

Canon 10D astro/infrared modification

Warning:

Opening the Camera may damage it and will void your warranty!

You do it on your own risk!

The open camera is very sensitive to static electricity, so wear a grounding strip!

Modern digital cameras are often used for astrophotography. As the used chips (CCD or CMOS) are very sensitive in the near infrared, the manufacturers put a infrared blocking filter (so called "hotmirror") in front of the chip.

This hotmirrors also block the Ha light from emission nebulae which is very interesting for astrophotographers. They also block most of the the infrared light if you want to do some IR work at daytime.

So what can you do? - Remove the hotmirror and replace it by a clear window....

Taking "normal" daytime photos with a modified camera is possible, but you have to take care of some issues:

The clear window must have the same thickness as the hotmirror (2.8mm) to get the autofocus work correctly. Most people use a 3mm window from Edmunds Scientific Optics ([Part No. 32741](#)). To compensate the difference in thickness you can use some 0.1mm plastic spacers. Gary Honis describes this on his website ([link below](#)). Because I use my camera only for astro and infrared I did not do this. The images straight out of the camera look rather reddish. To compensate this you can use a custom white balance setting. To get optimum results you should use a color correction filter in front of your lenses (X-Nite CC1 Filter, sold by [Maxmax](#))

I did my modification based on the procedure of Manfred Schwarz. His website can be found at www.astrophoto.at

Other helpful sites with a lot of information are the site of

Gary Honis (<http://ghonis2.ho8.com/rebelmod.html>) and

Terry Lovejoy (<http://www.pbase.com/terrylovejoy/iraamod>)

Both describe how to modify a Canon 300D

Now let's go to the modification...

First some tips:

I cut my clear window as describes on Gary Honis site, but would not do it again. I had trouble getting a decent piece. Next time I would pay a glassworker or optician to do the job...

I printed out the description of Manfred Schwarz and put some double sided tape on the prints to fix the screws exactly at the place they came from....

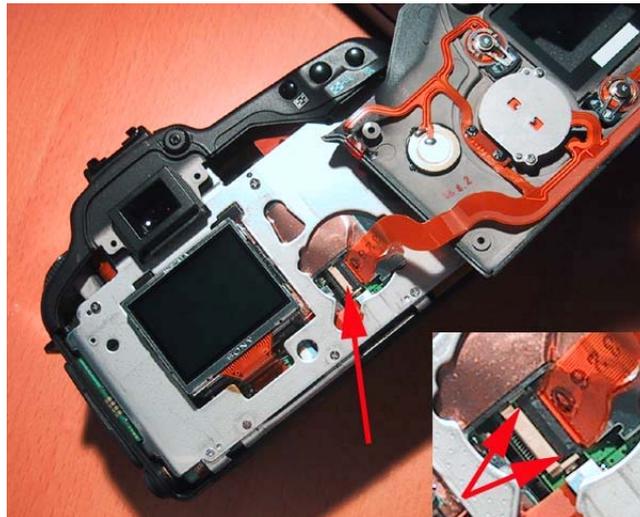
Before you start you should remove the normal battery and the small buffer battery.



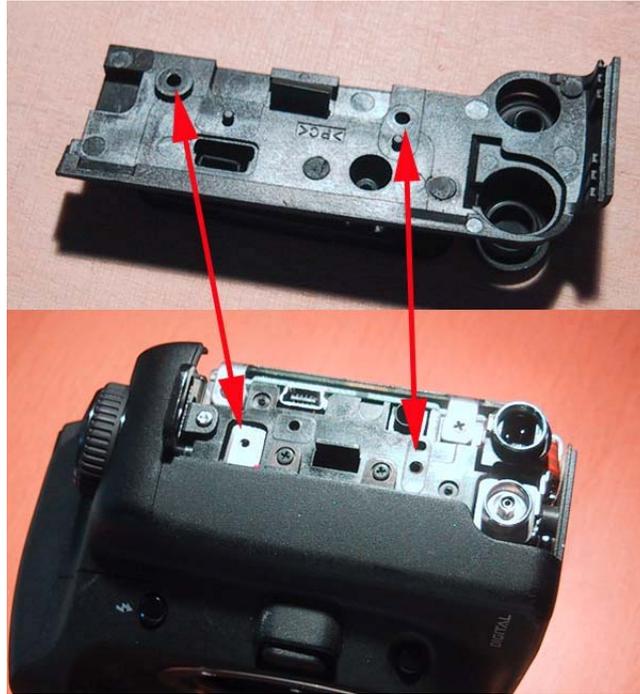
Open the two screws at the bottom of the camera. For all screws I used a #000 size philips screwdriver



Remove the rubber on the back of the camera (blue arrow shows where the rubber was). You can lift it at a corner with a small knife and pull it off. It is just soft glued and can be reattached later without problems. Then remove the four screws on the back



Next step ist to open the back. Be careful, because the flat ribbon cable is still connected. Lift up the black hinge and pull off the cable



Remove the 2 screws and open the left side



Remove the soft glued rubber from the handle



Remove the 5 screws at the frontside



Remove the frontplate



To loosen the top case remove the screw close to the top display



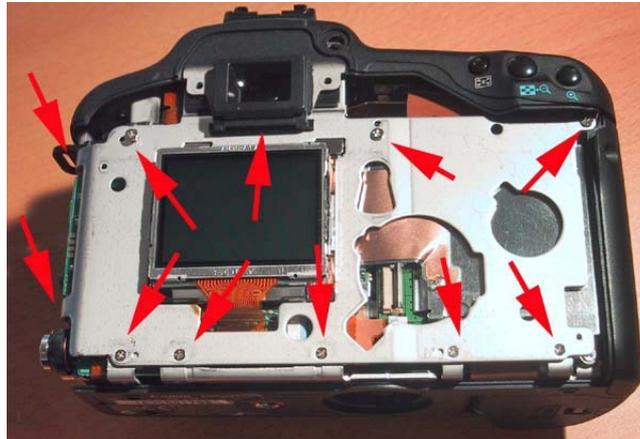
To further loosen the top case remove the screw at the handle



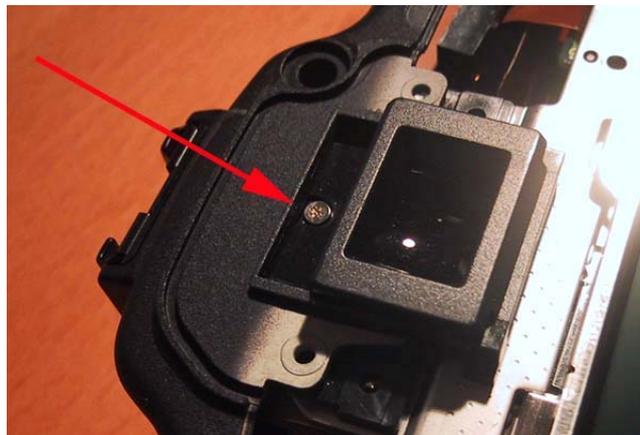
Then remove the screw at the viewfinder (diopter adjustment) and the screw at the left side (see next step)



The screw at the left side



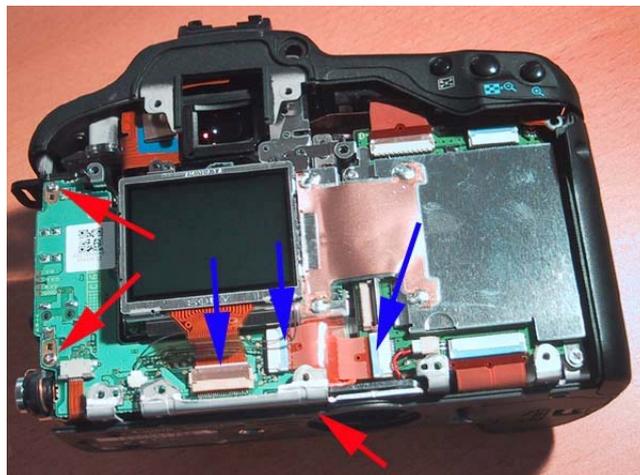
Now you can lift the top case a little bit until you can remove the screw above the viewfinder. Take care not to push any of the buttons on the top, as they can fall inside...



Here you have a closer look at the screw above the viewfinder



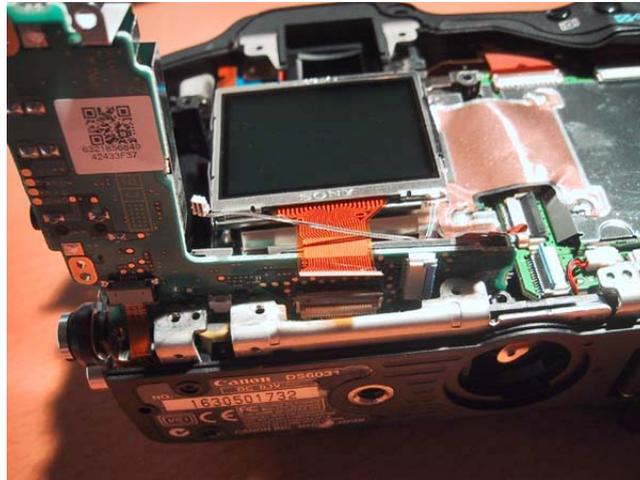
After removing the 11 screws which fix the tinplate you can remove it



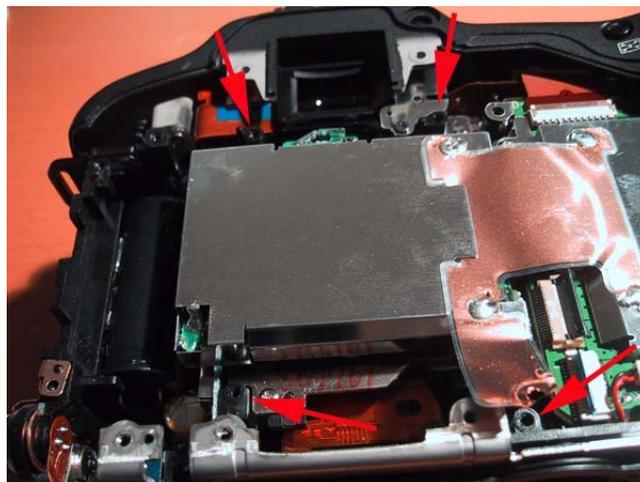
Open the 3 hinged connectors (blue arrows) and disconnect the ribbon cables.
Then remove the screws of the electronic plate (3 red arrows)



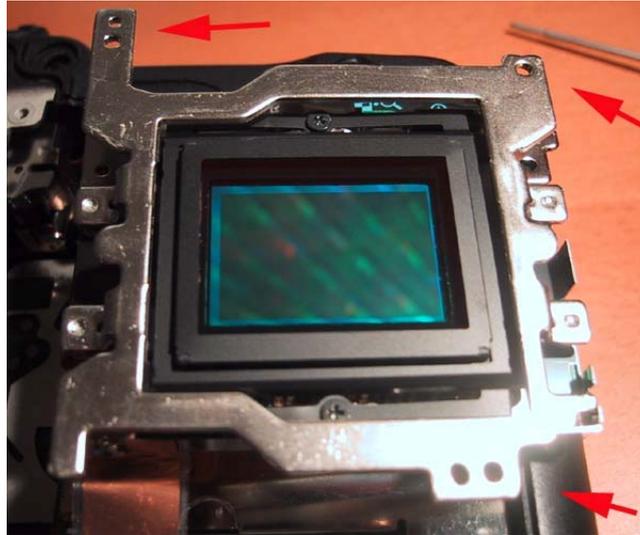
Pull off the little white connector



"Swing out" the electronic plate. It remains connected with a ribbon cable on the left side.

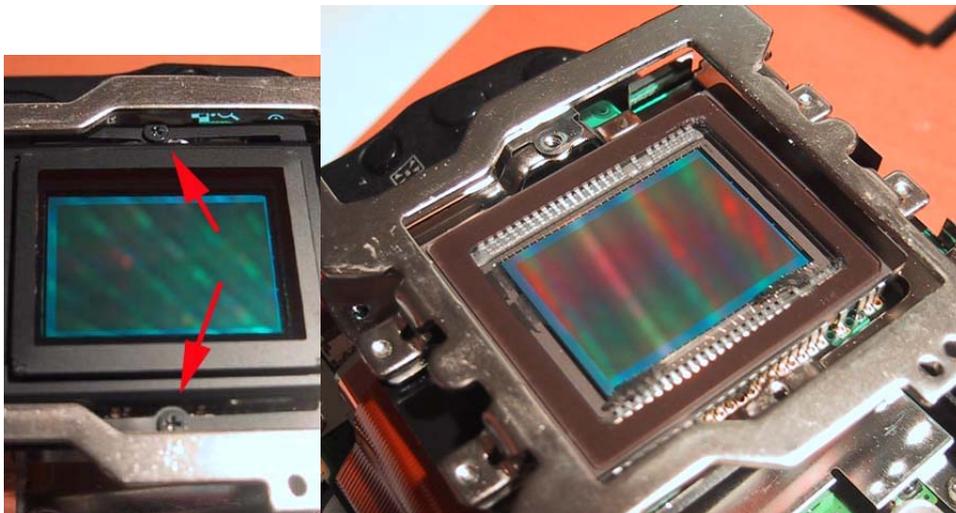


Remove the display (4 screws). On the photo it is already removed.



Remove the CCD "cage" unit. M. Schwarz reports that it is locked with black adhesive. Mine wasn't, see his page for details.

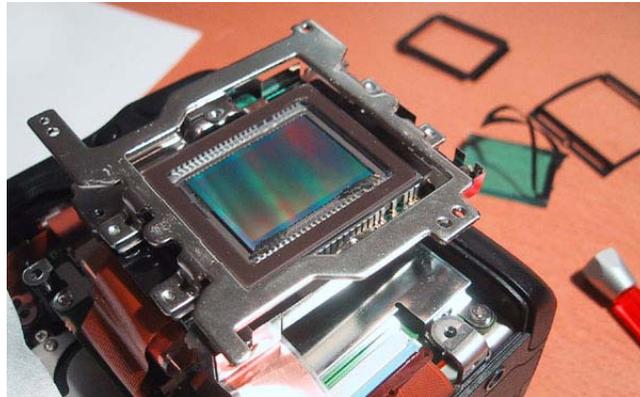
To correct the optical path (for autofocus) you can put some plastic washers under the frame when reassembling the camera (see Gary Honis' website for details)



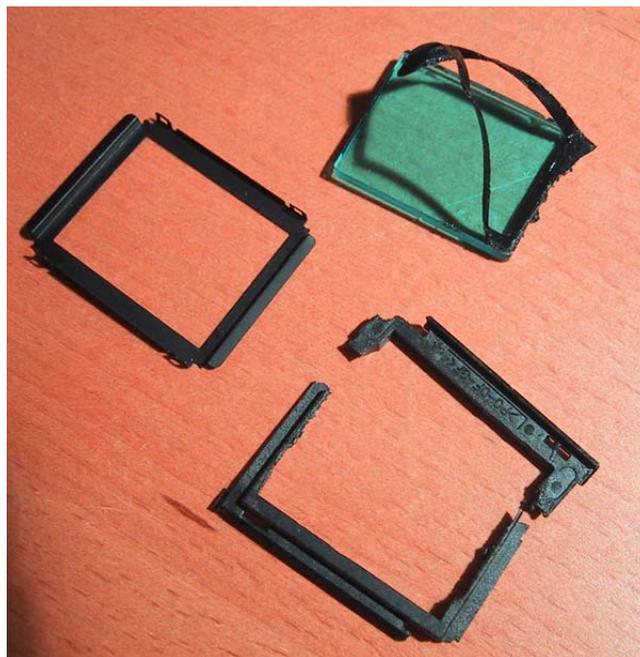
Remove the thin metal frame (2 screws). Remove the second metal frame. It is pressed onto the plastic filter frame (pull the small leashes with a small screwdriver or knife).

Now comes the hardest part, be careful not to damage the coverglass of the chip! Use a small flat screwdriver or knife to loosen the filter. Work slowly around the

chip.until it “pops off”. The plastic frame is likely to break, because otherwise you will not get it outside the cage. Doesn’t matter, I glued it into the metal frame.



Here you can see the rest of the glue on the coverglass of the CMOS-chip. In the background you can see the filter with the adhesive and the frames.



Now glue the broken plastic frame into the metal frame an put the new filter (not shown) inside.

Now reassemble the camera in reverse order and you hopefully have a working modified Canon 10D!