

# DVD Burners: Spinning as Fast as They Can

BY DON LABRIOLA

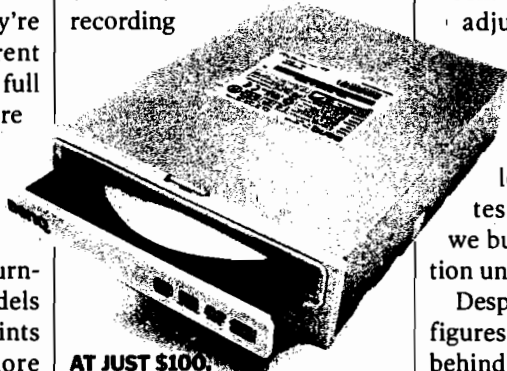
The advent of 16X DVD+R recording could have been a non-event. Because 16X drives reach their highest speed only at the outermost edge of a disc, they're not much faster than current 12X models and can burn a full disc only a few minutes more quickly than the best 8X units. But that doesn't mean that there aren't compelling reasons to upgrade to a 16X DVD+R burner. Many of these new models have additional selling points beyond speed, such as more reliable (and faster) dual-layer recording and the ability to burn 8X-certified DVD-R media at 12X or 16X (which means you don't necessarily have to pay extra for the higher-rated discs).

The four 16X models we received for this story were all early production units, most of which were still being tweaked as we began testing. We were pleased to see that all had resolved most of the compatibility problems we encountered when recording dual-layer media in our recent DVD+R DL roundup ("Double-Stuff DVDs," September 7, 2004). That said, when burning at the highest speeds, we found that the quality of our output often depended on the brand of media we used. (As always, our benchmark tests were conducted with Verbatim media.)

The good news is that DVD manufacturers are already aggressively addressing these issues with rapid-fire firmware upgrades. So by the time you read this, these drives will probably be able to burn most brands of high-speed media reliably—and a few may have even added a new recording mode or two. So be sure to check vendor Web sites for spec changes before you make a purchasing decision.

## BenQ DW1620

The BenQ DW1620 is an improvement on the company's earlier offerings, with enhancements such as dual-format (DVD±R) 16X recording



**AT JUST \$100,** the BenQ DW1620 is a treat for bargain hunters.

and the ability to burn DVD-R and DVD-RW media. It's a competitive product, and we recommend it to anyone looking for functionality and performance at a reasonable price.

One of the BenQ drive's strengths is its blazing DVD-ripping speed. Our test unit took a mere 5:38 to rip an entire 4.37GB single-layer DVD-Video disc to our hard drive, easily the best performance we've seen lately from a rewriter. The drive also ranked first when packet-writing 2GB of data to DVD+RW media. But the DW1620 took longer than the other drives we tested to burn a dual-layer DVD+R DL disc at 2.4X, and its 16X DVD+R and DVD-R single-layer recording times were closer to the best 8X results we've measured than to those you'd expect from a 16X drive.

The DW1620 ships with a cornucopia of software, including InterVideo's WinDVD Creator authoring system and WinDVD movie player, Sonic Solutions' RecordNow! disc-burning suite, and BenQ's QVideo 2.0 video capture program. Rounding out the package is the BenQ Book-Type Management utility, which helps make RW media more

compatible with older players.

The drive also incorporates BenQ's error-reducing Write Right technologies, which include a disc auto-centering mechanism and the ability to adjust laser angle and intensity continuously to compensate for media defects. Except for one Video CD that locked up one of our test players, all the discs we burned with our evaluation unit worked perfectly.

Despite several performance figures that are a few minutes behind the state of the art, we believe that the drive's many other strengths make it a fine choice at the price.

## Ben Q DW1620

\$100 street. BenQ America Corp., [www.BenQ.com](http://www.BenQ.com). ●●●●○

## Lite-On SOHW-1633S

Although the Lite-On SOHW-1633S is one of the few 16X rewriters to come in below the \$100 price barrier, the company doesn't appear to



**THE LITE-ON SOHW-1633S** is the best 16X burner on the market, but it's priced right.

have cut too many essential corners to get there. True, the device doesn't offer 16X DVD-R or 4X DVD+R DL recording speeds. But it stands up to the competition in most other ways and even managed to earn first place on our DVD+R and CD-R burning tests.

Lack of 16X DVD-R support resulted in relatively slow -R recording, but the SOHW-1633S

burned a 4.37GB disc image, 16X DVD+R media in 6:03, the fastest single-layer DVD recording time we've ever measured. The SOHW-1633S inched ahead to a first-place finish on our Burn 30-Minute VCD test, but it produced mixed results in other areas tested: It yielded one of the slowest DVD-RW times we measured (7:37) and one of the fastest DVD+RW times (6:57).

Our test unit exhibited scattered compatibility problems. Its 16X DVD+R recordings locked up the TEAC DW-224E-A DVD-ROM drive in our HP Pavilion zt3000 notebook; our hoary Pioneer DVR-A05 rewriter could not play its dual-layer output; and one of our set-top boxes would not display menus on the Video CDs it produced.

The SOHW-1633S's bundled version of Ahead Software's Nero digital-media includes the core Nero Express 6, NeroVision Express 2, BackIt-Up, InCD 4, and Nero Media-Player components. But the Lite-On drive lacks other important modules, such as Nero Recode 2, which lets users copy and edit DVD-Video discs and encode content in Ahead's MPEG-4-based Nero Digital format. (Ahead includes some of this functionality in the bundled version of Nero Express.)

Despite these caveats, we feel comfortable recommending the SOHW-1633S to buyers for whom price is important. The industry as a whole is quickly solving its 16X and DL compatibility problems, and the drive's outstanding performance on some of our most important benchmark tests outweighs its less impressive results elsewhere.

## Lite-On SOHW-1633S

\$99 list. Lite-On IT Corp., [www.liteonamericas.com](http://www.liteonamericas.com). ●●●●○

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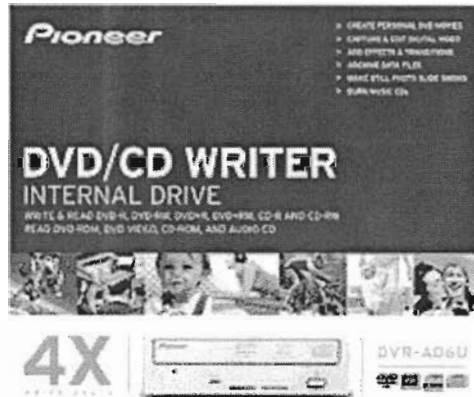
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Writes: DVD-R, DVD-RW, DVD+R, DVD+RW, CD-R, CD-RW

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- DVD+R 4X, DVD+RW 2.4X
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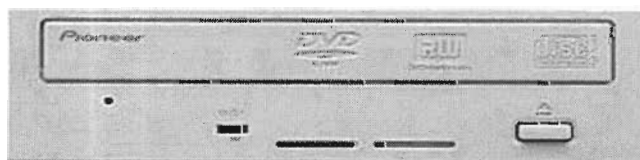
Supports "Buffer Under Run" protection

Disc-at once and incremental write

Re-Recordable

Ultra DRA (Dynamic Resonance Absorber)

\*Requires certified 4X or 2X media



## DVR-A06 Specifications

Write Support DVD	DVD-R 4.7GB*1, DVD-RW, DVD+R, DVD+RW	
CD	CD-R 700(type 80), 650MB(type 74), CD-RW, High-speed CD-RW	
Read Support DVD	DVD-ROM, DVD-VIDEO (Single & Dual layer), DVD-R, DVD-RW, DVD+R, DVD+RW	
CD	CD-ROM(Mode1&2), CD-ROM XA, CD-DA (CD Audio), Video CD,  PhotoCD (single/multi-session), CD EXTRA (CD-Plus), CD-Text, CD-R, CD-RW	
Write Speed	DVD-R	4x*2, 2x*3, 1x CLV (5.54MB/s)
	DVD--RW	2x*4, 1x CLV (2.77MB/s)
	DVD+R	4x*5, 2.4x CLV (5.54MB/s)
	DVD+RW	2.4x CLV (3.32MB/s)
	CD-R	16x, 12x, 8x, 4x CLV (2.4MB/s)
	CD-RW	10x*5, 4x CLV (1.5MB/s)
Read Speed	DVD-ROM (single)	Max 12x CAV (16.62MB/s)
	DVD-ROM (dual)	Max 8x CAV (11.08MB/s)
	DVD-R, DVD-RW	Max 6x CAV (8.31MB/s)
	DVD+R, DVD+RW	Max 6x CAV (8.31MB/s)

	CD-ROM	Max 32x CAV (4.8MB/s)
	CD-R, CD-RW	Max 32x CAV (4.8MB/s)
Access Time	DVD-ROM	140 msec
(Random Average)	CD -ROM	130 msec
Mounting Orientation	Horizontal and Vertical	
Interface	ATAPI (PIO Mode4)/Multi Word DMA Mode2) Ultra DMA33(Ultra DMA Mode2)	
Data Buffer (size)	2 MBytes	
Dimensions (W x H x D)	148mm x 42.3mm x 198mm 5-13/16"x1-11/16"x7-13/16"	

\*Please refer to the specification sheet for important related information.

For more information and pricing please contact our sales staff.

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## PINNACLE STUDIO DELUXE 8

Pinnacle Studio Deluxe delivers everything you need to make fantastic Digital movies on your PC, all in one easy to use package. From Analog or Digital video capture and editing all the way through to burning a disc to play on your set top DVD player, Pinnacle Studio Deluxe makes it easy to make great movies at home.

### KEY FEATURES

#### Advanced Video Editing

- Capture and edit footage from your DV, Digital8 or MicroMV digital camcorder
- • Capture and edit footage from your 8mm, VHS, SVHS, VHS-C, or SVHS-C analog camcorder
- Capture and edit DVD quality MPEG video from your DV or Digital8 camcorder
- Import and edit MPEG-1 and MPEG-2 files
- Easy drag-and-drop editing lets you assemble your masterpiece
- Advanced timeline features for frame-by-frame editing
- Preview window shows your edits immediately

#### Transitions and Effects

- More than 200 scene transitions with the included Hollywood FX Plus for Studio software.
- Professional title effects with Pinnacle TitleDeko, including drop shadows and neon glows
- Fast/slow motion effects
- Special video effects and image correction

#### Audio

- Import background music as MP3 files or rip directly from an audio CD
- Record your own voice-over narration
- Create custom musical soundtracks precisely matched to the duration of your movie

#### Advanced Video Publishing

- Share your movies on video tape, DVD, CD, and the Internet
- Burn a disc that you can play on your living room DVD player
- Hollywood-style DVDs, Video CDs, and S-Video CDs with
  - Videos and photo slideshows
  - Motion menu backgrounds and buttons
  - Automatic scene index menus
  - Menu background music
  - Linked/nested menus
- Intelligent Rendering feature renders only the effect, saving you time and disk space
- Stream your video in RealVideo8 or Windows Streaming Media formats
- Publish for PC playback or email in MPEG-1, MPEG-2, or AVI format

#### Minimum system requirements:

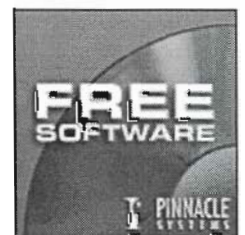
- Intel Pentium or AMD Athlon 800 MHz or higher (1.5 GHz recommended)
- 1 x Free PCI slot
- 128 MB of RAM (256 MB recommended)

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- Windows 98 SE, Millennium, 2000 or XP (Windows XP recommended)
- DirectX-compatible graphics card (ATI Radeon 9700 or Nvidia Geforce 3 or higher recommended)
- DirectX-compatible sound card
- Mouse, CD-ROM drive, Speakers
- 4 GB of disk space for every 20 minutes of video captured at "Best" quality (dedicated hard drive recommended)
- Optional: CD or DVD burner for creating VCD, SVCD or DVDs



## SOFTWARE SPECIFICATIONS

### Input formats:

- Capture from analog camcorders or VCRs (NTSC only)
- Capture from DV camcorders

### Output formats:

- Output to analog videotape (NTSC only)
- Output in DV format to DV camcorder.
- Video CD (VCD) or Super Video CD (SVCD) with optional CD burner
- DVD with optional DVD burner
- MPEG1 & MPEG2
- AVI
- RealVideo
- Windows Media Format

### Import

- Video: MPEG-1, MPEG-2, AVI
- Audio: WAV, MP3
- Graphic: BMP, JPG, PCT, TGA, TIF, WMF

## HARDWARE SPECIFICATIONS

- Plug and Play 32 bit PCI board with bus mastering interface
- Video inputs: 1 composite, 1 S-Video, 1 DV port for both input & output
- Video outputs: 1 composite and 1 S-Video
- Audio input RCA audio Left/right
- Audio output RCA audio Left/right

### Video Capture and Output

- Video format: NTSC
- Frame Rate: Up to 30 frames per second / 60 fields per second
- Frame Size: Up to 720 x 480
- Compression: MPEG2, DV, MJPEG (user-selectable. Available formats depend on CPU speed)

Buy Studio Deluxe  
Price: \$ 199.99





LINUX

How to burn a DVD-Video under Linux with mkisofs and dvdrecord

Prerequisites:

Prerequisite is that you have a valid VIDEO\_TS/AUDIO\_TS structure with valid VOB,BUP and IFO files. If any of those files are not up to the spec of the DVD-Video specification the burned video will not play in a stand alone player. This document is not how to rip a DVD or author a DVD it's about the image and burning part of the DVD-Video making. To see how you can create a DVD-Video backup that you can burn following this document see [dvdbackup](#).

The VIDEO\_TS/AUDIO\_TS can look something like this if you do a ls -lR in the top directory.

```

.:
total 16
drwxr-xr-x    4 root    root    4096 Jan 22 18:45 .
dr-xr-xr-x    4 root    root    4096 Jan 22 19:08 ..
dr-x-----   2 root    root    4096 Jan 22 16:34 AUDIO_TS
dr-x-----   2 root    root    4096 Jan 22 18:58 VIDEO_TS

./AUDIO_TS:
total 8
dr-x-----   2 root    root    4096 Jan 22 16:34 .
dr-x-----   4 root    root    4096 Jan 22 18:45 ..

./VIDEO_TS:
total 4051408
dr-x-----   2 root    root    4096 Jan 22 18:58 .
dr-x-----   4 root    root    4096 Jan 22 18:45 ..
-r-----    1 root    root    12288 Jan 22 16:47 VIDEO_TS.BUP
-r-----    1 root    root   159744 Jan 22 16:34 VIDEO_TS.VOB
-r-----    1 root    root    71680 Jan 22 16:47 VTS_01_0.BUP
-r-----    1 root    root    71680 Jan 22 16:47 VTS_01_0.IFO
-r-----    1 root    root   159744 Jan 22 16:34 VTS_01_0.VOB
-r-----    1 root    root  1073565696 Jan 22 16:47 VTS_01_1.VOB
-r-----    1 root    root  1073565696 Jan 22 16:47 VTS_01_2.VOB
-r-----    1 root    root  1073565696 Jan 22 16:47 VTS_01_3.VOB
-r-----    1 root    root  1073565696 Jan 22 16:47 VTS_01_4.VOB
-r-----    1 root    root  923359232 Jan 22 16:47 VTS_01_5.VOB
    
```

It's important that you have both the AUDIO\_TS and VIDEO\_TS directory even if shouldn't make a difference if the AUDIO\_TS one is missing. Some player simply refuse to play the disk if there is no AUDIO\_TS directory. You must have all file names in UPPER CASE, all files should have the 400 permission and directories should have 500 permission. I don't know how important the latter once are but it's always nice to be on the safe side.

DVD-Video physical layout:

In order to make a valid DVD-Video image the files in the image has to ordered in a specific physical order. It's important the the first file on the disk is the VIDEO\_TS.IFO file. The DVD player will seek the VIDEO\_TS.IFO and from it get the information on which sectors the other files start and end

The physical layout must follow the roules in the VIDEO\_TS.IFO, and the VTS\_XX\_0.IFO files. E.g if the VIDEO\_TS.IFO specifies that VTS\_01\_0.IFO starts at sector 345 (offset from VIDEO\_TS.IFO) it must do so. There are similar "rules" in all the IFO files.

It's also imperative that VTS\_XX\_1.VOB comes before VTS\_XX\_2.VOB sector wise. A stand alone DVD player doesn't have a clue about individual VOB files and plays them in one chunk starting at sector X and end at sector Y. (A good not over

technical guide is available at [www.pioneer.co.jp/crd1/tech/dvd/](http://www.pioneer.co.jp/crd1/tech/dvd/).

The file order is as follows in our case:

```
VIDEO_TS.IFO
VIDEO_TS.BUP
VTS_01_0.IFO
VTS_01_0.VOB
VTS_01_1.VOB
VTS_01_2.VOB
VTS_01_3.VOB
VTS_01_4.VOB
VTS_01_5.VOB
VTS_01_0.BUP
```

If your DVD-Video would contain more than one "vob" set it could look like this (In this case we had a VIDEO\_TS.VOB menu VOBS are optional hence you may not have a VTS\_XX\_0.VOB)

```
VIDEO_TS.IFO
VIDEO_TS.VOB
VIDEO_TS.BUP
VTS_01_0.IFO
VTS_01_0.VOB
VTS_01_1.VOB
VTS_01_2.VOB
VTS_01_3.VOB
VTS_01_4.VOB
VTS_01_0.BUP
VTS_02_0.IFO
VTS_02_0.VOB
VTS_02_1.VOB
VTS_02_2.VOB
VTS_02_3.VOB
VTS_02_4.VOB
VTS_02_0.BUP
```

Controlling the physical layout of the iso/udf image:

To be able to control the physical layout of the iso/udf DVD-Video image you will need the 1.11a27 alpha/beta of [mkisofs](#) it includes the latest patches that enables mkisofs to parse the IFO files and extract the information how to layout the DVD-Video file structure. Mkisofs - already has capability to sort the files so you don't need to do anything besides using the right switch :).

Making the image with mkisofs:

Now when we have made the sort file we are ready to burn the image. Let say that we have the top of our AUDIO\_TS/VIDEO\_TS structure under /DVD\_PROJECTS/HOMEDVD/ an example session of mkisofs would be like this.

```
$ cd /DVD_PROJECTS/HOMEDVD/
```

```
$ ls -R
```

```
.:
.  ..  AUDIO_TS  VIDEO_TS
```

```
./AUDIO_TS:
```

```
.  ..
```

```
./VIDEO_TS:
```

```
.  VIDEO_TS.BUP  VIDEO_TS.VOB  VTS_01_0.IFO  VTS_01_1.VOB  VTS_01_3.VOB
.. VIDEO_TS.IFO  VTS_01_0.BUP  VTS_01_0.VOB  VTS_01_2.VOB  VTS_01_4.VOB
```

```
#####
# Now we know that every thing is correct and we can make the image!
#####
```

```
$ cd /
```

```
$ mkisofs -dvd-video -o /DVD_PROJECTS/homedvd.img /DVD_PROJECTS/HOMEDVD/
```