CORSAIR™

RAM GUY TECH NOTE

THE RAM guy

DO I WANT REGISTERED MEMORY OR UNBUFFERED MEMORY?

This one is pretty easy, once you understand the basics...

What are registers?

Registers are components, like DRAMs, only they perform a different function.

What is the function they perform?

Registers are known as logic, rather than memory, components. The function that they perform is the buffering of the address and control signals going on to the module.

Why are they called Registers and not Buffers?

In the language of system designers, buffers are known as "asynchronous". Whatever signals are on the input pins appear directly on the output pins (after a few nanoseconds). Correspondingly, registers are known as "synchronous" components. When new signal values appear on the input pins, they don't show up on the output pins until (a few nanoseconds after) the next tick of the system clock.

So, why are synchronous modules without registers known as "unbuffered" rather than "unregistered"?

Hmmm... there are some questions even the Ram Guy cannot answer! Old EDO and Fast Page Mode modules were known as "unbuffered" and "buffered", which makes a little more sense.

You said that the registers perform a "buffering" function. What does this do to help?

Think of it as "power steering" for the memory module.

If you have a sports car, you don't need power steering. The steering wheel directly controls the direction of the wheels. In fact, this direct control even maximizes the car's performance (except when parallel parking, of course...)

But, if you have a big, heavy truck, only Ahhh-nold has the strength to move those tires without a little help. So, when you turn the wheel, the relatively weak energy you put into the steering wheel is assisted by a much more powerful motor, which actually sets the direction of the wheels.

So, you want registers if you are moving a heavy load?

Yes, exactly. That's why most servers use registered memory, and in fact most server motherboards REQUIRE registered memory.

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Do all registered modules come with ECC?

All Corsair registered modules have ECC. But, strictly speaking, this does not have to be the case. But, since most registered memory configurations have large amounts of mission-critical memory, it only makes sense to use error correction. (Read my bulletin on ECC for more info).

Give me the bottom line - do I need it or not?

The Ram Guy suggests these guidelines:

- Gaming Systems: Registered memory not needed, may actually degrade performance slightly.
- Servers: ALWAYS use registered memory. Most server boards require it. Plus, it will make it easier to add more memory later.
- DDR Systems: Use registered modules if you will be installing more than two DIMMs.
- High Performance Workstations: If you want a gigabyte of memory or more in your system, use registered memory (and a board that supports it!).