

To increase the **depth of field** the f-value of the lens must be set and – to achieve better results – the photographer must be careful to **hyperfocal focusing** as well.

A good contribute by **Gary Nugent** I quote from:

<http://www.picturecorrect.com/tips/hyperfocal-focusing-photography-tips/>

Depth of field in fact "extends 2/3 behind the point focused on and 1/3 in front", but from that 2/3 beyond towards infinity the focus is not sharp.

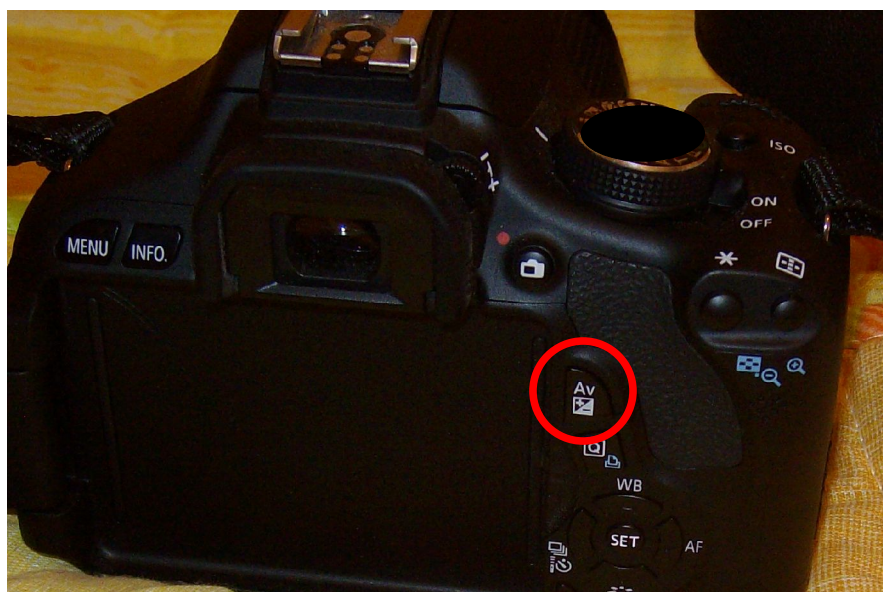
Hyperfocal distance is a distance beyond which all objects can be brought into an "acceptable" focus (*Wikipedia*) and the photographer should calculate this distance from the camera to make the object and all that's beyond be in sharp focus.

The following steps show how I do with my Canon 600d (Rebel T3i).



To set the value of diaphragm aperture let's choose **Av** on the wheel top left...

Or, in manual mode (**M** on the wheel) I push the **Av** button on the right ...



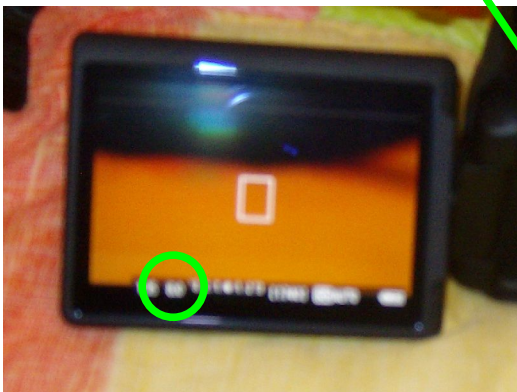
... and turn the wheel on the top:

- right (to increase) or
- left (to decrease)

the f-value (setting of the **depth of field** in photography).



The result will appear on the screen (sorry for the poor performance of my pocketcam with near objects).



A great algorithm to calculate the **depth of field** depending on the settings of your shot is:

<http://www.dofmaster.com/dofmtable.html>

It is possible to select:

- focal length in mm,
- film format, digital camera, or circle of confusion,
- units (feet, inches, meters).

If you have an iPhone or a smartphone an application can be downloaded and installed.

If not (as in my case) it works fine on your computer: I printed four tables corresponding to the four focal lengths marked on the lens and ... went out for great pics.

Let's chose – for example – a **focal length** of **20** in our **Canon EOS 600d (Rebel T3i)** and **meters** as units.

If the object is 1 meter away from the camera, all will be in good focus that comes:

- from 0,94 to 1,07 meters at aperture of diaphragm f/1,4 ,
- from 0,91 to 1,10 meters at aperture of diaphragm f/2 ,
- from 0,88 to 1,15 meters at aperture of diaphragm f/2,8 ,
- from 0,84 to 1,23 meters at aperture of diaphragm f/4 ,
- from 0,79 to 1,36 meters at aperture of diaphragm f/5,6 ,
- from 0,73 to 1,59 meters at aperture of diaphragm f/8 ,
- from 0,66 to 2,11 meters at aperture of diaphragm f/11 ,
- from 0,57 to 3,92 meters at aperture of diaphragm f/16 ,
- from 0,49 meters to infinity at aperture of diaphragm f/22 ,
- from 0,40 meters to infinity at aperture of diaphragm f/32 .

Focal Length:	Film Format, Digital Camera, or Circle of Confusion:	Units:
20 mm	Canon Digital Rebel T4i, T3i, T3, T2i, T1i	meters

Calculate

Canon Digital Rebel T4i, T3i, T3, T2i, T1i											Focal Length: 20 mm									
Distance (meters)	f/1.4		f/2		f/2.8		f/4		f/5.6		f/8		f/11		f/16		f/22		f/32	
	Near	Far	Near	Far	Near	Far	Near	Far	Near	Far	Near	Far	Near	Far	Near	Far	Near	Far	Near	Far
0.25	0.25	0.25	0.24	0.26	0.24	0.26	0.24	0.26	0.24	0.27	0.23	0.27	0.22	0.29	0.21	0.30	0.20	0.33	0.19	0.38
0.5	0.48	0.52	0.48	0.52	0.47	0.53	0.46	0.55	0.44	0.57	0.42	0.61	0.40	0.67	0.37	0.79	0.33	1.03	0.29	1.85
0.75	0.71	0.79	0.70	0.81	0.68	0.83	0.66	0.87	0.63	0.93	0.59	1.04	0.54	1.23	0.48	1.68	0.42	3.48	0.36	∞
1	0.94	1.07	0.91	1.10	0.88	1.15	0.84	1.23	0.79	1.36	0.73	1.59	0.66	2.11	0.57	3.92	0.49	∞	0.40	∞
1.5	1.36	1.67	1.32	1.75	1.25	1.87	1.17	2.09	1.07	2.49	0.96	3.43	0.84	7.33	0.71	∞	0.58	∞	0.46	∞
2	1.77	2.31	1.68	2.46	1.58	2.72	1.45	3.21	1.31	4.27	1.14	8.08	0.97	∞	0.80	∞	0.64	∞	0.50	∞
2.5	2.14	3.00	2.02	3.27	1.88	3.75	1.70	4.73	1.50	7.49	1.29	43.4	1.07	∞	0.87	∞	0.68	∞	0.52	∞
3	2.50	3.75	2.34	4.18	2.14	5.00	1.92	6.92	1.67	15.1	1.41	∞	1.15	∞	0.92	∞	0.71	∞	0.54	∞
3.5	2.84	4.57	2.63	5.23	2.38	6.57	2.11	10.3	1.81	54	1.51	∞	1.22	∞	0.96	∞	0.74	∞	0.56	∞
4	3.16	5.46	2.90	6.43	2.61	8.60	2.28	16.4	1.93	∞	1.59	∞	1.27	∞	0.99	∞	0.76	∞	0.57	∞
4.5	3.46	6.44	3.16	7.83	2.81	11.3	2.43	30.2	2.04	∞	1.67	∞	1.32	∞	1.02	∞	0.77	∞	0.58	∞
5	3.75	7.51	3.39	9.49	3.00	15.1	2.57	93	2.14	∞	1.73	∞	1.36	∞	1.04	∞	0.79	∞	0.58	∞
5.5	4.02	8.70	3.62	11.5	3.17	20.9	2.69	∞	2.22	∞	1.78	∞	1.39	∞	1.06	∞	0.80	∞	0.59	∞
6	4.28	10.0	3.83	13.9	3.33	30.5	2.81	∞	2.30	∞	1.83	∞	1.42	∞	1.08	∞	0.81	∞	0.59	∞
8	5.21	17.2	4.55	33.1	3.86	∞	3.18	∞	2.54	∞	1.98	∞	1.51	∞	1.13	∞	0.84	∞	0.61	∞
10	5.99	30.3	5.13	193	4.27	∞	3.45	∞	2.72	∞	2.09	∞	1.57	∞	1.16	∞	0.85	∞	0.62	∞
15	7.48	∞	6.19	∞	4.98	∞	3.90	∞	2.98	∞	2.24	∞	1.66	∞	1.21	∞	0.88	∞	0.63	∞
20	8.54	∞	6.90	∞	5.43	∞	4.17	∞	3.14	∞	2.33	∞	1.70	∞	1.24	∞	0.89	∞	0.64	∞
30	9.95	∞	7.80	∞	5.97	∞	4.48	∞	3.31	∞	2.42	∞	1.75	∞	1.26	∞	0.90	∞	0.64	∞
50	11.5	∞	8.70	∞	6.48	∞	4.76	∞	3.47	∞	2.50	∞	1.79	∞	1.28	∞	0.91	∞	0.65	∞
∞	14.9	∞	10.5	∞	7.46	∞	5.28	∞	3.74	∞	2.65	∞	1.88	∞	1.34	∞	0.95	∞	0.68	∞
Hyperfocal Distance	14.9		10.5		7.46		5.28		3.74		2.65		1.88		1.34		0.95		0.68	
Circle of confusion: 0.019 mm																				

Please note that the algorithm has already detected the **circle of confusion** of your camera, that we will consider just below.

Now it's time to **hyperfocal focusing**, to calculate the best distance between the main object and the camera to have the whole view in focus towards infinity.

The main problem is that modern lenses (like my **Canon EF-S 18-55 mm**) report very few marks (differently from analogue reflex cameras), so that dynamic tables are the best tools to use (and an advantage too versus the traditional formulas).

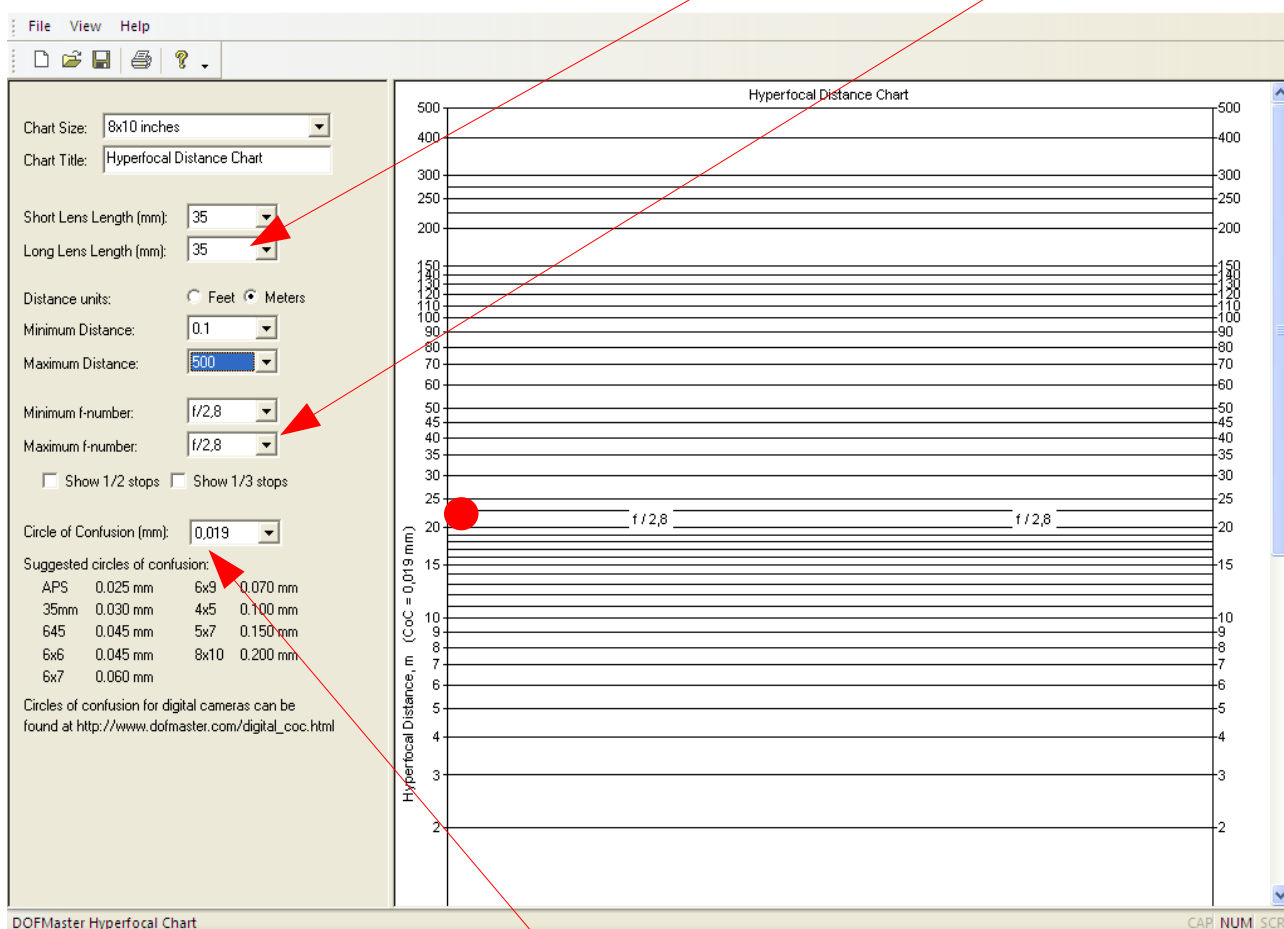
DOFMaster Hyperfocal Chart Version 0.5 for Windows

(download at http://www.dofmaster.com/download_chart.html)

renders the value of the **hyperfocal distance** depending on **focal length value**, the **f-value** and the **circle of confusion** (which is the smaller circle the human eye can distinguish at a given distance, different from camera to camera).

Look for your camera's model in the table at http://www.dofmaster.com/digital_coc.html to find the value of its **circle of confusion** .

In this window I can see that if I chose the **focal length of 35** and the **f-value of 2,8** the **hyperfocal distance** is around **24 meters**.

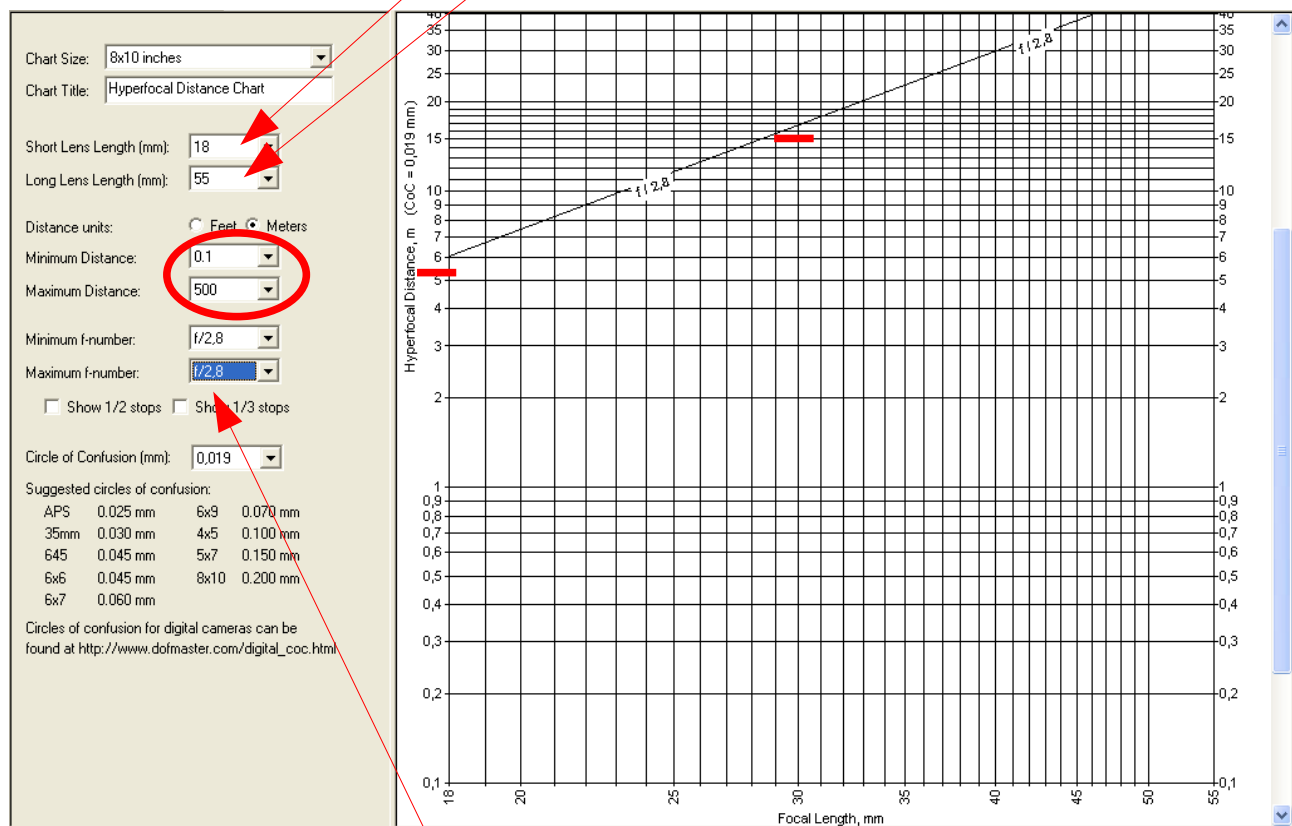


Don't forget to pinpoint – once and forever – the value of the **circle of confusion** of your faithful camera.

You might also decide to know the whole range of the **hyperfocal distances** of your lens at (for example) $f/2,8$ value of diaphragm aperture.

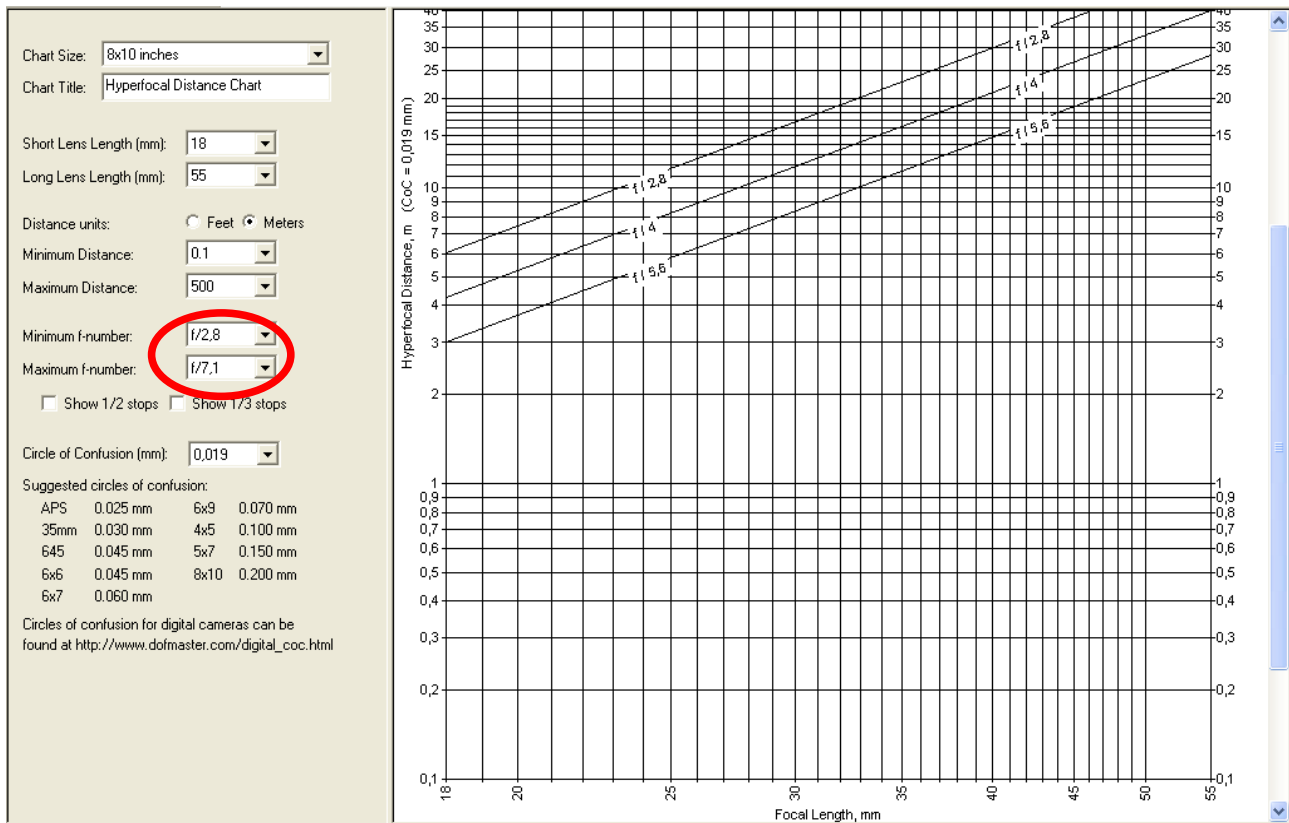
This is the chart, you had set the minimum and maximum hyperfocal distance you would know in a wide range (from **10 centimeters** to **500 meters**, or the equivalent in feet):

The range of **focal length** is from **18** to **55**.



At **focal length 18** (with the **aperture $f/2,8$**) your hyperfocal distance will be **6 meters**, at **focal length 30** it will be **between 17 and 18 meters** and so on.

Let's see what happens if we set the range of the **f-value** from **f/2,8** to **f/7,1** with a range of **focal length** from **18** to **55**.



The chart will provide three different curves, one of each showing the **hyperfocal distances** corresponding to the different values of **focal lengths** (from **18** to **55**) at the values of aperture of diaphragm of:

- f/2,8
- f/4,
- f/5,8 .