NEC develops 4-gig chip

The Press (Christchurch)

February 11, 1997, Tuesday

Section: FEATURES; COMPUTERS;; COMPUTERS

Length: 399 words

Body

NEC says it has developed the world's largest-capacity memory device, a four-gigabit dynamic random access memory (dram) chip, which has 128 times the memory capacity of the 32-megabit drams now widely used in PCs.

NEC says the four-gigabit chip, which has about the capacity of a CD-rom, uses new technology, making it half the size of a conventional microchip at one-tenth the cost.

The chip uses four-level storage, allowing the memory cell to function as a multi-bit unit, effectively halving the cell size. NEC says the chip achieves a high data transfer speed of one-gigabit per second.

Sample shipments are expected to begin in 2000, with production planned from 2002 or 2003.

The company has not disclosed the expected price for the chip, but notes it will not be extraordinarily high.

Meanwhile, a team of international scientists has discovered a new phenomenon that may pave the way for the development of immensely dense computer memory and ***quantum computing***.

The heart of the team's discovery is the behaviour of a magnet one molecule in size, created from a special combination of manganese, oxygen, carbon, and hydrogen. If scientists can devise a technology to read and write from the tiny magnet, it will create the basis for a data storage unit one molecule in size. Currently, magnetic storage units require billions of molecules each.

The material used for these experiments is a crystalline substance found in ordinary vinegar. Using molecular magnets, it is theoretically possible to store hundreds of gigabytes of data in an area no larger than the head of a pin.

The findings may also be the first practical step in the development of a new breed of supercomputer called a ***quantum computer***, which would process calculations at enormous speeds and in a manner much like the complicated processing functions in the human brain.

While the possibility of ***quantum computing*** has only been proven mathematically, a key factor in the creation of such a device would be a material that demonstrates the phenomenon of quantum superposition, where each memory unit in a ***quantum computer*** represents a yes'' and a no'' state simultaneously. By applying strong magnetic fields, the team observed the ability to control the quantum mechanical tunnelling rate between the yes'' and no'' states.

CAPTION:

The mini marvel _ NEC's new memory chip has about the capacity

of a CD-rom.

Classification

Language: ENGLISH

Subject: MEMORY TECHNOLOGY (91%); ***QUANTUM COMPUTING*** (89%); QUANTUM MECHANICS (87%); BRAIN (73%)

Company: NEC CORP (58%); NEC CORP (58%)

Ticker: 6701 (TSE) (58%)

Industry: NAICS334413 SEMICONDUCTOR & RELATED DEVICE MANUFACTURING (58%); NAICS334111 ELECTRONIC COMPUTER MANUFACTURING (58%); SIC3674 SEMICONDUCTORS & RELATED DEVICES (58%); SIC3571 ELECTRONIC COMPUTERS (58%); SIC3571 ELECTRONIC COMPUTERS (58%); MEMORY TECHNOLOGY (91%); COMPUTER CHIPS (90%); DATA STORAGE TECHNOLOGY (90%); MEMORY CHIPS (90%); SEMICONDUCTORS (90%); ***QUANTUM COMPUTING*** (89%); PERSONAL COMPUTERS (79%); COMPUTER EQUIPMENT (78%)

Geographic: CHRISTCHURCH, NEW ZEALAND (73%); NEW ZEALAND (58%)

Load-Date: February 12, 1997