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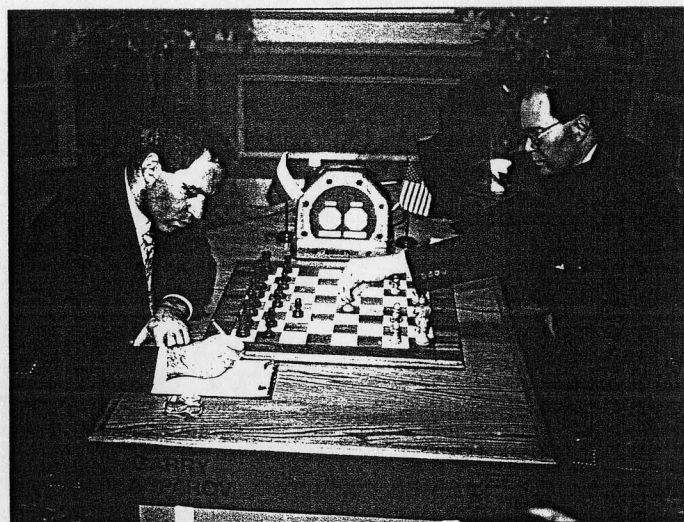
Deep Blue Sweeps Through

TAKING A GIANT leap for machinekind, the 1997 version of Deep Blue®, the chess-playing computer designed at IBM's Thomas J. Watson Research Center, defeated human world champion Garry Kasparov by 3.5 games to 2.5. Deep Blue's reversal of last year's loss to Kasparov astonished the chess world. For IBM, the victory marked a beginning rather than an end. The Watson team, headed by C.J. Tan, is now seeking ways to exploit Deep Blue's technology.

Winning two games outright, to Kasparov's one, Deep Blue showed itself a more formidable opponent than the version of a year ago (see "The Making of a Chess Machine," Research, Number 2, 1996, page 26). Improvements were made to both the hardware and software of the system, including the incorporation of chess knowledge supplied by Joel Benjamin, a chess grandmaster who worked with the Watson team.

"The biggest improvement involved changes in Deep Blue's evaluation functions for different positions and other parameters," explains team member Murray Campbell. As a result, Deep Blue played better positional and strategic chess. The doubling of Deep Blue's speed of calculation allowed those extensive positional evaluations to take place.

The team is now seeking ways to apply its technology. One possibility is developing commercial chess ventures. Deep Blue software might be accessed on the Internet. Deep Blue's fundamental approach, which uses special-purpose processors in parallel with general-purpose machines, has potential in other applications. The most promising is the design of pharmaceuticals. To that end, Watson researchers are working on a chip that calculates the forces between atoms in a molecule. ∎

Team member Joe Hoane making the moves for Deep Blue

Wireless Transmission at High Speed

IBM RESEARCHERS WORKING on high-speed radio frequency wireless network technology have transmitted data at speeds of 38 megabits per second (Mbps) under laboratory conditions. That highest-ever wireless performance matches the best speed in wired data links in corporate communication environments. It far exceeds the 2 Mbps limit of current wireless local area networks.

The work forms part of an effort to develop a commercial low-cost radiofrequency wireless network technology that transmits virtually error-free data at up to 10 Mbps. "We've proven that an affordable and robust wireless data link can operate reliably in indoor environments," says Modest Oprysko, senior manager of communication technology at IBM's Thomas J. Watson Research Center,

The keys to IBM's patent-pending transmission technology are advanced algorithms and coding based on digital signal processing techniques. These solve the "multipath" transmission problems responsible for effects similar to "ghosts" in television reception that have bedeviled previous efforts to design high-speed radio links for indoor use. ∎