

Foldable Kick Net Table

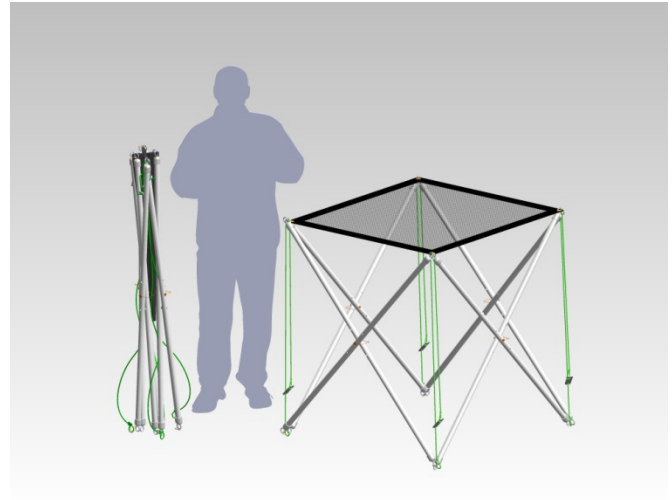
for Stream Team Macroinvertebrate Monitoring

DIY ASSEMBLY INSTRUCTIONS

Designed and developed by Bob Virag – Stream Team 5080 – for free and unrestricted use by the public.

The Foldable Kick Net Table is a lightweight portable platform for use by Stream Team volunteers as a workbench to support the macroinvertebrate kick net during monitoring.

- No assembly is required at the stream site.
- The table legs and top net surface simply unfold and “pop-up” from their compact collapsed position to provide a sturdy one-meter square work surface.
- Four tensioning cords are tightened at each corner using simple rope clamps to make the table rigid and stable.
- Based on the design of the commonly available pop-up camping chairs, the table folds into a compact and easily carried package.



EXAMPLES OF THE FOLDABLE KICK NET TABLE IN-USE



Stream Team 463



Stream Team 3612



Stream Team 5080



Stream Team 4343

SUPPLIES

| Quantity | Item |
|-----------|--|
| 4 | PVC pipes -- ¾ inch -- 10 feet long |
| 16 | PVC end caps -- ¾ inch |
| 1 | Can PVC Pipe Cement |
| 16 | Eye bolts with nuts -- 3/16 in x 1 ½ inch (minimum length) |
| 8 | Flat washers -- 3/16 inch |
| 8 links | Hanging Light Lamp chain |
| 4 | PTO (power take-off) Pins -- ¼ inch x 2 ½ inch |
| 1 | Screen mesh tarp |
| 1 roll | Black Duct Tape – 2 inches wide – heavy duty |
| 1 spool | Heavy duty nylon or polypropylene sewing thread |
| 1 | Tarp Grommet kit |
| 24 feet | ¼ inch nylon cord |
| 8 inches | Aluminum bar stock -- ¾ inch wide |
| | |
| | <u>Optional for carrying bag:</u> |
| 2 yards | Rip-stop nylon fabric |
| 24 inches | Nylon cord - ¼ inch |
| 1 | Cord cinch clamp |

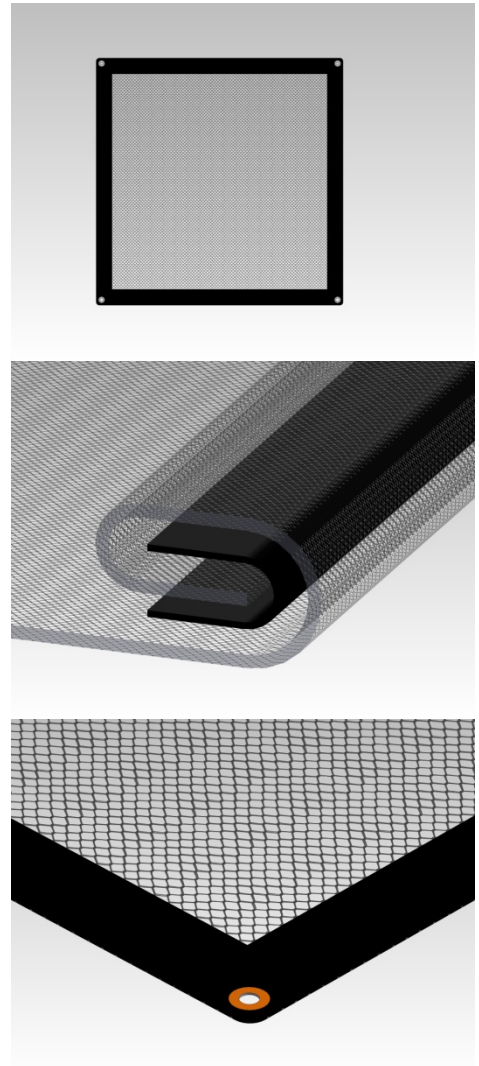


ASSEMBLY INSTRUCTIONS

1. Black screen mesh fabric table top – 39 inches square

- a. **Make a one meter square screen mesh tarp** with doubled 1.5 inch wide sewn hems and corner grommets.
- b. **Cut a square section of the screen mesh tarp 45 inches square.**
- c. **Tape the cut edges** with the Black Duct Tape by folding the tape onto itself capturing the cut edge.
- d. **Form a doubled 1.5 inch wide hem** by folding the taped edge toward the center of the square twice. Staple the hem temporarily to prevent it from shifting while sewing.
- e. **Sew the hem** with strong nylon thread suitable for outdoors.
- f. **Repeat** this process for all four sides of the net.
- g. **Punch holes in the corners** using the hole punch provided with the kit.
NOTE: I found it is easier to melt the holes by heating the punch with a propane torch.
- h. **Install the grommets** using the grommet tool and a hammer.

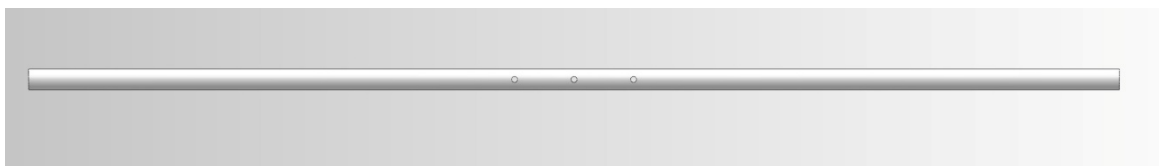
NOTE: The resulting net must be 39 inches by 39 inches in order for the resulting table height to be as listed below. Larger net dimensions will result in a table that is shorter using the listed leg lengths below. Conversely, smaller net dimensions will result in a taller table than listed below.



2. Table legs

- a. **Cut 8 tubes** from the four 10 foot long PVC tubes to a length that is selected from the chart below to suit your desired finished work surface height for comfortable use :

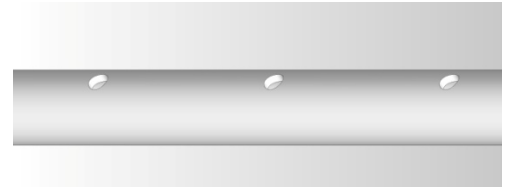
| | Desired Work Surface Height (inches) | PVC Pipe Length Required (inches) |
|-----------------------------|---|--------------------------------------|
| Standard Table-top Height | 30 | 48 |
| Standard Counter-top Height | 36 | 52 |
| Standard Bar-top Height | 42 | 56 |
| Tallest Height | 48 | 60 |



- b. **Drill ¼ inch hole** in the CENTER of each tube length.
- c. **OPTIONAL (Recommended):**
For an adjustable table height, **drill TWO more holes** 3 inches FROM EACH SIDE OF THE CENTER HOLE. These holes will allow for the table height to be adjusted approximately +/- 2 inches from the

nominal height.

- d. **Clean and debur** the holes and cut ends of the pipes with sandpaper or a file.



3. End caps with eye bolts

- a. **Drill 16 PVC end caps** with a 1/8 inch hole.
- b. **Thread 3/16 inch eye bolts** into each end cap. The eye bolt should act as a self tapping screw.

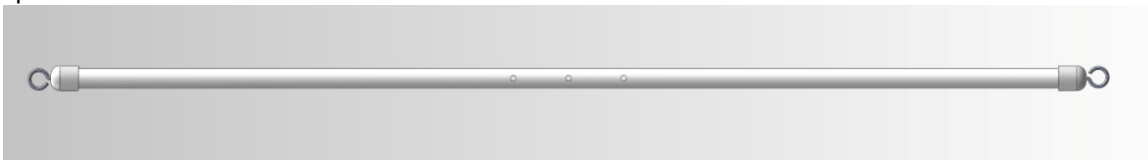
NOTE: I found that these can be quickly tightened using an Allen Wrench in a drill chuck as a rotating hook.



- c. **Attach 1-2 washers** to each eye bolt screw on the inside of the end cap to serve as strain relief spacers.
- d. **Tighten the retaining nut** using a deep socket in a drill chuck.



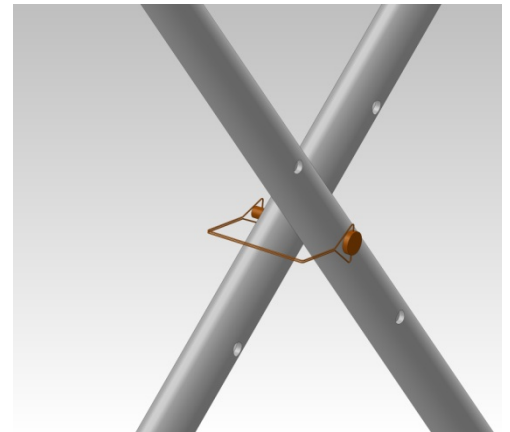
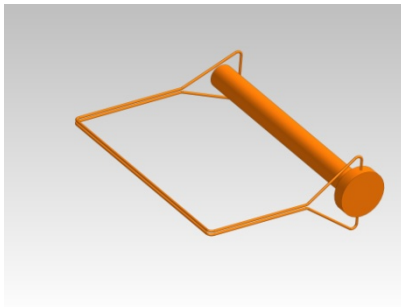
- e. **Glue each of the 16 end cap assemblies** to the open ends of the 8 pipes using PVC plumbing cement. Push them as tightly as possible into the pipe to assure a strong bond. Follow the directions on the bottle. Cleaning or priming each end cap is not necessary as these caps will not be used with pressurized water.



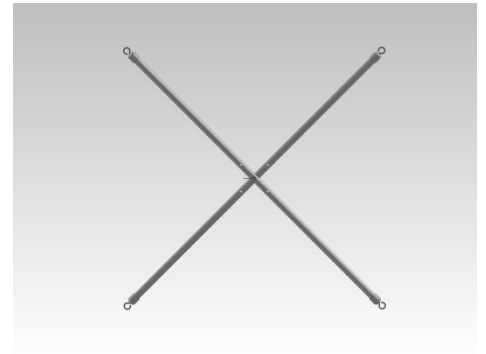
4. Leg assembly

- a. Insert the PTO pins in the center of holes of two of the pipes so they make an X.

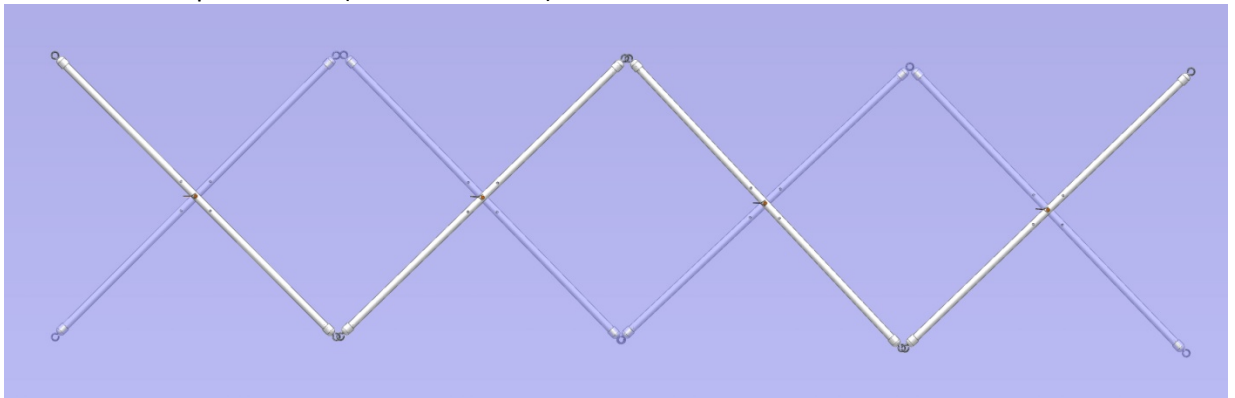
NOTE: 1/4 inch – 21/2 inch long bolts and nuts can be used in place of the PTO pins if the table is not intended to be made adjustable in height.



- b. **IMPORTANT:** Arrange the wire bail of the PTO pin to either the LEFT or RIGHT side of the X (and not facing UP or DOWN). This will allow the legs to completely fold when not in use.



- c. Lay out the legs in an X-pattern on the floor with the 4 X's end-to-end. The PTO pins should be upright and facing the same direction.
- d. To assure that legs collapse and close as tightly as possible, arrange the legs so 4 pipes lay completely on the floor, in the shape of an "M" (shown in BLUE) and the remaining 4 pipes are crossed on top of these in the shape of a "W" (shown in WHITE) and do not touch the floor.

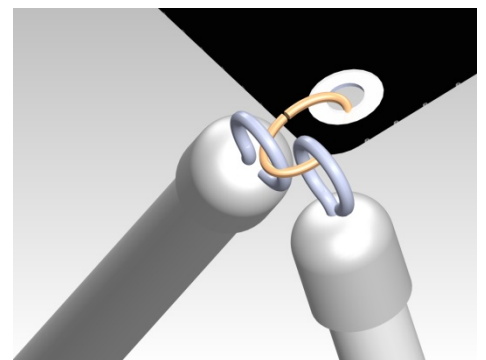


- e. Using short (6 inch) pieces of string or cord, temporarily tie the adjoining end caps together. This cord will be removed when the chain links are attached. The caps at each end of row will not need to be tied at this time.
- f. Lift one end of the crossed legs and roll the assembly on top of the other half. The unattached end caps should now be adjacent to each other. Secure these with cords.
- g. You should now be able to upend the assembly into a square table shape.
NOTE: I've found that the remaining steps are more easily accomplished if this table assembly is placed inside a large rectangular trash barrel. In this manner the crossed legs are retained and held stationary inside the barrel.

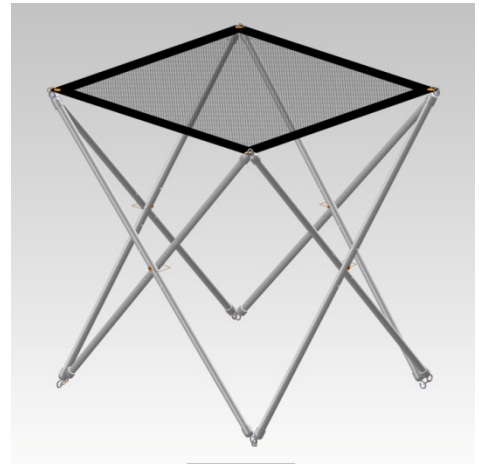


5. Assemble the table top

- a. Use the links from a hanging lamp chain to secure the eye-bolts to top net grommets. Open 8 chain links from the hanging lamp chain by bending the ends of the link away from each other in a ROTATING direction using two pliers.
- b. Thread the opened chain links through the grommets in the screen mesh top and each of the paired eye bolts. Close and tighten each chain link by rotating the ends using pliers. When all four of the top links are closed, remove the temporary retaining cords on the top.
- c. Close and tighten each chain link by rotating the ends together using pliers.



- d. When all four of the top links are closed, remove the temporary retaining cords on the top and invert the table in the trash barrel so the bottom end caps are facing up.
- e. Thread the remaining open chain links through the remaining paired eye bolts. Close and tighten as before and remove the cords.
- f. Remove the assembly from the trash barrel. Invert the table and it should stand when each of the assembled legs are opened. Check the height and verify that all PTO pins are assembled with the bale facing either left or right and NOT up or down (as this will prevent the table from being folded).

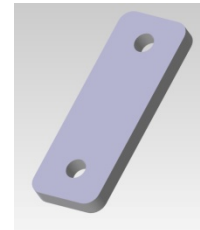


- g. Finally collapse the table legs so all legs are vertical. The table should fold to a compact bundle of parallel tubes. If it does not inspect the orientation of each of the crossed legs and inspect the location of the bales on each of the PTO pins. It may be necessary to disassemble the end cap links and repeat the entire assembly process if the legs were incorrectly assembled.



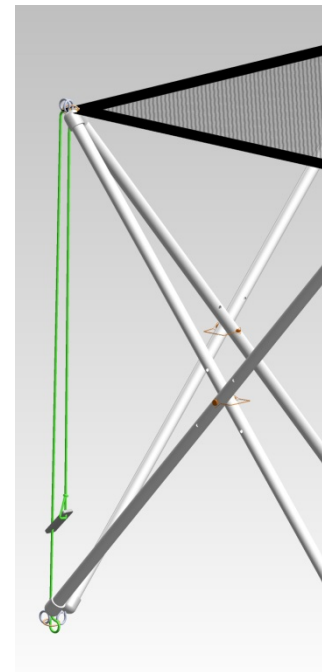
6. Tie down tensioning clamps

- a. **Make 4 simple tensioning clamps** for the tie-down cords using the $\frac{3}{4}$ inch wide aluminum flat stock.
- b. Cut 4 pieces, 2 $\frac{1}{2}$ inches long each using a metal hack saw.
- c. Drill two $\frac{3}{8}$ inch holes near each end.
- d. Sand and debur all edges and chamfer all holes.

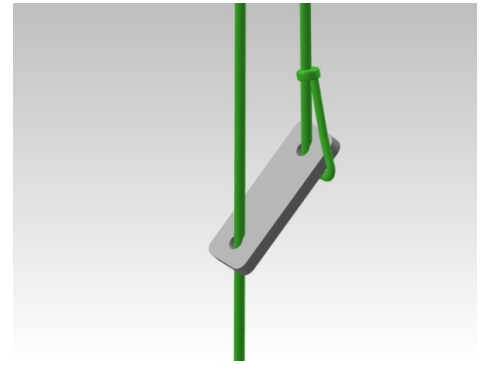


7. Tie down cords

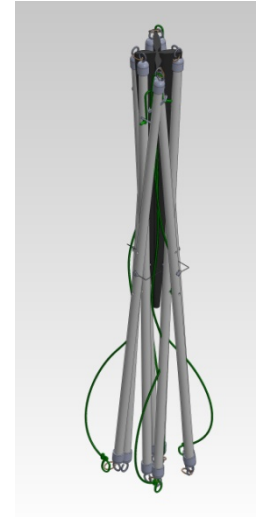
- a. Cut four $\frac{3}{8}$ inch diameter cords 10 inches longer than the length of the chosen leg pipe length.
- b. Melt each end of the cut cord using a flame (i.e. propane torch).
- c. Thread one end of each cord through the bottom eye bolts and tie securely (i.e. using a bow knot).
- d. Insert the other end of the cord through a one of the holes in a tensioning clamp and then insert that end through the top eye bolts.
- e. Insert the end of the cord through the remaining hole in the tensioning clamp and tie securely (i.e. bow knot) in such a way that the extended cord nearly matches the length of the leg.
- f. Repeat steps for the remaining cords.



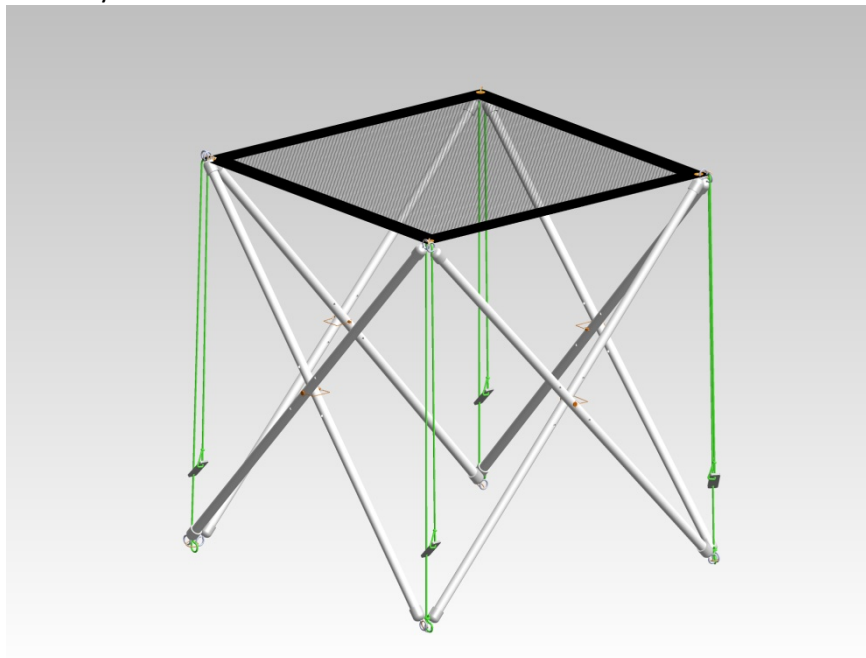
g. Detail of the tensioning clamp



h. When assembled correctly, the lengthened cord allows the table to be collapsed and bundled without restriction and then allows the cord to be tightened when the table is fully opened.



8. Finished table assembly



9. Table height adjustment

- a. To INCREASE table height approximately 2 inches, insert all PTO pins into the LOWER leg holes.
- b. To DECREASE table height approximately 2 inches, insert all PTO pins into the UPPER leg holes.

10. Carrying bag (not shown)

- a. Sew a carrying bag using rip stop nylon or polypropylene fabric.
- b. Hem all edges. And a top closing cord with a cord cinch clamp.