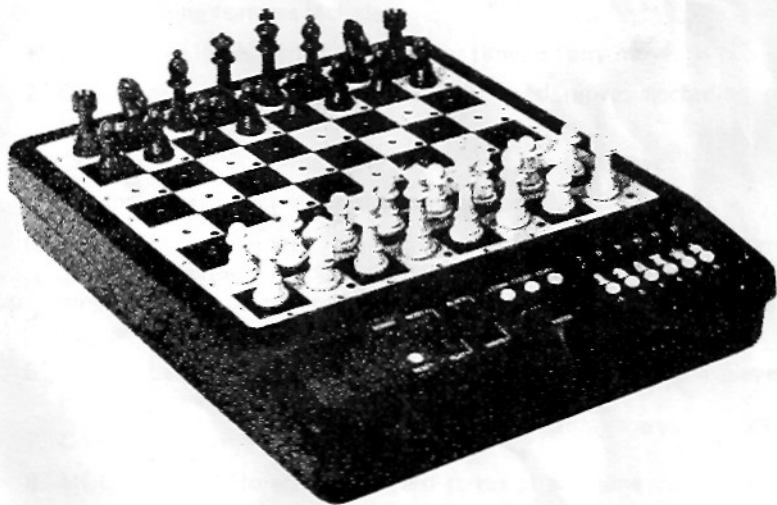


COMPUTER CHESS

MODEL: CC 1



INSTRUCTION MANUAL

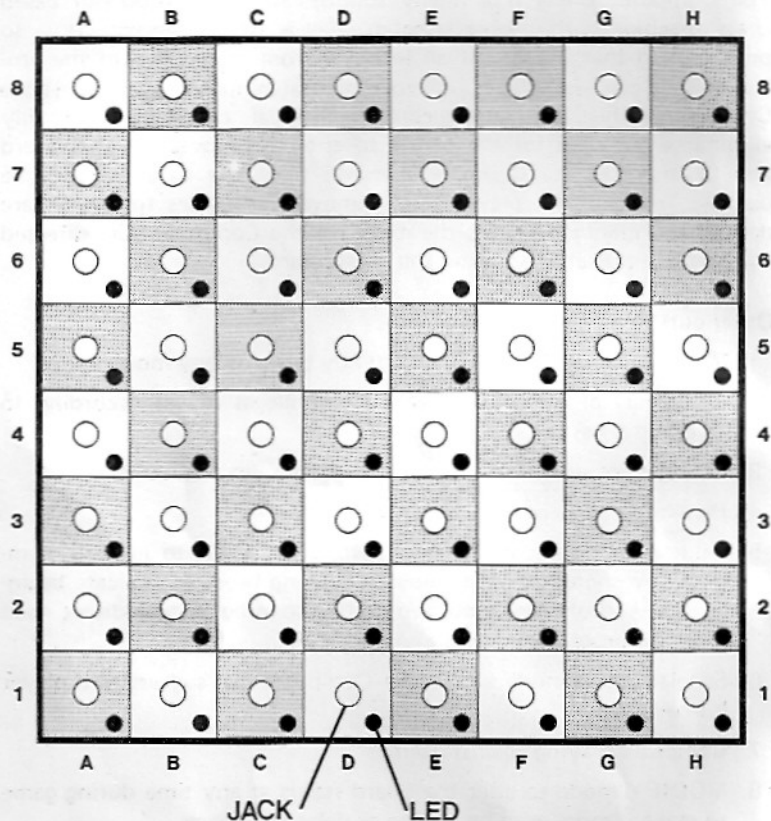
I. INTRODUCTION

The Computer Chess is a highly sophisticated microprocessor based chess machine with twelve selectable levels of intelligence. It is so programmed that players of all levels — from the novice to the professional — can learn from, improve or match their skills against the Computer. The full size electro-mechanical chess board totally eliminates the need for the player to enter his moves via a keyboard and to interpret the Computer's moves from the data shown on a display. Instead, the player simply moves his pieces to the square desired and manually makes the move for the Computer as so directed by the LED indicator lamps on the chess board.

Other outstanding features include:

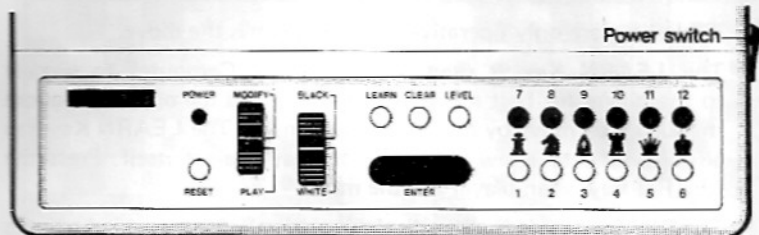
1. Changing of levels during game at any time, on any move.
2. Checking for and the prevention of illegal moves according to standard chess rules.
3. Changing of sides during game at any time, on any move.
4. Playing of new game or from given positions.
5. Audio feedback consisting of two short beeps to indicate computer's response to each move; two long beeps to indicate beginning or end of game; and two double tone beeps to indicate need of board programming.
6. Special Learn mode which the Computer can suggest to a player his best move.
7. Computer playing against itself.
8. MODIFY mode to alter the board status at any time during game to make it more even by adding or deleting a piece.
9. Special moves —
 Queening
 En Passant
 Castling
10. A built-in timer which will generate an audio signal to indicate that the player's thinking time is up.

II. THE CHESS BOARD



Each square (location) has a jack for inserting the piece and a red LED (Light Emitting Diode) which will light up to TRACE the moves.

III. CONTROLS AND THEIR FUNCTIONS



1. RESET KEY

RESET Key is used to:

- A. start a new game with the MODE SELECT Switch set at the PLAY position or
- B. program given positions with the MODE SELECT Switch set at MODIFY position (refer to paragraph 3 "MODE SELECT Switch").

The following will happen when RESET Key is pressed:

- A. At PLAY position for a new game, the LED on every occupied square will light up and Computer will generate two long beeps to signify readiness to start play. Game CANNOT be started with the MODE SELECT Switch set at MODIFY position.
- B. At MODIFY position (for setting up a given position), the LED on every square, occupied or unoccupied, will light up and Computer will generate two long beeps to signify readiness for board programming (refer to MODIFY ROUTINE).

NOTE: If the RESET Key is pushed accidentally in the midst of a game at PLAY position, the LED on every occupied square will flash and Computer will generate a siren sound to indicate that its memory has been cleared. The board status immediately before clearing can be restored via the MODIFY ROUTINE by pulling out and reinserting every piece on the board.

The RESET Key automatically sets the Skill LEVEL at 1.

2. LEARN, CLEAR and LEVEL Keys

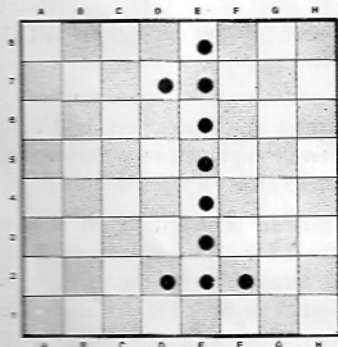
These keys are only operative when player has the move.

The **LEARN** Key is used to request the Computer to suggest to the player his best move. Player always has the option to ignore the suggested move by making his own move. The LEARN Key can also be used to allow Computer to play against itself. Press the LEARN Key when player has the move.

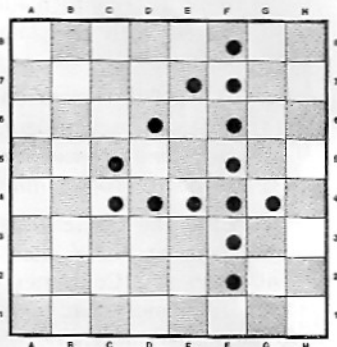
The **CLEAR** Key is used to display positions of unoccupied squares and to delete unwanted pieces from the board. This key is operative only in MODIFY mode (See VERIFY ROUTINE).

The **LEVEL** Key is used to change the skill level. When it is pressed, the Computer will display the previously selected level on the board. Press the desired level number key and the new level number will be displayed. If no level change is required, the player must press the same level number key again to resume play.

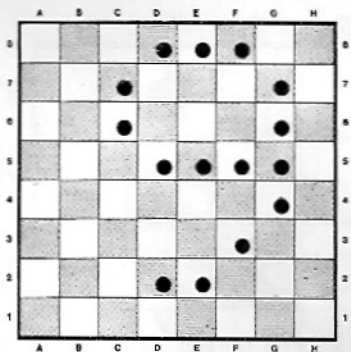
A unique display technique is employed to show the level number by making use of the LEDs on the board as shown in the following example:



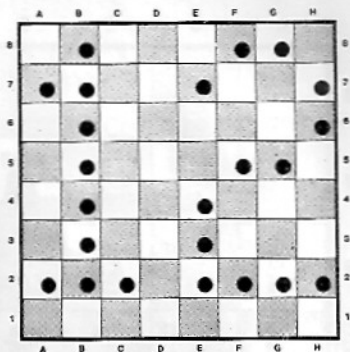
Level 1



Level 4



Level 9

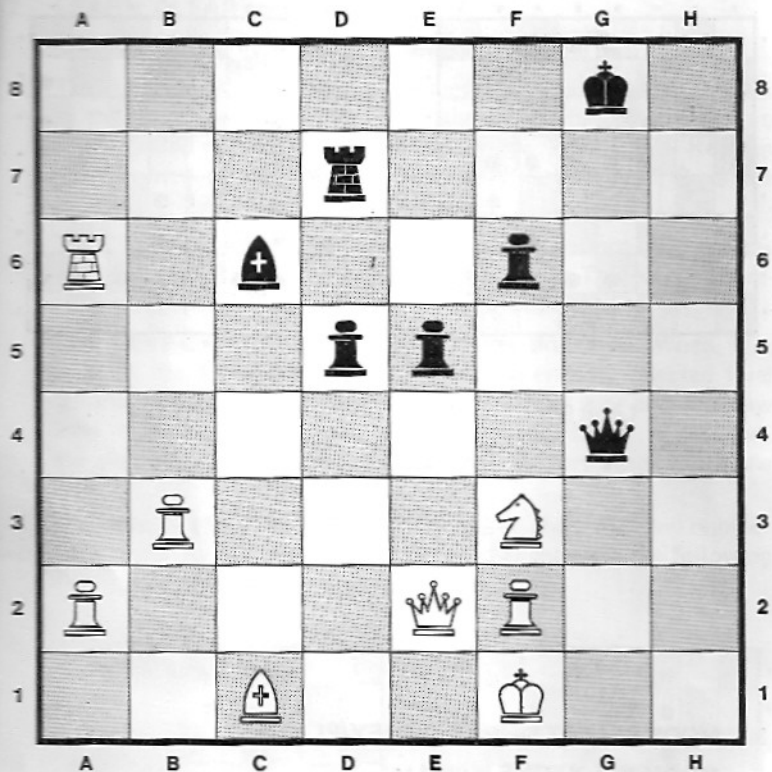


Level 12

3. MODE SELECT Switch (MODIFY/PLAY)

MODIFY ROUTINE is used to:

- set up a given position on the chess board,
- make changes on the board, and
- verify the board status in the midst of a game.



The following example shows the procedures for setting up a given position shown by the diagram above.

1. Start with a cleared chess board.
2. Set MODE SELECT Switch at MODIFY position.
3. Press RESET — [REDACTED] Computer will generate two long beeps.
4. Press Black Pawn (No. 7) key — [REDACTED]
Now insert Black Pawns into D5, E5, F6 — the LEDs on these squares will light up as the pieces are inserted.
5. Press Black Bishop (No. 9) key — the LEDs on the Black Pawn positions will go off. Now insert a Black Bishop into C6 — C6 LED will light up.
6. Press Black Rook (No. 10) key and insert a Black Rook into D7.
7. Press Black Queen (No. 11) key and insert a Black Queen into G4.
8. Press Black King (No. 12) key and insert a Black King into G8.
9. Continue with the White side in the same manner.
10. Return MODE SELECT Switch to PLAY position.

MODIFY ROUTINE is now completed.

VERIFY ROUTINE

In the course of programming, the player may inadvertently press the wrong keys while pieces are placed at the desired squares. Accordingly, a VERIFY ROUTINE has been designed to ensure correct programming. The player simply has to press each piece key in turn and check if the LED on the corresponding pieces will light up.

Assuming that the Black Rook (D7) key in the previous example (refer to MODIFY ROUTINE) was programmed as a White Rook by mistake (i.e. key No. 4 was pressed instead of key No. 10), the LED on position D7 will light up when key No. 4 is pressed but will remain unlit when key No. 10 is pressed. This mistake may be corrected by the VERIFY ROUTINE as follows:

1. Set MODE SELECT Switch to MODIFY position.
2. Press CLEAR Key – ALL LEDs on unoccupied squares will light up.
3. Remove Black Rook from D7. The D7 LED will light up together with all other LEDs on unoccupied squares.
4. Press Black Rook (No. 10) key – all LEDs will go off except those on the square(s) occupied by Black Rook. In this case, there is none.
5. Re-insert Black Rook into D7. The D7 LED will now light up.
6. Return MODE SELECT Switch to PLAY position.

VERIFY ROUTINE is now completed.

4. COLOR SELECT Switch (BLACK/WHITE)

BLACK – Player plays **BLACK**

WHITE – Player plays **WHITE**

It is possible to change color in the midst of a game if the player so desires by switching the **COLOR** Switch and pressing the **ENTER** Key. In this case, observe the following rules:

- A. Changing color during a game can only be made when no **LED** is on (i.e. when player has the move).
- B. It is always the Computer's turn to make the next move. Press **ENTER** Key to allow the Computer to move.

5. ENTER Key is used to enter the player's move or to terminate a side changing procedure.

6. PIECE/LEVELS Keys are dual function keys.

The key numbers indicate the skill levels to be selected during **LEVEL** select routine.

The chess piece symbols indicate the keys to be used during **MODIFY** or **VERIFY** routine.

7. POWER Switch is used to switch on/off power supply to the entire unit.

IV. HOW TO PLAY

1. Insert the AC adaptor output plug (supplied with unit) to the power jack located at the left rear panel of the unit.
2. Connect the AC adaptor input plug to an AC wall outlet.
3. Turn POWER Switch to ON position.
4. Select color (See COLOR SELECT Switch).
5. Select PLAY mode for new game or MODIFY mode for programming a given position.
6. Press RESET Key.
7. Proceed as follows for a new game (for programming a given position refer to MODIFY ROUTINE) — WHITE always makes the first move. Player's side must be the side close to the keyboard at the beginning of game.

If the player selects white, he makes his first move then presses ENTER Key.

If the player selects black, he simply presses the ENTER Key to allow Computer to make its first move.

V. MAKING A MOVE

1. Player's Move

- A. Remove the selected piece from the chess board.
- B. Insert it to the new location. Both LEDs on the old and new locations will light up.
- C. Press ENTER Key. Both LEDs will go off to indicate that the Computer has accepted the move.

2. Player capturing Computer's piece

- A. Remove the capturing piece from the chess board.
- B. Remove the captured piece from the chess board. (NB: Steps A and B CANNOT be reversed or Computer will treat it as error).
- C. Insert the capturing piece into the location of the captured piece. The LEDs on both pieces will light up.
- D. Press ENTER Key. Both LEDs will go off.

3. Computer's Move

- A. Press ENTER Key. Computer will generate two short beeps and 2 LEDs will light up, one indicating the selected piece to be moved and the other indicating to where it should be moved.
- B. Remove the selected piece.
- C. Insert it to the indicated square. If this square is occupied by the player's piece, remove it; the Computer has made a capture.

VI. TIMING

The Computer is programmed to warn the player that his thinking time is up. The time period is set according to the level selected and is equal to the time taken by Computer to make such a move. Player may ignore the warning beep.

The following table indicates the approximate time taken by the Computer to make a move at various levels.

LEVEL		AVERAGE RESPONSE TIME
1 2	Beginners	30 seconds
3 4	Intermediate	40 seconds
5 6	Experienced	1 minute
7 8	Advanced	9 minutes
9 10	Semi-professional	12 minutes
11 12	Professional	15 minutes

The thinking time taken by the Computer varies according to the complexity of the game status. It is directly proportional to the number of possible moves of every piece on the chess board. The Computer may take longer time when a check condition occurs or when one of its pieces is in danger of being captured. On the other hand, its response may be faster if an obvious move exists.

The Computer has a memory capacity to handle 6,250,000 possible moves. It is extremely rare that the number of possible moves in a given board position may exceed the Computer's memory capacity. If such condition occurs, the Computer will automatically terminate its thinking and reset the game.

VII. ILLEGAL MOVES

The Computer is programmed to detect illegal moves. Once an illegal move is made, the Computer will flash the 2 LEDs where the move is made and will not allow game to continue until the move is rectified by reinserting the illegally moved piece to its original location and a legal move is made.

LED flashing may also happen when poor contacts between the chess piece and the chess board jack are made. In such case, repeat the move.

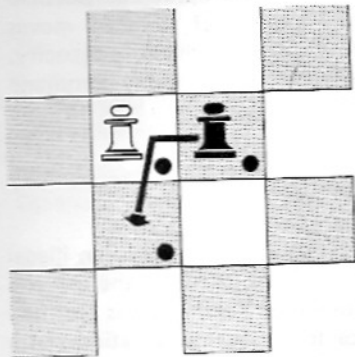
VIII. SPECIAL MOVES

1. **Queening** —

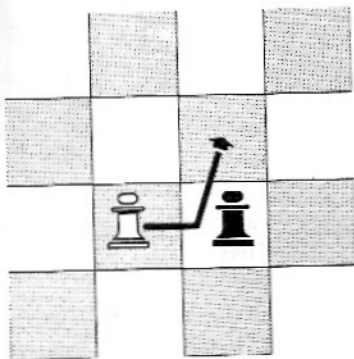
The Computer will automatically promote pawns to queens when they reach the eighth rank. Therefore, remember to identify these pieces correctly.

Player has the option to promote the pawns to any piece other than QUEEN by using the MODIFY ROUTINE.

2. En Passant Capture



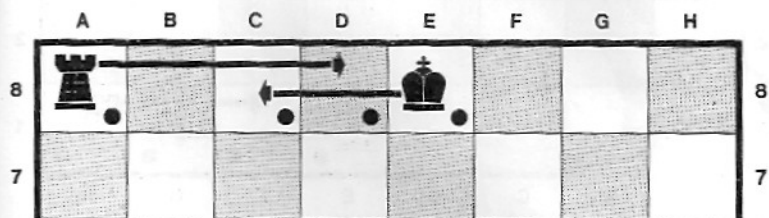
Computer's Move
All 3 LEDs will turn on



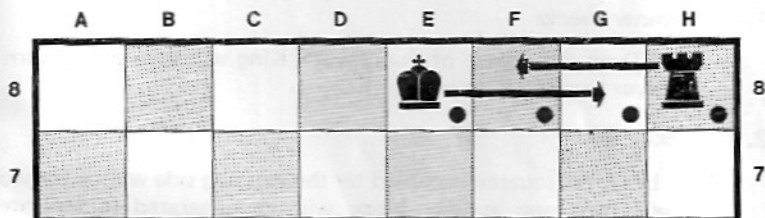
Player's Move

3. Castling

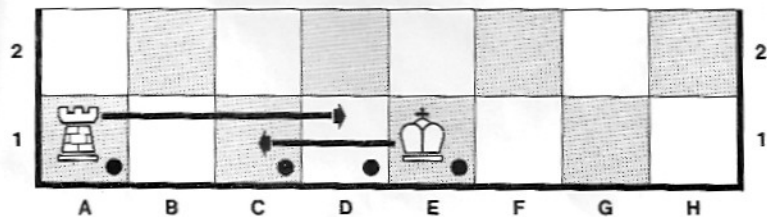
Computer playing BLACK: Queen's side



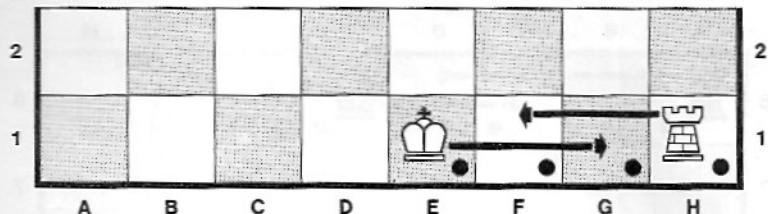
King's side



Computer playing WHITE: Queen's side



King's side



IX. STATUS INDICATIONS

1. Computer checks

The LED on the square of the player's King will turn on to warn the player that the King is in CHECK

2. Checkmate

ALL LEDs on squares occupied by the winning side will be turned on and two long audible beeps will be generated to indicate victory.

3. Stalemate

ALL LEDs on squares occupied by both sides will be turned on.