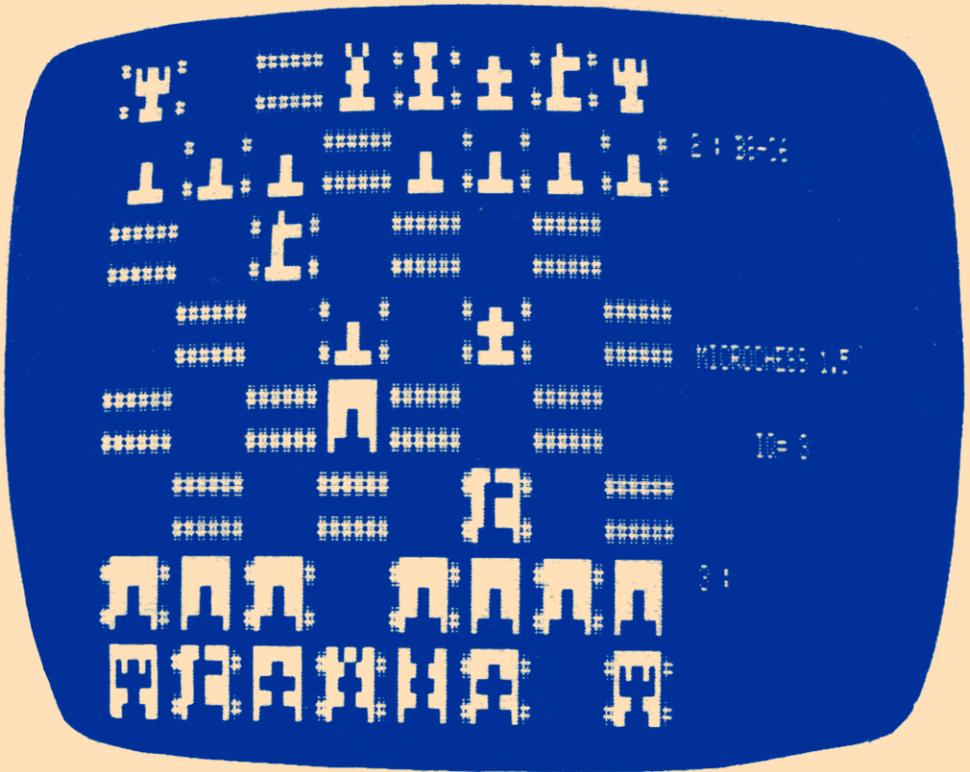


# MICROCHESS 1.5



A Chess Playing Program  
For the TRS-80 Level I and II  
4K RAM

Written by  
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# Introduction

Microchess was originally conceived as a program which would play a reasonably good game of chess using a minimum of computer hardware. This version of the program is written in the Z-80 machine language and is designed to make optimum use of the features of the TRS-80 microcomputer. The program is a full 4K bytes in length and includes a graphics driver to display the chess board on a video monitor.

Microchess is a tireless opponent, always ready for a quick blitz game, or a slow thoughtful one. It is ready at any time to assist you in learning to play chess, or to help you practice your chess skills.

Microchess 1.5 is a Z-80 machine language program, and the procedures for loading it from cassette are somewhat different from those for regular BASIC programs. Also, Microchess 1.5 can only be loaded from the supplied cassette; it cannot be copied onto another cassette using the BASIC CSAVE command or the machine language monitor, nor can it be reliably copied using two tape recorders. So you should treat your Microchess 1.5 cassette with care and read these instructions carefully before you begin. To ensure that you can load Microchess 1.5, the program is recorded three times on the Level I side and five times on the Level II side. Make sure that the correct side is 'up' in your cassette recorder, and follow the appropriate procedures below.

Once Microchess 1.5 is loaded, you can play as many games of chess as you please (using the R command to reset the board). You will find, however, that neither the BREAK key nor the Reset switch at the back of your keyboard has any effect. To load or type in another program, you must turn power off on your TRS-80 and then turn it on again. (On Disk BASIC systems, pressing the Reset switch will boot the DOS.)

Microchess 1.5 and other Micro-Ware Ltd products are produced and marketed by **Personal Software™**, Box 136-M, Cambridge, Mass. 02138, telephone (617) 783-0694. For a catalog of additional programs, send us a letter giving your TRS-80 configuration (Level I or II, memory size, etc.) and your most wanted software product.

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## Level I

Set the volume on your cassette recorder at about 7-8, and test the volume setting by loading a Radio Shack supplied tape. After you have verified that this program will load, take out the EAR plug, play back a portion of the tape and listen to it. Now insert your Microchess 1.5 cassette, play a portion of the tape and listen again. If the Microchess 1.5 recording is significantly louder than the Radio Shack supplied tape, turn down the volume slightly so that the two volumes are roughly equal. (Microchess 1.5 is recorded on extremely high quality, high output tape, and may load at volume settings as low as 5.)

Now type **CLOAD** (followed by the ENTER key) and wait. You should see two flashing asterisks in the upper left corner of the screen. Do not be surprised if the asterisks hold steady and flash only occasionally; this is normal for a machine language program. (If the asterisks never change, the volume is probably too low; raise the volume slightly and try again.)

If all is well, the Microchess 1.5 playing instructions will appear, line by line, on the screen. Do not turn off the cassette recorder at this point! Since Microchess 1.5 takes up all available memory in 4K, the playing instructions are read from cassette and displayed on the screen, then discarded. If your TRS-80 is plugged into the cassette recorder's REM jack, the recorder will stop automatically.

Make sure you have waited long enough for Microchess 1.5 to load—the index counter on Radio Shack CTR-41 recorders will go to at least 140 before the loading is finished. When the recorder stops, you should be positioned to read another copy of Microchess 1.5 from the tape. If you listen to the entire tape, you will find that each copy of Microchess 1.5 is recorded in three segments—one long, one short and one medium in length.

If you get the message **WHAT?**, invalid data has been read and a 'checksum error' has occurred. This usually means that the volume setting on your recorder is too low; raise the volume slightly and try again. If this doesn't solve the problem, you should clean and/or demagnetize your recording heads. With some effort, you should be able to load Microchess again and again without any problems.

## Level II

Set the volume on your cassette recorder at about 5-6, and test the volume setting by loading a Radio Shack supplied tape. After you have verified that this program will load, insert your Microchess 1.5 cassette. (If you listen to both a Radio Shack supplied cassette and your Microchess cassette, the volumes should be roughly the same, with the Microchess 1.5 recording slightly louder.)

Now type **SYSTEM** (followed by the ENTER key). You should see the **\*?** prompt of the Level II machine language loader. Now type **CHES** (followed by ENTER). You should see flashing asterisks in the upper right corner of the screen for a brief moment, followed by another **\*?** prompt. If you don't see the flashing asterisks at all, the volume setting is probably too high; lower the volume slightly and try again. If a **C** appears in the upper right corner of the screen, a 'checksum' error has occurred and the volume is probably too low; raise the volume slightly and try again.

If everything looks good, type a single / (followed by ENTER) in response to the second **\*?** prompt, and wait. You should see two flashing asterisks in the lower right corner of the screen. Don't be surprised if the asterisks flash less rapidly than they do for a BASIC program; this is normal for a machine language program.

If all is well, the Microchess 1.5 playing instructions will appear, line by line, on the screen. Do not turn off the cassette recorder at this point! Since Microchess 1.5 takes up all available memory in 4K, the playing instructions are read from cassette and displayed on the screen, then discarded. If your TRS-80 is plugged into the cassette recorder's REM jack, the recorder should stop automatically.

Make sure you have waited long enough for Microchess 1.5 to load—the index counter on Radio Shack CTR-41 recorders will go to at least 80 before the loading is finished. When the cassette recorder stops, you should be positioned to read another copy of Microchess 1.5 from the tape. If you listen to the entire tape, you will find that each copy of Microchess 1.5 is recorded in two segments—one very short, the other quite long.

If the screen goes blank and the message **MEMORY SIZE?** appears, invalid data has been read from the tape and a 'checksum' error has occurred. Don't be dismayed! Just raise the volume slightly, rewind the tape, press ENTER to get the usual **RADIO SHACK LEVEL II BASIC** message, and try again with **SYSTEM**. If this doesn't solve the problem, you should clean and/or demagnetize your recording heads. With some effort, you should be able to load Microchess 1.5 again and again without any problems.

## The Display

Microchess displays a graphic depiction of the chess board on your TRS-80 screen. The computer's men will always appear at the top of the display, whether the computer is playing White or Black. Your pieces are shown at the bottom of the display.

The right hand side of the screen is used for communications between you and the computer. Microchess will display its moves at the top of the screen. You enter your moves at the bottom. The current setting of the intelligence level is always displayed in the middle of this screen area.

## Level of Play

Microchess will play chess at three different levels. Level 1 responds very quickly, but the moves are less skillful than the higher levels and often show lack of foresight. Level 2 requires only a few seconds for each response. The average player will find this level of play very enjoyable because the moves are challenging but the speed is not too slow. At level 3, a game may require an hour of playing time. However, this is Microchess's best level of play. The skill of the computer is considerably enhanced and even good players should be wary of falling into one of the computer's well laid traps.

Select the level of play you wish to use by typing:

**IQ=n**        where n=1, 2 or 3

Remember to use the ENTER key to complete every command. The display should now show the new IQ of Microchess.

## Exchange

Because it is a gentleman, Microchess has given you the white pieces to start the game. If you would prefer to play Black, use the Exchange command (**X**) to reverse the board. The graphic board display should immediately reflect the change. If you wish to be totally fair, flip a coin. If a head shows, the type **X** and give the computer White. Otherwise, you will play White.

Note that the Exchange command may be entered at any time to reverse the board. Thus, you may switch sides and let the computer play a move against itself (with **X**, **P**, **X**, **P**,...).)

## Notation

In order to maintain compatibility with chess textbooks, algebraic notation has been used. The files are lettered from A to H starting from White's queen rook file, and numbered from 1 to 8 starting from White's back rank.

If you are unsure of a square number, type **N**. The Notation command will display the notation in the top left corner of each square.

Moves are usually entered by typing the number of the square your piece is on, a hyphen, and the identification of the square you wish to move the piece to. For example:

**1: E2-E4**

indicates a move of the white king pawn from square E2 to square E4 (equivalent to KP-K4 in older textbooks).

## Castling and En Passant

Castling is handled in the usual manner by typing **O-O** to castle on the king's side, or **O-O-O** to castle on the queen's side. Note that the letter O must be used and not the numeral 0. En passant capture of the computer's pawn is indicated by entering an **EP** after the pawn move. For example:

**7:E5-D6EP**

will move your pawn from E5 to D6 and remove the computer's pawn at D5.

In order to reduce memory requirements, the computer does not check castling or en passant moves for legality. Thus, special care should be taken to see that you do not accidentally move illegally.

## The First Move

If you are White, type your move using the notation described above. The program will immediately begin to 'think' about the position and will generate its response. If you have used the Exchange (**X**) command to give the computer White, type **P**. The computer will then make the first move. The Play command (**P**) may be typed at any time to cause the computer to evaluate the current position and move one of its pieces. Note that unless you type **X** in between uses of the Play command (**P**), the computer will simply continue to move its pieces without allowing for a response.

## Position Adjustments

Occasionally, you may wish to adjust the pieces on the board in order to correct an entry error, or to set up a chess problem or a position from a previous game. This may be done by appending an asterisk (\*) to a normal move description. The computer will not generate a response or evaluate the legality of the entered move in any way. Thus, you may capture your own pieces, or move the computer's pieces as you wish. For example:

**1: X**  
**1: E8-D8\***  
**1: D8-E8\***  
**1: P**

will set up the board with the computer playing White, remove your queen to give the computer a piece advantage, reset your king to its own square, and initiate play.

## Resignation

If you wish to start a new game, type **R**, instead of a move, in order to resign. **R** (Reset or Resign) must also be typed at the end of a game to restart the program. You will have to press the ENTER key twice after typing **R** in order to begin a new game.

Note that the IQ of Microchess will be reset to Level 2 at the start of each new game.

## How It Works

When presented with a position to examine, Microchess will internally evaluate the result of every legal move it can make. In order to perform this evaluation it is necessary for the computer to generate all of the possible reply moves its opponent might make. Then, the program will generate all of the continuation moves it could play after the opponent has replied. The resulting positions are scored in terms of their effect on material balance, total threat of capture in each direction, and positional factors. The best move according to this scoring system is the one the computer selects. At Level 3, the computer may generate up to three moves for each side, if the position is complicated, in order to decide on a good move.

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