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ideas for life

AVCCAM
AG-3DA1
Integrated Twin-Lens 3D Camera Recorder

Visit the website for details: <www.panasonic.biz/sav/pass_e>

AVCCAM 3-Year Warranty Repair Program*
* AG-3DA1 users qualify for a 3-year warranty on repairs.
Visit the website for details: <www.panasonic.biz/sav/pass_e>
Another Step Closer to Natural Human Vision

The World’s First* Integrated Twin-Lens 3D Camera Recorder Accelerates 3D Video Production

Real-life 3D images are expected to find widespread application in fields ranging from movies and TV broadcasts to industrial and educational uses. In response to the rapidly growing needs for 3D image production, Panasonic now offers a revolutionary solution: AG-3DA1 the world’s first* integrated twin-lens FULL HD 3D camera recorder. The AG-3DA1 features a camera section with two integrated lens systems that are configured to resemble the human eyes, and a recorder section that records left-channel and right-channel full-HD images using the high-quality PH mode of the file-based AVCHD format. With the same approximate weight and size of a 2D camera recorder, the AG-3DA1 is easy to handle. It’s also quick to operate, as it doesn’t require any adjustment of the left and right lens alignment such as vertical gap, size difference, rotation and luminance difference. The AG-3DA1 frees the user from the kind of complex, cumbersome procedures of a conventional rig-type 3D camera system. Data files recorded onto a memory card are readily processed using a nonlinear editing system. With its excellent mobility, flexibility and low cost operation, the AG-3DA1 opens the door to 3D image production.

* As an integrated twin-lens 3D camera recorder capable of recording full-HD video to its memory card. As of August 2010 (based on our investigations).
Schematic of the AG-3DA1:
The left-channel and right-channel optical sections, image sensors, signal processing circuits and recording section are precisely synchronized. The AG-3DA1 outputs left-eye and right-eye full-HD image signals as simultaneous HD-SDI video and also records to the SD/SDHC memory cards in the AVCHD format.
The high-precision HD twin-lens system allows easy acquisition of natural-looking 3D images.

The Integrated Structure Revolutionizes Mobility for Nimble Camera Work

Conventional rig-type 3D camera systems are large and heavy because they mount two existing cameras onto a robust frame. They also require a separate recording system and power supply unit, which makes the cable connection complex and restricts the location and the type of camera work. As a result, the scenes that can be acquired with a rig-type 3D camera system are limited. The compact body of the AG-3DA1 integrated twin-lens FULL HD 3D camera recorder weighs only 2.4 kg (5.3lb). It offers the same portability and mobility as a conventional 2D camera recorder for flexible image acquisition. The AG-3DA1 enhances camera work for all kinds of 3D image production.

The Twin-Lens System Sets You Free From Complex Camera Adjustments for 3D Images

To achieve natural-looking 3D images, you need to pay close attention to the following key points for left- and right-eye images: (1) Vertical deviation, (2) Angle deviation, (3) Difference in brightness and color, (4) Rotation error, (5) Correct adjustment of the parallax, (6) Appropriate image composition. With a conventional rig-type 3D camera system using two separate cameras, these adjustments have to be made precisely for each and every scene. The two integrated optical systems of the AG-3DA1 eliminate the need for manual adjustments of (1) through (4), because they’re performed entirely inside the camera recorder.* The optical systems are assembled with high precision, and the lenses, image sensors and signal processing circuits for the left and right systems are accurately synchronized (see the diagram on the previous page). The AG-3DA1 lets you concentrate only on the parallax adjustment and image composition.

*Fine adjustments of the vertical position, focus and iris are also possible.
**HD Twin-Lens with No Adjustment for Image Acquisition**

The distance between the two lens axes is approximately the same as the distance between the human eyes, to provide easy-to-view, natural-looking 3D images. The HD twin-lens system is set with a distance of about 60 mm (2.3 inches) between the two lenses. The lens axes, viewing angle, rotation, and gradation are pre-adjusted before the components are precisely assembled. This eliminates the need for lens adjustment before shooting. Camera operations such as focusing, zooming and iris adjustment are also synchronized for the left and right lenses. The new twin HD lenses were designed exclusively for FULL HD 3D image acquisition. They boast low chroma aberration and high resolution, and deliver superb color reproduction, detailed nuances and crisp 3D images even in dark scenes—with minimal flare and ghosting. A built-in 5.6x (approx.) optical zoom function, which extends from 47.1 mm (35 mm equivalent) wide angle to 264 mm (35 mm equivalent) telephoto, covers a wide viewing angle that is well matched to 3D content production.

**Convergence Point Adjustment Function**

The parallax angle between the two lenses is varied inside the optical unit. This moves the convergence point (the reference plane of the 3D image) in a fore-and-aft direction to control the leaping and depth effects of recorded objects, and acquires natural-looking 3D images. The convergence point can be adjusted easily by using the CONV (convergence) dial* while viewing the L/R-MIX image on the LCD monitor.

*The dial function is switchable between CONV (convergence) adjustment and IRIS (iris) adjustment.

**Display Functions Assist 3D Image Acquisition**

The LCD monitor and viewfinder of the AG-3DA1 both display a variety of information to assist 3D image shooting and ensure superb 3D effects.

- **3D Guide:** This displays numerical values for the distance range of the subject to achieve better 3D effects while viewing. Natural-looking 3D images can be captured by using the displayed information as a guide. This function offers two modes: Guide Display 1 mode assumes playback on screens that are 196 cm/77 inches or smaller, and Guide Display 2 mode is designed for a screen size of 508 cm/200 inches.
- **Convergence Point:** This displays the numerical value of the convergence point together with the 3D Guide to assist adjustments.
- **L/R-MIX Monitor Image Selector:** The image display on the LCD monitor and viewfinder can be selected from three modes: Left Lens (no mode indication), Right Lens (R-IMAGE) and Left/Right Mix (MIX).

*When the subject is located outside the distance range indicated by the 3D Guide, it may result in a double image or an unnatural image without proper 3D effects.

**Dual 3MOS for High-Quality FULL HD 3D Images**

The AG-3DA1 is equipped with two 1/4.1 type 2.07-megapixel (approx.) 3MOS units for left- and right-eye images. Full-pixel full-HD left- and right-eye images are accurately synchronized to create FULL HD 3D images.
6-Mode Gamma includes "Cine-like" mode
Drawing on technologies developed for the VariCam, Panasonic has equipped the AG-3DA1 with advanced gamma functions that address six different shooting scenarios and enhance your creative abilities.

AG-3DA1 Gamma Modes
- **HD NORM**: Suitable for HD recording
- **LOW**: Works to flatten out a high contrast scene
- **HIGH**: Expands the tone of dark parts and makes a brighter image the contrast softens
- **B.PRESS**: Makes the contrast sharper than LOW
- **CINE-LIKE D**: The Cine-Like mode shifted to prioritize dynamic range
- **CINE-LIKE V**: The Cine-Like mode shifted to prioritize contrast

Advanced Image Adjustments Built-In
- **Matrix Tables**: Enable quicker color settings for each scene, with three modes: NORM1, NORM2 and CINE-LIKE.
- **Knee point settings**: Low, Mid and High
- **Adjustable H detail level, V detail level, and detail coring
- **Adjustable chroma level, chroma phase, color temp and master pedestal

High Image Quality Color Viewfinder and LCD
The AG-3DA1’s color EVF uses a 1.14 cm/0.45 inches approx. 1,226,000 dots-equivalent (852 x 480 x 3 [RGB]) LCOS (liquid crystal on silicon) display panel. This system delivers bright, detailed, high-resolution images and a high response speed. The AG-3DA1’s LCD monitor is a 8.13 cm/3.2 inches panel with a 16:9 aspect ratio. With approx. 921,000 dots (1920 x 480), it boasts high resolution.

Focus Assist Functions
The AG-3DA1 has a focus ring for manual focusing, much like a conventional 2D camera recorder. As a focus assist function, a focus bar is displayed on the LCD monitor and viewfinder. The AG-3DA1 also features a PUSH AUTO button that temporarily activates the auto focus function.

Simplified Waveform and Vectorscope Display
The AG-3DA1 has waveform and vectorscope display functions of the captured video signal on the LCD monitor.
* for only Left channel signal in camera mode.
Two User Buttons
The AG-3A1 allows four functions (listed below) to be assigned to two user buttons. Assigned functions can be accessed at the touch of a button.

Assignable Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-IMAGE</td>
<td>Displays the right-eye image on the LCD monitor and viewfinder.</td>
</tr>
<tr>
<td>MIX</td>
<td>Overlays the left-eye image and right-eye image on the LCD monitor and viewfinder.</td>
</tr>
<tr>
<td>SHOT MARK</td>
<td>Records a shot mark.</td>
</tr>
<tr>
<td>INH</td>
<td>Pressing this button does not activate any function.</td>
</tr>
</tbody>
</table>

Other Professional Camera Features

- **White balance**: Two memories (A/B) and Preset (3200K or 5600K).
- **Mode check**: Displays a list of the camera settings on the viewfinder and monitor.
- **Zebra**: Select any two levels from among 50% to 105%.
- **Color bar and 1 kHz test-tone output**.
- **Tally lamps**: Provided on the unit’s front and rear.

Superb Mobility for Low-Angle Shots
Lightweight camera body weighs 2.4 kg (5.3 lb.) approximately. The upper part of the handle grip contains both the Rec Start/Stop button and a lens zoom control (with three speeds). This design assures easy shooting even at low angles. The excellent mobility of the AG-3DA1 allows flexible camera angles that are not possible with other 3D cameras.
File-Based Recording to Two Memory Cards
Using the two Left/Right memory card slots, the AG-3DA1 records left-channel and right-channel full-HD images simultaneously to two SD/SDHC Memory Cards. The solid-state memory card ensures high reliability and withstands operating temperatures of –25°C to 85°C (–13°F to 185°F). This enables use in harsh temperatures and fluctuating humidity. It is also free of dropouts and head clogging. With memory cards, there is no need to search for a blank space to record. Data is automatically recorded in an available space. This eliminates accidental overwriting of existing data. After shooting, recorded clips can be previewed or deleted immediately. After recording, data can be uploaded to editing software without digitizing. SD/SDHC Memory Cards are inexpensive and can be easily purchased in local markets.

* Use SDHC/SD Memory Cards of Class 4 or higher. SDXC cards cannot be used.

AVCHD PH Mode for FULL HD 3D Recording
The AG-3DA1 records in AVCHD PH mode, based on MPEG-4 AVC/H.264 High Profile, which is the latest video compression technology. With more than twice the compression efficiency of MPEG-2 (such as in HDV), AVCHD provides both high image quality and a low data rate. PH mode was developed by Panasonic exclusively for AVCCAM professional video production. Boasting 24 Mbps (average: 21 Mbps), which is the maximum bit rate for the AVCHD format, the AG-3DA1 records 1920 x 1080 full-pixel HD images. The multi-slice feature of the PH mode also helps to speed up processing by nonlinear editors that are equipped with multi-core CPUs, by using parallel processing to take full advantage of the CPU power.

Sample comparison: When a flash causes large contrast differences and reduces correlation of consecutive image, HDV shows considerable block noise, while AVCHD in the PH mode minimize break-up.

Comparison of HD Recording Formats

<table>
<thead>
<tr>
<th></th>
<th>HDV</th>
<th>AVCHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pixel (H x V)</td>
<td>1440 x 1080</td>
<td>1920 x 1080</td>
</tr>
<tr>
<td>Compression Method</td>
<td>MPEG-2</td>
<td>MPEG-4 AVC/H.264</td>
</tr>
</tbody>
</table>

HD Multi-format Recording
Multi-format HD recording in the AG-3DA1 responds to a host of 3D content production needs and worldwide applications. It supports the following HD video formats. The maximum recording time is approximately 180 minutes in each mode (when two 32 GB SDHC cards are mounted in the Left/Right slots).

AG-3DA1 series Recording Format

* 59.94Hz mode:
  - 1080/60i, 1080/30p (over 60i), 1080/24p (native*), 720/60p
* 50Hz mode:
  - 1080/50i, 1080/25p (over 50i), 720/50p

* In Native mode, the AG-3DA1 records only active frames.
**Versatile Solid-State Recording Functions**

- Thumbnail View for easy playback or deletion of clips displayed on the LCD monitor
- Shot mark: Allows convenient OK and NG marking, and can be added to each clip during or after recording.
- Rec check: You can check the end of the most recently recorded clip with one-touch ease.

**Clip Metadata Function**

You can create a metadata upload file (produced with AVCCAM Viewer software) containing information such as clip name, the name of the camera operator, the recording location, and text memos on an SD/SDHC card, and load it as clip metadata. This information will be very useful when it comes to editing the project and quickly finding the right clip to place on the timeline.

**Professional-Level Audio Input**

The AG-3DA1 is equipped with two audio input channels for digital audio (Dolby Digital) recording. The AG-3DA1 also comes equipped with a built-in stereo microphone and with XLR-type audio input terminals (2 channels, mic/line switchable, 48 V compatible) on the rear panel. You can switch audio channels 1 and 2 separately to either line or front mic input. Large level adjustment dials are easy to operate and offer high visibility.

**SMPTE Time Code Generator/Reader**

The built-in SMPTE time-code generator/reader lets you select the Drop Frame/Non-Drop Frame and Free Run/Rec Run modes, preset and regenerate. User bits are also provided.

**HD SDI Simultaneous Output with Sync-Rec Function**

HD SDI Left/Right terminals on the AG-3DA1 allow camera-through or playback left-channel/right-channel FULL HD 3D image output (simultaneous). This enables 3D images to be monitored on a BT-3DL2550 3D Video Monitor. When the external recorders/recorder are/is connected, line recording of camera-through FULL HD 3D video signals is also possible.

**HDMI 1.4a Output**

The AG-3DA1 features an HDMI 1.4a output terminal*1 that outputs FULL HD 3D video signals for viewing on 3D VIERA and Panasonic 3D plasma displays.*2 This terminal outputs camera-through signals or left-channel/right-channel FULL HD 3D playback signals.

1: HDMI output and HD SDI output cannot be used simultaneously.

**3D Compatible Camera Remote**

The camera remote terminal allows remote adjustment of the convergence point in addition to the focus, iris, zoom and REC start/stop.
3D SYSTEM WORKFLOW
System workflow for 3D recording and editing with the AG-3DA1, and peripheral equipment

3D Acquisition System
Connecting the BT-3DL2550 3D LCD Video Monitor via HD SDI Dual-Link lets you view the stereo image so that you may adjust the 3D image to create the effect you want by varying the focus and convergence point.

3D Content Editing System
3D video data recorded by the AG-3DA1 can be edited by a computer-based (Windows/Mac), low-cost nonlinear editing system installed with a 3D editor plug-in (third-party software, sold separately)* that supports existing AVCHD-compatible video editing. The use of files allows easy ingestion to a computer, much in the same way as in ordinary 2D image editing. The addition of the 3D plug-in also lets you adjust the 3D images. This plug-in produces a DVI-D video output so that images can be viewed and checked using the BT-3DL2550. Editing results can be saved in an external storage unit for handover to the subsequent process (MA/Blu-ray and checked using the BT-3DL2550. Editing results can be saved in an external storage unit for handover to the subsequent process (MA/Blu-ray and checked using the BT-3DL2550. Editing results can be saved in an external storage unit for handover to the subsequent process (MA/Blu-ray and checked using the BT-3DL2550. Editing results can be saved in an external storage unit for handover to the subsequent process (MA/Blu-ray.

File Operation with Windows® PC or Mac®

AVCCAM Viewer
Viewing Software for AVCHD files (download free*, not compatible with 3D files)
AVCCAM Viewer for Windows PC/Mac*2 makes it easy to preview AVCCAM files. Files can be played from an SD Memory Card, Blu-ray Disc, or hard disk, and saved to a PC (hard disk) from an SD Memory Card or Blu-ray Disc. Files can also be copied to an SD Memory Card or Blu-ray Disc*3 or deleted and meta data can be displayed.

AVCCAM Viewer System Requirement
[for Windows PC] • CPU: Intel® Core™2 Duo (2.4 GHz or faster) • OS: Microsoft® Windows® 7 (32bit), Windows Vista® Business (32bit), Windows XP SP2 or later (32bit) • RAM: 1GB or more (2GB or more recommended)
[for Mac] • CPU: Intel® Core™2 Duo 2.6 GHz or faster • OS: Mac OS X 10.6 (Snow Leopard), 10.5 (Leopard) or 10.4 (Tiger) • RAM: 1024 MB or more (2048 MB or more recommended)

*1: AVCCAM Viewer software can be downloaded for free from the following Panasonic website. PASS registration is required. For details, please visit the following website and click on “Support and Downloading Information.” <https://eww.pavc.panasonic.co.jp/pro-av/support/desk/e/download.htm>
*2: The software does not support 3D playback, 3D BD production or simultaneous management of two SD Memory Cards. Use the software individually for the left and right channels.
*3: Copying and playing data on Blu-ray Discs (BD-RE Ver 3.0) are not supported by Mac OS X 10.4 (Tiger). Do not insert a disc [DVD (AVCHD)] produced with the provided HD Writer 2.5E software into a device that does not support the AVCHD standard. If it is inserted into such a device, the disc may not eject. Also, do not play the disc with a device that does not support the AVCHD standard.

AVCCAM Restorer
HD Content File Restore Software (supplied with CD-ROM®)
AVCCAM Restorer software can also be used to restore files that were damaged, for example, by a power interruption during recording. This software also provides a repair function for 3D data files.

AVCCAM Restorer System Requirement
[for Windows PC] • CPU: Intel® Pentium® III 1.0 GHz or faster • OS: Microsoft® Windows7 (32bit), Windows Vista® SP1 or later (32bit), Windows XP SP2 or later (32bit) • RAM: 1GB or more (2GB or more recommended)
[for Mac] • CPU: Intel® Core™2 Duo 2.0 GHz or faster • OS: Mac OS X 10.6 (Snow Leopard), 10.5 (Leopard) or 10.4 (Tiger) • RAM: 1024 MB or more (2048 MB or more recommended)

*1: AVCCAM Restorer is included in the supplied CD-ROM. This software can also be downloaded free. For details, please visit the following website and click on “Support and Downloading Information.” <https://eww.pavc.panasonic.co.jp/pro-av/support/desk/e/download.htm>
[GENERAL]
Power Supply: DC 7.2 V (when the battery is used) / 7.9 V (when the AC adapter is used)
Power Consumption: 17 W (recording)
Operating Temperature: 0°C to 40°C (32 °F to 104 °F)
Operating Humidity: 10% to 80% (No condensation)
Weight: Approx. 2.4 kg (5.3 lb) (excluding battery)
Dimensions (W x H x D): 158 mm x 187 mm x 474 mm, excluding the projecting part (6-1/4 inches x 7-3/8 inches x 18-11/16 inches)

[OPTICAL SYSTEM]
Shutter Speed [set to 59.9 Hz]:
(Preset) 1/60 sec., 1/100 sec., 1/120 sec., 1/250 sec.
(30p mode) 1/30 sec., 1/60 sec., 1/120 sec., 1/250 sec.
60i, 60p mode: 1/60 sec. to 1/250 sec.
60p mode: 1/60 sec. to 1/250 sec.
30p mode: 1/30 sec. to 1/250 sec.
(35 mm equivalent: 23.5 mm)
[set to 50 Hz]:
60i, 60p mode: 1/50 sec., 1/60 sec., 1/120 sec., 1/250 sec.
60p mode: 1/60 sec. to 1/250 sec.
60i, 60p mode: 1/60 sec. to 1/250 sec.
(30p mode) 1/30 sec. to 1/250 sec.
(30p mode) 1/30 sec. to 1/250 sec.

[Video Output]
HDMI Output: HDMI type A connector x 1, HDMI ver 1.4a Standard
(set to 59.94 Hz): 1080/60i*, 1080/24p*, 720/60p*, 720/24p*
(set to 50 Hz):
1080/50i (Frame Packing)
1080/50p (Frame Packing)
1080/50i, 1080/50p, 720/60p*
HD SDI Output: [set to 59.94 Hz]: BNC × 2 (HD SDI 1/2 for L/R), 0.8 V [p-p], 75 Ω
(set to 50 Hz): 1080/60i*, 1080/24p*, 720/60p*

[Audio System]
Compression Method: Recording/playback: Dolby Digital/2 channels
Sampling Frequency: 48 kHz
Quantization: 16 bit
Compressed Bit-Rate: PH mode: 384 kbps

[Audio Input/Output]
Internal Microphone: Stereo Microphone
XLR Input: XLR 3-pin x 2 (INPUT 1, INPUT 2), High Impedance LINE: 0 dBu, MIC: –50 dBu–60 dBu (selectable in menu)
HDMI Output: 2 channels (Linear PCM)
Headphone output: stereo mini jack (3.5 mm diameter) x 1
Built-in Speaker: 20 mm (round) x 1

[Other Input/Output]
Camera Remote: Super mini jack (3.5 mm diameter) x 1 (ZOOM, REC S/S)

[Monitor]
LCD monitor: 81.3 mm (3.2 inches), approx. 921,000 pixels, 16:9
Viewfinder: 11.4 mm (0.45 inches), approx. 1,226,000 pixels, 16:9

[Standard Accessories]
Accessories: AC adapter with AC power supply cable, Battery (5400 mAh x 1), Battery charger with AC power supply cable, Microphone holder with adapter and screws, Eye cup, Lens cap, Input terminal cover x 2, Screw spacer, CD-ROM (contents repair software)

*1: SD/SDHC Memory card (8MB to 32GB) can be used for recording metadata. Use an SD/SDHC Memory Card of class 4 or above when recording. The SDXC card cannot be used.
*2: 24p=23.98p, 30p=29.97p, 60p=59.94p and 60i=59.94i
*3: In the Native mode, AG-3DA1 record only active frames.

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

**Options**

**CGA-D54**
Battery Pack
- 7.2 V, 5,400 mAh

**AG-MC200G**
XLR Microphone
- Sensitivity: -40 dB ±3.5 dB (0dB=1V/Pa, at 1kHz)
- Maximum Input level: 127 dB (1000Hz, Distortion within 1%)
- SNR: More than 69 dB

**RP-SDW32G/ RP-SDW16G**
SDHC Memory Card

*These options are not available in some areas.*
**P2 Asset Support System**  The member’s service program

Providing valuable information when you need it

P2 Asset Support System assists you in AVCCAM use by providing extended warranty repair & various technical information (update notices, operation guides, etc.) upon registration.

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### Free registration, no membership fees

#### 3-year extended warranty repair program

Exclusive offer for AVCCAM!

Maximum 3-year extended warranty repair is applied for AVCCAM models after registration. Several other services are also provided to members.

<table>
<thead>
<tr>
<th>Year</th>
<th>Warranty Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>Basic warranty*</td>
</tr>
<tr>
<td>2nd year</td>
<td>AVCCAM Extended warranty repair**</td>
</tr>
<tr>
<td>3rd year</td>
<td>AVCCAM Extended warranty repair**</td>
</tr>
</tbody>
</table>

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### Latest news only for you

In the member’s website, information is selected and presented for your models. To be alerted to new firmware information and other releases, an email newsletter can be subscribed to.

### Document library

You can browse through and find various technical information (operation guides, technical descriptions, etc.) quickly from the library.

### Manage your equipment

You can easily view the update status and past service history of each unit, and can leave comments in free text as memos about your equipment.

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* Not all models are eligible for extended warranty coverage.
* Please note that this extended warranty is not available in some countries/regions. See the website below for details.
**: The basic warranty period may vary depending on the country/region. See the enclosed warranty card for warranty coverage.
* Not all repair work is covered by this extended warranty. See the enclosed warranty card for warranty coverage. The maximum warranty period may be adjusted depending on the number of hours the device has been used.

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Details and user registration: [http://panasonic.biz/sav/pass_e](http://panasonic.biz/sav/pass_e)

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Please refer to the latest 3D Product Information on the Panasonic website.

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http://pro-av.panasonic.net/en/3d

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Please refer to the latest 3D Product Information on the Panasonic website.