

## As Seen in DV Magazine

February 2002  
www.dv.com



By John Jackman

## The Real Meaning of Real

---

### DVRaptor-RT

Canopus, \$599

DV Score: 4

**Pros:** Least expensive "realtime" DV card. Excellent integration with Premiere. Best basic tools.

**Cons:** Must render for 1394 output. No realtime 3D transitions.

**Bottom Line** A great option for those users who want to preview their effects in realtime, or who need to output to analog in realtime. Best option of this group for those who do greenscreen work or need very good color-correction. Lacks realtime 3D transitions.

---

### RT2500

Matrox, \$899

DV Score: 3

**Pros:** Huge assortment of keyframable 2D and 3D transitions. Native MPEG-2 support. Nice upgrades available. Multicam editing and After Effects preview.

**Cons:** Must render for 1394 output. Installation can be difficult. Sluggish and unresponsive with Premiere. No realtime color-correction.

**Bottom Line** Lots of eye candy. Realtime engine isn't as powerful as Pro-One's. A strong contender with unique upgrades available.

---

### Pro-One

Pinnacle Systems, \$1299

DV Score: 3.5

**Pros:** Zillions of keyframable 2D and 3D transitions that can be combined. Strong realtime playback engine. Advanced keyframer.

**Cons:** Must render for 1394 output. Sluggish and unresponsive with Premiere. Very basic color-correction. Limited transparency options.

**Bottom Line** Strong realtime playback engine. Effects can be combined, but it has limited transparency options. More effects than any real person needs.

---

What is realtime, anyway? "Unmatched Realtime Capabilities!" "Realtime Where It Counts!" "Creativity in REAL Realtime!" With all of the slogans, you'd think that waiting for a render would be an obsolete concept in the under-\$1500 DV editing market. Well, it's not.

The true category for the group of cards that includes the Canopus DVRaptor -RT ([www.justedit.com](http://www.justedit.com)), Matrox RT2500 ([www.matrox.com/video](http://www.matrox.com/video)), and Pinnacle Systems Pro-One ([www.pinnaclesys.com](http://www.pinnaclesys.com)) is "Realtime Preview." We mean preview in the literal sense-you can see your edits at full resolution before you output them-not in the sense of a low-resolution proxy.

For Mac-based editors, the [Matrox RTMac \(Nov. '01 DV\)](#) also fits in this group. None of these boards are realtime in the traditional sense; that is, like a full, dual-stream system such as an Accom Affinity, Avid Media Composer, DPS Velocity, Matrox DigiSuite, or Pinnacle Systems Targa 3000.

Yes, this new group of DV boards will display certain effects and transitions in realtime to the analog outputs, but everything must be rendered for 1394 output to DV tape. Because just about everyone I know who does DV-based production shoots in DV and outputs back to DV, what these boards provide amounts to a realtime preview. Newspeak

The way manufacturers are using industry-standard terms has caused a lot of confusion among users, forcing us to distinguish between realtime preview and realtime output. How can a purchaser cut through the hype? That's what we're here for.

There are very few people who shoot in DV and then master to Betacam SP or other analog formats. Most of them will have higher-end systems and most will want full component I/O instead of these boards' S-Video. And if there's anyone out there shooting in DV and then mastering to S-VHS or Hi8, well, they ought to have their heads examined. And not the heads on the video deck, either.

This isn't to say that realtime preview doesn't have any merit. If you don't have to wait to render each and every cross-dissolve during editing, you can save a lot of time. If for some reason you're only outputting to analog tape, then you won't have to wait for that either.

The question of whether the price of a board is worth the time you save has an answer that depends on each studio's time-versus-money ratio. For many editors, purchasing a board like these will be a no-brainer; for some, it will be a head-scratcher. Many editors, especially those with a client looking over their shoulders, will need the affordable realtime preview this product group provides.

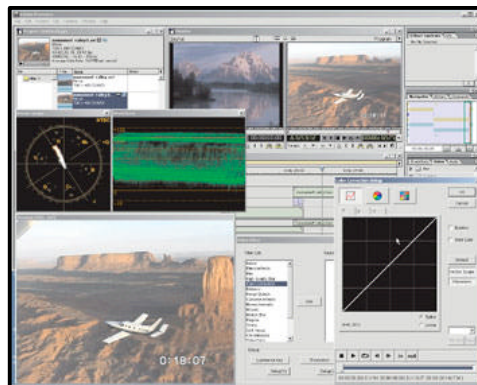
## Canopus: DVRaptor-RT

With the DVRaptor-RT card, Canopus ups the ante in the realtime preview DV editing card market. The DVRaptor-RT operates under Windows 98SE, Me, and 2000. There are no Windows NT 4 drivers available at this time. The DVRaptor-RT comes with Adobe Premiere 6.0, Canopus's Xplode Basics, SoftMPG Encoder, and Sonic DVDit authoring software. Canopus recommends a PIII 700MHz CPU or better as a minimum configuration. I tested the card in a 1.2MHz AMD Athlon machine with a Gigabyte GA-7 motherboard with Via chipset.

The price of the DVRaptor-RT is significantly lower than the competing cards for roughly comparable performance, although its system requirements are slightly more demanding.

In a head-to-head comparison, the DVRaptor-RT offers stronger performance on some fronts than the ProOne or RT2500, but the Matrox and Pinnacle Systems products come with a wider variety of out-of-the box realtime transitions and effects.

But let's take a look at the effects that come with DVRaptor-RT because this is what determines the usefulness of a card for a particular user. In the Premiere Transitions list, only four basic transitions are listed under Canopus: Chromakey, Luminance Key, Picture in Picture, and Canopus Transition. The all-purpose Canopus Transition plug-in contains a list of 13 selectable transition effects that are roughly analogous to the basic transition set: dissolves, wipes, slides. Picture in Picture offers the basic news over-the shoulder effect, with edge, shadow, and size controls-all of which are keyframable. The luma keyer is quite nice, very straightforward; but what really got me excited is the chroma keyer.



**The Canopus DVRaptor-RT is the only board in this Roundup to perform realtime color-correction, and it does so with clean keys and simple automatic controls.**

---

## Easy being green

I've done a number of greenscreen shows for broadcast-some of them shot in DV-and I have always had gripes about the poor software implementation of chroma key for this ubiquitous 4:1:1 format. Doing it well usually involves lots of tweaking and a good matte choker. Not that it's impossible-I've had discussions with at least one R&D director about how clean DV chroma keying could be

implemented. Well, Canopus has done it, cleanly upsampling the chroma and interpolating the information to create a smooth-edged matte with none of the stairstepping that usually plagues the format. Given halfway decent greenscreen footage, you just drop the transition in, click "Autofit," and you're 90 percent there. A tiny bit of tweaking and the results are clean, clean, clean. Nothing fancy like shadows; but hey, you can't have everything. Of course, this nifty keyer is also available with the Storm and RexRT packages as well.

The Premiere Filters list shows two Canopus filters-Title Motion and Video Filter. Title Motion adds a simple variety of basic slides and wipes, none of which are 3D, to a keyed title. The Video Filter contains 20 filters that can be used in combination. These are reminiscent of the basic Adobe filters, and some clearly are more useful than others (I don't recall the last time I used Pencil Sketch on live video). However, realtime Blur, Motion Blur, and Monochromatic can be useful. The handiest filter in my opinion is the Color Correction filter, which offers quite powerful image control-and operates in realtime. Multiple versions of the Color Correction filter can be stacked on a clip for sophisticated control. I was also pleased to see a true SMPTE color bar generator, although Adobe has now fixed the color bars in the host program, so it's a bit superfluous. But the bars do play back in realtime.

The proprietary Canopus titler is pretty flexible. I don't like the interface as much as some folks do, but then I gripe about all of them. The titler provides the basic controls and features of the Title Deko and Inscribe plug-ins included with the Pro-One and the RT2500.

There are no realtime 3D transitions in the DVRaptor-RT. The bundled Canopus Xplode Basics includes a huge variety of software transitions, but none will play without rendering. If realtime preview of page turns and flipping cubes are what you live and breathe, the DVRaptor-RT is probably not the best card for you. Bear in mind, however, that with all of these cards, a render is coming no matter what the preview does if you're outputting to DV tape.

The audio filters in Premiere mostly work in realtime anyway, but Canopus adds a Canopus Audio Filter that includes seven effects, all of which are improvements over the basic Adobe equivalents. The Graphic EQ is 11 band instead of seven band as in the Adobe filter, and it includes a graphic curve display. The Parametric EQ can be controlled directly from a nifty graphic curve, much like the Photoshop Curves control. Other effects include Delay (reverb), Pan Pot and Balance, Hi- and Low-Pass, and Tone Controller. The Adobe Audio Mixer is fully implemented.

By the way, it's always a good idea to check the compatibility list for motherboards whenever installing any video editing card. If you're building a system from scratch, use a motherboard that's known to be compatible. I first tested the DVRaptor-RT in an Intergraph TDZ dual-processor machine with a Micronics Helios 440BX motherboard, and I could not get it to operate at all. My own limited and unscientific survey of early DVRaptor-RT owners shows relatively few compatibility problems. But they do happen. No manufacturer could ever test its hardware with every board on the market.

There is an upgrade program for current DVRaptor and EZDV owners. The cost of the upgrade is \$399 for DVRaptor owners, or \$449 for EZDV owners. Adobe Premiere 6.0 (full version) owners can also purchase a DVRaptor-RT for \$399.

One of the hallmarks of the Canopus line has been tight and well-engineered integration with Premiere. That's certainly the case here. There are none of the rough edges that I've seen with some other DV cards. Pro-One and RT2500 both felt sluggish and clunky while I was working in the Premiere timeline, but the DVRaptor-RT felt snappy and responsive when I was scrubbing or trimming.

## **Matrox: RT2500**

The Matrox RT2500 is an upgrade of RT2000 that I reviewed earlier ([June '00 DV](#)). The main change in hardware is that the RT2500 is a single card that works in conjunction with your graphics card, whereas the RT2000 has a graphics adapter included with the video card. Software has also improved since the last time I used this product.

Matrox provides a big bundle with the RT2500. Software includes Adobe Premiere 6.0; Inscribe TitleExpress; Ligos LSX MPEG encoder; Matrox Media Tools for logging and capture (and one-pass tape scanning for editors who load all of their footage at once); Cleaner 5 EZ; and Sonic Foundry Acid Music. The inclusion of a decent titler that works in realtime addresses one of my complaints about the original RT2000 package.

The RT2500 runs on Windows 98SE, Me, XP, or 2000. A crucial stop is at [www.matrox.com/videoweb/support/rt2500/rec/rec.htm](http://www.matrox.com/videoweb/support/rt2500/rec/rec.htm), where you'll find links to the strict requirements for minimum system, validated computer systems and motherboards, compatible 1394 devices, storage recommendations, and RT2500-tested AGP display cards. Some Matroxvalidated RT2500 turnkey systems are also listed.

To give the card a fair test, we had three DV reviewers run through a complete installation. Bruce A. Johnson's experience was illuminating. He built a system with a Matrox-validated MSI 694D Pro motherboard with PIII 1GHz processor, 256MB of memory, and an nVidia GeForce2 graphics card-all of which are on Matrox's list of approved gear. Here is what Johnson wrote:

To Matrox's credit, the installation section of the manual is exacting and exhaustive. But even with specific directions, the process took some unwelcome turns. Early on, I discovered the latest BIOS and software drivers were essential to even get the card installed, and this isn't listed as one of the requirements. To make a long story short, I've built well over a dozen video editing computers, using cards from Canopus and Pinnacle Systems, and although it hasn't all been roses, I've never encountered the trouble I had installing the RT2500. The tech support people at Matrox were great, patient, and usually right on the nose with their advice, but getting the system to a point where I could start to review its functionality took three reinstalls of the Matrox software and multiple updates of the BIOS, the Via 4-in-1 drivers, and the video card drivers. A complete reinstall of Windows 2000 was required after the Windows taskbar

inexplicably disappeared in the middle of an editing session. It's hard to imagine a normal purchaser going to the lengths I did just to get the RT2500 running.

Technical Editor Kimberly Reed had fewer troubles, but she found the installation comparatively time-consuming. My installation went smoothly on an HP x2000 workstation, but I wasn't able to iron out intermittent problems with 1394 capture.

Device control worked fine, but sometimes I would lose the VGA overlay (no picture!) and couldn't get it back without a reboot. Matrox tech support is excellent, but more work on the installation routine and driver compatibility would make installation much more efficient. We all would recommend that less-experienced PC builders buy a prebuilt turnkey system from an integrator.



**The Matrox RT2500 ships with more than 1000 realtime effects, many of them 3D, that work via Adobe Premiere.**

---

## The big setup

Once the RT2500 is set up and stable, it's impressive. There have been many improvements to the software since my RT2000 review—the main improvement is that effects are now keyframable. The Colorization filter has been improved, although it still falls short of real color-correction, and a decent titler is included.

If you dig 3D transitions, you'll have a ball. Matrox says that over 1000 prebuilt transitions are included, and I didn't try to count them. Many filters are designed for a motion graphics look—pushes, zooms, and spins.

However, just as with the Pinnacle Systems Pro-One, I didn't think that many of them were useful, although I was impressed with the ingenuity and inventiveness that went into the eye candy. I guess if I did local car dealer ads for a living, I would be more impressed.

But even when I tried to imagine myself as a transition-demented wedding videographer, I couldn't see how I might use most of these effects in actual practice. I couldn't help feeling that the same amount of programming effort would have been more profitably spent creating more sophisticated tools and smoothing out compatibility issues.

The RT2500 can run two video streams and a transition with a title overlay in realtime. That means that you can't have a video filter (such as Colorization) that also runs through a transition without rendering. You can apply a filter to the superimposed title track, but you can't apply two filters to a track without rendering.

If you use more filters than transitions, this hardware is more limited than either the Pinnacles Systems Pro-One or the Canopus DVRaptor-RT in a practical sense. However, you can use multiple Targa files in the overlay track (unlike with the Pro-One) and you can play back graphics using the Premiere alpha transparency in realtime, making this a good choice for editors who use more titles than filters.

There is, however, no realtime greenscreen filter and no true color-correction filter. Although the RT2500 offers basic hue, color level, and brightness proc amp controls during capture, these don't all apply as a filter to a clip that has already been captured. The Matrox proc amp, however, allows the user to add 7.5 IRE setup to analog output, an option not available on the other two boards in this Roundup.

The downside with all of these boards, as I mentioned before, is the lack of realtime DV output. Matrox Video Tools version 3.1 includes an accelerated DV rendering engine called TurboDV that speeds up rendering slightly on faster machines.

There is also a \$99 additional cost Pro Pack that provides WYSIWYG output from Adobe After Effects and additional keyframe options and a batch Web encoder. **United Media (the company that makes Online Express editing software; [www.unitedmediainc.com](http://www.unitedmediainc.com)) has a Multicam plug-in that works with the RT2500 for virtual switching among up to four synced camera sources. These extras may be important decision making points for some buyers.**

## Pinnacle Systems: Pro-One

I tested the Pro-One in a plain vanilla 1.2GHz AMD Athlon machine. It had a Via chipset that was identical to the one in the machine I used for the DV/Raptor-RT. Installation was straightforward, but as with the RT2500, required many full reboots. There were no conflicts with existing hardware.

The package includes Adobe Premiere 6.0, Pinnacle Systems Hollywood FX-RT, TitleDeko RT, and Pinnacle Systems Impression DVD-SE for DVD authoring. At the time of this review, Pro-One worked only under Windows 98SE or the now-buried Windows Me. No Windows 2000 drivers are available, which may be a decision making factor for some people.

I have to admit that Hollywood FX-RT is pretty impressive. It comes with a truckload of prebuilt 3D transitions, and all of them are editable and keyframable. You can flip, fly, warp, and skewer video and graphics just about any way you can imagine, and they do indeed play back in realtime. The Hollywood FX-RT keyframer is more complex than Matrox's, and offers a lot of control with a some what steeper learning curve. At first it's a kick to play with, but as with the other cards, I quickly began to question how many of these variations were truly useful in the real world. The "optional" feature list has gotten longer than anyone really needs!



**The Pinnacle Systems Pro-One provides more 2D and 3D effects than you could ever use.**

---

## Back to the basics

So how about the basics? Basic production work includes cuts, dissolves, color-correction, and titling. Fortunately, one of my biggest gripes about a lot of products-lack of decent titling-has been fixed. Most products now include a quality titling program that provides basic functionality, even if the bells and whistles of the full pro versions are missing. The Pro-One includes the excellent and venerable TitleDeko, which is probably one of the best titlers on the market. So titles are dandy. You can use the Premiere titler in realtime, but why would you want to if you have TitleDeko? You can also superimpose a 32-bit Targa image with transparency, but it's a strange deal-you can only use one of these in a timeline. I don't mean one at a time, I mean one per project. There are no other realtime transparency options, such as a greenscreen filter. So if TitleDeko fills all of your superimposition needs, you'll be happy. If not, you may be posting complaints to your favorite video mail list.

Pro-One color-correction still leaves a lot to be desired. Unlike the RT2500, which only offers proc amp controls on capture and a simplistic colorization filter, the Pro-One has a color-correction tool. It is quite simple and adjusts only hue, saturation, and brightness. There is no gamma curve control, no knee, and no independent control of color channels. In short, you can't do much more correction with it than you can twiddling the knobs on your TV set. I'd love to see one of these manufacturers support a more sophisticated image processing plug-in such as ViXen or Synthetic Aperture Video Finesse so you could really do some serious color-correction. Maybe the target market doesn't feel the same as I do, but everyone should be interested in color-correction, and the realtime correction previews would greatly expand the usefulness of these products.

Pro-One's realtime playback hardware is more powerful than the Matrox RT2500's. You can run two video streams with a title overlay, a 3D transition, and still apply a filter to both video streams. So it is possible to color-correct or otherwise filter both video streams passing through a transition and still play back in realtime. You can also run two video clips in slow-mo simultaneously. Just as we were going to press, Canopus announced the release of realtime 3D transition plug-ins for its line of RT products. The software includes five keyframable transition groups: Page Peel, Fly Away, Single Door, Double Door, and Sphere. These will output to DV in realtime on the Storm and RexRT, but of course must still render on the RaptorRT. We were not able to test these as a part of the Roundup; but they help level the playing field a bit.

## **Making a decision**

A purchase decision among these three cards really boils down to your needs and uses. If you do any greenscreen work, the decision is simple: DVRaptor-RT is your only choice. If you need subtle color-correction on a regular basis, DVRaptor-RT is the best bet. It's also the cheapest, by almost half. But if you never do greenscreen work and color-correction isn't a consideration, then you should weigh other factors.

The RT2500 runs under the more stable Windows 2000, while Pro-One only works under Windows 98SE and Me. I'd say that Pro-One wins hands-down for playback power and flexibility of 3D transitions. It's also a bit easier to install and configure according to our experience. However, the RT2500 can edit MPEG-2 natively and it has some options (Multicam and After Effects preview) that aren't available on the Pro-One.

## **Feedback loop**

The Pinnacle Systems DV500 (predecessor of the Pro-One) and Matrox RT2000 (predecessor of the RT2500) are well over a year old now. Both created much confusion about realtime output-or the lack thereof. Requests for low-cost realtime DV output apparently fell on deaf ears. In my opinion, these companies should have listened to the feedback and strapped an extra codec chip onto their cards to enable the realtime output that people were asking for back then-or perhaps at least offered this as an extra-cost option. That would have truly justified the Pro upgrade for Pinnacle Systems and added the extra 500 points for Matrox. And frankly, the company that actually has a "real" realtime card in this price category (the \$1000 Canopus StormSE, which outputs DV over 1394 in realtime) muddies the water by promoting the \$599 DVRaptor-RT as a realtime product when it isn't quite realtime.

I think that this product group of realtime preview DV editing cards represents a poor compromise: marketing flash wins over substance. Having a bazillion 3D transitions (only 10 percent of which will ever be useful) that all play back in realtime but require rendering for output seems really unsatisfying. Yes, it's handy and helpful to preview full-quality effects in realtime. But with all of these cards, there's a render coming, and it's gonna be just as long as the render on those under-\$100 OHCI 1394 cards. The emphasis is on the wrong part of the equation.

*The Rev. John Jackman is vice president of Comenius Communication, an independent television production company based in North Carolina. You can reach him online at [john@dv.com](mailto:john@dv.com) or in the *Craft of Lighting* forum on DV.com.*