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Macintosh 128K ROMs: RAM cache

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Macintosh computers with 128K ROMs include a Control Panel feature, RAM cache, through which the user can select the cache memory size.

To reduce the time the program uses for accessing a disk, RAM cache acts as a special RAM buffer between applications and disk drives. Blocks of data are read from disk into program memory and RAM cache. The application can flush from program memory certain data that the program needs later on. At that time, the program submits a request for the data from blocks on disk. If the blocks are still in RAM cache, the data can go from the RAM cache blocks to the application heap, saving the significantly greater time needed for disk access.

Of course, the RAM cache will eventually run out of space as the number of blocks of data read from disk increases. When this happens, new blocks overwrite the blocks of data used least recently, keeping frequently used sections of code in RAM cache to speed up operation of the system.

The RAM cache is capable of tracking 36 different files and may occupy from 32K to 768K of memory. A RAM cache of moderate size will not only increase speed within an application but will also cause applications to be launched from and return to the Finder more quickly.

The optimum RAM cache size depends on (and the use of RAM cache is largely dictated by) how memory and disk segments of code are juggled by one or more of the applications in use. Rarely are applications larger than 300K on disk, so a RAM cache of a slightly smaller size should be sufficient - say 256K. If you are using a very large program, it might be of some benefit to increase the size of the cache to 384K. However, if the cache is much larger than that, the document and program segments in use will only have available the restricted memory that begins to degrade performance.

While applications accessing a LaserWriter increase the need for disk access, there is only a small benefit to be had in increasing the size of the cache in this situation. Most applications will continue to operate very efficiently with a RAM cache of 256K.

It is possible to set the size of the RAM cache so high that the program cannot operate in the remaining space. MacWrite 4.5, for example, must have a minimum of 144K of memory to run and print to the LaserWriter. Don't set the RAM cache so high that less than 144K remains for the program.

The AppleLink article "Switcher: Memory Configurations for LaserWriter printing" includes a table that lists the preferred memory size needed by applications under Switcher. This information can provide a guideline for safe RAM cache sizes. Note that many of the programs will take advantage of more memory if it is available. If RAM cache is set high enough to cut into that capability, the cache will not necessarily improve overall performance.

Remember also that active desk accessories require dedicated memory. Some combinations of applications and desk accessories will occupy so much memory that the size of the RAM cache must be severely limited.

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