

P2HD

Memory Card Camera Recorder

*The microphone shown in the photo is an optional accessory.

AVC ULTRA AVC INTRA AVC LONG G AVC PROXY P2 P2^{micro} S2TM XCTM HDMITM
HIGH-DEFINITION MULTIMEDIA INTERFACE

ULTRA SPEED, ULTRA QUALITY and ULTRA USABILITY.



Featuring superb image quality, functionality and operability matching shoulder-type camera and network capability, this hand held camera recorder revolutionize ENG workflow.

The AJ-PX270 is a compact, lightweight professional ENG camera recorder for broadcast applications. It inherits Panasonic's accumulated broadcast technologies and know-how to offer high performance, easy operation and excellent versatility rivaling many shoulder-type models. The AJ-PX270 features the AVC-ULTRA* codec family and support the microSD card. Its AVC-Intra/AVC-LongG/AVC-Proxy multi-codec recording capability responds to diverse broadcasting needs, ranging from program production to swift news gathering using networking functions.** The AJ-PX270 is equipped with a powerful 22x zoom lens with three manual rings and the high-resolution OLED viewfinder. Control switches, such as the front REC button, and a variety of terminals are positioned to match shoulder-type camera recorder specifications. Armed with networking functions, this camera recorder enables both file-based recording and more advanced network-based recording, to revolutionize your workflow. It will also connect directly to a server via a wired LAN, wireless LAN** or 4G/LTE** network, for easy configuration of a streamlined news-gathering system.

* The AJ-PX270 does not support all of the formats included in the AVC-ULTRA family.

** For details, refer to "Notes Regarding Network Functions" on the back page.

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ULTRA SPEED

Dual Codec Recording* for Smooth Network Connection**

The AJ-PX270 can record the main video data (MXF format) with an AVC-Intra100/50 or AVC-LongG50/25 codec, while simultaneously recording proxy video data at a low bit rate. Using the network function, it is capable of IP transmission of proxy video data via LAN, wireless LAN*³ or 4G/LTE network.*⁴ This enables news flash distribution and advance editing before the main video data arrives, dramatically speeding up the video production workflow.

** For details, refer to "Notes Regarding Network Functions" on the back page.

* Some formats are not supported depending on the recording mode. For details, visit Panasonic website (<http://pro-av.panasonic.net/>).

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Wired/Wireless LAN, 4G/LTE Network Functions**

The standard LAN (Ethernet) port allows network connection via a wired LAN. When the optional AJ-WM30 Wireless Module is installed, the AJ-PX270 gains wireless LAN (IEEE 802.11g/n) connectivity, enabling access to the following functions from a network-connected PC/Mac, tablet device or smartphone. 4G/LTE connection is also possible.

- **Proxy Preview:** Plays back proxy files (AVC-Proxy), downloads file/clip information, displays and allows editing of metadata, and enables addition/deletion of shot marks and text memos.*
- **Camera Remote:** Easy remote operation is possible from various devices by using a web app. The P2 ROP App (available free of charge from the Apple App Store) for iPad enables multifunctional remote operation equivalent to ECU. (See page 8 for details.)
- **Playlist Editing:** Playlists can be created using proxy video with a PC/Mac or tablet. The workflow can be streamlined to be faster by rough editing on location, and then transferring the content files.
- **File Transfer:** When connected via wired/wireless LAN or 4G/LTE, the FTP client function lets you transfer clips from the camera recorder to a network.

** For details, refer to "Notes Regarding Network Functions" on the back page.

*Some functions are not supported by some devices.

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Full-HD Streaming Supported**

Full-HD (1920 × 1080) proxy video*¹ can be streamed via a network connection (wired LAN, wireless LAN, 4G/LTE network) while recording mainstream video onto a memory card. The video can be received and playback on a PC or Mac. It also AVC-G (QoS) and SHQ (QoS) streaming modes which prioritize uninterrupted video transmission. "QoS*²" stands for Quality of Service. Using this function, bitrate is optimized to match the network condition and continue streaming distribution even when the communication bandwidth is reduced.

This provides solutions for a variety of situations such as news acquisition, while recording mainstream video, video for newsflash can be streamed live*³ to a broadcast station from the field.

** For details, refer to "Notes Regarding Network Functions" on the back page.

*1: When the AVC-Intra200 is selected, streaming output is not supported. When the AVC-Intra50 is selected, only SD Streaming mode is supported.

*2: P2 Streaming Receiver software (Windows only, not supported by Mac; available free of charge) is required for receiving the QoS mode. Please visit Panasonic website <<http://pro-av.panasonic.net/en/download/>>.

*3: The video and audio signals arrive with a delay. The latency varies depending on the network environment and the hardware/software environment of the PC, server, etc.

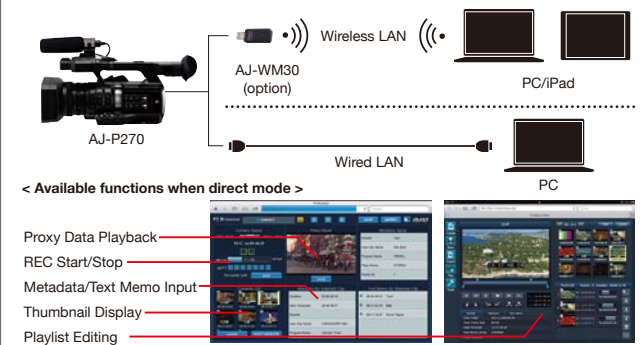
Streaming Mode Specifications

Mode	Resolution	Frame Rate	Bit Rate	Codec* ¹
AVC-G6	1920 x 1080* ²	30 fps/25 fps* ⁴	6 Mbps	H.264 High Profile
	1280 x 720* ³	60 fps/50 fps		
	HQ	640 x 360	1,500 kbps	
AVC-G (QoS)	1920 x 1080* ²	30 fps/25 fps* ⁴	Variable depending on the communication band, Maximum 9 Mbps	H.264 High Profile
	1280 x 720* ³	60 fps/50 fps	Variable depending on the communication band, Maximum 9 Mbps	
SHQ (QoS)	960 x 540	30 fps/25 fps	Variable depending on the communication band, Maximum 6 Mbps	H.264 High Profile

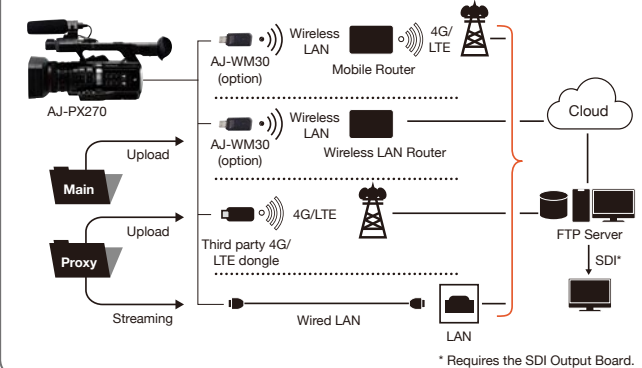
*1: The audio codec is AAC LC 2ch in all streaming mode. *2: When only the record signal is 1080/59.94i or 1080/50i. *3: When only the record signal is 720/59.94p or 720/50p. *4: Output becomes 1080/59.94i or 1080/50i.

Network Functions Link to from the Field in Real Time

Camera Remote/Playlist Editing (Wireless LAN, Wired LAN)



File Upload/Streaming (Wireless LAN, 4G/LTE, Wired LAN)



Automatic Transferring: Rec during Uploading Function

The Rec during Uploading function*, which automatically and sequentially transfers recorded clips to an FTP server or cloud service, has also been newly added. Uploading is done in the background, and recording/playback continues during the transfer. The transfer status can be checked on the LCD monitor or viewfinder. If the network is disconnected during transfer, or the power of the camera is turned off, transfer resumes when the connection or power is recovered. Manual transfer of up to 100 registered clips is also possible.

* During simultaneous recording, only recorded clips in slot 1 or slot 3 are automatically transferred. Clips of interval recording, loop recording, one-clip recording or one-shot recording are not transferred automatically. While the Rec during Uploading function is enabled, Last clip delete function and streaming function are disabled.

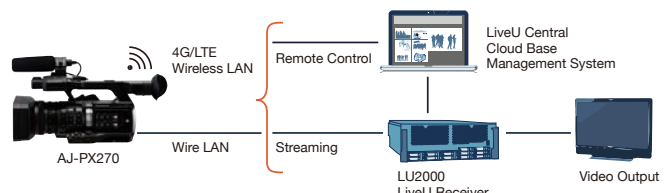


Direct Connection to The LiveU Video Uplink Solution**

The AJ-PX270 supports direct connection to the LiveU Central management platform using public networks, such as 4G/LTE, wireless LAN or wired LAN. There is no need for special uplink equipment. This enables both live previews on the reception side, and on-air streaming. Users are also able to remotely control the zoom, focus, iris, white balance and master gain of the AJ-PX270 on LiveU Central.

** For details, refer to "Notes Regarding Network Functions" on the back page.

* Contract with LiveU is required separately. For details, contact LiveU: <http://www.liveu.tv> Contact: info_us@liveu.tv (US & Americas), info@liveu.tv (International)



ULTRA QUALITY

Approaches High-End Shoulder-Type Camera Recorder Performance

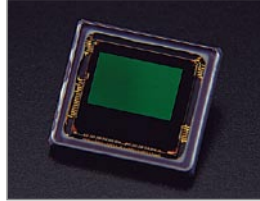
600% Dynamic Range with New 1/3-Type 3MOS Image Sensors

Newly developed 2.2-megapixel 1/3-type 3MOS (RGB) image sensors offer full-pixel HD (1920 x 1080) resolution, F11 (59.94 Hz) or F12 (50 Hz) sensitivity* and low noise. They also achieve rich gradation and vibrant color reproduction. The new 1/3-type image sensors achieve the same maximum 600% level (compared to the 300% level of our previous model) of dynamic range as many high-end shoulder-type models. This captures rich data all the way from highlights to shadows, to render truly realistic images. Features such as color grading also expand post-production flexibility.

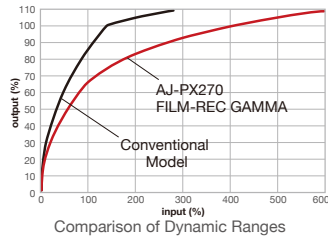
* In [HIGH SENS.] mode

• **FILM-REC Gamma:** Featured in our previous VARICAM model, this function was made possible by the new 600% dynamic range. It achieves a latitude that exceeds the CINE-LIKE D mode in our previous handheld camera recorder. Gamma curves can be selected from 7 modes (HD/SD/FILMLIKE 1/FILMLIKE 2/FILMLIKE 3/FILM-REC/VIDEO-REC).

• **DRS (Dynamic Range Stretch):** Suppresses blocked shadows and blown highlights to achieve a visually wide dynamic range.



1/3 type, 2.2 megapixel MOS sensor



Dynamic range 300%



Dynamic range 600%

22x Zoom Lens with Three Manual Rings and Ultra Low-Speed Seesaw Zoom Levers

The AJ-PX270 features a newly developed, high-performance, compact zoom lens. Zooming from 28 mm to 616 mm (35 mm equivalent), this 22x zoom lens covers a wide field of view, from wide-angle to telephoto, without the need for a conversion lens. Combining 18 lens elements in 12 groups, this advanced lens unit further adds a UHR (Ultra High Refractive) glass element, a low dispersion element and aspherical lenses. This newest optical technology provides superbly high resolution. In addition, it is combined with our unique, Emmy awarded digital signal processing technology called Chromatic Aberration Compensation (CAC) to minimize color bleeding in the surrounding image areas and to achieve rich expression with finely rendered nuances and excellent shading.

The AJ-PX270 has three manual rings: a mechanical (cam-type) zoom ring, a focus ring and an iris ring. The operating feel and rib pattern of these rings are carefully designed to make manual operation feel using an interchangeable lens. The focus ring is knurled for reliable fingertip control of delicate focusing. The seesaw zoom levers (grip/handle) support extra-slow zooming down to 180 seconds.



Lens Ring



Wide 28 mm

Tele 616 mm (22x)

22x optical zoom x 10x digital zoom (220x)

Optical Image Stabilizer (OIS), Digital Zoom and ND Filter

- Hand-shake correction with the built-in optical image stabilizer (OIS).
- Equipped with a digital zoom function.*1 Magnification control can be assigned to a user button for quick zooming to 2x, 5x or 10x. It provides a telephoto capability of up to 220x in combination with the optical zoom.
- Built-in ND filter (OFF, 1/4, 1/16, 1/64).

*1: Flash Band Compensation will not operate while digital zooming.

Image Adjustment Function from a New Menu

The AJ-PX270's camera signal processing LSI enables hue-adjustable 12 axis color compensation for each color gamut, independent 3 axis skin-tone color compensation, and also has a detailed image adjustment function. The new image adjustment menu brings you intuitive image control.

Setting Items: H detail, V detail, detail coring, skin tone detail, chroma level, color temperature, master pedestal, knee, matrix, color correction, RB gain control, chroma setting, black control, gamma, high color, white clip.

SCEN	SKIN TONE DTL SET	EXIT	(SAT)	(PHASE)
SVST1	RB GAIN CONTROL		0	0
USER	COLOR TEMP Adj SW	R	0	0
SW M	COLOR TEMP Adj SW	R-R-Mg	0	0
AUTO	CHROMA LEVEL	R-Mg	0	0
RECO	CHROMA PHASE	Mg	0	0
CLIP	MATRIX	Mg-B	0	0
AUDK	MATRIX SETTING	B	0	0
OUTP	COLOR CORRECTIO	B-Cy	0	0
NETW	MASTER PED	Cy	0	0

New image adjustment menu

Advanced Flash Band Compensation (FBC)

This function detects and precisely compensates the flash bands (bands of light and dark) that often occur in still cameras equipped with an MOS sensor.

Variable Frame Rate Supporting 1080p

The Variable Frame Rate function (AVC-Intra100)* was inherited from the Panasonic VariCam, which is widely used for producing movies, TV series and TV commercials. Featuring a variable frame rate of 1 to 60 fps, this function creates a wide range of film-camera-like images, such as overcranking for slow-motion and undercranking for quick-motion effects.

* Pre-Rec, Loop Rec, Interval Rec, One-Shot Rec, Dual Rec and One-Clip Rec cannot be used while recording at the native variable frame rate.



Overcranking (higher-speed shooting)



Undercranking (lower-speed shooting)

Advanced Focus Assist Functions

A variety of focus assist functions support quick and accurate focusing in manual focus mode.

- **Turbo-Speed One-Push AF:** Pressing the PUSH AUTO button enables focusing in 0.5 seconds or less.*
- **Focus-in-Red Display:** Emphasizes the image areas in focus by marking the edges in red.
- **Expand:** Enlarges the center portion for increased visibility.
- **Focus Bar:** The meter graphically displays the focus level.

* The focusing time varies depending on the shooting conditions and subjects.



Focus-in-Red



Expand

New Built-in Electronic Level Gauge

The electronic level lets you easily confirm camera tilting on the LCD monitor screen. It helps to keep the camera level during handheld shooting, low-angle shooting and high-angle shooting.



Electronic Level Gauge

OLED EVF and High-Resolution LCD Panel

The AJ-PX270 is the first professional handheld camera recorder to feature a viewfinder with a high-resolution OLED display (approximately 2,360 K dots; image display area: approximately 1,770 K dots) for minimal image delay and superb color reproduction. The LCD monitor uses a QHD IPS LCD panel. These allow more easy focusing.



OLED EVF

Scene Files and User Files

Six preset scene files can be changed freely. One set of scene files can be stored internally in the AJ-PX270, and eight sets can be stored on an SD Memory Card. In addition, one user file containing camera settings can also be stored internally in the AJ-PX270, and eight files can be stored on an SD Memory Card.

•Scene File Preset (Initial Settings)

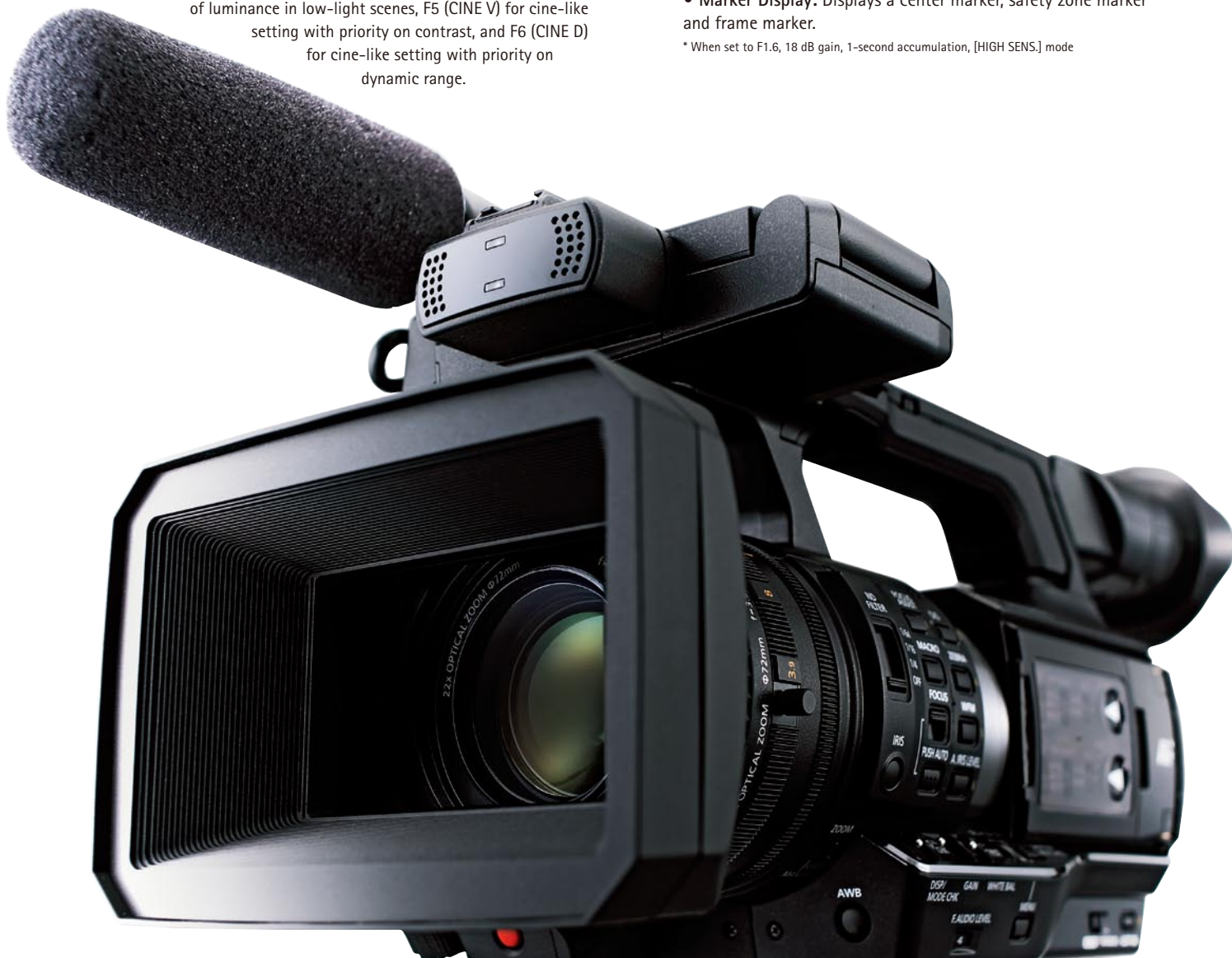
F1 for standard setting, F2 (FLUO.) for shooting under fluorescent lights, F3 (SPARK) for emphasizing contrast, F4 (B-STR) for enhanced gradation of luminance in low-light scenes, F5 (CINE V) for cine-like setting with priority on contrast, and F6 (CINE D) for cine-like setting with priority on dynamic range.

Other Recording Support Functions

Professional Image Quality and Advanced Functions

- **Eight User Buttons:** Functions can be freely assigned to each buttons.
- **WFM/VECTOR:** Simplified waveform and vectorscope display.
- **Three-position Gain Selector:** The 3-position gain selector can be assigned with gain levels selected from a range of -3 dB to +18 dB to its L, M and H positions.
- **+36 dB Super Gain:** +24 dB/+30 dB/+36 dB Super Gain function enable extra-high sensitivity with subject luminance of as low as 0.02 lx.*
- **Electronic Shutter with Slow Shutter Capability:** The shutter speed can be set in seven steps between 1/60 and 1/2000 second (60i/60p mode). It is also equipped with Slow and Synchro Scan (variable) mode. The shutter opening angle (deg value) can be set with synchro scan mode.
- **Shockless Auto White Balance:** A smooth transition occurs when switching White Balance modes. This is effective, for example, when moving from outdoors to indoors.
- **Mode Check:** Displays a list of the camera settings on the viewfinder and LCD monitor.
- **Zebra:** Select any two levels from among 0% to 109%, in 1% steps. A mode also allows two patterns to be overlaid and displayed.
- **Y-GET:** Measures brightness at the center and displays numerical data.
- **Knee Mode Setting (AUTO/MANUAL/OFF).**
- **Two-value (A/B) memory and preset (3200/5600/VAR)** white balance selector.
- **Scan Reverse Function:** Displays/records images in vertically or horizontally inverted orientation.
- **Marker Display:** Displays a center marker, safety zone marker and frame marker.

* When set to F1.6, 18 dB gain, 1-second accumulation, [HIGH SENS.] mode



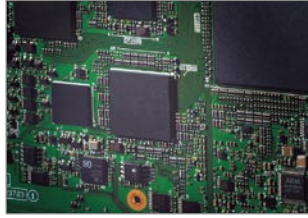
ULTRA QUALITY

High-Quality Image Acquisition for
News and Image Production Needs

AVC-ULTRA Includes High-Quality AVC-Intra200 Codec

The AJ-PX270 is the first handheld camera recorder that features the AVC-ULTRA codec family as standard. To meet the various needs from mastering to streaming, the image quality and bit rate can be selected to match the application.

(See the table on the next page.)



AVC-ULTRA Codec LSI

AVC INTRA An intra-frame compression method that is highly suited to image production. In addition to the conventional AVC-Intra100/50 codec, the AJ-PX270 features the AVC-Intra200 codec with twice the bit rate (10 bit quantization, 4:2:2 sampling, and a bit rate of approximately 200 Mbps*). With superb images that approach uncompressed quality and 24 bit audio, it offers a level of quality that meets the needs of mastering and archiving.

AVC LongG This inter-frame compression method achieves high-quality HD recording at a low bit rate. Ideal for providing on-air content direct from the shooting location and for workflows using content transferred over the internet. Three bit rates are available: AVC-LongG50/25/12 Mbps. AVC-LongG25 provide 10 bit/4:2:2 quality at a bit rate of approximately 25 Mbps.

AVC Proxy Low-bit-rate, high-resolution, high-sound-quality proxy video (Quick Time/H.264) is also recorded with the actual data.*² Also includes metadata for efficient offline editing. See the table (AVC-Proxy Recording Modes and Recording Signals) on Page 6.



*1: For 1080/59.94i.

*2: Proxy data cannot be recorded when using the Loop Rec or Interval Rec function.

Proxy data is low-resolution video and audio data with time code, metadata, and other management data in a file format.

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HD/SD Multi Format/Multi Codec

In addition to 1080/60i,* the AJ-PX270 supports 24p,* 30p,* 60p,* and 720p multi HD format and SD recording. 59.94 Hz/50 Hz switchable for convenient use in productions headed for global use. (Please see the table at the right for more details.)

* 60i, 60p, 24p, and 30p are actually recorded at 59.94 Hz, 23.98 Hz, and 29.97 Hz respectively. 24p, 25p, and 30p are all available with native mode recording.

Full Frame Progressive Recording

1080/60p* (50p) full frame progressive recording is supported for the first time in the AJ-PX270. In addition to being able to record with the AVC-Intra100 or AVC-LongG25/LongG12 codec, the camera can be capable of camera through output from the 3G-SDI and HDMI output terminals.

* 60p is actually recorded at 59.94 Hz.

High-Quality 24 Bit 4 Channel Audio Recording

AVC-Intra and AVC-LongG*¹ modes support 24 bit digital audio recording*² (16 bit for AVC-LongG12, DVCPRO HD, DVCPRO 50, DVCPRO and DV).

The AJ-PX270 offers 4 channel audio in all recording modes. Channel input locates in front and rear (both selectable from mic/line).

The level volume also supports 4 channels.

*1: The AVC-LongG12 mode does not support 24 bit digital audio recording.

*2: The audio signal can be played back by using 24 bit digital audio equipment.

For details, refer to "Note Regarding 24 bit Audio" on the back page.

Standard-Equipped microP2 Card Slots

The AJ-PX270 comes with two slots for the microP2 card, the broadcast-use memory card downsized to match the size of a conventional SD memory card.

- **microP2 card:** While inheriting the high reliability of the P2 card and maintaining the large capacity of 64 GB,*¹ the microP2 card was greatly downsized to match the size of an SD Memory Card, resulting in a considerable reduction in cost.

One P2 card slot is also provided for the use of a conventional P2 card.*²

- **Content Protection System (CPS):**

A new security function featured on the microP2 card. The content recorded on the card is locked with a password to protect against unauthorized access. This prevents data from being stolen and enables secure media control.

- **Highly Mobile and Reliable:** The microP2 and P2 cards are highly resistant to temperature changes, dust, impacts, and vibration, and there are no worries about condensation, head clogging, or dropout as there are with VTR systems. Data is recorded onto empty card spaces, so there is no need to search for the beginning and ending of recorded portions. There is also no danger of mistakenly recording over existing data.

*1: Total card capacity includes space for data management, such as system data; therefore, the actual usable area is less than the capacity indicated on the card. See the "Recording Times" table on Page 6 for recording times.

*2: microP2 and P2 cards cannot be simultaneously recorded on.



Multifunctional Recording Including Simultaneous Recording*¹

- **Simultaneous Rec:***² Records simultaneously onto two microP2 cards.
- **Background Recording:***² Slot 1 records with the Rec Start/Stop control, while slot 2 continues recording even while recording is stopped.
- **Hot-Swap Rec:***² Thanks to the two card slots,*³ you can hot-swap microP2 cards for continuous non-stop recording.
- **One-Clip Rec Mode:** Records up to 99 consecutive cuts as a single clip. A text memo is automatically attached to the Rec Start point for easy searching for the beginning of the cut.
- **Pre Rec:** This stores approximately 3 seconds of HD or 7 seconds of SD video and audio data in memory while in standby mode and lets you recover and use the data from the point before you started recording.
- **Loop Rec:** Maintains a recording of a certain time period through repeated loop recording.
- **Interval Rec:** Records intermittently based on a set interval time.
- **One-Shot Rec:** A frame-shot recording function for producing animations.
- **Text Memo:***⁴ Up to 100 memos can be posted onto a clip as bookmarks.
- **Shot Marker:***⁴ Used to mark clips as OK, NG, etc.
- **Last Clip Delete:** Deletes the last recorded clip with a single touch.
- **Rec Check:** This lets you run a quick playback check of the clip-end you have just recorded.

*1: microP2 and P2 cards cannot be simultaneously recorded.

*2: Recording is possible only through the microP2 card slots.

*3: Slots cannot be switched during recording.

*4: The text memo and shot mark cannot be added in Loop Rec, Interval Rec, or One-Shot Rec mode.

Metadata Function Supporting Wireless Connection

The metadata function attaches metadata (text memos tagged to time, GPS data, selected character strings and frames) to P2 files. Metadata can be edited using a tablet or smartphone connected via USB or wireless LAN.* Metadata can be used effectively for searching and management, facilitating the editing, distribution and archiving of video data.

* For a wireless LAN connection, the AJ-WM30 Wireless Module is required.

Recorder Section

Recording Codecs and Video Formats

Codec	1080							720					480		576	
	60p	50p	60i	50i	30pN*1	24pN*2/ 23.98PsF	25pN*3	60p	50p	30pN	24pN	25pN	60i	30p	50i	25p
AVC-Intra200	—	—	✓	✓	✓	✓	✓	✓	✓	—	—	—	—	—	—	—
AVC-Intra100	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	—	—	—	—
AVC-Intra50	—	—	✓	✓	—	—	—	✓	✓	—	—	—	—	—	—	—
AVC-LongG50	—	—	✓	✓	✓	✓	✓	✓	✓	—	—	—	—	—	—	—
AVC-LongG25	✓	✓	✓	✓	✓	✓	✓	✓	✓	—	—	—	—	—	—	—
AVC-LongG12	✓	✓	✓	✓	✓	✓	✓	✓	✓	—	—	—	—	—	—	—
DVCPRO HD	—	—	✓	✓	—	—	—	✓	✓	—	—	—	—	—	—	—
DVCPRO 50	—	—	—	—	—	—	—	—	—	—	—	—	✓	✓	✓	✓
DVCPRO	—	—	—	—	—	—	—	—	—	—	—	—	✓	✓	✓	✓
DV	—	—	—	—	—	—	—	—	—	—	—	—	✓	✓	✓	✓

*1: 1080/29.97p over 59.94p output *2: 1080/23.98p over 59.94p output *3: 1080/25p over 50p output

Recording Times**

Recording format (Compression Format) 59.94Hz/50Hz	Card x 1		
	16 GB	32 GB	64 GB
AVC-Intra200	Approx. 8 min.	Approx. 16 min.	Approx. 32 min.
AVC-Intra100/ DVCPRO HD	Approx. 16 min.	Approx. 32 min.	Approx. 64 min.
AVC-LongG50/ AVC-Intra50/ DVCPRO 50	Approx. 32 min.	Approx. 64 min.	Approx. 128 min.
AVC-LongG25/ DVCPRO/DV	Approx. 64 min.	Approx. 128 min.	Approx. 256 min.
AVC-LongG12	Approx. 120 min.	Approx. 240 min.	Approx. 480 min.

AVC-Proxy Recording Modes and Recording Signals

Recording Mode*5	Video			Audio		
	Resolution	Codec	Bit Rate	Codec	CH	Bit Rate/1CH
AVC-G6 2CH MOV	1080i mode: 1920 x 1080 720p mode: 1280 x 720	H.264 High Profile	6 Mbps*6	AAC-LC	2CH	64 kbps
SHQ 2CH MOV	960 x 540	H.264 High Profile	3500 kbps	Linear PCM	2CH	768 kbps
HQ 2CH MOV	640 x 360	H.264 High Profile	1500 kbps	AAC-LC	2CH	64 kbps
LOW 2CH MOV	480 x 270	H.264 Baseline	800 kbps	AAC-LC	2CH	64 kbps

*4: For 1080/60p and 1080/50p, the recording times become 1/2 of those shown above. All of the times apply when single clips are recorded continuously one after the other onto a P2 card. Depending on the number of clips to be recorded, the recordable time may be shorter than the times given. *5: Some recording modes are not supported depending on the main recording format. *6: For 720/30pN, 720/24pN or 720/25pN, the bit rates become 3 Mbps.



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ULTRA USABILITY

Operating Ease and System Expansion
Approaching Shoulder-Type Models

New Design – Switches Match Like Shoulder-Type Models

The AJ-PX270 was designed for easy operation as an ENG camera. It inherits the functions, switch layout and dials of shoulder-type camera recorders. Users of professional shoulder-type camera recorders will be able to take advantage of the mobility of the AJ-PX270 immediately.

• Front Rec Button

The front Rec button is positioned immediately below. When a tripod is used, this button allows smooth recording starts after operating the lens.

• Front Audio Level Dials

This is the industry's first handheld camera recorder to feature audio input level controls (which can be allocated with ON/OFF and CH) on the front side of the unit. This allows quick operation during recording.

• Triple Toggle Switches

Three toggle switches – DISP/MODE CHECK, GAIN and WHITE BAL – are provided. They are located at the same location as on a shoulder-type model to support operation during recording.

• Audio Level Dials

Large 2 channel (switchable between CH1/ and CH2) audio level dials.



Separately Positioned XLR Audio Input Terminals

The AJ-PX270 is equipped with 2 channel XLR mic/line audio input terminals supporting a +48 V phantom power supply. They are arranged on the front and rear sides of the unit, just like on a shoulder-type model. The front mic terminal is located behind the rear mic mounting section, eliminating problems resulting from catching protrusions on the side panel. The rear external audio terminals are located on the right side for comfortable holding of the AJ-PX270 against the chest during recording, and also permit easy connection and disconnection while holding the camera recorder in shooting position.



Battery Replacement during Recording

The large-capacity battery is housed in the main body, and does not extend beyond the rear panel. This ensures comfortable holding of the AJ-PX270 against the chest. When power is supplied to the DC power supply input terminal using the AC adaptor, the battery can be changed while recording.

Handle with Multi-Stage Zoom Lever

The zoom lever located on the upper part of the handle is also provided with a multi-stage variable zoom function. It provides the same smooth zooming operation from a super-low speed as the zoom lever on the hand grip, allowing smooth zooming when shooting from a low angle or using a tripod.



New Design Offering Enhanced Mobility and Easy Operation

Even with its high-power zoom lens, the AJ-PX270 is compact and has a low center of gravity. It remains stable during handheld shooting, and provides excellent visibility and a wide field of view. The lens hood with a built-in cover improves convenience and safety while moving. The magnesium alloy diecast chassis is rugged and durable.



3G-SDI Output and HDMI Output

- **3G-SDI OUT:** A 3-Gbps speed supports 1080/60p and 50p progressive full frame image output. Can be set to HD-SDI or down-converted SD-SDI. Allows Rec Start/Stop linked backup recording with a Panasonic recorder equipped with SDI input.
- **HDMI OUT:** This terminal allows digital A/V output to a wide range of devices such as an HD monitor.
- **Aspect Conversion:** The aspect ratio can be selected from among Side Crop, Letter Box, or Squeeze mode when down-converting and outputting from the SDI OUT terminal.



Combination with the AJ-PG50 Field Recorder, using either HDMI or SDI connection, enables back-up recording linked to the AJ-PX270.

HDMI™
HIGH-DEFINITION MULTIMEDIA INTERFACE

USB 3.0 High-Speed Transfer Interface

- **USB 3.0 (HOST):** High-speed file copying to external storage.*
- **USB 2.0 (DEVICE):** Allows use as a P2 card drive.

* Storage media with more than 2 TB of capacity cannot be used.

Multi-Camera Synchronizing with Genlock IN and TC IN/OUT

This handheld camera recorder supports a multi-camera configuration. It features a built-in SMPTE time-code generator/reader, TC input/output, and Genlock input for multi-camera recording with time-code synchronization. Images can be synchronized and output to a switcher, providing the same level of operation as many shoulder-type models.

Operation & Connection

The P2 ROP App for Wireless Control using iPad**

The P2 ROP App (downloadable free of charge from the Apple App Store) for iPad is available. It enables iPad to control functions/setting of the AJ-PX270 Camera Recorder remotely via wireless connection.

P2 ROP App can control Focus, Zoom and variety of settings similar to those of the AG-EC4G Extension Control Unit controls, including picture quality settings and REC start/stop. Easy-to-see value display and easy-to-operate up/down touch keys provide settings and adjustments. Proxy browser is also built into the app so that operator can adjust the setting while checking recorded clips with thumbnail and previewing. Metadata can also be displayed and edited on iPad to support post production work.

** For details, refer to "Notes Regarding Network Functions" on the back page.

* It supports to iOS7.1 and iOS8.1.

• Apple App Store and iPad are service marks or trademarks of Apple Inc. registered in the United States and other countries.



Thumbnail View

Preview View



"P2 ROP App" Control from iPad

picture simulated

Wired LAN Remote Focus and Zoom Supported

Wired remote operation is enabled with the optional AK-HRP200G Remote Operation Panel via LAN connection. In addition to joy stick operation of the aperture and pedestal, as well as menu-operated adjustment of the picture quality, this allows remote-controlled focusing and zooming on the AJ-PX270.

* Only functions that are supported by the AJ-PX270 can be controlled.

Interfaces and Devices

- Supports live video transfer uplink equipment (scheduled for the near future).
- Equipped with an audio output terminal (stereo mini-jack).
- Equipped with a headphone terminal (stereo mini-jack).
- Back tally, rear tally equipped. ON/OFF switchable.
- Camera Remote: Focus, iris, zoom and REC start/stop can be controlled.



Rear Terminal (when cover is open)



Side Terminal (when cover is open)



AK-HRP200G
Remote Operation Panel (ROP)

Options and P2 HD Equipment

As of April, 2015



AG-MC200G
XLR Microphone



VW-VBD58
Battery Pack (5,800 mAh)
CGA-D54/CGA-D54s
Battery Pack (5,400 mAh)



AG-B23
Battery Charger



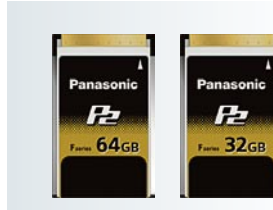
AJ-WM30
Wireless Module



AK-HRP200G
Remote Operation Panel (ROP)



AJ-P2M064AG
AJ-P2M032AG
microP2 Card



AJ-P2E064FG
AJ-P2E032FG
Memory Card "P2 card" F Series*1



AJ-XPDI "P2 drive"
Memory Card Drive*2
1-slot card drive for an expressP2 card/P2 card with bus power from a USB 3.0/2.0 interface.



AJ-MPD1G "microP2 drive"
Memory Card Drive
Compact, lightweight, cost-effective USB-Bus powered microP2 card drive with USB 3.0 support and 2 card slots.



AJ-PCD2G "P2 drive"
Memory Card Drive
USB-Bus powered 1 slot P2 drive
Ideal for mobile application.



AJ-PCD30 "P2 drive"
Memory Card Drive
3-slot drive with USB 3.0 interface for high-speed 1.5 Gbps data transfer.



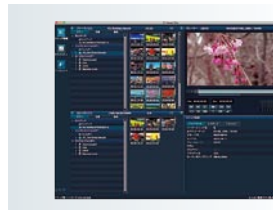
AJ-PCD35 "P2 drive"
Memory Card Drive
High-speed PCI Express interface.



AJ-PG50 "P2 field reorder"
Memory Card Recorder
A portable field recorder with AVC-ULTRA codec and microP2 card compatibility, network function, and battery operation.



AJ-PD500 "P2 portable deck"
Memory Card Recorder
AVC-ULTRA and microP2 supported.
A half-rack size recorder for a high-quality, cost-effective workflow



P2 Viewer Plus
Viewing Software*3
Supports P2HD. This Windows/Mac utility makes it easy to view and copy P2 files.



AJ-SK001G (for P2 Viewer plus)
Ingesting Function Software Key*4
The ingesting function copies all clips on P2 cards to a storage medium, such as an HDD. During ingesting, the clips are verified for secure copying, with log files created.



P2 Streaming Receiver
Streaming Receiver Software*5
Enables receive QoS (Quality of Service) mode. Windows only, not supported by Mac.

Avid NLE Plug-In Software



AJ-PS001G
Software Key
for AVC-Proxy re-link.



AJ-PS002G
Software Key
for AVC-Intra50/100 P2 file export.



AJ-PS003G
Software Key
for AVC-LongG P2 file export.



AJ-PS004G
Software Key
for AVC-LongG file import to edit.

*1: The P2 card F Series may require P2 equipment software to be updated. Please go to the P2 support page on the Panasonic web page <http://pro-av.panasonic.net/>

*2: Connection of the AU-XPDI requires two USB cables. And a power supply is connected with USB 3.0 port of PC or an AC adaptor.

*3: For information on purchasing software keys, see "Service and Support" on the Panasonic web page <http://pro-av.panasonic.net/>

*4: For P2 Viewer Plus download and operating requirement information, see "P2 Viewer Plus" on the Panasonic web page http://pro-av.panasonic.net/en/sales_o/p2/p2viewerplus/

*5: For P2 Streaming Receiver download and operating requirement information, see "P2 Streaming Receiver" on the Panasonic web page <http://pro-av.panasonic.net/en/download/>

Specifications

As of April, 2015

General

Power:	DC 7.2 V (when the battery is used) DC 12 V (when the AC adaptor is used)
Power consumption:	19.5 W (when the LCD monitor is used)
Operating Temperature:	0 °C to 40 °C (32 °F to 104 °F)
Operating Humidity:	10 % to 80 % (no condensation)
Weight:	Approx. 2.2 kg (4.9 lbs.) (body only, excluding lens hood, battery, and accessories) Approx. 2.6 kg (5.7 lbs.) (including lens hood, supplied battery, and microphone holder)
Dimensions:	176 mm(H) x 171 mm(W) x 329 mm (D) (excluding protrusion) (6-15/16 inches x 6-23/32 inches x 12-15/16 inches)

Camera Unit

Pickup Device:	1/3-type 2.2 million pixels, MOS solid state image sensor x 3
Lens:	Optical image stabilizer lens, optical 22x motorized zoom F1.6 to F3.2 (f=3.9 mm to 86 mm) 35 mm conversion: 28 mm to 616 mm (16:9)
Filter Diameter:	72 mm
Optical System:	Prism system
ND Filter:	OFF, 1/4, 1/16, 1/64
Shortest Shooting Distance: (M.O.D.)	1.1 m from the front lens Approx. 0.06 m from front lens (When Macro=On, at wide-end)
Gain Setting:	L/M/H selector switch-3 dB to 18 dB (in 1 dB steps) (Negative value of gain is only in [HIGH SENS.] mode.) (When assigning [S.GAIN] to the USER button: Switching between 24 dB, 30 dB, and 36 dB)
Color Temperature Setting:	ATW, ATW LOCK, Ach, Bch, preset 3200 K/preset 5600 K/VAR (2000 K to 15000 K)
Shutter Speed:	When [SYSTEM MODE] = 59.94 Hz • 60i/60p mode: 1/60 (shutter off) sec., 1/100 sec., 1/120 sec., 1/250 sec., 1/500 sec., 1/1000 sec., 1/2000 sec. • 30p mode: 1/30 sec., 1/50 (shutter off) sec., 1/60 sec., 1/120 sec., 1/250 sec., 1/500 sec., 1/1000 sec., 1/2000 sec. • 24p mode: 1/24 sec., 1/50 (shutter off) sec., 1/60 sec., 1/120 sec., 1/250 sec., 1/500 sec., 1/1000 sec., 1/2000 sec. When [SYSTEM MODE] = 50 Hz • 50i/50p mode: 1/50 (shutter off) sec., 1/60 sec., 1/120 sec., 1/250 sec., 1/500 sec., 1/1000 sec., 1/2000 sec. • 25p mode: 1/25 sec., 1/50 (shutter off) sec., 1/60 sec., 1/120 sec., 1/250 sec., 1/500 sec., 1/1000 sec., 1/2000 sec.
Slow Shutter Speed:	Setting is possible when [VFR]=[OFF] When [SYSTEM MODE] = 59.94 Hz • 60i/60p mode: 1/1 sec., 1/2 sec., 1/4 sec., 1/6 sec., 1/15 sec., 1/30 sec. • 30p mode: 1/1 sec., 1/2 sec., 1/4 sec., 1/6 sec., 1/15 sec. • 24p mode: 1/1 sec., 1/2 sec., 1/4 sec., 1/6 sec., 1/12 sec. When [SYSTEM MODE] = 50 Hz • 50i/50p mode: 1/1 sec., 1/2 sec., 1/4 sec., 1/6 sec., 1/12 sec., 1/25 sec. • 25p mode: 1/1 sec., 1/2 sec., 1/4 sec., 1/6 sec., 1/12 sec.
Synchro Scan Shutter:	When [SYSTEM MODE] = 59.94 Hz and [SYNC SCAN TYPE] = [sec] • 60i/60p mode: 1/60.0 sec. to 1/249.8 sec. • 30p mode: 1/30.0 sec. to 1/249.8 sec. • 24p mode: 1/24.0 sec. to 1/249.8 sec. When [SYSTEM MODE] = 50 Hz and [SYNC SCAN TYPE] = [sec] • 50i/50p mode: 1/50.0 sec. to 1/250.0 sec. • 25p mode: 1/25.0 sec. to 1/250.0 sec.
Shutter Open Angle:	3.0 deg to 180.0 deg to 360.0 deg (in 0.5 deg steps, angle display)
VFR Recording Frame Rate:	• 1080/59.94p: 1, 2, 4, 6, 9, 12, 15, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 32, 34, 36, 40, 44, 48, 54, and 60 (frames per second) • 1080/50p: 1, 2, 4, 6, 9, 12, 15, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 37, 42, 45, 48, and 50 (frames per second)
Sensitivity:	[HIGH SENS.] mode F11 (2000 lx, 3200 K, 89.9 % reflection, 1080/59.94i) F12 (2000 lx, 3200 K, 89.9 % reflection, 1080/50i)
Minimum Subject Illumination:	0.02 lx [F1.6, gain 18 dB, [1S.EXP.], [HIGH SENS.] mode]
Digital Zoom:	x2/x5/x10
Lens Hood:	Hood with lens cover

Memory card recorder

Recording Media:	microP2 card, P2 card
Recording Slot:	microP2 card slot x2, P2 card slot x1
System Format:	1080/59.94p, 1080/59.94i, 1080/23.98PsF, 720/59.94p, 480/59.94i, 1080/50p, 1080/50i, 720/50p, 576/50i
Recording Format:	AVC-Intra200/AVC-Intra100/AVC-Intra50/ AVC-LongG50/AVC-LongG25/AVC-LongG12 DVCPR0 HD/DVCPR050/DVCPR0/DV formats
Recording Video Signal:	1080/59.94p, 1080/59.94i, 1080/29.97pN, 1080/23.98pN, 720/59.94p, 720/29.97pN, 720/23.98pN, 480/59.94i, 480/29.97p 1080/50p, 1080/50i, 1080/25pN, 720/50p, 720/25pN, 576/50i, 576/25p
Recording/Playback Time*:	16 GBx1 32 GBx1 64 GBx1 AVC-Intra200: Approx. 8 min. Approx. 16 min. Approx. 32 min. AVC-Intra100: Approx. 16 min. Approx. 32 min. Approx. 64 min. AVC-Intra50: Approx. 32 min. Approx. 64 min. Approx. 128 min. AVC-LongG50: Approx. 32 min. Approx. 64 min. Approx. 128 min. AVC-LongG25: Approx. 64 min. Approx. 128 min. Approx. 256 min. AVC-LongG12: Approx. 120 min. Approx. 240 min. Approx. 480 min. DVCPR0 HD: Approx. 16 min. Approx. 32 min. Approx. 64 min. DVCPR0 50: Approx. 32 min. Approx. 64 min. Approx. 128 min. DVCPR0/DV: Approx. 64 min. Approx. 128 min. Approx. 256 min.

Digital video

Sampling Frequency:	AVC-Intra200/AVC-Intra100/AVC-Intra50/AVC-LongG50/ AVC-LongG25/AVC-LongG12/DVCPR0 HD Y: 74.1758 MHz, Pb/Pr: 37.0879 MHz (59.94 Hz) Y: 74.2500 MHz, Pb/Pr: 37.1250 MHz (50 Hz) DVCPR050 Y: 13.5 MHz, Pb/Pr: 6.75 MHz DVCPR0 Y: 13.5 MHz, Pb/Pr: 3.375 MHz
Quantizing:	AVC-Intra200/AVC-Intra100/AVC-Intra50/AVC-LongG50/ AVC-LongG25: 10 bits AVC-LongG12/DVCPR0 HD/DVCPR050/DVCPR0/DV: 8 bits
Video Compression Format:	AVC-Intra200/AVC-Intra100/AVC-Intra50/ MPEG-4 AVC/H.264 Intra Profile AVC-LongG50/AVC-LongG25/AVC-LongG12: MPEG-4 AVC/H.264 DVCPR0 HD: DV-Based Compression (SMPTE 370M) DVCPR050/DVCPR0: DV-Based Compression (SMPTE 314M) DV: DV Compression (IEC 61834-2)

Digital audio

Recording Audio Signal:	AVC-Intra200/AVC-LongG50/AVC-LongG25: 48 kHz/24 bits, 4 CH AVC-Intra100/AVC-Intra50: 48 kHz/16 bits, 4 CH and 48 kHz/24 bits, 4 CH switch AVC-LongG12/DVCPR0 HD/DVCPR050: 48 kHz/16 bits, 4 CH DVCPR0/DV: 48 kHz/16 bits, 4 CH
Headroom:	12 dB/18 dB/20 dB switchable menu

AVC proxy

File Format:	MOV
Video Compression Format:	H.264/AVC Baseline Profile, H.264/AVC High Profile
Audio Compression Format:	AAC-LC, Linear PCM
Approximate Recording Time (1 GB)*:	AVC-G6 2CH MOV: Approx. 13 min. SHQ 2CH MOV: Approx. 25 min. HQ 2CH MOV: Approx. 78 min. LOW 2CH MOV: Approx. 135 min.

Video input/output

SDI OUT:	BNC x 1, HD (3G/1.5G), SD: 0.8 V [p-p], 75 Ω
VIDEO OUT:	BNC x 1, Also used as the GENLOCK IN, IN/OUT switch selection Composite: 1.0 V [p-p], 75 Ω
HDMI OUT:	HDMI x 1 (HDMI type A terminal, not compatible with VIERA Link)

Audio input

Built-in Microphone:	Supports stereo microphone
AUDIO INPUT 1/AUDIO INPUT 2:	XLR x 2, 3 pin.Input high impedance, LINE/MIC switch selection LINE: 4 dBu/0 dBu (selectable menu) MIC: -40 dBu/-50 dBu/-60 dBu (selectable menu), +48 V on/off (switch selection)

Audio output

AUDIO OUT:	3.5 mm diameter stereo mini jack x 1, Output level: 600 Ω, 316 mV
Headphones:	3.5 mm diameter stereo mini jack x 1 100 Ω, -16 dBV (32 Ω load, at maximum output level)
Speaker:	20 mm diameter, round x 1

Other input/output

CAM REMOTE:	2.5 mm diameter super mini jack x1 ZOOM S/S 3.5 mm diameter mini jack x1 FOCUS IRIS
GENLOCK IN:	BNCx1, also used as the VIDEO OUT, IN/OUT switch selection, 1.0 V [p-p], 75 Ω
TC IN/OUT:	BNCx1 Used as the input and output terminals, IN/OUT switch selection Input: 1.0 V - 4.0 V [p-p], 10 kΩ Output: 2.0 V±0.5 V [p-p], low impedance
LAN:	100BASE-TX/10BASE-T
USB2.0 DEVICE (device):	Type miniB connector, 4 pin
USB3.0 HOST (host):	Type A connector, 9 pin
USB2.0 HOST(sub-host):	Type A connector, 4 pin (exclusively for wireless module AJ-WM30)
DC IN 12V:	DC 12 V (DC 10.5 V - 13.5 V), EIAJ type 4

Monitor

LCD Monitor:	3.5 type QHD color monitor (Approx. 1560000 dots)
Viewfinder:	0.5 type OLED (organic EL display) (Approx. 2360000 dots, video display area: Approx. 1770000 dots)

Included Accessories

Battery (VW-VBD58), Shoulder strap, Battery charger, AC adaptor, Microphone holder, Screw for microphone holder (12 mm), Power code x 2, Eye cup, Lens hood, Grip belt

*1: Figures are for continuous recording as one clip. Depending on the number of clips, the overall recording time may be shorter than the above.

*2: These are reference values for continuous recording using the Panasonic products. The recording time may differ depending on the scene or the number of clips.

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

Please refer to the latest Non-linear Compatibility Information, P2 Support, Download and Service Information, etc. at the following Panasonic web site.



<http://pro-av.panasonic.net/>

Notes Regarding the Handling of P2 Files Using a PC

Mounting and Transferring Files

The PC must be installed with the included P2 driver in order to recognize, copy and transfer P2 files. This driver is also necessary when using the PC card slot and when handling P2 files stored on a hard-disk device, such as P2 store. For other operating requirements, refer to the P2 installation manual. The P2 driver and the P2 installation manual can be downloaded free from a Panasonic website. Visit <http://pro-av.panasonic.net/en/download/>.

Preview and Nonlinear Editing

To preview (play) P2 files on a PC, it is necessary to install P2 Viewer Plus software (downloadable for free, for Windows and Mac), both from Panasonic, or P2-compatible editing software available from other companies (for details, visit http://pro-av.panasonic.net/en/sales_o/p2/partners.html). Note that each software places specific requirements on the operating environment, and the operating environment must meet additional requirements to play and edit HD content on Windows PCs and Macs. For P2 Viewer Plus download and operating requirement information, visit <http://pro-av.panasonic.net/en/download/>. For operating requirements and details of other P2 editing software, visit the website of the relevant software manufacturer.

** Notes Regarding Network Functions

- **For 4G/LTE connection:** 4G/LTE module is required from a 3rd party. Availability of this function may vary depends on areas. For details, please visit Panasonic website http://pro-av.panasonic.net/en/sales_o/p2/server/4glte.html.
- **For wireless LAN connection:** Wireless module (optional, AJ-WM30) is required. For the OS, browser, device compatibility information, see "Service and Support" on the Panasonic website <http://pro-av.panasonic.net/>. Some functions are not supported by some devices.
- **For iPad remote control:** The P2 ROP App (downloadable free of charge from the Apple App Store) is required. For details, please visit Panasonic website http://pro-av.panasonic.net/en/sales_o/p2/ver_up/p2rop_app.html.
- **For streaming:** Transfers only to a designated server (one server). The proxy image cannot be recorded while streaming. The streaming function cannot be used together with dual codec recording and simultaneous recording, or with the Rec during Uploading function. For details on downloading and the operating environment of video streaming compatible application software, please refer to the Panasonic website http://pro-av.panasonic.net/en/sales_o/p2/aj-px270/. For streaming, 4G/LTE USB modem and PC must be able to access directly each other by Public IP (Global IP). Please contact your provider to get Public IP (Global IP). To display the streaming video using P2 browser, player is required. (VLC MEDIA PLAYER or Windows PC, QuickTime Player for Mac.) P2 Streaming Receiver software (Windows only, not supported by Mac; available free of charge) is required for receiving the QoS mode. Please visit Panasonic website <http://pro-av.panasonic.net/en/download/>.

Precautions When Using SD Memory Cards

On the Memory Card Camera Recorder, use SD memory cards that conform to the SD standard, SDHC standard, or the SDXC standard. When performing proxy recording (extra-cost option), use SDHC memory cards, SDXC memory cards, or Panasonic SD memory cards with the class description of class2 or higher. The MMC (Multi Media Card) cannot be used. Be sure to format cards on the Memory Card Camera Recorder before use. In this Memory Card Camera Recorder, memory card of the capacity of SD (8 MB to 2 GB), SDHC (4 GB to 32 GB), and SDXC (32 GB to 128 GB) can be used.

Note Regarding 24 bit Audio

Clips recorded using 24 bit audio must be played back with 24 bit compatible P2 equipment or the P2 Viewer Plus. If clips are played back with equipment not compatible with 24 bit audio, the clip number will be indicated in red and the clips will not be played back.

"AVC-ULTRA", "P2HD", "AVC-Intra", "AVC-LongG", "AVC-Proxy", "DVCPRO HD", "DVCPRO 50" and "DVCPRO" logos are registered trademarks of Panasonic Corporation. SDHC logo and SDXC logo are trademarks of SD-3C, LLC. Quick Time is a trademark of Apple, Inc., registered in the U.S. and other countries. HDMI and the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing, LLC. VLC media player is trademarks internationally registered by the VideoLAN organization.

Panasonic®

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Vietnam	+65 6277 7284



JQA-QA443



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