

Making the Surplus!

Homemade Electronic Bore Cleaner

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Recently I met a reader of Surplusrifle.com and tried to help install a scope mount on his Mauser rifle. To make a long story short - I didn't install the mount. For a **"no-gunsmith required"** type scope mount, it came with one of the most complex set of installation procedures I had ever seen (*in my entire life*). You had to remove the rifle stock's butt plate and attach a 4"x8" piece of plywood in its place (*this part is completely true*). Next, you had to spin three times while standing on your left foot (*this part is a slight exaggeration*). It also required you to modify the stock. I feel comfortable performing this task on one of my own rifles, but not on someone else's. I really think possibly learning to drill and tap the receiver with the telekinetic powers of my mind (*as limited as they may be*) would have been an easier task - but this is a story for another day.

Later, as we were talking, he told me about a project he recently completed . He said that he had wanted to purchase one of the electronic bore cleaners that are available on the market and had been searching around on the internet and came upon the instructions to build one. Build one? I asked. Not only was he able to make one - but it actually worked! He told me it was made from a cleaning rod and a flashlight. I was intrigued.

Looking for a faster and easier way to clean rifles has become somewhat of a pastime for me. Combine that with the fact that in my early years I had been an *honest to goodness*, electronics technician. The thought came to me - I could possibly make one of these gadgets for myself and it actually might work.....

I searched the internet and sure enough I found a set of instructions that told me how to build the device using simple plumbing washers, a cleaning rod, and a cheap flashlight.

In comparison the commercial equivalent of the device cost anywhere from \$69 to \$129.

Description of the Commercially Available Product
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<i>The Foul Out III bore cleaning system's electrochemical process strips lead or copper deposits from your bore without harming barrel steel. The new Foul Out design is more compact and quicker to use than previous models. Thanks to new technology, the in-line control unit cleans barrels faster than ever before. Accuracy and barrel life are improved. Foul Out III is AC powered. Comes with: Foul Out III control unit, electrode, assorted bore plugs and O-rings, Cop Out Plus and Lead Out Plus solutions, dispensing cap, and AC adapter.</i>
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So, one Saturday I went on an adventure to gather all of the parts needed for the project.

Parts/Ingredients	Price
00 Beveled Washers 1/2" Pkg 10	\$1.30
Stainless Steel - One Piece Cleaning Rod	\$9.99
Plastic Radio Shack - Flash Light	\$0.97
Package "D" Cell batteries	\$2.99
Test/Jumper Leads - w/Heavy Duty Clips	\$1.99
Electrical Tape	\$1.79
Household Ammonia	\$1.77
Household White Vinegar	\$1.69
Total	\$22.49+/-

Tools/Equipment Needed

Syringe or Oven Baster

Soldering Iron

Solder

Cleaning Stand

General Cutting Knife

Bucket

Cleaning Solution Mixing Container



Everything was pretty easy to find except for the beveled rubber washer. You need to find a washer that will both fit over your cleaning rod tightly as well as fitting into the bore of the rifle making a good enough seal to keep the chemicals inside.



I settled on the Danco, Stem Repair, **00 Beveled Washers 1/2"** (shown in **figures 1, 2, and 3**). The washer was too large to fit the bore, so I had to trim a little off.



The beveled washer slid over the cleaning rod, but was still tight enough to stay in position and also prevent leakage (as shown in **figure 3**).

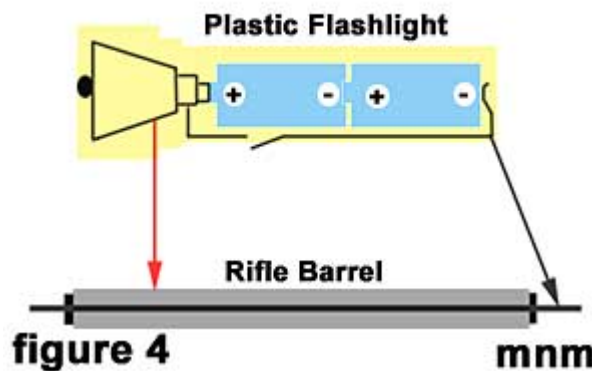


Figure 4 shows the basic design of the bore cleaner. The flashlight works as both the power source and operational

indicator.

The cleaning rod must rest on the beveled washers and be isolated from the barrel. If the cleaning rod shorts to the barrel the flashlight will burn bright at full power.

The instructions I found stated that you would need to place small rubber washers the length of the cleaning rod to prevent the rod from contacting the barrel. The cleaning rod I used must be larger in diameter. When I tried placing the small washers the length of the rod I found it prevented me from filling the barrel with the cleaning solution. I suppose if the barrel was a larger caliber then this would be necessary.

The negative contact of the power source connects to the cleaning rod, while the positive contact connects to the exterior of the rifle barrel.

The barrel is plugged at both ends and contains a mixture of water, Ammonia, and Vinegar.

As the electricity flows through the barrel, the copper and other metals inside the rifle bore are drawn to the cleaning rod and away from the barrel.



The **Test/Jumper Leads** that I purchased had large alligator clips at each end. I removed one alligator clip from each set and tinned the bare/exposed wire with solder (*twist the wire together and then heat it quickly while applying a bead of solder to it*). Tinning the wire will help make the soldering tasks easier.



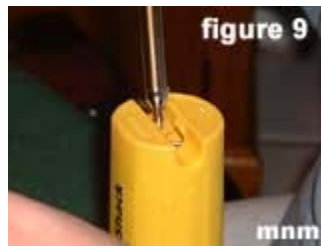
Cut a small hole in the flashlight cap (*above the threads*).



Insert the tinned end of the red wire through the hole.



Solder the red wire to the back of the metal reflector (as shown in *figure 8*).



Solder the black wire to the negative contact at the bottom of the flashlight.



Insert the batteries and assemble the flashlight.



Connect both red and black leads together and the flashlight should light full brightness (as shown in *figure 11*).



The recipe for the cleaning solution is -

2 parts Water

1 part White Vinegar

1 part Ammonia



I inserted the cleaning rod with the trimmed beveled washer into the receiver of the rifle. I then pushed the washer snugly into the bore.



Fill a syringe or a kitchen baster with the cleaning solution (as shown in **figure 15**).



With the crown of the barrel pointing up, fill the barrel with the solution (as shown in **figure 16**).



Slide another beveled washer down and push into the end of the barrel (as shown in **figure 17**).



Wrap electrical tape around the barrel, beveled washer and the cleaning rod (as shown in **figure 18**). The electrical tape will hold the washer and cleaning rod in place and also seal the end so the cleaning solution does not leak.



Set the barrel down on a level surface, like a cleaning stand.

Attach the alligator clip of the black (*negative*) lead to the (as shown in **figure 19**) cleaning rod .



Connect the red (*positive*) lead to the front sight post.



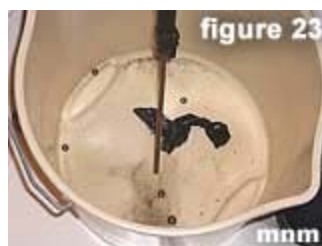
The flash light should only light dimly when everything is installed and connected properly. If the flashlight lights full power than you have shorted the cleaning rod to the barrel.

Let the barrel sit while cleaning for no more than 45 minutes.



Remove the leads.

While holding the barrel over a bucket, remove the electrical tape and the beveled washer at the crown of the rifle barrel.



Pour the bore cleaner out of the barrel and into the bucket (as shown in **figure 23**).

Note: Inside the bucket in **figure 23** are small rubber washers that I thought I was going to need. Also note the amount of the black grime floating in the cleaning solution.

Before using the electronic bore cleaner again, you will want to steel wool the cleaning rod lightly to remove any copper or metal deposits.

After removing the cleaner, clean the rifle barrel like you normally would with patches, solvent, and so on. The patches that came out of the bore were really grimy and it took me over a dozen patches soaked with solvent before I saw a clean patch come out the end of the barrel when pushed through.

The barrel was very clean. I tested cleaning the bore with traditional copper solvent to see if there was any remaining copper. I passed three soaked patches through and not once did I see a patch turn blue.

Conclusion: It actually did work. It did not speed things up, but it did really get the built-up grime out of the bore.

jlm ;)

Updates from Readers!

Submitted by Louis Deboer

Regarding your electric bore cleaner, you can make the project a little easier for those people not wanting to solder up an old flash light. Use and electricians continuity tester flash light.

See <http://www.fultonindoh.com/catalog/flashlights/6.htm> for an example. You can usually find these around a lighting or electrical supply outfit.

[Fulton Continuity Tester Flashlight is \\$13.50](#)

You should be able to find these at your local electrical supply house (Graybar, All-Phase, Ackerman Electric, etc) for less then \$10.00.

[Combination Continuity Tester Flashlight \(only 1-1/2volts\) is \\$6.50](#)

[MEGATESTER \(might work\), about \\$15.00](#)

Submitted by R. Ted Jeo

I put a set-up together using your plans but substituted a plain steel rod, from a hardware store, instead of a stainless rod. The system I put together worked GREAT, to say the least, using my mild steel rod (they are cheaper also, plus, come in three diameter sizes).

The differences in my project were:

1. I used a rubber stopper (from chemistry class) to plug the breach end completely.
2. I sharpened the rod to a point and then ran it down to the rubber stopper and jabbed it in to hold it in place and in center
3. I used the same beveled washers you did, but I didn't seal the muzzle end, nor did I run the set up horizontally. Instead I ran it vertically, wrapped several paper towels around the muzzle. Mostly I did this because if you completely seal both ends of the barrel, you pressurize the set up and it will leak. The reaction causes a gas

build up and it has to be allowed to vent somehow.

It did work. And it worked very well. I attached a picture of the gunk that I dumped out.

I had cleaned up a recently purchased MAS36 a few weeks ago using the traditional scrub-brush-swab-patch method. I thought, at the time, that I did a good job. Well, let me tell you, after 45min of the electro cleaner, geez, you would have thought that I didn't even run a single patch down the barrel!



In any case, I am very pleased with the results.

I spoke to metallurgist bro-in-law and he said that system with a mild steel rod should work the same as a stainless steel rod. The difference between types of steel is that mild steel is probably all iron except 0.2% carbon or so. Stainless has like 85-95% iron and a mix of other metals including chrome etc. to help with corrosion. The stainless would rust also, eventually. He didn't think that the mild steel rod would corrode while it has the charge on it, as anything that came off the rod would not go anywhere with the electrical charge on it. It may be a little harder to clean off, but I figure you use some 000 or 0000 steel wool and then wipe it down with some acetone or some degreaser and you'll be as good as new again. Or, spend another \$1.50 and get another rod.... So there, it seems that mild steel is okay.

I think that your quote of "really grimy" is an understatement!

Sludge comes to mind. In any case, I have to agree with you.

Submitted by Jeff Hamaker

First, in talking with another guy who had built one, I didn't go with the flashlight idea--which you really don't need anyway (this will be explained later). I got:

A selectable transformer from Walmart (3vdc-12vdc).
A normal (non-stainless), 3/16"X4' steel rod,
28 gauge galvanized safety wire,
3/16" innerX1/4" outer diameter lock washers,

A 1' length of nylon reinforced hose (5/8" inner diameter-- depend on cal of gun cleaning but works good for .30 cal),
A hose clamp (to fit hose),
5/32" inner diameter X 1/4" outer diameter o-rings,
And a couple of the 00 beveled washers from Ace,
Assorted package of corks from Walmart's housewares section,
And the electrolyte mix from the Grocery store.

All costing around \$20.

I took the rod and cut it down to fit my rifle. Took one end of the rod and drilled two holes about 1"-1.5" apart in the approx. diameter of the wire. Drilled a hole (just a smaller diameter than the rod) in a cork to fit the chamber end of the rifle. Put a lockwasher on the barrel/small side of that cork and wrapped 1-2 wraps of the wire around the rod to keep the lock washer from moving forward. Put the cork on the rod and put one of the beveled washers, big side towards the cork, with one of the o-rings between washer and cork on the rod. Then secured beveled washer with wire in aft hole. This is so that you can achieve a tight fit in the chamber by pulling the rod and then be able to remove the whole assembly without the cork being stuck in the chamber.

To clean I put the hose (cut down to about 1.5-3"-- depends on how straight the hose is) on the end of the barrel and secure it with the hose clamp. I have another cork with a hole in it that functions as a centering device for the rod that will just snug into the end of the hose. The hose assembly is for overflow of electrolyte when power is applied and to ensure you are cleaning the whole length of the barrel. You will need to check this every 10-15 minutes, and refill as necessary. Thus, there is no need for a light to let you know when it is done. With my set up I could put a light on (which WAS the original plan), but I just don't want to mess with it.

This set up works "as-is" for bolt actions. For semi-auto's you can flip the rod so chamber end is sticking out end of barrel and drill another hole (again smaller than the rod diameter about 1/4-1/2) in cork that would be in chamber--do not drill all the way through the cork--bad day will ensue and you will have to do it over.

Jeff

Submitted by T.J. Harrell III

I enjoyed the page about the electronic bore cleaner and decided to build my own. I wanted to keep it as simple (and cheap) as I could get away with, so I went to Home Depot yesterday and got the following parts:

1 4' section of 1/8" steel rod

1 rubber stopper

1 pack of 20-21 AWG heat-shrink tubing

Forgot the household ammonia so I picked up a half-gallon at Walgreen's.

Total cost for the materials was about \$6 including tax.

I decided to test it out on my beater VZ-24 rifle from Big 5 with a dark, grungy bore that had resisted all efforts to get clean. I deviated from your plans by using heat-shrink tubing instead of rubber grommets and O-rings. I also used just one stopper in the chamber, requiring the rifle to stand muzzle up. Also, I skipped the vinegar and used straight household ammonia. Apparently vinegar can remove bluing if given the chance, though on this rifle it wouldn't have mattered!

I also skipped the light part, figuring that I could use a multimeter to check for shorts before I started.

The heat-shrink tubing came in an 8-pack of 4" pieces. I took three of the pieces and cut them into 1" quarters. I then washed the rod with dish soap and a Scotchbrite pad to get all the protective grease off of it, then took one of the small pieces and put it over the end of the rod. I shrunk it in place and snipped off some, but not all, of the excess. Then I shrunk the other pieces on the rod at somewhat even intervals, leaving enough surface area for the rod to work but giving enough coverage to prevent shorting to the bore.

I dropped the stopper in the chamber and tapped it a couple of times with the end of a cleaning rod. Then I stood the rifle on its buttstock and dropped the rod into the barrel. I marked where the rod would contact the crown, and shrunk a piece of tubing at that point.

The rod was now complete, and the barrel plugged. On to the power supply.

I decided to keep the power supply as simple as possible.

I had a half-spool of two-conductor DC power supply wire on hand, so I cut off two or three feet and stripped the wires at both ends. For power, I resisted the urge to use my Astron 7A 12V power supply. Instead, I used 2 AA batteries installed in a TV remote control that wasn't being used at the time. The positive and negative wire ends were sandwiched between the batteries and their respective spring contacts. I put the rod in the barrel and checked for lack of continuity with a multimeter. Satisfied that there were no shorts, I filled the barrel with ammonia. The positive wire was secured to the screw of the front sight protective cover, and the negative wire was just wrapped around the rod. As soon as the negative wire made contact with the rod, the ammonia started foaming.

I topped it off half an hour later, and after an hour had gone by, I disconnected the power and removed the rod. Yecch. It was caked with powder fouling residue and some copper fouling residue as well. When I poured the contents of the barrel into a bucket, it was black and full of copper fouling. The rod cleaned up easy enough with dish soap and a Scotchbrite pad, though, and is ready for use again.

I'm still in the process of cleaning this barrel, but the electric bore cleaner has already removed more crud from the barrel than I ever could. I may add a short length of plastic tubing and a funnel to slip over the muzzle end so I can get full bore coverage without worrying about spillage.

Maybe later I'll even build the deluxe version and use a battery holder with gator clips!

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T.J. Harrell III

Submitted by Bryan Carrillo

I tried out your homemade electronic bore cleaner and got amazing results. I did mine in a simpler fashion:

Project Gun: 1937 Mauser Karabiner 98 Kurz. Made in Oberndorf, Germany.

I used a #00 rubber stopper for the breech end. I used a punch to seat a 4 foot 1/8" steel rod in the center of the rubber stopper. I then fed the rod/stopper through the

receiver of my rifle and lightly pressed the stopper into place. Then I marked where the rod exited the muzzle and removed the rod. I put a 2" strip of electrical tape around the mark to prevent shorting out the electrode. I then replaced the rod and taped a funnel over the muzzle.

With that part complete, I soldered two alligator clips on two lengths of wire. For a battery, I chose one of several 4.2 volt rechargeables that I had. I used a multimeter to test the battery charge and double check for shorts. Everything looked good so I mixed up a solution of 2/3 water and 1/3 ammonia. I poured this down the barrel slowly and until it was about 1/2 deep in the funnel. When power was applied, the ammonia started foaming. (I wonder what gas this is?)

After 1 hour of treatment, the electrode was covered in grime, the solution had turned blue, and copper fouling was floating in the solution.

The bore looked rather good, so I cleaned it and gave it another hour of electrochemical treatment. By the way, the first battery had lost almost all of its charge, so I had to use a second one.

Total costs were very reasonable, as I purchased all of the following for 24.25:

- 1 qt ammonia
- 3 rubber stoppers
- 4 foot steel rod
- goo b gone
- naval jelly
- johnsens floor wax

It was pretty much everything you need to get any milsurp rifle looking nice.

I just wanted to post a little write up about the electronic bore cleaner. Yesterday I decided to go to Lowe's and The Dollar Store and got all the materials for about 10 dollars. This is a great little device, and I think I am going to give the barrel a second cleaning with it later. The flashlight idea works great, but I really like the idea of the pre-made continuity tester/flashlight combo.

If you need to buy a soldering iron or other tools, then the price may be a little higher; I picked up a soldering iron for about thirteen dollars because my old one has

disappeared in a recent move. When I got home, I began the project by soldering single strand 14 gauge wire to the flashlight contacts and to the alligator clips. Lowe's didn't have any more of the large clips, so I had to use the smaller ones. No big deal though; they transfer electricity just like the big ones. I recommend multi-strand wire because it is much easier to maneuver than the single strand. The whole process to drill and solder the flashlight took about thirty minutes.

Then I began working on the steel rod. For this application, I chose a 1/8 inch rod because it will also fit in .22 and .17 caliber barrels. In the plumbing department I found some tiny o-rings with an inside diameter of 1/8 inch, and they are small enough not to seal the inside of the barrel on my 30-06. This means fluid can flow around them.

I read that the Foul Out III can be used on .17 caliber guns, but that no plug comes with the product for that size bore. I found on a website that you use Teflon plumbing tape to build a plug for these smaller guns, so I did the same for the 30-06. You just wrap it until it is thick and pull it through the bore. It should fit snugly. The method is very cheap and absolutely water tight.





I stood the barrel up vertically and did not seal the both ends. To keep the rod from touching the barrel, I put a little Teflon tape around it. I let it work for about 45 minutes and the cleaner got a good bit of stuff out. After it finished, I had to run about 20 patches through the barrel to get it to come clean, but now it shines very nicely. Later I will do the process again to make sure I got all the fouling, although Hoppes 9 isn't turning anything green in there right now. Also, I may run some barrel polish through it because the gun probably hasn't been this clean in about twenty years. I hope this helps somebody.

Supplies:

- One 1/8 inch rod (not threaded! About \$4)
- Small o-rings with 1/8 inside diameter (\$1.27 for ten)
- Teflon plumbing tape (five rolls for about \$3)
- Copper wire (10 cents per foot)
- Flashlight (\$1 at the dollar store)
- D-cell Batteries (4 for \$1 at the dollar store)
- Alligator clips (2 for \$1)

Submitted by Mike Conroy

As far as the homemade bore cleaner is concerned, I used a small 6/2 amp dual rate battery charger. I left it on the lowest setting and it worked great. Most of the rifle that I shoot are either some version of .30 caliber or 8 mm. I bought a dry firing device from Fulton Armory that fits the bore of a .30 caliber rifle. This device actually plugs the chamber shut. I wrapped some plumbers tape

around it and it sealed it shut. Before doing so, I drilled a hole in to the device so that the steel rod would fit perfectly. This prevented the rod from touching the sides of the barrel. I did not seal the top of the muzzle off. When the current was turned on, you could see the pressure build up. I didn't want ammonia spraying everywhere. I had the bore cleaner on an old 1917 Enfield that was very dark. I couldn't believe it when it was done. Because the battery charger give a stronger current, I only had it on each rifle for about 20 minutes. The crap and sludge that came from each of the older rifles was amazing. I plan on doing it at least once a year.

Mike Conroy

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