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*magazine*

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Realtek Ex. 1015

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**Q: I am putting together a two-node network at home for head-to-head/cooperative gaming. Is a 10Mbps network fast enough or should I opt for a 100Mbps setup?**

Shane L.

**A:** A 10Mbps LAN will be fast enough for even the most demanding games, especially with only two nodes. However, there are lots of other good reasons to make a 100Mbps network instead. Networking kits with two 10/100Mbps cards and a small 100Mbps hub are available for less than \$100. The faster network speed will come in handy when transferring those large demos or patches between two machines. When building a small network, you don't pay a whole lot more to get that 100Mbps speed, and it's really the best value.

**Q: What are Z buffers and all the rest of the buffers?**

Bevan B.

**A:** Answering that question as asked would take, oh, about 60 pounds of paper. Simply put, a "buffer" is a piece of memory where frequently needed data is stored to be retrieved more quickly than it could be re-calculated or retrieved from somewhere else. Buffers are *everywhere*, and have been used in computing for a very long time. So I'm going to avoid "all the rest of the buffers" and just talk about a few common ones that have to do with 3D graphics.

**Z-Buffer:** This is also called a "depth buffer" and it is a measure of the placement of a pixel along the Z-axis. In other words, it is a measure of how far "into the screen" a pixel should be. If you are running a game at a resolution of 800x600 and it's using a 16-bit z-buffer, your 3D card stores in memory 16 bits of information for each pixel it draws. Why is this important? Because your 3D card can then use that information to properly draw something on top of something else. Imagine a chain-link fence in front of a tree... you want the tree to show through where the holes in the fence are, but you still want the fence drawn in front of the tree.

**Frame buffer:** This is, basically, the image that's displayed on your screen. The frame buffer is where your 3D card writes pixels to when it wants it displayed on your monitor. Your RAMDAC then converts the info in the frame buffer to an analog signal and sends it out to your monitor. Of course, if your monitor refreshes before your 3D card is done drawing the frame buffer, it would look terrible. So the 3D card actually has two frame buffers, one which is displayed and one which is written to. When the one being written to is finished, they swap. This is called double-buffering. It gets a lot more complex from there, but that's the basic idea.

**T-buffer:** 3dfx's newly-announced T-buffer is like a frame buffer than stores multiple slightly different versions of the same scene, which it can then combine in different ways to do special effects like motion blur. This technology actually has been around for a while in what is called an "accumulation buffer," and the T-buffer is incredibly similar. The reason it hasn't been in a video card yet is because an accumulation buffer or T-buffer requires using several times the fill-rate of the video card to produce good special effects. Video cards need to get a lot faster before this becomes commonplace.

**Q: Is there a way to toggle a cheat on and off as you're playing a level? For example, sometimes I might use the fly cheat in Unreal for one or**

**two hard jumps and then would like to disable it for the rest of the level. Can this be done?**

Barbara R.

**A:** This varies from game to game, but most allow you to disable a cheat in much the same manner you enabled them. Some cheats are one-time bonuses that can't be rescinded (like ones that give you extra ammunition or health, or make a weapon or object appear). Others, like the "fly" cheat you mention in *Unreal*, are turned off by another command. Just as you type "fly" in the console to start flying, try typing "walk" to stop. In most games, when in doubt, try typing in the same cheat again to see if it disables it.

**Q: I'm running a 266MHz P2, 32 MB SDRAM, 16 MB AGP Banshee and I'm not sure if my system has the cajones to run the likes of Mechwarrior 3, Quake III, and others. My question to you is... What is the most pragmatic and cost-effective upgrade I can make, that will allow me to continue gaming through the millennium?**

Johnny F.

**A:** Buy a new system. Seriously! The most pragmatic and cost-effective upgrade you can make is to get a new system. I hate to be the one to tell you that, but you're in a situation where all the parts of your machine, except one, aren't fast enough to handle the most demanding games of this year, let alone next year. You can probably run most of them, but not fast and smooth enough, or with enough options enabled, to see them in all their glory. A 266MHz CPU is quickly becoming the bottom-end of what will run most games, many require 64MB of RAM to even operate (128MB or more to run well), and that Banshee is seriously outstripped by the Voodoo3 and TNT2, both in features and speed. It's likely that other components, like your hard drive, are pretty slow compared to the new stuff out there as well. You can probably spend hundreds of dollars to "patch up" your machine to a reasonable level for today's games, but you'll find yourself quickly in the same situation you're in now. Given the incredible value that most PCs in the \$1500-2000 range are now, really your best choice, looking to the future, is to buy a new PC.

**Q: I am an avid gamer with a PIII 450 with a Voodoo3 3000. I don't have a TV (I'm at college). I would like to try out the Sega Dreamcast. My video card, as you already know, has a TV out. I was wondering if I could hook up a Dreamcast directly to my computer without a TV. I would appreciate if you guys could help me out here.**

Josh W.

**A:** The problem here, is that a TV-out goes out to a TV. What you would need is a video card that has a TV "in" feature, which is definitely more rare (and more expensive). However, there is a VGA box that hooks to a Dreamcast and will let you hook it up directly to your computer monitor. Sega's official model isn't available yet, but a third-party one is. It also includes S-video and composite video and audio outputs for when you do get a TV (hey, you're in college, it's only a matter of time before you get a really big TV and stereo on credit). It doesn't work with every single game, but most of them work well with it. We've been using one here in the office and the visual quality is excellent. ■

## Gizmoopolis

**3dfx's New Open-Source Texture Compression**—3dfx is making its new FXT1 texture compression technology available to software and hardware developers in a free, open-source format. 3dfx claims that this new technology dramatically reduces the size of texture images with little or no loss in visual quality, enhancing game speed and improving the overall gaming performance. The technology is supports multiple platforms including Windows, Macintosh, BeOS, Linux and other platforms.

**Savage 2000 Announced**—S3's new chip, the *Savage2000*, boasts such features as support for up to 64 MB of video memory, a QuadTexture Engine (the ability to composite four textures in a single cycle), S3TL (transform and lighting engine), DTV/DVD Playback, a dynamic Multi-Tap Scalar, Dynamic Multi-Tap Scalar and a third generation Motion Compensation Engine. Products based on the chip may be available as early as this Christmas, the first of which being the *Viper II* from Diamond Multimedia.

**NVIDIA Reveals GeForce 256 GPU**—The company is dubbing it's new graphics chip a "GPU" or "graphics processing unit," because it can potentially take much of the graphics work previously done by the system's CPU and perform it on-chip. The *GeForce 256* contains nearly 23 million transistors, 50 Gigafllops of floating-point calculation capability dedicated to 3D, the ability to handle 15 million sustained polygons per second and more than 480 million pixels per second. It also supports up to 128MB of frame buffer memory, AGP 4X with Fast Writes (a unique feature in *GeForce 256*) and a 350MHz RAMDAC offering resolutions and color depths up to 2048 x 1536 @ 75MHz.

**S3 & Diamond Multimedia Merger Completed**—Stockholders of both Diamond Multimedia and S3 Inc. have finally approved the merger of the two companies. Shareholders of Diamond Multimedia will receive .52 of a share of S3 stock for each share of Diamond Multimedia stock held as part of the merger agreement. With the merger behind them, S3 announced that it plans to reorganize in four business units: Communications, Multimedia (includes graphics, audio and mobile graphics technology) Professional Graphics (Corporate, Workstation graphics) and RioPort.

**S3 & Nintendo Partner for Dolphin**—Nintendo and S3 Incorporated announced a partnership to employ S3's texture compression technology on Nintendo's next home video game console system, code-named 'Dolphin.' *Dolphin* will be the first home video game console system to embed S3's texture compression technology (S3TC) right onto the graphics chip. S3 claims that the end result of this will be the 'Realtek Ex. 1015' blockiness and monotonous repetition of the same elements on screen. ■

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