

Basics

Quick History



Leonardo of Pisa was known as the “greatest European mathematician of the middle ages”. He was born in Italy in about 1175 AD (not to be confused with Leonardo da Vinci, who lived about 200 years *after* the death of Leonardo of Pisa).

He was known by a handful of names, one of which is “Fibonacci”. Some think this name came from shortening of the Latin “filius Bonacci”, used in the title of his book “Liber Abaci”.

We shall just call him *Fibonacci*, as do most modern authors, but if you are looking him up in older books, be prepared to see any of the above variations of his name.

Fibonacci had many accomplishments, including being one of the first people to introduce the Hindu-Arabic number system to Europe, the positional system we use today, based on ten digits with its decimal point and a symbol for zero (1 2 3 4 5 6 7 8 9 0). However, we will focus on his accomplishments as they pertain to what we are interested in... trading!

Fibonacci Numbers

In Fibonacci’s *Liber Abaci* book, chapter 12, he introduces the following problem (here in Sigler’s translation – see below):

How Many Pairs of Rabbits Are Created by One Pair in One Year?

A certain man had one pair of rabbits together in a certain enclosed place, and one wishes to know how many are created from the pair in one year when it is the nature of them in a single month to bear another pair, and in the second month those born to bear also.

He then goes on to solve and explain the solution:

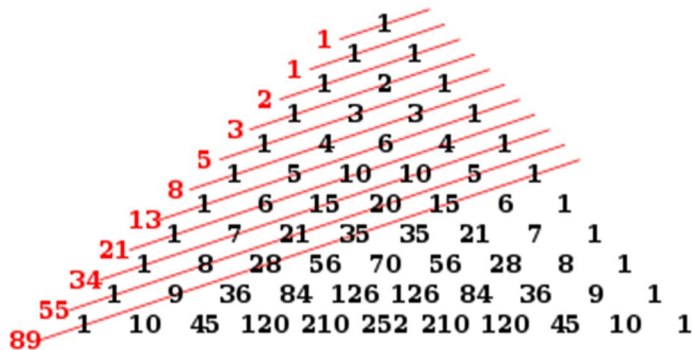
Because the above written pair in the first month bore, you will double it; there will be two pairs in one month. One of these, namely the first, bears in the second month, and thus there are in the second month 3 pairs; of these in one month two are pregnant and in the third month 2 pairs of rabbits are born, and thus there are 5 pairs in the month;

...

there will be 144 pairs in this [the tenth] month; to these are added again the 89 pairs that are born in the eleventh month; there will be 233 pairs in this month. To these are still added the 144 pairs that are born in the last month; there will be 377 pairs, and this many pairs are produced from the abovementioned pair in the mentioned place at the end of the one year.

Ultimately, this leads up to the “Fibonacci Series”: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, etc. where each number is the sum of the two numbers that precede it. History is blurry on whether Fibonacci actually invented this problem or series (history points to Indian mathematics). In any case, it now bears his name.

This Fibonacci series is also illustrated in Pascal's Triangle.

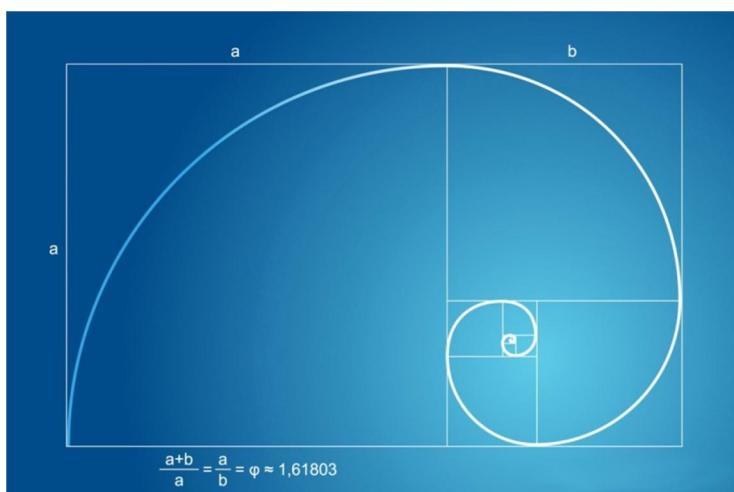


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Why is this Number Series Important?



As these numbers grow in size, the relation of any pair of numbers gets closer and closer to the “golden ratio” (also known as the “golden mean”), which is 1.61803399... In other words, to go forward in the sequence, you multiply the number by 1.618. To go backwards, you multiply by 0.618.

For example, in the series:

... 55, 89, **144**, 233, 377...

$$144 * 1.618 = 233$$

$$144 * 0.618 = 89$$

Primary Ratios:

1.618 = The Golden Ratio

0.618 = Inverse of 1.618 ($1/1.618$)

These ratios are found in nature, the human body, plants, DNA, the solar system, art, architecture, music, and even the stock market!

From this one number, 1.618, we can derive various other important numbers.

Primary Derived Ratios:

0.786 = Square root of 0.618

0.886 = Square root of 0.786

1.130 = Inverse of 0.886 ($1/0.886$)

1.272 = Square root of 1.618 (or the inverse of 0.786 ($1/0.786$))

Complementary Derived Ratios:

0.382 = 0.618^2 (or $1 - 0.618$)

1.414 = Square root of 2.0

2.000 = Square root of 4.0 (or $1+1$)

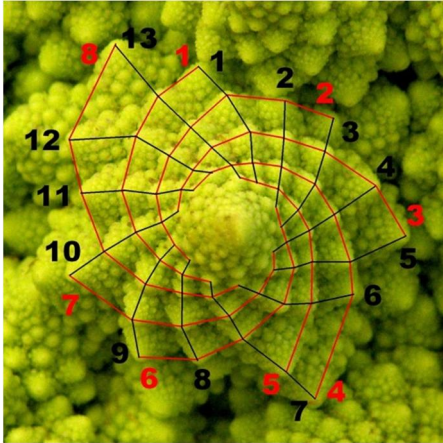
2.236 = Square root of 5.0

2.618 = 1.618^2

Let's also not forget the series generated by repeatedly multiplying 1.618... 2.618, 4.235, 6.854, 11.09, 17.94, 29.03, 46.97...

Next, we take a look at the harmonic patterns. You will quickly notice that the above ratios make up most every ratio of every pattern! Coincidence?

Patterns



Here, we'll go into the descriptions of the various harmonic patterns we look for on our charts.

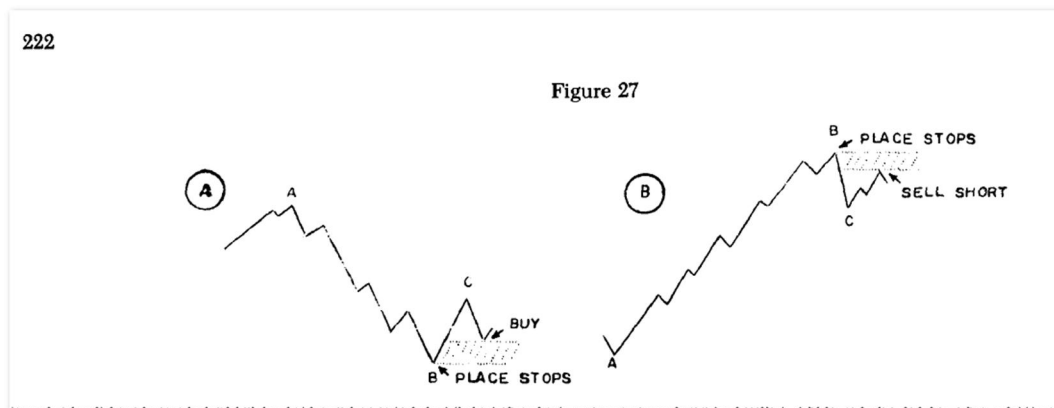


For easy reference, [click here](#) for a harmonic pattern “cheat sheet” you can easily print!

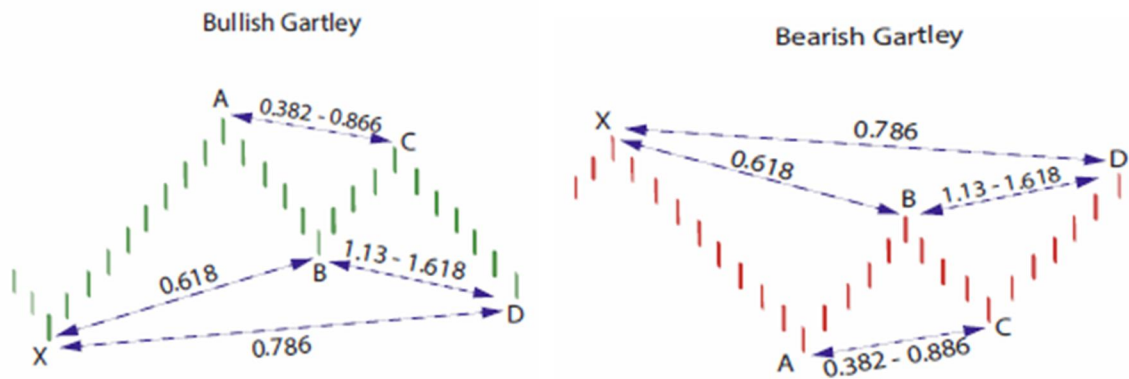
Gartley

The *Gartley* pattern was outlined by H.M. Gartley in his book *Profits in the Stock Market*, published in 1935. Although the pattern is named “The Gartley,” the book did not discuss specific Fibonacci retracements!

The pattern is also known as Gartley 222, in reference to the page number the discussion of the pattern occurred.

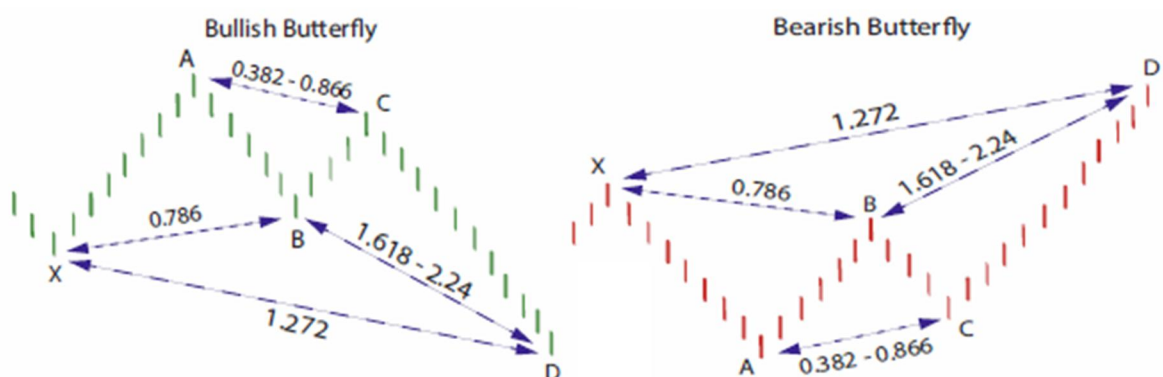


It was not until "The Harmonic Trader" by Scott Carney was released that the specific retracements of the B point at a 0.618 and the D point at a 0.786 were assigned to the pattern. There are others who have assigned Fibonacci retracements to this framework. However, they use a variety of Fibonacci numbers at the B and D points. Despite these variations, the Fibonacci retracements that yield the most reliable reversals are the 0.618 at the B point and the 0.786 at the D point. Furthermore, the pattern should possess a distinct AB=CD pattern that converges in the same area as the 0.786 XA retracement and the BC projection (either 1.27 or 1.618). The most critical aspect of the Gartley is the B point retracement, which must be at a 0.618 of the XA leg.



Butterfly

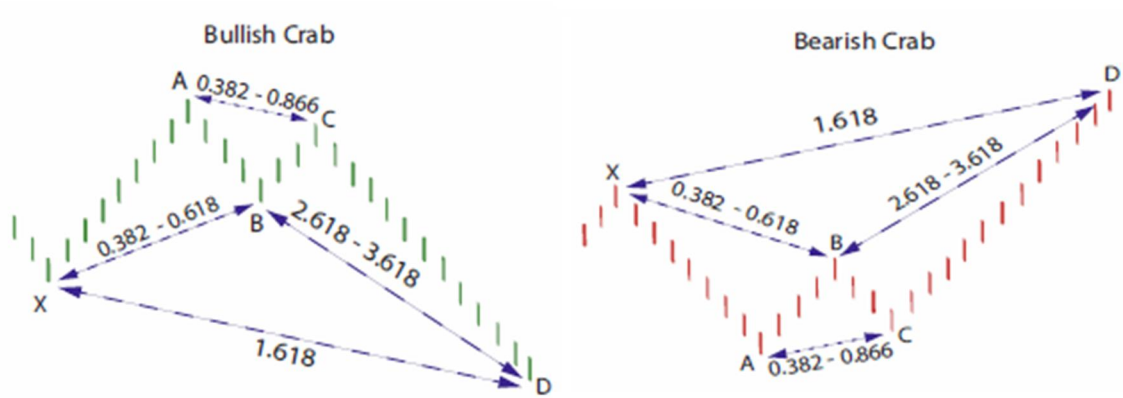
The structure of the *Butterfly* pattern was discovered by Bryce Gilmore. The Butterfly pattern must include an AB=CD pattern to be a valid signal. Frequently, the AB=CD pattern will possess an extended CD leg that is 1.27 or 1.618 of the AB leg. Although this is an important requirement for a valid trade signal, the most critical number in the pattern is the 1.27 XA leg. The XA calculation is usually complemented by an extreme (2.00, 2.24, 2.618) BC projection. These numbers create a specific D point that can yield powerful reversals, especially when the pattern is in all-time (new highs/new lows) price levels.



Crab

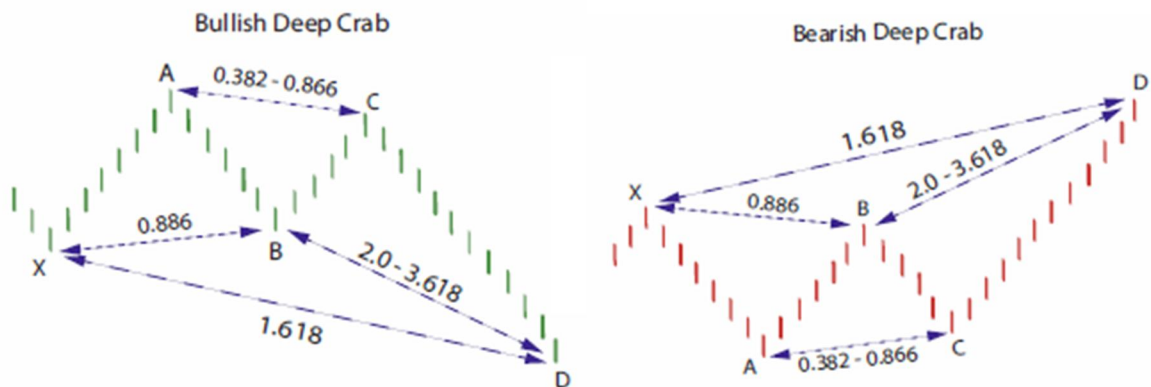
The *Crab* is a Harmonic pattern discovered by Scott Carney in 2001. The critical aspect of this pattern is the tight D point created by the 1.618 of the XA leg and an extreme (2.24, 2.618, 3.14, 3.618) projection of the BC leg but employs an 0.886 retracement at the B point unlike the regular version that utilizes a

0.382-0.618 at the mid-point. The pattern requires a very small stop loss and usually volatile price action in the D area.



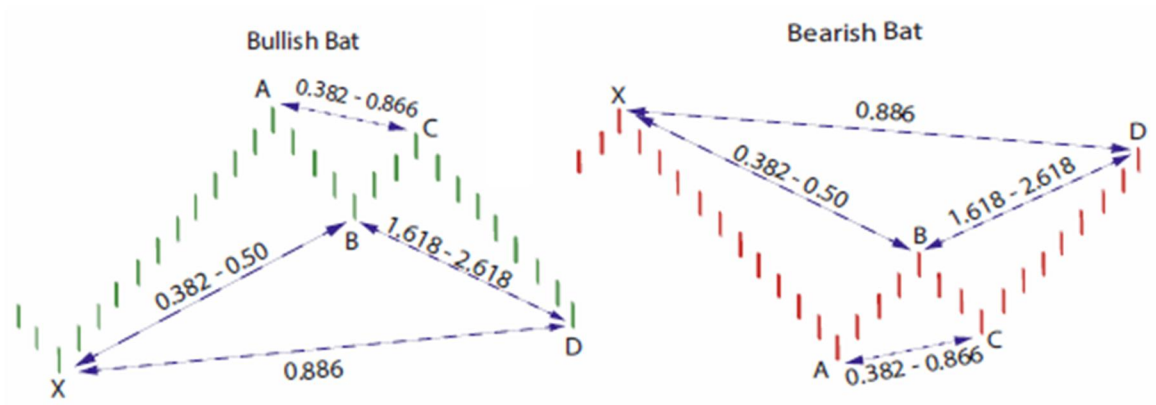
Deep Crab

The primary difference between a *Crab* and a *Deep Crab* is the retracement of point B. A *Deep Crab* has a much *deeper* retracement, yet keeps the same 1.618 projection of the XA leg to point D, which allows it to keep the same “Crab” name.



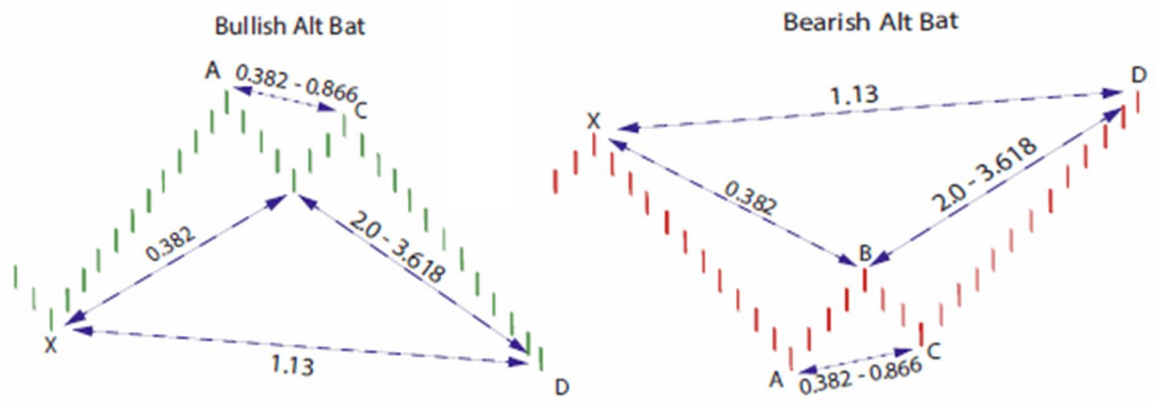
Bat

The *Bat* pattern is a precise harmonic pattern discovered by Scott Carney in 2001. The pattern incorporates the 0.886 XA retracement, as the defining element in the D area. The B point retracement must be less than a 0.618, preferably a 0.50 or 0.382 of the XA leg. The Bat utilizes a minimum 1.618 BC projection. In addition, the AB=CD pattern within the Bat is extended and usually requires a 1.27 AB=CD calculation. It is an incredibly accurate pattern and requires a smaller stop loss than most patterns.



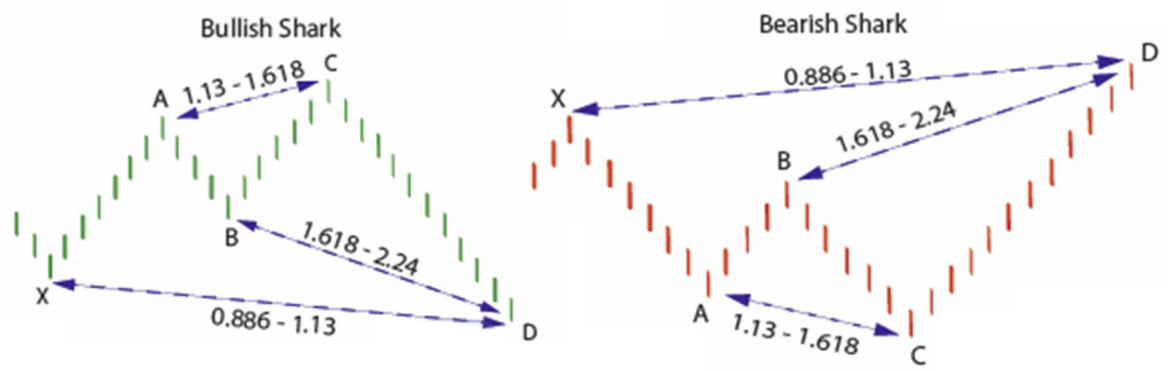
Alt Bat

The *Alternate Bat* pattern is a precise harmonic pattern discovered by Scott Carney in 2003. The pattern incorporates the 1.13 XA retracement, as the defining element in the D area. The B point retracement must be a 0.382 retracement or less of the XA leg. The Alternate Bat utilizes a minimum 2.0 BC projection. In addition, the AB=CD pattern within the Alternate Bat is always extended and usually requires a 1.618 AB=CD calculation.



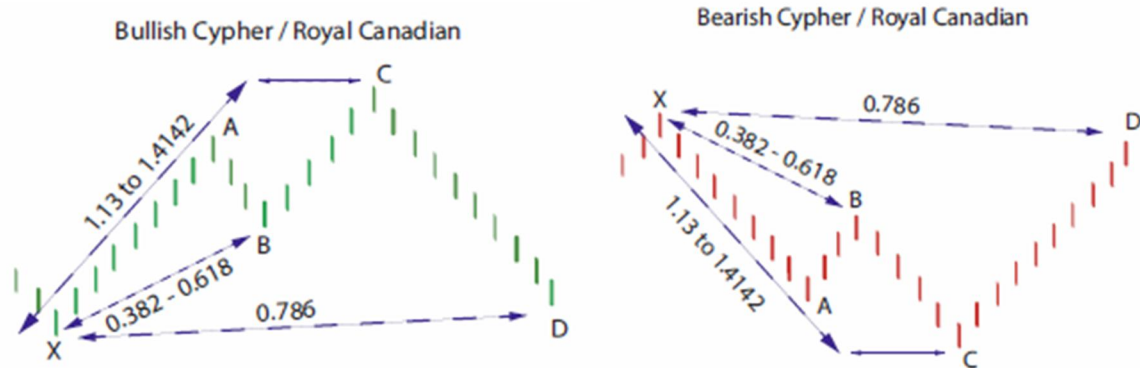
Shark

The Shark pattern is the first of our "class 2" patterns, where point C exceeds the AB leg. As you can see, the pattern is very similar to the *Bat*, except for the location of C in relation to AB.



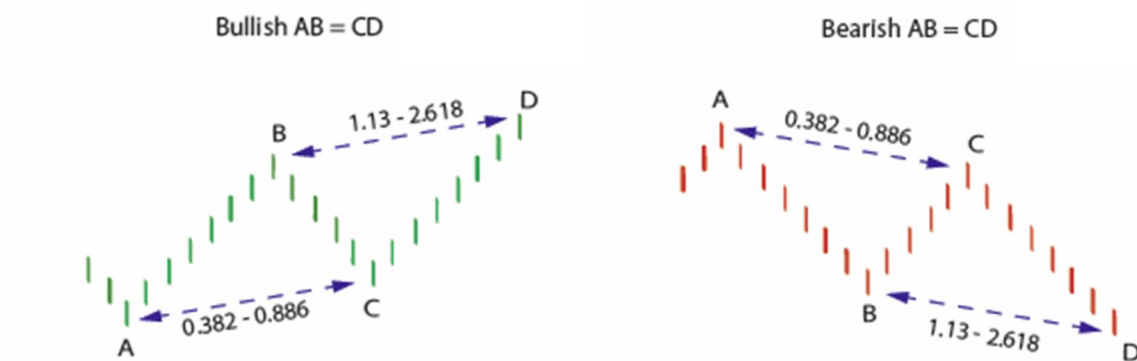
Cypher

The *Cypher* pattern is the second of our “class 2” patterns, where point C exceeds the AB leg. Other than using different ratios from the *Shark* pattern, the *Cypher* also looks for point C to be 1.13 to 1.414 projection of the XA leg, rather than the AB leg. This pattern was discovered by the team at TripleThreatTrading.com.



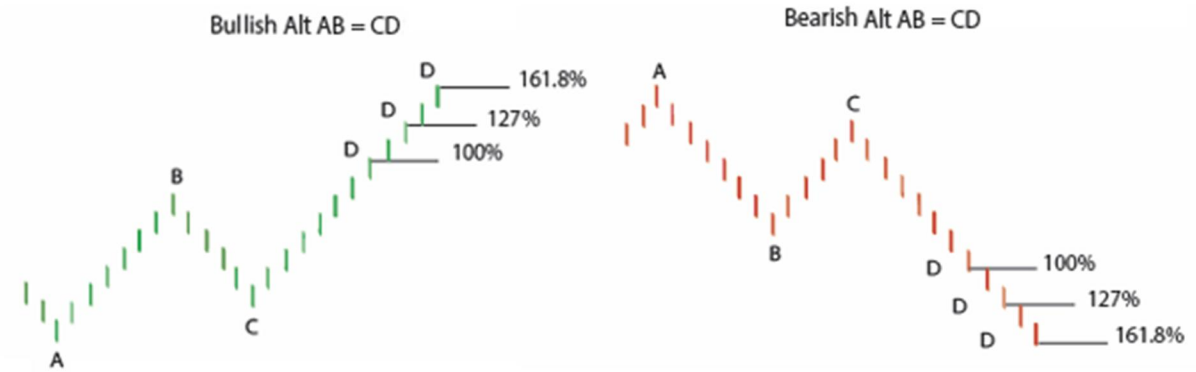
AB=CD

The *AB=CD* pattern is a price structure where each price leg is equivalent. The Fibonacci numbers in the pattern must occur at specific points. In an ideal *AB=CD*, the C point must retrace to either a 0.618 or 0.786. This retracement sets up the BC projection that should converge at the completion of the *AB=CD*.



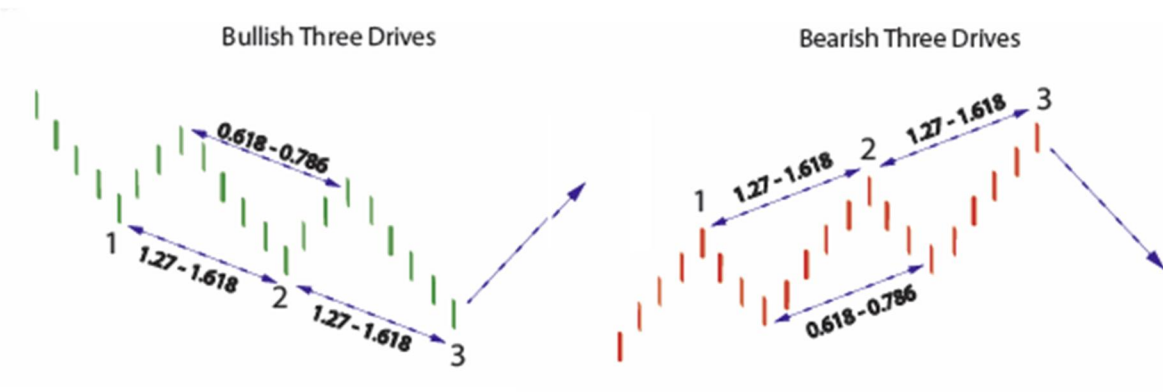
Alt AB=CD

Based on the retracement of point C, there are other extensions of the CD leg to look for. Namely, either a 1.27 or 1.618. When there is a 0.618 retracement at the C point, then look for a 1.618 BC projection. If there is a larger 0.786 retracement at the C point, then look for a 1.27 projection. The most important consideration to remember is that the BC projection should converge closely with the completion of the *AB=CD*.



Three Drive Pattern

Although it was not specifically identified, one of the first references to a *Three Drives Pattern* was outlined in Robert Prechter's book, "Elliot Wave Principle." He described the general nature of price action that possessed either a three-wave or a five-wave structure. Adapted from this principle, symmetrical price movements that possess identical Fibonacci projections in a 5-wave price structure constitute a Three Drives pattern. In "The Harmonic Trader," the pattern's importance of other larger retracements and projections improved the accuracy of the pattern in real trading situations. The book was one of the first to emphasize the critical aspect of this pattern that each drive complete precisely at consecutive harmonic ratios – either a 1.13, 1.27 or a 1.618. Also, the price legs should possess clear symmetry with each drive forming over equivalent time periods.



If you missed the link at the top, [click here](#) for a harmonic pattern "cheat sheet" you can easily print!

Next, learn how the *neoHarmonics Pattern Analyzer* can help you identify these patterns.

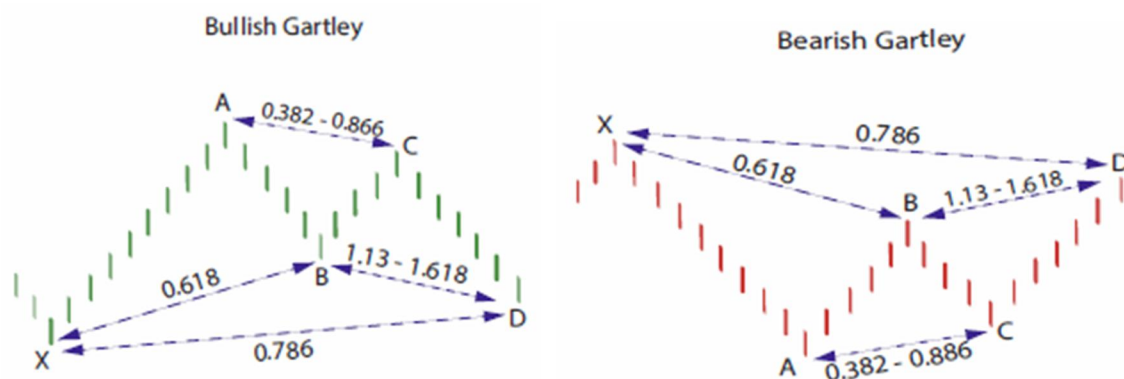
Harmonic Pattern Analyzer

Different Classes of Patterns

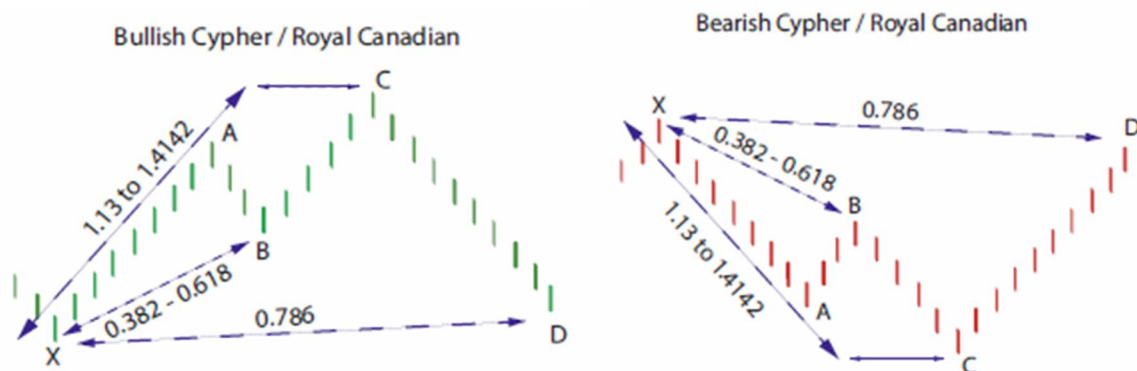
Before getting into how to use the Harmonic Pattern Analyzer (“H” on the neoHarmonics toolbar), it’s important to understand how the patterns are shaped and how we classify them into two main classes of patterns. For a list and overview of the patterns, please visit our [Harmonic Patterns](#) page. Once you understand what you are looking for, however, the *neoHarmonics* tools takes the details of the actual Fibonacci levels and makes them incredibly fast and simple to analyze!

The Harmonic Pattern Analyzer (“H”) puts the patterns into two main classes, one where point C exceeds point A and one where it does not. For example, the Gartley, Butterfly, Bat, Alt Bat, Crab, and Deep Crab all have point C as a retracement of the A to B leg. We’ll call this “Class 1”.

To illustrate, here is a picture of a Gartley pattern. Note the position of C in relation to the A to B leg (inside the range from point A to point B). Again, think of this as “Class 1”.



What we call “Class 2” patterns are ones where point C goes *beyond* point A (either higher or lower, depending on the direction of the pattern). “Class 2” patterns are the Shark and Cypher patterns. Below is an example of a Cypher pattern (also known as the “Royal Canadian”). Note the location of C in relation to the A to B leg.



The reason we put the patterns into two classes, is you use the tool in two distinct ways depending on the class of pattern. These methods are outlined below.

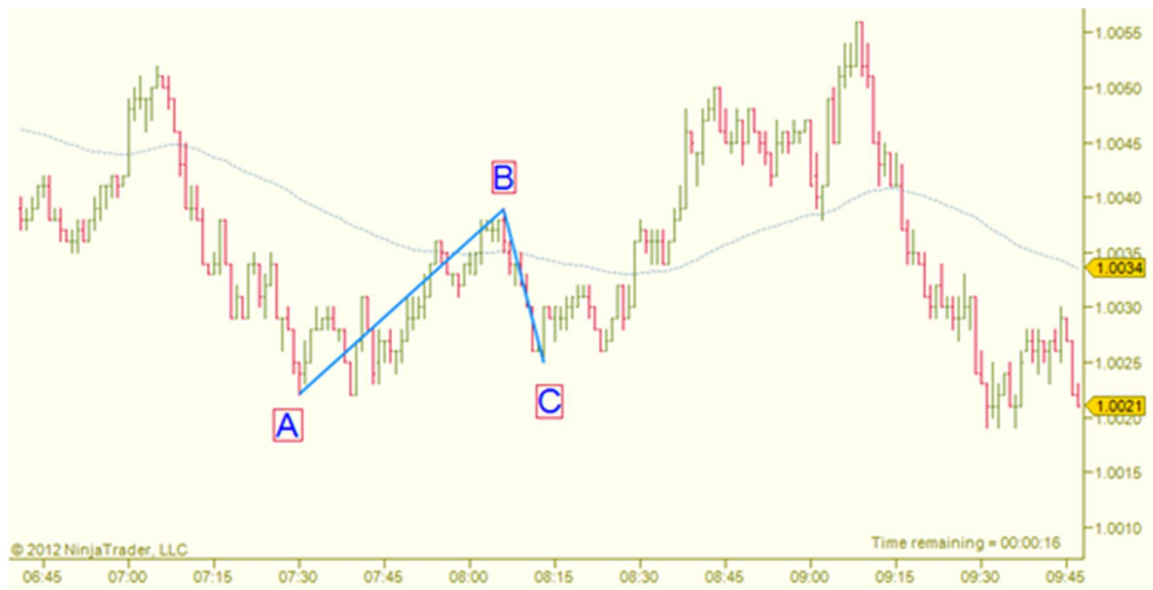
(It's important to note that the neoHarmonic tools do not automatically find patterns on a blank chart. Instead, they are drawing tools used to analyze a set of swings dictated by the user.)

H How to Use the Harmonic Pattern Analyzer (“Class 1” patterns – Gartley, Butterfly, Bat, Alt Bat, Crab, and Deep Crab)

Step 1, Look for ABC:

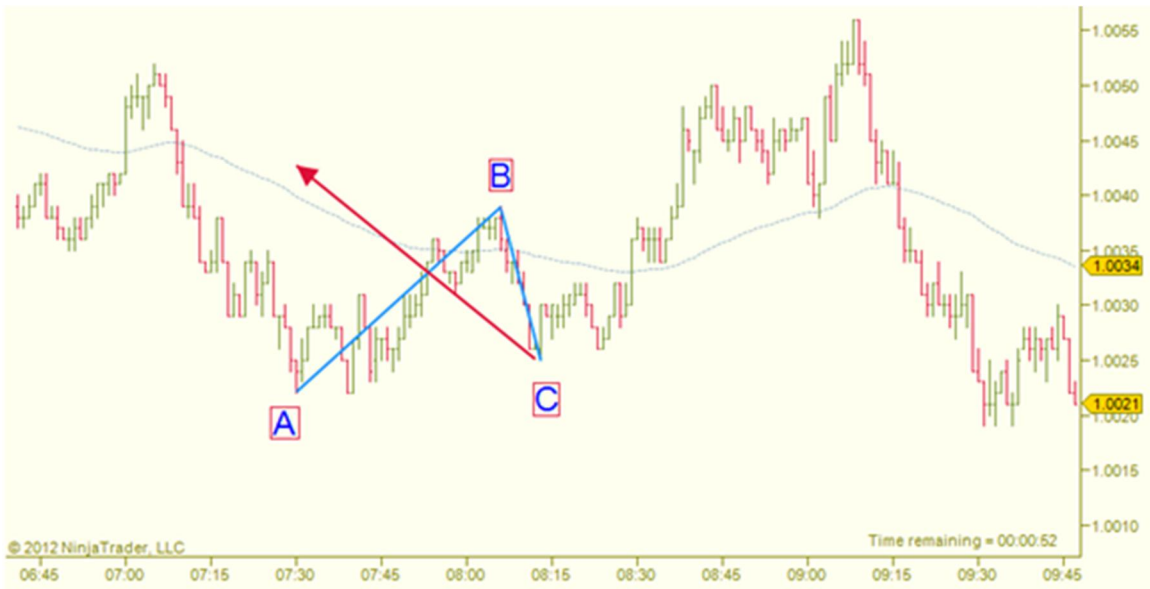
After a significant high or low is put in, visually look for the ABC portion of the pattern.

Bearish example: In this example, there is a low (point A) and a higher low (point C). This creates the ABC portion of a potential pattern (noted by the blue lines). Keeping this A, B, C move in mind, continue to step 2.



Step 2, Analyze the Pattern:

If this market continues to rally from point C, where may it terminate and start going down? Using the tool, drag from the low at point C to the left of point A (as illustrated by the red arrow in the chart below). Knowing where you expect points A, B, and C to fall (from step 1, above), it's important to drag X to the left of point A to make sure the tool correctly identifies points A, B, and C. Also, it's important to note that if point C is a “low”, then point X will be a “high” point above point B (and vice versa). Continue to step 3 for a screenshot of the tool finding these swings.

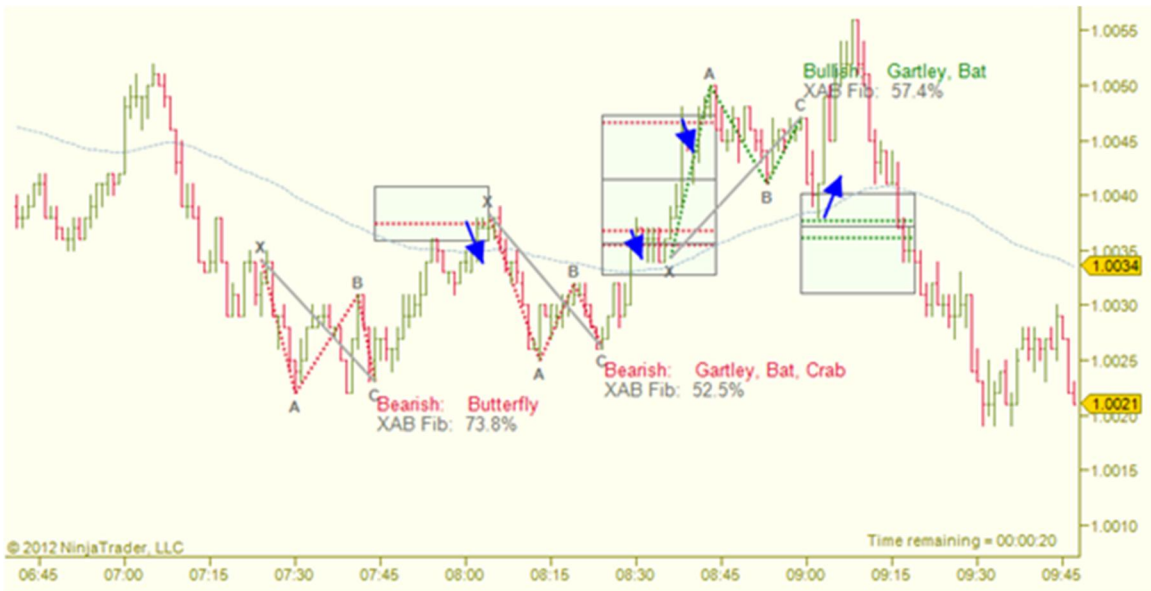


Step 3, Choose Point X:

Below is the tool in action. After you click on point C, drag to where you want point “X” to be (see section on “Finding X” for detailed examples). In this example, using the price that the “Suggested X” gives (indicated by the little blue arrow (blue line added for explanation purposes)). In the screenshot, the gray line between C and X is the line you actually draw, the tool will add the connecting lines, the labels, and the target area for D. This example finds a “Deep Crab” pattern and outputs the target area for D with a rectangle and a dotted line within the rectangle. The price of this dotted line is what you want to pay the most attention to! As you can see, there was a lot of resistance at this area (indicated by the dark blue arrows).



Once you get good at seeing this initial “ABC” pattern, you still start seeing them everywhere! The chart below is the same chart as above, but looking at the minor swings. There are more, but for sake of clutter and readability, only three are drawn.



Bullish example: A high is put in, then a lower high is put in (noted by the blue lines). Where may this fall reverse?



Drawing from “point C” to point X, we see a “suggested X” price (noted by the little, blue arrow (blue line added for explanation purposes)). Using this price as X (making sure X is to the left of A), we get a target area with two overlapping patterns (a Butterfly and a Deep Crab). Paying the most attention to these horizontal, dotted lines in the rectangle, this gave a great entry area for the long. (In this example, the two dotted lines are only 8 pips apart.)



On the same chart, another long presented itself earlier (chart below). They're everywhere!



H Using the Harmonic Pattern Analyzer ("Class 2" patterns – Shark and Cypher)

Step 1, Look for ABC:

After a significant high or low is put in, visually look for the ABC portion of the pattern. In this case, we look for a lower high leading into a new high.



Step 2, Analyze the Pattern:

Analyzing this class of pattern is slightly different than the “class 1” patterns. Instead of drawing the tool from point C and going left, you go from point A and go right (as indicated by the red arrow on the chart below). Make sure you drag to the right of “C” to allow the tool to correctly identify the A,B,C points. Also, it’s important to note that if point A is a “high” point, then point X will be a “low” point below point B (and vice versa). See step 3 for a screenshot of the tool finding these swings.



Step 3, Choose Point X:

This method may seem a little awkward at first, but once you understand what it’s doing, it’s very simple. As you drag downward, point X is chosen to the left of A at the same price that you drag down to. In the screenshot, the gray line originating at point A and sloping down to the right is the line you actually draw, the tool will add the connecting lines, the labels, and the potential reversal zone (point D). In this example,

it found a potential Cypher pattern and the support area this pattern creates. Note, this class of pattern does not have a “suggested X” feature and typically a major swing is the best choice for point X.

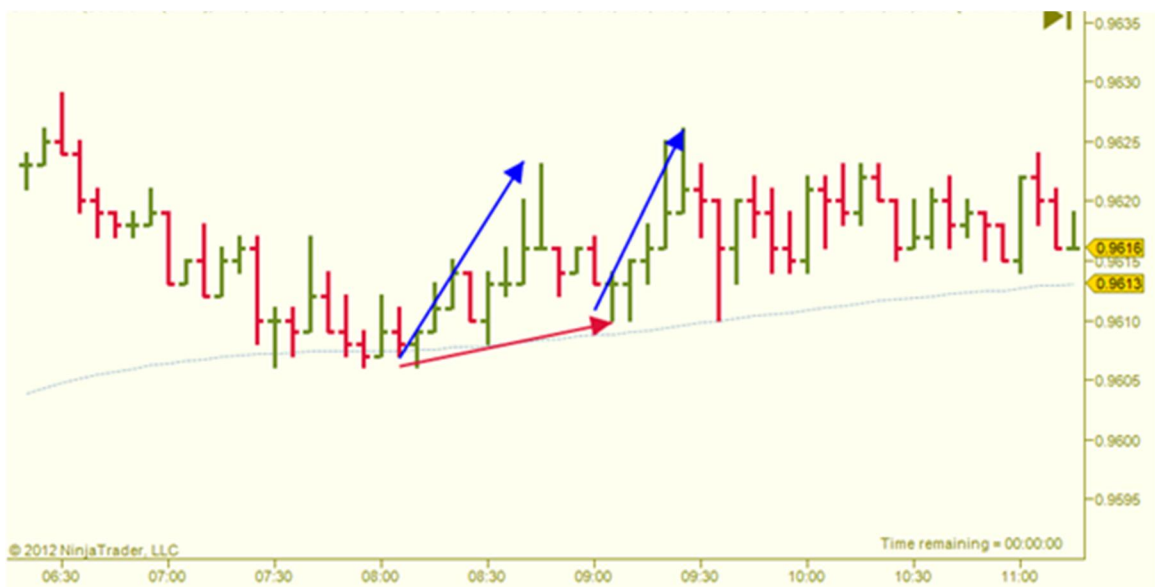


⊖ Using the AB=CD Tool (Symmetry)

AB=CD

This tool is a great way of analyzing symmetrical moves. In other words, looking at the range of one swing and giving potential targets of the next swing in the same direction.

In this example, if you want to analyze the relationship between the swings indicated by the two blue arrows, you use the AB=CD tool and draw where the red arrow is indicated (from low of the swing to the low of the swing).



When using this tool, you will always draw from a low point to a low point or a high point to a high point. This equates to drawing from point A to point C. At this point, the tool will automatically find point B, then project the range of the AB leg from point C to give you point D.

Here is the result of using the tool in the above example. As you can see, the swing from A to B is equal to the swing from C to D ($AB=CD$). Symmetry!



Here is another example where $AB=CD$ to the downside. In this example, you draw a line from the high of A to the high of C and the labels and lines are all drawn for you.



Alt $AB=CD$

Often the market swings move in a fib relationship to the AB leg, thus there is an option to include the major fib levels to this CD line (named "Alt Levels" in the parameters). Those levels are 0.618, 1.272, and 1.618.

As you can see, when the “alt levels” are enabled, additional lines are drawn on the CD leg of the tool. In this example, the market found support on the 0.618 of the range of the AB leg (see blue arrow).

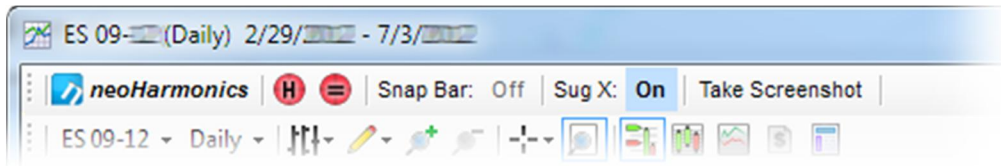


Here is an example of the market going to the 1.618 extension (red arrow). Another way to think of this is 161.8% of the AB leg, projected from point C. As you can see, there was a reaction at the “D” point (100% of AB), as well (blue arrow).



Screenshot Tool

Since collaboration is an underappreciated aspect to trading, we felt it was important to include a quick and easy way to share your charts with others.



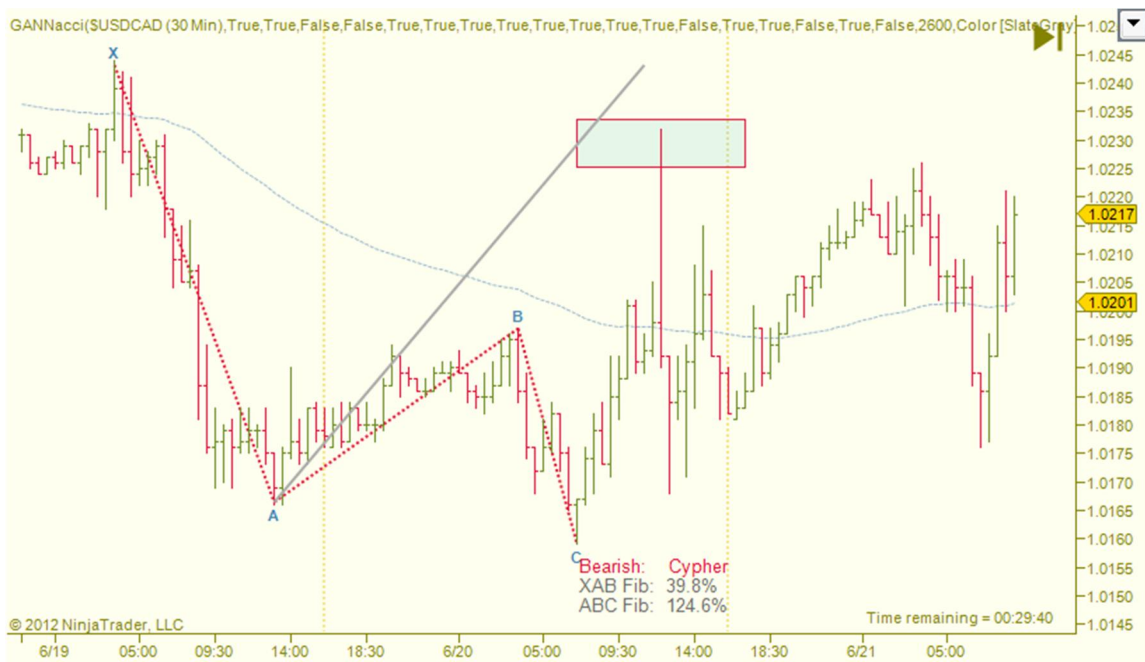
On the toolbar is a button to “Take Screenshot”. When you click this button, it will grab a screenshot of your chart, upload it to an image sharing site, determine the URL of your image, and then put that URL in your clipboard; ready to be pasted. All in one click!

You can, optionally, have the tool automatically prefix the instrument and time frame of your chart to the URL as well.

Here is an example of what is put into the clipboard after “Take Screenshot” is clicked:

USDCAD (30 Min): <http://i.imgur.com/iX4AD.png>

...which links to the chart below...



Custom Intervals

Bonus Feature!

One of the missing features within NinjaTrader is the ability to add intervals (time frames) to the interval drop down on each chart. As a bonus feature, the *neoHarmonics* toolkit allows you to add any supported interval to this list.

In the *neoHarmonics* parameters, there is a parameter to specify a list of custom time frames (delimited by commas). *Note, built-in intervals cannot be removed at this time.*

For more information on the built-in NinjaTrader intervals and suffixes, please see [How to Change a Data Series](#).

Below is an example of custom time frames added to the interval drop down. You can even include a symbol with the interval!

