Notes:

1. Calculations are based on parallel shafts. If using tapered wood shafts then the dynamic arrow spine will be slightly weaker and the FOC will be slightly higher. Subtract 2# from the arrows dynamic spine number and add 1.5% to the FOC number shown.
2. A heavy arrow crown/cresting or thick crown wrap will slightly increase the dynamic arrow spine so add the appropriate weight along with the nock weight in box ❾.
3. If using multiple or extra heavy string silencers on your bow then the required dynamic arrow spine will be slightly reduced. Subtract 2# from the bows required dynamic spine number.
4. Fine tuning tips:

   Once the arrow dynamic matches the requirement of the bow (approx within 2#) then fine tuning can be accomplished in a couple ways:

   A. Brace Height:
      - If the arrow is slightly weak (lower dynamic spine) for what the bow needs, then lower the brace height.
      - If the arrow is slightly stiff (higher dynamic spine) for what the bow needs, then raise the brace height.

   B. Shelf Cut:
      - If the arrow is slightly weak (lower dynamic spine) for what the bow needs, then build out the strike plate slightly. Amount required can be estimated by changing the "Shelf Cut" number in the Bow Input section to match the weaker spine.

Instructions for use

1. Enter Bow Information:

❶ Rated Weight

Enter the rated weight of your bow in pounds. *Ex: **45#** @ 28"*

Note: It is always wise to confirm the actual draw weight using as the bow makers marking are sometimes off.

❷ Rated Draw

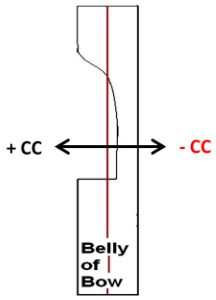
Enter the draw length in inches at which the bow is rated. *Ex: 45# @ **28"***

❸ Your Draw

Enter your own actual draw length in inches. Don't assume that you draw a standard 28". Have a friend mark an arrow at the front of your bow hand when at full draw and at your correct anchor. Your draw length is from that mark to the bottom of the arrow nock groove where the string touches.

❹ Shelf Location

Select from the drop down menu the amount of center cut of your bows riser window. Use the actual measurement of your actual bow to the surface of the strike plate where the arrow rests. *Ex: Reference the attached sketch to the right.*
True center cut is = 0. Plus +1/8" would be less than center cut (strike plate surface is outside of string centerline), and
***-1/8"** would be more then center cut (strike plate surface is inside of the string centerline).*
Most recurves are center cut or more, most long bows are slightly less than center cut.



❺ String Material

Select from the drop down menu the type of string material that is being used.

Results:

After each cell (❶ to ❺) has been entered the recommended arrow dynamic spine for your bow will be displayed. This spine is theoretically correct for that bow set-up and only minor tuning (see notes above) should be required to achieve good arrow flight. This assumes a good form and release. (*Ex: A poor release or "plucking" will require a weaker dynamically spined arrow to compensate for the exaggerated string deflection.*)

2. Enter Arrow Information:

❻ Arrow Shaft Size

Select from the drop down menu the arrow size that will be used. The menu contains most popular Easton XX75/78 series and X7 series arrows. There are also a few popular carbon arrow shafts listed. If you are using a carbon or an aluminum size not shown, then choose "Other" and enter the actual shafts static spine and weight (GPI) in the two boxes directly below. If you are using a wood shaft select the "Wood Shaft" option ans enter the static spine and shaft weight (GPI).

NOTE:

1. The static spine must be per the AMO standard (2# @ 26" centers). *Most carbon and aluminum arrow manufactures do not report spine in this way.*
   If the spine is reported using 1.94# @ 28" centers then divide that number by 0.825 to get the AMO spine.
   A static spine converter is included and is useful if the specific shafts deflection is known.
2. The weight should be entered in grains per inch (GPI) of the bare shaft. If a weight tube that runs the entire length of the shaft is being used them make sure to combine it's GPI with that of the shaft itself. This will affect the dynamic spine of the arrow.

❼ BOP Length

Enter the Back Of Point shaft length. This is the length from the back of the point (BOP) to the bottom of the arrow nock groove where the string touches.

❽ Point Weight

Enter the point weight that will be used. Remember to also take into account any weights that are added behind the point including the insert used with aluminum and carbon shafts. *Ex: 5/16" aluminum insert weighs ~16 grains, a 11/32" aluminum insert weighs ~ 30 grains. CE 150 insert weighs 11 grains .*

❾ Extra Nock End Weight

If extra weight is added at the rear of the arrow then fill in the appropriate number in grains. The weight of the nock and/or nock insert should be added to ensure an accurate total arrow weight. *Ex: A 11/32" Bohning Classic Nock weighs 13.5 grains. A CE Nock weighs 9.8 grains.*

❿ Fletching

Select from the drop down menu the type of fletching that will be used. The calculations assume a three fletch with either 5" feathers or 4" vanes.

Results:

Total Weight

The assembled arrow final weight is automatically calculated and displayed in this box. Aluminum and carbon weights will be very accurate. Wood arrow finishes are not accounted for due the variability of types and application techniques. If desired, this additional weight should be added to the total for wood shafts (*A typical wood arrow finish runs about 10 grains*) or be included in the wood shafts GPI weight.

F.O.C. % (Forward of Center)

This is the measure of how far forward from the center of the shaft is the balance point. A minimum amount of approximately 5% is necessary to ensure stable arrow flight. Too much F.O.C. will result in a trajectory that has too much ark and will limit effective cast. Recommendations are:

- For 3D / Target shooting try to remain in the range of 8% - 12%. This will ensure stability while maintaining a flat trajectory.
- For Field / Hunting try to remain in the range of 10% - 20%. The effect on trajectory at normal hunting distances will be minimal and the chance of arrow deflection if contacting leaves or small branches will be minimized. Penetration may also be improved with a higher F.O.C.

3. Compare Dynamic Spines:

Compare the dynamic spine required by the bow setup to the one calculated for the specific arrow parameters entered (two black boxes). These numbers should be as close as possible to ensure that fine tuning can be successfully accomplished with brace height and minor shelf adjustments (see notes above). If the two numbers are more than ~2# apart then modify the arrow design inputs in order to reduce the variation. The arrow point weight and shaft length are generally the most feasible and effective to modify.