Chess playing computer wins championship

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A chess playing computer developed at CMU recently won the North American Computer Chess Championship in Denver, Colorado.

"A breakthrough in technology" is what Hans Berliner, CMU Senior Research Computer Scientist, calls "Hitech," presently the most highly rated computer ever in chess.

Hitech, a custom computer consisting of 64 custom-made silicon chips, has been in the making for the past three years. This computer chess player was the idea of Andy Palay, system designer at the Information Techology Center (ITC). Palay thought that with state-of-the-art Very Large Scale Intergration (VLSI) technology, a faster computer could be built.

The idea became a reality. Carl Ebeling, a Computer Science (CS) graduate student, spent a year and a half designing 64 chips, one for each square on the board. When a piece lands on a square, the chip assigned to that square evaluates the possible moves in response. The 64 chips can evaluate 30 million moves in the three minute timespan allotted each player per move.

Ebeling said, "Hitech is good because it's very fast. Instead of doing things one at a time, it does things in parallel."

CS graduate student Gordon Goestsch programed Hitech, and CMU Research Engineer Larry Slomer built all of the hardware. According to Ebeling, approximately one year was spent constructing the machine and doing the programing.

Berliner and CS graduate student Murray Campbell are responsible for the program Oracle, which contains all of the game knowledge and controls the long-term strategy.

During the 1950's and '60's, Berliner, a former chessmaster, was rated 12th in the country. In 1968, he won the World Correspondence Chess Championship. Oracle is made up of his knowledge of chess.

On Oct. 13-15, Hitech was entered in The North American Computer Chess Championship in Denver, just four months after its first game.

In the first round, Hitech, a computer that almost exclusively plays chess, competed against LACHEX, the fastest general purpose machine. Hitech made some errors, but eventually pulled through.

Next, Hitech played PHOENIX. According to Berliner, this game was a good one because no second-guessing was involved.

The most critical game took place in the third round, where Hitech was up against BEBE. BEBE had just defeated Cray Blitz, the defending champion of four years, in the second round. Berliner said that this was a "wild game," but "Hitech had more of what it took at the crucial point, and we beat it."

In the final round, Hitech defeated Cray Blitz itself and won the championship.

The computer 'tuned-up' for the competition in Denver by playing four human chess masters and defeating them all. Because of the results of this, and the Denver wins, Hitech has achieved master ranking and broken new ground in computer technology.

The next tournament Hitech will participate in against other computers will be held in June '86 in Germany. Berliner said he thinks Hitech will do very well against European opponents.

Ebeling will probably accompany Berliner on the next tournament and says that the computer will play humans in the meantime. "We want to try to get (Hitech) up to the level of the best human players, although it's certainly nice to be the best computer around too," he said.

While Berliner is excited about Hitech's newly achieved status, he has higher goals for the computer to beat the world champion chess player.

Presently, two Soviets, Anatoli Karpov and Gary Kasparov, are competing for the world chess championship title. Whoever the winner may be, Hitech is sure to be a future opponent.