

NOVAG<sup>®</sup>

CONSTITUTION 3.6 mhz  
INSTRUCTIONS



## NOVAG® CONSTELLATION

### GENERAL HINTS

Playing with the NOVAG® CONSTELLATION is far simpler compared to other chess computers. However, we recommend reading the GENERAL HINTS before starting to play. The detailed instructions are laid out in such a way that each section is self-contained, so you do not have to read everything at once.

If you encounter any problems with your computer, refer to the Trouble Shooting List for advice.

### Batteries

The NOVAG® CONSTELLATION runs on six 1,5V C-type alkaline or heavy duty batteries (not included). Note: Do not use ordinary batteries as they will result in irregular performance!

To insert the batteries, open the BATTERY DOOR on the bottom of the unit and place the batteries as indicated by the +/— signs. A set of new alkaline batteries runs approx. 20 hours (continuous operation).

### Battery-Low-Indicator

If the batteries are down to approx. 20% of their original capacity, the flashing of the LED-lights will become markedly slower. The batteries should be changed soon, otherwise the computer's operation will become irregular.

### Adaptor

The adaptor for the CONSTELLATION has the Art. No. 8220 and is separately available. Before using the adaptor check that the voltage of your electric output is within the range specified on the adaptor label. The adaptor socket is located at the back panel of your computer. Please note that you must only use the adaptor specified for your computer. The use of another adaptor automatically invalidates the warranty.

### Beginning to Play

Before commencing play set up the chess pieces that are enclosed with your set in the opening position (white pieces on rows 1 and 2, black pieces on rows 7 and 8).

The power switch is a 3-position switch and located at the back panel. It is marked ADTR/OFF/BATT. Switch it to:

- ADTR: if you play with the adaptor
- BATT: if you play on batteries
- OFF: to switch any power supply off.

## 1. Making a Move

Your NOVAG® CONSTELLATION has a SENSOR-chessboard which registers your moves automatically. Moves to be executed for the computer are indicated by the 2×8 row and column LEDs (light emitting diodes), working on the principle of coordinates. Each square of the chess board can be called-out by 1 row and 1 column LED, indicating the coordinates of that square.

To start, press NEW GAME and you automatically play white (for CHANGE COLOUR see Para. 15). The White-LED flashes indicating that it is your move. Gently press down the piece you want to move and the 2 respective row and column LEDs come up. Then set the piece on the square you wish to move to and press it down again. The Black-LED comes on, indicating that the computer has registered your move and started to compute its counter-move.

When it has found it you will hear 2 beeps and the 2 row and column LEDs indicate the 'from' square of the piece the computer wants you to move. Press it gently and pick it up. Now the row and column LEDs of the 'to' square come on and you set this piece on that square, pressing it gently again. Thus the computer's move is executed. The White-LED will flash now indicating that it is your move again.

Each pressing on a square is accompanied by a beep unless the sound is switched off.

## 2. Capturing a Piece

If the computer indicates a move onto a square that is occupied by an opponent's piece, it means that this piece is captured and must be removed from the board. Simply take it off without applying pressure. Likewise the computer will capture any of your pieces.

## 3. Impossible and Illegal Moves

The NOVAG® CONSTELLATION is programmed in accordance with all international chess rules and does not accept nor make illegal moves. Corrections of illegal moves or mistakes in executing computer moves are very simple.

If you try to make an illegal move, you hear 3 beeps. Further the row and column LEDs of the illegally occupied square, the ERROR and Colour-LED is flashing at fast intervals. To correct this, reverse this move by pressing the piece gently on both squares. You can now make another, legal move.

If you try to move the wrong piece when executing a computer move, the row and column LEDs of the correct square of piece to move as well as the ERROR and Colour-LED will flash at fast intervals. To correct this, move the piece indicated.

If, by mistake, you move a computer piece not to the square indicated by the computer, the row and column LEDs of the correct square, the ERROR and Colour-LED will flash at fast intervals. Simply set the piece on the indicated square and the mistake is corrected.

If you encounter difficulties in reconstructing your wrong move and fail to solve them as described above, press TAKE BACK (Para. 14) to take back your last move. You can now call off a computer move by pressing GO or else enter your next move.

#### **4. Castling**

According to the rules, during a castling first move the King and then the Rook. Both pieces are moved by pressing them down gently like in any other move.

If you take back a castling make sure to also reposition the rook as the computer will indicate. The computer accepts and executes castlings in set-up board positions (see Para. 17.B).

#### **5. En Passant**

If you or the computer make an en-passant capture, do not forget to remove the captured pawn. You or respectively the computer can capture en passant in set up board positions (see Para. 17.B).

#### **6. Pawn Promotion/Underpromotion**

If one of your pawns reaches the opposite side of the board, the CONSTELLATION allows you to promote or underpromote it to any desired piece.

As soon as you set your pawn on the 'to' square in the promotion move, the row and column LEDs of the square, the 4 Piece Symbol LEDs to which you can promote to (Queen, Bishop, Knight, Rook), and the Colour LED lights up. You can now choose the piece you want to promote/underpromote to by pressing the respective Piece Symbol Key. The LEDs will disappear and the computer will start computing its counter-move.

If a computer pawn reaches the opposite side of the board, the computer indicates to you into which piece the pawn will be promoted/underpromoted. As soon as you press the 'from' square of the pawn, the respective Piece Symbol LED lights up and will disappear when you move on to the 'to' square. If you did not pay attention, you can always check in VERIFY Mode, which piece is on that square.

The computer also executes/accepts pawn promotions in set-up board positions (see Para. 17.B).

#### **7. Stalemate/Draw**

A stalemate is announced by flashing the MATE and DRAW-LEDs. A draw is indicated by flashing the DRAW LED. The computer can recognize the different draw conditions.

#### **8. Check and Check Mate**

Check announcements will be made via the CHECK-LED. The king must be moved out of check immediately.

In a checkmate situation the CHECK and MATE-LEDs will come on together with the LED of the winning colour.

## 9. NEW GAME Key

Pressing NEW GAME will start a new game. The previous game is cancelled and in the computer's memory all pieces are now in the opening position.

Press NEW GAME every time you switch the computer on, or during or at the end of a game, whenever you want to commence a new game.

## 10. SET LEVEL Key — Setting the Skill Level

The NOVAG® CONSTELLATION has 8 levels of skill. Level 1 is the easiest and level 8 the strongest. The higher the skill level, the deeper the computer will search for the best move and thus play a better game.

### NEW:

To give you fast play, the computer will make 40 moves in only 2 hours on the highest playing level, which is an average of 3 minutes per move.

The sophisticated programme of the CONSTELLATION also uses the time you think about your next move, analysing positions, even taking your possible next moves into account.

The skill levels are shown by the 8 row LEDs, when pressing LEVEL. Every time you switch the computer on, it is automatically set to level 1. If you want to increase the level, press LEVEL and it will jump to level 2 etc. Once the desired level is displayed, press GO to enter it into the computer.

You can also check or change the skill level during a game, however not while the computer is computing. Press LEVEL and the row LEDs display the level the computer is presently set to. Every time you press LEVEL increases the level by 1. When you have reached level 8 you press LEVEL again to go back to level 1. Once you have set the desired level, press GO to enter it into the computer.

If you start a new game (without switching the computer off), the previously set skill level will be retained.

The computing process of the computer can be interrupted at any time. To call off a move, simply press GO. However, the computer will only give you the best move found up to that moment.

Below an indication of the average reply times on the different levels. On the levels marked TOURNAMENT, the computer will not exceed the stated time limit for the number of moves. However, it will average the time, using more for complex moves and less for simple ones.

### Level

1	0-5 secs.	BLITZ TOURNAMENT (60 moves in 5 minutes)
2	2-10 secs.	BLITZ TOURNAMENT (40 moves in 5 minutes)
3	30 secs.	
4	1 min.	
5	3 mins.	
6	1-5 mins.	TOURNAMENT (40 moves in 90 minutes)
7	1-10 mins.	TOURNAMENT (40 moves in 120 minutes)
8	INFINITE,	until you press GO

### NEW:

Level 8 is an analytic level to give the computer more time to find the best move in complex situations. It operates with an infinite search time and will only display a counter move while still in the opening book or if it has found a mate.

During the time of analysis you may find it interesting to see from time to time which move the computer is analysing right now by pressing SHOW MOVES (see Para. 13). On level 8 the computer can be analysing a position for hours or days. If you want to terminate the analysis and call off a move, press GO.

### **11. BEST MOVE/RANDOM Key**

Computer programmes are designed to compute and compare possible moves. Typically the move with the highest rating is chosen, based on the depth of the search which is determined by the skill level (deeper search on higher skill levels). However, this may not always provide the desired variety.

Every time you switch the computer on, BEST MOVE is automatically activated, meaning the computer will choose as its reply the move with the highest rating. The randomisation of openings however, is not affected by BEST MOVE.

If you press RANDOM (2 beeps) you activate RANDOM. The computer will now choose a move at random out of several ones with high ratings. If you press BEST MOVE again (1 beep), you disable RANDOM and activate BEST MOVE again.

### **12. MULTI MOVE/PLAYER vs PLAYER Key**

In MULTI MOVE/PLAYER vs PLAYER Mode you disable the computing of moves by the CONSTELLATION so you may make moves for white and black, while the computer still checks their legality. This feature may be used to enter particular book openings or to allow 2 human players to play on the board.

You can go into MULTI MOVE Mode at the beginning or during a game before you make your (next) move. Just press MULTI MOVE (2 beeps). Apart from being able to enter moves for both sides, the following features are also operational: Take Back, Change Colour (at the beginning of a game), Hint, Set Up, Verify and Sound.

You can terminate this mode at any time by pressing MULTI MOVE again (1 beep). The LED of the colour to move next will flash. Depending which colour you wish to play, either make a move or call off a computer move for the colour displayed, by pressing GO.

### 13. HINT/SHOW MOVES Key

#### Move Suggestions

#### Watching the Computer's Analysis of Moves

#### HINT:

The computer can suggest moves, if you are not sure how to continue your game. You may also call off all moves legally possible in your present position, which is a great tutoring feature. The computer will rate the moves, first showing the ones that have the highest rating, according to the brief computing time granted.

Now press HINT, when it is your turn to move, and the computer will show the first suggested move by flashing the row and column LEDs of the 'from' square; pressing HINT a second time, will flash the row and column LEDs of the 'to' square. Note, that the flashing for the 'to' position is faster than the flashing for the 'from' position.

The computer will display another move, every time you press HINT twice until you have scanned through all moves legally possible, after which it repeats the process.

You can accept any suggested move as soon as the row and column LEDs of the 'to' square light up. Move the piece as indicated by the computer. If you do not wish to accept any of the suggested moves, just make the move of your choice.

#### SHOW MOVES:

In longer computing times it may be interesting for you to see which move the computer is presently analysing. Pressing SHOW MOVES gives you the following information:

- 1st press = 'from' square LEDs light up
- 2nd press = 'to' square LEDs light up
- 3rd press = cancels Show Move function

You can repeat this process as often as you wish and will notice how the moves change. Note, that SHOW MOVES cannot be used in a Mate Search (see Para. 18).

#### 14. TAKE BACK Key

The NOVAG® CONSTELLATION allows you to take back up to 30 moves (15 for each side) to enable you to rectify an earlier mistake or to play a different strategy. These moves are however cancelled once you go into SET UP Mode (Para. 17.B).

Wait until you have executed the computer's move and proceed as follows: press TAKE BACK and the row and column LEDs will show the computer's last move in reverse, e.g. first the 'to' square and then the 'from' square. Execute this move just as any ordinary one, i.e. applying pressure on both squares.

Every time you press TAKE BACK the computer will reverse the next move. If a captured piece has to be replaced, the row and column LEDs will indicate the square and the Piece Symbol LED points out the piece to be replaced. Place the piece on that square by applying gentle pressure.

#### 15. CHANGE COLOUR Key

The computer is generally set to play black and you white. If you play black, disregard the notations along the chess board.

If you want to play black in a new game, set up the black pieces on row 1 and 2 and the white ones on row 7 and 8. Press NEW GAME, CHANGE COLOUR, and GO. The computer will make its opening move for white from the top of the board, while you have your black pieces in front of you.

To change the colour during a game you use the GO Key (see Para. 16).

After you have set up board positions (see Para. 17.B) you can choose the colour to move first via the CHANGE COLOUR Key. As soon as the LED of the requested colour flashes you can either enter a move or call off a computer move. The position of pieces does not have to be changed under these circumstances.

#### 16. GO Key

The GO Key is used to enter a command or to terminate a Special Function. Its function is explained in the respective paragraphs.

The GO Key is also used to interrupt the computing time and call-off a computer move instantly (see Para. 10).

Furthermore it can be used to change colours during a game. Wait until it is your turn to move, then press GO. The computer will now compute a move for your colour, while you play its previous colour. The position of the pieces do not have to be changed under these circumstances.

It may also be of special interest at a certain point during a game, or for learning purposes, to let the computer play against itself. Every time you press GO the computer computes a move for white or black alternately. All moves will be computed according to the skill level set.

## 17. VERIFY/SET-UP Key

The VERIFY/SET-UP Key is a dual function key. If pressed once you enter the VERIFY Mode and the VERIFY LED comes on. If you press it again you are in the SET-UP Mode, indicated by the SET-UP LED. To exit from VERIFY or SET-UP mode, press GO.

Note that you can only press VERIFY/SET-UP after the computer has stopped computing and you have executed its move.

### 17.A VERIFY MODE Verifying a Position

At any point in a game or after entering a board position you can check the position of any number of pieces. You can also check each square to see if it is occupied and by which piece.

- Method:
1. Press VERIFY/SET-UP once, so that the VERIFY-LED comes on.
  2. You can change the colour of the piece(s) to be verified with the CHANGE COLOUR Key which is indicated by the Black/White-LEDs.
  3. Choose the piece(s) to be verified via the Piece Symbol Key(s) one after the other OR
  4. Press a square. The computer will flash the White or Black LED and a Piece Symbol LED to indicate the piece and colour occupying the square. If the square should be empty, the ERROR, VERIFY and White or Black LEDs flash rapidly.
  5. To end this mode, press GO. You can now enter your next move.

When you press a Piece Symbol Key, the row and column LEDs of the square of the first piece of this kind light up. Pressing the Symbol Key repeatedly will scan through all pieces of this type. The squares they occupy are indicated by the row and column LEDs.

If, for example, there is only one rook left in the game and you press the Symbol Key twice, the row and column LEDs of the first rook come up again.

If there is no piece left of one type, you will hear an acoustic signal and ERROR will light up. You simply continue to verify the position of the next piece and the ERROR LED will automatically disappear.

### 17.B. SET-UP Mode

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.

You can clear the entire board by simply pressing CLEAR BOARD, so that you can easily create your desired board position and subsequently enter it into the computer.

**NEW:**

In SET-UP Mode the computer's legality check as to the movement of pieces is disabled and you can enter, remove or change positions of any piece. However, you cannot set up incorrect positions, e.g. without both kings, with more than 1 king for each colour, with pawns on row 1 or 8 or with the number of pieces exceeding the legal limits for each kind of piece (taking possible promotions/underpromotions into account).

If the position is incorrect in any way, the ERROR-LED comes on if you want to terminate the SET UP Mode and you are automatically put into VERIFY Mode, so you can determine the mistake.

The computer will accept and execute castlings, pawn promotions and en passant captures if you play from set up board positions. Note, that all stored 30 half moves are cancelled as soon as you go into SET UP Mode (see Para. 14).

### 17.B.1 Removing a Piece

If you wish to remove one or more pieces, proceed as follows:

- Method:
1. Press VERIFY/SET-Up twice, so that the SET-UP LED comes on.
  2. Remove the piece(s) one by one by applying gentle pressure. The row and column LEDs of each square will light up as you press on it.
  3. To end the procedure, press GO.
  4. You can change the colour to move via the CHANGE COLOUR Key. You can now enter your next move or call off a computer move.

### 17.B.2 Entering a Piece

Enter one or more pieces as follows:

- Method:
- 1st Piece:
1. Press VERIFY/SET-Up twice, so that the SET-UP LED comes on.
  2. You can change the colour of the piece(s) to be entered with the CHANGE COLOUR Key which is indicated by the Black/White-LEDs.
  3. Select the piece to be entered via the Piece Symbol Key, and the respective Piece Symbol LED will flash.
  4. Enter the piece by gently pressing it on the desired square and the respective row and column LEDs will come on.
- 2nd and subsequent pieces:
- Proceed as described above without pressing SET-UP again
  - Only press the Piece Symbol Key if it varies from the preceding piece.
  - Only change the colour of the piece if it varies from the preceding piece.
5. To end this mode, press GO.
  6. You can change the colour to move via the CHANGE COLOUR Key. You can now enter your next move or call off a computer move.

### 17.B.3 Moving the Piece to another Square

If you wish to change the position of one or more pieces whilst the game is in progress, proceed as follows:

- Method:
1. Press VERIFY/SET-Up twice, so that the SET-UP LED comes on.
  2. Move the piece(s) by proceeding as you would in a normal move.
  3. To end this mode, press GO.
  4. You can change the colour to move via the CHANGE COLOUR Key. You can now enter your next move or call off a computer move.

### 17.B.4 CLEAR BOARD Key Setting-Up a Board Position

If you want to clear the entire chess board to set-up a board position, proceed as follows. Before you switch the computer on, remove all pieces from the board and set up your position. Now enter this position as follows, after you have switched on the computer:

- Method:
1. Press VERIFY/SET-Up twice, so that the SET-UP LED comes on.
  2. Press CLEAR BOARD to cancel all pieces from the computer's memory.
  3. Now enter your position piece by piece into the computer as described in Para 17.B.2.
  4. To end this mode, press GO.
  5. You can change the colour to move via the CHANGE COLOUR Key. You can now enter your next move or call off a computer move.

If your board position does not vary too much from the opening position, it might be simpler to change the position of some pieces as described in Para. 17.B.3.

### 18. SOLVE MATE Key Chess Problems

The NOVAG® CONSTELLATION can solve chess problems as well as mate problems up to mate-in-8 even if those require castlings, en passant captures or pawn promotions/underpromotions. On the infinite analytic mate level (level 8), it can even solve up to mate-in-12.

Press NEW GAME and set-up the required board position as described in Para. 17.B Afterwards you can change the colour to move first via the CHANGE COLOUR Key. This is the colour for which the computer will execute its mate search.

The depth of the mate search is set with the SOLVE MATE Key and is indicated by the 8 row LEDs. The number of LEDs coming up correspond with the depth of the mate search, e.g. 3 LEDs for a mate-in-3 moves. Every pressing of SOLVE MATE increases the mate search by one move. When the correct move number is displayed, press GO to start the mate search.

If the computer finds a mate in at least the set number of moves, this is displayed by flashing the row and column LEDs of the key move. Execute the computer's key move and then enter your move and so on, until the computer mates you in the set number of moves or earlier.

If there is no solution, e.g. to a mate-in-3 the ERROR LED flashes. You may now check for a solution to that problem in 4 moves. Press SOLVE MATE, set it to 4 and press GO. This is particularly convenient, as with most other chess computers you would have to go through the trouble of setting-up the board position again.

**NEW:**

The CONSTELLATION's newly designed, super fast mate search is described by experts as a breakthrough in programming. It can solve problems in minutes or even seconds, where other computers need hours. The search times naturally vary and depend on the depth of the required search and the complexity of the problem.

If solving your very difficult mate problem takes longer, just leave the computer on and check from time to time if the response has come up yet. It is recommended in such cases to use the adaptor as compared to batteries.

Note: SHOW MOVES cannot be used in mate searches (see Para. 13)

### 19. SOUND Key

The different acoustic signals and beeps can be switched on and off with the SOUND Key. If you hear 2 beeps while pressing SOUND, it is activated, if you hear 1 beep, the sound is switched off.

### 20. ERROR LED

The ERROR LED generally flashes if you try to enter an illegal move or make a mistake in executing a computer move (see Para. 3). In VERIFY Mode it indicates if there is no piece left of one type (see Para.17.A), if you try to terminate SET UP Mode while the position is incorrect (see Para. 17.B) or if a mate search is negative (see Para. 18). The ERROR-LED will go off automatically as explained in the respective paragraphs.

If you try to go into any of the Special Functions while the CONSTELLATION is computing a move, the ERROR LED will start to flash. Wait until the computer comes up with its move and execute it for the computer. You can now go into any of the Special Functions.

## APPENDIX

### A. Care of the NOVAG® CONSTELLATION

Dirt or dust can be removed with a soft cloth. Do not use any chemical solvents or water on the set. Any damage caused by their use invalidates the warranty.

Always keep the 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.

### B. Trouble Shooting List

All computers are extensively tested before leaving the factory to ensure troublefree operation. If

you encounter any problems during play, please check the following trouble shooting list:

**1. Your computer does not work**

If your Computer does not work at all, the problem can be the power supply, the batteries or the adaptor.

- 1.A If you are playing on batteries, replace them with new ones. We only recommend the use of alkaline or heavy duty batteries. Do not use ordinary batteries as they will result in irregular performance! Make sure the batteries are inserted correctly according to the +/— signs.
- 1.B The on/off switch is marked 'Adaptor-Off-Battery'. To switch the computer on, either slide to 'Adaptor' or to 'Battery' respective of your power supply.
- 1.C If you are playing with an adaptor, check if you are using the specified NOVAG adaptor. Any damage caused by the use of another adaptor invalidates the warranty (see also GENERAL HINTS).
- 1.D Check if the adaptor plug sits properly in the socket. If not, this can result in interrupted power supply to the computer.
- 1.E Check if the small adapter plug is connected properly to the computer.
- 1.F Check if the voltage of your electric output is within the range specified on the adaptor label as recommended under GENERAL HINTS. A voltage fluctuation of more than 10% will create a non-function or malfunction.  
Some areas have greatly fluctuating power supplies, especially during peak consumption times (lunch and dinner times). Wait until the power supply has stabilized.
- 1.G Connect the adaptor to another power outlet in your house, as the outlet you are using could be defective.
- 1.H If none of the above remedies the situation, check if your computer plays on batteries. If yes, there is something wrong with your adaptor. Send it for service (no need to send the computer as well) or buy a new one.

**2. The blinking frequency of LEDs is slower**

Refer to GENERAL HINTS 'Battery-Low-Indicator'. Change the batteries. Do not use ordinary batteries as they will result in irregular performance.

**3. All LEDs light up when you switch on the Computer and it is blocked.**

- 3.A Switch the computer slowly on and off several times.
- 3.B If you still cannot get the computer to work, check the power supply carefully (see Appendix 1).

3.C If 3.A and B. do not remedy the situation, turn the unit over and open the ROM DOOR. Tiny dust particles may have settled on the ROM connectors. They can usually be removed by taking out each ROM carefully and placing it again in its socket. Make sure that you do not bend the ROM legs and that both ROMs are sitting firmly in their sockets. Try if the computer works now. If not, repeat the procedure several times. If the computer still does not work, you have to send it in for service.

4. **One of the LEDs does not light up.**

Go in VERIFY and check all row and column LEDs by pressing on square A1-A8 and A1-H1. If the particular LED does not light up, you have to send your computer in for service.

5. **The Queen, Bishop, Knight, Rook and Colour LEDs light up.**

These LEDs light up in a pawn promotion (see Para. 6).

6. **One square does not register a move.**

Go in VERIFY and check the square. Depending whether it is occupied or not, you should get a positive or negative response. If you get any type of response the square is in working order and you tried to enter something irregular. If, after several attempts, also in a new game, there is no response on that particular square, you have to send the computer in for service.

7. **Blocking of all Functions**

In case the computer does not accept any move or Special Function, check the power supply (see Appendix 1). If this is not the reason for the blockage the computer may be completely confused by conflicting commands. Switch it off and on again and you should be able to start a new game. Try Appendix 3 if the these recommendations do not help.

**C. Technical Data**

Operating Voltage:	9V DC 6×1.5 V C-cell batteries 8.5 V AC (through AC to AC adaptor)
Current Consumption:	800 mA max.
Read Only Memory:	16 KB, ROM
Random Access Memory:	2 KB RAM

All data subject to change without notice

**NOVAG®**

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