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Piecing together a Pocket PC

A deeply cycled, defunct battery provided a good excuse to crack open a classic: Compaq/HP's popular late-2001 iPaq 3835, whose hardware design formed the foundation of five product-family generations. What did Compaq squeeze inside the 5.29×3.12×0.65-in., 6.4-oz form factor, and what did it omit?

The iPaq 38xx models incorporated a then-state-of-the-art SD (Secure Digital) card socket, which earlier generation iPaq models lacked. Unfortunately, the socket didn't support SDIO mode for SD-connector-equipped Bluetooth, Wi-Fi, camera, and other adapters and was therefore usable only with memory cards.

The photo does not show the passive touchscreen display on the backside of the system board. At the time of its introduction, the iPaq was notable for the ability to view its front-lit, reflective LCD in bright sunlight; competitors' PDAs employed backlit, transmissive LCDs. Modern Pocket PCs incorporate trans-reflective (also known as transflective) LCDs, which combine the best attributes of both earlier generation technologies: an adjustable-intensity backlight for dim, ambient-light use and front illumination for high-ambient-lighting environments.

The iPaq 31xx, 36xx, 37xx, and 38xx product variants all employed a common processor foundation: Intel's (www.intel.com) StrongARM SA1110 CPU, running at 206 MHz. Near the CPU is an HTC (High Tech Computer, www.htc.com)-labeled ASIC, which likely acts as glue logic between the CPU and the system's memory and various input and output modules: a touchscreen display, buttons and a joystick pad, expansion buses, and an infrared transceiver.

The iPaq 3835 integrated a ROM-code-stickered, 32-Mbyte NOR-flash memory and a 64-Mbyte DRAM. The PDA directly executed the OS and factory-installed applications from nonvolatile memory. Unused flash-memory blocks found use as a user-accessible read-and-writeable "iPaq File Store" embedded drive, which a firmware upgrade would wipe clean, and user-installed applications went into system RAM. The latest generation Windows Mobile 5 OS migrates to a different memory model, which broadens the number of flash-memory options—NAND, for example—available to designers.

Although the 3835's feature set pales in comparison with today's devices, the device's bottom-edge connector accommodated a series of add-on options, such as PCMCIA and CompactFlash adapters, cameras, keyboards, and even supplemental batteries.

