

The 20th Annual ACM North American Computer Chess Championship Reno, Nevada November 12-15, 1989

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Despite entering ranked almost a class above the field, a last-round loss forced DEEP THOUGHT to settle for a first place tie with HITECH at the 20th Annual ACM North American Computer Chess Championship. The five round Swiss-style tournament was held November 12-15 at Bally's-Reno in conjunction with Supercomputing '89. It marked the twentieth consecutive year that the ACM has organized this major chess event. Until 1988, the tournament took place at the Annual ACM Conferences. However, in 1988 and again this year, the event was hosted by the joint ACM SIGARCH/IEEE Computer Society Supercomputing Conference. Ten teams participated in the strongest computer chess tournament in history. Every program was playing at least at the Expert level.

Since 1970, these championships have served as a catalyst and as a historical record of progress in this most exciting area of artificial intelligence research. During these twenty years, programs have improved from the level of rank club players to among the best in the world; their USCF-equivalent ratings have gone from approximately 1600 to 2600!

David Slate, Larry Atkin, and Keith Gorlen's program, CHESS 3.0, then 3.2, 3.5, 4.0, 4.5, and finally 4.9 dominated the ACM championships throughout the 70's. Developed at Northwestern University, their program ran at first on a CDC 6400 computer. When CDC's Cyber 170 series computers appeared in the middle 1970's, the authors joined forces with David Cahlander of CDC and transferred their program to the Cyber 175 and then shortly thereafter to the even more powerful Cyber 176. RIBBIT, developed at Waterloo University by a team of students — Ron Hanson, Russell Crook, and Jim Parry — surprised everybody when it upset the Northwestern program at ACM '75, but except for that year, versions of the Slate, Atkin, and Gorlen's program won all the ACM championships from 1970 through 1977. By 1977, CHESS 4.9 was playing at the level of a chess expert, with a rating of approximately 2100.

Ken Thompson and Joe Condon's BELLE, using special purpose chess hardware, upset CHESS 4.7 in 1978, but the latter came back in 1979 and won its last ACM championship. 1980-1982 were years during which BELLE was invincible. BELLE was awarded the title of US Chess Master in 1983 by the United States Chess Federation, the first program to receive that distinction. Its USCF rating was just over 2200. Thompson and Condon's special purpose chess hardware searched approximately 160,000 chess positions per second.

In 1983, however, Robert Hyatt, Harry Nelson and Burt Gower's CRAY BLITZ upset Thompson and Condon's protégé in the Fourth World Championship (held at ACM '83 in New York in place of the usual NACCC). It was, in fact, on the very evening that BELLE was awarded the title of US Chess Master that CRAY BLITZ upset BELLE on its way to winning the championship. CRAY BLITZ won again at ACM '84 and seemed to be playing at the 2300 level.

However, HITECH came to ACM '85 in Denver and performed at a new level of strength.

Developed at Carnegie-Mellon University by Carl Ebeling, Hans Berliner, Any Goetsch, Andy Gruss, and Murray Campbell, HITECH used special-purpose circuitry designed by Ebeling. Berliner served as head of the team. In 1986, HITECH passed up defending its ACM title, and BELLE came out of retirement to capture first place.

For the last two years, DEEP THOUGHT has led the competition at the ACM championships, and it seemed likely to do so again this year. DEEP THOUGHT was developed at Carnegie-Mellon University by Feng-Hsiung Hsu, Murray Campbell, Thomas Anantharaman, Peter Jansen and Andreas Nowatzyk. It searches approximately 2,000,000 chess positions per second, ten times as many as any other program. It currently uses six special-purpose VLSI chess chips, two per SUN 4 computer, and carries out a parallel search of the chess tree. DEEP THOUGHT seems to be playing chess at the Grandmaster level, at least in the middlegame and ending. It played a two game match against Gary Kasparov in New York just several weeks prior to Reno; Kasparov decisively won both games. The match was held at the New York Academy of Art on October 22, 1989, organized by Shelby Lyman. Kasparov, in an interview just prior to the start of the match, gave DEEP THOUGHT credit for a FIDE rating of 2480-2500, the equivalent of at least a 2600 USCF rating.

This year's tournament offered \$5000 in prizes. HITECH and DEEP THOUGHT's programmers each won \$2000 for their first place tie while MEPHISTO X and BEBE's programmers split the \$1000 third place prize. In addition to the cash prizes, trophies were awarded to the first three finishers. A special trophy was given to MEPHISTO X as the "Best Small Computing System."

A Technical Session chaired by Tony Marsland was held on Tuesday afternoon. The topic of the session was endgame play by computers. Once upon a time computers played the endgame particularly badly, but this is no longer the case. The session considered some of the improvements and some of the problems that remain.

David Levy served as Tournament Director, returning after almost a decade layoff. He served as TD for the first time in 1971, continuing into the early 1980s when his own programs began to compete. Levy will take on DEEP THOUGHT in London in a four game match in December. In 1978, he won a bet made in 1968 that no computer would defeat him during the following ten years. This time he appears to be the underdog.

Attending the championship as an Honored Guest was Ben Mittman. Mittman was head of Northwestern University's Vogelback Computing Center during the years that Slate, Atkin, and Gorlen dominated the ACM events. Some give him credit as being Northwestern University's greatest and most successful "coach." From 1971 through 1983, Ben was also involved in the organization of the tournaments. From 1977 through 1983, Ben served as the first president of the International Computer Chess Association. He was also the first editor of what is now call the ICCA Journal, the main journal for technical papers on computer chess.

Next year the championship is scheduled to be a part of Supercomputing '90 in New York City on November 11-14. The '90 event will see the first major change in the tournament rules. For the last twenty years, the rules have specified that each player is given two hours to make the first forty moves and an additional hour for each twenty moves thereafter. Games frequently lasted more than six hours. Next year, each computer will be required to make all its moves in two hours, thus guaranteeing that no game will last more than four hours. In addition to the main

championship, a special endgame tournament will be held testing the programs' abilities on this special part of the game. For the first time at Supercomputing '90, all games will be played during the day beginning at 1:00 pm — except for one 7:00 pm Sunday evening game on the 11th. The event will be a five round Swiss style event.

The 1989 championship

The first round saw second seeded CRAY BLITZ and fourth seeded MEPHISTO X forced to settle for draws with REBEL 89 X and ZARKOV respectively. Top seeded DEEP THOUGHT found itself in a very bad position against PHOENIX, but turned the tables when the latter failed to press its advantage. The game revealed a castling bug to DEEP THOUGHT's programmers. This bug caused them to avoid castling in its games with Kasparov and again against PHOENIX. The bug was corrected before the second round began. If it had not surfaced in this game, it is quite likely that DEEP THOUGHT would have lost to HITECH in the third round. Third seeded HITECH defeated NOVAG X and BP upset BEBE. The results of the first round showed how evenly balanced the field was.

With the exception of third seeded HITECH's defeat of second seeded CRAY BLITZ, the second round went according to form. DEEP THOUGHT waltzed over BP, MEPHISTO X went down to REBEL 89 X, PHOENIX defeated ZARKOV and BEBE defeated NOVAG X.

DEEP THOUGHT and HITECH remained the only two undefeated teams going into round three, and they were paired to play. In making the pairing Levy decided that colors would be decided by a flip of the coin. Berliner appealed this procedure to the Appeals Committee (Marsland, Mittman, and Newborn); prior to the tournament there had been discussion of how pairing would be made and colors decided and the Appeals Committee overruled Levy, concluding that HITECH was, in fact, due White. Berliner had a special interest in having HITECH play White. He had seen DEEP THOUGHT lose to Kasparov playing White, and had prepared a large opening book based on the assumption that HITECH's game with DEEP THOUGHT would follow the same line. Kasparov also defeated DEEP THOUGHT playing Black, but DEEP THOUGHT was not as likely to follow that line of play against HITECH. In 1988, Berliner had also prepared a large opening book for its individual encounter with DEEP THOUGHT. When they played, HITECH got to use the specially prepared book, but quickly got into trouble after leaving the book. Exactly the same thing happened this year; DEEP THOUGHT recovered from a shaky opening and defeated HITECH in a wild encounter.

In the other four games in round 3, REBEL 89 X defeated BP, MEPHISTO X defeated CRAY BLITZ, PHOENIX defeated BEBE, and NOVAG X drew with ZARKOV.

In round 4, DEEP THOUGHT (3 points) trounced REBEL 89 X (2 1/2 points), HITECH refuted BEBE's early diversions from book play, MEPHISTO X and PHOENIX drew as did ZARKOV and BP, while CRAY BLITZ won its first game of the tournament by defeating NOVAG X.

The fifth and final round proved to be the most exciting. Two games finished early: BEBE defeated ZARKOV and NOVAG defeated BP. But DEEP THOUGHT vs. MEPHISTO X, REBEL 89 vs. HITECH and CRAY BLITZ vs. PHOENIX were all long thrilling games. DEEP

THOUGHT had played MEPHISTO X in the last round of the 1988 tournament and had barely managed to win. This year, the game had some of the same flavor as the previous year; MEPHISTO X had won the battle for space in both games. While in 1988, DEEP THOUGHT managed to wiggle out of its confinement, this time it was not able to do so and went down to defeat on the 64th move. Meanwhile on the next board, HITECH and REBEL 89 X maneuvered for 71 moves before REBEL 89 X threw in the towel thus giving HITECH a tie for first place. CRAY BLITZ managed to end the tournament with an even 2 1/2 - 2 1/2 score.

The Games

Three annotated games are presented are presented below. They are the three most crucial games of the tournament were the HITECH vs CRAY BLITZ (Round 2), HITECH vs DEEP THOUGHT (Round 3), and MEPHISTO X vs DEEP THOUGHT (Round 4), and they are annotated below. Also following is a listing of the moves and overview comments from three other important games, namely, PHOENIX vs DEEP THOUGHT (Round 1), BEBE vs HITECH (Round 4), and REBEL 89 X vs HITECH (Round 5). These six games were played by seven of the ten programs, and should give the reader an excellent feel for their capabilities.

ROUND 1

PHOENIX(White) vs DEEP THOUGHT(Black) English Opening (A21/23 5 Be7)

This first round battle should have provided a major upset as DEEP THOUGHT, uninterested in castling, was in serious trouble throughout much of the game. Only well into the endgame does PHOENIX finally get tripped up by a frisky passed pawn, and by DEEP THOUGHT's ability to carry out deeper searches.

1 c4 e5 2 Nc3 d6 3 Nf3 f5 4 d4 e4 5 Bg5 Be7 6 B:e7 N:e7 7 Nd2 c5 8 Nb3 Qb6 9 e3 Be6 10 Be2 Nd7 11 d5 Bf7 12 f3 e:f3 13 g:f3 Nf6 14 O-O a5 15 Qc2 Nd7 16 Bd3 Bg6 17 Nc1! Ra6? 18 N1e2 Ne5 19 Nf4 N:d3 20 Qa4+ Kf8 21 N:d3 Be8 22 Qc2 Qd8 23 Nf4 Bd7 24 Kh1 Kg8? 25 Rg1 g6 26 Nb5 Qf8 27 Nc7 Ra7 28 Nce6 Qf7 29 Qc3 B:e6 30 N:e6 (better d:e6) b5 31 Rg2 (e4!) b:c4 32 Q:c4 Ra8 33 Rag1 Qf6 34 Qd3 Kf7 35 e4 Rhb8 36 Qe3 Rb4 37 a3 Rb6 38 Qh6 Rh8 39 Re1 Kg8 40 Qd2 Rb5 41 Nc7 Rb7 42 Ne8 Qd4 43 Q:d4 c:d4 44 N:d6 Rb3 45 e:f5 (better N:f5) Re3 46 R:e3 d:e3 47 f:g6 h:g6 48 Nc4 N:d5 49 R:g6+ Kh7 50 Rg1 e2 51 Re1 Nf4 52 b3 Re8 53 Nb2 Rc8 54 Nc4 a4 55 h4 a:b3 56 Nb2 Rc2 Black resigns.

ROUND 2

HITECH(White) vs CRAY BLITZ(Black) Torre Attack (C11/20 8 Nxf6+)

This game has a bit of everything. It starts with a relatively quiet opening, but gains intensity and momentum when White and Black castle on opposite wings. After a careful central buildup,

both sides start to attack their opponent's king. White's attack is more dangerous and faster. The Black king becomes somewhat exposed. However, a number of exchanges ensue and a decisive outcome seems unlikely. HITECH keeps up the pressure against the exposed Black king. This difference in king safety in the king, queen, rook and pawns ending ultimately proves the critical factor in determining White's victory. HITECH's technical display is very fine.

1 d4 Nf6 2 Nf3 e6 3 Bg5

The Torre Attack, named after the great Mexican attacking player of the early 1900's. It is quite a comfortable line to play in that it allows White to be aggressive and sound with simple developing moves without requiring too much theoretical knowledge.

3 ... d5 4 Nbd2 Be7 5 B:f6 B:f6 6 e4 d:e4 7 N:e4 Nd7 8 N:f6+

This ends the Encyclopedia of Chess Openings main reference for this variation. The identical position can easily be reached from a king's pawn opening, namely the Rubenstein Variation of the French Defense, i.e., 1 e4 e6 2 d4 d5 3 Nc3 d:e4 4 N:e4 Nf6 5 Bg5 Be7 6 B:f6 B:f6 7 Nc3 Nd7 8 N:f6+. Now the reader may wonder how many programs really know this, besides from their transposition tables.

8 ... N:f6 9 Qd2

White has a slight advantage in space and it is clear that White will castle queenside while Black will castle on the kingside. Usually, White's attack is faster and more dangerous.

9 ... Qd6 10 O-O-O O-O 11 Bc4?!

Not the natural square for this piece. Normal is Bd3.

11 ... b6 12 Ne5 Bb7 13 f4

Guarding the g-pawn and adding support to the N/e5 while creating the later possibility of f5. Many humans, however, would be eager to sacrifice the g-pawn for open lines or play 13 Rhg1 with g4 to follow.

13 ... Rad8 14 Rhe1 a6 15 Qe2 b5 16 Bb3

HITECH has played the opening very solidly with little risk involved.

16 ... Nd5

CRAY BLITZ has also played the opening very solidly and is now very close to equalizing.

17 g3 c5 18 d:c5 Q:c5 19 Qh5!

Renewing White's attack with tactical potential like 20 f5, then if e:f5 21 Q:f5 with 22 N:f7 R:f7 23 B:d5 B:d5 24 R:d5 R:d5 25 Re8+ etc. looming.

19 . . . Rd6 20 Nd3 Qb6 21 f5! Ne3

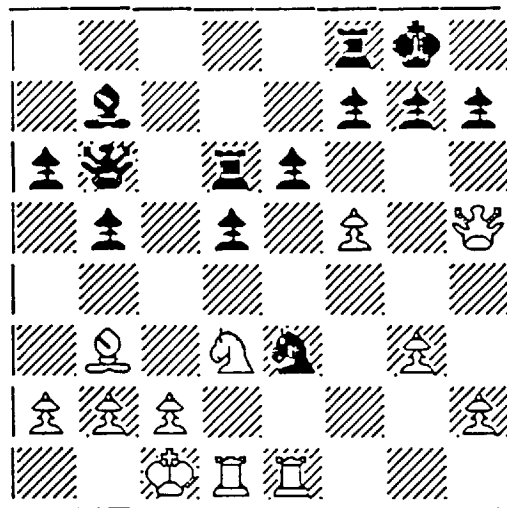


Figure 1. Position after Black's 21 . . . Ne3

22 f:e6! f:e6

If 22 . . . N:d1 23 Q:f7+!! R:f7 24 e:f7 and mates.

23 Nf4!

Continuing the attack with furor.

23 . . . R:d1+

Now if 23 . . . N:d1 24 N:e6 wins for White.

24 R:d1 Bc8

Sadly forced.

25 Re1 Nc4 26 Qe2

White's persistent attack on the central files, especially focusing on e6, has been most impressive.

26 ... g5?!

Such a weakening move rarely survives into the endgame, but CRAY BLITZ hopes for counterplay on the f2 square.

27 Nd3 Qc7 28 Qg4 Rf5 29 h4 h6 30 a3

CRAY BLITZ has defended its disjoint position rather well and now HITECH effectively takes a time out.

30 ... Kf8 31 h:g5 R:g5 32 Qh4 Q:g3 33 Q:h6+ Ke7 34 Qh8 Bb7 35 Qc3 Bd5 36 Qd4

Up to now, Black's defense has held up very well, but there are still weaknesses in the position of the Black king which White can exploit.

36 ... Qd6 37 Rf1 Ne5 38 N:e5 R:e5 39 Qa7+ Kd8 40 B:d5 R:d5 41 Rh1 Rh5!

If now 42 R:h5 Qf4+ 43.Kb1 (or 43. Kd1 Qf3+) Qf1+ etc., draws.

42 Qa8+ Ke7 43 Rg1 Rg5 44 Rh1 Rh5

It almost appears that Black has secured a draw.

45 Rg1 Rg5 46 Qb7+

HITECH doggedly pursues a win.

46 ... Kf6 47 Qf3+ Rf5 48 Qa8 Qf4+ 49 Kb1 Qd6 50 Qh8+ Ke7 51 Qh4+ Ke8 52 Qh7 Rf7 53 Rg8+

If this were a game between two humans, White's persistence might almost seem annoying, but ...

53 ... Rf8

If 53 ... Ke7 54 Qh4+ Kd7 55 Rd8+ wins.

54 Rg7

Finally, White can declare a winning advantage based on the safety of its king and the exposure of the Black king.

54 ... Qd5 55 b3 Qd4 56 Ka2 Q:g7

Desperation. If ... Rf1 57 Qg8+ wins quickly. Otherwise the threat of 57 Rb7 (or a7) was deadly.

57 Q:g7 Black resigns

A very impressive technical performance by HITECH.

ROUND 3

HITECH(White) vs DEEP THOUGHT(Black) Queen's Gambit Accepted (D/20/06 3... Nc6)

This game portrays some of the major problems still confronting computer chess. Here we have a program rated 2413 (HITECH) against a program rated 2551 (DEEP THOUGHT) yet the differences in the performance of each program in the two halves of the game are like night and day.

After 13 Bh3, Berliner's protege has an overwhelming position, but to whom should the credit or blame go? Surely the credit for White's brilliant opening success must go to Berliner himself for after thirteen moves his program is in a position that any ordinary club level player would be delighted to have.

Despite DEEP THOUGHT's divergence from its second game against World Champion Gary Kasparov in New York just three weeks earlier, it plays the opening very poorly. However, HITECH, once out of Berliner's book, quickly goes astray to recover the sacrificed pawn only to thereby lose the thread of the game.

1 d4 d5 2 c4 d:c4 3 e4

The Queen's Gambit Accepted has been a well-known, well analyzed opening for many years, yet this most aggressive natural move has gone in and out of vogue, but when the World Champion plays such a move it automatically seems revitalized. Previously it was generally accepted that 3 e4 allows Black several ways to equalize including 3... c5, 3... Nf6 and the complicated 3... e5. Perhaps Kasparov had expected 3... Nc6, which is also not considered bad.

3... Nc6 4 Nf3 Bg4 5 d5 Ne5 6 Nc3

This simple temporizing move is Kasparov's improvement over the normal 6 Bf4 Ng6 7 Be3, etc. About three weeks earlier, against Kasparov, DEEP THOUGHT played 6... c6, which turned out badly after 7 Bf4 Ng6 8 Be3 c:d5 9 e:d5 Ne5 10 Qd4 N:f3+ 11 g:f3 B:f3 12 Bc4!.

6... Nf6

DEEP THOUGHT divulged this "improvement" to Kasparov at an informal dinner gathering at Harvard, when the World Champion expressed his curiosity about how it might improve over its play from a week earlier. Berliner prepares a wonderful continuation involving a pawn sacrifice for

development and central control which virtually leads to a won game.

7 Bf4 Nfd7 8 Qa4!

Black is now compelled to accept the pawn sacrifice, and DEEP THOUGHT being temporarily two pawns up, cannot be too unhappy.

8 ... N:f3+ 9 g:f3 B:f3 10 Rg1

White has excellent open lines and lots of space. It is hard for Black to complete the development of its pieces.

10 ... a6 11 Q:c4 Rc8 12 Rg3 Bh5 13 Bh3 f6

A very poor-looking move, but Black threatens 14 ... g5 and 15 ... Ne5 with some semblance of counterplay. HITECH no doubt sees this and gets "worried" with 14 Qb4. White should play 14 Be6 so that on 14 ... g5 15 Be3 Ne5 16 Qf1 (with the idea 17 Qh3) would be crushing, e.g., 16 ... Nf3+? 17 R:f3 B:f3 18 Qh3 or on 16 ... g4 17 f4 is dynamite.

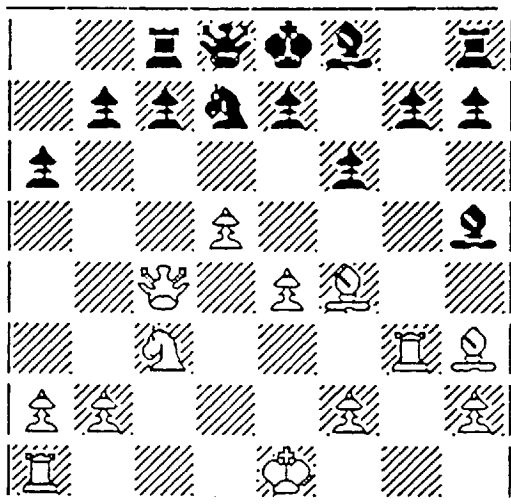


Figure 2. Position after Black's 13 ... f6

14 Qb4?

If 14 ... e5 15 d:e5 e.p.B:b4 16 e:d7+ Q:d7 17 B:d7+ K:d7 18 R:g7+ is winning for White, but Black has other ways to proceed, while the White queen is not comfortable on b4.

14 ... g5 15 Be3 b5 16 Qd4?

Now 16 Qa5 threatening the weak a6 pawn and preparing to attack the backward c7 pawn looks right.

16 ... c5 17 d:c6

Black may already be better after this. Better was 17 Qd2.

17 ... R:c6 18 R:g5

Within just a few moves much of White's overwhelming edge has disappeared. Black's principal threats include ... Rc4, ... Ne5, and then ... b4 in addition to ... Rd6 and then ... Ne5; suddenly White's king is caught in the line of fire. It's already hard to suggest a good move for White.

18 ... f:g5 19 Q:h8 Nf6 20 Bf1

The errors in White's play are revealed. How quickly the tables have turned. Black suddenly threatened to win with 20 ... R:c3 21 b:c3 Qd3. HITECH's reply was sadly necessary.

20 ... Qa5 21 Bd4 Qb4 22 B:f6 R:f6

White is in zugzwang (there are no moves which don't lose material or ground). If 23 Rb1 Qd4 wins immediately.

23 Rd1 B:d1 24 a3 Q:b2 25 N:d1 Q:a3 26 Q:h7 Qa5+ 27 Ke2 Rd6 28 Qh5+ Kd8 29 Q:g5 Bh6 30 Qg8+ Kc7 White Resigns.

ROUND 4

BEBE(White) vs HITECH(Black) Irregular King's Pawn Opening

Tony Scherzer wanted to avoid HITECH's opening book and does so quite effectively but this does not affect the outcome of the game.

1 Na3 e5 2 e4 B:a3 3 b:a3 Nf6 4 f3 d5 5 Bb2 Qe7 6 Bd3 Nbd7 7 Qe2 d4 8 f4 c5 9 g3 e:f4 10 g:f4 Nb6 11 e5 Nfd5 12 Qf2 Be6 13 Qg3 O-O-O 14 Ne2 f5 15 Rg1 c4 16 B:d4 c:d3 17 Q:d3 Kb8 18 Rd1 Rd7 19 h3 Rhd8 20 Qf3 Rc7 21 Qd3 Nc4 22 Rg3 Qh4 23 Qf3 Bf7 24 Qf2 Bh5 25 B:a7+ Ka8 26 Rb3 Q:f2+ 27 B:f2 B:e2 28 K:e2 N:f4+ 29 Ke1 Ra7 30 d4 N:e5 31 Kf1 g5 32 Re1 Nc6 33 R:e7 N:e7 34 Rg3 Rc8 35 c3 Ned5 36 Be1 h5 37 Bd2 g4 38 h:g4 f:g4 39 Bc1 Re8 40 c4 Ne2 41 Rg2 N:c1 42 c:d5 Rd8 43 Ke1 Black resigns.

ROUND 5

**MEPHISTO X(White) vs DEEP THOUGHT(Black)
Queen's Gambit Accepted (D25/18 8 g4)**

The first game which the "mature" DEEP THOUGHT has lost to another program. Appropriately it is the very positional, ever-dangerous MEPHISTO X program which achieves this feat against the tactically ferocious DEEP THOUGHT. The game follows a quiet course whereby Black never quite equalizes from the opening. White enjoys a strong, solid center which it never relinquishes. The reader may recall that MEPHISTO X almost beat DEEP THOUGHT at last year's 19th ACM NACCC in the same round with the same colors.

1 d4 d5 2 c4 d:c4 3 Nf3

MEPHISTO X follows the more solid, traditional lines of the Queen's Gambit Accepted which can also give White a nice edge.

3 . . . Nf6 4 e3 Bg4 5 B:c4 e6 6 h3 Bh5 7 Nc3 Nbd7 8 g4 Bg6 9 Nh4 Be4?!

It is better to "lose" the bishop on g6 and recapture with the h-pawn with play on the half-open h-file.

10 N:e4 N:e4 11 Nf3 Nd6 12 Bb3 Qe7?

A very poor placement of the queen, interfering with the development of the king's bishop. Indicated is 12 . . . c5 with counterplay. As the game continues, Black never gets to play the lever . . . c5.

13 Bd2 h5 14 Rg1 h:g4 15 h:g4 O-O-O 16 Ba5 b6?

Could Black really be a 2551 player? Why weaken the White squares around the king voluntarily? Indicated was 16 . . . Nb6 or Kb8.

17 Bb4

The ensuing trade of this bishop seems unnecessary, but if 18 Ba3, DEEP THOUGHT may get some counterplay with . . . e5. White should just try to play Rc1, Qe2, Bc6 and exploit the weakened white squares.

17 . . . a5 18 B:d6 Q:d6 19 Qc2 Be7 20 O-O-O Rh3 21 Nd2 c6

This pawn remains weak throughout the game and MEPHISTO X quietly exploits this.

22 Rh1 Rdh8 23 R:h3 R:h3 24 Ne4 Qc7 25 Kb1 g5

Black could not play 25 . . . c5 because of 26 d5.

26 Rc1 Kb7 27 Ba4

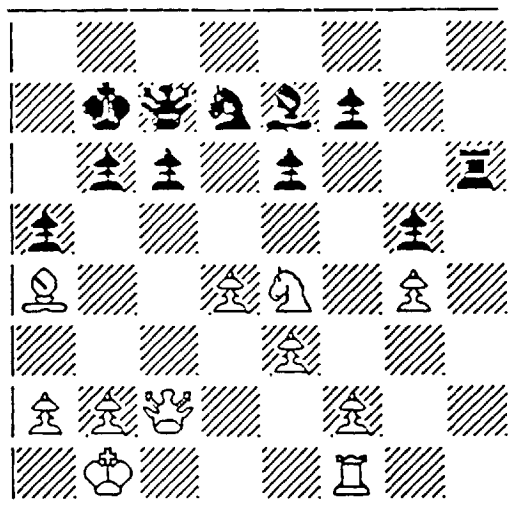


Figure 3. Position after White's 27 Ba4

MEPHISTO X plays directly and simply. It is not the world's most tactical program, and over the years I have noticed that it is reluctant to play line-opening pawn thrusts. Here 27 d5!? is one such try, but there could follow 27... e:d5 28 B:d5 Ne5 29 f4 g:f4 30 e:f4 Qd7! and perhaps MEPHISTO X's decision not to play 27 d5!? is correct.

27... Nb8 28 Nd2 Qd7 29 Bb3

Quite a sober but disappointing move. I can't prove it here, but intuition tells me that 29 Nc4!! must win. I would be willing to bet on this. There are lines like 29... b5 30 Ne5 Qe8 (30... Qd5? 31 Bb3) 31 B:b5 c:b5 32 Qc7+ with a winning attack. Besides 30 Ne5 there is the threat of 30 Qb3 hitting b6 and a5. I'm sure DEEP THOUGHT saw these possibilities against itself.

29... Na6 30 Qe4 Nb4 31 a3 Nd5 32 Qg2 Rh8 33 Ne4 f6 34 Qg3 Rg8 35 Rh1 f5 36 g:f5 e:f5 37 Qh3

The game has taken another course since the previous note, but White still enjoys a comfortable edge via the solid central pawn chain and control of the h-file which Black once owned.

37.. Rf8 38 Nd2 Bf6 39 Qh7 Rf7 40 Qh6 Qe6 41 Qg6 Rg7 42 Rh7 R:h7 43 Q:h7+ Be7 44 Kc1

Despite the foregoing exchange of rooks, White has made inroads into Black's position which is

somewhat tangled.

44 ... Kc7 45 Nf3 Kd8 46 Ne5 g4 47 Qh8+ Kc7 48 Kd2 Kb7 49 N:c6!

Finally MEPHISTO X finds a tactical coup which converts its positional advantage into a material win (a pawn). If now 49 ... K:c6 50 Qa8+ Kd6 51 Qb8+ Kd7 (or Kc6) 52 Ba4+ and wins.

49 ... Q:c6 50 Qe5 Nc7 51 Q:e7 Qg2 52 Qh4 f4 53 e:f4 Qe4 54 Q:g4 Q:d4+

Black's checks quickly run out.

55 Kc1 Q:f2 56 Qf5 Qf3 57 Kc2 Kc6 58 Qe5 Nd5?

This loses quickly, but there was little Black could do to stop the f-pawn in any case.

59 Qe6+ Kc5 60 B:d5 Q:d5 61 Q:d5+ K:d5 62 Kd3 a4 63 Kc3 Kc5 64 f5 Black resigns.


REBEL 89 X(White) vs HITECH(Black) Queen's Pawn Opening

This Queen's Pawn Opening between REBEL 89 X and HITECH is hard to call exciting, but it was very important in determining first place. In essence, after some early queen maneuvering, Black sets up an impregnable position. After much prying, White gradually misplaces its pieces, especially the bishop on h4 where it gets trapped. HITECH efficiently prepares this bishop's capture. REBEL 89 X gets two pawns for the piece, but they are to no avail. HITECH exemplifies championship-level technique to mop up.

1 d4 d5 2 Nf3 Nf6 3 Bf4 Bf5 4 e3 e6 5 Bd3 B:d3 6 Q:d3 Nbd7 7 Nbd2 c5 8 O-O c4 9 Qe2 Qb6 10 Rab1 Qa5 11 a3 Be7 12 e4 Qa4 13 c3 d:e4 14 N:e4 N:e4 15 Q:e4 Qb5 16 a4 Qa6 17 b4 Nf6 18 Qc2 Nd5 19 Bg3 Rc8 20 Rfe1 O-O 21 Re2 Qb6 22 Ne5 Qd8 23 a5 Qe8 24 Ra1 Qb5 25 h3 a6 26 Rb1 Rfd8 27 f4 Bd6 28 Rf1 Re8 29 Ng4 Re7 30 Bh4 Ree8 31 g3 Qc6 32 Ra1 Qb5 33 Nf2 Qd7 34 Ne4 Bf8 35 Rd1 h6 36 Kh2 Rb8 37 Nc5 Qb5 38 Ra1 Kh8 39 Rf1 Rbc8 40 Rb1 Rc7 41 Ra1 Rcc8 42 Rf1 g6 43 Ne4 Kg7 44 Rfe1 Rc7 45 Rd2 f6 46 Rde2 Rf7 47 Nf2 g5 48 f:g5 f:g5 49 B:g5 h:g5 50 R:e6 R:e6 51 R:e6 Kh8 52 Nd1 Re7 53 Qe2 R:e6 54 Q:e6 Kg7 55 Qe5+ Nf6 56 Qe6 Qe8 57 Q:e8 N:e8 58 Kg2 Nd6 59 Kf3 Kg6 60 Kg4 Ne4 61 h4 Nf6+ 62 Kf3 g4+ 63 Kg2 Kh5 64 Ne3 Ne4 65 N:c4 N:c3 66 Ne3 B:b4 67 d5 Bc5 68 Nc4 N:d5 69 Kf1 Nf6 70 Nd2 Bb4 71 Nb3 Ne4 White resigns.

Score Table for the 20th ACM NACCC, Reno

Team	Rounds					Total Points	Final Place
	1	2	3	4	5		
1. HITECH	1 9B	2 6W	2 2W	3 4B	4 5B	4	1=
2. DEEP THOUGHT	1 7B	2 8W	3 1B	4 5W	4 3B	4	1=
3. MEPHISTO X	1 10W	2 5B	3 6B	4 7W	4 2W	3	3=
4. BEBE	1/2 8B	1/2 9W	1 1/2 7B	2 1W	3 10B	3	3=
5. REBEL 89 X	1/2 6B	1 1/2 3W	2 1/2 8B	2 1/2 2B	2 1/2 1W	2 1/2	5=
6. CRAY BLITZ	1/2 5W	1/2 1B	1/2 3W	1 1/2 9B	2 1/2 7W	2 1/2	5=
7. PHOENIX	0 2W	1 10B	1 4W	1 1/2 3B	1 1/2 6B	1 1/2	7=
8. BP	1 4W	1 2B	1 5W	1 1/2 10B	1 1/2 9W	1 1/2	7=
9. NOVAG X	0 1W	0 4B	1/2 10W	1/2 6W	1 1/2 8B	1 1/2	7=
10. ZARKOV	1/2 3B	1/2 7W	1 9B	1 1/2 5W	1 1/2 4W	1 1/2	7=

Code:  Number of points
Number of opponent and color

Computing System Information

<u>Program</u> , <u>Authors</u>	<u>Computing system</u> , <u>language</u> , etc.	<u>Book size</u>	<u>Nodes/sec.</u>	<u>Rating</u>
BEBE Tony Scherzer, Linda Scherzer	SYS-10 Chess Engine, assmblr 64Kb, 16 bits, 10 mips, 256K hash table.*	5K	40K	2175
BP Compaq 386/20, C+assmblr Robert Cullum	1Mb, 32 bits, 5 mips, 32K hash table*	15K	600	2050
CRAY BLITZ Robert Hyatt, Harry Nelson, Alburt Gower	Cray XMP 48, Fortran+C+assembler 8 Mw, 64 bits, 105 mips/proc., 4 M hash table, (Lawrence Livermore National Lab.).	60K	80K	2375
DEEP THOUGHT Thomas Anantharaman, Mike Browne, Murray Campbell, Feng-hsiung Hsu, and Andreas Nowatzyk	3 SUN 4's with two special processors per SUN, 5K C+microcode, .5 M hash table per SUN, (Carnegie-Mellon Univ).	5K	2000K	2551
HITECH Carl Ebeling, Hans Berliner, Gordon Goetsch, Murray Campbell, Andy Gruss, and Andy Palay	SUN 4 with special chess hardware, assembler 1 M hash table, (Carnegie-Mellon University).	NA	100K	2413
MEPHISTO X Richard Lang	68030 Mephisto machine, assmblr 128k ROM, 32bit, 45 mh., 1meg hash table.*	60K	10K	2350FIDE
NOVAG X David Kittinger	6502 dedicated hardware, assembler 64K, 8 bits, 4 mips.*	10K	4K	2164
REBEL 89 X Ed Schroeder	6502 bit slice processor, assembler 64Kb, 8 bits, 18mh.*	12K	2K	2170FIDE
PHOENIX Jonathan Schaeffer	7 Sun 4s, C, 256K hash table/processor, (Carnegie-Mellon University)	20K	10K	2200
ZARKOV John Stanbeck	Hewlett-Packard 9000/835, C 48Meg, 32 bits, 10 mips, 16K hash table. (HP, Fort Collins, Colorado)	5K	3K	2200

Notes:

- (1) Hash table size indicates the number of positons.
- (2) Rating estimates are based on USCF points unless otherwise specified.
- (3) * denotes computer at site.