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Understanding Gann Price and Time Cycle

365 days is an important cycle of one year. In a circle there are 360 degrees which very nearly correspond to this cycle. In other words, one day is equal to one degree of the circle that the earth makes around the sun. Hence the significance of the important divisions of the circle (into angles) on the chart. **These angles are 45, 90, 120, 135, 180, 225, 240, 270, 315 and 360.**

Dividing a line parallel to the 90 degree division of the circle we get a square. Divisions of this square gives important angles on the charts.

There are two kinds of cycles:

- Time cycle or natural cycles and
- Cycles derived from the significant prices.

And these cycles will have important divisions on 1/8, 1/4, 1/3, 3/8, 1/2, 5/8, 2/3, 3/4 and 7/8. Thus the 30 year time cycle will be divided into important probable turning points as follows:

1/8 – 3.75 years
1/4 – 7.5 years
1/3 – 10 years and so on.

The significant time cycle/squares are Square of 52 on weekly charts.
Use it on important high/low as well as on those points which start a 90 day cycle. Also two squares or a cycle of two years can be used. Inner squares (squares formed within the square) and outer squares (squares of the same size placed adjacent or diagonal to the square) should also be seen when price moves into the same. Square of 90 is also important – in the same manner as square of 52 on weekly charts and monthly charts.

Square of 144 is the most important square for use on monthly charts. These cycles have influence on price in terms of absolute numbers in addition to the time cycles they signify. It means that a movement of 144 point in a stock is important by itself.

Weekly and monthly time cycles are the most important cycles.
The cycles derived from prices are based on High, Low and Range (i.e. difference between high and low). The most powerful is the square of the range. **The absolute number at high, low or that of range is assumed to be forming a time cycle with so many days, weeks or months. In other words, a high at 60 means a time cycle of 60 days/weeks/months.**
For the below points visualize using gann box it will be easy to understand.
Thus a cycle derived from prices will have two axis – Vertical price axis and horizontal time axis. Significant changes can be expected at important divisions of price or time. But the most significant changes should be expected at the angles made by combining the two. These angles are made on the square of the price. Here square does not mean price raised to the power of two. This is the geometrical square where the length of one side is equal to the price. The square is drawn down from high and up from low. The square of range can be made down from top or up from low. In a square of high at say 60, drawn on daily graph will have its corners at the following four points – 1) at the price (at 60) 2) at the price (at 60) 60 days away in future i.e. 60 on price axis 60 days to the right on the time axis from the day on which the price has reached 60. 3) at zero on price axis just below the high and 4) at zero 60 days to the right of point 3.

If the price moves down one point each day the price will reach to the point 4, i.e. 0 on the 60th day. This action is called **squaring off of the price.** The angle of fall will be 45% on the square. This is also referred to as 1×1 angle i.e. fall of one unit in one day. In same fashion we can draw angle 2×1 i.e. fall of two units in one day and so on. The most significant angles are 2×1, 1×1 and 1×2. These angles are drawn from point 1, 3 and the mid-point between 1 and 3 and the mid-point on 2 and 4.
Crossing over of the angles drawn on the square are considered probable turning points. Angles from 50% mark should always be seen.

When the price breaks below 45% angle line it signifies a weak position and indicates a decline to the next angle. If it again crosses the 45% angle it is said to have regained its strength. At the crossover of these angles distance from the base i.e. the day of high/ low is important. Larger the distance, more powerful the trend is likely to be.

1/2 is the most important level. This is the centre of gravity. **If the price falls below this level and bounces back to touch this level again, on the first such occasion it is good set up to shortsell. If the price comes to 50% of high and 50% in time, it may be a high probability buy which may result in 3 months fast move up on the weekly chart.**
The third time against any support or resistance zone is the dangerous time. The 1st, 2nd, 3rd, 4th, 7th, 9th and 12th squares are the significant squares of lows but all should be monitored. (i.e. the price levels at 2,3,4,7,9,12 times the low).

Gann trend following techniques

http://www.brameshtechanalysis.com/2015/01/gann-trend-following-techniques/

Trend and trend following techniques: In fast advancing markets, in the last stage of the campaign, reactions get smaller as stocks work to higher level, until the final run has ended. Then comes a sharp reaction and a reversal in the trend. Same happens in the bear market. Once you are convinced that a trend is in force, do not wait too long to go with the trade. Early in the trend buy/sell a stock which is already strong/weak.

- Fast moves generally come from bear market bottoms.
- These moves usually run three weeks up, then move sideways three to five more weeks, and then accelerate followed by another sideways movement.
- Under fast moves the first signal to trend change is overbalance i.e. reaction gets larger compared to the earlier ones, specially in the fifth wave. Watch the changes in momentum of price – is the market/stock gaining less points in more time? If the market is trending up, then it should go up more time than it goes down. And vice versa.

Any reversal pattern should be seen in conjunction with the time cycles. Do not pay attention to the financial press.

Use simple trading filter of not entering the market on the third day of the move.

The Cycle of years : Seasonality
Watch for significant days in solar year – Dec. 22, March 21, June 22, Sep 21/23 etc. and days on important angles from these days e.g. 15 days from Dec. 22 i.e. Jan 5-6, Feb 5, May 6, July 7, August 8 etc.
Important count of days: Significant changes in trend may take place on the following days from the significant highs/ lows – 30, 45, 60, 90, 135, 150, 180, 210, 225, 315, 330 and 360.
These are calendar day counts: Trading day counts are 11, 22, 33, 45, 56, 67, 78, 90, 101, 112, 123, 135, 146, 157, 168 and 180. True understanding of cycles are obtained from the calendar days.
Important count of weeks: 13, 26, 39, 45, 52, 78.   7 week period is considered as death zone.
Important count of months – 6, 12, 144.

In the short term, watch 3.5 day i.e. the 3rd / 4th day from the important top / bottom for change in minor trend. It may become a beginning of a major trend.
Reactions will often last for two or three weeks. Therefore watch 14th day and 21st day along with the 7th day from the important top/ bottom. Out of these 14th is the most significant and 21 the next. (Note that 14 is very close to 13 and 21 is Fibonacci number itself).
1/16 of the year is 23 days. Watch for this too.
Square of 7, 49 is very important for change in trend.
Watch for a change after 42 days (2×21), but the change may not occur until 45th-46th day. (I have noticed that on many charts of A group stocks 42 day or near about fixed time cycles are important. These numbers, very close to each other, gives some flexibility in analysis, Fibonacci numbers plus minus a few days).
On yearly charts, 90 year, 60 year, 30 year, 20 year, 10 year, 7 years and their multiples and 5 year cycles are important to watch especially the simultaneous end/ beginning of these cycles.

1/3 years from any top/bottom when combines with 1/2 or 1/4 years from any other top/bottom becomes very important. 1/2 of the year is the very important – same as the half of the range/high. Anniversaries, however are the most important. 39 weeks and 17 weeks and 35 weeks are also important.

Techniques in Market Timing - Price Time Squaring

In this article I will discuss a technical analysis technique used for forecasting a change in market trend called Price/Time Squaring. It is a technique that many associate with the late great W. D. Gann.

The idea here is to start from a major market top or bottom price and to calculate its 'square'. At first glance you might think this means to simply square the price by multiplying it with itself. Close, but not exactly.

First, to solve for the 'time' itself, you would actually take the 'square root' of the starting price. Take for example the weekly chart of Soybeans. Week of December 5, 2008 put in a major market bottom. Using the low of that week (my charts are reverse-adjusted, so your price may differ somewhat) at 626, you take the square root to arrive at 25.02. Because the result is just above 25, it is now inside the 26th square. To understand this, think of the first square to be from 0 to .99. The second square would then begin at 1 to 1.99, etc.

Starting from the December 5, 2008 weekly price bar as bar zero, you start to count 26 price bars to the right. We arrive at June 5, 2009, which turned out to be one weekly price bar from the major top of week June 12, 2009. In the world of market timing, getting to within a single price bar of a major market trend change is quite the edge to have.

Another misconception that some have is that when you are calculating for Price/Time that when 'time' arrives the 'price' would be at exactly square of the original price. In reality, however, while this may occur at times it is not what should be expected. Rather, when 'time' nears the trader should then be looking at price to reach one of the 'square' levels for which there will be more than one.

Techniques in Market Timing - Price Time Squaring I

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Price and Time Decision Points the W. D. Gann Way

W. D. Gann was an incredible chartist and trader back in the early part of the 20th Century. One of the most powerful technical analysis methods he shared in the works he left behind was the application of 'percentage movements'.

Gann believed (and has demonstrated) that important price levels could be determined by dividing ranges by 8 as well as 3. He then pointed out that these divisional price points had different levels of importance.

For example, dividing a range by 8 you would end up with percentage levels of 12.5, 25, 37.5, 50, 62.5, 75 and 87.5. And of course there is 100%, although focus is on the divisions of the complete 100% range.

First level of importance is generally considered the 50% level. After that would be 33.3 and 66.66 (thirds).

These levels could be determined on a market that is correcting (moving back within the price range the divisions are derived from) in order to try and determine price levels that might stop the correction, or they could be added to the end of the price range to determine levels of extension (beyond the range).

For the first example, say price moves up from a bottom at 100 and stops at 200, then starts down again. The range equals 100 points, so the support levels would be 200 (the top of the range) minus 12.5 (187.50), 25 (175), 37.5 (162.5) and so-forth.

For the second example using the same range as the previous example, the extended price levels would be 200 (again the top of the range) plus 12.5 (212.5), 25 (225)...50 (250) and so-forth. And of course you would do the same with the levels calculated from thirds.

These levels act as price decision points, where the technical analyst and trader would then have to further determine if price is likely to make bottom or top at that level. While price often forms bottoms and tops at one of these levels, knowing which one requires more than just noticing a pause in price action at that level.

Thus, W. D. Gann also expressed how these percentage calculations can be applied to TIME. For example, if the range from 100 to 200 took 28 days to complete, that gives a range in TIME as well.

With your range in time, best divided in quarters (25, 50, 75, 100) and thirds (33.33, 66.66) and the result added to the last day of that range, you get points in time where you would look to see if price is also at one of the support or resistance levels you calculated from price.

This is just one of the many valuable methods taught by W. D. Gann that every technical trader should know and put into practice.

The DYNAMIC FAN LINES Calculator

https://www.amazingaccuracy.com/tradingcalculators/index.php
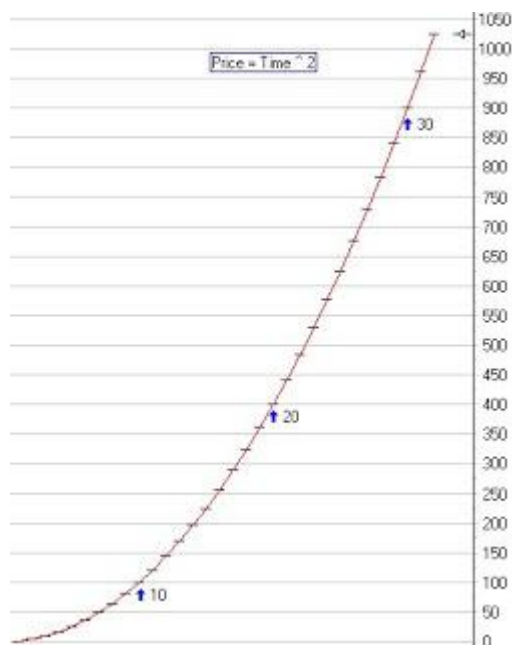
Time and Price

By Howard Arrington

William D. Gann (1878-1955) was a legendary trader who designed several unique techniques for analyzing price charts. He developed a unique combination of precise mathematical and geometric principles which are not easy to grasp. Gann analysts have spent years pouring over old charts and writings in search of Gann's secret, and there is no end to the number of people who claim to have discovered Gann's insight and technique that has eluded everyone else. Perhaps someone has discovered it. I am not in a position to appraise all the claims because I am not a Gann expert and have not read Gann's writings.

Don Hall has published a book and developed a system called Pyrapoint which seems to me to be well founded in Gann principles. The purpose of this article is to take one idea used in Don's work, and present it from a different approach, and yet arrive at the same useful conclusion. I hope even Don will fi nd my article to be an original insight to substantiate the validity of his work.

Gann's geometric angles are trend lines drawn from prominent tops or bottoms at certain angles. The most important angle is 45 degrees, which means the line's slope is one unit of price per unit of time. (Note: Depending of the chart scale used, the line may or may not appear to be plotted at a 45 degree angle.) For years, I thought this is what Gann analysts meant by the phrase 'squaring time and price.' However, Don's Pyrapoint method gave me a new insight, which is:
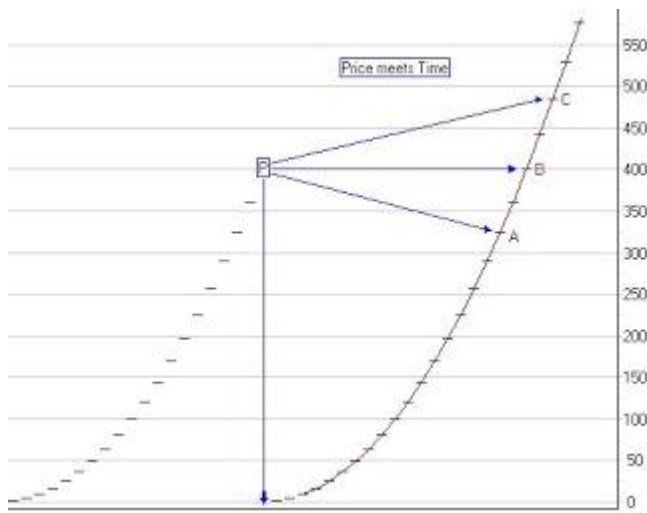Price = Time squared or $P = t^2$

Let me take this mathematical relationship and develop it in this article. The above relationship between price and time can be plotted on a chart as shown in this illustration. The time values of 10, 20, and 30 are marked by the three arrows. See Figure 1.

For the sake of illustration, let's suppose a prominent top or bottom occurs at a price of 400. The theory is that this signifi cant point has a mathematical counterpart. Start a new time curve at this point in time, and it will give us an expectation for a future top or bottom to occur on this curve. This principle can be stated as 'When price meets time, a change is imminent.' This 'price meets time' relationship is shown in the following chart. See Figure

2.

With the prominent top or bottom at P, if price meets the curve at point A it will do so in 18 bars. The time to A is the square root of the price at A. Price at A is 324. Square root of 324 is 18.
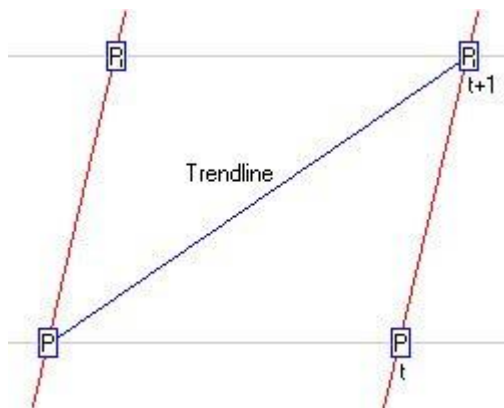
If price meets the curve at point B, it will do so in 20 bars. The time to B is the square root of the price at B. Price at B is 400, therefore the time to B is 20 bars.

If price meets the curve at point C, it will do so in 22 bars. This is a very interesting concept!

Remember that price and time are related by the formula:
$P = t \wedge 2$ or $t = sqrt(P)$

In this article, I will develop the mathematics for the slope of a trend line using the price and time relationship presented in the previous article. Let's work with the model illustrated in this See Figure 3.

From the previous article, the next time curve will be t bars away for a given price P. At a time t+1 price would meet the curve at price P1. Now, lets solve for the slope of the trend line shown in blue which connects P and P1.

$P = t \wedge 2$

$P1 = (t + 1) \wedge 2 = t \wedge 2 + 2 t + 1 = P + 2 t + 1$

Slope = (Change in price) / (Change in time)

Change in price = P1 - P = P + 2 t + 1 - P = 2 t + 1 = 2 t + 2 - 1 = 2 [t + 1] -1

Change in time = t + 1

Therefore, slope of P to P1 is = (2 [t + 1] - 1) / (t+1) = 2 − 1 / (t+1) = 2 - 1 / sqrt(P1)

If we normalize all prices to consider three signifi cant digits, then all prices will fall in the range of [100 ... 1000]. By substituting the price boundaries into the slope formula, we can get a range of slopes as follows.

For a P1 of 100, the slope of the up trend line to 100 = 2 - 1 / 10 = 1.9
For a P1 of 1000, the slope of the up trend line to 1000 = 2 - 1 / 100 = 1.99
The slope of the up trend line at the midpoint of this price range is 2 - 1 / sqrt(500) = 1.96

Let's call this trend line a 45 degree line because we developed the slope using one unit of price change from P to P1 with one unit of time t. For this 45 degree line, the slope is basically 2. I think this is strong justifi cation as to why Gann used 2 cents as the price grid interval of his daily grain charts. Such a scale layout would naturally give Gann 45 degree angles with a slope of 2 cents per daily bar. I have shown that 2 is the slope of the upward 45 degree trend line that develops from the price and time relationship given by the formula: P = t ^ 2.

One can solve for the slope of the downward trend line from P1 to P to obtain this result:

Slope of P1 to P = (-2 t - 1) / (t-1) = (-2 [t - 1] - 3) / (t-1) = -2 - 3 / (t-1) = -2 – 3 / (sqrt(P) - 1)

For a P of 100, the slope of the down trend line to 100 = -2 - 3/9 = -2.33

For a P of 1000, the slope of the down trend line to 1000 = -2 - 3/99 = -2.03

Again, the slope of the down trend line approaches a value of -2. Therefore, -2 is a good approximation for the slope of a downward 45 degree trend line.
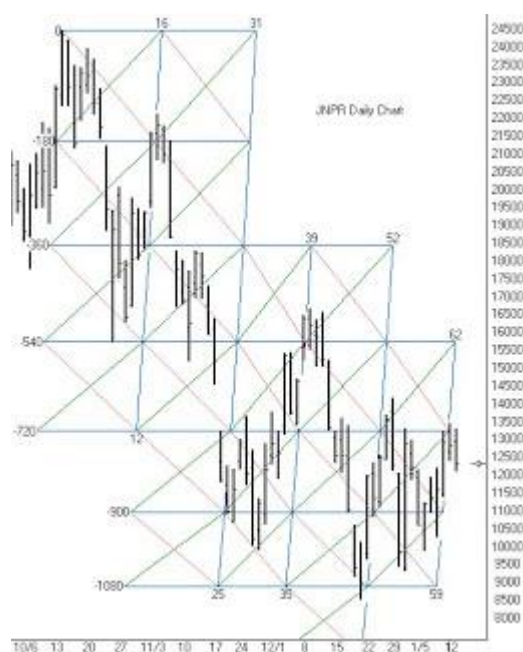
Now I would not bother to give you the mathematics in the previous two articles if I did not fi nd application of this theory in the charts. I used the mathematics given in the fi rst two articles to develop a tool in ESPL which draws horizontal lines at calculated price levels, and nearly vertical time curves at the calculated time intervals. This forms a grid of trapezoids like the previous illustration. (Don Hall calls them 'squares'.)

Diagonal lines connect the corners of the trapezoids to give support and resistance trend lines.
Here is a daily chart of JNPR with the construction started on the highest high. All price levels, time intervals, and trend lines are constructed mathematically from two pieces of information: the price $244.50 on the date 10-16-2000.

There is more in this chart than I have space to explain. But, I can point out some haracteristics. The horizontal price lines have a label on the left which is a degree of rotation around a Square of 9. This is covered in the Pyrapoint book, but is beyond the scope of this article. Note that in my example, the time lines are nearly vertical. This is a slight variation from the method of construction in the Pyrapoint book which shows vertical lines. I feel that my presentation is appropriate because of the theory of the time curve illustrated in my fi rst article. The time curve forms the left and right sides of the trapezoid, and the price levels form the top and bottom sides.

Time: Time is measured by the time curve, which is related to price.

Tip: 'As price meets time, a change is imminent.'

Note the first time line labeled 12 on the bottom and 16 on the top.

If price meets time at the -720 horizontal, then the time for the change would be the 12th bar from the top.

If price meets time at the -540 horizontal, then the time for the change would be the 13th bar from the top. At the -360 horizontal, the time change would be in the 14th bar. At the -180 horizontal, the time change would be in the 15th bar. At the 0 line, the time measured would be 16 bars.

That is why the top of the time line is labeled with a 16, and the bottom of the line is labeled with a 12. Starting at 16, for each 180 degree down the time count is reduced by one bar, or for every 180 degree rise, the time count increases another bar. Note that the market did experience a change when price met the time curve labeled 12 to 16!

The price at the 12 to 16 time line was used to obtain a forecast of the 2nd time line, which is labeled 25 to 31. As the price meets each time curve, a new time curve is calculated based on the price. Each of the time curves shows excellent correlation with market change when price met the time line.

Prices: The prominent high of $24.50 is the calculation basis for all the horizontal price levels that are shown.

Tip: The market seeks out these price levels, and you can calculate these prices in advance. Note how the market fell to the -540 horizontal, rallied to the -180 horizontal, fell to the -900 level, rallied to the -540 level, fell to the -1080 level, and rallied to the -720 level.

Trend Lines: The downward 45 degree trend lines shown in red create a flow channel, or 'price highway' as Don calls it.

The upward 45 degree trend lines shown in green create a price highway going the other direction.

The red lines are resistance lines that the market must close above to change direction from bearish to bullish.

The green lines are support lines that the market must close below to change direction from bullish to bearish.

We all have used upward trend lines placed underneath action lows to indicate support, and downward trend lines placed above action highs to indicate resistance. The beauty of this tool is that these diagonal trend lines are computed in advance, and the market seems to have respect for them. Price fl ows up and down the channels. The more you study the example, the more impressed I think you will be with this tool.

The Pyrapoint tool can also be applied to intra-day charts with good success. The size of the price interval used on a daily chart seems to be too big for use on an intra-day chart. No problem. Don points out that there are squares within a square. All one needs to do is subdivided the price interval into halves, fourths, or eighths. The time interval is determined from price and will not change.
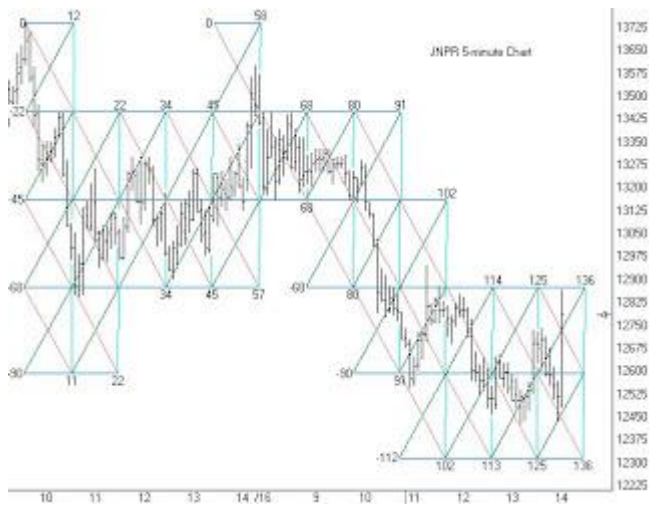
One question that I have dealt with is this: If the time interval computes to be 11 bars because the price is at 121, which intra-day bar time frame should I use? If 1-minute bars are used, then we have a time curve 11 minutes later. If 2-minute bars are used, then the time curve would be 22 minutes later. If 5-minute bars are used, then the time curve is plotted 55 minutes later. Now do you see why I have a question? The selection of the intra-day bar time frame greatly affects the time interval measured by the next time curve.

Here is how I tackled the problem, and the proposed solution. I displayed a 1-minute chart and used a cycle tool to measure in hindsight the cycle rhythm from bottoms to bottoms, tops to tops, and/or bottoms to tops. When I found a cycle width that seems to fi t by catching multiple turning points, I note the number of minutes in the cycle. I use this formula to estimate a good intra-day time frame to use.

Intra-day Bar Time Frame = Cycle width in minutes / sqrt(P)

Example: On the JNPR 1-minute chart I found a 65 minute cycle when the price was around $133. Therefore, bar time = 65 / sqrt(133) = 5.6 minutes per bar. So, using a 6-minute chart, or possibly a 5-minute chart should show a good fi t with the Pyrapoint tool. I happened to have been following a 5-minute chart, and I do fi nd excellent correlation.

I have used a smaller price interval by subdividing the 180 degree interval into eighths in this example. See Figure 5.

JNPR 5-minute Chart

Please study the chart, and observe the fl ow of prices in the up and down trend channels. Note how trend changes occur on or near the vertical time curves, and how the market seeks the horizontal price levels. This entire road map is computed in advance from the prominent
top that occurred on January 12th at 9:35 a.m.

Mr. Arrington can be reached at Ensign Software, www.ensignsoftware.com. This article came from thier technical newsletter. If you are interested in the Pyrapoint System. You can purchase the Pyrapoint Book with the script and demo program on CD for just $179.95. + shipping. Call 800-288-4266 or go to www.tradersworld.com