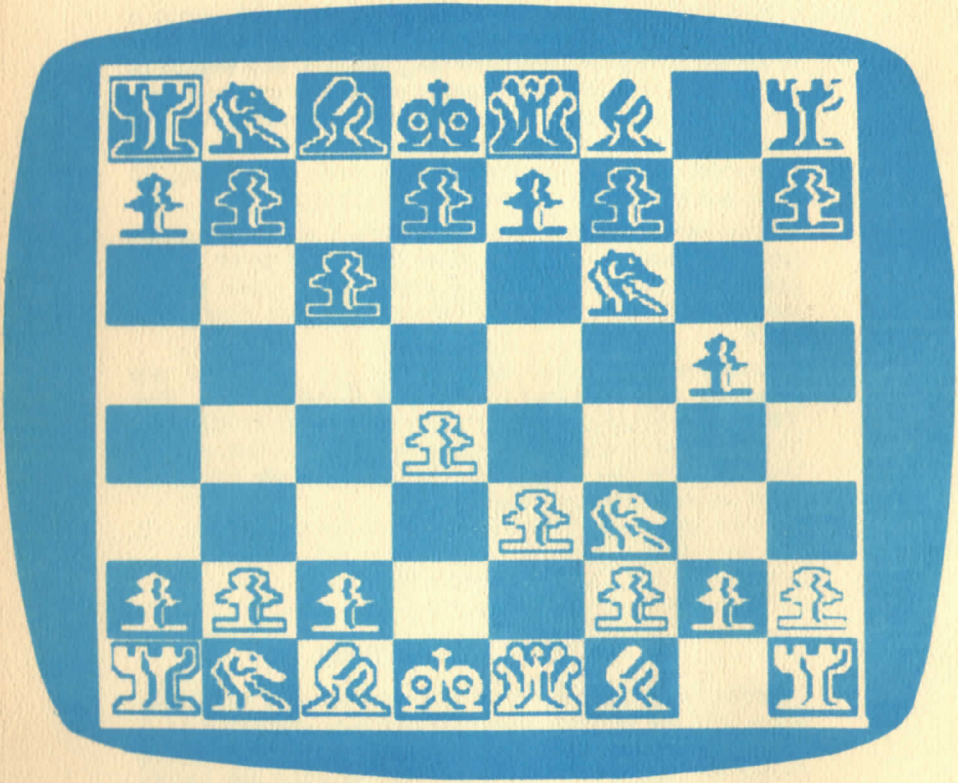
BASICS DISK VOLUME 10

MICROCHESS 2.0



A Chess Playing Program For the APPLE II 16K RAM

Written by
Peter R. Jennings

Produced by
Personal Software™
P.O. Box 136-M
Cambridge, MA 02138
(617) 783-0694

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 6502 machine language and is designed to make optimum use of the features of the Apple II computer. The complete program runs in 16K of memory and includes the high resolution graphics routines used to display the chessboard, as well as an opening book containing 32 openings to a depth of 8 moves for each side.

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

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

Loading Microchess

In order for Microchess to fit into memory on a 16K Apple along with the 8K high resolution graphics memory area, it must be loaded with the aid of a special initialization and relocation program. This program is recorded just before each copy of Microchess on your cassette tape. To load Microchess, follow the instructions below.

Copyright © 1978 Micro-Ware Ltd.

Microchess 2.0 is a copyrighted software product. Copyright infringement is a crime punishable by fines and imprisonment, regardless of the number of copies made and whether or not a profit motive is involved. In addition, infringers may be sued for civil damages. Micro-Ware Ltd. and Personal Software Inc. will seek maximum penalties and damages against persons violating the copyright laws.

1. Press RESET. You should hear a beep and see the asterisk prompt of the Apple Monitor.
2. Place the Microchess cassette in your cassette player with the Apple's plug removed from the EAR jack, and press PLAY. Adjust the volume control until the sound you hear is about the same volume as that of other cassettes which you have loaded before.
3. Rewind and stop the cassette player, and re-insert the Apple's plug into the EAR jack. Type:

   2000.2200R 2000G

   (Leave a space between the R and the 2.) Do not press RETURN yet.
4. Press PLAY on your cassette recorder, and now press RETURN. After a brief pause, the Microchess title screen and copyright notice will appear. At the bottom of the screen you should see the message:

   GAME BEGINS IN 2 MINUTES

   Let your cassette player continue to run. The title screen will disappear and your screen image will turn either all white or all black (depending on your Apple's memory size).
5. After about two minutes of loading, the chessboard will appear on the screen and you are ready to play. For example, you could type E2-E4 (RETURN) to move White's King Pawn to square K4 (see the section on Notation).

Because of the way Microchess uses memory, if you hit RESET while playing chess you will partially destroy the program in memory. For the same reason, if you have a disk system you will have to re-boot the DOS after running Microchess.

There are **three copies** of Microchess recorded on your cassette. If one copy does not load properly (e.g. if the tape accidentally becomes dirty or damaged), you can still load one of the other copies.

On some cassette players, you will get an **ERR** message (cassette load error) unless you advance the tape to the point where the initial steady tone can be heard before pressing PLAY and RETURN.

If your cassette does not load properly on the first try, adjust the volume and tone controls on your cassette player and try again. (You may wish to follow the procedure outlined in the Apple BASIC manual for finding the right volume setting.) You will usually find a setting at which the cassette will load successfully. Write this setting on the cassette for future reference.

The Display

Microchess displays a graphic depiction of the chessboard on the Apple 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.

At the right hand side of the screen, Microchess displays the current setting of the intelligence level, and the number of moves that the computer has made so far. The lower right hand portion of the screen is used for communication between you and the computer. The Apple's moves are shown here just above your moves.

Level of Play

Microchess 2.0 will play chess at eight different levels. The lowest levels respond very quickly, and are excellent for speed chess and for novice players. As the IQ is increased, Microchess requires more time to think about the position because it searches further ahead in the move tree, and considers additional heuristics in its algorithm. Level 8 requires an average of 90 to 100 seconds per move and searches to a depth of up to six half moves ahead. The skill of the computer is highest at this level, 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,...,8

This command may be typed at any time during the game when you have the move. Remember to use the RETURN 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, then 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 the newer chess textbooks, algebraic notation has been used. The files (vertical rows) are lettered from A to H starting from White's queen rook file, and the ranks (horizontal rows) are numbered from 1 to 8 starting with 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).

In order to facilitate the quick entry of moves for speed chess, a shorthand numeric notation may be used. Instead of typing the letters A through H, the numerals 1 through 8 may be substituted. The hyphen may also be omitted. Thus, 5254 is identical to E2-E4, except that it may be entered entirely from the row of numeric keys.

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

En passant captures are automatically recognized by Microchess, and the computer's pawn is removed as your piece is moved. The computer may also make en passant captures from time to time. However, should you make a diagonal pawn move using the position adjustment feature described below, the computer's pawn will not be removed automatically.

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

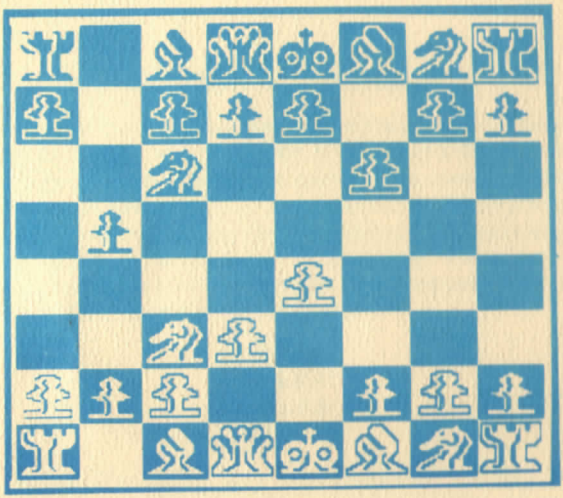
Occasionally, you may wish to adjust the pieces on the board in order to correct an entry error, or to set up a chess problem or a position from a previous game. This may be done by appending an asterisk (*) to a normal move description. The computer will not generate a response or evaluate the legality 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. Note that the IQ of Microchess will be reset to Level 8 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 8, the computer may generate up to three moves for each side, if the position is complicated, in order to decide on a good move.