Picturing Prop Pitch

Article Published in the September 2003 Issue of the Windy Sock, the newsletter of the San Antonio, Texas, Alamo Escadrille, Joe Joseph, Editor

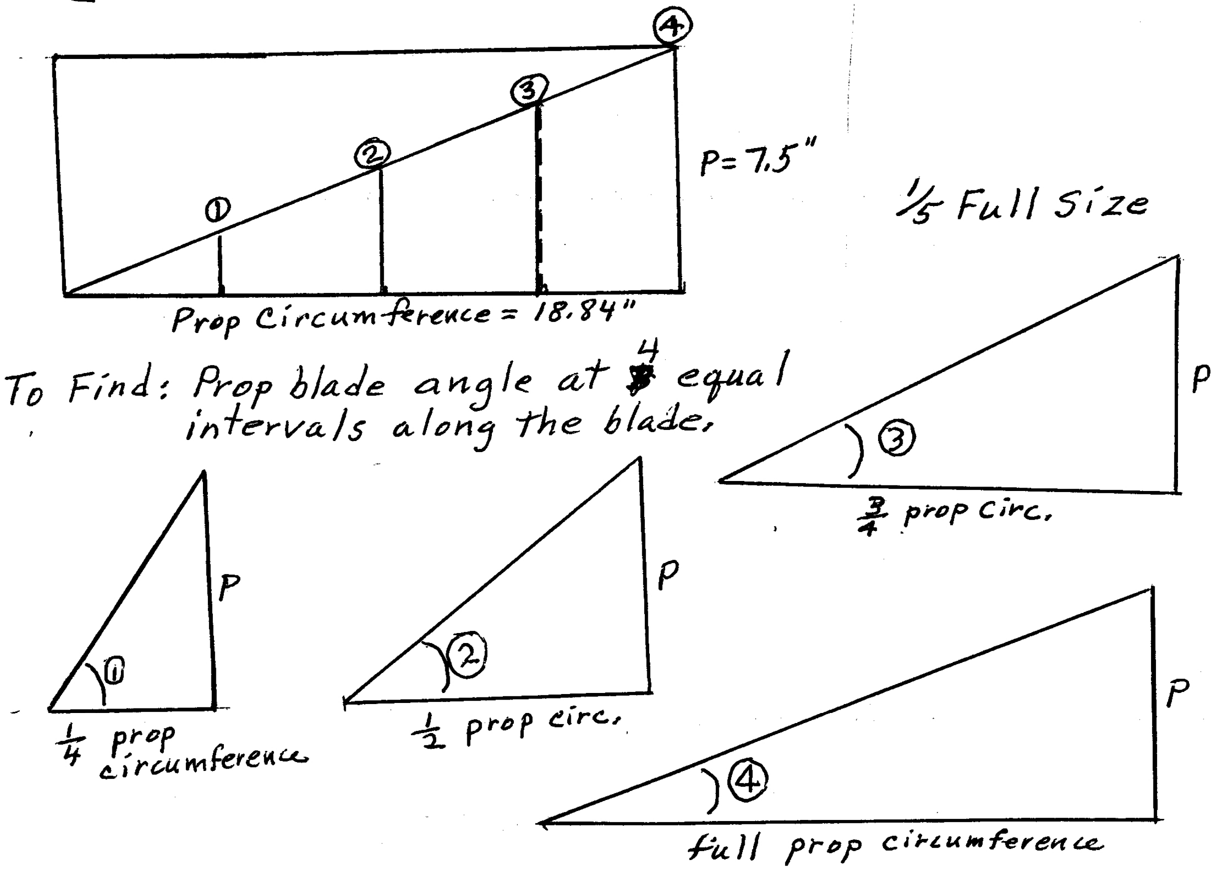
For those who want more flexibility and want to know what's going on in figuring prop pitch, using the numerous tables available leaves a bit to be desired. And using fancy math formulas has its share of moaners and groaners, too. so how about a *graphical* solution? Your editor often wondered in struggling through higher math courses: If the goal is to determine the area under the curve, why not simply measure the area directly? Whoa, boy, let's not start the debate of the year!

Norm Furutani, in a recent e-mail to the FFML (FFML@airage.com), suggested a neat graphical solution to the problem of determining blade angle at any value of pitch and/or P/D ratio. Here it is in words and pictures:

Draw a rectangle, making the width equal to the circumference of the circle the blade tip makes in one rotation. (3.14 times diameter) Make the height equal to the distance forward the prop travels in that same rotation. You get this value from the Pitch-to-Diameter ratio (P/D). For example, if the P/D ratio is 1.25, the Pitch has to be 1.25 times the diameter. As shown by the illustration below, you draw a different rectangle for every desired position along the blade. Note that the Pitch stays the same at all points, only the circumference of the arc at that point changes. This graphical solution allows you to find the blade angle at every point along the blade, and you don't even need a protractor to use the data. Simply cut out the triangle that is formed and use it directly. Neat, huh? You end up with an ideal blade angle all along the blade, that is every point on the blade travels the same distance forward.

Given $\left\{ \begin{array}{l} \text{Prop diameter} = 6'' \\ \text{prop travel circumference} = 3.14 \times 6 = 18.84'' \\ P/D = 1.25 \quad P = 7.5'' \end{array} \right.$

AND REMEMBER: Every prop does the best it can!



For more info:
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