Star constellation

Novag's Constellation is already a force to be reckoned with in computer chess, but even better things are on the way, as Tony Harrington discovers . . .

Back in October 1983 we looked at the Novag Constellation. Novag has now beefed up the standard Constellation's processor speed from 2MHz to 3.6MHz, which, for very little more money, offers a definite increase in power over the standard 2MHz version.

In playing terms, the increased processor speed has resulted in a slight gain in strength at tournament level and an appreciable gain at the blitz level. Ken Thomson (of Belle fame) reckons that one ply (one move by either side) is worth 250 ELO points. You have to take account of the branching that occurs in the search tree when a program considers a further ply. With an efficient pruning algorithm, the branching factor is about six, so six times as fast gives you 250 ELO points, 1.8 times as fast gives you 75 points — thus putting the 3.6 version 75 ELO points ahead of the standard version.

What this actually means to the player attempting to beat Constellation is difficult to define. It is also a little academic, since Novag is about to launch the Super Constellation, which has already proved itself much stronger than even the beefed-up 3.6 version.

Nevertheless, the 3.6MHz machine with its 16k program will be around for a while yet, despite the imminent launch of its bigger 52k program, 4 MHz brother. And since it will, in all probability, be considerably cheaper than the Super Constellation it should have no difficulty in finding takers.

The games section contains the results of one tournament level game played by the 3.6 version against the Mephisto III (with annotations by Grandmaster Dr John Nunn).

In a one off game anything can happen. My interest in this particular game is twofold. Firstly, the game shows that the Constellation, even in its 3.6 MHz format, has a tendency to over aggressive tactical plays which can get it into self-inflicted difficulties. Secondly, it produced, by computer chess

standards, a very interesting ending which both machines played better than might have been expected.

While the Mephisto III seemed to be able to hold its own at tournament level, at speed chess (five seconds a move) there was no contest. The Constellation 3.6 scored a clean sweep here with five out of five.

So, from the buyer's point of view, if you like playing speed chess, the 3.6MHz machine looks good.

The Super Constellation looks like being even better. At the Commonwealth Championship (sponsored by Novag) and held in Hong Kong recently, the Super Constellation beat 18 out of 29 tournament players at blitz chess (and all the players in the tournament had ratings of 2200 or over). Its victims included a couple of international masters; only the Grandmasters seemed to be able to cope. The Super Constellation's rating for the tournament proper (as opposed to the speed chess event) was 190.

This still has to be confirmed, but the ELO equivalent is around 2120.

David Kittinger, the program's designer, reckons that it could be the first master level microcomputer program. Enrique Irazoquil, who carried out a substantial review of the Constellation's play for *Computer Chess Digest*, sums it up thus:

'Constellation is tactically better and positionally weaker than most human players. It plays some very nice games and some rather poor ones. At speed chess, it is the best thing on the market, with the possible exception of the Fidelity Prestige.'

Novag has entered an experimental form of the Super Constellation in several other open competitions, including the 1983 US Open.

It recorded the first win of any microcomputer over a rated master under actual tournament play conditions, beating Jerry Simon, rated 2207 in 55 moves. One Al Goncer, rated 2037, also fell victim, as did Strayer, rated 2138, and one or two others who

should have known better.

This level of performance is much stronger than most casual players can expect to beat. So it opens the question, once again, as to the point of developing even stronger chess programs.

The real benefits of further development will be felt in better play at the faster response times. Casual chess players like to have virtually instant responses to their moves. Hanging about for five or ten minutes while the computer grinds out a reply at tournament level time settings is tedious; Super Constellation promises to take a large step towards solving that particular problem.

Its arrival on the market will send shivers through Novag's competitors, since if the commercial version lives up to this preview when it is released in September or October this year, there will be nothing in its class.

Games section

White: Mephisto Y. Black: Super Constellation. Budapest 1983. Sicilian Defence. Notes by David Levy.

1	e2-e4	c7-c5
2	Ng1-f3	d7-d6
3	Bf1-c4	e7-e5
4	0-0	Ng8-f6??

(A terrible move, but it requires an 11-ply search to realise that White can win a pawn in reply.)

5	Nf3-g5	d6-d5
6	e4xd5	Bc8-f5

(Now Black can see that 6 . . .Nf6xd5 allows 7 Ng5xf7! Ke8xf7 8 Qd1-f3+ Kf7-e6 9 Nb1-c3, winning back the piece with an overwhelming game.

7	Nb1-c3	Bf8-d6
8	Bc4-b5+	Nb8-d7
9	d2-d3	0-0
10	f2-f4?	

(Unnecessarily opening up a diagonal to White's king, and by allowing the trade of the d6 bishop immediately increasing the pressure on the d5 pawn. White was a safe pawn up and need not have taken any such risks.)

10	...	e5xf4
11	Bc1xf4	Bd6xf4

12	Rf1xf4	Bf5-g6
13	Ng5-e4	

(No matter how White plays, the d5 pawn is looking precarious.)

13	...	Qd8-b6
14	Ne4xf6+	Nd7xf6
15	Ra1-b1	a7-a6
16	Bb5-c4	Qb6-d6
17	Qd1-f3	b7-b5
18	Bc4-b3	Ra8-d8
19	Rb1-e1	h7-h6
20	a2-a3	Nf6-h5
21	Rf4-h4	Qd6-b6

(Threatening 22 ... c5-c4+

22	Qf3-e3	Nh5-f6
23	Nc3-e4	Rf8-e8
24	Ne4xf6+	Qb6xf6
25	Qe3xe8+	Rd8xe8
26	Re1xe8+	Kg8-h7
27	Rh4-h3	Qf6xb2

For the time being the complications have come to an end, and once White loses the a3 pawn the position will be materially level (a queen and pawn are worth roughly the same as two rooks). White's rooks are not particularly well coordinated in this position, but with correct play I would not expect White to lose. On the other hand, it is easier in a computer game to play with an active queen than with two rooks.)

28	Rh3-e3	a6-a5
29	d5-d6	

(Losing the d-pawn, but the threat of ... a5-a4 could not be met.)

29	...	Qb2-a1+
30	Kg1-f2	Qa1-f6+
31	Re3-e4	Qf6-d4+
32	Kf2-f1	c5-c4
33	d3xc4	b5xc4
34	Bb3-a4	Qd4xd6
35	h2-h3	c4-c3
36	Ba4-b3	Qd6xa3
37	Kf1-e1	

(After 37 Kf1-g1 a5-a4 38 Bb3xf7 Bg6xf7 39 Rf3xf7 Qa3-c1+ 40 Kg1-h2 Qc1xc2, Black's passed pawns look very menacing.)

37	...	Qa3-c1+
38	Ke1-f2	Bg6xc2
39	Bb3xf7	Qc1-d2+
40	Kf2-g1	Bc2-a4
41	Bf7-g8+	Kh7-h8
42	Re8-c8	Ba4-d7
43	Rc8-f8??	

(43 Rc8-d8 appears to save the game: for example, 43 ... c3-c2 44 Bg8-b3+ Kh8-h7 45 Bb3xc2.)

43	...	Qd2-d4+
44	Rf3-f2?	

(As a matter of principle I would prefer not to walk into a pin, and would have moved the king instead.)

44	...	h6-h5
45	Bg8-b3+	Kg8-h7
46	Bb3-c2+	kh7-h6
47	Kg1-f1??	

(Correct was 47 Kg1-h1. See how much better things would be for white had it played 44 Kg1-h1 instead of 44 Rf3-f2.)

47	...	Qd4-e3
48	Rf2-e2	Bd7-b5
49	Rf8-h8+	Kh6-g5
50	h3-h4+	Kg5xh4

(White resigns.)
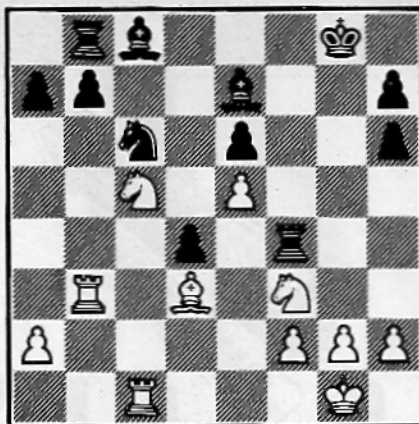
Position after 10 ... Nf6xe4

White: Constellation. Black: Mephisto III. Notes by Grandmaster Dr John Nunn.

The Constellation is the 'fast' version, running at 3.6MHz. Mephisto is reputed to be better at strategy than tactics, but it quickly exploited an opening error by Constellation to win a pawn. A further dubious knight adventure by Constellation should have cost the game, but Mephisto erred and a fascinating ending resulted.

1	c2-c4	e7-e6
2	Ng1-f3	c7-c5
3	e2-e4	Nb8-c6
4	Nb1-c3	Ng8-f6
5	d2-d4	c5xd4
6	Nf3xd4	Bf8-b4
7	Bc1-g5??	

(A move capable of sending a shudder down the spine of a hardened chess master. Material loss is unavoidable after Black's reply. 7 Nd4xNc6 was essential.)

7	...	Qd8-a5!

(With threats to c3, g5 and e4.)

8	Nd4xNc6	Bb4xNc3+
9	b2xBc3	Qa5xBg5
10	Nc6-d4	Nf6xe4

(Black has not only won a pawn but also inflicted serious weaknesses on White's queenside.)

11	Nd4-b5	Qg5-e5?!

(11 ... 0-0 was a simpler and better way of meeting the threat 12 Nb5-c7+.)

12	Qd1-d4	Qe5xQd4
13	c3xQd4	0-0

(White's pawn structure has been improved by the exchange at d4 and although Black should still win, he now faces a much harder task.)

14	Bf1-d3	f7-f5
15	Nb5-c7	

(The start of a pointless knight manoeuvre. 15 f2-f3 followed by Nb5-d6 would have occupied a useful outpost.)

15	...	Ra8-b8
16	0-0	b7-b6
17	Nc7-b5	a7-a6
18	Nb5-a7?	

(Suicidal. The knight has no way to escape from a7 and should soon be rounded up.)

18	...	Bc8-b7
19	f2-f3	Rb8-a8?

(Black sees the chance for temporary material gain and takes it. However, 19

... Ne4-f6 would have left White helpless against the threat of 20 ... Rb8-a8 winning a piece.)

20	f3xNe4	f5xe4
21	Rf1xRf8+	Kg8xRf8
22	Bd3-e2	Ra8xNa7

(Thanks to his 19th move Black has won a second pawn, but now White forces the recapture of one of the lost pawns.)

23	Ra1-b1	b6-b5
24	c4xb5	a6xb5
25	Be2xb5	Kf8-e7
26	a2-a4	Ke7-d6!

(Mephisto understands that the king should be used actively in the end game.)

27	Rb1-f1	Bb7-c6
28	Rf1-f7	Kd6-d5

(Black's passed pawn at e4 will become a powerful weapon when aided by his king. With a potential queen at stake, Black doesn't mind the loss of his kingside pawns.)

29	Rf7xg7	Bc6xBb5
30	a4xb5	Kd5xd4?

(Black shouldn't take this pawn because it can be used as a shield to defend his king against checks from White's rook; for example, he could have won easily by 30 ... e4-e3! 3 Kg1-f1 Kd5-e4 32 b5-b6 Ra7-a1+ 33 Kf1-e2 Ra1-a2+ 34 Ke2-f1 Ke4-d3 — notice that the pawn on d4 prevents Rg7xd7 with check — and the e-pawn will promote.)

31	b5-b6	Ra7-b7?

(Throwing away the win. One of the basic rules of rook and pawn endings is that the rook should be deployed to the rear of enemy passed pawns. 31 ... Ra7-a1+ 32 Kg1-f2 Ra1-a2+ 33 Kf2-f1 d7-d5 34 b6-b7 Ra2-b2 would still win.)

32	Rg7xh7	e4-e3
33	Rh7-h4+?	

(A misguided move. After 33 Kg1-f1! Kd4-d3 34 Kf-e1 White can draw because the pin along the 7th rank prevents the advance of black's d-pawn.)

33	...	Kd4-d3
34	Rh4-b4	d7-d5
35	Kg1-f1	d5-d4

(The advancing mass of Black pawns is more than enough to overwhelm White's king and rook.)

36	h2-h4	Kd3-c3
37	Rb4-b1	Kc3-c2
38	Rb1-a1	d4-d3
39	Ra1-a2+	Kc2-b1
40	Ra2-a7	Rb7xb6
41	Ra7-a5	Rb6-b2
42	Ra5-a7	Rb2-f2+
43	Kf1-g1	d3-d2

(The space invaders are about to touch down.)

44	Ra7-b7+	Kb1-a2
45	Rb7-a7+	Ka2-b2
46	Ra7-b7+	Kb2-c2

(Getting the right idea second time around.)

47	Rb7-c7+	Kc2-d3
48	Rc7-d7+	Kd3-e2
49	g2-g4	d2-d1=Q+
50	Rd7xQd1	Ke2xRd1
	0-1	**END**