# Roadside Video Surveys of Coconut Rhinoceros Beetle Damage

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## Contents



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[1] The most recent version of this document can be downloaded from https://github.com/aubreymoore/CRB-trap-improvement/blob/master/results.pdf.

# 1 Background

Vaqalo et al. 2017

# 2 Data Acquisition

## 2.1 Mounting a Smart Phone on a Vehicle

Preliminary work show that mounting the smart phone externally produces much better results than mounting the phone internally as a dash cam. This eliminates problems cause by dirty windshields and internal reflections.

A smart phone can be mounted externally using a ball and socket anchored using a magnet (1).

Optimal placement of the smart phone camera appears to be above the right-hand corner of the windshield (passenger side in the US)

### 2.1.1 Setting the Direction of View Angle

The direction of view angle has two components, a horizontal angle with respect to direction of travel and a vertical angle. The horizontal angle is set using the scale at the base of the ball joint. The vertical angle is set using a free Android app called Clinometer (`https://play.google.com/store/apps/details?id=net.androgames.clinometer`) (Fig. 2).

Optimal angles for direction of view appear to be 45 degrees to the right of direction off travel and 15 degrees above horizontal.

## 2.2 Parameter Choices

### 2.2.1 Camera and Lens

We are currently using a Samsung Galaxy S10 Smart Phone. This phone is equipped with a 16MP ultra-wide-angle camera for 123° field of view which seems to be a good choice for this application.

### 2.2.2 Resolution

Maximum resolution for videos recorded with the ultrawide angle camera is 4K 3840x2160 (16:9, 8.29MP). Initial recordings were made using this resolution, but this can probably be reduced without significant loss of precision.

### 2.2.3 Frames per Second

Standard frame rate is 30 fps. Initial recordings were made using this rate, but this can probably be reduced without significant loss of precision.

## 2.3 Using the Open Camera App

Open Camera (https://opencamera.org.uk/) is a FOSS app for Android smart phones which enables much better control of hardware features than the default Camera app provided with Samsung phones.

Open Camera offers a plethora of settings which can be saved in a configuration file for later use. For screenshots of *Video settings* see figures 3, 4, and 5.

## 2.4 Georeferencing

Although Open Camera has an option to georeference video frames, this feature proved unreliable in preliminary tests. As an alternative, it was decided to use a free called GPSLogger which logs timestamped GPS coordinates to a file at a frequency of once per second.

The author has cobbled together a jupyter notebook called georef which uses the GPSLogger log to calculate the GPS coordinates for each frame in a video recording.

# 3 References

Vaqalo, Maclean, Visoni Timote, Senimili Baiculacula, Gideon Suda, and Frank Kwainarara (2017). *The Coconut Rhinoceros Beetle in the Solomon Islands: A Rapid Damage Assessment of Coconut Palms on Guadalcanal.*

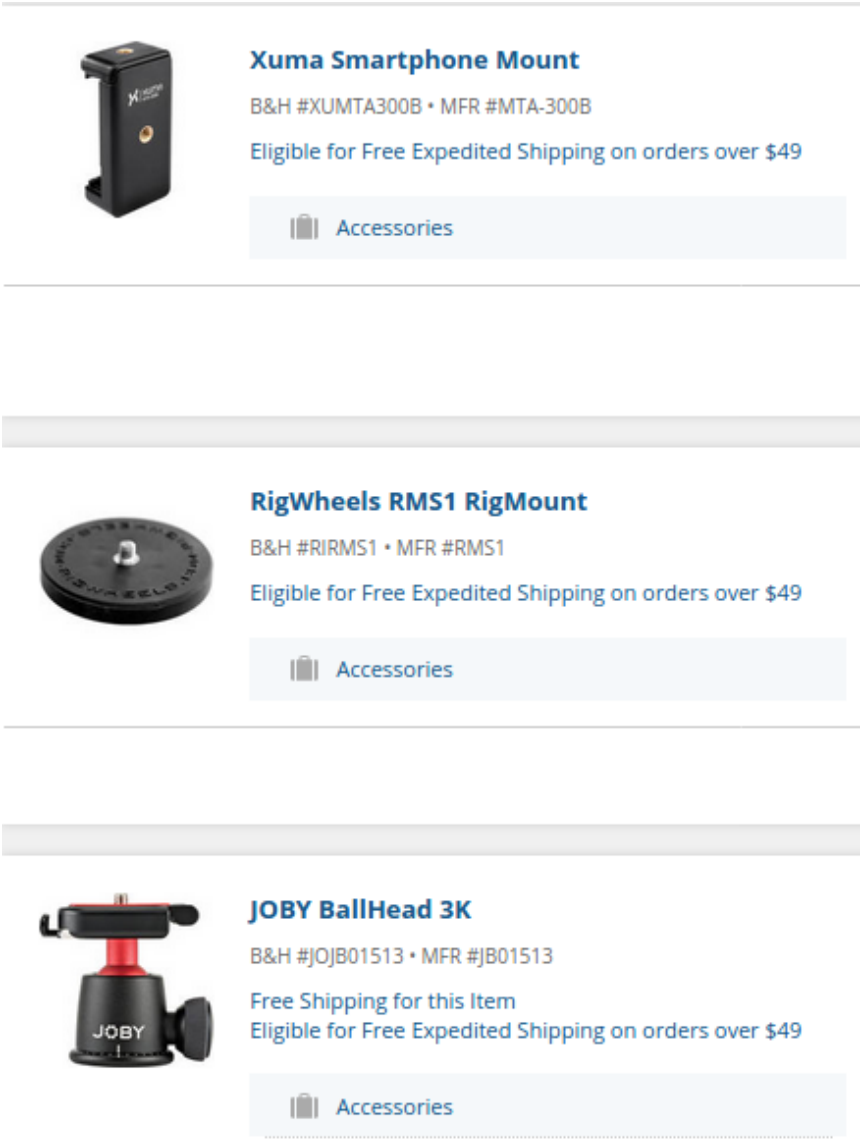


Figure 1: Smart phone mount.


Figure 2: Setting camera angles using Clinometer app.

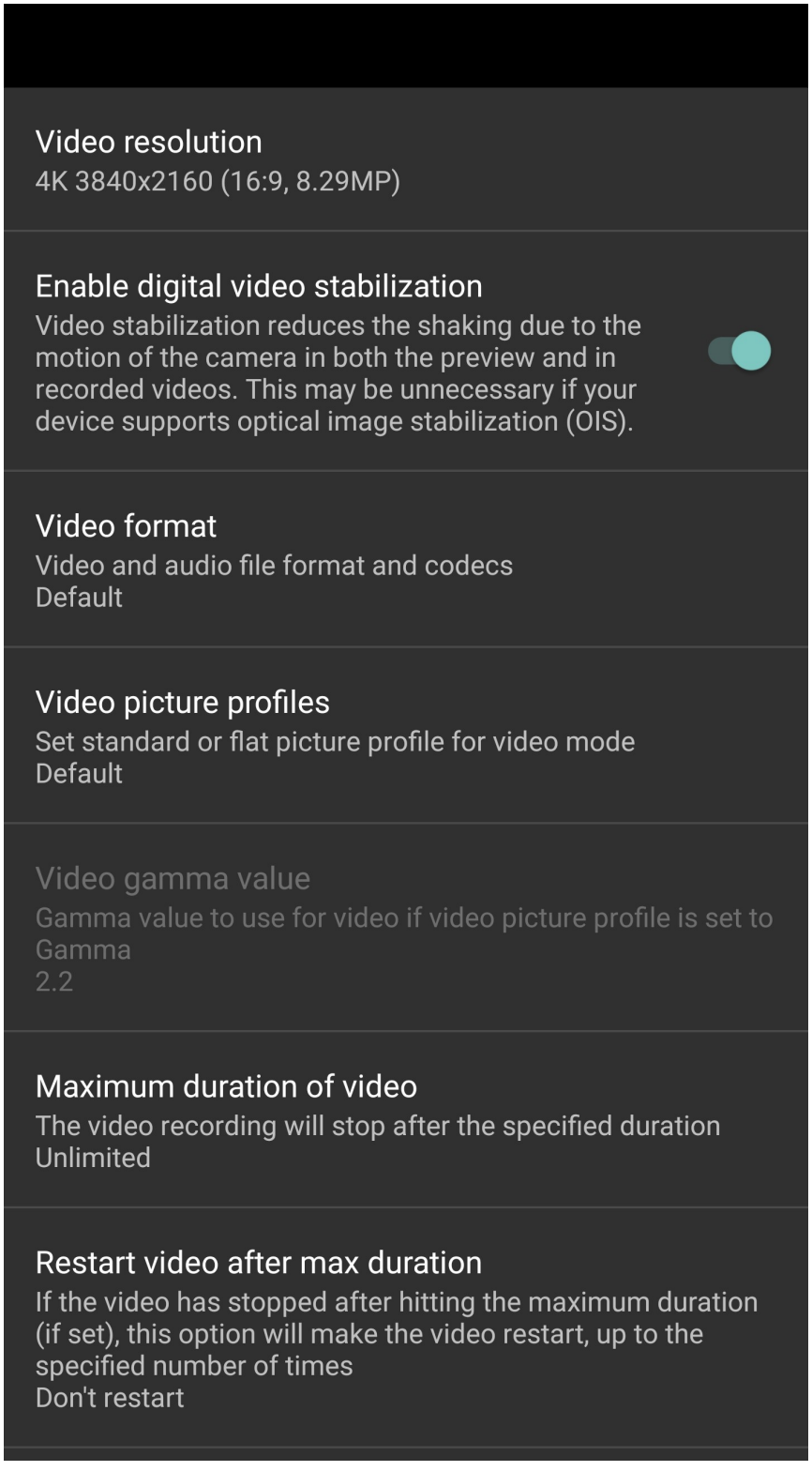


Figure 3: Video settings (1/3).

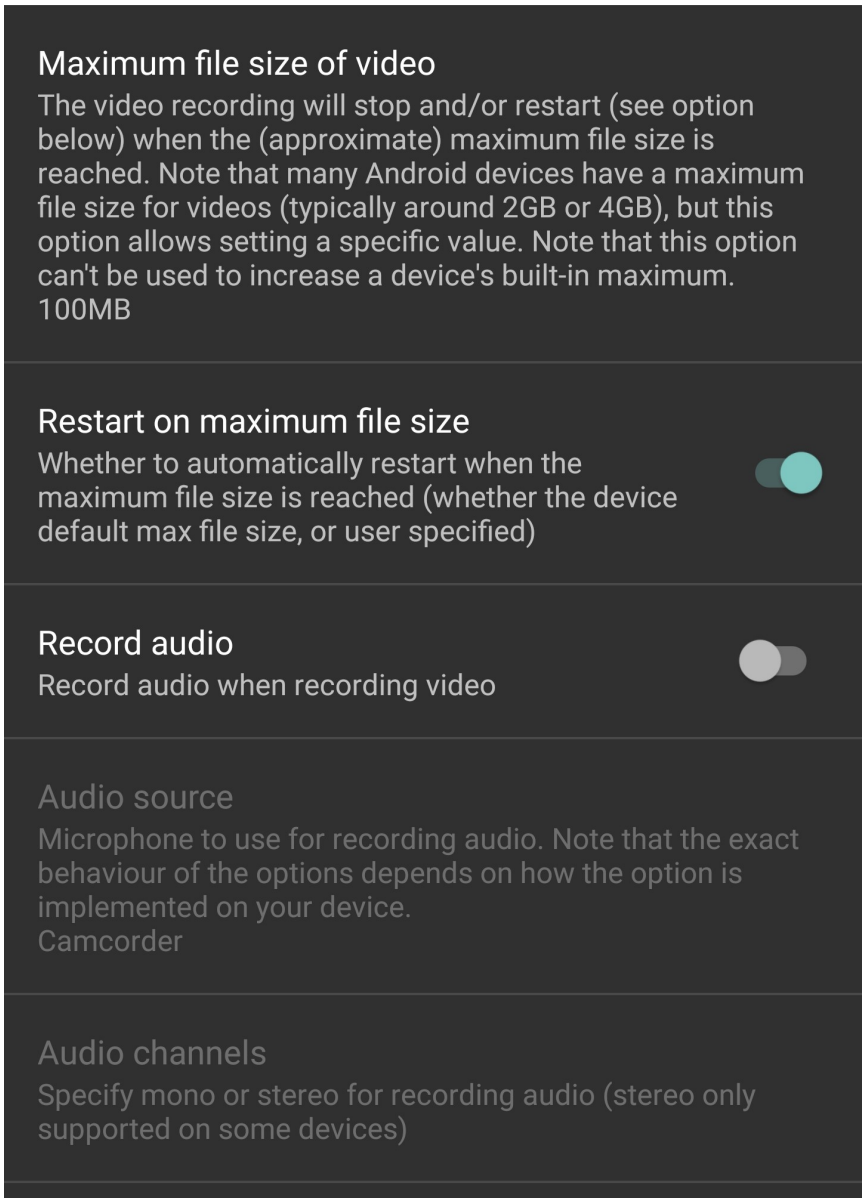


Figure 4: Video settings (2/3).

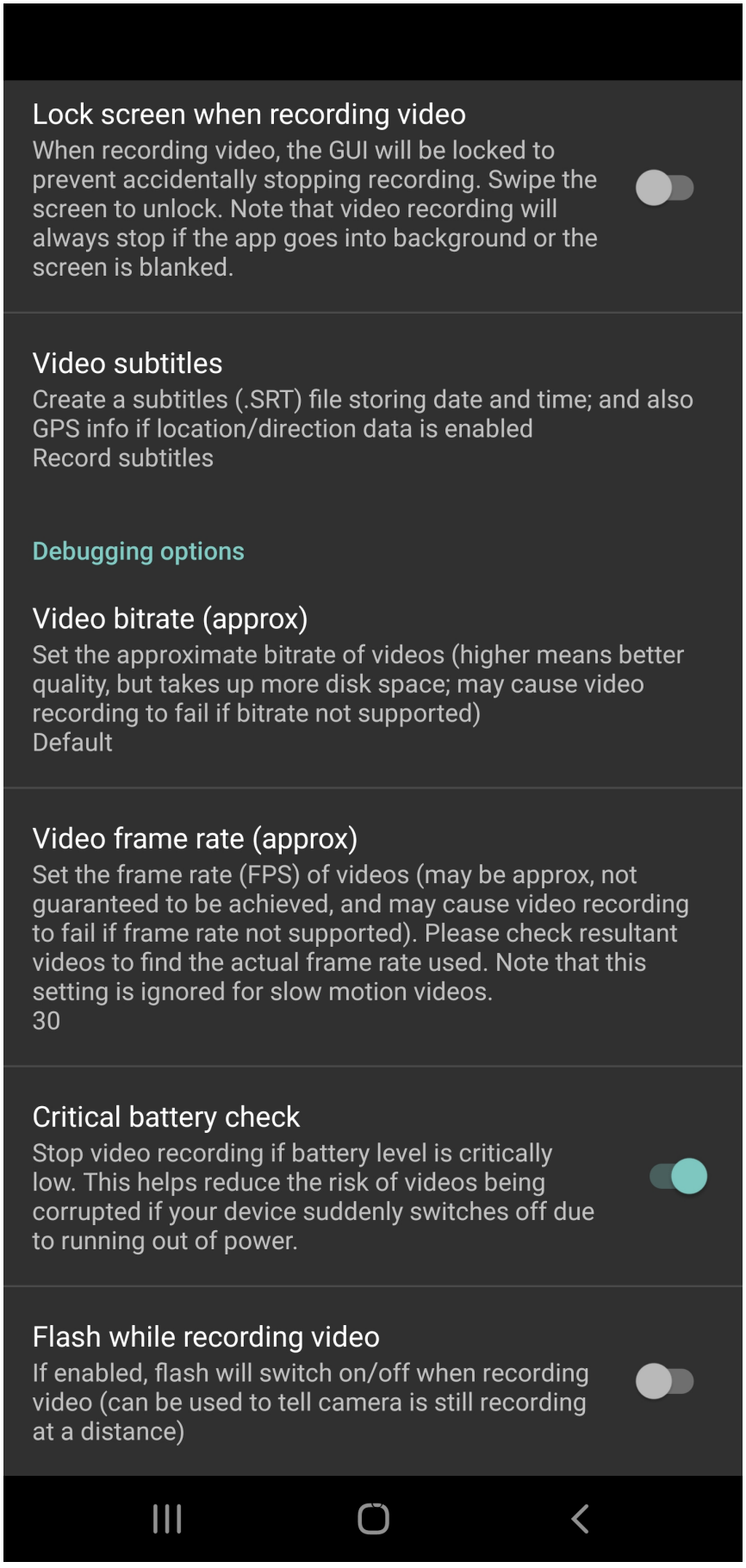


Figure 5: Video settings (3/3).