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HOLLERITH CODE

Designed by Herman Hollerith (1860-1929) in 1888, the *Hollerith code* is a method by which letters of the alphabet, the decimal digits 0 to 9, and special characters can be coded onto a punched card. The card is divided into 80 columns and 12 rows. Each column represents a single character by holes that are punched in either one, two or three of the rows. The card is then read by a tabulator machine, or card reader, which processes the information.

Herman Hollerith
The inventor of the Hollerith Code for processing data on punch cards, Hollerith founded the tabulating machine company that became IBM

HOLOGRAPHIC MEMORY

Recently-issued credit cards and bank cards carry a small three-dimensional imprinted design known as a 'hologram'. This is produced as an interference pattern on photographic material, usually by a source of high-intensity radiation. Banks and credit card companies are hoping that the use of holograms will reduce the amount of credit card fraud by making it more difficult to forge cards. However, this particular application is insignificant compared with their enormous potential as a mass storage medium for computer data.

Holographic memory has been a reality in laboratories since the early 1970s. It involves coding binary information as an interference pattern on a photographic surface with a laser beam. Data can be read back from the hologram by projecting a low-power laser beam from behind. Holographic memory has the same advantages that laser discs have over other storage media — a holographic surface is highly resistant to environmental factors such as dust and extremes of temperature, as well as surface scratches. A holographic device created in the late 1970s could store 200 million bits of data on a 4in by 6in plastic card.

HOST COMPUTER

The terminal or computer that controls operations within a network is called the *host computer*. It can have many functions. In a microcomputer local area network (LAN), the host computer is primarily a 'server': it handles files, controls the flow of information and may act as a printer depository for the other nodes of the system. With more powerful systems, particularly in mainframe networks, the host computer may act as a switching device for time-sharing or multiple-user applications. Within a hierarchical communication system, with many levels of computer involvement, a host computer may act as a controller on one level, and at the same time serve as a working node on another level.

HOUSEKEEPING

Housekeeping tasks are program or operating system routines that keep computer operations running smoothly, without having a direct effect on the actual outcome of the program. The purpose of such routines is to keep things orderly and organised. Initialisation, garbage collection and memory management are typical housekeeping routines.

HUMAN FACTORS ENGINEERING

Successful computer systems design requires the analysis of a multitude of factors. Many of these factors are systems-based — including speed of processing, input/output management, and so on. But computers are used by humans, so systems designers must take human factors into account as well. The recent science of *human factors engineering* aims to incorporate traditional systems design and engineering with marketing and operational psychology to create a total man-machine system. Many new users of computers fear the power of the machines and feel intimated by them. To overcome this very deep-rooted emotional block, engineers design systems to be 'user friendly' and 'intuitive'. The use of menus and straightforward language in software, and the development of 'user interfaces' in hardware — such as Apple's mouse and icon system, or Hewlett-Packard's touch screen — aim to make the computer less frightening. A very recent development in human factors engineering finds interior designers working with systems design teams to create a total man-machine environment. The location of work surfaces, the positioning of computers, and other design elements all come together into a uniform system.

HYBRID INTEGRATED CIRCUIT

Large circuits can be assembled by combining a number of smaller circuits, each of which may be constructed by using a variety of technologies. The smaller components are placed on an insulating base material, then linked with conductive tracks that are printed on the base in several layers. The resulting circuit, which can then be connected to additional chips, transistors and other components, is called a *hybrid integrated circuit*, or 'hybrid IC' for short.