

The EB 1/24th TWIN WAVE as a Mechanical Discovery



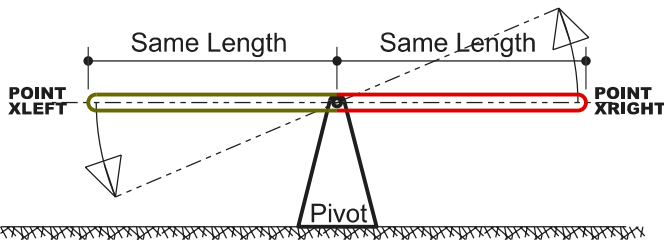
(A SeeSaw Comparison are used as a Simplified Explanation)

Please START here from POINT 01

I Started to prepare this on the 24th of January 2017 & Posted it on the 25th of January 2017. A Long lasting issue with secure access to my web site prevented any earlier posting. These security matters was resolved only for a short time. Then returned. A new site may be needed. Please do this Experiment if you Wish;- More Later. Reported : 17 FEB 2017

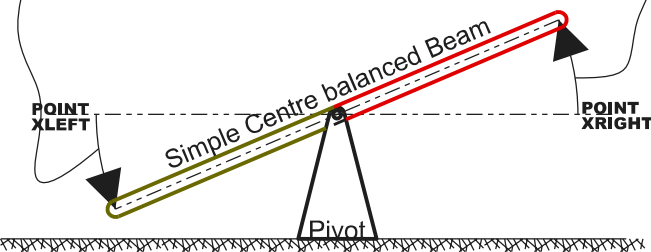
POINT 01 :

DISPLACEMENT on one side is IDENTICAL to the Displacement on the other side even though it take place in a REVERSE MIRROR fashion.



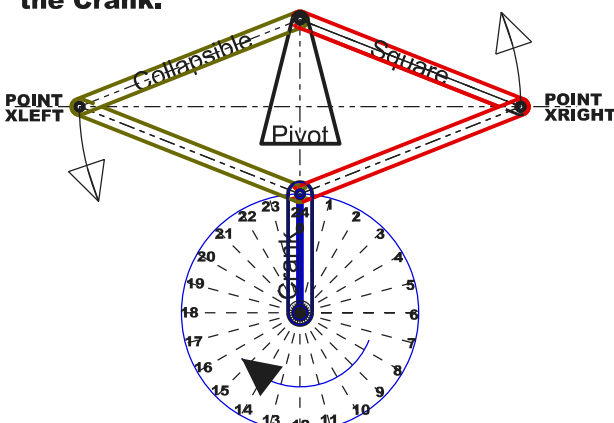
POINT 02 :

So to put it another way ;- DISPLACEMENT = distance travelled on one end, is the exact same as on the opposite end of the equal length / balanced centre pivoted seesaw.

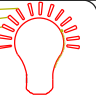


POINT 03 :

NOW lets change the simple beam to a Collapsible Square fixed to a Crank (or Circle) and put motion on the whole system through the Crank.



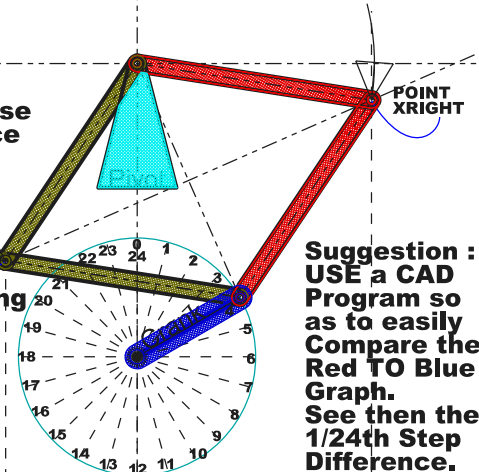
POINT 04 : The 1/24th discovery



NOW we discover that the DISPLACEMENT on one side (XLEFT as opposed to XRIGHT) is NOT IDENTICAL to the Displacement on the other side while the rest of the Motion also take place in a Obvious REVERSE MIRROR fashion. ONE POINT is 1/24th OUT OF PHASE or BECOME (JUMP actually) 1/24 OUT of STEP with the opposite POINT.

This Phase difference is easily proven

by plotting XLEFT & XRIGHT as done Below.



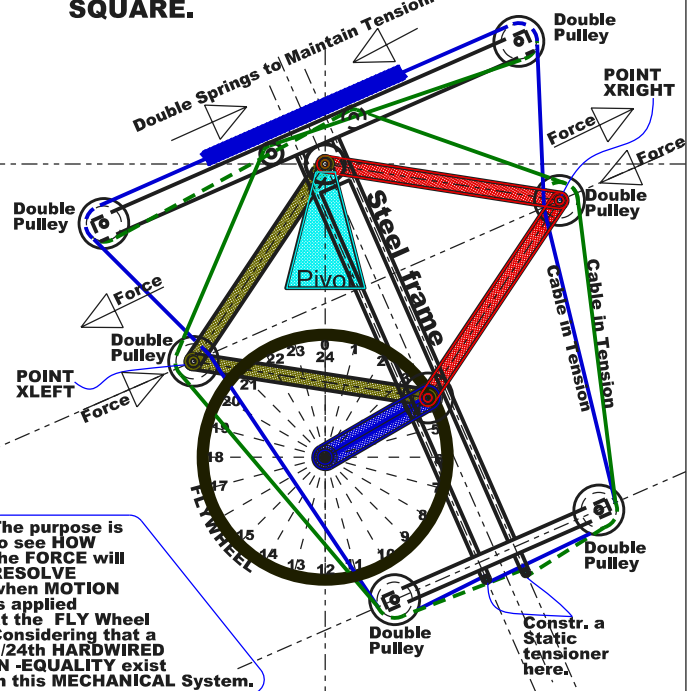
Suggestion : USE a CAD Program so as to easily Compare the Red TO Blue Graph. See then the 1/24th Step Difference.

These Plots May look similar but it is NOT. THERE is a small 1/24 out of Phase Difference you will only Spot with a Physical Overlay.

Thus one side is @ 1/24th More or Less LEVERAGE than the other side During each Half Cycle If EQUAL force is applied with Initial Equilibrium as a Start. It makes sense that a circle will introduce something into a system different from a simple see-saw with it's simple equivalence.

POINT 05 :

NOW lets put Equal FORCE on the XLEFT & XRIGHT Points to Create EQUILIBRIUM of FORCE in the SQUARE.

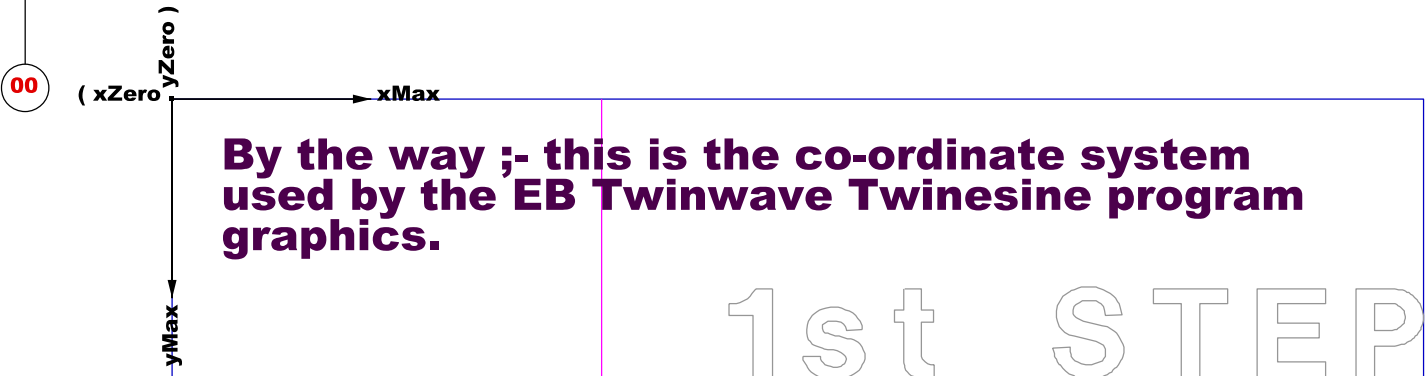


The purpose is to see HOW the FORCE will RESOLVE when MOTION is applied at the FLY Wheel Considering that a 1/24th HARDWIRED IN -EQUALITY exist in this MECHANICAL System.

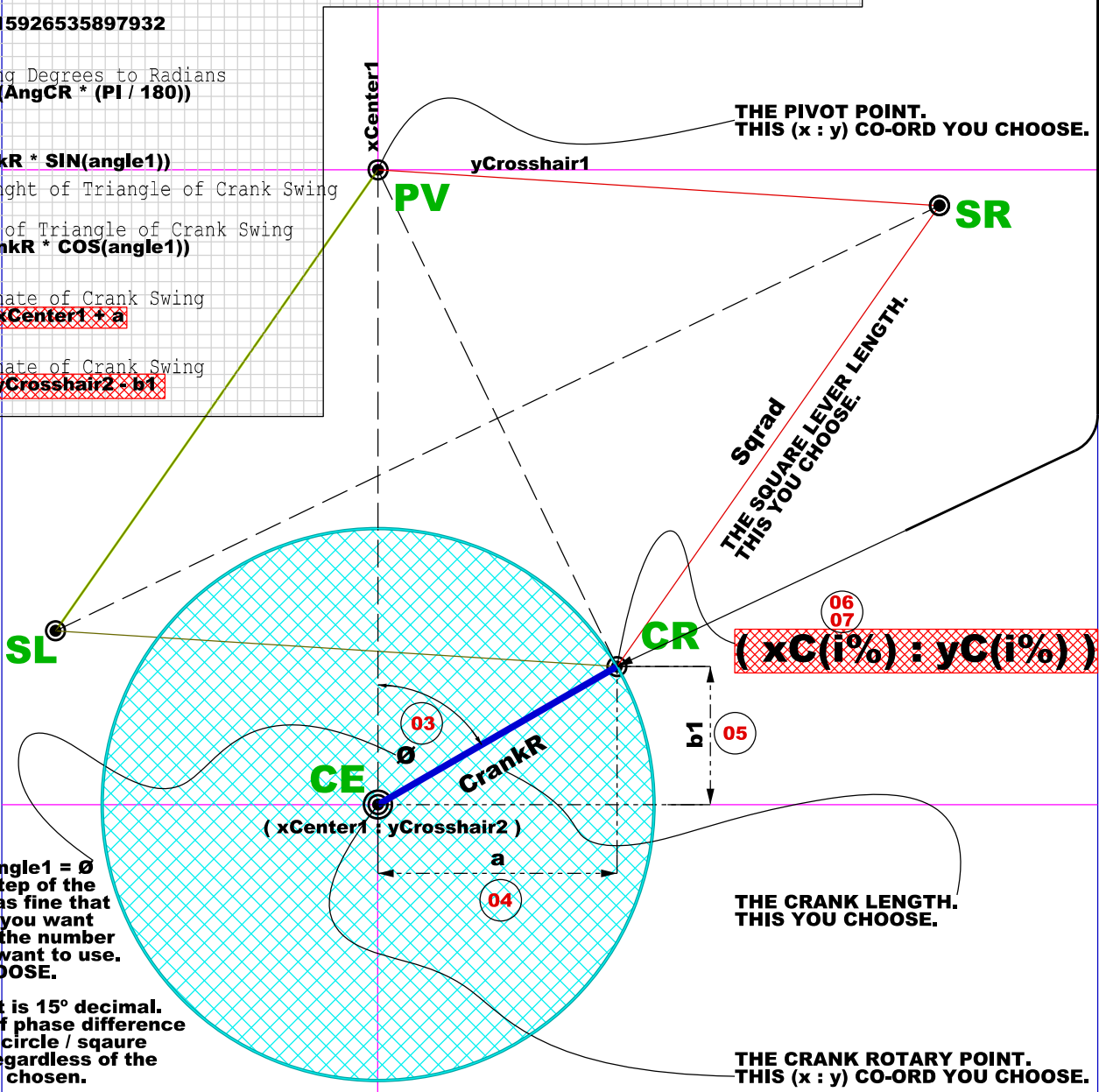
0 The EB 1/24th TWIN WAVE as a Mechanical Discovery m

This is the EB Calculation 1st breakup page. This will start to show with a Simpler section that will indicate how the Calculations add up to the Full page. We start with the 1st step : the ROTATION CALCULATION.

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- 01 BELOW : GEOMETRIC DEDUCTIONS TO GET TO CRANK ROTATION'S xC : yC CO-ORDINATES. The (i%) indicate the storage array increment number, there being any no. of co-ord sets you determine in your programing language of choice.
- 02 $PI = 3.1415926535897932$
- 03 Converting Degrees to Radians
 $angle1 = (AngCR * (PI / 180))$
- 04 $a = (CrankR * SIN(angle1))$
the a lenght of Triangle of Crank Swing
- 05 b lenght of Triangle of Crank Swing
 $b1 = (CrankR * COS(angle1))$
- 06 X coordinate of Crank Swing
 $xC(i\%) = xCenter1 + a$
- 07 Y coordinate of Crank Swing
 $yC(i\%) = yCrosshair2 - b1$



THE CRANK angle1 = θ
THIS angle1 step of the crank can be as fine that is as many as you want depending on the number of arrays you want to use. THIS YOU CHOOSE.

The EB default is 15° decimal. The 1/24 out of phase difference remain in this circle / square arrangement regardless of the angle1 degree chosen.

This $(xC(i\%) : yC(i\%))$ will fill up it's pre-defined arrays;- now after reaching goal:- 06+07 ;- on to 2nd step.

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The EB 1/24th TWINWAVE as a Mechanical Discovery m

This is the EB Calculation 4th breakup page.
 The goal here is to use W & $xT(i\%) : yT(i\%)$ co-ords to get to calculate a Major Goal of the SL + SR points.

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18 BELOW : CALCULATING COORDINATES FOR SQUARE LEVER : 2 SETS OF X & Y COORDINATES

19 $xL(i\%) = xT(i\%) - (W * \text{COS}(\text{angle}2))$

20 $yL(i\%) = yT(i\%) + (W * \text{SIN}(\text{angle}2))$

21 $xR(i\%) = xT(i\%) + (W * \text{COS}(\text{angle}2))$

22 $yR(i\%) = yT(i\%) - (W * \text{SIN}(\text{angle}2))$

NB :

Leglenght = $W * \text{COS}(\text{angle}2)$

SideLeglenght = $W * \text{SIN}(\text{angle}2)$

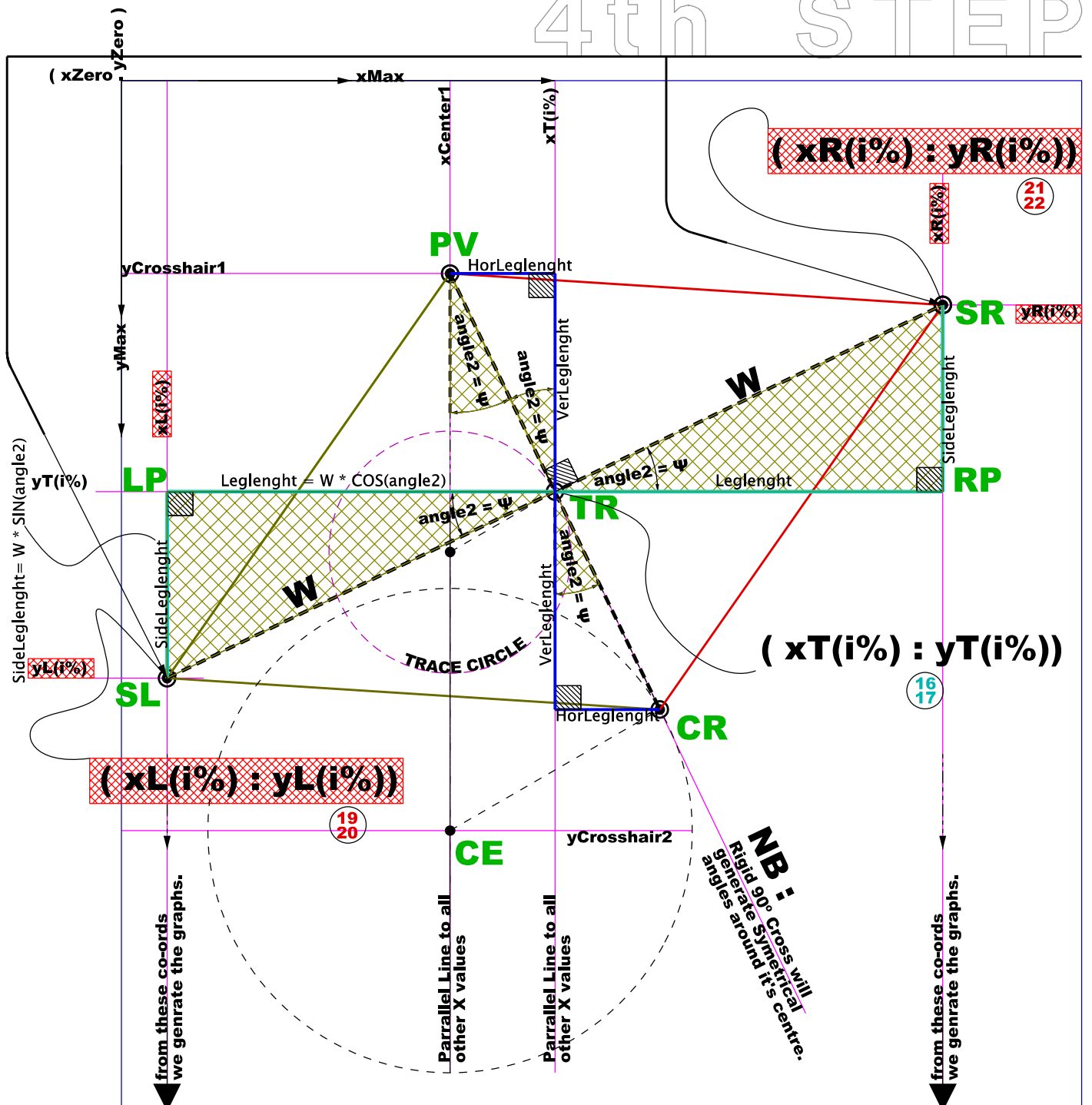
Leglenght = $W * \text{COS}(\text{angle}2)$

SideLeglenght = $W * \text{SIN}(\text{angle}2)$

REMINDER : Simple Symetry will determine that certain angles will be the Same in any Geometrical construct. See how angle2 occur in 5 ways below.

This we use to make final co-ord calculations for SL + SR;- with the aid of the W- Length.

4th STEP



The $xL(i\%) : yL(i\%) + xR(i\%) : yR(i\%)$ will fill up it's pre-defined arrays;- now after reaching goal:- 19 to 22;- on to 5th step.

The EB 1/24th TWINWAVE as a Mechanical Discovery

This is the EB Calculation 5th breakup page.
 The goal here is to show the 1/24th OUT OF STEP or 1/24th OUT OF PHASE DISCOVERY.

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NB :
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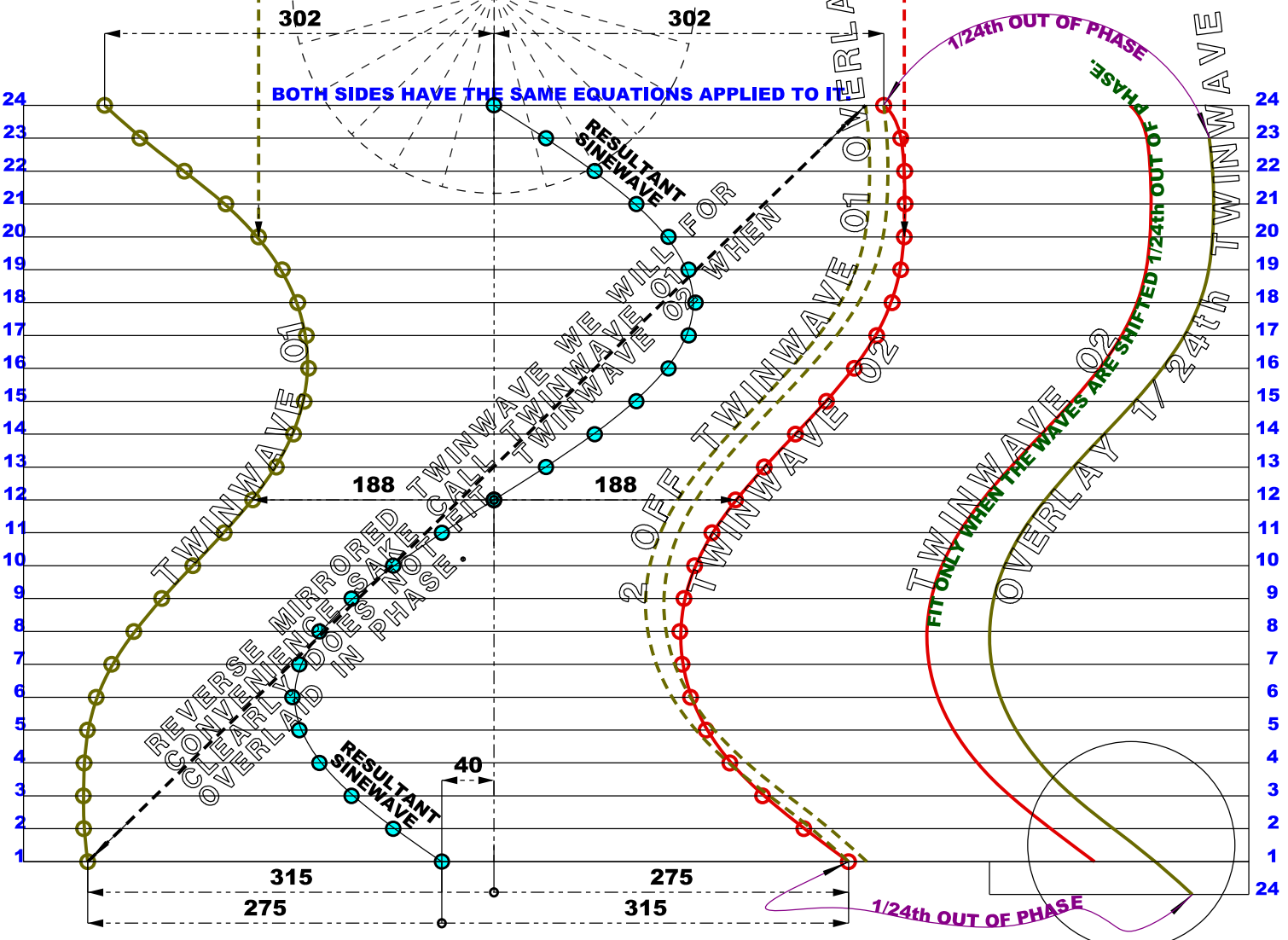
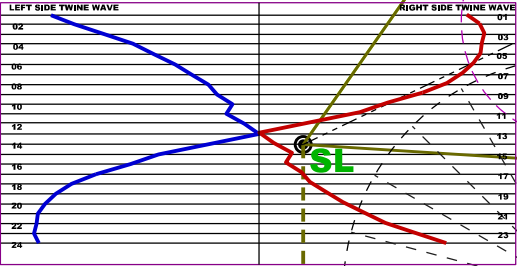
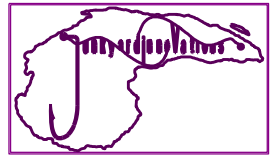
NOTE :
 THE TWIN WAVE SHAPES VARY IN THEIR PATHWAYS DEPENDING ON THE DISTANCE BETWEEN PV - TO CE-. SEE MORE ABOUT THAT ON THE WEBSITE. JUNKYARDINNOVATIONS.COM

SO WHAT ! YOU MAY ASK :-

The purpose is to see HOW we can Use this 1/24th HARDWIRED IN-EQUALITY existing in this MECHANICAL System.

Also see the musings on PHYSICS theory that may be hidden in this Discovery on the website http://junkyardinnovations.com/0000_TwineSine_StartHere.html

SEE SOME WEIRD TWINWAVE PATERNS SUCH AS BELOW ON THE WEBSITE.



5th STEP

Sugestion :
 USE a CAD Program so as to easily Compare the Red TO Blue Graph. See then the 1/24th Step Difference.

The SL + SR Points Co-ords need to be Graphically connected to the Grid to generate the Wave Graphs. Next :- 6th step.

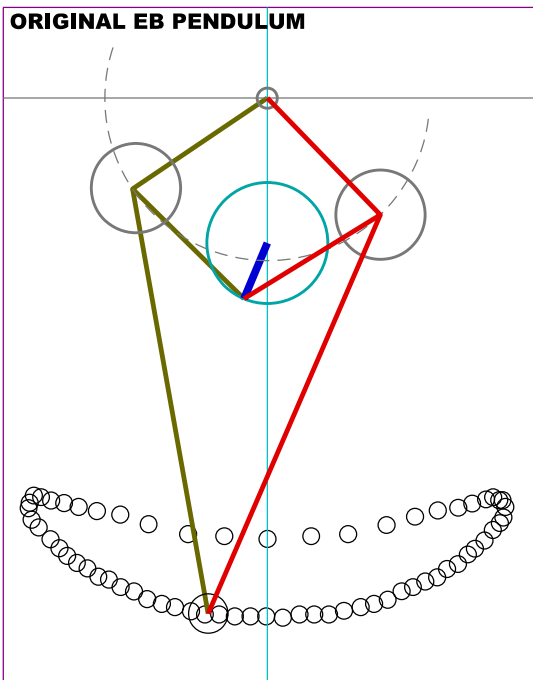
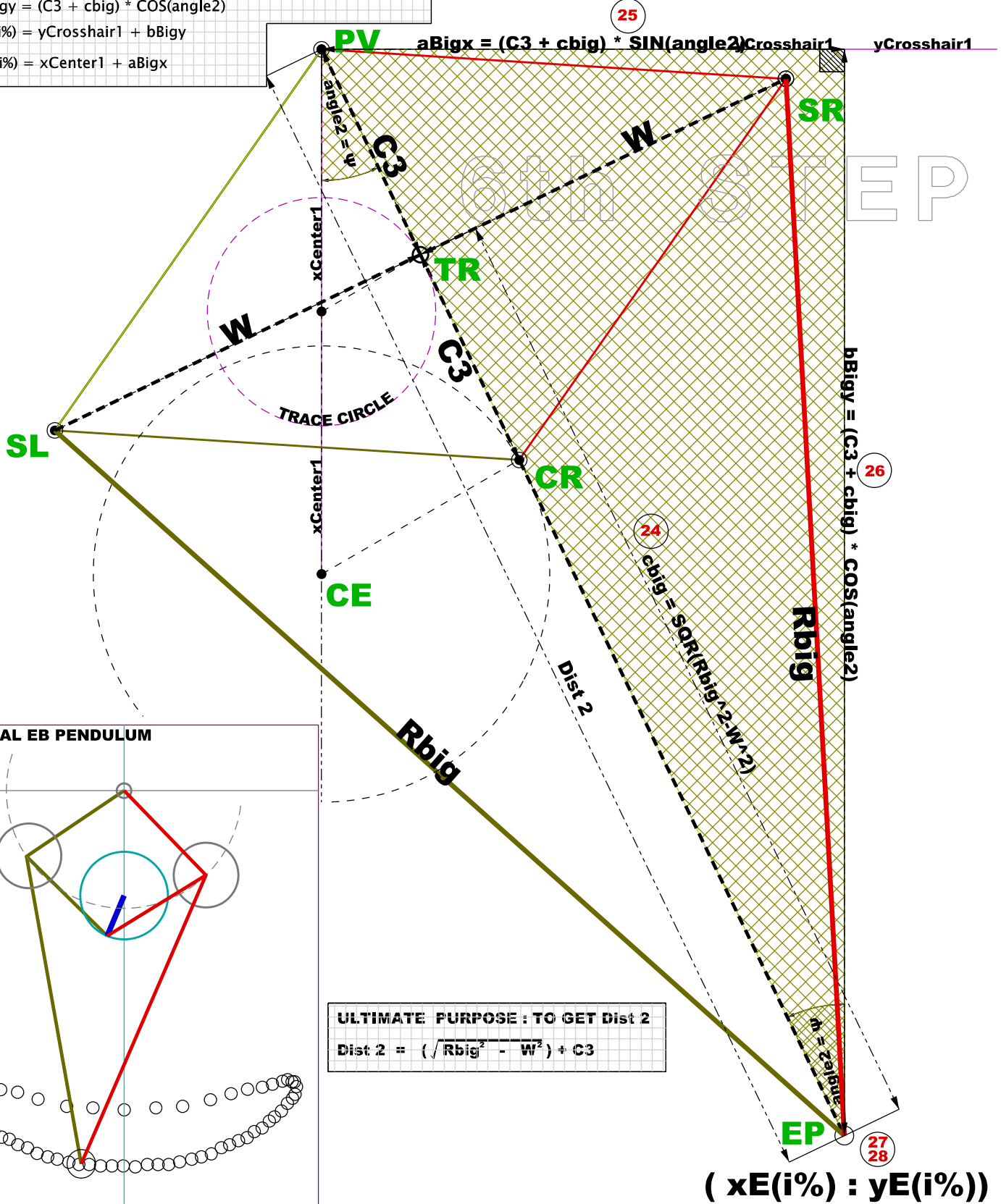
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The EB 1/24th TWINWAVE as a Mechanical Discovery m

This is the EB Calculation 6th breakup page.
 The goal here is to show the extension point of the EB pendulum calculation.

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- 23 NOW TO CALCULATE PENDULUM EXTENSIONS: x & y POINTS
 'DEPENDANT ONLY ON VARIABLES w & c3 & angle2.
- 24 $c_{big} = \text{SQR}(R_{big}^2 - W^2)$
- 25 $a_{Bigx} = (C3 + c_{big}) * \text{SIN}(\text{angle}2)$
- 26 $b_{Bigy} = (C3 + c_{big}) * \text{COS}(\text{angle}2)$
- 27 $yE(i\%) = y_{\text{Crosshair}1} + b_{Bigy}$
- 28 $xE(i\%) = x_{\text{Center}1} + a_{Bigx}$



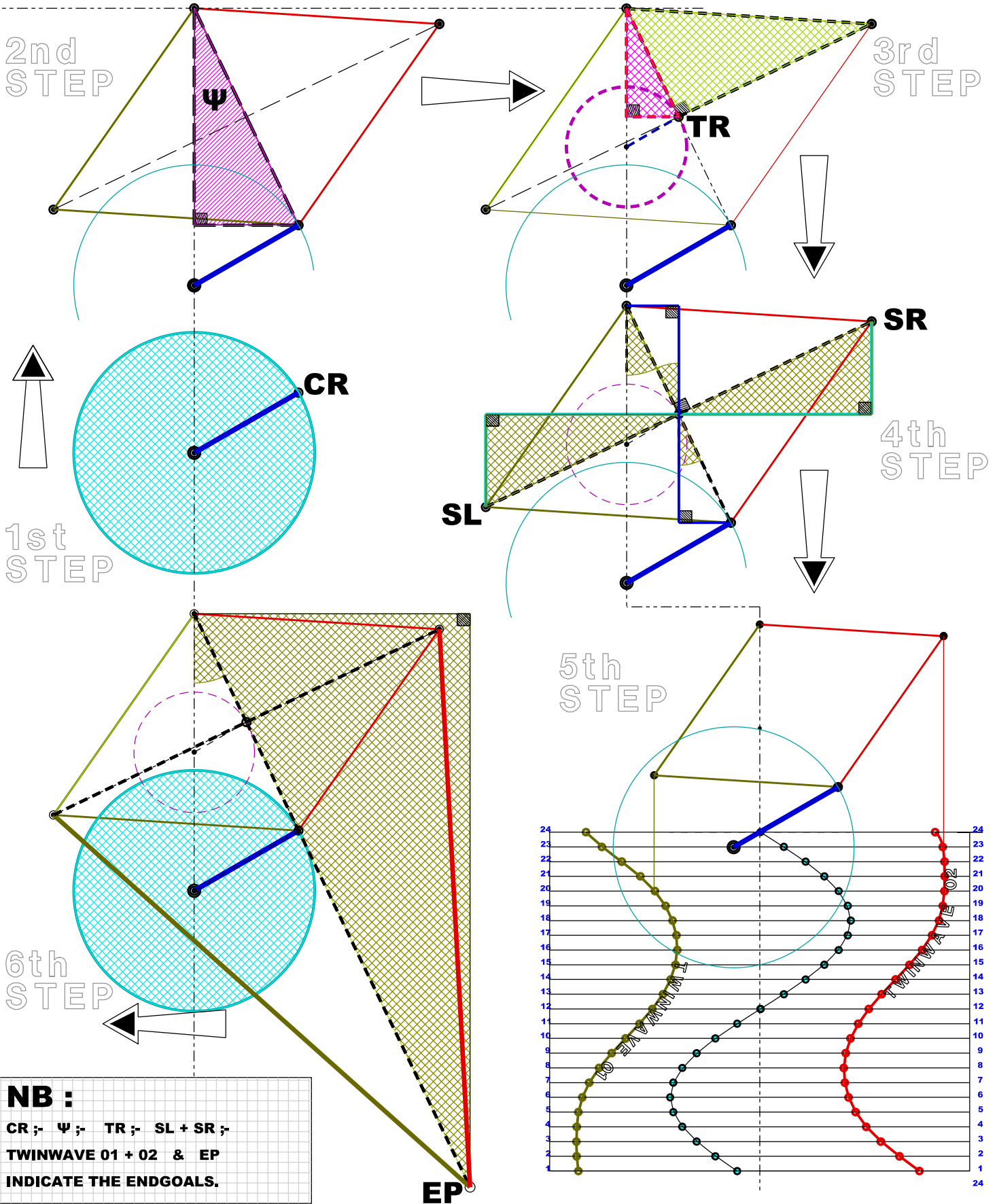
ULTIMATE PURPOSE : TO GET Dist 2
 $\text{Dist } 2 = (\sqrt{R_{big}^2 - W^2}) + C3$

($xE(i\%)$: $yE(i\%)$)

Now that we got the xE + yE Co-ords we go to a Summation page on as a 7th step. That will conclude the EB formula.

0 **The EB 1/24th TWINWAVE as a Mechanical Discovery** **m**
This is the EB Calculation 7th breakup page.
The goal here is to show the EB formula's in a single glance as a series of Pythagoras + Trigonometry application to Triangles.

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Now that we got the xE+yE Co-ords :- this Summation page is a 7th step. This then conclude the EB formula.