



# Tech Info Library

## PowerBook 500 Series Memory Allocation (6/94)

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Security: Everyone

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TOPIC -----

When I choose "About This Macintosh..." the Macintosh gives incorrect reports about how much memory I have available.

We see in "About This Macintosh..." :

Total Memory: 4096K  
Memory available: 1682K  
System: 2029K

Memory available: 1682K + System: 2029K = 3711K but Total Memory is 4096K

We find than about 300K (385K) RAM is missing. We think that this amount of RAM is memory reserved for Built-in Video, and in order to reduce the amount of this memory, we hold down the Option key while clicking the Option button in the Memory control panel. This doesn't brings up the special dialog box where you can set the maximum number of colors or grays to 256,16, 4 or black and white. So, we don't know why this 300K is missing.

DISCUSSION -----

To get the correct amount of memory available for applications users should look at the "largest unused block" field on About This Macintosh (generally about 1.9 to 2 MB after boot on a 4 MB system). As you indicated, this number does not add up to the RAM configuration when totalled with the system size (you typically get a discrepancy of about 400K.) This space is not available to the user EVER as it is allocated by the ROM at boot time. Here's an explanation as to what that space is used for and why it is somewhat larger than that found on other 040 computers:

Less space is available on the PowerBook 500 Series due to the relatively larger amount of space allocated above the buff point at boot time (approximately 400K.) This space can be broken down thus:

- Modem/Sound buffers (64K)
- Boot Globals (327K)  
Physical space table  
MMU tables

The 327K allocated for the bulk of the space is larger than what is allocated on a Quadra 950 (209K) for example. This increase is due to the video architecture implementation found on 040 PowerBooks. Because we must support both internal and external video (versus a single video architecture on the Quadra), a larger space must be allocated at boot time. While there is a way to support both internal and external video and not take so much memory on the front end, such an approach is more complicated, would require more development time, and involves considerable risk. Apple took a very conservative approach -- which resulted in additional memory use and reduced the amount of RAM available to run applications. The same case holds true for the new PowerBook 200 Series (although the numbers are slightly smaller).

As a side note, the additional RAM allocation on the PowerBook 500 Series is also the reason why you must have at least 6 MB of RAM installed to set up a RAM disk, while on the PowerBook 180c, for example, you can set up a RAM disk with just 4 MB installed.

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