

NOVAG®

star sapphire

- **INSTRUCTION**
- **ANLEITUNG**
- **MODE D'EMPLOI**

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I. INTRODUCTION

We congratulate you on your purchase and recommend that you read the instruction manual thoroughly in order to learn how to fully operate and enjoy your new chess computer. The LCD chessboard and the function section at the bottom of the LCD screen are touch-sensitive and can be accessed with the special Pen, located on the left side of the unit. **Always** use this Pen when operating the unit to avoid scratching or breaking of the LCD glass, which is not covered by the limited warranty. The LCD screen is protected by a cover. To flip the protective cover back, please pull the button on the right side of the unit to release it. When using the pouch you can remove the protective cover carefully from its hinge and store it in the pocket on the left side underneath the writing pad.

BATTERIES/ ADAPTOR

The chess computer runs on 3 x 1.5V UM 4 type, or size “AAA” alkaline or heavy duty batteries (not included) or a mains adaptor (Novag adaptor 1021 not included). Please note that the adaptor is a d.c. 9V adaptor with 300 mA and it has a negative centre and make absolutely sure that you only buy an adaptor with exactly these specifications (use of adaptors with other specifications invalidates the limited warranty). Before using the adaptor, check that the voltage of your electric mains is within the range specified on the adaptor label and that it is not damaged. Make sure that you first connect the adaptor with the computer before you plug it into the mains and that the unit is turned off before connecting it to the mains.

IMPORTANT NOTICE

Before replacing/ inserting batteries, turn the unit off first and remove the adapter if connected. To insert batteries, open the battery door on the back of the unit by unscrewing the screw and lifting the battery door. Insert the batteries according to the correct polarity as indicated by the +/- signs and then replace the battery door again. Do not place any other object(s) in the compartment but the batteries as described above. To remove batteries pull each battery out of its compartment. Do not use any objects to remove the batteries and remember, batteries must be removed when exhausted. Always use new alkaline or heavy duty batteries of the same type only – never mix old and new batteries or batteries of different type, e.g. disposable and rechargeable batteries. Do not recharge non-rechargeable batteries. Remove rechargeable batteries from the chess computer before charging and charge rechargeable batteries under adult supervision only. Any battery charger (for use with rechargeable batteries) or adaptor or transformer should be examined regularly for potential hazards, such as damage to the cable or cord, plug, enclosure or other parts, and that, in the event of such damage, the battery charger/ adaptor/ transformer (or any other electrical appliance) must not be used until that damaged part has been properly removed or repaired. Please also note that a battery charger/ adaptor / transformer is not a toy. If you do not use your computer over a long period of time, please remove the batteries. Never short-circuit the unit or the battery charger or any other electrical appliance. The chess computer is not intended for children under 3 years of age. The packaging must be kept as it contains important information.

LOW BATTERY INDICATION

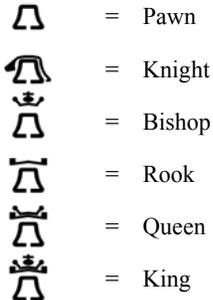
When the LCD shows [lobatt] it indicates that the batteries have to be replaced.

MEMORY

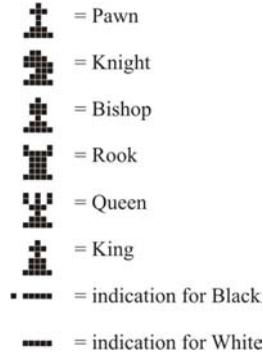
The computer has a long-term memory and will retain the last board position. However, make sure that there are working batteries in the chess computer otherwise you will lose the memory contents.

II. LCD DISPLAY

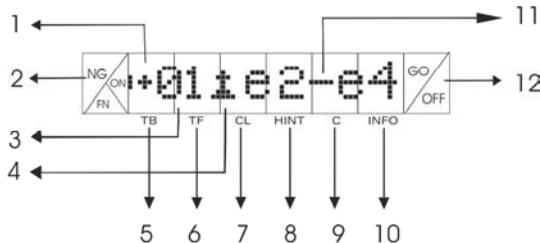
CHESSBOARD CHESS PIECES:



LCD DISPLAY CHESS PIECES:



LCD DISPLAY:



<p><u>1 = Colour indicator</u></p> <p> = White  = Black</p>	<p><u>2 = Multifunction Key NG/FN/ON</u></p> <ul style="list-style-type: none"> • Turns unit on (1 brief tap) • New game (1 long tap for 3 seconds) • Function access (brief taps)
<p><u>3 = Number of moves</u></p> <p>Shows number of moves made</p>	<p><u>4 = Chess piece symbols</u></p> <p>Shows active chess piece (see above)</p>
<p><u>5 = “TB” Trace Back</u></p> <p>Each time tapped it takes a move back</p>	<p><u>6 = “TF” Trace Forward</u></p> <p>Each time tapped it takes a move forward</p>
<p><u>7 = “CL” Clear</u></p> <p>Clears the LCD, deactivates chess piece.</p>	<p><u>8 = “HINT” Hint</u></p> <p>The computer will make move suggestions</p>

9 = “C” Colour Change colour	10 = “INFO” Info Shows times, number of moves and scores
11 = “e2-e4” Move Indicates the move (here from e2 to e4)	12 = GO/OFF Multifunction Key <ul style="list-style-type: none"> • Turns unit off (1 long tap for 3 seconds) • GO function (1 brief tap)

III. PLAYING THE CHESS COMPUTER

If you wish a quick game of chess without having to use all the special functions of this model, you may refer to the following instructions.

Step 1 : Insert batteries or connect to the mains as described above. Turn the chess computer on by tapping on the NG/FN/ON key on the bottom left hand corner once briefly. The chess pieces will be set up on the LCD screen automatically.

Step 2 : To start a new game tap the NG/FN/ON square continuously for **3 seconds** now. Three beeps will sound and the LCD will show:

|+Ø1 - - - - -. Tapping the square NG/FN/ON for less than 3 seconds will access the function groups (please refer to the FUNCTION GROUPS chapter below).

Step 3 : To make your first move for WHITE, tap your special PEN on the chess piece you wish to move and then tap your PEN on the chess field where you wish to move your chess piece to (imagine it as picking your chess piece up from one square and placing it on another square). At the same time your move will be displayed on the LCD screen, e.g. if you move the white pawn from e2: |+Ø1 e2- - - to e4: |+Ø1 e2-e4

Step 4 : Once the chess computer has registered your move it will immediately start computing its counter move. Illegal moves are not accepted and the unit will beep 3 times and show error on the LCD. When the chess computer is ready to move it will make its move on the LCD chessboard automatically and at the same time the move will be displayed on the LCD, e.g. the black pawn is moved from c7 to c5: |- Ø1 c7-c5. Now you can make your counter move.

IV. GAME FEATURES

a) Making moves

Enter your move by first tapping the chess piece you wish to move. Then tap on the chess field you wish to move to (FROM ⇒ TO). Your entered move is shown on the LCD together with the colour moved (“+” = white; “-” = black). If you have chosen the “wrong” chess piece you can deactivate it by tapping on it again but only if you have not made your “TO” move, otherwise you will have to use the TAKE BACK function.

The computer’s moves are executed automatically on the LCD chessboard and will also be displayed on the LCD screen at the same time. Once executed a short beep will sound. When the unit is computing it will ignore all inputs, with the exception of the GO function (GO/OFF key). Once tapped briefly, it will interrupt the computer’s calculation process and will force it to make its move immediately.

b) Capturing a Piece

If you or the chess computer makes a capturing move the symbol “x” will be displayed on the LCD, for example move from e5 to g7 captures a chess piece: c7xc5 .

c) Impossible and Illegal Moves

If you try to make an illegal or impossible move, you hear 3 beeps and on the LCD display you will see the error sign. You can now make another legal move.

d) Castling

According to the rules of chess you must first move the King then the Rook to complete this move. The computer accepts and executes castlings in set-up positions.

e) En passant

If you make this special pawn capture you only have to tap the “from” and “to” squares of this move as in a normal move. The captured pawn is automatically removed by the computer and the LCD shows “x”.

f) Pawn Promotion / Underpromotion

If one of your pawns reaches the 8th rank, the computer will prompt you to promote or underpromote it to any desired piece and you will see the symbols for Queen, Bishop, Rook and Knight displayed. Please tap on one of the symbols to enter your choice of promotion and the computer will automatically replace your pawn with this piece.

When the computer promotes one of its pawns, it will replace the pawn automatically with the promoted piece and at the same time the move is displayed in the LCD.

g) Stalemate / Draw

A draw is announced on the LCD with the appropriate message :

[dr Stl] no legal moves, but not in check, therefore draw
[dr 3rd] position repeated 3 times
[dr 50] 50 moves made without capture and pawn move
[dr ins] insufficient material for either side to check mate the other

h) Check and Checkmate

Check announcements are made with the “+” sign on the right side of the move shown on the LCD, e.g. ... g7-g8+ . Checkmate will be indicated on the LCD with mate .

i) Early Mate Announcements

The computer will always announce mate if it sees it and will show the number of moves to mate on the LCD. Example: mate 1 .

j) Resignation

The computer will recognise positions which are lost and will resign the game showing resign on the LCD. You may reject this resignation and play on but please note that the computer will only resign once per game. If either side’s time runs out, the LCD display will show flag and you may continue the game by entering your next move.

V. GENERAL FUNCTION KEYS

A. ON KEY (NG/FN/ON)

To turn the unit on, tap the NG/FN/ON square once briefly. The unit will power on and the LCD screen will be visible.

B. NEW GAME (NG/FN/ON)

The NEW GAME key (NG/FN/ON) will reset the board to the starting position if pressed for **more than 3 seconds**. Three beeps will sound, the LCD chessboard will be set up in the set up position and the LCD display will show: 1+Ø1 - - - - - Tap the NG/FN/ON square for more than 3 seconds every time you switch the computer on, or whenever you wish to commence a new game.

Note: The SOUND, BOOK SELECT, RANDOM, LEVEL function will remain the same. EASY and REFEREE are turned off.

C. FUNCTION KEY (NG/FN/ON)

The different functions can be accessed by tapping the NG/FN/ON key **briefly**. Each tap will change to a different function group (please see Function Group chapter above).

D. TAKE BACK (TB)

The TAKE BACK key is located right next to the NG/FN/ON key (TB). Wait until it is your turn to move. Tap the TAKE BACK key and the last move will be taken back automatically. When you reach the beginning of the current game the display will show begin. To exit make your next move or tap the GO/OFF key to recall a computer move.

Note: If you select COLOR or SET UP to alter the position of any of the pieces, all prior moves will be deleted and you may not TAKE BACK moves before the change of colour or position. If no moves are in the game history the LCD will show begin.

E. TRACE FORWARD (TF)

This key is located on the right hand side of the TAKE BACK key (indicated by TF on the bottom of the LCD screen) and is mainly used for tracing forward all moves after using the TAKE BACK function. If no moves are in the game history the LCD will show end.

F. CLEAR (CL)

If you start entering a move and wish to cancel it you may press this key to deactivate the initially chosen chess piece. You can also clear the LCD display by tapping “CL”, e.g. when in HINT mode.

G. HINT (Hint)

The computer will suggest a move for you (“HINT” on the bottom LCD). To accept the suggestion tap GO/OFF and the computer will move for you. You can also make a move of your choice at any time whilst HINT is displayed. In this case do not tap GO/OFF but just make your move. If you tap the HINT icon whilst the computer is calculating, the display will show the move the computer thinks is so far the best for itself up to 9 ply. The display will show hint # whereas “#” represents the depth of the move from 1-9.

H. COLOUR (C)

- The computer is generally programmed to play White first. If you wish to play Black (Black chess pieces on row 1 & 2), tap NG/FN/ON (for new game) → **C** (to change colour) → tap GO/OFF and the computer will make its move for White.
- During a game tap “C” and you will change the colour to move.

I. INFO FUNCTION (Info)

This key provides information on the current game as it progresses. To exit this function at any stage simply continue with your move and the computer will do the same.

- First tap on the INFO icon shows the clock of the side to move. For 1 second **total** and the colour icon of the side whose clock is being shown will be displayed. Then the display will automatically show the total elapsed time for that side.
- Second tap on the INFO icon shows the clock of the side **not** to move, **total** and the colour icon will be displayed followed by the **total** time elapsed for this side.
- Third tap on the INFO icon shows the score **score** for the current side to move. This gives you some idea of how the computer thinks you stand in the current position.
Example: Disadvantageous evaluations are marked with a “-” sign. For example if the computer sees you or it is going to be mated then the score could be [-n 03], whereas the “n03” stands for mate in 3.
- Fourth tap on the INFO icon will show the current move count for the side to move. For 1 second **count** and the colour will be displayed and then rotate to the number of halfmoves played so far.

Whilst the computer is calculating the rotating display shows the current status:

- The time spent on this search so far
- The next 3 ply the computer is anticipating so far.
- The computer’s evaluation of the position
- The current search depth
- The number of legal moves remaining to search and the total number of legal moves.

J. OFF KEY (GO/OFF)

To turn the unit OFF, tap the GO/OFF key **continuously for 3 seconds**.

K. GO KEY (GO/OFF)

The GO function is used in conjunction with many of the computer’s other functions and normally acts as an exit function. To access tap the GO/OFF key once briefly.

MAIN USES:

- To make the unit compute for the colour to move, even if in REFEREE mode.
- To exit from the SET UP / LEVEL mode.
- To start the SOLVE MATE search (set the level to Solve Mate Level Setting, set up the chess pieces, tap GO/OFF).
- To start the AUTOPLAY mode.
- To interrupt the computing time and force a computer move instantly. Please allow at least 5 seconds of search time before tapping the GO/OFF key in order to let the computer calculate a reasonable move. The evaluations of these moves do not correspond with the evaluation of the set-up level.
- To change sides during a game. Wait until it is your turn to move then tap GO/OFF once briefly. The computer will now compute a move for your colour, and you will play the other colour from now on.
- To let the computer play against itself. Every time you tap GO the computer calculates for the side to move. All moves will be computed according to the set playing levels.
- To accept a HINT. If the first Hint is shown on display, tapping GO accepts the Hint as though keyed in.

VI. FUNCTION GROUPS

The functions are collected in 5 different groups, which are listed below. The 5 different FUNCTION GROUPS are accessed by tapping the NG/FN/ON square briefly until the desired FUNCTION GROUP (“FG”) is displayed, whereas the first digit displayed represents the group number e.g. 11 = FG1, 21 = FG2, 31=FG3, etc.. The individual functions within each FUNCTION GROUP can be accessed by tapping the FUNCTION GROUP number itself, e.g. “11”. Once you have found the desired function, please tap on the function itself, e.g. the word “Level”.

Note: The multifunction key NG/FN/ON doubles as the NEW GAME (NG) key and the FUNCTION (FN) key depending on how long it is pressed for. One long tap (3 seconds) will start a new game and one short tap (1 second) will access the different function groups.

Example: To access the EASY function under GROUP 3 tap the NG/FN/ON square until you see **31 Ref**, then tap directly on the number “31” as many times as necessary until the LCD displays **35 Easy**. Now you can activate/ deactivate the EASY function by tapping on the word “Easy”. To exit the function tap on the GO/OFF key once briefly.

FUNCTION GROUPS TABLE

GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5
11 Level	21 Hash	31 Ref	41 Save	51 Intr
12 Setup	22 Sel	32 Sound	42 Load	52 Clock
13 Rate Gm	23 Pass	33 Norm BK	43 Pro Sv	53 Auto
	24 Act	34 Rand	44 Pro Del	54 Video
	25 Book	35 Easy	45 Pro Top	55 Print Gm
	26 Learn	36 ELamp	46 Pro Tx	56 Print Bd
	27 Extn			

GROUP 1 FUNCTIONS:

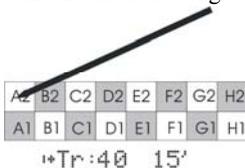
11 LEVEL SETTING (Level)

The chess computer has 8 different types of Levels and 64 unique time controls to suit every type of players. You may enter different playing levels for WHITE and BLACK. To set the unit to any of the 8 different types of levels tap the NG/FN/ON square briefly for as many times as necessary until you see **11 Level** in the LCD display. Then tap the word “Level”. The different levels can be accessed via the LCD chessboard by tapping the individual fields:

- Square A1 – A8:** TR = Tournament Level,
Square B1 – B8: AV = Average Time Level,
Square C1 – C8: SD = Sudden Death Level,
Square D1 – D8: FD = Fixed Depth Level,
Square E1 – E8: AN = Analytical Level,
Square F1 – F8: NV = Novice Level,
Square G1 – G8: BG = Beginner Level,
Square H1 – H8: IN = Find Mate Level.

Please refer to the Level Chart below for the meaning of each of the 64 time controls.

Example: To set Tournament Level 2 (Tr 2), tap **NG/FN/ON** until **11 Level** is displayed. Then tap on the word “Level”. Now you are in the LEVEL SETTING mode. To enter the level Tr2, tap the field A2 and the following will be displayed:



To set this level for your game, please tap the GO/OFF square briefly to exit this mode.

Note: If you switch the computer off to continue your game at a later time or if you start a New Game, the previously set skill level will be retained. You can check or change the skill level during a game, when it is your turn to make a move. Changing level resets the clocks.

LEVEL CHART

Level	Square	Time Control	Level	Square	Time Control			
TR	1	a1	40 moves in	5 minutes	AN	1	e1	9 ply search
	2	a2	40 moves in	15 minutes		2	e2	10 ply search
	3	a3	40 moves in	30 minutes		3	e3	11 ply search
	4	a4	40 moves in	60 minutes		4	e4	12 ply search
	5	a5	40 moves in	90 minutes		5	e5	13 ply search
	6	a6	40 moves in	100 minutes		6	e6	14 ply search
	7	a7	40 moves in	2 hours		7	e7	15 ply search
	8	a8	40 moves in	2.5 hours		8	e8	Infinite search
1 ply search with limited capture search:								
AV	1	b1	2 seconds per move	NV	1	f1	1 ply + 2 captures	
	2	b2	5 seconds per move		2	f2	1 ply + 3 captures	
	3	b3	10 seconds per move		3	f3	1 ply + 4 captures	
	4	b4	15 seconds per move		4	f4	1 ply + 5 captures	
	5	b5	30 seconds per move		5	f5	1 ply + 6 captures	
	6	b6	1 minute per move		6	f6	1 ply + 7 captures	
	7	b7	2 minutes per move		7	f7	1 ply + 8 captures	
	8	b8	3 minutes per move		8	f8	1 ply + 9 captures	
SD	1	c1	game in	3 minutes	BG	1	g1	2 ply + 2 captures
	2	c2	game in	5 minutes		2	g2	2 ply + 3 captures
	3	c3	game in	10 minutes		3	g3	2 ply + 4 captures
	4	c4	game in	15 minutes		4	g4	2 ply + 5 captures
	5	c5	game in	30 minutes		5	g5	2 ply + 6 captures
	6	c6	game in	1 hour		6	g6	2 ply + 7 captures
	7	c7	game in	1.5 hours		7	g7	2 ply + 8 captures
	8	c8	game in	2 hours		8	g8	2 ply + 9 captures

Level	Square	Time Control	Level	Square	Time Control
FD	1	d1	IN	1	h1
	2	d2		2	h2
	3	d3		3	h3
	4	d4		4	h4
	5	d5		5	h5
	6	d6		6	h6
	7	d7		7	h7
	8	d8		8	h8

DESCRIPTION OF LEVEL TIME CONTROLS:

Tournament Level TR 1 - TR 8

For tournament time controls. All moves are pre-set which have to be played within a fixed time, e.g. 40 moves in 120 min. (level 8 is the strongest). If you or the computer exceeds the specified time control, the game will be declared lost.

Average Time Level AV 1 - AV 8

These levels are to be used for casual play. They allow you to enter the average response time per move for the computer. The computer tends to play faster during opening and end games.

Sudden Death Level SD 1 - SD 8

For play to the finish. The computer has to finish its game within a given time. If you or the computer exceed the specified time control, the game will be declared lost (clocks count down to zero and LCD shows flag and 3 beeps to warn you if you overstep). If you wish you can continue to play and finish the game. On the LCD display the total time used will be shown and will count continuously.

Fixed Depth Level FD 1 - FD 8

The computer will only compute up to the depth selected. This provides a means of limiting the computer play to suit a wide range of opponent's abilities.

Analysis Level AN 1 - AN 8

These levels provide deeper searches for more difficult problems.

Novice Level NV 1 - NV 8

1 ply search with limited capture search. These levels provide a level of play even suitable for novice players.

Beginner Level BG 1 - BG 8

2 ply search with limited capture search. These levels provide a level of play for mediate beginner.

Note: All of the above levels can be modified by turning on the EASY mode. This keeps the computer from searching while you are thinking and weakens its play.

Find Mate Level mate-in-1 to mate-in-8 (“In: mate 1 ... 4”)

On Find Mate levels the computer will find the shortest mate up to the stipulated depth. The normal playing levels will generally find a checkmate in any given position faster, however, it is not guaranteed that the checkmate found is the *shortest* mate possible. Whilst the chess computer is searching it will show the main variations which it is presently considering and will rotate a variety of information on the LCD display:

- a) Time used up so far (e.g. **00:12:32**)
- b) 1st move of main line (e.g. **g5-g4**, display of the most anticipated move for Black)
- c) 2nd move of main line (e.g. **f3-h4**, display of the expected counter-move for White)
- d) 3rd move of main line (e.g. **d6-d5**, display of the anticipated counter-move for Black)
- e) Position evaluation = score from computer’s standpoint (e.g. **00.21**, +0.21 Pawns up)
- f) Depth of search (e.g. **d 06** means now searching 6 halfmoves)
- g) Moves not searched during current iteration (e.g.: **15/21**, means 15 moves out of 21 are not searched during the current iteration)
- h) If there is no solution you will see **[none]**

Independent Level Settings for Black and White

- a) Enter the Level Mode as described above.
- b) Once you are in the Level mode, change the colour from WHITE to BLACK by tapping the NG/FN/ON square. The colour icon is shown on the bottom row display:
[+] for WHITE and **[-]** for BLACK
- c) Tap GO to exit.

Note: Setting the level for WHITE will change the level for both BLACK & WHITE.
Setting the level for Black will change the BLACK level only.

12 SET UP FUNCTION (Setup)

This mode is designed to enable you to set up board positions to solve chess problems or to set handicaps by removing or entering a piece, as well as changing the positions of pieces. Here the computer’s legality check as to the movement of pieces is disabled and you can enter, remove or change positions of any piece, but you cannot set up an incorrect position, e.g. play without both Kings or with more than one King for each colour.....etc. The computer will not let you exit this mode if your SET UP includes an illegal position. The computer will accept and execute castlings, pawn promotion and en-passant captures if you play from a set up board position.

Note: All previous stated moves are cancelled as soon as you enter the SET UP mode.

A. REMOVING A PIECE / CLEARING THE ENTIRE BOARD

- To remove a piece, tap the chess piece you wish to remove once in SET UP mode.
- To clear the entire board of all pieces tap the NG/FN/ON square once briefly.
- To end this mode tap the GO/OFF key.

B. ENTERING OR MOVING A PIECE / SETTING UP A BOARD POSITION

You can set up a chess piece on an empty chess field by tapping on the desired chess piece symbol on the LCD display. The colour is indicated by **[●-]** for Black and **[-]** for White. To change colours re-tap the chess piece symbol. For example if you wish to place a Black Pawn on a field currently occupied by a White Knight, tap on the White Knight to

empty the field. Then tap on the Pawn symbol on the bottom of the LCD until you see the same symbol as shown below. Now tap on the empty chess field previously occupied by the White Knight and the Black Pawn will be automatically placed on this field.



Other option: If the same chess piece you wish to set up is already on the chessboard, simply tap this chess piece twice (once to delete it and once more to replace it) and then copy it to the desired field, by tapping this field.

Note: The computer memorises the last chess piece used for SET UP and will use this piece until you select a new chess piece. To end this mode, tap the GO/OFF key.

13 GAME RATING (Rate Gm)

You can rate your game according to the FIDE ELO rating system. Your starting position is 1400 ELO points and will be adjusted during your game. A game can only be rated when the chess computer has resigned or there must be a draw or mate condition, otherwise you will hear 3 beeps and the **error** sign will be displayed.

- **RATING:** Tap **13 Rate Gm** and the rating, e.g. **13 elo 1400 +-** will be displayed. Tap on **+-** at the end of the game to rate it.
- **To offer a draw:** tap on **13 elo 1400** as many times as necessary until you can see **elo 1400 =**. The chess computer will only consider a draw based upon your current rating and score. You can only claim a game as a draw position after 20 moves have been played. The LCD will show **error** if a draw is not accepted.
- **Resign a game:** tap on **13 elo 1400** as many times as necessary until **13 elo 1400 ♚** is displayed. Tap **♚** to ask the chess computer to rate this game as a losing game.
- **To reset RATING,** tap on **13 elo 1400** as many times as necessary until you can see **elo 1400 ↵**. Tap on the **↵** symbol and the rating will be reset to 1400 ELO points.
- **To exit the RATING function:** Tap the GO/OFF key

Note: To qualify for a game rating the chess computer must play one and only one side (black or white) and no moves to be taken back are allowed.

The rating system used here is similar to the US Chess Federation two-tiered formula.

The first tier is suitable for new players and enables rapid advancement:

Win: $((PELO \times G) + (OELO + 400)) \div (G + 1)$

Draw: $((PELO \times G) - (OELO + 0)) \div (G + 1)$

Loss: $((PELO \times G) + (OELO - 400)) \div (G + 1)$

New players only stay in this tier for the first 20 games then they move up to the second tier which will stop the dramatic changes and stand to settle down to the actual rating:

Win: $(PELO - ((OELO - PELO) \times .04) + 16)$

Draw: $(PELO - ((OELO - PELO) \times .04) + 0)$

Loss: $(PELO - ((OELO - PELO) \times .04) - 16)$

Note: “PELO”: stands for Players ELO.

“OELO”: stands for Opponents ELO and

“G”: stands for number of games played

GROUP 2 FUNCTIONS

21 HASH TABLES (Hash)

This technique allows the computer to search deeper into many positions, especially in the end game. The default mode is Hash which means Hash Tables on. You can turn this function OFF by tapping the word “Hash” itself until you see Hash . To exit the HASH TABLES function tap on the GO/OFF square once briefly.

22 SELECTIVE SEARCH (Sel)

Selective Search allows the computer to find combinations much faster than a Brute Force Search. Selective Search ON should play about 120 rating points stronger than having Selective Search OFF. The default mode is Sel which means Selective Search ON. To exit the SELECTIVE SEARCH function tap on the GO/OFF square once.

23 PASSIVE BOOK (Pass)

Turning on Passive Book 23 Pass will make the computer prefer to play certain opening book lines that are more passive in nature. To exit the PASSIVE BOOK function tap on the GO/OFF square once briefly.

24 ACTIVE BOOK (Act)

Turning the Active Book on 24 Act will make the computer prefer to play opening book lines which are more active in nature. Both Active and Passive Book may be on at the same time! To exit the ACTIVE BOOK function tap on the GO/OFF square briefly.

25 OPENING BOOK (Book)

Turning off the opening book 25 Book will disable both the normal built in opening book and the PRO-OP book. To exit tap on the GO/OFF square once briefly.

26 LEARN (Learn)

Turning Learn mode on 26 Learn will allow the computer to learn from some of its mistakes, which it will store in its memory. To delete this memory tap on the CLEAR (“CL”) key when the LEARN mode is activated. To exit tap on the GO/OFF square once briefly.

27 EXTENSIONS (Extn)

The chess program in your computer uses a number of intelligent heuristics to direct the search to look deeper into relevant positions and to try to resolve tactical skirmishes. Turning off this mode Extn will disable the Extension possibility. This makes the search faster in most positions but means the computer may miss some important tactical threat. To exit the EXTENSIONS function tap on the GO/OFF square once briefly.

GROUP 3 FUNCTIONS

31 REFEREE FUNCTION (Ref)

This is a toggle function which allows the user to play a game on the computer with the computer only checking the legality of the moves and declaring DRAW, CHECK MATE,

and STALE MATE. All games played can be stored in one of the 64 game slots (see STORE GAME) or could be entered for processing to a PC (see INTERFACE). The LCD display will show **31 Ref x** where REFEREE is off and **31 Ref ✓** when REFEREE is on. The REFEREE mode may be selected at any time during a game except while the unit is computing.

Note: Following functions will work whilst in REFEREE mode: TAKE BACK / HINT / SET / SOUND / GO/OFF. To exit the REFEREE function tap on the GO/OFF key.

32 SOUND FUNCTION (Sound)

To turn the sound off tap on the word “Sound” and you will see **32 Sound x**. To turn the sound on again, re-tap the word “Sound”. To exit tap on the GO/OFF key briefly.

33 BOOK SELECT FUNCTION (Norm BK)

This mode is used to tell the computer whether you wish to use the *normal built in opening book* or if you wish to use *your own programmable opening book*:

- The default mode is **Norm BK** which means the computer will only look into its *normal built in opening book*.
- The second option shown as **Prog BK** on the LCD means the computer will only search *your own programmable opening book*.
- The third option allows the computer to use both. Selecting option **Nor-Pro** makes the computer search the *normal built in opening book* first for its next move and only if it **does not** find a solution it will search the user programmable opening book. Selecting **Pro-Nor** reverses the computer’s search.

To leave this function please tap on GO/OFF once briefly.

34 RANDOM FUNCTION (Rand)

Every time you switch the computer on, the move with the highest rating is automatically chosen based on the depth of search which is determined by the level.

This is always the case after the opening is finished. However, this may not always provide the desired

variety. There are 4 options with RANDOM. The default is **Rand 0** which means little randomness and will generally make the computer play its very best. The next options designated as **Rand 1**, **Rand 2** and **Rand 3** make the computer vary its play more and more. To change the RANDOM level, please tap on the word “Rand”. Each tap will change to the next higher level and when the highest level **Rand 3** is reached it will go back to **Rand 0**. To exit the RANDOM function tap on the GO/OFF square once briefly.

35 EASY FUNCTION (Easy)

The computer always uses the opponent’s time to compute its best response. To disable this advantage please activate the EASY function **Easy ✓**. In order to turn it ON or OFF just tap the word “Easy” itself. Each tap will change it from ON to OFF and vice versa. To exit the EASY function tap on the GO/OFF square once briefly.

Note: This feature is automatically disabled when you start a new game by pressing the NG/FN/ON square for more than 3 seconds.

36 BACKLIGHT FUNCTION (ELamp)

To turn the backlight ON or OFF tap the word “ELamp”. Please note that the battery consumption will be higher with the EL light on. To exit tap GO/OFF.

GROUP 4 FUNCTIONS

Note: Functions marked “*” only apply when the chess computer is connected to a PC.

41 SAVE GAME FUNCTION (Save)

This function saves up to 64 games (from A1, A2, A3, to H8) to the computer’s memory or erases a game from its memory.

To save a game enter the SAVE GAME function and you will see

41 Save xx

 on the LCD, whereas “xx” represents an empty square, for example

41 Save b1

 and the square “B1” stands for the first empty square available. The cycle continues from A1 to H8. The user may enter any square of his choice by tapping the A1-H8 fields and then the word “save” again. Tap GO/OFF to exit.

To erase a game from the memory enter the SAVE GAME mode, then enter the square location you wish to erase and press the NG/FN/ON key. Tap GO/OFF to exit.

EXAMPLE: To erase a game from location A5, enter the SAVE GAME mode, tap A5, then tap NG/FN/ON. Tap GO/OFF to exit.

Note: The SAVE GAME function only works when the game starts from a New Game position. You cannot save a game if you are in Set Up mode.

42 LOAD GAME FUNCTION (Load)

To load a game enter the LOAD GAME function. The LCD will show

Load xx

, whereby “xx” represents a saved game location. Supposing square A1 is empty and B1 is occupied (i.e. has a saved game), the LCD will show

Load b1

 representing square B1 as the first saved game location. The cycle continues viewing all locations containing a saved game. You may enter any location of your choice by using the A1-H8 fields. Tap the chessboard field that contains the game you would like to load and the computer immediately starts playing the game. If the game is not finished you may input your next move right away. To load the game currently displayed on the LCD from the memory tap “Load” during the cycle. To terminate the LOAD GAME function tap the GO/OFF square once briefly during the cycle.

Note: LOAD GAME only works from a New Game position. You cannot load a game if you are in Set Up mode. To view a stored game use the TAKE FORWARD or TAKE BACK function. All clock information is saved or restored during the SAVE/LOAD GAME function.

43 PRO SAVE FUNCTION (Pro Sv)

This function saves any opening lines to the user programmable opening book at the lowest priority which means each new entry will be stored at the end of the already entered opening books.

- Switch on the REFEREE mode

Ref ✓

 and exit it by tapping the GO/OFF square
- Enter your opening moves.

- Enter the PRO SAVE function **43 Pro Sv**
- Tap **Pro Sv**

Note: No Set Up positions or colour to move changes are allowed before a PRO-OP SAVE entry. The currently played game history is saved in the user programmable opening book.

44 PRO DELETE FUNCTION (Pro Del)

This function deletes one or all opening lines from the user programmable opening book. To delete opening moves proceed as follows:

- Switch on the REFEREE mode **Ref ✓** and exit it by tapping the GO/OFF square
- Enter the complete opening line you wish to delete.
- Enter the PRO DELETE function **44 Pro Del**
- Now tap “Pro Del” twice. Tapping **Pro Del** for the first time will show **del** on the display. Tap **del** again and you will see the opening line you wish to delete for reconfirmation. Tap this opening line again for confirmation.

Note: If you have stored several PRO-OP Books containing e2-e4 opening lines you may delete ALL of these opening lines starting with e2-e4 by entering “e2-e4” as your opening line you wish to delete as described above.

45 PRO PRIOR FUNCTION (Pro Top)

This function allows the user to save the user programmable opening book at the highest priority, which means each new entry will be placed in front of all stored opening books.

- Switch on the REFEREE mode **Ref ✓** and exit it by tapping the GO/OFF square
- Enter your opening moves.
- Open the PRO PRIOR function **45 Pro Top**
- Tap “Pro Top”

Note: No Set Up position or colour to move changes are allowed prior to PRO-OP PRIORITY entry.

46 PRO PRINT FUNCTION * (Pro Tx)

This function prints the user programmable opening book via the serial interface to a PC. Open the PRO PRINT function **46 Pro Tx**. When the chess computer is not connected to a PC “error” will show on the LCD and 3 beeps will sound.

Note: PRO PRINT only works from a New Game position and at least one programmable opening book move must have been saved via PRO SAVE or PRO PRIORITY function.

GROUP 5 FUNCTIONS

Note: Functions marked “*” only apply when the chess computer is connected to a PC.

51 PRINT MOVES * (Intr)

When PRINT MOVES is turned on **Intr ✓** your chess computer will send all moves to the PC in real time. To exit this mode tap on the GO/OFF key.

52 AUTO CLOCK * (Clock)

When AUTO CLOCK is on: Clock, the computer will send the clock times of both players to the interface. To exit this mode tap GO/OFF.

53 AUTOPLAY (Auto)

This function allows the computer to play against itself. There are two options, either the computer will play up to the conclusion of the game = Auto 1, or the computer will play against itself continuously until you stop it = Auto 2. With each tap on the word "Auto" you can change the setting from Auto 0 (= AUTOPLAY off) to Auto 1 to Auto 2. If either Auto 1 or Auto 2 mode is selected, tap the GO/OFF square once briefly and the computer will begin to play against itself from the current position and at the preset level. Tapping the GO/OFF square or the NG/FN/ON square will exit the AUTOPLAY mode.

Note: Tapping any function key during the AUTOPLAY mode will stop the repeat cycle.

54 VIDEO MODE * (Video)

By setting this function on human mode, the information sent to the PC will be in a format more readable for the player. When video is displayed, the information sent to the PC is in a format readable for the interface system.

55 PRINT GAME * - (Print Gm)

Entering this function will send the current game to the PC. To exit tap on GO/OFF.

56 PRINT BOARD * - (Print Bd)

Entering this function will send the current position to the interface. To exit tap on GO/OFF.

VII. EXAMPLES & EXPLANATIONS

The following are examples of the most important displays of the NOVAG chess computer.

+01 i -----	The computer is ready and it is your first move or the move for White ("01" for 1 st move and "+" for White).
+01 i e2---	Display after input of 1 st half move of White, indicating chess piece (here Pawn) and where you moved FROM.
+01 i e2-e4	Display after input of the destination square that you wish to play TO (from E2 to E4).
-01 i c7-c5	Display of the computer's first counter-move (Black ["-"] Pawn from C7 to C5).
-00:02:27	COMPUTING INFO-Display: Shows the total time used so far for Black, while the computer is computing.
- b8-c6	COMPUTING INFO-Display: The computer's counter move.
- c1-e3	COMPUTING INFO-Display: The chess computer expects this move after the previous b8 c6.
- c5-b4	COMPUTING INFO-Display: On c1 e3 this would be the computer's reply.

- 00.03	COMPUTING INFO-Display: Score for Black currently being computed.
- d 05	COMPUTING INFO-Display: Number of half moves the computer has searched so far.
- 39/43	COMPUTING INFO-Display: Out of 43 variations there are still 39 to compute.
+ total	INFO-Display: Shows that the total time for White is selected and will appear after 1 second.
+00:08:13	INFO-Display: Shows the total time used by White so far.
- total	INFO-Display: Shows that the total time for Black is selected and will appear after 1 second.
-00:09:14	INFO-Display: Shows the total time used so far for Black.
+ score	INFO-Display: The display for the scoring is selected and the score for White will appear after 1 second.
+ -00.05	INFO-Display: Position evaluation for White, and it is White to move.
+ count	INFO-Display: The display for the number of moves is selected and will appear after 1 second.
+12	INFO-Display: Shows the total number of moves made so far.
-02±c5xd4	The piece on square d4 gets captured by the Black Pawn in the second move from C5 to D4.
-25±h4×g3+	Black's Pawn move was from h4 and captures on the square g3 and announces check.
+ mate 1	The computer announces a mate-in-1, the game is lost for you.
mate	The announcement of a checkmate.
flag	Time out.
error	Any illegal move or input will be indicated by the ERROR message.
resign	The chess computer resigns the game.
dr stl	Shows the announcement for a draw, due to stalemate.
dr 3rd	Shows a draw with 3 time repetition of the position.
dr 50	Shows a draw according to the 50-move rule.
dr ins	Draw due to insufficient mating material (see F.I.D.E. rules).

	The computer asks into which piece your pawn will be promoted/underpromoted.
-12 a1	The chess computer promoted its pawn to a rook which moved to square a1.
begin	Shows that the game is set back to the beginning of the game by activating the TAKE BACK icon.
end	The last move of the game has been made, there are no other moves stored in the memory.
11 Level	The SET LEVEL function has been chosen. You will see the selected level when tapping "Level".
+Tr: 40 5'	Tournament level 1 has been selected and will be effective after tapping the GO/OFF key.
+Av: 2s/mv	Average Time playing level 1 has been selected and will be effective after tapping the GO/OFF key.
+SD: 15min	Sudden Death playing level 4 has been selected and will be effective after tapping the GO/OFF key. Clocks will count down to zero time.
+FD: 3 Ply	Fixed Time level 3 has been selected and will be effective after tapping the GO/OFF key.
+AN: 11 Ply	Analysis level 3 is selected and will be effective after tapping the GO/OFF key.
+Nv: 1P+2c	Novice playing level 1 is selected and the chess computer will play less strongly.
+B9: 2P+2c	Easy level 1 is selected and will be effective after tapping the GO/OFF key.
+In mate 4	A mate-in-4 is entered by using the SOLVE MATE Function.
12 Setup	In SET UP you may remove or add any chess piece to make up a new position. By tapping the NG/FN/GO key the chessboard will be cleared.
13 Rate Gm	To select the GAME RATING function.
13 elo 1400+-	Current rating of player (Tap "+-" a the end of the game).
13 elo 1400=	Offer to draw (rating after draw tap "=").
13 elo 1400 P	Resign a game (rating of losing game tap " P").
13 elo 1400+	Reset ELO points to 1400 (tap "+").
21 Hash ✓	To select the Hash Table Generation function.
22 Sel ✓	To select the NOVAG chess computer selective search.
23 Pass ✓	Certain opening book lines which are more PASSIVE in nature have been selected.

24 Act ✓	Certain opening book lines which are more ACTIVE in nature have been selected.
25 Book ✓	The chess computer will consult the opening book.
26 Learn ✓	The learning mode is has been selected.
27 Extn ✓	The extensive search algorithm will be employed by the NOVAG chess computer.
31 Ref ✓	The REFEREE-Function is activated by tapping the REFREE icon.
32 Sound ✓	The SOUND is switched on.
33 Norm BK	The built in opening book is selected.
33 Pro BK	The user programmable opening book is selected.
33 Nor - Pro	Both books as above but the built in opening book will be looked at first.
33 Pro - Nor	Both books as above but the user programmable opening book will be looked at first.
34 Rand 0	The RANDOM Function is deactivated.
34 Rand 1	RANDOM level 1 is activated.
34 Rand 2	RANDOM level 2 is activated.
34 Rand 3	RANDOM level 3 is activated.
35 Easy ✓	The EASY Mode is activated.
36 ELAMP ✓	The backlight is turned on.
41 Save	This function saves a game to the NOVAG chess computer's memory or erases a game from its memory.
42 Load	This function loads a game stored in the chess computer's memory.
43 Pro Sv	To save opening lines at the lowest priority to the user programmable opening book.
44 ProDel	This function deletes one or all opening lines from the user programmable opening book.
45 ProTop	To save the user programmable opening book at the highest priority.
46 ProTx	This function transfers the user programmable opening book via the serial interface to a PC.
51 Intr ✓	Moves will be sent to the PC as they are played on the chess computer.
52 Clock ✗	The AUTLOCK function has been turned off.

53 Auto 1	The AUTOPLAY function 1 is on and the chess computer will play 1 game against itself.
53 Auto 2	The AUTOPLAY function 2 is on and the chess computer will play against itself continuously.
54 Human	The HUMAN interface mode has been selected.
54 Video	The VIDEO interface mode has been selected.
55 PrintGm	This function will send the current game to the PC.
56 PrintBd	This function will send the current position to the PC.

VIII. TROUBLE SHOOTING

All NOVAG computers are extensively tested before leaving the factory to ensure trouble free performance. However, if you encounter any problems during play, please check the following list first before calling your dealer or sending it in for repair or contacting us at our website: <http://www.novag.com>.

1. The computer does not work and the LCD is blank:
 - Check if your batteries have sufficient charge, always use heavy duty or alkaline batteries for reliable performance.
 - Check if the adaptor plug sits properly in the socket, as tight as possible with minimal movement. If this is loose it may interrupt the power supply to the unit.
2. The letters on the LCD display are faint and get dimmer as you use the NOVAG computer:
 - The batteries might be run down, please change them.
3. The computer locks up and will not respond to any icon tap: Please reset the computer by switching it off and removing the batteries or the adaptor. Then press the RESET button on the back on the unit below the back label. It can be accessed by using a pin like object. You may set it up again after a few seconds and continue using the computer normally.

IX. CARE OF THE NOVAG CHESS COMPUTER:

Dirt and dust can be removed with a soft slightly damp cloth (please remove all batteries or connections to the mains prior to cleaning the unit). Do NOT use any chemical solvents or other fluids or solvents on the unit or expose it to rain or moisture (it is not water proof!). Any damage caused by their use/ exposure invalidates the warranty. Always keep the chess computer in a dry and cool place (normal room temperature). Avoid exposing the computer to heat, e.g. spot lights, radiators, sunshine, etc. as this may lead to permanent damage caused by overheating which is not covered by the warranty. Be careful not to scratch the LCD screen and only use the supplied Pen, or specially designed pens for touch screens.

Also be reminded that the LCD screen is made of glass and therefore the chess computer should not be dropped, exposed to any impact, or sat on as the glass may break! Breakage or scratching of the LCD screen is not covered by the limited warranty.

X. TECHNICAL DATA AND FEATURES

Microprocessor	RISC processor
Program Size	512K Byte ROM, 256K Byte RAM
Hash -Table Size	118K Byte
System Clock Speed	25 MHz
Power Consumption	1.3 W Max., 150mA Max.
Battery	4 x 1.5V, UM-4 or size “AAA” (alkaline batteries)
LCD Display and Information LCD	Yes
Playing Levels	64
To Make a Move	Tap icons on LCD screen
Showing Move	LCD
Opening Book Size (ply)	>> 123,000
Maximum Opening Book Depth	60 ply
Programmable Opening Moves	3,000 ply
Game and Opening Memory	Yes
Games can be saved	up to 64 games or approx. 10,000 ply
Take Back Move	up to 400 ply
Set Up / Verify Function	Yes
Solves Mate	most mate - in - 8
Mate Announcement	up to mate - in - 14
Depth of Search	28 ply
Shows Depth (in ply)	Yes
Strategy of Endgame	Yes
Special Learning Function	Learning up to 140 position.
Random Generator	Yes
Restore Function	Yes
Replay of Game	Yes
Autoplay	Yes
Shows Score and can Resign	Yes
Portable unit	17 x 88 x 129 mm

PERFECT TECHNOLOGY LTD reserves the right to make technical changes without notice.

ADDITIONAL INFORMATION REGARDING WARRANTY:

For details regarding the warranty of this product and how to obtain warranty service please refer to the enclosed Warranty Card. In addition, Perfect Technology Ltd. or the Distributors of Novag branded products shall not be liable under the product's warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by Customer's or any third person's misuse, neglect, improper installation or testing, unauthorised attempts to repair or modify, or any other cause beyond the range of the intended use, or by accident, fire, lightning, or other hazards or acts of God. The product's warranty does not cover physical damage to the surface of the product, including cracks or scratches on the LCD touch screen. The product's warranty does not apply when the malfunction results from the use of this product in conjunction with accessories, other products, or ancillary or peripheral equipment and Perfect Technology Ltd. or the Distributors of Novag branded products determine that there is no fault with the product itself. **LIMITATION OF LIABILITY.** To the full extent allowed by law Perfect Technology Ltd. also excludes for itself and its suppliers any liability, whether based in contract or tort (including negligence), for incidental, consequential, indirect, special, or punitive damages of any kind, or for loss of revenue or profits, loss of business, loss of information or data, or other financial loss arising out of or in connection with the sale, installation, maintenance, use, performance, failure, or interruption of this product, even if Perfect Technology Ltd. or the Distributors of Novag branded products have been advised of the possibility of such damages, and limits its liability to replacement or repair of the product or part at the option of Perfect Technology Ltd. or the Distributors of Novag branded products. This disclaimer of liability for damages will not be affected if any remedy provided herein shall fail of its essential purpose. **GOVERNING LAW:** The product's limited warranty shall be governed by the laws of the Hong Kong Special Administrative Region unless otherwise specified.

XI. RULES OF CHESS

I. GENERAL MOVES

1. The two players must alternate in making one move at a time. The player with the white pieces moves first to start the game.
2. With the exception of castling (section II.1.), a move is the transfer of a piece from one square to another square which is either vacant or occupied by an enemy piece.
3. No piece, except the Rook when castling and the Knight (section II.5) may cross a square occupied by another piece.
4. A piece moved to a square occupied by an enemy piece captures it as part of the same move. The captured piece must be immediately removed from the chessboard by the player making the capture.
5. When one player moves a piece into a position whereby he can attack the King, the King is in "Check" (announced by the CHECK LED and on the LCD display) and must either:
 - a) move the King,
 - b) block the path of the attacking piece with another piece,
 - c) or attack the attacking piece.
6. The game is over when there is no escape for the King from an attacking piece. This is known as "Checkmate" (the CHECK and MATE LED and on the LCD display).

II. INDIVIDUAL MOVES

1. KING

Except when castling, the King can move only one space to any adjoining square (including diagonally) which cannot be attacked by an enemy piece.

Castling is a move of both the King and either Rook which counts as a single move (of the King) and is executed as follows:

- a) The King is moved from its original square two squares toward either Rook on the same rank, and
- b) The Rook is moved to the opposite side of the King.

Castling cannot occur if:

- a) the King has already been moved.
- b) the Rook has already been moved.
- c) the King's original square or the square which the King must cross or the one which it is to occupy is attacked by an enemy piece.
- d) there is any piece between the King and the Rook.

2. QUEEN

The Queen can move to any square along the same rank, file or diagonal on which it stands (except as limited by Article I.3).

3. ROOK

The Rook can move to any square along the same rank or file on which it stands (except as limited by Article I.3).

4. BISHOP

The Bishop can move to any square along the same diagonal on which it stands (except as limited by Article I.3).

5. KNIGHT

The Knight's move is in the shape of an "L", moving two squares horizontally vertically, and then one square at 90° angle from the first move. These two moves can be reversed (one square and then two) if desired.

6. PAWN

The Pawn can move either one or two squares forward on its original move, and then one square forward at any time afterward. When capturing, it advances one square diagonally (forward). When a Pawn reaches the last rank, it must be immediately exchanged for a Queen, Rook, Bishop, or a Knight of the same colour as the Pawn, at the player's choice and without taking into account the other pieces still remaining on the chessboard. This exchange is called a "promotion".

En Passant: A Pawn can attack a square crossed by an enemy Pawn which has been advanced two squares in one move from its original square as though the latter had been moved only one square. This capture may be made only on the move immediately following such an advance and is called capturing "en passant". (When your computer makes an en passant capture it will display the icon "ep".)

III. HINTS & TIPS

Get a feel for the values of different pieces, which will be useful when making decisions on captures and exchanges. In general, try to capture the more valuable pieces. Some important principles:

- Castle your King into safety as soon as possible.
- If you control the centre squares, this will give you the advantage. To do this, move your centre pawns and develop your Bishops and Knights early in the game.
- Take advantage of capture situations, particularly if you will gain material.
- Concentrate – don't be caught off guard by your opponent!

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