Clarkwood Software

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Peek-A-Boo

Peek-a-Boo

Take control of your programs
running on the Mac OS

Clarkwood Software Focus

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Peek-a-Boo Overview

What is new in Peek-a-Boo 1.5?

Peek-a-Boo 1.5 has an improved Special Technology mechanism. Its efficiency is improved, and certain processes that would not respond to earlier versions of Special Technology now respond admirably.

Peek-a-Boo now has the capability to track Temporary Memory usage. (Temporary Memory is also known as the Process Manager Heap.) This new Temporary Memory support is visible in several places:

- The MemGraph column can now include Temp Mem in the graph.
- There is now a column to show exactly how much Temp Mem each process uses.
- There are now three additional options available when you open a Logging window, all relating to Temp Mem.

A "Reveal in Finder" menu item has been added: when using System 7.5 or later, you can open the folder where a process's file is.

Several cosmetic improvements, including fuller color support in the main window and new "techie" CPU history windows, have been implemented.

Peek-a-Boo 1.5 now runs natively on PowerPC computers, with a performance improvement of about 15%.

What is Peek-a-Boo?

Peek-a-Boo is a utility to monitor and manipulate all running processes. You can watch how much CPU time each process uses, adjust the CPU time requested by each process, and look at any piece of information available through the Process Manager.

The Process Manager (available in MacOS System 7 and later) maintains a dozen or so pieces of information about each running process (normally an application); many fine utilities show a subset of this information.

My personal motivation for writing Peek-a-Boo was that no existing utility showed precisely the subset of Process Manager information I needed to know at a given time. So I made sure that Peek-a-Boo can show any piece of information available via the Process Manager; preferences can be edited to view only those pieces of information you need. And, with the Special Technology of Peek-a-Boo ST, you can now adjust the priorities of processes to customize which processes get more processor time.

If you want to experience Peek-a-Boo with Special Technology, please download it.

Peek-a-Boo is shareware. You may register online at http://order.kagi.com/?C9, or use the included "Register Peek-a-Boo" application to do the right thing.

Peek-a-Boo Special Technology

Peek-a-Boo's "Special Technology" feature lets you customize how each process utilizes the CPU.

A little background: The MacOS uses what is called a "cooperative" multitasking model. That means that whenever you're running several processes, each one gives up the processor occasionally. At that time, it also says how soon it would like to use the processor again.

Sometimes a process doesn't make that request in as sophisticated a manner as it should. For example, there might be a word-processing program that demands as much of the CPU as possible, even when it's in the background and not doing anything. On the other hand, a database program might not request any CPU time, even though it really needs it.

These scenarios have always been visible in Peek-a-Boo: by watching the "CPU%" column, or creating a CPU history window, you can generally get a feel for some processes that are more CPU-hungry than others.

With the new features of Peek-a-Boo ST, you have the ability to adjust that. Each process may be set to one of four priorities: Normal, High, Medium, and Low.

By adjusting a process's priority to Normal, the "special technology" doesn't kick in, and the process behaves as it usually would without "special technology" at all. By setting it to High, that process will ask for all the CPU power available. By setting it to Medium, the "special technology" forces the process to be between High and Low priority. By setting it to Low, that process will ask for very little of the CPU power available.

Due to some of the awkward characteristics of the MacOS's cooperative multitasking model, these issues mostly arise, and the special technology mostly applies, when a process is in the background. When a process is in the foreground, the MacOS will give it plenty of CPU time, even if it doesn't request it!

Now, it's probably obvious that simply setting all processes' priority to High won't make your Mac run faster! There's only so much CPU power to divvy up between all the processes, and what Special Technology does is let you adjust how that CPU power is divvied up.

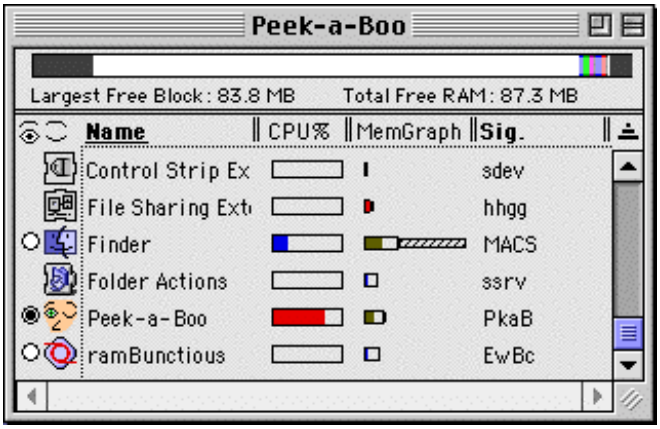
For example, suppose you're running an AppleScript that seems to be extra slow when a word processor is running. If that word processor is hogging the CPU, then you could use Special Technology to make the word processor low priority, leaving more CPU power available for the AppleScript. Or if your database needs to be more snappy if it's in the background, you could set it to high priority to ensure that any available CPU power gets allocated to it.

As you use Special Technology, you'll find that you occasionally need to manipulate a combination of processes' priorities. In other words, setting the "important" process to High priority may be only the first step; you may also need to set another process to Low priority. This is the main reason that I always turn on "CPU%" whenever I need to use Special Technology. That makes it very easy to see what needs to be manipulated, and how.

The Special Technology priorities are adjusted via the Processes menu. It is often convenient to use the popup menu (click and hold on a process, or option-click on a process) to adjust the Special Technology priorities.

To use Special Technology, you need to drag "PaB Special Technology" to your System Folder. The MacOS will automatically put it into the Extensions folder. You'll need to restart your computer before Special Technology takes effect.

Main Peek-a-Boo Window



On the left side of the main Peek-a-Boo window are the icons for each running process; each icon may have a radio button. The selected (filled) radio button shows which application is in front. Clicking a radio button brings that application to the front. This can be quite convenient for rapidly navigating running applications.

Some applications will not show a radio button. These applications (such as File Sharing Extension) are background-only applications, and can not be brought to the front.

The top of the window contains a map of the Macintosh's memory. This memory map shows how much of the Macintosh's memory is being used, and how it's being used. The dark gray portion is memory used by the system; the colored portions of the memory map show memory used by processes. If a process is selected, that process's memory is colored a bit darker. This can be convenient, since sometimes a large chunk of memory is "blocked" by a small application in the middle of it. Peek-a-Boo lets you find these situations and deal with them; if you quit the small application, you can then launch an application that needs the big chunk. In many cases, there's even menory to launch the small application again!

For your convenience, you may click on a process's memory in the memory map and it will be automatically selected.

If you click on a process, you select it. There are several ways to manipulate processes; see the Processes Menu section for more information.

If you start typing the name of a process, Peek-a-Boo will automatically select it. You can also use arrow buttons to navigate through the process list: the up and down arrows select up and down through the process list; the left and right arrows select based on the location in memory. (I.e. it goes left and right through the memory map.)

Many pieces of information in the main window may or may not be

showing, depending on the Preference settings. For a further explanation of these items, see the Preferences section.

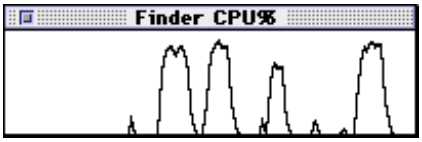
The "process header" is the part of the screen above the processes and below the memory map. Each heading has a double vertical bar that may be dragged to resize the width of each column. (Holding down "option" when click-dragging will do a "live" refresh while you're resizing.)

Some headers are **bold**. These are headers that you can click on to change the sort order of processes. You can sort processes based on the following fields:

- Name
- Active Ticks
- Type
- Signature
- Size
- Free Memory
- Temporary Memory
- Process Serial Number
  Note: since Process Serial Numbers are assigned incrementally, sorting by PSN also effectively sorts by launch time. So if you want to view processes by launch order or UpTime, sort by Process Serial Number.
- Location

There's a "sort direction" icon above the vertical scroll bar to specify whether it sorts from the smallest value to the largest, or from the largest to the smallest.

CPU History Window



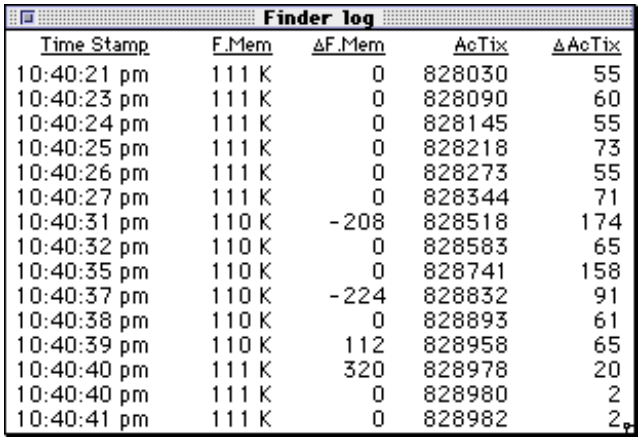
Each time the CPU% bar in the main Peek-a-Boo window gets updated, the CPU history graph is also updated. The graph moves slowly to the left.

When you open a CPU History window (from the Processes menu, or press Cmd-U), a window like the above window will open for the selected process. This information is stored, so in the future, Peek-a-Boo will periodically check to see if that process has been started and, if so, it'll pull up its CPU History window to track CPU usage. To make Peek-a-Boo forget about a given CPU History window, close the CPU History window. Then Peek-a-Boo won't include that window in its periodic search any more.

You can open several CPU History windows for the same process. While this isn't terribly useful for normal Macintosh use, it can give a marvelous hi-tech feel to your Mac if seventeen history windows are plastered at random intervals on your screen.

Introduced in Peek-a-Boo ST 1.5 is the ability to show CPU history windows as "Techie" CPU Windows. This makes the windows look a bit different -- a dark background with an oscilloscope-like line. To move these "techie" windows, just click anywhere on them and drag them to their new place. You can turn "Techie" CPU Windows on and off in the preferences dialog.

Logging Window



Finder log

Time Stamp	F.Mem	ΔF.Mem	AcTix	ΔAcTix
10:40:21 pm	111 K	0	828030	55
10:40:23 pm	111 K	0	828090	60
10:40:24 pm	111 K	0	828145	55
10:40:25 pm	111 K	0	828218	73
10:40:26 pm	111 K	0	828273	55
10:40:27 pm	111 K	0	828344	71
10:40:31 pm	110 K	-208	828518	174
10:40:32 pm	110 K	0	828583	65
10:40:35 pm	110 K	0	828741	158
10:40:37 pm	110 K	-224	828832	91
10:40:38 pm	110 K	0	828893	61
10:40:39 pm	110 K	112	828958	65
10:40:40 pm	111 K	320	828978	20
10:40:40 pm	111 K	0	828980	2
10:40:41 pm	111 K	0	828982	2

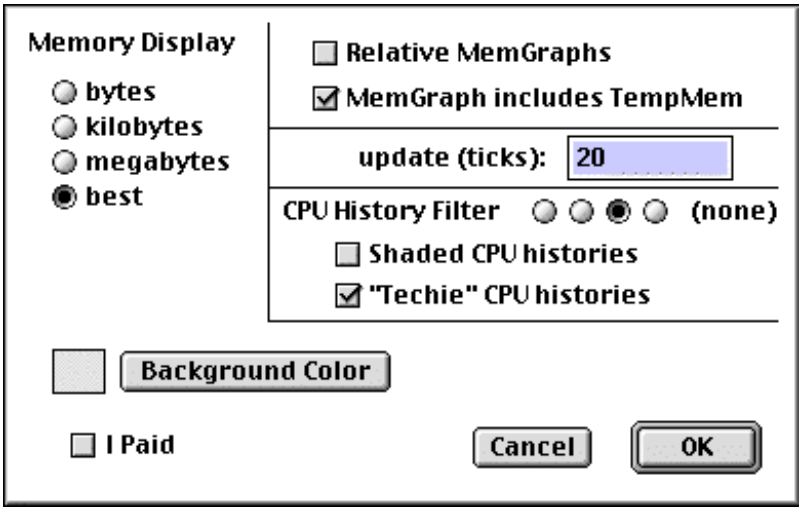
You can monitor several pieces of Process Manager information simultaneously for a given process with the Log function. This was designed to keep track of all the Process Manager information that changes in the course of normal operation. So you can track total free memory, the change in free memory, active ticks, the change in active ticks, and several variations of Temporary Memory usage, along with an optional time stamp.

One of the most helpful uses of this feature is to detect memory leaks. If you log the change of free memory for a process, you can see how much memory is being allocated and de-allocated as you use the application.

The logging info can be written to a file. This file holds tab-delimited fields of everything that the log window shows. Rather than always write to one specific file, though, Peek-a-Boo creates a new log file each time a process is logged. This is so all the data in a file is consistent with itself: if the first part of a file had total free memory and the last part of the file had a time stamp and delta active ticks, that could confuse both users and any spreadsheet or database that you tried to import the file into. So Peek-a-Boo autogenerates a name and creates the file in whatever folder you specify.

Although the time stamp in the window is in hour:minute:second format, it's different in the file: it's based on the system tick count. The file includes the hour, minute, and second in the name.

Peek-a-Boo Preferences



The Peek-a-Boo Preferences dialog is shown above. There are several options that can be adjusted using this dialog.

- **Memory Display** lets you choose how you want to view several memory-related items (such as FreeMem, Size, TempMem, Largest Free Block, and Total Free RAM). You can choose to view in bytes, kilobytes, megabytes, or best. The choice "best" views in bytes if the value is up to about 5K, in K if the value is up to 1MB, and in MB if the value is larger than one megabyte. This is the option I regularly use.
- Choose **Relative Memgraphs** if you're especially interested in the *percentage* of free memory of a process. It will "expand" the MemGraph to the maximum width for all processes.
- Select **MemGraph includes TempMem** if you want the MemGraph to include the Temporary Memory that the process uses to be included in the graph. If so, it will add the TempMem as a thinner bar to the right of the main memory bar, with a diagonally-striped pattern.
- **Update (ticks)** is an important preference. This lets you adjust the period between updates of items such as CPU%, AcTix, FreeMem, and MemGraph, as well as how often Peek-a-Boo checks for newly-launched or recently-quit processes. One tick is about 1/60 second; for example, a value of 30 for Update (ticks) would result in Peek-a-Boo updating its fluctuating items every half second. A short time interval generally provides quicker feedback, but can slow down other processes slightly.
- **CPU History Filter** is a series of several radio buttons that lets you choose how "smooth" you want CPU History windows' graphs to be.
- **Shaded CPU Histories** lets you choose how the CPU histories are displayed. If it's selected, the graphs have a gray or black pattern -- gray if the process is in the background, black if it's in the foreground. If it's not selected, each graph is a simple line. The line display looks much better on LCD

displays such as PowerBooks than the shaded display.

- **"Techie" CPU histories** changes the appearance of CPU history windows to a green line on a dark background; an example is on the cpu history window page.
- If you would like a different color for all your windows, click the **Background Color** button. The current background color is shown in the little box to the left of the button.
- After you pay for Peek-a-Boo, you may click the **I Paid** button. Subsequently, the splash screen and the about screen will both say "Registered" to show that you are a user with honor and integrity.

Peek-a-Boo Processes Menu

You can use the Process menu in two ways:

- Use the Processes menu in the menu bar.
- Use the popup Processes menu in the main Peek-a-Boo window. If you click a process and hold the mouse button down while not moving the mouse for a moment, the Process menu appears right under your cursor. Also, holding down the option key while clicking on a process brings up the Process popup menu instantaneously.

Both ways of bringing up the Processes menu have the same options.

- **Launch Process** shows a dialog where you can choose an application to launch. This can be used to launch the Finder, or startup-time background-only applications (of type 'appe'), for example.
- **Bring to Front** makes the selected process the frontmost application. Clicking on that process's icon or radio button will also bring it to the front.
- **Kill Process** sends a 'quit' Apple Event to the selected process, terminating it.
- **Hide Process** hides all the windows of the selected process.
- **Reveal in Finder** opens the window in Finder where that program is.
- **CPU% History** opens a CPU history window of the selected process.
- **Logging** allows you to open a logging window for the selected process.
- **Normal**, **High**, **Medium**, and **Low** refer to the Special Technology priority settings.

Peek-a-Boo ProcInfo Menu

Process Info Display

The ProcInfo menu lets you choose which fields are displayed. Each item can be selected to toggle a check mark and the Peek-a-Boo display.

Here is an explanation of each field:

- The **name** is the name of the process.
- **CPU%** is a bar graph (updated periodically) that shows how much of the system's CPU time was spent in that process. Normally the process in front will take most of the CPU time. If there's a background process using a lot of the CPU, it's often processing. Sometimes when things seem sluggish in, say, a word processing application, it's because processes in the background are using too much CPU time. Peek-a-Boo lets you identify these CPU hogs, and special technology lets you fix 'em good.
- The **MemGraph** is a bar graph showing memory usage in a process. The dark part of the graph is the memory used, and the light part of the graph is the memory available. Peek-a-Boo scales all MemGraphs so they all fit in the allocated space. Since their size is shown proportionally, smaller processes will not use the full allocated space unless "Relative Memgraphs" is selected in the preferences. The MemGraph can also show how much temporary memory is being used by the process. Temporary memory usage is shown as a black and white striped pattern to the right of the normal application memory. (Temporary Memory displayed in the MemGraph can be adjusted in the Preferences Dialog.)
- **Active Ticks** tells how much CPU time this process has had since it was launched. One tick is about 1/60 second, so if a process has had 3600 Active Ticks, it has actually been using the CPU for one minute.
- The process **Type** tells whether a given process is an application, Finder, an extension, or other. 'APPL' means it's an application; 'FNDR' means Finder; and 'appe' means extension process.
- The process **Signature** is the creator type of that process. This four-character code is an identifier Finder uses to find applications.
- **Size** tells the amound of Macintosh memory the process is using. This can often be changed from Finder using the Get Info command and relaunching the application.
- **FreeMem** is the amount of free memory available to that process. It can give clues such as whether more windows can be opened, or whether complicated features can be used. FreeMem is extra handy for people debugging applications and watching for memory leaks. (Set the Memory Display to "bytes," then watch FreeMem.)
- **Temp Mem** is the amount of Temporary Memory the process is using. Temporary Memory is also called Process Manager Heap memory, and another name for it (rather old, though) is Multifinder Memory. Programs often use Temporary Memory when they don't know beforehand how much memory they'll need. It usually turns out to be a smarter way to use memory than simply increasing the application's suggested memory field, because it never wastes unused memory. *Note:* the MemGraph feature uses the same values that the Size, FreeMem, and TempMem use.
- **Launch Time** shows the time of day the process was launched.
- The **PSN** is the Process Serial Number of the process. This doesn't have much meaning to everyday users of the Macintosh, but it's available from the Process Manager, so Peek-a-Boo can display it.
- The **Location** of a process is the place in the Macintosh's memory where the process resides.

- The **Mode** of a process is a four-byte integer that contains several pieces of information that tell Finder how the process behaves. See a technical reference manual (such as *Inside Macintosh* or Think Reference) for the meaning of the Mode field.
  When Mode is being displayed, the header of the main Peek-a-Boo window includes:

  This header tells what each bullet mark indicates.

  ob
  : **Ob**solete or reserved for future use.

  sr
  : Accepts **s**uspend/**r**esume events.

  cb
  : **c**an run in the **b**ackground.

  ba
  : **B**ackground-**a**ware.

  bo
  : **B**ackground-**o**nly.

  fc
  : Get **f**ront **c**lick.

  cd
  : Accept **c**hild-**d**ied Apple Events.

  32
  : **32**-bit compatible.

  hl
  : **H**igh-**l**evel event aware.

  re
  : Accepts local and **r**emote **e**vents.

  st
  : Is **st**ationery aware.

  te
  : Uses **T**ext**E**dit services.

- **Path** shows the full path to the process.
- **Launched By** tells the name of the process that launched the selected process. Most of the time it's Finder; it could be any application capable of launching other applications, however. Also, if the application that launched this process has quit (or if the System launched the process, like it does for Finder), this says "<unknown>."
- **Uptime** shows how long each process has been running.
- **ST Priority** shows the Special Technology priorities for each process. A convenient way to view ST Priority is to make the column as narrow as possible; that lets you see just the icon that identifies each priority:
  - a tiny blue circle means low priority
  - a medium yellow circle means medium priority
  - a large red circle means high priority
    no circle means normal priority

FAQ

Q Who are some people whose help has been valuable?

A Many people have suggested features, techniques, and UI enhancements. Without the help provided by these people, Peek-a-Boo would not be the product it is today.

- Elden Wood -- Your continual suggestions on all aspects of Peek-a-Boo keep it improving.
- Greg Robbins -- Your generous technical suggestions have helped me overcome several hurdles. Thanks for sharing your expertise.
- Rich Fattic -- Your refusal to acknowledge the unreasonableness of a situation provides much-needed levity. I must admit, though, that your continual harping on various themes has been an impetus.
- Larry Wilson -- Your unceasing focus on Peek-a-Boo's useability and visual appeal have contributed noticeably to its appearance, from version 1.0 through the present.
- Troy Gaul -- Your Infinity Windoids have helped many programmers in the Mac community.

Q What's the difference between Size and FreeMem?

A Size is the total memory allocated to the process, while FreeMem is how much of that memory is still available for the process to use.

Q What do the two dark gray areas in the memory map represent?

A Both of them are parts of memory used by the System. The part to the left is the System Heap, and the part to the right is System memory above BufPtr.

Q What other programs are designed to work with Peek-a-Boo?

A There are several programs that are either designed specifically to work with Peek-a-Boo, or work with Peek-a-Boo as a convenient additional feature.

- ramBunctious, a MacOS RAM disk program, communicates via Apple Events with Peek-a-Boo so Peek-a-Boo can show where the RAM disks exist in the Process Manager Heap.
- CSM Pack, a collection of useful Control Strip modules, includes a module that can set the priority of the frontmost process.