

## PR035: Variable Framerates & High Shutter Speeds

### Background

Because of the physics of optics and the Pro35 there are some limitations when using the Image Converter on an electronic camera:

The image of the 35mm lens is projected to an oscillating "target", similar to a groundglass. If you increase exposure time (shutter speed) you need to increase the speed of the oscillating target as well. The higher the shutter speed the less is the movement of the rotating target glass in the Pro35 per frame. Less movement of the target can cause visible structure in the image. So there is no FINAL solution for that problem, except adjusting the target speed to the ideal speed corresponding to the shutter speed (it is **not** always best at maximum speed, maybe it is a little lower and depending on the shutter speed). Use a plain coloured, grey or white background on a good (HD-)Monitor to find the best solution for the cyclic movement - usually you can fix the artefacts.

In the current version of the converter it is not possible to speed up the Pro35 system as much as necessary for high shutter speeds.

### We can not tell at which shutter frequency it will cause artifacts; this depends on

- your image content
- the focal length of the film lens (shorter focal length > more difficult than long focal length)
- High Def or Std. Definition
- T-Stop on Film lens (depth of field)

To keep the Pro35 as silent as possible the speed range of the target is not easily "tuned" to higher speeds.

### Recommendations:

- shot wide open (T 1.4 - 2.0) on film lens
- use longer focal length lenses if possible
- use standard shutter speeds like 1/48s, 1/50s, 1/60s (180 deg. shutter @ 24/25/30fps)

### Variable Framerates on Panasonics Varicam:

If you use the Varicam in 60P mode with a 180° shutter angle, you might get artifacts because of the short exposure time and the high definition CCDs (depends on lens etc.).

This is not a problem when the camera is operating @ 24/24/30P (1/48s vs. 1/120s).

### Recommendation

- A) Turn the shutter OFF (1/60s @ 60fps)  
or
  - B) Adjust the "SYNCHRO SCAN 2" up to 350° shutter angle @60fps, which decreases exposure time to an acceptable value. Double check that this does not cause flickering with other frequencies (such as HMI lights).
1. Make sure that "SYNCHRO SCAN 2" is enabled:  
Go to FILM CAM MAIN MENU 2 - SHUTTER SPEED - SYNCHRO SCAN 2 >ON<
  2. Use the shutter select switch on camera front to activate SYNCHRO SCAN 2
  3. Use the SYNCHRO + - buttons on camera right side to adjust the "SYNCHRO SCAN 2" to the value you need, e.g. 350 degree
  4. Make sure the SHUTTER switch is at its ON position

Check the Varicams user guide page 55ff for details about the speed adjustment of the shutter.