COMPUTER CASE VENTILLATION
By Bruce Pierson

There seems to be a widely held belief that computer cases need to have a large number of fans sucking the hot air out of the case, in order to properly ventilate the case and keep the CPU, hard drive and RAM cool. This wide-spread practice usually causes more problems that it's worth, later in the life of the computer. I often work on older computers and I see the result of this first-hand, on far too many occasions.

With more fans sucking the warmer air out of the case than the number of fans blowing cooler, outside air into the case, this causes a low pressure situation within the case. This means that additional air has to enter the case from somewhere and this is usually through any external openings in the case, including the optical drive, card reader (where fitted), floppy drive (in older computers only) and external ports, such as USB and audio ports.

Air entering the case in this manner will carry with it a certain amount of dust. In humid climates, this dust contains moisture. The result of this ingress of moist dust is corrosion to the internal components and connections in the peripherals and ports. Apart from making the peripherals and ports unreliable, this can also lead to their premature failure, often resulting in the early demise of an otherwise functional computer.

A case in point is a computer that I worked on recently. This computer was assembled by a well-known Australia-wide computer chain (which I will not name for obvious reasons). The computer was fitted with a power supply with a 120mm fan in the bottom, plus it had another 120mm fan at the back of the case, both sucking air out of the case.

The inside of the case was extremely dusty and on further checking, I found that both the optical drive and the floppy drive had failed as a result of the ingress of dust and moisture, so they were both written off. Cleaning the floppy drive with a cleaning disk failed to revive it. As well as this, the audio ports, USB ports and the card reader were full of dust, but fortunately, I was able to clean the dust out of them and restore them to working order.

In the process of servicing this computer, I removed the rear 120mm fan and I moved it to the front of the case, where I set it to blow cooler, outside air into the case. This restored the pressure balance in the case, meaning that there would now be no air entering the case through the peripherals and the ports.

Whenever I build a computer or service an existing computer, I always make a point of installing a front fan to blow cooler outside air into the case wherever possible and I do not have any additional fans sucking air out of the case, apart from the fan in the power supply. With some cases, I may also install an additional fan in the side cover of the case, with a trumpet, which directs cooler outside air directly to the CPU fan.

Depending on the design of the case, it's not always possible to install a front fan or a side fan, so sometimes, with this type of case, I may install a rear fan blowing cooler outside air into the bottom of the case. Again, this is not always possible or practical, depending on the design of the case. In the worst case scenario, I may have a case with the only fan being the exhaust fan in the power supply. While this situation is undesirable, it is often unavoidable, due to the poor design of some computer cases.

The theory of computer case ventilation is to maintain a good airflow, with neutral air pressure inside the case, or a slightly positive air pressure inside the case, but definitely not negative air pressure inside the case, which results in the problems outlined earlier.