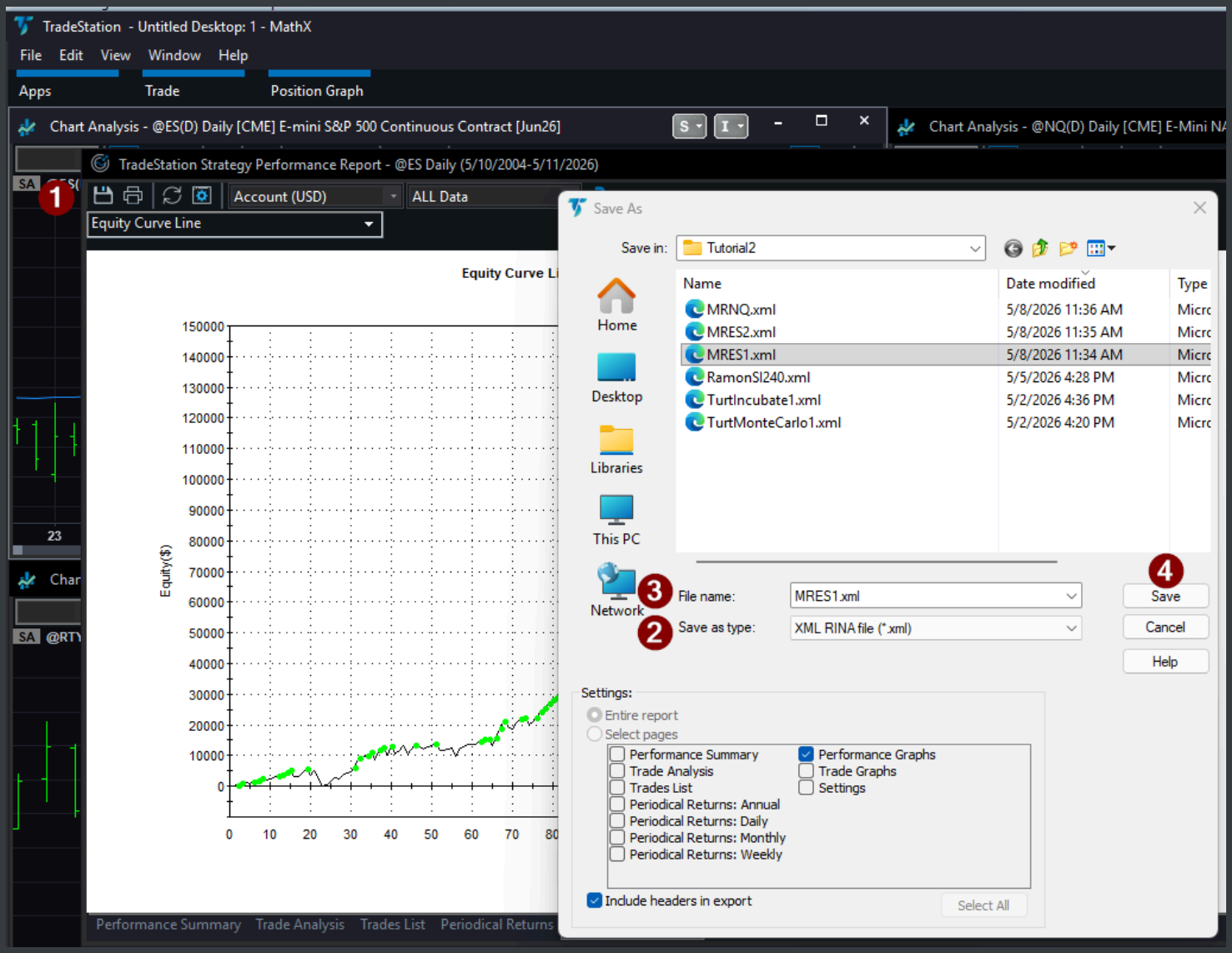
TS-SystemChecker Quick Start

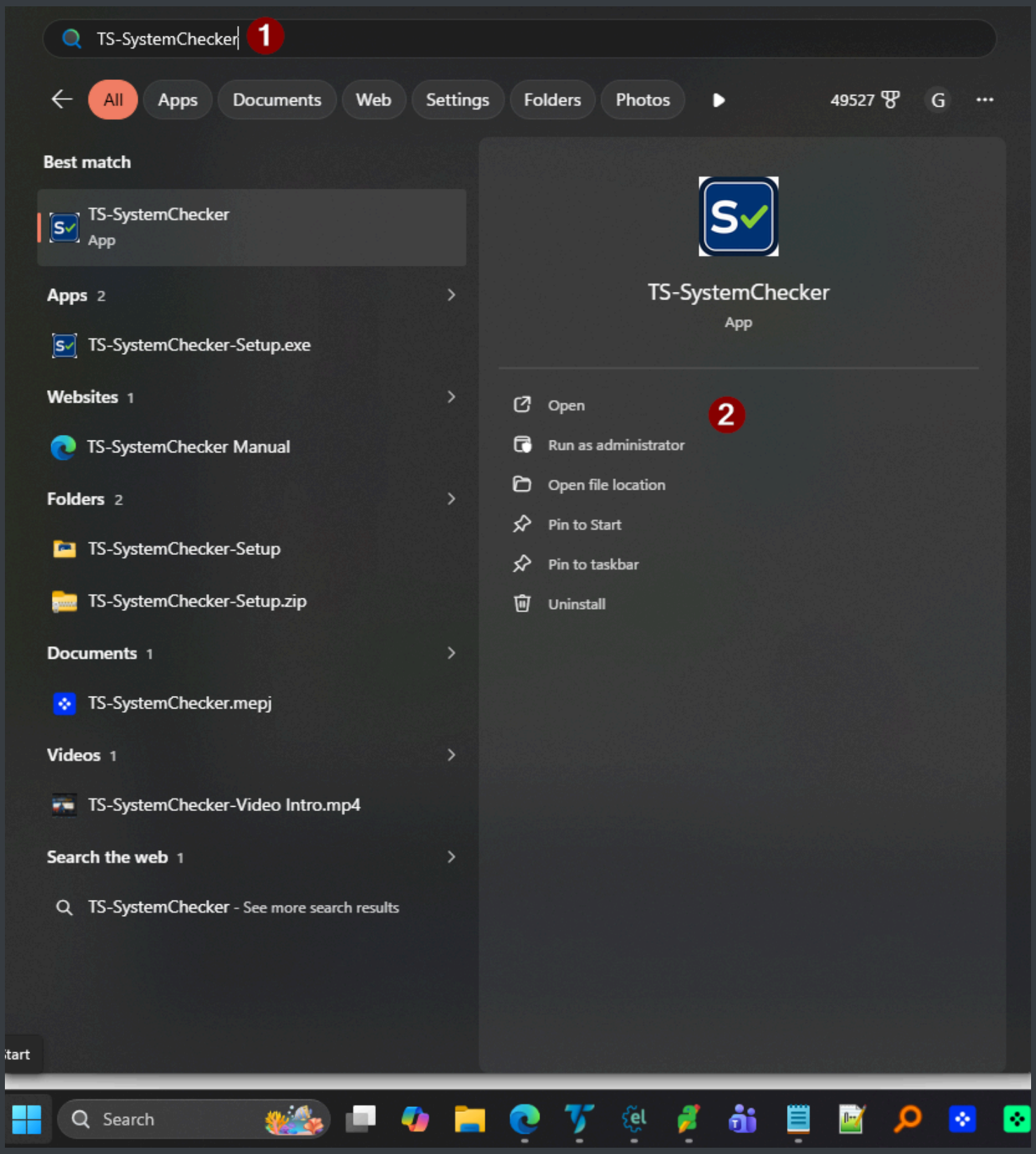
One of the beauties of TS-SystemChecker is that is really easy to run. Simply export you TS or MC reports as XML



Save the xml file into a folder that you can user to organize your work. Here I am going to save in a folder off my c drive name Tutorial 2.

As you save your xml files, make not of when the OOS data begins. You don't need the exact date, but one close to the OOS date frame is best for Incubation Analysis.

You may or may not have select for a DeskTop Shortcut. If not just go to Start and type TS-SystemChecker and you will see the applicastion.



Windows "Unknown Publisher" Warning

Because TS-SystemChecker is specialized, low-volume Windows software, Microsoft Defender SmartScreen may show an **"Unknown Publisher"** or **"Windows protected your PC"** warning the first time you install or launch it.

This usually means Windows does not yet recognize the application or publisher. Microsoft explains that new applications may show SmartScreen warnings until they build sufficient reputation through clean installs and usage.

If you downloaded TS-SystemChecker from GeorgePruitt.com, PayHip, or a link I personally provided:

1. Click **More info**.
2. Confirm the app name is **TS-SystemChecker** or **TS-SystemChecker-Setup**.
3. Click **Run anyway**.

Only proceed if you are sure the file came from the official download source.

If Smart App Control Completely Blocks TS-SystemChecker

On some Windows 11 computers, **Smart App Control** may completely block TS-SystemChecker or its installer. This is different from the normal **Unknown Publisher** warning because there may be no **Run anyway** button.

Microsoft states that Smart App Control does not currently offer a way to allow one specific blocked app. If Smart App Control blocks a trusted application, the available option is to turn Smart App Control off in Windows Security.

Only do this if you downloaded TS-SystemChecker directly from GeorgePruitt.com, PayHip, or a link I personally provided.

To turn Smart App Control off

1. Open **Windows Security**.
2. Choose **App & browser control**.
3. Open **Smart App Control settings**.
4. Set Smart App Control to **Off**.

5. Run the TS-SystemChecker installer or application again.

Do not turn off Smart App Control for software from unknown websites, unexpected email attachments, or file-sharing sites.

To turn Smart App Control back on

After TS-SystemChecker has been installed or launched successfully, you may turn Smart App Control back on if your version of Windows allows it.

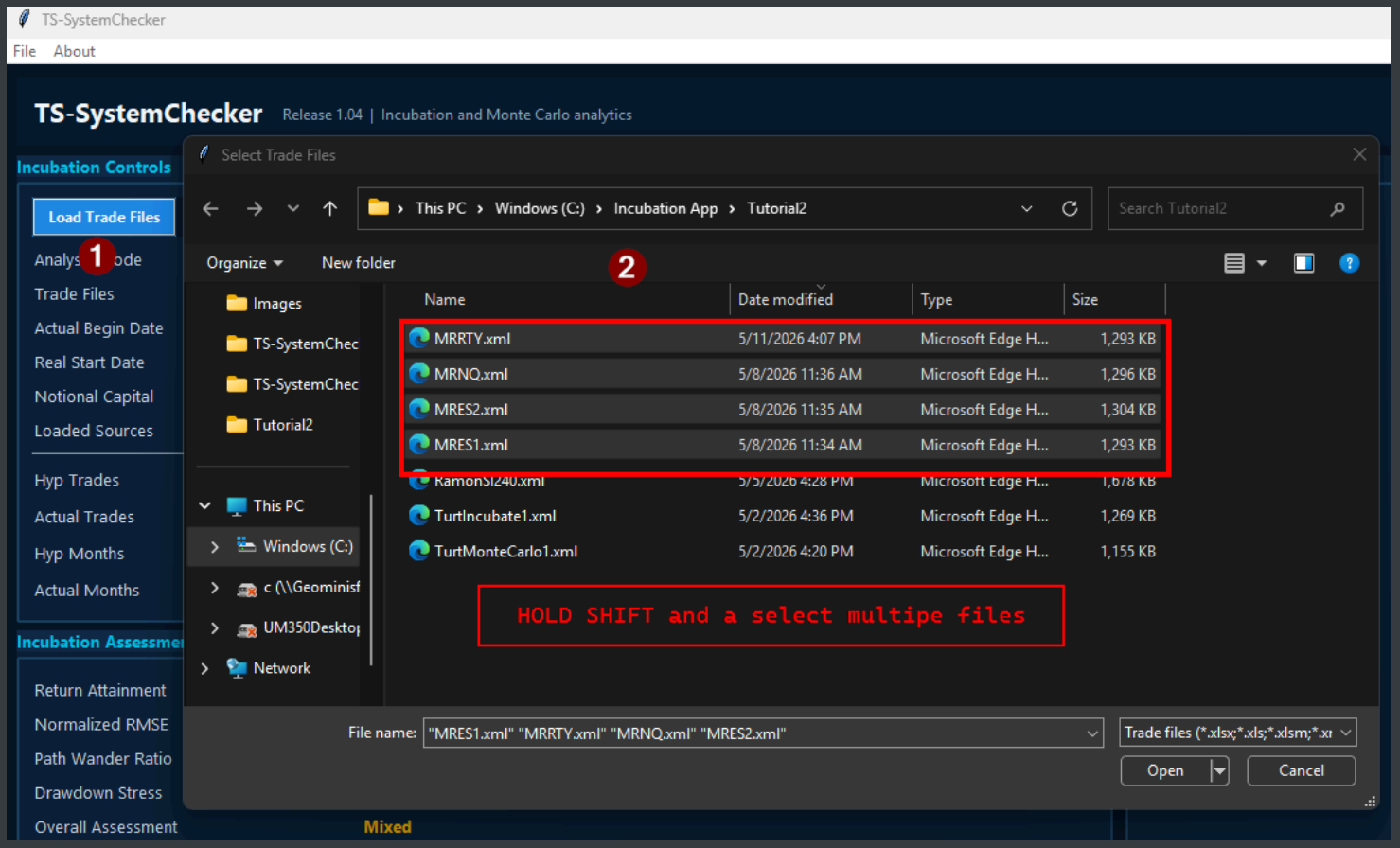
1. Open **Windows Security**.
2. Choose **App & browser control**.
3. Open **Smart App Control settings**.
4. Set Smart App Control back to **On**.

On some older Windows 11 installations, Smart App Control may not allow you to turn it back on without resetting or reinstalling Windows. On newer updated systems, Microsoft indicates that Smart App Control can be turned back on from Windows Security.

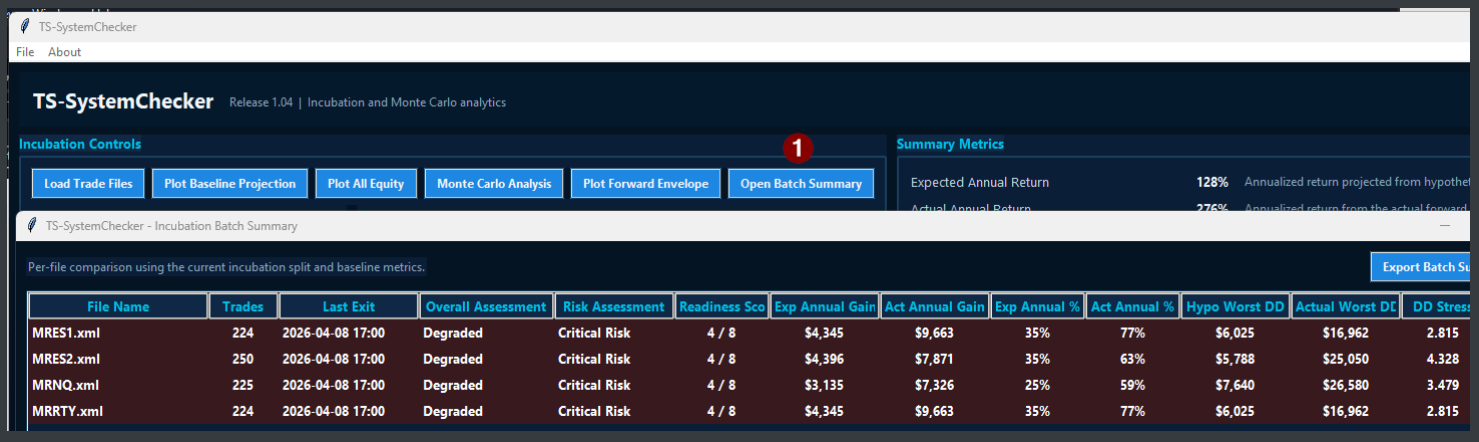
Smart App Control is a Windows security feature designed to block malicious or untrusted apps. Turning it off should only be done when you are confident the software came from a trusted source.

Batch File Processing

You can process multiple files for a batch process if all the files have similar start OOS dates.



Batch processing will combine all trades into a single run. However, you can a quick snapshot of OOS performance metrics by selecting OPEN BATCH SUMMARY:



TS-SystemChecker Charts and Manual

Continuous-flow edition combining the Expanded Charts guide with the TS-SystemChecker Manual. Styled to match the dark chart/report theme.

Expanded Chart Guide

The Charts of TS-SystemChecker

TS-SystemChecker contains two complementary analysis engines. The Incubation Engine is designed to answer one of the most important questions in systematic trading: Is this system still behaving like the system I tested, or has something changed? The Full Monte Carlo Engine takes the entire trade history and stress-tests the system across thousands of possible future paths.

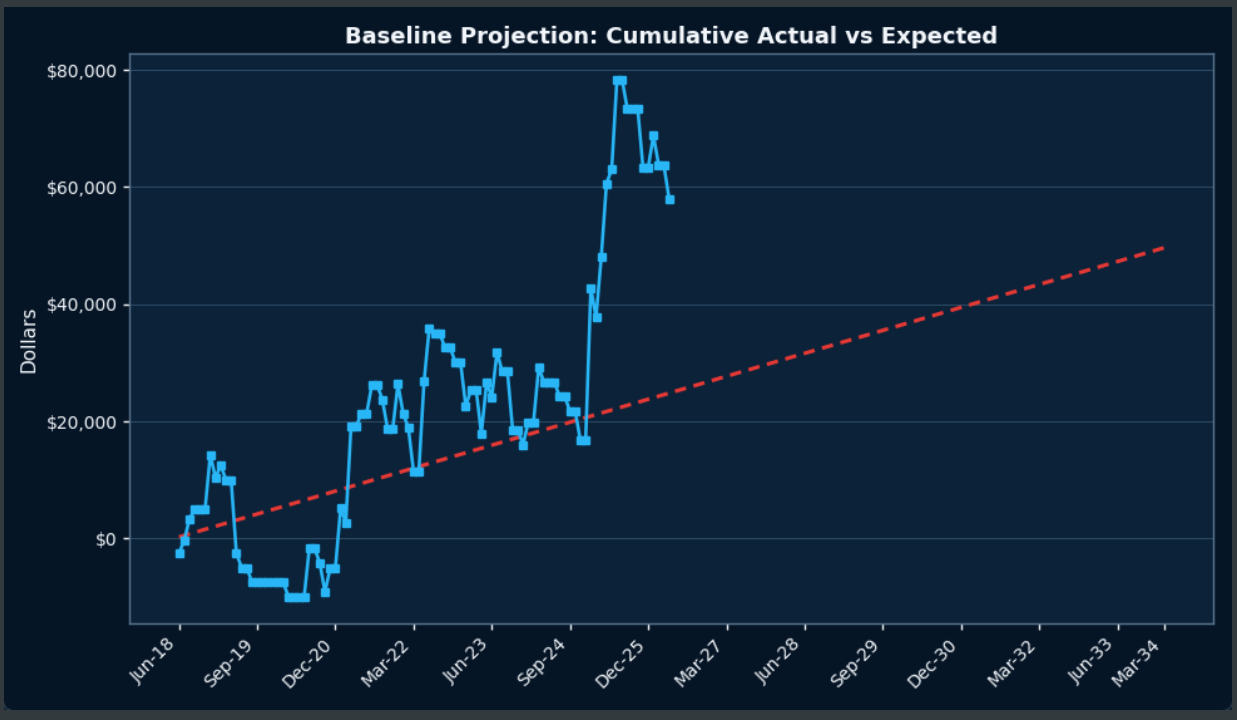
Together, these charts help separate normal trading system discomfort from genuine system deterioration. A strategy can make money and still be dangerous. A strategy can suffer a drawdown and still be behaving normally. The purpose of these charts is to give the trader a visual framework for making that distinction.

Incubation Engine

The Incubation Engine focuses on the period after the original historical test. This out-of-sample window is where the system begins to prove whether it can survive outside the comfort of the development data.

In TS-SystemChecker, the incubation charts compare the expected historical behavior of the system against the actual behavior that occurred after the system was placed into observation, paper trading, or live trading.

Actual versus Projected



The Actual versus Projected chart compares the system's real out-of-sample equity path against the baseline projection built from its historical performance.

The projected line represents what the system might have been expected to do if the historical edge continued forward at a similar pace. The actual line shows what really happened during the incubation period.

This chart is one of the quickest visual checks in TS-SystemChecker. It answers the question: Is the system generally tracking its historical expectation, or is it drifting away from it?

A system does not need to follow the projection perfectly. Trading systems rarely move in a straight line, and even robust systems can experience periods of underperformance, sideways movement, or temporary drawdown. What matters is whether the actual path remains within a believable range of historical behavior.

What to Look For

A healthy system will often show an actual equity curve that generally follows the direction of the projected path, even if it moves above or below that projection along the way. Strong systems may even run ahead of projection, but that should still be evaluated in combination with drawdown and volatility.

A warning sign occurs when the actual curve begins to separate dramatically from the projected curve. If the projected path rises while the actual path stagnates, declines, or wanders erratically, the system may be losing its historical character.

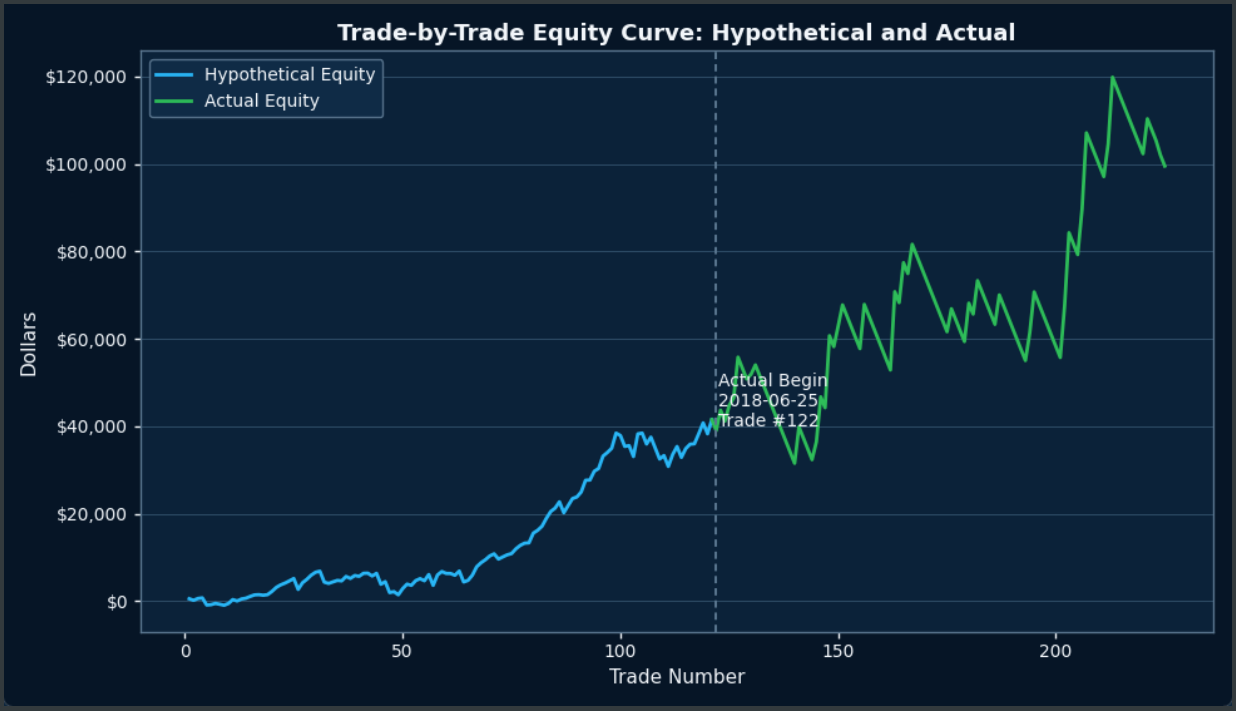
Why It Matters

This chart helps prevent emotional overreaction. A trader may feel that a drawdown is catastrophic, but the chart may show that the system is still behaving within a reasonable historical range. Conversely, a system may be profitable, but the path may be so unstable that it suggests the profits were achieved with much higher risk than expected.

Related Metrics

This chart should be viewed alongside metrics such as Return Attainment, Normalized RMSE, Path Wander Ratio, Drawdown Stress, and Monthly Equity Correlation. The chart provides the visual story; the metrics help quantify that story.

Combined In-Sample and Out-of-Sample



The Combined In-Sample and Out-of-Sample chart places the historical test period and the incubation period on the same equity curve.

This gives the user a broader view of the system's life cycle. Instead of looking only at the forward period in isolation, this chart shows how the out-of-sample behavior connects to the original historical test.

The in-sample section represents the period used to evaluate, design, or validate the system before incubation. The out-of-sample section represents what happened after that point.

What to Look For

The key question is whether the out-of-sample section looks like a natural continuation of the in-sample section.

A strong system will usually show an out-of-sample curve that continues with similar personality. The slope may change. The drawdowns may differ. The pace may slow down or speed up. But the general structure should still feel like it belongs to the same system.

A warning sign occurs when the out-of-sample section looks like a completely different animal. For example, a smooth historical curve followed by a chaotic forward period may indicate that the historical test was too optimistic, overfit, or no longer representative of the current market.

Why It Matters

Many systems look excellent in the original test, but the real truth begins after the test ends. This chart makes that transition visible.

It also helps the trader avoid judging the incubation period without context. A small out-of-sample drawdown might look scary on its own, but when placed next to the full historical curve, it may be ordinary. On the other hand, a drawdown that looks modest in dollars may be large compared to the historical personality of the system.

Practical Use

Use this chart to visually inspect the handoff from development to incubation. The smoother and more natural the handoff, the more confidence you may have that the system is still operating in a familiar regime. The more abrupt the change, the more caution is warranted.

Monte Carlo Analysis on Out-of-Sample Results [OOS]

The Monte Carlo Analysis on Out-of-Sample Results chart focuses only on the trades that occurred after the system entered incubation.

This is different from running Monte Carlo on the full historical record. Here, TS-SystemChecker asks: Based only on the forward trades we actually observed, what kind of behavior might we expect if those trades were reshuffled or resampled into many possible paths?

This chart is useful because it treats the incubation period as its own evidence set. Instead of relying entirely on the older historical test, it examines the more recent out-of-sample results directly.

What to Look For

If the out-of-sample Monte Carlo results show that the system still has a positive distribution of outcomes, that can support the idea that the system remains viable. If the distribution is weak, unstable, or highly dependent on a small number of favorable trades, that may be a warning sign.

Pay close attention to whether the actual out-of-sample path falls within a reasonable range of the simulated paths. If the actual path is far worse than most simulations, the system may be underperforming its own recent trade distribution. If it is far better than most simulations, the system may have experienced an unusually favorable sequence.

Why It Matters

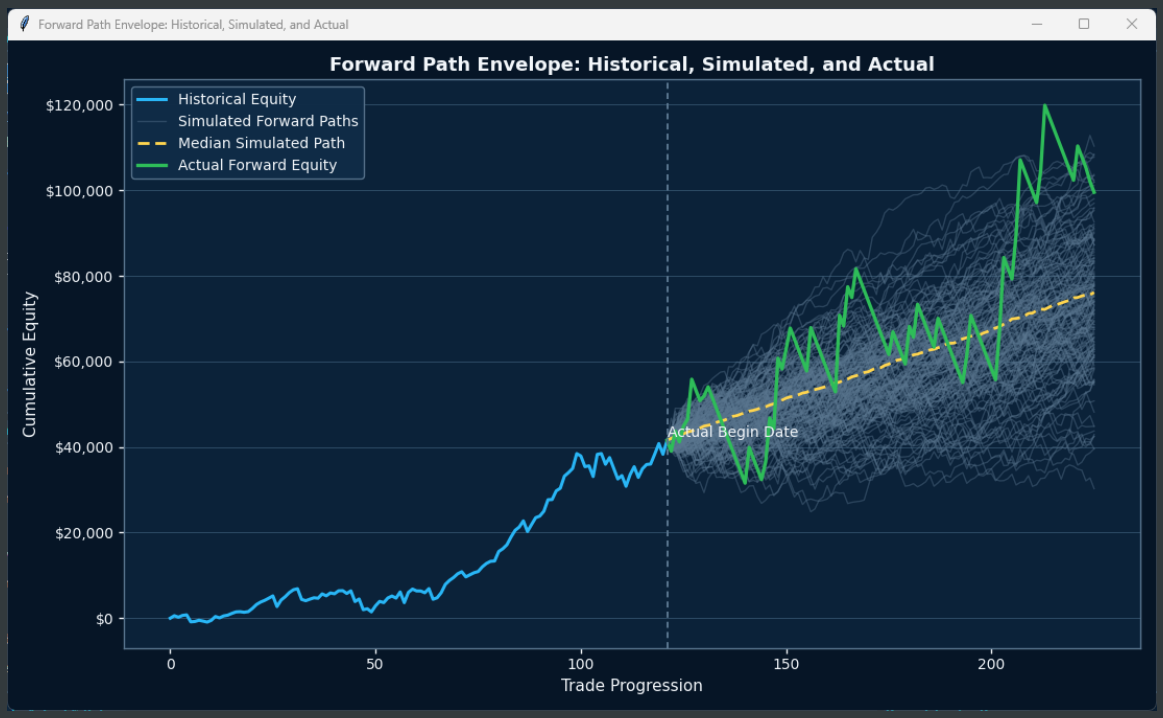
This chart helps answer a subtle but important question: Are the forward results themselves strong enough to stand on their own?

A system may have a beautiful historical test, but if the out-of-sample trade sample is weak, the system deserves caution. Conversely, a system that had a mediocre historical appearance may begin to show promise if the out-of-sample trade distribution improves.

Practical Use

This chart is especially useful for systems that have been sitting on the shelf. Once enough forward trades have accumulated, the OOS Monte Carlo analysis can help determine whether the system has bloomed, deteriorated, or remained inconclusive.

Monte Carlo - Forward Path Envelope



The Monte Carlo Forward Path Envelope chart projects many possible forward equity paths based on the system's observed trade behavior.

Instead of showing a single expected future, this chart displays a range of possible outcomes. The envelope represents uncertainty. It reminds the trader that even a profitable system can arrive at its destination through many different routes.

What to Look For

The most important feature is the width and direction of the envelope.

A narrow, rising envelope suggests a more consistent system. A wide envelope suggests greater uncertainty and larger possible swings in equity. If the envelope expands dramatically, the system may have substantial sequence risk, meaning the order of trades can have a large impact on the trader's experience.

Also look at where the actual or expected path sits within the envelope. A path near the middle suggests normal behavior. A path near the lower edge may indicate stress. A path below the lower edge may suggest that the system is performing worse than the simulated range would normally imply.

Why It Matters

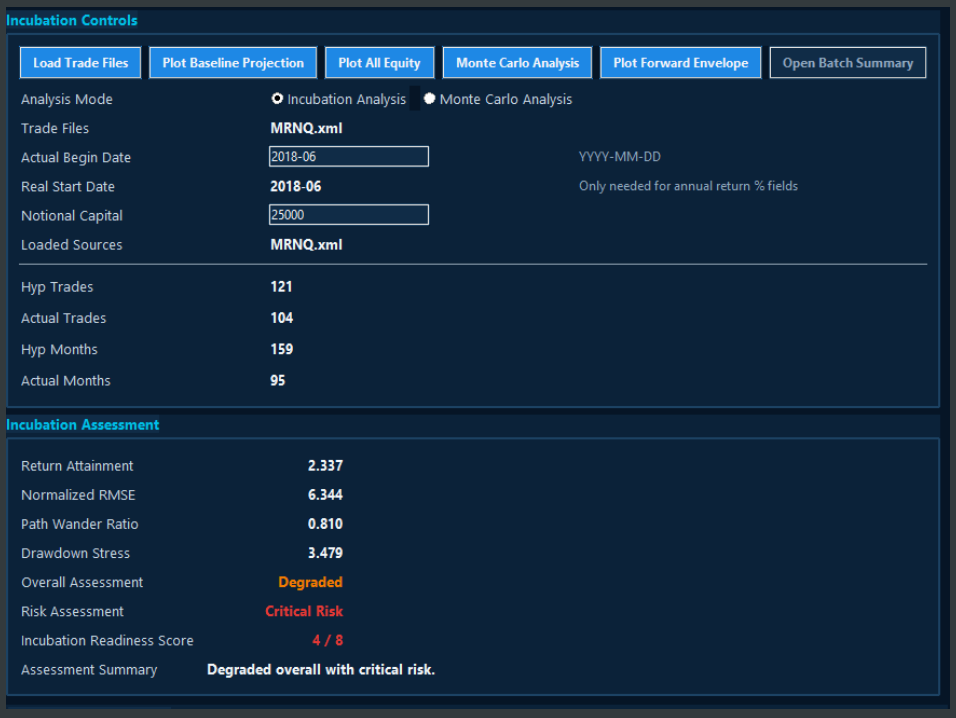
Many traders think in terms of average return, but they live through sequence risk. A system can have a positive average trade and still produce painful drawdowns if losing trades cluster together.

This chart helps the trader visualize the range of possible journeys, not just the average destination.

Practical Use

Use this chart when deciding whether a system has enough cushion to trade. If the lower portion of the envelope falls into unacceptable drawdown territory, the system may require smaller sizing, more capital, or additional filtering before it is suitable for live deployment.

Incubation Control Panel - Great Profits but Risk Is Way Out of Whack



The Incubation Control Panel brings together the key numerical evidence behind the incubation assessment.

This panel is important because profits alone do not tell the whole story. A system may be making money, but it may be doing so with far more risk, volatility, or path instability than the historical test suggested.

That is why TS-SystemChecker separates return behavior from risk behavior. A system can have strong return attainment and still receive a warning if drawdown stress, path wander, or Monte Carlo risk is excessive.

What to Look For

The user should pay close attention to the relationship between return and risk.

If the system is ahead of projection but drawdown stress is also much higher than expected, the profits may not be as comforting as they first appear. This can happen when a system produces strong gains but takes unusually large equity hits along the way.

A strong incubation profile usually combines acceptable return delivery with controlled drawdown behavior. The best case is not simply a system that makes money. The best case is a system that makes money while still behaving like the system you thought you were trading.

Why It Matters

This panel helps prevent one of the most common mistakes in system evaluation: celebrating profits while ignoring the risk required to achieve them.

In real trading, the path matters. A system that doubles the expected return but also triples the historical drawdown may not be healthier. It may simply be more dangerous.

Practical Use

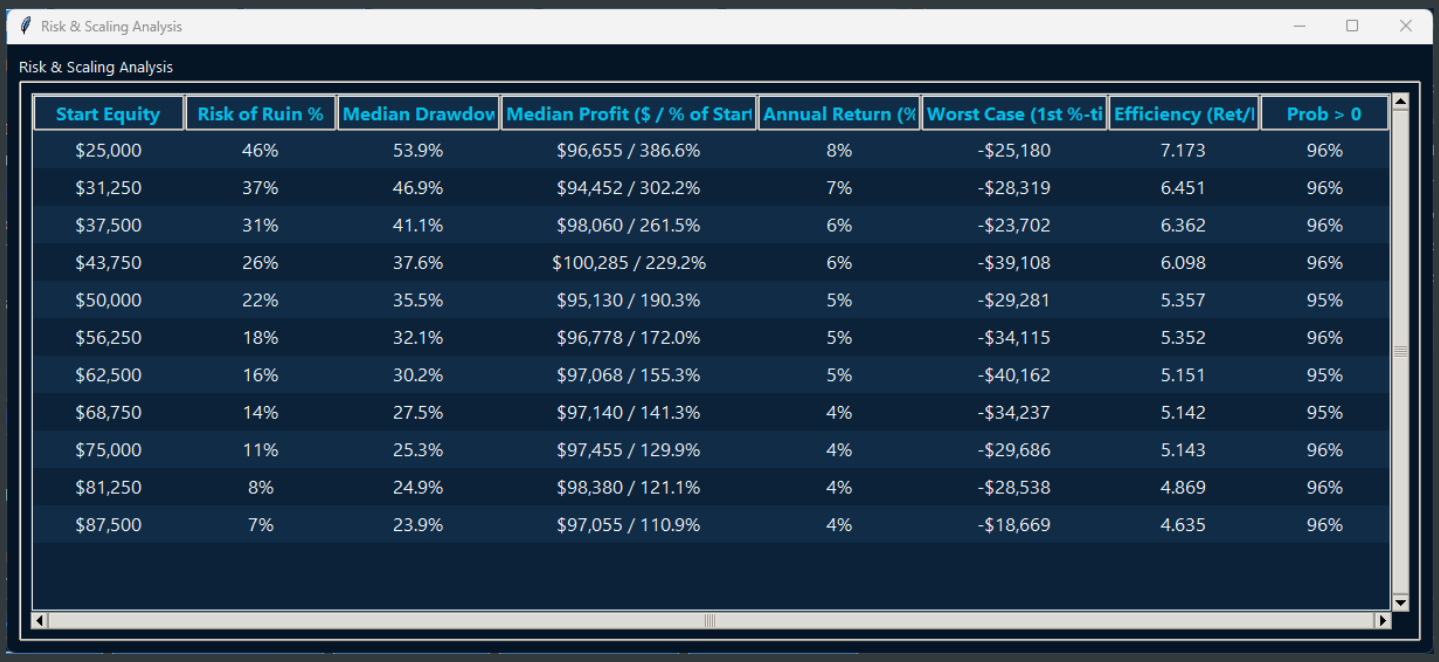
Use this panel as the main diagnostic summary for incubation. The charts show the shape of the behavior, while the control panel shows the numerical scorecard. When the two agree, the conclusion is usually clear. When they conflict, the system deserves closer inspection.

Full Monte Carlo Engine

The Full Monte Carlo Engine analyzes the broader system trade history and simulates many possible equity paths. This engine is not limited to the incubation window. It is designed to help the user understand the distribution of possible outcomes, the likelihood of serious drawdowns, and the account size required to trade the system with reasonable risk.

Monte Carlo analysis does not predict the future. It creates a structured stress test based on the trades the system has already produced.

Risk of Ruin and Scaling



Start Equity	Risk of Ruin %	Median Drawdov	Median Profit ($ / % of Start	Annual Return (%	Worst Case (1st %-ti	Efficiency (Ret/I	Prob > 0
$25,000	46%	53.9%	$96,655 / 386.6%	8%	-$25,180	7.173	96%
$31,250	37%	46.9%	$94,452 / 302.2%	7%	-$28,319	6.451	96%
$37,500	31%	41.1%	$98,060 / 261.5%	6%	-$23,702	6.362	96%
$43,750	26%	37.6%	$100,285 / 229.2%	6%	-$39,108	6.098	96%
$50,000	22%	35.5%	$95,130 / 190.3%	5%	-$29,281	5.357	95%
$56,250	18%	32.1%	$96,778 / 172.0%	5%	-$34,115	5.352	96%
$62,500	16%	30.2%	$97,068 / 155.3%	5%	-$40,162	5.151	95%
$68,750	14%	27.5%	$97,140 / 141.3%	4%	-$34,237	5.142	95%
$75,000	11%	25.3%	$97,455 / 129.9%	4%	-$29,686	5.143	96%
$81,250	8%	24.9%	$98,380 / 121.1%	4%	-$28,538	4.869	96%
$87,500	7%	23.9%	$97,055 / 110.9%	4%	-$18,669	4.635	96%

The Risk of Ruin and Scaling chart shows how the probability of ruin changes as starting equity changes.

This is one of the most practical charts in TS-SystemChecker. It helps answer the question: How much capital does this system need before the risk becomes acceptable?

Risk of ruin is based on the percentage of simulated paths that fall below a defined ruin threshold. In practical terms, it estimates how often the system might suffer a drawdown severe enough to violate the trader's capital limit.

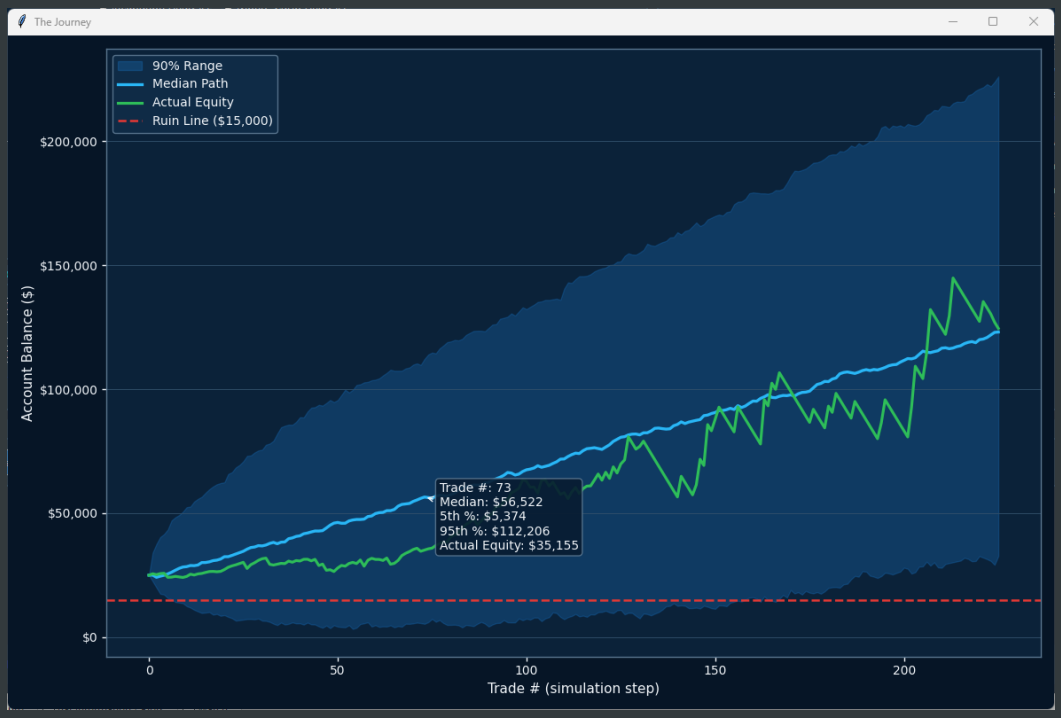
What to Look For

As starting equity increases, risk of ruin should generally decline. This happens because the same dollar drawdown represents a smaller percentage of a larger account.

The important point is not simply whether the system is profitable. The important point is whether the account size is large enough to survive the normal and abnormal losing sequences that the system can produce.

If risk of ruin remains high even at larger account sizes, the system may be too volatile, too highly leveraged, or too dependent on favorable trade sequencing.

Why Ret/DD May Diminish Across Higher Start Equity Values



As the starting equity increases, the system's dollar return may remain tied to the same trade size, while the return as a percentage of capital becomes smaller. The drawdown may also become smaller as a percentage of equity, but the return-to-drawdown relationship can compress depending on how the metric is scaled.

This is not necessarily bad. It reflects the tradeoff between aggressiveness and survivability. More capital can reduce ruin risk, but it can also make the percentage return profile look less exciting.

Practical Use

Use this chart to help determine whether the system is being traded at a reasonable size. If the risk of ruin is unacceptable at the intended capital level, the trader may need to increase capital, reduce contracts, combine the system with other non-correlated systems, or avoid trading the system altogether.

Monte Carlo - The Journey

The Monte Carlo Journey chart shows many possible equity paths generated from the system's trade history.

This chart focuses on the path, not just the final result. It illustrates how different the trading experience can be depending on the order and clustering of trades.

Two traders could trade the same system and experience very different emotional journeys if their starting points or trade sequences differ. This chart makes that reality visible.

What to Look For

Look at the spread of the simulated paths. A tight cluster suggests more consistency. A wide fan of outcomes suggests greater uncertainty.

Also look at the lower portion of the cone. The upper paths may be exciting, but the lower paths reveal what the trader must be prepared to endure. If the lower paths fall deeply below the starting equity, the system may require more capital or smaller position sizing.

The median or central path can be useful, but the danger usually lives in the lower tail. A system should not be judged only by its average path.

Why It Matters

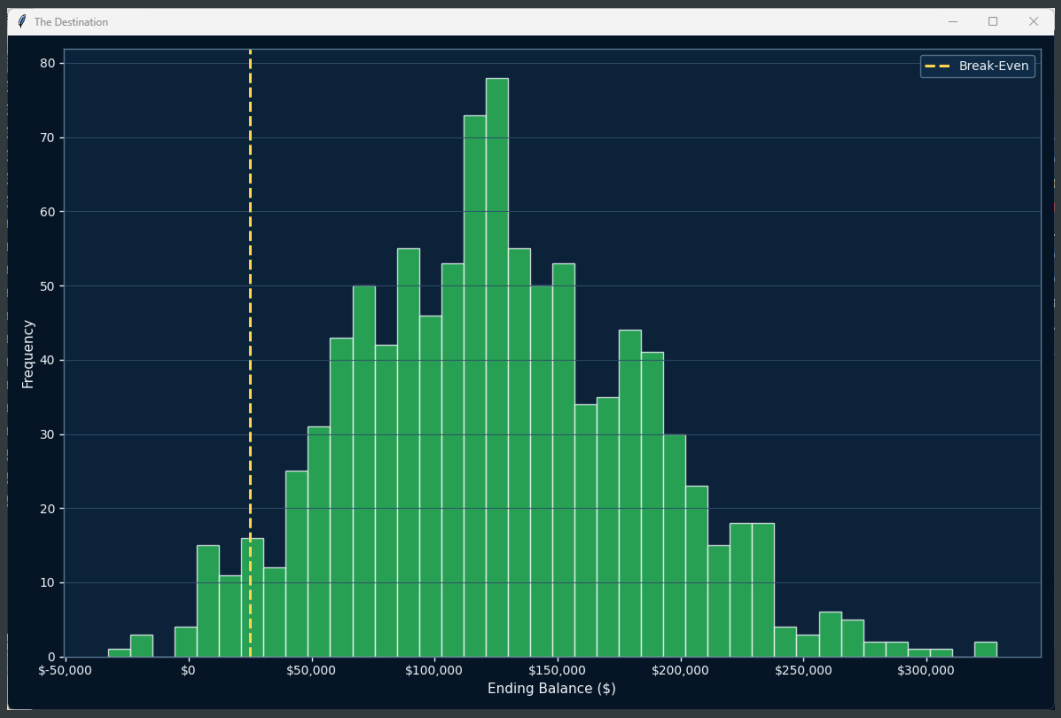
This chart is a reality check. Most traders imagine the smooth historical equity curve, but they experience one path from a large family of possible paths.

The Journey chart helps the user understand whether they could realistically sit through the kinds of drawdowns and sideways periods that the system may produce.

Practical Use

Use this chart before committing capital. If the lower paths are unacceptable, the system may still be profitable, but it may not be tradable at the intended size.

Monte Carlo - The Destination



The Monte Carlo Destination chart shows the distribution of ending equity values after many simulated paths.

While the Journey chart shows how the system might get there, the Destination chart shows where the system might end up.

This chart is typically displayed as a histogram. Each bar represents a range of ending equity values, and the height of the bar shows how many simulations landed in that range.

What to Look For

The most important features are the shape, center, and lower tail of the distribution.

A distribution centered well above the starting equity suggests that the system has a positive expectancy under the simulation assumptions. A distribution with a large lower tail suggests that unfavorable outcomes are still possible, even if the average result is profitable.

If the chart includes a break-even marker, pay close attention to how much of the distribution falls below that point. A small percentage below break-even may be acceptable for some traders. A large percentage below break-even may indicate that the system's profitability is fragile.

Why It Matters

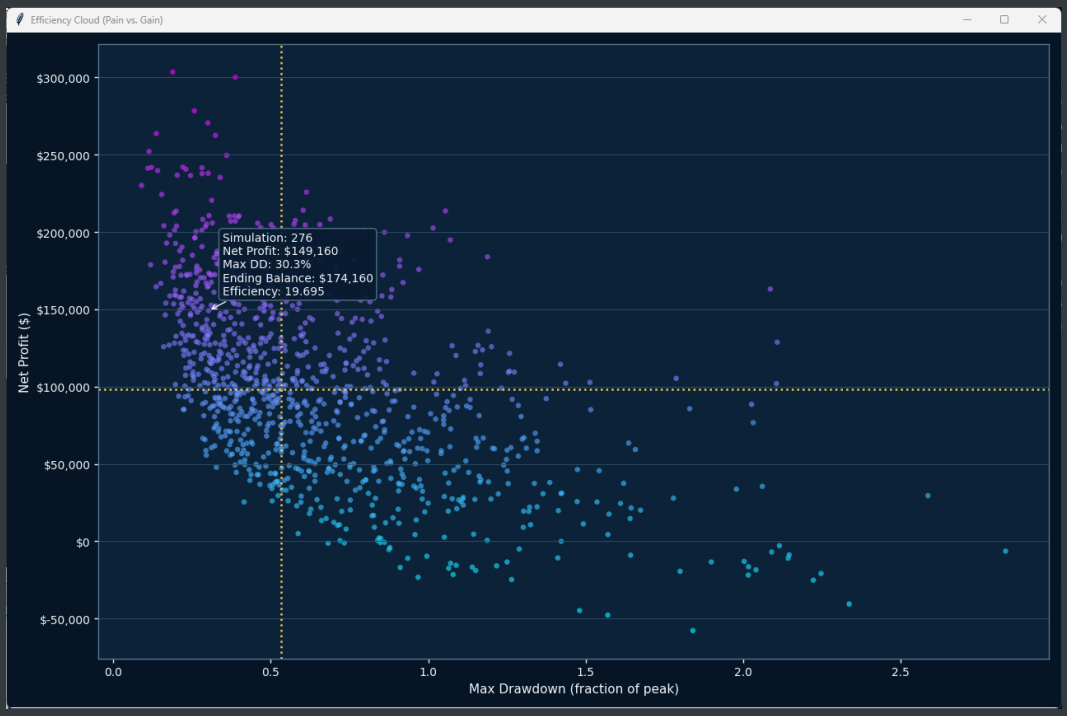
Traders often focus on the most likely outcome, but capital risk is often controlled by the less likely outcomes. The Destination chart helps show both opportunity and danger in the same picture.

A system with a high average ending equity may still be dangerous if the left side of the distribution is too large or too severe.

Practical Use

Use this chart to evaluate the probability of success over the selected simulation horizon. It is especially helpful for answering questions such as: How often does this system finish ahead? How often does it lose money? How wide is the range of possible outcomes?

Monte Carlo - Efficiency Cloud



The Monte Carlo Efficiency Cloud is a scatter-style view of simulated outcomes. Each point represents a simulated path, plotted according to selected performance and risk characteristics.

This chart helps the user see the relationship between reward and pain. Instead of looking at one metric at a time, the cloud shows how the simulations cluster across multiple dimensions.

Depending on the configuration, the cloud may compare ending equity, drawdown behavior, fraction of peak retained, or other Monte Carlo-derived measurements.

What to Look For

The ideal cloud is shifted toward strong returns and controlled risk. If most points cluster in an attractive area, the system may have a healthier reward/risk profile.

A cloud that spreads widely suggests uncertainty. A cloud with many points in poor-risk or low-return regions suggests the system may be vulnerable to unfavorable sequencing.

Understanding Fraction of Peak

A useful way to think about fraction of peak is that it measures how much of the best equity level was retained by the end of a simulated path. A path that finishes near its peak retains a high fraction of peak. A path that reaches a high point and then gives much of it back retains a lower fraction of peak.

This is important because two systems can finish with the same ending equity but have very different experiences. One may rise steadily into the finish. Another may soar and then collapse. Fraction of peak helps expose that difference.

Why It Matters

The Efficiency Cloud helps reveal whether returns were achieved efficiently or sloppily. A system that produces profit but regularly gives back a large portion of its peak equity may be difficult to trade psychologically and financially.

Practical Use

Use this chart to evaluate the tradeoff between opportunity and giveback. The best systems are not always the ones with the highest possible ending equity. They are often the ones that deliver acceptable returns with controlled drawdowns and limited giveback from peak equity.

Monte Carlo Console

Full Monte Carlo Summary

Number of Trades	699	Trade count from the shared loaded Excel data
Start Equity	$25,000	Starting balance used for the full Monte Carlo analysis
Ruin Level	$15,000 (60%)	Account level below which a simulation is considered ruined
Risk of Ruin %	26%	Percent of simulation runs that breach the ruin level
Median Drawdown	38.1%	Median peak-to-trough drawdown across simulated runs
Median Ending Equity	$375,941	Median ending balance after the full trade run
Median Profit	$350,941	Median net profit over the full trade run
Probability of Profit	100%	Percent of runs ending above the starting equity
Worst Case (1st %-tile)	$156,840	1st percentile profit outcome across simulated runs
Efficiency (Ret/DD)	36.884	Median return divided by median drawdown
Annual Return (%/yr)	14%	Annualized return when the loaded trade dates support it

The Monte Carlo Console is the control and summary area for the Full Monte Carlo Engine.

This console brings together the numerical output behind the Monte Carlo charts. It allows the user to review simulation settings, summary statistics, risk estimates, and key performance measures.

The charts provide the visual story, but the console provides the supporting numbers.

What to Look For

The user should review the number of simulations, the starting equity, the ruin threshold, the distribution of ending equity, drawdown percentiles, and any summary statistics related to risk and return.

The console is especially useful for comparing different systems or different position sizes. A chart may look attractive, but the console may reveal that the left-tail risk is too high. Conversely, a chart may look noisy, but the numerical summary may show that the risk is still within acceptable bounds.

Why It Matters

Monte Carlo analysis can produce a lot of information. The console acts as the dashboard that keeps the user grounded.

It helps prevent overreliance on a single chart. A system should not be approved because one visual looks good. The Journey, Destination, Efficiency Cloud, Risk of Ruin table, and Console should all tell a reasonably consistent story.

Practical Use

Use the console as the final checkpoint before making a decision. If the system looks good visually and the console confirms acceptable risk, then the system may deserve further consideration. If the charts and console disagree, the

system should be studied more carefully before trading.

Final Thought

TS-SystemChecker is designed to help traders move beyond simple net profit analysis. Net profit is important, but it is only one piece of the puzzle.

The real question is not simply whether a system made money. The better question is:

Did the system make money in a way that is consistent, survivable, and believable?

The Incubation Engine helps determine whether a system is still behaving like its historical self. The Full Monte Carlo Engine helps determine whether the system's risk profile is acceptable across a wide range of possible future paths.

Used together, these charts provide a practical framework for deciding whether a system is ready to trade, needs more incubation, requires smaller sizing, or should be retired.

Metric and Workflow Manual

TS-SystemChecker Manual

Created by George Pruitt Product: TS-SystemChecker Purpose: Trading system incubation analysis and Monte Carlo risk evaluation

1. What TS-SystemChecker Is Designed to Do

TS-SystemChecker is designed to help a trader or system developer answer one of the most important

questions in systematic trading:

> *Is this trading system still behaving like the system I originally tested?*

A backtest can tell you what happened historically. TS-SystemChecker helps you evaluate what happened after the system moved beyond the historical development period and began accumulating new, unseen data.

The software is best understood as two analytical engines in one application:

1. Incubation Analysis Engine Compares actual out-of-sample performance against the historical baseline.

2. Full Monte Carlo Analysis Engine Uses Monte Carlo simulation to study the possible range of future or alternate outcomes based on the system’s historical trade behavior.

Together, these engines provide a structured way to examine return, drawdown, path quality, risk of ruin, capital adequacy, and whether the system appears to be operating within historical expectations.

2. Important Concept: The Actual Begin Date

The Actual Begin Date is one of the most important inputs in TS-SystemChecker.

This date separates the trade history into two parts:

Historical / hypothetical baseline period The period before the Actual Begin Date.

Actual / incubation period The period on or after the Actual Begin Date.

The baseline period is used to establish expectations. The actual period is then compared against those expectations.

In plain English:

The Actual Begin Date tells TS-SystemChecker where the original test ends and where the real evaluation begins.

3. How to Think About the Metrics

The values and ranges in this manual are practical guideposts, not absolute rules.

Different trading systems have different personalities. A long-term trend-following system, a short-term mean-reversion system, and a portfolio of multiple systems may all produce different ranges of acceptable behavior.

Use the scales in this manual as a starting framework:

Good means the metric is generally favorable.

Acceptable means the system may still be operating normally but should be watched.

Caution means the metric deserves investigation.

Warning means the system may be operating outside historical expectations.

No single metric should be used alone. TS-SystemChecker is strongest when the metrics and charts are interpreted together.

Part I - Incubation Analysis Engine

4. Purpose of the Incubation Analysis Engine

The Incubation Analysis Engine asks:

> *Did the system deliver performance during the actual period that was reasonably consistent with the historical baseline?*

This engine compares actual out-of-sample results against historical expectations using return, drawdown, correlation, and path-quality measurements.

The goal is not to predict the future. The goal is to determine whether the system appears to be behaving normally, underperforming, degrading, or potentially breaking down.

5. Return Attainment

What It Measures

Return Attainment compares the actual return to the expected return from the historical baseline.

A value of 1.00 means the system achieved approximately 100% of the expected return.

A value above 1.00 means the system exceeded expectations.

A value below 1.00 means the system underperformed expectations.

Plain-English Explanation

Return Attainment tells you whether the system delivered the amount of return its historical record suggested it should deliver.

Practical Scale

Return Attainment Interpretation

Above 1.00 Strong. Actual return exceeded expected return.

0.75 to 1.00 Generally acceptable, especially if drawdown is controlled.

0.50 to 0.75 Caution. System is underperforming expectations.

Below 0.50 Warning. Serious underperformance may be present.

Notes

Return alone is not enough. A system can exceed expected return while taking excessive drawdown risk. Always review Return Attainment alongside Drawdown Stress, Normalized RMSE, and Path Wander Ratio.

6. RMSE and Normalized RMSE

What RMSE Stands For

RMSE stands for Root Mean Squared Error.

What It Measures

RMSE measures the average size of the difference between the projected equity curve and the actual equity curve.

Normalized RMSE scales this error so it can be interpreted more easily across systems.

Plain-English Explanation

Normalized RMSE tells you how large the miss was between the expected equity path and the actual equity path.

Another way to say it:

If the projected equity curve was the road map, Normalized RMSE measures how far the actual journey drifted away from that road.

Practical Scale

Normalized RMSE Interpretation

Below 1.00 Good. Actual path stayed relatively close to the projection.

1.00 to 2.00 Acceptable to moderate wandering. Watch in context.

2.00 to 3.00 Caution. Actual path differs meaningfully from expectation.

Above 3.00 Warning. Actual path is significantly different from expected path.

Notes

A high Normalized RMSE does not automatically mean the system is broken. A profitable but volatile system can have a higher RMSE. However, a high value means the actual path no longer closely resembles the projected path.

7. Path Wander Ratio

What It Measures

Path Wander Ratio measures how much the actual equity curve wandered relative to the size of the expected move.

It is related to Normalized RMSE, but it focuses more on the quality or efficiency of the journey.

Plain-English Explanation

Path Wander Ratio tells you whether the system reached its result in a controlled way or whether it meandered all over the place.

A useful analogy:

Normalized RMSE asks: How far did the car drift away from the planned road?

Path Wander Ratio asks: How much unnecessary wandering did the car do compared to the length of the trip?

Practical Scale

Path Wander Ratio Interpretation

Below 0.50 Very good. Path was controlled relative to expected move.

0.50 to 1.00 Generally acceptable. Some wandering but not extreme.

1.00 to 1.50 Caution. Actual path may be inefficient or erratic.

Above 1.50 Warning. System may be wandering too much.

Notes

A system may finish with a good profit but take an uncomfortable or abnormal path to get there. Path Wander Ratio helps expose that condition.

8. Difference Between Normalized RMSE and Path Wander Ratio

These two metrics are related, but they answer different questions.

Metric Primary Question

Normalized RMSE How far was the actual equity curve from the projected equity curve?

Path Wander Ratio How messy or inefficient was the actual journey relative to the expected move?

A system can move smoothly below the projected line and have a meaningful RMSE but a less extreme Path Wander Ratio. Another system can end near expectation but whip around wildly along the way, creating a higher Path Wander Ratio.

Use them together:

Normalized RMSE measures the size of the miss.

Path Wander Ratio measures the quality of the journey.

9. Monthly Equity Correlation

What It Measures

Monthly Equity Correlation compares the actual cumulative monthly equity curve to the projected historical baseline.

Correlation measures whether the actual path generally moved in the same direction and shape as the expected path.

Plain-English Explanation

Monthly Equity Correlation tells you whether the actual equity curve still resembles the projected equity curve.

Practical Scale

Monthly Equity Correlation Interpretation

Above 0.75 Strong. Actual path resembles the projection well.

0.50 to 0.75 Acceptable but not perfect.

0.25 to 0.50 Weak. Actual path only loosely resembles projection.

Below 0.25 Warning. Actual behavior may not resemble the original system.

Notes

Correlation measures shape and direction, not necessarily distance. A system can have decent correlation and still suffer from high RMSE if the actual path is parallel to the projection but far away from it.

10. Drawdown Stress

What It Measures

Drawdown Stress compares the actual worst drawdown to the historical worst drawdown.

A value of 1.00 means actual drawdown equaled the historical worst drawdown.

A value of 1.50 means actual drawdown was 50% worse than the historical worst drawdown.

A value of 2.00 means actual drawdown was twice as severe as the historical worst drawdown.

Plain-English Explanation

Drawdown Stress tells you whether the actual period is producing drawdowns beyond what the historical test prepared you to expect.

Practical Scale

Drawdown Stress Interpretation

Below 1.00 Good. Actual drawdown is still below historical worst drawdown.

1.00 to 1.25 Generally acceptable. Near historical stress boundary.

1.25 to 1.75 Caution. Actual drawdown is meaningfully worse.

1.75 to 2.00 Serious caution. System is under significant stress.

Above 2.00 Warning. Actual drawdown is more than twice historical worst drawdown.

Notes

Drawdown Stress is one of the most important risk metrics in the Incubation Engine. A system may still be profitable, but if its drawdown is far worse than anything seen historically, it deserves serious review.

11. Hypothetical Worst Drawdown

What It Measures

Hypothetical Worst Drawdown is the worst drawdown during the historical baseline period before the Actual Begin Date.

Plain-English Explanation

This is the worst pain the system experienced during the historical test period.

How to Use It

This value establishes the historical drawdown boundary. Actual drawdown should be compared against this number to determine whether the system is still behaving within historical expectations.

12. Actual Worst Drawdown

What It Measures

Actual Worst Drawdown is the worst drawdown after the Actual Begin Date.

Plain-English Explanation

This is the worst pain the system experienced during the actual out-of-sample period.

How to Use It

Actual Worst Drawdown should be compared to Hypothetical Worst Drawdown. If the actual drawdown is much larger, that may indicate degradation or a changing market environment.

13. Combined Worst Drawdown

What It Measures

Combined Worst Drawdown is the worst drawdown across the entire trade history, including both the historical baseline and actual period.

Plain-English Explanation

This is the worst drawdown seen anywhere in the full record.

How to Use It

Combined Worst Drawdown is useful for understanding the total system history, but it should not replace the separate comparison between baseline drawdown and actual drawdown.

14. Actual Worst Monthly Drawdown

What It Measures

Actual Worst Monthly Drawdown identifies the worst monthly drawdown during the actual period.

Plain-English Explanation

This shows the worst month-to-month pain during the incubation or live period.

How to Use It

This metric helps describe the practical discomfort a trader may have experienced during the actual period. A large monthly drawdown may deserve investigation even if the overall system remains profitable.

15. Drawdown Efficiency

What It Measures

Drawdown Efficiency compares return to drawdown.

Plain-English Explanation

Drawdown Efficiency tells you how much return the system generated for the amount of drawdown it endured.

Practical Interpretation

Higher is generally better.

Use this metric primarily as a relative comparison between systems, account sizes, or configurations.

A system with strong returns and modest drawdowns is more efficient. A system with weak returns and large drawdowns is less efficient.

16. Incubation Readiness Score

What It Measures

The Incubation Readiness Score summarizes several pieces of evidence into a simplified score.

It is intended to help classify whether the system appears healthy, questionable, degraded, or potentially broken.

Practical Scale

Incubation Readiness Score Interpretation

7 to 8 Strong. System appears to be behaving well.

5 to 6 Acceptable. Monitor but not necessarily alarming.

3 to 4 Caution. Several warning signs may be present.

0 to 2 Warning. System may be degraded or broken.

Notes

The score should not replace judgment. It is best used as a summary that points the user toward the underlying metrics and charts.

Part II - Incubation Charts

17. Baseline Projection Chart

What It Shows

The Baseline Projection Chart compares the actual cumulative equity curve against a projected baseline derived from historical performance.

How to Interpret It

A healthy system should generally remain near or above the projected path. It does not need to follow the projection perfectly, but large and persistent deviations deserve attention.

Talking Point

This chart shows whether the actual equity curve is still behaving like the system we originally tested.

18. Monte Carlo Incubation Envelope / Journey Chart

What It Shows

This chart compares the actual incubation equity curve against a Monte Carlo envelope generated from historical trade behavior.

The envelope shows a range of simulated outcomes.

How to Interpret It

Actual Curve Location Interpretation

Near the middle of the envelope Normal or expected behavior.

Near the upper part of the envelope Stronger than typical simulation results.

Near the lower part of the envelope Caution. Weaker than many simulations.

Below the lower envelope Warning. Actual result may be outside historical expectations.

Talking Point

The Monte Carlo Incubation chart asks whether the actual out-of-sample performance still falls within the range of outcomes suggested by the system’s own historical trades.

19. Monte Carlo Incubation Distribution Histogram

What It Shows

The distribution histogram shows the ending results of many simulated incubation periods.

Each bar represents a range of simulated ending outcomes.

The actual result marker shows where the real incubation result landed inside that distribution.

How to Interpret It

Actual Marker Location Interpretation

Near center Actual result was normal or typical.

Right side Actual result was stronger than most simulations.

Left side Actual result was weaker than most simulations.

Deep left tail Warning. Actual result was unusually weak.

Talking Point

This histogram keeps us from judging one profit number in isolation. It asks whether the actual result was normal, unusually good, disappointing, or dangerously weak compared to thousands of simulated outcomes.

20. Break-Even Marker on the Histogram

What It Shows

The break-even marker shows where zero profit or no gain occurs on the distribution chart.

How to Interpret It

If most of the histogram is to the right of break even, the system has a healthier simulated profile.

If a large portion of the histogram is to the left of break even, the system may have a fragile edge.

Practical Scale

Percent of Simulations Above Break Even Interpretation

Above 80% Strong. Most simulations were profitable.

60% to 80% Acceptable depending on drawdown.

50% to 60% Marginal. Edge may be thin.

Below 50% Warning. More simulations failed than succeeded.

Part III - Full Monte Carlo Analysis Engine

21. Purpose of the Full Monte Carlo Engine

The Full Monte Carlo Engine asks:

> *What range of outcomes could occur if the historical trade results were reshuffled and projected forward many times?*

Monte Carlo analysis does not predict the future. It creates a range of possible paths based on the system's own historical trade behavior.

This engine is useful when a user wants to understand possible future outcomes, capital requirements, risk of ruin, and drawdown behavior without waiting for a long incubation period.

22. Journey Chart

What It Shows

The Journey Chart shows many possible future equity paths or percentile bands based on Monte Carlo simulation.

It focuses on the path, not just the ending value.

How to Interpret It

Area of Chart Interpretation

Middle of cone More typical simulated outcomes.

Upper cone Stronger simulated outcomes.

Lower cone Weaker simulated outcomes.

Outside lower cone Potential warning if actual results fall there.

Talking Point

The Journey Chart helps determine whether the system is traveling through a normal range of outcomes or drifting into an unusually weak zone.

23. Destination Chart

What It Shows

The Destination Chart shows the distribution of ending equity values from the Monte Carlo simulations.

It focuses on where the simulated paths ended.

How to Interpret It

A distribution clustered well above break even is stronger than one spread widely across both profit and loss.

A wide distribution means there is a large range of possible outcomes.

Talking Point

The Destination Chart shows where the system might end up after many possible trade sequences. It tells us whether the system has a strong positive tendency or whether the range of possible endings is too wide for comfort.

24. Efficiency Cloud / Cluster Cloud

What It Shows

The Efficiency Cloud plots simulated outcomes in terms of reward and risk.

Typically, one axis represents return or ending gain, while the other represents drawdown or risk.

How to Interpret It

Cloud Shape Interpretation

Tight cluster with favorable return and controlled drawdown Stronger risk/reward profile.

Wide scatter More uncertainty.

Many points with high drawdown and low return Weak or dangerous profile.

Potentially profitable but difficult to

Strong returns but very large drawdowns trade.

Talking Point

The Efficiency Cloud reminds us that profit alone is incomplete. We also need to know how much drawdown had to be endured to get that profit.

25. Risk of Ruin

What It Measures

Risk of Ruin estimates how often simulated paths breached a defined loss threshold.

For example, if the ruin threshold is 50% of starting capital, Risk of Ruin measures how often the simulations dropped below that level.

Plain-English Explanation

Risk of Ruin tells you how often the system fell into unacceptable loss territory during simulation.

Practical Scale

Risk of Ruin Interpretation

0% Ideal. No simulated paths breached the ruin threshold.

Below 1% Strong. Very few paths breached the threshold.

1% to 5% Caution. Risk may be acceptable only for some traders.

5% to 10% Serious caution. Risk may be too high.

Above 10% Warning. Survival profile may be unacceptable.

Notes

A system can be profitable on average and still have unacceptable Risk of Ruin. Survival comes first.

26. Account Size and Scaling Analysis

What It Measures

The scaling analysis examines how different starting account sizes affect return, drawdown, risk of ruin, and return-to-drawdown relationships.

Plain-English Explanation

Scaling analysis shows whether the system is being traded with enough capital to survive normal and abnormal drawdown behavior.

Important Point

As starting equity increases, the same dollar profit and dollar drawdown represent smaller percentages of the account.

This is why return-to-drawdown ratios may change across different account sizes.

A larger account may make the system safer, but percentage returns may appear lower.

Talking Point

The same system can look aggressive in a small account and conservative in a larger account. Scaling analysis helps determine whether the account size is appropriate for the system’s risk profile.

27. Gain Percentile

What It Measures

Gain Percentile tells where the actual or selected result falls within the Monte Carlo gain distribution.

A value at the 70th percentile means the result beat approximately 70% of the simulated outcomes.

Practical Scale

Gain Percentile Interpretation

Above 70th percentile Strong. Better than most simulations.

50th to 70th percentile Acceptable to good.

30th to 50th percentile Weak but not necessarily broken.

Below 30th percentile Caution. Underperformed most simulations.

Below 10th percentile Warning. Unusually weak result.

28. Drawdown Percentile

What It Measures

Drawdown Percentile compares actual or selected drawdown against the Monte Carlo drawdown distribution.

The important question is whether the drawdown was normal or unusually severe.

Practical Scale

Drawdown Position Interpretation

Near middle or better Generally acceptable.

Drawdown Position Interpretation

Worse than 75% of simulations Caution. Drawdown was severe.

Worse than 90% of simulations Serious warning.

Worse than 95% of simulations Extreme warning.

Notes

With drawdown percentiles, be careful about direction. The key is not whether the number is high or low by itself, but whether the actual drawdown was worse than most simulated drawdowns.

Part IV - Summary Metric Scale Table

29. Quick Reference Table

Metric Good Acceptable Caution Warning

Return Attainment Above 1.00 0.75 to 1.00 0.50 to 0.75 Below 0.50

Normalized RMSE Below 1.00 1.00 to 2.00 2.00 to 3.00 Above 3.00

Path Wander Ratio Below 0.50 0.50 to 1.00 1.00 to 1.50 Above 1.50

Monthly Equity Correlation Above 0.75 0.50 to 0.75 0.25 to 0.50 Below 0.25

Drawdown Stress Below 1.00 1.00 to 1.25 1.25 to 1.75 Above 2.00

Incubation Readiness Score 7 to 8 5 to 6 3 to 4 0 to 2

Risk of Ruin 0% to 1% 1% to 3% 3% to 5% Above 5%

Gain Percentile Above 70th 50th to 70th 30th to 50th Below 30th

Worse than Worse than Drawdown Percentile Normal/middle Worse than 50% 75% 90%

Simulations Above Break Even Above 80% 60% to 80% 50% to 60% Below 50%

Part V - How to Decide If a System May Be Broken

30. Healthy System Profile

A system is generally showing healthy behavior when several of the following are true:

Return Attainment is near or above 1.00.

Normalized RMSE is below or near 1.00.

Path Wander Ratio is controlled.

Monthly Equity Correlation remains strong.

Drawdown Stress is below or near 1.00.

Actual drawdown remains within historical drawdown boundaries.

Monte Carlo histograms show the actual result near the center or right side of the distribution.

Risk of Ruin is low.

The Journey Chart shows actual performance inside the expected simulation envelope.

31. Degraded System Profile

A system may be degraded when several of the following are true:

Return Attainment is meaningfully below 1.00.

Normalized RMSE is elevated.

Path Wander Ratio is above 1.00.

Monthly Equity Correlation is weak.

Drawdown Stress is above 1.25.

Actual equity is drifting toward the lower Monte Carlo envelope.

Actual result lands in the left side of the histogram.

Risk of Ruin begins to appear at meaningful levels.

A degraded system is not necessarily broken, but it deserves closer monitoring.

32. Potentially Broken System Profile

A system may be broken or operating outside historical boundaries when several of the following are true:

Return Attainment is below 0.50.

Normalized RMSE is above 3.00.

Path Wander Ratio is above 1.50.

Monthly Equity Correlation is below 0.25.

Drawdown Stress is above 2.00.

Actual drawdown is far worse than historical worst drawdown.

Actual equity falls below the lower Monte Carlo envelope.

Actual result lands deep in the left tail of the histogram.

Risk of Ruin exceeds acceptable limits.

This does not automatically mean the system must be abandoned, but it does mean the system should be reviewed carefully before further capital is committed.

Part VI - Suggested Workflow for a Beta Tester

33. Basic Workflow

1. Load the TradeStation-style Excel trade report.

2. Enter or verify the Actual Begin Date.

3. Review the Summary Metrics.

4. Review the Incubation Assessment.

5. Compare actual return against expected return.

6. Compare actual drawdown against historical drawdown.

7. Review the Baseline Projection Chart.

8. Review the Monte Carlo Incubation Envelope.

9. Review the Distribution Histogram.

10. Run the Full Monte Carlo Engine.

11. Review the Journey Chart, Destination Chart, Efficiency Cloud, and Risk of Ruin table.

12. Decide whether the system appears healthy, degraded, or potentially broken.

34. Recommended Interpretation Order

For best results, review the outputs in this order:

1. Return Attainment - Did the system make what it was expected to make?
2. Drawdown Stress - Did it suffer more pain than expected?
3. Normalized RMSE - How far did the path miss the projection?
4. Path Wander Ratio - Was the journey controlled or erratic?
5. Monthly Equity Correlation - Does the actual path still resemble the expected path?
6. Monte Carlo Envelope - Is the actual path inside the simulated range?
7. Distribution Histogram - Was the final result normal, strong, or weak?
8. Risk of Ruin - Was the system survivable under simulation?

Part VII - Important Caveats

35. TS-SystemChecker Does Not Predict the Future

TS-SystemChecker does not predict future market behavior.

It compares actual results against historical behavior and simulated outcomes based on that historical behavior.

A system can pass all tests and still fail in the future. A system can also trigger warnings and later recover.

The purpose of the software is to provide evidence, not certainty.

36. Metrics Should Be Interpreted Together

No single metric tells the whole story.

For example:

A system can have strong Return Attainment but high Drawdown Stress.

A system can have good correlation but high RMSE.

A system can be profitable but land in the lower part of the Monte Carlo distribution.

A system can show low Risk of Ruin but still be psychologically difficult to trade.

The best decisions come from studying the full picture.

37. Final Thought

TS-SystemChecker was built to reduce emotional decision-making in trading system evaluation.

Instead of asking:

Do I feel good or bad about this system?

A better question is:

Is this system still behaving within the historical and simulated boundaries that I should reasonably expect?

That is the central question TS-SystemChecker is designed to help answer.

38. Contact

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TS-SystemChecker is designed to provide evidence, not certainty. Use the charts and metrics together to evaluate system health, risk, and robustness.