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AMD's K6-2+ in Notebooks - Evaluating Performance with PowerNow

by [Anand Lal Shimpi](#) on September 12, 2000 7:06 PM EST

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POWERNOW! ▼

PowerNow!

AMD's PowerNow! technology, originally introduced to us under the codename 'Gemini' last fall has been around for a little while now. The whole idea behind PowerNow! is to more intelligently manage the amount of power being used by the CPU depending on the type of task you're running.

For those of you that are in-touch with the mobile CPU industry, this may sound like a competing technology from Intel, known as Speedstep. While the two technologies have their similarities, keep in mind that Intel's Speedstep basically allows you to switch between two clock speeds depending on whether you're running off of your battery or your laptop is plugged into the wall. For example, a Pentium III 650 will run at 650MHz by default if plugged into the wall but if the notebook is running on battery power alone, in order to conserve power the CPU will drop down to a lower voltage and a 500MHz clock speed. This switching does not occur dynamically, as in, in the middle of programs, rather it happens based on the presence of an external power source. This is where PowerNow! separates itself from Speedstep.

The premise behind PowerNow! is a very simple one and when you think about it, it makes quite a bit of sense. Think about how much power your CPU must devote to running a word processing application, now think about how much power is required for a CPU to playback a DVD video stream. Are the two equal? No.

But if the two tasks don't require equal amounts of CPU power, then why is it that we are treating both tasks as if they did? This is the problem that PowerNow! attacks.

Instead of constantly running a CPU at its maximum frequency, PowerNow! allows the CPU to dynamically adjust its operating frequency according to the needs of the tasks that the CPU is running. For example, launching an application requires immediate attention of the processor, meaning that the CPU would jump up to a fairly high frequency in order to make sure that the application loaded quickly. However, upon entering the application, the system has to wait for user input, meaning that there's no reason for the CPU to sit there at full power waiting for the user to input commands. So, PowerNow! instructs the CPU to drop in clock speed. Then, as the user begins to use the program, the CPU clock speed varies according to the needs of the application and the tasks that are running.

As we should all know by now, lower clocked processors don't always require that the same amount of voltage be supplied to them as those with higher operating frequencies. It would thus only make sense that as the clock frequency of the processor is varying that its core voltage should vary as well, which is exactly what PowerNow! does.

SUPER7 LIVES: AMD'S K6-2+

HOW IT WORKS

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PowerNow! - a very clever idea back then to dynamically adjust cpu freq & VID output. The same idea still exists in today's day and age. No wonder where did intel took the inspiration from.

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