

COMPAQ LTE/286 AND COMPAQ LTE LAPTOP COMPUTERS TECHNOLOGY BACKGROUND

In October 1988 Compaq introduced its first battery-powered laptop computer with the COMPAQ SLT/286, carrying on the tradition started in 1982 of offering full function COMPAQ portable personal computers in as small and light a form as technology allows. Ruggedness and reliability have always been a part of that tradition. Compaq is taking another step forward in portable technology with the 6-pound COMPAQ LTE/286 and COMPAQ LTE. These 8 1/2 by 11 inch products were made possible through the use of state-of-the-art components in unprecedented sizes for the industry and new levels of miniaturization and integration.

COMPONENTS IN UNPRECEDENTED SIZES

The less than two-inch height of the COMPAQ LTE/286 and COMPAQ LTE was achieved without giving up the basic ingredients or functionality of a standard personal computer. This was made possible with: 40- and 20-megabyte 3/4-inch high fixed disk drives with less than 29 ms. access time and 1:1 interleave; a 3/4-inch high, 3 1/2-inch 1.44-megabyte diskette drive that accepts off-the-shelf software and allows interchange of files with other PCs; a 1/2-inch thick 80-key keyboard that is compatible with software written for a 101-key keyboard; and a 1/4-inch thick Electroluminescent (EL) backlit supertwist display that is CGA-compatible and displays 640 by 200 resolution or 25 lines of 80-character text.

(more)

STATE OF THE ART TECHNOLOGIES ALLOW MINIATURIZATION

The 8 1/2 by 11 inch footprint of the COMPAQ LTE/286 and COMPAQ LTE was made possible with the application of Surface Mount Technology (SMT), the manufacturing process which allows an ever-increasing number and density of Application Specific Integrated Circuits (ASICs) on printed circuit boards, and the development of very small ASICs that combine various functions in a single microchip to reduce circuitry. Flat ribbon connector/cable technology was used to save a great deal of space and some weight in the system. All these features combined made production of these small, lightweight PCs possible.

With the COMPAQ LTE/286 and COMPAQ LTE, all the logic of a full-function PC has been fitted onto about 30 square inches of board space; this is about 66 percent less space than the 90 square inches for the COMPAQ SLT/286. All functions for the video, disk controller, keyboard controller and memory, including 640 Kbytes of Random Access Memory (RAM), are concentrated in this small area. The entire memory controller for the COMPAQ LTE systems is now on a single chip. So is the controller that drives the display. Even standard interfaces of a standard size are provided within this small space: a parallel interface, a serial interface, an external CGA monitor connector and interfaces for the optional External Storage Module and External Numeric Keypad. In addition, the optional internal 2400-baud Modem allows communications with other PCs from remote locations, is about the size of a business card. Memory options, which can

(more)

expand the COMPAQ LTE/286 from 640 Kbytes to 1.6 or 2.6 megabytes have memory chips on both sides of the board to allow their 3 7/8 by 2 1/4 inch size.

SMALL YET RUGGED

Though all parts of the COMPAQ LTE/286 and COMPAQ LTE have been scaled down to achieve its 8 1/2 by 11 by 2 inch size and 6-pound weight, the systems are designed and built to withstand the rigors of a portable environment. To ensure their ruggedness, the COMPAQ LTE/286 and COMPAQ LTE passed extensive hardware quality and reliability testing for shock and vibration resistance. The drives themselves are mechanically designed to provide excellent shock resistance. In addition, the overall integrated design of the system helps protect the drives from damage or loss of data. The 3 1/2-inch diskette drives also contain shock resistance that is integral to their design. Instead of using a metal frame and metal enclosures, which add size and weight, the systems' plastics are reinforced at key points for durability and each component contributes to the overall structural integrity of the unit.

POWER SOURCES

The COMPAQ LTE/286 and COMPAQ LTE operate on DC power and have a sophisticated power management system. The power is obtained from the internal Enhanced Nickel-Cadmium (NiCad) battery pack or from the following external sources: AC Adapter included with the system; optional External Fast Charger/AC Adapter; optional Automobile Adapter.

(more)

The standard NiCad battery pack, which fits securely into an internal compartment on the side of the unit, provides more than 3 1/2 hours of battery life. The battery pack is comprised of four high-energy D cells, packing a remarkable amount of power in a small space. Additional battery packs, weighing 1 1/2 pounds, are available as options.

All of the COMPAQ LTE/286 and COMPAQ LTE models come with an AC Adapter, which recharges a battery internally-installed in a system unit in eight to 10 hours. A user can keep a unit plugged into the AC Adapter to maintain a fully charged battery when they have access to a power outlet and can continue using their computer during recharging.

The optional External Fast Charger/AC Adapter is an intelligent, self-contained subsystem that has its own microprocessor. A fully discharged battery pack placed in this external option is recharged in 1 1/2 hours. When left unattended and plugged into an AC outlet and a COMPAQ LTE unit, the Fast Charger will first charge the battery installed in its compartment. If there is also an internal battery in the system unit, the fast charger will then charge it. So if a user leaves a system overnight, on return there will be two fully-charged batteries. The Fast Charger can also minimize "memory effect" with the deep cycle charge feature. (During regular use, rechargeable NiCad batteries are often only partially discharged and recharged. Over time, the batteries tend to lose track of any power level that has not been used and they lose their

(more)

ability to use the full power capacity of the battery.) The deep cycle feature allows the user to fully discharge the battery pack before recharging it to peak level. The memory effect can be eliminated by fully discharging and recharging the battery every 90 days. This extends the battery pack's life and ensures that batteries are producing maximum power levels. The Fast Charger also indicates when the battery isn't charging due to possible faults.

Both the AC Adapter and External Fast Charger/AC Adapter provide flexibility for international travel by automatically accepting a wide range of voltages to which the charger or adapter is connected.

The optional Automobile Adapter powers the system and recharges the battery in 8 to 10 hours when plugged into any standard 12-volt cigarette lighter.

STANDARD COMPAQ SOFTWARE MAKES SYSTEMS FULLY FEATURED

The many COMPAQ software utilities provided with the COMPAQ LTE/286 and COMPAQ LTE add significant functionality to the systems' performance. These include: Power Conservation (PWRCON); Compaq Expanded Memory Manager (CEMMP); ADAPT display utility; Power-On Password; and Disk Cache.

During battery operation, the Power Conservation utility, first implemented in the COMPAQ SLT/286, conserves battery power by separately putting in low power mode the following components when inactive: the display backlight, fixed disk drive, diskette drive and optional modem. A user can adjust or disable the

(more)

period of inactivity before a subsystem is powered down through the PWRCON or SETUP utilities. To prevent loss of data this utility also alerts the user to low battery states through blinking LED indicators and beeps. A user can then save data and/or take the necessary steps to restore power.

If all of the system components go unused for the specified or default time, all the subsystems are put in low power mode, putting the system in STANDBY mode and providing maximum battery power conservation. A user restores operation by pressing the STANDBY button. A user can invoke the STANDBY mode by pressing the STANDBY button, thereby saving battery power when away from the system for a planned period of time.

The COMPAQ Expanded Memory Manager (CEMMP) supports the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS) Version 4.0, providing access to memory beyond the MS-DOS limitation of 640 Kbytes when a user adds memory beyond the systems' standard 640 Kbytes. This is necessary when a user has an application that takes advantage of LIM EMS 4.0 such as large spreadsheets and other demanding applications. Both the COMPAQ LTE/286 and COMPAQ LTE support LIM 4.0 with the use of the CEMMP utility.

The COMPAQ LTE/286 and COMPAQ LTE are CGA-compatible with four distinct gray shades displayed on the liquid crystal display (LCD). The 16 CGA colors of an application program are mapped to the four shades of gray. The COMPAQ Advanced Display Attribute Programming Tool (ADAPT) utility allows the user to adjust the gray shades used by an application program.

(more)

Power On Password is a software security feature that prevents access to the computer when it is turned on until a user-selected password is entered.

The performance of fixed disk drive operations is enhanced with the use of the COMPAQ Disk Cache utility, which stores frequently accessed disk information in memory to accelerate subsequent accesses. Queuing or buffering writes to the fixed disk drive allows the computer to start another task before the physical write has been completed to the fixed disk.

CMOS COMPONENTS ALSO CONSERVE POWER

The COMPAQ LTE/286 has a 12 MHz 80C286; the COMPAQ LTE has a 9.54 MHz 80C86. These microprocessors are complementary metal oxide semiconductor (CMOS) products which consume half the power of conventional NMOS processors while providing the same functions and performance. The COMPAQ LTE/286 system board contains a coprocessor socket for installing an optional 12 MHz 80C287 coprocessor, which consumes half the power of an 80287 typically used in AC-powered products.

All these features taken together -- the smallest high-performance components available, new levels of miniaturization and integration, built-in ruggedness, sophisticated power management and COMPAQ software that adds functionality -- put the COMPAQ LTE/286 and COMPAQ LTE in a size and performance class all their own.

Compaq Computer Corporation is a world leader in the manufacture of desktop, portable and laptop computers.

(more)

The Company is also a leading supplier of 386 microprocessor-based business PCs with the COMPAQ DESKPRO 386/33, COMPAQ DESKPRO 386/25, COMPAQ DESKPRO 386/20e, COMPAQ DESKPRO 386s and COMPAQ PORTABLE 386. Other COMPAQ products include the 12 MHz 286 microprocessor-based COMPAQ SLT/286 laptop, COMPAQ DESKPRO 286e, COMPAQ DESKPRO 286 and COMPAQ PORTABLE III.

#

COMPAQ, COMPAQ DESKPRO 286, COMPAQ PORTABLE 386 and COMPAQ PORTABLE III are registered trademarks and COMPAQ DESKPRO 386/20e, COMPAQ DESKPRO 386s, COMPAQ DESKPRO 286e, COMPAQ DESKPRO 386/25, COMPAQ DESKPRO 386/33, COMPAQ SLT/286, COMPAQ LTE/286 and COMPAQ LTE are trademarks of Compaq Computer Corporation.

Microsoft and MS-DOS are registered trademarks of Microsoft Corporation.

Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

For further editorial information, contact:

Bob Beach, Debra Globe,
Nora Rice, John Sweney
Compaq Computer Corporation
(713) 374-4616

Maura FitzGerald
Miller Communications
(617) 536-0470

Electronic Media should contact:

Tom Pearson
Pearson Communications
(215) 648-3975