



Trident™
Probability-Based Trade Management

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- **Maximize Gain for each Entry Signal**
 - Given the measured edge & signal duration
 - How do you optimize gains
- **Stop Loss Placement**
 - Given entry signal attributes & projected volatility
 - What should the occurrence probability be for an optimal return?
 - Where should a reasonable target be placed to take profits?
- **Position Sizing**
 - Given the stop location, available assets, & margin costs
 - How many shares or contracts can you afford to buy?
- **Hurdles**
 - Converting between a normal and fat-tailed (market) distribution
 - Accurately projecting volatility into the trading period
 - Accurately measuring the entry signal characteristics



Buy/Sell Investment Strategy Decoupled into Two Parts

Long or Short Entry Signals with a Measurable Edge

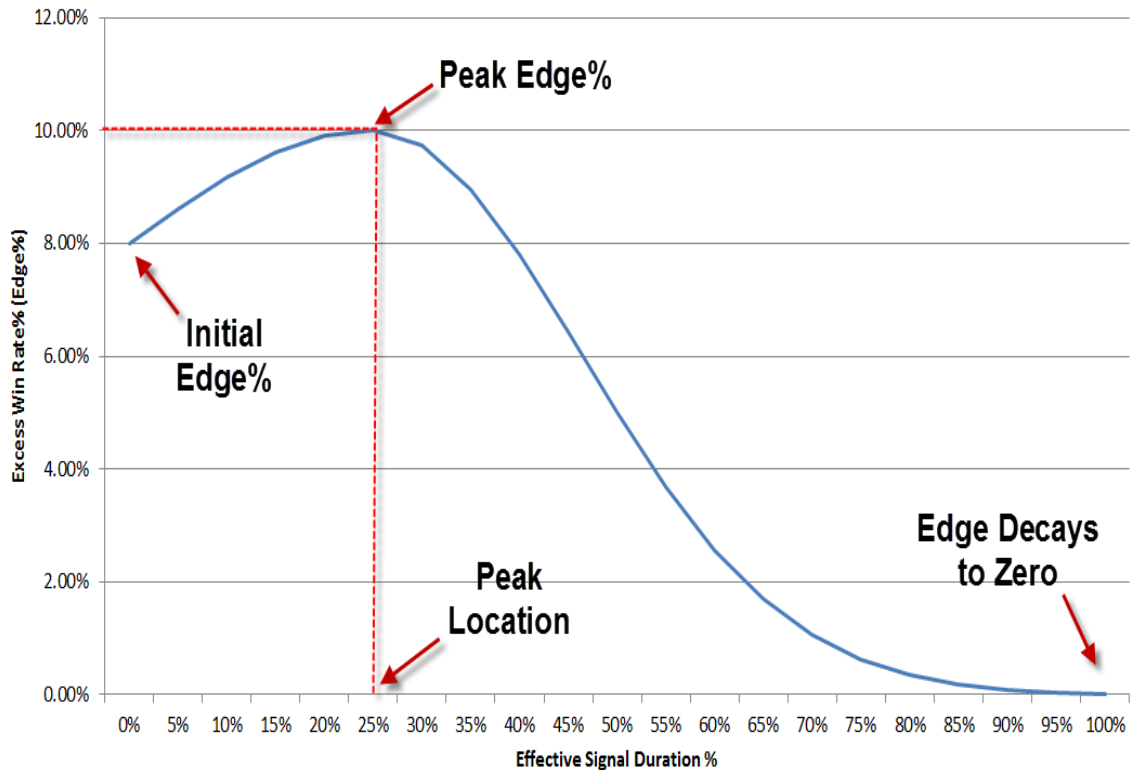
- Edge%
 - Initial Edge
 - Peak Edge
 - Edge Location
- Signal Duration

Probability-Based Money Management (Trident™)

- Stop Levels
- Profit Targets
- Expected %Winners
- Expected Ave. Duration
- No Free Parameters



Moving Edge Model



Entry Signal Parameters

- How much of an edge does the signal have over a random entry?
- Express this as the excess win rate percentage
- Where does the peak edge occur?
- How long does the edge last?
- Express duration as the time it takes for the edge to decay to zero

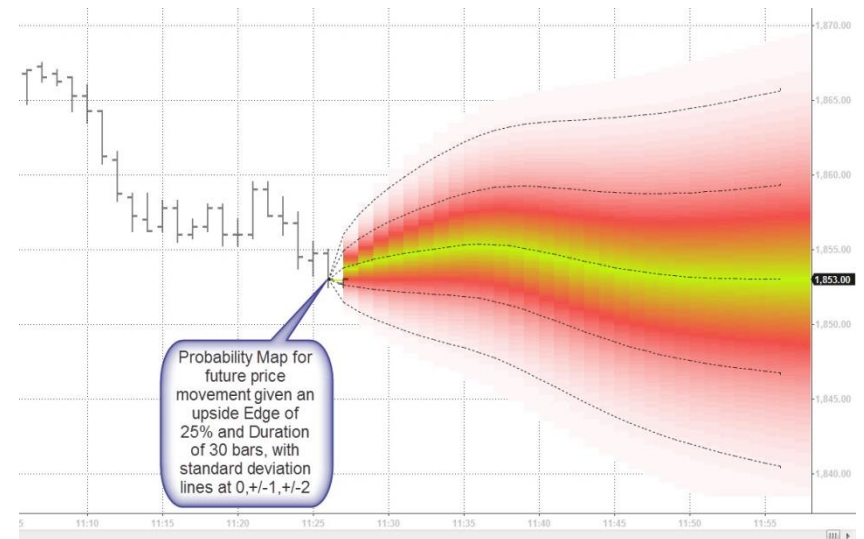


- **Directional Edge Bias**

- The probability of finding price at a certain level in the future is expressed as a cone of probability
- If there is a directional “edge”, then the cone is tilted up or down

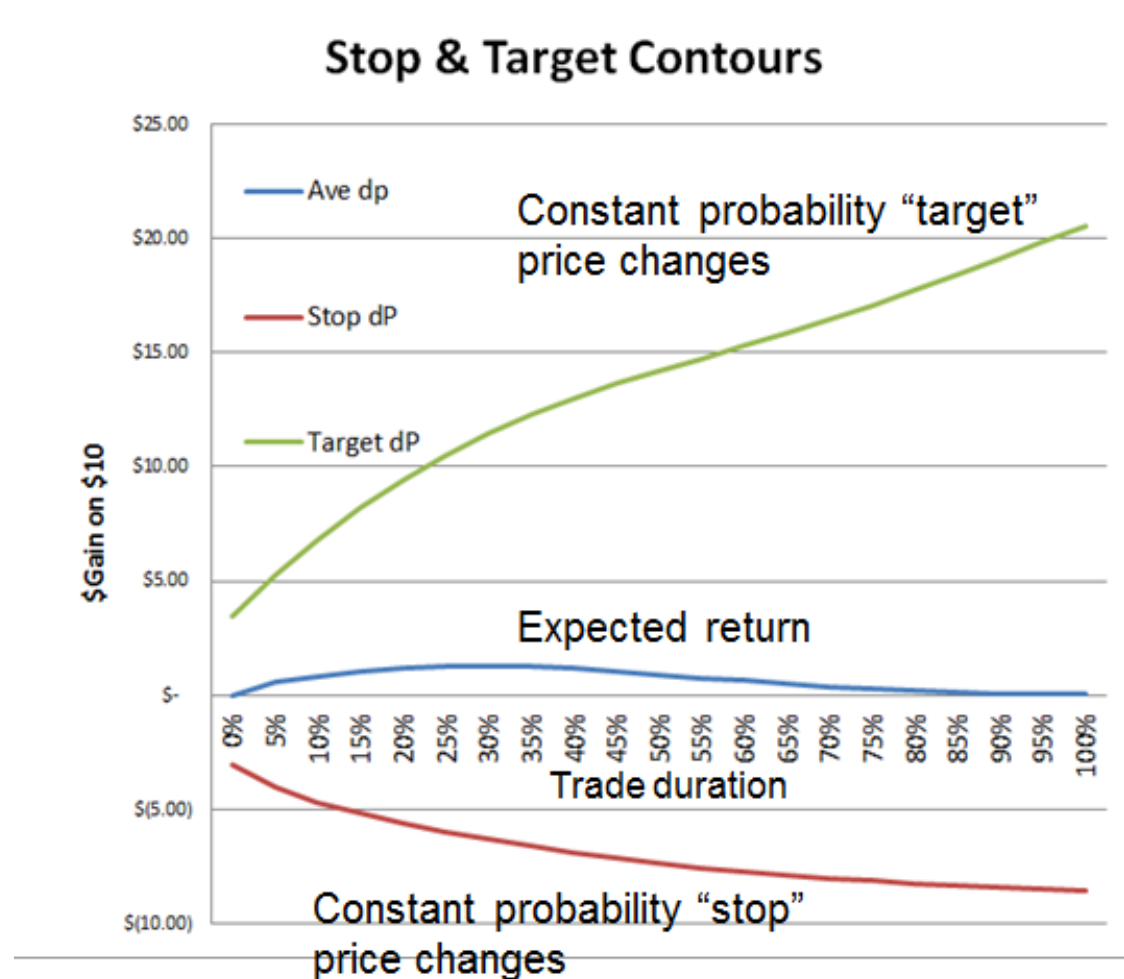
- **Volatility Bias**

- Market volatility can change, and this changes the width of the cone



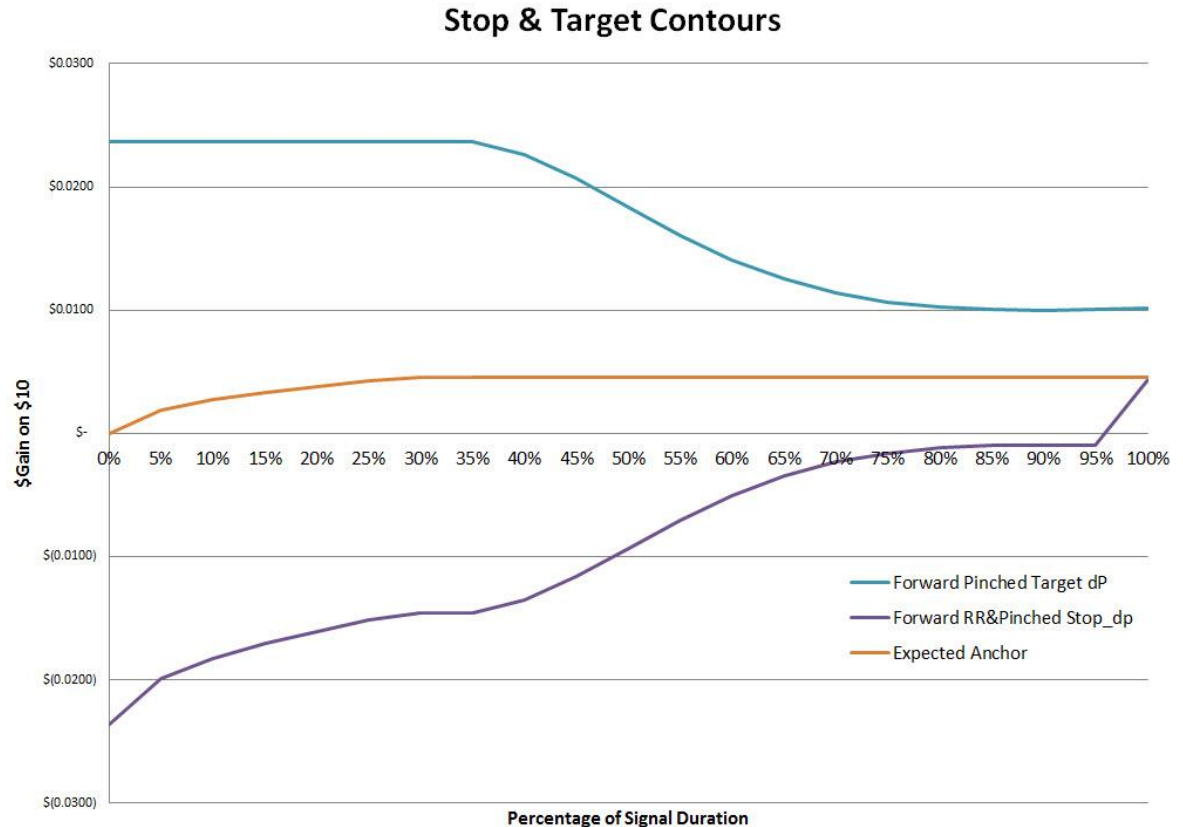


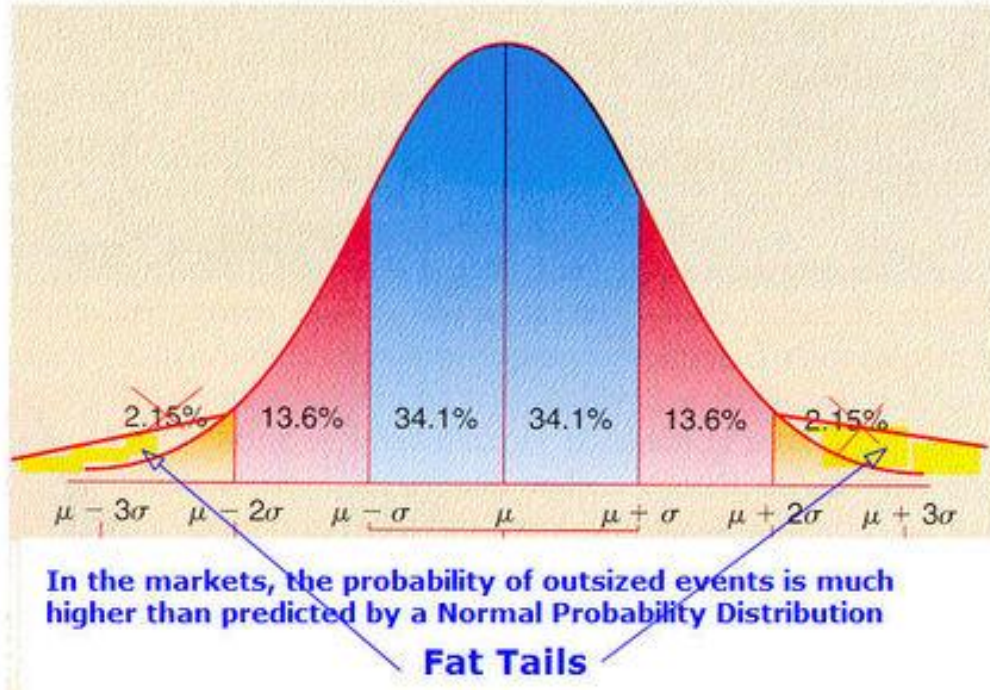
- Assume the entry signal has a positive edge that decays with the trade
- Average expected return (expressed as a change in price on a \$10 entry) is shown by the blue line
- A constant probability target line is shown in green
- A constant probability stop line is shown in red





- Constrain stops to never move away from trade
- Constrain stops and targets to “pinch” out trade as expected duration is approached
- “Hang” stops and targets from the best price achieved during the trade (Chandelier)
- Constrain the target probability to be optimal for all other settings



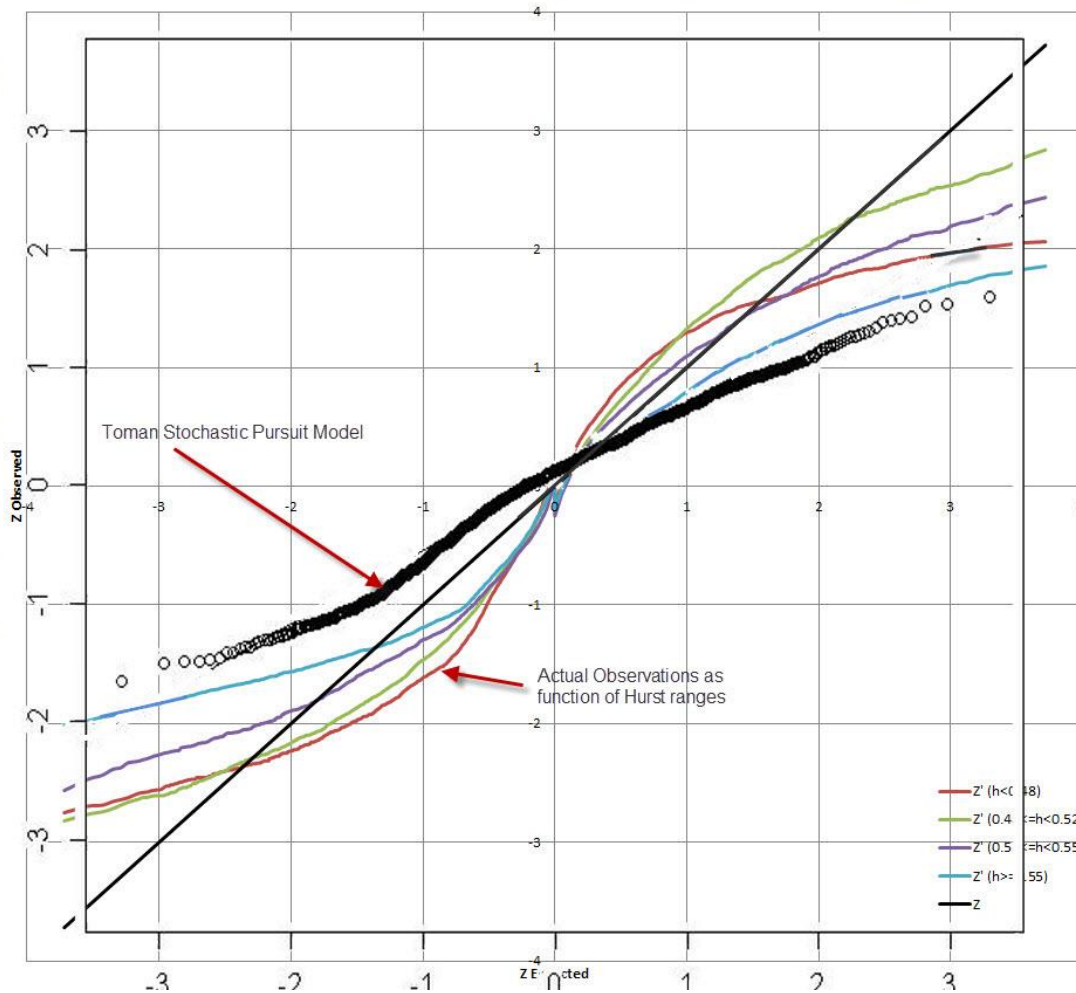


The Markets are not quite Gaussian

- Our stop and target management system assumed a random (Gaussian) distribution...which is not quite correct
- When we ask for a 10% chance of being stopped out, we may get a slightly different result
- We built a converter to correct for these differences



Gaussian to Fat-Tail Conversion as a function of Hurst Exponent



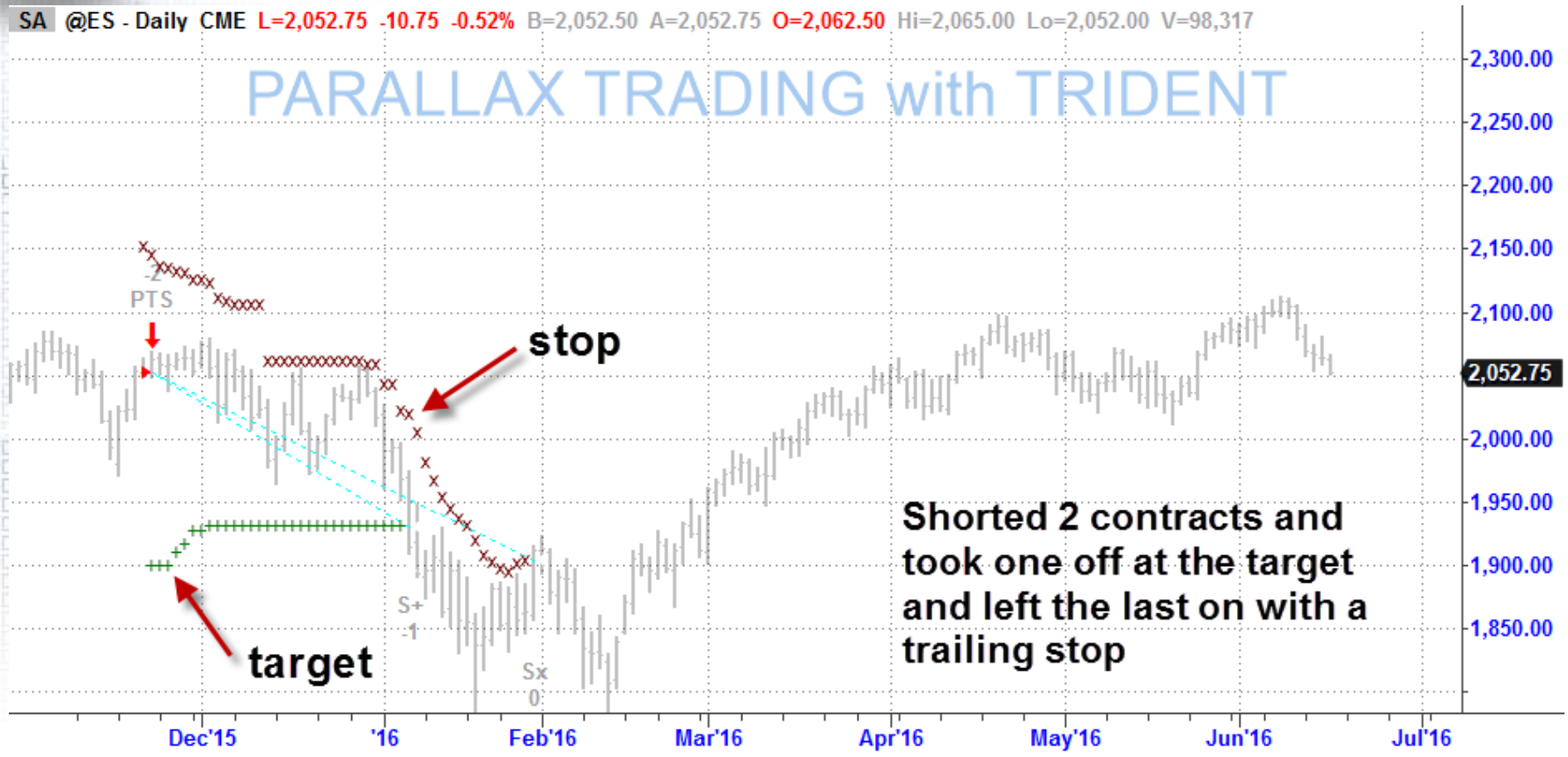
Conversion

- Desired occurrence rate must be converted to the equivalent Gaussian rate
- Conversion is a function of the Hurst exponent
- Up and Down move statistics are a bit different
- For example, if the desired probability is a 4% chance of hitting a long target, then the equivalent Gaussian rate is 1.5%,



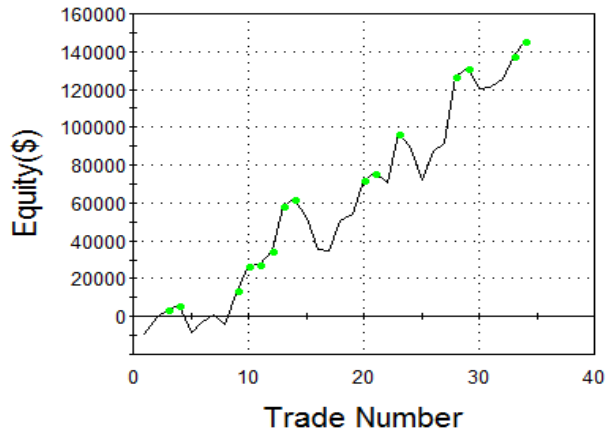
SA @ES - Daily CME L=2,052.75 -10.75 -0.52% B=2,052.50 A=2,052.75 O=2,062.50 Hi=2,065.00 Lo=2,052.00 V=98,317

PARALLAX TRADING with TRIDENT



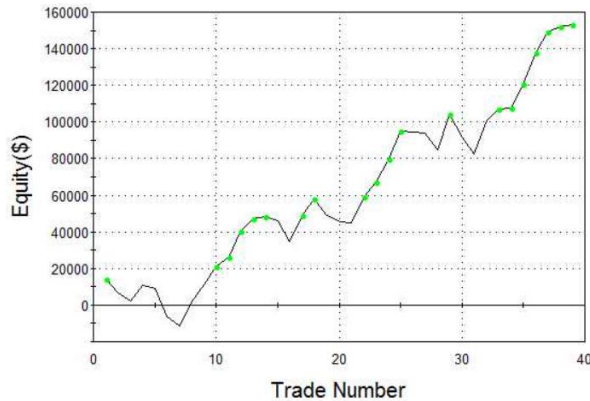


Equity Curve Line - @ES Daily(9/11/1997 14:00 - 6/16/2016 14:00)

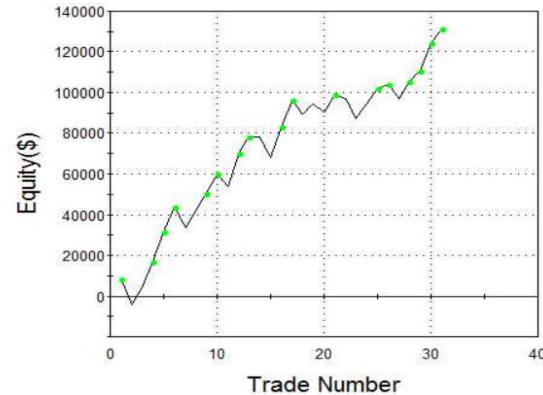


- P&L daily scale examples
- Using Parallax entry signals
- Using Trident trade management
- There are **NO FREE PARAMETERS** to adjust

Equity Curve Line - @BP Daily(9/8/2000 14:00 - 6/3/2016 14:00)

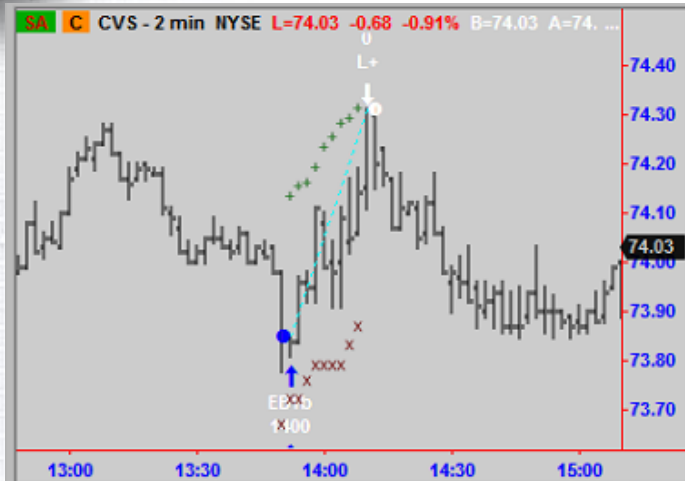


Equity Curve Line - @RB Daily(5/14/2001 14:00 - 6/3/2016 14:00)





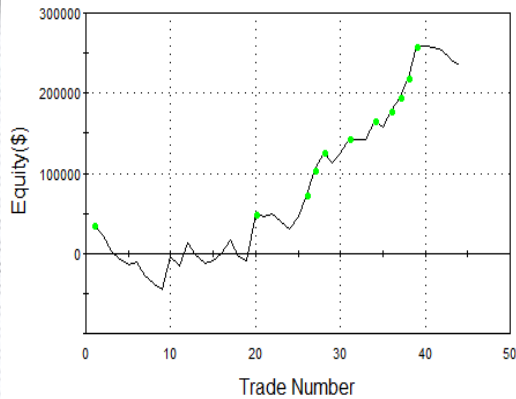
More Parallax Trading Examples (Intraday Equities)



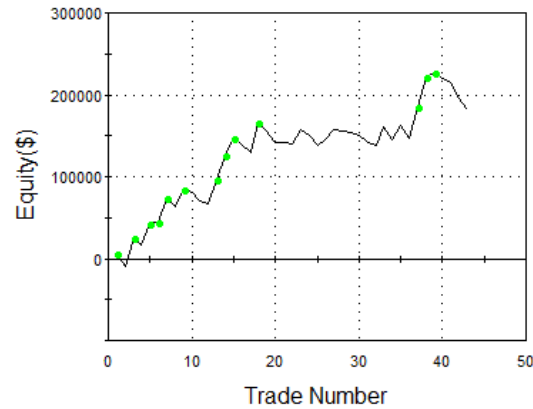


More Parallax Trading Examples (Daily Futures)

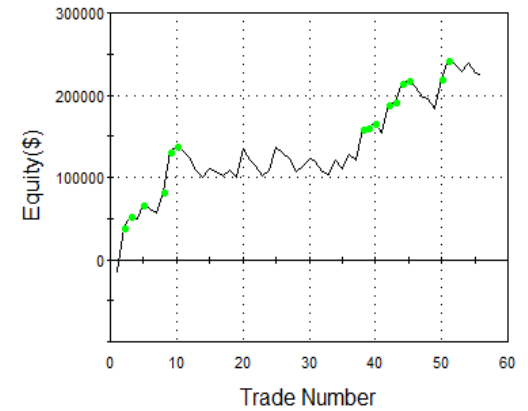
Equity Curve Line - @ES Daily(10/9/1997 14:00 - 10/11/2017 14:00)



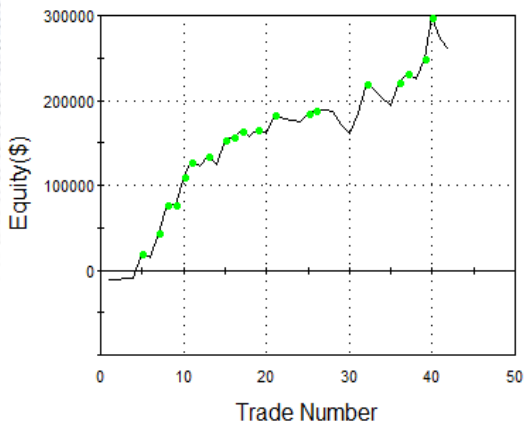
Equity Curve Line - @DX Daily(10/9/1997 14:00 - 10/10/2017 14:00)



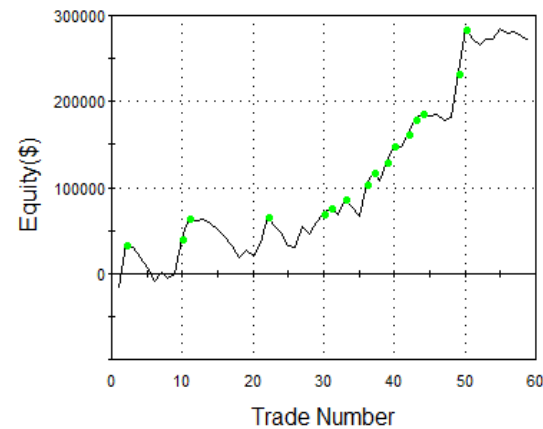
Equity Curve Line - @CT Daily(10/9/1997 11:20 - 10/10/2017 11:20)



Equity Curve Line - @YG Daily(10/1/2001 15:00 - 10/10/2017 15:00)



Equity Curve Line - @TF Daily(10/25/2001 15:00 - 10/10/2017 15:00)



Equity Curve Line - @FDAX Daily(1/4/1999 13:00 - 10/10/2017 13:00)

