

GETTING STARTED WITH THE PANASONIC HVX200 (Irene's Quick Reference Guide)

Getting Started / Shooting HD

- Always start by calibrating your LCD display and / or viewfinder (use Color Bars button inside LCD flip-out; see "Video and Hi Def" reading for step-by-step instructions for calibrating your display)
- Many cinematographers prefer to shoot using the viewfinder rather than the flip-out screen; the black and white viewfinder display setting (change in Display Setup menu) makes it easier to see focus and to assess exposure; also, many documentary filmmakers shooting in uncontrolled situations find the flip-out screen problematic because the subject / bystanders can get distracted trying to look at what you're shooting.
- If you're using the viewfinder, make sure the diopter ring is set correctly for your eyesight; if you wear glasses and prefer shooting without glasses, try calibrating the diopter for your vision (use ring on viewfinder)
- Format your P2 card before starting to record – make sure footage from previous user is cleared off.
- Always keep automatic / manual master switch set to manual for professional-quality recording
- **Shoot in 720p / 30PN format for optimized recording.** 720 is the only true progressive HD resolution available in the camera, and gives about 40 minutes of recording time on a 16 GB P2 card (as opposed to only 16 min. at 1080i). 30 PN is a native progressive frame rate, meaning it only does not record any extra frames or embed the progressive frames in a standard interlaced videotape stream, so that fewer total frames are stored on the P2 card (= more recording time) and no reverse pulldown is necessary in FCP. *PN frame rates are possible with P2 cards only.*
- If you're shooting a documentary and anticipate needing to shoot more than 40 minutes at a time, consider using the HVX to shoot miniDV instead of using the P2 cards.
- Go through and set all menus before you start shooting. Load previously saved scene files and user files from SD card if applicable.
- If a menu selection is blue and can't be changed, it means that you are in the wrong mode to access that particular menu function (for example you can't change variable frame rates if you are in VIDEO CAM mode).
- When shooting HD, carefully control your highlights to prevent clipping / blowing out. Use a light meter, as well as the camera exposure tools (Marker and zebra stripes) to make sure your exposure is not too hot; when in doubt, err on the side of underexposing.

- **Never use the Firewire port on the camera!** You must use the dual adaptor and a laptop (either your own or the transfer room MacBook Pro to transfer your footage off the P2 card).

CAMERA FEATURES AND OPERATION

Focusing

- Focus is truly manual and repeatable – you can set marks for focus pulls as you would on a professional broadcast or film camera.
- Viewfinder shows focus distance. It can be set to show a percentage number (00-99) or it can be set to show distance to subject / focal plane in meters or feet (this can be set up in Display Setup menu). Using feet is recommended because then you can use a tape measure to precisely measure focus / have an actor hit a mark if you are shooting in a controlled / fiction environment (note that this will no longer work accurately if you use an additional lens adapter).
- Focus can be switched to automatic or manual. Autofocus is very rarely recommended for professional shooting situations. Keep in mind that AF is much less responsive at slow frame rates (needs to be 60i or 60p to respond quickly) and doesn't perform well in low light.
- EVF detail button – creates slight edge enhancement highlight in viewfinder on objects in focus; useful for confirming focus visually.
- Focus assist button – works only in HD recording modes; creates pixel-for-pixel magnified extraction viewer window in viewfinder; another useful visual confirmation of focus
- **General Procedure to focus camera:**
 - a) Zoom in on subject to 100%
 - b) Open iris up to narrow DOF
 - c) Put on ND filter if image is too bright with open iris
 - d) Press focus assist to dial in on subject
- Use push auto focus to confirm focus in a rushed situation.

Zooming

- Zooming is also truly manual – in manual mode, zoom ring can do snap zooms like a true broadcast or film camera.
- Front manual / servo switch toggles zoom ring mode; servo allows use of rocker zoom switch controls. Manual allows faster snap zooms (great for documentary).
- Side zoom rocker switch is pressure sensitive
- Top zoom rocker switch speed is fixed, but can be changed using 1/2/3 mode switch. (customize in SW MODE menu)

ND Filter

- Each level is a 3-stop ND filter (=ND .9)
- ND 1/8 cuts exposure to 1/8 of the unfiltered exposure ($8 = 2^3 = 3 \text{ stops}$)
- ND 1/64 cuts 6 stops

Iris Dial

- Aperture readout is on LCD
- Max aperture depends on where you are in zoom range: zoomed in at 100%,

max=2.8, at widest angle, max=1.6.... So stay wide for low-light shooting!

- Press Iris button for auto Iris (factoring in iris bias customized in scene file menu)
- Iris display is calibrated in half stops, though the actual iris dial makes 1/6 of a stop increments between stops, so it's capable of very nuanced exposure distinctions.
- Iris readout numbers are sequences in half stops (i.e. 5.6 / 6.8 / 8 / 9.6 etc)

Gain

- Calculates amount of electronic gain that you add; brightens image electronically
- GAIN ADDS NOISE to picture, so use sparingly
- Gain is added in 6dB increments (low=0 / mid=+6dB / high=+12dB); customize these increments in SW MODE menu
- Gain will NOT work with a variable frame rate lower than 22fps and will not work with slow shutter speed (e.g. 1/12)

White Balance

- To use presets:
 - a) Set WB switch to preset
 - b) Hit AWB button in front of camera to toggle between two presets:
 - i) 3200K = tungsten preset
 - ii) 5600K = daylight preset
- To manually white balance:
 - a) Make sure iris is set correctly first
 - b) Select position A or B (you can store 2 manual white balance settings for easy access if you need to switch back and forth)
 - c) Put white paper in front of camera to fill viewfinder
 - d) Hit AWB button until "AWB Ach OK" prompt
 - e) Continue holding AWB button down to run ABB (Automatic Black Balance shuts iris completely and allows processor to balance black signal coming from chips; this is a calibration that does not need to be done every time you shoot, but can be done for general maintenance).
 - f) Customize AWB in SW MODE menu

Other Useful Camera Buttons/ Functions:

- Buttons inside flip screen:
 - a) Bars – press to generate SMPTE bars, use to calibrate LCD / viewfinder
 - b) Shutter:
 - i) First shutter button turns default shutter speed on / off
 - ii) If default is not enabled, + / - buttons can select variable shutter speed
 - iii) Shutter speeds are relative to recording mode, frame rate, etc
 - c) Audio Select Switches:
 - i) Camera can record sound from onboard stereo mic (2 channels), or from external XLR mics through side XLR jacks (Input 1 and Input 2)
 - ii) In HD or DVCPro mode, 4 channels of audio are always being recorded
 - iii) Only 2 channels can be manually adjusted and monitored; the remaining two come in at a fixed level
 - iv) Switches inside flip screen select which 2 out of 4 channels can be monitored and controlled using back dials
 - v) Use audio levels meter display in LCD to monitor audio levels; meter shows two marks @ -20 and -12dB; top of the scale turns red when levels are peaking; aim to keep normal dialog between -20 and -12dB
 - vi) Keep mic ALC on (in Recording Setup menu) to make sure audio doesn't exceed max threshold
 - vii) Turn on Mic Power 48V phantom power switches if using condenser mics that do not have their own power source; turn off if using dynamic microphones (the latter is more likely – condenser mics are higher quality but delicate and not usually used for rugged location shooting)
 - viii) If using external XLR mics, make sure mic inputs are switched to mic (NOT line; line is for mixer feed)
 - d) Counter:
 - i) Toggles display from Time Code
 - ii) To UB (User Bits) = customizable information input during shoot like reel #, shoot date, etc
 - iii) To frame rate
 - iv) To memory counter
 - e) Zebra
 - i) Exposure control tool that places white diagonal zebra stripes on LCD display to mark all areas of the image where brightness has exceeded a certain IRE threshold. These IRE values can be customized.
 - ii) Press once to toggle MARKER tool. Marker works more or less like a spot meter, taking local / targeted brightness readings for whatever is inside the

center box. This is a great way to quickly figure out the exposure range for different areas in a scene.

- iii) Press twice to toggle Zebra 1 (default is 80 IRE; I recommend 70)
- iv) Press again to toggle Zebra 2 (default is 100 IRE; I recommend 105)
- v) TIP: When setting exposure, use both Zebra buttons to get a more precise sense of the exposure range in the scene. For example, if you are shooting a Caucasian face, you should be aiming for around 70 IRE in the skin tones/ face. Turn on Zebra 1 to make sure skin tone is well exposed – none of the facial highlights should be triggering the 70 IRE zebra. Then turn on Zebra 2 to check the highlights – you should now see zebras on the face’s hotspots (tip of the nose, forehead, etc).

f) OIS (Optical Image Stabilizer)

- i) Turn on to minimize wobbly handheld shooting
 - ii) Turn OFF for tripod pans to avoid jerky motion (camera will try to fight the pan and “stabilize” the movement in the image, resulting in jittery image)
- Diopter Ring – adjustable ring around viewfinder, can adjust for individual vision for shooting without glasses

WORKING WITH SCENE FILES

- Setting up customized scene file settings allows you to optimize camera for the shooting situation at hand and also allows you to develop customized in-camera “looks” for your footage.
- The camera comes with 6 pre-set scene files that can be accessed by turning the scene file dial on the back of the camera: F1 (normal) / F2 (fluorescent) / F3 (scene spark = fuller color, contrast) / F4 (scene B-str – broadens contrast in darks) / F5 (scene cine V = max contrast) / F6 (scene cine D = max dynamic range)
- Any time you create new scene file settings and save them, they will “replace” whichever pre-set scene file position you are currently dialed into. You can always return to the factory pre-sets.
- Every time you turn the camera off and back on again, you will lose all your menu settings, so it’s a good idea to save your scene file settings as you work. When you save scene files, they are saved to the camera’s internal memory. You can save up to 6. You can always re-zero things by going back to default settings and restoring the original built-in scene file settings (so don’t be afraid to save your work in progress, because you can always go back to the defaults, but you can’t recall your selections if the camera gets turned off unless they are saved).
- Scene Files can also be saved to an SD card, shared with other camera users (especially useful to coordinate multi-day or multi-camera shoots with a consistent look, and re-uploaded so that successful scene file sets can be used on subsequent shoots. I highly recommend buying at least one SD card so you can archive your scene files (you can save up to 6). Since the cameras are shared among multiple users, even if you save scene files to the camera’s internal memory, they won’t be there any more the next time you shoot.
- ***NOTE that while stylized scene file settings can be fun to play with, be cautious about implementing extreme looks in-camera. In-camera day for night may seem like a great idea while shooting, but it leaves you with no room for changing your mind in post. Many of the same parameters can also be tweaked using a good color correction tool (like Apple Color), so there’s a good argument for shooting your footage as “clean” as possible with maximum dynamic range (and without crushing your blacks) and creating a more distinctive look in post.*

SCENE FILE MENUS

- Operation Type
 - a) Allows choice of VIDEO CAM or FILM CAM. Different operation modes allow you to access different camera features / menus. For example, only FILM CAM allows you to shoot variable frame rates. Only VIDEO CAM allows time-lapse, loop, or intervalometer shooting.
- Frame Rate
 - a) Only works in FILM CAM 720P mode
 - b) Allows selection of many different frame rates for in-camera motion effects, ranging from 12fps (undercrank / sped up) to 60fps (overcrank / true slow motion).
 - c) See Barry Green's book for in-depth discussion of uses of different frame rates, and frame rate hacks (using things like interval shooting and shutter angle) to increase frame rate choices even further.
 - d) Beware: NO SOUND is recorded when you use true variable frame rates in 720p
- Syncro Scan Shutter
 - a) Is measured in time in VIDEO CAM mode (default is 1/48th of a second)
 - b) Is measured in shutter angle in FILM CAM mode (default is 180° shutter angle)
 - c) To use this menu, shutter button on camera needs to be on. Use speed sel buttons to scroll through shutter speeds to access variable shutter mode, then use menu to scroll through possible choices.
 - d) Exposure will need adjustment depending on selected shutter speed / angle, since you are changing the effective exposure / amount of light per frame.
 - e) Tweaking the shutter in this menu can be very useful for eliminating the roll bar when shooting off a computer screen – shutter speed can be changed to match refresh rate of computer display.
- Detail Level
 - a) Scale from -7 to +7
 - b) Affects overall sharpness of image; higher setting adds edge enhancement and contrast to increase perception of sharp detail. Can also appear to add texture to image.
 - c) Higher settings also accentuate noise in image
 - d) Lower level can clean up noise, but can also look soft; low levels are optimal if you are planning to blow up to film
 - e) 0 - +5 is safe range for general use
- V Detail Level
 - a) Enhances perceived detail in image by accentuating difference between horizontal lines (vs. accentuating edges)
 - b) Much milder than Detail Level

- Detail Coring
 - a) -2 to +7 scale; +7 has most extreme smoothing effect
 - b) Helps mask appearance of noise in image
 - c) Works with other Detail settings by giving camera a threshold for when to ignore detail enhancement (to avoid creating edge enhancement around video noise - because Detail Level is boosting both fine detail and video noise at the same time)
 - d) This setting is only noticeable if Detail Level is set at a high setting

- Chroma Level
 - a) -7 - +7 scale, +7 is most saturated color
 - b) It's OK to max out the saturation on HD if you're looking for very vivid, bright color; HD color doesn't bleed like NTSC video

- Chroma Phase
 - a) Goes from -7 (more saturation in oranges and greens) to +7 (more saturation in purples and magentas)
 - b) Mild effect, similar to "TINT" knob control on NTSC TV

- Color Temperature
 - a) Much more extreme color shifts than Chroma Phase
 - b) Allows you to bias white balance
 - c) Ranges from -7 (orange bias) to +7 (blue bias) - similar to shooting in daylight with tungsten film or vice versa
 - d) Only works if you're not using WB preset positions on AWB camera switch.

- Master Pedestal
 - a) Contrast control; controls video black level
 - b) Lower setting (up to -15) = deeper, richer black
 - c) Higher setting (up to +15) = more washed out, milky black
 - d) Be cautious about setting pedestal too low; you risk crushing blacks and losing image detail in shadows. Crushed blacks can make a nice, sharp, snappy image, but this is the sort of thing you can also do in post when you color correct - so it's better to preserve as much detail as possible at the shooting stage.
 - e) -4 to -6 is good range for regular shooting
 - f) -8 - -10 is a starker hi con look, more like reversal film (and better to save for post unless you're absolutely sure about wanting this look)

- A. Iris Level
 - a) Lets you bias auto Iris reading to underexpose or overexpose (each setting = 1/3 of a stop)
 - b) You probably won't be using this, since you should be setting exposure manually!

- GAMMA CURVES – camera has 8 different gamma curves; the gamma curve determines the contrast curve of the camera, i.e. how quickly it responds to light; see “Exposure” reading for detailed discussion of logarithmic curves for film contrast.
 - a) News Gamma
 - i) This is separate from the other gamma curves in its own menu
 - ii) Main intended use is for people shooting news, who may be dealing with sudden / unexpected changes in exposure
 - iii) It prevents highlights from blowing out (for example, say you are shooting the news and you suddenly follow turn the camera to follow a subject and find yourself pointed at a bright window – news gamma will flatten highlight curve to prevent sudden blowout).
 - b) HD NORM – base level for comparison; default / standard HD response
 - c) SD NORM – is matched to Panasonic DVX camera; good for multi camera shoots using both kinds of camera
 - d) LOW – a bit more contrasty / less noisy than HD norm; compresses / darkens highlights a bit, pushes midtones a bit; allows you to open iris a bit to preserves shadow detail
 - e) HIGH – raises blacks a bit, maintains highlights; looks flatter and less contrasty than “LOW;” gives room to stop down a bit; try for low light
 - f) B(lack) PRESS – presses down blacks (similar to lowering master pedestal); makes slightly punchier, more contrasty image; increases dynamic range in midtones
 - g) CINELIKE D(yanamic Range) – gives most latitude, maximizes dynamic range (gives up to 1 stop additional dynamic range) in image, gives flatter and less contrasty curve, suppresses lights and midtones; noisier; optimal for transferring back to film and for maximizing options for manipulating image in post.
 - h) CINELIKE V(ideo) – exaggerates light / dark distance, makes contrasty, sharp image optimized for displaying on video; presses down highlights, has more range at top of curve, boosts midtones.
 - KNEE - Knee is like a limiter for gamma; it prevents overexposure by rolling off the intensity of the brightest part of the picture:
 - a) LOW – gives best protection against blowing out highlights, max dynamic range, but can make whites look too grey. Starts attenuating around 80 IRE
 - b) MID – rolls off around 90 IRE
 - c) HIGH – starts to affect signal around 100 IRE; looks more natural than “LOW” but offers less protection
 - d) AUTO – camera may change knee mid-shot – this isn’t really generally desirable – it may cause highlights to flicker
- * NOTE that KNEE is not available for CINELIKE gamma settings, so precise and careful highlight exposure is crucial in cinelike modes!

- MATRIX – remaps original colors to new matrix of colors
 - a) Normal – matrix looks realistic / mild / normal; good for outdoors
 - b) Enriched – richer / deeper palette
 - c) Fluorescent – boosts / saturates non-green colors to compensate for green spike in fluorescent light; i.e. richer purple-blue-magenta range, accentuated flesh tones
 - d) Cineline – boosts all colors brightly; most saturated matrix for richer, cinemalike colors (TIP: combine this with chroma level +7 for supersaturated candy colors that pop)

- Skin Tone Detail
 - a) Like detail coring, but only for portion of the color spectrum associated with skin tone (reddish) – softens skin blemishes by softening edge enhancement on skin detail
 - b) Very subtle / mild effect, only apparent at high detail settings
 - c) OFF – renders normally
 - d) ON – masks detail

- Name / Edit / Save
 - a) Use to name and save scene files
 - b) Use save / init function to save new scene file to internal camera memory or return to default settings

WORKING WITH USER FILES

All other settings (like format, frame rate, display and switch settings) are part of the User File. User File settings can also be saved to an SD card and reused on later shoots.

RECORDING SETUP MENU

- REC FORMAT
 - a) Available resolutions are 1080 / 720 / 480
 - b) 1080 and 720 are both certified broadcast standard HD
 - c) 1080 and 480 are both interlaced; both can shoot in progressive modes by embedding a progressive signal in an interlaced stream / using pulldown.
 - d) 720 is the only true progressive resolution
 - e) 24P vs. 30P: Both are progressive and both look somewhat film-like. 24P is a frame-by-frame match with film, but can have strobing issues (since it does not have the projector blade / 48fps projection rate of actual film), so it is optimal if you are planning to finish on film; 30P will have less strobing and is better for finishing on video.
 - f) 24PN / 30 PN are native frame rates that do not use pulldown and do not record any redundant frames. These frame rates maximize space on P2 cards and skip artifacts caused by reverse pulldown and frame rate conversions; only available in 720P
 - g) **Suggested setting is 720p / 30 PN** (unless you need longer recording times for documentary)

- Rec Function (video cam only)– for time lapse, interval, and looping; only works with tapeless shooting in Video Cam mode

- Prerec Mode (video cam only) – camera is continuously recording loop in 3 second buffer so that you always get preroll before you actually hit record (good for whale watching!)

- Mic ALC – sort of like knee for audio; controls loudest volume from overmodulating beyond threshold; starts attenuating at -6dB, rolls off at -4.5 dB; good to keep this on, esp. since HVX has no AGC function

- Mic Gain – use to match impedance of mic
 - a) -60 – boosts audio, good for less sensitive mic
 - b) -50 – better for sensitive / loud mic

- 25 Megabit Rec Ch Sel – ignore

- TC Mode – for drop frame / non drop frame

- TCG – time code generator: use REC RUN for normal shooting, FREE RUN to sync footage from multi-camera shoots (keeps continuous track of absolute time elapsed, regardless of whether or not cameras are recording)
- TC Preset – set TC for next recorded clip
- UB Mode – leave on frame rate
- UB Preset - ignore

OTHER MENU FUNCTIONS

- Camera Setup – you can pretty much ignore this if you are not shooting SD
- SW(itch) MODE – controls functionality of Gain, WB, Iris dial, and User buttons. User buttons allow you to custom map functions that you like to access frequently onto the buttons on the camera side. The most useful User button option that you may want to consider is the “shot mark” function, which allows you to “mark” a good take – this can be very useful for remembering which takes are good during a long shoot.
- AUTO SW(itch) – controls which functions of camera become automatic if you put camera in “auto” mode using front switch
- AV In / Out – mostly useful for using camera to dub to another format
- Display Setup – customizes various displays. Here are a few useful items:
 - a) Zebras – customizes IRE thresholds for zebra 1 and 2; recommended values are 70 IRE and 105 IRE
 - b) Safety zone – can be switched to show 4:3 if you want to optimize composition for 4:3 display
 - c) Zoom / focus – changes how focus and zoom level is displayed – do you want to see percentage or actual distance in feet (latter is probably more useful unless you are using lens adapter)?
 - d) LCD / EVF Set – to calibrate displays using color bars – good to do this each time you shoot to make sure you are getting an accurate display of the scene.
 - e) EVF Color – make viewfinder BW for easier focusing
- Card Functions – read from / write to / format SD card
- Other Functions – remote, rec lamp, beep, etc

MCR (Memory Card Recorder) MODE

- Toggle between camera and MCR Mode (VCR mode if shooting tape) using button on back of camera.
- Thumbnail Mode:
 - a) Navigate through and play thumbnails using arrow buttons on top of camera. Up button plays clip, down button returns to menu, left and right arrows navigate
 - b) Only clips recorded in current camera format setting will play back. Clips recorded in another format are numbered in red and will not play.
 - c) To select a clip navigate to clip and press pause button; clip will have blue outline. Multiple clips or groups of clips can be selected.
 - d) To delete a clip (to free up more space on the P2 card), select the clip(s) to be deleted, then select Menu > operation > delete.
 - e) Press Menu button to access clip menus:
 - i) Thumbnail Menu – format and sort thumbnail display; choose to display only selected clips, clips of the same format, marked clips, sort clips by p2 slot, etc. Change display setup, thumbnail size, etc.
 - ii) Operation Menu – deletes clips, repairs clips (clips can be damaged if battery dies during recording, format P2 cards or SD card (THIS WILL ERASE ALL DATA))
- Hit Thumbnail button to turn off thumbnails. This allows you to use LCD display to monitor incoming video if you're using camera as a recorder, and allows you to access a second MCR menu (by hitting menu in Blue Screen mode) with recording setup, playback setup, and display setup controls.
- To access the camera's PC mode, enter MCR mode and then continue to hold down the mode switch button. PC mode is used for things like outputting directly from the camera to a computer hard drive. Since you are not allowed to use the FW port on the camera, you will probably never need to use this camera mode.