

# Hyperfocal Distance

This tutorial will explain what hyperfocal distance is, how to calculate it and how to use it to set focus. It is a little more advanced than the other tutorials so far but you didn't think I was going to completely let you off without any of the more technical stuff now did you?

For the vast majority of my urban landscape shots, I simply use the focusing technique I described in the previous tutorial i.e. I focus on a point about  $1/3$  up from the bottom of the frame.

This works perfectly well in the majority of situations when you want the whole scene to be sharp. There are times however when using the hyperfocal distance to work out where I should focus can be very useful.

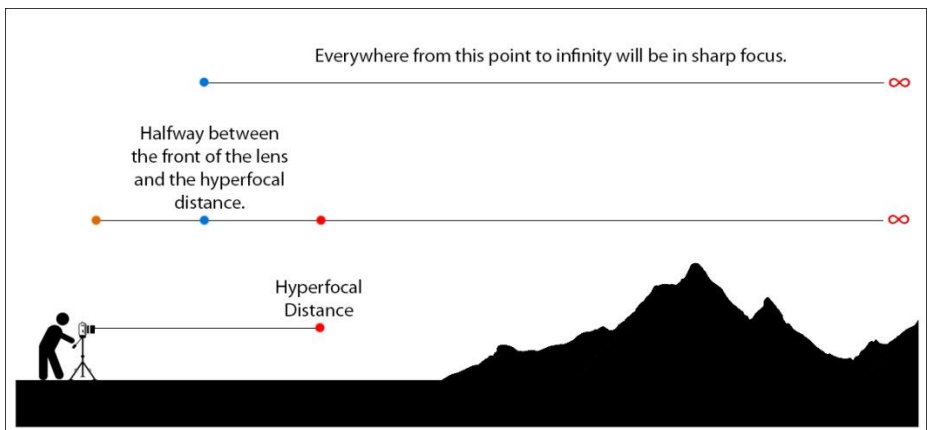
The hyper what now? If you are looking for a tutorial full of complex mathematical formulae and discussions of the importance of the

“circle of confusion”, you won’t find it here! My aim is to create a very simple guide to using hyper focal distance that won’t give you a headache.

## What exactly is the hyperfocal distance?

In short, the hyper focal distance is a **point a certain distance away from your camera**. If you focus on this point, **everything halfway between the camera and this point and everything after this point all the way to infinity will be in acceptably sharp**.

Shutterstock



In the example above, the hyperfocal distance is where the red dot is. This means that everything from halfway between the camera lens (blue dot)

and the hyperfocal distance all the way to infinity will be in focus.

The hyperfocal distance depends on the camera model, the focal length, the aperture used and whether or not there is a full moon. In a moment, we'll look at how to calculate the hyperfocal distance using this information.

### **So why use hyperfocal distance to focus in the first place?**

Put simply, this is the most accurate way of ensuring that you get the maximum sharpness and depth of field possible for the aperture you are using when photographing landscape scenes.



Landscape Photography at Glendalough in Ireland

## How do you calculate the hyperfocal distance?

Calculating the hyperfocal distance is actually easier than you would expect. You simply multiply the focal length (in millimetres) by itself and then divide the result by the circle of confusion multiplied by the f-stop value!!! Easy eh?

While what I have just said is technically true, the good news is that you don't need a degree in mathematics to work out the hyperfocal distance. There are plenty of smartphone apps out there that do all the calculations for you. All you need to know is:

- Your camera make and model.
- The focal length you are using for the shot.
- The aperture you are using for the shot.
- Your mother in law's maiden name and blood type.



# HyperFocal Pro

Zendroid

Unrated

UNINSTALL

OPEN



Downloads



3,882 



Photography



Similar

The pro choice for DOF & focus calculation

My favourite app for calculating hyper focal distance is **HyperFocal Pro**. This can be downloaded for free from the Play Store or App Store. There are others out there but I find HyperFocal Pro to be very easy to use and it's completely free. So, how do we use the app?

I'm going to use a photo I took of the Charles Bridge in the beautiful city of Prague to

demonstrate how to calculate the hyperfocal distance using HyperFocal Pro.

After you have chosen your aperture and composed your photo, just follow the following steps.

1. Find your make and model in the drop down list by tapping on the 'camera' field. In this case, I was using a now prehistoric **Canon 40D**.
2. Enter the focal length in the 'lens' field. In this case I was zoomed to **56 mm**. You can check this value by looking at the markings on your lens.
3. Select your aperture value. In this case, I was using **f14**.
4. Next, tap on 'Subject Distance', and then simply tap the '**use hfd**' button. You don't need to type in a specific value here when calculating the hyperfocal distance. I'll explain what happens if you do type in a specific value later.



Camera

Canon EOS 40D

Lens

56 mm

Aperture

f/14

Set focus subject

use hfd



m



12.42446



Hyperfocal distance: 12.424 m

DOF

near limit  
6.212 m

DOF  
 $\infty$

far limit  
 $\infty$

hfd: 12.424

focus: 12.424



6.212

$\infty$

You will see that the hyperfocal distance has been calculated for you at the bottom. In this case it is about **12.42 metres**.

You can then focus your lens to 12.42 metres. You can either use autofocus to focus on something that is 12.42 metres away or you can manually focus the lens.

This now means that **everything from half of the hyperfocal distance (6.21 metres) from the lens all the way to infinity will be sharp**. As you can see, this is also illustrated in the diagram at the bottom of the app display.





If you look at the photo above, you will see that everything from the base of the bridge in the foreground to Prague Castle in the background is sharp.

## **What happens if you type a specific distance into the 'Subject Distance' field?**

In step 4, I told you to 'tap the 'use hfd' button' in the 'Subject Distance' field. This means the app will calculate the hyperfocal distance allowing you to get as much depth of field as possible.

What if you are not so concerned with the whole image being sharp? For example, you are photographing a deer with mountains in the background. You obviously want the deer to be sharp but maybe you're not so concerned about the mountains. Let's say the deer is 6 metres away from you. In the example above, we type in **6 metres** to the 'Subject Distance' field.

By doing this, the app no longer calculates the hyperfocal distance. Instead, it gives us an idea of

how much depth of field we would have in front of and behind the deer that we focused on.

In this case we focused on the deer, 6 metres away. The app then tells us that **everything from 4.05 metres to 11.55 metres from the camera lens will be in sharp focus**. Anything in front or behind this will not be sharp. In this case, it means that the mountains in the background will not be in sharp focus.

This may not necessarily be a bad thing. In fact, we may want to blur the background to make the trees stand out. You can then change your aperture to get more or less depth of field as required. By now, the deer has probably wandered away so work quickly.



Camera

Canon EOS 40D

Lens

56 mm

Aperture

f/14

Subject distance

6 meters

Hyperfocal distance: 12.424 m

DOF

near limit  
4.052 m

26% ← DOF → 74%  
7.499 m

far limit  
11.551 m

hfd: 12.424

focus: 6



4.052

11.551

In-focus

## How do I focus my lens to the hyperfocal distance indicated by the app?

There are 2 methods for doing this:

1. If the hyperfocal distance is quite close (less than 3 metres away), you can switch your lens to manual focus and turn the focus ring to the distance indicated.
2. If the hyperfocal distance is further away like in our first example (12.42 metres), it is easier to switch to autofocus and focus on something which is that distance away.

How do we find something that is 12.42 metres away? Well, it's a bit tricky. You could measure it out or simply make an estimate. I don't know about you but I don't tend to carry a long measuring tape with me at all times.

If you want a really accurate measurement, you could use a **rangefinder**. I find that most of the time, simply estimating the distance works well.

Note that most cameras have a depth of field preview button which allows you to see exactly how much of the scene is in focus. We mentioned this in more detail in the last tutorial. Check your camera's manual to see how this works on your model.

Many lenses often have additional guides that help set the hyperfocal distance as accurately as possible. Again, check your manual for more information on how to use these guides.

Leica lenses come with a personal butler to help you set the hyperfocal distance and make you tea while you take photos.

### **Why not just set a narrow aperture and focus one third up from the bottom of the frame?**

I mentioned this method in the previous tutorial. This is a good rule of thumb for focusing on a landscape scene and will yield excellent results most of the time. If you were to set a narrow aperture of between f16 and f22 and focus one

third up from the bottom of the frame, you would get a decently sharp shot almost every time.

That said, most lenses are at their absolute sharpest when the aperture is set somewhere between f8 and f11. If you can manage to use an aperture value in this range and still achieve the required depth of field, you obviously have the best chance of creating the sharpest photo possible. Calculating the hyperfocal distance using an aperture in this range will let you know if it's possible to get everything you want in focus to be sharp.

In an earlier tutorial, we learnt that at narrower apertures, images can actually begin to become a little soft. This is called diffraction.

Sometimes, you may not be able to use an aperture in the f8 to f11 range as in the photograph taken in Prague above. I had to use f14 to get enough depth of field. I still got a very sharp image though even at f14. High quality

lenses will still perform very well at narrower apertures.

## **What are the advantages of using hyperfocal distance to focus?**

- It's a very accurate way of ensuring maximum depth of field.
- It gives you a better chance of setting your aperture so that the lens is at its sharpest.
- When using certain neutral density filters, autofocus does not work. The filter is often simply too dark to focus through. Using the hyperfocal distance to focus solves this problem.
- Speaking about 'hyperfocal distances' makes you sound intelligent.

In our final camera settings tutorial, we will look at the various camera drive modes and timers on your DSLR.