Pewatronic
Exklusive Schachcomputer

CHESS COMPUTER
Grandmaster 40/ 50
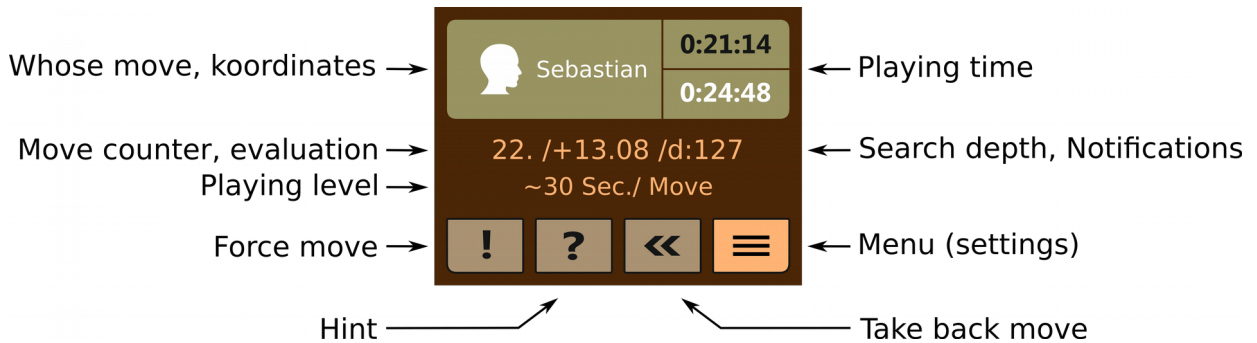# Software v1.6.1

Operating Manual

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1. Start-up operations

First plug the delivered power adaptor (5V, 2A) into a wall socket. Then connect the plug to your chess computer, the power connection is in the handle on the right hand side. The machine will boot up. To start after shutdown press the Start/Reset button also placed in this handle, for approx. 1 secound. This button pressed in a running status results in a reset of the device.

2. Main display

The main display shows various information of the game-in-play and allows to control the relevant functions. A hint can take a while according to the settings in 'Game options'. Force it by „!".

Whose move, koordinates → | Sebastian | 0:21:14 / 0:24:48 | ← Playing time

Move counter, evaluation → 22. /+13.08 /d:127 ← Search depth, Notifications
Playing level → ~30 Sec./ Move

Force move → [!] [?] [«] [≡] ← Menu (settings)

Hint ——————— Take back move

3. New game / How to play

Once the basic setting is recognized, a new game will start. Please take care to place the chessmen centered on its squares to be recognized correctly.

Captures can be done at will. No matter which piece one lifts first. Each field contains a light to illuminate the moves. Pleasant sounds attend the game in any situation. Castling is fully indicated including rook. „En passant" indicates also the captured pawn. The 'take back moves' indicates also captured pieces to be reset to the board. Take back is even possible after check mate.

4. Basic functions

A saved game may be continued straight after booting. If the chessmen are removed, their previous postition is shown in the position view. Now the chessmen can be placed as shown in the display. If, during a game, 3 or more chessmen should topple over, the position view will also be shown automaticly to fix up the correct position. The relevant squares are displayed in red.

Position view:

To check the positions at any time, a tap to the upper side of the main display shows the position view.

5. Control menu ☰
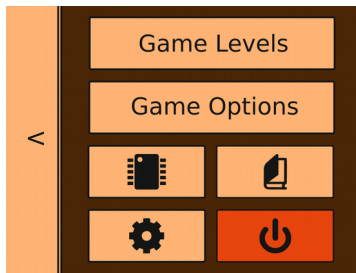
All settings will be done in the menu, while the game is paused.
The button "<" leads back a level.

Note: Some displays are scrollable.

5.1 Game levels

Tournament / Blitz: Select your play time and number of moves for Tournament, with 2nd time control (adds the same playtime and number of moves).

Select Blitz by setting the number of moves to „--". The engine calculates internally with 60 moves.

Playtime (3 to 180 min., time goes backwards)
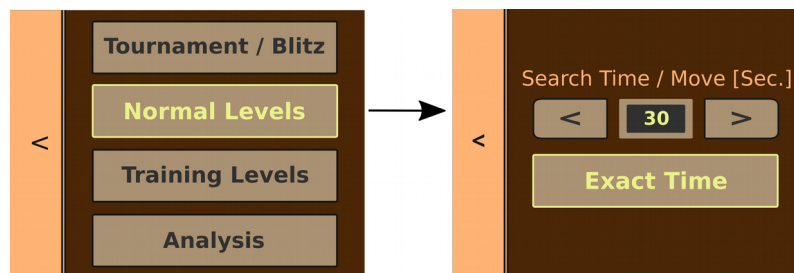Number of moves (--, 25 to 50)
Extra time per move 'White' (+1 to +30 sec.)
Extra time per move 'Black' (+1 to +30 sec.)

Normal levels: Average search time per move (0.2 to 900 sec.)
Exact time: The computer calculates exact the time set.

Training levels: Search depth (ply 1 to 64)

Analysis: The computer calculates the position without any time limit and always with 100% performance. The book is deactivated and the computer won't make a move in this mode. The position evaluation is shown in centi pawns referred to 'White'. A tab into the middle of the main display opens a seperate window with detailed information:
- evaluation (score) referred to 'White', in centi pawns. (For example: **+1.73** = White in advantage; **m3** = Black is mate in 3 moves; **m-5** = White is mate in 5 moves)
- search depth (depth) in half moves,
- nodes (n),
- nodes per second (nps),
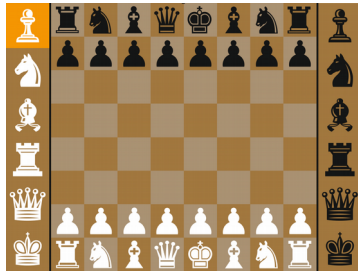- principal variation

5.2 Game Options

Player mode:
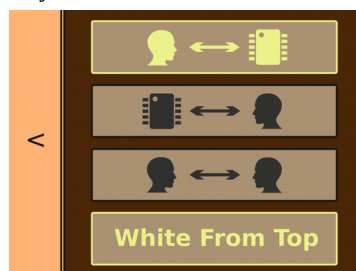
> Normal ('Grandmaster' plays from top)

> Changeover ('Grandmaster' plays from below)

> Human / human ('Grandmaster' acts as referee)

> Option (White from top)

Position Mode:

Make your own setup in this mode. Move chessmen individually to a new position. Or start with an empty board by choosing a pieces on the left and right hand side of the display, and placing it on the board. See the actual position setup on the display at will.

The currently shown piece on the orange square shows also the colour of the next move. A tap to the display saves the current position and leads back to the main display.

5.3 Engines (chess programs)

Find here a selection of engines. > For details see appendix: 10.1 Engines (chess programs)

The performance of an engine is determined by the following parameters you easily setup here by tapping an engine:

Skill level: The higher the level, the stronger the engine plays.

Contempt: Positive values results in an optimistic game. Negative values rather lead to 'Remis'.

Hashtable: The computer stores played positions in 'Hashtable'. The bigger its memory the faster the engine can play its move, especially in end games.

Ponder: The function 'Ponder' allowes the engine to calculate while the opponent is thinking, if activated.

5.4 Opening libraries

If an opening library (book) is selected, the chess computer can play its move much faster than by calculating. A book symbol is shown in the main display when the computer plays from the book.
> for details see appendix: 10.2 Opening libraries

5.5 System

Engine info: The evaluation, search depth and the currently calculated move are additionally shown in the main display, if activated. A tab into the middle of the main display opens a seperate window with detailed information:
   - evaluation (score) referred to 'White', in centi pawns. (For example: **+1.73** = White in advantage; **m3** = Black is mate in 3 moves; **m-5** = White is mate in 5 moves)
   - search depth (depth) in half moves,
   - nodes (n),
   - nodes per second (nps),
   - principal variation

Software: The current software version is shown in the display.
   - Update:
     It starts the search for the latest update. Follow the instructions on the display. The update is complete after rebooting automaticly. Do not unplug the device while this procedure. The update process takes only a few minutes.
     Update list: www.pewatronic.com/en-1/software/

   - Network:
     Available WIFI networks will be displayed as gray buttons and their names (SSID). Choose yours and connect with your network code and 'Enter'. A reboot is needed by 'Yes'. The code will be saved for coming updates. And the button of an active network will be highlighted.

Audio: Sounds for moves, hints and faults can be individually adjusted. The volume has 3 levels.

👤 Player name: Your entered name (9 letters max.) will be displayed when it's your move.

🌐 Language: German, English, Spanish, French, Italian, Dutch

5.6 Shutdown ⏻

A tap to 'Shutdown' saves all current data. After a few seconds the device turns off and the display becomes dark. Do not unplug the power adaptor or a power bank before the display is turned dark. This may result in loss of data.

6. Care and maintenance

Your chess computer is a precision electronic device, and should not be subjected to rough handling or exposed to extreme temperatures or moisture. Do not use chemical agents or liquids to clean the unit, as they may damage the surface. We recommend the use of a microfibre cloth.

7. Troubleshooting

- Due to static charge the display may show malfunction.
  Solution: Shot down your *Grandmaster* (if possible) and unplug the device from the power adapter. Then press the button for approx. 1 second and wait for about 10 minutes. After that connect the device again to the power supply to reboot. Now your chess computer should work properly again.

- The boot up procedure doesn't reach the main display nor position view.
  Solution: Build up the basic setting and remove all 4 rooks. Reboot your chess computer after that. This resets the device to factory settings except network and player's name.

8. Warnings

The chess pieces contain magnets. They could damage TVs and laptops, computer hard drives, credit and ATM cards, data storage media, mechanical watches, hearing aids and speakers. Keep magnets away from devices and objects that could be damaged by strong magnetic fields.

Use a center positive adaptor with safety isolating transformer. The polarity symbols confirming its center positivity should be clearly marked on the adaptor. The adaptor or powerbank should be regulary examed for potential hazards such as damage to the plug, cable or cord, casing or other parts. In the event of damage, the adaptor or powerbank should not be used.

PEWATRONIC disclaims any liability for damage caused by the use of wrong or damaged power adaptors or power banks.

Specifications subject to change without notice.

9. Technical specifications

Display:	TFT Display 2.8", colour pixel 16 Bit, 320x240
Input:	Display touch sensitive,
	Magnetic sensors (chessmen)
Indication:	optical: 64 board LEDs,
	acoustic: wav-sounds played by integrated speaker
Hardware:	ARM8 (BCM2837) 64Bit, 1200MHz (GM-40 till ser. no. 0069 = 900MHz),
	1 GB RAM, 32 GB flash-memory, WLAN,
Operating System:	Arch Linux
Power Consumption:	~2.5 Watts
Size Model **40 /50**:	450 x 450 x 39 mm, Field size: **40**mm / 520 x 520 x 39mm, Field size: **50**mm
Weight Model 40 /50:	3.5 kg / 4.6 kg (incl. chessmen)
AC-DC Adaptor	5V ⎓ 2A
or Power bank:	+ ─⊙─ –

10. Appendix

10.1 Engines (chess programs)

Stockfish 10:	Advanced players to strongest computer opponents. Best for analysis. Options: Skill level (0-20), Contempt (25, -100, 100), Hashtable (1-128MB), Ponder. ELO: ~**3350**, by Tord Romstad (Norway).
Texel 1.07:	A strong engine with a wide range of skill levels, that offers even novices a good chance to win. Options: Skill level (0-40), Hashtable (1-128MB), Ponder. ELO: ~**3000**, by Peter Österlund (Sweden).
DanaSah 6.5:	A unique chess programm, where one can achieve victory not least by skillful sacrifice of pieces. Options: Skill level (600-2450 Elo), Hashtable (1-128MB). ELO: ~**2450**, Pedro Castro (Spain).
CT800 v1.34:	For novices to experts. A well-liked chess partner with a unique play style. Options: Skill level (1000-2250 Elo), Contempt (30, -300, 300), Hashtable (1-128MB), Internal book. ELO: ~**2250**, by Rasmus Althoff (Germany).
MadChess 2.0:	Ideal for casual players up to the master. Options: Skill level (1-8), Hashtable (1-128MB). ELO: ~**2150**, by Erik Madsen (USA).
Cinnamon 2.2a:	This engine is especially fun for strong club players and experts. Option: Hashtable (1-128MB) ELO: ~**1950**, Giuseppe Cannella (Italy).
Claudia 0.5.1:	For intermediate club players. A demanding opponent with a remarkable human playing style. Options: Hashtable (1-128MB), Ponder. ELO: ~**1800**, by Antonio Garro (Spain).

10.2 Opening libraries

No Book':	If 'No Book' is selected, every move will be calculated by the engine.
Stockfish:	This strong opening library was made by the same-named engine, 5.8MB.
Human:	A bigger library with openings played by human grandmasters. Best for tournaments, 19.2MB.
Open:	Open played openings, 0.3MB.
Semiopen:	Semi-open played openings, 0.7MB.
Closed:	closed played openings, 0.4MB.
Indian:	'Indian' openings, 0.3MB.
Flank:	Flank played openings, 0.3MB.

Age recommendation: from 15 jears on
Warranty period is 2 years from date of purchase.