HOW SINGLE FOCUS ANAMORPHIC ATTACHMENTS WORK

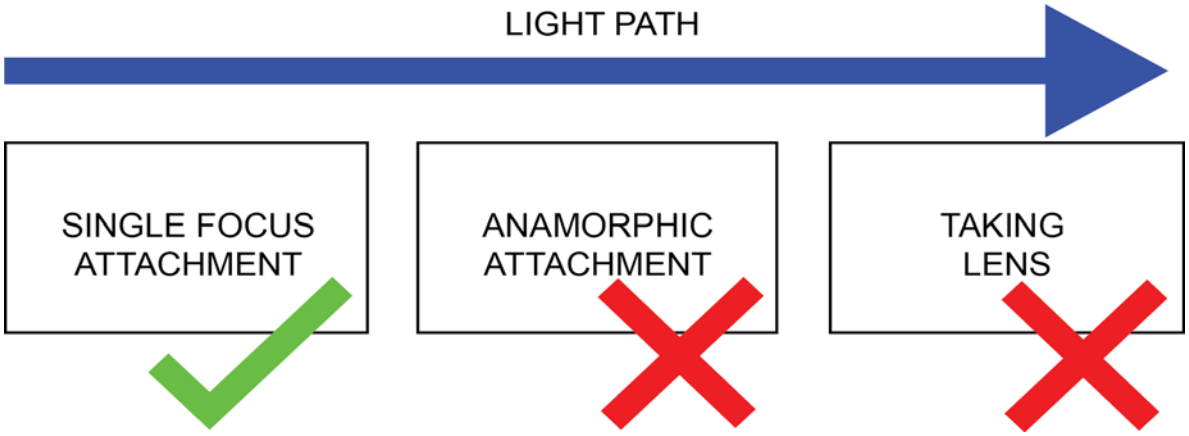
Since August 2014, I have had many emails about this topic. I have distilled them down from the bulk to this quick QA session. I hope it helps.

Q Hi John, can you tell me how these work?

A Sure, what do you need to know?

Q Pretty much everything really, from the ground up if you can spare the time.

A OK, let's look at the optical chain below, the blue arrow shows the direction of light travel and going from left to right there is the single focus attachment connected to the projection anamorphic attachment which in turn is connected to the taking lens which is mounted on the camera.



As you know, before I introduced single focus attachments for projection anamorphics to the market, back in August 2014, there was just the double focus method whereby both the projection anamorphic attachment and the taking lens had to be focused to the same distance. The addition of the single focus attachment means you just have to focus with it, instead of the other two, which are set to focus on infinity.

Q Wait a minute, if the projection anamorphic attachment and the taking lens are both focused on infinity how do you focus on a near object, surely it will be out of focus?

A When the projection anamorphic attachment and the taking lens are both focused on infinity, think of this like a person who suffers from hypermetropia or long-sightedness and needs correction eye glasses to see near objects clearly. The eye glasses cause a nearby object to be seen as a virtual image much farther away so that person can see it.

Q Wait a minute, what is a virtual image?

A A virtual image is one that cannot be projected and recorded on an image sensor, it is the same kind of image that you see when looking through a magnifying glass.

Q OK, but I don't understand how this thing can be focused

A Focusing is achieved by moving the glass elements apart in the single focus attachment by means of a mechanism, when they are close together far objects can be focused upon, and when they are some distance apart near objects can be focused upon. At all times the single focus attachment causes the virtual image of the object to be placed at infinity so that the projection anamorphic attachment and the taking lens can see it perfectly clearly.

Q Ah, I get it now, so it's kind of like a dioptre

A That's right, but it is really a variable dioptre which allows focusing from near to far and all points in between

Q Cool, so what is the effect on the footage with all this extra glass? I mean the flares and the bokeh?

A An optimised single focus attachment should have very little effect on the footage if it's designed properly. Basically it should behave as if it was not there or more precisely as if the projection anamorphic attachment and the taking lens had been focused to the same distance without the optimised single focus attachment fitted.

Q What do you mean by optimised?

A It is the best balance between all the adverse aberrations which are part of the optical designers challenge such as Spherical Aberration (corner/edge softness), Chromatic Aberration (colour fringing), Barrel Distortion, Resolution Losses etc. Optimised, means it is the best it can be subject to the constraints of cost.

Q What are the red X's for in the diagram above?

A Two things really,

The first signifies that once the projection anamorphic attachment and the taking lens are focused to infinity then they can be fixed at the infinity setting and no longer need to be focused since all the focusing is done with the single focus attachment.

The second signifies that when you buy a single focus attachment, you are not buying an anamorphic attachment and a taking lens, since you already own them or plan to buy them separately. You should not be overly influenced by bokeh and flares because that is not what you are buying, bokeh all over the frame is very nice but is not a good yardstick for evaluating the optics in the single focus attachment.

Q What do you mean by the second thing?

A Perhaps I should repeat that when you decide to buy a single focus attachment, you must never ever lose sight of the fact that *you are not buying* an anamorphic attachment and a taking lens.

You are buying an optical focusing system of glass lenses and a mechanism, they in themselves *are not* responsible for the bokeh and flares, so caveat emptor applies.

Q Ah, I see thanks for making that point very clear. So what should I be on the lookout for then?

A You should request high resolution stills taken with the widest supported lens at open aperture and check for edge and corner softness, chromatic aberration, basically all the things mentioned earlier

You should check these things at a near object focus, a mid object focus and a faraway object focus taken at wide open apertures, at say F5.6 and some stopped down say F11

You should check these things above with longer focal lengths up to the maximum supported focal length range

You should also be looking for how smooth and fast the focus mechanism is at close range where the throw has the biggest stroke and request some examples of follow focusing too

You should also be looking for mumps when focusing from very near to far focus pulls. Mumps is when the image seems to get wider as the focus goes from near to far.

Q Wow, how do I make my decision on which one to get?

A To be honest, everyone's needs and wants are different, so you should be diligent in figuring out what is best for you and your shooting style. I suggest you make a list covering the benefits such as:

Optical quality
Performance
Smooth focusing
Weight
Size
Balance
Build quality
Ergonomics and handling
Design features
Product support
Anamorphic compatibility
Resale value

Only then can you decide on the order of importance and value these benefits mean to you. When you have done this, have a look at the price and fine tune your decision.

Welcome to the world of cost benefit analysis!

Q Ha-ha thanks, John you have been really helpful

A My pleasure