

Panasonic

AJ-HDC27F_E
720p Variable Frame-Rate Camera/Recorder



A variable frame-rate camera
for an HD multi-media world.

High Definition



DVCPRO HD

The HD Story

The freedom to realize your vision.

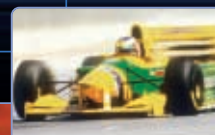
As technology evolves, Panasonic continues to bridge the gap between the artist and their vision through breathtaking advances in high-definition digital imaging. By empowering storytellers with a dazzling array of production-oriented technology, at significant economies, an exciting new world of

creative possibilities is emerging on the multi-media horizon.

Since the introduction of our DVCPRO family of digital products, we've placed over hundreds of thousands of key components in the world's news, production and post production communities. Already acknowledged as one of the most reliable and economical video



Whether episodic **television**, independent **films**, music videos, DVD, Internet or **new media** projects, Panasonic is ushering in a new era of **high definition**.



systems, DVCPRO HD is now building on this cachet with our HD Cinema cameras and related digital VTRs.

Whether episodic television, independent films, music videos, DVD, Internet or new media projects, Panasonic is ushering in a new era of high definition, digital production, finishing and distribution.

By bringing together the worlds of cinematography, digital recording and computer augmented post production, Panasonic has defined itself as the premier name for technology that fuels artistic freedom worldwide.

Expanding the boundaries of digital cinematography.

The AJ-HDC27FE is the first variable frame-rate camera designed to inspire and empower cinematographers,

directors and digital artists with exciting new creative options. From infusing documentaries with a lush, cinematic quality to creating stunning new visual effects for music videos, the AJ-HDC27FE gives unprecedented freedom for storytellers to realize their vision.

Open systems. Open minds.

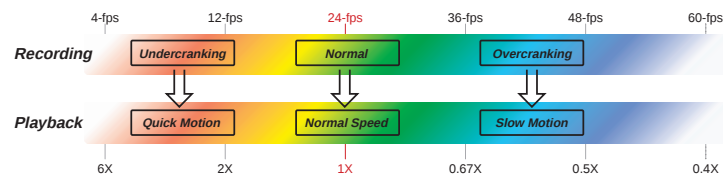
An important component of the AJ-HDC27FE is its compatibility with other international formats. Not only is it backwards compatible to Panasonic's own DVCPRO 25/50 and DV formats, but 1080i and 720p images can also be converted to 1080p/24 – a universal master from which 25-fps PAL programming and multiple other TV formats* are easily derived. You can also utilize your current SD Editing Systems. HD Shooting/SD Editing is realized.

*Panasonic equipment complies with ITU recommendations for HD production and international programme exchange.

The Camera for Cinema

Variable Frame Rate

The Panasonic AJ-HDC27FE is the world's first video camera able to simulate the "undercranking" and "overcranking" technique of film cameras to slow down or speed up images. By varying the frame rate from 4 to 60 fps and adjusting the shutter speed from 3.0° to 350.0° (0.8% to 97.2%) of the frame rate, you can create a wide range of cinematic



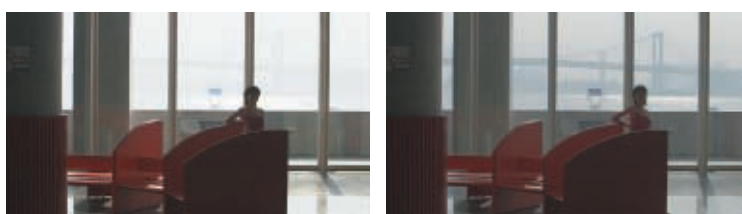
effects. And since the VTR section records at a constant 60 fps, you can edit offline with a conventional DVCPRO HD VTR. This lets you build a powerful 24p production system without a huge investment in equipment.



Film Gamma Selectable

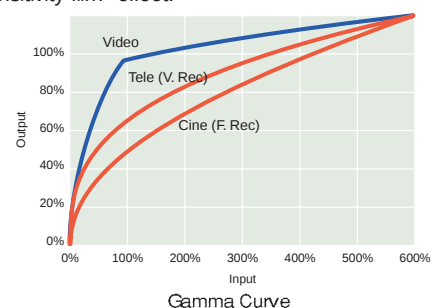
The extremely wide reproductive range of film is the key to its lush expression. Panasonic's new gamma curves -- developed specifically to allow a CCD camera to produce the tonal qualities of film -- now bring film's natural shading and rich coloration to the video camera. The AJ-HDC27FE also lets you switch between video and film gamma modes. Film modes include "Cine

Gamma" for film using ARRI laser recooder and "Tele Gamma" for monitor viewing and CRT base film recorders. Select the mode that suits your production. The ISO640-equivalent sensitivity -- which surpasses even film cameras -- combines with the brightness and superior picture quality to produce an essentially "grainless, high-sensitivity film" effect.



Video Gamma Image

Film Gamma Image



Gamma Curve

The AJ-HDC27FE Camera gives artists the **power to capture images** with the **same expressive characteristics as film**, and with **intuitive operation** that instantly feels comfortable.



Film User Menu

The AJ-HDC27FE is like a film camera not only in functions and performance, but in operation as well. The settings you need on the set are conveniently grouped in a single-page menu. Use this menu to select or adjust gamma, scan reverse ON/OFF, hardness/softness, shadow gradation, Y-Get , and latitude. Just as with a film camera, you can also select tungsten or daylight type lighting.



Film User Menu Screen

Scan Reverse

Peripherals, beginning with lenses, are an essential part of the artist's creative toolbox. Adding the optional lens adapter configures the AJ-HDC27FE for an Ultra Prime film lens.

The AJ-HDC27FE is also equipped with the industry's first scan reverse circuit, which cancels image reversal when the adapter is in use. This function, which is easily set from the menu, also accommodates other film camera peripherals such as a slide base and matte boxes.

Y-Get Function

You can set Y-Get function at side User Switch. This makes Spot Meter function realized on EVF.



Features and Functions

Camera section: Captures a wide range of images for use in cinematic or broadcast productions.

- Selectable frame frequency (60.0Hz for PAL area/59.94Hz for NTSC area)
- 3-CCD imager with 2000-lux sensitivity at F12, and minimum illumination of 0.7 lux
- Selectable gamma curves to create desired film tones
- Variable frame rate from 4 to 60 fps, including the traditional "film look" rate of 24 fps
- Digital setup for numeric image control. Easy jog dial and menu-driven operation.
- Simple cinematic settings via the Film User Menu
- Up to 8 setup data files can be stored on an SD Memory Card (RP-SD008B, sold separately)
- Picture-enhancing circuits: Auto knee, detailing, shading compensation, 12-pole colour matrix, masking
- "Y Get" makes spot meter function realized on EVF
- 2-level zebra pattern and spot zebra
- Up to 10 gain values ranging from -6 dB to +30 dB; 3 values can be saved as presets. Super Gain instantly increases gain to +36 dB.
- The following functions can be assigned to the USER1/USER2 button: Super Iris, Super Gain, Super Black, Black Stretch, front/rear mic input, Y-Get, Rec, Return
- 6 shutter speeds (1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec), plus 3°-350° (0.8%-97.2%) variable
- Same tungsten/daylight selection as in film cameras. Also comes standard with two ND and CC optical filter wheels.
- Auto Black Balance (ABB) and Auto White Balance (AWB). AWB stores two values for each set of four CC filter positions.
- ECU menu On/Off selectable on EVF





VTR section: High-quality recording of 720p images.

- Records up to 46 minutes on a compact DVCPRO HD cassette
- Recorded tapes can be played and edited on a DVCPRO HD studio VTR
- Recorded results can be checked on location via the viewfinder (black & white) or monitored in colour through the HD SDI out terminal
- Two channels of 16-bit/48-kHz digital audio
- Users Bit Data for post-process
- Audio input selectable from the front mic or rear panel line/mic input
- NEWS REC function prevents start/stop mistakes
- RETAKE function simplifies retakes of NG cuts
- REC REVIEW allows instant checking of recorded end
- Interval recording, with intervals from 2 seconds to 24 hours

The functions that professionals need, in a compact, lightweight unit with low power consumption.

- Scan Reverse function for cinematic lens adapter
- HD SDI monitor out for line recording with HD-D5 or other VTRs

The menu screen/viewfinder status display can also be superimposed on the SDI output signals.

- Handheld control of camera settings and VTR section remote control using the AJ-EC3E Extension Control Unit
- Built-in colour bar, reference audio signal generator
- Accommodates super-directional mic with phantom power supply
- Compact size, light weight —
- approx. 4.5 kg (7.2 kg in operating condition)
- Consumes only 33 W when recording in SAVE REC mode to minimize battery drain



15-frames



Normal shooting at 24 fps (for Film) or 25 fps (for TV program)

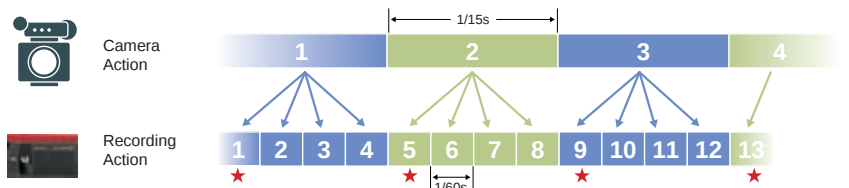
Normal cinematic shooting is done at true 24 fps, the same rate as in film cameras, or at the 25 fps used for TV programmes and commercials.

Discrete 720p images and a specially developed film gamma curve create images with the same tonal characteristics as film.

Lower-speed shooting at 4 to 23 fps

For example, shooting at 12 fps lets you attain a 2x fast-motion effect with playback at the cinema speed of 24 fps. This technique can be combined with zooming to create a warp-speed effect, such as for giving special emphasis to flowing water, scudding clouds, or a person standing still amid a bustling crowd. Decrease the shutter speed for a strobe effect, or increase it for a ghost effect. The expressive possibilities are endless.

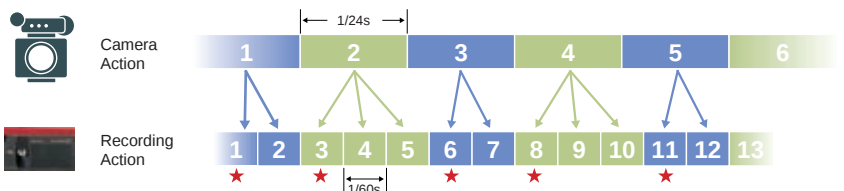
Low Speed Shooting (Ex. 15-fps)



24-frames

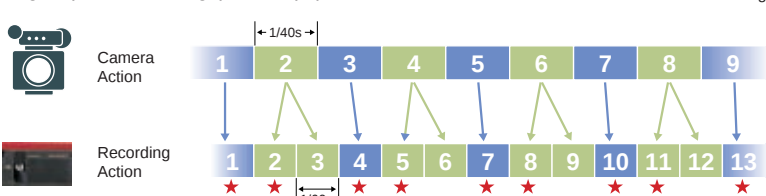


Normal Speed (24-fps)



40-frames

High Speed Shooting (Ex. 40-fps)

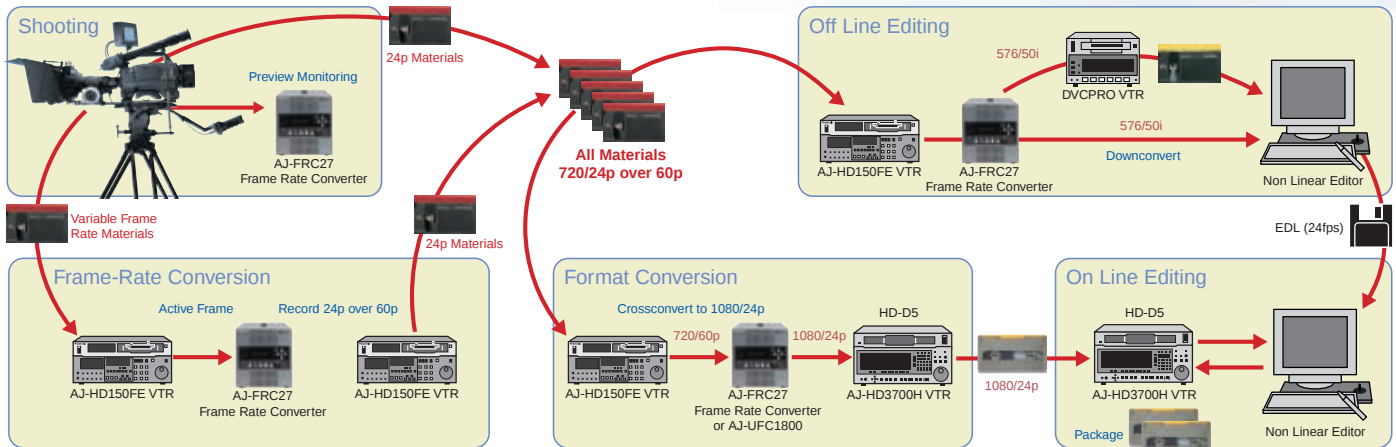


Higher-speed shooting at 25 to 60 fps

For example, shoot at 48 fps to attain a 1/2x slow-motion effect with playback at the cinema speed of 24 fps. This is especially effective for high-action scenes such as car chases or spectacular crashes, or for scenes with great dramatic impact. Unlike the slow motion captured at playback speed by ordinary video cameras, the AJ-HDC27FE captures highly dense frames to provide a smooth, naturally flowing slow-motion effect with vivid picture quality.

2, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60
selectable shooting frame rate of 4 fps to 60 fps, in 1-fps steps.

System Flow-Chart for Cinema Production (24-fps)



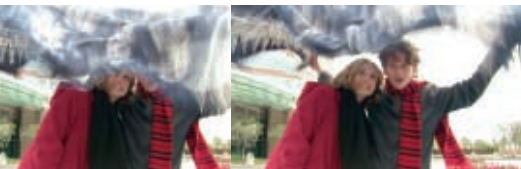
Recording at 60 fps

Although CCD frame rates may change, the VTR records at a constant 60 fps so that the audio timing is not affected. This is particularly important for avoiding audio synchronizing issues in post-production (unless a second audio recording system is

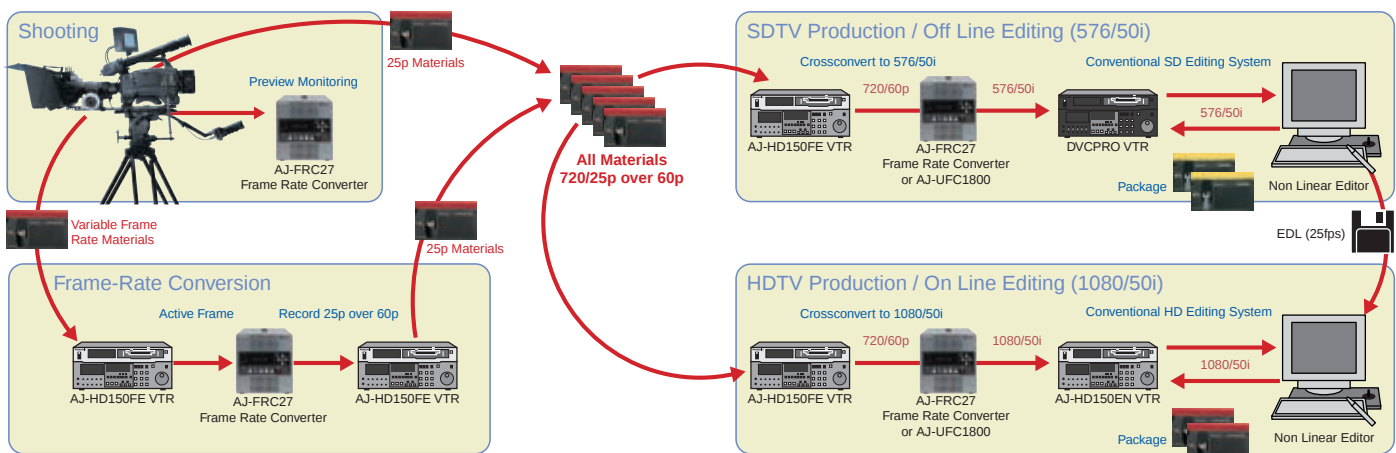
used). Another advantage is that tapes recorded at 60 fps can be played back directly on any DVCPRO HD VTR -- eliminating the need to invest in a second, special VTR. Plus, because the HD SDI out terminal outputs 60-fps non-compressed images, high-quality recording is possible on an extended-bandwidth HD-D5 recorder.

Frame rate conversion

The AJ-FRC27 Frame Rate Converter lets you extract only the frames you want from footage recorded by the AJ-HDC27FE at various frame rates. This lets you play fast-motion or slow-motion effects in their actual timeframes. At the same time, you can cross-convert from 720p to 1080/24p or 1080/50i, or down-convert to PAL or NTSC. Edit online with a HD-D5 recorder, or offline with DVCPRO. Again, the possibilities are unlimited.

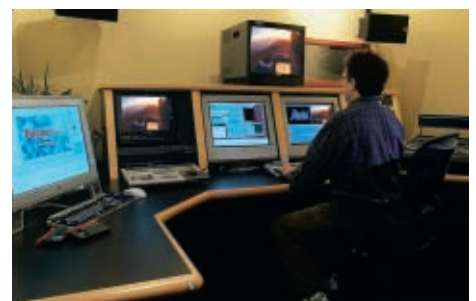


System Flow-Chart for TV Programme Production (25-fps)

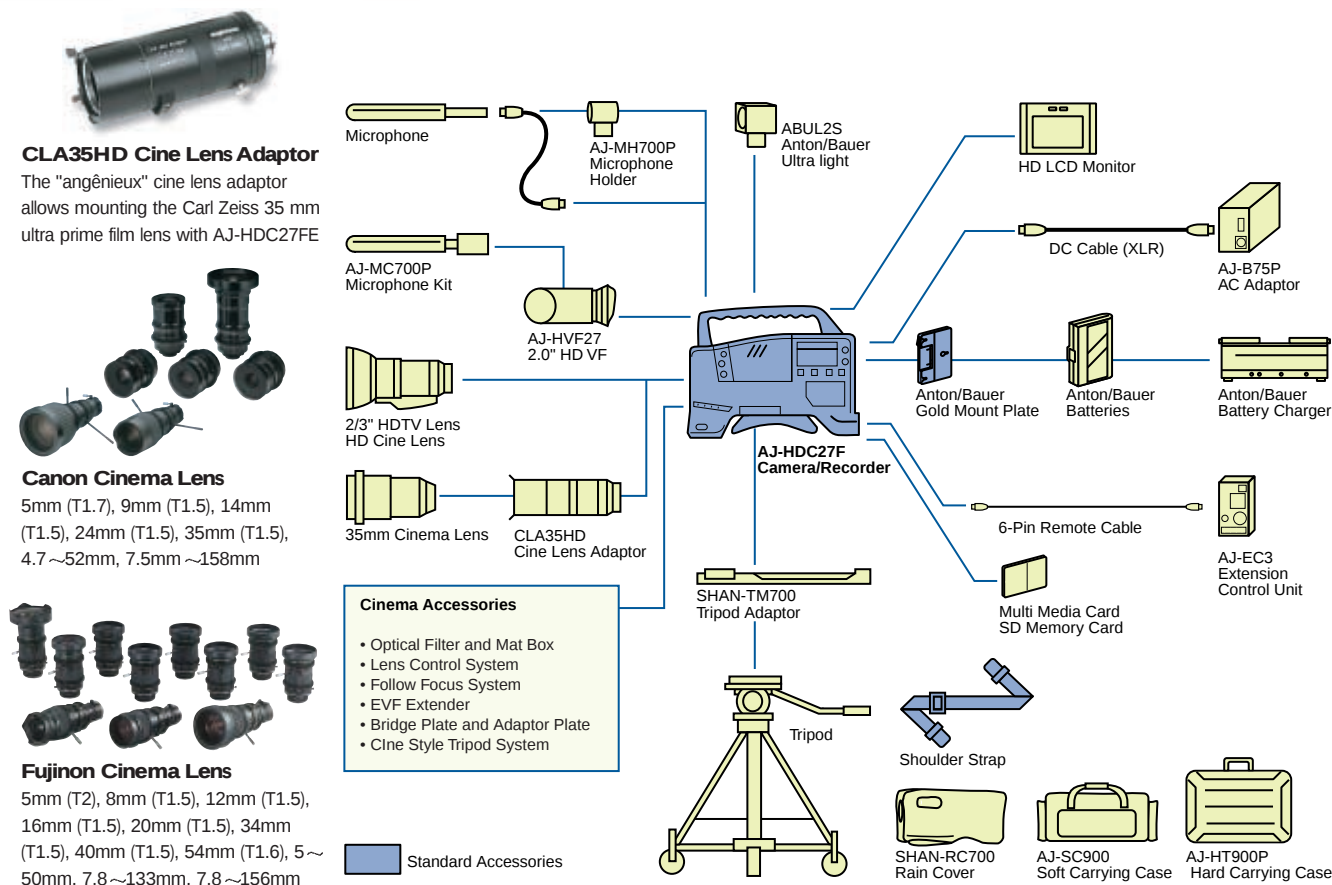


SXGA nonlinear editing

The 1280 x 720-pixel progressive scan images recorded by AJ-HDC27FE are fully compatible with the SXGA-resolution desktop nonlinear editing systems commonly used in high-end image production. User bits mark effective frames for extraction by nonlinear systems.



Supporting Cast



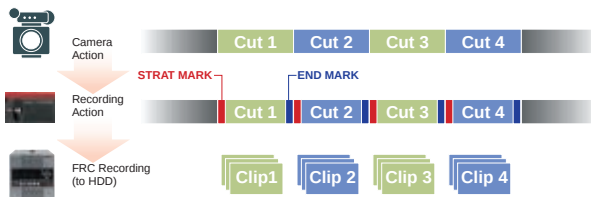
AJ-FRC27 Frame Rate Converter

The AJ-FRC27 converts the frame rates of images recorded using the AJ-HDC27FE. It extracts the frames you designate, records them to an internal HDD, and plays them back. This lets you play fast-motion or slow-motion effects in their actual, intended timeframes.

You can select the playback frame rate from 24-, 25- or 60-fps, up-convert to 1080/24psF or 1080/50i, or down-convert to SDTV (576/50i), working either on-line or off. If frame rate conversion is not required, you can also directly convert the input signal into EE-through for output.

Data can be automatically recorded by connecting to the AJ-HDC27FE via HD-SDI, and clip files of cuts that you designate by linking to the camera's REC/STOP control can be stored to an HDD for backup. These functions are also supported during studio editing, and the resulting tapes can be played on a DVCPRO HD VTR, making it possible to automatically create

Auto REC Function (in Recording)



Pre-Roll Image Insertion (in Playback)



a clip of each cut by simple frame rate converter recording. Management of OK/NG cuts is fast and easy.

During playback, a pre-roll image of up to 10 seconds in length can be automatically inserted and output with a continuous time code. This helps to speed up shooting by letting you use the leading/trailing parts of each cut as editing material, something that was difficult to do in conventional HD cinema production.

The AJ-FRC27's compact, half-rack size and 5U profile makes it good fit for applications ranging from studio use to EFP or relay use.

INFO

AJ-FRC27	Frame rate and format conversion	
Record/play 100 minutes	Half-rack size	
HD SDI I/O	SD (SDI/Component/Composite) out	

HD Cinema

Panasonic HD Cinema recording and video projection technologies represent the cutting edge of a new digital age in cinema.

The combination of HD digital acquisition with HD digital projection opens up a host of new business and programming opportunities -- such as live pay-per-view concerts, sporting events, theater, and other special events.



INFO	AJ-HD150FE Plays/Records 720p and 1080i	
	Playback all DV-based formats	Full editing
	Converts SD or HD	8-Ch audio

AJ-HD150FE Full-Featured Studio VTR

Supporting playback and record of both 1080i and 720p HD formats, the AJ-HD150FE is one of the most capable, most versatile HD VTRs ever. It plays back all DV-based cassettes including Mini-DV, DV, DVCPRO, DVCPRO50, DVCPRO HD and even DVCAM. With the addition of its dedicated format converter card, the AJ-HD150FE readily converts standard definition formats into 1080i or 720p HD formats – in real time. It also handles simultaneous aspect ratio conversion to best suit playout requirements.

With its wide range of capabilities, exceptional reliability and affordable cost of ownership, the AJ-HD150FE should be considered essential equipment for every broadcast and production facility that's even thinking about HD. Variable-speed playback ranges from -1 ~ +1x; in 0.02x steps via AJ-A95 remote controller or standard edit controller. 8 digital audio channels accommodate 5.1 surround sound plus stereo.

AJ-HD3700H Multi-Format/Multi-Standard Mastering VTR

The AJ-HD3700H VTR meets all high quality HD and SD production requirements in one VTR. HD studio quality is assured by full band width (1920 x 1080) in 1080i, and 4:2:2 digital 10-bit component recording, plus 1080/24p, 1080/25p, as well as standard definition non-compressed 480i. Metadata recording and playback is built in without sacrificing audio channels and conversion between formats is as simple as an optional converter card set. With a newly designed, easy-to-use front panel operation, full editing capability, and lower power consumption, the AJ-HD3700H is designed for integration into today's modern post and production facilities.

The advantage of reduced rack space with the 5 RU profile means less real estate devoted to multiple VTRs. The AJ-HD3700H provides the flexibility of having a single machine function in both HD and SD, plus the popular 1080/24p and 1080/24psF. With the optional built-in format converter card, SD to HD and HD to SD conversions are handled internally - without the need for outboard gear.



INFO	AJ-HD3700H HD-D5 Plays/Records ATSC formats	
	Supports multiple frame rates	10-bit recording
	Format Conversion	Metadata

PT-D9610U HD Cinema projection system

Using advanced licensed DLP (Digital Light Processing™) along with the proprietary re-sizing technology of Panasonic's Emmy® award-winning Universal Format Converter results in remarkably bright, vivid images. Combine that with Panasonic's Digital Cinema Reality™ circuit, which eliminates motion judder for an exceptionally smooth and sharp digital moving picture, and the realities of the digital future become unmistakably clear.

INFO	PT-D9610U DLP™	
	Bright 12,000 ANSI lumens	HD/SD multi format
	Digital processing	Edge blending for multi-screen



*DLP is a trademark of Texas Instruments. Emmy is a registered trademark of the National Academy of Television Arts and Sciences.

AJ-HDC27FE Specifications

General		Video	
Power Supply	DC 11V to 17V	Sampling Frequency	Y: 74.25MHz, Pb/Pr: 37.125MHz (60Hz) Y: 74.1758MHz, Pb/Pr: 37.088MHz (59.94Hz)
Power Consumption	33 W (without VF, SAVE REC MODE); 39 W typical operating conditions	Quantization	8 bits
Operating Temperature	0° C to 40° C	Error Correction	Reed-Solomon product code
Operating Humidity	Less than 85%	Compression Ratio	6.7:1
Weight	About 4.5 kg About 7.2 kg in operation	Bit Rate	100 Mbps
Dimensions (W x H x D)	132 x 204 x 313 mm	Video Band	Y: 20MHz, Pb/Pr: 10MHz
Camera Section		Audio	
CCD Elements	2/3" IT 3-CCD (RGB)	Sampling Frequency	48.048kHz (60Hz), 48kHz (59.94Hz)
Picture Elements	1,019,280 pixels (total, 1,370 x 744) 921,600 pixels (effective, 1,280 x 720)	Quantization	16 bits/sample
Optical Filters	CC: Cross, 3200K, 4300K, 6300K ND: CLEAR, 1/4ND, 1/16ND, 1/64ND	Frequency response*	20Hz to 20kHz, ± 1.0 dB (reference level)
Quantization	10 bits	Dynamic range*	More than 85dB (1kHz, AWTD)
Processing	74.25MHz (60Hz), 74.1758MHz (59.94Hz)	Distortion*	Within 0.1% (1kHz, reference level)
Gain	Programmable: -6/-3/0/+3/+6/+9/+12/+18/+24/+30 dB	Wow & Flutter*	Below measurable limit
Super Gain	+18/+24/+30/+36 dB	Headroom*	18 dB
Shutter Speed	1/100, 1/120, 1/250, 1/500, 1/1000 and 1/2000 sec.	Input	
Syncro Scan Shutter	0.8%~97.2% (3.0°~350.0°)	Audio IN	XLR x 2 (CH1/CH2) MIC/LINE/MIC+48V switchable LINE: 0 dBu MIC: -60 dBu MIC+48V: Phantom +48V, -60 dBu
Frame Rate	4 fps to 60 fps (in single increments)	MIC IN	XLR x 1, balanced, -40dBu (switchable to -50dBu using internal switch) Phantom +48V (On/Off)
Sensitivity	2000 Lux at F12 (89.9% reflection, 23.98p, 50% shutter)	Genlock IN	BNC x 1, 1.0Vp-p 75 Ω
Minimum Illumination	0.7 lux (F1.4, +36 dB gain 59.94p)	TC IN	BNC x 1, 0.5 to 8Vp-p, High-impedance
Video S/N	54 dB (standard)	Output	
Horizontal Resolution	700 TV lines at center	HD SDI OUT	BNC x 2, 0.8Vp-p 75 Ω
Registration Error	Less than 0.03% (whole zone, without lens distortion)	Audio OUT	XLR-5pin x 1, 0 dBu
Geometric Distortion	Below measurable limit	TC OUT	BNC x 1, 2.0Vp-p low-impedance
Lens Mount	2/3" Bayonet type	Phones	Stereo mini-jack x 1
Viewfinder	AJ-HVF27 (optional)	Others	
VTR Section		DC IN	XLR-4pin x 1 DC11V to 17V
Recording Format	DVCPRO HD (720p, 60Hz/720p, 59.94Hz)	DC OUT	4P x 1, DC11V to 17V, 400 mA
Tape	1/4" DVCPRO HD cassette tape	Lens	12P x 1
Tape Speed	135.42 mm/s (60Hz), 135.28 mm/s (59.94Hz)	ECU	6P x 1
Recording Time	Max. 46 minutes using AJ-HP46LP	EVF	20P x 1
FF/REW Time	About 3 minutes using AJ-HP46LP		

*The above specifications were measured by playing back tapes recorded by this unit on standard DVCPRO HD VTRs.

Weight and dimensions shown are approximate.

Features and specifications are subject to change without notice.

These products may be subject to export regulations.

Panasonic

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Austria	Tel. 43-1-61080-773
Bahrain	Tel. 973-252292
Belgium	Tel. 32-2-481-0481
Brazil	Tel. 55-11-3889-4035
Canada	Tel. 1-905-624-5010
China	Tel. 86-10-6515-8828
(Hong Kong)	Tel. 852-2313-0888
Czech Republic	Tel. 42-02-2166-4120
Denmark	Tel. 45-43-200-853
Egypt	Tel. 20-2-3938151
Finland	Tel. 358-9-521-5253
France	Tel. 33-149464388
Germany	Tel. 49-611-18160
Greece	Tel. 30-1-969-2300
Hungary	Tel. 36-1-382-6060
Indonesia	Tel. 62-21-801-5666 62-21-385-9449
Iran	Tel. 98-21-2271463
Italy	Tel. 39-02-67881
Jordan	Tel. 961-6-586-1914

Korea	Tel. 82-2-784-0245
Kuwait	Tel. 965-481-2123
Lebanon	Tel. 961-1-216827
Malaysia	Tel. 60-3-5549-5422
Mexico	Tel. 52-5-488-1000
Netherlands	Tel. 31-73-640-2721
New Zealand	Tel. 64-9-272-0100
Norway	Tel. 47-22916800
Pakistan	Tel. 92-21-455-5766
Peru	Tel. 51-145-29470
Panama	Tel. 507-229-2955
Philippines	Tel. 63-2-633-6162
Poland	Tel. 48-3912-3173
Portugal	Tel. 351-21-424-8630
Puerto Rico	Tel. 1-787-750-4300
Russia	Tel. 7-095-258-4237
Saudi Arabia	Tel. 966-1-465-0709
Singapore	Tel. 65-6270-0110
Slovakia	Tel. 421-7-5292-1423
South Africa	Tel. 27-11-313-1400
Spain	Tel. 34-93-425-9300
Sweden	Tel. 46-8-680-8238

Switzerland	Tel. 41-41-259-9632
Taiwan	Tel. 886-2-2725-9100
Thailand	Tel. 66-2-731-8888
Turkey	Tel. 90-216-416-0150
U.A.E.	Tel. 971-4-282201
U.K.	Tel. 44-118-902-9210
U.S.A.	Tel. 1-201-348-7621

