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## PowerBook: Not Enough Memory to Load Extensions (5/94)

Revised: 5/18/94  
Security: Everyone

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Article Created: 12 May 1994

TOPIC -----

When trying several extensions on my PowerBook 520, I get a dialog message during the boot process stating "There is not enough memory to load all of your extensions." The only button is "OK" and after pressing that, the machine continues to boot, but the menus are drawn weird, and the screen doesn't update correctly.

Is there some kind of limit on how much RAM can be used with extensions? Or is there some minimum free RAM that you must have coming out of the boot process?

DISCUSSION -----

The version of system software for the PowerBook 500 series and the PowerBook Duo 280 series is different from other versions of system software. It assures that 45% of RAM is free after the system boots, and will give that error when there are too many extensions in the System Folder to meet that requirement. To avoid this error you can limit the number of extensions in your System Folder, or to add more RAM to your PowerBook.

Detailed Explanation  
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The behavior the PowerBook 520 exhibits is the result of a new feature that is part of the common system source code developed for the PowerPC. This new feature, which sets the minimum amount of free RAM that you must have after booting has been included with the system on the 500 PowerBook series and 280 Duo series. The new addition to the system changes the behavior of a commonly used system routine called INIT 31.

System software has traditionally used the routine INIT 31 to load extensions (INITs) and system resources into memory. INIT 31 gets the size of each extension to be loaded and allocates memory for that extension and then repeats that process for all extensions that are loaded at system startup. This procedure calls another routine to set the memory address of the beginning of the application heap space. In previous versions of the system software, the

number of extensions that could be loaded was very much at the users discretion. Occasionally, a system could crash if the number of extensions loaded used up so much available RAM that there was not enough free RAM for the Finder to launch.

In system 7.1.1 (not System 7 Pro) on the PowerBook 500 series and Duo 280 series, the call made to INIT 31 loads the extensions and the size resources for those extensions as usual. However, a modification has been made to this routine which loads a value from a table which specifies how much free RAM (about 45% of RAM) must be available after the system boots. In the case of a 4MB PowerBook 520, this value is approximately 1600K. Once the available RAM reaches this value a dialog message "There is not enough memory to load all of your extensions" is displayed indicating that no more space is available for extensions. The "OK" button allows the user to continue booting the PowerBook without loading any additional extensions, and without having to restart.

The strange screen behavior is a result of available free RAM. Since the system has used so much of the RAM to load extensions there is not enough free RAM to allow the system to operate correctly. For example, the words in the menu bar disappear when selected. This is caused by insufficient space to copy the menu bar and display it with the highlighted selection. A blank (white) space is drawn causing the selected menu bar item to disappear. This can also affect the way items are displayed on the screen. Another factor is that the value in the table for the amount of free RAM after the system boots is too small.

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Tech Info Library Article Number:15334