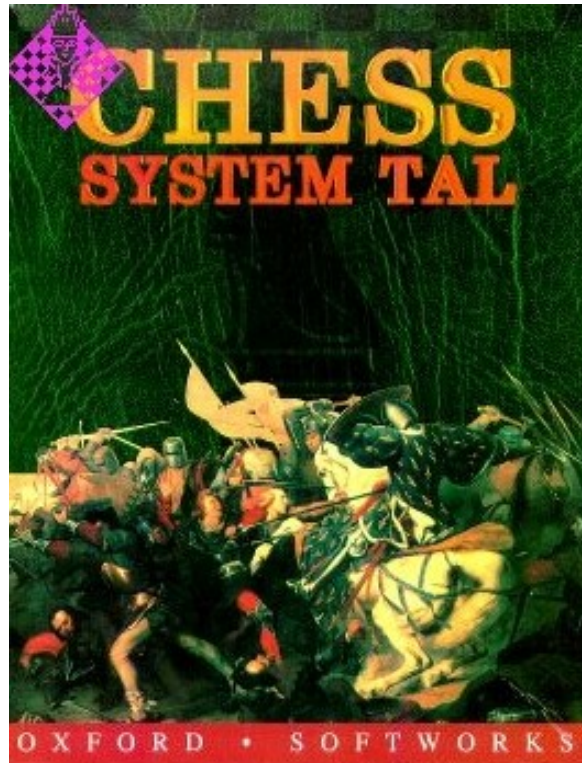


# Chess System Tal

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## User's Manual

## 1. Introduction

Chess programs have come a long way over the past ten years. Not long ago strong players would laugh at their weak moves and lack of forward planning ability; now, with the help of fast processors and more efficient algorithms, strong players are sometimes being beaten. But, unfortunately, the classical programs still play weak moves, still suffer from an inability to plan, and still fail to understand important aspects of chess - the strong players are still laughing, most of the time.

### **Strength through weakness...**

The strength of a classical chess program comes from look-ahead, such a program can search forward seven, eight, nine moves and sometimes deeper in certain tactical situations - if a strong player falls into a tactical hole within the search look-ahead or horizon of such a program, the strong player will lose.

Classical chess programs need deep look-ahead. To achieve deep look-ahead means trying to evaluate as many chess positions as possible each second. Some programs are achieving as many as 90,000 evaluations per second on fast Pentium processors.

### **They don't even know they don't know...**

Their weakness comes from their lack of knowledge at each evaluation. In the very worst cases, this knowledge is little more than adding up the material on the chess board, no room for any other intelligence there.

### **Fast and stupid**

Until now, artificial intelligence researchers have spoken of 'stupid, fast' programs and 'slow, intelligent' programs. But, even the slow, intelligent programs have vast holes in their chess knowledge, conventionally such programs understand about 'static' knowledge (pawn structure, weak pawns, pinned pieces etc.) but little or nothing about 'dynamic' knowledge (king attacks, changes in relative values of the pieces as the situation on the chess board changes etc.).

The world view of the slow, intelligent program can be expressed simply: search the position to the horizon; if, at each horizon node, the position is 'quiet', evaluate the position and return its score; or, if, at each horizon node, the position is not quiet (usually meaning there are checks or captures available) then extend the search until it becomes quiet and return the evaluation from the deeper horizon. You should note that the 'stupid, fast' programs have certain problems here, since they lack the intelligence to determine whether the position is 'quiet' or not.

But, more noteworthy, is that the classical programs, unable to evaluate dynamic, chaotic positions, and thus forced to only evaluate quiet positions, actually try to search towards these quiet positions. If you try to achieve quiet positions, you play boring chess, you play like Tarrasch, you don't play like Tal.

### **Paradigm shift**

Chess System Tal turns this classical chess programming technique on its head. With 2.5 Megabytes of source code devoted to its evaluation function alone, Chess System Tal tries to live on the edge of chaos; it evaluates dynamic, chaotic, non-quiet positions, it seeks these positions out. If you try to achieve chaotic positions, you play exciting chess, you don't play like Tarrasch, you play like Tal.

### **It just can't be done...**

The conventional view amongst the computer chess cognoscenti is that the 'high-intelligence' approach just doesn't work; they say that chess produces too many special cases for the intelligent evaluation function, and that such an intelligent evaluation function will always overlook tactics that are seen by a fast, search-based program. Congratulations on purchasing Chess System Tal, the program that proves the classicists wrong!

### **Do you want to play chess against a machine...**

Do you want your chess computer to have a knowledge-based human playing style? Would you enter a weight-lifting contest against a fork-lift truck? We think there is no satisfaction in playing games against a calculator that sees all to its horizon, but knows nothing. Chess System Tal plays with emotion, it takes risks, it even makes mistakes, just like a human-banish materialism, take the exciting, romantic, risk-loving, adventurous path of Chess System Tal.

**C. Whittington**

## 2. The World Champion Mikhail Tal

Born in November 1936, Mikhail Tal rose to the top of world chess with astonishing speed. Tal's name is now forever associated with attacks conjured out of nowhere, with sacrifices designed to break down the defences around the enemy king. Often, an objective analysis of his games showed Tal's speculative ventures to have been not totally correct, but over the board the tension always seemed too much for his opponent, whose defenses would almost certainly crack.

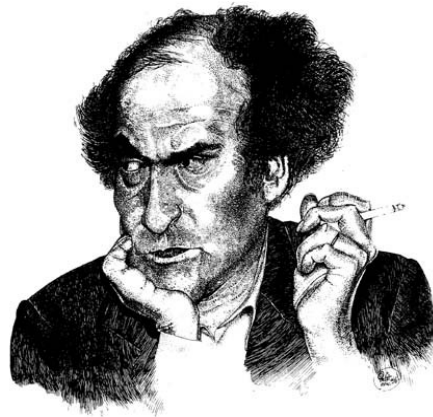
Tal brought an unrivalled, electrically charged atmosphere to his chess matches. He made his moves quickly, and then either paced up and down the stage between moves, or else gazed piercingly at his opponent in what has become known as the Tal stare, a withering, hypnotic gaze which froze the thoughts of his opponent.

With his all-out sacrificial style, the legendary Mikhail Tal was the world's greatest exponent of attacking chess. Spectators and opponents alike could expect games of blistering pyrotechnics, devastating attacks conjured up from nowhere from this master magician of the sacrificial king-attack.

Tal's risky style was always prone to make him come unstuck and lose games, but time and time again he proved that his great ability to introduce complications and deal with the incalculable was a serious weapon, capable of bringing success at the very highest levels.

Tal defeated Botvinnik to become World Chess Champion in 1960. One year later, with severe kidney problems and having declined a postponement offered by his opponent, he lost the return match. He subsequently had one kidney removed but, a heavy smoker and drinker, failed to pamper the remaining somewhat unhealthy kidney and was never again free from bouts of ill-health.

Full of nervous energy, chain-smoking, pacing restlessly between moves, Tal was obsessed with chess. Widely liked for both his scintillating style and infectious enthusiasm, he remained dogged by ill-health, and was never again able to retain his crown, but remained an outstanding and charismatic player until his death in 1992.



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*Mikhail Tal*

### **3. How to Use Chess System Tal**

Chess System Tal has two modes of operation:

- Chess Mode
- Database Mode

In both modes you will find most of the screen is active. i.e. wherever you click something will happen. The menu bar is accessed by moving the mouse to the top of the screen.

#### **3.1. The Chess Mode**

Chess mode is the mode in which you play your games. In this mode a number of different windows will be visible including the board. The available windows are dependent on the layout you have chosen. For instance when you first start Chess System Tal, you will be in the standard 2d layout which has a board, the clocks, a list of moves made and a window at the bottom for adding and editing comments.

Clicking in each of the windows will have a different effect, many of the windows also have a dropdown menu attached to their title bars which control what is displayed in the window.

##### **3.1.1. How to Use the Screen in Chess Mode**

A number of different styles of 2D and 3D pieces are available each with its own distinctive backdrop art, a clear diagrammatic black and white set is always available.

To make a move, place your mouse over the piece you want to move and press the left mouse button. This will pick the piece up, now move the piece to the new square, put the piece down by either pressing the left mouse button again or releasing it.

Chess System Tal will not allow you to pick up a piece that has no moves. For really fast move entry, Chess System Tal has an intuitive move option that normally requires only one mouse click. Click on a destination square rather than on one of your pieces. If the square only has one piece that can move there, the piece will move; if there are a number of legal moves to this square Chess System Tal will pick the most likely one and highlight it on the board. To make the highlighted move just click on the destination square again, if you want to make a different move click on the piece that you actually want to move to that square. Clicking on the board with the right mouse button while in a 2d mode will allow you to "Scribble" or doodle on the board. This doodling will disappear as soon as the board is used for something else. In 3d Black and White diagrammatic pieces will be superimposed on the 3d pieces while the right mouse button is held down.

Click on the clock to change between graphical and digital modes. The graphical clock has two dials, the dial on the left is the clock for white. Between the dials are tickers showing which side moves next. The digital clocks are arranged vertically. The top of the two is white's. If the clock mode is set to Blitz or Tournament (see Set Time menu optional then a countdown clock is provided below the normal clock, so that you can tell quickly how much time you have left before the next time control. If a database game has been loaded the venue is also shown below the digital clocks.

### 3.1.1.1. The Chess Mode Windows

#### Moves window

Shows all the moves played so far, with annotations, if any. The last move made is highlighted and shown in the centre of the window. You can move through this list using the arrow keys on your keyboard or by clicking on a move with your mouse. Clicking and holding with your right mouse button on a move will temporarily take you to that move and highlight it on the board. The move list is displayed in the current chess notation the notation can be changed by clicking on the dropdown menu icon to the right of the title bar. The move list is navigated using the keyboard or the mouse. Right cursor key moves you one half move forward. Left cursor key moves you one half move back. Up cursor key moves you one full move back (to the same colour). Down cursor key moves you one full move forwards. Home key takes you to the first move. End key takes you to the last move. Del Pressing the delete key will delete the current move from the list<sup>12</sup>. This also has the effect of deleting all further moves beyond this point.

You can add an annotation to any move by typing in the comments window. Up to three lines of comment will appear in the move list following the move.

#### Legal Moves window

The legal moves window shows a list of all moves that could be made from this position. The list has many functions. If the list is larger than the available window, then the scroll bar to the right of the window can be used to see the moves further down the list. Further information is given after the move. If the move is in the opening book the word 'Book' will appear after it. If the move gives known opening position than its name will appear. A ply zero score and primitive threat information is also shown for each move. Left clicking with the mouse on any move in the list will execute the move (but only if it's your turn to move). Right clicking on a move will highlight it on the board. Left clicking anywhere after the move - one of two things will happen. If the move is in the opening book you will be able to adjust it's weighting (see the book menu)<sup>3</sup>.

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1. A variation is denoted by a character Θ in front of a move. to add a variation simply play a different move in place of an existing move. Click on the Θ character to obtain the variation list. An unlimited number of variations can be put anywhere into the move list and can be nested (i.e. variations inside variations inside variations). Variations are useful for exploration of alternative lines of play. Look at the games in the demo database to see how to combine variations and comments effectively to illustrate 'what if' moves whilst retaining the main line of the game.

2. The delete key is only needed if you make a mistake. If during play you decide you want to go back and try a different move, you can simply take back, and then make the new move. A variation will be created so you will not lose your original line of play. Clicking the left mouse button on a move will take you to that move. Clicking and holding the right mouse button on a move will temporarily highlight this move on the board.

3. **Warning:** This is an advanced feature, changing the value of a book move in particular during the opening will permanently affect the way Chess System Tal plays. If the move isn't in the opening book, a popup menu will appear giving you a break down of it's score. (See the big thinking window section for more information on each of these components. Right clicking anywhere after the move will allow you to exclude that move from the search. This is an advanced feature and is discussed further in the Move Analysis menu section and the advanced section. This will only work if Analyse mode is switched on. The popup menu to the right of the title bar is used to follow named opening lines such as the Ruy Lopez opening, Selecting it with the right and

## Thoughts window

Shows you Chess System Tal's thoughts.

## Small thinking window

appears at the bottom of the screen in info layout. It consists of three lines. Line 1: Tells you what time mode you are playing in i.e. Blitz, Tournament etc. and how long the computer will allow itself to think before playing a move. In all time modes other than Exact this figure is only a guide to Chess System Tal's thinking time. Following the time is the status of the game i.e.. Opening, Early Middle Game, Late End Game and so on. If one of the test positions is loaded, it's solution and a brief description is given at the end of the line. Line 2: This is the searching line, it tells you how far the search has got. There are 3 numbers and a move. The first of the numbers is the nominal search depth, the second and third numbers are which move out of the total number of moves in the ply zero move list is being currently considered. (For an explanation of these terms please see the glossary. So the numbers 5/2/27 mean move 2 of 27 moves searching to a nominal depth of 5. Following this is the move currently being considered. Line 3: This is the best line, or best sequence of moves the engine has found so far. The number at the beginning of the line is the score in pawns, a score of +0.16 for instance would mean Chess System Tal thinks that this sequence of moves would leave it 0.16 times the value of a pawn up. If Chess System Tal is thinking on your time, then your predicted move will be displayed in brackets. If you click on any of the moves within the best line, the best line up to this move will be shown on the board.

## Big thinking window

appears in Techno mode, and is an extended version of the small thinking window. The first three lines are as for the small thinking window above. Below each of the moves in the best line though is a breakdown for the score after that move. The total or final score for the move is the last entry in the column, all the scores above this show how this score was arrived at. Each of these components is a balance of our score minus our opponents score. The meaning of each term is as follows:

- **Positional:** Is the additive total of the values of all pieces, modified by the square that each piece occupies. Opponents pieces are subtracted from Chess System Tal's pieces and a knight at the edge of the board would be worth less than a knight near the centre.

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the left buttons have different effects. If you click on the icon a popup menu will appear. The last two named positions you reached will appear at the top of the list and below this all the named openings that extend from here. If the list is longer than the box you may scroll through it by either moving the mouse to the scroll arrows at the top or bottom (while holding the mouse down) or by moving the mouse over any line and typing the first letters of the line you are interested in until the one you want appears. You may use backspace to go back a character and if you press space the next entry starting with this will be found. E.g. to find Ruy Lopez move the mouse over the popup menu until a line is highlighted and type "ruy" then press space till you find the line you want. Select any line by releasing the mouse over it. Using the menu with the left mouse button will play the next move in that line. With the right mouse you can "set" a named line. When you do this all information about lines will disappear from the legal list except the move that will take you to the chosen named position. to turn this off select none from the popup menu. If you find a line is absent from the list you may add it (see the advanced section at the end of the manual).

- **Mobility:** This is a measure of the freedom of movement of the pieces. Tal function: Measures attacks against the king. Chess System Tal is uniquely designed to execute king attacks in the style of Russian Grandmaster Mikhail Tal.
- **Development:** This measures how rapidly pieces are moved from their starting positions. Capablanca: Named after Cuban Grandmaster Capablanca, known for his 'technique' and knowledge of the relative values of bishops, knights and pawns.
- **Centre Control:** Control of the centre of the board is important in chess.
- **Key Squares:** Before each move we identify certain critical squares and measure the control each side has of them.
- **Pawn Structure:** deals with doubled, isolated, weak pawns etc.
- **Passed Pawns:** Evaluates the strength of pawns that threaten to promote.
- **Material Threats:** Evaluates attacks on enemy pieces.
- **Nimzowitsch:** Named after this famous Grandmaster who was known for his knowledge of pawn structures and restriction of the movement of enemy pieces.
- **Major Pieces:** Evaluates rooks, queens and pieces in danger of being trapped.
- **Total:** All the above terms added together.

### Inner-Eye window

The inner eye window gives you a graphical insight into the engine's thought processes. Click here to for an explanation of the terms used here. There are four modes available for this window. To change the mode click and hold the mouse down on the popup menu icon to the right of the title bar above the window, then select the mode you want from the popup menu that appears:

- **Mentor** - An emotionally expressive head will appear in the window representing how the engine is feeling. The mouth and lower face show how optimistic its evaluation is. The eyebrows and upper face respond to small changes in the evaluation.
- **Search profile** - This mode shows search width against depth. The lowest white line represents the number of computer moves considered so far at ply zero, the next black line the number of replies and so on. Since brute-force search is exponentially explosive with depth, Chess System Tal uses various techniques to reduce the number of moves it needs to search, sacrificing search width to gain search depth. So the search profile usually shows an inverted diamond shape, as the search width becomes wider with depth. Interesting positions are extended, this is shown by a sharp peak at the top of the profile, normally such peaks represent interesting tactical threads. Areas in blue signify checks and replies to check. For an explanation of the numbers and text that also appear in the window see the advanced section.
- **Move interest** - This mode shows how interested we are in each of the possible moves in the form of a bar graph. Clicking on a bar will tell you which move it corresponds to. The top section of the bar is in blue and represents how much the search was extended on this move.
- **Checker board** - At random intervals during the search the engine will draw a dot on the destination square of the move it's currently thinking about. Thus a map of 'interesting' areas of the board is built up.



- **Scatter diagram** - This gives a radial picture of the search tree, similar to a radar screen. At random intervals the search plots it's position in the window. The diagram is a semicircle, with it's centre at the bottom middle of the window. Radial distance from the centre represents depth. The angle from the bottom left going clockwise represents position. Thus if there 20 moves in the ply 0 move list, the semi-circle will be divided into 20 arcs. Imagine this graph as a tree growing outwards from the bottom centre. If you click with the mouse within the scatter diagram, the arc will be shown and the mouse cursor will tell you which move this arc corresponds to. Dots in blue represent positions with high activity. Arcs containing a lot of dots are moves found particularly interesting.

### **Capture/Points window**

This window either shows the captured pieces or a graph of points against move number. The popup icon to the right of the title bar will allow you to select the mode. The graph modes show how the score has changed as the game has gone on. If you see your score suddenly dropping for no apparent reason watch out!, the graph is from Whites' point of view, so a positive score is always good for White. For a description of the components see the big thinking window. The vertical points axis is logarithmic to allow sudden jumps in score to be shown. Left clicking on the graph will make the window cycle through all of it's modes. Right clicking and holding will allow you to rescale the graph axes. Adjust the vertical scale by clicking and holding on the window with the right mouse button and move the mouse up and down. The graph will only contain results for moves made in the current play session. Thus if you load a game or get a database game, the points graph will contain no results.

### **Comments window**

The comments window is used to enter a comment for the move just made. Click in it and start typing to add or edit a comment, the comment will also appear in the move list. To finish typing press escape or click outside the comment window. You can enter any comment you wish here - the standard shorthand comments used in chess notation are as follows.

- ! - good move
- ? - poor move
- !! - very good move
- ?? - very poor move
- !? - speculative move
- ?! - questionable move

#### **3.1.1.2. The Chess Mode Menus**

The menus are accessed by moving the mouse to the top of the screen. To select an item click and release the mouse over it.

### **File Menu**

- **New Game** - Starts a new game. If you have a game in progress you will be asked if you want to save it.
- **Load Game** - Load a game saved on disk.

- **Save Game** - Save the current game to disk. Type the name of the game in the filename box and any comments you want to make about the game in the comment box.
- **Import** - Import a game from disk in a format other than our standard save game format. Chess System Tal can load saved games from other chess programs and most text files containing games. Chess System Tal can load ChessMaster 4000 Turbo saved games, Kasparov's Gambit saved games. PGN (text) format saved games and any other generic text saved game format that contains lists of moves or Forsythe boards.
- **Export** - Export a game to disk.
- **Text** - PGN text format is a standard format used by chess programs and chess database programs to save games. If you export your games as PGN files, other programs can read them.
- **Art** - Save the picture of the board as a 256 colour picture file. The type of file is machine specific. For the PC version it's a Microsoft Windows.bmp file. These file can be loaded by Windows paint packages.
- **Who Are You** - This menu option allows you to set up details of the current user. Up to 10 different users may be registered with the program, each with their own settings. (Please note this does not mean you may have 10 copies of Chess System Tal - the 10 users must all use the same copy of the program on one machine).
- **New User** - Create a new user. Type your name into the name box. The dialog also shows your estimated grade and the number of games you have won, lost or drawn. Initially after no games played your grade will be set to the minimum. Your play strength is expressed as one of four figures selected in the "Set Playing Strength" menu optional. They are USCF (US Chess Federation), Swedish/German ELO, U.K. ELO or BCF (British Chess Federation). When you click on ok, the current settings of the program will be saved with your name. Each time Chess System Tal is quitted the last user and their preferences will be saved.
- **Choose User** - Switch to a different user, created with New User.
- **Delete User** - Delete an existing user from the list.
- **User Profile** - Get details on an existing user and allows their name to be changed.
- **Strict Game** - Strict play mode is a no cheating play mode used to assess your playing strength. When selected a new game will be started and tournament chess rules will apply. The results of games played in "strict mode" are used to obtain a recognized figure for your strength as a player. The following special things happen in "strict mode". You may only play in standard 2D or 3D layouts. You may not take back or stop the clocks during your turn. The only clock modes allowed are Tournament and Blitz. Time controls are enforced (i.e. if you run out of time you loose). When a game is finished the result is stored as part of your cumulative assessment, the more games you play the more accurate this figure will be. To quit "strict mode" before the game is finished use the adjourn game menu option.
- **Adjourn Game** - Quit strict mode play. You are allowed one adjournment each game. If you have already adjourned once this game you will be asked to resign or carry on playing. If you adjourn, next time you select strict play you will be given the option of continuing the adjourned game. When a "strict mode" game finishes your new grade will be given to you and you will be presented with the option of automatically setting Chess System Tal's strength to this new figure, this way the next game will be more balanced.

- **Beginners Menu** - When this is selected a simple "Beginners" menu is displayed as the second menu.
- **About** - This will show program credits and information about the performance of your computer.
- **Database Mode** - Switch to database mode.
- **Quit** - Exit to operating system. The current game position will be automatically re-loaded next time you use Chess System Tal.

## Beginners Menu

This menu will appear the first time you run the program. You may switch it on and off with the Beginners Menu option under the File menu. All of the functions within it (except Show Squares and Odds Chess) may be performed from other menus as well.

- **Start New Game** - Start a new game.
- **Normal Game** - Start a new game, in the currently selected clock mode.
- **Blitz Game** - Start a new game and switch to Blitz mode. You will be asked to enter the time you want the entire game to last.
- **Choose New Pieces** - Select different art to be used for the pieces, board and backdrop.
- **Switch to 3d/2d view** - Switch to the 3d board if you are playing in 2d or the 2d board if you are playing in 3d.
- **Swap Sides** - This is a quick way of making the computer start/stop thinking. It doesn't actually swap the sides though this is what often appears to happen. If the current side to move is being played by a human, this is changed to computer and the opponent to human, the opposite happens if the side to move is computer. This is useful after moving through the move list, as Chess System Tal will always leave the human with the move after going to a new move. Swap sides will start the computer thinking.
- **Set White Player** - Allows you to set exactly who should play White, Human or Computer. Use the White Player option under the Setup menu if you want to set one side to Network.
- **Set Black Player** - Allows you to set exactly who should play Black.
- **Flip Board** - Rotate the board by 180° (useful if you're playing black).
- **Show Squares** - When you pick up a piece all the squares that it may move to will be highlighted when this option is turned on.
- **Odds Chess** - Start a new game with a handicap against the computer. You will be asked what you want the handicap to be.

## The View Menu

- **Switch to the 3d/Switch to the 2d** - Switch to the 3d board if you are playing in 2d or the 2d board if you are playing in 3d.
- **Pick Chess Set** - Select different art to be used for the pieces, board and backdrop.
- **Layout** - Switches between four different screen layouts. The layouts can also be quickly switched between using the function keys F2-F5. Different windows are available in each layout.

- **Mono Set** - Turn the diagrammatic Black and White set on and off. This set is always available regardless of other colour set you have loaded.
- **Backdrops** - Toggles screen backdrops off, thus freeing memory for important items like the hash table. If you are running in low memory the program may have not loaded a screen backdrop, in which case the background will be grey.
- **Gamma correction** - Adjusts the brightness of the display. Once you have set the brightness the level will be remembered for the future.
- **Graphical clock** - Toggles between digital and graphical clock display. This can also be done by clicking on the clock.
- **Coordinates** - Displays standard chess coordinates 1-8 and a-h around the board.
- **Orientation** - View the board from different angles. Left to Right means White plays Left to Right and so on.
- **Notation** - Allows you to set the chess notation the program will use to display moves. See the glossary for more information. This can also be done using the popup menu on the Move List.
- **Blindfold Chess** - This will hide all the pieces during play except when they move. To turn blindfold mode off select this item again.

## Setup Menu

- **Board** - Set the board up. The mouse will turn into a '+' shape to indicate you are in setup mode. You will be prevented from making any further moves or using many of the menu options until you have finished. Click anywhere other than on a piece while the mouse is a '+' shape and the popup menu will appear. If your mouse isn't a '+' shape then right click first. While the mouse is a '+' shape you may pick up and move any of the pieces on the board. To put a new piece on the board, select the required piece from the popup menu. You may now add this piece to the board by clicking on a square. If the square already contains a piece the old piece will be deleted. Right click the mouse to return the mouse to the '+' shape. To delete a piece from the board select delete from the popup menu, the mouse will turn into an 'X' shape. Any piece you now click on will be deleted. Use the reset option to set the board to the standard startup position. Use the clear option to clear all pieces from the board. When you have finished select finish. You will then be asked for whose side it is to make a move. At all stages right clicking will return the mouse to the '+' shape. You will not be allowed to set up illegal chess positions. The "too many pieces" message will appear if you attempt to put too many pieces on the board (remember you start with 8 pawns so the maximum number of Knights or Bishops or Rooks you may have when all the pawns have gone is  $2+8=10$ ).
- **Time** - Set the time controls to be used whilst playing the game. These will be used by the computer but not enforced on you unless playing in 'Strict Mode'.
- **Blitz** - set the time to play the entire game. Exceeding the time control is equivalent to a loss. In Blitz mode the digital clock will show a count down clock below the main clock.
- **Infinite** - leaves Chess System Tal to think forever or until interrupted.
- **Average** - Chess System Tal will think for an average of the time set here throughout a game.

- **Tournament** - Chess System Tal's strongest mode: primary, secondary and tertiary time controls, Chess System Tal will use its time intelligently over the course of the game. In tournament chess it is required that both players meet certain time controls. The standard controls are 40 moves within 2 hours then 20 moves each hour after that. In Chess System Tal you may set up to three time controls, the third one is cycled. Time is cumulative so if you only take 1.5 hours to make the first 40 moves you will have 30 minutes spare on top of the 1 hour you are expected to make the next 20 in.
- **Matching** - Chess System Tal will, on the whole, try to move at the same rate as the human player.
- **Exact time** - the only strict time cutoff. Normally Chess System Tal treats the time control as 'flexible', thinking longer when necessary and quicker in trivial positions, in this clock mode Chess System Tal will think for exactly this amount of time each move.
- **Clock Method** - You can set the clock method for Blitz and Tournament chess games. The two clock methods are the Fischer Clock and the Bronstein clock. These are two new methods of time control becoming popular at chess tournaments aided by the introduction of electronic clocks. Under the Fischer method each time you make a move the time you enter in the dialog will be added to your clock. Thus if you set 15s and make your first move after 10s your clock will have gained 5s. The Bronstein method is similar except that the minimum of the time taken and the time you set here is added to your clock. Thus in the above example only 10s will be added after your move leaving your clock at zero. Thus under the Bronstein clock you can't ever have more time than you started with. The advantage of these methods is that in long endgame situations you can keep on playing so long as you keep moving fast.
- **Set Play Strength** - Set the strength of play of the computer. The engine in Chess System Tal will strive to match this level. You may set the grading scale you wish to use from German/Swedish ELO, BCF (British Chess Federation), UK ELO or USCF (US Chess Federation). When you first start Chess System Tal the Set To Maximum item will be selected, click on here to set the strength to a different value. Click on here again in the future if you want Chess System Tal to play at its maximum again. If you set the figure below about 1500 Swedish/German ELO Chess System Tal won't search and will make its decision purely on the basis of 1 ply of look ahead. If you're playing a tournament of 'Strict Mode' games it is worth letting Chess System Tal automatically adjust this figure to match your grade.
- **Style** - Chess System Tal gives you control over its evaluation and search parameters.
- **Evaluation** - Adjust the way Chess System Tal "scores" a position. Please see the advanced section for detailed instructions.
- **Search Extensions** - Adjust the way Chess System Tal decides to extend its search. Please see the advanced section for detailed instructions.
- **Save** - Save the current style to disk.
- **Load** - Choose the style you want to play against from this menu. If the style you want isn't visible then use the 'Other' option.
- **Default** - Set the style of play to the standard style.
- **Set draw** - Sets the desirability of a draw, otherwise known as the 'contempt' factor.
- **Hash Tables** - This allows you to recommend the amount of memory used by the main hash table and the pawn hash table. The actual values will be adjusted once the next move

is made, so as not to interrupt the engine. The main hash table is more important than the pawn hash table and should be given a lot more memory. Clear hash tables, will simply blank the entire contents of all hash tables. this can be done at any time, even if we are thinking, all information we have already thought of will be lost.

- **Swap sides** - This is a quick way of making the computer start/stop thinking. It doesn't actually swap the sides though this is what often appears to happen. If the current side to move is being played by a human, this is changed to computer and the opponent to human, the opposite happens if the side to move is computer. This is useful after moving through the movelist, as Chess System Tal will always leave the human with the move after going to a new move. Swap sides will start the computer thinking.
- **White player** - Can be set to Computer, Human, or Network. This way you can manually set up who is playing White. Network is only available when network communication has been established (see communications menu).
- **Black Player** - As for White player.
- **Communications** - This menu starts network play.
- **Connect** - Before network play can begin both players have to use connect, In order to use network play both computers must have read and write access to a common drive. For instance "f:\shared". Your computer will now wait until communication has been established with another player.
- **Check connection** - Once network play has begun, the connection between you and your opponent may be checked at any time with this option. If all is well the message "Message acknowledged" will appear almost immediately. NB.: This will not happen if your opponent is using their menus, in which case you must wait until they stop doing this.
- **Disconnect** - Use this option to stop network play. Your opponent will be notified if you do this.
- **Send message** - Send a text message to your opponent. The message will appear on your opponents screen. For more details on how to use network play see the advanced users section.
- **Options** - Sets various "chess etiquette" options.
- **Offer draws** - if set, Chess System Tal may offer a draw if it thinks it expedient, this control also allows Chess System Tal to offer resignations.
- **Slide pieces** - if set, Chess System Tal will slide pieces over the board as they are moved.
- **Must move touched pieces** - the 'touch and move' rule. If you pick up a piece it must be moved to a new square!
- **Sound** - Chess System Tal will bleep to warn you it is your turn to move.
- **Capture animation** - captured pieces will animate when taken or deleted.
- **Set clocks** - allows adjustment of the time on the clocks. If we are thinking you will be prevented from doing this until the next move has been made. If you set the auto query parameter up, you will be asked to set the correct time after this many moves repeatedly.

## The Control Menu

- **Move now** - Forces Chess System Tal to play its best move found so far, so long as it has been thinking and it is the computers turn.

- **Forwards** - Step forward through the game. This is the same as using the right cursor key.
- **Replay** - Takes back to the start of the game, before any moves have been made.
- **Automatic** - Slowly moves forward to the end of the game. Use the end key if you want to do this quickly.
- **Take back** - Takes back one move, this is the same as the left cursor key, note that control is always left with the human.
- **Delete** - Deletes the current highlighted move and continuation, if any. This is the same as using the Del key.
- **Pause** - Stops the internal clock - not available in 'Strict' mode.
- **Offer draw** - to offer Chess System Tal a draw, you may only offer us a draw while it is our turn to move. We may need to think about it and our decision will be based on the set draw level.
- **Resign** - Resign, losing the game.

## Book Menu

- **Book Control** - Gives control over Chess System Tal's opening book. For more information on opening books please see the glossary. Chess System Tal constructs it's opening books from databases of games. The method for selection of moves to play is governed by the Popularity, Strength, Random buttons and the slider bar below them. Popularity means the most common move that we know of that was played from this position. The unusual/common slider bar sets the likelihood of selecting moves that were uncommon to common. Setting the control to common will mean we will always play the same (most popular) response. Strength means we will pick moves that lead to the most wins for the side to move. The random/best slider bar moderates this between totally random moves to the strongest move we can make. Full on will make us always choose the strongest move each time. Random means moves are chosen totally randomly. Book moves may either be obtained from the main opening book (shipped with the program) or from opening books you create yourself. To use your own opening book turn the main book off by clicking on the tick box next to it, then click on the User Book drop down menu and select your book, select 'Other' if your book doesn't appear in the list or isn't in the books directory, finally turn your book on by selecting the 'User Book' item. The settings in the opening book dialog are saved in the preferences. The tick boxes next to each book turn it on and off. The priority is the order in which the books are searched, if both are set to on, then if moves are found in the first the second will not be searched.
- **Optimise use** - Speeds up usage of the opening book on slow computers.

## Analyses Menu

- **Hint** - If available, Chess System Tal will suggest a move for you to play.
- **Solve for mate** - solves standard mate in 2, mate in 3 etc. positions. All mates found are shown. To be a mate move, the move must lead to mate regardless of what the other side does. You have the option of searching for mate up to 31 half moves ahead, this would take a long time (probably longer than the existence of the universe) we recommend 8 as a sensible upper limit. At the end the results will be presented in a dialog box. Click on any move to make it.

- **Warnings** - if set this will give beginner style warnings if the human player makes a 'dangerous' move. Please note that this is a beginner feature and uses the ply zero scoring information rather than the search to decide on warnings. Thus it will still warn you even if you are making a deliberate sacrifice.
- **Grading** - This option will present you with a summary of your games played in 'Strict Mode' and give you your current grade.
- **Chess Puzzles** - Chess System Tal comes with over 6000 solved test positions or puzzles. Each position has been solved by a human and has one answer which is regarded as the best move to make. There are also extra suites shipped with Chess System Tal, including "BT2450.POS" and "BT2630.POS" these contain the positions in the standard Bednorz-T'nissen tests for computer chess programs. You can get an approximation of your ELO grade using these suites. The Bednorz-T'nissen tests are a suite of 30 positions with known solution times for a range of graded chess programs. Using the the Bednorz-T'nissen method ELO grades can be approximated. You can either choose to try against the two "official" suites or with a random selection of 30 positions from 6000. The Bednorz-T'nissen method awards points for the time taken to arrive at the correct answer, up to 15 minutes, an incorrect answer is scored at 15 minutes. When a test is completed the results are summarised into a dialog box. Each position will be shown as <the position number> <the solution> <time in seconds to find it (900 for a failure)>. At the bottom is the ELO grade in the various formats.
  - **My grade** - will grade Chess System Tal according to the current time set, for accurate grading set 15 minutes exact and use one of the "BT.POS" suites. (This will take 7.5 hours so using a lower time is acceptable). During grading, information about the position including the solution will appear at the top of the Thoughts window.
  - **Your grade** - will estimate your grade. You will have one chance at each position. If you get the correct answer, you will move on to the next one. If you get the wrong answer then you will be allowed to see the correct solution by clicking on the board. Remember your grade will be affected by how long you take to think.
  - **Goto next** - skips to next test position in suite. This has the effect of marking this position as failed.
  - **Terminate** - aborts current grading test, and brings up the summary on the basis of the positions played. If you abort after only completing a few tests, bear in mind the results will be very inaccurate.
  - **Load test position** - loads a specific test position.
  - **Load suite** - several suites of test positions are supplied. The default suite contains 6000 positions. BT2450 is the standard test suite of 30 Bednorz-T'nissen positions BT2630 as BT2450, but more difficult. Test suites with more than 100 positions are used to generate random positions for the My grade / Your grade tests. Positions from smaller test suites are read in order. The test suites use Forsythe notation and are in text, please see advanced section for details of how to create your own.
- **Move Analysis** - If Analyse mode is set, then moves in the 'legal move' list can be 'greyed out' - click to the right of the move using the right mouse button. Greyed out moves will then be ignored by the search. Useful for 'what if' scenarios and correspondence players. Please see advanced section for more details.



## 3.2. The Database Mode

To quickly switch between Database Mode and Chess Mode use the F1 key.

### 3.2.1. How to use the Screen in Database Mode

**Database Games** - The database games window shows a list of the games in the currently opened database. The following information is shown for each game. The White player, the Black player, the result of the game (1-0 for White win, 0-1 for Black win and 1/2-1/2 for a draw). The venue of the game and the year. The moves of the current highlighted game are shown in the move list and the position in the current game is shown on the board. The cursor keys have the following effect in database mode:

- **Right cursor** key moves you one half move forward in the current game.
- **Left cursor** key moves you one half move back in the current game.
- **Up cursor** key moves you one game backwards.
- **Down cursor** key moves you one game forwards.
- **Home** key takes you to the first game. End key takes you to the last game.

Games shown in Black are said to be hidden, if the database is searched or saved the hidden games will be ignored. This is similar to deleting the game from the database. Left clicking on a game will make it the current game. Right clicking on a game will change it from hidden to visible and back again.

### 3.2.2. How to use the Menus

#### File Menu

- **New Database** - Create a new empty database. If you select a database that already exists you will be asked whether you want to overwrite it (delete the old one) or append to it. Appending to it is the same as loading it.
- **Load Database** - Loads a database of chess games. To load Chessbase format databases please see the advanced section.
- **Close Database** - Close the current database. If there are unsaved changes you will be asked if you want to save it.
- **Save** - Saves the currently loaded database to disk. The database will be saved to the same name it was loaded from.
- **Save As** - Saves currently loaded database using filename of your choice. You will also be asked whether you want the new database to be smaller on disk or faster to access.
- **Merge Database** - Merge the current database into an existing database on disk.
- **Split Database** - Splits a large database into smaller, more manageable databases.
- **Export Database** - Exports database games as text to disk. Warning: this can create very large files. The database is exported in PGN text format.
- **Import Database** - Imports database games from a PGN text format file.
- **Database Info** - Displays the current database size, etc.
- **Verify Database** - Searches for and marks as hidden any corrupted games found.

- **Goto Game** - Type the number of the game you want to go to. If you type a number higher than the last game in the database you will be taken to the last game.
- **Chess Mode** - Switch back to Chess Mode.
- **Get game** - Use this option to add the currently played game from chess mode to the database. If the game originally came from the database by using the put game option you will be asked if you want to put it back where it came from. If not you will be asked to provide information on the game such as, the names of the players, where it was played and the result. To put a date in simply type the year at the end of the venue. Changed games will appear with a "\*" character in front of them in the list of games. The changed games will not be saved to disk until you choose save from the database menu. If you attempt to load a new database while there are unsaved changes you will be warned and asked if you want to save the changed database.
- **Edit game** - This option will overwrite your currently played game in chess mode with the currently highlighted database game and return you to chess mode. This will allow you delete/add moves variations and annotations. To put it back in the database, return to database mode and press the get game button.
- **Quit** - Quit Chess System Tal.

## View Menu

This menu is a reduced version of the view menu in chess mode. See the view menu under the chess mode menus.

## Search Menu

- **Search Database** - Search the current database for specific games. You will be presented with a large dialog box with a number of options in it. If any of these is left blank or is off it is ignored while searching. The fields are:
  - **Player:** Type the name of a player you want to search for here. An incomplete name such as "kas" will match with any names that start with this name such as Kasparov. Case is ignored so "Kas" is the same as "kas". Wildcards can be used in the name: The '\*' character means any letters can match this part of the name. So searching for "ka\*ov" would find all games played by Kasparov and all games played by Karpov plus all games played by anybody whose name starts in "ka" and ends in "ov". The '?' character matches any characters at this point in the name. This is useful when looking for games by a player whose name may have been misspelt such as Korchnoi whose name may have been spelt Korchnoj. You could look for "Korchno?". Next to the name are two tick boxes, at least one of these must be set if searching for a player. They determine whether you want to look for games played as White or Black or either.
  - **Venue:** Set a location for games you are interested in such as Buenos Aires. You may use wildcards in this field.
  - **Year:** Set the years to look for games between. Setting only the first year will look for games played in and after this year. Thus 1990- will look for all games from 1990 to the current time. 1990-1994 will look for games between these two years and 1990-1990 will look for games played in 1990.

- **Named line:** You can search for games starting with a named sequence of moves with this option such as the Ruy Lopez opening. Click on the dropdown menu and select the line you are interested in. (If the named opening you are interested in doesn't appear in the list see the advanced user section for how to add it.
- **Current database game line:** click on this tick box to look for games that contain moves up to the currently highlighted move in the current database game. This is useful for finding similar games in a database.
- **Main game line:** Same as above except the line searched for is taken from the game that was being played in chess mode before you switched to database mode. This is useful for finding what (if anything) other players did in the position you are now in.
- **Current database position:** This is similar to searching for the current database game line except that rather than looking for a sequence of moves, the games are searched for a matching position. Thus all transpositions are found.
- **Main game position:** As above except the game currently being played in chess mode. Setup positions: Look for any games that don't start from the standard chess starting position, this includes black starting.
- **Variations:** Look for any games that contain variations. Comments: Look for any games that contain text comments or annotations. Result: Look for games whose result was a draw (1/2-1/2), win for White (1-0) or a win for Black (0-1).

The final options in the dialog are the (and, or not) radio buttons. These should be read as they are said. Eg. Player is set to Kasparov as White and year is set to 1990-1990. With and - all games that were played by Kasparov and were played in 1990 will be found. With or - all games that were played by Kasparov or that were played in 1990 will be found. With not - all games not (played by Kasparov or in 1990) will be found. More than two things can be set at once so all games played by Kasparov in 1990 in Buenos Aries could be set with and. Clearly if only one option is set and/or will have no effect.

The reset button will reset all of the fields in the dialog to off.

The effect of searching is to set all games that don't match the filter to hidden. Only visible games are searched so the effect is cumulative. Thus if the first time you get all Kasparov games and the second time you search not draws. You will have all Kasparov games that were not draws<sup>4</sup>.

- **Sort** - Use this option to sort the database into a specific order such as chronological (year) or alphabetical on the White players name.
- **Show Hidden Games** - Hidden games can either be shown 'greyed out' in the game listing, or can be hidden completely.
- **Clear Filter** - This makes all games in the current database visible.
- **Invert Filter** - Shows hidden games and hides visible games. Useful for splitting databases into two parts. Eg. find all Kasparov games and save the result. Invert the visibility of all

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4. To search for all games played by a specific player set the players name, select White and Black and set "or".

the games and save the database. This has the effect of extracting and removing all Kasparov games from the database.

### **Book Menu**

- **Make New Opening Book** - Builds a new opening book from the current database. You will be asked for the name of the new book, if you choose an existing book you will be asked if you want to append or overwrite it (append means keep the old data and add the new data to the end). You will then be asked how many half moves you want to go into the opening book (up to 200). The number of moves affects how big the resulting book file will be and also how deep it can be played into. Pressing escape at any time will abort the process. When you have finished a book it may be optimised and you may fold it's transpositions together using the `optimise.exe` program you will find in the database directory.
- **New personality** - Builds a new opening book using database games played by your choice of named person (Eg: Tal or Kasparov). Again this option requires a database to be loaded. The database is searched for games played by the chosen player and the data from the game is put into the book in a specific way, such that the lines will be chosen even if the game was lost. This is because if you build a Kasparov book you want his bad moves as well as his good moves.

## **4. Advanced Features**

What follows is further information on some of the more advanced features of Chess System Tal.

### **4.1. Network Play**

Once a connection has been established network play can begin. As soon as anyone makes a move, the entire game including move times is transmitted to the opponent. This has the advantage of always keeping both sides in synchronisation. When a game is received it is assumed your opponent has just moved and it is now your turn to move, the opposite colour is automatically set to "network" for you. This means that if your opponent is White and they take back a move and now make a Black move instead, you will be expected to play as White. Clearly it is going to be very easy to cheat, but its up to both players to ensure they don't.

### **4.2. Text Files**

Various files in the datafile directory are text files that can be edited with a suitable word processor.

The file "engopen.txt" contains the named opening move sequences such as the Ruy Lopez opening. To add a new line put the name on a single line, then all the moves in coordinate notation on the next line. To add a continuation to the previous line put " >>" at the beginning of the line, remember to put a space first.

The .pos files are used for grade testing. The format for the first line is: Number of positions, followed by any comment, if the suite is to be used for grade testing then the comment must contain the text "BT=nnnn" where nnnn is the raw BT score for getting all the positions right instantly. The equation for BT is raw BT score - total time / no. positions. All the lines following this are the positions. The format for these is a Forsythe string for the position (see glossary), the last letter of which should be 'w' for White to move or 'b' for Black to move. The solution in coordinate notation should follow this, then any combination of the following letters to describe the type of the position (not essential). 'H' = hard. 'V' = Very hard. 'P' = Positional. 'R' = Rook,Knight,Bishop. 'T' = Tactical. 'L' = Plan. 'S' = Strategic.

### **4.3. Loading ChessBase Format Database**

Chess System Tal will load chessbase format databases, but we don't save in this format. Because of this we regard ChessBase databases as read only. If you make changes to a.CBF database you will be prevented from saving them. You can however load a.CBF database and then use save as to save it to Chess System Tal's database format. From now on you can treat it as a normal database. To load a.CBF format database select the \*.\* item when in the Load Database dialog.

#### 4.4. Move Analysis

The move analysis menu can be used to prevent the search looking at certain moves. In order to use this feature it must be turned on by clicking on the Analyse Mode menu option. The right mouse button may then be used on the legal move list to exclude/include moves from the search. When blued out a move will be ignored. Clearly you must always have at least one move for the search to look at or else Chess System Tal will think the position is checkmate or stalemate.

#### 4.5. Profile Text

The meaning of the text that appears in the profile inner eye window is:

##### Down the right hand side:

- **“EX=”** - the proportion of nodes that are extensions to the search (many other chess programs don't have any extensions, and have a horizon at which point they cut off but we extend the search in positions we find very interesting).
- **“BF=”** - branching factor, this number represents the proportion by which the number of nodes we look at 1 move ahead and n moves ahead grows. If we looked at all moves, by 3 moves deep at an average of 50 moves from any position we would need to look at 50 x 50 x 50 positions. So at depth n we would look at 50n, we don't do this but in fact use lots of AI searching logic to restrict what we look at. In an unrestricted search BF would be about 6, but after pruning, null move and restrictions it goes down to about 3 which is healthier.
- **“CS=”** - capture search. This is the proportion of the search involved in capture searching, which means at the end of the search we exhaustively research all captures.
- **“NS=”** - null search. This is the proportion of the search given over to the null move. Null move is the search-engine saying: this position is boring, I won't bother to make a move, and my opponent has to prove that the one move advantage I have thus given him will give him a major advantage.

##### Down the left hand side:

- **“n/s=”** - Nodes/second count - how fast we are thinking. This will decrease when you decrease our playing strength.
- **“tr=”** - Trivial - the % time spent looking at moves other than the best move during the search.
- **“la=”** - Activity, the smaller this is the more checks and general activity there is.
- **“ne=”** - Effectiveness of the null move algorithm.

## 4.6. Adjusting the Style of Play

**Evaluation** - this is a series of analogue controls that affect the way we score a position and thus how many points we give to any position. Twiddling these controls too far can make us throw pieces away, but if you do this you will be warned.

The controls are divided into 3 sections. At the top of each of these sections are the generic coarse controls. These are connected to all the other controls and allow the user to adjust all the others in one go consistently. They are:

- **Def-Agr** - Defensive play to aggressive play.
- **Psnl-Mtrl** - Positional play to material play.
- **Safe-Wild Centre-Flank** - Go for Centre control to Flank control.

The fine controls are divided into 3 sections as follows:

1. **Dynamic adjustments** - Happen all the time during the search.
  - **King attack** - increases the Tal or king attack function.
  - **Development** - Encourages getting pieces off back rank.
  - **Bishop pairs** - adjusts relative strength of bishops and knights. Thus in some positions it is better to have a pair of bishops than a bishop and a Knight.
  - **Centre control** - Encourages occupation and control of the centre of the board.
  - **Key squares** - Encourages occupation and control of certain important squares.
  - Pawn structure** - double pawns, passed pawns isolated pawns... (i.e. importance of the pawn)
2. **Static adjustments** - They are only done once before we start searching
  - **Attack enemy King** - Encourage attack of our opponent king.
  - **Attack weak pawns** - Encourage attack of weak pawns.
  - **Avoid pins** - Avoid having pieces pinned down (Eg Queen in front of king).
  - **Support passed pawns** - Keep your promoting pawns safe.
  - **Promote lever moves** - A lever move is one in which we try to attack the opponents pawn chain.
  - **Don't block pawns** - Don't get in the way of your pawns.
  - **Bad bishop** - Bishop restricted by its own pawns.
  - **Occupy enemy board** - Get into opponents half of the board.
  - **Lock flank pawns** - Inhibits the pushing of the wing pawns.
  - **Lock pawns near king** - Tries to maintain a pawn defence in front of the King.
  - **Knight freedom** - Increase mobility of the Knight.
  - **Knight attacks** - Promotes Knight attacking enemy pieces.
  - **Bishops and Knights to centre** - Encourages bishops and Knights specifically to control centre.

- **Castling** - Promotes castling.
- **Queen attack on King** - Tries to get the Queen into a position where it can attack the King.
- **Keep King near pawns** - Keeps King near pawns.

**Positional Material balance** - Increasing will make material less important and increase the likelihood of sacrifices.

3. **Piece adjustments** - These adjust relative piece values. i.e. you can make your Queen more valuable.

**Search extensions terms** - Are used to 'extend' the search in active positions (see glossary). If the search extension terms are set to 'active' or 'manic' Chess System Tal will detect tactical themes, but at the expense of the 'normal' positional search. Search extensions strike a fine balance between finding tactical themes and playing sound positional chess. With all extensions set Chess System Tal becomes a fine 'finder'; that is it will find tactical threads if they are there. Unfortunately this is not the same as playing good chess, so in a normal game it is necessary to reduce the extension settings. There a number of pages of these as follows and each one can be set to one of up to four settings.

- **Sacrifice for Queen check** - Looks for possible sacrifices so the Queen can follow through with dangerous checks.
- **Sacrifice for piece check** - as above but for any other piece.
- **Sacrifice for capturing check** - as above but capture while giving check.
- **Overloaded king defence** - Looks for pieces defending too many other pieces at once.
- **Queen infiltration near the King** - Looks for ways for the Queen to get near the King.
- **Skewer piece near King** - Pin pieces on the King.
- **Discovered check threat** - Look for discovered checks.
- **Discovered mate attack threat** - Looks to see if you can move a piece to reveal a mating attack.
- **Strong check sequence** - Extends the search if there have been a powerful series of checks.
- **Check piece can be captured** - Extends even if the checking piece can be taken.
- **King left in extreme Danger** - If a King is left in a dangerous position we extend the search.
- **King left in Danger** - as above but not so immediate.
- **Threaten check** - Extend if you threaten to give a check on your next move.
- **Give check** - Extends if just given check.
- **Check enemy Queen in danger** - Extend if you give check and threaten the Queen.
- **Check enemy Queen in extreme danger** - as above but threaten Queen extremely.
- **Check enemy piece in danger** - as above but for any piece.



- **Check, interposes forced** - Extend if opponent can only respond by putting a piece in the way.
- **Check king has only one reply** - The king can only make one move.
- **Tal defend** - Turns on/off Tal function for own King.
- **Tal attack** - as above but for enemy King.
- **Tal let's have fun** - Turns up Tal function.
- **Make King active in Endgame** - Looks for King attacks against pawns in endgame.
- **Promotion threats** - Extend if you threaten to promote.
- **Passed pawn threats** - If you threaten to move a passed pawn forwards.
- **Running pawn threats** - Pawns with free pathway to promotion.
- **Dangerous running pawn threats** - as above but more dangerous.
- **Rook support for promotion** - Rook is supporting a passed pawn.
- **Connected passed pawn threats** - Looks for adjacent pawns.
- **Attack enemy pieces** - Extend if we're attacking an enemy piece.
- **Look for Knight forks** - Fork King and Queen with Knight.
- **Trap major pieces** - Queens and Rooks having very few moves.
- **Trap minor pieces** - as above but Bishops and Knights.
- **Threaten trapped pieces** - Attack pieces seen as trapped.
- **Look for pinned pieces** - Detect pieces pinned against the King.
- **Look for pins against the Queen** - as above but for Queen.
- **Look for potential pinned pieces** - pieces might be pinned in future.
- **Equal capture extension** - Extends if a piece can be safely taken.
- **Capture Search** - Extends on certain types of capture.
- **Null move search** - Activates the null move algorithm (see the glossary).
- **General search extension 1,2,3,4** - These activate certain undefined and experimental routines.

## 4.7. Command Line Switches

When running the program a number of options may be typed after "chess" these are the command line switches and are as follows:

- **/?** - Print a list of all available switches (program won't start).
- **/nohash** - No pawn hash table.
- **/nofade** - The program doesn't do a fade out/fade in when switching layouts.
- **/c232** - Program will print every move that's made to PRN.

- **/autot** - Special mode for auto-tournamenting Chess Tal against other chess programs using a NULL modem cable and a FOSSIL driver - for further details contact Oxford Softworks.
- **/cd\_drive=** - (CDRom version only). This sets the name of the CDRom drive with the chess program on it, this is only necessary if problems arise. Eg. **/cd\_drive=D**  
**/no\_titles** - No title animation or logos shown. **/safety** Program will save game after every move made into the DATAFILE\LASTGAME.GAM file used for saving the current game when you quit. **/no\_3d** Program won't load 3d art - this can save about 600k of memory that the program can then use for other things like hash tables.

**E.g.:** To start the program with no 3d art and in safety mode type: C:\chess /no\_3d /safety.

## 5. Stop Press Items

Here are some things that didn't make their way into the online manual in time for release

### DOS or Windows 95

Chess System Tal will run best directly from DOS (not a DOS window under Windows, but bare DOS). There's no multitasking to steal time from CST, and CST can grab more memory without Win95 in the background. Your mouse driver will need to be enabled.

You can also run Chess System Tal from a DOS window under windows. To increase the performance, you should avoid trying to multitask other applications at the same time. But even so, Windows will give some performance degradation.

Click on the ABOUT menu item, then PERFORMANCE. This will tell you how much memory has been allocated to the hash tables, and the performance of your system relative to a Pentium Pro 200.

### Tournament Testing

Use as follows: bare DOS (not a DOS window), some disk cache to speed up the CD access, preferably transfer the large opening book to hard disk lots of memory - 32 Mbytes for a Pentium Pro 200 and tournament time controls would be suitable

- offer draws off
- slide pieces off
- must move off
- sound off
- capture animation off
- tournament times controls
- large opening book
- choose opening book move by strength, slider in middle
- book control set to priority large opening book (you can tell
- if the large book is selected, because the 'book values' (click
- on Nf3 at start position, legal move list) will be saturated
- at 50,000+
- play strength set to maximum
- F5 screen
- monochrome chess set
- backdrops off
- graphical clock off
- beginners menu off
- warnings off
- use default style
- set draw = equal
- hash tables maximum (unless fast blitz), and watch for hash
- permeability falling below 100%

### Information for techie

Press F5 for the tech window. On the inner eye window select SEARCH PROFILE. When CST is thinking the following data will appear:

- n/s: nodes per second
- ex: extensions: percentage of the search used by forcing line extensions
- tr: triviality: percentage of the search used by the best move
- bf: branching factor: measure of the exponentiation of the search growth
- la: line activity: average measure of the 'activity' of the position
- ip: interest pruning: percentage of nodes cut by interest pruning function
- cx: capture extensions: percentage of the search used by capture extensions
- bx: backwards extensions: percentage of the search used by b-extensions
- ns: null move percentage: percentage of the search used by the null move
- ne: null move efficiency: how often the null move 'gets it right'
- he: hash efficiency: how often the hash table holds the 'best' move.
- hp: hash permeability: percentage figure for available hash space. If this value falls below 97% or so, CST would like more memory, please. Longer time controls and fast processors need lots of hash memory.
- strange tree shape: representation of the search tree, width against depth.
- Blue areas indicate checks and replies to check.
- Spikes at the top of the tree represent deep search extensions.

### Hash table size

By studying the hash permeability figure above, you should be able to predict the 'optimal' size of hash table. For normal time controls, the bigger the better; but for blitz, the time taken to clear a big hash table every move can be appreciable. In such a case, use the HASH TABLES function to limit the hash table size to give you 99% hash permeability and the fastest possible hash table clearance time.

### Named Lines

In the datafile directory you will find the file "ecoclas.txt". This is a file of the named ECO system openings in our file format## (see main online help). You may replace the datafile\engopen.txt with this file by copying it onto it, i.e. from your chess directory in dos type "copy datafile\engopen.txt datafile\old.txt", this will make a backup copy of the old copy for you "copy datafile\ecoclas.txt datafile\engopen.txt".

You will now be able to use this far more complete opening classification. It **does make the choice of opening rather wide though!**

### Appending lines to the opening book

Should be no problem, but you'll need to transfer the opening book data from CD to hard disk and switch off the read only attribute for processing - writing to a CD is just not possible :) But please remember that the amount of data involved can be very large. For example to add 100,000 extra games to the library takes us about 5 hours of processing and hard disk access on a P90 with hard disk caching. No disk cache? - forget it!

## **Opening book optimization**

After a build to the opening book, you may wish to improve the book by linking transpositions (i.e. link identical positions that can be reached by swapping the move order). You'll find, on the distribution CD, or your hard drive, a program OPTIMISE.EXE.

If your opening book is large, be prepared to sacrifice your PC for several days!

Go into DOS.

Make sure your disk cache is functional, otherwise for days above, read months. Make sure that OPTIMISE.EXE is in the same directory as the OPENING.BOK.

Oh yes, make sure the opening book data is on your hard drive, not on the CD:

From DOS, type: OPTIMISE OPENING.BOK

The optimizer will search for as many transpositions as it can, until it runs out of memory. A 16 Mb machine will fix up all lines to a depth of 18-20 ply or so. 32 Mb machines will do better. But don't worry, we've done all this for you on the release book, and there should be enough links in it already to deal with any extra lines you choose to add.

## **More opening book optimization**

If you really have several hundred megabytes spare on your hard drive, then copy the big opening book from the CD to your hard drive, and use the BOOK CONTROL dialog to change the path. This will speed up opening book access slightly, although modern CD drives are likely to be fast enough anyway.

## **Acquiring more database games**

There are literally millions of games available free of charge by download from various internet sites. These games come in PGN format, and can be read directly into Chess System Tal, studied, and used to modify/increase the opening book.

## **Auto232 Autoplayer**

The Austrian autoplayer by Chrilly Donn timer is supported. Run Chess System Tal using the /c232 switch, eg. chess /c232. You should have installed the Donn timer software using the 'noname' option. To acquire Auto232 software and special serial cable for linking two PC's, try the Gambitsoft World Wide Web site for details.

## **Upgrades and bug fixes**

Chess System Tal is under constant development, you can look for an improved version, or a bug fix version, on our web site; this version (if any) may be downloaded free of charge. Of course the download will be only "partial"; you'll need the rest of the program to get it to run.

## **Saitek board detection**

We do support the Saitek (Mephisto) sensor board. You must run Chess System Tal using the /saitek switch to force the program to detect *the board uses the printer port to communicate with the computer and the detection process can lock up some printers.*

## 6. Glossary

A quick guide to the terminology used in this manual.

- **Best line** - Like all good chess players, when CST thinks it's looking many moves ahead. In fact unlike a human it will consider many thousands of moves each second. Each time it finds a better or more likely sequence of moves, it remembers it. This sequence of moves is called the best line and is simply the best CST has come up with so far. Thus a best line of G1F3 B8C6 B1C3 E7E5 D2D4 means white plays G1F3 then black plays B8C6 white responds with B1C3 and so on. In CST the best line is displayed in the thoughts window, clicking on any move in the best line will make CST show you the best line played out on the board.
- **Branch** - A branch in a search tree is a move that can be made from the position.
- **Coordinates** - In chess the coordinates of the board are taken from white's bottom left hand square, which is a1. The letters increase to the right and the numbers increase up.
- **Depth or ply** - This is simply how many moves ahead we are looking. The numbers start at 0. So the ply 0 moves are all the moves that can be made from the current position. The Nominal depth is the current depth that we will not search beyond unless we decide to extend.
- **Engine** - This is the intelligence of the program, or the bit that knows how to play chess.
- **Extensions** - Normally during searching, depending on the iteration the program won't look deeper than a certain number of moves. An extension is where it decides a certain line needs greater consideration and extends it's search beyond this point.
- **Forsyth board** - The Forsyth board (also known as Forsyth Edwards Notation FEN) is the most compact way of representing a chess board in text. The translation is as follows. Lower case pnbrqk means black Pawn Knight Bishop and so on. Upper case PNBQRK means white. You start at board square a8 and work right and down. A number means step on this many squares a '/' means go down to next line. So 3r3k means 3 spaces a black Rook on c8 3 spaces and the black King on f8. At the end of the line the side to move appears ('w' or 'b').
- **Hash Table** - Also known as the transposition table. The hash table is a large area of memory that's used by the chess program to remember things that it's already thought of. There are two reasons for this. Often sequences of moves can lead to the same position eg E2E4, E7E5 D2D4 is the same as D2D4 E7E5 E2E4. This is called a transposition and clearly CST would be wasting it's time if it thought of moves that continued from this position more than once. The second purpose is to guide the search by quickly providing information calculated in previous iterations to the current iteration.
- **Horizon** - The horizon is the depth or number of moves ahead that we are looking until before we stop looking.

- **Iteration** - Searching in chess is carried out in iterations. When CST starts thinking it firstly restricts itself to only looking say two moves ahead. It does this very quickly and then starts all over again and looks maybe 4 moves ahead, next time 6 and so on. Each time it starts again is a new iteration. This process may seem very inefficient but remember that information from previous iterations has been stored in the hash table. The reason for doing this is so that when we decide to stop thinking, we've covered as wide an area as possible, within the time available.
- **Move and Half move number** - A move in chess is really a pair of moves, i.e. the number of moves a particular colour has made. The half move number is the count of all the moves played.
- **Notation** - Many notations are used in chess to denote moves. We support all of them, here is a brief description of each:
  - **Coordinate** - also known as algebraic. This is the simplest notation, it is simply the coordinates of the start square followed by the coordinates of the end square. Thus E2E4 means move the piece on E2 to E4.
  - **FIDE** - FIDE is the most commonly used notation amongst chess players. It's more compact than coordinate, but also harder to read. FIDE is the International Chess Federation. The letters NBRQK mean Knight, Bishop Rook Queen King respectively. Except for castling all FIDE moves contain only one square coordinate which is the end square of the move. One coordinate by itself (eg. b4) means a pawn moves here. A capital NBRQ or K before the move (eg. Rb4) means that piece type moves here (Rook to b4). In cases where say two Rooks of the same colour could move to b4 a qualifying rank or file is given before the square (eg Rab4 Rook on file a moves to b4, or N3c5 Knight on rank 3 moves to c5). When a capture takes place the letter x is put before the square coordinate (eg. Bxb7 Bishop takes on b7). When a pawn is promoted, whatever it is promoted to is put after the square coordinate (eg. b8=Q Pawn moves to b8 and is promoted to Queen). Finally a short castle is denoted by O-O and a long castle (on the queens side) by O-O-O. We also provide the option of graphical FIDE in which the letters NBRQK are replaced by graphics symbols of the pieces.
  - **Long algebraic** - is a combination between Coordinate and FIDE, as with coordinate the start square and destination square are given. A '-' character is added between them which is replaced by an 'x' character when a piece is captured, and if the moving piece isn't a pawn the capital letter NBRQK is added before the move. (eg. g6-g7 Pawn on g6 to g7. Nf3xg5 Knight on f3 captures on g5). Promotions and castles are the same as in FIDE.
  - **Descriptive** - is an old fashioned notation. The start of the move is the type of the moving piece (i.e. PNBRQK), this is followed by a '-' or 'x' for capture. The destination square then follows. The destination square is given in terms of squares in front of the starting position of a piece. Thus K3 (King 3) for white is the third square in the King file (or e3) for black this would be e6. So P-K3 for white is E2E3 for black it's E7E6. Rooks, Knights and Bishops on the left hand side of the board are referred as Queens Rook,

Queens Knight and so on. On the Right side of the board they belong to the King. Thus N-KB3 means Knight to Kings Bishop 3 or Knight moves to f3. If there is ambiguity over the moving piece, it's qualified with King or queen (eg KN-Q4). Promotions come after the move and a '\ ' is used (eg P-KN8\Q). Castling is the same as for FIDE.

- **Correspondant** - This is simply coordinate replacing the letters with numbers, so a1 becomes 11 and e4 becomes 54. Finally in all the above notations check is denoted by a '+' following the move, except for Descriptive where the letters 'ch' are used instead. (eg. F1B5+, Bb5+, Bf1-b5+ and B-N5ch).
- **Null move search** - Special search technique in which the weaker side makes two moves in succession to determine if it can improve its position.
- **Opening book** - The first few moves played in any chess game often follow very similar sequences of moves eg (E2E4.. E7E5). Because of this chess programs employ opening books to help them make the first few moves. Rather than wasting precious clock seconds on deciding whether E2E4 is a better first move than D2D4 the decision is made instantly from a big external file of known opening move sequences. CST allows you to build different opening books from the databases provided.
- **PGN format** - PGN stands for Portable Games Notation - and is a text based way of saving chess games so that other programs may load them. Because the files created are text you may load and edit them in a suitable word processor. The format is too detailed to outline here but the full specification and specifications for FEN and EPD may be obtained from the author on the internet - Steven (sje@world.std.com). The main chess repository containing hundreds of PGN games and lots of other useful information can be found at the anonymous ftp site chess.uoknor.edu at the University of Oklahoma at Norman (USA) on the internet.
- **Pruning** - is a concept which derives naturally from the idea of a search tree. it's a process used by the search to prevent it from looking down certain lines, thus pruning all the positions beyond.
- **Result** - This is the result of the game and is one of 1-0 white wins 0-1 black wins or 1/2-1/2 draw.
- **Score or Points** - Scores or Points in CST are measured in terms of pawns. A score of 1 means we think we are exactly 1 pawn ahead, a score of 2.4 would mean we think we are 2.4 pawns ahead.
- **Search** - Searching in chess programs, means searching for the best move to make. This involves looking at as many positions as possible to come out with the most optimal move. This is not the same as the move which could lead to the best position. For example "Fools mate" can put your opponent in checkmate within 3 moves of the start of the game. Clearly the "Fools mate" is a very good position to be in, but we assume our opponent is as intelligent as us and won't allow us to get to this position. Thus we won't even search as far as it. This process is called



minimaxing, which means we take the minimum of the maximum scores available to us, this allows us to prune out large areas of the search tree.

- **Search Tree or Search Space** - This is an imaginary tree that represents, all the possible moves that could be made. This number is actually more than the number of atoms in the universe. At the start position there are 20 legal moves for white. If you draw a circle which represents this position then 20 lines or branches could be drawn from it to new circles or positions, if you then draw a branch from each of these new circles representing the moves that could be made from this position and so on you get a tree.
- **Transposition** - A transposition in chess is a position that can be reached by more than one sequence of moves. (eg. The position reached by E2E4, E7E5 D2D4 is the same as the one reached by D2D4,E7E5 E2E4).

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