

Bucket Boom

Parts List

- 3-gallon (or similar sized) bucket
- ¼" mesh screen
- Stainless steel ¼" pot rivets
- 1 3-hole brick
- 3 - 1/2" x 4" schedule-80 nipples (may vary with size of bucket)
- 2 - 1/2" schedule-80 PVC threaded endcaps
- 1 - 1/2" schedule-80 PVC "T" fitting
- 1 - 1/2" to 1/4" threaded reducing bushing
- 1 - 1/4" to 5/8" threaded barb
- 2 – 3/8" x 4" eyebolts with 3/8" x 1-1/2" fender washers (n=4) and nuts (n=2)
- Standard (2.4", outer diameter, 0.97" inner diameter) pool noodles to cover bucket rim
- Large (4.5" outer diameter, 2.5" inner diameter) clamp foam noodles to cover smaller noodles over bucket rim
- Large zip-ties for securing noodles over bucket rim and smaller diameter noodles
- 1/8", 1/4" and 3/8" Drill bits to drill holes for boom (PVC pipe), zipties for foam and brick (bucket) and eyebolts (bucket)

Prepping the bucket

1. Cut 2-3 windows/holes in opposite sides of bucket (Fig. 1 and 2).
2. Install mesh to cover holes onto bucket with rivets.
3. Drill two small holes in bottom of bucket to secure brick to bottom of bucket with zip-ties.
4. Zip-tie the 3-hole brick to the bottom of the bucket
5. Drill ¼"-hole into center of one side of the bucket. This will receive the boom nipple/bushing.
6. Drill 3/8" holes on either side of the ¼" hole. These holes will receive eyebolts to secure the boom to the bucket.
7. Take care to ensure the eyebolts will be 'snug' to the "T" fitting.

Making the boom (Fig. 1)

1. Teflon tape ½" x 4" threaded nipples.
2. Thread 2 nipples into the 'arms' of a threaded schedule-80 "T".
3. Thread ½" schedule-80 endcaps onto threaded nipples.
4. Drill 1/8" holes about ½" apart along both 4" nipple to form the boom or drip line.
5. At the 'center' or 'base' of the "T", thread a ½" to 1/4" threaded reducing bushing.
6. Thread a 4" threaded nipple into the bushing.
7. Place a nut and fender washer on the threaded sides of both eyebolts.
8. Slide the boom into the eyes of both bolts.
9. Slide the bolts and nipple through the holes drilled into the side of the bucket.
10. Tighten nuts on eyebolts to secure the boom into place.

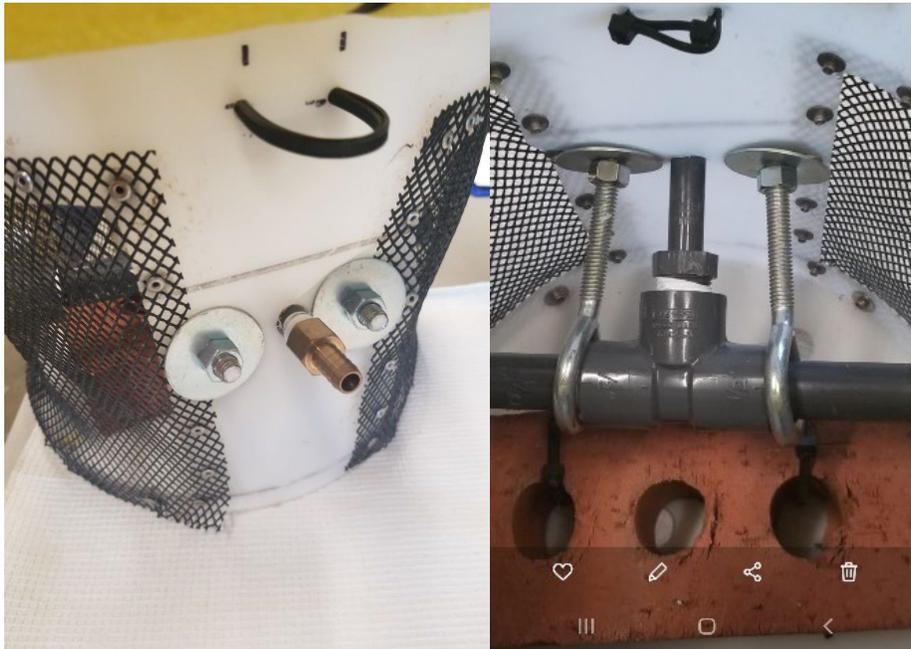


Fig. 1 Outside and inside boom assembly and brick in bucket boom.

Adding floating to bucket

11. Drill holes and zip tie around rim of bucket to secure pool noodles.
12. Slit the standard pool noodle down the center and wrap around rim of the bucket.
13. Silt a large clamp foam noodle then cut into ~7" pieces
14. Place over standard noodles,
15. Drill holes around the rim of the bucket and then secure noodles with zip-ties.



Fig. 2 Standard pool noodle and large clamp noodles secured to bucket boom.

Platform Boom Parts

Frame

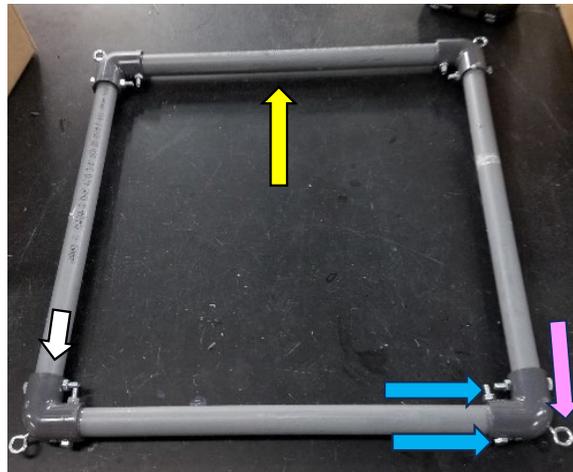
- 4 – ¾" schedule-80 PVC pipe – 20"
- 4 – ¾" schedule-80 – 90° elbows
- 4 – 7/16" x 2" bolts and nuts
- 4 – 1.5" medium eye screws

Boom

- 2 – ½" schedule-40 PVC pipe cut to ~20" lengths
- 1 – ½" schedule-40 PVC pipe cut to ~12" lengths
- 1 – ½" schedule-40 slip to thread coupler
- 1 – ½" to ¼" threaded reducing bushing
- 1 – ¼" thread to 5/8" barb
- 2 – ½" schedule 40 PVC slip caps
- 1 – ½" schedule 40 slip tee
- Large clamp foam noodle – 4.5" outer diameter, 2/5" inner diameter (4 x ~ 9.5" lengths)
- Pool foam noodle – 2.4" outer diameter, 0.97" inner diameter (4 x ~ 9.5" lengths)
- 1/8" drill bit for bolt holes in boom
- Zipties – large, to secure noodles to boom frame (~20-24 count)

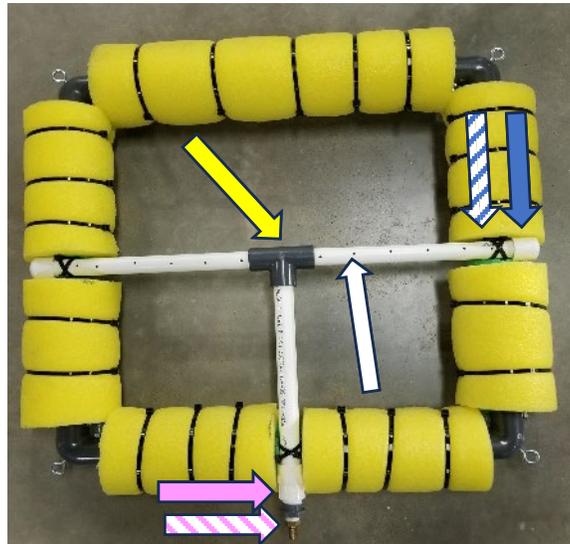
Constructing the boom frame

1. Cut schedule-80 PVC pipe into 20" section (yellow arrow).
2. Glue 90°-elbows on the four 20" schedule-80 sections to make the boom frame (white arrow).
3. Using 5/16" drill bit, drill holes thru side of each of the elbow (blue arrows).
4. Insert the 7/16" X 2" bolts into the holes and tighten nuts onto the PVC pipes (blue arrows).
5. Drill a small pilot hole into the side of the 90°-elbows and insert the 1.5" medium eye screws (white arrow).



Assembling the Boom

1. Assemble the $\frac{1}{2}$ " schedule-40 PVC pipe sections into a "T" to see how it fits over boom frame (see white pipe in picture below).
2. Glue ~ 12 " schedule-40 PVC sections into a schedule-40 slip tee (yellow arrow).
3. Glue $\frac{1}{2}$ " schedule-40 slip caps on the ends of the ~ 12 " sections (blue arrow).
4. Use a $\frac{1}{8}$ " drill bit to drill holes about 1" apart along the ~ 12 " sections to form the boom (drip line) (see white arrow).
5. Glue the $\frac{1}{2}$ " slip to thread couple onto the ~ 12 " section forming the 'base of the tee' (pink arrow).
6. Screw a $\frac{1}{2}$ " to $\frac{1}{4}$ " threaded reducing bushing (pin-white arrow).
7. Screw a $\frac{1}{4}$ " thread to $\frac{5}{8}$ " barb into the bushing (pin-white arrow).
8. Using heavy duty zip ties, secure (tia via chris-crossing) the boom to the frame (blue-white arrow).
9. Cut and split a standard pool noodle 2.4" X 0.97" in sections to cover the schedule-80 frame.
10. Cut a large clamp foam noodle 4.5" X 2.5" into sections to cover the standard pool noodles (see yellow foam in picture).
11. Use heavy duty zip ties to secure the noodles to the frame (see black rings on yellow foam).



"For users other than USGS-CERC staff, this document is for reference only. This is not a citable document."

Floating Pesticide Tank

Parts List

Item	Note	Link - examples
Battery 12v 5amp SLA (12 pack)	Buy the size package needed for pond treatment(s)	https://www.homedepot.com/p/MIGHTY-MAX-BATTERY-12-Volt-5-Ah-SLA-Sealed-Lead-Acid-AGM-Type-Replacement-Battery-for-Alarm-Security-Systems-12-Pack-ML5-12MP12/310290487#overlay
Battery connectors	Needed to secure pump leads to battery posts; make sure match battery posts	-
Bilge Pump	Choose higher GPH in hope pond mixing would be greater	https://www.amazon.com/dp/B07VKMTC9J/ref=twister_B09PYPVLSX?encoding=UTF8&th=1&qty=19&sbo=RZvfv%2F%2FHxDf%2BO5021pAnSA%3D%3D
Raft	Any shape floatation device is okay, but must be rated to hold weight (# gal * 8 lbs) of pesticide mixture	Amazon.com: Intex River Run I Sport Lounge, Inflatable Water Float, 53" Diameter : Toys & Games
Zipties	Secure various parts to raft or pesticide platform	https://www.homedepot.com/p/Commercial-Electric-14-in-UV-Cable-Tie-Black-100-Pack-GT-370STB/203531913
Silicone	To seal around battery wires to make water-tight(proof); Might have already	
Bricks or anchors	Used to anchor raft in place	https://www.lowes.com/pd/8-in-x-4-in-Clay-Red-Cored-Standard-Brick/5013595093
5-gal carboy with spigot	Size of carboy may vary based on pond size, number of rafts to be deployed per pond	5 Gallon E-Z Fill® Natural HDPE Carboy with Molded Drain & Spigot U.S. Plastic Corp. (usplastic.com)
Smaller diameter spigots	Spares always important for 'opps' moments	38/400 White Spigot U.S. Plastic Corp. (usplastic.com)
Milk crate for carboy	Any platform will do, but need to create head pressure, carboy needs to be above water surface	Amazon.com: Juggernaut Storage 24 Quart Indoor Outdoor Stackable Heavy Duty Storage Milk Dairy Crate with Handles for Home, Office, or Garage, Black : Office Products
Bungies	Buy size package needed for pond treatments(s); used to secure carboy to platform	Amazon.com: BLACK+DECKER BDX1011 Black/Orange 36" Flat Bungee Cord Straps, 2 Pack : Tools & Home Improvement
Carabiners	Not necessary but may speed deployment or be a convenience	
Hose for carboys	Use of what pesticide to discharge on outside of raft; FEP tubing	3/8" ID x 7/16" OD x 1/32" Wall Versilon™ FEP Tubing U.S. Plastic Corp. (usplastic.com)

“For users other than USGS-CERC staff, this document is for reference only. This is not a citable document.”

Item	Note	Link - examples
	secured with short piece of appropriately sized silicone tubing	
Hose for bilge	Any hose will work that fits securely over the bilge pump outflow; bilge pump hose is corrugated which is designed to prevent back flow into the pump	https://www.homedepot.com/p/Everbilt-1-1-8-in-I-D-x-6-ft-Polyethylene-Bilge-and-Pump-Hose-HKP004-001/303132516
Hose clamps	Pack of 10. I wasn't sure what this was for besides attaching the bilge pump. So I only added enough for that; hose clamp size needs to be matched to bilge pump outflow and hose diameter	https://www.grainger.com/product/Worm-Gear-Hose-Clamp-201-Stainless-16P295
Container for battery	Don't want to get battery wet and short battery/pump; safety hazard	https://www.dollartree.com/sure-fresh-square-plastic-food-storage-containers-with-lids-1285oz/16158?utm_content=gpla&utm_source=google&utm_medium=organic&utm_campaign=organicshopping
Rope	Secure to anchors; other uses?	
Battery charger		
Compressor to inflate raft	Optional, makes sure you have correct tip for raft intake	
Pool noodles	Use to lift bottom of carboy away from spigot to create flow out of carboy spigot	

Making the Raft Boom

1. Inflate the raft
2. Put platform in center of raft
3. Secure pump to raft (or can float next to raft) and pump hose around raft.
4. Place carboy on raft; secure outflow tubing over raft edge.
 - a. Note: Rafts have not been deployed yet, but we're planning to fill carboys and starting flow before pushing rafts into place.
5. Elevate carboy to create flow out of carboy spigot.
6. Attach anchors to raft.
7. See possible raft designs below.

“For users other than USGS-CERC staff, this document is for reference only. This is not a citable document.”

Possible Raft Designs



Fig. 1. Inflatable tube with mesh bottom (design selected for use).

“For users other than USGS-CERC staff, this document is for reference only. This is not a citable document.”



Fig. 2. Milk crates and various sizes of carboys (inflated with air).



Fig. 3. Square raft (solid bottom) with Rubbermaid container platform.

List of Parts

Pressurized spray gun with ¼" nipple (see white arrow in Fig. 1)

¼" threaded schedule-80 PVC pipe ~1-2" long (see blue arrow)

½" to ¼": threaded reducing coupler (see yellow arrow)

½" PVC threaded union or slip to threaded coupler (see pink arrow)

½" schedule-80 PVC pipe (see black-white arrow)

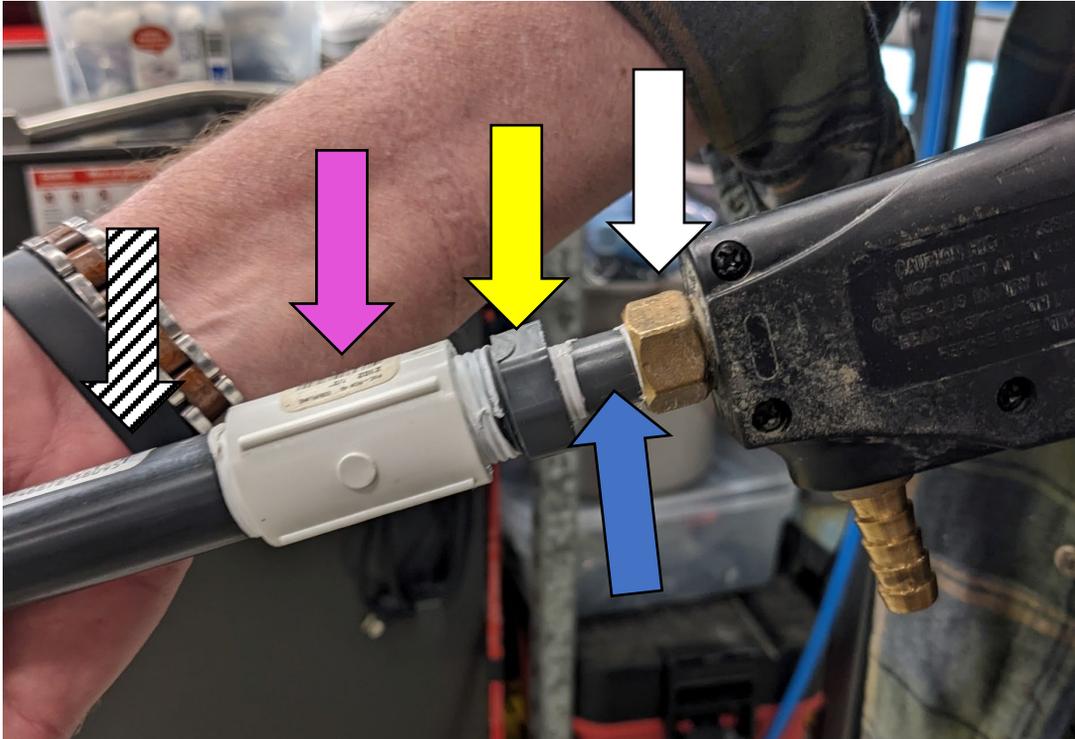


Fig. 1 Pressurized spray gun to PVC wand fittings.

Schedule-80 fittings (90° elbows, "Ts", endcaps) (white arrows in Fig. 2)

Schedule-90 PVC pipe and threaded or slip fitting to construct wand to length (see pink arrows)

Schedule-80 PVC pipe drilled with ¼" in holes to form boom (drip line) (see yellow arrow). Pool foam noodles might help keep boom afloat.

Alternatively – attach a platform boom to end of wand (Fig. 3).

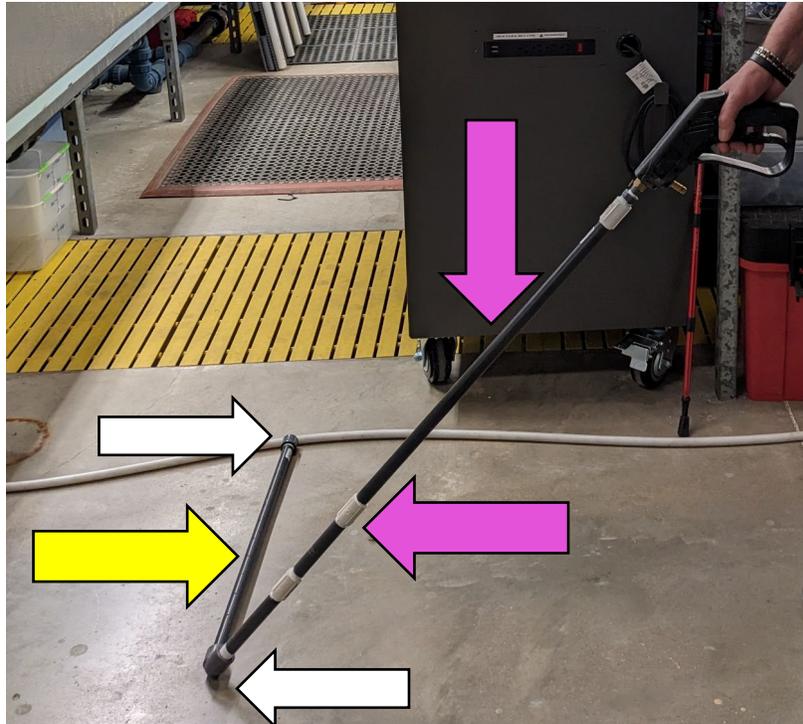


Fig. 2 PVC wand to deliver pesticide from pressurized spray gun.



Fig. 3 PVC wand made of spray gun, PVC pipe and fitting, and platform boom.