

# RunCam Night Eagle Recommended Settings

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January 9, 2017

## Introduction

The RunCam Night Eagle CCD video camera has been tested and the performance documented in previous reports.<sup>a, b</sup> The purpose of this report is to document the various menus in the camera and how to set the camera for optimum performance for asteroidal occultation astronomy.

## Menus

Here is the starting menu when you press the Dongle Button:



The 'IMAGE' menu is the most important in this camera and will be discussed specifically below.

The 'VIDEO STANDARD' menu is only set once to the video standard used in the country in which the observer resides, although either setting can be used if preferred by the user. For USA and Japan, use NTSC – 60 HZ. For Australia and Europe, use PAL – 50 HZ. For other countries, use the setting best for your area, considering what other observers around you are using.

The 'LANGUAGE' menu is only set once. At the time of this manual, only two options are available – Chinese/or/Japanese? and English.

The 'LOAD DEFAULT' menu loads the factor 'DEFAULT' settings into the camera.

The 'SAVE & EXIT' menu is self describing. Once you have settings you want saved you can save them by pressing the button on this menu. The setting will be the same when the camera is restarted, until you press the 'LOAD DEFAULT' button.

The 'EXIT' button exits the menu.

## 'IMAGE' Menu

Here is the menu when you press the 'IMAGE' menu:



The DEFAULT setting is for:			The RECOMMENDED setting is:		
3D-NR	=>	NR-MODE: AUTO		NR-MODE: OFF	
WDR	=>	ON		OFF	
IMAGE ENHANCE	=>	SHARPNESS:			
		DETAIL: AUTO		AUTO	
		EDGE: AUTO		AUTO	
		SATURATION: AUTO		AUTO	
MIRROR	=>	OFF		OFF	
BRIGHTNESS	=>	36		250	
ZOOM IN	=>	0		0 or AS NEEDED	

Individual observer preferences/needs may be different between observers and their specific equipment. The author has adapted the above settings for use with a 12-inch Meade LX200GPS telescope fitted with an f3.3 focal reducer. Other telescopes and focal reduction may require different settings.

## Camera Shutter Speed

The overall shutter speed for this camera is 1/30 second per frame (NTSC) or 1/25 second per frame (PAL). This shutter speed is 'automatic'. That is, we expect that the exposure can be reduced as needed by the camera to balance the exposure. This automatic feature might cause our users of standard NTSC (or PAL) CCD cameras to worry that vital temporal information could be lost. Fortunately, with the RunCam Night Eagle camera, the CCD CMOS chip uses a 'rolling shutter'. In a rolling shutter, each scan line in each field of the video is timed sequentially and read out to the recorder sequentially, regardless of the duration of the exposure for each scan line. The resulting image is therefore unlike a normal CCD video where all scan lines in the field are recorded simultaneously, and if there is a shorter than normal NTSC (or PAL) exposure, part of the event timing can be lost, or if the event is short enough, it can be missed while the shutter is not open. With the rolling shutter used in the CMOS CDD of the RunCam Night Eagle, this cannot occur. As noted in my previous report<sup>a</sup>, the timing of an event must be adjusted based on the position of the target object on the screen. Objects in the upper left corner of a frame will be observed and timed sooner than objects on the lower right corner of the frame.

## Automatic Gain Control

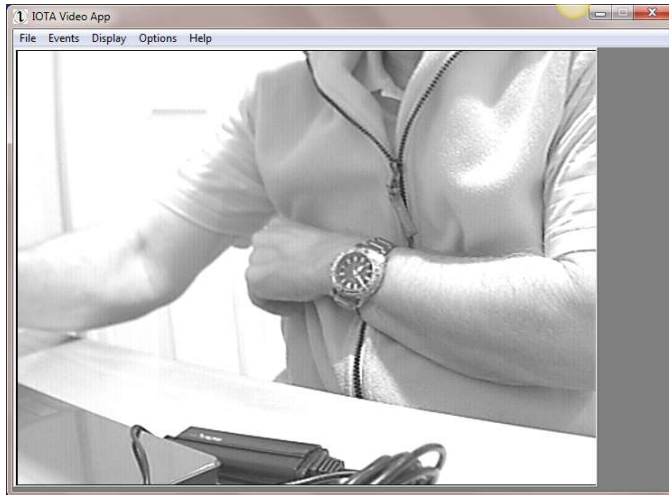
The RunCam Night Eagle has automatic gain control. There is no manual gain setting for this camera. In normal asteroidal occultation astronomy, the camera will most likely set the gain to maximum, however, if bright objects such as the moon are in the field of view, the automatic gain control can take over and change the overall gain of the video. This behavior is similar to the PC164C-EX2 camera that the RunCam Eagle is expected to replace, so there is not overall change in camera response when using this camera.

## Zoom In

A new feature that may be of use and interest to asteroidal occultation astronomers is the 'ZOOM IN' menu feature. Here is a normal view taken through the 140-degree field of view lens provided with the camera:



Now, with the camera in the same position and distance from the subject, with ZOOM IN at the max value of 5, here is a new full-frame image:



Notice the enlargement of the watch face. The ZOOM IN feature might prove useful when focusing or if the star field is very dense and the separation of stars within the field is desired.

## Conclusions

The RunCam Night Eagle is an acceptable replacement for the PC164C-EX2 CCD video camera. The settings indicated in this report are intended as a starting place and others may find better settings suited to their specific telescopes and methods of observing. Those who find that alternative settings work better are encouraged to submit their own reports and share their findings with the IOTA members at [IOTAoccultations@Yahoo.com](mailto:IOTAoccultations@Yahoo.com).

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<sup>a</sup> Testing RunCam Night Eagle, Tony George, December 2016, The RunCam Night Eagle CCD Video Camera is tested against three other cameras: WAT910HX, PC164C-EX2, and RunCam OWL Plus

<sup>b</sup> Dunham Hyades Comparison, David Dunham, January 2017, Test of RunCam Night Eagle vs PC164C-EX2 on the Hyades star field without and with 0.5X focal reducers (two suppliers)