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

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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 Anatoile Hotel in the evenings (with the exception of a Sunday matinee) while the WMCC will take place at the Innomart 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 field in 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, Pullay, Campbell, Slomer) in the final round. HITECH, winner of last year's ACM tournament, is passing up this event primarily because he 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 controlled by a Z80.
- LACHEX ............................................. 4 processors of a Cray XMP
- OSTRICH ............................................. 8 processors: Data General Novas 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 Kopp will be Official Scorekeeper. Both Valvo and Kopp 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)
   
<table>
<thead>
<tr>
<th>Round</th>
<th>Time</th>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6:30 PM</td>
<td>Friday</td>
<td>October 31</td>
</tr>
<tr>
<td>2</td>
<td>10:00 AM</td>
<td>Saturday</td>
<td>November 1</td>
</tr>
<tr>
<td>3</td>
<td>5:00 PM</td>
<td>Saturday</td>
<td>November 1</td>
</tr>
<tr>
<td>4</td>
<td>8:00 AM</td>
<td>Sunday</td>
<td>November 2</td>
</tr>
<tr>
<td>5</td>
<td>10:00 AM</td>
<td>Monday</td>
<td>November 3</td>
</tr>
<tr>
<td>6</td>
<td>10:00 AM</td>
<td>Tuesday</td>
<td>November 4</td>
</tr>
<tr>
<td>7</td>
<td>10:00 AM</td>
<td>Wednesday</td>
<td>November 5</td>
</tr>
</tbody>
</table>

2. Schedule of Rounds for the ACM's 17th NACCC:
   (games are in Ballrooms D and E of the Anatole Hotel)
   
<table>
<thead>
<tr>
<th>Round</th>
<th>Time</th>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2:30 PM</td>
<td>Sunday</td>
<td>November 2</td>
</tr>
<tr>
<td>2</td>
<td>8:30 PM</td>
<td>Sunday</td>
<td>November 2</td>
</tr>
<tr>
<td>3</td>
<td>7:30 PM</td>
<td>Monday</td>
<td>November 3</td>
</tr>
<tr>
<td>4</td>
<td>7:30 PM</td>
<td>Tuesday</td>
<td>November 4</td>
</tr>
<tr>
<td>5</td>
<td>7:30 PM</td>
<td>Wednesday</td>
<td>November 5</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Team</th>
<th>Rounds</th>
<th>Total Points</th>
<th>Final Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bebe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Chess Challenger X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 ChipTest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Cray Blitz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Cyrus 68K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Fidelity Experimental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Lachex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Mephisto Motorola</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Merlin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Novag Expert X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Ostrich</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Recom-Rebel 87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Rex III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Sun Phoenix</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 Vaxchess</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 WayCool</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Participants in the ACM's Seventeenth
North American Computer Chess Championship

Bebe

Chess Challenger X

ChipTest
Thomas Anantharamam and Feng-hsiung Hsu, c/o FH, Department of Computer Science, Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213.

Cray Blitz

Cyrus 68K

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 Olafsson, 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

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

* 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 choose 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 query 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 their values at the time the game was interrupted. 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 annually 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**

<table>
<thead>
<tr>
<th>Team</th>
<th>Rounds</th>
<th>Total Points</th>
<th>Final Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Atari Kempelen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Chess Monster</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Cyrus 68K A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Cyrus 68K B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Cyrus 68K C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Fidelity &quot;2533&quot; A</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. Fidelity &quot;2533&quot; B</td>
<td></td>
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<tr>
<td>8. Fidelity &quot;2533&quot; C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Mephisto Dallas 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Mephisto Dallas 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Mephisto Dallas 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Recom-deventer A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Recom-deventer B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Recom-deventer C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Code:**

- Number of points
- Number of opponent

---

9
# Computing System Information

**Sixth World Microcomputer Chess Championship**

<table>
<thead>
<tr>
<th>Program</th>
<th>Computing System</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atari Kempelen</td>
<td>Atari ST, 68000-based microcomputer</td>
<td>Andromeda Software Inc.</td>
</tr>
<tr>
<td>Chess Monster</td>
<td>IBM PC, 8086-based microcomputer</td>
<td>Enlightenment Inc.</td>
</tr>
<tr>
<td>Cyrus 68K A</td>
<td>68020-based microcomputer</td>
<td>Intelligent Chess Software Ltd.</td>
</tr>
<tr>
<td>Cyrus 68K B</td>
<td>”</td>
<td>”</td>
</tr>
<tr>
<td>Cyrus 68K C</td>
<td>”</td>
<td>”</td>
</tr>
<tr>
<td>Fidelity &quot;2533&quot; A</td>
<td>68020-based chess machine</td>
<td>Fidelity International Inc.</td>
</tr>
<tr>
<td>Fidelity &quot;2533&quot; B</td>
<td>”</td>
<td>”</td>
</tr>
<tr>
<td>Fidelity &quot;2533&quot; C</td>
<td>”</td>
<td>”</td>
</tr>
<tr>
<td>Mephisto Dallas 1</td>
<td>68020-based chess machine</td>
<td>Hegener and Glaser</td>
</tr>
<tr>
<td>Mephisto Dallas 2</td>
<td>”</td>
<td>”</td>
</tr>
<tr>
<td>Mephisto Dallas 3</td>
<td>”</td>
<td>”</td>
</tr>
<tr>
<td>Recom-deventer A</td>
<td>6502-based microcomputer</td>
<td>E. G. H. Schroder</td>
</tr>
<tr>
<td>Recom-deventer B</td>
<td>”</td>
<td>”</td>
</tr>
<tr>
<td>Recom-deventer C</td>
<td>”</td>
<td>”</td>
</tr>
</tbody>
</table>
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 2nd at 8:00 AM, the fifth round for Monday, November 3rd 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 interrupted. 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 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

<table>
<thead>
<tr>
<th>Year</th>
<th>City</th>
<th>Winner</th>
<th>Runner-up</th>
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<tr>
<td>1974</td>
<td>Stockholm</td>
<td>KAISSA; Donskoy, Arlazarov, ICL 4/70</td>
<td>CHESS 4.0; Slate, Atkin, CDC 6600</td>
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<tr>
<td>1977</td>
<td>Toronto</td>
<td>CHESS 4.6; Slate, Atkin, CDC Cyber 176</td>
<td>DUCHESS; Truscott, Wright, Jensen, IBM 370/165</td>
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<td>1980</td>
<td>Linz</td>
<td>BELLE; Thompson, Condon, PDP 11/23 with chess circuitry</td>
<td>CHAOS; Alexander, Swartz, Berman O'Keefe, Amdahl 470/V8</td>
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<tr>
<td>1983</td>
<td>New York</td>
<td>CRAY BLITZ; Hyatt, Gower, Nelson, Cray XMP 48</td>
<td>BEBE; Scherzer, Chess engine</td>
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<tr>
<td>1986</td>
<td>Cologne</td>
<td>CRAY BLITZ; Hyatt, Gower, Nelson, Cray XMP 48</td>
<td>HITECH; Berliner, et al., SUN workstation with chess circuitry</td>
</tr>
</tbody>
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#### ACM's North American Computer Chess Championships

<table>
<thead>
<tr>
<th>Year</th>
<th>City</th>
<th>Winner</th>
<th>Runner-up</th>
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<tbody>
<tr>
<td>1970</td>
<td>New York</td>
<td>CHESS 3.0; Slate, Atkin, Gorlen, CDC 6400</td>
<td>DALY CHESS PROGRAM; Daly, King, Varian 620/i</td>
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<tr>
<td>1971</td>
<td>Chicago</td>
<td>CHESS 3.5; Slate, Atkin, Gorlen, CDC 6400</td>
<td>TECH; Gillogly, PDP 10</td>
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<td>1972</td>
<td>Boston</td>
<td>CHESS 3.6; Slate, Atkin, Gorlen, CDC 6400</td>
<td>OSTRICH; Arnold, Newborn, DG Supernova</td>
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<td>1973</td>
<td>Atlanta</td>
<td>CHESS 4.0; Slate, Atkin, Gorlen, CDC 6400</td>
<td>TECH II; Baisley, PDP 10</td>
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<td>1974</td>
<td>San Diego</td>
<td>RIBBIT; Hansen, Crook, Parry, Honeywell 6050</td>
<td>CHESS 4.0; Slate, Atkin, CDC 6400</td>
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<td>1975</td>
<td>Minneapolis</td>
<td>CHESS 4.4; Slate, Atkin, CDC Cyber 175</td>
<td>TREEFROG; Hansen, Calnek, Crook, Honeywell 6080</td>
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<td>1976</td>
<td>Houston</td>
<td>CHESS 4.5; Slate, Atkin, CDC Cyber 176</td>
<td>CHAOS; Swartz, Ruben, Winograd Berman, Toikka, Alexander, Amdahl 470</td>
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<tr>
<td>1977</td>
<td>Seattle</td>
<td>CHESS 4.6; Slate, Atkin, CDC Cyber 176</td>
<td>DUCHESS; Truscott, Wright, Jensen, IBM 370/168</td>
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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

<table>
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<th>Year</th>
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<th>Winner</th>
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<tr>
<td>1980</td>
<td>San Jose</td>
<td>CHALLENGER</td>
<td>MYCHESS B</td>
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<tr>
<td>1981</td>
<td>Travemunde</td>
<td>FIDELITY X</td>
<td>CHESS CHAMPION MARK V</td>
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<td>1983</td>
<td>Budapest</td>
<td>ELITE A/S</td>
<td>MEPHISTO X</td>
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<tr>
<td>1984</td>
<td>Glasgow</td>
<td>Four way tie: ELITE X, MEPHISTO S/X, PRINCHESS, PSION CHESS</td>
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<tr>
<td>1985</td>
<td>Amsterdam</td>
<td>MEPHISTO AMSTERDAM I</td>
<td>MEPHISTO AMSTERDAM II</td>
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</table>
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 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 Baczyński, as some of the authors' notes are based on Baczyński'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 BEEBE

Round 2


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.


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 Bb5 as occurred in Rauzer-Kan, 1936, give White no advantage.

9. ... Re8?!

BEEBE probably tried to avoid the trade of its Dragon Bishop by enabling ... Bb8 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. Qd4 Ne5 12. Be2 Kb8 13. Nf5 Nxd5 14. Rxd5. CRAY BLITZ typically examined about 10 to 15 million positions on each move.]

10. ... Ng4?!

Another dubious move. Most probably because BEEBE mistakenly thinks that 11. ... Bxc3 is a threat.

11. h3 Ng5 ...

but probably only now saw that 11. ... Bxc3? 12. Qxc3 Nxf2? loses to 13. Rxf1.

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. Nf5.

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

Instead of ceding the b5-square to White, humans would have a notion of how 13. ... b5 with ... Nb4 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!

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.


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. Kbt gives it a slightly positive score.]

21. ... Rb8 22. b3

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. Rg1 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. Bbt1.]

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 Bb6+ 30. Kb1 Nxa4 is even worse.

28. ... Qa1+ 29. Kd2 Qxa2
30. Qxa2 Rxxa2+ 31. Kc1 d5!
A very fine and humane 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 Baczychinsky). 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. Rxd8 (35. Bxc4 Nb3+ 36. Kb1 Rb2 checkmate) 35. ... Bb8 36. Bxc4 Ra1+; if 34. b4 Nd3+ 35. Rxd3 Ra1+.

34. ... Nd3+ 35. Rxd3 Bxd3
The complications are over. BEBE lumbers through the rest sure-footed, 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 Bh3
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 Middle-game 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
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?!

14. ... Ba6?
HITECH, no longer having the crust 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... D-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
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
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... Re8
Qg8+ Kd7 23. e8 = Q+ Rxe8 24.
Qd5+ lose, but 19... Nxe7! 20.
Rxe7 Bc5 21. Re2 Nf4+ 22. Rxh2
Bxf2 results in an unclear position
19... Kh8 (analysis by Bac-
ynskyj). 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 reason-
able 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 com-
binative 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
tought 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 diag-
onal of Black's Ba6 repays the com-
pliment for Black's boner on move
14. Though its B/f7 and f-Pawn
are menaced, BEBE has plenty of
reasonable tries, such as:
Kxf2 Kxh7 21. Qd5+ Ke8 22. Be3
and White has a Pawn and good
attacking chances for the ex-
change.
2) 18. Be3 Nxe3 19. fxe3 Kxh7
20. Qd5+ and after any King
move, White plays 21. Nh4 with
an attack easily worth the in-
vested 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
[HITECH thought White should
have played 20. Nd2 and then on
20... Qc8 21. h3 Bxf2 22. Re4
Bxc4+.

20... Kxf7?
After two accurate moves exploit-
ing White's strange 18th move,
HITECH slips again. The convinc-
ing continuation is: 20... Nd4
21. Nxd4 (21. Qg8 Nx3+ wins)
21... Rxd4 22. Qg6 (22. Qf5 Rx4
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
HITECH, 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... gx6? 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. Qf8 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 Rx4
25. Kg1 Bxc4 26. Qf3 Qxf3
27. gxh3 (0—1).
A very complicated struggle in
which neither program was far-
sighted enough to tackle the dif-
ficult 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)

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<td>1790</td>
<td>3+0</td>
<td>7-0</td>
<td>8+0</td>
<td>1+0</td>
<td>2+2</td>
</tr>
<tr>
<td>Latch</td>
<td>0</td>
<td>1885</td>
<td>1-0</td>
<td>6+0</td>
<td>4-0</td>
<td>3-0</td>
<td>1+4</td>
</tr>
<tr>
<td>Spock</td>
<td>0</td>
<td>1676</td>
<td>4-0</td>
<td>10+0</td>
<td>6-0</td>
<td>9+1</td>
<td>9+1</td>
</tr>
<tr>
<td>Ostrich</td>
<td>1750</td>
<td>1633</td>
<td>2-0</td>
<td>3+0</td>
<td>10+0</td>
<td>8+0</td>
<td>1+4</td>
</tr>
<tr>
<td>Awit</td>
<td>1600</td>
<td>1502</td>
<td>5-0</td>
<td>8-0</td>
<td>9+0</td>
<td>6-0</td>
<td>4+4</td>
</tr>
</tbody>
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Round 1

**Awit — Cray Blitz** 1 c4 d6 2 e3 c6 3 d4 e5 4 e3 dxe4 5 dxe4 d5 6 cxd5 exd5 7 e4 c3 fxe3 gxf6 8 d5 cxd5 9 g4 c4 c4 10 cxd6 cxd6 11 c5 e8 12 0-0 c6 13 c3 e7 2 5 h5 6 g6 16 c6 17 e4 c5 18 c4 e5 c5 19 c4 e4 c4 20 c4 e3 21 e4 c3 22 5 e8 23 5 e7 24 c7 25 5 e6 26 c8 27 c7 28 c7 29 c7 c6 30 c5 c6 31 c5 c6 32 5 c4 33 5 c3 34 5 c4 35 5 c6 36 5 c4 37 5 c2 38 5 c2 39 5 c6 40 5 c2 41 5 c1 42 5 c2 0-1

**Hitech — Latchex** 1 e4 e5 2 d3 c6 3 d4 exd4 4 cxd4 c5 5 e3 c6 6 c3 d6 7 c4 0-0 8 c4 d6 9 c5 b5 c3 10 cxe4 c6 11 c7 12 c6 13 c2 14 c4 c4 15 c6 16 c6 17 5 b6 18 g4 19 5 e5 20 g2 21 g4 22 5 b6 23 a5 24 5 b6 25 5 b6 26 5 b6 27 5 b6 28 5 b6 29 5 b6 30 5 b6 31 5 b6 32 5 b6 33 5 b6 34 5 b6 35 5 b6 36 5 b6 37 5 b6 38 5 b6 39 5 b6 40 5 b6 41 5 b6 42 5 b6 43 5 b6 44 5 b6 45 5 b6 46 5 b6 47 5 b6 48 5 b6 49 5 b6 50 5 b6 51 5 b6 1-0

**Chaos — Intelligent** 1 d4 d6 2 c4 g6 3 c3 d5 4 cxd5 dxc5 5 e4 c3 6 bxc3 g7 7 c4 0-0 8 e5 d6 9 b1 a6 10 O-O e6 11 a3 b8 12 5 a4 13 f4 h6 14 g4 15 g3 16 h8 17 e5 18 a5 19 e5 20 c2 21 c3 22 c2 23 a4 24 c3 25 5 c4 26 5 c4 27 5 c4 28 5 c4 29 5 c4 30 5 c4 31 5 c4 32 5 c4 33 5 c4 34 5 c4 35 5 c4 36 5 c4 37 5 c4 38 5 c4 39 5 c4 40 5 c4 41 5 c4 42 5 c4 43 5 c4 44 5 c4 45 5 c4 46 5 c4 47 5 c4 48 5 c4 49 5 c4 50 5 c4 51 5 c4 1-0

**Spock — Phoenix** 1 e4 e6 2 d4 d5 3 c3 c6 4 exd5 exd5 5 e2 g6 6 b5 a6 7 g3 d6 8 5 a3 9 c2 d5 10 O-O-O c2 11 c3 b5 12 a3 13 5 c3 14 5 c3 15 5 c3 16 5 c3 17 5 c3 18 5 c3 19 5 c3 20 5 c3 21 5 c3 22 5 c3 23 5 c3 24 5 c3 25 5 c3 26 5 c3 27 5 c3 28 5 c3 29 5 c3 30 5 c3 31 5 c3 32 5 c3 33 5 c3 34 5 c3 35 5 c3 36 5 c3 37 5 c3 38 5 c3 39 5 c3 40 5 c3 41 5 c3 42 5 c3 43 5 c3 44 5 c3 45 5 c3 46 5 c3 47 5 c3 48 5 c3 49 5 c3 50 5 c3 51 5 c3 1-0

**Ostrich — Bebe** 1 e4 c5 2 c3 d5 3 exd5 cxd5 4 d4 e6 5 c3 c6 6 dxc5 dxc5 7
Round 2

Cray Blitz — Bebe

E3 4 c5 2 Qf3 d6 3 d4
cxd4 4 Qxd4 Qf6 5 Qc3 g6 6 Qg3 Qg7 7
Qd2 Qc6 8 QO-O 0-0 9 Qb3 Qe8 10
Qc4 Qg4 11 h3 Qge5 12 Qb5 a6 13 Qe2 a5
14 Qh5 Qe6 15 Qd5 a4 16 Qd4 Qd7 17
Qxb6 axb6 18 Qxe7+ Qxe7 19 Qe2 Qd7 20
Qxe6 21 Qxb1 Qb8 22 b3 axb3 cxb3
Qe8 24 Qc2 Qd7 25 Qf3 Qa8 26 Qc1 Qc5 27
Qd2 Qf6 28 Qc4 Qa1 29 Qd2 Qd2 30
Qxa2 Qxa2+ 31 Qc1 d5 32 exd5 Qd5
33 Qb5 Qb4 Qh1 Qd3 35 Qxd3 Qxd3 36
Qe1+ 37 Qd1 Qe1 38 Qc1 Qf3 39 Qd1
Qa1+ 40 Qd2 Qd1 41 Qc3 Qxc1 42 Qd2
Qe3 43 Qe1 Qh3 44 Qc4 h5 45 g5 h5
46 Qf2 h4 47 Qd3 Qf5 48 Qd4 h3 49 Qh4
Qc7 Qh5 0-1

Phoenix — Hitech

Qd1 e6 Qxe6 Qe4 Qd5 5 Qc4 Qb1 6 Qb1 Qb4
7 Qd1 Qe7 8 Qd5 Qd5 9 Qf3 Qd7 10
Qf3 h6 11 Qf4 Qb5 12 Qc2 c6 13 Qd3
Qb6 14 Qd2 Qd2 15 Qc1 a6 16 Qc4 QO-O
17 Qa5 a4 18 Qd3 Qg6 19 Qg4 f5 20 Qg3
Qd8 21 Qf1 a3 22 Qb3 Qf6 23 Qc4 Qh4
Qf4 Qg3 Qd5 c5 26 d5 Qa6 27 Qg3
Qf6 28 Qd2 Qd6 29 Qc5 Qd5 30 Qc8
Qc8 31 Qd6 Qd7 32 Qe1 Qd8 33 Qa3
Qd7 34 Qf3 Qd3 0-1

Intelligent — Ostrich

Qc3 d5 4 Qa4 Qh5 5 e3 Qf4 6 Qd4 6 g7
Qb5 c6 8 Qa4 Qd6 9 Qe5 Qh6 10 a3 QO-O
11 Qf2 f6 12 Qd3 Qh3 13 Qb3 Qd7 14
Qc4 Qc4 15 Qe5 Qc5 16 Qc5 Qh8 17
Qd1 b5 18 Qe6 Qxe6 19 Qxe6 Qc8 20
Qc8 Qxc8 21 QO-O Qf6 22 Qe6 23 Qe6
Qg8 24 Qe2 bxa4 25 Qxa4 Qa8 26 Qd1
Qf7 27 Qc3 Qe8 28 Qa8 29 Qc2 Qd6 30
Qd3 Qc7 31 Qa2 Qb8 32 Qe6 Qc6 33 Qa1
Qg8 34 Qe3 Qd8 35 Qa4 Qd6 36 Qh4 Qd8
37 Qa6 Qd6 38 Qd6 Qd6 39 Qd6 Qd6 40
Qd6 Qc7 41 h5 Qg8 42 h6 Qxg6 43 Qg6
Qd7 44 Qd3 Qb5 45 Qc1 Qb7 46 Qb5 Qg7
Qb1 Qg8 48 Qb6 Qd8 49 Qc7 50 Qd5 exd5
51 Qe2 Qe7 52 Qf3 Qc7 53 Qa7 54
Qbb7 Qc8 55 Qc5 Qe7 56 Qc4 Qg7 57
Qa7 Qh7 58 Qg4 Qxg4 59 Qxg4 Qg7 60 Qg5 Qe7
61 Qd7 1-0

Lachex — Chaos

Qe1 e4 c5 2 d4 Qd4 3 c3 Qf6
Qd8 35 Qc2 Qe1+ 36 Qe1 Qe1 37 Qc1
Qb8 38 b2 Qd1 39 Qd4 Qe2+ 40 Qc3
Qh2 41 Qc4 0-1

Round 3

Bebe — Hitech

E1 4 e5 5 Qd3 Qe6 3 a5
Qa6 4 Qa4 Qf6 5 QO-O Qb5 6 Qb3 Qb7 7 Qe
Qc5 8 c3 d6 9 d4 Qb6 10 Qd4 h4 11 a5 Qb5
12 Qa8 Qxa8 13 Qa3 exd4 14 Qa6 15
e5 Qxe5 15 Qc5 Qd4 17 Qc7+ Qf7 18 Qf1
b4 19 Qc4 Qd8 20 Qc2 Qxh7 21 Qh7 Qf6
22 Qxc2 b3 23 Qe2 Qd4 24 Qxd4 Qxd4 25
Qg1 Qxe4 26 Qf3 Qxf3 27 g3 0-1

Cray Blitz — Intelligent

E1 4 e4 c6 2 d4 Qc6 3 a5
e5 4 Qd3 Qd3 5 Qe3 e6 6 Qd3 0-0
E5 7 Qf3 Qf7 8 Qd4 g5 9 Qf3 g4 10 Qgl
Qd4 11 Qe2 h5 12 h3 Qf5 13 exf6 Qxf6 14 Qa3 Qa6
15 Qh5 Qxb6 16 QO-O Qc4 17 Qd7 Qh5
Qh5 18 Qxb4 Qf5 19 Qg7+ Qg8 20 Qxe6
Qf6 21 Qg8 Qf8 22 Qd7 23 Qg4
Qd8 24 Qd3 Qb8 25 Qc5 Oxc7 26 Qd6 Qd6
27 Qh8 Qh8 28 Qf4 Qf4 29 Qe1 Qa3 30
Qb3 Qe6 31 Qe7 32 Qd6 Qd6 33
Qc5 Qd6 34 Qc7 Qd6 35 Qc4 36
Round 4

Hitech — Clay Blitz 1 e4 e5 2 c3 c6 3 d4 ebd4 4 e4 d6 5 cxd6 cxd6 6 e5 a6 7 e4 "e4 8 a3 c6 9 bxc3 O-O 10 d4 cxd4 11 exd4 f5 12 exf5 gxf5 13 d5 cxd5 14 cxd5 c4 15 b3 c3 16 a3 a6 17 b4 f5 18 g3 h4 19 h3 g4 20 g4 f5 21 e5 d5 22 cxd5 e5 23 dxe5 c3 24 g3 cxe5 25 dxe5 f5 26 f5 c4 27 dxc4 dxc4 28 e5 dxe5 29 dxe5 fxe5 30 e5 exf5 31 gxf5 d8 32 d8 f6 33 c7 g8 34 e7 d7 35 f6 h5 36 g5 g6 37 h4 e8 38 d8 f8 39 e7 g8 40 e4 g7 41 h4 g6 42 e5 d8 43 d6 c7 44 c6 g4 45 d5 e3 46 a4 d8 47 d4 d8 48 b5 d5 49 h5 g5 50 d5 e5 51 f6 d8 52 a5 g5 54 d4 0-1

Bebe — Phoenix 1 e4 e6 2 d4 d5 3 c3 d6 4 c4 e5 5 d5 c6 6 b4 b6 7 d6 c5 8 c3 d6 9 e4 c6 10 b5 c5 11 c5 c7 12 b5 c6 13 e4 d7 14 a4 c5 15 b5 a6 16 c4 c5 17 e3 d8 18 f6 e6 19 a3 e7 20 e4 d5 21 c5 e5 22 c4 b3 23 c2 b2 24 g4 e7 25 d8 g5 26 e5 g6 27 c3 d4 28 c7 c5 29 d7 c8 30 e6 c6 31 f7 c7 32 d8 f6 33 e5 d4 34 e6 c6 35 f7 d7 36 e7 c5 37 g5 b6 38 c3 f5 39 c5 a5 40 c4 c3 41 e3 c4 42 f5 f5 43 d2 e5 44 e2 c6 45 c7 e7 46 e3 c5 47 d4 d4 48 c6 b5 49 d5 a5 50 c7 c6 51 f6 d8 52 a5 g5 54 d4 0-1

Intelligent — Lachex 1 d3 d5 2 c4 c6 3 b3 c6 4 a4 d4 5 a5 c5 6 a6 c3 7 b4 b4 8 b5 e6 9 O-O b7 10 c3 dxe5 11 dxe5 c6 12 c5 cxc6 13 dxc6 d8 14 e5 c4 15 d5 e7 16 c3 b6 17 d4 a6 18 e4 a5 19 e5 c5 20 c4 c2 21 c2 a7 22 c4 a6 23 e1 c2 24 d5 c3 25 g5 g6 26 e5 e5 27 fxe5 dxe5 28 c5 e8 29 d1 e6 30 g4 g4 31 e3 c4 32 d2 c3 33 c3 g3 34 f4 g2 35 e4 e7 36 f5 e5 37 g5 g5 38 f6 g6 39 c2 c5 40 f4 f4 41 e4 e4 42 d4 d4 43 c2 c2 44 e7 e7 45 d6 d6 46 d4 d4 47 e3 e3 48 d2 d2 49 c1 c1 0-1

Ostrich — Spock 1 e4 e5 2 c3 c6 3 c4 c6 4 cxd5 cxd5 5 a4 e6 6 a3 c5 7 b4 cxd4 8 cxd4 c5 9 c3 dxe4 10 dxe4 11 a5 e5 12 c4 c6 13 e4 e4 14 c5 e5 15 a4 b5 16 a5 c4 17 b4 d5 18 c3 dxc3 19 bxc3 d5 20 cxd5 e5 21 c3 c5 22 c4 c6 23 e5 c5 24 c5 e3 25 c5 d5 26 c5 e3 27 c5 d5 28 c5 c4 29 c5 e5 30 c5 f6 31 c5 g6 32 c5 h5 33 c5 g7 34 c5 f6 35 c5 g5 36 c5 e7 37 c5 d8 38 c5 c2 39 c5 e5 40 c5 d5 41 c5 e4 42 c5 d6 43 c5 e5 44 c5 f5 45 c5 e6 46 c5 f6 47 c5 g5 48 c5 h6 49 c5 g7 50 c5 h8 51 c5 g9 52 c5 h9 53 c5 g8 54 c5 f7 55 c5 e6 56 c5 d5 57 c5 c6 58 c5 b5 59 c5 a6 60 c5 g4 61 c5 e3 62 c5 e2 63 c5 d1 64 c5 c5 65 c5 b4 66 c5 a5 67 c5 c7 68 c5 b6
TRACK AI-1: Artificial Intelligence Algorithms

Seminar Chair: Prof. Tony Marsland
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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

David Levy
Intelligent Software Ltd.

Monroe Newborn
McGill University

Robert Hyatt
Univ. So. Mississippi

"Exploring the Knowledge Based Society"
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 annually 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.