Nikon Coolpix 995 x-mount settings recommendations

Top of Camera

MODE DIAL **M-REC**

Sets the camera so that manual overrides can be put in place. The A-MEC setting puts most of the camera controls on auto where they cannot be overridden.

FUNC1 button

EXPOSURE MODE  **APERTURE PRIORITY – wide open**

In aperture priority the operator set the ***f*** -number and the camera set the shutter speed. A wide aperture (low ***f***-number) lets the most light into the camera and produces the highest shutter speed Higher shutter speeds reduces the effect of vibration but at the expense of lower depth of field. The mode is set by pressing the button while scrolling with the command wheel through the various options. Rotating the command wheel without pressing the mode button sets the ***f***-stop.

FUNC2 button

EXPOSURE COMPENSATION  **- DEPENDS ON IMAGE**

This button controls the basic exposure of the image when the meter is engaged and should be adjusted until the image looks good. In most clinical situation one setting will do for the whole procedure, although some images may have to be individually adjusted. Viewing the histogram will help give an idea of the quality of the exposure. Be advised that the color of the rubber dam has a great influence on the basic exposure. A light rubber dam may require an exposure compensation of +0.7 or +1.0 whereas a dark rubber dam will be OK at 0.0. Surgery may require a different setting. The exposure compensation is set by pressing the exposure compensation button and turning the command wheel.

Rear of Camera Controls

BUTTONS

ZOOM **W / T**

The correct zoom setting is just before the maximum telephoto setting. Starting at wide angle zoom toward the telephoto setting until the vignetting just disappears. This will not be at the maximum telephoto setting.

FLASH **OFF**

The light source for the scope is the light source for the camera. You do not want the camera flash to influence the image. BBS (best-picture), infinity focus and all continuous modes also disable the flash.

FOCUS **INFINITY** 

The design of the photo mount assumes the camera is focused at infinity so the auto focus should be disabled. This setting will also disable the flash. Careful parfocus of the scope and the camera makes the scope and camera focus at the same plane of focus. You can then use either the scope or a monitor to determine focus while taking pictures. I think the scope is more accurate but has the disadvantage of not being able to see the framing. Focus can be adequately judged with a large external monitor. See appendix Parfocus

IMAGE QUALITY **FULL & NORMAL**

This setting seems to give the best balance between image size and quality. Which setting is selected depends to a large degree on the intended use of the image. See appendixes; “Preparing Images for computer Presentations” and “Image File Types” for a full discussion of resolution, file size, and compression ratios.

ISO **400 to start**

The higher the ISO the higher the shutter speed. Since vibration is a big problem with microscope photography, a high shutter speed is desired. However increasing the sensitivity adds noise to the image. An ISO of 800 has significantly more noise than 400, which has more noise than 200, which is about the same as 100. The setting is a balance between a high enough shutter speed to control vibration and a low enough ISO so that the noise is not obtrusive.

Record Mode

WHITE BALANCE **WHITE PRESET**

White balance is how the camera compensates for different light sources so the colors in the image look realistic. Their are a number of options; **AUTO, White preset, sunny, incandescent, fluorescent, cloudy and flash**. In the AUTO setting the camera measures the light and makes a light balance calculation for each exposure. White preset will give the most accurate colors. The reference target should be a very white matte paper like that use for high quality ink jet prints or better yet a Kodak Grey Card (can be purchased at you camera store). See article “White Balance” for more information.

METERING **MATRIX** or **SPOT**

There are three metering methods in the camera, **matrix, spot** and **center weighted**. Matrix measures about 256 areas of the frame and is probably the best method for general use. However there are two situations where the spot method is useful. They are: shooting down a canal and when there is a gold crown. Trying to shoot down a canal is difficult because there is so much light loss. Using spot metering will automatically increase the exposure if the spot is over the canal being photographed. Gold crown are highly reflective and will fake out the meter. Using spot metering will eliminate the highly reflective area from the exposure calculation. The caveat is that the spot must be accurately aligned over the intended area.

CONTINOUS SINGLE

For most situations "single" is the appropriate setting although short, low resolutions movies are possible.

BBS (best-shot) **ON**

This is an interesting feature designed to compensate for camera movement. As long as the shutter-release button is depressed, the camera takes a sequence of photos up to a maximum of ten. It then compares the photos and saves only the best one. This seems to make a significant difference. Since movement is a real problem with microscope photography we can use all the help we can get. It takes about 5 seconds for the camera memory buffer to fill up and another few seconds of calculations to select the best image. This is not really a problem once you are used to it. This setting turns the flash to OFF and precludes the use of multishot

IMAGE ADJUSTMENT **AUTO**

This feature gives control over the cameras internal processing algorithms and compensates for the overall contrast of the image and/or brightness of the midpoint (gamma) of the image. It does not compensate for basic exposure errors, they are adjusted with the exposure compensation button. It is not recommend to us image adjustment unless you see a definite trend in the histograms and the images that are already correctly exposed. See article "Histograms"

SATURATION CONTROL **NORMAL or +1**

This controls the saturation of the image. Normal setting gives relatively accurate color, which many people judge to have a "flat" look because they are so used to seeing slides that are very saturated. If you want to pick up the saturation try a +1 setting, which will make the image look more like a slide.

IMAGE SHARPENING — **NORMAL**

This setting applies a sharpening algorithm. Start with the Normal setting and see what you like. Be advised that a high degree of sharpening gives the image a "video" look.

> The affects of Image control, Saturation and Image Sharpening can all be done later in Photoshop.

DIGITAL ZOOM — **OFF**

The digital zoom increases the telephoto range of the zoom by using less of the pixels in the image to give the appearance of higher magnification. The problem is the image degrades because fewer pixels make up the image. This level of telephoto is not needed in microscope imaging.

BLACK & WHITE — **NO**

This setting supposedly results in the highest quality image. Reports from users say the difference is minimal at best. If you need a black and white photo for some reason the color image can always be converted in Photoshop.

LENS — **NORMAL**

AUTO BRACKETING — **OFF for both exposure and white balance**

The use of auto bracketing precludes the use of BBS (best-shot) and is not necessary if the correct exposure compensation is selected.

NOISE REDUCTION — **OFF**

This setting is designed to reduce the image noise produced by very long exposures and is not effective for our purposes

AUTO OFF — **depends on power source**

This setting turns the camera off after the selected amount of time. With the camera in sleep mode the power consumption is minimal which conserves the batteries. It takes a few seconds for the camera to turn itself back on when the shutter button is depressed, so there is a delay before an image can be taken. A setting of 5 minutes seems to eliminate most of the reboots. If the camera is powered by an AC adapter the sleep mode can be set to 30 minutes which will leave the camera on during the whole procedure and eliminate the time delay of the camera booting up. The internal battery will last about 2-2.5 hours so you may elect to have an extras battery and recharge as necessary.

SOUND — **ON**

In the sound-on mode the camera beeps when an exposure is made. This is a nice indicator that an exposure is made since the camera is dead quiet otherwise. In BBS mode the camera beeps only on the first exposure.