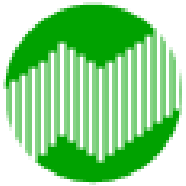


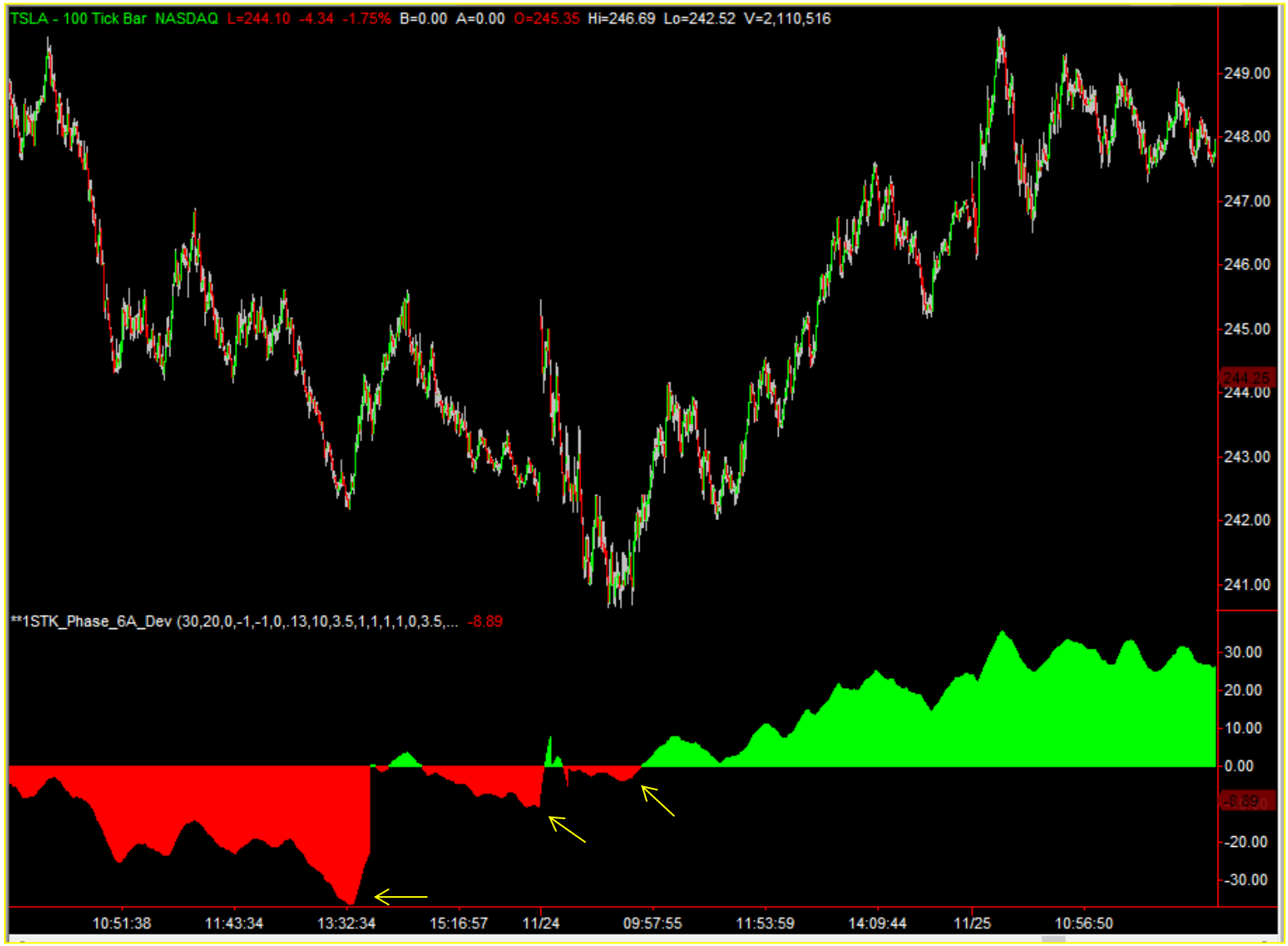
PhaseTrader® Indicators

PhaseTrader® Introduction Part I

- The Download Package
- Basic Tuning Parameters
- Single Stock Phase versus Relative Phase
- Line Break chart + PhaseTrader®

Homepage: https://phasetraderindicator.com
Registration: https://phasetraderindicator.com/product/phasetrader-indicator-subscription/

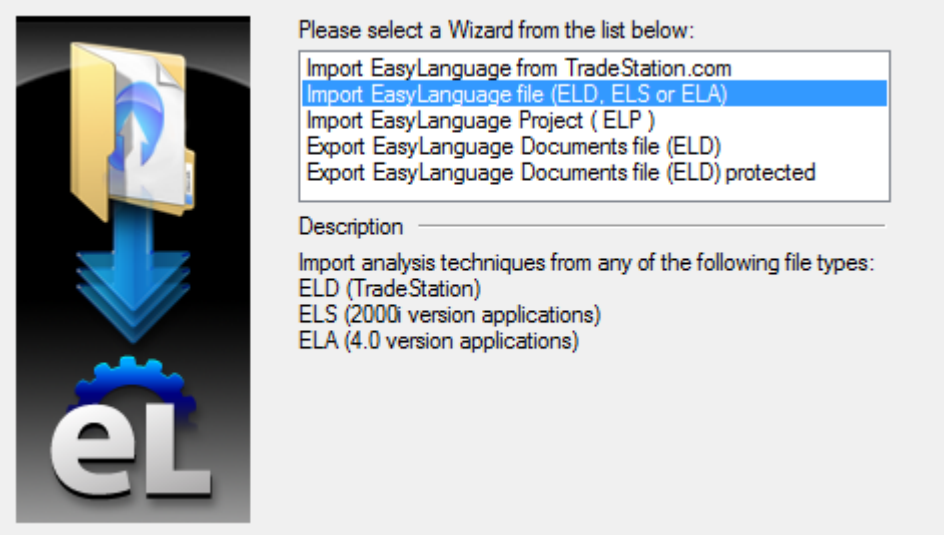
PhaseTrader® is a suite of proprietary indicators that use complex mathematical methods to track the behavior of program trading systems. The indicators decompose long run trends into smaller components with distinct starting and ending points or "phase transitions." The phases marked by these transitions grow progressively smaller as algorithmic trading systems leave the market. Traditional indicators based on price action, volume, moving average crosses, money flow, momentum, or time cannot be used to detect these changes and combinations of these indicators only add confusion. PhaseTrader® can be tuned for any timeframe that contains statistically significant trends. TSLA's mean reverting tendency is evident in this chart spanning a sharp Friday decline and a Monday morning reversal.

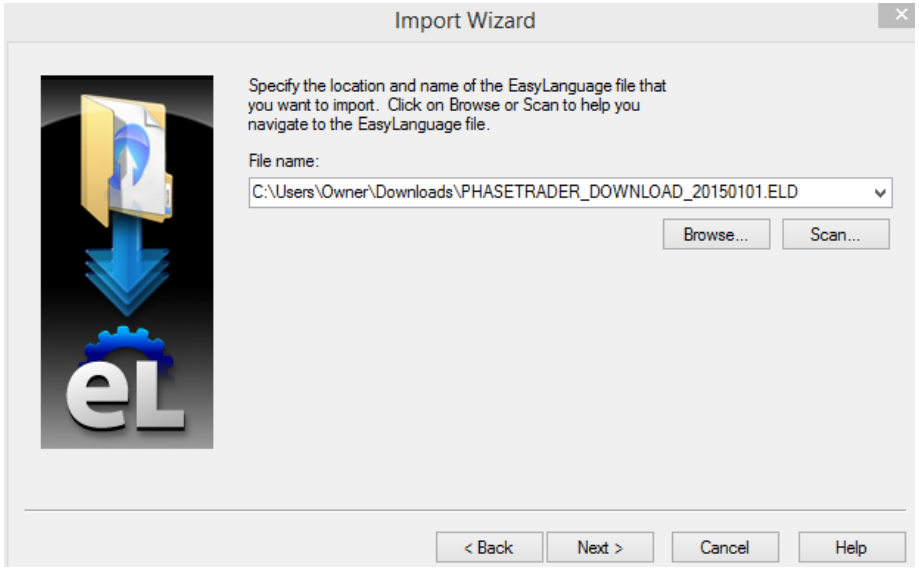


Importing the Download Package 1 of 3

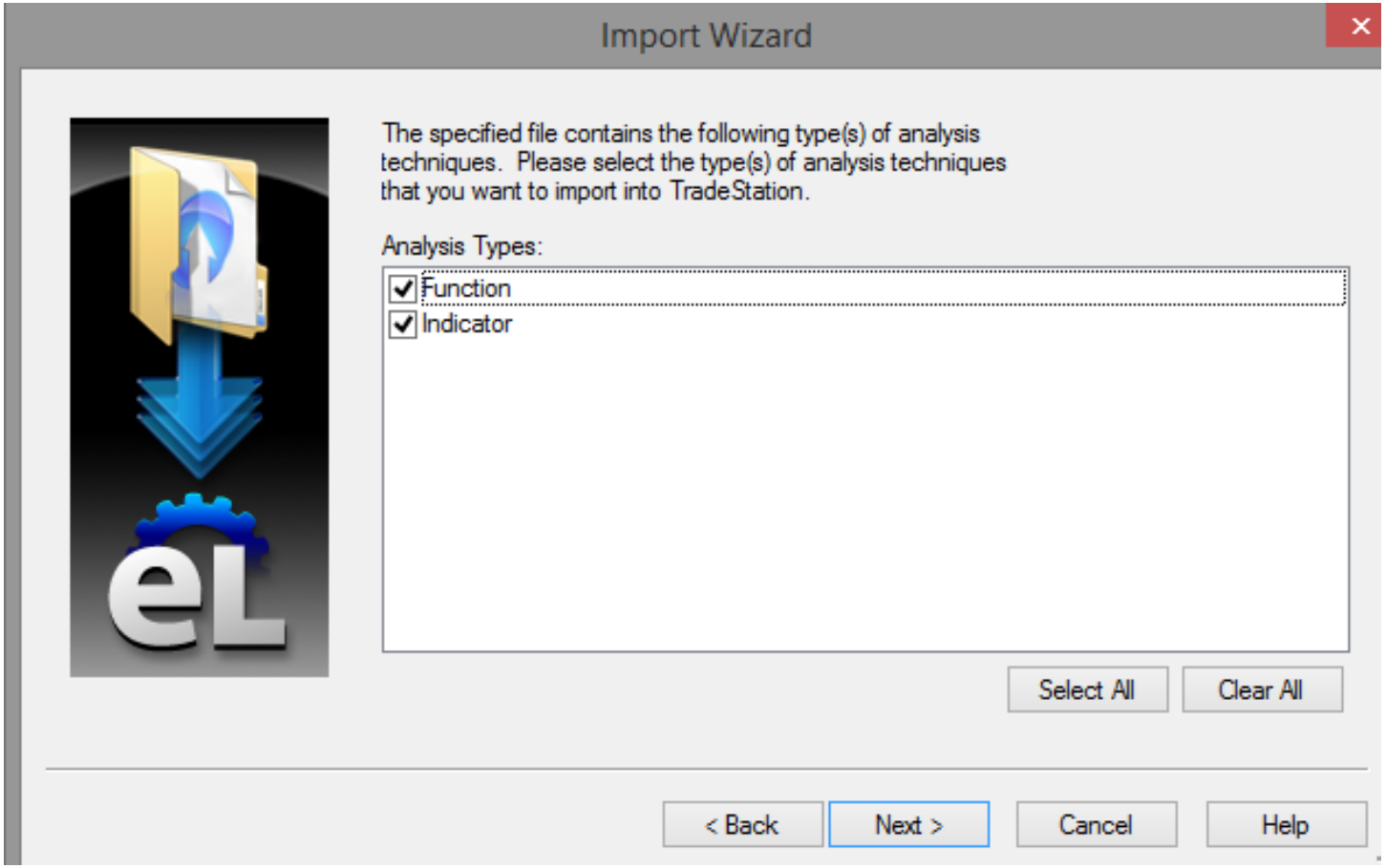
The download package contains a large number of files. Many are pre-tuned versions of the indicators that have been superseded by fully tunable versions. Two basic programs sit on top of the PhaseTrader® family of indicators – the single stock phase indicator (currently labeled FlexTune_5C) and the relative indicator (Phase_Relative) that compares the price action of one stock to another or to an index like the S&P, Dow, or Russell 2000. This presentation will focus on chart settings and tuning parameters for these indicators.

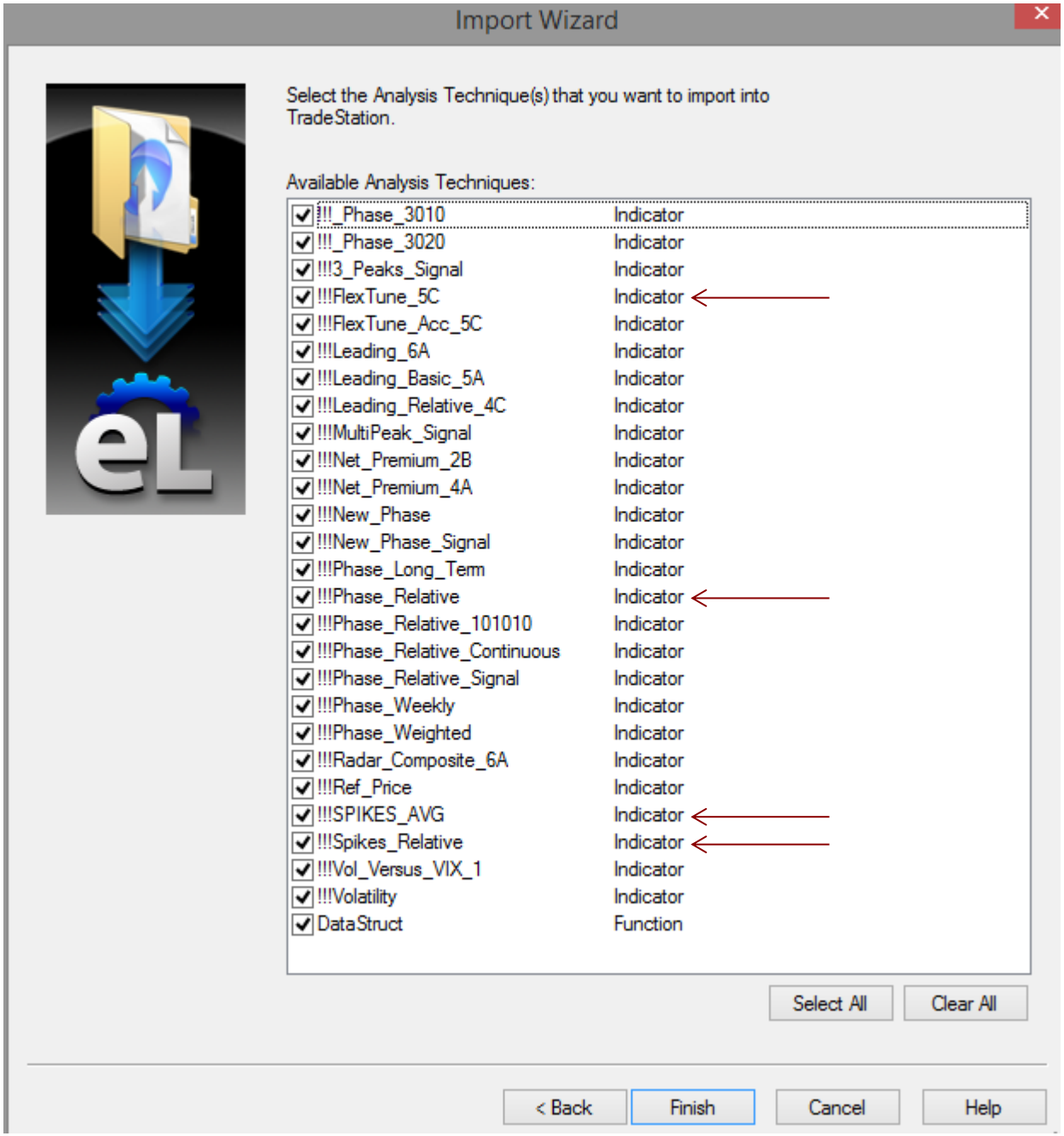
The package can be directly imported into TradeStation after it is downloaded from PhaseTraderIndicator.com. Click “File” then “Import/Export EasyLanguage” to begin. Select “Import EasyLanguage file (ELD, ELS or ELA)” from the import menu. The Import Wizard that opens has a Browse function that can be used to locate the file (usually C:\Users\Owner\Downloads\PhaseTrader_Download_yyyymmdd.ELD).





Follow the instructions clicking “Next” after each step. The Import Wizard will automatically select all functions and indicators associated with the new package.

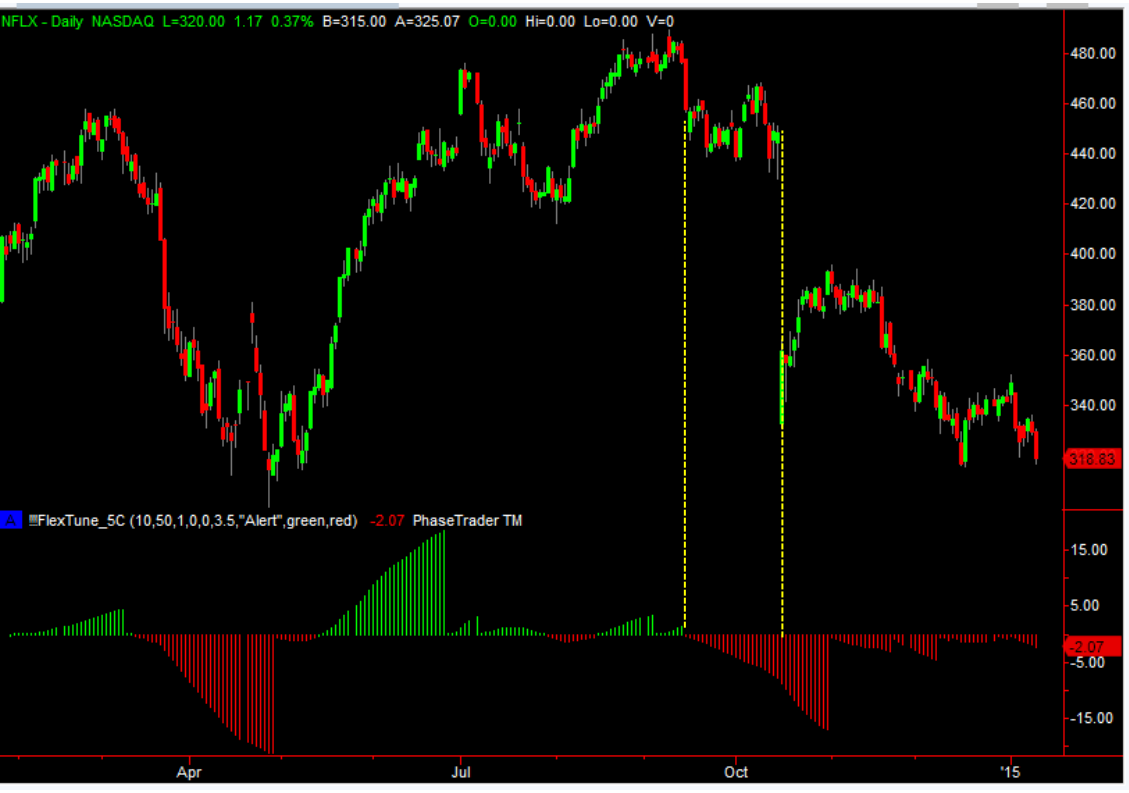




In the final step, the Wizard will display the complete list of programs. Each program is preceded by 3 exclamation marks (!!!) so they will be grouped together alphabetically near the top of the list that appears when inserting indicators into a chart.

Single and relative phase and spike programs are marked in the image on this page.

These recent Netflix daily charts span a timeframe that precedes then follows the October earnings report. Both approaches – single stock and relative – are represented and the charts confirm each other. Single stock phase reset and changed direction in early September, nearly a month ahead of earnings (left). Relative phase (right) was more revealing because NFLX underperformed the market, even when both were falling.



Relative Phase often simplifies complex situations. Single Stock Phase for Apple reveals two nearly identical rallies – late April through mid June and late October through early December.

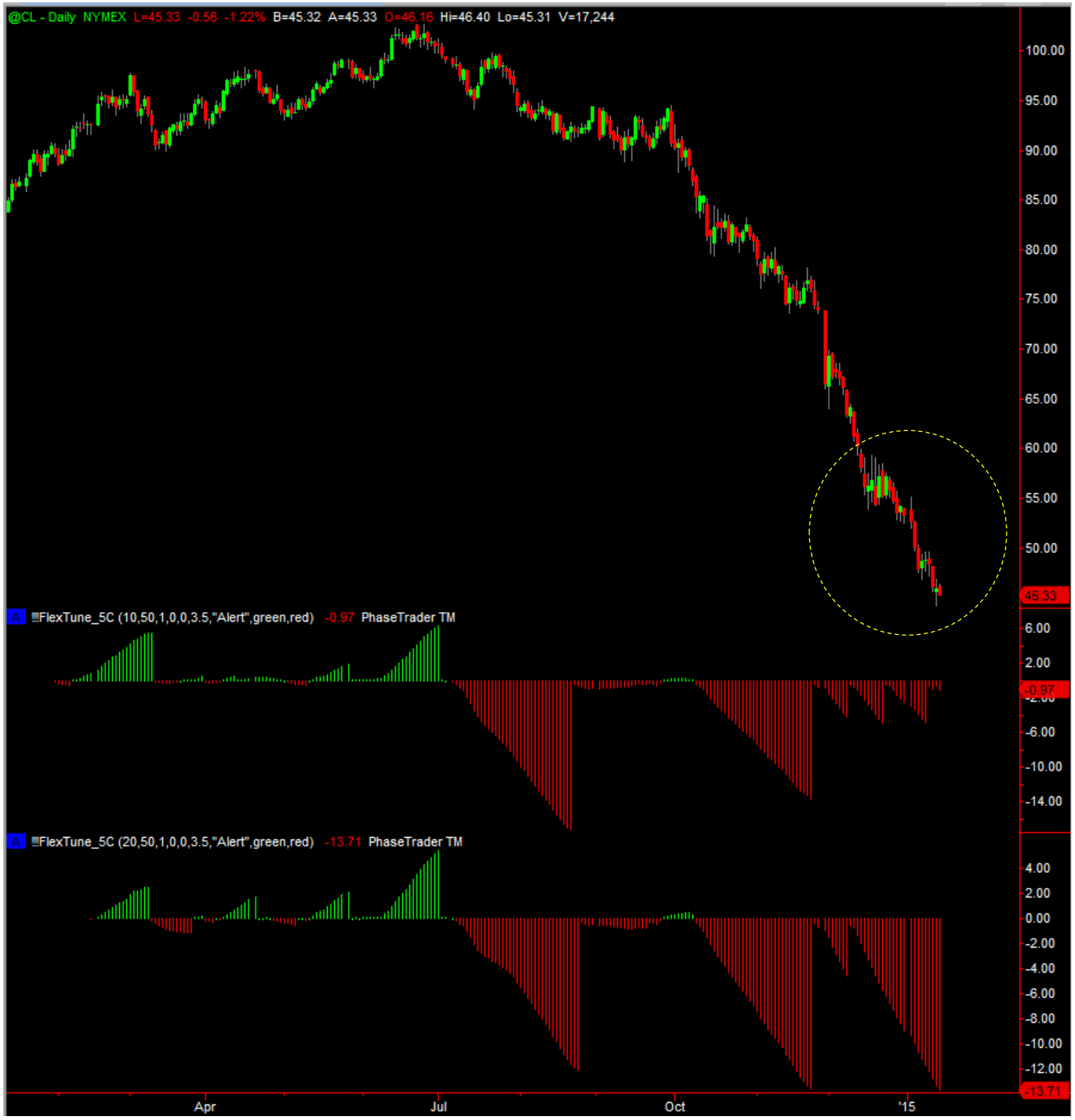
Relative Phase tells a different story. Both versions of the indicator generated a strong phase that peaked during May, but Relative Phase posted a strong result during August (circled) while revealing that AAPL was really pulled along by the market from October through the end of the year.

This information is helpful for long-term investors structuring trades with stock or far-dated options.

Phase transitions that mark the end of a subtrend result from a reset of the underlying phase calculation. Stated differently, the phase calculation ends and the indicator resets to 0.00 when PhaseTrader® senses the statistical end of a subtrend. Virtually every analysis we do with the indicator is based on measuring relative peak heights of the measured subtrends on a chart.

Tuning the indicator allows us to highlight key features and reduce noise. The process is somewhat similar to focusing a camera lens. The indicators have 3 main tuning parameters labeled P1-P3 and a filter that affects the sensitivity of the indicator to conditions that trigger a reset.

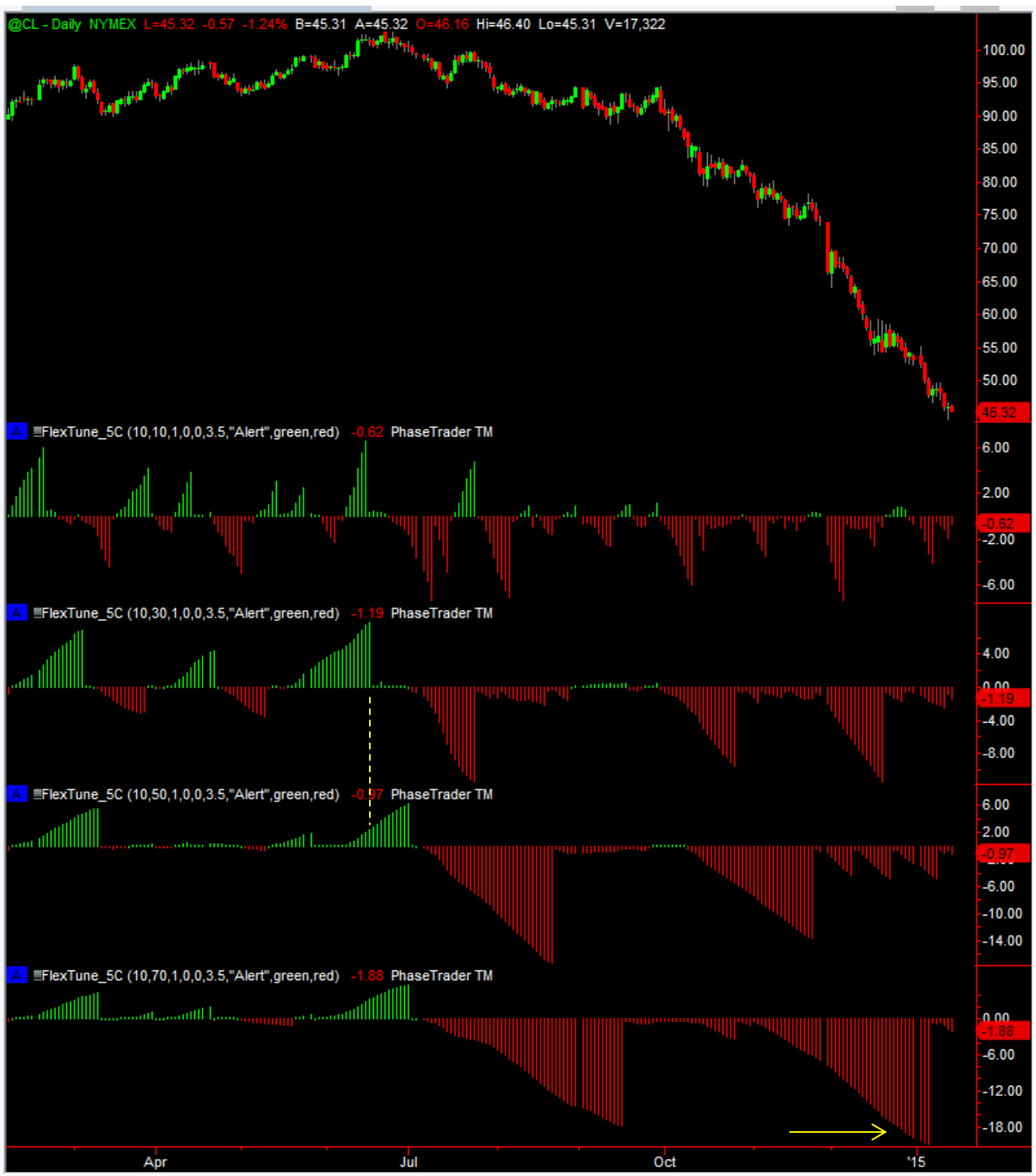
- P1 sets the length of the sliding window used for initial data transformation by the indicator. The first step in transforming the data involves converting absolute changes into standard deviations. P1, therefore, is sensitive to changes in volatility. Lengthening the window causes the indicator to measure each new change against a longer, more constant volatility. Short P1 values cause PhaseTrader® to measure price changes against the most recent environment. If the market has been volatile, as it often is during a sharp decline, then price changes that follow will have less effect on the final calculation. Conversely, price changes that follow a calm timeframe (like a steady rally) will have a larger impact on the final calculation. Lengthening P1 reduces this effect so that the effects of various size price changes remains constant over time. Long P1 values tend to unmask small price changes that have become obscured by high volatility levels. Short P1 values hide these price changes from the indicator calculation. In most cases short values (<20) are appropriate when P2 is long (>30). Long P1 values (>30) work best when P2 is short (<20).
- P2 is the most important parameter. It adjusts the length of the internal calculation window and controls the overall sensitivity of the Phase calculation. A short P2 window (10 bars) produces noisy results by allowing the indicator to respond to relatively small price changes and brief trends lasting only a few bars. Long windows (>30 bars) tend to hide subtle details by reducing the indicator's response to modest price reversals and short-lived trends. Lengthening P2 too far can hide important detail and setting it too short can create too much noise. Very long P2 values (>50) also delay the indicator's response causing it to appear as a "trailing indicator." This effect is sometimes desirable if the goal is to measure the relative strength of past trends such as those appearing on a weekly chart spanning several years. We often use this approach to study the post housing bubble rally that began in 2009.
- P3 adjusts the display by averaging the completed phase calculation across the number of bars selected. Setting the value to 1 turns off the adjustment increasing the sensitivity of the display. We rarely use this feature because it creates lag in the indicator.
- The NewPhaseFilter changes internal rules used to determine when the phase calculation should be reset. This adjustment is closely related to P2 (the length of the internal calculation window). Raising the threshold compensates for a short P2 value without creating a lagging indicator. NewPhaseFilter must be turned off when P2 is very long (>50) because the combined effect will completely blur the indicator. We often refer to "non-resetting Phase" which is created by raising the threshold so high (999) that the indicator never resets and charting the result as a continuous line. The new trace is a more accurate stock chart that often reveals the technical equivalence of peaks that are far different in actual price. A recent example marked USDJPY at 103 as being equivalent to 120 in the pre-2008 crash era. Once the yen reached this level it stopped weakening for nearly 1 year until the Japan Central bank took drastic action.



This daily chart of oil futures contains 2 similar tunings P1=10/P2=50 and P1=20/P2=50.

The area circled near the right side is characterized by high volatility levels that diminish the impact of price changes and reduce the magnitude of the Phase calculation when P1 is short (10 bars).

Measuring these price changes against a longer P2 (20 bars) that spans into a lower volatility timeframe highlights the size of these price changes.

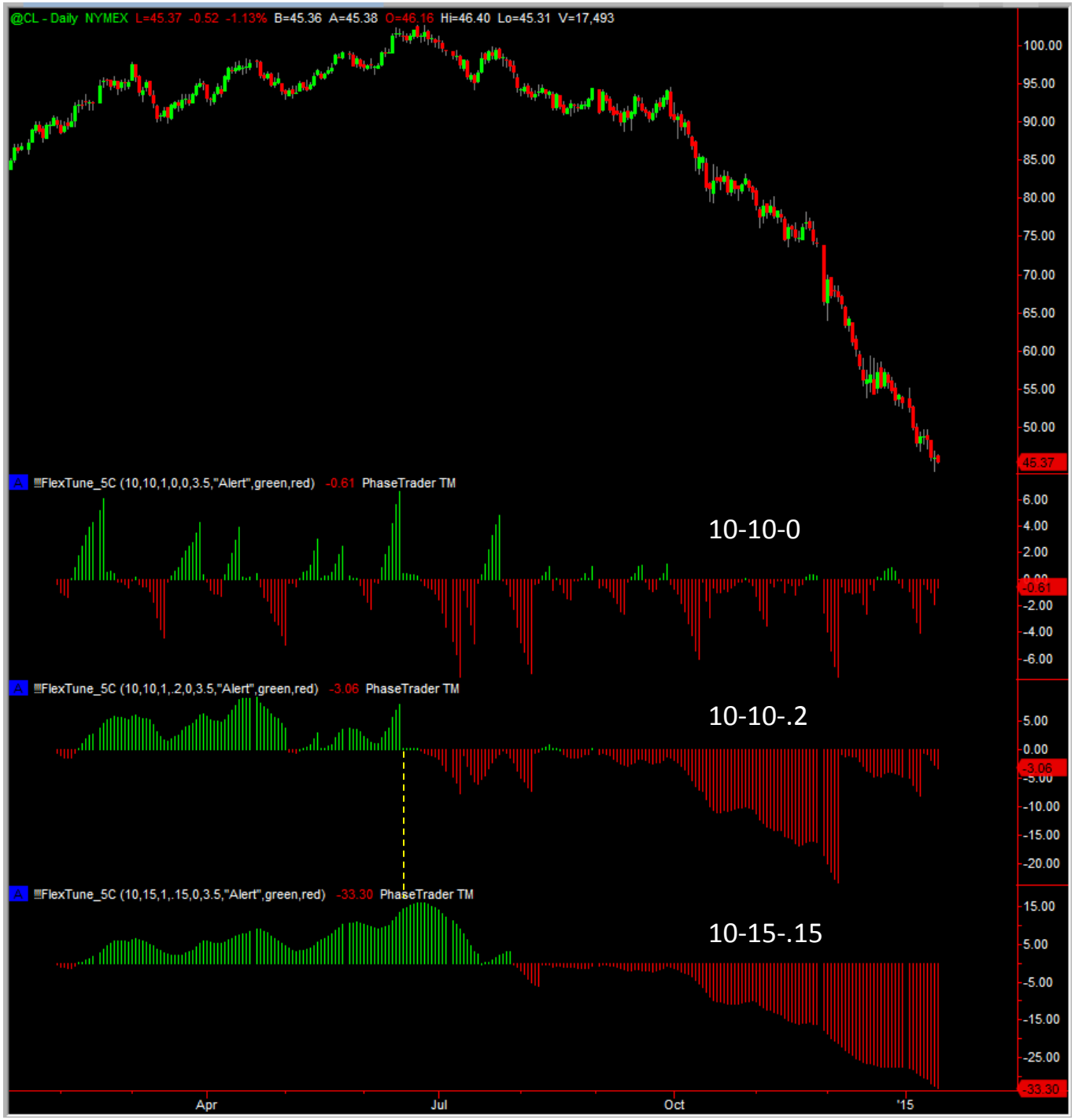


P2 has much more dramatic effects. This chart displays 4 different tunings – 10/10, 10/30, 10/50, and 10/70.

The 10/30 tuning represents the best balance between signal and noise. It distinctly lacks some of the lag evident in the 10/50 and 10/70 tunings (vertical line).

Lengthening P2 very far (70) obscures price changes near the right side of the chart in the same way as a long P1. In this case the changes are simply combined with the large downward moves of November creating a single large downward peak (arrow). In the case of a long P1 (previous chart), they are measured against a longer window with lower volatility causing them to appear much larger.

Understanding these tuning effects can be an important part of reading the indicator.



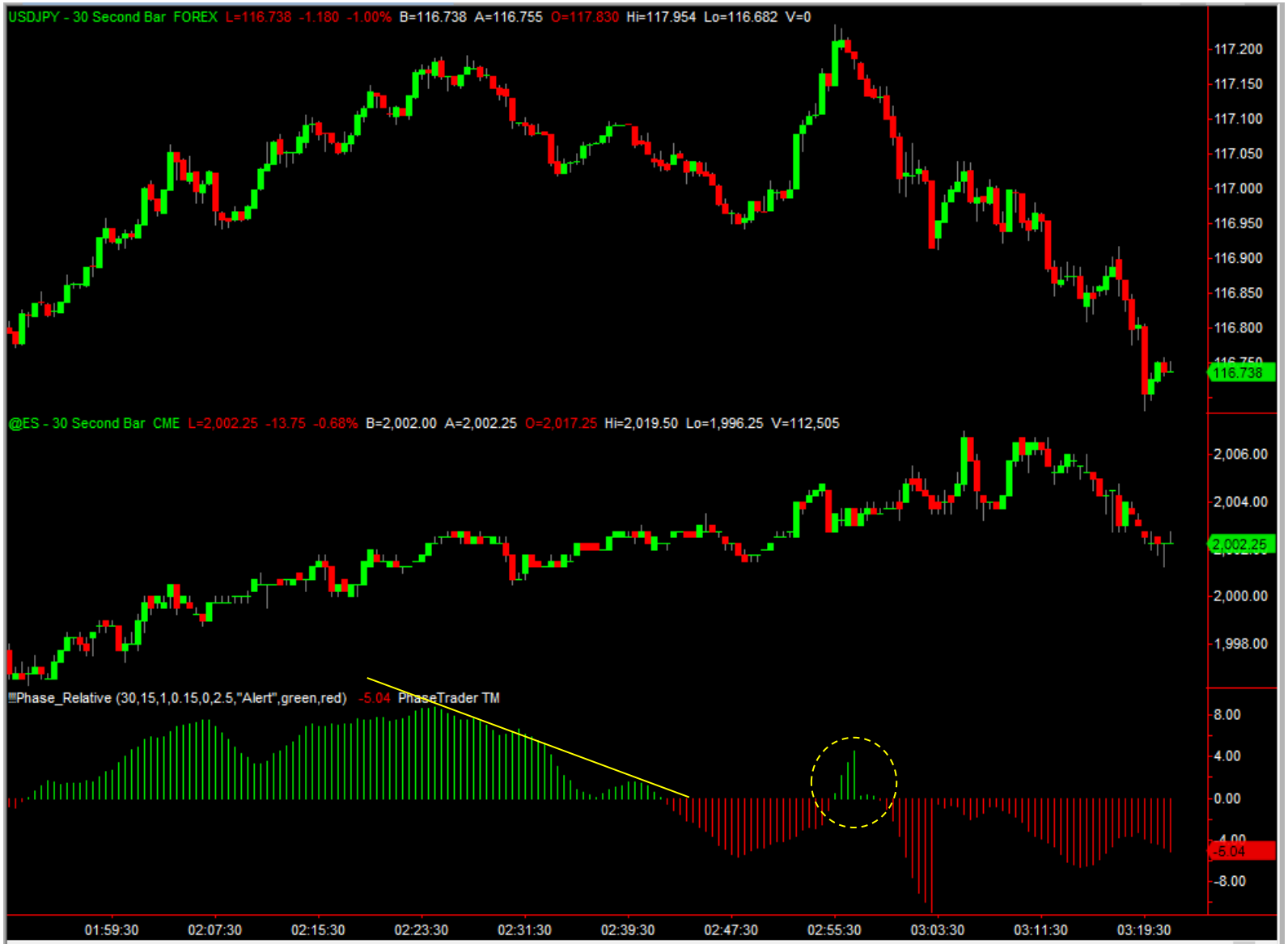
Subtle improvements can be gained by combining the effects of P2 and the NewPhaseFilter.

The first chart has no filter and a short P2 (10 bars). Although it measures every subtrend, it is difficult to read.

Chart #2 overcomes this problem with a very high NewPhaseFilter (0.2).

Chart #3 uses a slightly longer P2 to lessen the effect of individual large price changes or very brief trends and raises the internal calculation threshold so that only a sustained reversal will cause the indicator to reset. This chart accurately depicts the continued collapse of crude oil but suffers from some lag (vertical line). It also blurs the slight slowing of the collapse near the right side of the chart that occurred when oil fell below $55. One solution is to add a second chart with a faster timeframe – perhaps 30 minutes spanning 1 month.

Phase_Relative creates a new virtual ticker by subtracting price changes in standard deviations of the stock or index in chart #2 from the changes in chart #1. The result becomes a new data stream that PhaseTrader treats as a single stock. The tuning dynamics we have been discussing all apply to Relative Phase. Comparisons can take many forms beyond the basic stock versus index analysis. This chart, for example, compares the yen to S&P mini futures. We know that sharp weakening of the yen (rising USDJPY) tends to trigger a rally in U.S. stocks in the form of a carry trade. Strengthening of the yen (falling USDJPY) has the opposite effect. The yen is also mean-reverting in the sense that large outperforming trends tend to reverse. In this chart we can see that USDJPY began to lose its advantage against the S&P 500 between 2:31 and 2:39. The strong rally at 2:55 was not an exceptional outperform in the technical sense because it triggered a very small phase – a signal that USDJPY is about to fall with the S&P likely to follow.

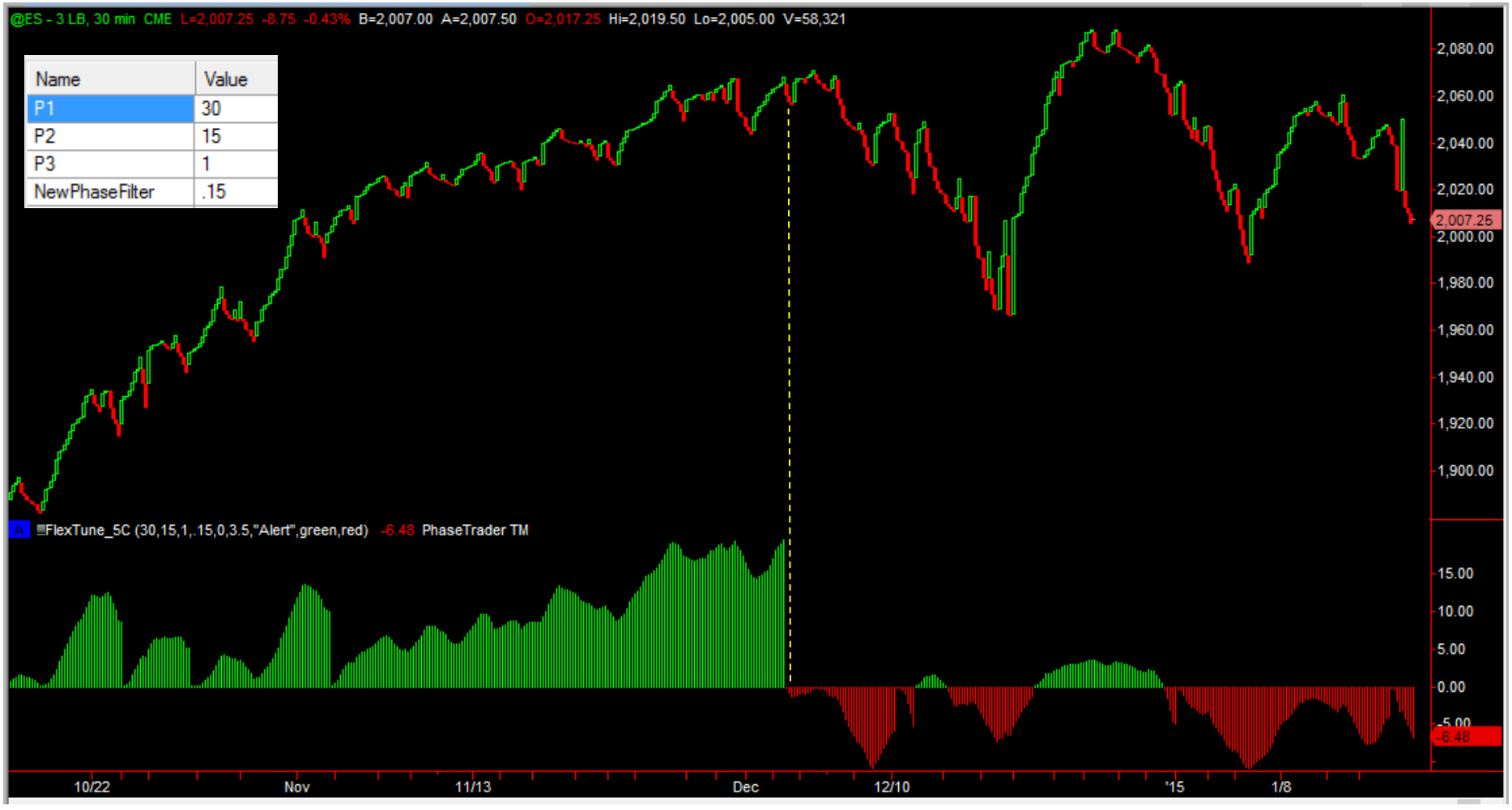


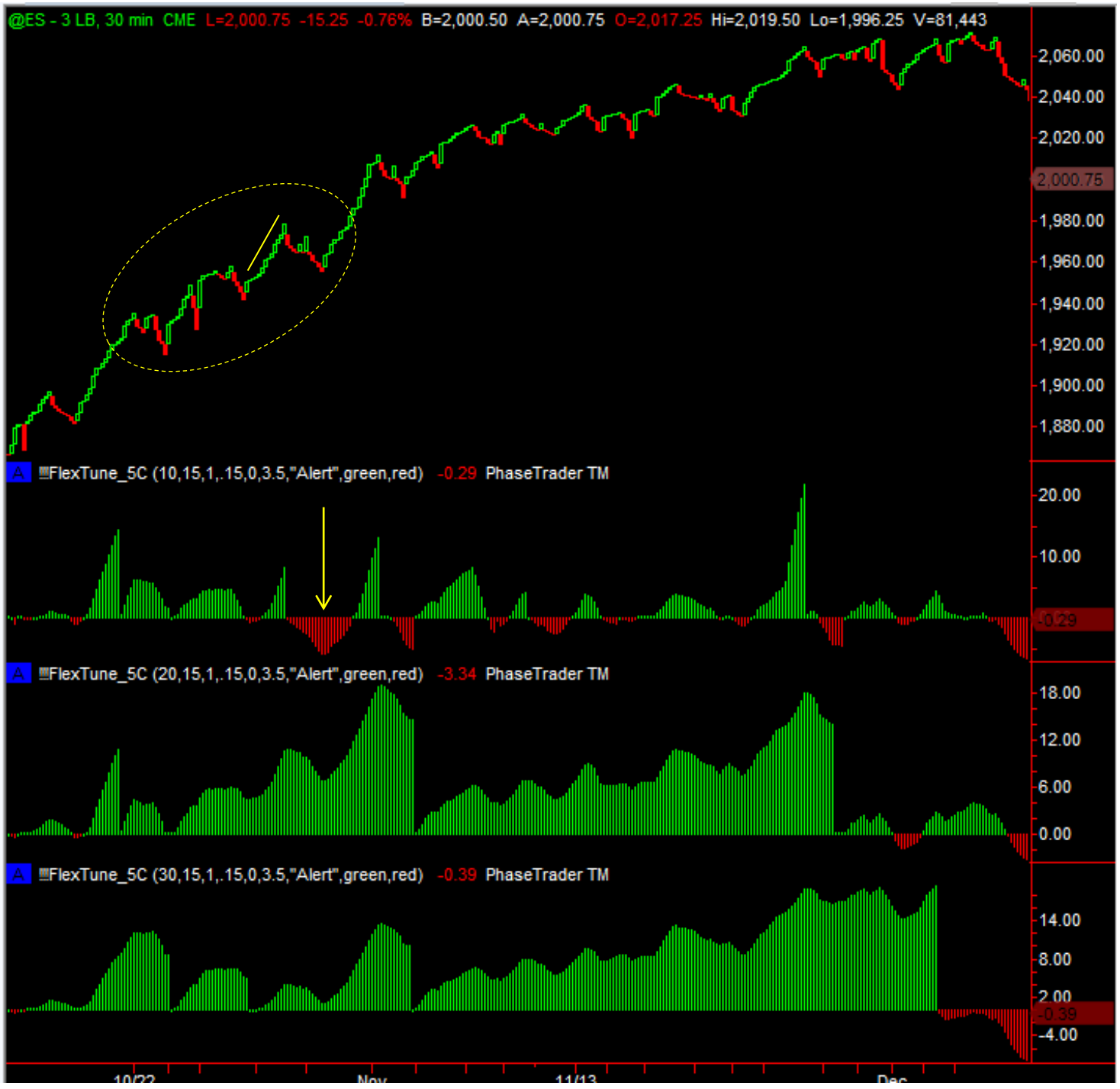
Relative Phase is useful across many different timeframes. This 60 minute chart reveals the general underperform of AAPL versus the S&P. The lower trace (Spikes_Relative) is a 10 bar moving average of the raw data feed generated by subtracting chart #2 price changes in standard deviations from chart #1. Outperforming bars in chart #1 rise above the x-axis; underperforming bars are below. Green signifies rising price bars and red marks falling. A third color can be set to indicate movement in opposite directions.

Color and direction are independent (e.g. a red up bar means that the stock in chart #1 is falling (red) but still outperforming the overall market (up)).

This chart reveals that AAPL underperformed the market throughout most of December, but that the underperform ended in January.

Line Break charts give excellent signals because they only measure price action. At each check interval, a new high or low in the same direction as the current bar is added as a continuation bar in the same direction. A reversal bar is generated when the price rises or falls above or below the closing price of a fixed number (usually 3) bars ago. The number of bars and the check interval are the only parameters that are set. Line Break charts act as an additional filter providing very clean data for PhaseTrader®. They are excellent platforms for trading futures or currencies. In this example the indicator reset sharply well ahead of December's 100 point drawdown. However, relatively large volatility swings make the Line Break chart/Phase Indicator combination sensitive to adjustments in P1. The next slide displays 3 different P1 settings for the same chart.





Lengthening P1 eliminates features like the one marked by an arrow in chart #1. The effect is caused by including additional up and down price reversals that increase volatility in the initial data transformation (circle).

The short P1 of chart #1 allows the calculated volatility to fall just ahead of the brief downward trend that generates the feature in the indicator (arrow). This falling volatility effect is caused by the brief uptrend visible just ahead of the feature near the right edge of the circle (small line).

End