Increasing Virtual and RAM Memory

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A user asked me if he increases the paging file size of the Windows virtual memory signifies a way to load more files in MBMAX64 (64-bit HYSWEEP® EDITOR), so I decided to test it.

WHAT IS VIRTUAL MEMORY?

Virtual Memory uses part of the hard drive to effectively expand your RAM, allowing Windows® to run more programs. The OS uses a space in the hard drive to store volatile data when there is not room in the RAM. It is very important to mention the information stored in the hard drive takes longer to be read, the RAM should be 10 times faster.

CHANGING THE VIRTUAL MEMORY

For the test, I used 130 HSX files from a survey done with a Reson 7125; the total size of the files was 2.70 GB. The computer used was a Panasonic CF-53 with the following specs:
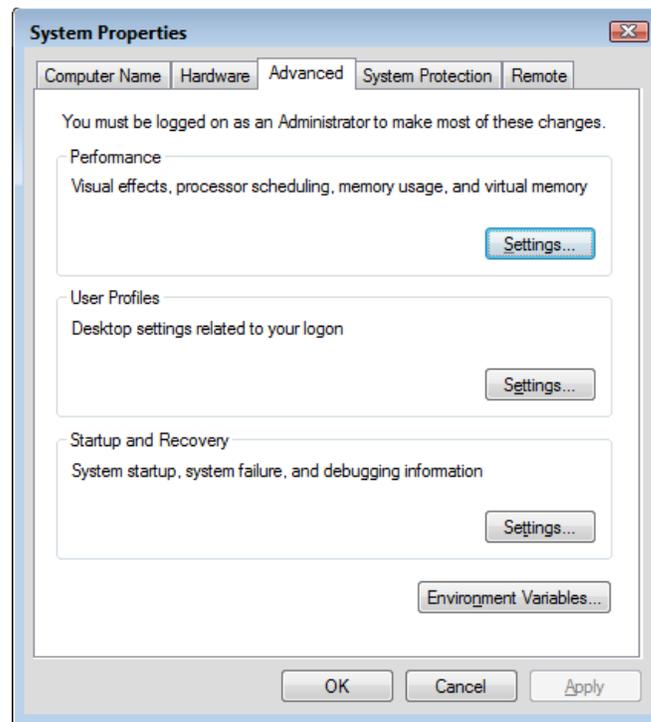
- Intel Core I5 2520M 2.5GHz.
- 4 Gb DDR3 1333 MHz.
- Solid State Drive.

To change the Virtual Memory in Windows® in Start Menu:

1. In the Start menu, type 'System' in the Search field, or select 'System' in the Control Panel.
2. Open the Advanced tab and, in the Performance area, click [Settings].

System

← → ↑ › Control Panel › System and Security › System

Control Panel Home

View basic information about your computer

Device Manager

Windows edition

Remote settings

Windows 10 Pro

System protection

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Advanced system settings

FIGURE 1. Advanced System Settings Dialog

3. In Performance Options Dialog, open the Advanced Tab, then click [Change].
4. In the resulting Virtual Memory Dialog, uncheck the "Automatically manage paging file size for all drives" option, then choose a drive.
5. In Custom Size, enter the initial and Max size values.

FIGURE 2. Advanced Performance Options (left), Virtual Memory Dialog (right)
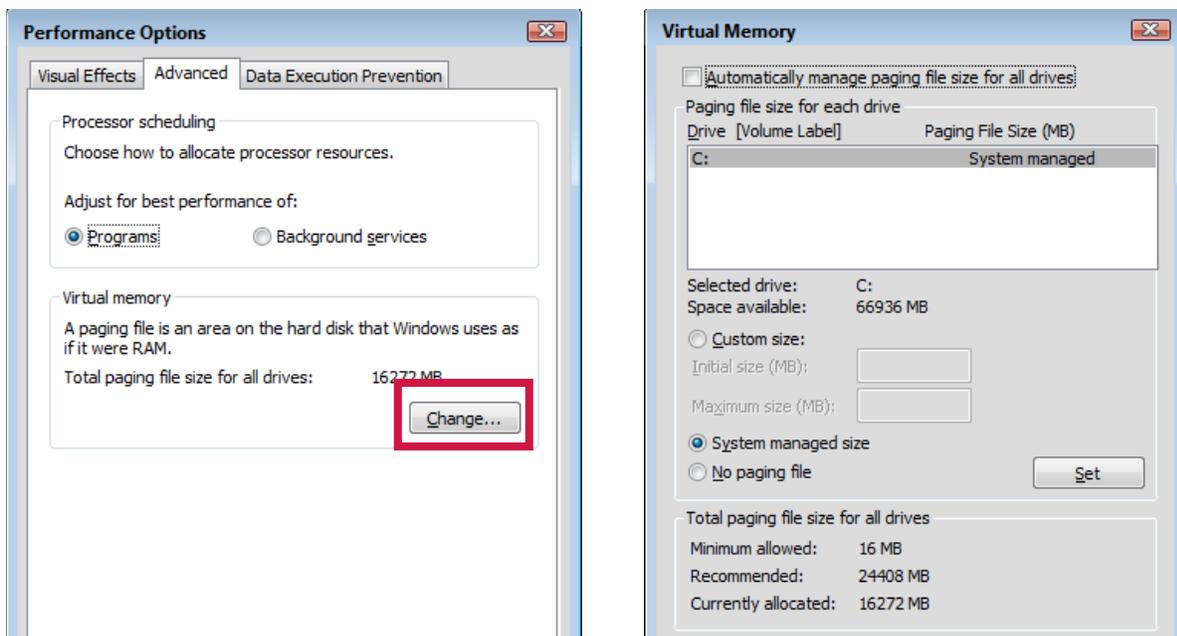
TESTING THE THEORY

I opened the 130 files in MBMAX64 with different configurations, everything was tested 4 times:

TABLE 1. *Test Results*

	TEST 1	TEST 2	TEST 3
Description	• No changes in Windows®	• Reduced the Virtual Memory to the minimum value that Windows® recommends.	• Increased the Initial Size to 1.5 times the memory RAM: 6144 MB. Maximum size to two times the memory RAM: 8192 MB.
Result	MBMAX64 could only load ~46 files of 130.	MBMAX64 could only load ~43 files of 130 before the program crashes.	MBMAX64 could only load ~50 files of 130.

Test 2: When I reduced the virtual memory, the program crashed, so having certain value of virtual memory can make Windows® more stable.

FIGURE 3. *Virtual Memory set to Minimum*
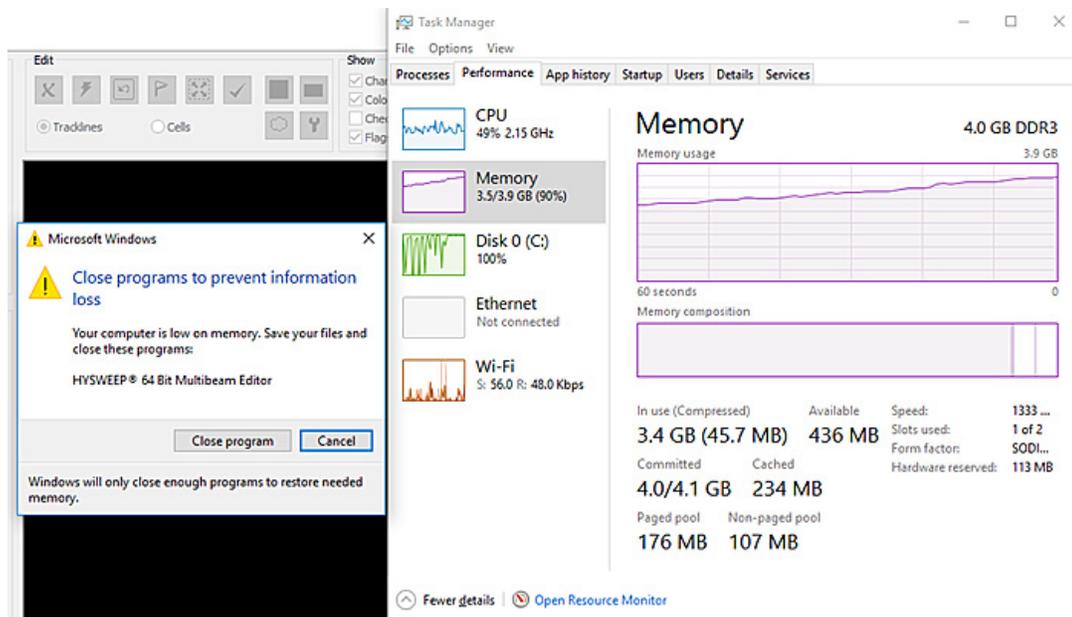
Test 3: Several articles recommended entering an Initial Size of 1.5 times the RAM, and a Max Size of 2 times the RAM the computer has. Increasing the paging file of the memory only increased the number of files loaded in by 8%. It is a slight improvement, but it's insignificant when you are loading big files in MBMAX.

In this case, the only option is having more RAM memory. Some users prefer to use computers with 16 GB of RAM or more to load one day of multibeam data. We always suggest having as much memory RAM as possible, especially when you work editing multibeam data.

BONUS

I was testing things so I decided to verify what makes MBMAX64 load the same files faster. I tested the time MBMAX64 completes loading the 130 files. In this case, I used a faster computer:

TABLE 2.   *Testing Loading Time*

Test System	Time
8 GB DDR4 800 MHz - Core I7 4GHz	2 mins 15.15 sec
8 GB DDR4 1333 MHz - Core I7 4GHz	2 mins 15.11 sec
8 GB DDR4 1600 MHz - Core I7 4GHz	2 mins 5.15 sec
8 GB DDR4 2666 MHz - Core I7 4GHz	1 min 57.14 sec
8 GB DDR4 2666 MHz - Core I7 2.2 GHz	2 mins 55.76 sec

The results are very clear, having a RAM with high speed does not change too much. Probably what you need is more memory with a certain speed. For example, the difference in the performance of a 2666 MHz RAM and 3200 MHz RAM is not so much.

What makes a big difference is the processor: twice the speed, reduced the time by around 1 minute.

I have seen users that survey using multibeam and LiDAR at the same time, then try to process that amount of data in a slow computer. Remember, in our manual we suggest the minimum requirements, but for this purpose, you will certainly need a processor with several cores and probably more than 12 GB of RAM.