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IBM'S DEEP BLUE ACCEPTS CHALLENGE TO COMPETE IN ULTIMATE CHESS MATCH WITH HUMAN CHAMP KASPAROV

YORKTOWN HEIGHTS, N.Y., May 30 IBM has accepted an invitation from the Association for Computing Machinery (ACM) for its Deep Blue computer-chess system to participate in a six-game, full-length, regulation match with world chess champion Garry Kasparov. The match will take place next February in Philadelphia, as a featured event of the ACM 50th Anniversary Celebration.

The opportunity arranged by the ACM represents for IBM computer scientists the culmination of their efforts to design and assemble a computer hardware and software system endowed with the ability to compete in full-length, regulation chess at the level of the human world champion. In preparing for that ultimate confrontation with Kasparov, Deep Blue will this year be challenging several chess grandmasters from different parts of the world. These competitions will test Deep Blue during its iterative progress from today's prototype form.

The Deep Blue system is a scalable, parallel computing system with hundreds of special accelerator chips custom designed by the computer-chess group and attached to a powerful IBM host computer. By February, Deep Blue will run more than 100

times faster than today's existing system, Deep Blue Prototype, allowing it to analyze nearly one-billion chess positions per second.

The IBM Deep Blue computer-chess project began in late 1989 when the Deep Thought team from Carnegie Mellon University joined IBM Research. At IBM they worked on upgrading the system, the team's first world champion. The result of their efforts, now called Deep Blue Prototype, was 10 times faster than its predecessor. Among its most recent achievements was its victory last June in becoming the International Computer Chess Champion.

Experience with Deep Blue Prototype has been invaluable in the design of what will be the fully implemented Deep Blue. Even a loss along the way, such as at the 8th World Computer Chess Championship just completed in Hong Kong, provides the computer scientists with knowledge that is going directly into the development of the vastly more powerful full system.

IBM Research has been involved in parallel processing for 15 years. The computer-chess project is a basic research effort in that area of computer science and is devoted to increasing the company's overall knowledge of the computational capabilities of scalable, parallel computing systems.

Based at the IBM Research Division's Thomas J. Watson Research Center in Yorktown Heights, New York, the computer-chess team consists of computer scientists Feng-Hsiung Hsu, Murray S. Campbell, and Arthur J. Hoane, Jr., and is managed by Chung-Jen Tan.

IBM does research at the Thomas J. Watson Research Center in Yorktown Heights, New York; the Almaden Research Center in San Jose, California; the Zurich Research Center in Rueschlikon, Switzerland; the Tokyo Research

Laboratory in Yamato, Japan; the Haifa Research Laboratory in Haifa, Israel; the China Research Laboratory in Beijing, China, scheduled to open in mid-1995; and the recently announced Austin Research Laboratory in Austin, Texas.

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IBM'S DEEP BLUE COMPUTER-CHESS SYSTEM: FACT SHEET

INTRODUCTION:

A world-class, long-term basic research effort in computer science devoted to increasing IBM's understanding of the computational capabilities of special-purpose, scalable, parallel computing systems.

GOAL:

To develop a computer-chess system, Deep Blue, capable of playing regulation-length chess at the level of the human world champion.

ULTIMATE CHESS MATCH:

World champion Garry Kasparov and Deep Blue to compete in a six-game match during the ACM 50th Anniversary Celebration in Philadelphia at the Pennsylvania Convention Center, February 10-17, 1996.

SYSTEM:

Up to 1000, massively parallel, custom accelerator chips attached to any of a variety of possible host computers, including an IBM ThinkPad, an IBM RS/6000 or even an IBM POWERparallel Systems SP2 with multiple processors.

PERFORMANCE:

Deep Blue, when completed in the fall of 1995, will be capable of searching one-billion chess positions per second. As of spring of 1995, the Prototype can search seven-million positions per second, and is acknowledged to be the most powerful and most highly rated computer-chess system in the world.

TEAM MEMBERS:

Murray S. Campbell, Feng-Hsiung Hsu, A. Joseph Hoane, Jr., and Chung J. Tan, manager, located at the IBM Research Division's Thomas J. Watson Research Center, in Yorktown Heights, New York.

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CHESS RATING:

Estimated that in its ultimate configuration, Deep Blue's chess rating will be approximately 2800, about that of the human world champion, Garry Kasparov. At present, the rating of Deep Blue Prototype is approximately 2600.

COMPETITION RECORD:

AGAINST OTHER COMPUTERS

Bebe	+
Belle	+
BP	+
Chess Machine	+
Cheiron	=
Cray Blitz	++
Fidelity	==+
Fritz	-
Hitech	+++--++
MChess	++
Mephisto	+--+
Moby	+
Phoenix	++
Rebel	++
Star-Socrates	++
WChess	++
Zarkov	+++
TOTAL:	+28 =2 -3

AGAINST TITLED HUMANS

(International Masters)

Blocker	+
Bonin	+
Danielsen	+
Gruenberg	+
Hoi	=
I. Ivanov	+=
Levy	++++
McCambridge	=
Peters	+
Rene	+--
Silman	+
Zlotnikov	+
TOTAL:	+13 =3 -1

(International Grandmasters)

Alburt	-
Bischoff	=
Boensch	+
Browne	-
Byrne	+--+
L.B. Hansen	+
Larsen	+====
Lobron	-
Miles	+
Pfleger	==
Tischbierek	-
Unzicker	-
Wahls	-
TOTAL:	+6 =6 -9

NOTES:

1. These games were played under regular tournament time controls. There have been a number of additional games at accelerated time controls, including losses to Kasparov and Karpov, and a victory and draw against Judit Polgar.
2. '+' indicates a win, '=' a draw, and '-' a loss