Some essential things to know about the JVC GY-HM100.

Paul Trilsbeek, MPI for Psycholinguistics, June 2011.

The JVC GY-HM100 is a semi-professional camcorder that is well suited for linguistic fieldwork since it combines the possibility of recording good quality high-definition video with the option to record high quality uncompressed audio. Because it is a semi-professional model, it has some more manual controls than the average consumer camcorder. Even though it is possible to operate the HM100 in fully automatic mode, you should familiarize yourself with these manual controls to get the most out of your recordings.

JVC have published a series of instruction videos for the HM100 that are worth watching in order to learn about certain functions of the camera, they are listed on the second half of this page:

http://www.jvcpro.eu/jpe/global/product.716.html

In addition, you should pay attention to the following:

Settings

In order to get the appropriate video format and quality, set the following values in the menu (press "MENU" on the side of the camera when in "CAM" (not "MEDIA") mode and navigate to the appropriate menu item with the joystick):
FILE FORMAT: MP4 (for MPI workflow with ffmpeg)
SYSTEM SELECT: 1080-50/25
REC MODE: 1920/25p(HQ) (**important!** If you do not record in progressive mode (p) but in interlaced mode (i) instead, you will get striping artifacts on moving objects. The only way to get rid of those is to post-process your recordings with a de-interlace filter, which is time consuming and reduces sharpness)
CLIP CONTINUOUS REC: OFF

"Optical Image Stabilizer (**OIS**)":
This feature will reduce vibrations of the image when holding the camera in your hands. It may have undesired side effects though when operating the camera on a tripod, therefore you should turn this setting on or off depending on the situation:
Set "MENU"->"CAMERA SETTINGS"->"OIS" to "OFF" when operating the camera from a tripod. Set it to "ON" when holding the camera in your hands.

Brightness of the image

There are several settings on the camera that influence the brightness of the image. Note that the HM100 is not particularly great at filming in dimly lit situations, so if you have the option to bring in more (artificial) light, this would give better results than boosting up the brightness with the GAIN switch or using the LOLUX setting (see further on).

The HM100 has several automatic modes (**PROGRAM AE**) that will adjust - among other things - the exposure and shutter speed for a variety of conditions:

PORTRAIT: Blurs the background to highlight the subject.
SPORTS: Captures fast moving subjects clearly in every single frame.
SNOW: Prevents the subject from appearing too dark, such as when shooting a snowfield on a sunny day.
SPOTLIGHT: Prevents the human subject from appearing too bright under light.
TWILIGHT: Makes evening scenes look more natural.

Push the joystick next to the screen to the right in order to select one of these modes.

Exposure controls:

There are 3 buttons on the back of the camera to influence the exposure manually: **IRIS**, **SHUTTER** and **AE±**. After pressing these buttons, their value can be changed using the ADJ./VOL. knob underneath them. For IRIS and SHUTTER adjustment, you need to be operating the camera in Manual mode (press "FULL AUTO" on the side of the camera once or twice until it reads " M MANUAL" on the display. Note that this doesn't influence the Auto Focus setting, Auto Focus can be turned on or off independently using its own "AF/MF" button located next to the "FULL AUTO" button).

- **IRIS** (sometimes referred to as "aperture"): this controls the diameter of the hole behind the lens that lets light through onto the imaging chip. The smaller the "F-value", the larger this hole is and the more light gets through, but also the narrower the "depth of field"[1] of your image is.

- **SHUTTER**: Unlike still cameras and analog film cameras, digital video cameras do not actually have a mechanical shutter that opens and closes to let light pass onto the film/imaging chip. Nonetheless, the same term is used to indicate the time during which the imaging chip is allowed to capture each image. A slower shutter speed means that the chip will capture each image during a longer period of time, which will result in a brighter image. When recording fast moving objects though, a slow shutter speed will also result in motion blur. It is possible to select a shutter speed that is even slower than the frame rate of the video (> 1/25), but doing so will effectively reduce the number of images you record per second and will result in jerky motion. This should be avoided unless you have no alternative options left to increase the brightness of your image. In general, one should adjust the IRIS first and only start adjusting the SHUTTER speed if that doesn't give you enough control, or when filming fast moving objects.

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[1] Depth of field is the distance between the nearest and furthest point in the image that appear sharp in focus. A narrow depth of field is often used as a photographic or cinematic effect to have objects in the background or foreground appear blurred – similar to what the human eye does - but if you want to capture a longer range of objects sharp in focus you should have a larger depth of field (= smaller Iris = larger F number).

- **AE±**: This function can be used in combination with an automatic exposure program when the camera is in "FULL AUTO" mode. It will allow you to quickly increase or decrease the exposure that has been automatically set by the camera, should it not be appropriate for the current situation. E.g. the face of a person with a dark skin might be under-exposed when being filmed in a bright background. In order to get the face well exposed (at the expense of over-exposing the background), one can increase this AE value.

In addition to these controls, there is a **GAIN** switch on the side of the camera, which boosts the light sensitivity up electronically in case you don't have sufficient light. This switch has 3 positions: L (no boost), M (boost by 9 dB), H (boost by 18 dB). These are the default values for this switch but they can be altered in the menu. Boosting the light sensitivity using the GAIN switch will make the image brighter but also noisier; use it only when necessary if you can't get a bright enough image using the other exposure controls.

The camera has a **LOLUX** mode, which can only be enabled by assigning it to one of the three "USER" buttons (MENU->Camera Settings->USER1/2/3). The LOLUX mode will boost up the light sensitivity even beyond the H(igh) GAIN setting, resulting in a much brighter image but also a much more noisy image. The LOLUX function will only work when the camera is in MANUAL mode. Note that the Lolux indication in the display will only be shown when you display the most details (press "DISPLAY" on the side of the camera repeatedly to cycle through the 3 levels of detail on the display). While LOLUX is activated, the SHUTTER and GAIN settings cannot be modified.

Last, there is a "**ND FILTER**" switch on the side of the camera, which can be turned on in order to reduce the amount of light coming through the lens when shooting in very bright outdoor conditions.

Focus

The camera has an Auto Focus function that works reasonably well (albeit a bit slow) under normal circumstances but which may be falsely triggered by suddenly moving objects at different distances than the object of interest, e.g. a dog walking by in the foreground or some branches moving in the background. In order to avoid these focusing problems one could de-activate the Auto Focus function once the object of interest is sharp in focus, or one could use manual focus throughout. Enabling/disabling Auto Focus can be done by pressing the **AF/MF** button on the side of the camera.

As long as the distance from the lens of the camera to the object of interest does not change, the focus setting can remain the same, even when using the zoom function of the lens. When filming scenes where the objects of interest move about a lot, the

focus needs to be adjusted constantly, either by using the Auto Focus function or by adjusting the focus manually.

When using Manual Focus, the focal distance can be changed by rotating the big ring around the lens of the camera, if the "FOCUS/ZOOM" switch on the side of the camera is in the "FOCUS" position. Since it can be difficult to determine whether something is sharp in focus or not just by looking at the small LCD screen, the HM100 has a "**FOCUS ASSIST**" function. You can turn this function on in the CAMERA PROCESS->FOCUS ASSIST menu. This function will make the image in the LCD display black and white and on top of that it will indicate with a red color (default is red, this can be adjusted) where it finds sharp contours in the image. This gives you a clue as to what is in focus. The FOCUS ASSIST function is mapped to the USER1 button per default.

Auto Focus does not work particularly well in dark circumstances, so you may have to use Manual Focus in such cases.

White Balance

The White Balance adjustment of the camera is used to adapt the color balance of the image such that what is supposed to be white actually looks like white. Different light sources will make the colors look slightly different (e.g. more blue-ish or more yellow-ish). Our eyes adjust for this automatically and the HM100 also has a function to adjust for this automatically, however it normally only does this in FULL AUTO mode. When operating the camera in MANUAL mode, you should either calibrate the white balance or use a white balance preset. The **WHT.BAL** switch on the side of the camera has 3 positions: B, A and PRST. B and A are two memory positions for a calibrated white balance. To calibrate the white balance, do the following:

- put the WHT.BAL switch in the A or B position depending on which calibration you want to override
- put a sheet of white paper (or some other white object) in front of the lens in a place that has the same lighting conditions as the object you want to film
- press the **AWB** button on the front of the camera (below the lens)
- keep filming the white paper/object until the camera displays AUTO WHITE A/B OK

In order to use a preset white balance (color temperature) you place the WHT.BAL switch in the PRST position and select a color temperature from the CAMERA PROCESS->PRESET TEMP. menu. There are two options: 5600K (looks "warmer", more yellow-ish) and 3200K (looks "cooler", more blue-ish).

It is also possible to map the "Full Auto White Balance" (**FAW**) function that adjust the white balance in "FULL AUTO" mode to one of the A, B or PRST positions of the WHT.BAL switch, such that it can be activated in MANUAL mode. To do that, go to

MENU->CAMERA PROCESS->FAW. JVC warn in their manual though that the accuracy of the FAW function is inferior to that of the AWB calibration function and that it takes up to 10 seconds to complete the FAW adjustment after the camcorder is turned on, during which you should not start recording.

Audio

It is recommended to use high quality external microphones rather than the built-in stereo mic and the mono directional mic that comes with the camera. The HM100 has two types of inputs for external mics, one mini-jack connector behind a plastic cover on the right side of the camera and two XLR-type connectors on the right side of the grip that is attached to the top of the camera. It is recommended to use the latter; they can accommodate professional quality condenser microphones either with or without supplying 48 Volts of power to the microphone. The recording level of the XLR inputs can be adjusted manually with two knobs on the left side of the grip, if the "AUDIO SELECT" switches are placed in the "MANUAL" position. It is recommended to adjust the recording level manually rather than automatically because the automatic function will drastically reduce the recording level if a sudden loud sound comes in and it takes some time before it returns to its previous recording level. The input level can be monitored on two level meters at the bottom of the LCD display.

When using a single mono microphone, the signal can be split across the left and right channels by attaching the microphone to XLR Input 1 and selecting "Input 1" as the "CH-2 INPUT" on the left side of the grip.

For further details please refer to the user manual. For details about the MPI video workflow using ffmpeg please read the document "Video Data Workflow" by Jeremy Hammond and Mark Dingemanse.