Macintosh LC II and IIsi: Comparing Performance

Article Created: 20 April 1992

Article Change History

06/21/93 - REVISED
- No longer includes specs on all Macintosh models. Refer to article titled "Macintosh Family: MIPS Ratings" for that information.

TOPIC ----------

I'm planning a lab for word processing as well as for desktop publishing tasks. I'm considering the Macintosh LC II or the Macintosh IIsi. What differences in performance can I expect between the two computers, since both have the 68030 processor? The performance issue is most important in the case of handling complex graphics. What would the addition of the optional math coprocessor mean to the performance of each computer?

DISCUSSION ----------

Following is the text of the AppleLink Tech Info Library article "MIPs Can be Misleading." Please remember that we don't quote MIPs values without strenuous disclaimers about their applicability in the Macintosh world.

Information pertinent to your decision is this:

Macintosh LC II	3.9	MIPs	**	
Macintosh IIsi	5.0	MIPs	**	***

* NOTE: The majority of our systems operate with a variable number of wait states. See the Tech Info article on Wait States and Macintosh.

** NOTE: This figure has been adjusted to reflect the improved efficiency of the 68020 and 68030.

*** NOTE: This figure does not reflect performance degradation due to the use of internal video, or increases provided by an optional cache card.

Using these values, the Macintosh IIsi is over 25% faster than the Macintosh LC II. While we don't have specific benchmarks of performance in desktop publishing applications, it's safe to say that the speed difference would be

significant.

Measuring MIPS is, at best, an inaccurate art. All the reference manuals we consulted stated that a MIPS rating can be misleading. MIPS (Million Instructions Per Second) is a measurement of CPU (Central Processing Unit) speed.

From Motorola's 68020/68030 Performance Report:

> "Benchmarking microprocessors is much like water-witching. Everyone wants to use the results but are skeptical of the 900-methods. From the user's point of view, the best benchmark to use in making a decision on a given microprocessor is to run the code which will be run in the final application. This, however, is usually difficult at best, and expensive and time consuming at least. Since running the actual code is usually not feasible, most users and all microprocessor manufacturers turn to either synthetic benchmarks - ones that simulate real-world conditions - or small standard benchmark programs which are designed to indicate real-world performance. Not everyone can agree on what simulates real conditions; thus, there are numerous benchmark programs available, each written to test some aspect of performance that the writer is interested in testing."

Another issue that causes MIPS ratings to be suspect is the fact that not all instructions take the same amount of time. A single instruction can take from 2 to over 200 machine cycles. The MC68020, for example, runs at a sustained rate of 2 to 3 MIPS, with occasional bursts of 8 MIPS.

Several other factors may enter into the process of obtaining the MIPS rating:

- Instruction in cache and cache enabled
- Instruction data size
- Addressing mode used -- extension words and indirect
- Memory port size
- Memory speed -- variable wait states
- Operand misalignment
- Prefetch sequence -- even or odd, word alignment of op word
- Instruction overlap

If a program is written to test the MIPS, other issues surface:

- Which instruction is used? The best instruction to make the MIPS rating look good would be the fastest executing instruction in the CPU set.

- What is the best program structure to use? Two choices, a loop or a straight line. A straight line program will take more space but is, by far, the fastest. The straight line program executes only the fast instructions without executing any looping instructions.

Copyright 1992, 1993, Apple Computer, Inc.

Keywords: <None>

==========

This information is from the Apple Technical Information Library.

19960215 11:05:19.00

Tech Info Library Article Number: 10131