The Twentieth ACM North American Computer Chess Championship

Reno, Nevada
November 12-15, 1989
A Special Event at the Supercomputing '89 Conference

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1970 New York: CHESS 3.0.....1971 Chicago: CHESS 3.0.....1972 Boston: CHESS 3.0.....
.....1973 Atlanta: CHESS 3.5.....1974 San Diego: RIBBIT.....1975 Minneapolis: CHESS 4.4..
..1976 Houston: CHESS 4.5.....1977 Seattle: CHESS 4.6.....1978 Washington: BELLE.....
....1979 Detroit: CHESS 4.9.....1980 Nashville: BELLE.....1981 Los Angeles: BELLE.....
..1982 Dallas: BELLE.....1983 New York: CRAY BLITZ.....1984 San Fransisco: CRAY BLITZ.....
.....1985 Denver: HITECH.....1986 Dallas: BELLE.....1987 Dallas: CHIPTEST-M.....
.....1988 Orlando: DEEP THOUGHT

Welcome and Overview

This tournament marks the twentieth consecutive year that the ACM has organized the ACM North American Computer Chess Championship. Beginning in 1970, these tournaments have served 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 going from approximately 1600 to 2600! These ACM championships have served as a catalyst for some of this progress.

It was 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 that dominated the ACM tournaments throughout the 70's. 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 tournaments from 1970 through 1977.

Ken Thompson and Joe Condon's BELLE, using special purpose hardware, upset CHESS 4.7 in 1978, but the later came back in 1979 and won its last ACM tournament. 1980-1982 were the years that BELLE dominated. BELLE was awarded the title of US Master in 1983. Just when BELLE seemed unbeatable, Robert Hyatt, Harry Nelson and Bert Gower's CRAY BLITZ upset Thompson and Condon's protegé in the World Championship (held in New York in place of the usual NACCC). CRAY BLITZ repeated at ACM '84. 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 dominated the ACM championships, and it is threatening to do so again this year. DEEP THOUGHT was developed at Carnegie-Mellon Unversity by Feng-Hsiung Hsu, Murray Campbell, Thimas Anantharaman, Peter Jansen and Andrew Nowatzyk. It searches approximately 2,000,000 chess positions per second, ten times as many as any other program. DEEP THOUGHT seems to be playing chess at the Grandmaster level. It played a two game match against Gary Kasparov in New York just several weeks ago with Kasparov decisively winning 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 playing at the 2480-2500 FIDE level.

But DEEP THOUGHT will find that its competition is far from giving up the race. HITECH, CRAY BLITZ, and MEPHISTO X are the main challengers, but PHOENIX and BEBE can also be expected to put in strong performances.

This year's tournament offers $5000 in prizes. The prize to the winner is $2500, second place is worth $1500, and the third place finisher will earn $1000. In addition to the cash prizes, trophies will be awarded to the first three finishers. A special trophy will be given to the "Best Small Computing System."

A Technical Session will be held on Tuesday afternoon from 3:30pm-5:30pm chaired by Tony Marsland. The topic of the session will be endgame play by computers. Once upon a time computers played particularly bad endgames, but this is no longer the case. Panelists include Hans Berliner, Robert Hyatt, Feng-hsuing Hsu, David Levy, Monty Newborn, Jonathan Schaeffer, and Tony Scherzer.

David Levy will serve as Tournament Director. David is returning after almost a decade layoff, replacing Mike Valvo. David served as TD for the first time in 1971, continuing into the early 1980s when his programs began to compete. He will be assisted by Tony Marsland and Monty Newborn.

Attending as our Honored Guest is Ben Mittman. Ben was head of Northwestern University's Vogelback Computing Certer during the years that Slate, Atkin, and Gorlen dominated the ACM events. From 1971 through 1983, Ben and I organized the tournaments together. From 1977 through 1983, Ben served as the first president of the International Computer Chess Association.

I would like to extend our thanks to the Reno Chess Club, and to its president, Gerry Weikel, for the help they have provided us in running this event.

This is the second year that we have been affiliated with the Supercomputing conference. Last year, Supercomputing '88 hosted us in Orlando, this year it's Reno, and next year we are scheduled to be a part of Supercomputing '90 in New York City. I would like to express our appreciation to Supercomputing '89 for having us as part of their program.

In ending, I want to thank the participants for coming here. I wish them good luck, and I hope the audience enjoys watching one of the greatest shows on earth.

Monty Newborn
Chairman, ACM Computer Chess Committee

Hans Berliner
Tony Marsland
Kathe Spracklen
Ken Thompson
Committee Members

Important Times and Places

1. Schedule of Rounds (All games are played in the Goldwyn Pavilion)

Round 1:	1:00 PM	Sunday	November 12
Round 2:	7:30 PM	Sunday	November 12
Round 3:	7:00 PM	Monday	November 13
Round 4:	7:00 PM	Tuesday	November 14
Round 5:	7:00 PM	Wednesday	November 15

2. **Technical Session:** Endgame Play by Computers, Tuesday, November 14 at 3:30PM. The moderator is Tony Marsland.

3. **ICCA Meeting:** Tuesday, November 14 at 6:00 PM in the Goldwyn Pavilion.

4. **ACM Computer Chess Committee Meeting:** Wednesday Luncheon, November 15, 1:00 PM.

5. **Wine and Cheese Party:** Wednesday November 15 at 10:30 PM, celebrating the 20th ACM's North American Computer Chess Championship.

6. **Awards Presentation:** Thursday Luncheon, Nov. 16 at 12:00 PM. (Location to be announced)

Awards:	First Place.....	$2500 and Trophy
	Second Place.....	$1500 and Trophy
	Third Place.....	$1000 and Trophy
	Best Small Computing System.....	Trophy

Tournament Director: David Levy (with Tony Marsland & Monty Newborn serving as assistants.)

* *

The ACM Computer Chess Committee

In 1979, the ACM established the Computer Chess Committee as a standing committee on the Management Board. The committee was given the responsibility of organizing computer chess activities with the ACM. In 1984, the committee was transferred to the Conferences Board where it is today. The main function of the committee is to organize the ACM's Annual North American Computer Chess Championship. The tournament has been held annually since 1970. The current committee members are Monty Newborn, Chairman, Hans Berliner, Tony Marsland, Kathe Spracklen, and Ken Thompson.

Information on Participants

BEBE	Tony Scherzer and Linda Scherzer, SYS-10 Inc., 2117 Stonington Avenue, Hoffman Estates, Illinois 60195.
BP	Robert Cullum, P. O. Box 111, Prospect Heights, Illinois, 60070.
CRAY BLITZ	Robert Hyatt, Harry Nelson, Alburt Gower, c/o RH, Computer and Information Science Department, Campbell Hall, University of Alabama at Birmingham, Birmingham, ALabama, 35294.
DEEP THOUGHT	Thomas Anantharaman, Mike Browne, Murray Campbell, Feng-hsiung Hsu, and Andreas Nowatzyk, c/o FH, IBM T. J. Watson Research Center, P. O. Box 704, Yorktown Heights, New York 10598.
HITECH	Carl Ebeling, Hans Berliner, Gordon Goetsch, Murray Campbell, Gruss, and Andy Palay, c/o HB, Department of Computer Science, Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213.
MEPHISTO X	Richard Lang, Hegener & Glaser A. G., Arnulf Street #2, 8000 Munich 2, West Germany.
NIGHTMARE	Reinhold Gellner, Gaby von Rekowski, Bohnenkampstrasse 12, D-4500 Osnabrueck, West Germany.
NOVAG X	David Kittinger, 5965 Arbon Drive, Mobile, Alabama 36608.
REBEL 89	Ed Schroeder, c/o Hegener & Glaser A. G., Arnulf Street #2, 8000 Munich 2, West Germany.
SUN PHOENIX	Jonathan Schaeffer, Department of Computing Science, University of Alberta, Edmonton, Alberta, T6G 2H1.
ZARKOV	John Stanbeck, 4237 Cape Cod Circle, Ft. Collins, Colorado 80525.

On Standby:

BELLE	Ken Thompson and Joe Condon, c/0 KT, Room 2C519, Bell Laboratories, Murray Hill, New Jersey 07974.

Computing System Information

Program	Computing system,language, etc. (* indicates computer at site)	Book size	Nodes/ sec.	Rating estimate
BEBE	SYS-10 Chess Engine, assmbler 65Kb, 16 bits,10 mips.*	5K	40K	2150
BELLE	Special Chess hardware, C (Bell Laboratories, Murray Hill)	200K	140K	2250
BP	Compaq 386/20, C+assmbler 1Mb, 32 bits, 5 mips, 300K hash table*	15K	600	2050
CRAY BLITZ	Cray XMP 48, Fortran+C+assembler 8 Mw, 64 bits, 105 mips/proc., (Lawrence Livermore National Lab.)	60K	80K	2373
DEEP THOUGHT	SUN 4 plus 6 special processors, C+microcode, 1 Meg hash table (Carnegie-Mellon Univ)	5K	2000K	2551
HITECH	SUN 4 with special hardware, assembler (Carnegie-Mellon University)	NA	100K	2413
MEPHISTO X	68030 Mephisto machine, assmbler 128k ROM, 32bit, 2meg hash table.*	60K	10K	2350FIDE
NIGHTMARE	IBM PC compatible, C*	15K	2K	NA
NOVAG X	6502 dedicated hardware, assembler 64K, 8 bits, 4 mips.*	4K	4K	2164
REBEL 89	6502 bit slice processor, assembler 48K, 8 bits.*	NA	4K	2250
SUN PHOENIX	5-7 Sun 4s, C (Carnegie-Mellon University)	8K	10K	2150
ZARKOV	Hewlett-Packard 9000/835, C 48Meg, 32 bit, 10 mips (HP, Fort Collins, Colorado)	5K	3K	2200

Score Table

Team	Rounds 1	2	3	4	5	Total Points	Final Place
1. BEBE							
2. BELLE							
3. BP							
4. CRAY BLITZ							
5. DEEP THOUGHT							
6. HITECH							
7. MEPHISTO X							
8. NIGHTMARE							
9. NOVAG X							
10. REBEL89							
11. SUN PHOENIX							
12. ZARKOV							

Note: Number under the name of each participant is its rating as provided on the entry form. All ratings are USCF unless noted otherwise.

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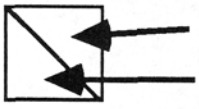

Number of points

Number and color of opponent

Tournament Rules

1. Each entry is a computing system and one or more human operators. A listing of all chess-related programs running on the system must be available on demand to the TD. Each entry requires at least one full-time operator (i.e., one operator cannot assist with more than one entry).

2. Participants are required to attend an orgaizational meeting at 12 noon on November 12 for the purpose of officially registering for the tournament. Rules will be finalized at that meeting. The TD has the right to chose an alternate to replace an entrant who fails to appear.

3. The tournament is a five round Swiss style tournament. The first and second rounds will be played Sunday November 12 at 1:00 PM and 7:30 PM respectively. The third round is scheduled for Monday, November 13 at 7:00 PM, the fourth round for Tuesday November 14 at 7:00 PM, and the final round for Wednesday November 15 at 7:00 PM.

4. Trophies and prizes will be awarded to the first three finishers. The order of finish will be determined by the total number of points earned. If two or more teams have an equal number of points, they will be considered as tied, and the trophies and prizes divided accordingly. A prize of $2500 will be awarded to the program which finishes the tournament with the most points, $1500 to the second most, and $1000 to the third most. A trophy will be awarded to the "Best Small Computing System."

5. Unless otherwise specified, rules of play are identical to those of "human" tournament play. If a point is in question, the TD has the right to make the final decision.

6. Games are played at a speed of 40 moves per player in the first two hours and 20 moves per player per hour thereafter.

7. The TD has the right to adjudicate a game after six hours of total clock time. The adjudication will be made on the premise that perfect chess will be played by both sides from the final position. Every effort will be made by the TD to avoid adjudication. In particular, the second round will not begin until 8:00 p.m. on Sunday, if necessary to avoid adjudicating a first-round game. A game will be adjudicated in the final round after 8 hours of play if the result of the game has no bearing on the order of the top three finishers.

10. An operator may ask that the TD stop the clock at most twice during the course of a game because of technical difficulties. The clock must be restarted each time after at most 15 minutes. If an operator using a remote computer can clearly establish that his problems are not in his own computing system but in the communication network, the TD can permit additional time-outs.

11. If a program experiences technical difficulties, the operator can ask the TD for permission to restart the program. When restarting a program after a failure of any kind, the operator must reset all parameters to their values at the time the game was interupted. An operator error made when starting a game or in the middle of a game can be corrected only with the approval of the TD.

12. If an operator types in an incorrect move, the TD must be immediately notified. The clock will be stopped. The game must then be backed up to the point where the error occurred. The clock of the side which made the error is left unchanged while the TD will back up the clock of the other side an amount equal to that lost. The TD may back up the clock of the side in error if it would otherwise force that side to lose the game on time, or leave it with less than two minutes per move until the next time control. In this case, the TD will back up the clock of the side in error to give it an average of two minutes per move until the next time control. If no record is available, the TD will assume each move by the side not in error required three minutes. Both sides may adjust program parameters after such an error with the approval of the TD. The TD may not allow certain parameters to be changed, e.g., the contempt factor.

13. Terminals located at the tournament site must communicate directly with remote computers, i.e., there cannot be any human intermediary at the remote location.

14. Each team that uses a terminal must position the terminal on the game table in such a way that the opponent has a good view of it. An operator can only (1) type in moves and (2) respond to request from the computer for clock information. If an operator must type in any other information, it must be approved ahead of time by the TD. (This might happen if there is noise on the communication line and, for example, a CR must be typed to clear the line.) The operator cannot querry the system to see if it alive without permission of the TD.

15. A team must receive the approval of the TD to change from one computing system to another.

16. Each game is officially played on a chess board provided by the Tournament Committee. The official clock is also provided by the Tournament Committee.

17. At the end of each game, each team is required to turn in a game listing to the TD.

History of Major Tournaments

ACM North American Computer Chess Championships

Year	City	Winner	Runner-up
1970	New York	CHESS 3.0; Slate, Atkin, Gorlen, CDC 6400	DALY CHESS PROGRAM; Daly,King, Varian 620/i
1971	Chicago	CHESS 3.5; Slate, Atkin, Gorlen, CDC 6400	TECH; Gillogly, PDP 10
1972	Boston	CHESS 3.6; Slate, Atkin, Gorlen, CDC 6400	OSTRICH; Arnold, Newborn, DG Supernova
1973	Atlanta	CHESS 4.0; Slate, Atkin, Gorlen, CDC 6400	TECH II; Baisley, PDP 10
1974	San Diego	RIBBIT; Hansen, Crook, Parry, Honeywell 6050	CHESS 4.0; Slate, Atkin, CDC 6400
1975	Minneapolis	CHESS 4.4; Slate, Atkin, CDC Cyber 175	TREEFROG; Hansen, Calnek, Crook, Honeywell 6080
1976	Houston	CHESS 4.5; Slate, Atkin, CDC Cyber 176	CHAOS; Swartz, Berman, ALexander Ruben, Toikka, Winograd, Amdahl 470
1977	Seattle	CHESS 4.6; Slate, Atkin, CDC Cyber 176	DUCHESS; Truscott, Wright, Jensen, IBM 370/168
1978	Washington	BELLE; Thompson, Condon, PDP 11/70 with chess hardware	CHESS 4.7; Slate, Atkin, CDC Cyber 176
1979	Detroit	CHESS 4.9; Slate, Atkin, CDC Cyber 176	BELLE; Thompson, Condon, PDP 11/70 with chess hardware
1980	Nashville	BELLE; Thompson, Condon, PDP 11/70 with chess hardware	CHAOS; Alexander, O'Keefe, Swartz, Berman, Amdahl 470
1981	Los Angeles	BELLE; Thompson, Condon, PDP 11/23 with chess hardware	NUCHESS; Blanchard, Slate, CDC Cyber 176
1982	Dallas	BELLE; Thompson, Condon, PDP 11/23 with chess hardware	CRAY BLITZ; Hyatt, Gower, Nelson, Cray 1
1983	Not held as the ACM's North American Computer Chess Championship that year but as the Fourth World Championship. See information above on this championship.		
1984	San Fransisco	CRAY BLITZ; Hyatt, Gower, Nelson, Cray XMP/4	BEBE; Scherzer, Chess Engine, and FIDELITY EXPERIMENTAL; Sparcklen, Spracklen, Fidelity machine

1985	Denver	HITECH; Ebeling, Berliner, Goetsch, Paley Campbell, Slomer, SUN w/ chess hardware	BEBE; Scherzer, Chess engine
1986	Dallas	BELLE; Thompson, Condon, PDP 11/23 with chess hardware	LACHEX; Wendroff, Cray X-MP
1987	Dallas	CHIPTEST-M; Anantharaman, Hsu Campbell, SUN 3 with VLSI chess hardware	CRAY BLITZ; Hyatt, Nelson, Gower Cray XMP 4/8
1988	Orlando	DEEP THOUGHT 0.02; Hsu Anatharaman, Browne, Campbell, Nowatzyk, SUN 3 w/ VLSI circuitry	CHESS CHALLENGER EXP; Spracklen, Spracklen, Nelson, Fidelity machine with Motorola 68030 microprocessor

World Championships

Year	City	Winner	Runner-up
1974	Stockholm	KAISSA; Donskoy, Arlazarov, ICL 4/70	CHESS 4.0; Slate, Atkin, CDC 6600
1977	Toronto	CHESS 4.6; Slate, Atkin, CDC Cyber 176	DUCHESS; Truscott, Wright, Jensen, IBM 370/165
1980	Linz	BELLE; Thompson, Condon, PDP 11/23 with chess circuitry	CHAOS; Alexander, Swartz, Berman O'Keefe, Amdahl 470/V8
1983	New York	CRAY BLITZ; Hyatt, Gower, Nelson, Cray XMP 48	BEBE; Scherzer, Chess engine
1986	Cologne	CRAY BLITZ; Hyatt, Gower, Nelson, Cray XMP	HITECH; Berliner, et al., SUN workstaton with chess circuitry
1989	Edmonton	DEEP THOUGHT; Hsu, Anantharaman Browne, Campbell, Jansen, Nowatzyk, SUN with VLSI chess hardware	BEBE; Scherzer, Scherzer, Chess Engine

World Microcomputer Championships

Year	City	Winner	Runner-up
1980	London	CHESS CHALLENGER	BORIS EXPERIMENTAL
1981	Travemunde	FIDELITY X	CHESS CHAMPION MARK V
1983	Budapest	ELITE A/S	MEPHISTO X
1984	Glasgow	Four way tie: ELITE X, MEPHISTO S/X, PRINCHESS, PSION CHESS	
1985	Amsterdam	MEPHISTO AMSTERDAM I	MEPHISTO AMSTERDAM II
1986	Dallas	MEPHISTO DALLAS 3	FIDELITY "2533"
1987	Rome	MEPHISTO	CYRUS 68K
1988	Almeria	MEPHISTO	FIDELITY

Results of The Nineteenth ACM North American Computer Chess Championship

Monty Newborn and Danny Kopec

In 1987, it was called CHIPTEST-M. In 1988, with tongue in cheek and after a major overhaul, it was renamed DEEP THOUGHT 0.02. Whatever it is called, it plays tough chess! DEEP THOUGHT 0.02 won three and drew one of its four games and captured first place at The 19th ACM North American Computer Chess Championship held November 13–15, 1988 at ACM SIGARCH/IEEE Computer Society's Supercomputing '88 in Orlando, Florida. Also finishing with three-and-a-half points was CHESS CHALLENGER X. DEEP THOUGHT 0.02 was awarded first place based on a tie-breaking scheme that considers how well each program's opponents performed. The two programs divided the $2000 first-place prize.

DEEP THOUGHT 0.02 was developed at Carnegie Mellon University by a group of graduate students headed by Feng-hsiung Hsu which included Thomas Anantharaman, Mike Browne, and Murray Campbell. It uses special-purpose VLSI chess circuitry developed by Hsu, and it searches approximately 720,000 chess positions each second. In 1987, its predecessor, CHIPTEST-M won all four of its games in winning the championship. This year, the competition was stronger yet, and while DEEP THOUGHT 0.02 finished first, the road to the title was strewn with obstacles. In Round 1, it had to be happy to finish with a draw with CHESS CHALLENGER X. It had a rather easy victory against SUN PHOENIX in Round 2, and played a brilliant game against HITECH in Round 3. In Round 4, it looked as though it would be upset by MEPHISTO X in an exciting, grinding game, but the great power of DEEP THOUGHT 0.02's search finally overcame the excellent positional play of MEPHISTO X.

To put the strength of the programs into perspective, it is important to note that in the week following its success in Orlando, DEEP THOUGHT 0.02 finished in a first-place tie with Grandmaster Anthony Miles in the $130,000 Software Toolworks Chess Championship in Long Beach, California. In doing so, it defeated Grandmaster Bent Larsen who holds a World Chess Federation (FIDE) rating of 2580. It finished ahead of five other Grandmasters, including former World Champion Mikhail Tal, Sammy Reshevsky, and Walter Browne. (A comprehensive report on this tournament appears in the March 1989 issue of *Chess Life*.)

It was expected that DEEP THOUGHT 0.02 would receive its stiffest competition from HITECH, also developed at Carnegie Mellon under the leadership of former World Correspondence Chess Champion Hans Berliner, and the team of Carl Ebeling, Gordon Goetsch, Murray Campbell, Andy Gruss, and Andy Palay. HITECH uses special-purpose circuitry connected to a SUN 4. It searches approximately 150,000 chess positions per second. HITECH had finished first in the Pennsylvania State Championship both in 1987 and 1988, and its rating appeared to be over the 2400 United States Chess Federation (USCF) level. Anticipating a showdown between his program and DEEP THOUGHT 0.02, Berliner prepared a special opening for their encounter. It involved an old variation where White (DEEP THOUGHT 0.02) was given the opportunity to make a pawn sacrifice in return for sustained attacking chances. The opening proceeded as Berliner expected, but DEEP THOUGHT 0.02 took advantage of several passive moves made by HITECH just after leaving its book and defeated the latter in elegant style.

DEEP THOUGHT 0.02's strongest test came, in fact, in its Round 1 battle with CHESS CHALLENGER X. DEEP THOUGHT 0.02 was at a disadvantage throughout much of the game but hung on for a draw. CHESS CHALLENGER X, written by Dan and Kathe Spracklen and Ron Nelson, is an experimental version of Fidelity International Inc.'s CHESS CHALLENGER series of products. It defeated CRAY BLITZ, the current World Champion, in the third round and HITECH in the final round showing that its success in the first round was far from an accident.

In the final round, DEEP THOUGHT 0.02 was paired with MEPHISTO X, programmed by Richard Lang. The program is an experimental version of the commer-

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cially available series of programs developed by West Germany's Hegener and Glaser A.G., which use the name MEPHISTO. Hegener and Glaser's best commercial version of MEPHISTO is currently the World Microcomputer Champion. For most of the game, MEPHISTO X had a positional advantage, gradually constraining DEEP THOUGHT 0.02's pieces into a smaller and smaller space. However, DEEP THOUGHT 0.02 fought tenaciously and slowly turned the tables, emerging as victor on move 73. If there is one weakness which could be observed in MEPHISTO X's play, it was the inability to convert an opening or middlegame advantage into a decisive attack by opening up the position in the correct way.

As mentioned earlier, the current World Champion, CRAY BLITZ, lost to CHESS CHALLENGER X but it also could do no better than to draw with MEPHISTO X in Round 2. It had to settle for a fourth-place finish, much to the disappointment of its programmers Robert Hyatt, Bert Gower, and Harry Nelson.

A field of twelve programs participated. Even the weakest, WAYCOOL, which managed only to pick up a half-point, played strong chess—apparently at the Expert level (2000 USCF). WAYCOOL used 256 processors of a 512-processor *N*-Cube, one of three multiprocessing systems to participate. SUN PHOENIX used a network of 28 SUN 3s, and CRAY BLITZ used a 4-processor Cray XMP.

Mike Valvo served as Tournament Director. It is interesting to note that following the tournament, Valvo and DEEP THOUGHT 0.02 entered into a two-game postal match via electronic mail. The games began in December and Valvo won both of them. Valvo has a USCF rating of 2481 and is also perhaps the best blindfold player in the United States. His two victories may mean: (1) computers intimidate Valvo less than others less familiar with their play; (2) play by computers, in contrast with that of man, is relatively weaker as time limits are increased—the combinatorial aspects of the game become less acute for humans; (3) Valvo had observed DEEP THOUGHT 0.02 play a number of games and had some feeling for its weaknesses, while DEEP

Score Table and Computing System Information

Number, program, computing system and language, (programmers), book size, nodes/sec, (* indicates computer at site)	Cumulative Points of Rounds				Place/Tie Break
	1	2	3	4	
1 DEEP THOUGHT 0.02, SUN 4 plus 2 special processors, C+microcode, at CMU, (Thomas Anantharaman, Mike Browne, Murray Campbell, Feng-hsiung Hsu, Andreas Nowatzyk), 5K, 720K.	0.5 (W2)	1.5 (B6)	2.5 (W5)	3.5 (B3)	1/10
2 CHESS CHALLENGER X, 68030-based micro, assmb., (Dan Spracklen, Kathe Spracklen, Ron Nelson), NA, NA.*	0.5 (B1)	1.5 (W12)	2.5 (B4)	3.5 (W5)	2/8.5
3 MEPHISTO X, 68020 Mephisto machine, assmb., 128K ROM, 2meg RAM, (Richard Lang), 60K, 3–5K.*	1.0 (B11)	1.5 (W4)	2.5 (W6)	2.5 (W1)	3/9/35
4 CRAY BLITZ, Cray XMP, 4 proc's, Fort + C + assmb., 32Mw, 64 bits, 105 mips/proc., at Cray Research, Mendota Heights, Minn. (Robert Hyatt, Bert Gower, Harry Nelson), 50K, 80K.	1.0 (W8)	1.5 (B3)	1.5 (W2)	2.5 (B9)	4/9/32
5 HITECH, SUN 4 with hardware for search and pattern recog., assmb., (Carl Ebeling, Hans Berliner, Gordon Goetsch, Murray Campbell, Andy Gruss, and Andy Palay), NA, 110K.	1.0 (B12)	2.0 (W7)	2.0 (B1)	2.0 (B2)	5/9.5
6 SUN PHOENIX, 28 SUN 3s, C, at SUN Microsystems, Mountain View, Cal. (Jonathan Schaeffer, Marius Olaffson), 8K, 20K.	1.0 (B10)	1.0 (W1)	1.0 (W3)	2.0 (B8)	6/9
7 BEBE, SYS-10 Chess Engine, assmb., 65Kb, 16 bits, 10 mips, (Tony Scherzer, Linda Scherzer), 4K, 40K.*	1.0 (W9)	1.0 (B5)	1.0 (W8)	2.0 (B12)	7/5.5
8 NOVAG X, Novag-dedicated Super Expert, 6502 bit-sliced micro, 6502 assmb., 64Kb for program, 16Kb for search, 6 mips, (David Kittinger), 3.2K, 3K.*	0.0 (B4)	0.5 (W11)	1.5 (B7)	1.5 (W6)	8/7.5
9 BP, Compaq 386/20, C + assmb., 1Mb, 5 mips, 70Kb for program, 300 Kb for search, (Robert Cullum), 15K, 6K.*	0.0 (B7)	1.0 (W10)	1.5 (W11)	1.5 (W4)	9/7
10 CYRUS 68K, IBM PC with 68020 card, assmb., 256K RAM, (Mark Taylor, David Levy), 25K, 1K.*	0.0 (W6)	0.0 (B9)	0.5 (B12)	1.5 (W11)	10/5
11 A.I. CHESS! X, IBM compatible 80286 AT or 80386-based, assmb., 3-4mips, (Martin Hirsch), 8K, 2K.*	0.0 (W3)	0.5 (B8)	1.0 (B9)	1.0 (B10)	11/7
12 WAYCOOL, 512 processor NCUBE/10, 1/2 Mb RAM/proc., 1mips/proc., C, at Cal Tech. (Ed Felton, Steve Otto, Rod Morison, Rob Fatland), NA, NA.	0.0 (W5)	0.0 (B2)	0.5 (W10)	0.5 (W7)	12/9

The notation (W2) indicates the program played against #2 with the White colors.

THOUGHT 0.02 had no similar opportunity. This might have been particularly important in the openings and long-term strategically or structurally based positions.

The table lists the participants, information on their computing systems, their authors and basic information about the programs. It is interesting to note that all programs were written in either C or assembler, something that no one would have imagined in 1970 when the first ACM Championship was held.

The 20th ACM North American Computer Chess Championship is scheduled to take place at Supercomputing '89 in Reno, Nevada on November 12–15, 1989. Prizes for the first three finishers for this special 20th year edition of the championship will total $5000. For information write to Professor Monty Newborn, School of Computer Science, McGill University, 3480 University St., Room 318, Montreal, Quebec, Canada, H3A 2A7.

THE GAMES

Five outstanding games are presented. Overview comments are made about three games, while the Round 3 showdown between DEEP THOUGHT 0.02 and HITECH and the critical Round 4 game between CHESS CHALLENGER X and HITECH are annotated in detail.

Round 1

Form held in the Round 1 with the exception of an outstanding performance by CHESS CHALLENGER X in drawing with favorite DEEP THOUGHT 0.02 although in the end the Fidelity program missed at least one clear chance to win. The opening was placid with a number of exchanges, but the isolated Black Q-pawn still offered White a long-term weakness to attack. DEEP THOUGHT 0.02 mishandled the position, however, looking for a tactical solution (16. c4) to exploit the weakness, only to emerge with a slightly disadvantageous ending of R+N against R+B. The resulting B versus N ending with pawns on both sides of the board and White's weakened, split Q-side pawns, clearly favored Black. A definite improvement was 34. . . . Ke4 when the BK could have become dominant. Instead, as more pawns were exchanged, Black's winning chances were eroded.

DEEP THOUGHT 0.02 (White) vs. CHESS CHALLENGER X (Black)
Sicilian Defense, c3 Variation

1. e4 c5 2. c3 e6 3. d4 d5
4. exd5 exd5 5. Nf3 Nc6
6. Be3 cxd4 7. Bxd4 Nxd4
8. Qxd4 Nf6 9. Bb5+ Bd7
10. Bxd7+ Qxd7 11. O-O Be7
12. Nbd2 O-O 13. Ne5 Qf5
14. Ndf3 Bd6 15. Rae1 Rfe8
16. c4 Ne4 17. Qxd5 Bxe5
18. Kh1 Rad8 19. Qxe4 Qxe4
20. Rxe4 Bxb2 21. Rxe8+ Rxe8
22. Rd1 Ba3 23. Rd7 Re2
24. h4 h5 25. Rd8+ Kh7
26. Rd2 Rxd2 27. Nxd2 Kg6
28. g3 Kf5 29. Nb3 Bb4 30. f3 f6
31. Kg2 g5 32. Nc1 Bd6
33. Kh3 Ke5 34. Ne2 Bc5
35. f4+ Kf5 36. fxg5 fxg5
37. hxg5 Kxg5 38. Nc3 Bb4
39. Nd5 Bd6 40. Kg2 Be5
41. Kf3 b6 42. a4 Bd6
43. Nc3 Bc7 44. c5 bxc5
45. Ne4+ Kg6 46. Nxc5 Kf5
47. Nd3 Kg5 48. Nb4 a5
49. Nd5 Be5 50. Ne3 Bf6 (Drawn by agreement) (½–½)

Round 3

When Round 3 began, HITECH was the only program with a perfect score. DEEP THOUGHT 0.02, CHESS CHALLENGER X, MEPHISTO X, and CRAY BLITZ followed with 1.5 points.

DEEP THOUGHT 0.02 (White) vs. HITECH (Black)
Alekhine's Defense
(ECO B, Section 04, Row 3)

Hans Berliner, the head of the programming team that developed HITECH, prepared a risky line in the Alekhine's Defense which involved an effort by Black to ensconce a pawn, but the program had to pay the price in terms of pawn structure, development, and king safety. This ploy backfired due to DEEP THOUGHT 0.02's ingenious tactical skills. Although the game was protracted, it was virtually decided by the twentieth move.

DEEP THOUGHT 0.02 was searching between eight and ten plies on most moves. Hsu provided us with a printout of the log of the game created by DEEP THOUGHT 0.02, and the following analysis of the game uses data from the log. On each non-book move, DEEP THOUGHT 0.02 prints out the first eight moves of the principal continuation and the score of that continuation.

1. e4 Nf6 2. e5 Nd5 3. d4 d6
4. Nf3 Nc6

Black can avoid the ensuing gambit with 4. . . . Bg4 which is the move usually seen at the Master level in this position.

5. c4 Nb6 6. e6 fxe6

Berliner had anticipated the game would follow this path, and he assumed his program was capable of gaining a positional advantage after accepting the pawn sacrifice. DEEP THOUGHT 0.02 responds strongly, however, and according to Robert Byrne of the *New York Times*, the game followed "known analysis" until Black's questionable tenth move.

7. Ng5

This is the sharpest move, threatening simply Bd3, but more preparation with 7. Nc3 is also possible, although theory then gives 7. . . . e5 8. d5 Nd4 9. Nxd4 exd4 10. Qxd4 e5 with equality. Another principal alternative is 7. h4 when White keeps an edge (as with the text move) after: 7. . . . e5 8. d5 Nd4 9. Nxd4 exd4 10. Qxd4 e5 11. Qd1 according to Boleslavsky in the *Encyclopedia of Chess Openings*, Vol. B, Section B04, pp. 32–34.

7. . . . g6

DEEP THOUGHT 0.02 leaves its opening book. If 7. . . . e5 then the *Encyclopedia* cites 8. Bd3 Nxd4 9. Bxh7! Rxh7 10. Nxh7 Bf5 11. Na3 Bxh7 12. Qh5+ Kd7 13. Qxh7 e6 as in *Ciric–Zuidema*, Belgrad, 1964, when White maintains an advantage.

8. Bd3

DEEP THOUGHT 0.02 predicts 8. . . . Nxd4 9. Nxh7 Nf5 10. Nxf8 Rxf8 11. Nd2 e5 with a score of −.77 pawns.

8. . . . Nxd4 9. Nxh7 Nf5 10. Nxf8 Kxf8

This seems to have been an error by HITECH. It may have been better to have captured with the rook. In any case, for the extra pawn Black pays the price of a shattered pawn structure around the king and weakened dark squares in the absence of his KB.

11. O-O c5

This seems overly ambitious. Black might better have played either Nd7 or e5 here, gaining some control of important center squares and giving his pieces a bit more freedom. Understandably, however, on 11. . . . e5 12. f4 may have been feared.

12. b3

An enterprising move when after Bb2 White's bishop will be impressive on the open long diagonal.

12. . . .d5 13. Nd2 Qd6 14. Nf3 Nd7

Although the deployment Bb2 has been discouraged, the weakness of Black's e-pawn is a permanent target which White can focus on.

15. Re1 d4 16. Ne5!!?

A brilliant move from many perspectives except for one: see note to Black's 17th move. DEEP THOUGHT 0.02, of course, realizes that this is not a real sacrifice. If 16. . . . Nxe5, then White plays 17. Bf4 pinning the Black knight to its queen. White also threatens 17. Nxg6. Thus Black is forced to continue:

16. . . . Nxe5 17. Bf4 Rh7

HITECH misses the opportunity to effect some exchanges and release some pressure with the queen sacrifice 17. . . . Nxd3 18. Bxd6 Nxd1 etc. with good compensation for the queen.

18. Rxe5

DEEP THOUGHT 0.02's scoring function goes positive for the first time, expecting the game to continue as follows: 18. . . . Qb6 19. g4 Nh4 20. Bg3 Bd7 21. Rh5 Rxh5.

18. . . . Qb6 19. g4 Nh4 20. Bg3

White has a won position highlighted by the blockading and splitting effect of the R/e5 on the Black position. DEEP THOUGHT 0.02's analysis gives 20. . . . Kg8 21. f4 Bd7 22. Qe2 Kg7 23. Rg5 Rg8. But HITECH thinks otherwise.

20. . . . Bd7

(See figure.)

21. Rh5

An elegant move that caught Tournament Director Valvo and the audience by surprise. DEEP THOUGHT 0.02's scoring function now believes White is ahead by approximately one pawn. However White could also win more routinely with 21. Bxh4 Rxh4 22. Qf3+ etc.

21. gxh5 Bxh7

DEEP THOUGHT 0.02 sees: 22. . . . Kg7 23. Qd3 e5 24. Bxh4 Rh8 25. Bf5 e6, and assigns the continuation a score of +2.69 pawns.

22. . . . e5

A good move giving Black's queen some room to maneuver.

23. Bxh4

This time, DEEP THOUGHT sees: 23. . . . xhg4 24. Bg3 Qf6 25. Qd3 b6 26. Re1 Kf7, leading to a score of +2.79 pawns.

23. . . . Bxg4 24. Qd3 Rc8 25. Re1 Qe6 26. f3 Bh3 27. Qg6

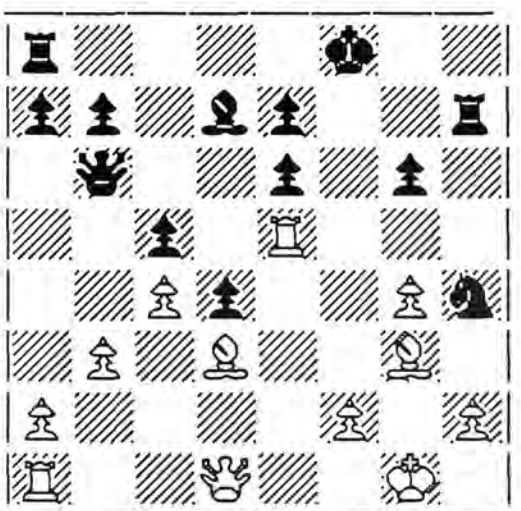
DEEP THOUGHT 0.02 sees: 27. . . Qxg6 28. Bxg6 Rc6 29. Bxh5 Re6 30. Bg3 d3 leading to a score of +3.32. A human might prefer to win with a K-side attack starting with 27. Bg3.

27. . . . Qxg6 28. Bxg6 Rc6 29. Bxh5 Re6 30. Bg3 Ra6

HITECH finds a way to ruffle DEEP THOUGHT 0.02.

31. a4 d3 32. Rxe5 Rd6 33. Re1 Rb6 34. Bf4 a5

HITECH has nothing better to do. Black's only chance now is somehow to trade off all material, winning the lone White pawn in the process. That would leave White with a single bishop, insufficient to mate Black. White, however, is a bit too strong to be led into this scenario. It has too many ways to win and knows that a lone bishop is a drawn game.



Position after 20. . . . Bd7

35. Be3 Rxb3 36. Bxc5 d2
37. Bxe7+ Kg7 38. Rd1 Re3
39. Bh4 Ra3 40. Be8 Rxf3
41. Bg5 Rf4 42. Bb5 Kg6
43. Be3 Rf3 44. Bxd2 Rd3
45. c5 Rd5 46. c6 bxc6
47. Bxc6 Rd6 48. Bf3 Rd4
49. Bxa5 Rxa4 50. Rd6+ Kf5
51. Bc3 Ra2 52. Rh6 Bg4
53. Bd5 Rc2 54. Rc6 Re2
55. h4 Kf4 56. Rc4+ Kg3
57. Ba5 and Black resigns.

DEEP THOUGHT 0.02 sees the game going as follows: 57. . . . Re7 58. Bc7+ Rxc7 (not 58. . . . Kxh4 because of 59. Bd8 pinning the rook) 59. Rxc7 Kxh4 60. Rg7.

CRAY BLITZ (White) vs.
CHESS CHALLENGER X (Black)

Sicilian Defense,
Accelerated Dragon Variation

In the Accelerated Dragon Variation of the Sicilian Defense essayed by CHESS CHALLENGER X against CRAY BLITZ, Black appeared to be in some trouble in the middlegame. 11. Qf3 was a short-sighted move, but so was Black's reply 11. . . . Ne5. White should have capitalized with 13. f4, while 13. . . . b5 was a viable alternative. Black's position after 13. . . . Qa6!? allowed isolated doubled pawns, however, but this was not as bad as the pawn structure might suggest. It should have followed with 19. Nd5 with unclear play. Instead CRAY BLITZ gravely mishandled the resulting bishops of opposite color ending by permitting Black's passed pawns to become decisively advanced while White's were blockaded.

1. e4 c5 2. Nf3 Nc6 3. d4 cxd4
4. Nxd4 g6 5. Be3 Nf6 6. Nc3 Bg7
7. Bc4 Qa5 8. O-O O-O 9. Bb3 d6
10. h3 Bd7 11. Qf3 Ne5
12. Qe2 Rac8 13. Rad1 Qa6
14. Qxa6 bxa6 15. f4 Nc4
16. Bxc4 Rxc4 17. e5 dxe5
18. fxe5 Nh5 19. Nf3 Bc6
20. Rd4 Rxd4 21. Nxd4 Bb7
22. e6 Bxd4 23. Bxd4 fxe6
24. Rxf8+ Kxf8 25. Ne2 g5
26. c3 Kf7 27. Kf2 Kg6
28. Bxa7 Nf4 29. Nxf4+ gxf4
30. Bd4 Kf5 31. Bc5 Kf6
32. c4 e5 33. b4 Bc6 34. Bb6 e4
35. Bd4+ e5 36. Bb2 e3+
37. Kg1 Kf5 38. c5 e4 39. Bc1 Bb5
40. Kh1 Ke6 41. Kg1 Kd5
42. a4 Bxa4 43. g3 e2 44. Kf2 f3
45. Bd2 Kd4 46. g4 Bc6
47. Bf4 Kd3 48. b5 axb5
49. Bh6 b4 and White
Resigns (0–1)

Round 4

Going into Round 4, three programs were tied for first place with 2.5 points: DEEP THOUGHT 0.02, CHESS CHALLENGER X, and MEPHISTO X. HITECH was fourth with 2.0 points. CHESS CHALLENGER X upset HITECH in a relatively fast game lasting 54 moves. The DEEP THOUGHT 0.02/MEPHISTO X game lasted much longer with MEPHISTO X in the lead for most of the game. For a long time it looked like the two microcomputers would finish 1–2; as it turned out they finished a most impressive 2–3.

From the opening, which appears to be DEEP THOUGHT 0.02's weakest phase of play, Black is worse. The game, which followed through White's 6th move SUN PHOENIX-DEEP THOUGHT 0.02 from Round 2, transposes into an Indian structure whereby White's spatial advantage and superior pieces (especially Q and B) reign superior for many moves. White tries to organize a breakthrough, but DEEP THOUGHT 0.02 defends well. MEPHISTO X's apparent weakness, which was alluded to earlier, namely the inability to find correct time (or way) to open up an advantageous position, proves costly. Around move 38 White should have tried to improve the position of its N by Ne2 and Nd4, heading for e6 or c6 with a decisive infiltration for which Black had no answer to while the BQ was tied to the defense of the bishop on b7.

Nonetheless, White maintains the same kinds of advantages for many moves as the position gradually transforms. 44. a4? was an error in ceding Black an outside passed pawn for no apparent reason. Much stronger would have been the sequence 44. Qh8+ Kg6 45. Qg8+ Ng7 (not Kh5 46. Bxg5) 46. Bd4 as given by Grand Master Raymond Keene (*ICCA Journal*, Vol. 11, No. 4, p. 191), when Black is tied up in knots. Still MEPHISTO X had a trap: if 45. . . . Nxe4? 46. Qd1+ Kg6 (Kh6 47. Qe2) 47. Qe2 and wins. But DEEP THOUGHT 0.02 continued to regroup, as on 48. e5+ Bf5 49. exf6? Qe1+ wins for Black and soon there was no win in the offing for White. MEPHISTO X's final error was 60. Nb5? (instead of Nxe4) after which DEEP THOUGHT 0.02 was able to gradually take over the center and K-side for an overwhelming onslaught.

MEPHISTO X (White) vs.
DEEP THOUGHT 0.20 (Black)
1. c4 e5 2. Nc3 Bb4 3. Nd5 Ba5
4. b4 c6 5. bxa5 cxd5 6. cxd5 Qxa5
7. e4 d6 8. Bb2 Nf6 9. Bc3 Qd8
10. Bb5+ Nbd7 11. d3 a6
12. Bxd7+ Bxd7 13. Ne2 Rc8
14. O-O O-O 15. Qd2 b5
16. Ba5 Qe7 17. f3 Nh5 18. Rac1 f5
19. Rxc8 Rxc8 20. Rc1 Nf6
21. Bb4 Qd8 22. Rxc8 Bxc8
23. Ba5 Qe7 24. Qc1 Bb7 25. Ng3 g6
26. Bb6 Kf7 27. Ne2 Kg7 28. Ba5 h5
29. Kh1 Kf7 30. h3 Kg7
31. Qe3 Kh7 32. Qb6 Ne8
33. Nc3 Qd7 34. Kg1 Kg7 35. d4 exd4
36. Qxd4+ Kf7 37. Qb6 fxe4
38. fxe4 Qe7 39. Bb4 Kf6
40. Ba3 h4 41. Bc5 Kg5
42. Be3+ Kh5 43. Qd4 g5
44. a4 bxa4 45. Qxa4 Nf6
46. Bd4 Kg6 47. Qc2 Bc8
48. Qd3 Kf7 49. Qf1 Bd7
50. Qf3 a5 51. Qe3 Kg6
52. Qd3 Kf7 53. Qf3 a4
54. Qe3 Kg6 55. Qd3 Kh6
56. Qb1 a3 57. Kh2 a2
58. Qxa2 Nxe4 59. Qe2 Bf5
60. Nb5 Qf7 61. Qc4 Bd7
62. Kg1 Qf4 63. Na3 Nd2
64. Qd3 Bf5 65. Qc3 Bxh3
66. Bg7+ Kh5 67. Qd3 Bxg2
68. Kxg2 Qg4+ 69. Kh1 Ne4
70. Qc2 Qh3+ 71. Kg1 Qe3+
72. Kh1 Qe1+ 73. Kg2 and White resigns (sees mate in seven against itself) (0–1)

CHESS CHALLENGER X (White)
vs. HITECH (Black)
Vienna Opening
1. e4 e5 2. Nc3 Nf6 3. f4 d5
4. fxe5 Nxe4 5. Nf3 Be7
6. d4 Nxc3 7. bxc3 O-O
8. Be2 c5 9. O-O Nc6
10. Be3 Qa5 11. Qd3

After an opening where White has no great prospects, this awkward move does not inspire confidence that White knows what is going on. However, the move does guard the c-pawn and prevents Bf5. Perhaps Black should play 11. . . . g6!? when Bf5 can indeed follow.

11. . . . Bg4 12. Kh1 Bh5
13. Rfb1 Rab8 14. dxc5

Now White's pawn structure becomes rather ugly, although the tripled c-pawns do maintain a vice-like grip on the Q-side.

14. . . . Bxf3 15. gxf3 Nxe5
16. Qxd5 Nc6 17. Bd4 Qd8!

Necessary and good. Not 17. . . . Rfd8 18. Qe4 Bxc5 19. Rb5 winning. The resulting ending is rather equal.

18. Bc4 Qxd5 19. Bxd5 Bg5
20. Rg1 Bh6 21. Rab1 Rfd8
22. Bxc6 bxc6 23. Be5?!

A stronger way for White to try to make headway might be 23. Rb3 when White may gain control of the b-file or straighten out its pawn structure to mobilize the Q-side.

23. . . . Rxb1 24. Rxb1 Re8
25. f4 a5 26. c4 f6 27. Rb8 Rxb8
28. Bxb8 a4 29. Kg2 g6
30. Kf3 Kf7 31. Bd6 Ke6
32. Ke4 Bg7 33. Kd4 f5+
34. Kd3 Bf6 35. Ke3 Bg7

Clearly if Black wants to win, a passed pawn should be created with 35. . . . g5 or by trading bishops with 35. . . . Be7 when Black cannot be worse in the king and pawn ending with a potential passed pawn on the K-side. Unfortunately, HITECH shows no inclination to create a passed pawn until it is too late.

36. Kd2 Bf6 37. Kd3 h5
38. Ke2 h4?

Not a particularly significant move in the ensuing play, but the pawn does become a fixed target on the color of White's bishop.

39. h3 Bb2 40. Bc7 Kd7
41. Ba5 Bd4 42. Bb4 Ke6
43. Be1 Bf6 44. Bd2 Be7
45. Be3 Bd8 46. Kd3 Kf7
47. Kc3

Black has been drifting and now suddenly its a-pawn is in serious danger.

47. . . . Bc7 48. Kb4 g5
49. fxg5 Kg6 50. Kxa4 Bh2
51. Ka5 f4 52. Bxf4 Bxf4
53. Kb6 Kf7 54. Kxc6 and
Black resigns (1–0)

ACM's Nineteenth North American Computer Chess Championship

RESULTS AND GAMES (Ken Thompson)

Orlando, Florida
November 13-15, 1988

		rate	perf	1	2	3	4	total
1	Deep Thought 0.02	1000	1241	2=□	6+■	5+□	4+■	3½
2	Chess Challenger X	1000	1241	1=■	12+□	3+■	5+□	3½
3	Cray Blitz	1000	1070	8+□	4=■	2−□	9+■	2½
4	Mephisto	1000	1070	11+■	3=□	6+■	1−□	2½
5	Hitech	1000	999	12+■	7+□	1−■	2−■	2
6	Sun Phoenix	1000	999	10+■	1−□	4−□	8+■	2
7	Bebe	1000	999	9+□	5−■	8−□	12+■	2
8	Novag X	1000	928	3−■	11=□	7+■	6−□	1½
9	BP	1000	928	7−■	10+□	11=■	3−□	1½
10	Cryus 68K	1000	928	6−□	9−■	12=■	11+□	1½
11	A. I. Chess	1000	851	4−□	8=■	9=□	10−■	1
12	Waycool	1000	757	5−□	2−■	10=□	7−□	0½

Round 1

Deep Thought 0.02 — Chess Challenger X

1 e4 c5 2 c3 e6 3 d4 d5 4 e×d5 e×d5 5 ♘f3 ♘c6 6 ♗e3 c×d4 7 ♗×d4 ♘×d4 8 ♕×d4 ♘f6 9 ♗b5† ♗d7 10 ♗×d7† ♕×d7 11 O-O ♗e7 12 ♘bd2 O-O 13 ♘e5 ♕f5 14 ♘df3 ♗d6 15 ♖ae1 ♖fe8 16 c4 ♘e4 17 ♕×d5 ♗×e5 18 ♔h1 ♖ad8 19 ♕×e4 ♕×e4 20 ♖×e4 ♗×b2 21 ♖×e8† ♖×e8 22 ♖d1 ♗a3 23 ♖d7 ♖e2 24 h4 h5 25 ♖d8† ♔h7 26 ♖d2 ♖×d2 27 ♘×d2 ♔g6 28 g3 ♔f5 29 ♘b3 ♗b4 30 f3 f6 31 ♔g2 g5 32 ♘c1 ♗d6 33 ♔h3 ♔e5 34 ♘e2 ♗c5 35 f4† ♔f5 36 f×g5 f×g5 37 h×g5 ♔×g5 38 ♘c3 ♗b4 39 ♘d5 ♗d6 40 ♔g2 ♗e5 41 ♔f3 b6 42 a4 ♗d6 43 ♘c3 ♗c7 44 c5 b×c5 45 ♘e4† ♔g6 46 ♘×c5 ♔f5 47 ♘d3 ♔g5 48 ♘b4 a5 49 ♘d5 ♗e5 50 ♘e3 ♗f6 ½–½

Waycool — Hitech

1 e4 e5 2 ♘f3 ♘c6 3 c3 d5 4 ♕a4 f6 5 ♗b5 ♘ge7 6 e×d5 ♕×d5 7 d4 e4 8 c4 ♕d7 9 ♘g1 ♕×d4 10 ♘c3 ♕d7 11 h3 f5 12 ♗e3 ♕d8 13 ♖d1 ♗d7 14 c5 a6 15 ♗e2 ♘e5 16 ♕b3 ♕c8 17 ♘d5 ♘7g6 18 h4 ♗c6 19 h5 ♘e7 20 ♘f4 h6 21 ♗d4 ♘d3† 22 ♗×d3 e×d3 23 ♖×d3 ♗e4 24 ♖g3 ♕d7 25 ♗×g7 O-O-O 26 ♕e6 ♗×g7 27 ♖×g7 ♕×e6 28 ♘×e6 ♖de8 29 ♘e2 ♗d5 30 ♘6d4 ♖hg8 31 ♖×g8 ♖×g8 32 ♘f4 ♗×g2 33 ♘×g2 ♖×g2 34 ♖h4 ♖g1† 35 ♔d2 ♔d7 36 ♖h3 ♖f1 37 ♖f3 ♖h1 38 ♘×f5 ♘×f5 39 ♖×f5 ♔e6 40 ♖f4 ♖×h5 41 ♖b4 ♖×c5 42 ♖×b7 ♔f5 43 ♖b3 ♔f4 44 ♖a3 a5 45 ♖d3 c6 46 ♖e3 h5 47 ♔d3 h4 48 ♔d2 ♖h5 49 ♖h3 ♔g4 50 ♖c3 h3 51 ♔e2 h2 **0–1**

Cray Blitz — Novag X

1 e4 e5 2 ♘f3 ♘c6 3 ♗b5 a6 4 ♗a4 ♘f6 5 d3 b5 6 ♗b3 ♗e7 7 O-O d5 8 e×d5 ♘×d5 9 ♖e1 ♕d6 10 a4 ♖b8 11 a×b5 a×b5 12 ♕e2 ♗g4 13 h3 ♗×f3 14 ♕×f3 ♘f6 15 ♘c3 O-O 16 ♕f5 b4 17 ♘e4 ♘×e4 18 ♕×e4 ♔h8 19 ♖a6 ♖b6 20 ♖×b6 c×b6 21 ♗a4 ♖c8 22 ♕f5 ♖a8 23 ♗×c6 ♕×c6 24 ♕×e5 ♗f6 25 ♕f4 ♕×c2 26 ♕×b4 ♕×d3 27 ♕×b6 ♕d5 28 ♗e3 ♔g8 29 ♖c1 ♗e5 30 b4 ♖d8 31 ♕a6 h6 32 ♕e2 ♗d6 33 ♗b6 ♖a8 34 ♖d1 ♕c6 35 ♗a5 ♖b8 36 ♕d2 ♗e5 37 ♕d3 ♕a4 38 ♖c1 ♖e8 39 ♕c4 ♗b2 40 ♖b1 ♗f6 41 ♗b6 ♖e6 42 ♗e3 ♖c6 43 ♕f1 ♖c2 44 b5 ♗d4 45 ♗×d4 ♕×d4 46 ♕e1 ♖b2 47 ♖×b2 ♕×b2 48 ♕e8† ♔h7 49 g3 ♕b1† 50 ♔g2 ♕b4 51 ♕c6 ♕a4 52 h4 g6 53 ♕d5 ♕a7 54 ♕b3 ♕b7† 55 ♕f3 ♕×b5 56 ♕×f7† ♔h8 57 ♕×g6 ♕d5† 58 f3 h5 59 ♕h6† ♔g8 60 ♕g5† ♕×g5 61 h×g5 ♔g7 62 ♔h3 **1–0**

Cryus 68K — Sun Phoenix

1 e4 c6 2 d4 d5 3 ♘c3 g6 4 ♘f3 ♗g7 5 h3 d×e4 6 ♘×e4 ♘d7 7 ♗c4 ♘gf6 8 ♘×f6† ♘×f6 9 ♘e5 ♘d5 10 O-O O-O 11 ♖e1 ♕c7 12 ♗b3 ♗f5 13 c4 ♘f6 14 c5 ♘d5 15 ♗d2 ♖fd8 16 ♖c1 ♖ab8 17 ♕f3 ♗f6 18 ♗f4 ♘×f4 19 ♕×f4 e6 20 ♖c3 h6 21 ♕g3 ♖×d4 22 ♘g4 ♕×g3 23 ♘×f6† ♔g7 24 ♖×g3 ♔×f6 25 ♖f3 ♔e7 26 g4 ♗d3 27 ♖d1 ♖bd8 28 ♖e3 ♗b5 29 ♖×d4 ♖×d4 30 ♖c3 ♖d2 31 ♗c2 e5 32 ♔g2 ♗e2 33 ♔g3 ♗f1 34 a3 ♔f8 35 b3 ♔e7

36 b4 ♔f6 37 h4 ♖d4 38 ♖e3 ♗c4 39 g5† h×g5 40 h×g5† ♔×g5 41 ♖×e5† f5 42 f4† ♖×f4 43 ♖e1 ♗d5 44 ♗d1 a5 45 b×a5 ♖c4 **0–1**

Bebe — BP

1 e4 e5 2 ♘f3 ♘f6 3 d4 ♘×e4 4 ♗d3 d5 5 ♘×e5 ♗e7 6 ♗×e4 d×e4 7 ♘c3 O–O 8 O–O f6 9 ♘c4 ♘a6 10 ♘×e4 ♕d5 11 b3 ♖d8 12 ♗b2 ♘b4 13 ♖e1 ♗f5 14 ♘c3 ♕d7 15 ♘e3 ♗g6 16 a3 ♘c6 17 d5 ♕c8 18 ♕e2 ♘e5 19 f4 ♘d7 20 f5 ♗f7 21 ♘e4 ♘e5 22 c4 c6 23 ♖ad1 c×d5 24 c×d5 ♕c7 25 ♖d4 ♕b6 26 ♕d1 ♖d7 27 ♖d2 ♖ad8 28 ♔h1 ♕a6 29 b4 ♗d6 30 ♘g4 ♗e7 31 d6 ♖×d6 32 ♘×d6 ♖×d6 33 ♘×e5 f×e5 34 ♖×d6 ♗×d6 35 ♗×e5 ♗f8 36 ♕f3 ♕b6 37 ♖c1 a5 38 ♕g3 ♕d8 39 b×a5 ♕d2 40 ♕c3 ♕f2 41 ♕d3 ♕a2 42 ♖a1 ♕f2 43 ♖c1 ♕a2 44 h3 ♕f2 45 ♔h2 ♕a2 46 ♖c8 ♗d5 47 ♗b2 ♔f7 48 ♕d4 ♗d6† 49 g3 ♗f8 50 a6 b6 51 ♖c7† ♔g8 52 ♖×g7† ♔h8 53 ♖d7† ♗g7 54 ♕×g7# **1–0**

A. I. Chess — Mephisto X

1 c4 c6 2 d4 d5 3 e3 ♘f6 4 ♘f3 ♗f5 5 c×d5 c×d5 6 ♗b5† ♘bd7 7 O–O e6 8 ♘h4 ♗×b1 9 ♖×b1 ♗d6 10 ♘f3 O–O 11 ♗d3 ♖c8 12 ♗d2 ♘e4 13 ♖c1 ♖×c1 14 ♕×c1 ♕b8 15 ♗a5 ♖c8 16 ♕e1 ♘df6 17 ♗b4 ♘g4 18 ♗×d6 ♕×d6 19 h3 ♘gf6 20 ♘e5 ♕c7 21 f3 ♘c5 22 ♗b1 ♘cd7 23 ♘d3 h6 24 ♕f2 ♕a5 25 e4 ♕b6 26 e5 ♘e8 27 b3 ♖c3 28 ♕h4 f6 29 ♔h1 ♖c8 30 e×f6 ♘e×f6 31 ♖e1 ♖c6 32 ♔h2 ♔h8 33 ♕f2 ♕c7† 34 ♔g1 ♔g8 35 b4 ♘f8 36 b5 ♖c4 37 ♘e5 ♖b4 38 ♗d3 ♕c3 39 ♖d1 ♕b2 **0–1**

Round 2
Hitech — Bebe

1 e4 c5 2 c3 d5 3 e×d5 ♕×d5 4 d4 e6 5 ♘f3 ♘c6 6 ♗d3 c×d4 7 c×d4 ♗b4† 8 ♘c3 ♘f6 9 O–O ♕a5 10 ♕c2 O–O 11 a3 ♗e7 12 ♗e3 ♖d8 13 b4 ♕h5 14 ♘e2 ♗d6 15 ♘g3 ♗×g3 16 h×g3 a6 17 ♖fb1 ♘g4 18 b5 a×b5 19 ♖×b5 ♖d5 20 ♖b6 ♖da5 21 ♕b3 ♘×e3 22 f×e3 ♕g4 23 ♔f2 h6 24 ♕c3 f6 25 ♖b3 ♖8a7 26 ♖h1 e5 27 d5 ♖×d5 28 ♗c4 ♗e6 29 ♖h4 ♕g6 30 ♗×d5 ♗×d5 31 ♖b5 ♗f7 32 ♘d2 ♕f5† 33 ♔g1 ♕e6 34 ♕d3 f5 35 e4 f×e4 36 ♘×e4 ♘d4 37 ♖c5 ♗e8 38 ♔h2 b6 39 ♖c3 ♗c6 40 ♕b1 b5 41 ♕e1 ♖f7 42 ♖c5 ♕a2 43 ♘d2 ♘b3 44 ♖×c6 ♘×d2 45 ♔h3 ♕d5 46 ♖c8† ♔h7 47 ♕e2 e4 48 ♖h5 ♖f5 49 ♖×f5 ♕×f5† 50 ♕g4 ♕f6 51 ♖c5 e3 52 ♖×b5 ♕f1 53 ♕f5† ♕×f5† 54 ♖×f5 ♘c4 55 ♖f1 ♘×a3 56 ♖c1 h5 57 g4 g6 58 g×h5 g×h5 59 ♔g3 e2 60 ♔f2 ♘b5 61 ♖c5 ♘d4 62 ♖×h5† ♔g6 63 ♖d5 ♘e6 64 ♖e5 ♔f6 65 ♖×e2 ♘f4 66 ♖d2 ♔e5 67 ♔g3 ♔e4 68 ♖d4† ♔×d4 **1–0**

Mephisto X — Cray Blitz

1 ♘f3 d5 2 d4 ♗f5 3 c4 e6 4 ♕b3 b6 5 ♘c3 d×c4 6 ♕×c4 ♘f6 7 ♗g5 ♗e7 8 e3 ♘bd7 9 ♕c6 ♗b4 10 ♗×f6 g×f6 11 ♖c1 a6 12 ♗e2 ♖a7 13 ♘h4 ♗×c3† 14 ♖×c3 ♗b1 15 ♕a4 ♗e4 16 O–O ♕b8 17 ♖fc1 b5 18 ♕a5 ♘b6 19 f3 ♗d5 20 b3 ♗a8 21 ♖c5 f5 22 g3 ♘d5 23 e4 f×e4 24 f×e4 ♘e7 25 ♗f3 O–O 26 ♖g5† ♘g6 27 ♖cc5 ♖d8 28 ♕c3 ♕b6 29 ♖g4 ♖d7 30 ♗g2 ♗b7 31 ♘f3 ♖a8 32 ♘e5 ♖d6 33 ♕e3 ♔f8 34 ♘f3 ♔e8 35 e5 ♖d7 36 ♘g5 ♗×g2 37 ♔×g2 h5 38 ♖e4 ♕b7 39 ♕f3 ♖ad8 40 ♕f2 ♖e7 41 ♔g1 ♖ed7 42 ♖c1 ♖e7 43 ♖f1 a5 44 ♕f6 ♕b6 45 ♖d1 ♕c6 46 ♖e2 ♕c3 47 ♘×f7 ♖×d4 48 ♖f1 ♕d3 49 ♖ef2 h4 50 ♖f3 ♕c2 51 ♖1f2 ♕c1† 52 ♔g2 h×g3 53 h×g3 ♕b1 54 ♘h8 ♘×h8 55 ♕×h8† ♔d7 56 ♖f7 ♕e4† 57 ♔h2 ♖×f7 58 ♖×f7† ♔c6 59 ♕e8† ♔b6 60 ♕b8† ♕b7 61 ♕×b7† ♔×b7 62 ♔g2 ♖d5 63 g4 ♖×e5 64 ♔f3 ♖e1 65 ♖f4 ½–½

Sun Phoenix — Deep Thought 0.02

1 c4 e5 2 ♘c3 ♗b4 3 ♘d5 ♗a5 4 b4 c6 5 b×a5 c×d5 6 c×d5 ♘f6 7 ♕a4 ♘×d5 8 ♕e4 ♘c7 9 ♕×e5† ♘e6 10 ♗b2 ♘c6 11 ♕d5 ♘×a5 12 e4 ♘c6 13 ♕d6 ♕b6 14 ♖b1 ♘c5 15 ♗c4 f6 16 f3 ♕b4 17 ♕d5 ♘e5 18 ♗f1 d6 19 a3 ♕b6 20 a4 ♗e6 21 ♗b5† ♔e7 22 ♕d4 ♗b3 23 ♖a1 ♗×a4 24 ♗×a4 ♘ed3† 25 ♔f1 ♕×b2 26 ♕×b2 ♘×b2 27 ♗c2 ♘c4 28 ♔e2 ♘e6 29 ♔d1 b5 30 ♘e2 ♖hc8 31 e5 ♘×e5 32 ♘c3 ♘d4 33 ♗×h7 f5 34 ♘e2 ♘×e2 35 ♔×e2 ♔f6 36 f4 ♘c4 37 g4 f×g4 38 ♗e4 ♖e8 39 ♔d3 d5 40 ♖a6† ♖e6 41 ♗×d5 ♖×a6 42 ♗×a8 ♖a2 43 ♗c6 a6 44 ♖g1 ♖×d2† 45 ♔c3 ♖×h2 46 ♗d5 ♘e3 **0–1**

Chess Challenger X — Waycool

1 e4 c5 2 ♘f3 ♘c6 3 ♗b5 a6 4 ♗×c6 d×c6 5 d3 g6 6 O–O ♗g7 7 ♘c3 ♕b6 8 a4 ♕b4 9 ♗d2 ♕×b2 10 ♖b1 ♗×c3 11 ♖×b2 ♗×b2 12 c3 c4 13 ♘e5 ♗a3 14 ♘×c4 ♗c5 15 ♕b3 b5 16 ♘e5 ♗e6 17 ♕b2 ♖c8 18 a×b5 a×b5 19 c4 ♘f6 20 c×b5 c×b5 21 ♕×b5† ♘d7 22 ♖c1 ♖b8 23 ♕c6 ♗b6 24 ♖b1 O–O 25 ♘×d7

♗×d7 26 ♕×d7 ♗×f2† 27 ♔×f2 ♖×b1 28 ♗h6 ♖fb8 29 ♕×e7 ♖1b6 30 ♕e5 f6 31 ♕d5† ♔h8 32 e5 ♖g8 33 ♔f3 ♖bb8 34 ♕f7 **1–0**

Novag X — A. I. Chess

1 d4 d5 2 c4 e6 3 ♘f3 ♘f6 4 ♘c3 ♘e4 5 ♗d2 ♘×d2 6 ♕×d2 ♗b4 7 a3 ♗×c3 8 ♕×c3 d×c4 9 ♕×c4 ♘d7 10 e4 O–O 11 ♖c1 c6 12 ♗d3 e5 13 O–O ♕f6 14 ♕c3 ♖e8 15 d×e5 ♕f4 16 e6 ♖×e6 17 ♖fd1 ♖g6 18 ♗b1 ♕g4 19 ♘e1 ♖h6 20 ♕d3 ♕f4 21 ♘f3 ♘f8 22 ♖c4 ♗e6 23 ♖d4 c5 24 g3 ♕g4 25 ♖d6 b6 26 ♕e3 ♖h5 27 ♗d3 f6 28 ♗f1 ♖e8 29 ♖d8 ♕g6 30 ♗b5 ♖×d8 31 ♖×d8 ♕f7 32 ♗e8 ♕c7 33 ♕d2 ♗f7 34 ♗b5 ♕e7 35 ♕d7 ♕×d7 36 ♗×d7 ♗c4 37 ♗c6 ♗e6 38 ♘d2 c4 39 ♘f3 a6 40 ♘d4 ♗f7 41 f4 ♖c5 42 ♗b7 a5 43 e5 c3 44 b×c3 f×e5 45 f×e5 ♖×e5 46 ♔f2 ♖c5 47 ♖c8 ♖×c8 48 ♗×c8 g6 49 ♔e3 ♔g7 50 ♔f4 ♔f6 51 h4 h6 52 ♔e4 g5 53 h×g5† h×g5 54 ♗g4 ♘e6 55 ♘×e6 ♗×e6 56 ♗×e6 ♔×e6 57 c4 ♔d6 58 ♔d4 g4 59 a4 ♔c6 60 ♔d3 ♔d7 61 ♔e4 ♔c6 62 ♔d4 ♔d6 63 ♔d3 ♔c7 64 ♔d2 ♔c6 65 ♔d3 ♔d7 ½–½

BP — Cryus 68K

1 e4 e5 2 f4 d5 3 e×d5 e×f4 4 ♗b5† ♗d7 5 ♕e2† ♕e7 6 ♘c3 ♘f6 7 ♗×d7† ♘b×d7 8 d4 ♘b6 9 ♗×f4 ♘b×d5 10 ♘×d5 ♘×d5 11 ♗d2 ♘b4 12 ♗×b4 ♕×e2† 13 ♔×e2 ♗×b4 14 ♘f3 O–O 15 h4 ♖fe8† 16 ♔d3 ♗d6 17 c4 ♖ad8 18 ♖ae1 ♗g3 19 ♖×e8† ♖×e8 20 d5 ♗f2 21 h5 a5 22 a4 ♖e3† 23 ♔d2 ♖b3 24 ♔c2 ♖b4 25 b3 f6 26 ♖f1 ♗c5 27 ♘e1 ♖b6 28 ♘d3 ♗d4 29 c5 ♖a6 30 ♖f4 ♗g1 31 b4 ♔f7 32 b5 ♖a8 33 ♖f1 ♗e3 34 c6 b×c6 35 ♘e5† ♔e7 36 ♘c4 ♗c5 37 d×c6 ♗b4 38 b6 ♖d8 39 b×c7 ♖c8 40 ♘b6 ♖×c7 41 ♘d5† ♔d8 42 ♘×c7 ♔×c7 43 h6 ♗f8 44 h×g7 ♗×g7 45 ♖f5 ♔×c6 46 ♖×a5 ♔b7 47 ♖b5† ♔c6 48 ♔d3 h6 49 ♔c4 h5 50 a5 **1–0**

Round 3
Deep Thought 0.02 — Hitech

1 e4 ♘f6 2 e5 ♘d5 3 d4 d6 4 ♘f3 ♘c6 5 c4 ♘b6 6 e6 f×e6 7 ♘g5 g6 8 ♗d3 ♘×d4 9 ♘×h7 ♘f5 10 ♘×f8 ♔×f8 11 O–O c5 12 b3 d5 13 ♘d2 ♕d6 14 ♘f3 ♘d7 15 ♖e1 d4 16 ♘e5 ♘×e5 17 ♗f4 ♖h7 18 ♖×e5 ♕b6 19 g4 ♘h4 20 ♗g3 ♗d7 21 ♖h5 g×h5 22 ♗×h7 e5 23 ♗×h4 ♗×g4 24 ♕d3 ♖c8 25 ♖e1 ♕e6 26 f3 ♗h3 27 ♕g6 ♕×g6† 28 ♗×g6 ♖c6 29 ♗×h5 ♖e6 30 ♗g3 ♖a6 31 a4 d3 32 ♖×e5 ♖d6 33 ♖e1 ♖b6 34 ♗f4 a5 35 ♗e3 ♖×b3 36 ♗×c5 d2 37 ♗×e7† ♔g7 38 ♖d1 ♖e3 39 ♗h4 ♖a3 40 ♗e8 ♖×f3 41 ♗g5 ♖f8 42 ♗b5 ♔g6 43 ♗e3 ♖f3 44 ♗×d2 ♖d3 45 c5 ♖d5 46 c6 b×c6 47 ♗×c6 ♖d6 48 ♗f3 ♖d4 49 ♗×a5 ♖×a4 50 ♖d6† ♔f5 51 ♗c3 ♖a2 52 ♖h6 ♗g4 53 ♗d5 ♖c2 54 ♖c6 ♖e2 55 h4 ♔f4 56 ♖c4† ♔g3 57 ♗a5 **1–0**

Cray Blitz — Chess Challenger X

1 e4 c5 2 ♘f3 ♘c6 3 d4 c×d4 4 ♘×d4 g6 5 ♗e3 ♘f6 6 ♘c3 ♗g7 7 ♗c4 ♕a5 8 O–O O–O 9 ♗b3 d6 10 h3 ♗d7 11 ♕f3 ♘e5 12 ♕e2 ♖ac8 13 ♖ad1 ♕a6 14 ♕×a6 b×a6 15 f4 ♘c4 16 ♗×c4 ♖×c4 17 e5 d×e5 18 f×e5 ♘h5 19 ♘f3 ♗c6 20 ♖d4 ♖×d4 21 ♘×d4 ♗b7 22 e6 ♗×d4 23 ♗×d4 f×e6 24 ♖×f8† ♔×f8 25 ♘e2 g5 26 c3 ♔f7 27 ♔f2 ♔g6 28 ♗×a7 ♘f4 29 ♘×f4† g×f4 30 ♗d4 ♔f5 31 ♗c5 ♔f6 32 c4 e5 33 b4 ♗c6 34 ♗b6 e4 35 ♗d4† e5 36 ♗b2 e3† 37 ♔g1 ♔f5 38 c5 e4 39 ♗c1 ♗b5 40 ♔h1 ♔e6 41 ♔g1 ♔d5 42 a4 ♗×a4 43 g3 e2 44 ♔f2 f3 45 ♗d2 ♔d4 46 g4 ♗c6 47 ♗f4 ♔d3 48 b5 a×b5 49 ♗h6 b4 **0–1**

Sun Phoenix — Mephisto X

1 c4 c6 2 ♘c3 d5 3 c×d5 c×d5 4 d4 ♘f6 5 ♘f3 ♘c6 6 ♗f4 ♗f5 7 e3 e6 8 ♗b5 ♘d7 9 ♕a4 ♖c8 10 ♗×c6 ♖×c6 11 ♕×a7 ♕c8 12 ♕a5 ♖a6 13 ♕c7 ♕a8 14 ♘e5 ♘×e5 15 ♕×e5 f6 16 ♕b8† ♕×b8 17 ♗×b8 ♔f7 18 ♗g3 ♗b4 19 O–O ♗×c3 20 b×c3 ♖c8 21 ♖fc1 b5 22 ♔f1 ♖ca8 23 ♗f4 h5 24 h3 ♗d3† 25 ♔g1 ♖c6 26 ♗h2 ♖a3 27 g4 h4 28 ♗f4 g5 29 ♗b8 ♔e7 30 ♔g2 ♖c8 31 ♗h2 ♖ca8 32 ♔h1 ♖8a4 33 ♗c7 ♗e4† 34 ♔g1 ♖a6 35 ♔f1 ♗d3† 36 ♔g2 ♔d7 37 ♗h2 ♗e4† 38 ♔f1 ♖a8 39 ♔g1 ♖c8 40 ♔f1 ♔e7 41 ♔g1 ♖c4 42 ♗b8 ♗d3 43 ♔g2 ♖a8 44 ♗h2 ♖ac8 45 ♔g1 b4 46 f3 ♗g6 47 ♔f2 b×c3 48 a4 ♖b4 49 ♔e1 ♖b2 50 ♗g1 ♗d3 51 ♗f2 ♖cb8 52 ♖d1 c2 53 ♖dc1 ♖b1 **0–1**

Bebe — Novag X

1 e4 e5 2 ♘f3 ♘c6 3 ♗b5 a6 4 ♗a4 ♘f6 5 O–O ♘×e4 6 ♖e1 ♘c5 7 ♘×e5 ♗e7 8 ♗×c6 d×c6 9 d4 ♘e6 10 ♗e3 O–O 11 ♘c3 ♖e8 12 ♕h5 g6 13 ♕d1 ♗f8 14 ♕d3 ♗g7 15 ♘f3 b6 16 ♘e4 ♗b7 17 ♗g5 ♘×g5 18 ♘e×g5 ♕d5 19 c4 ♕a5 20 ♕c3 ♕×c3 21 b×c3 c5 22 ♖ad1 h6 23 ♖×e8† ♖×e8 24 ♘h3 c×d4 25 ♘×d4 c5 26 ♘b3 ♗×c3 27 f3 ♖e1† 28 ♖×e1

♗×e1 29 ♘f4 ♔g7 30 h3 ♔f6 31 ♔f1 ♗g3 32 ♘d3 ♔g5 33 a4 a5 34 ♘d2 ♔f5 35 ♘b1 ♗c6 36 ♘c3 ♗e5 37 ♘d5 ♗×d5 38 c×d5 ♗d4 39 g4† ♔f6 40 f4 ♔e7 41 ♘e5 ♗×e5 42 f×e5 b5 43 d6† ♔d8 44 ♔e2 b4 45 ♔d3 g5 46 ♔c4 ♔d7 47 ♔d3 ♔c8 48 ♔c4 ♔d8 49 ♔b3 ♔d7 50 ♔c4 ♔c8 51 ♔d3 ♔b8 52 ♔c2 c4 53 ♔d2 c3† 54 ♔c2 ♔b7 55 ♔b3 ♔c6 56 ♔c2 f6 **0–1**

A. I. Chess — BP

1 e4 e5 2 ♘c3 ♘f6 3 f4 d5 4 f×e5 ♘×e4 5 ♘f3 ♗e7 6 d4 O-O 7 ♗d3 f5 8 e×f6 ♗×f6 9 O-O ♘c6 10 ♘×e4 d×e4 11 ♗×e4 ♘×d4 12 ♘g5 ♗f5 13 ♗×b7 ♗×c2 14 ♕g4 ♖b8 15 ♗e4 ♗×e4 16 ♕×e4 g6 17 ♔h1 c5 18 ♕h4 ♕e7 19 ♖b1 ♖b6 20 ♗e3 ♖fb8 21 ♖be1 ♕g7 22 ♕e4 ♗×g5 23 ♗×g5 ♕b7 24 ♕×b7 ♖8×b7 25 b3 ♖a6 26 ♖e8† ♔g7 27 ♗e7 ♘e6 28 ♗f6† ♔h6 29 ♖f3 g5 30 ♖g8 ♔h5 31 ♖h3† ♔g4 32 ♖g3† ♔f5 33 ♖f3† ♔e4 34 ♖e8 g4 35 ♖f1 ♔d3 36 h3 ♖f7 37 h×g4 ♘d4 38 g5 ♖×a2 39 b4 ♖e2 40 ♖×e2 ♘×e2 41 ♖f3† ♔e4 42 b×c5 ♘f4 43 c6 ♖c7 44 ♖a3 ♔d5 45 ♖a5† ♔×c6 46 ♗e5 ♖f7 47 ♗×f4 ♖×f4 48 ♖×a7 ♖h4† 49 ♔g1 ♔d5 50 ♖g7 ♔e5 51 g6 h×g6 52 ♖×g6 ♖c4 53 ♔f2 ♖c2† 54 ♔e3 ♖c3† 55 ♔d2 ♖a3 56 ♔e2 ♔e4 57 ♖g4† ♔e5 58 ♖g7 ♔f4 59 ♔e1 ♖a2 60 ♔f1 ♔e3 61 g4 ♔f3 ½–½

Waycool — Cryus 68K

1 e4 c5 2 c3 ♘f6 3 e5 ♘d5 4 d4 c×d4 5 ♕×d4 e6 6 ♗c4 ♘c6 7 ♕e4 ♘de7 8 ♘f3 ♘g6 9 ♗g5 f6 10 ♗e3 ♘c×e5 11 ♘×e5 ♘×e5 12 ♗b5 ♕a5 13 a4 a6 14 ♗e2 d5 15 ♕h4 ♘c4 16 ♗×c4 d×c4 17 ♕×c4 ♗d6 18 ♘d2 ♕c7 19 ♕h4 O-O 20 ♘e4 ♗e7 21 O-O ♖d8 22 ♖ad1 ♗d7 23 ♖d4 b5 24 a×b5 ♗×b5 25 ♖fd1 e5 26 ♕g3 ♖×d4 27 c×d4 ♕c2 28 ♘c3 e×d4 29 ♕f3 ♖d8 30 ♗×d4 ♕×b2 31 ♘d5 ♕a3 32 ♕e4 ♖d7 33 ♕g4 ♔h8 34 ♘×e7 ♖×e7 35 ♗e3 ♕b3 36 h3 ♖e8 37 ♖d6 a5 38 ♕h5 ♕c4 39 ♖d4 ♕c6 40 ♖h4 h6 41 ♕g6 ♖×e3 42 f×e3 ♕c1† 43 ♔h2 ♕×e3 44 ♕f5 ♕e8 45 ♕d5 a4 46 ♕c5 ♗d7 47 ♖d4 ♕b8† 48 ♔h1 ♕b5 49 ♕a7 ♗c6 50 ♖g4 g5 51 ♕e7 ♕b1† 52 ♔h2 ♕b8† 53 ♖g3 ♕f4 54 ♕f8† ♔h7 55 ♕f7† ♔h8 56 ♕g6 g4 57 ♕×g4 ♕×g4 58 h×g4 ½–½

Round 4

Mephisto X — Deep Thought 0.02

1 c4 e5 2 ♘c3 ♗b4 3 ♘d5 ♗a5 4 b4 c6 5 b×a5 c×d5 6 c×d5 ♕×a5 7 e4 d6 8 ♗b2 ♘f6 9 ♗c3 ♕d8 10 ♗b5† ♘bd7 11 d3 a6 12 ♗×d7† ♗×d7 13 ♘e2 ♖c8 14 O-O O-O 15 ♕d2 b5 16 ♗a5 ♕e7 17 f3 ♘h5 18 ♖ac1 f5 19 ♖×c8 ♖×c8 20 ♖c1 ♘f6 21 ♗b4 ♕d8 22 ♖×c8 ♗×c8 23 ♗a5 ♕e7 24 ♕c1 ♗b7 25 ♘g3 g6 26 ♗b6 ♔f7 27 ♘e2 ♔g7 28 ♗a5 h5 29 ♔h1 ♔f7 30 h3 ♔g7 31 ♕e3 ♔h7 32 ♕b6 ♘e8 33 ♘c3 ♕d7 34 ♔g1 ♔g7 35 d4 e×d4 36 ♕×d4† ♔f7 37 ♕b6 f×e4 38 f×e4 ♕e7 39 ♗b4 ♔f6 40 ♗a3 h4 41 ♗c5 ♔g5 42 ♗e3† ♔h5 43 ♕d4 g5 44 a4 b×a4 45 ♕×a4 ♘f6 46 ♗d4 ♔g6 47 ♕c2 ♗c8 48 ♕d3 ♔f7 49 ♕f1 ♗d7 50 ♕f3 a5 51 ♕e3 ♔g6 52 ♕d3 ♔f7 53 ♕f3 a4 54 ♕e3 ♔g6 55 ♕d3 ♔h6 56 ♕b1 a3 57 ♔h2 a2 58 ♕×a2 ♘×e4 59 ♕e2 ♗f5 60 ♘b5 ♕f7 61 ♕c4 ♗d7 62 ♔g1 ♕f4 63 ♘a3 ♘d2 64 ♕d3 ♗f5 65 ♕c3 ♗×h3 66 ♗g7† ♔h5 67 ♕d3 ♗×g2 68 ♔×g2 ♕g4† 69 ♔h1 ♘e4 70 ♕c2 ♕h3† 71 ♔g1 ♕e3† 72 ♔h1 ♕e1† 73 ♔g2 **0–1**

Chess Challenger X — Hitech

1 e4 e5 2 ♘c3 ♘f6 3 f4 d5 4 f×e5 ♘×e4 5 ♘f3 ♗e7 6 d4 ♘×c3 7 b×c3 O-O 8 ♗e2 c5 9 O-O ♘c6 10 ♗e3 ♕a5 11 ♕d3 ♗g4 12 ♔h1 ♗h5 13 ♖fb1 ♖ab8 14 d×c5 ♗×f3 15 g×f3 ♘×e5 16 ♕×d5 ♘c6 17 ♗d4 ♕d8 18 ♗c4 ♕×d5 19 ♗×d5 ♗g5 20 ♖g1 ♗h6 21 ♖ab1 ♖fd8 22 ♗×c6 b×c6 23 ♗e5 ♖×b1 24 ♖×b1 ♖e8 25 f4 a5 26 c4 f6 27 ♖b8 ♖×b8 28 ♗×b8 a4 29 ♔g2 g6 30 ♔f3 ♔f7 31 ♗d6 ♔e6 32 ♔e4 ♗g7 33 ♔d4 f5† 34 ♔d3 ♗f6 35 ♔e3 ♗g7 36 ♔d2 ♗f6 37 ♔d3 h5 38 ♔e2 h4 39 h3 ♗b2 40 ♗c7 ♔d7 41 ♗a5 ♗d4 42 ♗b4 ♔e6 43 ♗e1 ♗f6 44 ♗d2 ♗e7 45 ♗e3 ♗d8 46 ♔d3 ♔f7 47 ♔c3 ♗c7 48 ♔b4 g5 49 f×g5 ♔g6 50 ♔×a4 ♗h2 51 ♔a5 f4 52 ♗×f4 ♗×f4 53 ♔b6 ♔f7 54 ♔×c6 **1–0**

BP — Cray Blitz

1 e4 c5 2 ♘f3 e6 3 c3 d5 4 e5 ♕c7 5 d4 ♕b6 6 ♗e2 c×d4 7 c×d4 ♗b4† 8 ♘c3 ♗×c3† 9 b×c3 ♘e7 10 O-O O-O 11 ♕d3 h6 12 ♗a3 ♖e8 13 ♖ab1 ♕c6 14 ♕d2 a6 15 ♗d3 ♘d7 16 ♕c2 b5 17 ♗h7† ♔h8 18 ♗d3 ♗b7 19 ♖b3 ♘c8 20 ♖fb1 ♘cb6 21 ♕c1 ♘c4 22 ♗b4 ♖ec8 23 ♕f4 ♔g8 24 ♖e1 ♘db6 25 ♔h1 ♕e8 26 ♖eb1 ♖c6 27 ♖e1 ♖ac8 28 ♖bb1 ♘a4 29 ♖bc1 ♘cb2 30 ♕d2 ♘×d3 31 ♕×d3 ♘b2 32 ♕d2 ♘c4 33 ♕d3 ♘b2 34 ♕d2 ♘a4 35 ♗a5 ♘b6 36 ♕f4 ♘c4 37 ♗b4

a5 38 ♗c5 ♘b2 39 ♕e3 ♘a4 40 c4 d×c4 41 ♗d6 b4 42 ♕d2 c3 43 ♕f4 ♘b2 44 ♕e3 ♕d7 45 d5 e×d5 46 ♘d4 ♖c4 47 f3 ♗c6 48 a3 ♗a4 49 a×b4 a×b4 50 ♘e2 ♖e8 51 ♘g3 d4 52 ♕f2 d3 53 ♘e4 d2 54 ♘×d2 ♘d3 55 ♕e3 **0–1**

Novag X — Sun Phoenix

1 e4 e6 2 d4 d5 3 ♘c3 ♗b4 4 ♘ge2 ♘e7 5 a3 ♗a5 6 b4 ♗b6 7 a4 a5 8 b5 c5 9 b×c6 ♘b×c6 10 ♗b2 O-O 11 ♖b1 ♖e8 12 e×d5 e×d5 13 ♘b5 ♘f5 14 g3 ♘d6 15 ♗g2 ♗g4 16 f3 ♘f5 17 ♔f2 ♘e3 18 ♕d2 ♗f5 19 ♘a3 ♘b4 20 ♖hc1 ♖c8 21 ♔g1 ♘a2 22 ♖e1 ♘×c2 23 ♖bd1 ♘×e1 24 ♖×e1 ♕e7 25 ♔f2 ♘b4 26 ♘f4 ♕×e1† 27 ♕×e1 ♖×e1 28 ♔×e1 g5 29 ♘×d5 ♘×d5 30 ♔d2 ♖d8 31 ♘c4 ♗c7 32 ♗c3 ♘×c3 33 ♔×c3 ♗d7 34 ♘e3 ♗×a4 35 d5 b5 36 ♗h1 ♔f8 37 ♔d3 ♗b3 38 ♔e4 a4 39 ♔d3 a3 40 d6 **0–1**

Waycool — Bebe

1 e4 c5 2 c3 d5 3 e×d5 ♕×d5 4 d4 e6 5 ♘f3 ♘c6 6 ♗d3 c×d4 7 c×d4 ♗b4† 8 ♘c3 ♘f6 9 O-O ♕a5 10 ♗d2 O-O 11 a3 ♗e7 12 ♘b5 ♕d8 13 ♕a4 a6 14 ♘c3 ♕b6 15 ♕c4 ♖d8 16 ♘a4 ♕a7 17 ♗e3 ♘g4 18 ♔h1 ♗d7 19 ♘c5 b6 20 ♘×d7 ♕×d7 21 ♖ac1 ♘a5 22 ♕c2 h6 23 ♘e5 ♘×e5 24 ♗h7† ♔h8 25 d×e5 ♖ac8 26 ♕b1 ♖×c1 27 ♖×c1 ♘c4 28 ♗e4 ♘×e3 29 f×e3 ♗g5 30 ♕c2 ♗×e3 31 ♖e1 ♗f4 32 ♗f3 ♕d2 33 ♕×d2 ♖×d2 34 g3 ♗g5 35 ♗h5 g6 36 ♗e2 ♖×b2 37 ♗×a6 ♖a2 38 ♖b1 ♗e3 39 ♗b5 ♖×a3 40 ♗e8 ♔g7 41 ♖f1 ♖a7 42 ♖e1 ♗c5 43 ♖d1 ♖a8 44 ♗c6 ♖a5 45 ♗e8 ♔f8 46 ♗c6 ♗e3 47 ♖d8† ♔g7 48 ♔g2 ♖×e5 49 ♔f3 ♗c5 50 ♖d7 ♖e3† 51 ♔g2 ♖e2† 52 ♔h1 ♔f6 53 ♖d1 e5 54 ♗b5 ♖b2 55 ♗c4 ♔e7 56 ♖e1 ♗d4 57 ♗d5 f5 58 ♖c1 e4 59 ♖c6 e3 **0–1**

Cryus 68K — A. I. Chess

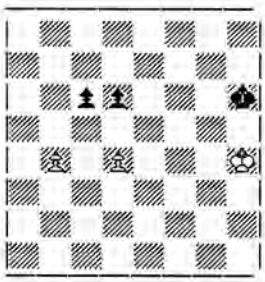
1 e4 c5 2 ♘f3 ♘c6 3 ♗b5 g6 4 O-O ♗g7 5 ♖e1 e5 6 ♗×c6 b×c6 7 c3 ♘e7 8 d4 c×d4 9 c×d4 e×d4 10 ♘×d4 ♖b8 11 ♘f3 ♖×b2 12 ♗×b2 ♗×b2 13 ♘bd2 ♗×a1 14 ♕×a1 O-O 15 ♕f6 d6 16 ♖c1 ♕d7 17 ♘c4 d5 18 e×d5 ♘×d5 19 ♕b2 ♘e7 20 ♕a3 ♕c7 21 ♘d6 ♖d8 22 ♘×c8 ♘×c8 23 h3 c5 24 ♕c3 ♘b6 25 ♕f6 c4 26 ♕c3 ♕f4 27 ♖e1 f6 28 ♕a3 ♘c8 29 ♕c5 h6 30 ♕c6 ♘b6 31 ♕e6† ♔h8 32 ♕f7 c3 33 ♖e7 ♖d1† **1–0**

The International Computer Chess Association

Established at the Second World Computer Chess Championship in Toronto in 1977, this international association has about seven hundred members from all aver the world. The ICCA Journal is the leading publication on the subject of computer chess, and one day may be the world's leading chess publication. It is published four times a year. Current officers are David Levy, President, Tony Marsland, Vice President, and Jonathan Schaeffer, Secretary/Treasurer. If you are interested in becoming a member, please write to Professor Jonathan Schaeffer, Department of Computing Science, University of Alberta, Edmonton, Alberta, Canada T6G 2H1. The annual dues is $25.00 (US).

Kings and Pawns Endgame Test

The set of Kings and pawns positions shown below serves as a good endgame test. HITECH and CRAY BLITZ took this test recently and solved them all in a minute or so. HITECH took no more than 40 seconds to solve any one. Try them yourself. The answers are at the bottom of this page. In each position it is White to move and win.



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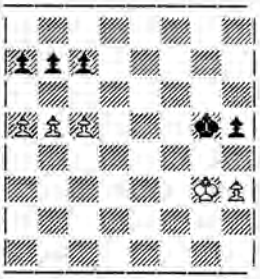

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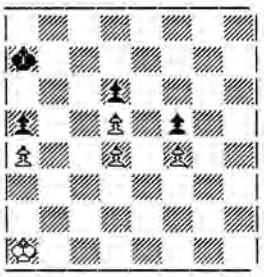

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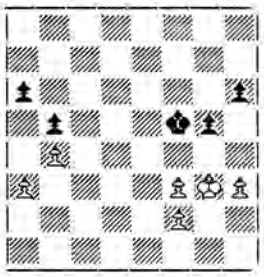

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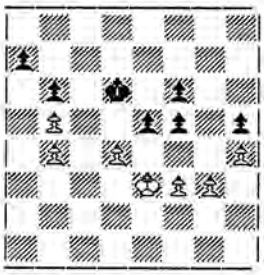
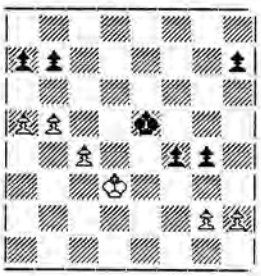
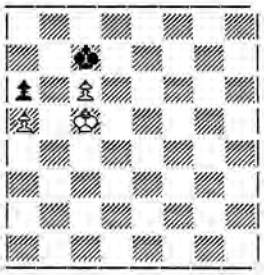


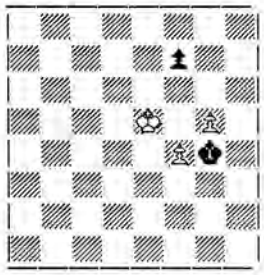
(c)_____



(d)_____



(k)_____



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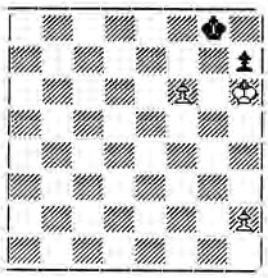
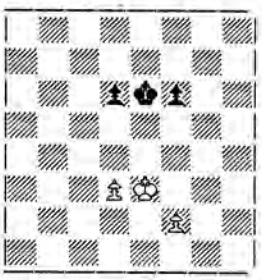
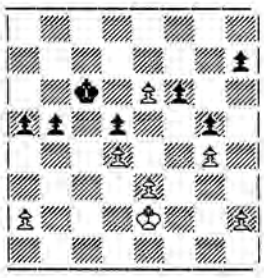


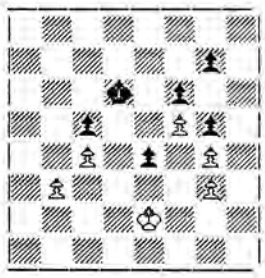
(e)_____



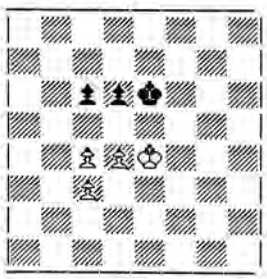
(f)_____



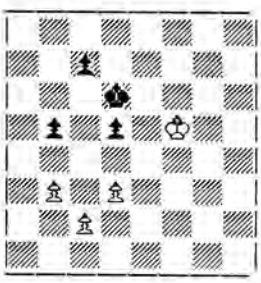
(m)_____



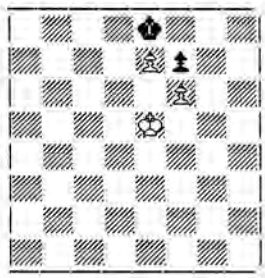
(n)_____



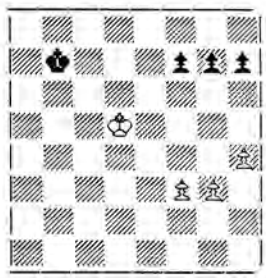
(g)_____



(h)_____



(o)_____



(p)_____

Solutions: (i) a1b1 (j) f3f4 (k) c5d5 (l) e5e4 (m) c3e4 (n) e2f2 (o) e5f4 (p) d5d6 (a) d4d5 (b) b5b6 (c) g3g4 (d) c4c5 (e) h6g5 (f) Ke4 (g) d4d5 (h) b4b5