

**APPENDIX**

**B**



# **MAKING YOUR OWN CRUISER STICK**



# Making Your Own Cruiser Stick

A Biltmore stick is used to measure DBH, and a Merritt hypsometer is used to measure the number of logs. Following is the procedure to construct a cruiser stick calibrated to your arm reach.

## PROCEDURE

1. Obtain a blank, quarter-round molding. A 4½-foot-long round, tapered broom handle also works well.
2. Determine the length of your arm reach:
  - Hold the blank at a comfortable arm's length. Use your right arm if you are right-handed or your left arm if you are left-handed.
  - Have someone *carefully* measure the distance from the back of the blank molding or broom handle (set against the tree) to the outside corner of the eye you are using to sight. Measure with tape as precisely as possible to the nearest ½ inch. Take three measurements.

Record measurements:

\_\_\_\_\_ inches  
 \_\_\_\_\_ inches  
 \_\_\_\_\_ inches

Compute the mean arm reach:

Sum of three measurements \_\_\_\_\_ ÷ 3 =  
 \_\_\_\_\_ inches

## THE BILTMORE STICK

See video B.1, Making a Biltmore Stick, on the Alabama Extension website at [www.aces.edu/go/ForestInventoryBasics](http://www.aces.edu/go/ForestInventoryBasics).

For the Biltmore stick, compute the diameter graduations to be used on your stick using the formula:

$$\text{scale graduation} = \sqrt{(aD^2 \div (a+D))}$$

**a = arm reach in inches;**

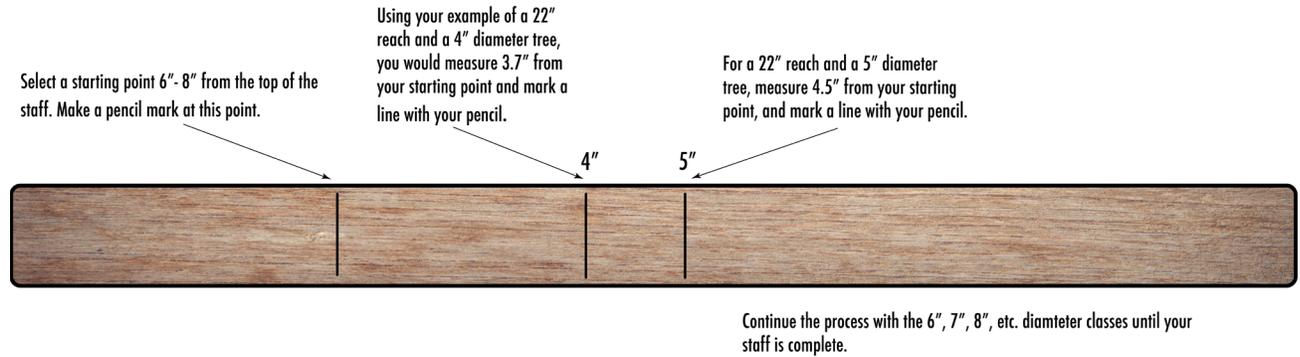
**D = diameter of tree being graduated**

These can be recorded on the calculation sheet provided. Do this for diameters starting at 4.0 inches and continue in 1-inch intervals to the 30 or more depending on the size of the timber you will be measuring.

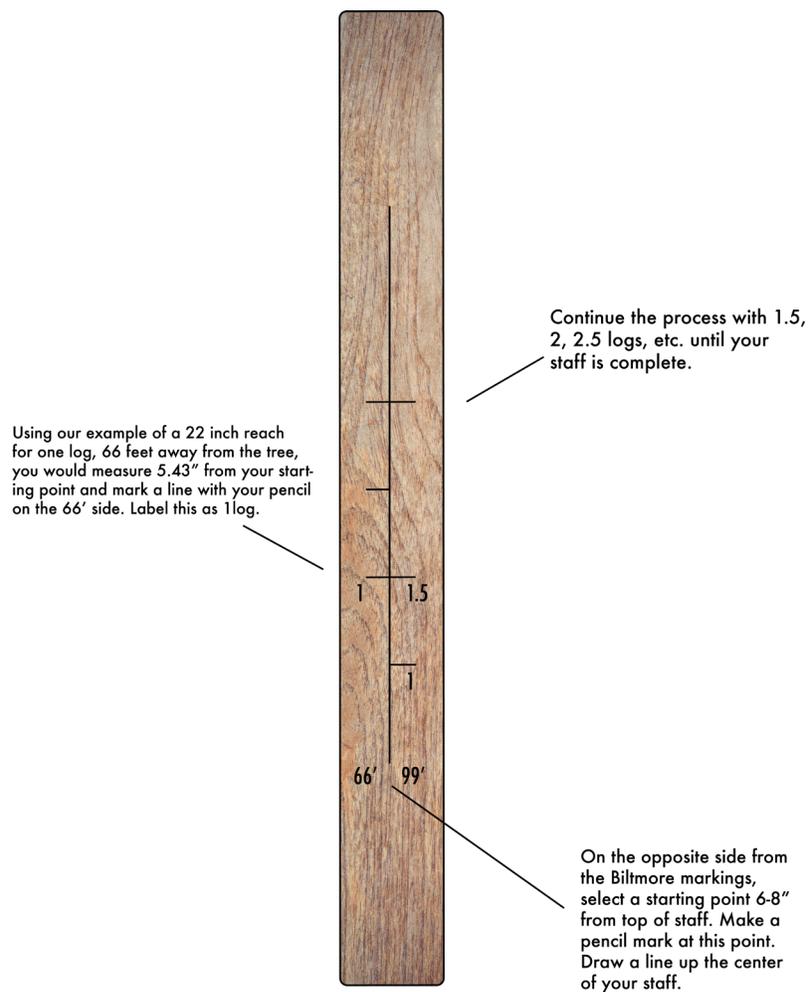
### Example Calculations

Arm Reach: 22 Inches for a 4 Inch Tree	Arm Reach: 22 Inches for a 5 Inch Tree
$= \sqrt{(22 \times 16) \div (22+4)}$	$= \sqrt{(22 \times 25) \div (22+5)}$
$= \sqrt{(22 \times 16) \div 26}$	$= \sqrt{(22 \times 25) \div 27}$
$= \sqrt{352 \div 26}$	$= \sqrt{550 \div 27}$
$= 3.68 \text{ inches}$	$= 4.51 \text{ inches}$

Mark the graduations from a starting point that is about 6 to 10 inches from the **TOP** of the stick. **Label them with a pencil first.** Once you have the graduations marked with a pencil, check the graduations for correctness. Measure several circular trees with a diameter tape and check the Biltmore against these measured trees. (Utility poles work well.) After you are convinced your stick is properly marked, repeat your pencil marks with a permanent sharp-pointed marker.



Example of how to mark the Biltmore stick on your cruiser stick.



Example of how to mark the Merritt hypsometer on your cruiser stick.

### Calculating Your Biltmore Stick Markings

Diameter Class in Inches	Distance to Measure from Starting Point Using Formula = $\sqrt{(aD^2 \div (a+D))}$
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	

## THE MERRITT HYPSONETER

See video B.2, Making Your Own Merritt Hypsometer, on the Alabama Extension website at [www.aces.edu/go/ForestInventoryBasics](http://www.aces.edu/go/ForestInventoryBasics).

For the Merritt hypsometer, compute the graduations for log lengths using the formula below. Begin with one log (16.3 feet) and continue at half-log increments (8.15 feet) until you reach the end of your stick.

**Scale graduation =  $(aL) \div d$**

**a = arm reach in inches**

**L = cumulative log length in feet**

**d = distance from tree (using 66 feet and 99 feet)**

### Calculating Your Merritt Hypsometer Markings

No. of 16.3-Ft. Logs	Log Length in Feet	D = 66 Feet	D = 99 Feet
1	16.30		
1.5	24.45		
2	32.60		
2.5	40.75		
3	48.90		
3.5	57.05		
4	65.20		
4.5	73.35		

### Example Calculations

**Arm Reach: 22 Inches for  
One Log 66 Feet Away  
from the Tree**

$$= (22 \times 16.3) \div 66$$

$$= 358.3 \div 66$$

$$= 5.43 \text{ inches}$$

**Arm Reach: 22 Inches for  
One Log 99 Feet Away  
from the Tree**

$$= (22 \times 16.3) \div 99$$

$$= 358.3 \div 99$$

$$= 3.62 \text{ inches}$$