

Frequently Asked Questions

Crossover lenses



005-1682005

Question

Why do I lose 20% of my focal length on a switchable camera during 4:3 use.

Answer

Most common day broadcast cameras are able to switch between 16:9 and 4:3 aspect ratios, what might result in a loss of approximately 20 % of your focal length in 4:3 use.

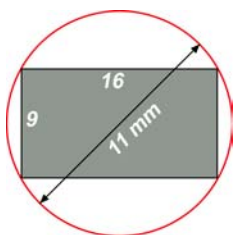
In example, if you have a Canon 17eX7.7 IRSE lens with a shortest focal length of 7.7 mm (63,9° horizontal), using the camcorder in 16:9 will actually enable you to use this 7.7 mm. But in 4:3 use your shortest focal length will only be 9.2 mm (59,5° horizontal).

How can I overcome this?

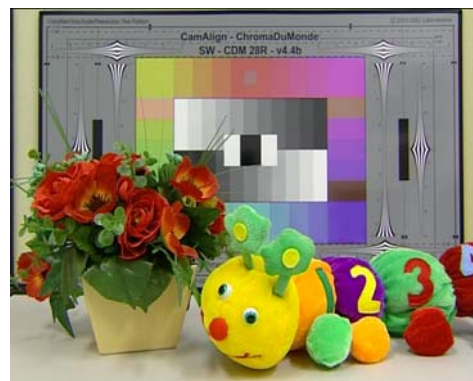
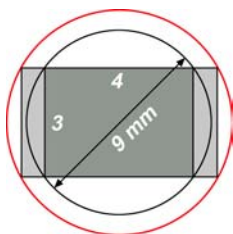
First of all you have to realize why this phenomenon occurs.

For a 2/3" CCD-block (most common format nowadays) the diagonal of the CCD is 11 mm.

The design of the lens covers the CCD completely in both 16:9 and 4:3 use. This is made visible in the underneath left hand picture, with the red circle representing the actual projection-plane of the lens. The right-hand picture gives a shot made with the 7.7 mm lens in 16:9 use.



The most common way to shoot in the 4:3 aspect ratio in switchable cameras is by using a smaller area of the CCD-sensor, more precisely only the center of the CCD. This results in a used diagonal of the CCD of only 9 mm. Again; this is visualized in the left-hand picture underneath. The right-hand picture gives the resulting shot made with the lens.



You can see the drastic reduction in the focal length; the lens has become more telephoto.

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This isn't such a big problem if you are using an extreme wide-angle lens as the Canon 11eX4.5 IRSE. If you only have a "standard-" or a "long lens" with a shortest focal length of 7.7mm this becomes a serious problem as you end up with a minimum focal length of only 9.2 mm during 4:3 use!

The crossover lens reverses this problem. It converts the entire picture of the lens (the 11 mm circle) into the 4:3 active area of the CCD (the 9 mm circle). This way we have the original focal length again.

