Suggestions for using DT423a

The presentations on this CD-ROM are composed in Microsoft PowerPoint 97 and should run equally well on PCs or Macintosh machines. For information about using PowerPoint presentations, refer to Help in your PowerPoint program.

PowerPoint Viewer

If you do not have the full version of PowerPoint on your machine, a freely-distributable version of PowerPoint viewer is on the CD-ROM, in the folder called POWERPOINT VIEWER.

This download is for users who don't have PowerPoint; it allows them to open and view PowerPoint 97 presentations. Also for users who do not have PowerPoint installed on their computers.

With this release, the Microsoft PowerPoint® Viewer 97 now also supports PowerPoint 2000 files. This viewer allows people who use PowerPoint to share their presentations with people who do not have PowerPoint installed on their computers. You can view and print presentations, but you cannot edit them in the PowerPoint Viewer.

The PowerPoint Viewer 97 supports PowerPoint 2000 files as well as those files created with previous versions of PowerPoint. The PowerPoint Viewer supports all PowerPoint 97 and PowerPoint 95 features. You can use it to view files created in both PowerPoint for Windows® and PowerPoint for the Macintosh.

Note This download is for Windows® 95, 98, and 2000 and Windows NT® and Windows® ME operating systems only.

For additional information, or to check for a more recent version of the viewer, go to www.microsoft.com.

Files on the CD-ROM

There are several files on the CD-ROM.

DT423a.ppt is a 81-frame PowerPoint97 presentation that includes line drawings, common names and step-by-step directions for marking braces, octagons, and rafters.
Quiz.ppt has three quizzes that are intended to be printed. The KEY'S are included for each quiz.
Problem.ppt is a series of practice problems to assist students learning to use the tables on the square for calculating board feet, brace length and rafter length. The Keys are included for each student problem.
Test.ppt is a 50 question multiple selection/true-false exam.
The file you are reading is readme.doc. On page 2 you will find a convenient key to the Rafter Marking CD-ROM navigation. This can be helpful when moving to specific parts of the presentation.

The student practice problems are presented as a series of problems starting with simple problems and becoming more detailed as the student advances from the beginning to the end of the problem set. Directions for using the Essex Board measure, Brace table, and the Rafter table can be located in U3009a, Using the Steel Square and the text in the Steel Square PowerPoint presentation.

The written exam is developed in PowerPoint to provide the instructor the opportunity to modify the questions to meet local department goals.
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**Navigation in DT423a (Steel Squares).ppt**

This button jumps back to the clickable table of contents

**Speed Square**

These blue underlined headings in the table of contents are linked to the slide with the same name. Click on the slide name and the program will advance to the identified slide within the presentation.

**Arrow keys**
Page Up key
Page Down key
Keypad number + Enter

These are all useful ways to navigate in a PowerPoint presentation. Read the Help file in PowerPoint for more instructions.
The Essex Board Measure Table is used to determine the number of board feet in lumber of common width and length. The number under the 12 on the outer edge of the blade is the starting place for this table.

![Essex Board Measure Table]

To use the table, first find the width of the lumber in the column under the 12. You will notice that not all widths are given in the table. Six and twelve-inch boards can be calculated easily as the length of a one-inch thick board twelve inches wide is equal to its number of the board feet. One half of the length will determine the number of board feet in a six-inch wide board one-inch thick.

Starting at the width, located in the column under the 12, move along the square to the column under the inch mark representing the length of the board in feet (use the numbers on the outer edge of the blade to represent the length of the board in feet).

![Outer edge of the blade]

The Brace Table is located on the back of the tongue on a square. The Brace Table is used to determine the length of common braces. All but one of the predetermined brace lengths on the brace table are for equal rise and run lengths. Rise is the vertical distance the brace will span and Run is the horizontal distance the brace will span.

The small numbers, one above the other are the rise and run of the brace in inches. The larger number is the length of the brace in inches and one-hundredth of an inch.
If the length of a brace cannot be found in the table an even multiple of this rise and run can be used to determine the brace length. For example, a brace with a rise and run of 12 feet would be three times the length given for a brace with a 48-inch rise and a 48-inch run.

Brace length for a 12 foot rise and run is 203.64 inches.
Rafter length may be determined several different methods each arriving at the correct length of the rafter. In this presentation, the practice problem keys use the following method of arriving at the rafter length. Rafter length is calculated by multiplying the building run in feet (horizontal distance under the rafter) by the length of common rafter per foot of run on the rafter table located on a framing square.

Square reading x Rafter run = Rafter length.

Example:

A 5-12 roof pitch will show a rafter length per foot of run as 13.00 inches. If the run in 10 feet the rafter length is calculated as:

\[
\begin{align*}
13.00 \text{ (square reading)} \\
\times 10 \text{ feet (run)} \\
130.00 \text{ inches (rafter length)}
\end{align*}
\]

Rafter length, on an even-span gable roof covers from the center of the building to the outside of the wall frame (stud). A roof frame incorporating a ridge piece will require the carpenter to shorten the rafter by one-half the thickness of the ridge board. Two-inch dressed lumber is actually 1.5 inches thick requiring the rafter to be shortened 3/4 inch, parallel with the plumb line. Remember that the rafter represents the diagonal in a triangle and the rise and run represent vertical and horizontal lines. The amount of correction has been stated as 0.9 inches for use in this problem set and will be very close in real life.

Example:

Square reading = 13.00 inches
Run = 10 feet
Ridge piece = two-inch dressed lumber (1.5 inches thick)

Square reading x run = Rafter length - RCF = corrected rafter length

\[
\begin{align*}
13.00 \text{ (square reading)} \\
\times 10 \text{ feet (run)} \\
130.00 \text{ inches (rafter length)} \\
- 0.9 \text{ inches (RCF)} \\
129.1 \text{ inches (corrected rafter length)}
\end{align*}
\]

The third step in marking a rafter is to mark the rafter for the roof overhang. Roof overhang is expressed as a horizontal distance and can be added to the rafter run when expressed in feet. The adjusted run is then multiplied by the square reading on the length of common rafters per foot of run from the framing square rafter table to determine the length of lumber required to construct the desired rafter. Overhang is often expressed in inches and must be converted to feet before it is added to the run of a rafter.
Square reading x Adjusted run = Adjusted rafter length - RCF = Corrected rafter length

Example:

Square reading = 13.00 inches
Run = 10 feet
RCF = 0.9 inches
Overhang = 24 inches

Overhang/12 = length of overhang in feet  (24/12 = 2 feet)

Run + overhang in feet = Adjusted run

10 feet (Run) + 2 feet (Overhang) = 12 feet (Adjusted run)

    13.00 (square reading)
* 12 feet (adjusted run)
    156.00 inches (adjusted rafter length)
-  0.9 inches (RCF)
    155.1 inches (corrected rafter length)