible to your expansion chamber. Next you straighten out a carter key, or you can also use a piece of clothes hanger. The hole you drill should be slightly larger than the carter key.

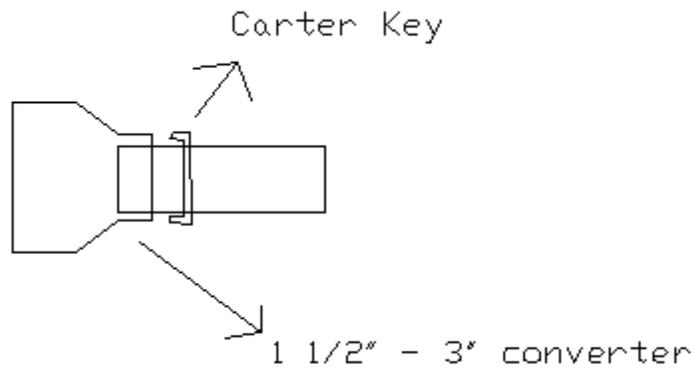
Place the carter key in the hole and bend over the ends. Here is a picture of how it looks depending on the type of barrel you have:

**Type 1-removable barrel (like green hornet)**

1 1/2" Threaded Female Adapter



**Type 2 (other guns)**



A side note: It may actually be better to use a 10-24 bolt in place of the carter key. I have had a leak caused by a carter key. The leak wasn't very big, and I fixed it with JB Weld.

## Burst Disk Attachment

Burst disks are about the easiest thing you could make for a spud gun. These help improve performance on guns with short barrels. They help counteract the affects of a less than ideal C:B ratio. Tests have found that one layer will improve most spud guns the best.

One reason you may want to make a burst disk attachment, even if you could care less about C:B ratios and performance, is that they are great for making extremely loud noise! Just put painting tape, or any thing for that matter over the male threads and screw the barrel over the threads. Just shoot as normal with no spud loaded. I guarantee it will be the loudest shot you have ever heard, I haven't even heard firecrackers this loud, or real guns for that matter! Its about the best noisemaker you could have!

### Instructions:

My spud gun has a 2" male adapter coming off the chamber. So I used these parts: 2" Female adapter, 2" to 1.5" bushing, and a 2" male adapter. The male adapter is a spigot type adapter, so it fits directly into the bushing.

If your gun uses a screw on 1.5" barrel, such as my green hornet gun, you don't even need the adapter. Very Simple!





## Chamber Fan

A chamber fan is a good addition to any spud gun. The purpose of a chamber fan is to provide a better fuel mixture inside of the combustion chamber. If you have ever used a spud gun in cold weather, you may have noticed a decrease in performance. This is due to the fact that the fuel (in my case propane) molecules do not move as fast when cold. As a result the fuel doesn't mix very well. A chamber fan is also useful to help vent out your chamber between shots. This characteristic works especially well with breech loading potato guns.

Below are some pictures of my chamber fan, as well as a wiring diagram of my setup. The fan is a 12v computer case fan, which can be easily salvaged from an old junk computer or bought cheaply from a computer store, Radio shack, or online. I will note that even though the fan is rated for 12v, I use a 9V battery and it functions nicely. The led light is not necessary, but is a cool little addition for a dollar or so more. If you do wire the led light in note it must be wired as a separate circuit, and cannot be wired inline, as a switch would be.

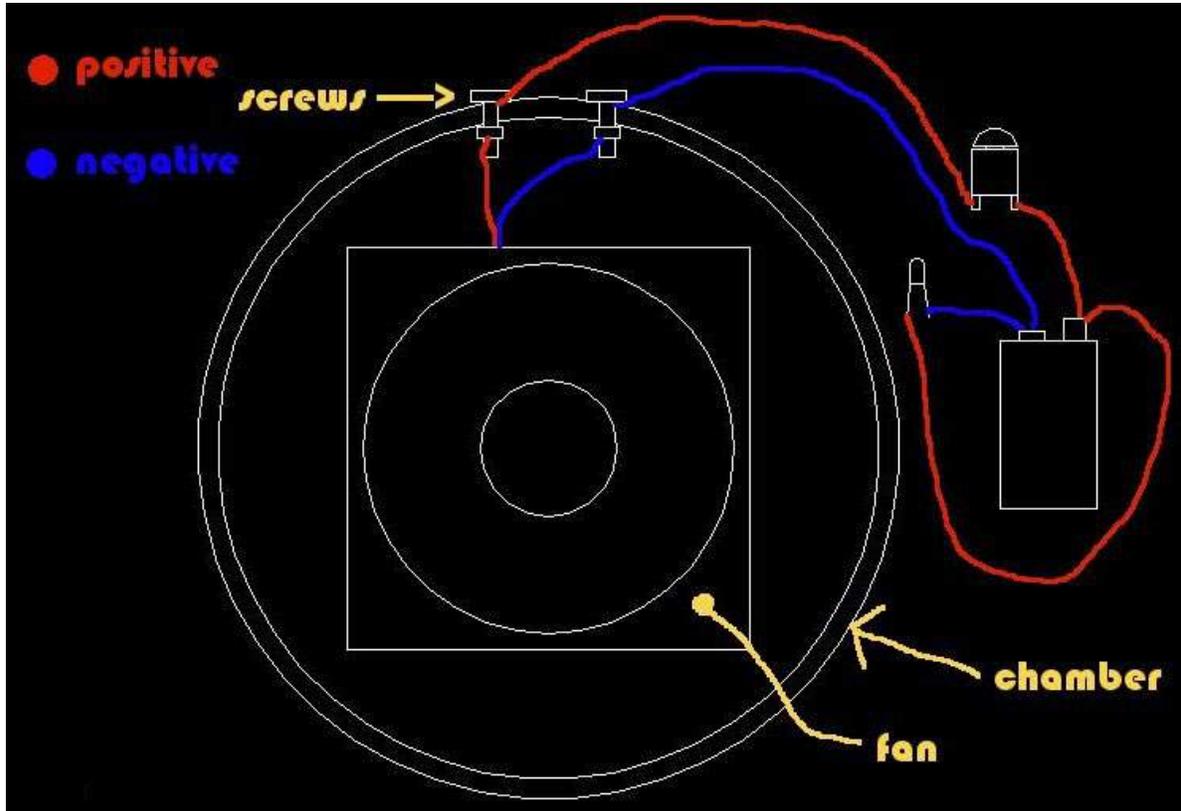




Parts:

1. 12V computer fan
2. 2 10-24 screws
3. 4 10-24 nuts

- 4. A momentary switch (sends current through when you push it down)
  - 5. LED light (rated for up to 12V)
  - 6. Wire
  - 7. 9V battery connector
  - 8. 9V battery
  - 9. Not shown, but I mounted the battery, LED, and switch inside of a "project box" made for homemade circuits.
- All of these parts are easily found at any Radio Shack store and should only run you approximately \$10-\$15.



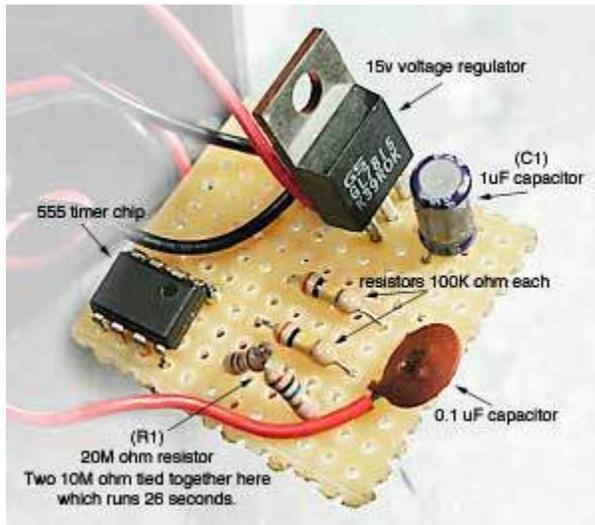
## fan controller

Batteries are required to power your fan in the field which can be cumbersome and expensive. An on/off switch of some type will help conserve batteries. A simple momentary push button switch may be the most elegant solution as a strong fan only needs to be turned on for a few seconds at a time. Rechargeable NiMh batteries can be used to soften the financial blow caused when the fan is accidentally left on. Multiple cells can be wired in series to achieve the required voltage. A typical high quality setup would be 8 AA cells with a momentary switch. Other more expensive battery options are 12v NiMh clusters used in RC cars/planes and cordless drills. The fan controller shown here uses (2) 9v cells to keep the controller small and lightweight and a voltage regulator to control the current. The controller also features a timer circuit which automatically shuts the fan off.

This timer is a monostable circuit which uses the venerable 555 timer chip. The 555 can only handle 15v so the power must be stepped down from 18v before entering the circuit. The duration of the timer depends on the values of (C1) and (R1) in the following examples. The parts shown here give a calculated run time of 22 seconds. Parts include: 2"x3"x1.5" project box, momentary pushbutton switch (special double pole 'DP' switch), LED w/resistor, 1/8" plug for fan (optional), circuit board, 555 timer, 15v voltage regulator, 0.1uF (micro farad) capacitor, 1uF capacitor (C1), (2) 100k ohm resistors, 20M ohm resistor (R1), 30 ohm resistor, (2) 12vdc 1A reed relays, (2) 9v battery connectors and (2) 9v



batteries. Tools include a small soldering iron, thin solder, thin jumper wire and safety glasses.



The voltage regulator tames the batteries to a steady 15v and the timer circuit eats up about 1.6v more. Typically 13.4v of current is supplied at the fan producing strong air flow from the slightly overclocked fan. The 555 chip usually has a marking near pin #1, in this case it's a small circle. The 1uF cap (C1) shown here was salvaged from an old television/target to save a trip to the electronics store. This image does not show the additional 2 reed relays and 30 ohm resistor needed to fix a problem with unintentional battery drain. These components are shown in the schematic below.



batteries and the additional resistor will fit on the main board. It is also possible to use smaller switching components like transistors in place of the relays. This circuit uses a double pole (DP) switch which triggers the two separate circuits at the same time providing 12v at the fan. The toggle style power shutoff switch has been eliminated from the design but is easy to add next to the battery if desired. Large fans running at 12v can easily vent or mix in 2-3 seconds, 26 seconds is a little overkill. This circuit features a bit of circuit protection so crossing your output wires on accident shouldn't cause any harm.

## Check Valve Assembly

Revolver X uses a check valve, or one way valve, in combination with a 12v high speed fan, to aid in rapidly exhausting spent fuel. This is highly important when dealing with rapid firing launchers such as this one. The check valve itself, the black portion, is a WAYNE sump pump check valve (part #57027-WYN). The reason for using a check valve is so that the high speed exhaust fan can open the valve, forcing fresh air in and exhaust fumes out. The valve seals as soon as the exhaust fan is shut off, and the combustion will not escape the chamber through the valve. The whole assembly is used to keep from unscrewing an end cap, as is done on more traditional launchers. One other aspect I feel is worth mentioning is the chamber fan wiring will be going through the top stainless bolts, eliminating a need for holes in the chamber. The check valve assembly can be used on the back of any chamber with the right adapter.

### Assembly:

The check valve assembly is straight forward in most aspects, but time and care are needed to get desirable results. The end of the check valve (opposite threaded end), fits inside regular sch40 PVC. The sch40 needed a 1.5" to 2" adapter, since it goes in a 2" fitting, so this was glued on the end. The check valve is made of ABS, PVC and ABS do not fuse properly when solvent welded, potentially creating a safety risk. To overcome this problem, a 1.5" sch40 coupler was glued over the end of the 1.5" PVC pipe and the sump pump valve. The valve had a section with the same OD as regular SCH40 pipe, making a perfect place to put the coupler. The problem of improper solvent welding still existed, so stainless steel 8-32 bolts were screwed around the circumference of the coupler. The screws went through both the PVC and the ABS, reinforcing the assembly. Problem solved.



Picture of the check valve assembly



Second picture of the assembly



The valve assembly setting vertical

Now all you need to do is hook up a 12v air mattress inflator to the back of the check valve. This can be taped in or held in place with machine screws. To vent the gun simply turn on the inflator for a second or two. I would highly recommend a setup like this on any launcher. It has become one of my favorite accessories.

---

# Modifications and Improvements

## A Better Ignition System

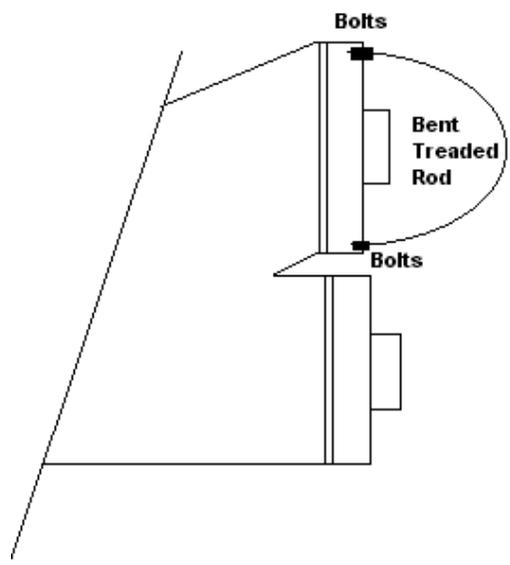
I have found that the BBQ igniter, being a mechanical device, wears out rather quickly due to the large amount of use it gets-it may take several pushes to fire the gun. You will notice the igniter wearing out when it takes more than a few pushes to fire the gun, or when you must clean the spark plug after every shot, or if the gun just plain won't fire. You can solve this problem by adding a solid state high voltage generator. Take a look at the [High Voltage Generator](#) from my [circuits](#) page. Build the circuit, but substitute two TIP31's instead of the 2N3055's, and don't build the power supply section (the transformer, bridge rectifier and filter capacitor). Build a 12V battery pack by putting 10 rechargeable "D" cells in series. Mount the circuit and battery pack on the gun, using a momentary switch that can handle at least 1 amp at 12V for the trigger. The transistors should be able to run for a few seconds without heatsinks before being fried, but I highly recommend installing heatsinks, even if they are small ones. Now connect the high voltage output lead of the flyback transformer to the top terminal of the spark plug, and ground the metal base of the plug. There. You now have a much better ignition system. The first time you fire the gun after installing this system, you should notice the increase in power. Be extra careful, because you have just increased the range of the gun by as much as several hundred feet. Remember to recharge the battery when the spark starts to look weak.

Take a look at the picture below to see the high voltage mod installed on my spudgun. The large silver box is the battery pack, while the black box contains the HV power supply.



## Make Loading Easier

You may have noticed that after shooting the gun it becomes very hard to unscrew the cleanout plug to prepare for the next shot. Indeed, you may even need a wrench or pair of pliers to do it. This little problem can be fixed by making a handle. Go to the hardware store and pick up a short (about 8 inches) length of thin threaded rod. Also, get 4 bolts that will fit the rod, 4 lock washers and 4 regular washers. All you have to do is drill two holes the same size of the rod in one of the cleanout plugs. Put one hole on each side. Now bend the rod into a half-circle and install a bolt, lock washer and washer on each end. Thread the bolt up about half an inch. Now insert each end of the rod through each hole in the cleanout plug. All you have to do now is bolt the rod on from underneath using the remaining bolts, lock washers and washers. You now have a handle to grip when removing and installing the cleanout plug. If you wish, you can use caulking to seal around the bolt holes.



### A Holder For Your Ramrod

Carrying around the ramrod you use to push the spud down the barrel could get annoying. This simple add on solves that problem. Get two plastic film canisters, cut the bottom off one and wrap them with a few coats of hockey tape. Now use the hockey tape to secure one to the bottom of the barrel and the one with no bottom to the top of the barrel. When you are not using the ramrod, just slip it in the holders.

### Spud Blocker

Sometimes when you ram your spud down the barrel it falls out the other end because you pushed too far. All you have to do to correct that is to install a bolt right at the bottom of the barrel. It will keep the spud from falling all the way through, and provide a resting place for some smaller objects that you enjoy seeing fly through the air.

### Fuel Injection

This simple mod uses a butane canister to easily refill the gun between shots. It originally came from the Anarchist's Cookbook. The butane canister is the kind that you use to refill lighters. You know, the tip of the canister is inserted into the the refilling orifice of the lighter.

If you look closely at the refilling tip, you will notice that there is a plastic lip about a centimeter and a half from the business end of the tip, this lip is what is very important. Do not damage it while converting for Starch Abuser ( I like that by the way ).

Now, you need something that will fit over the tip, but will still catch on the lip, so that when you press down on the something, butane gas is let out in a controlled fashion. More or less.

What I have used are your everyday coins that have a hole drilled in the center of them. I would recommend a size, but the o.d. of the tip varies from manufacturer to manufacturer.

Once you have your "actuator " attached, all you need to do is to channel the resulting butane gas into the combustion chamber. I have set mine up so that a rubber hose (whose i.d. varies according to the tip) just fits over the top part of the tip on the canister. It will need to fit tight, you would not want it to fly off and waste your propellant. Use epoxy if necessary.

The other end of the rubber hose is attached to metal tubing, or straight to the control valve. This is important, since the lack of a flow control/ shutoff valve will allow combustion temperatures and pressures to be applied to the rubber hose, and also to the butane canister. Do not leave out the valve!! Reason for the metal tubing from the valve to combustion chamber? To prevent blow out of rubber hose form combustion temperatures in middle of potato fight.

The metal tubing from the combustion chamber needs to be terminated at both ends with compression fittings. This is simple. One fitting, will attach the tubing to the valve, while the other needs to be securely fastened to the combustion chamber in one way or another. I used a compression fitting that had the female side attached to the combustion chamber via way of a large ball of epoxy. It works.

Now to use the autorefiller, just load barrel, turn on gas (press coin or whatever ), open valve, let chamber fill, and shutoff valve, and then gas. Now you are ready to go. Hit the igniter, and away she goes

## **Cheaper Ignition**

Instead of using a spark plug just buy a Coleman lantern lighter. It's cheaper and easier.

## **Chamber Changes, Ignition Inquiries and Fuel Facts**

### **Combustion Chamber Changes...**

Having been into auto racing since I was quite young, I have been applying some of the things I have learned to spudding. Everyone who has been around high performance cars know the Mopars Hemi (short for hemispherical head) engine was one of the most powerful production

engines of that era. This power was contributed significantly by the design of the combustion chamber. I'm willing to bet the most spud guns are only getting 50 to 60 percent combustion in the designs I have seen.

Just because it goes off doesn't mean it burns all available fuel. So I though went into the books to find out what Dodge had done in it's Hemi to combat this problem. I found that by rounding the back of the combustion chamber and placing the ignition device dead center in the back of the chamber, it ignites a flame front equally in all directions and provides a better surface and more surface area to reflect the pressure wave and flame front forward into the front of the chamber and into the barrel. The flame front will continue down the barrel providing spud acceleration until the potato actually leaves the barrel. While this happens on many spud guns (evident by a flame emerging from the barrel instead of just smoke), the rounded chamber end tends to push the unburnt fuel and air into the barrel instead of slow burning under oxidized fuel from a poor combustion. This further adds to the pressure wave. I haven't measured to PSI differences but using as close to the same charges as I can, I notice bigger brighter flames coming from the barrels end than the standard combustion chamber on a gun that is otherwise the same. I haven't yet measured spud distance but I can tell a definite increase in the height when shot at the a thirty degree angle to the ground that I use as a testing standard.

### **Ignition Inquiries...**

As with cars, a good ignition of the fuel/air mixture is required for good spud projection. Using BBQ grill igniters and lantern igniters might work but they don't work well. They use a Piezo electric disk which produces a quick, snappy, cold spark. This doesn't ignite the mixture well and much is just blown out into the atmosphere. It doesn't take a great deal of pressure to get a spud moving down the barrel. So you want as much pressure as you can build as quickly as possible. The problem lies in the fact that the amount of pressure you can build is inversely proportional to the amount of time you have to build it. The more pressure you build, the faster the spud moves out of the barrel. The fast the spud exits the barrel, the less time you have to build pressure. You your fuel/air mixture to ignite as fast and completely as physics will allow. So among other things, you need the best ignition system you can get. The auto industry has spent millions of dollars researching the best way to ignite an fuel/air charge. I use am currently using an DIS (Direct Ignition System) off an Oldsmobile to fire my gun. The DIS coils produce nearly 100,000 volts at close to an amp when fired with a pulse capacitor. This produces a hot, fat, long lasting spark. The grill and lantern igniters produce an output of maybe 1,000 or 1,500 volts in the micro amp range (.0001). You can see the difference. Grill and lantern ignitor are designed to be small and easy to fit on a lantern or in a

grill. They are designed to just ignite the fuel/air mixture, not produce a rapid powerful combustion. They draw back to using a DIS system is that they are large and heavy. You couldn't use one on a hand gun. But they are great for a tripod mounted system. **They most important draw back I must mention here is that they are deadly and will kill you without a second chance.** I have heard of mechanics losing fingers to these devices (These are the lucky ones that got hit by just a spark that jumped to one of their extremities. Direct contact with one of the high current wires causes your life flash to before your eyes.). There are safer alternatives which still provide a satisfactory ignition system. You can use are regular points type ignition coil with a buzzer from Radio Shack instead of the DIS coils and capacitors.

### Fuel Facts...

I have much talked about the relationship between spud gun and auto engines. Fuels are no different with one exception; octane ratings. The lower an octane rating a fuel the quicker it combusts. While I have been talking about rapid combustion, there is a draw back to low octane fuels. Burning fuels create hot expanding gases that push the beloved spud out of the barrel. A low octane fuel combusts very quickly and does not produce as much heat and therefore less pressure. For the same reason 93 octane gas produces more horsepower in your car, it sends your spuds farther down range. The exception I mentioned before is that in an auto engine, too high an octane will destroy it. There are thousands of detonations a minute at idle in a car. High octane fuel produces more heat than a lesser octane so you can burn up your engine with high octane. Also, at high RPMs extremely high octane fuel will continue to burn when the piston is returning to the top of the cylinder. This is why you see fire coming from the pipes of top fuel dragsters. A side note I must include is that, by these standards, 93 octane pump gas is not really a high octane. Since the spud does not return down the barrel, we don't have to worry about it. Also since even the fastest spud loaders only fire once every minute or so, heat is not as big of concern. You should make sure you gun is not over heating though. Nitro methane is about the most potent fuel you can get short of actually using gun powder. Even more powerful if you get the fuel/air mixture right. I used nitro methane and NO<sub>2</sub> (nitrous oxide) in my latest experimental shots. I don't know what happened to the spud but it blew the spark plug and a section of the end cap out of the back.

### Combustion Chamber Construction

Well, one small improvement would be to not use the Y pipe. Instead use one 4" pipe as the chamber and connect the firing device to the rear of the pipe. This allows the shock wave of combustion to go straighter to the

potato.. At the end of the 4" pipe, about a 1' long, the end will unscrew, allowing easier cleaning to be made.

## **Spud Trimmer Improvements**

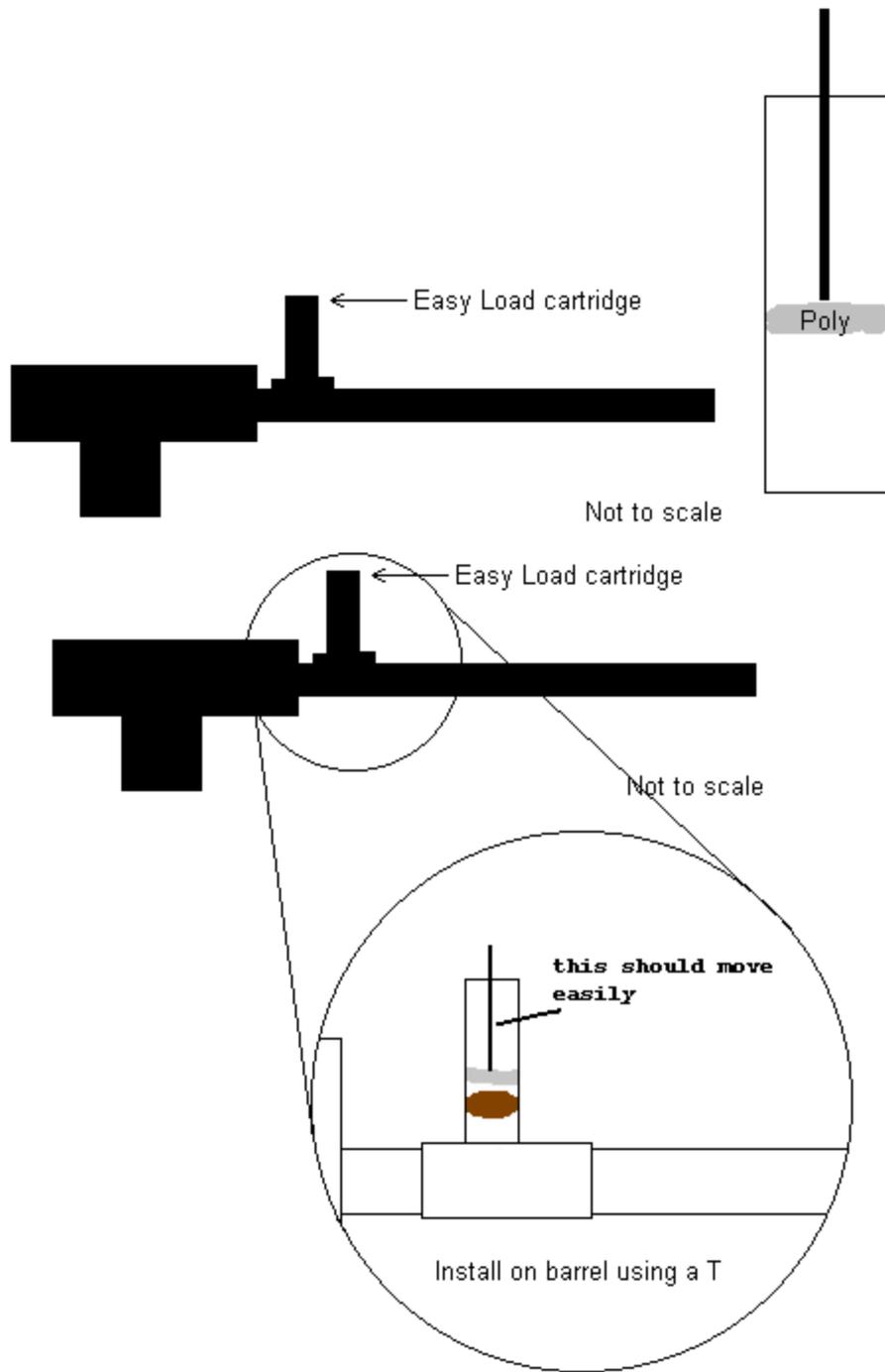
Sharpen the inside of the barrel about 1/16 of an inch. This cuts the potato a little bit larger than the barrel and provides a much better seal. This little improvement, if done right, will add on at least 100 yards to your gun's range.

## **Pressure Release**

Drill a hole in the bottom of the cap and super glue a piece of plastic over it. Do not use a lot of glue. Seal it with caulk. The purpose of this is if the pressure becomes too great in the chamber, the cover on the cap will blow off preventing a chamber explosion.

## **Easy Load**

You can make loading easier by applying the following modification. You will need: 1)2' piece of pipe the same type and thickness as your barrel, 2)T fitting of the same type and thickness as your barrel, 3)Stick or rod and 4)Polystyrene. The illustrations below show you how to apply the modification.



### Noisy Cricket Improvement

On the Noisy Cricket from back side of the T you could use a reducer to have a bigger chamber. Instead of using a grill sparker thing you could use a tip lighter and glue it in the back, then you could use the bottom of the T as a handle and have a trigger in the back.

## Nitrous Oxide

A cheap way to make a nitrous gun is to get a whip cream dispenser from a restaurant supply place and Whippet cartridges. Strap it to the gun with pipe clamps, put a air hose on it and connect it to a valve on your potato gun. The Whippets cost between 8 to 10 dollars a box and you get a 5 to six shots per cartridge. This is pure N2O like the stuff in the dentist office.

## LASER Sight

Get a cheap laser pointer and secure it to the side of your barrel somewhere in reach of your non-firing hand. In the evening or at night when the laser is most visible it will provide an accurate sight for up to 3/4 of you spudgun's range.

## Easy Refueling

To put fuel in my spud gun I got an old refillable butane lighter and took the refiller piece out of the lighter. I then installed it into my gun. When I put fuel into it I just attach a butane refiller nozzle to my starter fluid an shoot it in.

## Cheap Ignition

I have an idea for your ignition system. It is cheaper than any other thing I've seen. Just buy one of those cheap red lighters that have the trigger (for BBQs). Drill a hole in the side of your combustion chamber and just stick it in and pull the trigger. If it doesn't flame any more don't worry, if it sparks it will work very efficiently. *Note that this can be dangerous and could reduce the efficiency of your gun (big hole in the chamber).*

## Some Assorted Ideas

Instead of a Y section for the combustion chamber use 3" or 4" pipe with a threaded clean out valve. Don't put fuel in the chamber though, you will loose too much because of the wide opening. Instead get a 1/2" tap and put some threads in the middle of your chamber and screw in a copper pipe valve. You can save a lot of fuel this way, especially when using propane. It makes a tighter seal around the torch nozzle.

## Pressurizing The Chamber

What you do is tick the potato in about 4 inches down the barrel. Then spray in your propellant and cap it up. After that, push the potato down all the way. This compresses the gas and air giving you better pressure, combustion and therefore distance.

## Shorten That Huge Gun

Here's a simple thing to decrease the overall length of the big gun quite a bit: Get yourself two 90 degree elbows that are the same diameter as your barrel. Get a short length of pipe the same diameter as your barrel. Glue the two elbows onto the short section of pipe so that both openings point in the same direction. Glue your combustion chamber onto one side and your barrel onto the other. This gives you the same barrel length, but now the combustion chamber sits under the barrel instead of behind it. Greatly increases portability without decreasing range.

## Ammo Holder

Take a wood plank and put nails through it, duct tape or glue to the side of barrel and ramrod holder pipe. Now you have access to 10 extra taters right on the side of your gun were you need them!

## Propane Meter and Propane Injection

Propane is an excellent fuel for spudguns. It is clean, safe and very cheap! A blue cylinder for torches costs about \$3. Camping propane can be bought in the green Coleman cylinders for around \$5-6 for 2 cylinders. Either will work with this setup. Hopefully these plans will help with the construction.

### Type 1:



This is a little different style of propane meter than what everyone else uses. The advantage is that you can use this on any gun you make, just adjust the PSI of propane in the meter for each individual gun. All the launcher needs to use this meter is a schrader valve.

Here is a parts list:

1. propane torch head (the cheap ones) cut below the bend with a pipe cutter. This connects it to the propane tank.
2. a 7/16" compression to 1/4" male pipe fitting. This connects to the brass pipe you just cut on the torch head (these are extremely hard to find, but I bought mine at [www.plumbingsupplies.com/compress.html](http://www.plumbingsupplies.com/compress.html))
3. 1/4" Tee
4. out one side of tee: 100 PSI Pressure gauge with 1/4" male pipe thread (MPT) (100psi for more accuracy)
5. going out of the other side of the tee is a 1/4" MPT close nipple
6. a 1/4" ball valve
7. a 1/4" nipple ( I think it was 1" or 1 1/2" long)
8. 1/4" tee
9. out one side of tee: 1/4" close nipple
10. tire valve filling tool (air chuck?)

11. out the other side of tee: 1/4" close nipple
12. 1/4" to 3/8" adapter
13. 3/8" to 1/2" adapter
14. 1/2" to 3/4" bell adapter
15. 6" 3/4" pipe nipple
16. 3/4" pipe cap
17. lots of Teflon tape on all threaded parts.

I used brass on most of mine, but I would suggest using galvanized pipe, because it is much stronger, I had one mishap when my niece knocked mine off my dresser and broke it. It broke at the 1/4 inch nipple (the one I thought was either 1" or 1 1/2" long). But anyway that is the part list; one good thing about this propane meter is that you can use it on multiple guns. **The last thing you need is a valve stem with 1/4" pipe thread on the other end, and a pipe tap to tap your chamber** (I bought mine at [www.spudtech.com](http://www.spudtech.com) , but you should be able to find them at most hardware stores). One last thing, how to use it: with the ball valve closed let about 30 PSI into the small section, then close the gate valve on the torch, open the ball valve, and this small charge will seal the air chuck valve part. Then open the gate valve and fill the meter to the desired pressure, mine is 37psi, but will vary with the gun. Close the ball valve then press the air chuck onto the valve stem on your chamber. It sounds like a long procedure, but it is really simple and fast, only takes a few seconds to do.

As a side note you could put a small regulator somewhere before the ball valve to make the propane be the same pressure all the time without having to look at the pressure gauge.

## Potato Gun Silencer Plans

It took me a while to make these plans. They do help silence the gun, but only to a certain extent; you can still hear the boom. I would like to warn you that after a lot of use, this silencer may get potato pieces in it and need to be cleaned. Don't be discouraged though; it doesn't need cleaned out very often.

Here is a list of materials needed:

### Materials

Item	Length	Where to buy	Approximate Price Each
3" Schedule 40 PVC **	12"	Hardware Store	\$0.50
1 1/2" Schedule 40 PVC	3'4"	Hardware Store	\$1.50
Two 1/2" to 3" Converter	N/A	Hardware Store	\$3.00
1/2" Threaded Female Adapter	N/A	Hardware Store	\$1.50
cotton or furnace filter material	N/A	Hardware Store	\$1.00

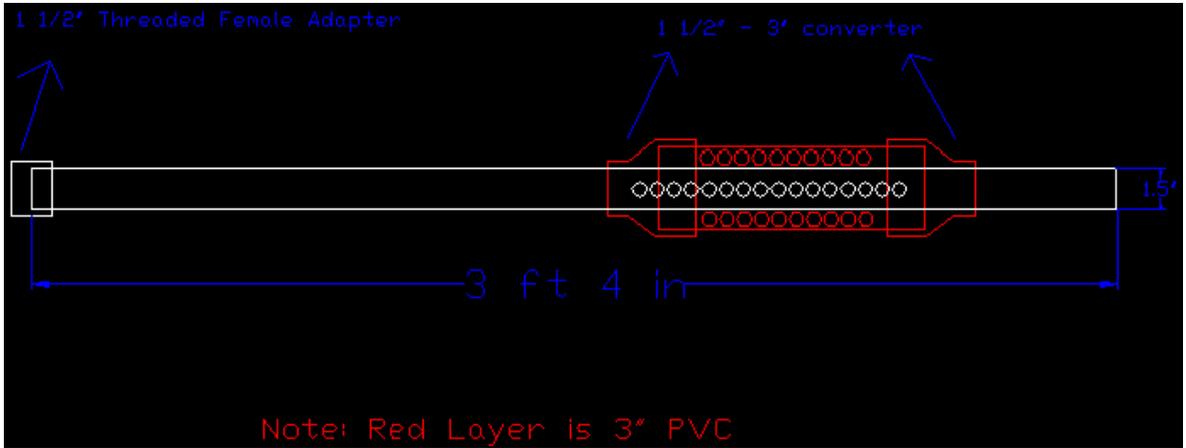
\*\* All PVC, including fittings, Must be Schedule 40

These Instructions are somewhat vague, since it is not feasible to write every step. For better instructions look at my other guns and barrels.

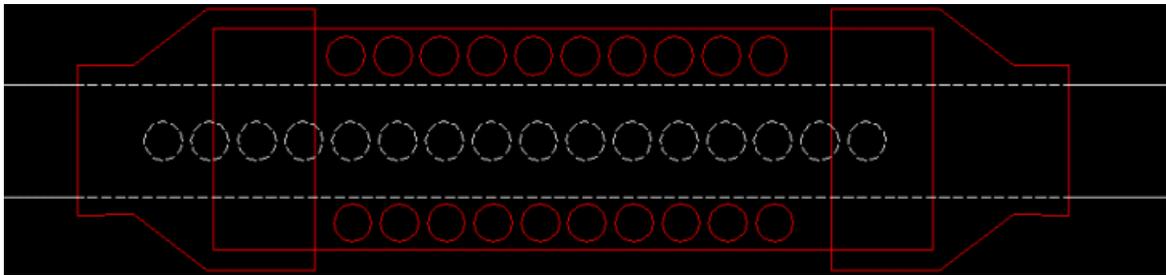
The first thing you need to do is examine the 3 1/2" to 1 1/2" adapters. Notice there is a lip inside of the fitting, this lip will need to be removed, I suggest a Dremel Tool, or a Round File. The reason it needs filed away is to allow the fitting to slide over the 1 1/2" barrel.

Next test fit all parts, this will give you an idea of how the finished product will look, you will not use glue on this project.

(As a side note leave about 6" of 1 1/2" PVC near the muzzle so you can still cut the potato easily.)



### Close-up Picture



This picture will give you a good idea of what to do. The barrel and the silencer need holes drilled in them, the holes wouldn't be as big as the ones in the picture, it was drawn that way for emphasis.

Next you will need to stuff the space between the barrel and the outside of the silencer with a sound absorbent material. A good material would be cotton, or furnace filter material.

*Note, do not glue the 3" to 1 1/2" adapters to the 3" pipe. This is to allow you to clean the material if it should become dirty.*

**DO NOT USE GLUE!!!**

This is for when you will need to clean out the silencer, and it must not be glued to do so.

## Guano grip



The Guano grip is an easy to make, reliable electronic trigger grip. The readily available parts include a 3/4" sch.40 tee, cap and pipe. Also needed are a small block of wood, 2 small screws and a clothespin. Total cost, about two bucks.

Cut the PVC tee in half as shown then cut the handle pipe to desired length. Cement the cap, handle and tee together. Inexpensive tape can be used to build up the diameter of the 3/4" handle to bring it even with the diameter of the fittings. Use a cloth tape or grip tape from a sporting goods supply to finish. Gather two small screws, one flat head wood type and one sheet metal type.



Drill a hole in the handle slightly larger than the wood screw, remove the threads near the head with a Dremel to allow it to slide freely through the hole. Reach down into the tube with a pair of needle nose pliers and hold the wood screw head firmly, thread the wood block onto this wood screw. Drill a pilot hole in the wood block first. A hard wood of some type should be used to prevent splitting, some broomsticks work well as would a small piece of ash. Shape finger

trigger with the Dremel. Check that the wood screw's threads do not hang up on the hole, regrind if needed. Position the trigger for proper travel and mark the area for the guide slot, cut slot with Dremel. Determine sheet metal screw placement after clothespin trigger construction, then drill pilot hole and attach.



Construct an electronic trigger from a clothespin and copper wire. Drill a hole in the end of both clothespin handle tips to secure the wire in position then tape wiring in place. The exposed copper should be tinned using solder to prevent fraying (not pictured). Terminate the trigger leads with a quick disconnect that can be plugged into the electronic ignition or stun gun.

Attaching the Guano grip to the chamber can be as simple as two hose clamps running through the handle and around the combustion chamber. A more finished technique would be to screw the handle directly into the barrel side of the 4" reducing fitting. The photo here clearly shows the safe, non pressurized half of the fitting. There's even enough room to put a lock nut on the other side of your mounting screws.



Guano grip in action. Mouse over the image for motion.

## laser guidance

An inexpensive laser pointer can provide improved accuracy in close range or lower light situations. The laser is simply strapped to the barrel or modified to fit a traditional scope rail. Align the laser by looking through the empty barrel at a target then position the spot in the center. The common issue is how to switch the unit on and off.



Once inside, it's clear that the miniature internal switch is too fragile for soldering. A connection between the pictured circuit board and battery spring would be unreliable. Before you cut a hole in your cat's favorite laser pointer, try this instead. Construct a simple, battery-side switch.

Drill a small hole in a thin sheet of metal, grind away any paint first. Use snips to cut a circle around the hole leaving a small, very flat doughnut. A small thin washer will also work.



Remove the battery cap and drill a small hole in the center. Cut a disk from non-conductive material like cardboard and punch a small hole in the center. Use a thin wire (22-24ga.) to form the circuit.

Most laser pointers pass current through the cap and body to complete the circuit. The cardboard disk will insulate the cap from the battery. Solder the metal disk to one wire to pass battery current to the new switch. The return wire can be soldered anywhere metal on the outside of the pointer. Grind this area down before soldering.



Place tape over the original switch to hold the laser in the on position. A momentary push button switch is connected to activate the laser. The switch is mounted in the front or rear handgrip. A two step switch can be built inside the Guano grip. Attach a lightweight spring switch (like tweezers) in succession with the heavier clothespin switch. The result: a light trigger pull activates the laser, a firm pull ignites the chamber. Quick disconnects on the wires help with disassembly.

## Pacific grip

The Pacific grip is a removable front handle that can be quickly removed for barrel changes or used on many different barrels. The design here works on 2" barrels and also on 1.5" barrels with a collar made from channeled 2"x1.5" adapters.



Pictured here, the parts to construct the Pacific grip, 2"x2"x1" tee, 1"x3/4" threaded fitting, 3/4" threaded cap, 3/4"x3" threaded steel pipe. Also needed are a 1/4"x4" screw, a 1/4" washer that will fit inside the threaded cap and a scrap of hardwood like ash.

This is the basic design of the Pacific grip. The plastic endcap is tightly threaded holding the washer in place against the metal pipe. The 1/4" bolt is held down also but spins freely. A wooden plunger is threaded to the 1/4" bolt and covered with rubber from an inner tube. The handle, as one piece, is threaded into the tee. Lock the handle to the barrel by tightening the handle, forcing the plunger against the barrel.





During testing, the broom handle used here as a plunger split in half, try a true hardwood like ash. The rubber plunger cover pictured here caused problems as it would fold and slip. Current designs do not use this rubber plunger cover.

This is the painful part. Channel the center of the T fitting to allow a 2" pipe to pass snugly through. Avoid touching the factory areas that already fit perfectly. These factory areas provide the handle's alignment should you decide to mount a sight or laser on the Pacific grip. Use a Dremel or a table router to remove the plastic. After grinding for a while, press a 2" pipe into the fitting. It will leave a shiny mark in high spots, grind these areas down.





Channeling a T fitting makes a mess, luckily PVC dust falls straight down. The fitting here was also chopped on both 2" ends to provide a more compact design. Sand everything smooth preserving the factory areas of the fitting.

This prototype version of the Pacific grip features a self contained laser sight. The laser, trigger and battery are attached to this removable barrel grip. Mouse over the image for motion effect.





To use the Pacific grip on a 1.5" barrel, a collar must be added to bring the diameter to 2". The collar is made from two chopped and channeled 1.5"x2" fittings. This collar is cemented to the barrel and fits perfectly into the Pacific grip.

Mark the area for the collar with a pencil then position both fittings on the pipe on either side of the marks. Lightly cement the marked area and bring the two halves of the connector together in the middle. Primer is not required for this connection.



Slide the Pacific grip over the sleeve and tighten in place. During barrel changes or loading, use the grip to loosen the barrel then loosen drive screw and spin the barrel in your fingertips to remove.

## pass-thru barrel

The pass-thru barrel is an obscure modification providing a few important benefits. The pass-thru looks like any other detachable barrel with male threads on one end. The difference is that the barrel extends through the threaded fitting providing a smooth passage for breech (rear) loading. When used with a female threaded slug cutter, breech loading potatoes is quick and simple using only a 6" pushrod. A knife edge added to the breech end of the barrel eliminates the need for a separate slug cutter. The pass-thru barrel requires a female thread in the chamber one size larger than the barrel used. A 1.5" barrel threads into a 2" or larger chamber. A 2" barrel would need a chamber opening of 2.5" or larger. Preparation and attachment of the threaded collar is critical as the pipe does not bottom out in the male threaded fitting as it normally would.



The following example will use a 1.5" barrel. Pictured above are the fittings needed, a 2" male threaded end and a 1.5" x 2" adapter. The 2" threaded fitting is ready to go but the adapter needs to be modified to allow the barrel to pass through it. This is sometimes referred to as a channeled fitting.



Sand the ridge inside the adapter down carefully. The inside of this fitting is tapered, almost a third of the fitting will need to be sanded to allow the barrel to pass through. When using a Dremel, keep moving in a circular motion to avoid flat spots. The ideal method is to use a table router with a fence set to the proper wall thickness. If the pipe does not

pass through, it will leave a shiny mark inside the adapter, that's a high spot, grind it down.

Try not to sand the half of the fitting that the pipe already clears. This will be the only area left with a factory fitting tolerance. Take your time and make it strong, this is a high pressure coupling.

Cement the two halves of the collar together, see the solvent welding page for a step by step using these same fittings. Ensure the two halves seat properly to prevent a crooked barrel.



Slide the collar on the barrel and mark the area with a pencil. Position a half an inch or more of barrel behind the collar. Be sure to calculate this extra length into your chamber to barrel ratio, anything behind the spud is chamber. Use primer to soften the fitting and marked area on the barrel. Cement the marked area and slide the collar into place. Use plenty cement and mask threads if needed.

Clean up any seams in the threads using a triangle file and a razor blade. Apply a small amount of clear grease to the female threaded fitting to help prevent jams. By greasing the female fitting only, you keep the unused upper threads of the male fitting clean. Grease can be a mess, avoid getting dirt on greasy fittings.



Pass-thru barrels offer the choice of safely adding some type of stopper or barrel bolt. A coarse wire mesh can be attached to prevent small objects from falling through. Use that #6 tap you bought to thread the electrode hole with to add a stainless steel barrel bolt as shown. Zinc bolts will bend, taking your threads with it.

The burn marks on the end of the barrel are caused when the launcher is test fired with no projectile or back pressure in the barrel. Use a wadding like paper towels or fabric when test firing. The construction techniques for the pass-thru barrel can also be used to create a seamless barrel extension.

## slug cutter

The traditional procedure of loading potatoes in a launcher is from the front with a long pushrod. This works fine but there is a different way. Breech loading from the rear offers some advantages despite the fact that the barrel must be removed. Using a slug cutter and a pass-thru barrel can speed up reloading, especially when shooting with friends. When one person has the launcher, another can be loading the slug cutter and a second barrel. The spud gets cut separate from the launcher preventing starch buildup on the handgrips and sights. The slug cutter uses a small 6" pushrod. With a 'shorty' cutter, you could push the potato into the barrel with your fingertips.



This is a completed slug cutter for a 1.5" barrel. Use a 2" female threaded adapter attached to a 2"x 1.5" reducer. A length of 1.5" PVC the same as your barrel is also needed, this is the cutting tube. The reducer fitting will need to be channeled to allow the 1.5" cutting tube to pass completely through. Visit the pass-thru barrel page for details on this. Cement the fittings together but wait to cement the cutting tube until the correct position is established.

The slug cutter should lock in place quickly with one or two turns. The amount of overhang on the pass-thru barrel determines the placement of the cutting tube on the slug cutter.





The position of the cutting tube is marked before it is cemented in place. Engage the threads to the desired depth then place the cutting tube inside the fitting against the barrel. Mark this area well with a pencil. Apply masking tape to protect the female threads then attach the cutting tube to the fitting with PVC cement.

Sharpen the edge of the cutting tube with a Dremel or file. A slight taper on the inside edge will help funnel the spud tightly into the pipe.



Cut..



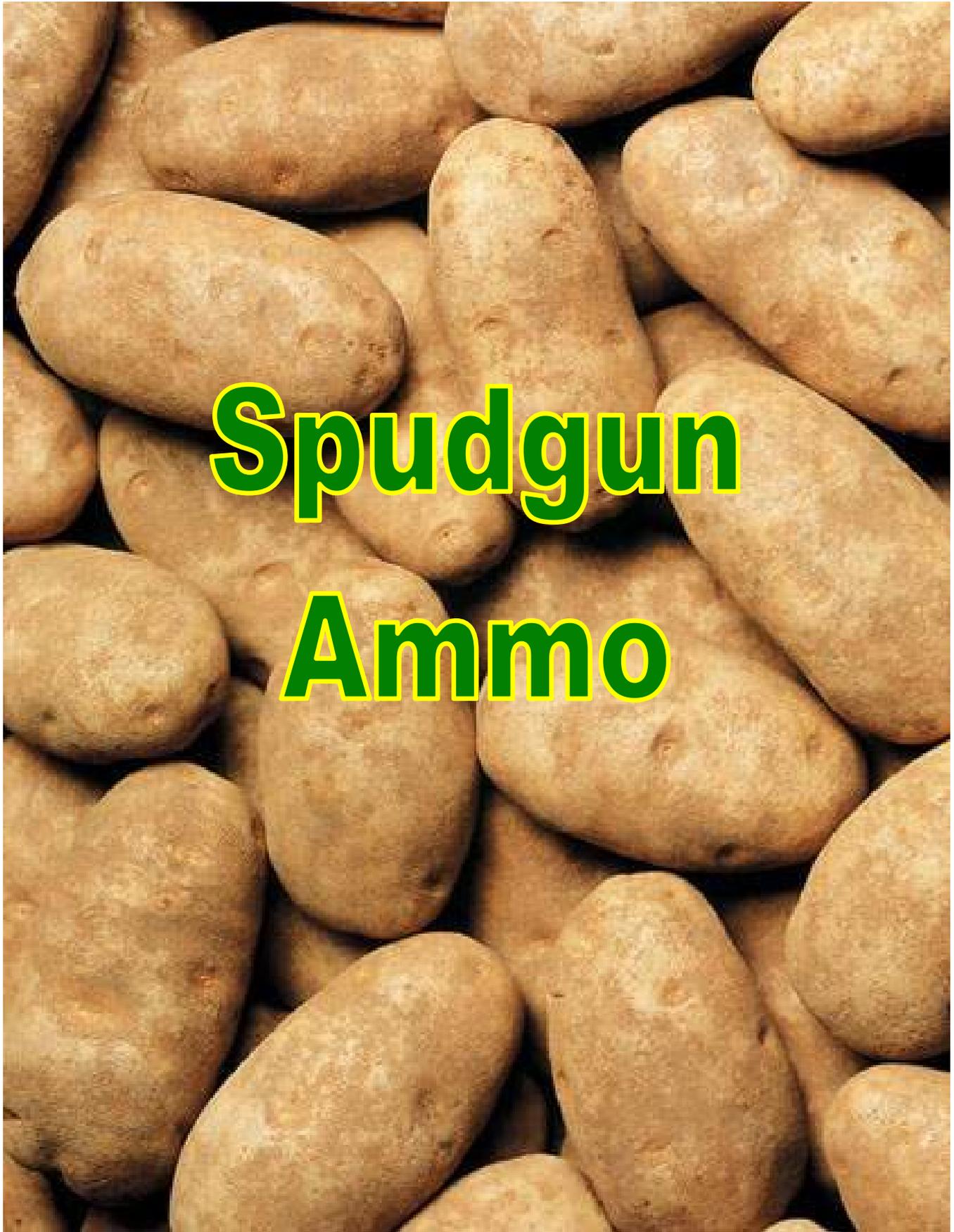
Attach..



Plunge..



Presto.



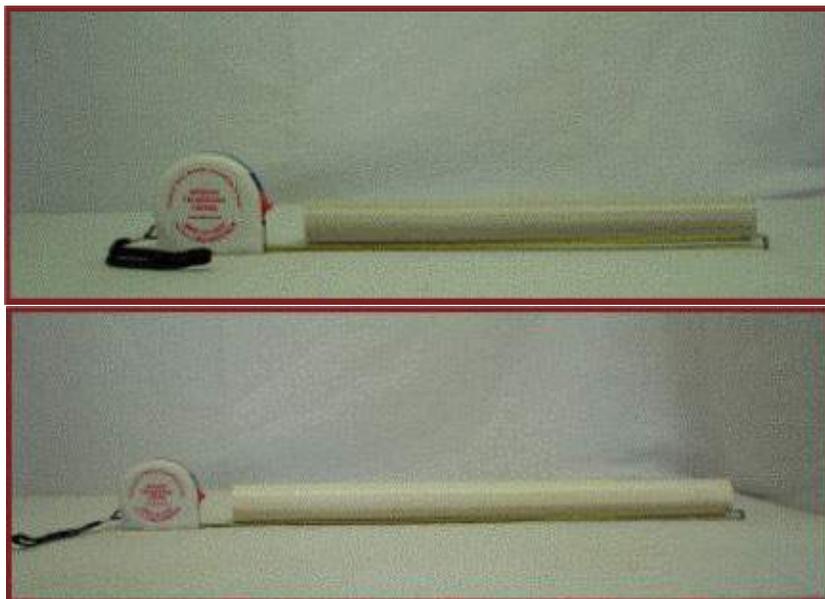
# Spudgun Ammo

## Building PVC rockets

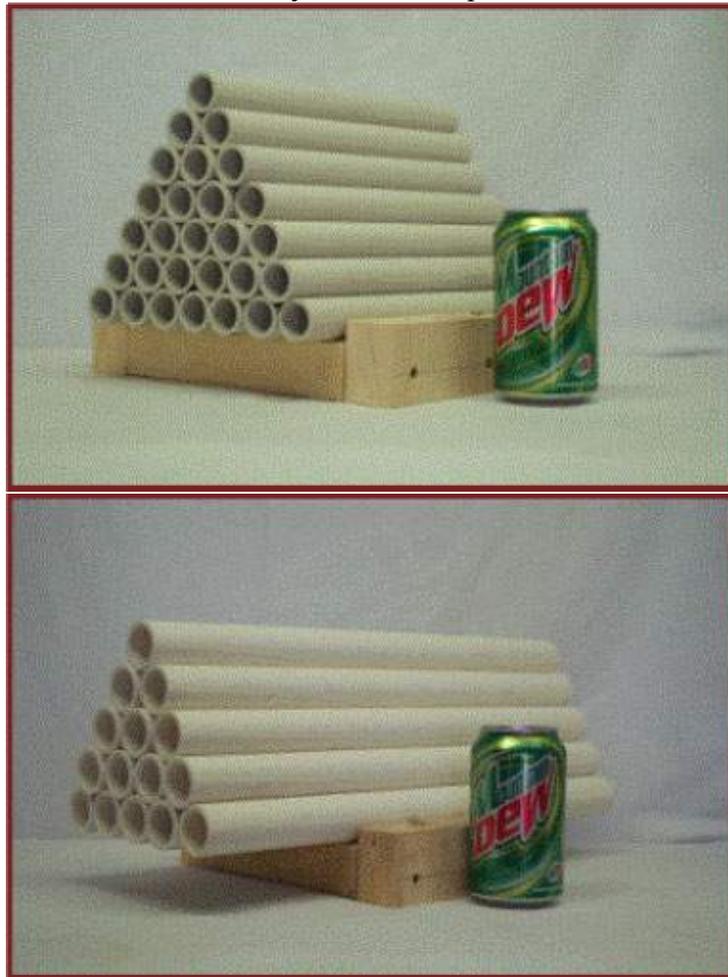


### Step 1: Cutting pipe to length

When making rockets for 1.5" barrels, it is best to use 3/4" PVC. I cut mine to a length of 10 7/8", I make them this length because that is the distance from the end of the table and my saw blade, so your lengths can vary slightly, but always try and stay above 10" and below 12". For a 2" barrel you will want to use 1" pipe cut to a lengths between 16" and 18", mine are 17". You can use any method of cutting you would like, however, try to have as square of ends as possible.



I will usually cut 20' of pipe at a time, it's a lot of work to make rockets, and so I like to do as many at a time as possible.



### Step 2: Washing the pipe

It is best to wash the pipe after cutting it, this will remove any dirt and PVC shavings that have collected.



### Step 3: Drying the pipe

After you have cleaned the pipe, you want it to dry completely, inside and out. You can do this be either letting it air dry, or drying it yourself with a towel. Here I am letting some pieces air dry. It is very important that you get the pipe totally dry; otherwise as soon as you put the pipe in the oil, the water will boil off and send very hot oil all over the place, not fun to get on your arm.



### Step 4: Preparing to flare the pipe

You will now need the following materials to begin the flaring process: From left to right: Metal pan (pie pan, anything to help catch spilled oil) metal funnel (plastic will work too, but might warp if it gets too warm) cooking pot (Yes, your wife/mother/girlfriend will get upset if you use that pot, go to a garage sale and by a

cheap one) small piece of pipe the same size as your intended barrel, cooking oil. Other things that you may want handy include, an oven mitt, bowl of ice water, and towels.



**Step 5: Setting up**

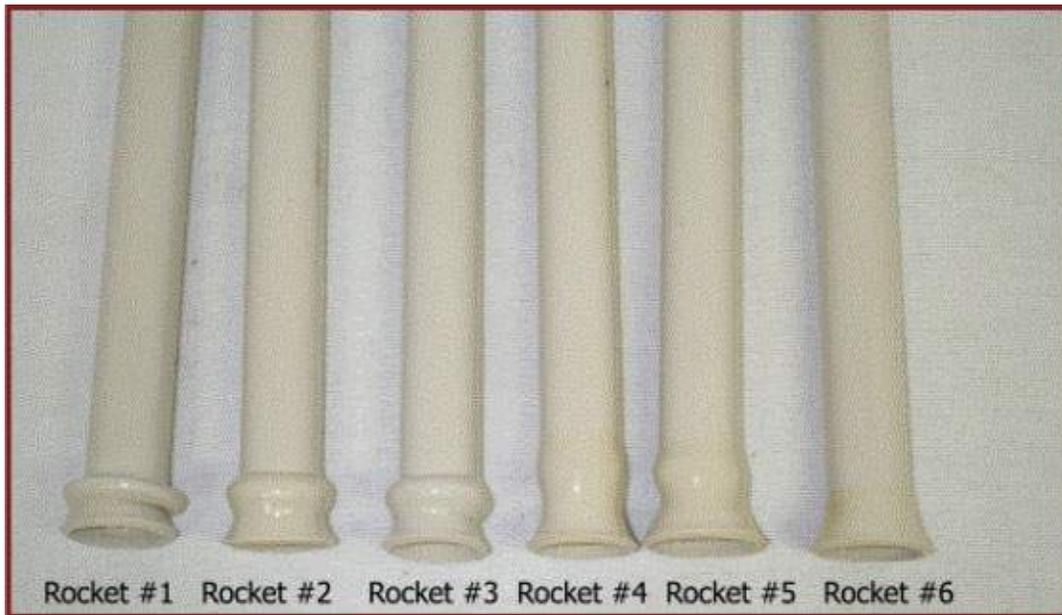
Start by pouring oil into your pot, about an inch will be enough. You may have to add some or take some out as you go, so have something you can pour hot oil into handy. Here you can see that I have everything ready, a bowl of ice water, funnel and drip pan, my soon to be missiles, and my pan of oil is being heated. You will want to test the temperature of your oil before you get started. Do this by holding a piece of PVC in the oil for about 30 seconds, if it gets very flimsy and pliable, the oil is hot enough, if not, turn up the temperature.



**Step 6: Flaring**

Now that your oil is hot you are ready to begin. Start by putting your small barrel sized piece of pipe on the funnel, this will act as your stop for the flare. With an oven mitt on your hand, hold your first piece of pipe in the oil for roughly 30 seconds. (Time will vary according to the temperature of your oil, experiment with different times.) Make sure to continue holding the pipe the entire time that it is in the oil, otherwise it may tip over and send hot oil everywhere. After the pipe has become pliable, quickly remove it from the oil and push it down on the funnel. With your flare stop in place, you should only be able to push the pipe down so far, don't push any farther. If you can push the pipe down all the way to your flare stop, your pipe isn't hot enough yet, put back in the oil. Lets now take a look at some different problems that may occur when flaring.

- Rocket #1: Pushing down too hard and too much oil in the pot.
- Rocket #2: Too much oil in the pot.
- Rocket #3: Too much oil in the pot and not pushing down straight.
- Rocket #4 and #5: A little too much oil and still pushing too hard.
- Rocket #6: Correct amount of oil and correct pressure applied.



## Step 7: Gluing end caps

Once all of your pipes have been flared, you are ready to begin gluing on your end caps.



Here I have sorted out my 1" caps and my 3/4" caps.

Because you are attempting to build PVC rockets, I am going to assume that you already have built a cannon and therefore you know how to prep and glue PVC. But before you glue on your end caps you may want to add some weight to them. I have found that a couple (3-4) washers inside of the caps work the best. However others have tried lead shot, experiment to see what suits you best.



Here is a picture with a washer inside the end cap. Once your weight has been added, you can glue your caps to your flared pipe.

Remember: You don't need to use any primer because these will not be holding any pressure, so don't worry about it.

### **Step 8: Painting (Optional)**

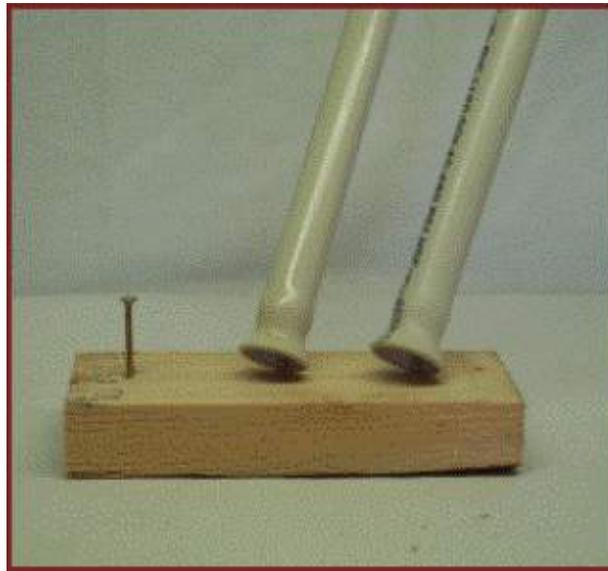
You should now have missiles that look something like this:



Now you may want to add some paint, it helps with visibility in the air, and also helps when trying to find these rockets. I usually use a bright colored spray paint.



You may also want to build a simple paint block to keep your rockets upright while painting. I simply put a couple screws in a 2x4 and put the missiles on the screws.



And now you are done. Enjoy, and as always, Keep it safe...

## 2.5" Concrete Balls

I have always wanted to shoot concrete balls or cans of concrete, but never really got a chance. There was a discussion on the spudtech.com forums, which lead to this information. It was really strange, because the same day that DR (from the forums) posted this how-to, A friend showed me about the light bulbs. What a very strange coincidence!

As you may know, regular light bulbs fit nearly perfectly in a 2.5" sch40 barrel (Tennis Ball Barrel). This method uses that to it's advantage, providing a cheap mold for making cement slugs. Think about how many burnt out light bulbs you throw away per year! You could even have your neighbors or friends save them for you!

It may be a good idea to wear protective gloves while doing this, or at least wrap the light bulb in a towel.

---

### This info was provided by DR from the spudtech.com forums:

A friend at work today showed me something VERY interesting. I won't share with you WHY he knows how to do this, but will share HOW to do it... (WEAR SAFETY GLASSES AS A PRECAUTION!!!)



The base of the bulb is wrapped tightly with electrical tape. The metal disc is bent up on each side, and pulled out of the insulation



The insulating resin is scraped out with the end of a pocketknife.



The inside edge of the metal base is folded over with a pair of needle nose pliers.



Inside you will see a long "nipple" of glass. pry it sideways with your pocketknife (or a small screwdriver. If it doesn't break clean off, don't worry! just work it

back and forth carefully with the needlenose pliers, and pull out all wires (filament) and glass chunks.



If you take ordinary table salt (a few tablespoons ) and shake it around in the lightbulb, it will remove all of the white powder from the inside of the bulb. You'll now have a clear bulb with a hole in the end for filling!



Currently in the garage "setting up".



As the cement cures, water will puddle at the top. I dabbed at the excess with a paper towel, and thought: "Geez, this will suck if I had to do this every ten minutes!- then it instantly dawned on me to stick a piece of the paper towel in as a wick. Capillary action should remove all of the excess water! (And hopefully won't allow the cement to set up too quickly, which will make it weaker, and more prone to cracks.)

Only time will tell...

## Thanks DR for the great how-to!

A few notes on how I did it: Instead of prying the metal up, I whacked it with the heavy end of a butter knife... the insulating resin part will crumble out.

Remember, you are not limited to cement! You could use plaster, sand, bondo or any number of fillers. I used some Durham's Rock Hard Water Putty to fill a bulb, and it worked perfectly. Here are a few pics of some ammo I have made:



## How to build a Spud-a-chute

by Jeff

---

Having built an outstanding air powered spud gun (based on the design of the Paintball "air cannon" shown on Bill Mills' Air Cannon Page), the never ending quest for things to shoot began. Hence, the spud-a-chute, which works better than the little plastic parachute men we played with as a kid.

First, get a spud gun - mine is two inch PVC and is air powered, but other guns should also work. I shot the spud-a-chute at 55 psi.

Next, get a spud. You will need to pre-fit the spud to the gun by shooting it once, hopefully without too much damage.

Drill a small hole in the spud (about 1/4") from the bottom up, it should go at least halfway up.

Drill a large hole (around 1") from the top down, about halfway down the spud. If you go too far, the spud will not last as long. The two holes should meet so you can see through the spud.

Make a parachute. I used a 4 gallon kitchen trash bag and cut a slit about 4" up both sides. You can also use any square of plastic cut from a trash bag. Take two pieces of string about 24" inches long. Tape the four ends to the four corners of the open end of the bag. This leaves two loops of string hanging from the parachute.

Attach the parachute to the spud: Drop the two string loops into the large hole. Use a thin screwdriver or stick to push them through the small hole. Tie a couple of knots in the end sticking out of the small hole. Pull up on the string so the knots block the small hole.

You now have a spud-a-chute!

Shooting tips:

Put a hole in the top of the chute to help the air escape as you load it. Don't push too much of the chute into the spud or wrap the strings around the chute, it may not deploy. Don't tie the knots in the string too tight, you will want to undo them when you move on to a new spud (Note that the spuds last longer when they parachute gently to the earth) Experiment with how tightly you put the chute in the spud, to get the deployment just right.



# Advanced Spudgun Ignition

## flint-type lantern lighter



Close up of the lantern lighter

These sparkers are found in the camping goods section of most department or retail stores (such as Target, K-Mart, Wal-Mart to name a few). Many spud gunners use BBQ lighters, which is O.K., but personally, I like the flint type. When I have tried BBQ igniters the BBQ wear out and the flint kind don't. If they stop working then you only have to replace the flint. Another reason I like them is that the flint type are a lot cheaper, almost \$10.00 less than BBQ at most stores! This is my favorite way to get a spark cheaply. One thing to remember with a flint type spark is to not spray the sparker directly, as it could make the flint wet. I now use stun gun ignition, but have no reservations suggesting Lantern Lighters.

### Installation:

If using a lantern lighter in your spudgun, this tip comes in handy. I suggest straying away from BBQ igniters on any gun.

This tip is for installing the sparker. This tip is necessary on the Green Hornet, since the sparker is installed through a double layer of PVC fittings. This tip may also be needed on other potato guns. The problem originates from the nut on the lantern lighter being too short. The way to overcome this obstacle is to take the nut off the sparker. Next drill a hole slightly smaller than the sparker. Now screw the sparker into the gun from the inside. The sparker will tap it's own threads into the PVC, resulting in no leaks, and no way for the sparker to come out.

If any mistakes are made and there is a leak, you can use an epoxy such as JB-Weld around the threads of the lantern lighter.

*On the following launcher I countersunk the area around the lighter. This should be safe, but I would recommend not doing so.*



Lantern Lighter installed



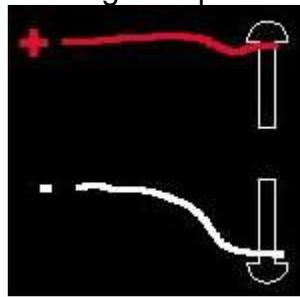
Inside View

## Multiple Sparks

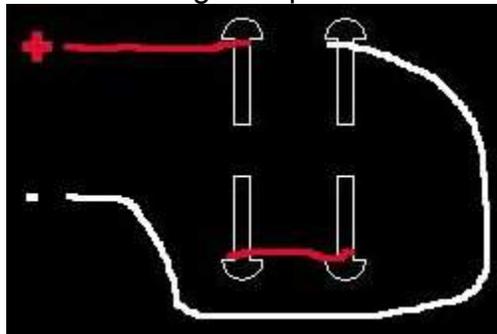
Potato guns can benefit from having multiple spark ignition. Here are the wiring details:

**Multiple sparks:** I have heard that 3 sparks increase efficiency by 30% compared to single sparks. This has recently come into debate and is being tested on the Burnt Latke web site. I am confident that they do improve power, and I think this is even more apparent on longer chambers. A BBQ igniter can make 2 sparks, but if you want to get some seriously powerful multiple sparks I suggest going with a stun gun. My chamber currently has 4 sparks. I had the hardest time trying to figure out how to get two or more sparks. Luckily I got some help from some users on the spudtech forum and they pointed me in the right direction. When wiring multiple sparks they must be wired in a series. The following pics should explain how to do this.

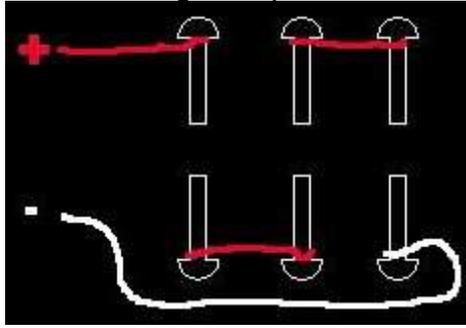
To get 1 spark



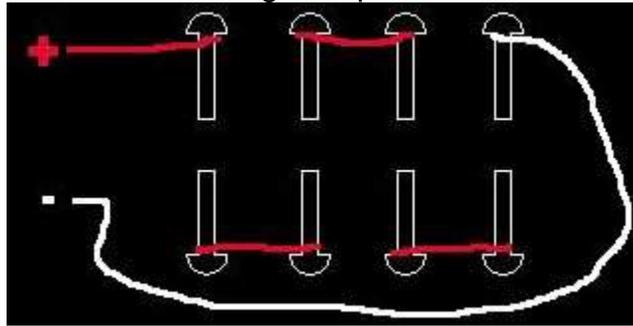
To get 2 sparks



To get 3 sparks



To get 4 sparks



It makes no difference which is negative and positive.

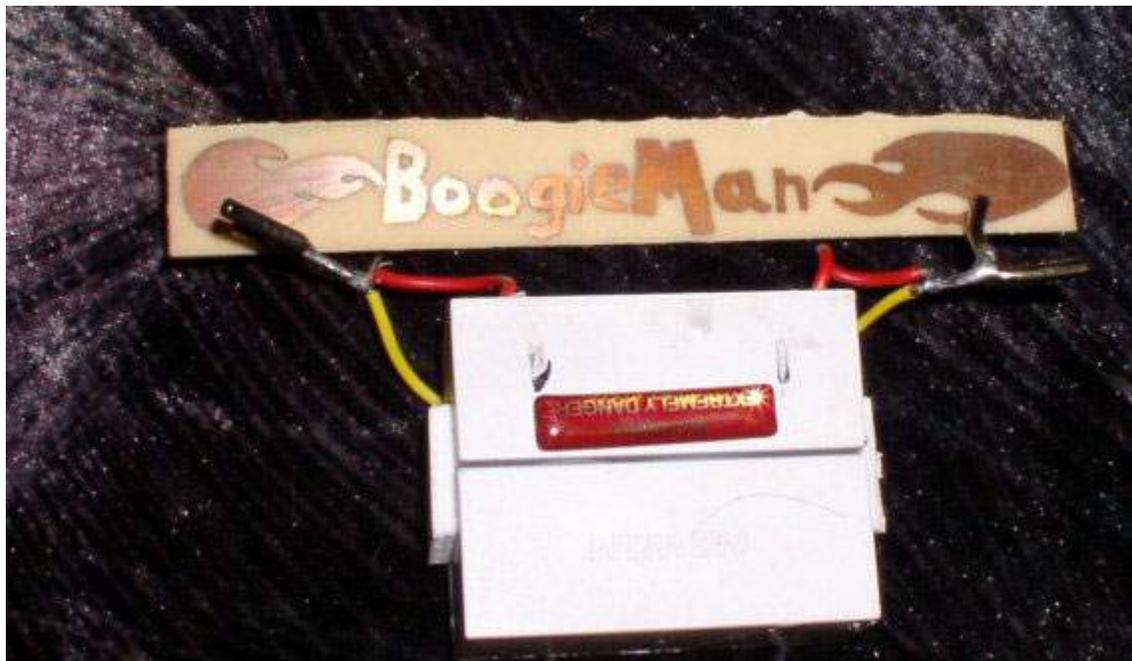
## Spark Strip

A spark strip is a reliable method for ignition. Stun gun Ignition is a must when using spark strips. Basically how it works is you etch a copper clad circuit board. The current travels from copper to copper, making sparks as it jumps from one copper patch to another. Copper etching kits can be found at stores such as Radioshack.

I need to drill and cut the holes, but here are a few pics:



Closeup



Before firing



While sparking... sparks are much fatter and brighter than they appear

Kudos to latke for coming up with such a brilliant idea, I saw his and knew I wanted one to try out!

This spark strip was touched up cosmetically and used in one of my cannons.

## Stun Gun Ignition:



The much imposing 200,000V beast!

Stun guns: Truly a marvel to behold. Stun gun ignition is a spudgunners best friend. Stun guns produce a very powerful spark and make it very easy to wire multiple sparks into your chamber. There are several reasons why I feel this way about stun guns. The following list contains pros and cons of stun gun usage, as well as a few tips on using one.

### Pros:

1. Stun guns are cool. I love the look on friend's faces when I tell them I have a 200000V ignition source on my spud gun.
2. Stun guns are extremely durable. I have used one for at least 500 rounds and it has never failed once. I have tried BBQ igniters before and they broke after 20 or so shots. This did not impress me at all.
3. Stun guns are cheap. Many people feel cost is a big issue on spud guns, and rightfully so. A common BBQ lighter cost about \$12 to \$15 in a store. I have bought a 100,000V stun gun on eBay for about \$18 after shipping. I bought my 200,000V one for about \$25, and I recently purchased a 300,000V one for \$32. If this seems like a large amount of money consider this: If you even had to replace your BBQ sparker once you would have at least \$24 wrapped up in it. Now call me crazy, but I would rather put \$3 with my \$15 and buy a stun gun. EBay is probably the best place to buy a stun gun.
4. Easy to wire. They are just as easy to wire as a BBQ igniter, but it is much easier to wire multiple sparks.
5. More design flexibility. If one knows about wiring and such it would be very easy to put different switches, remote controls, etc. to operate the stun gun.

6. Reusable. It is much easier to use a stun gun between multiple guns than any other ignition. I wouldn't want to even attempt using the same BBQ igniter on other guns.

**Cons:**

1. Legality issues. Stun guns are legal in most places in the U.S., but I know in Australia and some other foreign places they are illegal.

2. Being shocked. This is probably the only fear most have about using a stun gun for ignition. I have been shocked, and while it wasn't very fun, it was nowhere near as bad as I thought it would be. I wouldn't let this be a deterrent in choosing a stun gun ignition, because it is easily remedied. The best way to fix it is by using good wires, like the ones found on television fly backs (the wires that look like they attach with a suction cup to the back of the screen assembly), and to cover your screws. I haven't covered my screws, because I am careful when firing, and to tell you the truth being shocked doesn't hurt bad enough to go to the trouble to cover them.



A pic in the dark, the sparks blurred the pic some but you can still see the 4 sparks

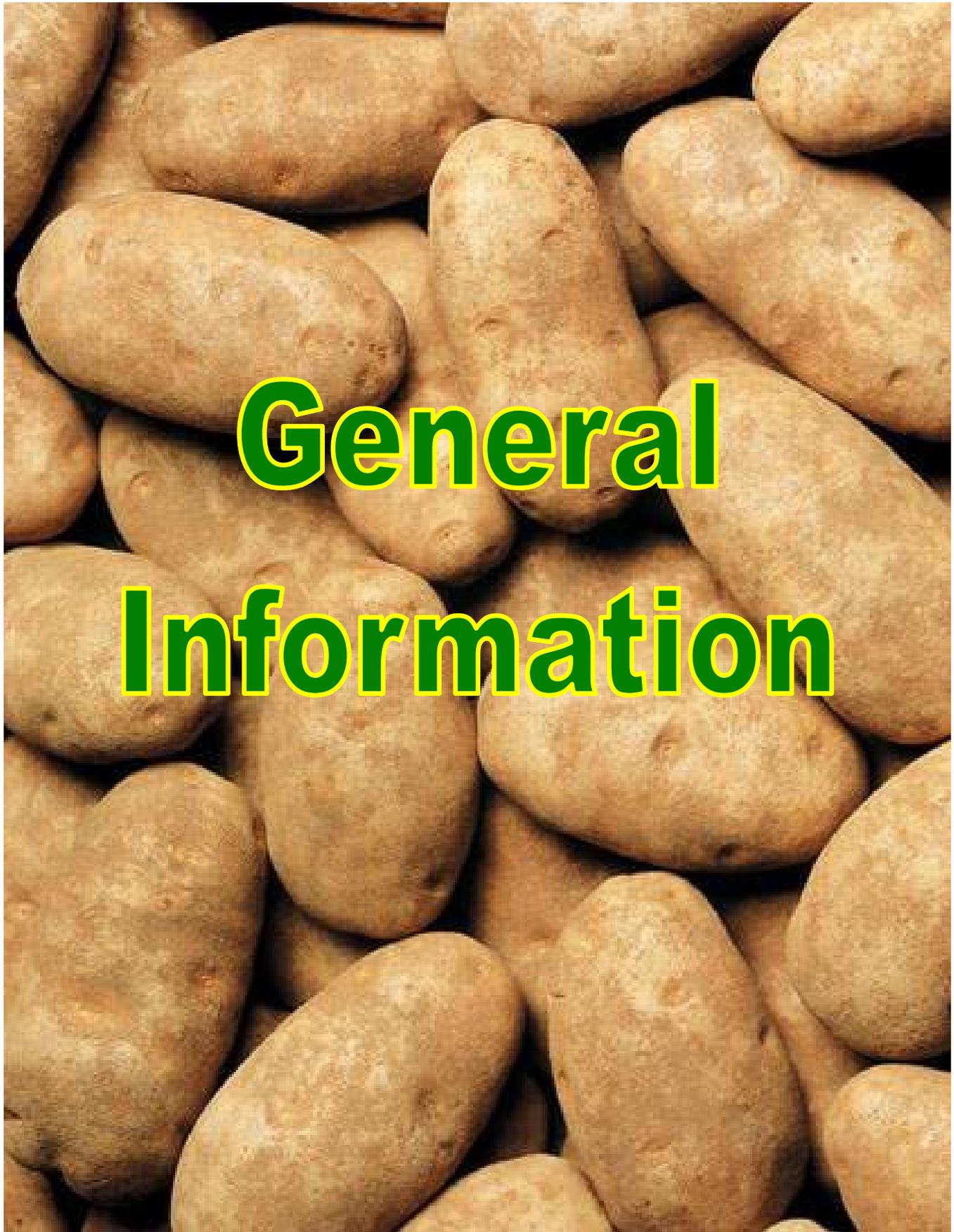


A pic in the light. *Note to self: Do not stick hand in chamber. :)*

**Instructions:** Basically a picture is worth a thousand words, so to save myself 1000 words I have included pictures. ☺ Here are a few general notes: The wires are attached to the outside post of the stun gun with crimp connectors. The wires must be attached to the outside so as not to interfere with the inside electrodes. The inside electrodes are the stun gun's default path, and if it is interfered with, will ruin the stun gun. As a result when making multiple sparks the total gap between all the bolt sets must be slightly less than the gap between the default electrodes. This is a fairly easy step. The other part is attachment to the chamber. I use a hose clamp for this.



Wiring and attachment detail.



# General Information

## PVC Solvent Welding

Gluing your PVC is one of the most important steps when making a launcher. To make a safe and strong Solvent Weld (glued joint), follow this process:

PVC solvent welding, or gluing PVC pipes together is a fairly easy process. Ensure that the following steps are completed for the strongest possible solvent weld.

1. If the pipe and fitting to be glued together are dirty, you should wipe the excess dirt off with a clean cloth, then clean the pieces with a PVC cleaner. To use the cleaner simply wipe it on the pipe and on the inside of the fitting with the supplied dauber. Next wipe the area dry with a clean cloth. This process can be done to clean PVC also, it is a good idea to clean all joints before gluing, so as to be sure they are clean.
2. Next you are ready for primer. Primer is essential to a good solvent weld. Some people say that it isn't necessary, and for usual applications, such as plumbing, it may not be a crucial. You are making a device that harnesses much power, and more pressure than standard applications. Do not skip this step, it is curtail. Use the supplied dauber to wipe the primer evenly on the pipe and on the inside of the fitting. Once primer has been applied, do not fully allow the primer/softened PVC to dry. Gluing should take place within a minute or so.
3. To actually glue the piping, apply a liberal amount of glue to the outside of the pipe and the inside of the fitting. Press the pipe into the fitting, giving a quarter turn twist while pushing it in. This reduces the chance of air bubbles. Hold the pipe and fitting in place for one minute to allow the bond to set.
4. The pipe should not be pressurized or filled with liquid for 24 hours to allow the glue to cure. If it is used before completely cured there is a very high probability for leaks to develop.

## Painting Techniques

I will explain painting spudguns using two methods, and then go into some painting procedures.

### Painting Methods

The first is using Krylon Fusion spray paint. As you may know Krylon recently came out with Fusion, paint made specifically for plastics. Krylon bonds to the plastic and becomes chip resistant after 7 days cure time. Fusion paint even lists PVC as a material on the can... Ladies and Gentleman we have found the Mecca of spudgun paint! To paint with Fusion I washed my gun with soap and water in the bathtub. I towel dried it, and let it dry overnight. Krylon recommends that you wipe new or shiny plastics (like your PVC) with paint thinner before application. After the thinner is dry, it's time to go to work! If you have never spray painted, I suggest you practice on a scrap piece before painting your spudgun so you will avoid runs. Also it is a good idea to follow the directions on the can. I lightly misted the PVC with paint; the first layer will come nowhere close to covering the entire white pipe. I just kept misting until it was as dark as I needed. This is not the proper way to paint, but I have found that it will work perfectly once you master the technique. Basically you are supposed to wait between layers of paint, but I do not, instead I make my layers extremely thin. When you are done let the paint cure for 7 days to ensure a chip resistant finish.

The second method is using ordinary spray paint. Ordinary paint is not very durable for spudguns, even the enamel spray paint. It can work, but not as good as fusion. Basically the painting is the same procedure, but you must rough up the PVC with fine grit sandpaper, then use primer. Primer helps the paint to adhere, and is applied the same way spray paint is applied. Next apply the paint over the primer. Make sure to follow the directions on the cans for drying times, recoat, etc.

### Painting Procedures

When painting a multi-colored paint job, you must paint the lighter colors first, and paint the darker colors last. Basically if you can, you should paint from lightest to darkest. This allows you to have lighter colors that are unaffected by the dark colors. It also saves paint.

You may wonder how in the heck I painted the flames. One could use an airbrush, but you would need an airbrush. I used contact paper to mask off the flames. I drew the design on the white contact paper and then cut out the flames with an X-acto knife. Contact paper is the best paint masking I have ever used, it

has perfect tack, and will not leave sticky residue on your project. It releases great, and it is waterproof, meaning the paint will not bleed through.

To mask off large areas use the slick newspaper that store ads come on.

I made a paint stand, simply out of an old table that I turned upside down. I then put the spudgun over the leg. I painted the chamber and the barrels separate. You can screw old fittings, or barrels into the threads of your launcher to keep paint from building up on the threads.



Quadzilla, painted with Krylon Fusion paint.

## Spudgun fuels

Some basic fuel advice for using aerosol propellants:

Less fuel will often make your spudgun shoot farther. Always experiment with different amounts of fuel. It seems strange but when you combust a fuel inside of a closed container, such as a spud gun chamber, if you have too much fuel you will not have enough oxygen to ignite the fuel mixture.

Remember less is more!

Do not use high powered fuels such as acetylene, hydrogen or oxygen. If you do you will die. PVC is nowhere capable of withstanding the extreme power of these fuels, and will explode with much PVC shrapnel.

### A list of fuels commonly used in spudgunning:

FUEL	DESCRIPTION
Right Guard	See above link, its good stuff, clean and very powerful!
Glade Air Freshener	Has propane, butane, isobutane as propellants, powerful, but has a large percentage of water and smelly stuff.
Starting Fluid (Either)	Very powerful, but a little difficult to measure out, usually 1/2 a second will be enough fuel.
Static Guard (for static on clothes)	This stuff rules, as good, or better than right guard! It is very clean burning, leaves no smell or buildup. Again, very powerful! (update, it is now "fresh scent"-- not a bad smell, similar to hairspray smell)
Butane (for refilling lighters)	A clean reliable fuel, very powerful. The only drawback is that it is somewhat difficult to get the right amount.
Propane	Cheap, very powerful, EXTREMELY reliable, clean burning. Able to be precisely metered.
Oust Air Freshener	I haven't used it personally, but it is supposed to be powerful. Again, it has stinky stuff like glade air fresheners. I would assume performance would be similar.
Cologne (sd-40 alcohol kind)	Very stinky chamber, but a good fuel.

Hairspray	Terrible... it gums up your chamber, don't even mess with it. (Plus its weak compared to right guard or many other fuels)
Super-Lube Dri-Film Lowe's	I've not used it personally, but it's supposed to be dang good!
Some Airbrush Propellants	I have not used it personally, but it would be clean burning, as it would be a pure fuel.
WD-40	Used to work, but now the propellant is CO2, forget it, its worthless now, wont even light...  However, if you find an old can (it wont have a blue dot around the nozzle hole) you are in luck! Its good stuff, but does leave a film in the cannon.
Old Spice Deodorant (aerosol)	Clean and powerful, similar to Right Guard