

Desk Top Video Production – Week 1

During this course we will be filming in Digital Video (DV or mini DV). Digital Video began as a home format. Professionals began to use it for applications where high production values were not needed (docusoaps etc) or where large professional cameras would be difficult to use (rock/mountain climbing etc).

Although DV gives very clear pictures, it is fairly unstable in SP mode (no more than five passes under viewing heads recommended) and even more unstable in LP mode (don't use it).

DV Production

Using DV in SP mode gives 60 minutes of shooting time. Because of its instability, professional productions shot on DV used to be either

- a) Transferred to Betacam SP for editing (with analogue tape you can do 30 passes without losing quality) or
- b) Transferred to VHS with a Burned-In Time Code (BITC) for paper edits (BITC logs in hours/minutes/seconds/frames).
- c) Now that hard disk storage is both cheap and vast capacity, downloaded to disk completely – in 30' clips, for later sub-clipping.

UK television uses 25 frames per second (fps). Europe uses PAL (Phased Alternating Light) at 625 lines. The United States uses NTSC at 525 lines.

HD channels use 1080 lines, but much of this so far (SKY etc) has actually been shot on cameras using 720 lines.

It is good practice to do at least two copies of the finished tape / DVD after mastering the finished film: i) The Master Tape – which should be stored as a back-up

ii) The Copy Master – from which all further copies for viewing are made.

Professional production companies are now archiving their material on optical laser discs.

Costs

Consumer Camcorder £40 to £1,000+

Prosumer DV Camcorder £500 (SH) to £2500

Technology moves fast in the video industry. Five years ago, thanks to the prohibitive cost of HD (HD rigs cost a minimum of £70,000 back then), standard

definition tape was the only medium we had to consider. At the moment (August 2010) we are in a state of flux regarding (Standard Definition vs HD) where resolution is concerned, and (tape vs solid state vs optical) where data capture is concerned. Having looked at pro supplier recently, there are no fewer than 6 broad categories of Video camera systems generally available at the moment:

Standard Definition - Tape

DV (SD Tape) - Sony, Canon, JVC - £950 to £6,300

DVCAM (SD Tape) - Sony - PD175 £2,400, DSR450 £11,750

DVCPPro (SD Tape) - Panasonic - £10,700

Digital Betacam or DigiBeta (SD Tape) - Sony - £40k

DVCPPro 50 (SD Tape) - Panasonic - £15,000

Standard Definition - Optical

XDCAM (SD Optical) - Sony - £14k to £28k

DV / HD Hybrid - Tape

HDV (HD/DV Tape / Hybrid) - Sony, Canon, JVC - £940 (handicam), £3,750

(Sony HVR-Z5E), £5,100 (Sony HVR-Z7E), £5,900 (JVC GY-HD251E),

High Definition - Tape

DVCPPro HD (HD Tape) - Panasonic - £23,200 to £44,500

HDCAM (HD Tape) - Sony - £38,800

HDCAM SR (HD Tape)- Sony - £58,750

High Definition - Solid State

P2 (HD Solid State) - Panasonic - £5,000 (Panasonic AG-HVX201AE) to £30,500

(Panasonic AJ-HPX3000 Full 1920x1080 4:2:2 P2 2/3inch)

AVC HD (HD solid state) - Sony / Panasonic - £1300 to £3,700

XDCAM EX (HD Solid State) - Sony - £5,500 (EX1R) to £9,700

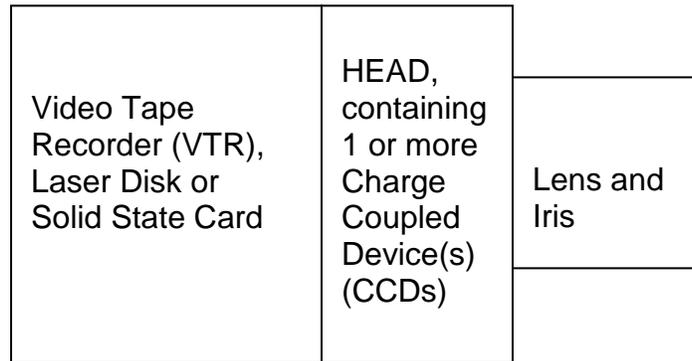
JPEG2000 (HD Solid state) - Grass Valley - £16,000

Quick Time (HD Solid State) - JVC - £2,800 to £8,700

High Definition - Optical

XDCAM HD (HD Optical) - Sony - £9,700 to £34,700

The Video Camera



The Video Camera is made up of three sections:

- 1) The Lens and Iris. The lens focuses the light entering the camera. The Iris governs the amount of light entering the camera.
- 2) The Head converts light to electrical impulses to digital format using one or more CCDs (Charge Couple Devices). Domestic/consumer camcorders have only one CCD to collect all light. 3CCD models have separate chips to monitor red, green and blue light, thus giving a better end picture. CCDs come in various sizes: $\frac{1}{4}$ ", $\frac{1}{3}$ " $\frac{1}{2}$ " and $\frac{2}{3}$ ". The bigger the CCDs, the better the picture, $\frac{2}{3}$ " chips giving professional quality.
- 3) Video Tape Recorder (VTR) where these electrical impulses are digitally recorded onto the video tape (or laser disc or solid state card).

The camera can be powered directly from the mains (via an adapter) or by Lithium Ion (Li-ion) batteries. The small batteries give around 1 hour of running time and the medium sized batteries give around 4 hours.

Most camcorders have a 3-way switch

- Camera
- Off
- Playback

Video Camera Operation

There are a number of things which need to be set correctly in order to take good footage. The following is a 'check list'.

1) Tripod

Generally speaking, the steadier the camera is the better the shots will be. For this reason it is always advisable to use a tripod wherever possible. Tripods have two main parts – the frame itself and the 'plate' or 'shoe' which attaches to the camera. Remove the plate (by unclipping), screw the camera to the plate then replace the plate + camera on top of the tripod. A spirit level allows the tripod to be levelled, either by adjusting the height of the tripod legs (on older models) or by directly manipulating the tripod head. When the bubble is in the centre of the black circle, the tripod is level. The tripod has a fluid head, allowing panning (moving camera from side to side) and tilting (moving camera up and down).

2) Viewfinder/LCD Screen

A camera operator can frame and monitor shots using either the viewfinder or LCD screen. If using the viewfinder (which uses less power and prolongs battery time) the viewfinder has to be focussed to the operator's eye, otherwise the end results will be out of focus. If using the LCD screen, bear in mind that the brightness of the screen will not necessarily reflect the brightness of the end result after shooting (they are not good for checking exposure/aperture).

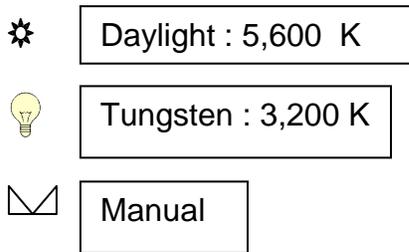
3) Shutter Speed

The standard shutter speed is 1/50 of a second. Use 1/60 (or the lowest possible figure not divisible by 50) if filming computer screens. Higher shutter speeds are for filming fast moving objects. They need more light to use, but the higher the speed the more you can slow things down in the edit.

4) White Balance

Different kinds of light have different Colour Temperatures – measured in degrees Kelvin (K). Daylight has a much greater proportion of blue light, and artificial light a much greater proportion of red light. Our brains compensate for this automatically, but cameras need to be told what white looks like in different lighting conditions. Most modern cameras have an auto setting for this now, in addition to factory pre-sets for daylight (5,600 K) and tungsten (artificial light, 3,200 K). If the manual setting is used, we must 'show' a piece of white paper or card and then press the white balance button to take a reading.

The symbols used on cameras to denote the different settings are as follows ('AUTO' is the usual way they denote the automatic setting).



We need to re-examine and / or reset the white balance whenever levels of light are different from those of the previous shot.

5) Focus

Focusing is a function which should ALWAYS be done manually. When autofocus is used, anything passing before the lens (such as a fly or a falling leaf) will lead to the camera refocusing on this momentarily, thus ruining the shot.

To focus correctly, the camera operator should zoom in on the subject as closely as possible (zooming in on the eye of a subject when filming an interview) and turn the focus ring until the image is pin sharp. The shot can then be framed by zooming out again before filming.

6) Exposure / Aperture

Behind the lens is an Iris which controls the amount of light coming through (the exposure or aperture reading). An aperture reading of F 1.6 (fully open) is used for low light conditions. Video cameras have a maximum aperture of F 11 or F16 (which is literally as narrow as a pinprick).

In very low light conditions the Gain function (which gives a signal boost) can be used. Gain is measured in decibels (dB) and generally ranges from 0 dB to 12 dB. Generally, don't boost over 6dB or 9dB to avoid 'noise' (random spots of colour) on tape.

For very bright conditions, video cameras have one or more Neutral Density (ND) Filters, which cut down the amount of light entering the camera without altering the colour temperature. Since the lower the aperture reading is, the narrower the depth of field is (whereas at a reading of F 16 everything from less than a metre to infinity can be clearly in focus), ND filters are also used to get shots where subjects are in focus whilst the foreground and/or background is blurred.

To set the exposure, zoom in on the subject then press the aperture button for a couple of seconds. This sets the exposure to the subject automatically. It can then be fine tuned manually, if necessary, using the viewfinder. (NB, do not use the LCD screen to set the exposure since this may not give an accurate representation).

7) Sound Levels

Generally speaking, there are two kinds of microphones that can be used in conjunction with video cameras – onboard microphones and external microphones (whether boom-mounted or clip on / radio mics).

Onboard microphones are perfectly adequate for recording ambient (background) sounds. They are powered from the camera itself. For the best results when recording dialogue external mics (which have their own power source) should be used. Generally speaking, the closer an external mic is to the sound source (so long as the mic is not in shot, of course) the better the results will be.

Auto settings for sound are pretty good these days. If setting sound levels manually, where DV filming is concerned the sound level should be set at -12 dB, ensuring that the sound doesn't peak higher than -5 dB. (Peaking higher than these can cause speakers to buzz).

NB If monitoring sound through earphones, don't forget that the volume level of earphones is usually set separately. Make sure that -12 dB is what sounds 'right' (i.e. neither too loud nor too soft) through the earphones.