

Panasonic AJ-HDX400E

MICHAEL BRENNAN shoots with the new Panasonic switchable HD camera and digs down into the DVCPRO HD codec

Panasonic's latest HD camcorder adds a new flavour to the crowded HD camcorder market. The good news is that it uses the DVCPROHD 1080i codec. This codec processes 1440 x 1080 pixels 8-bit at 4:2:2 then compresses to 6.7:1 to tape.

This compares more favourably with Varicam and HDCAM codecs. (see box on page 42 for more details)

The bad news is that the three 2/3 inch CCDs in the 400 are not 1920 x 1080 pixel CCDs, but 1280 x 720 pixel CCDs. So the camera cross converts (I call it up converts) from 720p to 1080i.

Starting at higher res and sampling down (if you must) has established technical advantages like reducing jaggies, but up conversion in camera offers no improvement in picture quality which is why manufacturers prefer to call it 'cross' conversion!

There is no HD camcorder (excluding the Genesis if you can call it a camcorder) that records 1920 x 1080 pixels, perhaps the diminutive Panasonic HVX-200 palmcorder will be the first!

Varicam Relations

The 400 draws on features of its older brother the Varicam and

so is well designed and conforms to the now industry standard layout in respect to viewfinder, shoulder pad and essential switches and controls, including a jog dial button and two filter wheels.

I'm not sure if the Japanese designers are all drinking beer in the same pub but similarities in menu layout must be more than a coincidence. On one hand it is a relief for camera operators to have similarities in menu structure from one camera to the next, on the other hand, improved menus and camera functions are more likely to evolve if there is competition. The menu structure includes; PAINT, FILE, MAINTENANCE, VTR, USER MENU.

Panasonic have added a 'System setting' page where frame rate is selected – this is a welcome improvement on having the frame rate buried in the maintenance menu.

The 400 has true progressive scanning, this combined with the 12-bit A/D makes for filmic looking pictures. Three 2/3 inch IT type CCDs are employed, reducing the cost of manufacture. Resolution of 700 TV lines is claimed, this from a 720 line CCD seems optimistic.

The 400 has a choice of two film-like gammas but does not have full cinema gamma functions that the Varicam has, the FILM REC MODE is not included. Perhaps Panasonic want to distinguish this camera as a camera for HDTV? A pity for Euro-indie film makers who can shoot movies at 25p and would benefit from the FILM REC MODE.

Digital enlargement of up to 400 percent is available, which quickly runs out of steam due to the 1280 x 720 pixel CCDs but is useful for checking back focus and in principle it is better to enlarge this way than do it in post.

In addition to three user definable gain settings of low medium and high, the 400 has three additional and very useful other modes of shooting in low light.

CULMINATIVE FRAME (long exposure in film terms) where the frame is exposed for more than 1/25th of a second, LINE MIX that mixes the gain of two lines, thus reducing resolution but increasing effective sensitivity without noise and finally SUPER GAIN of 30db.

Common with most cameras scene files can be stored and a paint function includes a 12 axis colour matrix.

There are three buttons that are user programmable with DIGITAL SUPER GAIN, CONVENTIONAL ELECTRONIC GAIN, and LINE MIX MODE to SUPER IRIS, SUPER GAIN, DIGITAL SUPER GAIN, SUPER BLACK, BLACK STRETCH, FRONT/REAR INPUT SELECT of audio CH1/CH2.

Viewfinder

The 400 has an improved viewfinder and shoulder pad adjustments and an Ikegami-style uni-slot behind the handle



The new Panasonic HDX-400 will be compared to the Sony 750 and Sony Z1 HDV cameras in the next issue

HDX400E – A 25p 1080i camcorder for the TV market



that accepts a diversity radio receiver.

The 400 uses the red coloured EX tapes enabling 33 minutes of recording. Note that older decks like the 130 will not playback the new EX format tapes.

A 10 second RAM recording board enables interval recording or pre-recording. HD-SDI and SD outputs as standard eliminate additional boxes and converters. A GPS receiver is available as an accessory that plugs directly into the camera.

In Use

The camera is comfortable and easy to use hand held or on a tripod. It is just about the right size and weight and was particularly easy on batteries.

All in all this is a very neat package let down by a low horsepower CCD.

Note that the USA version the AJ HDX 400 is a 60i model.



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The three faces of DVCPROHD

DVCPRO HD (D-12 by SMPTE recognition) is a dual video format, menu selectable HD tape format that is switchable between 1080i and 720p. The compression scheme is DVCPRO HD, a frame bound, deterministic HD CODEC. The video payload on recording is 100Mb/s. Audio, metadata etc is added to bring the total recorded bit rate to about 175Mbs.

DVCPRO HD uses the following three sampling structures;

DVCPROHD 1080i 25.00 (SMPTE 274M)

Input signal is 1920 x 1080 10 bit for Y and 960 x 1080 for R-Y/B-Y.

On recording they sub-sample the Y signal to 1440 x 1080, and the R-Y/B-Y to 720 x 1080, both at 8 bits then compressed approx 6.7 to 1

DVCPROHD 1080i 29.97 (SMPTE 274M)

Input signal is 1920 x 1080 10 bit for Y and 960 x 1080 for R-Y/B-Y.

On recording they sub-sample the Y signal to 1280 x 1080, and the R-Y/B-Y to 640 x 1080, both at 8 bits then compressed approx 6.7 to 1.

DVCPRO HD Varicam (SMPTE 296M)

Input signal 1280 x 720 pixel 60p/59.94p

On recording they sub-sample the Y signal to 960 x 720, the R-Y/B-Y is sub sampled to 480 x 720, both at 8 bits.

Then compressed 6.7:1 to achieve 99.038Mb/s on tape. This is for 60 frames per sec. When shooting at 24p the camera adds frames to make up to 60p. The Varicam format always records 60 frames.



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