

Panasonic ideas for life

DVD RECORDER **DIGA**: Sales Person Support Book

Panasonic ideas for life

DIGA



DVD RECORDER
DIGA
Sales Person Support Book

Panasonic
ideas for life

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PANASONIC DVD RECORDER

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DIGA

DVD
RAM



Ultimate Simple Solution

The recording media for the next generation is already here today. It's DVD-RAM — an advanced format that lets you enjoy the many applications of digital data, including moving pictures, still images, PC data and more. DVD-RAM makes it easy to handle data transfer over the Internet. DVD-RAM makes it easy to link mobile equipment. And DVD-RAM's applications will continue to expand as technology evolves. DVD-RAM offers a host of exciting benefits today, and it will offer even more tomorrow. Read on to learn more about the remarkable functions made possible by DVD-RAM.



DVD-RAM disc with cartridge



DVD-RAM disc



DVD-RAM disc for camcorders

The ultimate standard for recordable DVD

Attractive DVD-RAM Features

1 High-Speed Read & Write

DVD-RAM not only handles huge volumes of data, it also has the high-speed (22.16 Mbps) read/write capability that today's digital applications demand.

Actual Fastest
22.16 Mbps
No need for border in/out writing

2 Fast Random Access

DVD-RAM uses the ZCLV (Zoned Constant Linear Velocity) system*1 to achieve high-speed random access.

*1 In this system, a zone is a set of tracks.

Time Slip
Recording & Playback at the Same Time

Seamless Playback

3 Durable Storage Performance

DVD-RAM disc can be rewritten approximately 100,000 times. Plus, DVD-RAM has the exclusive ability to write large volumes of continuous data to non-continuous data space on the disc. This enables more efficient use of the data space.

100,000
times

4 Outstanding Reliability

To assure accurate data storage and retrieval, DVD-RAM incorporates an advanced defect management and error correction system.

Defect Management & Error Correction

5 Copyright Protection

DVD-RAM supports sophisticated copyright protection technology called CPRM (Content Protection for Recordable Media).

CPRM
Ready



Comparison of DVD-RAM/DVD-R/ DVD-RW/+R/+RW

	DVD-RAM	DVD-R	DVD-RW	+R	+RW
Capacity (Single Sided/Double Sided)	4.7GB/9.4GB	4.7GB/ —	4.7GB/ —	4.7GB/9.4GB	4.7GB/9.4GB
Data Transfer Rate (Basic spec.)	22.16Mbps	11.08Mbps*1	11.08Mbps*1	11.08Mbps*1	11.08Mbps*1
Recording System	Non Linear	Linear	Non Linear	Linear	Linear
Fast Random Access	64 address/32kB (Header address)	4 address/32kB (Distributed address)	2 address/32kB (Distributed address)	16 address/32kB (Distributed address)	16 address/32kB (Distributed address)
Rotation Speed	ZCLV*2	CLV*3	CLV*3	CLV*3	CLV*3
Writing Cycle	Approx. 100,000	1	Approx. 1,000	1	Approx. 1,000
Disc Cartridge	Available	No	No	No	No
Availability of DVD Video Camera	Yes	Yes	Yes	No	No
Availability of 8cm (approx. 3") Disc	Yes	Yes	Yes	No	No
Defect Management System	Yes	No	Available	No	No
AV-PC Compatibility (VR mode)	Yes	No	No	No	No
CPRM (Content Protection for Recordable Media)	Yes	No	Yes	No	No
Recording without border in/out writing	Yes	No	No	No	No

*1 Need to write border in/out every time when disc is ejected, even if writing a small-sized file.

*2 Zoned Constant Linear Velocity

*3 Constant Linear Velocity

(As of April, 2003)

The Panasonic DVD Recorder Concept

The advent of the DVD recorder is revolutionizing the way people record video. Rather than recording on VHS format tapes, more and more people are recording on DVD discs.

DVD recorders also match today's lifestyles better, because they work together with digital video cameras and digital still cameras, which have become very popular. Panasonic is creating new styles of A/V enjoyment by finding new ways to link different kinds of equipment. With our DVD recorders, Panasonic is opening the door to an exciting new DVD world that meets the needs of today's digital generation.

DIGA

DIGA = Digital + Giga

The name DIGA comes from the words "digital" and "giga". It describes the Panasonic concept of high quality and easy data handling made possible by digital processing and a large, gigabyte-level recording capacity.

••• Panasonic DVD Recorder Line-up

Record everything onto the hard disk, and store onto a DVD

DMR-E100H



- 160-Hour Extended Recording onto the Hard Disk (EP mode)
- High-Speed Recording from Hard Disk to DVD-RAM (Max. x12) or DVD-R(Max. x24)
- SD Moving (MPEG2/MPEG4) & Still Picture (JPEG) Storage/Playback
- Time Slip Functions
- DV Auto Recording & Creating Playlist Automatically



••• Panasonic DVD Recorder Line-up

Record onto a DVD



012

- Time Slip Functions
- JPEG/TIFF Photo data Storage/Viewer
- DV Auto Recording
- Quick View (x1.3)

013

- Time Slip Functions
- 12-Hour Recording
- Quick View (x1.3)



DIGA: Product Positioning

DMR-E100H



The E100H features a large-capacity hard disk drive (HDD), so you get a super-long recording time. It also has slots for both SD Memory Cards and PC cards, so it's easy to link with digital still and digital video cameras?

DMR-E60



The E60 makes it easy to enjoy DVD recording. The E60 has slots for both SD Memory Cards and PC cards, so it's easy to link with digital still and digital video cameras?

DMR-E50



The E50 is a basic model that gives you an easy, convenient way to explore the fun of DVD recording.

Turn Your Recording Life On

CONTENTS

Watch a TV program from the beginning, while the rest of the program continues to record.

Chasing Playback ----- ● 018 - 019

Play back one recorded program while recording another.

Simultaneous Rec. & Play ----- ● 020 - 021

Replay a scene again and again, while the program continues to record.

Time Slip ----- ● 024 - 025

Easy editing and playback.

Playlist Playback ----- ● 026 - 027

Instant recording, with no worry about recording over another program.

One-Touch Rec. & Play ----- ● 028 - 029

Instant playback of any scene you wish.

Direct Navigator ----- ● 030 - 031

Record moving pictures from a digital video camera.

DV Auto Recording (E60/E100H) ----- ● 032 - 033

DV Auto Recording automatically creates a playlist for you.

Auto Playlist (E60/E100H) ----- ● 034 - 035

Save and view images from a digital still camera.

JPEG Photo data Storage and Viewer (E60/E100H) ----- ● 036 - 037

Play back moving images from an SD Memory Card.

MPEG4 Data Storage/Viewer (E100H) ----- ● 038 - 039

Play back a recorded program at high speed, with natural-sounding voices and audio.

Quick View ----- ● 040 - 041

Hybrid variable bit rate (VBR) recording.

Extended DVD-R Recording with Superior Image Quality ----- ● 042 - 043

Play back DVD-Video discs, video CDs, music CDs, CD-R/RW discs and more.

Play a Variety of Discs ----- ● 044 - 045

Enjoy sound quality that's far superior to music CDs.

DVD-Audio Playback (E60/E100H) ----- ● 046 - 047

Record on the entire disc, with no wasted space.

Overwrite-Free Recording ----- ● 048 - 049

Provides the best image quality given the amount of disc space.

Flexible Recording Mode ----- ● 050 - 051

Chasing Playback

Watch a TV program from the beginning, while the rest of the program continues to record.

Before

“
What can I do?
It’s still
recording!
”



DIGA Style

“
I can watch right
from the beginning,
without interrupting the
recording.
”



with TAPE

If you want to watch the beginning of a program being recorded, you have to stop recording.

with DVD-RAM

You can watch the beginning of a program while the rest of the program continues recording.

*This function is also available using the hard disk.

Simultaneous Rec. & Play

Play back one recorded program
while recording another.

Before



DIGA Style



with TAPE

You can play back a program or you can record a program — but you can't do both at the same time.

with DVD-RAM

You can play back and record at the same time.

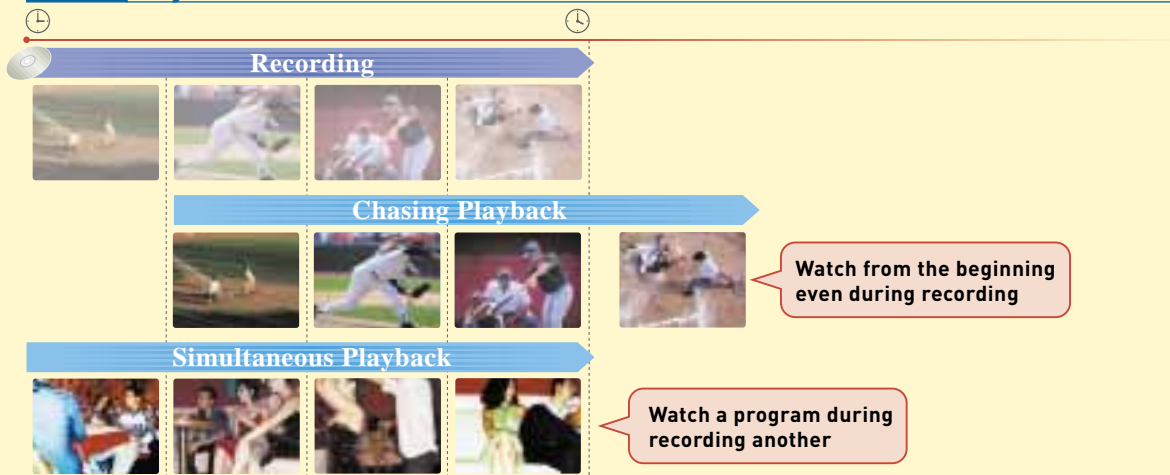
“Column”

You don't have to wait for it to finish recording!

Before



DIGA Style



Panasonic's Time Slip functions give you great new features like Chasing Playback and Simultaneous Rec. & Play. Here's how Chasing Playback works. Imagine that you come home in the middle of a program that's being recorded. With Chasing Playback, you can watch that program right from the beginning, while at the same time recording the rest of the program.

Here's how Simultaneous Rec. & Play works. Imagine that you recorded a program earlier in the day, but you didn't have time to watch it. Now you want to watch it — but there's another program you also want to watch. With Simultaneous Rec. & Play, you can watch the program recorded earlier, while recording the other program at the same time.

TIME SLIP Button

Replay a scene again and again, while continuing to record.

Before



“The most exciting part of the show is on — and then the telephone rings! What should I do?”

WITH TAPE

If you answer the telephone, you miss the best part of the show.

DIGA Style



“When I’m done talking on the phone, I pick up watching right where I left off.”

with DVD-RAM

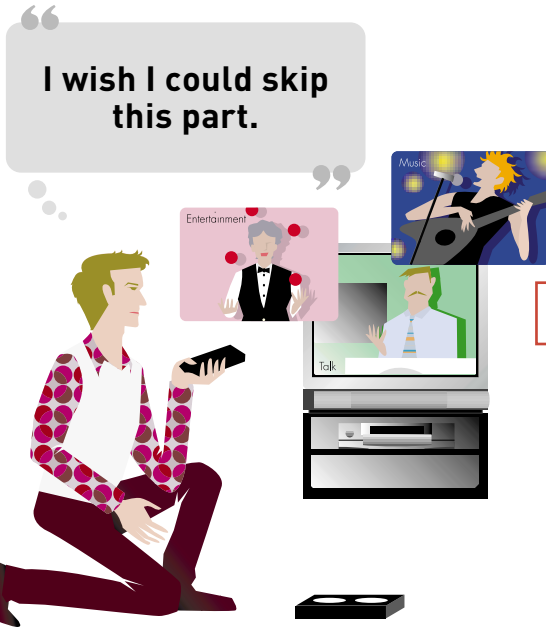
The Time Slip button lets you go back and watch any scene you want, as many times as you want. You never miss the best part of the show.

* This function is also available using the hard disk.

Playlist Playback

Use playlist to edit & play scenes in any order you want.

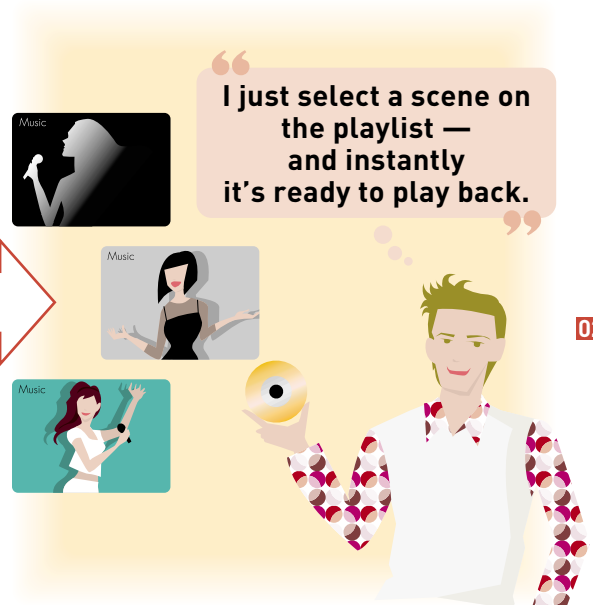
Before



WITH TAPE

You have to fast-forward past the parts you don't want to watch.

DIGA Style



WITH DVD-RAM

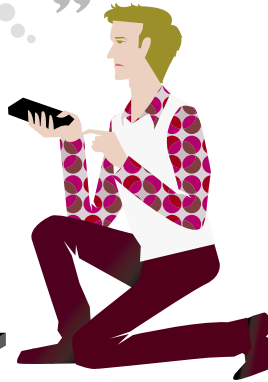
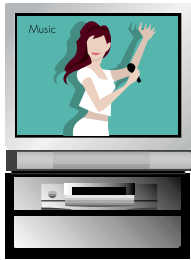
The playlist feature, you can select the scenes you want to see and play them in any order you wish. Playback is seamless, so the transition from one scene to another is smooth and natural.

One-Touch Rec. & Play

Instant recording, with no worry about recording over another program.

Before

“It takes too much time to find a blank section of tape.”



DIGA Style

“Just press the button! Don't need to find a blank section for recording.”



with TAPE

You have to keep using fast-forward and rewind until you finally find where the last recording ended.

with DVD-RAM

Just press the Record button. The DVD recorder automatically finds blank sections of disc, so you never have to worry about recording over something you recorded earlier.

Direct Navigator

You never have to fast-forward or rewind to find the beginning of a program or scene you want to watch.

Before

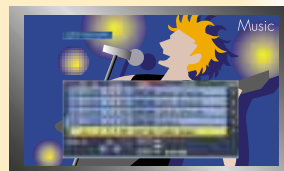


“Back and forth, back and forth — it takes me forever to find the beginning of a scene.”



DIGA Style

“To find a scene, I just point with the cursor and look at the thumbnail images.”



030

031



Finding the beginning of a scene or program can take a lot of time and trouble.



Press the DIRECT NAVIGATOR button to display a list of the programs and scenes on the disc. Then select the one you want and press ENTER. It's that easy.

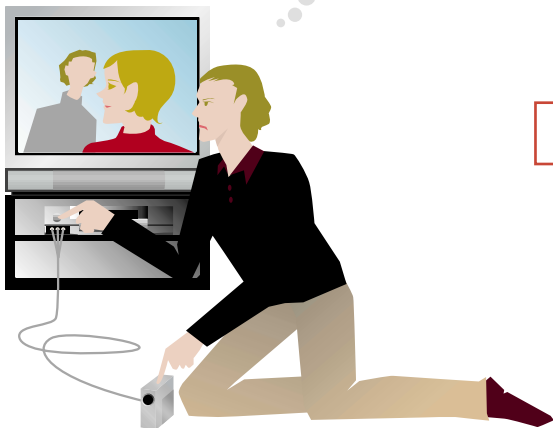
DV Auto Recording

(E60/E100H)

Using the DV input terminal connection, you can record moving images from a digital video camera by simply pressing a button.

Before

“I never thought it would be so hard to get these images recorded onto tape.”



DIGA Style

“It's as easy as 1-2-3: Connect the DV cable, select Auto Recording, and press the Rec button.”



with TAPE

There's no quick and easy way to dub images from a digital video camera, and the resulting picture quality is often lower.

with DVD-RAM

You can record digital video images using just the DVD recorder. And, you can record the images onto a DVD disc or the hard disk, preserving the full picture quality.

Auto Playlist

(E60/E100H)

DV Auto Recording automatically finds the start and end points of each scene, and creates a playlist.

Before

“
I'd like to edit some programs, but it's pretty hard to do.
”



DIGA Style

“
I let my recorder do all the work.
This is easy.
”



with TAPE

You need to read the manual to do digital video editing, and you need expensive equipment.

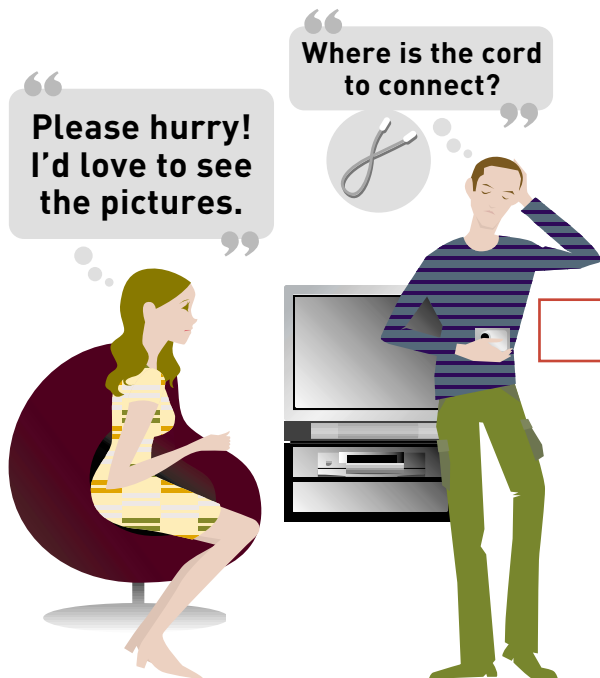
with DVD-RAM

The playlist makes it easy to select scenes, put them in a different order, and even shorten them if you wish.

JPEG Photo data Storage and Viewer (E60/E100H)

You can view and save pictures taken with a digital still camera. Just insert the SD Memory Card and you're ready to view.

Before



DIGA Style



In the past, if you wanted to display digital still images on your TV, you had to find the video cord and AC adapter, and connect the camera to the TV.

It's easy to view digital camera stills on your TV or save them to a DVD-RAM disc or the hard disk. Just slip the SD Memory Card containing the images into the recorder, and you're ready. You can view images stored on other kinds of memory cards, too, by using a PC Card Adapter.

MPEG4 Data Storage/ Viewer (E100H)

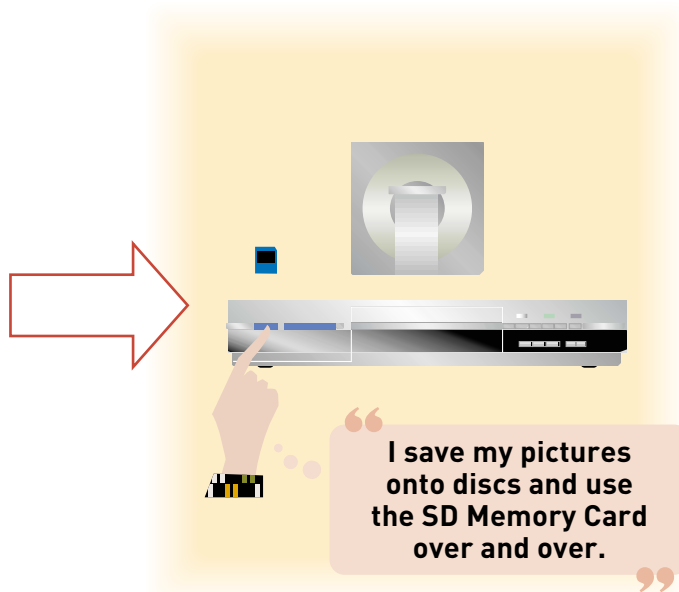
You can view or save moving or still images taken with the D-snap (Multi AV Device). You can also record a TV program onto an SD Memory Card.

Before

“
I took these great
moving images and
now I want to
save them...”



DIGA Style



“
I save my pictures
onto discs and use
the SD Memory Card
over and over.”

In the past, MPEG4 moving images taken with a D-snap could be saved only on an SD Memory Card or a compatible PC.

With the E100H you can view and save MPEG4 moving pictures. You can also record TV programs and previous recordings onto an SD Memory Card.

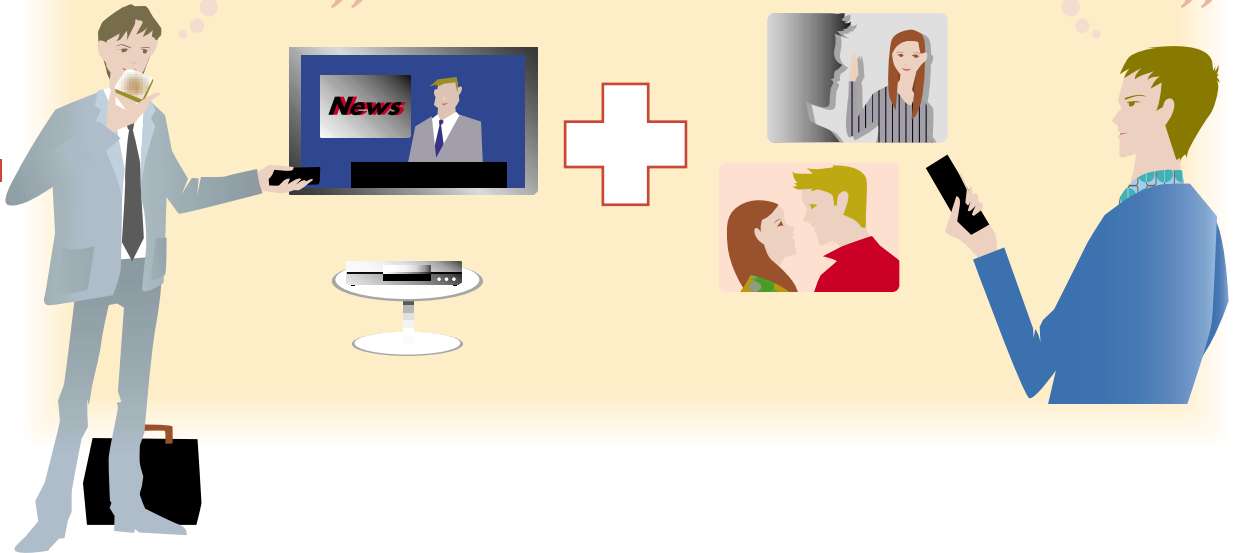
Quick View (x1.3)

Watch recorded programs at 1.3 times the normal playback speed, with natural-sounding audio.

DIGA Style

“It’s 30 percent faster than normal speed, but the voices are clear and easy to understand.”

“I can quick-view even when using Chasing Playback, so I can catch up to the real-time broadcast.”



Quick View a 2-hour program in about 93 minutes. The audio pitch doesn't change, so you still catch all of the voices and

other sounds. And You can use Quick View even when using the Chasing Playback feature.

* Quick View cannot be used with Chasing Playback in XP mode or FR mode.

Extended DVD-R Recording with Superior Image Quality

You get both outstanding image quality and extended recording time, even when using DVD-R discs.

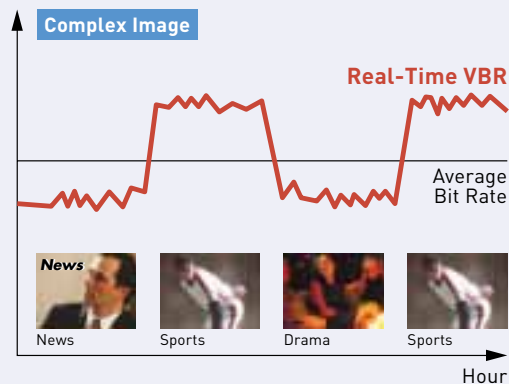
DIGA Style

“Wow! The picture quality is so good.”

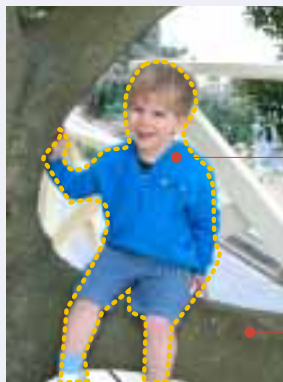


Panasonic uses a hybrid VBR system that combines Real-Time VBR with Visibility Modulation Technology. This fancy technology means that even when recording on a DVD-R disc, you get the same beautiful picture quality and long recording time as you get on a DVD-RAM disc.

Real-Time VBR



Visibility Modulation Technology



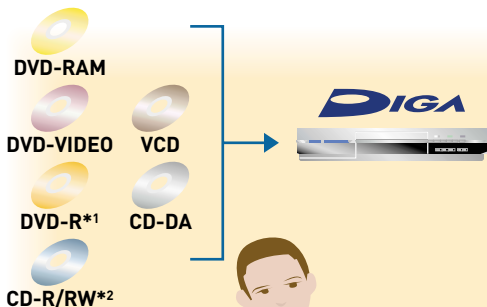
Important area
Low compression
Low distortion

Unimportant area
Reduce data through filter

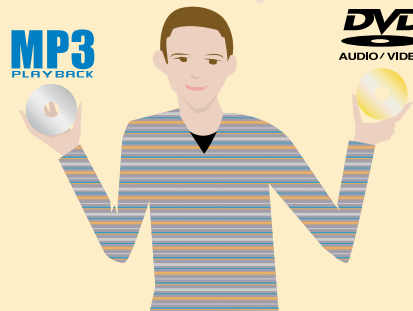
Play a Variety of Discs

You can play back DVD-Video discs, video CDs, music CDs, and CD-R/RW discs.

DIGA Style



“
My Panasonic model can also play MP3 music data and DVD-Audio discs too.
”



“
I can enjoy various kinds of discs in one unit.
”

All Panasonic DVD recorders play a variety of discs, including DVD-RAM, DVD-R*1 and DVD-Video discs, music and video CDs, and CD-R/RW*2 discs.

*1 This unit can play back Panasonic DVD-R discs recorded with a Panasonic DVD video recorder. It may not be able to be played back depending on the DVD-R disc and the recording condition.

*2 It may not be able to play some CD-R or CD-RW due to the condition of the recording.

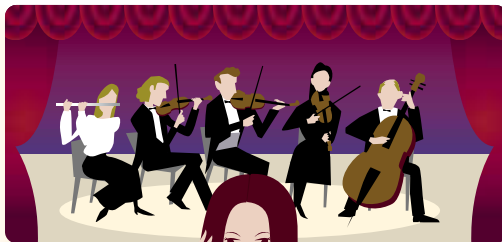
The E50, E60 and E100H can play MP3 data recorded on CD-R/RW discs. The E60 and E100H can play high-quality DVD-Audio* as well.

* Multi-channel DVD-Audio is reproduced in 2-channel stereo.

DVD-Audio Playback (E60/E100H)

Enjoy truly high-fidelity sound that's much higher in quality than music CDs.

DIGA Style



I'd love to listen to this — but will my DVD recorder let me?

DVD-Audio has about 1,000 times as much data as a music CD. That's why the sound is so much better.

Previous DVD recorders could not play DVD-Audio discs.

The E60 and E100H can play DVD-Audio (stereo). The sound quality is truly remarkable. You can even "hear" the depth and sense of space in the original sound.

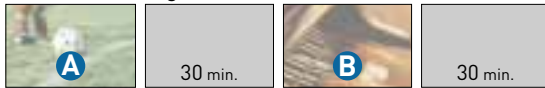
* Multi-channel DVD-Audio is reproduced in 2-channel stereo.

Overwrite-Free Recording

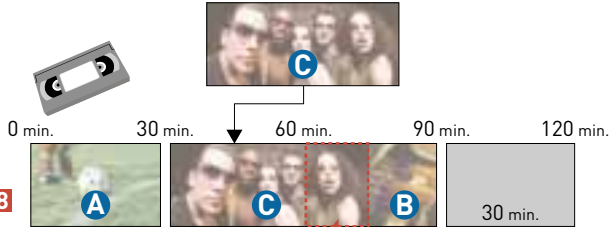
DVD-RAM records consecutively onto blank spaces.

Before

Present recording



Record Program C for 45min.



Overwrites the other program

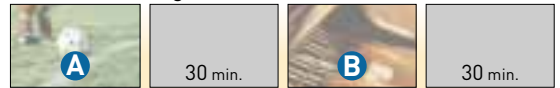


with TAPE

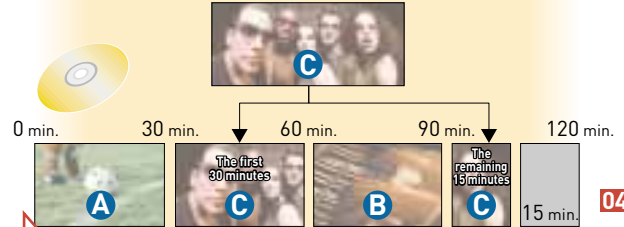
If you try to record a 45-minute program in a blank space that is only 30 minutes long, you will overwrite part of the previous recording. It is possible to accidentally overwrite a program that you want to keep.

DIGA Style

Present recording



Record Program C for 45min.



It's no problem with DVD-RAM.

with DVD-RAM

Thanks to full random access, DVD-RAM can record data even in non-consecutive blank disc spaces. You never have to worry about overwriting a recording that you want to keep.

Flexible Recording Mode

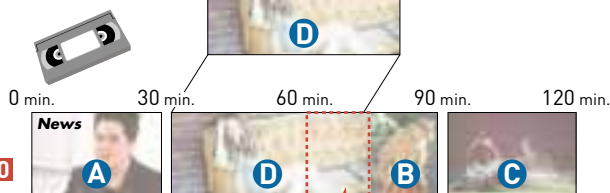
When you use FR mode, you automatically get the best picture quality possible.

Before

Present recording



Record Program for 45min.



Overwrites the other program

“ Oh no! I recorded in SP mode but there wasn't enough tape space. I should have used LP mode. ”

with TAPE

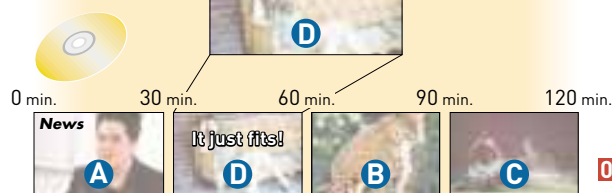
You have to find out how much blank space remains and then figure out if you have enough for the program you want to record.

DIGA Style

Present recording



Record Program for 45min.



“ With FR mode, I get the best quality possible and I don't waste any space. ”

with DVD-RAM

Panasonic DVD recorders feature an FR (Flexible Recording) mode that automatically chooses the recording mode that provides the best picture quality given the amount of blank disc space. It selects a mode from XP (highest quality) to EP (extended time).

* FR mode is available only when making a Timer Recording or a Best-Fit Recording on a DVD disc.

Feature Comparison

DVD VIDEO RECORDER		DMR-E50	DMR-E60	DMR-E100H
Playable Discs		DVD-RAM: 12cm [4.7GB/9.4GB], 8cm [2.8GB], DVD-R*1 [for General Ver. 2.0]: 12cm [4.7GB], 8cm [1.4GB], DVD-Video, DVD-Audio, CD-Audio (CD-DA), Video CD, CD-R/RW*2 (CD-DA, Video CD, MP3 formatted discs)		
Recordable Discs		DVD-RAM: 12cm [4.7GB/9.4GB], 8cm [2.8GB], DVD-R*3: 12cm [4.7GB], 8cm [1.4GB] [for General Ver. 2.0]		
Recording Standards		DVD Video Recording Standards [DVD-RAM], DVD Video Standards [DVD-R]		
Built-in Hard Disk Capacity		—		
Recording System	VIDEO	—		MPEG2 [Hybrid VBR]
	AUDIO	Dolby Digital 2ch		Dolby Digital 2ch, Linear PCM 2ch (XP mode)
Recording Time	XP mode	Approx. 1 hour [with 4.7GB Disc]		
	SP mode	Approx. 2 hours [with 4.7GB Disc]		
	LP mode	Approx. 4 hours [with 4.7GB Disc]		
	EP mode	Approx. 6 hours [with 4.7GB Disc]		
Video System	TV System	NTSC system, 525 lines, 60 fields		
	Input	Line [pin jack], 1.0 Vp-p; 75 ohm, S connector Y: 1.0 Vp-p; 75 ohm, C: 0.286 Vp-p; 75 ohm		
	Output	Line [pin jack], 1.0 Vp-p; 75 ohm, S connector Y: 1.0 Vp-p; 75 ohm, C: 0.286 Vp-p; 75 ohm		
	Component Video Output (480P/480i)	Y: 1.0 Vp-p; 75 ohm, PB: 0.7 Vp-p; 75 ohm, PR: 0.7 Vp-p; 75 ohm		
Audio System	Antenna Reception Input	TV Channel: 2ch-69ch, 75 ohm, CATV Channel: 1ch-125ch, 75 ohm		
	Input	Line [pin jack], Reference Input: 309 mVrms, FS: 2 Vrms [1 kHz, 0 dB], Input Impedance: 47 k ohm		
	Output	Line [pin jack], Reference Output: 309 mVrms, FS: 2 Vrms [1 kHz, 0 dB], Output Impedance: 1 k ohm, [Load Impedance: 10 k ohm]		
	Number of Channels	Recording: 2 channels, Playback: 2 channels		
DV-Input	—	—		4-pin
SD Card Slot	Compatible Media	— SD Memory Card Slot		
	Format	— SD Memory Card, Multi Media Card		
	Image Format	— FAT12, FAT16		
		— JPEG DCF		
		— [Design rule for Camera File system]		
		— TIFF (Uncompressed RGB chunky)		
Number of Pixels	— DPOF			
	— 320 x 240 to 6144 x 4096			
	— [sub sampling:4:2:2 or 4:2:0]			
PC Card Slot*4	—	— PC Card Slot [TypeII]		
Compatible Media	— A PC Card adapter conforming to PC Card Standards, ATA Flash PC Card, Mobile Hard disk, PC Card adapter [SD Memory Card, MultiMediaCard, Compact Flash, Smart Media, Memory Stick, microdrive, XDpicture Card]			
	—	—		
	Format	—		
	Image Format	— JPEG DCF		
		— [Design rule for Camera File system]		
		— TIFF (Uncompressed RGB chunky)		
Number of Pixels	— DPOF			
	— 320 x 240 to 6144 x 4096 [sub sampling:4:2:2 or 4:2:0]			
Power Supply	— AC 120V, 60Hz			
Power Consumption	— 28W			
Dimensions [W x H x D]	16 ¹⁵ / ₁₆ " x 3 ¹ / ₈ " x 11 ³ / ₁₆ "		16 ¹⁵ / ₁₆ " x 3 ¹ / ₈ " x 11 ³ / ₁₆ "	
Weight	8.14lbs		8.58lbs	
Operating Temperature	— 41°F-104°F			
Operating Humidity Range	— 10-80%RH [no condensation]			

*1 This unit can play back Panasonic DVD-R discs recorded with a Panasonic DVD video recorder. It may not be able to be played back depending on the DVD-R disc and the recording condition.

*2 It may not be able to play some CD-R or CD-RW due to the condition of the recording.

*3 DVD-R discs recorded on the Panasonic DVD video recorder may not be able to play on some DVD players, depending on the player, the DVD-R disc, and recording condition.

*4 DMR-E60/DMR-E100H are compatible with SD Memory Card, MultiMediaCard, Compact Flash, Smart Media, Memory Stick, ATA Flash PC card. A PC Card adapter conforming to PC Card standards is necessary. This unit is compatible with DCF based, still picture [JPEG] files recorded using a digital camera. This unit is not compatible with sound, moving pictures or still pictures not in accordance with DCF standards [i.e. MOTION JPEG etc], or with types of still pictures other than JPEG / TIFF. When saving still pictures on HDD, it is recommended that you copy them to the PC card or DVD-RAM also.

* Specification are subject to change without notice. Weight and dimensions are approximate.

Sales Strategy

Your role is not to force the customer to buy your product. Your role is to help the customer see how the product would enhance his or her lifestyle, and to plant a dream in the customer's mind.

054 The DVD recorder is an information-rich product. It is changing the world's basic concept of recording. To help your customer understand the DVD recorder, start by answering his or her questions clearly and thoroughly. Then go a step further. Find out what he (or she) needs, and offer him information about answering those needs. This can lead directly to a sale.



Situation Questions



Find out what the customer's present situation is.



Problem Questions



Make him (or her) aware of the problem.



Implication Questions



Help him (or her) understand the importance of the problem.



Need-Payoff Questions



Help him see the ideal solution.

055 **SPIN** is a sales strategy described by Neil Rackham in his 1988 book, *Making Major Sales*. In essence, the SPIN strategy is to find out what a customer needs by asking the right questions, and then to find the best solution to those needs. Many of today's top companies are introducing SPIN training so that their services and products become more closely focused on customer needs.

25 FAQs (Frequently Asked Questions)

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| Q02 | How is it different from a VCR? | ----- | •059 | Q16 | When do I use the Time Slip™ functions? | ----- | •073 |
| Q03 | What kind of discs does it use? | ----- | •060 | Q17 | Why is the editing so much easier? | ----- | •074 |
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...Q1

What is a DVD recorder?



A VCR records onto video tape. A DVD recorder, on the other hand, is a device that records onto 12-cm DVD discs, like the ones used for DVD movies.

058

...Q2

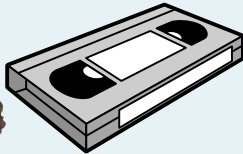
How is it different from a VCR?



You don't have to rewind or fast-forward to find a scene, so it's faster and easier. Also, discs don't degrade the way tapes do, so the picture quality stays better for a much longer time. Another advantage is that discs take up far less storage space than tapes.

059

“
**With tape, you have to
rewind and fast-forward.
And tapes wear out over time,
so the picture quality goes down.**
”



“
**DVD gives you random access,
long-lasting images,
and a space-saving size.**
”



...Q3

What kind of discs does it use?



DVD recorders can record onto DVD-RAM, DVD-R, DVD-RW, and DVD+RW discs. Panasonic DVD recorders can record onto DVD-RAM and DVD-R discs.

060

You get full random access and super-fast data transfer (22.16 Mbps), and you can record onto a disc up to 100,000 times. There's also a cartridge type available.

DVD-RAM

You can play discs on any DVD player, but you can record on a disc only once. There's also a cartridge type available.

DVD-R


...Q4

How is DVD-RAM different from DVD+RW?

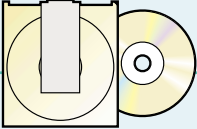


DVD+RW records in a "linear" way, like video tape. It lets you record on a disc up to 1,000 times. DVD-RAM, on the other hand, is "non-linear", it lets you record up to 100,000 times on a disc, and it transfers data at 22.16 Mbps.

061



DVD+RW
1,000 times



DVD-RAM
100,000 times

If you overwrote the same disc once each day...

The disc would last about **3 years.**

The disc would last about **270 years.**

...Q5

Why do they make a cartridge type disc?



The cartridge protects the disc from scratches and fingerprints, so it provides more reliable long-term storage. You can choose a disc without a cartridge if you prefer.



...Q6

Can anybody watch the discs I record?



Most DVD players can play DVD-R discs. And the model with DVD-RAM video playback capability can play a cartridge-type disc.



...Q7

Can I record any TV channel I want?



Yes. A built-in UHF/VHF or CATV tuner lets you record TV programs just the way you did with your VCR. Using the external input jacks, you can also record satellite broadcasts.



UHF/VHF and CATV are OK. You can also record programs input from an external source, such as a satellite antenna or tuner.

...Q8

Can I record without a disc?



If your DVD recorder has a hard disk drive, then you can record for hours without a disc.



Able to record for hour after hour, without even changing a disc.

...Q9

What's a hard disk drive?



The hard disk drive on a DVD recorder is just like the hard disk drive on your PC. It stores data. It has a large capacity, it reads and writes data quickly, and it can rewrite again and again.



- **Large capacity**
- **Long-term storage**
- **Fast data access**
- **Rewritable**

...Q10

Can the hard disk drive ever freeze up?



It happens rarely, but it's possible for the hard disk drive to freeze up. That's why it's a good idea to record important data onto a DVD disc.



Recording onto a disc gives you the most reliable long-term storage.



...Q11

Can I connect a DVD recorder to an old type of TV?



Yes. You can connect a DVD recorder to your TV — even if it's old — just like you did with your VCR. You can also connect a DVD recorder to a high-definition TV with progressive scan capability.



...Q12

Can I dub from old video tapes and LDs?



Yes. You can record material from an external source — such as a video tape or LD — onto a DVD disc or the hard disk drive. That means you can watch your favorite recordings years and years from now, and the picture quality will still be excellent.



...Q13

How many hours can I record on a single disc?



You can record up to 6 hours on a singled-sided 4.7-GB disc. You can record up to 12 hours on a dual-sided 9.4-GB DVD-RAM disc.

070

...Q14

Can I record TV programs without the commercials?



No, but in some cases you can automatically skip the commercials during playback.* Also, disc recording gives you unique editing functions that you can use to get rid of the commercials later.

* This is possible only when the commercials are broadcast in stereo sound and the program itself is not. Even in this case, however, commercials at the very start of the recording cannot be automatically skipped.

071

Four Recording Modes To Meet Your Needs	DVD-RAM		DVD-R
	4.7GB	9.4GB (Double Sided)	4.7GB
XP High picture quality recording mode	1 hour	2 hours	1 hour
SP Standard recording mode	2 hours	4 hours	2 hours
LP Long recording mode	4 hours	8 hours	4 hours
EP Extra long recording mode	6 hours	12 hours	6 hours

Flexible Recording — recording the best quality pictures in a set time

FR Flexible recording mode	60 to 360 min. [4.7GB]
----------------------------	------------------------

Recording time is approximate.

...Q15

What is Chasing Playback?



Say you've recorded the first 20 minutes of a program. Chasing Playback lets you go back and watch the program from the very beginning, while the rest of the program continues to record. You can also use the Quick View, fast forward, or skip functions to catch up to the current broadcast.

072



I can watch right from the beginning, without interrupting the recording.

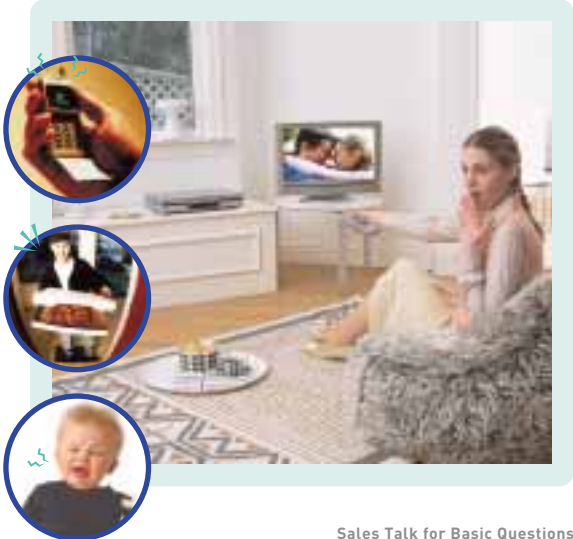
...Q16

When do you use the Time Slip functions?



Say you're watching a TV program and someone knocks at the door. You miss 10 minutes of the program. With Chasing Playback, you can go back and watch the part you missed and everything that comes after it. It's like putting a TV program on "pause". So, you can have an "intermission" during a program, or take a few moments to use the restroom, without missing anything.

073



...Q17

Why is the editing so much easier?



A video tape recording is linear. But a DVD disc recording is nonlinear. This means it has random access — so you don't have to fast-forward or rewind to find a scene. Editing is much easier. And, unlike with +RW discs, you can replace scenes with ease, anytime you want.

074

News

Using playlists makes editing even easier.

...Q18

What other kinds of discs can my DVD recorder play?



Your Panasonic DVD recorder can record and play DVD-RAM and DVD-R discs. It also can play commercially available DVD discs, music CDs, video CDs, and CD-R/RW discs made on a PC.

* The E50, E60 and E100H can also play MP3 data and the E60 and E100H can play DVD-Audio disc.

075

DVD-RAM

DVD-R

DVD-VIDEO

VIDEO CD
CD-DA
CD-R/RW

...Q19

What is Progressive Scan?



Some DVD media, such as movies, are recorded with a film-like quality (called progressive images). The Progressive Scan function lets you play back these recordings in full quality.*

* Your TV (or other monitor) must be compatible with progressive images and be equipped with a composite video or D terminal.



076

...Q20

What can I use digital audio output for?



Use digital audio output to connect with a home theater system.* Then you can enjoy the breathtaking 5.1 or 6.1 channel sound of DVD media recorded in Dolby Digital sound or DTS.

* Your DVD recorder must be connected by digital cable to a compatible AV amp and speaker system.



077

...Q21

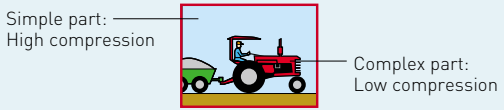
What is MPEG2?



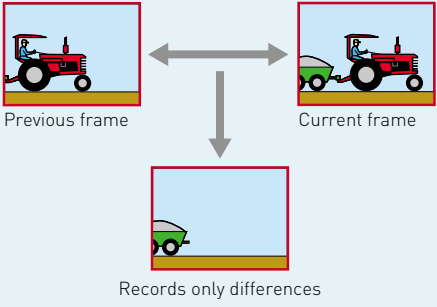
MPEG2 is a standard format for compressing moving pictures. It's used for DVD media and digital broadcasting all over the world.

078

Compression in Individual Picture



Compression between Pictures



...Q22

What do "formatting" and "finalizing" mean?



"Formatting"
 means to erase everything on a disc and restore it to a blank condition. Note that, with some equipment, you have to format new discs before you can use them.

"Finalizing"
 is the process that finishes a DVD-R recording, so you can play it on other players.

079

...Q23

Which has better picture quality — VHS or DVD?



The longest-play mode (EP) for both DVD discs and the hard disk drive is about equal in quality to the longest-play mode (LP) in VHS. But a DVD's EP mode looks better than VHS LP mode because there's no jitter or degradation.

080



...Q24

Which is more expensive — a video tape or a DVD disc?




A video tape is less expensive to buy, but a DVD-RAM disc gives you so much more. For example, you can rewrite on a DVD-RAM disc 100,000 times, and the picture quality stays high for much longer. That's why most people agree that, over the long run, a DVD disc is a better value than a VHS tape. DVD-R discs are quite economical, too.

081


Which is the better value? You decide.

**Video
Tape**



Slightly cheaper

**DVD-RAM
D i s c**



- Rewritable 100,000 times
- No picture degradation
- Random access
- Chasing Playback
- Other great features

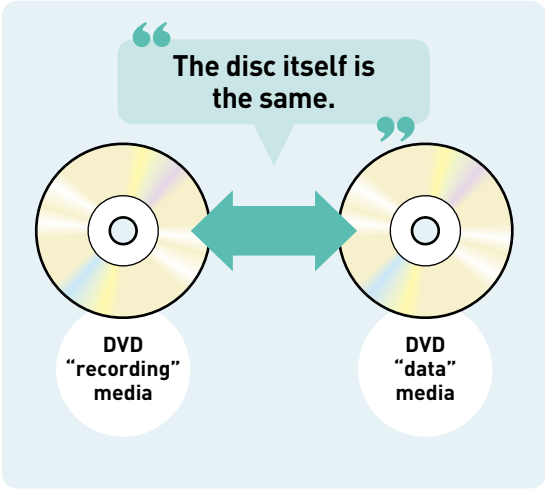
...Q25

What's the difference between DVD "recording" media and DVD "data" media?



DVD "recording" media is for recording images. DVD "data" media is for use on a PC. The disc itself is the same, but the formatting is different. Since only the formatting is different, "recording" media and "data" media can be used for both PCs and recorders.

082



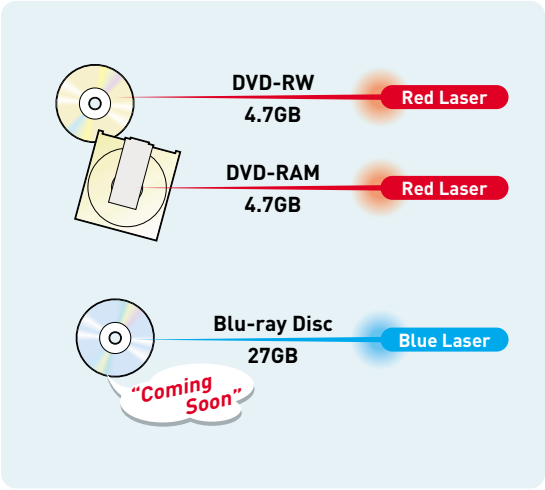
...Bonus Question

How are these discs different from Blu-ray discs?



Blu-ray discs represent the next-generation DVD recorder standard. A red laser is used to read DVD-RAM and other discs. The new standard uses a blue laser, which has a shorter wavelength. This allows faster data transfer and a much greater recording capacity. Panasonic is already developing products that use Blu-ray technology.

083



Quick Demo Guide

Having the customer actually see and try the DVD recorder and its functions is more effective than simply giving an explanation.

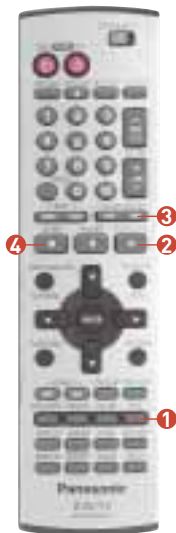


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•• Chasing Playback

Watch from the beginning even during recording.



- 1** Press the REC button to start recording. (Continue recording for a while.)
- 2** Press the PLAY button to play back the recording from the beginning.
- 3** Press the SLOW/SEARCH button to demonstrate fast forward (rewind) operation.
- 4** Press the STOP button once to stop playback.



1 REC indicated in STATUS* section.



2 REC, PLAY indicated.

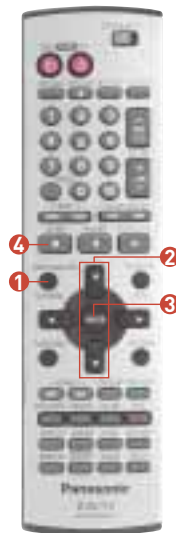


4 Indication returns to REC.

* Open the cover of the remote control and press the STATUS button to display this indication.

•• Simultaneous Rec.& Play

Watch a program during recording another.



- 1** Press the DIRECT NAVIGATOR button to display the list.
- 2** Select the program to watch.
- 3** Press ENTER to start playback.
- 4** Press the STOP button once to stop playback.



1 List displayed.



3 REC, PLAY indicated.

Time Slip Button

Go back to a desired scene during recording.



- 1 Press the TIME SLIP button. The program recorded 30 seconds ago is shown in the right corner of the screen.
- 2 After 5 seconds, the sub-screen is enlarged to full screen.
- 3 Press the TIME SLIP button again. Use the CURSOR key to set the desired time, and press ENTER.
- 4 Press the STOP button once to stop playback. Press the STOP button again to stop recording.

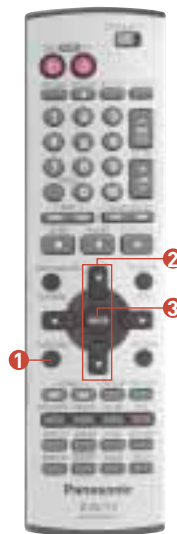


1 Sub-screen displayed.



JPEG Photo data Storage/Viewer

Displaying photos recorded by a digital camera on a large screen.

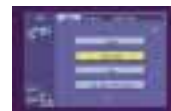


- 1 Press the FUNCTION button. Using the CURSOR key, select JPEG, and press ENTER.
- 2 Use the CURSOR key to select Slide Show.
- 3 Press ENTER to start the slide show. Press STOP to return to the JPEG Menu.



1 Function Menu

JPEG Menu



2 Select Slide Show.

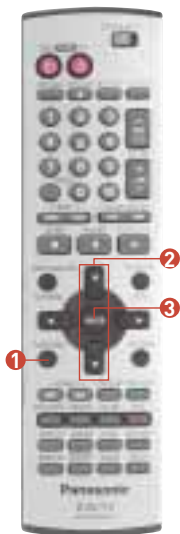
Select Album from the JPEG Menu. Select the desired photo from the list to view it on-screen.



Album display

SD VIDEO (MPEG4) data Storage/Viewer

Displaying SD VIDEO (MPEG4) recorded by an SD Multi Camera.



- 1 Press the FUNCTION button. Using the CURSOR key, select SD VIDEO (MPEG4), and press ENTER.
- 2 Use the CURSOR key to select the program.
- 3 Press ENTER to start the program.



1 Function Menu



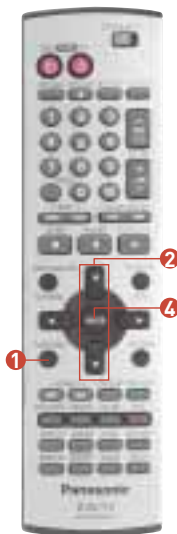
2 Select the program.



3 Playback starts.

MPEG2/4 Dubbing

You can record your favorite programs onto a DVD-RAM disc or SD Memory Card.



- 1 Press the FUNCTION button. Using the CURSOR key, select DUBBING, and press ENTER.
- 2 Select the dubbing direction and Rec Mode [MPEG2/MPEG4].
- 3 Select dubbing data from the program list.
- 4 Use the CURSOR key to select Start Dubbing. When the confirmation window appears, select Yes, then press ENTER.



1 Function Menu



2 Select the dubbing direction.



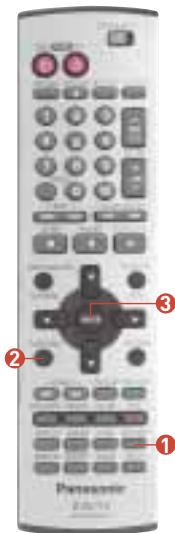
3 Select from the list.



4

••• DV Auto Recording

Simply connect a digital camcorder to the DV input terminal to transfer images from a camera onto the hard disk or DVD-RAM disc.



- 1** Use the REC MODE button to select the recording mode (XP/SP/LP/EP).
(If no selection is made, images will be recorded in the mode currently set on the DVD Video Recorder.)
- 2** Press the FUNCTION button. Select DV Auto Rec, and press ENTER.
- 3** After confirming that the REC button is automatically selected, press ENTER.
(The tape is rewound for 5 seconds, and playback starts. Then after 5 seconds, the DVD Video Recorder automatically starts recording.)



② Function Menu



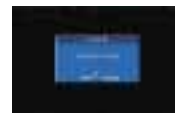
③ The REC button is automatically selected.

••• Auto Creating Playlist

DV Auto Recording makes it easy to find the beginning of each scene, by automatically creating a playlist.



- 1** Press the STOP button to stop the DVD Video Recorder recording and digital video camera playback.
(When the screen displays "Recording has finished", press ENTER or the RETURN button.)
- 2** Press the PLAYLIST button. Make sure the Playlist you have just recorded is shown at the bottom of the displayed list.



① Recording finish screen.

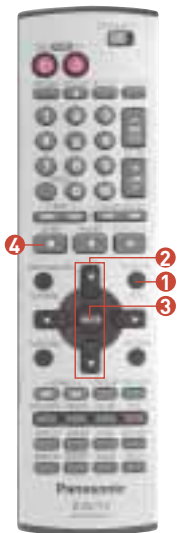


② Playlist



●● Playlist Playback

You can select from among the scenes recorded on the disc and arrange them in any order you want.



- 1 Press the PLAYLIST button to display a list of the Playlists.
- 2 Using the CURSOR key, select a Playlist.
- 3 Press ENTER to start playback according to the sequence shown in the Playlist.
- 4 Press the STOP button to end playback.



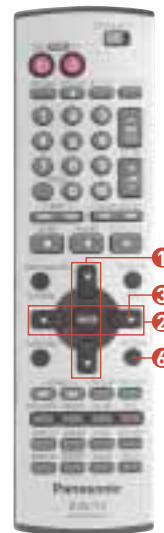
1 Select a Playlist.



3 Playback starts.

●● Playlist Editing

Easy editing by rearranging scene sequences.



- 1 Using the CURSOR key, select a Playlist to be edited.
- 2 Press the CURSOR right key. When the Command window appears, select Edit Scenes.
- 3 Using the CURSOR key, select Move. Use the CURSOR key to move. Select a scene, and press ENTER. [A check mark is added.]
- 4 Using the CURSOR key, select the destination scene, and press ENTER.
- 5 Check the screen to make sure the scenes are arranged in the desired sequence.
- 6 Press RETURN to display the Playlist screen. Select the Playlist that you just produced, and press ENTER to play it back for confirmation.



1 Playback starts.



2 Select the command.



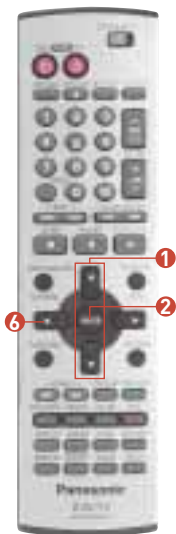
3 4 Select the scene to be moved and its destination.



5 Check the sequence.

Copying to DVD-RAM

You can record the favorite pictures onto a DVD-RAM or DVD-R disc.



- 1 Select Copy from the JPEG Menu, and press ENTER.
- 2 Select the desired image, and press ENTER.
- 3 Select Copy, and press ENTER.
- 4 After the copy confirmation window appears, select Destination, then press ENTER.
- 5 Select DVD, select the folder, and press ENTER.
(For the first time, select a new folder.)
- 6 Using the CURSOR left key, select Copy, and press ENTER to start copying. Check the copy destination folder to confirm the copied image.



2 Select the image to copy.



4 Select the copy destination.



6 Select the folder.



The picture is worth
a thousand words.

DIGA Digital Networking

Connect a Panasonic DVD recorder to other equipment and explore the exciting world of DVD!

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- With Digital Video Camera ---●098 - 099
- With Digital Still Camera ---●100 - 101
- With DVD Video Camera ---●102 - 103
- With AV Multi Device D-snap ---●104 - 105
- With Personal Computer ---●106 - 107
- With Video Cassette Recorder ---●108





•• With Digital Video Camera: E60,100H

How to connect

Open the lower left door of the DVD Video Recorder, and connect a digital video camera with a prerecorded tape using a DV cable. Turn on the Power switch of the camera, and, in VCR mode, wind the tape to the beginning of the recording.

* Tape is rewound for about 5 seconds before recording starts. Therefore, tape section long enough for 5 seconds of winding must be provided before starting point.

Benefit 3

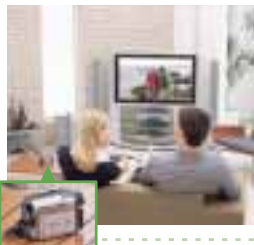
A playlist is automatically generated. The playlist makes it easy to delete scenes or change their order.



100

Benefit 1

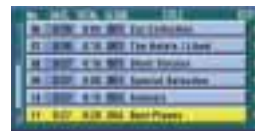
Images copied onto a hard disk drive or DVD disc retain full quality for a long, long time. Plus, discs take up little storage space. And, there's no need to connect a cable to a TV.



101

Benefit 4

A number of playlists can be produced and saved, each with its own title. The original images remain unchanged. Example of playlist titles: The Hotels I Liked, Short Version, Best Places, All Around Rome,...



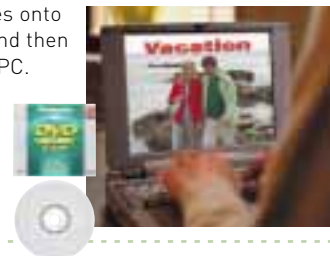
Benefit 2

Images copied onto a DVD-R disc can be played on any ordinary DVD player. A disc full of images makes a great gift for family or friends.



Benefit 5

You can dub images onto a DVD-RAM disc and then edit them on your PC.





•• With Digital Still Camera: E60,100H

How to connect

Just slip the SD Memory Card from your LUMIX into the DVD recorder's SD card slot. If you have a camera that uses a different kind of memory card, put the card in the adaptor and put the adaptor into the PC card slot. Check to make sure the card indicator light comes on.

* Before taking out the SD Memory Card or PC card adaptor, make sure the indicator light has turned off. Then switch off the power and press the Remove button several times.

Benefit 3

One DVD-RAM disc can hold lots of photos, so you don't fill up memory card after memory card.



The same capacity as twenty 256MB memory cards

102

Benefit 1

You can view images on a TV without connecting any cables. You can also play the images back as a slide show.



103

Benefit 4

You can store still images and DV moving pictures on the same disc.



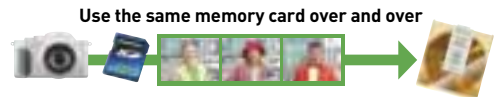
Benefit 2

While viewing images on the TV, you can delete the ones you don't want to keep and mark others for printing.



Benefit 5

Copy the images from a memory card onto a DVD-RAM disc, and then erase the card and use it again and again. That way you don't have to keep buying new memory cards.





•• With DVD Video Camera

How to connect

Take the 8cm DVD-RAM or 8cm DVD-R disc out of the DVD video camera and put it on the disc tray of the DVD recorder.

Benefit 3

Playlists can be edited. You can also use a playlist that's created by the DVD video camera.



104

Benefit 1

You can view the images on a TV right away, without connecting any cables.



Benefit 4

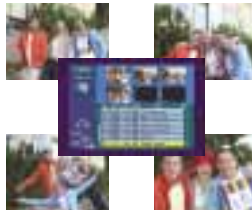
You can copy images from the 8cm disc onto a DVD-RAM disc, and compile your own video library. Then you can use the same 8cm disc over again.



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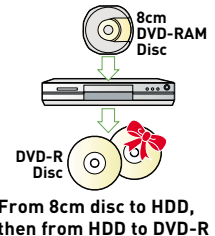
Benefit 2

Playlists make it easy to play back favorite scenes and still images.



Benefit 5

You can copy images onto the hard disk drive, and then copy them onto a DVD-R disc to give to a friend. (100H only)





••• With AV Multi Device D-snap

How to connect

Insert the SD Memory Card from the D-snap into the DVD recorder's SD card slot (or insert a blank SD Memory Card). Make sure the card indicator light comes on.

* Before taking out the SD Memory Card, make sure the indicator light has turned off. Then switch off the power and press the Remove button several times.

Benefit 3

You can record a TV program with the DVD recorder, copy it onto an SD Memory Card, and then use the D-snap to watch the program anywhere you like. (100H only)



Outdoor playback

Benefit 1

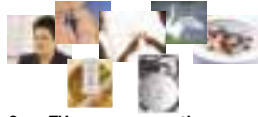
You can use your TV to view the still images and moving pictures you recorded with the D-snap, without connecting the cradle.



No need to connect the cradle

Benefit 4

You can copy recorded TV programs from a DVD disc or the hard disk drive onto an SD Memory Card, and then view them on the D-snap. (100H only)



Copy TV programs or other content onto an SD Memory Card



Benefit 2

You can copy still images and moving pictures onto the hard disk drive or a DVD disc for safekeeping. Then you can erase the memory card and use it again.



Use the same memory card again and again

Note: DVD recorders cannot play back voices recorded with the D-snap or MP3/AAC music.

•••With Personal Computer



How to connect

Take the disc from your DVD recorder and put it in your PC's DVD-RAM drive. (If you're using a cartridge type disc, you might have to take the disc out of the cartridge.)

Benefit 3

Images saved on a DVD-RAM disc are easy to upload to a PC and attach to e-mail messages.



You can attach moving pictures to your e-mail messages

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Benefit 1

You can use your PC's advanced editing software. When you're done editing, you can put the disc back into your DVD recorder and play it.



Use your PC to edit subtitles

Benefit 4

You can copy moving and still images from a DVD-RAM disc onto a PC, then upload them to your own homepage for everyone to see.



Create your own personal homepage

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Benefit 2

View your favorite photos on your PC. Use one of the photos as the desktop background image.

Be sure to people that they can view images not only on their TVs, but on their PCs as well.



Use one of your own photos as the background image on your PC's desktop

••• With Video Cassette Recorder

How to connect

Connect an AV cable from the VCR's output terminal to the DVD recorder's external input terminal. Or, you can connect an S-Video cable to each device's S-Video terminal.

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Benefit 1

Dub your old VHS tapes onto DVD discs. The image quality will stay beautiful for years and years, and discs take up much less storage space than tapes.



Benefit 2

With a DVD disc you can skip ahead or back to any scene almost instantly. There's no more waiting around for a tape to fast-forward or rewind.

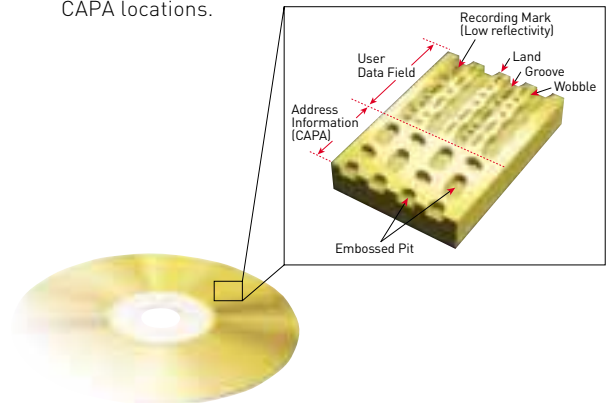


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Description of The Physical Format of DVD-RAM Disc

TECHNICAL INFORMATION OF THE DVD-RAM FORMAT

As a recording medium format, DVD-RAM uses the highly reliable wobble-land-groove recording system, the most suitable system for precise, high-density recording. It has been authorized as an official format by the DVD Forum. This recording system boasts the advantages of the land-groove and wobble-groove recording systems and the CAPA (Complementary Allocated Pit Addressing) system. Conventional optical discs use the continuous groove system which records data only in the tracking guide groove in the disc substrate. To enable high-density recording, the land-groove system records data in both the groove and the land between grooves. With the wobble-groove recording system, the lands and grooves walls are undulated. By counting the number of undulations, the wobble-groove system enables precise detection of CAPA locations.



Recording Standards of DVD-RAM Disc

The DVD Video Recording is a newly created format for real-time video recording on a DVD disc. Since the existing DVD Video for read-only DVD is for playback only, enabling real-time recording, video/audio writing/erasing, editing and other operations was a problem. The new DVD Video Recording Format is more than an improved version of the DVD Video for rewritable DVD media enabling real-time recording and editing. It is a format that realizes the full potential of DVD discs, offering a Playlist function for easy changing of track playback order, still image compatibility, text information recording for search applications, and other features.

	Recording Format	DVD Video Recording Format
Video	Encoding system	MPEG1/MPEG2
	Number of streams	1 stream only
	Aspect ratio	4:3/16:9
	Number of pixels (for NTSC)	720 x 480, 704 x 480, 544 x 480, 480 x 480, 352 x 480, 352 x 240
Audio	Encoding system	MPEG/Dolby Digital (AC3)/Linear PCM
	Number of streams	Max. 2 streams
	Number of channels per stream	Mono/Stereo/Dual Mono Multi (Max. 7.1 channels)
Sub-picture	Encoding system	Runlength encoding
	Number of streams	1 stream only
Multiplex format		MPEG2 program stream

Address

- ① In computer hardware, this is a particular location on a memory or input/output port.
- ② In the e-mail and Internet world, each PC has an "address" so the user can receive e-mail.

Bilingual Recording

Many of today's DVD movie discs feature the original spoken language on one channel and a second language (dubbed or subtitled) on another channel. Viewers can select either language to listen to. And DVD-RAM can record both the original spoken language and a second language audio channels of sound multiplex broadcasting programs.

Bit rate

This is the same as data rate. It refers to how much data is transferred in a given amount of time.

Bit stream

This is a series of digital data that is intended to be processed as a continuous stream.

Block Noise Reduction

The MPEG format (defined above) compresses data to save space. This process can add "noise" to an image. A Block Noise Reduction system blocks out that noise.

B's Recorder GOLD5

The opposite of up-convert. For example, a 1080i signal can be down-converted to a 480i signal.

CAPA

Complementary Allocated Pit Addressing. This refers to the recording system used with DVD.

CLV

Constant linear velocity. This refers to a rotating disc system in which the head moves over the disc surface at a constant velocity. The advantage of CLV is that data density remains constant over the entire disc surface.

CPRM

Content Protection for Recordable Media. It is a type of copy protection for writable DVD formats. Its purpose is to prevent people from making illegal copies of discs, such as DVD movies.

Data Transfer Rate

This is the speed at which one device sends data to another device such as when you transfer images from your digital camera to your PC. It's usually measured in units of Mbps or MBps. A higher data transfer rate means that you can upload or download something more quickly.

DCF

The Design rule for Camera File system is a standard established by the Japanese Electronics Industry Development Association (JEIDA).

Digital Re-Master Processing

This is a type of processing used to improve sound quality. Research shows that ultra-high-frequency sounds — even those outside our normal hearing range — influence the way we perceive midrange sounds. However, most recordings do not have ultra-high frequencies. Digital re-master processing is a way of “extending” these recordings to a higher frequency. As a result, you can enjoy a more natural, higher-quality sound from sources such as CDs.

DNR

Digital Noise Reduction. This kind of system reduces high-frequency “noise”. A DNR system can be applied to CDs, DVDs and other sound sources.

Dolby Digital (AC-3)

This is the standard surround sound system used in the DVD-Video format. It provides 5.1 channels, a wide frequency response, and outstanding sound clarity and directivity. AC-3 refers to the digital compression technology it uses.

DPOF

Digital Print Order Format. This system allows digital cameras (and some other devices) to tell a printer which images to print. Say, for example, that you take 30 photos, but you only want to print 10 of them. You use this system to tell the camera which photos to print, and how many copies of each. The camera then transmits that information to a printer that's compatible DPOF.

DVD-Audio

This is a format developed to replace the CD as a music medium. Unlike the CD format, DVD-Audio can record sounds above 20kHz, which makes the overall sound much more true-to-life. DVD-Audio also features several different recording modes — from a 192kHz, 2-channel mode to a 96kHz, 6-channel mode — to match the content. And, you can record still and moving pictures on a DVD-Audio disc, as well as music. DVD-Audio has the same Visual Menu function as DVD-Video and offers advanced copy protection features.

DVD Forum

The Forum is a voluntary association of hardware manufacturers, software firms and other users of digital versatile disc (DVD) formats. The Forum has two major purposes:

- ① To establish a single format for each DVD application product, including revisions, improvements and enhancements for the benefit of consumers and users.
- ② To promote broad acceptance of DVD products on a worldwide basis, including the entertainment, consumer electronics and IT industries as well as the general public.

DVD VR Format

DVD Video Recording is a format that allows real-time video recording on a DVD disc. This new format is like an improved version of rewritable DVD Video, but it offers even more functions.

(DVD)+R

This is a DVD format developed cooperatively by Hewlett-Packard, Mitsubishi Chemical, Philips, Ricoh, Sony, and Yamaha. It allows recording on a disc one time only (there's no re-writing), and thus is suitable for distributing data and video content, or for archiving.

(DVD)+RW

This is a DVD format developed cooperatively by Hewlett-Packard, Mitsubishi Chemical, Philips, Ricoh, Sony, and Yamaha. It is rewritable, which means that you can record on the same disc again and again. The DVD Forum does not support the DVD+RW standard.

DVD-R

This is a DVD format that allows writing only one time. In other words, once you make a recording, you cannot “erase” it and record something new in its place. You can play a DVD-R disc in most DVD-Video players, without using a caddy or cartridge. It has a capacity of between 4 and 4.7 GB.

DVD-RAM

This stands for “Digital Versatile Disc — Random Access Memory”. It is a format for recording and playing pictures and sound using discs (rather than tape, for example) as its media. With DVD-RAM, you can write (record) on a disc as many times as you want. DVD-RAM can also be used to record data from a PC.

Because DVD-RAM can be used for both audio-video and PC data, we expect that it will serve as a “bridge” between different kinds of digital equipment.

DVD-ROM

Digital Versatile Disc — Read-Only Memory. This is a format used by PCs for recording data. The discs are similar to DVD-Video and DVD-Audio discs. A DVD-ROM disc holds 4.7 GB of data, which is about as much as 7 CDs. These discs are also used for things like video games and car navigation systems.

••• Glossary

DVD-RW

This is a rewritable version of DVD-R that is endorsed by Ricoh, Pioneer and Yamaha. You can play a DVD-R/W disc in most DVD-Video players, without using a caddy or a cartridge. A DVD-R/W disc has a capacity of between 4 and 4.7 GB.

128 FAT12/16/32

FAT stands for File Allocation Table. This is a system that some PCs use to store and retrieve files from their hard disks.

Field

This term is used to describe a component of a TV picture. A “top” field plus a “bottom” field make up a “frame”.

Format

A format is a defined way of coding information for storage or transfer. For example, your VCR probably uses the VHS format. DVD-RAM is a new, high-quality digital format that uses discs to record picture, sound, and computer data.

GUI

Graphical User Interface. This is a display on a monitor, such as a TV or computer screen, that shows information about a player, disc, or other equipment or device. A GUI makes it easier to change settings or operate equipment remotely.

Interlace

This is a method that some types of TVs and video monitors use to create a picture. Basically, the interlace method first splits the image into two fields and then recombines the fields. This helps minimize flicker in the transmitted image.

JPEG

Joint Photographic Experts Group. JPEG is a format for digital images. For example, many digital cameras save images as JPEG files. JPEG files have better color fidelity than files from other formats, and they take up less space and thus they download faster.

130 Longhorn

This is Microsoft's next operating system — the successor to Windows. It is due to be released in mid-2004. Longhorn will be bundled with .NET Framework, a Web operating environment that Microsoft will include with all Windows products.

LPCM

Linear Pulse Code Modulation is a digital technology used in many kinds of audio, such as CDs.

Mosquito Noise Reduction

“Mosquito noise” is a type of image distortion you sometimes see at the edge of moving objects. A Mosquito Noise Reduction system cuts out that noise, so the image remains smooth and sharp.

Motion JPEG

This is a format that creates moving pictures by using individual JPEG images as the frames. For example, Motion JPEG could display a series of 30 JPEG images in one second to create a 30-frame-per-second moving picture.

MP3 (MPEG-1 Audio Layer 3)

This is the most widely used sound compression format for distributing music over the Internet. It compresses data to between about 8% and 10% its original size. One drawback to current MP3 systems, however, is that they do not provide effective copyright protection.

MPEG2

This is the image compression format used in DVD-Video and elsewhere. It provides a high overall compression ratio while maintaining excellent picture quality. Without compression formats such as MPEG2, a DVD-Video disc could hold only about four minutes' worth of image data. With MPEG2 compression, a disc can hold more than two hours' worth.

MPEG4

This is a standard format for recording images and sounds. In other words, some images and sounds are recorded as MPEG4 files. MPEG4 is compatible with most other major recording formats.

NTSC

NTSC is the standard used in the United States and Japan for broadcasting television signals. NTSC actually stands for National Television System Committee, which is part of the Electronics Industries Association (EIA). This organization sets standards for television and video in the United States.

PAL

Phase Alternate Line. This is the standard used in Europe and some other parts of the world for broadcasting television signals.

Playlist

This is a set of images or scenes arranged in a list. You can put images recorded onto a DVD-RAM disc in any order you want, and thus create a playlist. For example, if you shoot a lot of different scenes with your digital camcorder, you can arrange some or all of those scenes in a particular order for more viewing fun.

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Progressive Scan

This refers to the way a TV creates its picture. Ordinary TVs use what's called the interlace method. In interlace TVs, there is always some flicker. Progressive scan is a more advanced method that delivers higher-resolution images with no flicker.

RTSC

This acronym — for Read The Source Code — is used by software developers.

SECAM

Séquential Couleur Avec Mémoire (Sequential Color with Memory). This is the standard used in France and a few other countries for broadcasting television signals.

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TBC

A time base corrector is a kind of circuitry offered on some Panasonic cameras. It helps eliminate jitter, so that you enjoy a clear, stable picture.

TIFF

Tag Image File Format. This is a format used for still images.

UDF1.02/1.5/2.0/2.01

Universal Disk Format. These are standard recording and random-access formats developed by the Optical Storage Technology Association.

ZCLV

This stands for Zoned Constant Linear Velocity. It refers to when each of the concentric rings on a disc (such as a DVD-RAM disc or a CD) hold the same amount of data.

3D Digital Noise Reduction

This is a kind of circuitry used in video devices, such as VCRs. It removes “noise” from the signal during playback, so you get a clear, sharp picture.

3D Digital Y/C Separation

This is a kind of circuitry used in certain video devices, such as VCRs. A video signal has two components, the Y component and the C component. This circuitry minimizes the problems caused from these signals interfering with each other.