

Introductory Statement

If one is going to measure or cruise standing timber, he will need a tree caliper to get the diameter breast high (dbh). After measuring the height and diameter breast high, one can use a log scale stick to determine the board feet in a log.

Materials Needed

Ash, gum or other hardwood
1 pc. $\frac{1}{2}$ " x $1\frac{1}{2}$ " x 12" for the stationary arm
1 pc. $\frac{1}{2}$ " x $1\frac{1}{2}$ " x $25\frac{1}{2}$ " for the calibrated part
2 pc. $\frac{1}{2}$ " x $1\frac{1}{2}$ " x 13" for the movable arm
1 pc. $\frac{1}{2}$ " x 1" x 4" for the end brace on movable arm
7 No. 6 flat head screws $\frac{7}{8}$ " long
4 No. 6 flat head screws $\frac{1}{2}$ " long

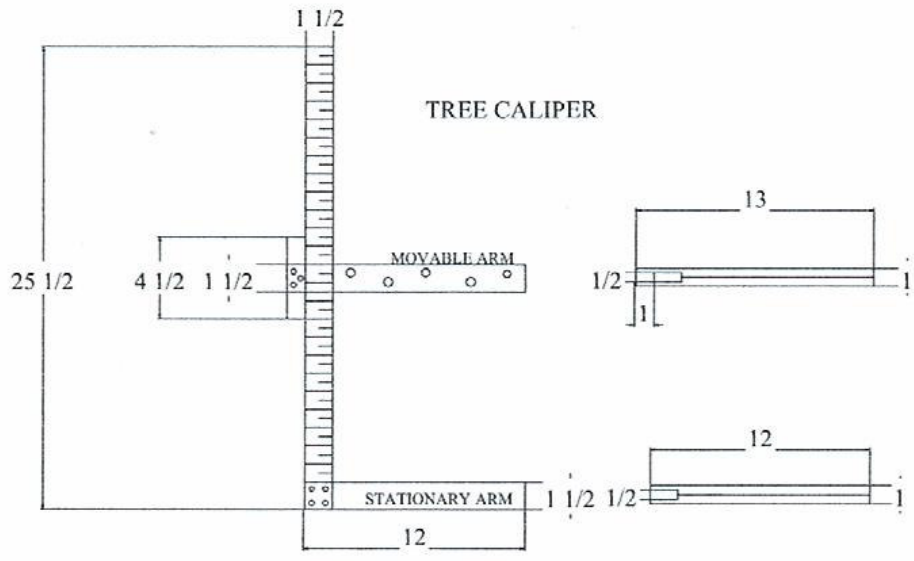
Tools Needed

Tri-square, 10 pt. cross-cut hand saw, screw driver
Measuring stick, $\frac{3}{4}$ " and $\frac{1}{4}$ " wood chisel
One sheet of No.1 sand paper, and 2" paint brush

Building Procedure

1. Select and bring to dimensions:
 - a. 1 pc. $\frac{1}{2}$ " x $1\frac{1}{2}$ " x 12" for stationary arm
 - b. 1 pc. $\frac{1}{2}$ " x $1\frac{1}{2}$ " x $25\frac{1}{2}$ " for calibrated part
2. Mark and chisel out a $1\frac{1}{2}$ " x $1\frac{1}{2}$ " end-lap $\frac{1}{4}$ " deep on the end of the calibrated part and stationary arm of the tree caliper.
3. Attach two end-lapped joints with four $\frac{1}{2}$ " screws, two screws on each side.
4. Select and bring to dimensions two pieces of $\frac{1}{2}$ " x $1\frac{1}{2}$ " x 13" for the movable arm. Chisel out from one end of each piece a portion $\frac{1}{4}$ " deep and $2\frac{1}{2}$ " long. Attach these two pieces together with the $\frac{7}{8}$ " screws with open ends together as illustrated.
5. Mark and cut a piece of 1.2 " x 1" x 4" for the back brace of movable arm and squarely attach with screws as illustrated.
6. Sand all parts until smooth and movable arm works freely.
7. Calibrate main stick into inches and half inches.
8. Varnish.

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Supplement Reading

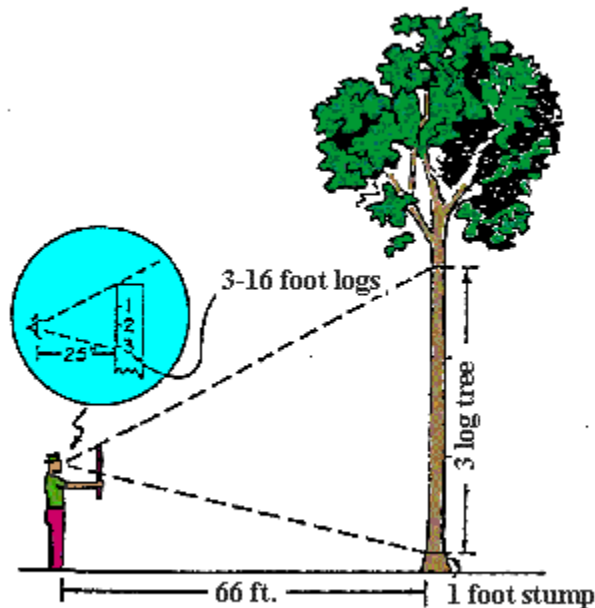
Measuring trees to calculate board feet in the field has not changed much in the past years. Sawyers and cruisers today still use the same techniques employed by your grandfather and great grandfather.

To make this project useful, there are a few more things to add. First, the standard for measuring diameter is referred to as Diameter Breast High (DBH) and has been established as a height of 4 ½ feet from the ground.

Next, you need to determine the number of 16-foot logs in the tree. You do this with a Merritt stick. To inscribe the Merritt rule on the stick, simply mark graduations of 6.1 inches from the zero end of the stick. Each graduation represents one 16-foot length. Inscribe half-log marks halfway between the 16-foot marks.

Now, using the stick:

1. Stand 66 feet from the base of the tree holding stick vertically, with zero pointed toward the tree top, at a distance of 25 inches from your eye.
2. Adjust the stick so that the zero end is in the line of sight with the upper limit of usable height.
3. Without moving your head or the stick, shift your line of sight to the stump at the base of the tree (usually 12 to 16 inches above ground level) and then read the marking on the Merritt stick.
4. If the ground is not level, choose an area that has the same elevation as the base of the tree.



Tree Volume Table Based on International Log Rule				
Diameter 4 ½ feet above ground	Number of 16-foot logs			
	1	2	3	4
(inches)	Volume in board feet			
10	35	60		
11	45	75		
12	55	90	120	
13	65	110	145	
14	80	130	175	
15	90	155	200	
16		180	240	285
17		205	280	330
18		235	315	375
19		265	360	425
20		295	400	480
21		330	450	540
22		370	500	605
23		405	550	665
24		440	605	725
25		485	665	800
26			725	880
27			790	950
28			850	1030
29			920	1110
30			990	1200

With the known DBH and the number of 16-foot logs calculated, use the above chart to find the board feet.

