## Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1 – Welcome</td>
<td>3</td>
</tr>
<tr>
<td>Chapter 2 – The ACT Tools in Metastock</td>
<td>5</td>
</tr>
<tr>
<td>Chapter 3 – The Trading Concepts</td>
<td>9</td>
</tr>
<tr>
<td>Chapter 4 – The Trading Strategies</td>
<td>13</td>
</tr>
<tr>
<td>Chapter 5 – Developing Your Own Strategies</td>
<td>17</td>
</tr>
<tr>
<td>Disclaimer</td>
<td>20</td>
</tr>
</tbody>
</table>
Chapter 1 – Welcome

Welcome to the manual for the Adaptive Cycle Toolkit!

The Adaptive Cycle Toolkit, or ACT, is a package of tools created for the Metastock software platform. The core of ACT is two original sets of indicators based on work by John Ehlers, and created for just for Metastock.

These indicator sets, ASI and ADSI, were sold in the past, but the new ACT Add-On now contains Metastock templates, system tests, expert advisors, and explorations, as well.

The toolkit contains the following Metastock tools:

- 10 Templates
- 8 Expert Advisors
- 6 System Tests
- 6 Explorations
- 87 Custom Indicators
- 72 External DLL Formulas

The new tools with ACT should allow you to quickly utilize the cutting-edge technology to immediately impact your trading. This manual will get you started using ACT for immediate results. The manual will present the new tools and give a high-level introduction to the concepts behind them. The ASI and ADSI manual that accompanies this one contains in-depth discussions of the indicators and trading strategies.

Now that you have an idea of what ACT is, and how this manual can help you, let’s get an introduction to ASI, ADSI, and the trading techniques developed by John Ehlers…

ASI and ADSI – The Core Indicators

Markets change quickly. Adapting to these changes can be critical to you as a trader. The Dynamic Market Lab, LLC provides two products to help your analysis adapt to changing markets: ASI and ADSI. ASI is a set of traditional indicators which accept dynamic period lengths. ADSI is a set of signal processing indicators based on John Ehlers’ books Rocket Science for Traders and Cybernetic Analysis for Stocks and Futures.

The Dynamic Market Lab (DML) has developed key signal processing applications based on the work of a noted signal processing analyst, John Ehlers. These complex, computationally intensive tools are no longer the exclusive domain of the mathematical and programming elite. Instead of trying to create them, now you can simply focus on using them. It has never been hard to understand how to use them. Coding them has been
Quite another story. The Dynamic Market Lab has kept life simple. These techniques may be based on “Rocket Science”, but you don’t need to work for NASA to use them.

As a group, these indicators:

- **minimize or eliminate lag**

  Cutting-edge mathematics give you indicators that are smooth, but with much less lag.

- **identify trending vs. cycling markets**

  Many people follow trends, or want to know when the market is “cycling”. These tools can help you identify “market modes”

- **identify noisy markets**

  Stay out of whipsaw markets to improve your bottom line

- **filter very short data arrays for extremely responsive, but smooth indicators**

  The Laguerre transform “warp” data to give you adaptive smoothing, and just the right amount of lag vs. smoothness.

- **transform price or indicators to approximately normal distributions. This permits measurement of statistical extremes.**

  Several well known authors suggest markets don’t have a normal distribution, and prices swing to extremes more often than not. Enter the Fisher Transform. A century-old statistical method for converting “non–Normal” distributions into something that is much closer to a Normal distribution.

As you can see, ACT is based on some very powerful and interesting ideas – Ideas that are now integrated into the Metastock platform!

These new tools can be used “out of the box” for immediate benefit from the concepts and cutting-edge mathematics in the core indicators. However, a good trader will use these only as a starting point for unleashing the full power of the software. Remember that ASI and ADSI were originally developed to be open and flexible. Their design considerations allow them to be applied to your unique trading styles and ideas. Unlike some Add-Ons, ACT’s tools are not “black box” – meaning you have full access to the formulas – giving you nearly unlimited potential for developing your trading methods!

Good luck, and we hope that you enjoy the software…
Chapter 2 – The ACT Tools in Metastock

This chapter will show you how to apply the tools provided with ACT when running Metastock.

Let’s look at examples of using each type of ACT tool…

Templates

Templates are files in Metastock that allow you to save most of your workspace screen, including any Custom Indicators, applied Expert Advisors, Metastock screen settings, etc. Using Templates is an easy way to save the things that you like to see on the screen when you are trading.

ACT provides you with starting Templates for each of the trading strategies. The Templates provided with ACT correspond with an Expert Advisor and the base indicators that accompany it. We recommend using these Templates as a starting point, altering them to the trading indicators and experts that you prefer to have on the screen.

To apply a Template:

- Position the mouse in the workspace area
- Right-click and hold down the button
- Select “Apply Template” from the pop-up menu

You should see the “Apply Template” box appear. Here is where you select a Template (*.mwt) file to open…

NOTE: The ACT Templates use the naming convention prefix, “ACT –“, and are located in the subfolder: Program Files/Equis/Metastock/Charts/Brad’s Charts/Experts/.

- Select an ACT Template and click “Open”. That’s It!

To save the current configuration as a Template:

- Click the “File” Menu
- Click “Save As…”

You should see the “Save As” box appear…
Select the drop-down arrow on the combo box at the bottom of the Save As box, titled “save as type:”.
You should see a selection named “Template”. Select this row with your mouse.
Type a name for you template in the “file name:” edit box.
Click Save. That’s It!

Please refer to the Metastock Manual for more information on Templates.

**Expert Advisors**

Expert Advisors are Metastock tools that can be used to notify you of trade signals or other important market conditions. They can also provide commentary that explains why the conditions were triggered, and what they mean.

ACT provides you with eight Expert Advisors, complete with Commentaries.

The ACT Expert Advisors start with the prefix: “ACT – “

Please see the Metastock Manual for more information on applying and editing Expert Advisors.

**System Tests**

System Tests are Metastock tools that can be used to create trading signals and then test these signals on market data with trading simulations.

ACT provides you with six System Tests.

The ACT System Tests start with the prefix: “ACT – “

Please see the Metastock Manual for more information on running simulations and editing System Tests.

**Explorations**

Explorations are Metastock tools that can be used to scan multiple securities to find certain market conditions.

ACT provides you with six Explorations.

The ACT Explorations start with the prefix: “ACT – “

Please see the Metastock Manual for more information on running and editing Explorations.
**Custom Indicators**

ACT provides you with 87 new custom indicators. These indicators can be accessed by opening a security in Metastock, and then doing the following:

- Select "Insert" from the Main Menu
- Select "Indicators"
- Scroll to the bottom of the list box, where you should see all of indicators, which start with _DML_
- Select “OK” to plot the indicator with the current security…That’s it!

The custom indicators provided with ACT use the following naming convention:

- **_DML_ASI_**

  Indicators starting with this prefix are simple examples of all of the ASI indicators. These ASI indicators that accompany these formulas are covered in chapter 4, section 2 of the *ASI and ADSI Manual*.

- **_DML_ADSI_**

  Indicators starting with this prefix are simple examples of all of the ADSI indicators. These indicators are described in chapter 4, section 1 on the *ASI and ADSI Manual*.

- **_DML_CUST_**

  These indicators are custom indicator formulas provided with ADSI. Most of these indicators also provide code for the examples from chapters 5 and 6 of the *ASI and ADSI Manual*.

- **_DML_EXP_**

  These indicators are meant to accompany the Expert Advisors. They contain the same logic that is used in the similarly named Experts. They are displayed in conjunction with the Experts when you apply the Template of the same name, allowing you to see the signal that it generating your trades.

**External Formulas**
External Formulas are a part of the Metastock Formula Language (MFL) that allow you to call functions that are provided in External DLLs. ASI and ADSI are both External DLLs, and together they provide you with 72 External Formulas. You can see an example of how to call the formulas provided with ASI and ADSI by looking at any of the Custom Indicators. Please see the Metastock Manual for more information on External Formulas.

Below are instructions for creating your own Custom Indicator with the External Formulas from ASI and ADSI:

- Select "Tools" from the Main Menu
- Select "Indicator Builder"
- Click "New" to open the "Indicator Editor"
- Click the "Functions" button on the lower right
- Scroll down the "Function Category" to find ADSI or ASI
- Select ADSI or ASI depending on which group the desired indicator is stored in.
- Select the desired indicator. Note in the "Format" box below the indicators, the format & arguments required for the indicator.
- Click "OK". The indicator is placed in the "Indicator Editor" box.
- Name & define input variables necessary to complete the arguments in the indicator. This is similar to completing any formula in Metastock's language.
- Place the variables in the appropriate position in the indicator. Refer to the comment above about noting the format & arguments. The variables must be placed in the location specified in the format.
- Assign a unique name to the indicator, and click "OK"
- Done! You are now ready to plot some very powerful indicators. The process to plot these indicators is the same as for a regular Metastock indicator.
Chapter 3 – The Concepts

As we said before, the tools are based on a rather small set of “concepts” that are combined to create “trading strategies”. Let’s take a look at some of the concepts…

**Instantaneous Trend**

The Instantaneous Trend, or ITrend, is an indicator developed by John Ehlers. The indicator falls into the category of a “zero-lag moving average”, and it uses an engineering method known as the “Z-transform” to extract cycle content from the trend content in the price data.

ACT uses the Instantaneous Trend is two separate ways.

First, it uses a system that is *loosely based on* John Ehlers ITrend Trading Strategy:

In this strategy, a “trigger” is derived from the Instantaneous Trend by adding a two day momentum to the ITrend. The trigger predicts the ITrend’s value two bars from the ITrend’s current value. A long position is indicated when the trigger crosses above the ITrend. A short position is indicated when the trigger crosses below the ITrend.

In the other strategy, a simple crossover of the ITrend and the price gives the trading signals.

**MAMA/FAMA**

MAMA and FAMA are moving averages developed by John Ehlers that are intended to reduce whipsaws.

MAMA and FAMA are computed adaptively based on a concept that is known as the “Cycle Phase Rate of Change”. MAMA is a shorter-term average, and FAMA a longer-term one.

The ACT strategy is based on the crossover of these two different length moving averages.

Please see pages 32 and 33 of the *ASI and ADSI Manual* for more detailed information on MAMA and FAMA.

**Laguerre Filters**
The Laguerre Filter uses a technique derived from signal processing mathematics, and has been applied in the field of technical analysis by John Ehlers. Ehlers suggests applying the filter to several popular indicators, including the relative strength index (RSI).

Like many of Ehlers indicators, the Laguerre RSI is improved with high-tech engineering, but the application is straightforward. The Laguerre RSI can be used much like you would use a traditional RSI.

In ACT, the Laguerre RSI is used as an oscillator to show overbought and oversold conditions.

See pages 48 and 49 of the *ASI and ADSI Manual* for a more detailed explanation of the Laguerre RSI.

**Signal-to-Noise Ratio**

Signal-to-Noise Ratio, or SNR, is an established method for measuring noise in most engineering fields, and was developed in the area of signal processing. The SNR measures the ratio of the actual market signal to the noise. Experienced traders know that it is nearly impossible to trade in a noisy market that has no strong direction.

ACT uses a strategy where trades are not entered when the market is noisy….It is that simple! You would be surprised how often this idea can help your overall trading strategy.

The ACT tools that are labeled with “(no noise)” use the SNR-based strategy.

**Adaptive Momentum**

Adaptive Indicators are indicators that change, or adapt, the number of bars over which they are calculated. The number of bars over which an indicator is calculated is commonly known as the “lookback period”, or simply, period. Traditional, or static indicators use a constant lookback period, such as 14 or 20.

One way of making an indicator adaptive is to find the most dominant cycle in the market, and then use the length of that cycle as the lookback period. This method was developed by John Ehlers in *Rocket Science for Traders*, and is used as the basis for several of his concepts.

The Adaptive Momentum strategy in ACT is based on a trading strategy presented by John Ehlers in chapter 12 of his book, *Cybernetic Analysis of Stocks and Futures*. The strategy is also presented in Section 6.3 of the *ASI and ADSI Manual*. 
The adaptive momentum indicator starts with the traditional momentum indicator, which is defined as the difference, or change, in the price from one bar to the previous bar. The adaptive momentum indicator is simply the momentum indicator measured over the adaptive cycle period length.

Although the adaptive momentum indicator is an oscillator, it may be used to measure trends. The rationale for this use is best described in a paraphrase from Chapter 12 of *Cybernetic Analysis of Stocks and Futures*:

*The point at one point in a cycle to the same point in the next cycle is exactly the same. It doesn’t matter whether the point you select is the peak, the valley, or anyplace in between. The slope between the same points in an idealized cycle is zero. If there is a difference in amplitudes between successive samples, either the cycle period has changed or the market is in a trend. Since cycle periods change very slowly, it is more likely than not that the one cycle momentum is an indication of the trend.*

The above paragraph may be tough to digest without a good understanding of cycle theory…if you have trouble understanding the logic, you may want to refer to the *ASI and ADSI Manual*. However, it is not essential to understand the theory to use the strategy…

The strategy itself is simple: If the Adaptive Momentum indicator is positive, the market is considered to be in an uptrend. If it is negative, the market is considered to be in a downtrend. A long position is indicated when the Adaptive Momentum crosses above zero. A short position is indicated when the Adaptive Momentum crosses below zero.

John Ehlers also suggests use of a money management stop, but this is left as an exercise for the user to implement.

**Adaptive EMA**

ACT uses an adaptive exponential moving average (EMA) in one of its trading strategies. The EMA changes its lookback period based on a volatility measurement.

The basic concept of the adaptive EMA is that it is calculated over a shorter period when the market is choppy, and over a longer period when the market is moving strongly. Perry Kaufmann, an experienced trader and market theorist, is known for developing and presenting this fundamental concept.

ACT uses a well established strategy based on the crossover of two adaptive exponential moving averages.

*More Applications*...
Remember that ASI provides adaptive versions of many traditional indicators, such as moving averages, the RSI, CCI, Stochastic, etc. and you can use these indicators in any place where you may have used a traditional indicator…that is, pretty much anywhere! We have already introduced you to two of the most popular ways in which indicators are made adaptive: the dominant cycle period and a volatility measurement. Please see chapters 3 and 4 of the *ASI and ADSI Manual* for a better understanding of how and why to make indicators adaptive.
Chapter 4 – The Trading Strategies

Adaptive Momentum Trend

This trading strategy is based on the adaptive momentum indicator presented in the previous chapter.

The trading strategy itself is simple: If the Adaptive Momentum indicator is positive, the market is considered to be in an uptrend. If it is negative, the market is considered to be in a downtrend.

The trading signals, entries and exits, are as follows:

A long position is entered (and any short positions exited) when the Adaptive Momentum crosses above zero. A short position is entered (and any long positions exited) when the Adaptive Momentum crosses below zero.

Notice that this system is always “in the market”, either long or short.

Adaptive Momentum Trend (no noise)

This trading strategy is exactly like the previous one, except for one difference.

This strategy does not enter into trades, either long or short, when the SNR is below 9.0. The SNR does not affect the exits.

Notice that this strategy is NOT always “in the market”.

The value 9 has been found to be a good cutoff value, but it can be changed to enter more often or less often. Other values in the formula may also be changed to “tweak” the strategy. See the next chapter for how to make these and other changes to the Metastock tools.

Adaptive EMA

This trading strategy is based on the volatility-based adaptive EMA presented in Chapter 3.

The trading strategy starts by generating two different length EMAs. Both EMAs are adaptive, but the lookback period of one is always three times longer than that of the other.
The trading strategy itself is simple: If the shorter-term EMA is above the longer-term EMA, the market is considered to be in an uptrend. If it is the other way around, the market is considered to be in a downtrend.

The trading signals, entries and exits, are as follows:

A long position is entered (and any short positions exited) when the shorter-term EMA crosses above the longer-term EMA. A short position is entered (and any long positions exited) when the shorter-term EMA crosses below the longer-term EMA.

**Instantaneous Trend**

This trading strategy is based on the Instantaneous Trendline indicator presented in the previous chapter.

The trading strategy itself is simple: If the price is above the ITrend of the price, the market is considered to be in an uptrend. If it is the other way around, the market is considered to be in a downtrend.

The trading signals, entries and exits, are as follows:

A long position is entered (and any short positions exited) when the price crosses above the ITrend. A short position is entered (and any long positions exited) when the price crosses below the ITrend.

**InstTrend Trading Strategy (BETA)**

This strategy is *loosely based on* John Ehlers ITrend Trading Strategy, which he presents in Chapter 3 of *Cybernetic Analysis of Stocks and Futures*.

In this strategy, a “trigger” is derived from the Instantaneous Trend by adding a two day momentum to the ITrend. The trigger predicts the ITrend’s value two bars from the ITrend’s current value. A long position is indicated when the trigger crosses above the ITrend. A short position is indicated when the trigger crosses below the ITrend.

The reason that this strategy is loosely based on Ehlers strategy is that Ehlers also implements the following rules with his strategy:

A buy limit price is set as follows: the current bar’s closing price less a suggested 35% of the current bar’s *range*.

A sell short limit price is set as follows: the current bar’s closing price plus a suggested 35% of the current bar’s *range*.
If the position moves against the direction entered by more than a suggested 1.5%, the trade is closed and the position is reversed.

Ehlers suggests use of a $2,500 money management stop.

The trading strategy also uses limit orders for both long and short signals. Limit orders allow the trader to avoid chasing fast moving markets, and the inevitable slippage.

The above rules have not been programmed into the tools provided with ACT, and it is left as an exercise for the user to implement these suggestions. For more information on Ehlers strategies, please see his books and website.

NOTE: Because this strategy is not programmed as the complete system, it is included only as an Expert Advisor, and not as a System Test or Exploration.

**Laguerre RSI Overbought/Oversold**

This trading strategy is really not a complete trading strategy, but an oscillator that signifies overbought or oversold conditions.

The Laguerre RSI ranges between 0 and 1. When the indicator is above 0.8, it signifies an overbought condition – meaning that it *may* be a good time to exit a long position or enter a short position. When it is below 0.2, it signifies an oversold condition – meaning that it *may* be a good time to exit a short position or enter a long position.

Like most oscillators, the Laguerre RSI here is used in a “contrarian” nature…that is, it tries to predict a change in the market before the change actually occurs. For this reason, a trading strategy based purely on an oscillator is usually not a good idea. It is typically best to use this oscillator to confirm entries or, more typically exits, by a trend following indicator. People use oscillators in many different ways, and you should be able to use this much like you would use a traditional RSI.

NOTE: Because this strategy is not recommended as a complete system, it is included only as an Expert Advisor, and not as a System Test or Exploration.

**MAMA/FAMA**

This strategy uses the tried and tested method of generating trading signals with the crossover of two different length moving averages.

The trading signals, entries and exits, are as follows:
A long position is entered (and any short positions exited) when MAMA crosses above FAMA. A short position is entered (and any long positions exited) when the MAMA crosses below FAMA.

Notice that this system is always “in the market”, either long or short.

**MAMA/FAMA (no noise)**

This strategy is exactly like the previous one, and it uses the same “no noise” logic as the previously mentioned strategies.
Chapter 5 – Developing Your Own Strategies

Changing the Formulas

Special attention must be taken when editing the formulas for the Expert Advisors, System Tests, and Explorations included with ACT.

First, we recommend that you make a copy of the tool that you are attempting to edit before making ANY changes. You can make copies of any of the tools mentioned above by selecting the “Copy” button on the box where the tools are listed. Give the copy a name that sets it apart from the original, so that you are careful not to edit the original.

Now that you have made a copy, you are ready to make some changes.

The most important (and honestly, annoying) part of making a change to a Metastock tool is that you will probably have to make the change in more than one location. For example, if you would like to change the cutoff value of the “no noise” logic from 9 to 8, as mentioned in the previous chapter, then you need to make this change in the following sections of the Expert Advisor:

Under the “Highlights” tab:
- LONG
- SHORT
- Out

Under the “Symbols” tab:
- Long Entry (LE)
- Short Entry (SE)
- Long Exit (LX)
- Short Exit (SX)

Remember that you have to change the formula is the same way is all of these places for the expert or system to work properly!

One suggestion that may save you time is to develop you trading signals as indicators first, actually plotting the final “crossover signal”, and then, when you have it the way you want it, program it in the Expert or System.
The Forum.Latch Function

You may notice a section of code like this one, taken from the InstTrend Expert Advisor:

\[
\begin{align*}
LE &= \text{itrend}<pr; \\
SE &= \text{itrend}>pr; \\
LX &= 0; \\
SX &= 0;
\end{align*}
\]

The four variables are binary variables where the transition from one state to another (in this case, above zero or below zero) represents the “trigger”.

In the case that you always enter in the opposite position when you exit a trade, then you do not even need exit logic, and you can leave LX and SX equal to zero. However, many systems have exits, and this is where advanced users may apply a stop-loss or money management stop.

Next, the Latch function removes unnecessary signals to produce the three-state “B” variable that represents “short in the market”, “out of the market”, and “long in the market”. The Latch function is included in a separate DLL known as the Forum DLL. This DLL was developed through an open source effort by the Equis forum community. Its main author is Patrick Nouvion. A manual for the DLL can be found through the Equis Forum at forum.equis.com.

Also, you should not change the last two lines of code:

\[
\begin{align*}
B &= \text{ExtFml("Forum.Latch",LE,LX,SE,SX)}; \\
B &= 1
\end{align*}
\]

unless you are confident that you understand what the equations mean and how you may want to modify them.

The Latch function is becoming a common and easy method for creating trading signals, and we recommend and use it for creating ours.
Developing Better Tools

It is worth mentioning that we have not included tools with ACT that use all of the concepts that are presented in the *ASI and ADSI Manual*. We recommending reading and understanding this manual to the point that you can create your own trading logic based on your own research and experience. For example, a very powerful concept developed by Ehlers is the **Stochastic-Fisher Indicators**, was not presented in the ACT tools, but is available via the ADSI DLL. The ideas behind this indicator can easily be developed into trading strategies and logic.

After you have a good indicator setup, logic can also be added to the formulas that implements trailing stop losses and combinations of multiple entry and exit logic. There is good open source material of this type available through the Equis forum and the Yahoo metastock groups. There is unlimited potential to develop and improve your strategies!

We also recommend developing generally good trading practices outside of the software itself, including proper money management. The topics are also touched-on in chapter 6 of the original manual.

We hope this manual has helped you get a better understanding of the how to improve your trading with the ACT Add-On for Metastock…Best regards, and we wish you the best of luck in your trading endeavors!
Disclaimer

The Dynamic Market Lab, LLC (the DML) advises any visitor to this site or user of the products, services, or techniques provided herein of the following:

1. While the DML has used its best efforts in preparing this site and the products offered by it, no representations or warranties are made with respect to the accuracy or completeness of this site or its products. The DML specifically disclaims any warranties, including "merchantability" or "fitness for a particular use". No warranty may be created by sales representatives, or written / electronic sales materials. The information and products are sold "as is" "where is". Please be aware that some jurisdictions do not accept disclaimers of implied warranties.

2. The techniques and products contained herein are solely for research. **They are experimental, and may not be suitable for your situation.** The DML shall not be liable for any loss of profit or any other commercial or personal financial damages, including but not limited to special, incidental, consequential, or other damages from use of its products or services.

3. The DML does not sanction or advise any application of the techniques or products contained herein to real money trading or investing. The user is solely responsible for his actions.

4. The DML is not acting as investment or trading adviser in any capacity, and does not intend to be viewed as acting in these roles.

5. Although the DML is not acting as investment or trading adviser, it believes any individual seeking to apply money in the markets in any manner should seek competent, independent trading or investment counsel before doing so. Also, it believes an individual should never use enough money that would jeopardize their lifestyle, obligations, or mental, emotional or physical health of themselves or family if lost. The DML does not offer these ideas as expert, but from what appears to be prudent. Furthermore, the interplay of software and hardware can be complex and, at times, unpredictable. Emergency systems should always be in place to satisfy the user's needs.

6. This disclaimer extends to any products or services, free or for compensation, offered by this site.

7. Any dispute will be resolved under the laws of the state in which the Dynamic Market Lab, LLC was formed (Kentucky).

8. By using the Dynamic Market Lab's products, services, or techniques, the user accepts the terms mentioned above. The user further recognizes that the DML may, at its discretion, and without obligation, refund any monies paid. The user accepts this as the extent of any request for recovery of whatever kind.