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# Palm™ Database Programming

The Complete  
Developer's  
Guide

Eric Giguère

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*To my wife, Lisa, who has shown me other ways to synchronize*

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- **Sleep mode** occurs when there has been no user activity on the device for a certain number of minutes. The default is two minutes, but you can change the wait period to one or three minutes using the Preferences application. Sleep mode is also entered when you turn off the device using the power button. In sleep mode, the processor, screen, and most of the other hardware do not receive any power, but the memory chips, the real-time clock, and some low-level circuitry do stay powered. Pressing a button restores power to the processor and the other hardware. The real-time clock can also wake the device at a predetermined time.
- **Doze mode** (sometimes referred to as *idle mode*) occurs when an application is waiting for user input. The processor is halted until a hardware interrupt signals user activity, such as the press of a button or a stroke of the pen. Most of an application's time when the device is on is spent in doze mode.
- **Running mode** occurs when the processor is executing instructions. This mode consumes the most power, so the device returns to doze mode as soon as possible in order to conserve battery power.

As you can see, the power is never really turned off unless you pull out the batteries and let the internal capacitors (which keep the device charged while you change batteries) discharge completely. The active application is simply in a halted state when in sleep mode, ready to resume where it left off as soon as power is reapplied to the processor.

## Operating System

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The Palm operating system (Palm OS) provides the environment for your applications to run in and consists of two parts, the kernel and the managers.

### The Kernel

The *kernel* is the core of Palm operating system (Palm OS). It provides the interface between the hardware (such as trapping interrupts when the user strokes the screen with the pen) and the rest of the operating system and also manages multiple threads of execution. The kernel in current use is licensed from Kadak Products Ltd. ([www.kadak.com](http://www.kadak.com)).

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Although Palm OS uses several threads internally, applications cannot create or use any threads other than the one they're running on. *You can only write single-threaded applications*, which means that you'll have to perform long operations in small chunks to avoid the appearance of hanging the device. We discuss this further in Chapter 4 when we deal with event processing.

Although applications are single-threaded and only one application ever appears active to the user, a second copy of the active application sometimes runs on another thread but in a more limited environment. This is also covered in Chapter 4 when we discuss application launching.

## The Managers

Apart from the kernel, Palm OS consists of a series of *managers*, which are collections of APIs grouped by function. Your applications use the managers to obtain system resources and interact with the user. The managers can be grouped as follows:

- The UI managers handle all interaction with the user. This includes general functions for drawing on the screen as well as functions related to specific user interface elements such as fields and lists.
- The system managers handle non-UI interaction with the device, including access to the timers and the system event queue.
- The memory managers handle memory allocation and management of Palm OS *databases* and *resources*, discussed later in this chapter.
- The communication managers handle communications between the Palm device and the external world, using the serial port or the infrared port.

We discuss most of the managers as we explore Palm programming.

## Palm OS Versions

As the Palm devices have evolved, Palm Computing has released new versions of the operating system. Palm OS 3.2 is the most recent version of the operating system at the time this book was written and is available on the Palm VII. The Palm IIIx and Palm V run Palm OS 3.1, while the Palm III runs Palm OS 3.0. The original Pilot 1000 and Pilot 5000 machines run Palm OS 1.0. The PalmPilot Personal and PalmPilot Professional models run Palm OS 2.0. All Palm models prior to the Palm III

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