
Analysis of shroud extension on Tanzer T22 during mast stepping

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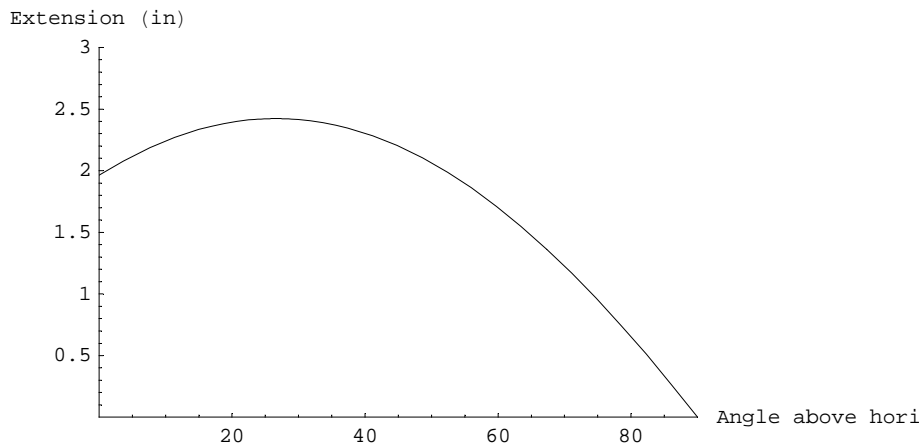
This worksheet computes the extension required by a shroud for it to remain attached to the mast and chainplate without distortion as the mast is lowered. The need for an extension arises from the horizontal offset (offx) between the mast pivot and the point of attachment of the shroud at the chainplate.

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In[28]:= lattach = 13.33; (* Height of point of attachment of shroud on mast *)
offx = 4/12; (* Offset of chainplate forward of mast pivot *)
ltoggle = 1.125/12; (* length of toggle on shroud *)
offy = 3.125/12 - ltoggle; (* Offset of chainplate below mast pivot *)

lshroud = Sqrt[(lattach + offy)^2 + offx^2]; (* Length of shroud *)
Xmast[theta_] := lattach Cos[theta] (* X attach point vs. angle of mast *)
Ymast[theta_] := lattach Sin[theta] (* Y attach point on mast vs. angle of mast *)

Exten[theta_] := Sqrt[(Xmast[theta] + offx)^2 + (Ymast[theta] + offy)^2] - lshroud

In[34]:= Plot[Exten[t Degree] * 12, {t, 0, 90},
  AxesLabel -> {"Angle above hori", "Extension (in)"},
  PlotRange -> {{0, 90}, {0, 3}}];
```



```
In[35]:= FindMaximum[Exten[t Degree] * 12, {t, 0}, AccuracyGoal -> 2]
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Out[35]= {2.42275, {t -> 26.5651}}
```

The maximum extension required is 2.42 inches and occurs at an angle of 26.5 degrees above horizontal.