



## Care of Control Lines

by Doug Blackmore

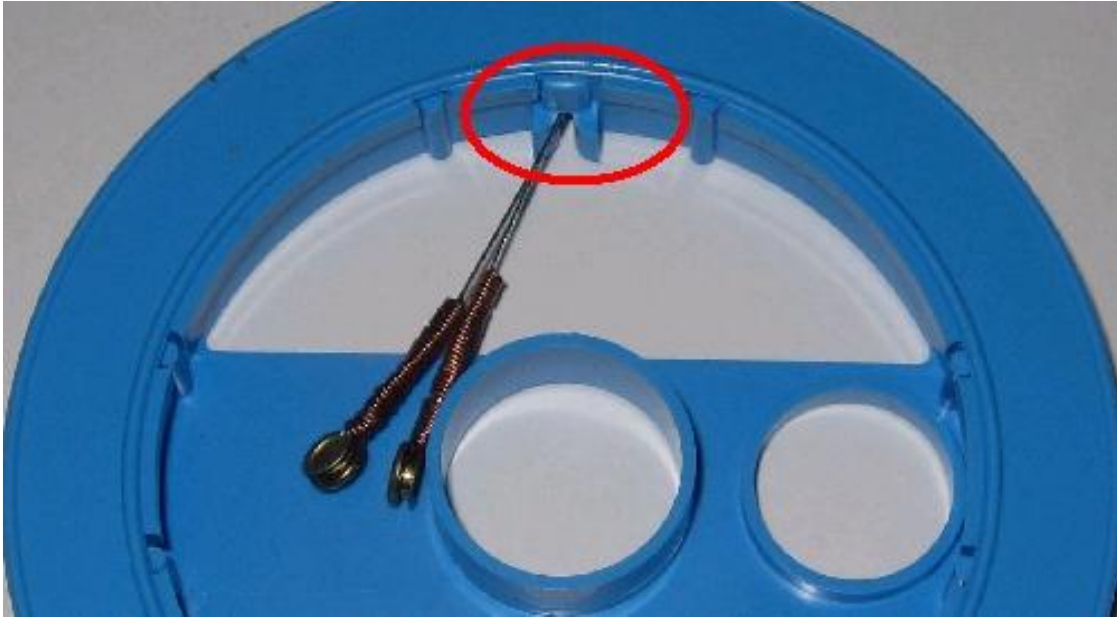


Good care of control lines will help make them last and reduce the likelihood of them breaking, which would present a safety hazard. Keeping them clean helps reduce aerodynamic resistance and allows your plane to perform better. There are different ways to accomplish this, and the following series of pictures and captions is just one approach.

The ideal situation is to have a handle and set of control lines for every model airplane you fly. If you try to share lines amongst airplanes, you will have to adjust the handle each time you switch planes. This is inconvenient and often requires several flights until you get the adjustments "just right". Unfortunately a handle with lines adds about \$80 CDN (2012) to the cost of the plane.



Control lines typically come longer than necessary, and often with a factory-installed eyelet and crimped ends, as shown in the picture on the left. Many modelers choose to cut the lines to a more suitable length, and re-install the eyelets using copper binding as shown on the right. When competing, check the rules for required line length, but most will say the distance from the centre of the airplane's fuselage to the palm side of the control handle must be sixty feet. When wrapping the line with copper, the usual technique is to apply two wrappings, the second applied after folding the line back on itself again. The entire wrapped bundle is secured with thin cyanoacrylate (CA) glue.



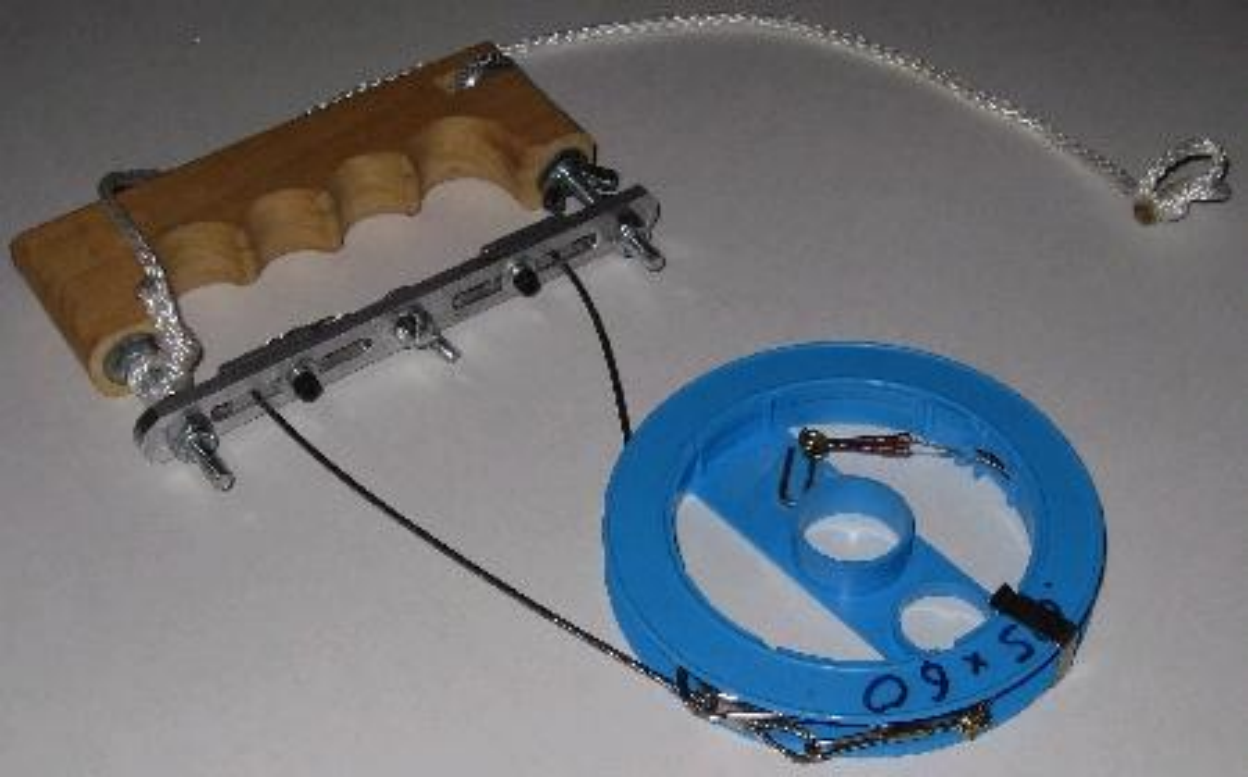
The storage reel that comes with the control lines can cause the lines to kink in the area indicated above, causing weakness in the lines. This is because the lines make an almost 90-degree turn without sufficient turning radius. The solution involves two modifications to the reel.



First, the slot where the lines come through the reel is elongated around the reel's circumference about half an inch using a Dremel. This allows the lines to make a more gradual turn into the hub of the reel. The unfortunate side effect is that the lines are almost impossible to start winding. To get around this, a second modification is made by installing a wire pin over which the eyelets can be hooked to start winding. The wire pin is secured with CA.



The yellow reel shows the wire pin in more detail. The blue reel shows the control lines ready for winding on the reel.



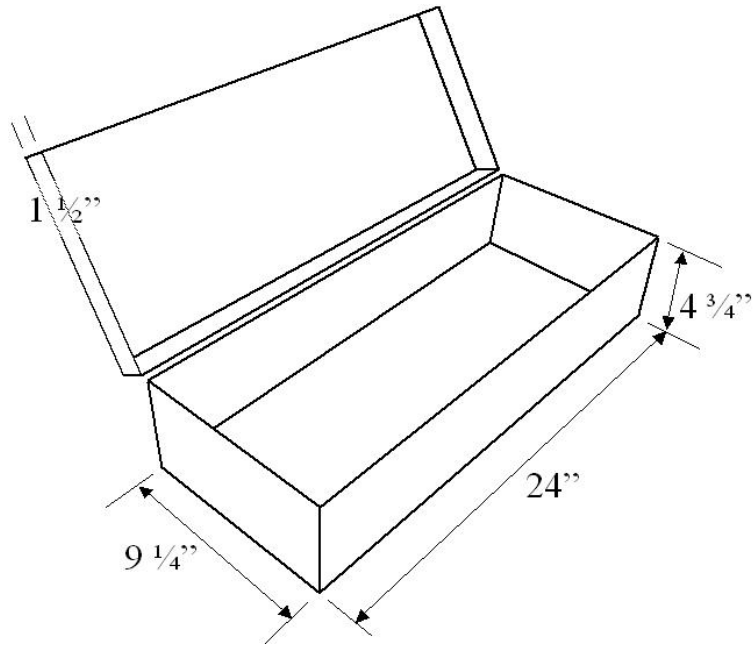
The lines can be stored with the handle attached.





Your lines should be organized for transportation. A purpose-built box will keep them secure. This example uses the following materials:

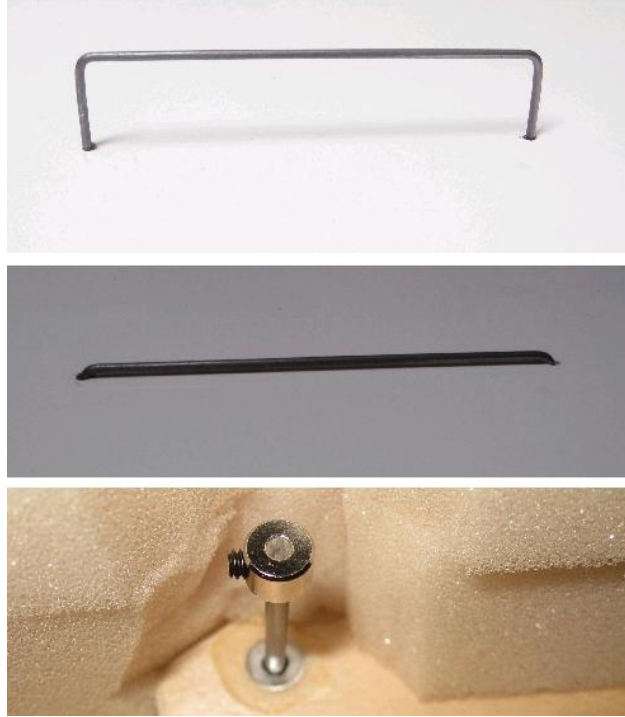
- Front/back: half-inch nominal (3/8" actual) pine
- Sides, top, bottom: quarter-inch nominal (3/16" actual) plywood
- Hinge/latch reinforcement: 1/16" plywood
- 5- and 30-minute epoxy for all wood-to-wood joints, gap filling, and interior joint filleting
- Tacks to reinforce plywood-to-pine joints
- 4 brass hinges, 1 brass latch
- Open-cell foam for interior of lid, secured with hot glue
- C-I-L brand garage, porch & floor gloss paint, oil base, with urethane
- 3/32" wire and 2 wheel collars for handle
- 1/8" corrugated cardboard (U-Haul boxes), cut and glued for slotted inserts
- 2 eyelets and string to hold the lid in its open position.



This diagram shows the exterior dimensions of the box.



The box is fitted with inserts made of corrugated cardboard. The cardboard is glued with LePage® SureGrip® Carpenter's Glue (the yellow one). The inserts are three inches high. The provision of four independent sections means the box can be reconfigured without having to redo the entire system.



The carry handle is made of 3/32" wire. It is shown here in the "up" position (for carrying) and the "down" position (for travel). The down position allows additional tool boxes to be stacked on top. The last photo shows the sliding mechanism from the interior, including the wheel collar used to retain the handle. Its area is reinforced with a second layer of plywood.



The lid is secured with four hinges on the back and one latch on the front. The pine wood is reinforced with 1/16" plywood where the attachments are made. The box weighs just under five pounds with cardboard inserts and no control lines.