



# The EOSHD Anamorphic Shooter's Guide

**Second Edition**

E-Book

By Andrew Reid



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# Part 1 - Introducing Anamorphic



## Attaching an anamorphic lens

Anamorphic lenses are all adapter lenses. They need the main camera lens to operate. Some are permanently attached to a prime lens, or at least matched to a particular focal length - but most anamorphic lenses are simply attachments which can be used on a variety of normal camera lenses. I refer throughout this guide to the main camera lens as a *prime lens*. Anamorphic lenses can work with zoom lenses but I recommend prime lenses for better image quality.

Anamorphic lenses need to be the correct way round, if they are slanted the image will be too. Apart from the Panasonic LA7200 most

anamorphic lenses do not have a rotating mechanism. Some don't even have a standard thread on the back of the lens to screw it onto the front of the camera lens. For that reason you will need an anamorphic lens clamp.

### Recommended clamps on eBay

#### [Vamp Clamp from Vid-Atlantic](#)

Affordable clamps from the maker of the CineMorph anamorphic-style filter (see Part 7)

#### [Redstan Clamps](#)

Limited quantities but the best clamps. Tony also sells a range of higher end clamps which are more expensive. Tony is a cinematographer based in London and has one of the largest personal collections of anamorphic lenses - a great chap.

#### [Clamps from Ed Lee](#)

Very affordable clamps from Ed Lee, a Hong Kong based DSLR shooter

The clamps fit almost all anamorphic lenses and feature a 52mm or 58mm thread at the side which attaches to the prime lens. The anamorphic lens itself is held in place by thumbscrews in the clamping mechanism, so it can be rotated to the right orientation and locked securely in place.

**TIP:** you can check your lens is straight by shining a torch light into the lens to cause a horizontal flare. If the flare is slanted you need to correct the rotation of the lens in the clamp. Also make sure the curve in the anamorphic lens bends outwards horizontally side to side, not top to bottom! Most lenses have a marking or coloured red / white notch to denote the correct way round. The distance between lens and anamorphic in the clamp not critical to the image, but too big a gap will result in vignetting (black borders on the image) so try and keep it to a minimum.

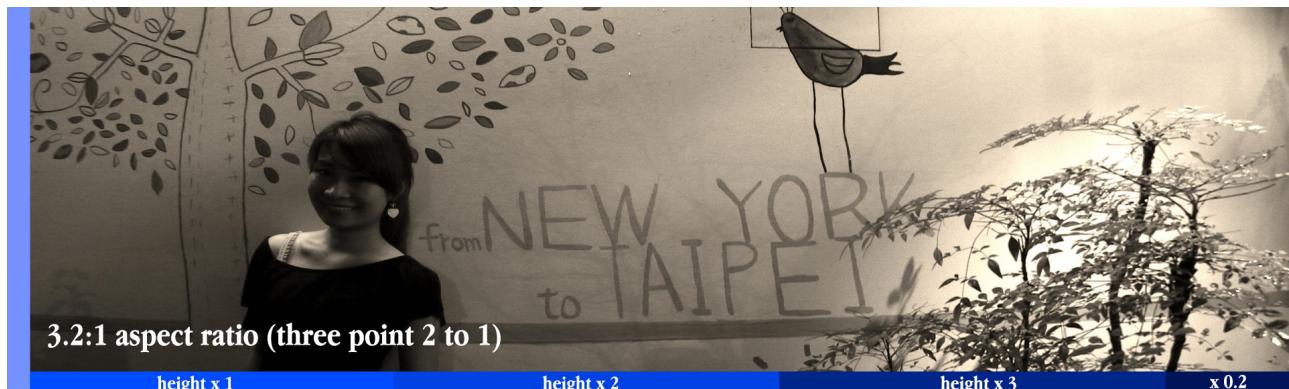
## Aspect ratios and ‘cinemascope’

An aspect ratio is simply an expression of image width versus height. As an example:

1:1 would be perfectly square.

3:1 would be 3 parts wide and 1 part high.

3.2:1 would be 3.2 parts wide and 1 part high.

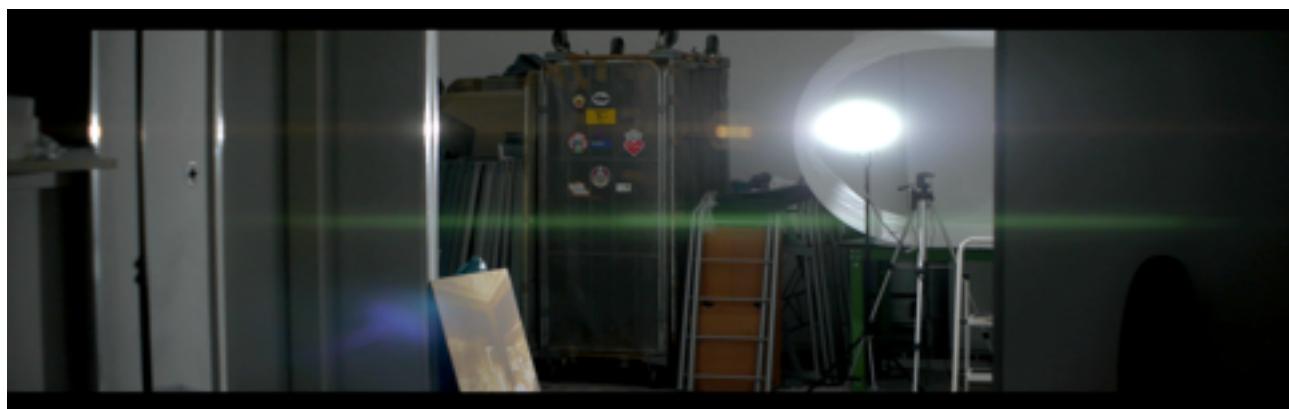


Anamorphic lenses were originally designed to convert the 4:3 aspect ratio of 35mm motion picture film to 2.35:1 cinemascope - the cinema standard of wide-screen - without the resolution loss caused by cropping.

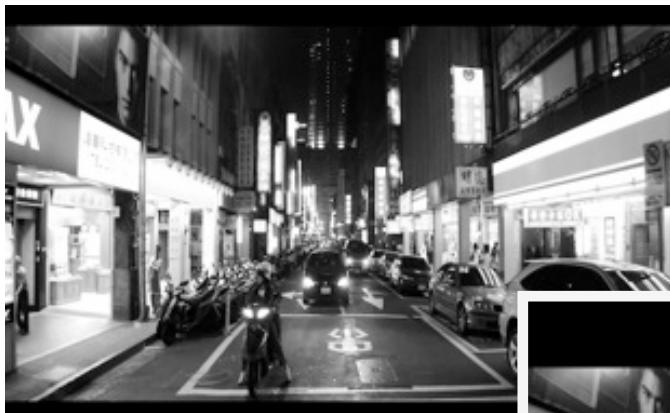
Without an anamorphic lens editors would have to crop the top and bottom of the square-like 4:3 film frame to achieve widescreen, wasting film and resolution in the process.

**Tip:** 4:3 on a digital camera actually converts to 2.39:1 with a 2x anamorphic lens, since film has a sound track taking up yet more room on the 4:3 frame whilst digital does not. The visual differences between 2.33:1 and 2.39:1 are almost unnoticeable.

Modern digital cameras shoot HD video in wider aspect ratio of 16:9 so applying an 2x anamorphic lens will make for a wider image than 2.39:1. Below is a 3.55:1 anamorphic aspect ratio produced by the Kowa 2x lens on a GH2 in AVCHD 16:9 mode, with anamorphic lens flare. Other lenses are less wide like the LA7200 and Iscorama which produce 2.39:1 with a 1.33x stretch and 2.66:1 with a 1.5x stretch respectively.



Anamorphic lenses work by containing bent glass which is wider horizontally than it is vertically. This squeezes a wider image into the camera sensor. As a result, whilst recording the footage will look stretched vertically like the top image here...

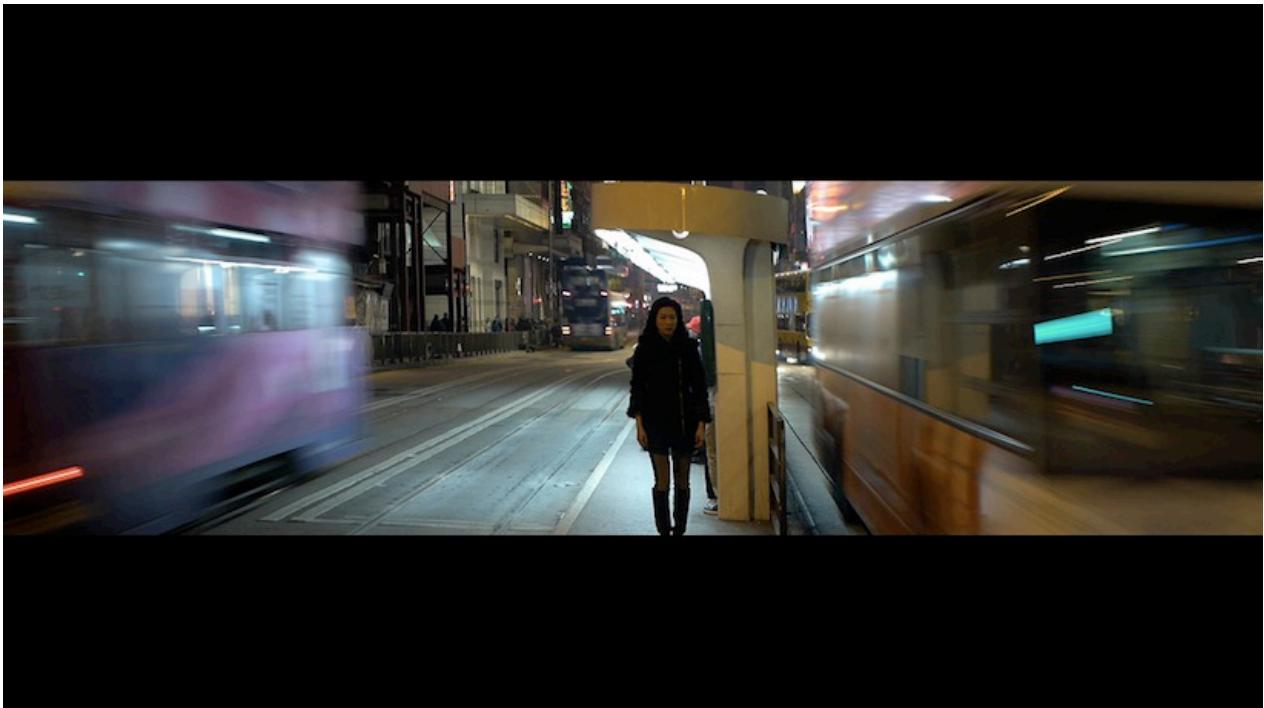


Extra width is being squashed into a boxier rectangular 16:9 image on-camera. The bottom image is the corrected 2.39:1 frame size in Final Cut Pro. (*See Part 3 for editing techniques*).

Some accessories like EVFs and external monitors can de-stretch the image live so you can shoot whilst looking at the correct anamorphic aspect ratio.

This is useful but not essential, you can still frame and compose a shot with an anamorphic lens with ease despite the moderate distortion effect.

The widest aspect ratio of 3.55:1 (2x)



A less wide aspect ratio of 2.66:1 (1.5x)

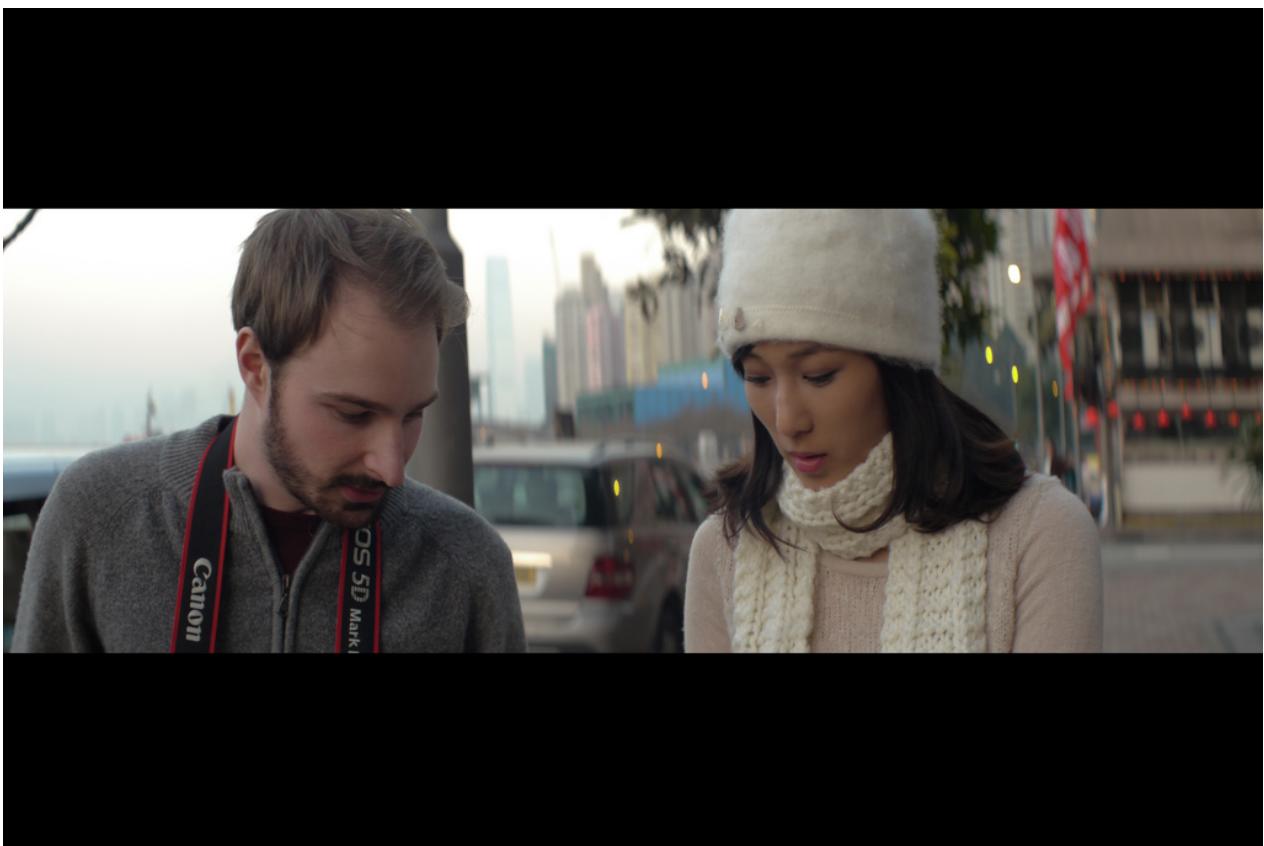


Image by Edwin Lee (<http://www.vimeo.com/edwinlee>)

## Benefits of anamorphic lenses

### 1. FLARE.

A desirable quality of anamorphic lenses is unique lens flare. Horizontal lens flare and stretched oval lens flare can be achieved, a style used often in sci-fi movies.

### 2. WIDE AND FASTER.

Anamorphic lenses give a wider field of view, whilst maintaining the aperture of the camera lens. So a fast 50mm F1.4 lens will stay a fast F1.4 yet gain a wider angle. Most standard wide lenses have slower apertures.

### 3. SHALLOW DEPTH OF FIELD.

An anamorphic lens also maintains the shallow depth of field of a longer focal length and a fast aperture. So anamorphic lenses can achieve a shallower depth of field than standard wide angle lenses.

### 4. STRETCHED BOKEH.

An anamorphic lens gives a unique look to bokeh (out of focus points of light). Bokeh maintains a stretched look after the correct aspect ratio is applied to the footage.



## Disadvantages of anamorphic lenses

### 1. MULTI COATING.

Some anamorphic lenses are multi-coated (MC) which reduce or eliminate the horizontal lens flare effect.

### 2. FOCUS DISTANCE.

Minimum focus distances are not as good as a standard lens unless a diopter is used.

### 3. LIVE VIEW.

Live monitoring of DSLR footage whilst shooting with an anamorphic lens looks distorted unless a monitor is used and configured appropriately (i.e. Small HD DP6).

### 4. INDIVIDUAL LENS QUIRKS.

Most anamorphic lenses require both the prime lens and anamorphic lens to be focussed at the same time. Isco patented the single-focussing anamorphic, preventing other companies from adopting it. LOMO used the mechanics of the lens housing to focus both aspherical and anamorphic lens at once. Often what you will find on eBay has some LOMOs have mechanical deficiencies or incomplete housing, so it is better to use a normal prime lens and focus both lenses for best results. The Kowa and Sankor lenses are also fantastic lenses but they require both prime and anamorphic to be focussed to the same point in order to revolve a sharp image.

### 5. SOME ARE SOFT AT FAST APERTURES.

Some lenses are soft at fast apertures unless a diopter is used. Anamorphic lenses tend to be softer than normal aspherical prime lenses, but this is no bad thing unless extreme, since a cinematic image looks like video if it's too sharp and clinical.

Overall the shortcomings of anamorphic shooting are more like quirks than show-stoppers, and the advantages and style far outweigh the quirks.

The issue of focussing both lenses will be fixed over-time by a follow focus system, but a product has yet to be developed and would have to be adaptable to many different anamorphic and prime lens combinations.

On some higher end anamorphic lenses none of the above quirks apply.

The Iscorama and some well kept LOMOs are sharp at fast apertures, have short minimum focus distances, do not have excessive multi-coating and flare nicely.

**Tip:** With the Zacuto EVF and SmallHD DP6 you can overcome the monitoring distortion in live view on a DSLR. You can use a custom aspect ratio, or one of the preset aspect ratios like 2.39:1 to display a live view feed via HDMI at the correct aspect ratio with no distortion. There are other offerings under development too.

These accessories are covered in Part 7 with a link to the full reviews on EOSHD.com

## List of notable movies shot with anamorphic lenses

The below list is a small subsection of classics shot on anamorphic lenses

- Alien
- Apocalypse Now
- Batman Begins
- Blade Runner
- Chinatown
- Close Encounters of the 3rd Kind
- Dances With Wolves
- The Deer Hunter
- Die Hard trilogy
- Donnie Darko
- Ghostbusters I and II
- The Graduate
- Grease
- Halloween (John Carpenter)
- Indiana Jones franchise
- I Am Legend
- Inception
- Inglourious Bastards
- James Bond franchise
- Jaws
- Léon
- Logan's Run
- Mad Max
- Mission Impossible franchise
- Moulin Rouge
- Oklahoma! (Original Cinemascope)
- The Omen
- Planet of the Apes
- Pulp Fiction
- There Will Be Blood
- Transformers
- Solaris (Tarkovsky original)
- Speed
- Scream franchise (Wes Craven)
- Star Trek
- Star Wars Ep1: The Phantom Menace
- Superman I - IV
- Westworld
- X-Men

## Directors who shoot predominantly with anamorphic lenses

- Ridley Scott (Alien, Blade Runner, Thelma & Louise)
- Quentin Tarantino (Pulp Fiction, Inglourious Bastards)
- Christopher Nolan (Inception, Insomnia, Batman Begins, The Prestige Memento)
- Paul T. Anderson (There Will Be Blood, Magnolia, Boogie Nights, Punch Drunk Love)
- Andrei Tarkovsky (Solaris, Stalker, Mirror)
- Wes Craven (Scream, Nightmare On Elm Street)
- Baz Luhrmann (Romeo + Juliet, Moulin Rouge)

## Squeeze factor / compression ratio / wideness

Anamorphic lenses usually have a squeeze factor of 1.33x, 1.5x or 2x.

It is a multiplier of how much wider the anamorphic is than a standard lens and what aspect ratio they are designed to produce.

The hard way to look at this is that HD video is 16:9 a 1.33x squeeze will produce cinemascope 2.39:1 and a 2x squeeze will produce an even wider aspect ratio of approximately 3.55:1.

All you need to know is that 1.33x is less wide than 2x, and you need to set the aspect ratio of your footage when editing appropriately to get the proper aspect ratio that the anamorphic is intended to provide.

The multiplier numbers themselves are easier to visualise. A 2x anamorphic lens would make a lens twice as wide horizontally. A 50mm lens would become 25mm in terms of field of view across the width of the image.

An anamorphic lens does not give any wider field of view vertically, only horizontally.

### 2x anamorphic lenses

- LOMO OCT18 / OCT19 for Konvas 35mm
- Kowa Prominar / Kowa Bell & Howell
- Sankor 16C, 16D, 16F / Singer
- Isco CentaVision 2x
- Proskar

### 1.5x anamorphic lenses

- Iscorama 36
- Iscorama 54

### 1.33x anamorphic lenses

- Panasonic LA7200
- Century Optics anamorphic
- Isco 2000
- Optex anamorphic

## Part 2 - Anamorphic lens buyers' guide



### Recommended anamorphic lenses

#### LOMO OCT18 / OCT19 square-front 2x

**9/10 (for a good unit)**

#### Pros

Designed together with a high quality backing prime lens, probably the most cinema-like image, these are historic Russian Konvas 35mm motion picture film lenses as used by Tarkovsky on Solaris and other masterpieces. Incredible flare and character. High quality aspherical lens at the rear. Good colour and contrast. Comes in several varieties, between 30mm and 80mm. The 35mm and 50mm are most common. The 50mm can also be used with a 75mm lens but the 35mm is optimal at the 35mm focal length only. Can be separated from original prime lens. The 35mm lens also pairs well with Canon FD 35mm F2 SSC (and some other lenses) so just the anamorphic can be used on any camera (if OCT18 / OCT19 adapter is not available) - though both prime and anamorphic must be focussed separately. The 35mm LOMO is compatible with Canon DSLRs when using a non-OCT18 prime lens, or in LOMO OCT19 mount guise. The 50mm vignettes at anything wider than 40mm on Micro Four Thirds or 50mm on Canon DSLRs. 75mm needed for 5D Mark II. Can be opened and cleaned relatively easily. Minimum focus distance 1m.



## Cons

Since these are between 30-40 years old, selecting a lens on eBay can be like a lucky dip. Many of the lenses have a very soft image, fungus, and poor focussing mechanics.

OCT18 mount lenses are only compatible with mirrorless (although anamorphic part can be removed and fitted to any standard camera lens).



The poor focussing mechanics can vary depending on the lens and is down to a few factors. Sometimes the lens housing which connects the anamorphic to the prime is missing, incomplete, or damaged. Also the OCT18 to Micro Four Thirds adapter at time of writing does not feature the critical notch which allows the lenses to focus. A new adapter by Cecio7 on eBay designed in conjunction with EOSHD should enable the LOMO anamorphic OCT18 lenses to focus with their original LOMO primes as long as focussing mechanics are intact. (Check EOSHD.com for updates).

The front of the lens must be held by rails since it will rotate when the focusing barrel is turned if not secured, and the lens is heavy so rails help support the DSLR's mount. It is necessary to focus both the anamorphic lens and prime if using on a standard camera lens like a Canon FD. Some LOMOs available today have severe fungus and require cleaning though light fungus does *not* effect the image.

*Below: lens flare from a LOMO 35mm anamorphic lens (not corrected for aspect ratio)*



## LOMO OCT19 Round-Front 2x

### Pros

As the square-front lenses optically but with improved focussing mechanics and the better OCT19 mount. Compatible with Canon DSLRs.

### Cons

At the time of writing they are almost 3x the price of square-fronts.

### A note on LOMO mounts - Konvas OCT18 and OCT19

There are two LOMO anamorphic mounts - OCT18 and OCT19, sometimes written as OST18 and OST19.

OCT18 is a basic Konvas 1M design (35mm film cinema camera) and it rotates in the camera's mount when focussing, whilst the optical element of the lens is held by a notch. The whole lens barrel rotates, even the part inside the mount so it is a peculiar design by modern standards. Only compatible with mirrorless cameras due to a short flange back distance.

OCT19 is a bayonet mount for the Konvas 2M and is compatible with Canon DSLRs due to the longer flange distance specification. Improved focusing mechanics over OCT18.

## Iscorama 36 1.5x

**EOSHD Rating - 9/10**



### Pros

Optically brilliant, a German lens designed for both cameras and projectors with excellent build quality and compact size. Very sharp. Understated but attractive flare especially in sunlight. Easy to focus due to unique Isco patented focus system. You set the prime lens to infinity and only focus with the anamorphic's focus ring. Designed to work on 35mm stills cameras at 50mm, optimal at F2.8 - sometimes found with Isco prime lens. Compatible with full frame 5D Mark II - a good match for that camera. 1.5x stretch is rare and a great balance for 16:9

1080p, producing a 2.66:1 image slightly wider than 2.39:1 but not as extreme as the 3.55:1 produced by 2x anamorphic lenses. Minimum focus distance only 5ft, less with diopters.



### Cons

The '36' is extremely rare and expensive like all Iscoramas. Later 2004 / 2005 versions are multi-coated (denoted by MC lettering on front) which reduces characteristic lens flare, these remain extremely expensive and thus overpriced.

Most Iscoramas don't have the '36' designation but are practically the same in terms of optics, just with a slightly smaller rear element. The Nikon and Pentax mount Iscoramas for example, which come with a Isco 50mm F2.8 prime are not designated '36'.

## Iscorama 42 and the big beast 54 1.5x (pictured)

EOSHD Rating - 9/10



### Pros

The other Iscoramas retain much of the charm of the Iscorama 36, and are also great lenses which you can rack focus with. Everything that goes for the standard Iscorama 36 goes for this lens apart from the two cons below...

### Cons

Slightly softer than the 36 and much larger.  
Even rarer.

## Iscoro 2000 Widescreen 1.5x

EOSHD Rating - 6/10



### Pros

Good sharpness and not as rare as the other Isco lenses - yet! Much cheaper to buy than Iscorama. You can focus through it with the prime lens so can rack focus during a shot with it successfully.

### Cons

Fixed focus lens designed for projection means very poor minimal focus distance of around 5m! Does not flare as well as the Iscorama or LOMO anamorphic lenses.

## Isco Centa Vision 2x



**EOSHD Rating - 8/10**

### Pros

Similar to Iscorama 42 but allegedly made partly with glass from Kowa. Even rarer than the usual Iscorama lenses. EOSHD has one, and I have only seen one on eBay in the last year since. The CentaVision also has the unique patented Isco focusing system where prime is set to infinity and focus racking can be achieved with only the anamorphic lens. Like the Iscorama capable of very sharp results even at F1.4 especially with a diopter.

### Cons



Multi-coated and light on flare, vignettes easier than the Iscorama and Kowa anamorphic lenses. Poor 2m minimum focus distance, improves greatly with diopters. Suitable for use only at 50mm and beyond.

On Micro Four Thirds you may get away with some 35mm lenses but not all, and 40mm should avoid vignetting, though at wider focal

lengths there is an issue with egg-shaped flare vignette when pointed directly at light sources.

## Panasonic LA7200 1.33x

**EOSHD Rating - 9/10**



### Pros

The only anamorphic lens which can do ultra wide-angle shots on a DSLR since it does not vignette until 14mm with most lenses on Micro Four Thirds, 18mm on APS-C cameras. Large glass.

Extravagant, easily evoked horizontal flare though thinner and not as cinematic as the LOMO flare which consists of heavily stretched ovals.

1.33x ratio is great for achieving true 2.39:1 with DSLRs and their 16:9 video modes.

Optex and Century anamorphic adapters are similar and also worth a look though corner sharpness will often not be as good. Comes to life with rare LOMO Foton +1 diopter. Easy to focus with, the camera lens just focusses through it, can even zoom through. AF compatible so a good choice for run and gun documentary shooters.

### Cons

Needs an oversized and extremely rare diopter to enable shallow depth of field, fast apertures and longer focal lengths between 35mm and 85mm. Otherwise extremely blurry at anything faster than F4 or longer than 25mm. Side of frame sharpness is an slight issue at wide angles like 14mm. Not as good on full frame cameras due to soft sides.

## Kowa Prominar 8Z / 16H 2x / Bell & Howell

**TIP:** Kowa anamorphics come in a confusing array of different barrel designs. The 8Z/16H is black, stocky with black and silver focus ring, Kowa Prominar 2x written on barrel. The Bell & Howell version is the same but for the housing. It features the Kowa logo and Bell & Howell in upper-case lettering.

**EOSHD Rating - 8/10**

### Pros

Excellent optics, extremely sharp and well on par with the Iscorama 36. In terms of overall image quality, second only to Iscorama and the very best examples of LOMO. Good flare especially in sunlight. Compact and nowhere near heavy as the LOMOs. Well built and durable, smooth focus ring. Can be used at fast apertures even without diopters.

Reasonably good minimum focus distance. At time of writing MUCH cheaper than the Iscorama - 10x less, which makes these lenses a bargain in terms of image quality. Can

be used on variety of camera lenses. Can go as wide as 35mm on Micro Four Thirds before vignetting.



## Cons

Prime and anamorphic lens must be focussed in unison, so it is impossible to rack focus during a shot without a custom built follow focus - of which kind does not even exist yet. This is the primary reason for the Kowa's lower price than the Iscorama. Had Isco not patented the system, Kowa would have followed suit. Otherwise a great lens.

## Proskar Ishico 2x

**EOSHD Rating - 7/10**



## Pros

Narrower and longer than Kowa by body appearance, good sharpness but image quality varies greatly depending on usage history of lens. Common and cheaply priced relative to Isco and LOMO anamorphics.

## Cons

Softer at the edges than the Kowa and needs longer focal lengths to avoid vignette especially on 5D Mark II where it cannot be

used on anything under 135mm. 50mm recommended for Micro Four Thirds. 85mm recommended for APS-C.

**Sankor 16-C,16-C,16-F (sometimes labeled Singer)****EOSHD Rating - 7/10****Pros**

Glossy black with narrow silver markings on focus ring grip, narrower and longer than Kowa. Probably the 4th best option of all anamorphic lenses behind the LOMO, Iscorama and Kowa. Very good image, often matching the Kowa like for like.

**Cons**

2m minimum focus distance instead of 5ft on the Kowa. Vignettes a little easier - 35mm is not usable on Micro Four Thirds unlike the Kowa, you need at minimum a 45mm or 50mm lens, and longer for APS-C Canon (85mm) and Full Frame DSLRs (135mm).

## What to avoid - anamorphic lenses which are NOT recommended

### Almost any bulky projection lens



Anything too heavy is hard to mount and not very practical. Projection lenses are designed for long throws which mean the minimum focus distances are terrible (5m+), and you have to use diopters to do even the most basic portrait shot. There's also a dearth of information on such lenses, you never know quite what you're buying.

There are a vast array of projection lenses available yet nobody has shot any footage of worth with them - so that tells us a lot.

### Isco Projection lenses (non-Iscorama)



Identifiable for their crazy colour schemes - often gold coloured and with much longer barrel than the Iscorama, not as stocky.

Poor minimum focus distance, too bulky and heavy, some do not have focus marks, some are dried out from usage on hot projectors. Not practical to mount or to focus.

### Most Vintage pre-1970's anamorphic or models not mentioned here

Almost without exception (apart from Zeiss and Henri Chretien Hypergonar) optically rubbish. Stuff from the early days of anamorphic lenses especially poor, usually clapped out since they're so old! Though there may be the odd undiscovered gem remaining, best avoided - a risky purchase at best.

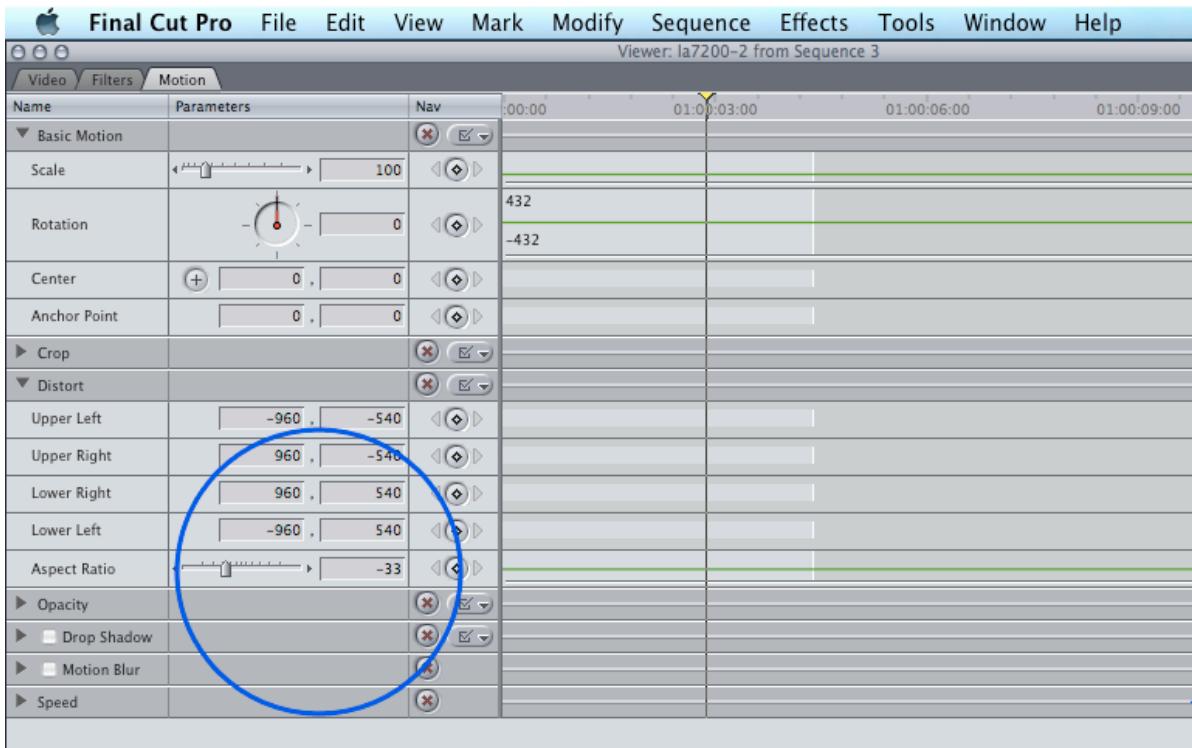
## Part 3 - Editing workflow

It is necessary to return the image to its proper proportions in the editing suite. The easiest way do this use the Aspect Ratio slider in Final Cut Pro, by entering the number (-33, -50 or -100) as shown above, depending on the type of anamorphic lens used. -33 is for 1.33x anamorphic lenses (LA7200), -50 for 1.5x (Iskorama) and -100 for 2x (LOMO, Kowa).

See the screen shot below for location of the option.

Since DSLRs are designed for the TV wide-screen aspect ratio, 16:9 instead of the squarer 4:3 like 35mm film, anamorphic lenses usually produce a wider aspect ratio than standard cinemascope (2.39:1) since DSLR footage is wide-screen to begin with.

However we will now explore some more advanced anamorphic workflow techniques.



### 4K x 1080p anamorphic footage for huge resolution gain

Would you like a 4K DSLR which shoots in cinemascope widescreen? Well it turns astonishingly out we can do it.

Because more detail is squeezed into the image horizontally than vertically you can afford to break the 'digital zoom' rule and extend the image horizontally, whilst keeping 1080 real lines of vertical resolution. The results are superb and can project to cinema proportions.

The perceived wisdom with anamorphic lenses so far has been to ignore the resolution gain they are designed to produce with 35mm film, and crush the image vertically to get the wider aspect ratio.

So for example a 2x anamorphic lens would reduce vertical height by half, and the aspect ratio would be 3.55:1 giving a 1920x540 widescreen image.

The digital rulebook has always told us that a digital zoom of any kind makes for a soft image. By instead stretching 1920 pixels to 2x the width, and keeping the height at 1080p with an 2x anamorphic lens must hurt the image?

Actually since an anamorphic is optically packing in more horizontal detail than vertical, although the maximum resolving power of the sensor is still limited to 1920 pixels, quite unlike 35mm film, the stretch does not hurt.

By stretching 1920 x2 and giving a 3840x1080 3.55:1 aspect ratio image, you have two advantages:

- I. You do not lose vertical resolution in a squeeze (or a crop if no anamorphic is used to produce cinemascope)
- II. You can crop horizontally down from 3840 to produce a less extremely wide 2.39:1 cinemascope image from a 2x anamorphic on a 16:9 DSLR

The 2x stretch from 1920 to 3840 is a way to avoid a squash from 1080 to 540 vertically, you are gaining vertical resolution - or at least keeping vertical resolution 1080p whilst achieving the wider aspect ratio the lens is intended to produce.

If we're squashing 1080p down to 540p, we may as well just crop. We're losing vertical resolution. Horizontal resolution in either case stays at 1920 pixels (lines), but since more resolved detail is packed into a smaller space by the anamorphic, when we stretch out the 1920 pixels, they blend neatly into one another and it doesn't appear to look blocky - in fact some extra detail is magnified.

So it really does look like a true 3840x1080p frame, especially on highly resolving cameras like the Panasonic GH2. Projected large on a 4K projector and it looks much better than 1920x540.

## Making 2x wide anamorphic footage less extreme

With the 3840x1080 aspect ratio described above you are then free to crop horizontal resolution down to produce a less wide aspect ratio.

The image is 16:9 on DSLRs (1920x1080) therefore multiplying 1920 x 1.33 will produce a traditional 2.39:1 cinemascope aspect ratio. You can mimic the look of 1.33x or 1.5x anamorphic lenses with a 2x anamorphic lens using this workflow. Here are the resolutions produced by the stretch or squeeze approach.

## Stretch and squeeze resolutions for 16:9 HD video



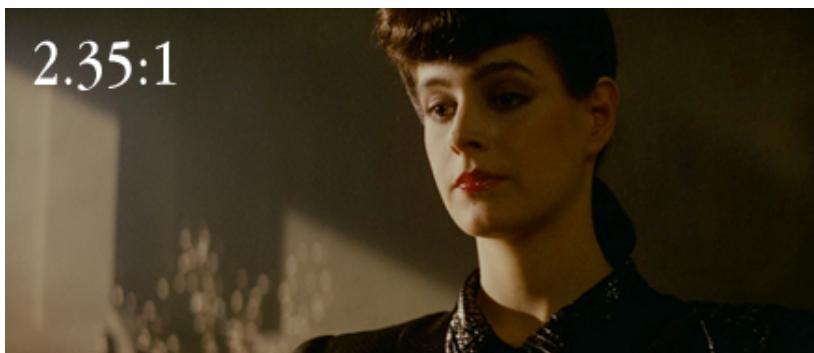
### Anamorphic 2x on 16:9

Ratio: 3.55:1  
Stretch: 3840x1080  
Squeeze: 1920x540



### Anamorphic 1.5x on 16:9

Ratio: 2.66:1  
Stretch: 2880x1080  
Squeeze: 1920x720



### Anamorphic 1.33x on 16:9

Ratio: 1.33x  
Stretch: 2554x1080  
Squeeze: 1920x820

The stretch resolutions wider than 2.39:1 can be cropped at the sides to produce 2.39:1.

For 1.5x and 1.33x anamorphic lenses you can also use the 2880x1080 and 2554x1080 stretch approaches (without a horizontal crop required) to avoid loss of vertical resolution.

## Stretch or squeeze?

When to stretch or squeeze? A stretch will make horizontal resolution much larger and keep the 1080 lines of HD video resolution, but it can make for large video files at non-standard resolutions.

When uploading to the web it is best to **squeeze** instead. So a 2x anamorphic would produce 3.55:1 footage at 1920x540.

When projecting a large image or watching on a TV it is best to use the higher quality **stretch**. So a 2x anamorphic would produce 3840x1080 footage, which could then be cropped to 2.66:1 or 2.39:1, or kept at the widest 3.55:1 aspect ratio.

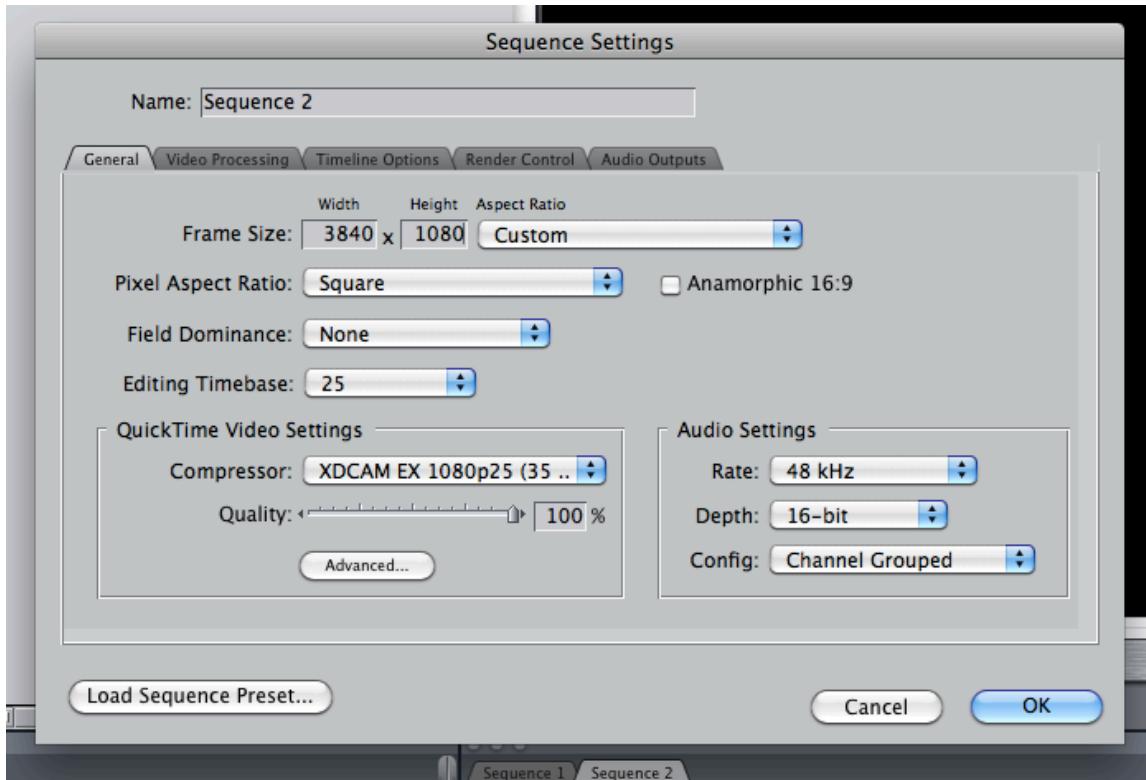
With a squeeze, although you lose resolution you gain sharpness - since the squeeze downscales the image vertically - any softness in the lens is improved. This technique is recommended when footage has been shot at fast apertures and is not optimally sharp.

**This figure represents the typical squeezed resolutions (and the Final Cut Pro aspect ratio which produces them) from each type of anamorphic lens, relative to normal 16:9**

1920x1080	-0	NON ANAMORPHIC 16:9			
1920x820	-35	E.G. LA7200	1.33X ANAMORPHIC 2.39:1		
1920x720	-50	E.G. ISCORAMA	1.5X ANAMORPHIC 2.66:1		
1920x540	-100	2.0X ANAMORPHIC 3.55:1			
E.G LOMO, KOWA, CENTAVISION					
					

## Applying a stretch or squeeze in Final Cut Pro 7

### To apply a stretch



### Step 1 - sequence settings

- I. Right click on the sequence in the project's file viewer window
- II. Select aspect ratio as custom
- III. Enter the desired resolution
- IV. Ignore the anamorphic 16:9 checkbox and select Square Pixels

### Step 2 - timeline clip settings

▼ Distort	
Upper Left	-1920 , -540
Upper Right	1920 , -540
Lower Right	1920 , 540
Lower Left	-1920 , 540
Aspect Ratio	0

You put half the horizontal resolution in the boxes where 1920 is on the screen shot opposite (3840x1080 timeline used for example). Leave the rest at -540 and 540. The purpose of this is to extend the edges of the video clip to the edges of the sequence frame.

You can then cut and paste the clip parameters to every other clip on the timeline, or as you add new clips to the timeline.

## To apply a squeeze

Use the Aspect Ratio option under the Motion tab for a clip on the timeline, and enter the following value depending on the anamorphic lens used:

**-35**

All 1.33x anamorphic lenses, like the Panasonic LA7200, Optex and Century Optics.

**-50**

All 1.5x anamorphic lenses, like the Iscorama 36, 54 and 2004 MC

**-100**

All 2x anamorphic lenses, like the Kowa Prominar, LOMO square-front & round-fronts

## Part 4: Diopters



### What is a diopter and why is it important for anamorphic shooting?

A diopter is a glass filter which brings the focus point of a lens closer. A diopter has a magnifying power, like +0.5, +1 or +2. A diopter can be stacked - one on top of another - to increase the overall power.

Anamorphic lenses do not focus closely, and some are even designed to throw images at a wall (projector anamorphic). Usually anamorphic minimum focus distances range between 1m (3ft) and 2m. A diopter can improve minimum focus distance and they sharp up the image by removing other aberrations.

## Diopter buyers' guide



### Tokina +0.5

This is a 72mm round threaded filter which can attach to a clamp thread, the clamp then screws onto the front of the anamorphic lens. It is a double-element design for higher optical quality than the cheaper macro filters / close up filters from China.

Price between \$70 and \$150

Related eBay searches: Tokina diopter, Tokina close-up 0.5, Anamorphic filter clamp

### Cokin P101 +1 (P Series)

This is a 82mm filter - again round but encased in a square holder for use in matte boxes. This is more affordable than the Tokina, and I have not yet tested it though others say it is good.

Price between \$20 and \$60

Related eBay searches: Cokin p close-up, Cokin +1 diopter, Cokin p101

### LOMO Foton-A +1

(Pictured on previous page). This is an extremely high quality cinema diopter for use with the LOMO Foton-A anamorphic zoom lens. It is very rare but is one of the largest +1 diopters available. This diopter is easily the best option for any lens which has a large square front like the Panasonic LA7200 and LOMO 35mm OCT18 / OCT19 anamorphics. It is quite heavy and comes in a metal frame. Mounting it requires a DIY solution and I recommend the smaller Tokina lenses for Isco, Sankor and Kowa anamorphic lenses.

Related eBay searches:

*LOMO foton diopter*

### When not to use a diopter

You do not need to use a diopter when close focussing isn't required. A diopter disables infinity focus, or longer focus distances. If you shoot at a slower aperture like F5.6, a diopter will have little effect on sharpness. A diopter is only useful for when a close-up is required, and when the shot (a close up or the maximum focal distance allowed by the power of the diopter) can benefit from increased sharpness.

## Part 5: Choosing a prime lens



### Choosing a prime lens

Anamorphic lenses can get on with some lenses better than others. I've found that it's often the cheaper, basic lenses that work best with anamorphic lenses. Though I am not sure of the technical reasons for this though it may be that a less fussy optical design works best. I've tested my anamorphic lenses on over 20 prime lenses - ranging in price from Canon FD lenses to Contax Zeiss.

Canon FDs seem to work best - however if you have a Canon DSLR I recommend M42 mount lenses like the Asahi Pentax 50mm F1.8 or Russian Helios 44 58mm F2, since FDs are not suited to Canon DSLRs only the mirrorless cameras, like the Panasonic GH1 and GH2.

It's best to choose lenses without sophisticated multi-coating which can damped down the attractive anamorphic lens flare, so often older lenses and Russian optics work best.

Choosing a prime lens heavily depends on your anamorphic lens and camera body but I can recommend some specific affordable lenses which will be suitable in almost all situations:

### If you have a Micro Four Thirds camera or APS-C mirrorless (Panasonic GH2, AF100, Sony NEX)

- The Canon FD 50mm F1.4 goes well with anamorphic lenses.
- The Canon FD 35mm F2 SSC goes well (especially with the LOMO 35mm anamorphic if it is separated from its original prime lens).
- The Zeiss Jena M42 35mm F2.4 works well although will vignette with some lenses like the Sankor - see next section on choosing a prime lens focal length.
- The Proskar anamorphic lens works particularly well with the Canon FD 50mm Macro F3.5

### If you have an APS-C camera (Canon DSLR like 7D, 600D or a Sony NEX / FS100)

- The Pentax Asahi M42 mount 50mm F1.8 (Super Takumar or Auto Takumar) works well.
- Russian lenses like the Helios 44 and 77, go well and help to produce better flare due to their simplistic single layer coating.
- On mirrorless APS-C / Super35 cameras like the Sony NEX 5N and FS100 you can use Canon FD lenses

### If you have a full frame DSLR (5D Mark II, Nikon D5S)

- You can use the same lenses recommended for APS-C Canon DSLRs above, but I'd recommend 85mm and longer focal lengths.
- The Canon EF 85mm F1.8 is a good option.
- The Pentax M42 135mm F2.8 may be needed for the Sankor lens

## Choosing a prime lens focal length

Different camera lenses suit different anamorphic lenses, so it is not always purely the focal length which determines whether an anamorphic lens covers the field of view or whether the anamorphic lens barrel shows in the image. For example I recommend avoiding complex zoom lenses, these tend to encourage vignetting on anamorphic lenses at the same focal length where a prime lens would have none.

You must also avoid any lens where the front rotates to focus or zoom. Anamorphic lenses must remain the correct orientation, if they rotate the image becomes skewed and you will get some dramatic effects!

I don't recommend focal lengths beyond 135mm, since anamorphic lenses become blurred easily beyond that especially at faster apertures than F4. For example without a diopter the LA7200 becomes blurred on the 5D Mark II beyond just 50mm. Some lenses cope better than others with long focal lengths and shallow depth of field, like the Kowa, Sankor and Iscorama lenses.



Some lenses are designed to be optimal around just one focal length like the LOMO 35mm anamorphic lens. Although you can remove it from the original prime and use it fine on any lens with a 35mm focal length, if you try it on a 50mm lens for example, it will not focus correctly.



Too wide a focal length, depending also on the size of your camera sensor will result in vignetting, where black borders appear and you can see the back of the anamorphic lens barrel on the image.

The following section will explain what focal lengths to use depending on your camera and anamorphic lens, to avoid vignetting. These are the maximum wide-angles you can achieve with each recommended anamorphic lens on specific DSLRs.

## Maximum wide angle and coverage (anamorphic lens vignetting)

Vignetting is when a lens does not cover the sensor of a DSLR, resulting in black or darkened corners of the image. In extreme cases the image can be reduced to a round circle on a black rectangle, since the edge of the lens is in the image.

Here I rate each recommended anamorphic lens in terms of coverage - that is, how wide an image they can produce on DSLRs without vignetting.

Since DSLRs have different sizes of sensor this also influences coverage, so I have grouped the results into sensor size as well as the anamorphic.

### Key

FF = Full Frame sensor (*5D Mark II, Nikon FX, etc.*)

APS = APS-C sensor (*7D, 550D, 60D, 600D, Sony NEX etc.*)

M43 = Micro Four Thirds sensor (*GH1, GH2, AF100, Olympus PEN, etc.*)

### Panasonic LA7200

Coverage rating 10/10

FF - 35mm

APS - 24mm

M43 - 16mm

### Iscorama

Coverage rating 8/10

FF - 50mm

APS - 35mm

M43 - 25mm

### LOMO 35mm

8/10

FF - 50

APS - 35

M43 - 35 \*

### Kowa

Coverage rating 7/10

FF - 75mm

APS - 45mm

M43 - 35mm

### LOMO 50mm / 75mm

Coverage rating 7/10

FF - 75mm

APS - 50mm

M43 - 40mm

### Isco CentaVision

Coverage rating 6/10

FF - 85mm

APS - 58mm

M43 - 45mm

### Sankor 16C / Singer

Coverage rating 5/10

FF - 135mm

APS - 85mm

M43 - 50mm

\**Possibly ok with 28mm lens but designed to be optimal at 35mm*

## Maximum effective fields of view

In this section I have taken into account the effect on field of view that the wideness increase of the anamorphic lens gives the image, and calculated how wide a field of view you will get on each camera, when used at the widest possible focal length before the anamorphic lens begins to vignette.

The FF equivalent focal length takes into account the crop factor of the sensor and how that effects the field of view.

### Full Frame

1. LOMO - 25mm
2. LA7200 - 26mm
3. ISCORAMA - 33mm
4. KOWA - 37.5mm
5. CentaVision - 42.5mm
6. Sankor - 67.5mm

### Canon APS-C

1. LA7200 - 18mm (28mm FF equivalent)
2. ISCORAMA - 23mm (35mm FF equivalent)
3. LOMO - 22.5mm (35mm FF equivalent)
4. KOWA - 22.5mm (35mm FF equivalent)
5. CentaVision - 29mm (45mm FF equivalent)
6. Sankor - 42.5mm (68mm FF equivalent)

### Micro Four Thirds

1. LA7200 - 12mm (24mm FF equivalent)
2. ISCORAMA - 16.5mm (33mm FF equivalent)
3. LOMO - 17.5mm (35mm FF equivalent)
4. KOWA - 17.5mm (35mm FF equivalent)
5. CentaVision - 22.5mm (45mm FF equivalent)
6. Sankor - 25mm (50mm FF equivalent)

The LA7200 is capable of the widest angles, but it is not a 2x lens - only 1.33x.

At it's maximum wide angle before vignetting, 16mm on Micro Four Thirds, this will give you an effective field of view of 12mm.

The LOMO, Iscorama and Kowa can be used at 35mm on Micro Four Thirds and APS-C.

Since these are 2x wide anamorphics, 35mm becomes 17.5mm - not as wide as the LA7200. For the Sankor / Singer anamorphic, a 45mm or 50mm lens is recommended for Micro Four Thirds whilst 75mm or 85mm is recommended for APS-C. On the 5D Mark II I recommend a 135mm lens for the Sankor / Singer.



# Part 6: The GH2 Hack and Anamorphic



The Panasonic GH2 firmware hack by Vitaliy Kiselev has not just enabled better image quality in video mode on that camera, but allows shooting in a 4:3 aspect ratio.

This has the advantage of making the anamorphic image from 2x lenses less wide. Instead of 3.55:1 you will get 2.66:1, closer to that of an Iscorama 1.5x lens in 16:9 AVCHD mode.

The only drawback at present is that rather than use the AVCHD 24p mode, 4:3 only works in MJPEG which has a frame rate of 30p not the more cinematic 24p.

The hack is set to 1920x720 for 2.66:1 when used with a 2x anamorphic.

## The advantages

- The GH2 applies the aspect ratio squeeze in-camera so can edit the footage direct off the card without alteration
- It enables you to get 2.66:1 from a 2x anamorphic without cropping the sides in post or losing horizontal resolution

## Using the GH2 hack - PTools

PTools is the software developed by Russian hacker Vitaliy Kiselev that reconfigures the GH2's factory firmware. The firmware controls all key functionality on the camera.

[Download PTools](#) and follow the instructions on this page.

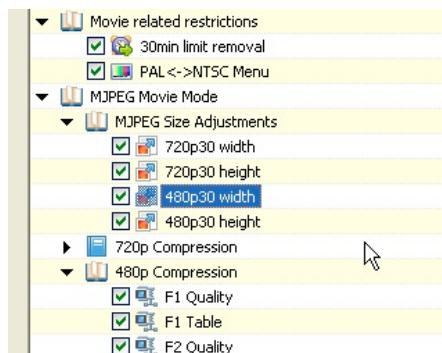
PTools is a Windows application. Mac users need a virtual Windows environment to run it. The best options are [Winebottler](#) or VMWare.

Lastly you need to download the [GH2's v1.0E firmware file from here](#)

## Applying the EOSHD anamorphic hack

[Download the EOSHD 2.66:1 2x anamorphic .INI settings file here](#)

*Note: this file also gives you AVCHD 42Mbit. You can select or change other patches as necessary after loading the settings file*



1. Download the EOSHD .INI above. Put this file in the same place as PTools
2. Open PTools and left click the E settings preset (round buttons at the bottom)
3. 480p30 width should now be 1920 and height 720. The 480p higher bitrate settings are loaded automatically as well (100Mbit VBR).
4. Click any other patch you wish to have like the PAL / NTSC menu and set the version increment as you see fit. I have it at 10. You don't need to change it every time you apply a new firmware patch.
5. Save as GH2\_V11.bin and copy to card, turn on camera and press play to update

***Remember - with this hack you do not need to adjust the aspect ratio of your footage in Final Cut Pro or Adobe Premiere.***



# Part 7: Anamorphic rigs and accessories

For handheld work on a DSLR, a rig improves image quality by reducing the jittery hand shake common to footage shot on small and light cameras. They also allow the mounting of useful accessories such as viewfinders, microphones and monitors.

Here are EOSHD's current anamorphic rigs for professional handheld camera work.

## The Super 8



This is a light weight handheld rig with a pistol grip and electronic viewfinder. The pistol grip featured is the ST GH2 Pistol Grip which features a remote trigger button on the grip itself so you can start and stop recording one-handed.

The Zacuto EVF is attached to the hotshoe of the camera. Any DSLR can be used, the GH2 is pictured. The Zacuto EVF adjusts the image on the fly so you can monitor recording in the correct aspect ratio. To enable this you select the Anamorphic option in the menu and either 1.33x, 1.5x or 2x lens stretch depending on the anamorphic used. Pictured is the Panasonic LA7200 1.33x with Lumix 14mm F2.5 pancake.

## The ENG



This is a shoulder mounted rig for more stability. It is suitable for cinematic and ENG (documentary, news) style shooting. The weight on the shoulder gives the camera more stability, as do the twin handlebars at the front. The rig is made up of the following accessories:

- [Half Inch Rails](#) handlebar kit for 15mm rods ([click here to buy online](#))
- A set of Letus 15mm rails and a shoulder mount ([from the Talon DSLR rig](#))
- Zacuto EVF Flip or Small HD DP6 ([click here to see EOSHD's review](#))
- ReWo GH2 cage with 15mm rod support block ([click here to see EOSHD's review](#))

The lens shown in the rig is a Panasonic LA7200 and Lumix 14mm F2.5 pancake on the GH2. You can of course use any DSLR and lens with this rig. I chose the LA7200 and Lumix lens since you can have continuous autofocus for run & gun camera work and it does not need a follow focus like manual focus lenses do.

## Anamorphic monitoring



I can recommend two solutions currently. Both allow you to focus more easily with manual focus anamorphic lenses and they give you a distortion free 2.39:1, 2.66:1 or 3.55:1 image from the anamorphic whilst recording and in playback mode.

### Zacuto EVF

The Zacuto EVF is capable of taking an HDMI feed from the camera, and with anamorphic options built into the menu it can resize the image live to the correct aspect ratio, such as 2.66:1. [For EOSHD's review of the Zacuto EVF click here](#)

This is a very small and light monitoring solution, and yet the viewfinder part can be removed and it can be used as a small monitor.

### SmallHD DP6

This is a larger 5.6" monitor. You can choose custom aspect ratios in the menus which makes it suitable for use with anamorphic lenses.

[For EOSHD's article on anamorphic monitoring on the SmallHD DP6 click here](#)  
[For EOSHD's overall impressions of the SmallHD DP6 click here](#)

**Tip:** Some older DSLRs like the GH1 do not output a live HDMI feed whilst recording, so cannot be used with an HDMI EVF or monitoring solution.

## Accessories for the anamorphic look and faking it!



*Above: DoP Robert McLachlan ASC / CSC with The Filter Gallery Blue Streak filter*

To mimic the anamorphic cinema look without an anamorphic lens, accessories are available.

### Blue Streak Filters

These filters mimic the look of anamorphic lens flare. They're not common on eBay but I can recommend two that can be ordered via the Internet. These are available direct from their respective designers based in the US.

#### The Filter Gallery Blue Streak Filter (as pictured above)

These are professional grade filters which were used on the set of the US network TV show Human Target by cinematographer Robert McLachlan ([read the EOSHD interview here](#)).

They're not available to buy online but you can enquire and order via email directly with Stan here - [stanwallace@filtergallery.com](mailto:stanwallace@filtergallery.com)

#### Optefex Streak and Star filters

Like Stan's filter these are professional square filters designed for matte boxes. You will need the appropriately sized matte box attachment for your DSLR rig and anamorphic lens to use them.

[The Optefex filter is \\$280 and can be ordered online here.](#)

## DIY Anamorphic Streak Filter

There's also an ingenious technique available to create a DIY streak filter, made with a plastic CD case cover and a stanley knife. The resulting flares are surprisingly attractive!

[Follow the 3 minute instructional video on Vimeo here and view the flare in action](#)

## Mimic the look of an anamorphic lens - Vid-Atlantic CineMorph filter



The CineMorph filter is an affordable screw-on filter that mimics both the flare and oval bokeh of anamorphic lenses. As with the blue streak filters you will need to crop your 1080p source footage to the desired anamorphic aspect ratio in post to complete the look.

Although the CineMorph cannot replace a true anamorphic, it can be used to good effect if you are creative with it. It is fantastic for the price.

The CineMorph even has some advantages over anamorphic lenses. It is compatible with almost any lens (apart from extreme wide angle) and does not effect the minimum focus distance or focussing mechanism of the lens. There are of course drawbacks as well which can be expected for the price and the nature of it not being a true anamorphic! Bokeh has a thin line through it and flare can be very thin except with bright light sources, you lose a few stops of low light performance with the narrower oval aperture it provides on the front of your lens and of course it does not make the aspect ratio or field of view wider whilst maintaining the same aperture. The alignment of the filter can also easily be knocked out of position but can easily be re-aligned.

[You can order the CineMorph filter here](#)

For an in-depth 10 minute look at the CineMorph filter watch this on Vimeo  
<http://www.vimeo.com/27036210>

# Appendix

## A. Example Footage

**For a Minute There I Lost Myself (LA7200 in Hong Kong)**

<http://www.vimeo.com/11349060>

**One Last Ride - Voigtlander Nokton 25mm F0.95 with LA7200**

<http://www.vimeo.com/22806106>

**核 (Panasonic LA7200 on Zeiss Jena 35mm F2.4)**

<http://www.vimeo.com/21191918>

**GH2 hack 4:3 MJPEG for true LOMO anamorphic 2.66:1**

<http://www.vimeo.com/26115801>

**The effect of a diopter - LA7200 and LOMO Foton-A Diopter**

<http://www.vimeo.com/20219795>

**Radio Ether (Proskar Anamorphic)**

<http://www.vimeo.com/17349932>

**LOMO vs ISCO vs PROSKAR vs LA7200 sharpness shootout**

<http://www.vimeo.com/16538991>

**LOMO OCT18 cinema anamorphic flare test**

<http://www.vimeo.com/16106480>

**Bridge (Optex 1.33x anamorphic on Olympus 9-18mm)**

<http://www.vimeo.com/15543342>

**Frontline Sanctuary (Isco Centavision)**

<http://www.vimeo.com/13004933>

**Alleyway 2.39:1 (LA7200 in Taiwan)**

<http://www.vimeo.com/10039537>

## B. Further reading at EOSHD.com

### 2.66:1 for 2x anamorphic on GH2

<http://www.eoshd.com/content/3515/2-661-for-2x-anamorphic-on-gh2-rebooted>

### Panasonic LA7200 2.39:1 Anamorphic - Summary & Tips

<http://www.eoshd.com/entries/63-Panasonic-LA7200-2.35-1-Anamorphic-Summary-Tips>

### Anamorphic Widescreen - Panasonic GH1 with LA7200 Lens - Part 2

<http://www.eoshd.com/entries/47-Anamorphic-Widescreen-Panasonic-GH1-with-LA7200-Lens-Part-2>

### Anamorphic Widescreen - Panasonic GH1 with LA7200 Lens - Part 1

<http://www.eoshd.com/entries/37-Anamorphic-Widescreen-Panasonic-GH1-with-LA7200-Lens-Part-1>

### Isco Centavision Part 3 - Frontline Sanctuary

<http://www.eoshd.com/content/271-Isco-Centavision-Part-3-Frontline-Sanctuary>

### High quality 2:35, Iscorama the only option? Think again...

<http://www.eoshd.com/entries/25-High-quality-2-35-Iscorama-the-only-option-Think-again>

### Proskar - the forgotten anamorphic

<http://www.eoshd.com/content/461-Proskar-the-forgotten-anamorphic>

### Enabling shallow DOF and low light on Panasonic LA7200 anamorphic with LOMO Foton

<http://www.eoshd.com/content/555-Enabling-shallow-DOF-and-low-light-on-Panasonic-LA7200-anamorphic-LOMO-Foton-A-diopter>

### Century Optics anamorphic viewfinder hood for DSLRs

<http://www.eoshd.com/content/434-Century-Optics-anamorphic-viewfinder-hood-for-DSLRs>

### 4 way anamorphic shootout - sharpness

<http://www.eoshd.com/content/426-4-way-anamorphic-shootout-sharpness>

### The anamorphic miracle filter

<http://www.eoshd.com/content/396-The-anamorphic-miracle-filter>

### Apocalypse Now gets anamorphic 2.39:1 Blu Ray release

<http://www.eoshd.com/content/387/apocalypse-now-gets-anamorphic-2-35-1-blu-ray-release>



**London based cinematographer on anamorphic lenses**

<http://www.eoshd.com/content/382-London-based-cinematographer-on-anamorphic-lenses-iscorama-optex>

**Shooting anamorphic 2.39:1 productions on the 5D Mark II, an interview with Holscope Productions**

<http://www.eoshd.com/content/376-Shooting-anamorphic-productions-on-the-5D-Mark-II-an-interview-with-Holscope-Productions>

**Optex 2.39:1 anamorphic shooting with the GH1 in Germany**

<http://www.eoshd.com/content/368-Optex-anamorphic-shooting-with-the-GH1-in-Germany>

**Lomo cinema anamorphic primes (Konvas OCT18) - Part 1**

<http://www.eoshd.com/content/399-Lomo-35mm-F2.5-Authentic-Cinema-Anamorphic-Primes-Part-1>

**Anamorphic monitoring on the SmallHD DP6**

<http://www.eoshd.com/content/551-Anamorphic-monitoring-on-the-SmallHD-DP6>

**Anamorphic flare shootout - KOWA - LA7200 - ISCO**

<http://www.eoshd.com/content/538-Anamorphic-flare-shootout-KOWA-LA7200-ISCO>

