The ACM's Seventeenth North American

Computer Chess Championship

and

The Sixth World Microcomputer Chess Championship

Dallas, Texas

October 31th-November 5th, 1986

A Special Event at the ACM-IEEE Computer Society FJCC

Table of Contents

- Welcome and overview	1
- Important times and places	2
- Scorecard for NACCC	3
- List of Participants in the NACCC	4
-Computing system information for the NACCC	5
-Rules for the NACCC	6
-Scorecard for the WMCC	8
-List of participants and computing systems in the WMCC	9
-Rules for the WMCC	10
-History of the major tournaments	12
-The ACM's Sixteenth NACCC	14
- Technical Session and Panel Discussion	24
-The ACM's Computer Chess Committee	25
- The ICCA	25

Welcome and Overview

This year, the ACM Computer Chess Committee is giving its members, those of the IEEE Computer Society, and the general public a real treat. In addition to holding the usual ACM's North American Computer Chess Championship, we are also holding the Sixth World Microcomputer Chess Championship. The NACCC will take place in the Anatole Hotel in the evenings (with the exception of a Sunday matinee) while the WMCC will take place at the Infomart during the days. There are sixteen entries in the NACCC and fourteen in the WMCC making the combined tournaments the single largest computer chess program in the history of such events. Participants are coming from Holland, England, Germany, Hungary, Canada, and the USA. And while several leading programs will not be present, both tournaments may provide new levels of excellence and excitement. Winners of each event will receive trophies and a $2000 prize.

The world champion program, CRAY BLITZ(Hyatt, Gower, Nelson, Meade), will head the fieldin the NACCC. The program, executing on a four processor Cray XMP will execute about 420 million instructions per second, searching about ten to fifteen million chess positions during the course of a single three-minute move. CRAY BLITZ defended its title of world champion in June of this year in Cologne, Germany, defeating HITECH(Berliner,Ebeling, Goetsch,Palay, Campbell, Slomer) in the final round. HITECH, winner of last year's ACM tournament, is passing up this event primarily because it is in the middle of a major revision. The opposition will come from a slew of multiprocessing systems and special purpose systems. In addition to CRAY BLITZ, five other entries will run on more than one computer:

WAYCOOL	64 processors of an N-cube
SUN PHOENIX	20 SUN-3 workstations
CHESS CHALLENGER X	16 or more 68000s controoled by a Z80.
LACHEX	4 processors of a Cray XMP
OSTRICH	8 processors:Data General Novas and and an Eclipse master.

While running on a number of computers is clearly the current fashion, special purpose circuitry may be equally the wave of the future. BEBE and CHIPTEST represent that trend. And microcomputers will take on this group as represented by CYRUS 68K, MEPHISTO MOTOROLA, NOVAG EXPERT X, RECOM-REBEL 87, and REX III. It's worth recollecting that it was only slightly more than ten years ago that the issue of programming languages was on everyone's mind at these tournaments.

The WMCC will see continued improvement in the level of play by these featherweight processing machines. Play should be approaching the Master level, just a notch off the level of play in the NACCC. The favorites are the Fidelity computers and the Mephisto computers.

A Technical Session on AI Algorithms will be held on Tuesday, November 4th from 3:45-5:15 PM in Room H with two papers presented, one by Tony Marsland and N. Srimani and another by Jonathan Schaeffer. A Panel Discussion will follow with participant including Ken Thompson, David Levy, Robert Hyatt and Monty Newborn.

Mike Valvo will serve as the Tournament Director with Tony Marsland serving as Assistant Director. Danny Kopec will be Official Scorekeeper. Both Valvo and Kopec will provide running commentary on the games and we encourage the audience to feel free to ask questions. (In the old days, the audience couldn't understand why the programs played so badly; now they just don't understand what the programs are doing at all!). Local arrangements have been carried out by Glenn Scharp and Kermit Paulos and I would like to extend both of them a big thanks. The Dallas Chess Club has also provided us some help and I would like to thank them also.

We hope you enjoy our show.

Monty Newborn, Chairman, ACM CCC.
Hans Berliner, Tony Marsland, Kathe Spracklen,
and Ken Thompson, Members of the ACM CCC.

Important Times and Places

1. **Schedule of Rounds for the World Microcomputer Chess Championship: (games are in the Edison Room of the Dallas Infomart)**

Round 1:	6:30 PM	Friday	October 31
Round 2:	10:00 AM	Saturday	November 1
Round 3:	5:00 PM	Saturday	November 1
Round 4:	8:00 AM	Sunday	November 2
Round 5:	10:00 AM	Monday	November 3
Round 6:	10:00 AM	Tuesday	November 4
Round 7:	10:00 AM	Wednesday	November 5

2. **Schedule of Rounds for the ACM's 17th NACCC: (games are in Ballrooms D and E of the Anatole Hotel)**

Round 1:	2:30 PM	Sunday	November 2
Round 2:	8:30 PM	Sunday	November 2
Round 3:	7:30 PM	Monday	November 3
Round 4:	7:30 PM	Tuesday	November 4
Round 5:	7:30 PM	Wednesday	November 5

3. **Awards Presentation Breakfast:** Thursday, November 6th at 8:30 AM.

4. **Technical Session:**"AI Algorithms", Tuesday, Nov. 4th at 3:45-5:15 PM in Room 3H.

5. **ACM Computer Chess Committee Meeting:** 4:00-5:00 PM, Monday, November 3rd.

6. **ICCA Meeting:** 5:00-6:00 PM, Wednesday, November 5th.

Tournament Officials:

Mike Valvo, Tournament Director, and Tony Marsland, Assistant Director.

Organizing Committee:

Glenn Scharp, Monty Newborn

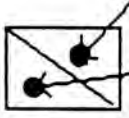
Admissions Committee:

Ken Thompson, Hans Berliner, Tony Marsland, Monty Newborn, Kathe Spracklen.

Score Table

ACM's 17th North American Computer Chess Championship

Team	Rounds 1	2	3	4	5	Total Points	Final Place
1 Bebe							
2 Chess Challenger X							
3 ChipTest							
4 Cray Blitz							
5 Cyrus 68K							
6 Fidelity Experimental							
7 Lachex							
8 Mephisto Motorola							
9 Merlin							
10 Novag Expert X							
11 Ostrich							
12 Recom-Rebel 87							
13 Rex III							
14 Sun Phoenix							
15 Vaxchess							
16 WayCool							

Code: 

Participants in the ACM's Seventeenth North American Computer Chess Championship

Bebe	Tony Scherzer and Linda Scherzer, SYS-10 Inc., 2117 Stonington Avenue, Hoffman Estates, Illinois 60195.
Chess Challenger X	Ron Nelson, Dan Spracklen, Kathe Spracklen, and Danny Kopec, Boris Baczynskyj, c/o RN, Fidelity International Inc., 13900 N. W. 58th Ct., Miami, Florida, 33014.
ChipTest	Thomas Anantharamam and Feng-hsiung Hsu, c/o FH, Department of Computer Science, Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213.
Cray Blitz	Robert Hyatt, Harry Nelson, Burt Gower, and John Meade, c/o RH, 1020 Gordon Woods Drive, Birmingham, Alabama 35244.
Cyrus 68K	Mark Taylor, David Levy, and Kevin O'Connell, c/o DL, Intelligent Chess Software Ltd., 11 Loudoun Road, London NW8 0LP, England.
Fidelity Experimental	Dan Spracklen, Kathe Spracklen, and Danny Kopec, c/o DS, 4540 Kearney Villa Road, Suite 104, San Diego, California 92123.
Lachex	Tony Warnock and Burt Wendroff, c/o BW, MS B284, Los Alamos National Laboratory, Los Alamos, New Mexico 87545.
Mephisto Motorola	Richard Lang, Hegener + Glaser AG, Arnulfstr. 2, D8000 Munich, West Germany.
Merlin	Hermann Kaindl, Marcus Wagner, and Helmut Horacek, c/o HK, Marxergasse 18/2/1, A-1030 Wien, Austria.
Novag Expert X	David Kittinger, 18923 Cantara Street, Reseda, California 91335.
Ostrich	Monty Newborn, School of Computer Science, McGill University, 805 Sherbrooke Stree West, Montreal, Quebec, Canada H3A 2K6.
Recom-Rebel 87	Ed Schroder, Merel 10, 7423 EH Deventer, Holland.
Rex III	Don Dailey, 1328 Dale Avenue, Roanoke, Virginia 24013.
Sun Phoenix	Jonathan Schaeffer and Marius Olaffson, c/o JS, Department of Computing Science, University of Alberta, Edmonton, Alberta, T6G 2H1.
Vaxchess	Tony Guifoyle and Richard Hooker, c/o TG, 13 Walgrove Road, Hitchen Herts, England.
Waycool	Ed Felten, Rod Morrison, and Steve Otto, c/o RM, Cal Tech, 206-49 Pasadena, California 91125.

Computing System Information

ACM's Seventeenth North American Computer Chess Championship

Program	Computing System and Language	Book	Nodes/Sec
Bebe	SYS-10 Chess Engine*, assembler, 65Kb 16 bits, 10 mips.	4K	40K
Chess Challenger X	Z80 controller + 16 or more 68000*, C(for Z80) and assembler for 68000.	16K+	NA
ChipTest	SUN 3 plus high speed move generator, assemblr,(at Carnegie-Mellon Univ.)	NA	100K-1M
Cray Blitz	Cray X-MP 4/8, Fortran and assembler, (at Apple Corporation, Culpertino, California)	60K	120K
Cyrus 68K	68020-based microcomputer*, assembler.	16K	4K
Fidelity Experimental	68020-based microcomputer*,assembler.	30K	NA
Lachex	Cray X-MP 48, Fortran and assembler, Cray Research, Chippawa Falls, Minnesota	4K	50K
Mephisto Motorola	68020-based microcomputer*, assembler, 64 Kb RAM, 32 bits, 4 mips.	NA	NA
Merlin	IBM 3081, Pascal, 12 mips, IBM Dallas.	6K	.6K
Novag Expert X	6502-based microcomputer*, assembler, 56 Kb ROM.	22K	2-3K
Ostrich	8 DG computers: 1 Eclipse S/120, 6 Nova 4's, 1 Nova 3, on high speed DMA bus, 64 Kb/computer, 16 bits, 1mips/computer. (McGill University)	4K	2K
Recom-Rebel 87	6502 gate array processor*, assembler.	NA	NA
Rex III	Intel 80286-based microcomputer*, Pascal.	.1K+	.3K
Sun Phoenix	20 SUN 3 Workstations, C, SUN Corporation, Sunnyvale, California.	8K	20K
Vaxchess	Microvax 2,C + assembler.	14K	1K
WayCool	N-cube (64-processors @ 128Kb/proc., 1 mips/proc), Cal Tech.	15K	14K

* indicates computer is at tournament site

17th ACM North American Computer Chess Championship

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 a meeting at 2:00 PM on Sunday, November 2 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 any entry which fails to appear.

3. The tournament is a five round Swiss style tournament. The first and second rounds will be played Sunday November 2 at 2:30 PM and 8:30 PM. The third round is scheduled for Monday, November 3rd at 7:30 PM, the fourth round for Tuesday November 4th at 7:30 PM, and the fifth round for Wednesday November 5th at 7:30 PM.

4. Trophies 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, the sum of the opponents' points will be used as a second factor. If a tie still remains, the opponents' opponents' points, etc., will be used.

5. A trophy will be awarded to the entry running on a computing system that is present in Dallas and finishes highest based on tie-breaking points and weighs under 25 kilograms. That program will receive the title of North American Small Computing System Chess Champion.

5. A prize of $2000 will be awarded to the program which finishes the tournament with the most points. In the event of a tie, the prize will be divided equally.

6. 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.

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

8. The TD has the right to adjudicate a game after five 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.

9. A team may request the TD to stop its 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 a team using a remote computer can clearly establish that its problems are not in its own computing system

but in the communication network, the TD can permit additional time-outs.

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

11. 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.

12. If a failure occurs during the course of a game, the program parameters must be reset to thier values at the time the game was interupted. An operator error made when starting a game or when restarting in the middle of a game after a failure cannot be corrected!

13. If an operator types in an incorrect move, the TD must be immediately be 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 consent of the TD. The TD may not allow certain parameters to be changed, e.g., the contempt factor.

14. A team must receive the approval of the TD to change from one computing system to another. The new system cannot be any more powerful than the original.

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

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

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 responsible for organizing computer chess activities within 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. This tournament has been held anually starting in 1970. Currently, the Members of the Committee are Monty Newborn, Chairman, Hans Berliner, Tony Marsland, Kathe Spracklen, and Ken Thompson.

The International Computer Chess Association

Established at the Second World Championship in Toronto in 1977, this international association has about seven hundred members from all over the world. It was formed by the programmers of the leading programs and its chief purpose is to serve this community. The ICCA Journal publishes technical and non-technical papers on computer chess and is the foremost publication of its kind. It may one day be the world's leading chess publication. Currently, it is published four times a year. Authors of articles should send them to Jaap van den Herik, Department of Mathematics and Informatics, Delft University of Technology, 2628 BL Delft, The Netherlands. Individuals interested in becoming members should write to Jonathan Schaeffer, Department of Computing Science, University of Alberta, Edmonton, Alberta, T6G 2H1. Dues are $20 annually. Officers are David Levy, President, Tony Marsland, Vice President, and Jonathan Schaeffer, Secretary/Treasurer.

Score Table

Sixth World Microcomputer Chess Championship

Team	Rounds 1	2	3	4	5	6	7	Total Points	Final Place
1. Atari Kempelen									
2. Chess Monster									
3. Cyrus 68K A									
4. Cyrus 68K B									
5. Cyrus 68K C									
6. Fidelity "2533" A									
7. Fidelity "2533" B									
8. Fidelity "2533" C									
9. Mephisto Dallas 1									
10. Mephisto Dallas 2									
11. Mephisto Dallas 3									
12. Recom-deventer A									
13. Recom-deventer B									
14. Recom-deventer C									

Code:

Computing System Information

Sixth World Microcomputer Chess Championship

Program	Computing System	Organization
Atari Kempelen	Atari ST, 68000-based microcomputer	Andromeda Software Inc.
Chess Monster	IBM PC, 8086-based microcomputer	Enlightenment Inc.
Cyrus 68K A	68020-based microcomputer	Intelligent Chess Software Ltd.
Cyrus 68K B	" " "	" " "
Cyrus 68K C	" " "	" " "
Fidelity "2533" A	68020-based chess machine	Fidelity International Inc.
Fidelity "2533" B	" " "	" " "
Fidelity "2533" C	" " "	" " "
Mephisto Dallas 1	68020-based chess machine	Hegener and Glaser
Mephisto Dallas 2	" " "	" "
Mephisto Dallas 3	" " "	" "
Recom-deventer A	6502-based microcomputer	E. G. H. Schroder
Recom-deventer B	" " "	" "
Recom-deventer C	" " "	" "

The ACM's World Microcomputer Chess Championship

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). The computing system must use only one microprocessor for searching the chess tree. That microprocessor can be inside a conventional microcomputer or inside a chess-playing machine. Bit-sliced machines and multiprocessing machines are not allowed.

2. An organization or company can submit as many as three entries.

3. Participants are required to attend a meeting at 6:00 PM on Friday, October 31st for the purpose of officially registering for the tournament. Rules will be finalized at that meeting.

4. The tournament is a seven round Swiss style tournament. The first is on Friday October 31st at 6:30 PM. The second and third rounds will be played Saturday November 1st at 10:00 AM and 5:00 PM. The fourth round is scheduled for Sunday, November 2rd at 8:00 AM, the fifth round for Monday, November 3th at 10:00 AM, the sixth round for Tuesday, November 5th at 10:00 AM, and the seventh round for Wednesday, November 6th at 10:00 AM.

5. Trophies 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, the sum of the opponents' points will be used as a second factor. If a tie still remains, the opponents' opponents' points, etc., will be used.

6. A prize of $2000 will be awarded to the program which finishes the tournament with the most points. In the event of a tie, the prize will be divided equally.

7. 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.

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

9. 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.

10. A team may request the TD to stop its 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.

11. 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.

12. If a failure occurs during the course of a game, the program parameters must be reset to their values at the time the game was interupted. An operator error made when starting a game or when restarting in the middle of a game after a failure cannot be corrected!

13. If an operator types in an incorrect move, the TD must be immediately be 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 consent of the TD. The TD may not allow certain parameters to be changed, e.g., the contempt factor.

14. A team must receive the approval of the TD to change from one computing system to another. The new system cannot be any more powerful than the original.

15. Entries from the same organization will not be paired together.

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

18. There is an entry fee of $550 US. If paid before September 20, the fee is $500 US. Checks should be made out payable to the Association for Computing Machinery.

History of Major Tournaments

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

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ACM's 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, Ruben, Winograd Berman, Toikka, Alexander, 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 17
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, Palay, Campbell, Slomer, SUN with chess hardware	BEBE; Scherzer, Chess engine

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World Microcomputer Championships

Year	City	Winner	Runner-up
1980	San Jose	CHALLENGER	MYCHESS B
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

ACM's Sixteenth North American Computer Chess Championship

Danny Kopec San Diego State University

Monty Newborn McGill University

HITECH, a program developed at Carnegie-Mellon University by a group of researchers under the direction of Hans Berliner, finished first in the ACM Sixteenth North American Computer Chess Championship held during the Association's annual conference in October 1985. The field of 10 was the smallest in many years while the level of play was the best yet.

The tournament may have marked the emergence of a new era in computer chess. The 1970s were the years of the CHESS series programs developed at Northwestern University by David Slate, Larry Atkin, and Keith Gorlen. The period from 1979 to 1983 marked the reign of BELLE, developed by Ken Thompson and Joe Condon of AT&T Bell Laboratories. BELLE was World Champion from 1980 through 1983, when it was dethroned by the current World Champion CRAY BLITZ running on a Cray X/MP computer. CRAY BLITZ was developed at the University of Southern Mississippi by Robert Hyatt, Burt Gower, and Harry Nelson. Now CRAY BLITZ seems to have been dethroned by HITECH. The week before the ACM tournament, HITECH participated in a tournament for human masters and won with an impressive 3½–½ score earning a performance rating of 2486. Berliner, former World Correspondence Chess Champion, predicts that "in the next five to ten years, HITECH will be ready to take on the top ten players in the world in a match." HITECH searches trees at a rate of 175,000 nodes/second, while running on a SUN workstation with a specially designed VLSI chip attached that permits the high-search speeds. Berliner is optimistic that HITECH can achieve a 2400 USCF (United States Chess Federation) rating by the summer of 1986 and then possibly take on David Levy in a six-game match in November in Las Vegas to see whether HITECH can finally surpass the English International Master. Levy beat CHESS 4.9 in 1978 to win a sizable bet made 10 years earlier that no computer could defeat him in a match during the coming 10 years. Levy also defeated the current World Champion program CRAY BLITZ 4–0 in a match in London in 1983 at the end of a five-year bet.

Finishing second for the third consecutive year was BEBE, written by Tony Scherzer of SYS-10, Hoffman Estates, Illinois, with a 3–1 score. A surprising, clear third place finish was achieved by INTELLIGENT SOFTWARE, the joint effort of Levy, Mark Taylor, and Kevin O'Connell of Intelligent Software, London, England. CRAY BLITZ had to settle for a fifth place finish and an even 2–2 score.

The Play

The first round saw routine victories by the first and third seeds, CRAY BLITZ and BEBE, while after a considerable struggle, the highly touted HITECH overcame a strong challenge from Burton Wendroff's LACHEX, which ran on a Cray 1M computer at Cray Research in Chippewa Falls, Wisconsin. There was also a minor upset when INTELLIGENT SOFTWARE defeated CHAOS after the latter, in an excellent position, tried an interesting positional sacrifice of its Queen for Rook and Knight. After great complications, newcomer SPOC fell apart against PHOENIX.

Round 2 saw the head-to-head encounter between CRAY BLITZ and BEBE. Despite lacking its openings transposition table due to hardware problems, BEBE obtained excellent attacking chances in a Sicilian Dragon with Kings castled on opposite wings and an early departure from theory (the fully annotated game follows). Despite considerable complications BEBE found a way to press its attack and force CRAY BLITZ's resignation in a piece-down endgame. This loss marked the first

The authors would also like to express gratitude to FIDE Master Boris Baczynskyjs; some of the authors' notes are based on Baczynskyjs's analysis in *CHESS LIFE*. Comments in brackets are those of Monty Newborn, who based his remarks on computer printouts provided by the authors of HITECH and CRAY BLITZ.

Symbols
!! = An outstanding move
! = A very good move
!? = An interesting move
?! = A dubious move
? = A mistake
?? = A blunder

CRAY BLITZ versus BEBE
Round 2

1. e4 c5 2. Nf3 d6 3. d4 cxd4 4. Nxd4 Nf6 5. Nc3 g6 6. Bg5

The authors of CRAY BLITZ, which boasted the largest Opening book in the tournament, like to steer their program into unusual channels as per the text move.

6. . . . Bg7 7. Qd2 Nc6 8. O-O-O O-O 9. Nb3

Usually White tries to initiate the "Yugoslav Attack" against Black's *Dragon Defense* with f3, h4, g4, etc., but here the White Knight on d4 is unstable and hence White tries to find a safe home for it. Alternatives such as 9. Nxc6 bxc6 10. e5!? Ne8 (10. . . . Nd5 and 10. . . . Ng4 deserve attention) 11. exd6 Nxd6 12. Bxe7 Qxe7 13. Qxd6 Qg5+ 14. Qd2 Qa5 15. Bc4 Rb8 16. Bb3 Bf5 as occured in Rauzer–Kan, 1936, give White no advantage.

9. . . . Re8?!

BEBE probably tries to avoid the trade of its *Dragon Bishop* by enabling . . . Bh8 after Bh6. The more natural, "human" move is 9. . . . Be6. A program is not apt to make such a move because most are penalized for developing their Bishops in front of their central Pawns—a legacy of misplaced clergymen in an earlier era of computer chess.

10. Bc4?!

This piece is clearly "loose" and misplaced here. CRAY BLITZ's choice is comprehensible on the grounds that it develops White's last minor piece to its most mobile and center-oriented square (even aiming at the Black King), but as is typical of computer play, it is not part of any coherent plan. Better is 10. Be2 with the idea of 11. h4 and 12. h5 [This is CRAY BLITZ's first move out of book. It examined 25,105,612 positions in just under four minutes and predicted 10. . . . Bd7 11. Qf4 Ne5 12. Be2 Kf8 13. Nd5 Nxd5 14. Rxd5. CRAY BLITZ typically examined about 10 to 15 million positions on each move.]

10. . . . Ng4?!

Another dubious move, most probably because BEBE mistakenly thinks that 11. . . . Bxc3 is a threat.

11. h3 Nge5

. . . but probably only now saw that 11. . . . Bxc3? 12. Qxc3 Nxf2? loses to 13. Rhf1.

12. Bb5?!

Again, a human would probably retreat this Bishop to e2 not subjecting it to further harassment and threatening f4, and then on 12. . . . Be6 13. Nd5.

12. . . . a6 13. Be2 a5?!

Instead of ceding the b5-square to White, humans would have a notion of how 13. . . . b5 with . . . Nc4 to follow would fit into a general plan of attack on the White King.

14. Bb5

Computer programs are unprejudiced when it comes to moving pieces more than once to achieve mobility and tactical ends. Hereby . . . a4 is detained, but 14. a4 was a viable alternative.

14. . . . Be6 15. Nd5?

Since Black can now force play with 15. . . . a4. 15. a4 was still indicated; CRAY BLITZ probably did not relish the shattering of its Q-side pawn formation after 15. a4 Bxb3, but then White's position is really not bad.

15. . . . a4 16. Nd4 Bd7!

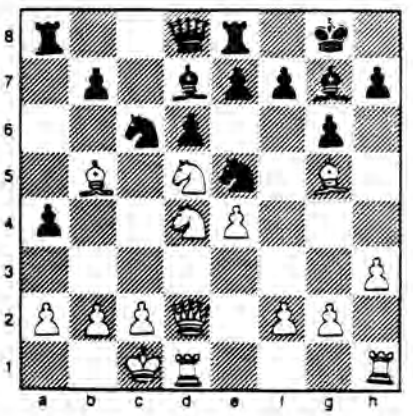

FIGURE 1. Position after 16. . . . Bd7!

A strong move because it exposes the insecurity of White's actively and centrally posted pieces, although 16. . . . Nxd4!? with tremendous complications, also deserves attention. [CRAY BLITZ predicted Black's move and saw the game continuing 17. Nxc6 bxc6 18. Nxe7+ Rxe7 19. Bxe7 Qxe7 20. Be2.]

17. Nxc6?

Initiating a misdirected sequence that results in a decisive material gain for Black. However, after 17. Ne2 or 17. Nf3 Black would have few problems if 17. . . . Na5 is played.

17. . . . bxc6 18. Nxe7+ Rxe7 19. Bxe7 Qxe7 20. Be2

Now that the smoke has cleared, CRAY BLITZ probably expected to

gain a slight material advantage with 20. Qxd6. However, there is never time for this capture because the White King proves to be inadequately defended as the Black minor pieces continuously harass him.

20. . . . Qe6! 21. Kb1

If 21. Qxd6 Qxa2 22. f4 a3 and Black quickly crashes through. [CRAY BLITZ, on its seventh iteration, figured that 21. Qxd6 Qxa2 22. f4 Nc4 23. Bxc4 Qxb2+ 24. Kd2 Qc3+ 25. Kc1 Qb2+ results in a Draw and on the eighth iteration felt 21. Kb1 gives it a slightly positive score.]

21. . . . Rb8 22. b3

If 22. Qxd6 Rxb2+ 23. Kxb2 Nc4+ wins.

22. . . . axb3 23. cxb3 Be8

BEBE has conducted its attack quite well, but players who hate retreating might prefer moves such as 23. . . . Nc4 or 23. . . . d5 or 23. . . . Nf3! which when followed by 24. . . . Qf6 or 24. . . . Qe5 probably leads to an irrepressible attack that most strong humans would enjoy and most machines would not touch. In any case, White's King position seems too compromised for successful resistance.

24. Kc2

White's tries to guard the P/b3 since on 24. Qxd6? Rxb3+ is decisive. [CRAY BLITZ saw the game continuing 24. . . . Ra8 25. Kc1 Qf6 26. f4 Nc4 27. e5 Nxd2 28. exf6 still leading to a slightly positive score.]

24. . . . Nd7 25. f3 Ra8
26. Kc1 Nc5

Threatening 27. . . . Nxb3+ 28. axb3 Ra1+ 29. Kc2 Ra2+. [CRAY BLITZ realized that 26. . . . Bh6 27. f4 (if 27. Qxh6 Rxa2 wins) Qxe4 28. g3 d5 29. Bd3 Qf3 30. Rhg1 leaves it down a Pawn. It saw its own score go negative for the first time on move 25 when it anticipated 25. . . . Ra8 26. Kc1 Qf6 27. Bd3 Ra5 28. b4 Qa1+ 29. Bb1.]

27. Qc2 Qf6 28. Bc4

One would expect the materialistic machine to try 28. a4 to save the threatened a-Pawn, but CRAY BLITZ can appreciate that 28. a4 Rb8 29. Bc4 Bh6+ 30. Kb1 Nxa4 is even worse.

28. . . . Qa1+ 29. Kd2 Qxa2
30. Qxa2 Rxa2+ 31. Kc1 d5!

A very fine and *humanlike* Pawn sacrifice that activates Black's only misplaced piece, although it probably stems from the machine's ability to see that it will receive more than sufficient interest for its small investment.

32. exd5 cxd5 33. Bxd5

If 33. Rhe1 Bc6 34. Bxd5 Rxg2! 35. Bc4 (35. Bxc6? Nxb3+ 36. Kb1 Rb2 checkmate; 35. b4 Bb2+ 36. Kb1 Na4; 35. f4 Rf2 is sufficient for Black to win) 35. . . . Bb2+ 36. Kb1 Bxf3 (analysis by Baczynskyjs). If 33. Rxd5 Ra1+.

33. . . . Bb5! 34. Rhe1

CRAY BLITZ walks into a Knight fork, but by now there is nothing better. If 34. Bc4 Bxc4 35. Rd8+ (35. bxc4 Nb3+ 36. Kb1 Rb2 checkmate) 35. . . . Bf8 36. bxc4 Ra1+; if 34. b4 Nd3+ 35. Rxd3 Ra1+.

34. . . . Nd3+ 35. Rxd3 Bxd3

The complications are over. BEBE lumbers through the rest surefooted, if not always elegantly.

36. Re8+ Bf8 37. g4 Kg7
38. Re3 Ba3+ 39. Kd1 Ra1+
40. Kd2 Bf1 41. Kc3 Rc1+
42. Kd2 Rc5 43. Ke1 Bxh3
44. Bc4 h5 45. gxh5 gxh5
46. Kf2 h4 47. Rd3 Bf5
48. Rd4 h3 49. Rh4 Rc7
50. Rh5 (0–1).

Although both programs made a number of errors in the transition phase from Opening to Middlegame play, BEBE's capitalization on its advantage after 19. . . . Qxe7 was quite impressive overall.

BEBE versus HITECH
Round 3

After BEBE's stunning victory over World Computer Chess Champion CRAY BLITZ, the following proved to be the key encounter between the tournament leaders.

1. e4 e5 2. Nf3 Nc6 3. Bb5 a6
4. Ba4 Nf6 5. O-O b5 6. Bb3 Bb7

The Archangel Variation, named for the White Sea port city, is one of the sharpest and lesser known defenses to the Ruy Lopez. White's next enters the main line.

7. Re1 Bc5 8. c3 d6
9. d4 Bb6 10. a4

The first departure from main-line theory (10. Bg5), although this move is in the book for both programs.

10. . . . h6 11. axb5 axb5
12. Rxa8 Qxa8 13. Na3 exd4!

Since there is no convenient way for Black to defend his P/b5 and 13. . . . b4 is strongly met by 14. Nc4, HITECH opts for central counterplay.

14. cxd4?!

Better is 14. Nxb5 O-O 15. Nbxd4 (15. cxd4 Na5 would transpose into the next note) 15. . . . Nxd4 16. Nxd4 Bxe4 = Kostro versus Ceshkovsky, 1969.

14. . . . Ba6?

HITECH, no longer having the crutch of its Opening book, immediately errs by misplacing its Bishop. It is precisely here where some further book knowledge is most pertinent for survival in this complex variation [HITECH expects 15. d5 Ng4 16. Re2 Na5 17.

Bc2 O-O]. Correct is 14. . . . O-O 15. Nxb5 (15. e5 dxe5 16. dxe5 Ng4 17. Re2 Rd8 with a strong initiative for Black) 15. . . . Na5 and Black will win back the Pawn with the advantage, for example:

1) 16. Bc2 Nxe4

2) 16. Nc3 Nxb3 17. Qxb3 Bxe4

3) 16. e5? dxe5 (16. Nxe5 Nxb3 17. Qxb3 Bxg2; 16. Rxe5 Bxf3 17. gxf3 Nxb3 18. Qxb3 c6 19. Nc3 Bxd4) 17. dxe5 Ng4 18. Rf1 Rd8 and White will not be able to protect all its weaknesses.

4) 16. d5? Nxb3 17. Qxb3 Nxe4! (Gulko versus Bajkov, 1975).

15. e5! dxe5 16. dxe5

16. d5 also deserves attention.

16. . . . Ng4 17. Bxf7+!?

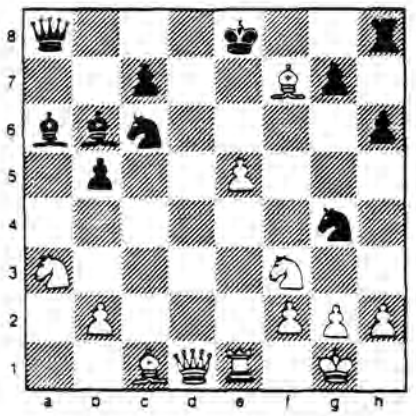

FIGURE 2. Position after 17. Bxf7+

[After 16. . . . Ng4, HITECH thought the game would continue 17. Re2 b4 18. Nc4 Qa7 19. Nxb6 Qxb6.] A typical computer move based on shallow materialism. If 17. . . . Kxf7? 18. Qd7+ Kg8 19. Qxg4 and White is a Pawn up with a fine position. Though BEBE's Bishop offer is sound enough, more critical is 17. e6! Bxf2+ (17. . . . Nxf2? 18. Qd7+ Kf8 19. Qf7#) 18. Kh1 O-O 19. exf7+ (if 19. e7!?, both 19. . . . Re8 20. Bxf7+! Kxf7 21. Qd5+ Kg6 22. Qe4+ Kh5 23. Qf5+ g5 24. Qf7# and 19. . . . Rc8 20. Bxf7+ Kxf7 21. Qd5+ Ke8 22. Qg8+ Kd7 23. e8 = Q+ Rxe8 24. Qd5+ lose, but 19. . . . Nxe7! 20. Rxe7 Bc5 21. Re2 Nf2+ 22. Rxf2 Bxf2 results in an unclear position) 19. . . . Kh8 (analysis by Baczynskyjs). In this final position it seems that White stands better because Black's King seems in greater peril, but to substantiate this feeling would require more space and analysis than are reasonable for this task. There is the tame 20. Re4 as well as 20. h3 and 20. Nh4, rife with exciting branch variations. Perhaps such a position is a bit too much for the human mind—and for the computer, too. BEBE, easily one of the top five programs in the world, lacks the ability to cope with the deep combinative complexities hidden in this position, and it is even further handicapped by the inability to make intuitive judgements such as "good attacking chances" at the end of long-forced variations.

17. . . . Ke7! 18. Kf1?

[After playing 17. . . . Ke7, HITECH thought the game would continue with 18. e6 Bxf2+ 19. Kh1 Rd8 20. Qc2 Bxe1 21. Qc5+; for the first time, its score goes positive.] This bizarre move onto the diagonal of Black's Ba6 repays the compliment for Black's boner on move 14. Though its B/f7 and f-Pawn are menaced, BEBE has plenty of reasonable tries, such as:

1) 18. Re2 Nxf2 19. Rxf2 Bxf2+ 20. Kxf2 Kxf7 21. Qd5+ Ke8 22. Be3 and White has a Pawn and good attacking chances for the exchange.

2) 18. Be3 Nxe3 19. fxe3 Kxf7 20. Qd5+ and after any King move, White plays 21. Nh4 with an attack easily worth the invested piece.

3) 18. Qd5 Bxf2+ 19. Kh1 Qc8, etc.

18. . . . b4+! 19. Nc4 Rd8 20. Qc2

The best try, since Black has no problems winning on 20. Qb3 Na5 21. Qxb4+ Kxf7 and 20. Qe2 Kxf7. [HITECH thought White should have played 20. Nfd2 and then on 20. . . . Qc8 21. h3 Bxf2 22. Re4 Bxc4+.]

20. . . . Kxf7?

After two accurate moves exploiting White's strange 18th move, HITECH slips again. The convincing continuation is: 20. . . . Nd4 21. Nxd4 (21. Qg6 Nxf3+ wins) 21. . . . Rxd4 22. Qg6 (22. Qf5 Rxc4 23. Bxc4 Bxc4+ 24. Kg1 Bf2+; 22. Be3 Nh2+ 23. Kg1 Rg4) 22. . . . Nh2+ 23. Kg1 Rg4 winning.

21. Qf5+ Nf6 22. Qc2?

Another inexplicable error by BEBE, letting its last winning position slip by; Black's winning method is now simple and should have been within BEBE's tactical purview. Correct is 22. exf6 Bxc4+ 23. Kg1 g6 (23. . . . gxf6? 24. Qh7+ Kf8 25. Bxh6#; 23. . . . Bd3 24. Qe6+) 24. Qf4 with the double threat of 25. Qxc4+ and 25. Qxh6 —and because of Black's exposed King, White can expect to win. [HITECH saw this predicting 22. exf6 Bxc4+ 23. Kg1 g6 24. Qf4 Bd5 25. Qxh6 Rg8 26. Qf4 Rd8, but White mates after 26. Qh7+ Kxf6 (Kf8 Bh6+ mates quickly) 27. Bg5+ Kf5 28. Qh3; HITECH has only used 23 minutes on its clock to this point.]

22. . . . b3! 23. Qe2

If 23. Qxb3 Na5.

23. . . . Nd4! 24. Nxd4 Rxd4 25. Kg1 Bxc4 26. Qf3 Qxf3 27. gxf3 (0-1).

A very complicated struggle in which neither program was farsighted enough to tackle the difficult problems posed. Instead, as often happens when computers play one another, the game was decided by one side's more weird and serious inexplicable errors.

ACM's SIXTEENTH NORTH AMERICAN COMPUTER-CHESS CHAMPIONSHIP
Denver, Colorado
October 13-15, 1985

Results and Games (Ken Thompson)

		rate	perf	1	2	3	4	total
1	Hitech	2200	2486	7+□	4+■	2+■	5+□	4
2	Bebe	2100	2224	9+■	5+■	1−□	4+□	3
3	Intelligent	0	2005	6+■	9+□	5−■	7=□	2½
4	Phoenix	0	1967	8+■	1−□	7+■	2−■	2
5	Cray Blitz	2200	2045	10+■	2−□	3+□	1−■	2
6	Chaos	1800	1790	3−□	7−■	8+■	10+□	2
7	Lachex	0	1885	1−■	6+□	4−□	3=■	1½
8	Spock	0	1676	4−□	10+■	6−□	9=■	1½
9	Ostrich	1750	1633	2−□	3−■	10=□	8=□	1
10	Awit	1600	1502	5−□	8−□	9=■	6−■	½

Round 1

Awit — Cray Blitz 1 c4 ♘f6 2 ♘c3 c6 3 ♘f3 d5 4 e3 ♗e6 5 d4 d×c4 6 ♘e5 b5 7 e4 b4 8 ♘a4 ♘×e4 9 ♘×c4 ♘d6 10 ♘×d6† e×d6 11 ♗e2 ♗e7 12 O-O O-O 13 ♗d2 a5 14 ♗d3 ♖e8 15 ♕h5 h6 16 ♖fe1 ♗f6 17 ♖e4 d5 18 ♖f4 ♗g5 19 ♖e1 ♗×f4 20 ♗×f4 ♗c8 21 ♖×e8† ♕×e8 22 ♗d2 ♖a7 23 ♘c5 ♘d7 24 ♘×d7 ♕×d7 25 ♕e5 ♕d8 26 ♕b8 ♕c7 27 ♕×c7 ♖×c7 28 h4 c5 29 ♗f4 ♖c6 30 ♗e5 c×d4 31 ♔f1 ♖c1† 32 ♔e2 ♗g4† 33 f3 ♗d7 34 ♗×d4 ♖a1 35 h5 a4 36 g4 a3 37 ♔d2 ♖×a2 38 ♔c2 ♖a1 39 b×a3 ♗a4† 40 ♔b2 ♖d1 0–1

Hitech — Lachex 1 e4 e5 2 ♘f3 ♘c6 3 d4 e×d4 4 ♘×d4 ♗c5 5 ♗e3 ♕f6 6 c3 ♘ge7 7 ♕d2 O-O 8 f4 d6 9 ♘b5 ♗×e3 10 ♕×e3 ♗g4 11 ♘×c7 ♖ac8 12 ♘b5 ♘d5 13 ♕g3 ♕×f4 14 ♕×f4 ♘×f4 15 h3 ♗e6 16 ♘×d6 ♖b8 17 g3 ♘h5 18 g4 ♘g3 19 ♖h2 ♖fd8 20 ♖d2 ♘×f1 21 ♔×f1 ♖d7 22 ♘f5 ♖bd8 23 ♖×d7 ♖×d7 24 ♔g2 ♖d3 25 b3 g6 26 ♘g3 f6 27 ♘h1 ♔g7 28 ♘f2 ♖e3 29 c4 ♘b4 30 ♘a3 ♖e2 31 ♔f3 ♖×a2 32 ♖×a2 ♘×a2 33 ♘d3 ♘c3 34 ♘f4 ♗d7 35 ♘c2 g5 36 ♘d5 ♘×d5 37 c×d5 h5 38 g×h5 ♗×h3 39 ♘d4 ♔h6 40 ♘f5† ♗×f5 41 e×f5 ♔g7 42 h6† ♔f8 43 d6 a6 44 h7 ♔g7 45 d7 ♔×h7 46 d8♕ ♔g7 47 ♕e7† ♔g8 48 ♔g4 a5 49 ♔h5 b6 50 ♔g6 g4 51 ♕e8# 1–0

Ostrich — Bebe 1 e4 c5 2 c3 d5 3 e×d5 ♕×d5 4 d4 e6 5 ♘f3 ♘c6 6 d×c5 ♕×d1† 7 ♔×d1 ♗×c5 8 ♗e3 ♗×e3 9 f×e3 ♘f6 10 ♗b5 O-O 11 ♗×c6 b×c6 12 ♔c1 ♘g4 13 ♖e1 ♖d8 14 h3 ♘f2 15 ♔c2 ♗a6 16 b3 ♗d3† 17 ♔c1 ♗e4 18 ♖f1 ♘d3† 19 ♔c2 ♘b4† 20 ♔b2 ♘c2 21 ♘g5 ♗×g2 22 ♖f2 ♘×e3 23 ♖e2 ♖d3 24 ♘d2 h6 25 ♘ge4 ♗×h3 26 ♔b1 ♖ad8 27 ♘f2 ♗f5 28 ♘de4 ♖d2 29 ♖×d2 ♖×d2 30 ♘h3 ♗×e4† 0–1

Chaos — Intelligent 1 d4 ♘f6 2 c4 g6 3 ♘c3 d5 4 c×d5 ♘×d5 5 e4 ♘×c3 6 b×c3 ♗g7 7 ♗c4 O-O 8 ♘e2 ♘c6 9 ♖b1 a6 10 O-O e6 11 ♗a3 ♖e8 12 ♕a4 ♕h4 13 f3 ♗h6 14 f4 ♕g4 15 g3 ♖b8 16 ♕×c6 b×c6 17 ♖×b8 a5 18 ♖fb1 ♕f3 19 e5 ♕e3† 20 ♔g2 ♕e4† 21 ♔f2 ♗f8 22 ♗×f8 ♖×f8 23 a3 c5 24 ♖1b2 c×d4 25 ♘×d4 ♗d7 26 ♗e2 ♖×b8 27 ♖×b8† ♔g7 28 ♖d8 ♗a4 29 ♗f3 ♕b1 30 ♘e2 ♕b2 31 ♖c8 ♕b6† 32 ♔g2 ♗c6 33 ♖d8 ♗×f3† 34 ♔×f3 ♕c5 35 ♖c8 h5 36 ♔g2 ♕e3 37 ♔f1 ♕f3† 38 ♔e1 ♕b7 39 ♖d8 c5 40 ♔f2 a4 41 ♔e3 ♕b3 42 ♖d7 ♕×a3 43 ♖c7 ♕b2 44 ♖c8 a3 45 ♖a8 a2 46 ♖a7 a1♖ 47 ♖×a1 ♕×a1 48 ♔d3 ♕h1 0–1

Spock — Phoenix 1 e4 e6 2 d4 d5 3 ♘c3 ♘c6 4 e×d5 e×d5 5 ♕e2† ♗e6 6 ♕b5 a6 7 ♕d3 ♕f6 8 ♗e3 ♘b4 9 ♕d2 ♗f5 10 O-O-O ♗×c2 11 ♖e1 ♕f5 12 a3 ♘d3† 13 ♗×d3 ♗×d3 14 ♗f4† ♘e7 15 ♗×c7 ♖c8 16 ♖e5 ♕g4 17 ♘×d5 f6 18 ♖e3 ♕×g2 19 ♕×d3 ♕×h1 20 ♔d2 ♕×d5 21 ♗b6 ♔f7 22 ♖e1 ♕a2 23 ♕b1 ♕×b1 24 ♖×b1 ♘d5 25 ♗a7 ♖a8 26 ♗c5 ♗×c5 27 d×c5 ♖hd8 28 ♘f3 ♖ac8 29 b4 ♘×b4† 30 ♔e2 ♖e8† 31 ♔d1

♘d3 32 ♖×b7† ♔f8 33 ♔d2 ♘×c5 34 ♖b2 ♖cd8† 35 ♔c2 ♖e2† 36 ♔b1 ♖d1† 37 ♔a2 ♖×b2† 38 ♔×b2 ♖f1 39 ♘d4 ♖×f2† 40 ♔c3 ♖×h2 41 ♔c4 **0–1**

Round 2

Cray Blitz — Bebe 1 e4 c5 2 ♘f3 d6 3 d4 c×d4 4 ♘×d4 ♘f6 5 ♘c3 g6 6 ♗g5 ♗g7 7 ♕d2 ♘c6 8 O-O-O O-O 9 ♘b3 ♖e8 10 ♗c4 ♘g4 11 h3 ♘ge5 12 ♗b5 a6 13 ♗e2 a5 14 ♗b5 ♗e6 15 ♘d5 a4 16 ♘d4 ♗d7 17 ♘×c6 b×c6 18 ♘×e7† ♖×e7 19 ♗×e7 ♕×e7 20 ♗e2 ♕e6 21 ♔b1 ♖b8 22 b3 a×b3 23 c×b3 ♗e8 24 ♔c2 ♘d7 25 f3 ♖a8 26 ♔c1 ♘c5 27 ♕c2 ♕f6 28 ♗c4 ♕a1† 29 ♔d2 ♕×a2 30 ♕×a2 ♖×a2† 31 ♔c1 d5 32 e×d5 c×d5 33 ♗×d5 ♗b5 34 ♖he1 ♘d3† 35 ♖×d3 ♗×d3 36 ♖e8† ♗f8 37 g4 ♔g7 38 ♖e3 ♗a3† 39 ♔d1 ♖a1† 40 ♔d2 ♗f1 41 ♔c3 ♖c1† 42 ♔d2 ♖c5 43 ♔e1 ♗×h3 44 ♗c4 h5 45 g×h5 g×h5 46 ♔f2 h4 47 ♖d3 ♗f5 48 ♖d4 h3 49 ♖h4 ♖c7 50 ♖h5 **0–1**

Phoenix — Hitech 1 d4 d5 2 ♗g5 ♘f6 3 ♗×f6 e×f6 4 e3 ♗f5 5 c4 ♗×b1 6 ♕×b1 ♗b4† 7 ♔d1 ♗e7 8 c×d5 ♕×d5 9 ♘f3 ♘d7 10 ♗d3 h6 11 ♗e4 ♕b5 12 ♕c2 c6 13 ♗d3 ♕b6 14 ♘d2 ♕c7 15 ♖c1 a5 16 ♗c4 O-O 17 ♕f5 a4 18 ♗d3 g6 19 ♕g4 f5 20 ♕g3 ♕d8 21 ♖f1 a3 22 b3 ♗f6 23 ♘c4 ♗h4 24 ♕f4 ♗g5 25 ♕d6 c5 26 d5 ♖a6 27 ♕g3 ♘f6 28 ♘d2 ♖d6 29 ♖×c5 ♘×d5 30 ♖c8 ♕×c8 31 ♕×d6 ♘c3† 32 ♔e1 ♖d8 33 ♕×a3 ♕d7 34 f3 ♕×d3 **0–1**

Intelligent — Ostrich 1 ♘f3 d6 2 d4 ♘f6 3 ♘c3 d5 4 ♗f4 ♘h5 5 e3 ♘×f4 6 e×f4 g6 7 ♗b5† c6 8 ♗a4 ♕d6 9 ♘e5 ♗h6 10 g3 O-O 11 ♕e2 f6 12 ♘d3 ♗h3 13 ♗b3 ♘d7 14 ♘e4 ♕c7 15 ♘ec5 ♘×c5 16 ♘×c5 ♔h8 17 ♖d1 b5 18 ♘e6 ♗×e6 19 ♕×e6 ♕c8 20 ♕×c8 ♖f×c8 21 O-O e6 22 ♖fe1 ♖e8 23 a4 ♔g8 24 ♖e2 b×a4 25 ♗×a4 ♖ac8 26 ♖de1 ♔f7 27 c3 ♖c7 28 b4 ♗f8 29 ♗c2 ♗d6 30 ♗d3 ♖ce7 31 ♖a2 ♗b8 32 ♖a6 ♖c8 33 ♖ea1 ♔g8 34 ♖6a3 ♖d8 35 ♖a4 ♖d6 36 h4 ♖d8 37 ♖a6 ♖d6 38 ♖6a5 ♔h8 39 ♗e2 ♖d8 40 ♖a6 ♖c7 41 h5 ♔g8 42 h×g6 h×g6 43 ♔g2 ♖dd7 44 ♗d3 f5 45 ♖e1 ♔f7 46 b5 ♖d6 47 ♖b1 ♔g8 48 b×c6 ♖d8 49 c4 ♔f7 50 c×d5 e×d5 51 ♗e2 ♖e7 52 ♗f3 ♗c7 53 ♖×a7 ♔f6 54 ♖bb7 ♖c8 55 ♗×d5 ♖h7 56 ♗c4 ♖g7 57 f3 ♖h7 58 g4 f×g4 59 f×g4 ♖g7 60 g5† ♔e7 61 ♖×c7† **1–0**

Lachex — Chaos 1 e4 c5 2 d4 c×d4 3 c3 ♘f6 4 e5 ♘d5 5 ♘f3 ♘c6 6 c×d4 d6 7 ♗c4 ♘b6 8 ♗b5 e6 9 O-O ♗e7 10 ♕c2 ♗d7 11 e×d6 ♗×d6 12 h3 a6 13 ♗×c6 ♗×c6 14 ♘c3 O-O 15 ♕d3 f6 16 ♗d2 ♕d7 17 ♖fe1 ♗c7 18 ♘e4 ♕d5 19 ♗b4 ♖fd8 20 b3 ♕f5 21 g4 ♕g6 22 ♗c5 ♘d7 23 ♗e7 ♖dc8 24 ♗b4 ♕h6 25 ♔g2 ♕g6 26 ♘h4 ♕h6 27 ♘f3 ♕g6 28 ♘h4 ♕f7 29 ♘f3 e5 30 ♖ac1 a5 31 ♗d2 e×d4 32 ♘×d4 ♘e5 33 ♕e2 ♗d5 34 ♘b5 b6 35 ♘×c7 ♖×c7 36 ♔g3 ♖×c1 37 ♖×c1 ♕e6 38 ♖e1 ♖e8 39 ♘c3 ♗b7 40 f4 ♖d8 41 f×e5 ♕×e5† 42 ♕×e5 f×e5 43 ♗e3 ♖f8 44 ♔h4 ♖f3 45 ♘b5 ♖f6 46 ♗g5 ♖e6 47 ♘d4 ♖e8 48 ♗f4 e4 49 ♗c7 a4 50 ♗×b6 a×b3 51 a×b3 ♗d5 52 b4 e3 53 ♘f5 e2 54 ♗c5 ♖e5 55 ♘e7† ♖×e7 56 ♗×e7 ♗c4 57 ♔g3 ♔f7 58 ♗c5 ♗b5 59 ♖a1 ♔e6 60 ♔f2 ♔d5 61 ♖a7 g5 **1–0**

Awit — Spock 1 c4 e6 2 ♘c3 d5 3 c×d5 e×d5 4 d4 ♗b4 5 e3 ♗×c3† 6 b×c3 ♘e7 7 ♖b1 O-O 8 ♗a3 ♖e8 9 ♗d3 c6 10 ♕h5 ♘g6 11 ♘f3 ♘d7 12 ♖b3 ♘f6 13 ♕g5 h6 14 ♕g3 ♘h5 15 ♕d6 ♘gf4 16 ♗f1 ♕f6 17 ♕×f6 ♘×f6 18 ♘e5 ♘g6 19 ♘×g6 f×g6 20 ♗d3 ♖e6 21 ♗×g6 ♘g4 22 ♗f5 ♖f6 23 ♗×g4 ♗×g4 24 ♖×b7 ♗c8 25 ♖b3 ♗a6 26 ♗c5 ♗d3 27 f3 ♖e8 28 ♔d2 ♗c4 29 ♖b7 ♖fe6 30 ♖e1 ♖g6 31 ♖g1 ♖ge6 32 ♖e1 ♖g6 33 ♖g1 ♖ge6 34 ♖×a7 ♖×e3 35 a4 ♖d3† 36 ♔c1 ♖×c3† 37 ♔b2 ♖ce3 38 a5 ♖b8† 39 ♔c1 ♖eb3 40 ♖e1 ♖b1† 41 ♔d2 ♖8b2† 42 ♔c3 ♖b3† 43 ♔d2 ♖d3† 44 ♔c2 ♖×e1 45 ♖a8† ♔h7 46 ♖c8 ♖e2† 47 ♔c1 ♗b3 48 ♖h8† **0–1**

Round 3

Bebe — Hitech 1 e4 e5 2 ♘f3 ♘c6 3 ♗b5 a6 4 ♗a4 ♘f6 5 O-O b5 6 ♗b3 ♗b7 7 ♖e1 ♗c5 8 c3 d6 9 d4 ♗b6 10 a4 h6 11 a×b5 a×b5 12 ♖×a8 ♕×a8 13 ♘a3 e×d4 14 c×d4 ♗a6 15 e5 d×e5 16 d×e5 ♘g4 17 ♗×f7† ♔e7 18 ♔f1 b4† 19 ♘c4 ♖d8 20 ♕c2 ♔×f7 21 ♕f5† ♘f6 22 ♕c2 b3 23 ♕e2 ♘d4 24 ♘×d4 ♖×d4 25 ♔g1 ♗×c4 26 ♕f3 ♕×f3 27 g×f3 **0–1**

Cray Blitz — Intelligent 1 e4 c6 2 d4 d5 3 e5 ♗f5 4 ♗d3 ♗×d3 5 ♕×d3 e6 6 ♘c3 ♘a6 7 ♘f3 ♗e7 8 ♗f4 g5 9 ♗e3 g4 10 ♘g1 ♘b4 11 ♕e2 h5 12 h3 f5 13 e×f6 ♘×f6 14 a3 ♘a6 15 h×g4 ♕b6 16 O-O-O ♘×g4 17 ♖×h5 ♖×h5 18 ♕×g4 ♖f5 19 ♕g8† ♖f8 20 ♕×e6 ♖f6 21 ♕g8† ♖f8 22 ♕g6† ♔d7 23 ♕g4† ♔d8 24 ♘f3 ♖b8 25 ♘e5 ♕c7 26 ♗h6 ♕c8 27 ♗×f8 ♗×f8 28 ♕f4 ♗e7 29 ♖e1 ♗×a3 30 b×a3 ♕e6 31 ♘f7† ♔d7 32 ♖×e6 ♔×e6 33 ♘e5 ♔d6 34 ♕f7 ♖g8 35 ♘c4† d×c4 36

...c++ 1–0

Lachex — Phoenix 1 e4 e6 2 d4 d5 3 ♘c3 ♘c6 4 e×d5 e×d5 5 ♘f3 ♗f5 6 ♗b5 ♗b4 7 O-O ♘ge7 8 a3 ♗×c3 9 b×c3 O-O 10 ♘h4 ♗e6 11 ♗f4 ♖e8 12 ♕h5 a6 13 ♗d3 ♘g6 14 g3 ♕d7 15 f3 ♘a5 16 ♘×g6 h×g6 17 ♕h4 ♕c6 18 ♗d2 ♘c4 19 ♗×c4 ♕×c4 20 ♖ab1 b5 21 ♕f4 ♗f5 22 ♖b2 ♗h3 23 ♖f2 ♖e2 24 g4 ♖ae8 25 ♖b1 ♖×f2 26 ♔×f2 ♕e2† 27 ♔g3 ♕g2† 28 ♔h4 f6 29 ♕×c7 g5† 30 ♗×g5 f×g5† 31 ♔×g5 ♕×f3 32 ♕f4 ♗×g4 33 ♕×f3 ♗×f3 34 a4 b×a4 35 ♖b6 ♗e2 36 ♔g6 ♖c8 37 c4 ♗×c4 38 ♖b7 ♖c6† 39 ♔g5 ♗b5 40 ♖d7 a3 41 ♖e7 a2 42 ♖e8† ♔f7 43 ♖e1 **0–1**

Spock — Chaos 1 d4 ♘f6 2 c4 e6 3 ♘f3 b6 4 ♗f4 ♗b4† 5 ♗d2 ♘c6 6 ♗×b4 ♘×b4 7 ♕d2 a5 8 ♘c3 ♗b7 9 O-O-O ♘e4 10 ♘×e4 ♗×e4 11 b3 ♕f6 12 ♔b2 h6 13 ♕e3 ♕f5 14 g4 ♕×g4 15 ♖g1 ♕f5 16 ♘h4 ♕h7 17 ♕g3 g5 18 ♕×c7 g×h4 19 a3 ♘c6 20 f3 ♗g6 21 e4 ♖b8 22 ♕f4 ♕g7 23 e5 a4 24 b×a4 ♖a8 25 ♗d3 h3 26 ♗b1 ♖×a4 27 ♗c2 ♖×c4 28 ♗b3 d5 29 ♗×c4 d×c4 30 ♖g3 ♘e7 31 ♕c1 b5 32 ♖×h3 ♘d5 33 ♔a1 ♔e7 34 ♕b2 b4 35 ♕c1 c3 36 ♖g3 b3 37 ♖g2 ♖b8 38 ♖dd2 c×d2 39 ♕c5† ♔e8 40 ♕c6† ♔d8 41 ♕d6† ♔c8 42 ♕c6† ♘c7 43 ♖×d2 ♗c2 44 ♔b2 ♕g1 45 ♕b7† ♖×b7 46 a4 ♕a1† 47 ♔×a1 b2† 48 ♔a2 b1♕† 49 ♔a3 ♖b3# **0–1**

Ostrich — Awit 1 e4 c5 2 c3 ♘f6 3 e5 ♘d5 4 d4 c×d4 5 c×d4 ♘c6 6 ♘f3 d6 7 ♗c4 ♘b6 8 ♗b5 e6 9 O-O ♗d7 10 ♘c3 d×e5 11 d×e5 ♗c5 12 ♗×c6 ♗×c6 13 ♕×d8† ♖×d8 14 ♗g5 ♖d7 15 ♖fb1 h6 16 ♗h4 ♘c4 17 b3 ♗×f3 18 b×c4 ♗c6 19 ♘e2 ♖d2 20 ♖d1 ♖×d1† 21 ♖×d1 g5 22 ♗g3 O-O 23 h3 f6 24 e×f6 ♖×f6 25 h4 ♔f7 26 h5 e5 27 ♘c1 e4 28 ♘b3 ♖f5 29 ♘×c5 ♖×c5 30 ♖d6 ♔g7 31 ♖g6† ♔h7 32 ♗d6 ♖×c4 33 ♗e5 ♖c1† 34 ♔h2 a6 35 ♖g7† ♔h8 36 ♖×g5† ♔h7 37 ♖g7† ♔h8 38 ♖×b7† ♔g8 39 ♖g7† ♔f8 40 ♖c7 ♔g8 41 ♗f4 ♖c5 42 g4 ♖c2 43 ♔g1 a5 44 a3 ♗a4 45 ♖b7 ♖c6 46 ♖b8† ♔f7 47 ♖b7† ♔g8 48 ♖b8† ♔f7 49 ♖b7† ♔g8 ½–½

Round 4

Hitech — Cray Blitz 1 e4 e5 2 ♘f3 ♘c6 3 d4 e×d4 4 ♘×d4 ♘f6 5 ♘×c6 b×c6 6 ♗d3 d5 7 ♕e2 ♗g4 8 f3 ♗e6 9 e×d5 ♘×d5 10 ♗f5 ♕h4† 11 ♔f1 ♕f6 12 ♗×e6 ♕×e6 13 c4 ♕×e2† 14 ♔×e2 ♘b6 15 b3 ♗d6 16 ♘c3 O-O 17 ♗e3 ♗e5 18 ♖ac1 ♖fe8 19 ♔f2 ♖ad8 20 f4 ♗f6 21 ♖hd1 ♖×d1 22 ♘×d1 h5 23 ♘c3 ♔h7 24 ♘e2 ♖d8 25 ♔f3 ♔g6 26 ♘g3 h4 27 f5† ♔h7 28 ♘e4 ♗e7 29 ♔g4 ♖e8 30 ♗f2 ♘d7 31 ♔h3 a6 32 ♖d1 ♘f6 33 ♖e1 ♘×e4 34 ♖×e4 ♔g8 35 ♗d4 ♔f8 36 c5 f6 37 ♖×h4 ♖d8 38 ♖h8† ♔f7 39 ♖×d8 ♗×d8 40 ♔g4 ♗e7 41 h4 ♔e8 42 ♔f4 ♗d8 43 g4 ♗e7 44 ♔e4 ♗d8 45 ♗e3 ♗e7 46 a4 ♔d8 47 ♔d4 ♔c8 48 g5 f×g5 49 h×g5 ♔d8 50 ♔e5 ♔d7 51 f6 ♗f8 52 a5 g6 53 ♗d4 **1–0**

Bebe — Phoenix 1 e4 e6 2 d4 d5 3 ♘d2 ♘f6 4 e5 ♘g8 5 ♘gf3 c5 6 d×c5 ♗×c5 7 ♗b5† ♗d7 8 ♗×d7† ♘×d7 9 O-O ♗b6 10 c4 ♘e7 11 c×d5 e×d5 12 ♕b3 ♖c8 13 ♖d1 O-O 14 ♘f1 ♘c5 15 ♕b5 a6 16 ♕e2 ♘e6 17 ♘g3 f6 18 e×f6 ♖×f6 19 a3 ♕d7 20 ♘e4 ♖f5 21 ♕d2 ♕c6 22 ♘g3 ♖f6 23 ♕e1 ♕c2 24 ♗d2 ♖c4 25 ♖ac1 ♕a4 26 ♘h5 ♖g6 27 ♖×c4 d×c4 28 ♘e5 ♘d4 29 ♘×g6 h×g6 30 ♘×g7 ♕c2 31 ♘e6 ♘b3 32 ♘g5 ♘d4 33 ♖c1 ♕d3 34 ♕×e7 **1–0**

Intelligent — Lachex 1 ♘f3 d5 2 c4 c6 3 b3 ♘f6 4 ♗b2 d×c4 5 b×c4 e6 6 ♗d4 ♗e7 7 ♕a4 O-O 8 ♘c3 c5 9 ♗×f6 ♗×f6 10 ♕b5 ♗×c3 11 d×c3 ♕f6 12 ♖c1 b6 13 e3 ♗b7 14 ♗e2 ♗c6 15 ♕b1 ♖d8 16 ♗d3 g6 17 ♗e4 ♕g7 18 ♘g5 h6 19 ♘f3 f5 20 ♗×c6 ♘×c6 21 O-O ♘e5 22 ♘×e5 ♕×e5 23 ♖fd1 ♖×d1† 24 ♖×d1 ♕×c3 25 ♕b5 ♕c2 26 ♕b3 ♕e2 27 ♕a4 ♖f8 28 g3 ♖f7 29 ♖d8† ♔g7 30 ♕b3 e5 31 ♕c3 ♖e7 32 a3 ♔f7 33 ♖d5 ♕f3 34 a4 ♕e4 35 ♕b3 h5 36 a5 h4 37 a×b6 a×b6 38 ♕d3 h×g3 39 h×g3 ♕×d3 40 ♖×d3 e4 41 ♖d6 ♖e6 42 ♖d7† ♖e7 43 ♖d6 ♖e6 44 ♖d7† ♖e7 45 ♖d6 ½–½

Ostrich — Spock 1 e4 e5 2 ♘f3 ♘c6 3 ♗b5 a6 4 ♗×c6 d×c6 5 d4 e×d4 6 ♕×d4 ♕×d4 7 ♘×d4 ♘f6 8 O-O ♗c5 9 c3 ♘×e4 10 ♖e1 f5 11 f3 O-O 12 f×e4 ♖d8 13 e×f5 ♗×f5 14 ♗e3 ♗×d4 15 ♗×d4 ♖d7 16 ♖c1 ♖e8 17 ♔f2 ♖de7 18 ♔f3 ♖f7 19 ♘d2 ♗e4† 20 ♔e2 ♗×g2† 21 ♔d3 ♗h3 22 ♖e1 ♗f5† 23 ♔c4 ♗e6† 24 ♔d3 ♗f5† 25 ♔c4 ♗e6† 26 ♔d3 ♖f4 27 ♗e5 ♖d8† 28 ♔e3 ♖f7 29 ♘f3 ♗c4 30 ♘d2 ♖d3† 31 ♔e2 ♖×c3† 32 ♔d1 ♖d3 33 ♗c3 ♖f2 34 ♖g1 ♖f7 35 ♔c2 b5 36 b3 b4 37 ♗×b4 ♗b5 38 a4 ♖d4 39 a×b5 c×b5 40 ♗c3 ♖d6 41 ♖af1 ♖e7 42 ♗b4 c5 43 ♗×c5 ♖c6 44 b4 ♖e8 45 ♔d1 ♖d8 46 ♖f3 ♖cc8 47 ♖g4 ♖d5 48 ♔e1 ♖cd8 49 ♗e3 ♖d3 50 ♖e4 ♖c3 51 ♘b1 ♖b3 52 ♘d2 ♖b2 53 ♖e6 ♖×b4 54 ♖×a6 ♖h4 55 ♘f1 ♖e8 56 ♖a7 ♖he4 57 ♖g3 g6 58 ♖h3 h5 59 ♖a6 ♖g4 60 ♖g3 ♖×g3 61 h×g3 ♔f7 62 ♖b6 ♖e5 63 ♖b8 g5 64 ♖c8 b4 65 ♖b8 ♖e4 66 ♖b7† ♔e6 67

♔d2 ♖c4 68 ♗×g5 ♖d4† 69 ♔c2 ♖d5 70 ♗f4 ♖d4 71 ♗e3 ♖e4 72 ♔d3 ♖g4 73 ♗d4 h4 74 g×h4 ♖f4 75 ♘e3 ♖×h4 76 ♖×b4 ♔f7 77 ♔e2 ♖e4 78 ♔e1 ♔g8 79 ♔d2 ♖h4 80 ♔e1 ♖e4 81 ♖c4 ♖e8 82 ♖c7 ♖e4 83 ♗c5 ♖e5 84 ♔d1 ♖g5 85 ♔e1 ♖e5 86 ♔d1 ♖g5 87 ♔e1 ♖e5 88 ♔d1 ½–½

Chaos — Awit 1 d4 ♘f6 2 c4 g6 3 ♘c3 d5 4 c×d5 ♘×d5 5 e4 ♘×c3 6 b×c3 c5 7 ♗c4 ♗g7 8 ♘e2 ♗g4 9 ♕b3 c×d4 10 ♗×f7† ♔f8 11 f3 d3 12 f×g4 d×e2 13 ♔×e2 ♕c8 14 ♗e6 ♕×c3 15 ♕×b7 ♕c6 16 ♖f1† ♔e8 17 ♗f7† ♔d8 18 ♖d1† ♕d7 19 ♗f4 ♗d4 20 ♖×d4 ♕d6 21 ♖×d6† ♘d7 22 ♖×d7# **1–0**

ACM-IEEE C/S
FALL JOINT
COMPUTER CONFERENCE
NOV. 2-6, 1986, DALLAS, TX.

REPLY TO:

Dr. Stanley Winkler
Conference Chair
Dr. Harold Stone
Program
Toni Shetler
Professional Development
David C. Wood
Finance
David M. Hyatt
Industry Liaison
Alex A.J. Hoffman
Society Liaison
Harry M. Kepner
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Bruce Anderson
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Special Events
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Resources
Adrian J. Basili
Technical Advisor
Dennis J. Frailey
Conference Advisor
Elizabeth B. McKeown
Media Advisor
Dick B. Simmons
Advisor
Roseta L. Winkler
Conference Secretary

TRACK AL-1: Artificial Intelligence Algorithms

Seminar Chair: Prof. Tony Marsland
University of Alberta
Computing Science Dept.
Edmonton T6G 2H1, Canada
403 432-5189/98(dept), 403 432-3971(office)
email: tony@alberta.UUCP

Session 1 Tues. 4 Nov. 3:45-5:15 Room H
Title: Computer Chess Techniques

Abstract: Papers and comments on algorithms for playing chess. Papers on game tree search and advanced chess program design. The panel will address the issue of how computer chess affects the AI community, identifying those methods which are more widely applicable and explaining why brute force search is a useful AI tool.

Refereed paper session:

Phased State Space Search
T. A. Marsland and N. Srimani
University of Alberta and
University of Southern Illinois

A Multiprocessor Chess Program
J. Schaeffer
University of Alberta

Panel Discussion

Hans Berliner
Carnegie Mellon University

Ken Thompson
AT&T Bell Laboratories

Monroe Newborn
McGill University

David Levy
Intelligent Software Ltd.

Robert Hyatt
Univ. So. Mississippi

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 responsible for organizing computer chess activities within 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. This tournament has been held anually starting in 1970. Currently, the Members of the Committee are Monty Newborn, Chairman, Hans Berliner, Tony Marsland, Kathe Spracklen, and Ken Thompson.

The International Computer Chess Association

Established at the Second World Championship in Toronto in 1977, this international association has about seven hundred members from all over the world. It was formed by the programmers of the leading programs and its chief purpose is to serve this community. The ICCA Journal publishes technical and non-technical papers on computer chess and is the foremost publication of its kind. It may one day be the world's leading chess publication. Currently, it is published four times a year. Authors of articles should send them to Jaap van den Herik, Department of Mathematics and Informatics, Delft University of Technology, 2628 BL Delft, The Netherlands. Individuals interested in becoming members should write to Jonathan Schaeffer, Department of Computing Science, University of Alberta, Edmonton, Alberta, T6G 2H1. Dues are $20 annually. Officers are David Levy, President, Tony Marsland, Vice President, and Jonathan Schaeffer, Secretary/Treasurer.