Construction of Poles for Double-tiered Mist Nets

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It is always a challenge to operate mist nets more than seven or eight feet above the ground. Nixon (1972) described the use of external marine (sail boat) tracking on mist net poles to hoist stacked nets to a height of 12 to 13 feet. I found that it would be very expensive (about $150) to duplicate her method. The owner of a local marine supply store told me of an alternative method used by cost-conscious sailing enthusiasts. Although more work to build, the resulting mist net hoisting assembly works more smoothly than the loop and pulley method of Don and Elaine Meese (1980).

Materials

Most of the materials and special tools needed to construct two 13-foot mist net poles can be obtained in a hardware store:

3 10' sections of 1" galvanized conduit
1 10' section 3/4" PVC conduit, Schedule 40
2 10' sections 1/2" PVC conduit, Schedule 40
Pop rivets: 8 3/16" diam., 1/4" grip range
50 1/8" diam., 1/8" grip range
8 1/2" stainless steel sheet metal screws
18 3/16" eye bolts and 36 3/16" nuts
2 3' lengths of 3/4" reinforcing bar
4 3' lengths of 1/2" reinforcing bar
Cobalt heavy duty drills: 1/8, 3/16, & 9/64" diameters
Conduit cutter or hacksaw
8 1/2" flat Phillips head aluminum screws
25' 1/16" nylon cord
1' 1/16" copper wire
110' 3/16" line

The following items are usually found in a marine hardware store:

4 stainless steel eye straps (holes 1 1/2" centers)
2 jam cleats
4 thimbles (for 3/16" line)
2 pulley blocks for 3/16" lines

Preparation of components and assembly

Poles
Cut 2 3' pieces from one 10' section of 1" steel conduit. Join them to the 2 10' lengths using 2' sections of 3/4" PVC. These are carefully scraped and sanded to produce snug-fitting dowels. Insert 12" into each piece of galvanized conduit and fix with 4 3/16" pop rivets.

Net loop slide tracking
Precisely bisect the 1/2" PVC conduit pieces using a narrow, fine-toothed plywood blade on a circular or radial arm saw. Next adjust the saw guide to cut 1/16" from one edge of the bisected sections (feed cut side down). Now narrow the space between saw blade and guide another 1/16" and shave the other side. The tracking should be 3/4" wide. Sand the edges lightly (see Figure 1). Cut 2' sections to be butted to 10' track to make a 12' track. The track will be set in 6" from the ends of the poles. Then 1/8" holes are drilled every 8" along the center of the track. The track is laid on the conduit, fixed carefully with tape and the conduit is marked through the drilled holes. Use a drill guide and the 1/8" drill to make the corresponding holes in the conduit. Enlarge the holes in the conduit with the 9/64" drill and attach the track with pop rivets. Carefully butt in the 2' sections.

Net loop slides
These are fabricated from the remaining section of 3/4" PVC conduit. The saw blade is adjusted to cut through one wall of the tubing. Make a full length cut, then another parallel cut so that the outside edges are 13/16" apart (see Figure 1). From this trough cut 18 1-1/2" sections.

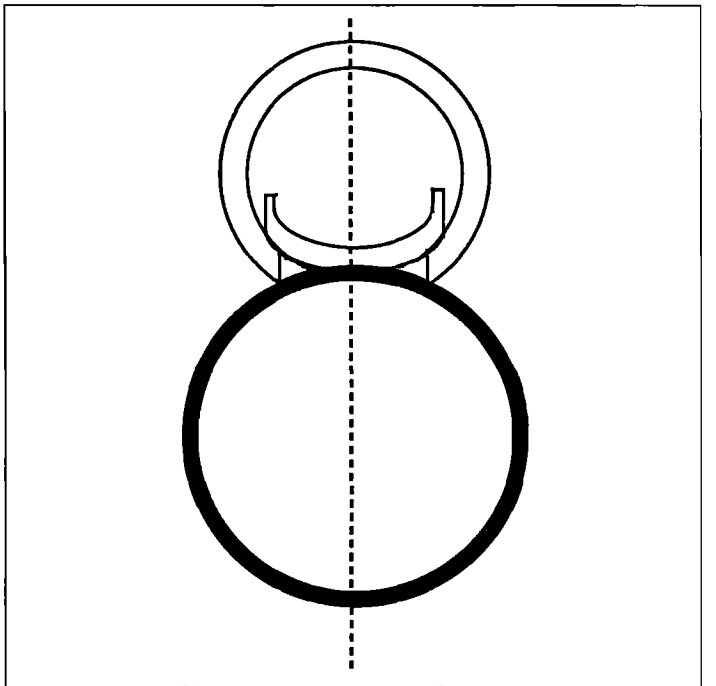

Figure 1. Cross-section of net slides and track

In the center of the convex surfaces drill 3/16" holes to hold the eye bolts. In 16 of these drill 1/8" holes, centered and 1/4" in from the ends. In the remaining slides drill one hole as above in one end; at the other drill 2 horizontal holes 1/4" apart and in from the ends. These will anchor, with copper wire, the net control line.

The eye bolts are opened about 1/8" to accommodate the net trammel loops. Open steel vice jaws about 3/8", lay the loop across and insert a nail set and strike it a few blows with a hammer. Next run a nut down to the loop end of the thread on the eye bolt, insert the bolt through the center hole and tighten another nut against the inside of the slide. Run 9 of these over each slide track with the double-holed slide on top.

Track end stops
Make 4 of these by cutting 1/2" wide sections of the 3/4" PVC conduit. Cut each open, soak in very hot water and wrap around the galvanized conduit at the ends of the track. Fasten each with 2 1/8" pop rivets, 1/2" from the ends.

Final assembly (The rest is easy.)
The pulley block is mounted 1" below the top of the pole directly over the track (see photo #1). Fix with 4 1/8" pop rivets. Eye straps are mounted at the top and 65" from the top (photos #1 & #2) opposite the sail tracking. Fasten with sheet metal screws. These hold the thimbled guy lines, 17' long at the top and 10' long at the bottom. The jam cleat is fastened about 50" from the lower end on the outside of the pole using 4 flat head aluminum screws (photo #3).

The 23' control line is passed over the pulley block and is fixed to the upper sail slide with copper wire twisted on the inside of the slide (photo #1). This may be done before attaching the top track-end-stop.
Place the poles across supports and tie the slides about 14" apart using nylon cord. Tie the knots on the inside to avoid net snarls in the wind, trim excess cord and flame the knot (photo #3).

Erection

Two sections of 3/4" reinforcing bar are driven perpendicularly into the ground about 41' 2" apart and poles are placed on them. Two 1/2" reinforcing bars are driven slantwise at 4' and 8' distances from the net poles as guy-line stakes. The nets are fastened to slides which are raised by pulley so that the top slide is about 7' above the ground, starting with the top trammel. The top net is raised at both ends and the lower net is attached using #5 slide in common for trammel 5 of the upper net and trammel one of the lower net. Fasten the nets in place by cleating the control line. With practice this is an easy one-person operation.

In the spring of 1987, the total cost was around $70 with the sail blocks and the galvanized conduit making up half of the cost.

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Literature Cited

Mease, D and E. Mease. 1980. Aerial net assembly. N. Am. Bird Bander 5:138-139.

Nixon, G.A. 1972. A use of external marine sail tracking on mist net poles. W. Bird Bander 47:53-55.

Photo 1. Top of Pole

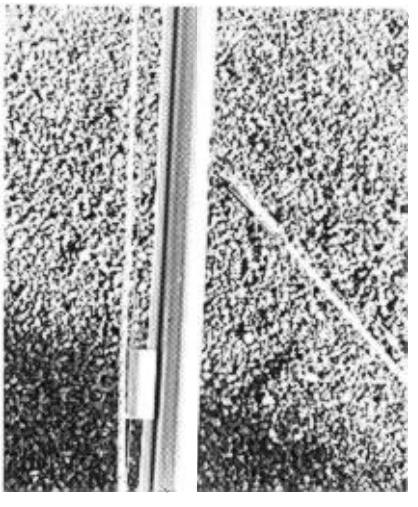

Photo 2. Net Loop Slide and Eye Strap

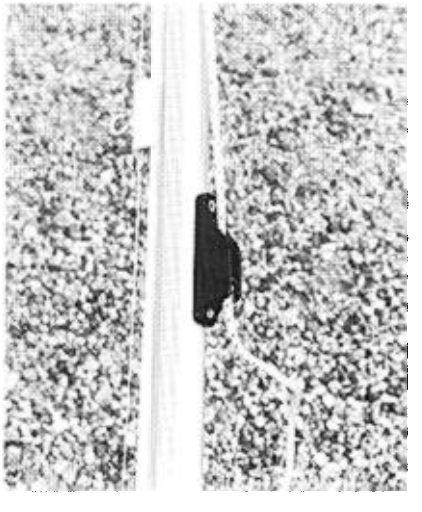

Photo 3. Jam Cleat