How it All Started...

This article was written back in 1995-1996 and was featured in the RASC AstroNotes and on the OAOG web site. Prices and technology has changed since. This is how the first MallinCam was made back in 1994... Our in house custom made video board made it all happen.

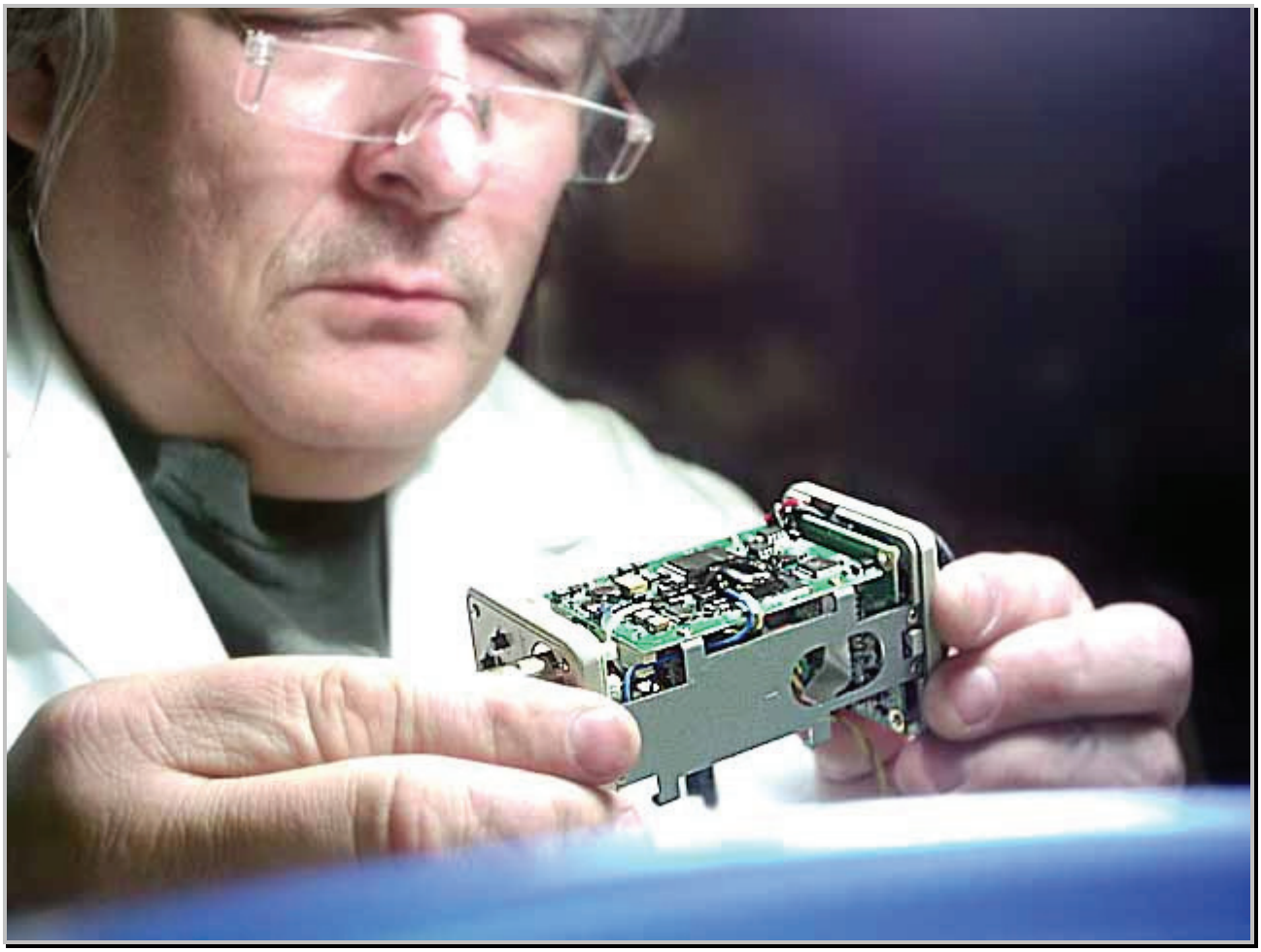
For some time, I always wondered if it would be possible to modify an existing CCD video camera available on the market today. Well, it is. Having experience with conventional CCD camera such as SBIG, Meade among others, the price is well above the average amateur astronomer. The difficulties involved with CCD imaging can be frustrating and time consuming. These are some of the reason I decided to look into an alternative and cheaper way to obtain some images with less effort.

After experimenting with over 14 different models available to security agencies, I came up with something rather simple and economical and very lightweight. It can even be used on a Dobsonian scope of all size. It will work with just about any telescope, and is easy to use. Some extensive modification has to be done with this specific model. This includes building a 1.25 barrel, modifying the actual gain of the CCD chip and customizing the wiring involved with video output.

The first thing to do is to disassemble the camera, and remove the actual lens that came with it, exposing the CCD device. The Board is then removed from its case, and prepared to be modified to boost the actual gain of the chip without increasing the noise factor. The auto iris is also modified to augment the gain of the video amplifier, to re- match the gain of the CCD device. The model already comes with a Sony CCD chip, of 0.02 LUX sensitivity. This is so far the most sensitive device available for video work. It is black and white with a resolution of 420 lines. The chip is also covered with a optical window to seal the chip. The size is 520 x 492, making it a full 1/3 of an inch! With a chip this size it is easy to use with any size telescope. Since the electronics are fully automatic, such as auto iris, auto gain, the best way to reduce its gain is to use an aperture stopper on the telescope. It is by far the best way to obtain better resolution, with out saturating the chip. Other companies offer a video camera with manual adjustment on their models. In the experiment I have worked with, it prove that reducing the gain manually does not reduce the pixel saturation. Therefore, stopping or controlling the amount of light entering at the telescope with a home made aperture stopper, will reduce or eliminate pixel saturation. It requires a little bit more effort, but the result at the end is better, and more precise.

To built such a camera, is cheap.... You need a 1.25" chrome tube, (plumbing fixture made out of brass works well), some commercial cement to bond the tube to the case of the camera, and some electronic skills. The cost? Camera: $189.00 the 1.25" tube: $6.00, The cement glue: $6.00, the extras electronics parts: $15.00, Total cost: $216.00 plus taxes.

The camera can be used live with a monitor, or on a VCR, or with a frame grabber like *snappy* or other models. The camera works wonders on the sun with a solar filter and it will see in white light and infrared too! It also works wonders on the moon and it excels on planets. I have even seen M31 with my 16" dobsonian, and it will see stars as faint as magnitude 12 or more. The only limit to this camera is your imagination, and skill to use such a device. And best of all is that it weights only about 4 ounces, and its size is as big as a wrist watch.

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