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Magnetic Bubble Devices

T. Furuoya

Central Research Laboratories, Nippon Electric Co., Ltd.,
1753 Shimonumabe Kawasaki

Since a magnetic bubble was invented, there has been growing interest in practical application of the magnetic bubbles. The Bell system expects to use a bubble memory in repartry dialer and voice message recording, on the other hand, Hitachi had announced a inventory machine utilizing bubble memory will available in the middle of 1976.

The most promising application of the magnetic bubble is concentrated on memory, in spite of many proposals of bubble logics.

Recently, 64 K bit to 256 K bit chips, having bubble diameters of 3 to 6 μm , have been developed. The chip capacity is increasing exponentially year by year. Using a major-minor organization, mega byte capacity and 0.1 to 10 msec access time memory will be available.

The bubble memory offers solid state access, information non-volatility, asynchronous operation and low stand by power. As a result, replacement of drum, head per track disk, cassette tape and floppy disk for computer and data terminal are expected to be main bubble memory application.

A bubble memory which is used as a program loader in a data station was developed. Capacity of the memory is 32 K byte. It consists of two memory planes, each plane contains nine 16 K bit chips. Characteristics and problems of the memory will be discussed.

In comparison with semiconductor memory, desiable bubble memory characteristics of non-volatility and simple production process to achieve low cost should be noted, in spite of slow speed. To achieve much higher density resulting in lowing cost per bit, materials for small bubble and submicron device fabrication technologies, such as electron beam lithography and dry processing, are being developed.

The logic is another application of the magnetic bubbles. However, a semiconductor logic is competitive with superior speed. In order to compete with the semiconductor logic, it is necessary to make the best use of a distinctive feature indigenous to the magnetic bubbles for development of the bubble logics. Bubble sequential logic circuit will be presented as an example.

