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A PORTABLE FIELD SHELTER

Abstract. Describes the materials and methods used in constructing a 4-x-8-foot instrument shelter.

Field experiments often require the use of expensive recording equipment. Since study locations are often far from permanent facilities, some type of field shelter must be provided to protect equipment from weather and vandalism. An inexpensive portable shelter providing a floor space of about 4 x 8 feet has been devised and satisfactorily used in experiments in sugar maple sap production by personnel of the Northeastern Forest Experiment Station in Burlington, Vermont (fig. 1). This portable shelter, which is easy to construct and assemble, is used for storage and protection of recording instruments in maple sugar orchards. However, it could be used for a variety of other purposes.

We used the following material in the construction of the shelter:

Plywood, exterior grade $\frac{1}{4}$ -inch x 4-feet x 8-feet	8 sheets
Plywood, exterior grade $\frac{5}{8}$ -inch x 4-feet x 8 feet	1 sheet
Spruce blocks, 2-inches x 2-inches x $6\frac{1}{2}$ -inches	6 pieces
Spruce framing lumber, 2-inches x 2-inches x 6-feet	6 pieces
Spruce framing lumber, 2-inches x 2-inches x 8-feet	4 pieces
Spruce framing lumber, 2-inches x 4-inches x 8-feet	4 pieces
Spruce framing lumber, 1-inch x 3-inches x 8-feet	4 pieces
Spruce framing lumber, 1-inch x 1-inch x 8-feet	4 pieces
Asphalt roll roofing	40 square feet
Machine bolts, $\frac{5}{16}$ -inch x 5-inches	36
Washers, $\frac{5}{16}$ -inch	72
Wing nuts, $\frac{5}{16}$ -inch	36
Asphalt roofing cement	1 quart
Wood-preservative stain	1 quart
Nails, No. 6 coated	$1\frac{1}{2}$ pounds
Nails, No. 10	$\frac{1}{2}$ pound
Nails, No. 4	$\frac{1}{2}$ pound
Roofing nails, galvanized $\frac{1}{2}$ -inch	1 pound
Window sash, 16-inches x 22-inches	1
T-hinges, 4-inch	1 pair



Figure 1.—Portable field shelter used for housing environmental equipment used in maple sugar research investigations.

We used standard 4 x 8-foot sheets of exterior plywood for our principal construction material to reduce the amount of cutting. We used $\frac{1}{4}$ -inch plywood for the walls and roof, and $\frac{5}{8}$ -inch plywood for the floor (fig. 2).

The plywood is fabricated into eight panels with 2 x 2-inch lumber used for framing. Figure 2 shows an inside view of each panel and illustrates the location of framing members and the pattern of construction.

The roof panel was made of four pieces of plywood (two 60 x 48-inch pieces and two 30 x 11 $\frac{1}{2}$ -inch pieces). A 1 x 1-inch wooden strip was nailed with No. 4 nails on the underside of the roof, 2 inches outside of the 2 x 2 frame. This strip covers the joint between the roof and wall panels. The roof was covered with roll roofing paper, and asphalt roofing cement was applied around the edges and at the overlapping seams.

The wall panels were fastened with No. 6 nails. In the window panel, the sash may be either fixed with small brackets or hinged in place. The

window opening was framed on the outside with 1 x 3-inch boards. The plywood piece cut for the door was framed and braced with 1 x 3-inch boards. A pair of T-hinges were used to attach this door to the wall panel. The door opening was framed on the outside with 1 x 3-inch boards.

Dashed lines in the floor panel represent a foundation base made of 2 x 4-inch boards. This is permanently attached to the floor with No. 10 nails. The small circles on the frames of each panel identify the locations of 5/16-inch holes for machine bolts used in assembling the shelter. Care must be used in drilling these holes to make certain that adjacent panels are properly aligned.

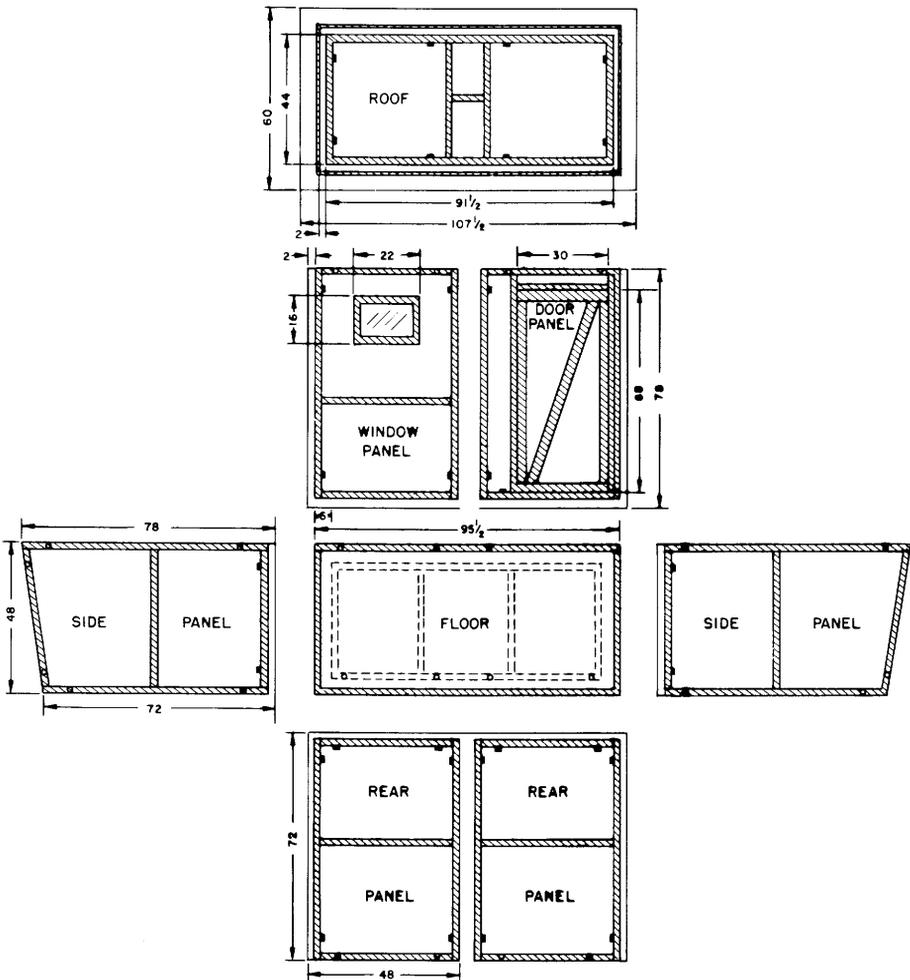


Figure 2.—Expanded view of instrument shelter, showing construction and arrangement of panels. All dimensions are in inches.



Figure 3.—Wing nuts are used for rapid assembly of the instrument shelter.

After construction was completed all exposed portions of the shelter were treated with a wood-preservative stain.

After all the panels are constructed the shelter can be moved unassembled to the desired field location. Here the floor panel is set down and leveled. Then each side panel is bolted through the pre-drilled holes to the floor section and to adjacent panels. Wing nuts are used for rapid fastening of all panels (fig. 3). When the walls of the shelter are all assembled, the roof panel is installed and fastened in a similar manner.

Two men can completely assemble the shelter in less than 20 minutes. The shelter may be readily disassembled and moved by simply removing the bolts and separating the panels. Any section of the shelter can be transported easily by two men. The heaviest section (floor panel) weighs approximately 100 pounds.

The basic structure as described above has been highly useful. A folding table, work bench, or wall shelves can be installed to accommodate instruments, chemical reagents, or other equipment. Through the use of a small oil or gas-heater, the shelter can be used at any time of the year.

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