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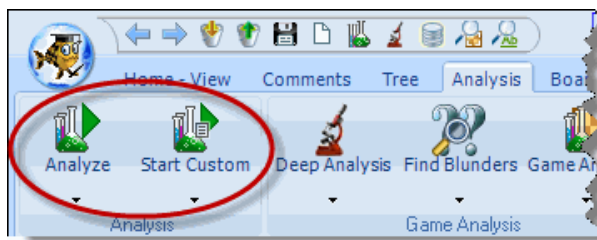
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Infinite Analysis with Rybka Aquarium

Last [month](#) we examined Interactive Deep Analysis (IDeA) in Rybka Aquarium. This month we'll look at its infinite analysis function. Infinite analysis is perhaps the oldest and most widely used analysis method with chess software, and over the years many chess players have perfected their ways of utilizing it. You might think that with its long history and a multitude of different implementations there wasn't much room for improvement. Well, the developers of Aquarium clearly thought otherwise, as you will see.

Starting Infinite Analysis

Starting infinite analysis can be as simple as pressing the spacebar, but to get the most out of it you should familiarize yourself with all the available options.



Starting and configuring infinite analysis

The two buttons that are highlighted in the image above, Analyze and Start Custom, are different ways of configuring and starting infinite analysis.

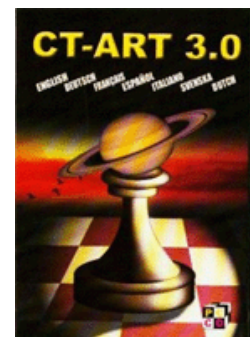
If you click the Analyze button directly, it is equivalent to pressing the spacebar and starts infinite analysis. But there are many options you can set for the analysis by clicking the small, black downward-pointing triangle at the bottom of the Analyze button: this is called a split button. Clicking the triangle will open a menu where you can select "Options" to display the "Infinite analysis options." We'll look at these later, but first let's see what simple infinite analysis with a single analysis pane and one engine looks like in Aquarium. This has probably been the most common way of using infinite analysis, so it's a good place to start and get acquainted with the basics.

One thing you'll notice is that Aquarium automatically displays the analysis pane only when you are actually analyzing. When you are not analyzing, other panes are resized to take advantage of the additional space.

Simple Infinite Analysis in Action

When you begin the analysis (either by clicking the Analyze button or by pressing the spacebar), Aquarium creates the analysis pane, as shown in the next screenshot.

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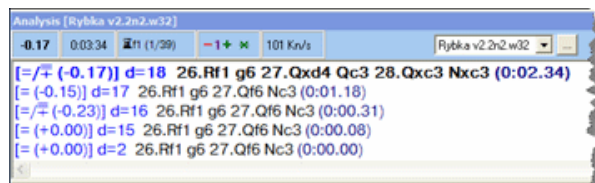
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The analysis pane

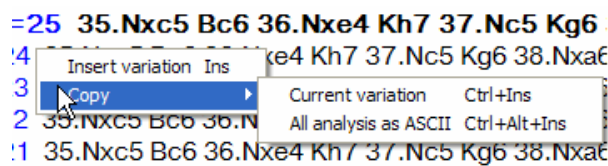
At the top of this window we see the information and control panel, which displays information regarding the current status of the analysis. The list of variations displayed below that is familiar to most users. Note that the most recent (deepest) variation is conveniently displayed at the top of the list, next to the information and control panel.

One very convenient feature is that you can click on any of the variations in the analysis pane and replay them on the board. Here is one example. I'm analyzing the normal starting position, but the board shows the position after White's 3.Bf4 in the second variation from the top in the analysis pane.



Browsing analyzed variations

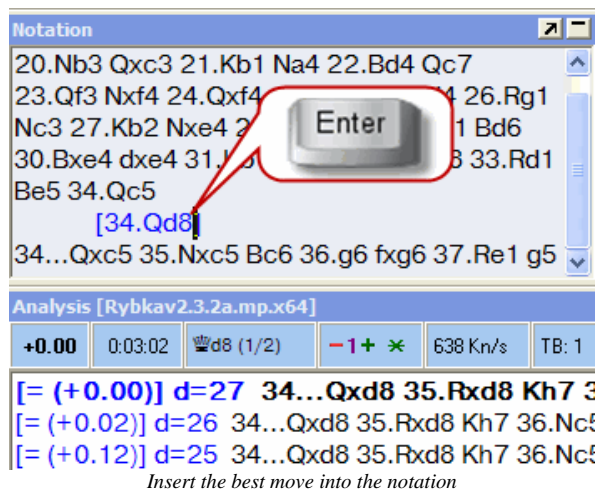
Any of the analyzed variations can be inserted into the notation by right-clicking on it.



Insert or copy any of the analyzed variations

The image above shows the right-click menu for the analyzed variations. Right-clicking on any of them displays this menu, allowing you to copy it (Ctrl+Ins), e.g. for pasting into a forum post, or insert it into the game notation (Ins). Additionally you can copy all the analysis as text (Ctrl+Alt+Ins).

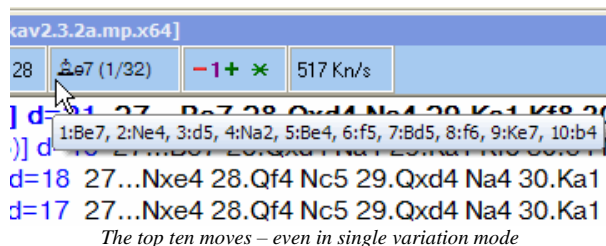
Many chess players trust the first move in a variation produced by infinite analysis, but are less confident about the following moves. Others don't like to add the full variations for other reasons. Aquarium allows you to add just the first move of the current variation to the notation by pressing Enter as shown in the next image.



In this example, I first placed the cursor after White's 34.Qc5 and pressed Enter. As you can see, the move 34.Qd8 was picked up from the analysis pane and added to the notation as a variation. The cursor moved automatically to the position after 34.Qd8 and now that position is being analyzed by the engine. At depth 27, it sees 34...Qxd8 as the best move. If I press Enter again, 34...Qxd8 would also be added to the notation.

If you want to examine or comment the game without affecting the infinite analysis, you can lock the analysis to a specific position.

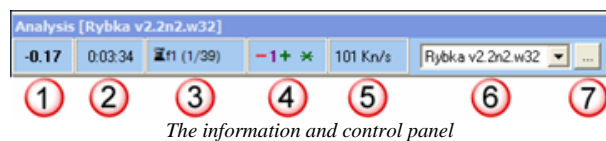
Often one of the shortcomings of infinite analysis is that it only gives you what the chess engine considers the best move. You don't get any information about the second or third best moves unless you switch to multi-variation mode. Well, Aquarium has a nice little feature that allows you to see the ten best moves – even in single variation mode.



The top ten moves – even in single variation mode

To view the list of moves just place the mouse pointer over the current move display in the information and control panel and a tooltip will pop-up with a list of the best moves.

Now that we have seen the simplest type of Aquarium's infinite analysis in action, let's have a closer look at the information and control panel at the top of the analysis pane.



The information and control panel

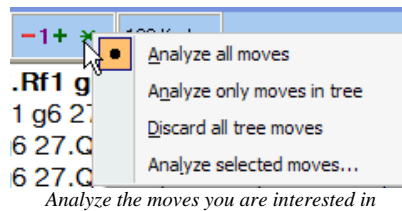
The title bar indicates that this is an analysis window and the name of the chess engine (Rybka v2.2n2.w32) is also displayed. Below that we see the following seven items (marked 1-7 in the image):

1. The current engine evaluation, where -0.17 means that Black has an advantage of 17 centipawns.
2. The total analysis time, which in this case is 3 minutes and 34 seconds.
3. The engine is currently evaluating the move Rf1 and this is the first of 39 legal moves in the position.

4. This allows you to set various options for the analysis as described below.
5. The number of positions the chess engine is evaluating per second. Here we see the number “101 Kn/s,” which means 101,000 positions per second.
6. A drop-down list with all available engines. It shows that we are currently using Rybka, but you can switch to a different engine at any time by selecting it from the list.
7. Clicking this button displays the “Engine options” dialog box for the currently selected engine. This feature is described below.

Items 4 and 7 require further explanation.

Item 4 holds an interesting feature of infinite analysis in Aquarium. We are currently analyzing in single variation mode, as shown by the number “1” between the minus and the plus sign. Clicking on the green plus will switch to multivariation mode and each additional click increases the number of variations. Likewise, clicking the red minus sign decreases the number of variations. Clicking the green asterisk allows you to choose which moves to analyze. There are several options here, as shown in the next screenshot.

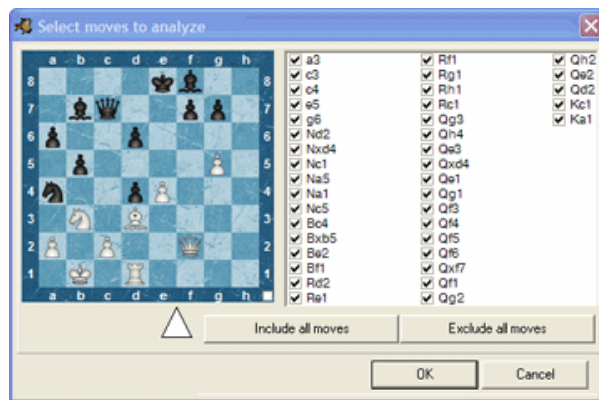


Analyze all moves is the default. All legal moves are considered in the analysis.

Analyze only moves in tree: This option and the next one is of interest to opening book authors and players developing their opening repertoire. In both cases they would store their analysis in an Aquarium tree (position database) and this option allows them to analyze only the moves that they have included in their repertoire/opening book. It is actually more accurate to talk about all moves displayed in the tree window rather than simply the moves in the tree. The reason is that moves that occur in the notation are displayed in the tree window and are treated as part of the tree when this option is selected.

Discard all tree moves: Let’s say that you have been developing your opening repertoire or an engine opening book. You think it’s pretty solid, but you want to check if some of the moves you have not considered in a certain position might bust your opening line. All you need to do is start infinite analysis, select this option and Aquarium takes care of the rest. The evaluations will tell you if you missed a critical move. Again, remember that all moves in the notation are displayed and treated as part of the tree.

Analyze selected moves... Here you can decide precisely which moves are analyzed and which ones are excluded from the analysis, as shown in the “Select moves to analyze” dialog box in the next image.



Select individual moves to analyze

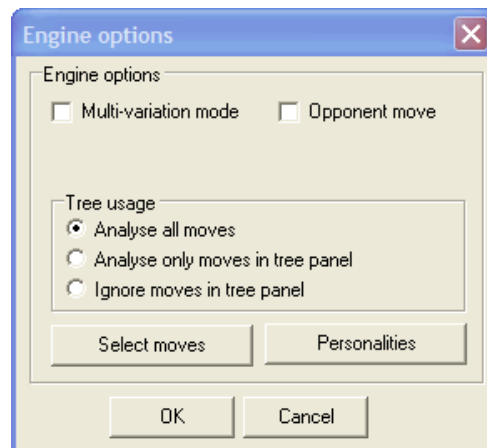
You can mark/unmark each move individually. They are all marked by default. If you only want to analyze a few moves, it's fastest to click the "Exclude all moves" button below the move list and then mark those moves you are interested in.

You can also exclude moves without opening this dialog box. While the analysis is running simply hold down the Ctrl key and then use the mouse to make the moves that you want to exclude.



Exclude moves by holding down the Ctrl key

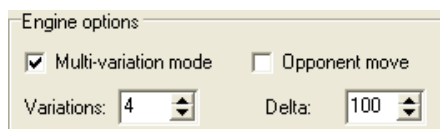
OK, now we move on to item 7. The button to the right of the engine dropdown list displays the "Engine options" dialog box for the currently selected engine.



The "Tree usage" options are already familiar. They are equivalent to the options when you click the asterisk in the information and control panel as discussed above. The same goes for the "Select moves" button, which allows you to exclude moves from the analysis.

If you select “Opponent move,” the engine will analyze the threats of the side that just moved.

“Multi-variation mode” has a nice twist. If you select this mode, the following options are displayed.

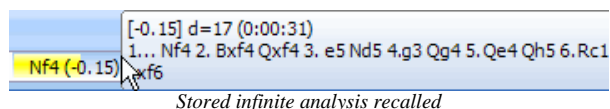


Here you can select the number of variations that should be analyzed, but the second field “Delta” defines a maximum deviation from the evaluation of the best variation. Here it is set to 100 centipawns (1 pawn). Aquarium uses this parameter to decrease the number of variations if their evaluation falls below this limit.

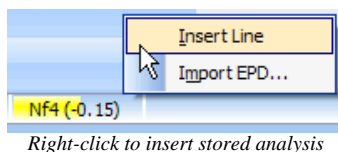
The “Personalities” button allows you to change the engine parameters for the currently selected engine.

Stored Infinite Analysis

One of the unique features of Aquarium is that it stores the results of all infinite analysis that is sufficiently deep. In the past you either had to save the results of infinite analysis in the notation or it was lost forever. If you spent a lot of time analyzing a specific position, you might or might not remember that analysis if you ran into the same position in a different game. The software did not remind you of your previous analysis. This is all changed with Aquarium. If you run into a position that you have previously analyzed, Aquarium will tell you. It makes no difference if the position was reached through a different move order or even if it’s in a game in a different database.



The image above shows a part of the Aquarium status bar when the position you are viewing has been analyzed before. The best move that was found is displayed along with its evaluation. If you place the mouse pointer over the status bar, the full variation is displayed, just like it was in the analysis pane when you ran infinite analysis. Right-clicking on the status bar displays a menu allowing you to insert your old analysis into the current game.



If you like you can also display the infinite analysis evaluations in the tree window.

Infinite Analysis and IDeA

Another important feature of infinite analysis in Aquarium is that Interactive Deep Analysis (IDeA) can take advantage of the stored results to build its analysis tree. This means that if you have spent some time analyzing a position with infinite analysis, you can start IDeA and it will reuse and expand on that analysis. Additionally, IDeA stores its analysis in the infinite analysis history, so the status bar will also show moves that were analyzed with IDeA. Thus, these two analysis methods work very well together.

Storing Analysis Configurations

Aquarium also allows you to store infinite analysis configurations. This is especially helpful for those running multiprocessor or multicore computers. For instance, if you are running a dual-core computer, you can create a configuration where you automatically run two different engines, one on each core. You can run them both in the same analysis pane or each engine in its own pane. On a quad-core, one engine can be given 3 processors and then you could use the fourth core for a tactical engine, such as Rybka WinFinder.

Infinite analysis and Interactive Deep Analysis (IDeA) are just two of the many tools offered by Aquarium. They show that the developers have done an excellent job in improving on a well known analysis method, as well as creating a new and powerful one, which I believe is a must for every serious chess player. Next month we'll continue our discussion of Aquarium and Rybka 3.

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