



MICROCHESS



Of might and men

The recently released Colossus Chess 2.0 for the Commodore 64 claims to be the best home computer chess program on the market. An impressive statement and one which Tony Harrington cannot dispute.

It is good to see that the drive for faster and better chess programs is not just restricted to dedicated chess computer suppliers.

Colossus for the Commodore 64 is the second home computer chess program by Martin Bryant. It's nice to see that Bryant hasn't been resting on his laurels and has gone on to write a program which thrashes White Knight (his first program) by 11.5 to 5.5 over a 16-game match.

Although this result is taken from the manual, where Bryant claims to have played Colossus against just about every home computer program around, I have found no reason to dispute it. Colossus is definitely better and stronger than White Knight.

For a start, the manual consists of 14, clearly and concisely laid-out pages. The board graphics are neat, and the colours of the squares and the background border can be set by the user. This is something of a double-edged benefit. Beginners should note that this feature needs to be used carefully. My first attempt to vary the colours — provoked by the fact that with the default values, with black as the colour of the dark squares, the black pieces didn't show up well — created an illegal chessboard.

As the old adage has it, chessboards should always be set up with 'white in the right' — that is, a white square in the bottom right-hand corner. My attempt to redesign the colour schemes switched the dark and light squares. The result was that the set looked as if I was playing with the black pieces on an incorrectly set up board. For a moment or two I thought Bryant had got so involved with the program that he'd forgotten what a chessboard looked like!

As well as the graphics display, there is an excellent 'status' screen, which has a number of very good features. It shows the time elapsed on both clocks and — an intriguing feature — during Colossus's thinking time, it shows the

number of positions currently examined. The two left-most figures on this counter revolve at an amazing rate. More usefully, perhaps, this screen also shows the best line found so far by the program, up to its current look-ahead level (also displayed). You toggle between the board display and the status screen by pressing the space bar.

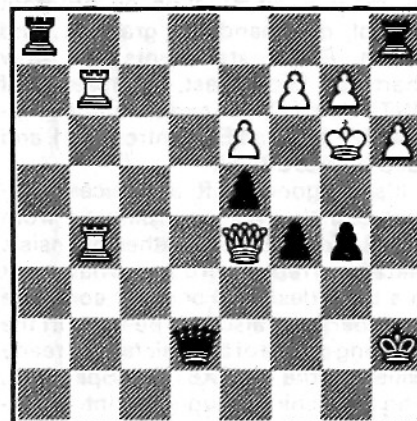
There are six playing modes, ranging from tournament level to problem mode. In practice, since mode 3 allows any clock setting, from blitz upwards, there is an endless set of playing levels. The program clock can be set independently, so weak players can give the computer a time handicap. Strong players can try handicapping themselves.

One of the good things about the design of this program — aside from its playing strength — is that all the commands are easily input. Compared to the highly complex command sequences we saw in last month's review of the Fidelity Elite, the commands are all of the single-key, capital letter type. All numerical input, even the clock setting, is done by pressing the up-arrow key to increase the default number, and the down-arrow key to decrease it. Position set up is the easiest I have come across yet and takes all the sting out of setting up complex positions.

Like several other home computer programs, it enjoys an advantage over dedicated chess computers in that games can be replayed on the screen at any stage from the beginning. Unlike all other home computers though, the replay is done automatically, with any move interval between one and 20 seconds. There are also backward move and forward move commands for stepping manually in either direction, for as many moves as you like (though there is an upper limit, imposed by the 64's memory, of around 120 moves).

Colossus has an excellent problem-solving mode (mode 6). Its strategy is to search all logical moves, beginning with the King and proceeding down

through the pieces until it has found all possible mates. When one mate is found it asks 'Continue?' and goes on to check for others which, of course, there shouldn't be in a good chess problem. The manual claims that it can solve mate-in-seven problems. I tried it on



mate-in-two problems, which it solved almost instantly, and on the above mate-in-three problem, from Donald Bloss's book, *Rate your own Chess*.

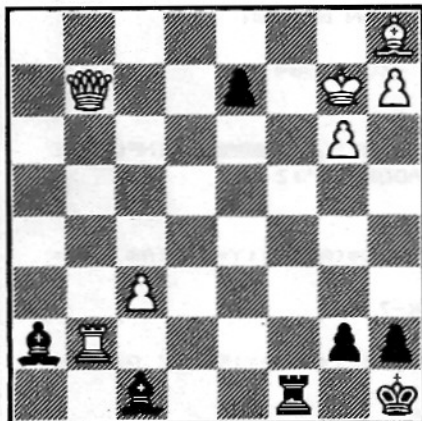
The program took 104 seconds to find the correct solution, which is 1) f4-f5+ e6xf5 2) Qd2xh6+ g7xh6 3) Ra8-g8 mate. In terms of speed, this performed on a par with a US Chess Federation rating of around 1740, according to Bloss's rating chart, but not too much should be made of this since: a) the ratings only begin to mean something over a series of problems; and b) Colossus's cast-iron technique of starting all its problem-solving by looking first at combinations beginning with the King, then the Queen, and so on, slow it down. Once it started looking at combinations beginning with the f-pawn it found the mate almost instantly, despite the five-ply finale.

The seven-move-mate limit cannot be exceeded because the program has a maximum look-ahead of 14 ply. Put into 'infinite mode' (mode 5) it will hunt for the best move, searching all combinations of all moves. It gradually

extends its search, ply by ply, until it either finds a mate or reaches the limit of its search, when it will report the best move available to it, according to its evaluation.

Interestingly, the program recognises self-mate problems as well as the more standard variety (self-mate, as the name implies, is where white has the first move and tries to mate himself in the shortest possible sequence). Bryant claims that this is a first for Colossus — certainly I am not aware of any other program that recognises self-mates. It is not a feature that will excite users unless they happen to be chess problem enthusiasts.

Much to its credit, Colossus, unlike White Knight, and almost all other home computer chess programs, recognises and can use underpromotions. To test this point, I set up the following problem — which, I might add, has nothing to recommend it as a chess problem except for the fact that it proves conclusively whether a program will underpromote when searching for a mate in problem mode.



The only one move mate in the position is the blindingly obvious 1)

SPEED CHES

Game No 1. Player vs Colossus

1 e2-e4	Ng8-f6	33 Ng4-e3	Bf5-d7
2 e4-e5	Nf6-d5	34 Be5-f6	b6b5
3 c2-c4	Nd5-b6	35 Bc4-b3	Rh1-h5
4 d2-d4	d7-d6	36 g2-g4	Rh1-h2+
5 e5xd6	e7xd6	37 Kf2-e1	Rh2-h3
6 Bf1-d3	Nb8-c6	38 Ke1-e2	Rh3-h2+
7 Ng1-e2	Bc8-g4	39 Ke2-d3	Kb7-b6
8 f2-f3	Bg4-d7	40 Bf6xg5	Kb6-c5
9 Bc1-e3	Qd8-e7	41 Bg5d8	Kc5-d6
10 Be3-f2	d6-d5	42 Ne3-c2	a7-a6
11 c4xd5	Nb6xd5	43 Nc2-d4	a6-a5
12 Qd1-d2	Nc6-b4	44 Kd3-e4	a5-a4
13 Bd3-c4	Bd7-f5	45 Bb3-c2	Rh2-g2
14 0-0	Nb4-c2	46 Bd8-f6	Kd6-c5
15 Bc4xd5	Nc2xa1	47 Bc2-d3	Rg2xa2
16 Nb1-a3	0-0-0	48 Bf6-e7+	Kc5-b6
17 Bd5-c4	Qe7-b4	49 Be7-b4	Ra2-g2
18 Qd2xb4	Bf8xb4	50 Ke4-e5	Bd7-e8
19 Rf1xa1	Bb4xa3	51 Bd3-c4	Be8-d7
20 b2xa3	Rh8-e8	52 Ke5-f6	Rg2-f2
21 d4-d5	Kc8-b8	53 Kf6-e7	Bd7-c8
22 Ne2-f4	g7-g5	54 Nd4-f5	Be8-f5
23 Nf4-h5	b7-b6	55 g4xf5	f7-f6
24 Nh5-f6	Re8-e7	56 Ke7xf6	Rf2-e2
25 h2-h4	h7-h6	57 Kf6-e7	Re2-e3
26 h4xg5	h6xg5	58 f5-f6	c7-c5
27 Ra1-e1	Re5xe1	59 d5xc6	Re3-e2
28 Bf2xe1	Rd8-d6	60 f6-f7	Re2-g2
29 Be1-c3	Kb8-b7	61 f7-f8=Q	Rg2-e2
30 Bc3-e5	Rd6-d8	62 Qf8-b8+	Kb6-a6
31 Kg1-f2	Rd8-h8	63 Qb8-b7+	mate
32 Nf6-g4	Rh8-h1		

e7-e8=N checkmate. But for programs that haven't been told that pawns can become anything other than Queens when they reach the eighth rank, this is an impossible problem. They simply report that there is no mate in one — a technical absurdity. Colossus, I am happy to report, found the right move instantly.

It is much harder to tell whether it would underpromote spontaneously in a game, when the situations called for it, but I am prepared to give it the benefit of the doubt. The more sceptically minded may test this for themselves by finding a game where a player underpromotes successfully and keying in the appropriate position.

All in all, Colossus is a very neat, powerful little program.

Games section

White: V Korchnoi. Black: Nuchess.

Notes by Grandmaster Dr John Nunn.

On 9 April 1984, the Dutch city of Delft witnessed a chess battle between Grandmaster Viktor Korchnoi, currently rated fifth in the world, and Nuchess, designed by David Slate and William Blanchard. The program ran on a Cray-1.

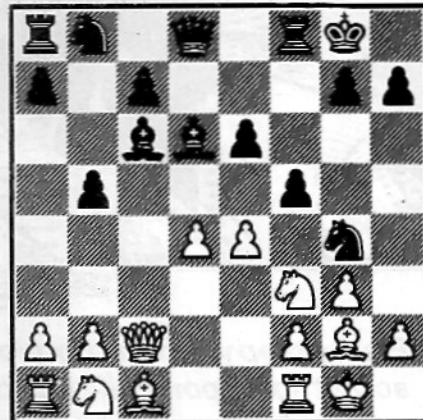
The game wasn't of much sporting interest since Nuchess made some weak moves early on which were more than enough for an opponent of Korchnoi's calibre. The two main errors were both of the same type and, although the game went on for a long time, the crucial phase lasted just five moves.

1	Ng1-f3	d7-d5
2	c2-c4	e7-e6
3	g2-g3	Ng8-f6
4	Bf1-g2	d5xc4
5	Qd1-a4+	Bc8-d7
6	Qa4xc4	Bd7-c6
7	0-0	b7-b5?

(A very bad move. The program is tempted by the gain of time inherent in chasing back the white queen, but pays no regard to the long-term weaknesses created by this rash pawn advance. Human players think very carefully before pushing a pawn because such a move is irrevocable; it's no good deciding later that you shouldn't have committed the pawn, because you can't move it back again. 7... b7-b5? means that the b-pawn can never again guard the squares c5 and c6, which is particularly serious here because Black no longer has a d-pawn which might have given alternative protection to these squares. The squares on the c-file become permanent Black weaknesses.)

8	Qc4-c2	Bf8-d6
9	d2-d3	0-0
10	e2-e4	Nf6-g4
11	d3-d4	f7-f5?

(Defending against the threat to win a piece by e4-e5.)



(The same mistake again! Now it is the e6 square which is deprived of protection, but unlike the earlier error, which could only be exploited gradually, this one leads to immediate loss of material.)

12 Nf3-g5
(Straight away Korchnoi attacks the new weak point.)

12 ... Qd8-d7

13 Qc2-b3

(By reinforcing the pressure against e6 White puts Black in an impossible position. 13... Rf8-f6 loses to 14 e4-e5, while after 13... Rf8-e8 14 e4xf5 the pin along the b3-g8 diagonal nets two pawns.)

13	... Bc6xe4
14	Ng5xe6 Be4xg2
15	Ne6xf8+ Qd7-f7
16	Qb3xf7+ Kg8xf7
17	Kg1xg2 Kf7xf8

(The series of exchanges has given Korchnoi the advantage of rook for knight. If there is no compensation, this material plus is almost always enough to win.)

18	Nb1-c3	a7-a6
19	a2-a4	b5-b4
20	Nc3-d5	Nb8-c6
21	Bc1-f4	Bd6xf4
22	Nd5xf4	Nc6xd4
23	Ra1-c1	

(Black is finally made to suffer from the c-file problems caused by 7... b7-b5? and must now return the pawn.)

23	... Ra8-a7
24	Rc1-c4 Nd4-f3

(This leads to further exchanges leaving Korchnoi a piece up.)

25	Rc4xb4	Kf8-f7
26	Kg2xf3	Ng4xh2+
27	Kf3-g2	Nh2xf1
28	Kg2xf1	Kf7-e7
29	Rb4-b8	c7-c6
30	a4-a5	Ra7-d7
31	Rb8-b6	g7-g5
32	Nf4-h3	g5-g4
33	Nh3-f4	Rd7-d2
34	b2-b4	Ke7-d6
35	Rb6xa6	Rd2-b2
36	Ra6-b6	Rb2-b1+
37	Kf1-e2	Rb1-a1
38	Ke2-e3	Ra1-a3+
39	Ke3-d4	Ra3-a2
40	Nf4-d3	h7-h6

(and Black resigned.)
Colossus is available from CDS Micro Systems. Tel: (0302) 21134. **END**