Panasonic
ideas for life

Professional 3D Production Systems

April 2010

3D PROFESSIONAL™

Panasonic's Professional 3D Production Systems Open a New 3D Era

Panasonic's Total 3D Solution for Next-generation 3D Production Environments

In response to the growing need for 3D image production, Panasonic offers a high-quality 3D production solution by drawing on our expertise in all facets of visual technology, ranging from professional cameras and authoring to display systems. Our integrated twin-lens 3D camera recorder combines excellent flexibility, portability and operating ease, and eliminates many of the time-consuming processes that are common to conventional Rig-type 3D camera production.
It also ushers in a revolutionary file-based 3D image production workflow. With its improved efficiency, the Panasonic 3D camera recorder saves both time and cost for use in more creative activities.

Panasonic also supports high-quality 3D image packaging. The Panasonic Hollywood Laboratory's Blu-ray 3D™ authoring service replicates 3D content.

And Panasonic offers a wide range of 3D display systems to suit various applications, including a 3D plasma display*1 for use in digital signage and presentations, and 3D projection systems for use in larger screen. By offering a total 3D solution and a FULL HD 3D Home Theater System configured with a FULL HD 3D Blu-ray Disc™ Player and FULL HD 3D Plasma TV that are already in commercial production, Panasonic is bringing exciting 3D experiences to more people than ever.

*1: Scheduled for release (as of April 2010)

3D™

PROFESSIONAL

AG-3DA1
Integrated Twin-lens
3D Camera Recorder

PROFESSIO

〈 In schools, public facilities, event halls, etc. 〉

Panasonic provides 3D plasma display and 3D projection systems for displays of large 3D images.

3D Plasma Display

3D Projection Systems

FULL HD 3D Home Theater System

〈 For homes 〉

Panasonic FULL HD 3D TVs use a plasma panel with self-illuminating pixels to bring stunning FULL HD 3D images to viewers at home.

Panasonic Disc Manufacturing Corporation of America (PDMC)

Blu-ray Disc™

Blu-ray 3D™ authoring

By maximizing the know-how that we have accumulated with the establishment of the Blu-ray 3D™ standard and the development of a unique encoding system, Panasonic offers a high-quality 3D authoring service for replicating 3D images.

Panasonic Hollywood Laboratory Advanced Authoring Center

3D Broadcasting

3D Editing

Panasonic plans to release a professional, 3D plasma display that delivers high-quality 3D images for use in color grading and image quality management for 3D LCD video monitors. In the area of 3D editing, Panasonic also actively collaborates with manufacturers of nonlinear editing systems and software.

NAL **3D** PRODUCTION SYSTEMS

The world's first*2 AG-3DA1 integrated twin-lens 3D camera recorder, which was developed with proprietary Panasonic technologies, provides a simple solution for high-quality 3D video production. Panasonic also offers the AG-HMX100 3D Compatible Digital AV Mixer for switching signals from 3D cameras and the BT-3DL2550 Professional 3D LCD Video Monitor for on-site checking of captured 3D images in order to respond to diverse 3D production needs.

BT-3DL2550
Professional 3D
LCD Video Monitor

AG-HMX100
3D Compatible
Digital AV Mixer

*2: As an integrated twin-lens 3D camera recorder capable of recording full-HD video to its memory card. As of April 2010 (based on our investigations).

AG-3DA1 < Available in this September >

Integrated Twin-lens 3D Camera Recorder

The World's First*1 Integrated Twin-lens FULL HD 3D Camera Recorder. File-Based Recording for Efficient FULL HD 3D Production

AVCCAM

- The twin-lens system lets you adjust the convergence point for recording 3D images with natural-looking depth.
- The two independent optical systems add flexibility to expressive 3D image recording.
- Automatic correction of left-eye/right-eye image deviation within the camera.
- Equipped with two 1/4.1-inch Approx. 2.07 megapixels MOS units for left-eye and right-eye images.
- The recording system uses AVCHD Pro high-image-quality PH mode. Full-HD left-eye and right-eye images are recorded in sync onto two SDHC Memory Cards.
- Switchable 59.94Hz/50Hz for worldwide recording capability.

Recording Format	When set to 59.94 Hz	When set to 50 Hz
1080	1080/59.94i, 1080/29.97p, 1080/23.98p (Native)	1080/50i, 1080/25p
720	720/59.94p	720/50p

* In the Native mode, AG-3DA1 records only active frames.

- The lenses, camera head and recorder section are integrated into a compact body. Unlike a conventional rig-type 3D camera system, this model brings excellent flexibility and mobility to FULL HD 3D recording.
- Lightweight camera body weighs less than 2.8 kg (Approx. 6.17 lb.) for excellent mobility.
- Equipped with a 3.2-inch (16:9) side-mounted LCD monitor with approx. 921,000 dots. Lch/Rch/overlay switchable display.
- Equipped with HDMI 1.4 (frame and field sequential output) in addition to HD-SDI (x2, simultaneous).
- Built-in Stereo microphone.
- Provided with an XLR Audio input terminal for line recording in halls, studios, etc.
- Equipped with remote terminal for focus iris, zoom, REC start/stop, and convergence point.
- Auto REC function for control of REC start/stop of an external recorder connected by SDI.

*1: As an integrated twin-lens 3D camera recorder capable of recording full-HD video to its memory card. As of April 2010 (based on our investigations).

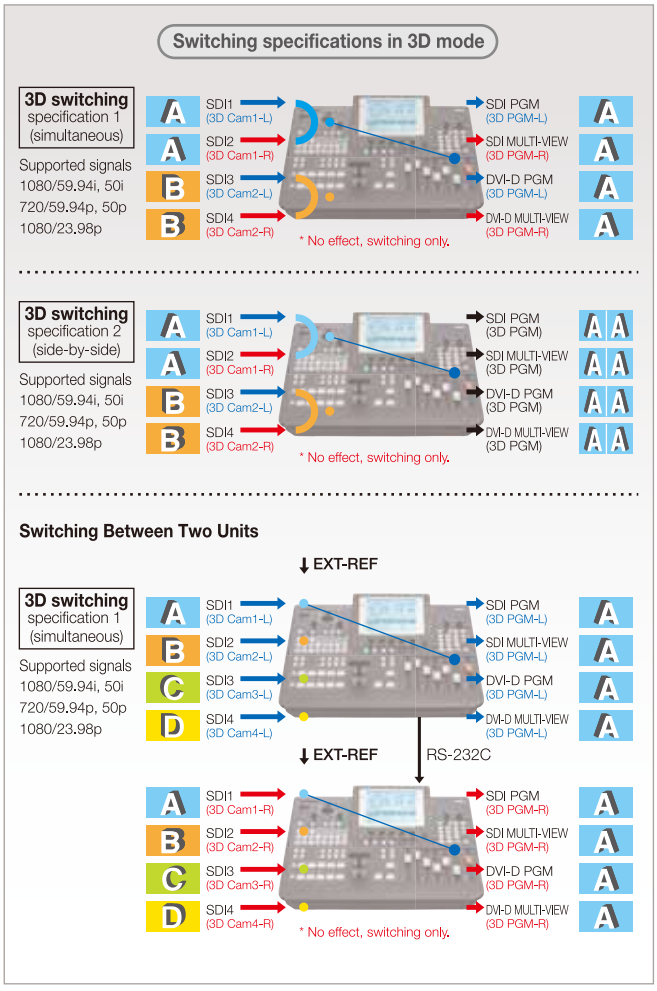
AG-HMX100 < Coming soon >

Digital AV Mixer

Switchable 3D Camera Images for Low-cost HD Production

- Simplified switching function*2 for dual-SDI images from 3D cameras.
- Can be used to configure a 3D live switching system by combining with multiple 3D cameras and 3D projection systems.
- Supports two types of 3D video output: Simultaneous and side-by-side.

*2: Swiching of images only. Effects not supported.



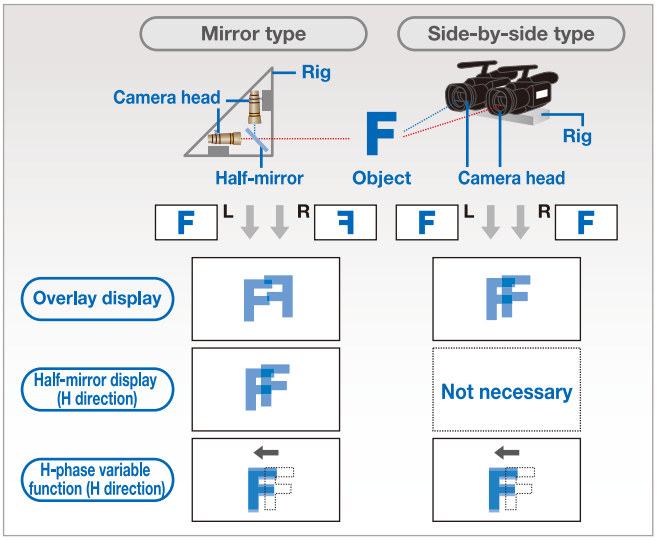
BT-3DL2550 < Available in this September >

3D LCD Video Monitor

Complete Functions and Interfaces for Broadcast and Professional Use Support 3D Production

Two BT-PGL10G polarized glasses supplied with the product.

- 25.5-inch LCD panel with wide color gamut and 10-bit 3D LUT (Look Up Table) for faithful color reproduction.
- Uses Xpol® polarized filters.*3
- This product offers to supports dual SDI input. For displaying images directly from a 3D camera.
- Supports three types of 3D video input: Simultaneous (dual SDI), line-by-line and side-by-side.
- Equipped with special display functions for adjusting images from a rig-type 3D camera system.



- Equipped with functions and interfaces necessary for broadcasting use.
  - · Equipped with a calibration function.
  - · Split-screen (Two windows) function are equipped.
  - · High-quality image processing achieved by an I/P conversion circuit with a delay of less than 1 field, diagonal line correction, high-speed moving picture response and others.
  - · Various markers, crosshatch pattern display, blue-only display.
  - · Time code display with HD-SDI input.
  - · RS-232C and GPI remote.

*3: Xpol® is a registered trademark of Arisawa Manufacturing Co., Ltd.
This system requires circularly-polarized glasses.

3D Plasma Display

< Scheduled for release >

3D images can be displayed and checked on a large screen.

- Full-HD signals for each eye - frame sequential technology, which produces high-quality 3D images, is used.
- Clear, detailed 3D images are achieved by a crosstalk reduction technology developed by Panasonic.
- HDMI 1.4 compatible.

DLP™ Projector

3D Projection Systems

For Displaying Bright, High-contrast 3D Video at Large Events

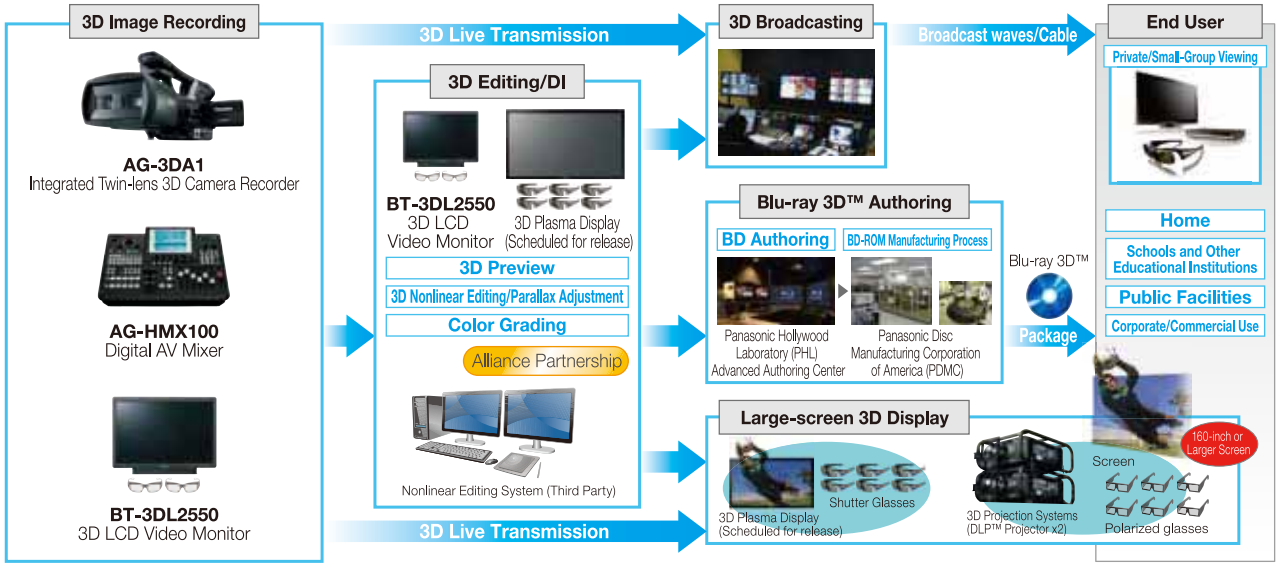
Projection system configuration example

- The 3-chip DLP™-system projectors achive high brightness of 12,000 lm and high contrast of 5,000:1, and are compatible with WUXGA Real for full-HD display.
- Uses two DLP™ projectors for left-eye and right-eye images to ensure high brightness and contrast even on a screen larger than 150 inches.

* This system uses polarized glasses.

System Applications for Professional 3D Production

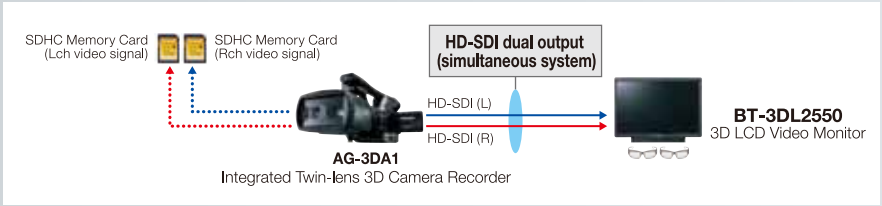
From Shooting to Editing, Broadcasting, Authorizing and Home Viewing Panasonic's 3D Solution Does It All



3D Acquisition System

● 3D Recording with 3D Camera/P2 Mobile

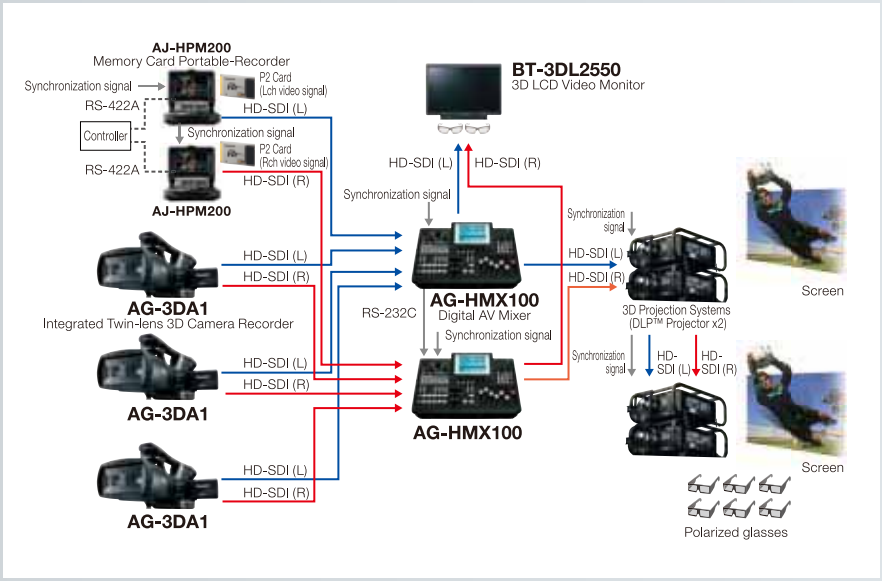
Connecting the BT-3DL2550 to the AG-3DA1 lets you adjust the 3D and other effects by varying the convergence point while viewing the adjustment results in real time on the image being recorded.



Display/Recording System with 3D Cameras for Live Events

● Display Live Events with 3D Camera/ P2 Mobile Switching

The AG-HMX100 can switch signals (dual SDI, simultaneous system) from two 3D cameras and output both dual HD-SDI (L/R) and DVI-D (L/R) 3D video signals as PGM. For example, when using a high-brightness, high-contrast 3D projection system with two professional DLP™ projectors, dynamic live images can be projected in 3D onto large screens. With the AG-HMX100, the shutter and power ON/OFF of the professional projectors can be remotely controlled. By connecting the BT-3DL2550, PGM video can be monitored. Also, by connecting two AG-HMX100 units, up to four inputs of 3D video signals (dual HD-SDI) can be switched, and a maximum of four PGM outputs can be generated for a dynamic, large-scale 3D image presentation.

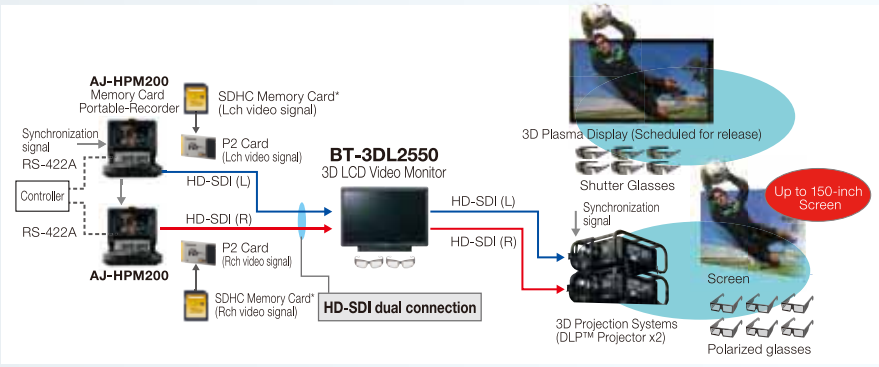


3D Content Display System

Displaying Events in 3D Using a P2 Mobile

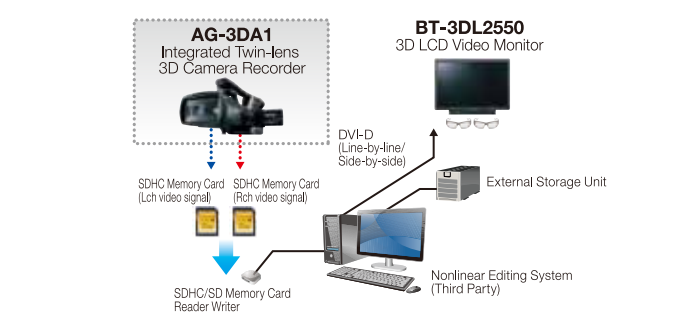
A 3D video transmission system can be configured with two AJ-HPM200 units. Since the AJ-HPM200 can load AVCHD files, it can convert video data (AVCHD files)* recorded by the AG-3DA1 to P2 files for use as source material. The operator can view 3D images using the BT-3DL2550. We also feature 3D plasma display (Scheduled for release) that uses the Frame Sequential technology and displays high-quality, FULL HD 3D images. For larger-screen needs, Panasonic provides FULL HD 3D projection systems with high-brightness, high-contrast DLP™ projectors.

* AVCHD data on an SDHC Memory Card cannot be directly played.

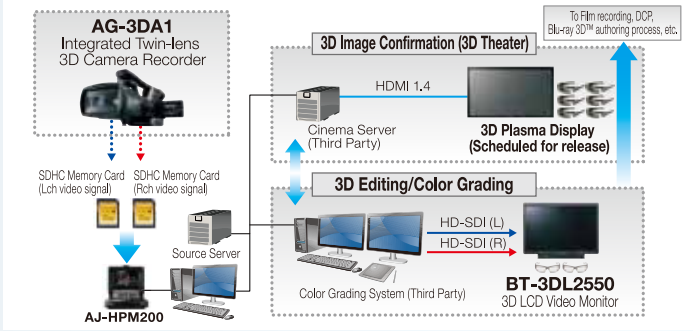


3D Content Editing

3D Editing



3D video data recorded by the AG-3DA1 can be edited easily and at low cost editing system and a computer (Windows PC/Mac) installed with a 3D editor plug-in (third-party software, sold separately)*1 that supports existing AVCHD-compatible video editing software.*2 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.



The production of 3D content with higher quality is made possible by converting images from AVCHD to P2HD (AVC-Intra 100, P2 files) with the AJ-HPM200. This enables high-speed ingestion*3 to a source server or 3D video editing/color grading system through an external P2 drive, thus providing a highly efficient, file-based DI environment. The 3D images can be checked by using the BT-3DL2550. Panasonic also plans to release a professional, 3D plasma display, now under development, that will let you view 3D images on its large screen.

Panasonic Hollywood Laboratory's High-Quality Blu-ray 3D™ Authoring Service

The Advanced Authoring Center was recently established inside the Panasonic Hollywood Laboratory (PHL), which is a video research facility located in Universal City, California. The center has been conducting film-to-digital conversion, compression and authoring of image data for Blu-ray Disc™ and DVD, and research and development related to video enhancing technologies. By maximizing the know-how accumulated in the establishment of the Blu-ray 3D™ standard and the development of an innovative encoding system, the Advanced Authoring Center offers a high-quality 3D authoring service that prevents color degradation.

Blu-ray encoding room used for high-resolution compression of 3D image data.

A system that allows interactive title/menu production.

Numerous verifying processes for image and sound quality.

Production of test discs.

*1: Panasonic does not guarantee proper operation of third-party plug-ins. Also, the operating conditions recommended by each plug-in software manufacturer must be satisfied. *2: The operating conditions recommended by each software manufacturer must be satisfied. *3: The provided P2 driver software must be installed in the computer in order to recognize, copy and transfer P2 files. The driver must also be installed even when using a PC card slot or when handling P2 files stored on an HDD such as P2 Store. The P2 driver supports Windows Vista®, Windows® XP and Mac OS X. For operating conditions and other details, refer to the P2 driver installation manual. The P2 driver and P2 driver installation manual can be downloaded for free. For details, please visit the following website "P2 Support & Download Information". < For US Customer: www.panasonic.com/broadcast > < For Outside US: http://panasonic.biz/sav/pass_e >

Specifications/Options

AG-3DA1 Specifications (Tentative)

[GENERAL]	
Power Supply:	DC7.2 V (using with battery), 7.9 V (using with AC adapter)
Power Consumption:	19 W or less (when recording)
Operating Temperature:	0 ℃ to 40 ℃ (32 ℉ to 104 ℉)
Operating Humidity:	10 % to 80 % (No condensation)
Weight:	Approx. 2.8 kg max. (Approx. 6.17 lb.) excluding battery and standard accessories
Dimensions (W x H x D):	158 x 187 x 474 mm (6.22 x 7.36 x 18.66 inches) excluding the projection

[CAMERA]	
Pick-up Device:	3MOS (1/4.1-inch progressive modes supported) x2
Picture Elements:	Effective: (Approx. 2.07 megapixels x3 (16:9)) x2
Lens:	TBD
Optical Color Separation:	Prism system
Standard distance adjustment range:	Approx. 2.2 m to ∞
Minimum Shooting Distance:	TBD
Gain Selection:	0 dB to +24 dB (Variable in 1-dB steps)
White balance:	preset 3200 K, preset 5600 K, Ach, Bch
Shutter Speed: (Preset)	[59.94 Hz] 60i/60p mode: 1/60 sec. to 1/250 sec. (4 steps) 30p mode: 1/30 sec. to 1/250 sec. (5 steps) 24p mode: 1/24 sec. to 1/250 sec. (5 steps) [50 Hz] 50i/50p mode: 1/50 sec. to 1/250 sec. (4 steps) 25p mode: 1/25 sec. to 1/250 sec. (5 steps)
Shutter Speed: (Synchro Scan)	[59.94 Hz] 60i/60p mode: 1/60.0 sec. to 1/250.0 sec. 30p mode: 1/30.0 sec. to 1/250.0 sec. 24p mode: 1/24.0 sec. to 1/250.0 sec. [50 Hz] 50i/50p mode: 1/50.0 sec. to 1/250.0 sec. 25p mode: 1/25.0 sec. to 1/250.0 sec.

[Video Recording]	
Recording Format:	AVCHD
Compression Method:	MPEG-4 AVC/H.264
Recording Media*1:	SD Memory Card : 512MB, 1GB, 2GB (FAT12, FAT16) SDHC Memory Card : 4GB, 6GB, 8GB, 12GB, 16GB, 32GB (FAT32)
Recording Video Format:	[59.94 Hz] PH mode: 1080/59.94i, 1080/29.97p (over 59.94i), 1080/23.98p (Native)*2, 720/59.94p [50 Hz] PH mode: 1080/50i, 1080/25p (over 50i), 720/50p
Transmission Rate:	PH mode: Approx. 21 Mbps
SD Memory Card Slot:	L/R 2 Slot
SD Memory Card:	Max. recordable clips per card: 200 (after formatting, without removing/inserting the card) Max. playable clips: 200 (up to 200 clips displayed)
Thumbnail View:	Selectable from 8 clips/page
Editing Functions:	Delete, write-protect
Formatting Function:	Yes

[Video System]	
HDMI Output:	HDMI x1 (HDMI Type A terminal) [59.94 Hz] 1080/59.94i (Field Packing), 1080/23.98p (Frame Packing), 720/59.94p (Frame Packing), 1080/59.94i, 720/59.94p, 480/59.94p [50 Hz] 1080/50i (Field Packing), 720/50p (Frame Packing), 1080/50i, 720/50p, 576/50p (Not compatible with VIERA Link)
HD SDI 1 (L) Output:	BNC x1, 0.8Vp-p, 75Ω [59.94 Hz] 1080/59.94i, 1080/23.98PsF, 720/59.94p [50 Hz] 1080/50i, 720/50p
HD SDI 2 (R) Output:	BNC x1, 0.8Vp-p, 75Ω [59.94 Hz] 1080/59.94i, 1080/23.98PsF, 720/59.94p [50 Hz] 1080/50i, 720/50p

[Audio System]	
Compression Method:	Recording/Playback: Dolby Digital/2 ch
Sampling Frequency:	48 kHz
Quantization:	16 bit
Compression Bit-rate:	PH mode: 384 kbps

[Audio IN/OUT]	
Internal Microphone:	Stereo microphone
XLR Input:	XLR (3pin) x2 (INPUT1, INPUT2) Input high impedance LINE: 0dB MIC: -50/-60dB (Selectable from menu)
HDMI Output:	2 ch (Linear PCM)
Headphone:	Stereo mini jack (3.5 mm diameter) x1
Built-in Speaker:	20 mm (round)

[Other Connectors]	
Camera Remote:	Super mini jack (2.5mm diameter) x 1, for zoom and rec start/stop operations Mini jack (3.5mm diameter) x 1, for focus and iris controls Super mini jack (2.5mm diameter) x 1, for conv

[Monitor]	
LCD Monitor:	3.2 inches, wide LCD color monitor, Approx. 921,000 dots
Viewfinder:	0.45 inches, wide LCOS color viewfinder, Approx. 1,226,000 dots-equivalent

*1: SDHC/SD Memory Card (8MB to 32GB) can be used for storing/reading scene file and user file, and reading metadata.

*2: In the Native mode, AG-3DA1 records only active frames.

AG-3DA1 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%)
- S/N: More than 69 dB

RP-SDW32G
RP-SDW16G

SDHC Memory Card

* These options are not available in some areas.

AG-HMX100 Specifications (Tentative)

Power Supply:	AC: 100 V-240 V 50/60Hz
Power Consumption:	60 W
Dimensions (W x H x D):	424 x 197 x 400 mm (16.7 x 7.8 x 15.8 inches)
Weight:	Approx. 8.7 kg (Approx. 19.2 lb.)
System Format:	HD: 1080/59.94i, 1080/50i, 1080/23.98PsF (3D only), 720/59.94p, 720/50p SD: 480/59.94i, 576/50i
Video Signal Processing:	4:2:2:4 12 bit (Internal processing)
Video Input:	Analog composite x2 SDI x4, HDMI x2, DVI-I x1
Video Output:	PGM: SDI x1, DVI-D x1 PVW: SDI x1 AUX: SDI x1 MULTIVIEW: SDI x1, DVI-D x1
Audio Input:	XLR x8, SDI x4 (Embedded Audio, Max. 8 channels each) HDMI x2 (Embedded Audio, Max. 2 channels each) AUX: Pin jack x1 (L/R) MIC: M6 x1
Audio Output:	PGM: XLR x2 (L/R), Pin jack x1 (L/R) SDI x1 (Embedded Audio, Max. 2 channels each) PVW: SDI x1 (Embedded Audio, Max. 2 channels each) AUX: SDI x1 (Embedded Audio, Max. 8 channels each) Headphone: M6 x1
Other Connectors:	Reference Input: BNC x2 (Looping through) Advance Reference Output: BNC x1 Tally Output: D-sub 9pin x1 GPI: BNC x1 Remote: D-sub 9pin x1 (RS-232C)

BT-3DL2550 Specifications (Tentative)

[GENERAL]	
Power Supply:	DC24 V 4.5 A, DC5 V 0.03A AC adapter input: 100 V-240 V 50/60Hz, 1.6 A to 0.6 A
Dimensions (W x H x D):	599 x 440 x 220 mm (23.6 x 17.3 x 8.7 inches) Stand included 599 x 410 x 100 mm (23.6 x 16.1 x 3.9 inches) Main unit only, not including the stand AC adapter: 232 x 50.5 x 177 mm (9.1 x 2.0 x 7.0 inches)
Weight:	Approx. 10.5 kg (Approx. 23.1 lb.) Approx. 9.0 kg (Approx. 19.8 lb.) AC adapter: Approx. 1.7 kg (Approx. 3.7 lb.)
Operating Temperature:	5 °C to 35 °C (41 °F to 95 °F)
Operating Humidity:	20 % to 80 % (No condensation)
Storage Temperature:	-20 °C to 60 °C (-4 °F to 140 °F)
[Display Panel]	
Screen Size:	25.52-inch
Aspect Ratio:	16:10
Resolution (H x V):	1,920 x 1,200 pixels (WUXGA)
Display Color:	Approx. 16,770,000 color
Viewing angle (for 2D):	178°vertical and horizontal viewing angles
[Connectors]	
Video Input:	Video: BNC x2 (Through out connector) BNC x6 (Through out connector x3) SYNC/HD: BNC x2 (Through out connector x1) VD: BNC x2 (Through out connector x1) SDI: 2 system/Dual SDI(L/R), BNC x4 (Active Through (L/R) connectors x2) DVI-D (HDCP compatible, TMDS Single link: 1 system, DVI-D x1 Vertical frequency: 50.0Hz to 60.0Hz, Horizontal frequency: 31.5kHz to 67.5kHz, Dot clock: 25MHz to 165MHz
Audio Input:	Pin jack x2 (stereo)
Headphone Output:	M3 Stereo mini jack x1
GPI:	D-SUB, 9pin
RS-232C:	D-SUB, 9pin
External DC Power Supply Input:	XLR, 4pin (Exclusive for the included AC adapter)
[Signal Level]	
Video	SYNC signal level: 0.3 Vp-p to 4.0 Vp-p HD/VD signal level: TTL level
Audio	Audio input signal level: 0.5 Vms Headphone Output: 32Ω, (Variable level)
SDI embedded	HD SDI: SMPTE299M compliant, 48kHz, 8CH synchronous/asynchronous compliant SD SDI: SMPTE272M compliant, 48kHz, 4CH synchronous compliant
[Other]	
Standard Accessories:	Polarized glasses x2, Power cord, Power cord hook, Machine screw, AC adapter x1
Option:	Polarized glasses: BT-PGL10G, Wall-Hanging Bracket: BT-WMA26G, Integrated Twin-lens 3D Camera Recorder: AG-3DA1, 3D Digital AV Mixer: AG-HMX100

BT-3DL2550 Options

BT-PGL10G

Polarized Glasses

* The BT-PGL10G is exclusively for use with the BT-3DL2550. It cannot be used with other 3D TVs.

BT-WMA26G

(Indoor use only)
Wall Mount Adaptor for BT-3DL2550

3D Projection System Devices

PT-DZ12000

3-chip DLP™ Projector

- 12000 ANSI Lumens
- 5000:1 Contrast Ratio
- 4-lamp optical system
- 1920 x 1200 Native Resolution

* The photograph shows the unit with a projection lens (sold separately) mounted.

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

Glossary

A

● Active shutter glasses

A type of 3D eyewear. Active shutter glasses have LCD shutters that are timed to open and close alternately for each frame or field to separate left-eye and right-eye images, thus allowing the viewer to perceive 3D images. Panasonic FULL HD 3D Plasma TVs active shutter glasses operate at a high speed of 120 Hz and use infrared rays for synchronizing with the display.

● Amount of parallax

→ Parallax

B

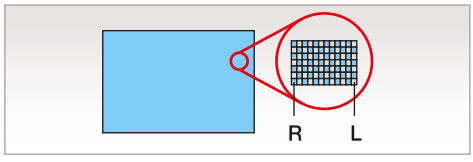
● Blu-ray 3D™

Blu-ray 3D™ is a standard for recording 3D images on Blu-ray Discs. It was announced in December 2009. This standard was established to enable the viewing of 3D movies at home with theater-like quality, in response to the recent commercial success of 3D movies. The Blu-ray 3D™ specifications are based on the MVC (Multiview Video Coding) standard, which is an extended version of the MPEG-4 AVC (Advanced Video Coding) standard supported by all Blu-ray Disc™ players available today. The MPEG-4 MVC format compresses the left-eye and right-eye images to a data amount that is about 1.5 times more than the data for equivalent 2D content. It offers backward compatibility so that existing 2D Blu-ray Disc™ players can play back 3D Blu-ray Discs with 1080i/p full-HD image quality. Also, because the Blu-ray 3D™ specifications incorporate an enhanced graphic function for 3D, they allow the display of a 3D graphic menu for disc content navigation as well as 3D subtitles on 3D videos.

C

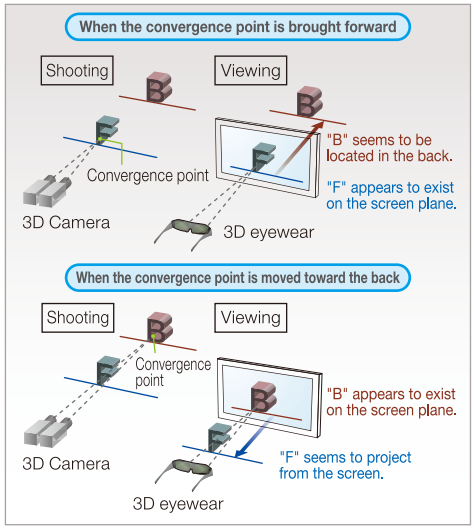
● Checker sampling technology

The checker sampling technology is one of the 3D video signal display technologies. With this technology, the left-eye and right-eye images are arranged in a checker pattern using individual pixels on the screen. As a result, image information is delivered by half the number of full-HD pixels per eye. This system uses polarized glasses to separate the left-eye and right-eye images.



● Convergence point

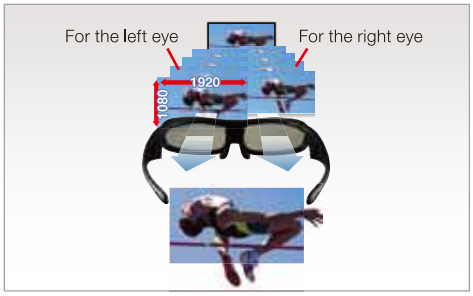
The convergence point is a point where the optical axes of the two lenses of a twin-lens camera meet. On the 3D display, objects located in front of the convergence point appear to project from the screen toward the viewer, while those behind the convergence point seem to be located in the back of the display plane. By varying the convergence point, the feeling of depth can be adjusted. The convergence point adjustment function is essential for designing 3D effects.



F

● Frame sequential technology

The frame sequential technology is one of the 3D video signal transmission/display technologies. With this method, active shutter glasses are used to separate the left-eye and right-eye images in synchronization with the alternating images displayed on a 3D display in order to provide a 3D effect to the viewer. This technology transmits and displays full pixels to provide high-quality pictures. The Panasonic FULL HD 3D Plasma TVs displays the left-eye and right-eye images recorded in 1920 x 1080 full-HD alternately at an extremely high rate of 120 frames per second, or 60 frames per second for each eye.



H

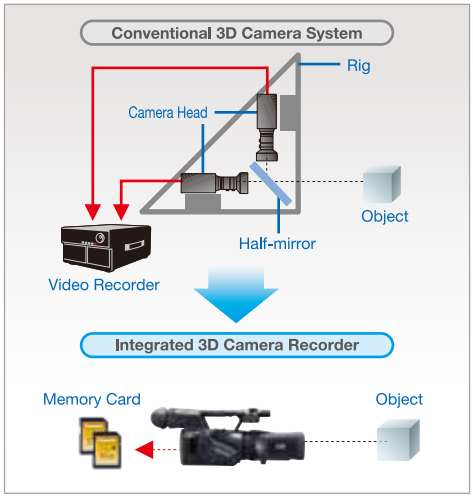
● HDMI 1.4

HDMI (High-Definition Multimedia Interface) 1.4 was developed by adding functions to support the HDMI Ethernet channel (HDMI HEC), audio return channel (ARC), 3840 x 2160 and 4096 x 2160 resolution, SYCC601, Adobe RGB, Adobe YCC601 and 3D video as well as Micro HDMI definition and the automotive connection system definition to the HDMI 1.3 standard. The HDMI 1.4 specifications were announced in May 2009.

I

● Integrated Twin-lens 3D Camera Recorder

A type of 3D camera system. A twin-lens 3D camera section and a recorder section are combined into the integrated twin-lens 3D camera recorder. Since the twin-lens 3D camera section is mounted on the frame of the camera recorder, it does not require frequent optical axis adjustment as compared to a rig-type 3D camera system, and also offers excellent mobility and flexibility.



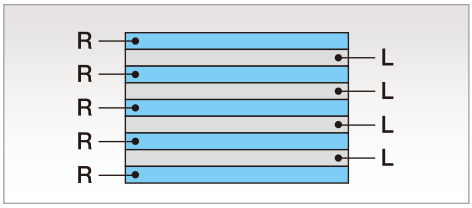
● Inter-axial (Inter optional/Inter pupillary) distance

This refers to the distance between the centers of the two eyes on a human face. In terms of 3D, it sometimes means the distance between the optical axes of the left and right lenses of a twin-lens 3D camera recorder. The inter-axial distance on an adult is about 6.5 cm. If this distance is too large in 3D recording, the amount of visual disparity increases, resulting in the kind of view that a giant might have, and if it is too small, the projecting effect reduces and results in an image as if seen by a tiny insect.

L

● Line-by-line technology (interleave system)

The line-by-line technology is one of the 3D video signal transmission/display technologies. With this technology, the left-eye and right-eye images are allocated to the field (scanning lines) of odd-number lines and the field of even-number lines, respectively. While its advantage is that the conventional video signal bandwidth can be used for signal transmission, it decreases the horizontal resolution to one-half. Horizontal resolution is maintained. For display systems adopting the line-by-line technology, polarized filters with different polarizing directions for the two fields are attached on the display surface and polarized glasses are used to separate the left-eye and right-eye images.



M

● MPEG-4 AVC

MPEG-4 AVC is a motion image data compression coding system. AVC stands for Advanced Video Coding. It was established for a wide range of uses, ranging from low-rate, low-image-quality applications such as the videoconferencing function of mobile phones and webstream video to high-rate, high-image-quality applications such as HD broadcasting. MPEG-4 AVC compresses data to about 1/2 the size achieved by the popularly used MPEG-2 format in the past, while keeping the image quality about the same. MPEG-4 AVC is used in the AVCHD format and for Blu-ray Discs, and also in the AVC-Intra codec for broadcasting applications.

● MPEG-4 MVC

MPEG-4 MVC is a motion image data compressing coding system. MVC stands for Multiview Video Coding. It is an extended standard of MPEG-4 AVC/H.264 and is designed to efficiently code free-viewpoint video and 3D video. MPEG-4 MVC was adopted as a data compression system for the Blu-ray 3D™ Disc.

P

● Panasonic Hollywood Laboratory (PHL)

The Panasonic Hollywood Laboratory is Panasonic's video research center located in Hollywood, the Mecca of the movie world. PHL conducts research and development aimed at further improving image quality based on Panasonic's activities in Hollywood for more than 15 years and the results of research pertaining to film-to-digital conversion, image compression for DVDs, authoring (video editing) and digital cinema.

● Panasonic Hollywood Laboratory Advanced Authoring Center

A Blu-ray Disc™ authoring center established inside Panasonic Hollywood Laboratory.

● Parallax (Binocular parallax)

Visual disparity is an angular difference between the lines of sight of the left eye and right eye of a person viewing an object. It sometimes refers to the apparent difference in the images perceived by the left and right eyes. It is believed that the human brain combines and processes the two images seen by both eyes to perceive solidity.

● Parallax barrier system

The parallax barrier system is a type of 3D display system that does not require special 3D eyewear. This system uses a corrugated lens or masking shield installed on the display surface to separate light (parallax separation effect) for the viewer's left eye and right eye to provide a 3D effect without the use of 3D eyewear. Since this system requires a fixed viewing position, it is suitable for mobile equipment such as cell phones.

● Polarized glasses

A type of 3D eyewear with different filters (polarizer/wavelength plates) attached to the left and right lenses. With this system, the left-eye and right-eye images are displayed in an overlapping manner through filters with different polarizing directions. A viewer wearing glasses with polarized filters perceives these images separately with the left and right eyes to recognize the 3D effect. Polarized glasses may use a linearly polarized system or circularly polarized system. With the linearly polarized system, a viewer may not perceive the full 3D effect when his/her head or glasses are tilted to one side. Therefore, the circularly polarized system is commonly used today. The Real D™ system (Real D™, Inc.) for 3D movies employs the circularly polarized system.

R

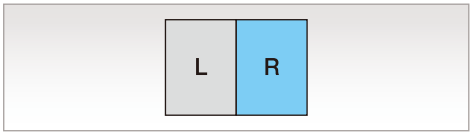
● Rig-type 3D camera system

This is a 3D camera system configured with two conventional camera units and attached to a rig (frame). Two cameras are mounted horizontally in some systems, while a half-mirror type is employed in other systems. Unlike a fully integrated 3D camera system, a rig-type 3D camera system requires precise adjustment of optical axes before shooting. Many rig-type 3D camera systems require separate recording units.

S

● Side-by-side technology

The side-by-side technology is one of the 3D video signal transmission technologies. It combines left-eye and right-eye images into one frame in a split-screen format. This system is used mainly for 3D broadcasting. While its advantage is that the conventional video signal bandwidth can be used for signal transmission, it decreases the horizontal resolution to one-half. In the case of progressive signals, vertical resolution is maintained, making it suitable for fast-moving 3D images such as sports events. For displaying images, signals are converted to another system (line-by-line, checker flag, frame sequential, etc.).



● Simulcast (Dual SDI) System

One of the transmission methods for 3D video signals. Simulcast splits the left and right images into two signal lines and transmits them. Dual SDI can transmit full-HD signals (1080i or 1080/24p signals) over two SDI lines.

T

● Time-division technology (time sequential technology)

The time-division technology is one of the 3D video signal transmission/display technologies. It allocates left-eye and right-eye images to each field or frame for transmission and display. With this technology, active shutter glasses are usually used to separate the left-eye and right-eye images. In the case of the frame sequential technology, high-quality full-pixel images can be displayed. → Frame sequential technology

X

● Xpol® system

Xpol® is a 3D image display system. It allocates left-eye and right-eye images using the line-by-line technology. This system uses polarized filters with different polarization rotation directions for alternating lines. The circularly polarized glasses used with this system maintain the 3D effect for the viewer even if the viewer's head is tilted to one side. * Xpol® is a registered trademark of Arisawa Manufacturing Co., Ltd.

#

● 3D broadcasting

3D broadcasts deliver 3D content by means of radio waves or cable transmission much in the same way as ordinary TV broadcasts. In order to use the same bandwidth as ordinary HD broadcasting, most current 3D broadcasts adopt a "side-by-side" technology. Received signals are converted to a 3D technology (the frame sequential or line-by-line technology) used by the TV for displaying 3D images. A TV that is not compatible with 3D broadcasts will display two images (side-by-side) on the screen.

● 3D eyewear

3D eyewear refers to glasses that are worn for viewing stereoscopic 3D images. 3D eyewear separates left-eye and right-eye images and provides binocular parallax to enable the viewer to perceive 3D images. To separate the images, 3D eyewear uses polarized filters, electronic shutters or spectrum separated lenses. They are called polarized glasses, active shutter glasses, or spectrum separated glasses, depending on the method employed. The XpanD system (X6D Limited) adopted by FULL HD 3D Plasma TVs and 3D movie theaters requires active shutter glasses. Other popular systems used for 3D movies include Real D™ (polarized glasses) and Dolby 3D (spectrum separated glasses).

● 3D video

Video images in which a viewer perceives depth and the solidity of objects (recognizes width, height and depth). For a 3D effect, left-eye and right-eye images recorded by a twin-lens camera recorder with two lenses set apart from each other by a distance equaling that between the two eyes on a human face are displayed on the same display screen (overlapping images with binocular parallax). The viewer sees the left-eye and right-eye images separately with the left and right eyes through 3D eyewear or a parallax barrier. This causes the viewer to reconstruct the images in the brain and perceive depth and solidity.

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The maximum warranty period may be adjusted depending on the number of hours the device has been used.

Details and user registration: **For US Customer: www.panasonic.com/broadcast**
For Outside US: http://panasonic.biz/sav/pass_e

Please refer to the latest 3D product Information at panasonic website.

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

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Factories of Systems Business Group have received ISO14001:2004-the Environmental Management System certification. (Except for 3rd party's peripherals.)