

BLACK BOX MODULE of the MARKET TRADER

Lesson 4: Inputs and Optimization Process

Learning objectives

- 1. Application of the idea of Astrological Language.**
- 2. Difference between Model Editor and Choice of Criteria window.**
- 3. The idea of optimization.**
- 4. Parameters that can be optimized.**
- 5. Aspect's figure.**

Inputs: Astrological Language in Action

As you remember, the main idea of the Market Trader program is to get an acceptable prediction for the markets. Or - to get an acceptable prediction for any consistent time series data. We do this prediction taking Astrology as a base. Our reason is that astrology deals with time better than any known system of knowledge. (Actually, it is a theme for a separate study project.) In brief, everything we know and use in our lives in respect of time is based on different *cycles*. Sun and Moon cycles are well-known and accepted by modern science and common sense (our calendar - a year - a month; the divisions such as a day, an hour, a minute). Astrology describes and applies plenty of other cycles - planetary, for example. So, the core idea is: while something (markets) is changing upon the time, let us compare this to something else that is changing within the same time period and is well-known to us. Applying this idea to the markets, we compare price changes to the movement of celestial bodies.

In the previous lesson, we have discussed outputs (i.e. price events). Those are events we want to predict. Let us talk a bit about the inputs. It is the other side of our problem. We want to specify different astronomical/astrological/physical/mathematical factors that might influence the price we want to predict.

Thus, we are entering the "Astrological Language" field. We started to develop it as a specifically astrological tool. Astrological Language makes possible to define and record any astrological event. Astrological events may be single ones (like some planet's position in a specific sign or a house, some planet's movement (direct or retrograde), an aspect between two planets or between a planet and a middle point.

Astrological events may be compounded (a position of several planets in specific signs and/or houses, different aspects between two specific planets or inside a group of planets, and much more). Astrological events give us plenty of possibilities and combinations. But later, solving some pure physical problem, I came across to a new idea. This idea is quite simple: to add another kind of events to the Astrological Language. These new events are non-astrological and non-astronomical (i.e., do not reflect physical movement of the celestial bodies), but they are related to the subject of our research. This is the way how Astrological Language can grow to the LANGUAGE OF EVENTS. In other words, this should be the way is to describe any event that occurs in time and space. It is one direction of the main stream of our efforts. This allows us to be optimistic in developing forecasting systems. We can study different factors that might move the market and, one by one, add these events to the Astrological Language. (For example, market research may include such price related events as the regression models, Fibonacci levels, etc.) We understand that our knowledge of the causes and effects is restricted by many things; however, we are developing a system that allows to include more factors into our consideration...

This is our future. Let us return to our present.

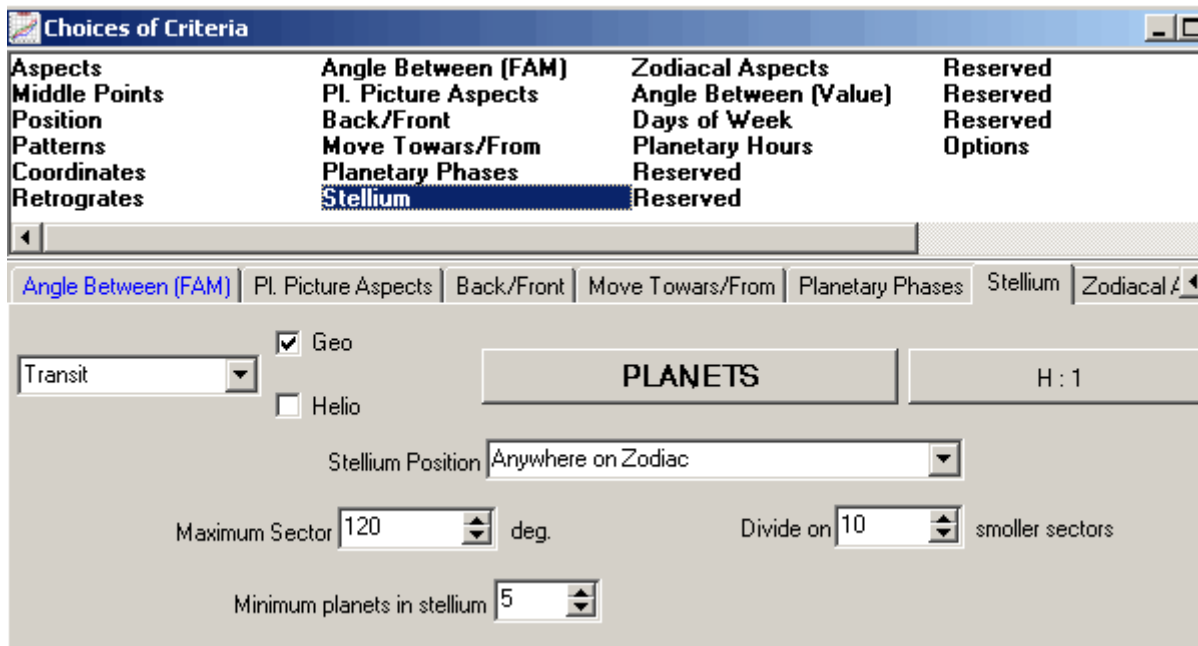
Here is an example of how we develop the Astrological Language (AL). Sometimes ago, I explored the possibility to predict sunspots activity by means of our Market Trader program. What astrological factors would you consider for this project? I started with heliocentric aspects. I also used the position of Solar System's center of mass and aspects to this point as well (I did it after reading a book by Th. Landscheidt, "Sun-Earth-Man"). Then I received the information about the study conducted by one of Russian physicists. He has investigated sunspots activity and has found that this activity increases when several planets are located within a narrow arc. This conclusion can be easily interpreted by any astrologer: we are speaking about the stellium in heliocentric Zodiac. So, I have created the new kind of astrological event - planets' stellium. Here is how it looks in the model editor window:

The screenshot shows a software interface titled "Stellium". It features several input fields and a button:

- At least:** A numeric input field containing the value "4".
- Transit:** A dropdown menu with "Transit" selected.
- Planets located in Sector:** A text input field containing "060 ° 00' 00\"".
- Harmonic:** A numeric input field containing "1" and a dropdown menu with "H" selected.
- Zodiac:** A dropdown menu with "Helio" selected.
- Center of Gravity:** A text input field containing "000 ° 00' 00\"".
- Use:** An unchecked checkbox.
- Button:** A button with a grey background and a black border, containing a row of astrological symbols: ☉☽♂♂♂♂♂♂♂♂.

It means that in Heliocentric Zodiac at least 4 planets (any combination, including any planets from Mercury to Pluto) are located within a sector of 60 degrees. There is one more thing there, "Center of Mass". If we activate this option, the program will search for the stellium of the planets while this center (Center of Mass) is located in some particular place of Helio Zodiac. Now, after recording this event in AL, we can use it for our research. We can find easily all moments when this stellium in helio zodiac occurs. (By the way, it took me just a few hours to program this window, and I could check my idea regarding to sunspots activity at the same day).

But this is only one half of the problem. The other half is the optimization and creation of the forecasting model. For this particular task (forecast sunspots activity), we need to research the sector's size, nature of involved planets, the number of planets in the stellium (4 is set by default), and we need to understand should we use or do not use the Center of Mass. What I want to tell is: it is one thing when you tell that "stelliums cause the sunspots activity", but it is totally different when you want to create the real forecasting model. For this task, it is necessary to analyze thousands of stellium events with different parameters. It is time-consuming, but we can do it faster: run "Choices of Criteria" window that allows to create a *list of events*:

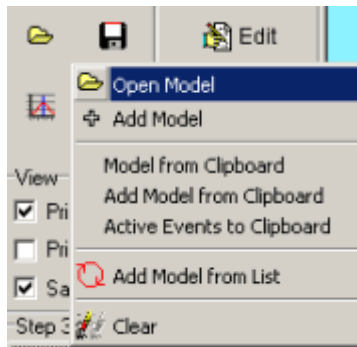


After that, you can run Black Box optimization (see below), and the program will find what parameters are the best for forecasting model.

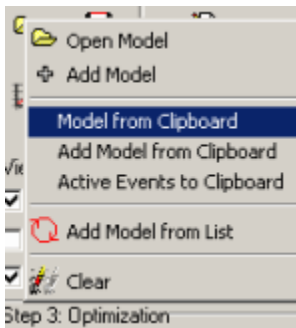
Inputs in Black Box

There are several ways to define the input events in Black Box.

- You can download the early saved (in *.hyp file) model:

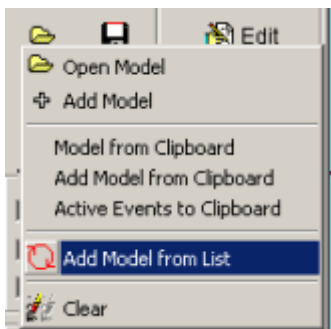


- You can download the model from clipboard:



In this case, it is useful to work with Statistic Expert and Black Box together. You can provide the statistical analysis for astro events, choose the most effective events, put them into clipboard. Then you can use these events in Black Box.

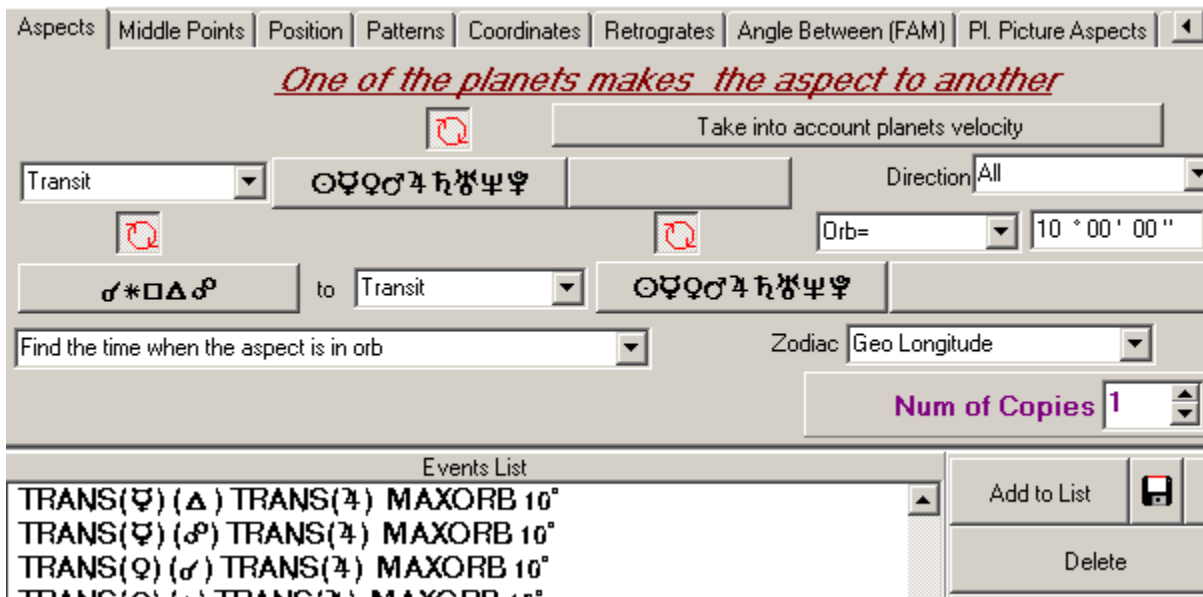
- You can create the list of events using "Choices of Criteria" window (I prefer this way):




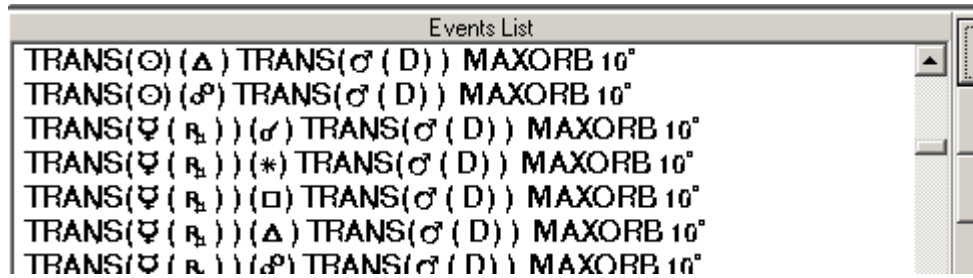
After you activate this option, you will see the window "Choice of Criteria". Part of this window reminds Model Editor window, which is not surprising as both windows are based on the idea of Astrological Language (AL). However, their designation is different. Model Editor is universal, its purpose is to create a model, for variety of different tasks. Choice of Criteria window was designed for specific needs of Black Box (as you remember, the main idea of Black Box is to evaluate the importance of different factors in the model, it is *why* we assign *weights* to aspects, etc.), it supplies material for Black Box optimization process. If, for example, you would like to use aspects for Black Box model, you can define each one of them through Model Editor, then make a formula that somehow combines them all - it is OK when you work with several aspects. If you research several hundred of aspect, the process of creating a model might be very tiresome, and you will waste a lot of time. Choice of Criteria does all this mechanical work of creating astro models itself, somewhere inside the program, providing you a list of events in the end; it is a true time-saver.

This window has many tabs devoted to different categories of events. The order of tabs reflects the way of our work on the Black Box module. Here are some examples:

a) Choose the "Aspects" tab. Setting parameters exactly as it is shown below, you can create the list of **transit-transit** aspects:



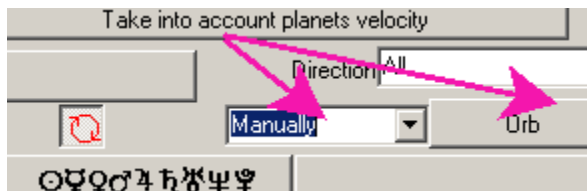
It takes just instants to create the list of couple hundreds events which are all possible planetary pairs for Ptolemy aspects. If you would like, push this button  and re-create the list once again:



The program will create the list of 1440 aspects taking into account the type of planetary motion. For example, we can consider aspect **Venus trine Jupiter** in general and as four different modifications: **-Direct Venus trine Direct Jupiter, Direct Venus trine Retrograde Jupiter, Retrograde Venus trine Direct Jupiter, Retrograde Venus trine Retrograde Jupiter** (it may worth to research the impact of all these aspects on the market).

Also, you can consider the aspect's type whether it is an applying or separating. You should define where goes any planet involved into the aspect (press this button and choose the direction - **Front of, Back to**). So for one aspect **Venus trine Jupiter** we have 8 possible combinations.

One more possibility is to define the orb. Of course, you can set one orb for all aspects: . But you can set different orbs depending on involved planets:




. Press the "Orb" button and you will get this window:

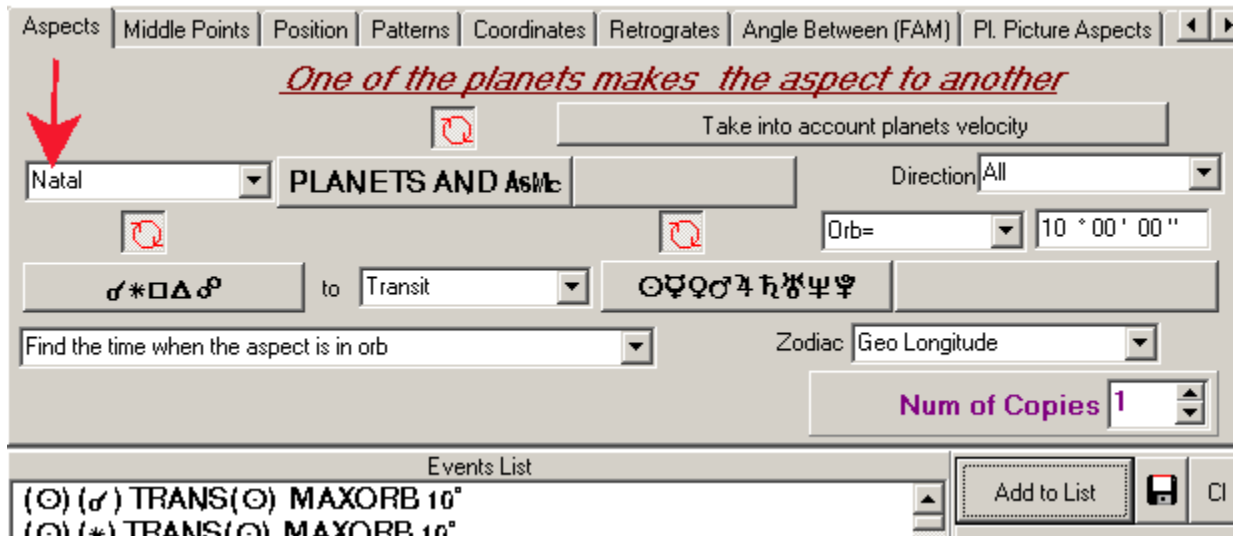
Manual Orb/Step	
Orb/Step for Fastest Transit Planet	
Sun	3,00
Moon	15
Mercury	3,00
Venus	3,00
Mars	2
Jupiter	1
Saturn	1
Uranus	1
Neptune	1
Pluto	1

Here you can define the orb for each planet. For example, for all aspects involving the Moon the orb might be 15 degrees (Moon conj Sun, Moon trine Mars, etc.- all aspects). The program finds the fastest planet in the aspect and uses the appropriate orb. For example, if we have the aspect **Mars trines Uranus**, the fastest planet here is **Mars**, and the program uses the orb **Mars** here (i.e. **2 degrees** orb). Logically the orbis of the planet should be proportional to the average speed, but it is necessary to test this hypothesis.

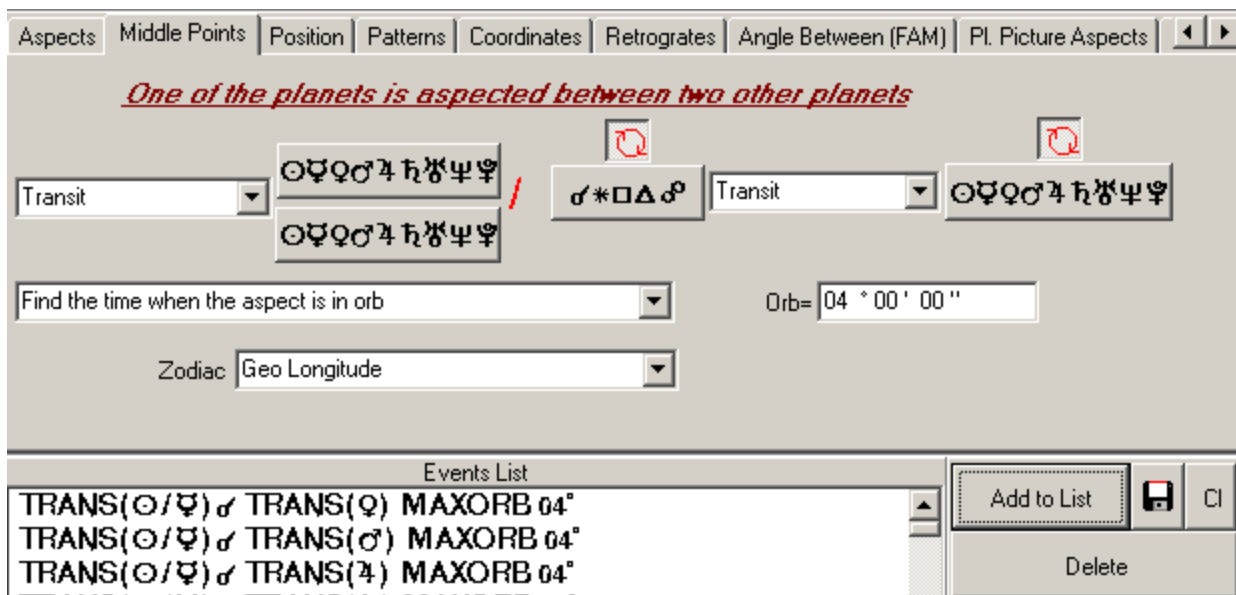
This option  allows you to choose the Zodiac.

One more feature: you can define several copies of the same aspect. Sometimes it improves the results: 

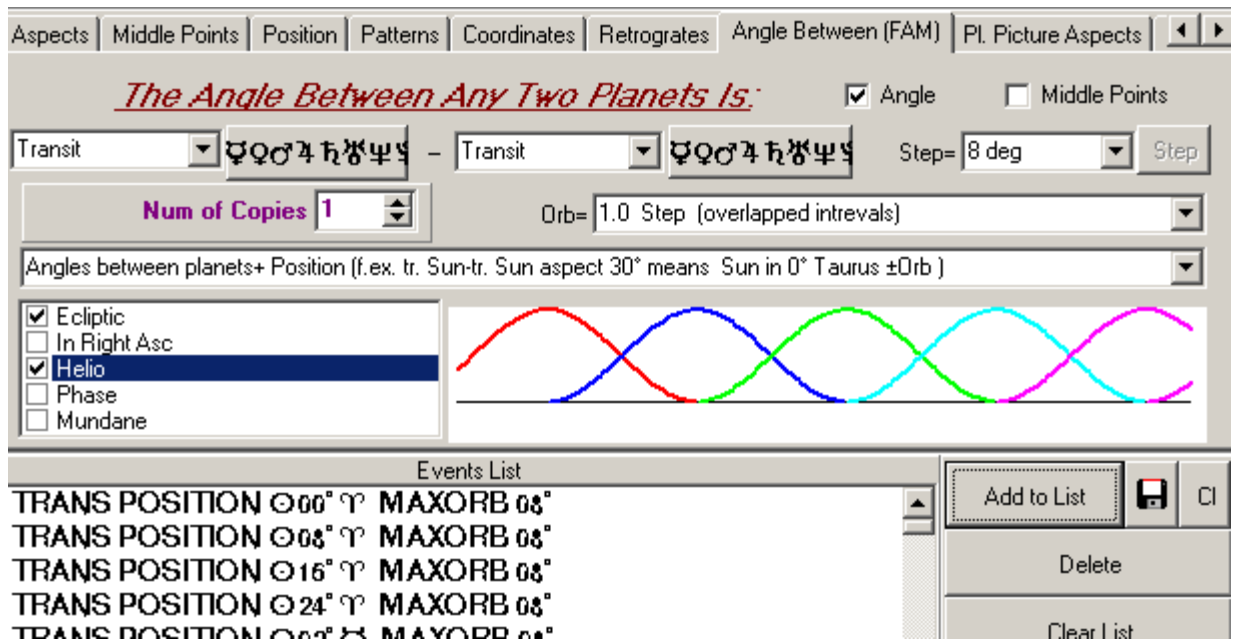
b) Setting the parameters this way (still on the same "Aspects" tab), you can create the list of **natal-transit** aspects:



c) Choose "Middle points" tab. Setting parameters exactly as it is shown below, you can create the list of **transit-transit** aspects to middle points:



d) Choose "Angle Between (FAM)" tab. Here you can analyze **each** degree of zodiac and **each** degree for the angle between planets (it analyze all planetary pairs):





I gave a name to this model, it is Floating Angle Model (**FAM**). It is a very promising model. Its best feature is that it covers such events as the aspects to natal planets (it simply analyzes each degree) and transit-transit aspects as well.


Intuitively, I like this model more than some other models. The reason is that it eliminates the problem of the natal chart's rectification - we do not need the natal chart here, because it analyzes each and every degree, all of them. It locates the sensitive points and this way takes into consideration the "natal" chart though we might not have this chart at all.

If you use this option , the program will analyze each Zodiacal degree.

If you use another option,

, the program will analyze each degree of Zodiac and each degree of the angle between two planets (thus, we can take into account all possible transit-transit aspects). The Orbis/Shift (see below) provides very accurate search of sensitive points.

A very important parameter here is *Step*: . It shows how program analyzes Zodiac in detail. The smaller the step is, the more sensitive points in Zodiac (or angle between planets) program can specify during the optimization.

You can define the step depending on the involved planet:  .
The "Step" button becomes available only when you choose "Manually" setting in the list. It works exactly like "Orb" option in the "Aspects" tab. We recommend to use the smaller step for fast moving planets. May be, the step should be proportional to the average speed of the planet, more research should be done on this. [Here you can read some details about Floating Angle Model \(FAM\)](#). Some mathematical details are very important here.

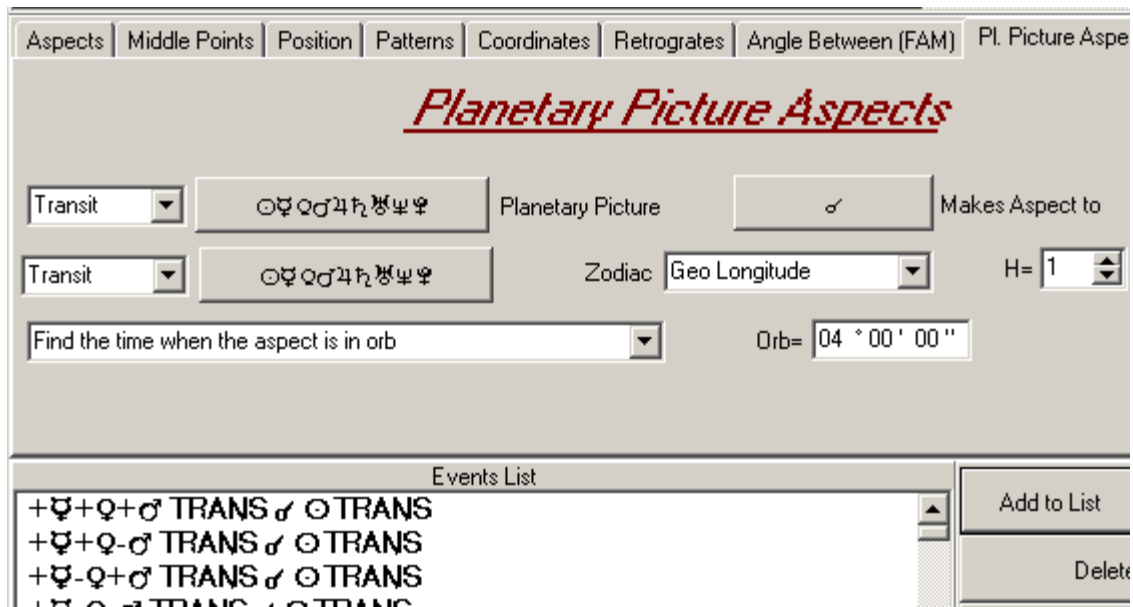
Usually, I use geocentric floating model (with Step 5 or 8 degrees). However, recently I started to use different orbs ("Manually" setting) adding sometimes Heliocentric and Phase Zodiac for inner planets and the Moon. Usually I use the "Position Only" setting, i.e. the program analyzes active points of Zodiac, but sometimes better results are with "Angles+Position..." setting, i.e. sensitive points for angle between transit planets can also give some information. This question needs more detailed research.

The Black Box model that predicts volatility for Dow Jones using data from 1915 year consists of almost 20.000 FAM events; it analyzes more than 25.000 price points. It means that the program does 500.000.000 calculations to prepare this model. This is HUUUGE model. But it takes only 2 hours to calculate and optimize this model - because of the incredible potential of Astrological Language approach.

e) Choose the "Retrogrades" tab. Here you can define the type of planetary movement (either direct or retrograde):



f) The tab "Pl.Picture Aspects" is designed to define events related to planetary pictures:

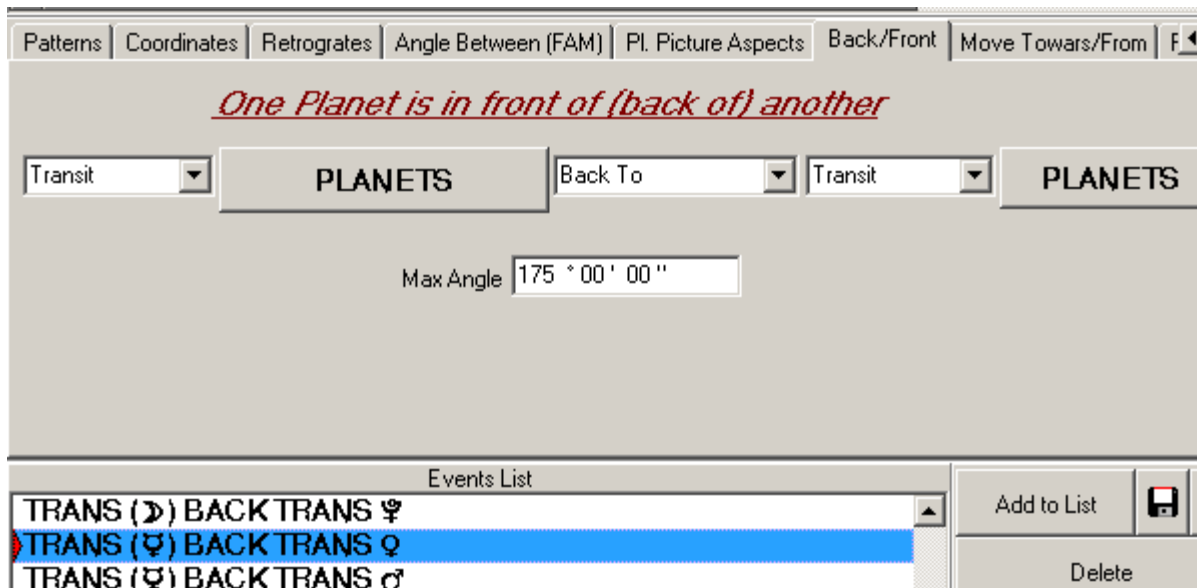


It is something kind of **Mercury plus Venus plus Mars conjuncts Sun**. Or **Mercury plus Venus minus Mars conjuncts Sun**. In one instant you can create the list of 1008 combinations for planetary pictures and in a couple of minutes you can check how these aspects move the stock market. These are very interesting events!

Next two tabs are the illustration of the process of the model's creation. We will not look here at *aspects*, we will try to see the bigger *picture*.

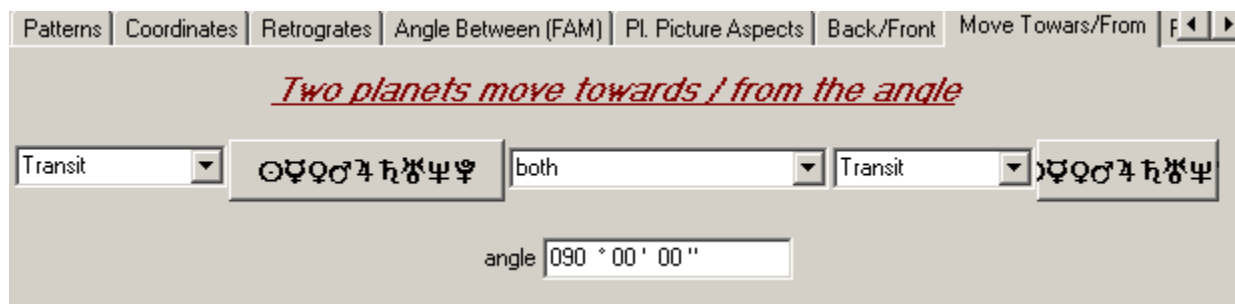
g) Here is an example of one model that sometimes gives very good results.

Choose the "Back/Front" tab in the "Choices of Criteria" window and set parameters exactly as it is shown below:



This is an attempt to describe how the planets are located relative to each other. This setting records all planets that are behind other planets. Press "Add to List" button, and the program will create 45 events. For example, look at this event: **TRANS (♃) BACK TRANS ♀**. It means that **transit Mercury is located back to transit Venus** (as an example, Venus might be in 25 degrees of Taurus and Mercury might be in 1 degree of Taurus). Now choose this option **Front Of** and press "Add to List" button once again. The program will create 45 events more for "Front of" location. Now we have 90 events that describe how planets are located with respect to one another.

h) Then go to the next tab "Towards/From":



Here you can create the list of events list that describe another kind of planetary moves relative to each other. Set the angle value: **angle 000 ° 00' 00"** and press "Add to List" once again. The program adds 72 events more to our list. Here they are:

```

TRANS (♃) ⇄ TRANS ♃ TO 0°
TRANS (♃) ↔ TRANS ♃ TO 0°
TRANS (♃) ⇄ TRANS ♃ TO 0°
TRANS (♃) ↔ TRANS ♃ TO 0°
TRANS (♃) ⇄ TRANS ♃ TO 0°

```

The first event **TRANS (♃) ⇄ TRANS ♃ TO 0°** means that transit Venus moves toward transit Saturn. It looks like applying conjunction between these planets. The next event means the opposite movement. Orbs are not important here, we are not considering them.

Now set the angle and press "Add to List", the program will create 72 events more:

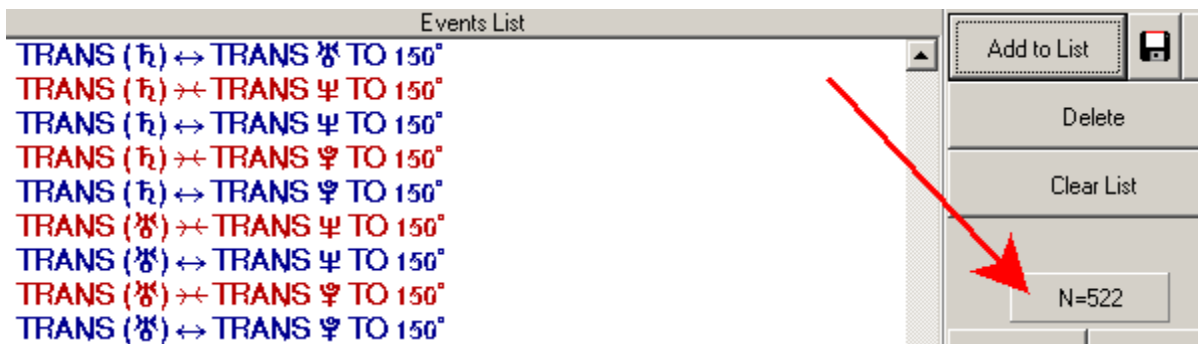
```

TRANS (♃) ⇄ TRANS ♃ TO 30°
TRANS (♃) ↔ TRANS ♃ TO 30°
TRANS (♃) ⇄ TRANS ♃ TO 30°
TRANS (♃) ↔ TRANS ♃ TO 30°
TRANS (♃) ⇄ TRANS ♃ TO 30°
TRANS (♃) ↔ TRANS ♃ TO 30°
TRANS (♃) ⇄ TRANS ♃ TO 30°
TRANS (♃) ↔ TRANS ♃ TO 30°

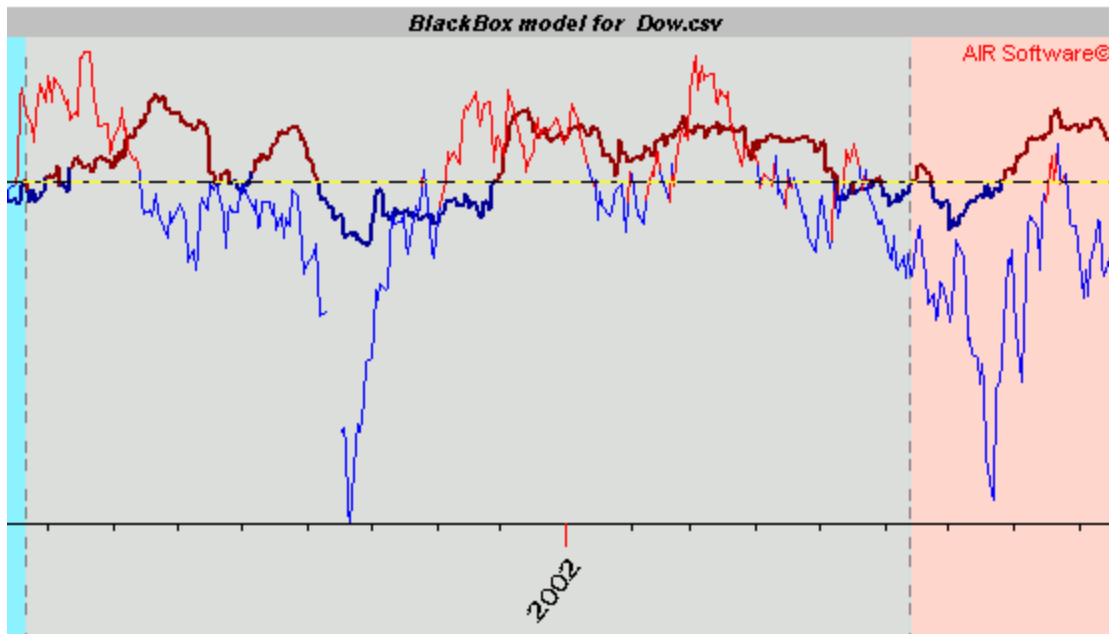
```

It is another list of events; it shows planets moving towards the angle 30 degree between them. It means like 30 degrees applying aspects between these planets (again, we do not take orbs into account).

Then create the same thing for angles 60,90,120 and 150 degrees.

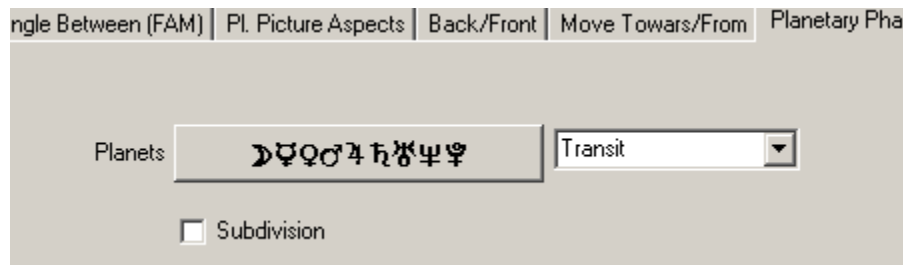


When this is done, press "OK" button. Now we can calculate and optimize this model. Here are its results on testing interval:

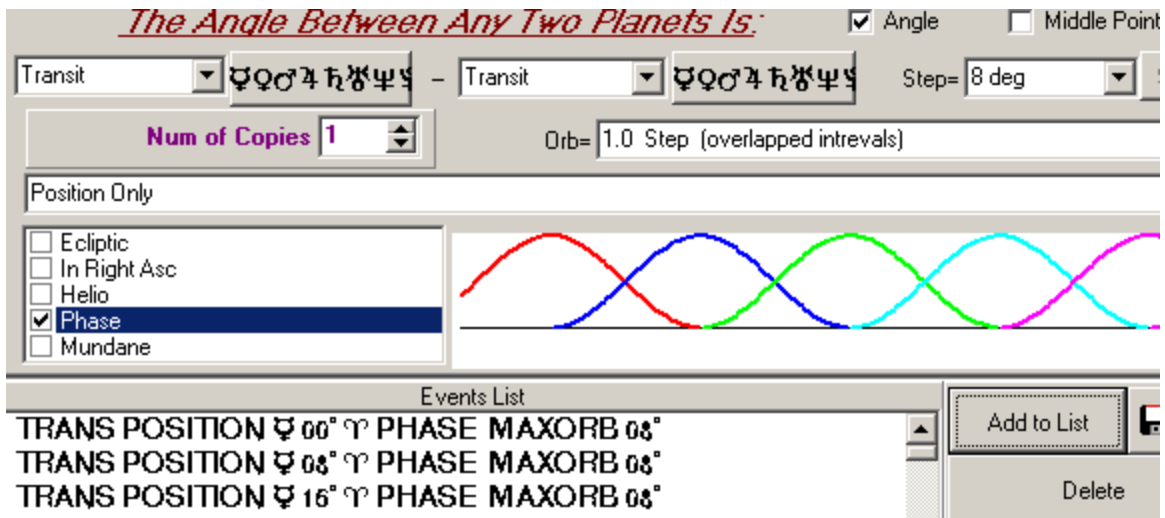


Of course, it is only a draft of the model, but you can combine it with other events. This issue also needs more research.

i) Let us look at one more tab, "Planetary Phases". Here we can create lists for planetary phases and Moon phases:



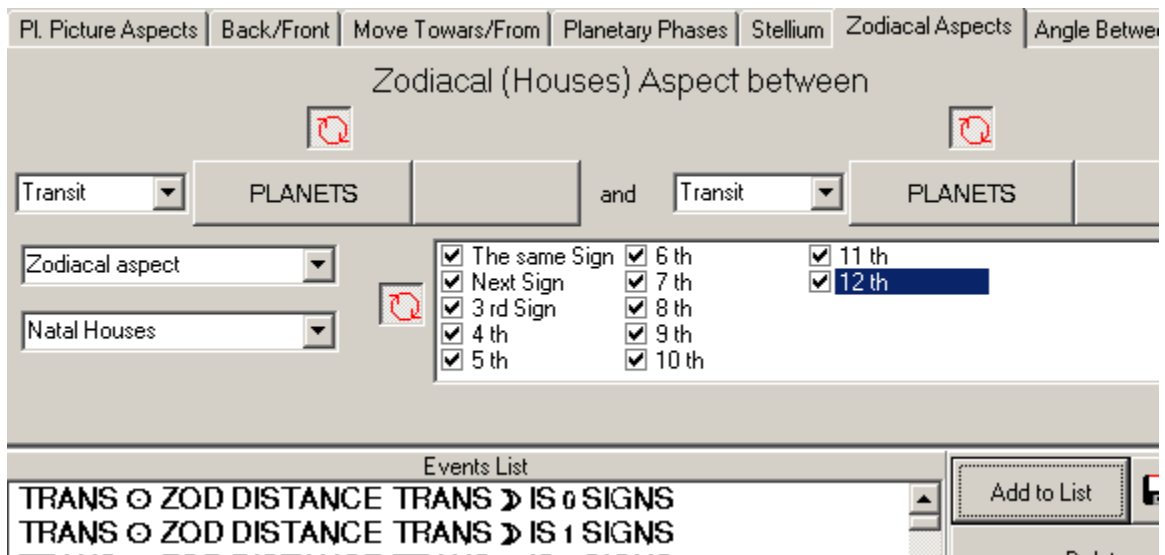
By default, the program divides a planet's cycle on 8 parts (similar to Moon phases). If you check the subdivision option, the division will be on 3 parts. Thus, the whole planet's cycle will be divided on 24 parts. Now, the Floating Angle Model with Phase Zodiac covers also this type of events:



Besides, the orb optimization (see below) allows to get more information for planetary phases.

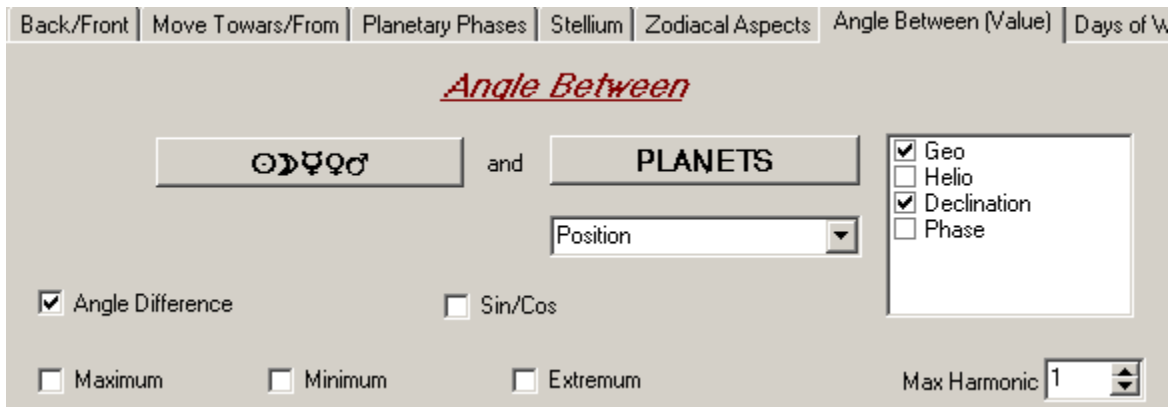
Here is one more example of creating models based on information that came from ancient astrology (I mean aspects based on the position in the sign/house, like two planets conjunct when they are in the same sign though one of them might be in 5th degree and the other in 25th).

j) Choose the "Zodiacal Aspects" tab:

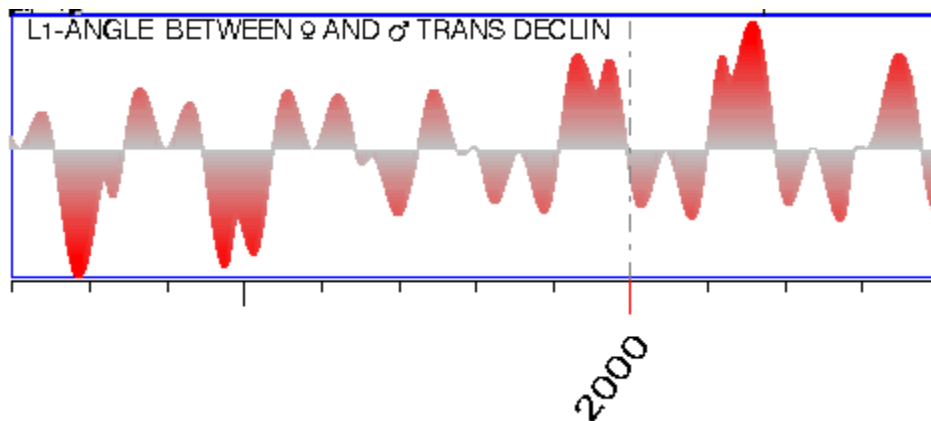


Here you can define the events like Moon is located in the Same Sign (House) as the Sun, or in Next Sign (House), etc.

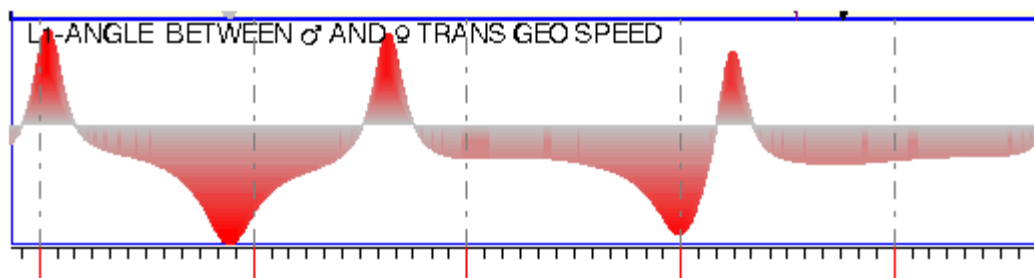
k) In the tab "Angle Between (Value)" you can set the value of the angle between planets:



For example, you can use the declination angle between planets. The classical example (invented by Donald Bradley) is the declination angle between Venus and Mars. Look at it:

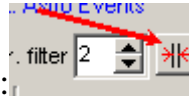


You can use these curves as an element in Black Box model. Another input may be the speed difference between planets:



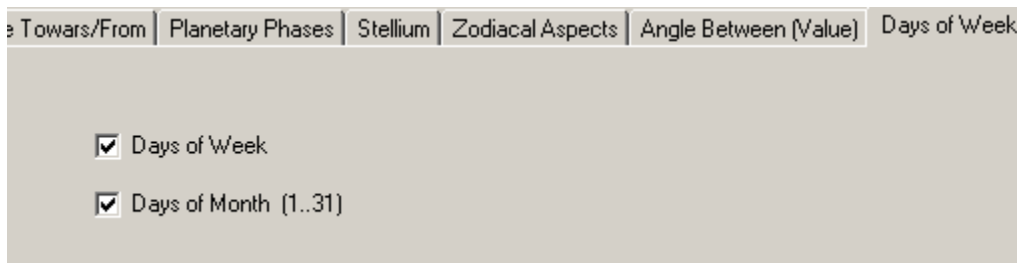
Important note: But there might be one small problem regarding to planetary speed difference: some curves for different planetary pairs are similar. If you create several

of them, you will see it yourself. There is nothing surprising because the speed difference is often defined by the faster planet. Thus, speed difference curves for planetary pairs involving Mercury and slow planets are very similar -whether we speak about Mercury-Neptune or Mercury - Pluto. To avoid this problem, press this



button (it makes inactive the similar events): . You should press it before the optimization process.

l) You can define special days of Week and Month (the tab "Days of Week"):



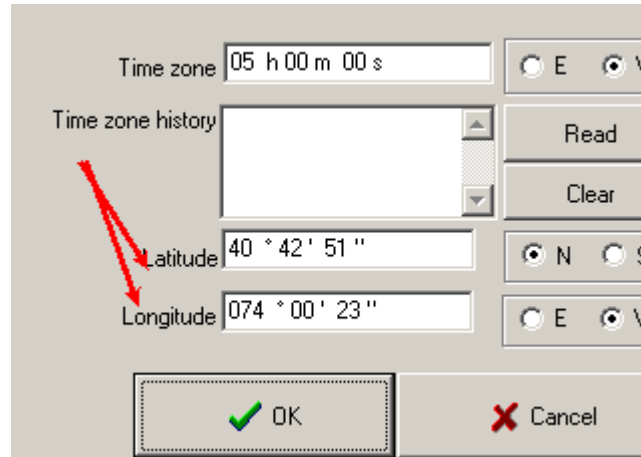
There are some stocks with changes dependable on the day of the week (like the same thing happens each Monday) or the day of the month (like the same thing happens every 15th). I recommend to use these events, especially because these event do not need much memory (there are only 38 events).

m) Choose the tab "Planetary Hours". Here you can define the transit planetary hours:




We recommend to use it for intraday trading models as planetary hours change every hour (approximately). You should remember that the planetary hours strongly depend on the trading place.

When you download the price chart, the program will ask the place of trade:




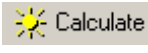
These coordinates are used to calculate the planetary hours.

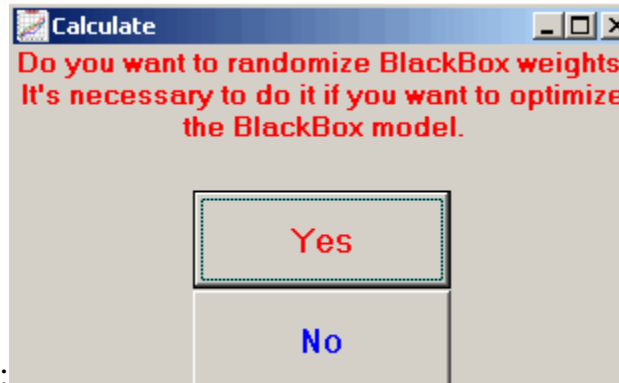
Important note: if you would like to create model with events that are not among these tabs (like aspects between rulers of some houses, press this  Edit button - you will run the Model Editor. This window has a lot of features that make possible to work with almost any astrological event.

In general, it is very important to define the model. The performance of forecasting model drastically depends on the models (i.e., inputs) that we use for forecasting. It takes 90% time to find a good model. The program has a feature that helps to do that; I mean the idea of "back testing". We run different models and compare them to each other trying to figure out which models and within which time frame give the best results. The "back testing" will be one more main stream direction for the next versions of Market Trader program. We need to collect this information. Maybe we should organize the library of models. This is a huge work, not for one person and not for the small group, but it gives keys for creating the reliable strategy for trading using astrology.

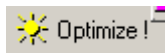
Optimization

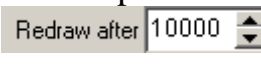
Now the model is ready for optimization. The idea of optimization is simple: the program finds the weights for all events of the model seeking for the best fit to the price. Suppose we have already created the price events that we want to predict ( Price Events, lesson 3). Suppose we have already chosen the inputs (i.e., the astrological model you want to use); for example, it is transit-transit aspects). Now

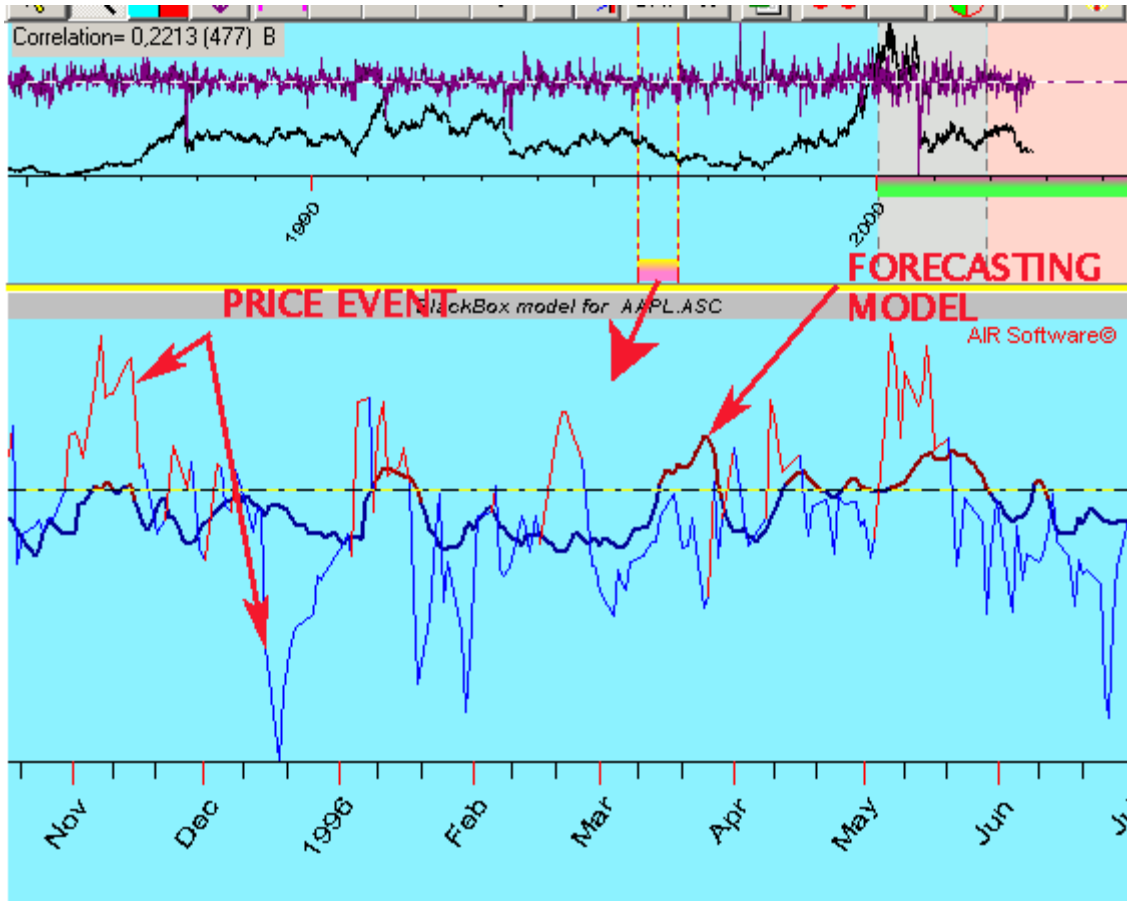
you should press  button to calculate these events. After the calculation, the program will ask you:



Press "Yes", it causes the program to set the weights for events as the initial position (with small random value).

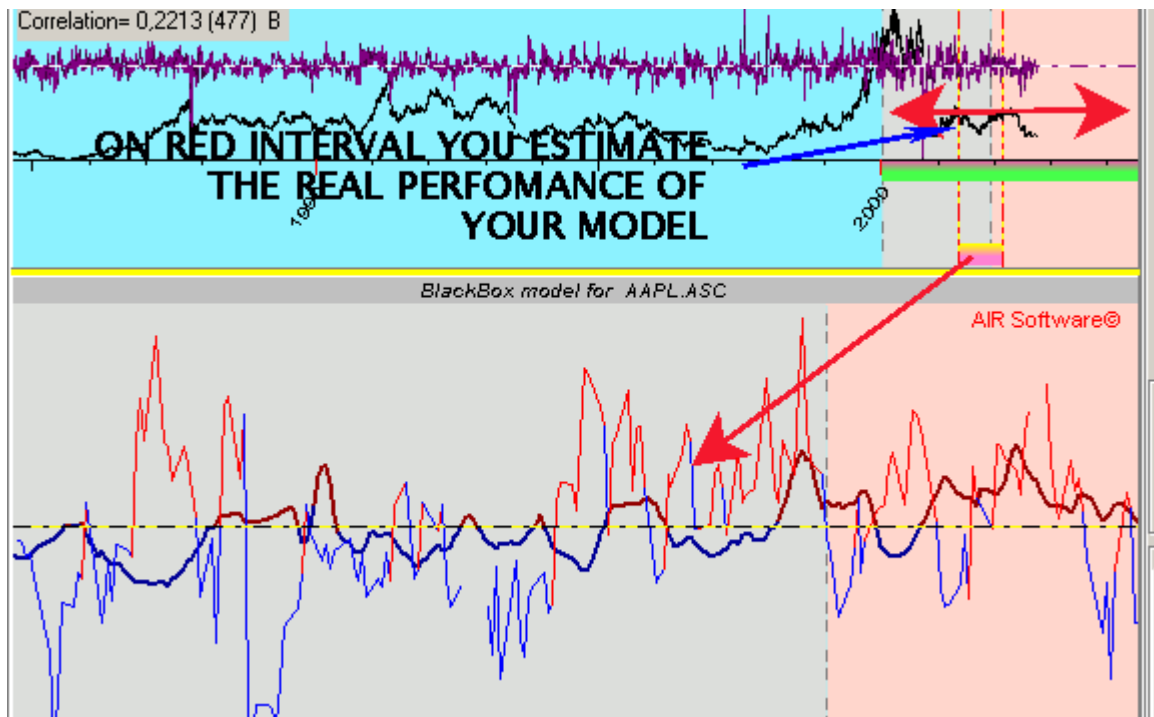
Now we are ready to optimize our model. To begin the optimization process, press  button. The program starts to optimize the weights for all events defined above, step by step. Under each step, the program is changing a bit the weight for some randomly selected event from our events' list. It makes the forecasting model to become closer to the price curve within the optimizing interval.


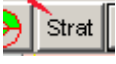
After each set of steps (the option  steps), the program recalculates the forecasting model, and you can compare this model to the reality. To do it, you should select a piece of the price diagram; it will be displayed on the bottom of the window:





Here the red-blue thin curve represents the price event. It is what you want to predict (Price Oscillator, for example). The thick dark curve is our model. You see yourself that this model gives the good coincidence within the optimized interval (blue). The reason is that the program uses these points (blue interval) to adjust the weights for our model.

To see the real performance of the model, you should watch how the price line and model line coincide on testing (red) interval:



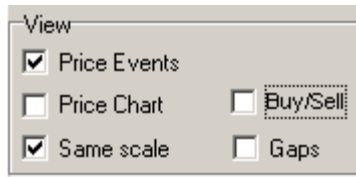
This procedure is called "back testing". We use part of available price points to optimize the model and another part to check the performance of the model. When we decide that the model is good enough or the model curve does not change noticeably during the optimization process, you can press  Break button to stop the optimization process. You can put this model to the main window pressing  button.

Any time you can randomize the model pressing   button. It sets the model to initial state (small random weights for all events).

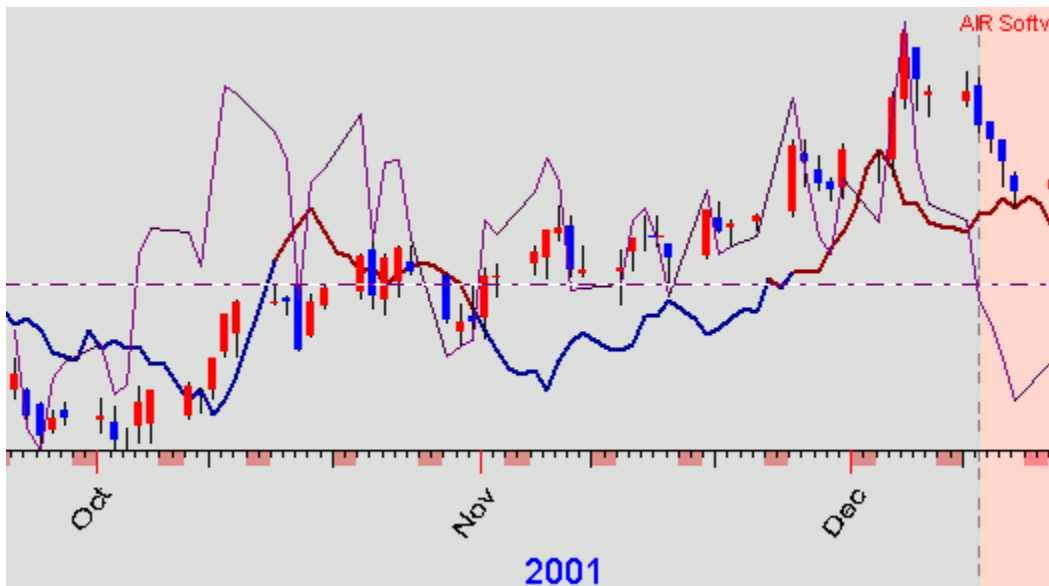
Black Box Options

There are several options in Black Box window.

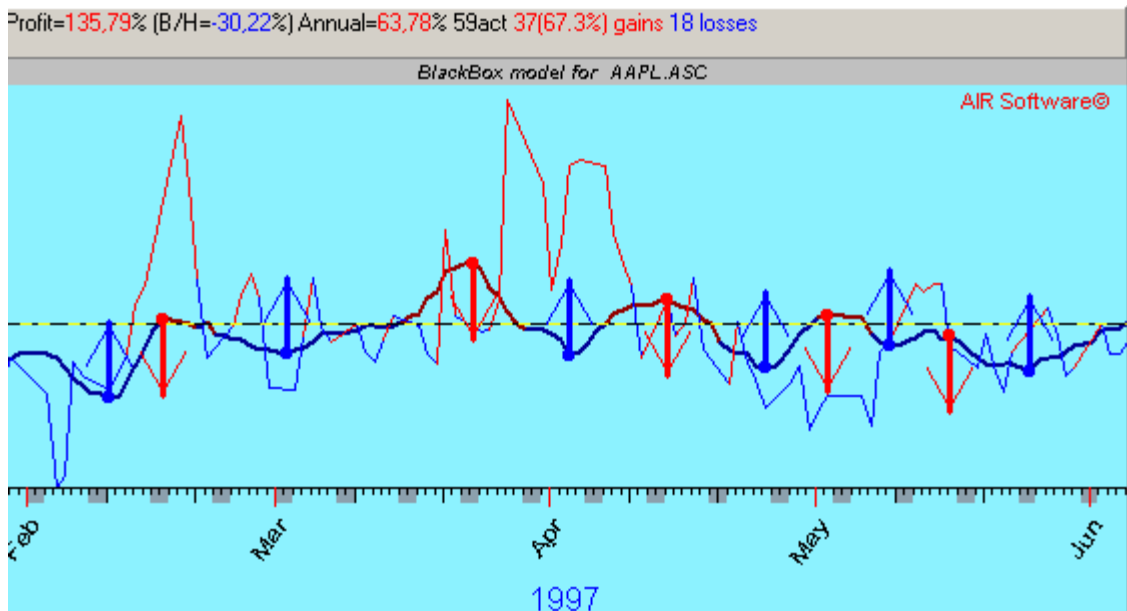
Viewed Options




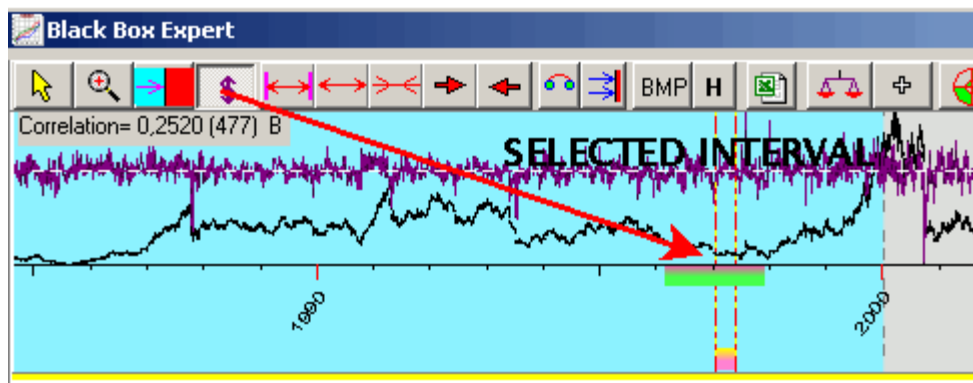
- **Price Event** - there you choose to display or not display the price event in Black Box window.
- **Price Chart** - this option allows to display the price chart in Black Box window, like this:



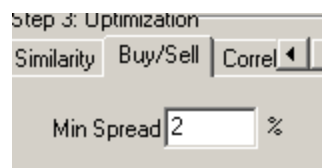
- **Same Scale** - if this option is checked, the program displays the price line and forecasting line using the same scale. Sometimes (especially when optimizing the long time series) the forecasting line almost does not change, it looks like a straight line. In this situation, we recommend to uncheck this option: the program will display each curve (the price curve and forecasting curve) using its own scale.
- **Buy/Sell** - this option allows to display buy/sell arrows and the information related to the profit. The buy/sell points are calculated using the forecasting curve:



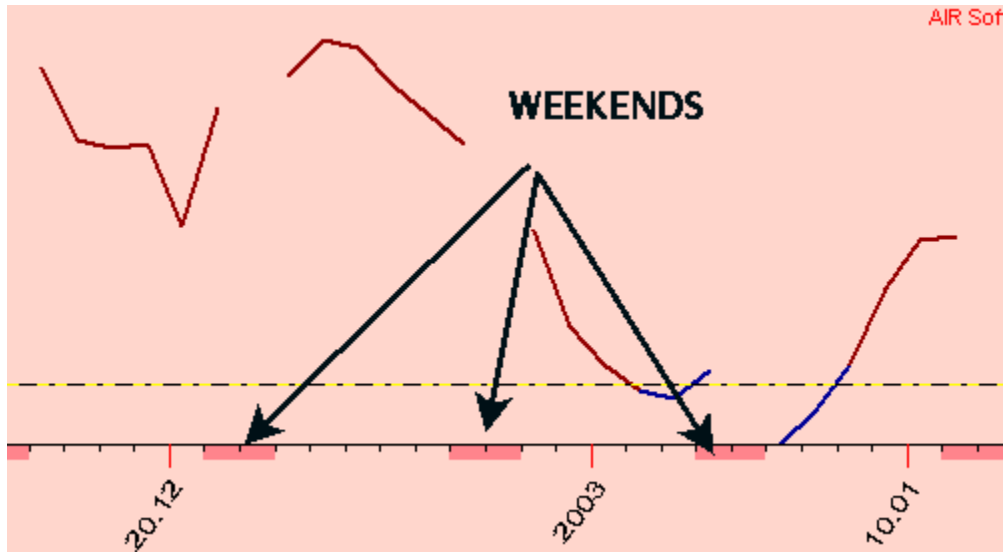
The profit calculates on selected interval. To choose the selected interval, push  button and select (dragging the mouse) the interval where you want to estimate the profit. This is **green** interval:



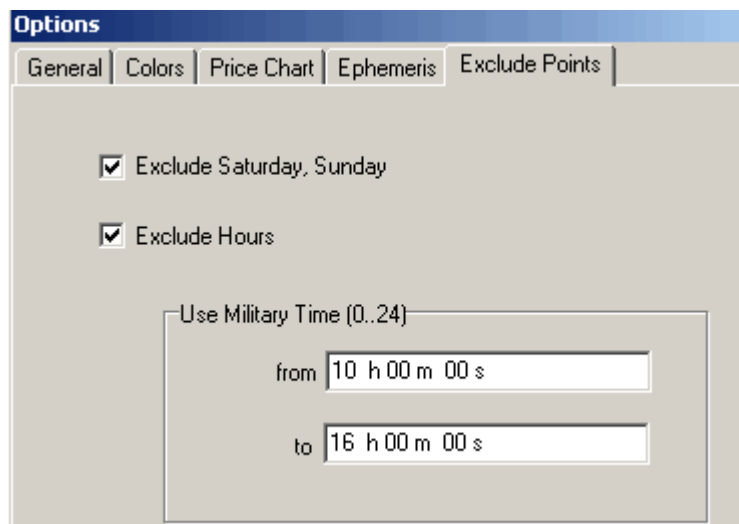
Sometimes there are too many buy/sell arrows, and it is necessary to choose the most important arrows only. In this case, use the spread option:



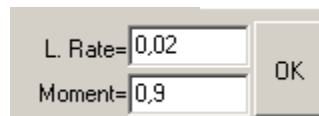
- **Gaps**- this option is useful for intraday charts. If we check this option, the program will not display the forecast line during weekends:



If you do not want to display the forecasting curve at specific times, you should define the working hours in the "Options" window:



Optimization Options

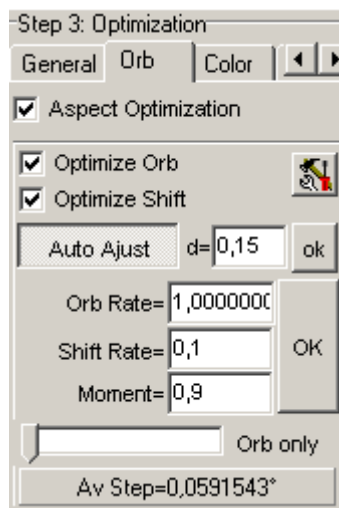


- **Learning Rate** - this option sets the speed of optimization. Usually we do not need to change this option. But it might become necessary. If the optimizing curve almost does not change during the optimization process, we recommend

to increase the learning rate. Vice versa: if the forecasting curve changes chaotically during the optimization. In this case we recommend to decrease the learning rate parameter. The last variant occurs when we use some numeric inputs like the value of planetary speed or regular (math) cycles.

- **Momentum** - we recommend to keep this option as it is. This value provides you the better quality of the optimization and finding the optimal weights. If you enter a small value of momentum (like 0.0), the program might find weights for events that are not the best ones (it is called "local extremum problem"). We will discuss this issue later.

Orb Optimization



This is the most sophisticated and the most powerful part of our program. It took a lot of time and efforts to make this option alive.

Let us explain the idea of orb optimization in brief. If we analyze any aspect (like transit Sun conjuncts transit Mercury), we can select three parameters that describe this aspect:


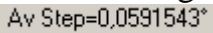
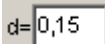

- 1) **Weight** - optimizing the weight of this aspect, we are seeking in what direction and how strong this aspect moves the stock market
- 2) **Orb** - optimizing the orb, we are seeking the best orb for this aspect, i.e., boundaries within which this aspect works.
- 3) **Orb Shift** - it possible that the aspect has maximum influence at few degrees (or minutes) before/after the culmination point; this kind of optimization finds this value.


The points 2 and 3 are related to extremely important information on aspect's performance, and it is very difficult to get this information. There are no problems with the information about aspect's weight, but the orb or the orb shift is a subtle kind of information about the aspect. Thus, it improves the quality of forecasting drastically. We do not recommend to change these parameters. Changing these parameters can cause unpredictable effect during the optimization process. It is not our fault, it is just math.

Here is the list of options for the process of optimization:

- **Aspects Optimization** - this option enables/disables the orb/shift optimization as the whole;
- **Optimize Orb** - enables/disables the orb optimization;
- **Optimize Shift** - enables/disables the shift optimization.

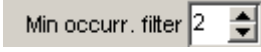
You can experiment with the orb optimization without shift or the shift optimization without orb.

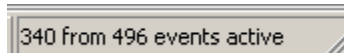
- **Orb Rate** - defines the speed of orb optimization. If  button is pushed, the program is looking for the optimal value of **Orb Rate**. The control parameter to figure out how the process of optimization is going on is . This parameter shows how in average the orb/shift changes during one optimize step. To do the orb optimization more extensively, you can increase this parameter  .
- **Shift Rate** - sets the balance between orb and shift optimization. If you put this value greater than it is, the program takes more attention to the shift optimization than to the orb optimization.

One more button related to the orb/shift optimization is . If you press this button (you can press this button later, during the optimization process), the program sets the orb to initial value and the orb shift to zero.

IMPORTANT NOTE: Black Box provides the ORB optimisation for such events as: aspects, middle points aspects, angle between (Floating Angle Model), planetary pictures aspects and asteroids aspects.

Model Filter

There is an option . Its default value is 2. This means that Black Box works with aspects that occur at least 2 times during the optimizing period. And these 2 times should be independent (for example, the aspect of Uranus conjuncting the natal Sun lasts several weeks, but the program takes it as 1 event). If the aspect for analysis occurs lesser than that default amount, the program does not consider it. From the point of view of the information theory, we cannot use for projection the event that is happening first time - because we do not know its effect. We can only compare such event (as transiting Uranus hitting the natal Sun) with the data for other similar stocks. After the calculation, the program points the number of active events:

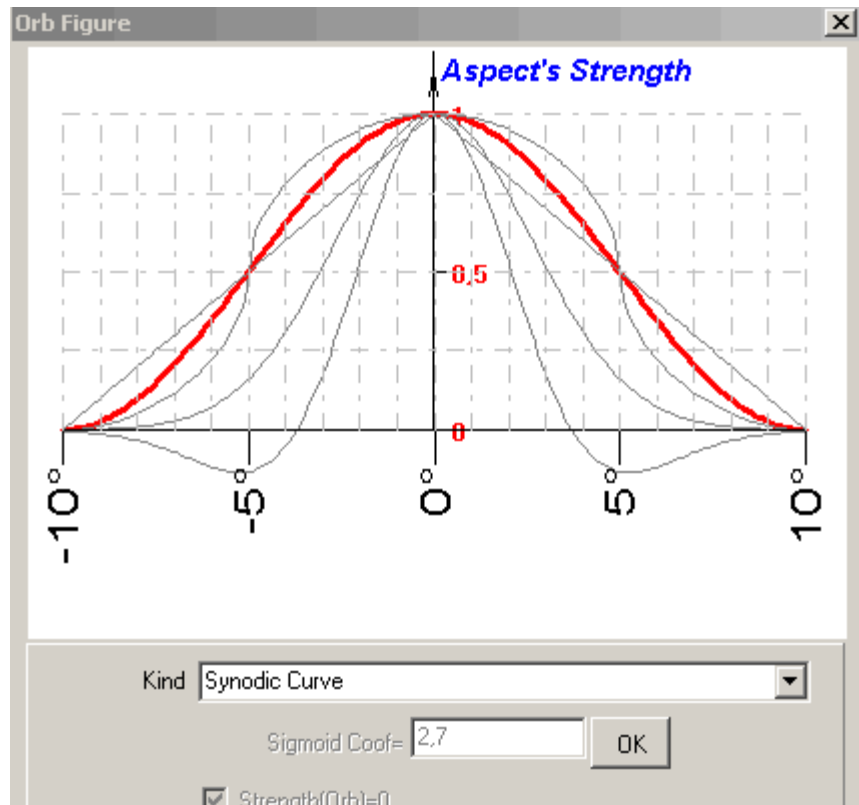


Orb Figure

There is another option:



Press this button, and you will get this window:






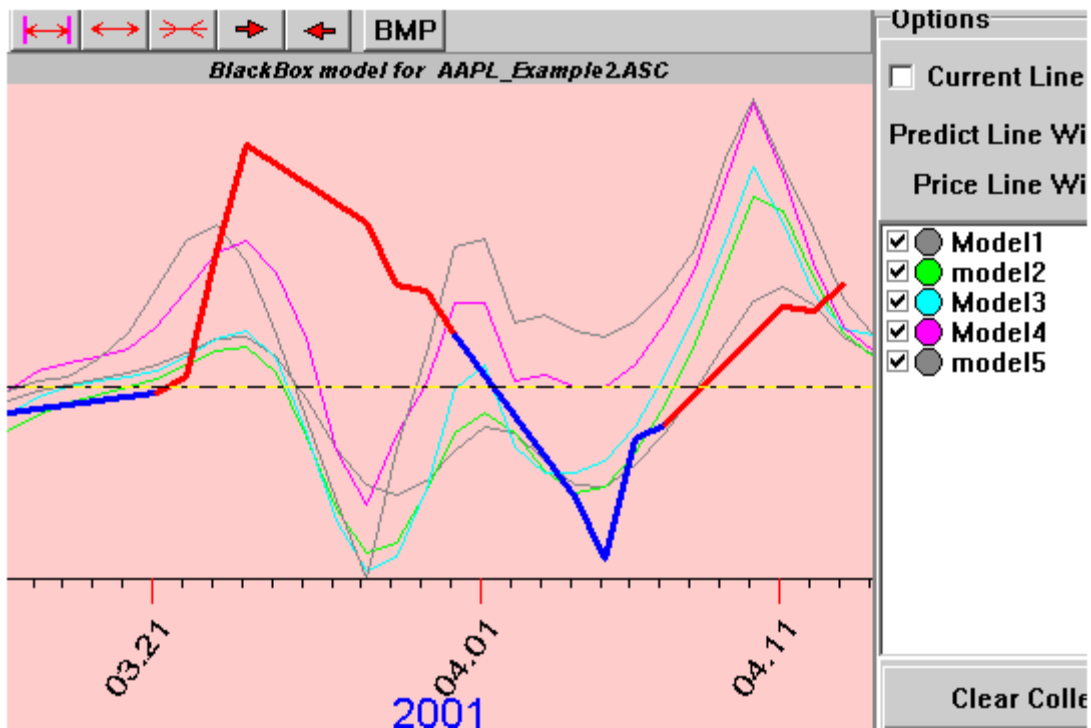
Here we deal with the theory of aspects. This dialog window allows to set aspect's strength depending on its orb. In general, the aspect's strength starts a bit earlier than the exact moment of culmination. The aspect has maximum of its strength at the moment of culmination. After that, its strength starts to diminish. Thus, for any aspect, we have 3 significant points - its beginning and end (defined by the orb) and its culmination. How does the strength of the aspect change between this points? We propose several hypotheses in this window (a straight line and different curves, we call them "the aspect's figure"). You can experiment with different kind of aspect's strength figure (you can do it during the optimization process as well) and look how the projected curve changes.

Stochastic Effects in Black Box / Neural Net

If you observe the projected curve during the optimization process, you can see that this curve is changing. Sometimes it changes very much. The reason is that the optimization process is a stochastic process: the program starts with the randomly chosen event's element, optimizes parameters for this element (like weight and orb), then takes another randomly chosen event and optimizes its parameters, then takes the other element, etc.

For example, if we optimize some model, the program remembers the projected curve, then randomizes this model and optimizes it once again and compares the new calculated projected curve with the old one; thus, we can see that these curves differ. Mathematically it means that you can optimize the same model in many ways, i.e., this task has more than one solution. The **Momentum** parameters help us to find the best solution, but not guarantee it (this is called "the problem of local and global extremums" in math).


The button set   allows you to keep an optimizing model in a special window. We can easily figure out how the optimization process goes in time. The program can remember parameters of the optimized function at this particular moment and keep them together with other "snapshots" (all these "snapshots" represent the same Black Box model at different moments). The  button allows you to collect a lot of them:

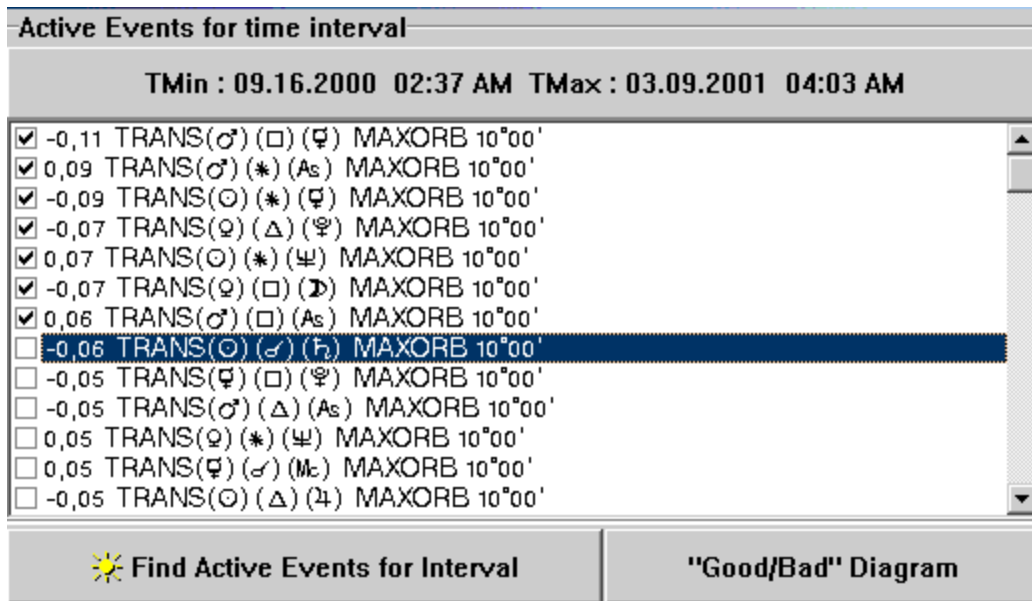


This window helps to understand the tendency for all models.

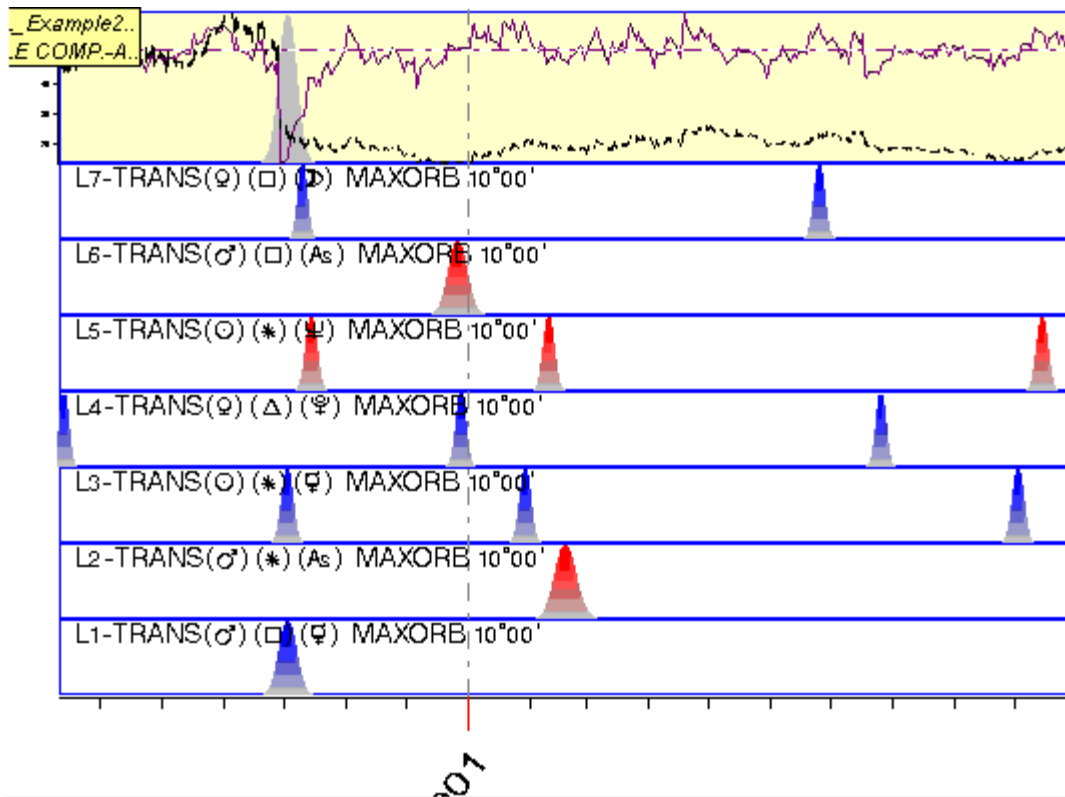
So our recommendation is: to optimize the same model couple times to figure out the possible ways of projected curves. This effect is especially strong for Neural Net optimization.

 **Button**

Another button, , allows you to find the "playing factors" within some magnified interval. For example, you have selected some interval and want to know what aspects have the biggest influence on the market during this time interval. Press this button, and program will run the "Events Rating" window:




Press the "Find active events for interval" button; the program will display the ranged aspects that have been active at this period. In our example, the most important aspect was transit Mars squaring natal Mercury. You can check the most important events and press the "Good/Bad Diagram" button; the program will calculate the Super Search model for those selected events:



On this screen all selected aspects are shown in time.

Real Prediction

The real prediction is made this way: Find the best astronomical/astrological model that gives good results on the testing interval, then move the border line between optimizing and testing interval to the last price point (using  button) and optimize the model using all available price points. We can do all these operations (change magnify interval, change learning/testing border line) "on the go". When you decide that you have found the best fit, stop the optimization process; the forecasting line after the last available price point is the real prediction.

Summary

This lesson was devoted to specific details of Black Box module. Here we discussed the use of Astrological Language in Black Box and details of optimization process. You should try the possibilities of all options discussed to better understand abilities of this module.

AIR Software

2004 year