the ASTROGRAPH



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the ASTROGRAPH

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COVER PHOTOGRAPH

Object.....NGC 2237, the Rosette Nebula

Photographer.....Robert C. Price

Instrument.....TeleVue NP-101, 540mm F.L F/5.4 refractor

Exposure/Camera.....611 seconds/Hutech Canon 350D at 400ASA

Date.....30 October 2006

Location.....Just south of Blue Knob State Park in Pennsylvania

VOLUME 38 No. 3
EDITOR.....Robert C. Price
CONTRIBUTING EDITOR.....Ralph Proctor
PROOFING CONTRIBUTOR.....Linda Miller
CONTRIBUTORS.....Lee C. Coombs

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Product Evaluation: Hutech Canon 350D

by

Robert Price

Most modern digital cameras including the DSLR type camera incorporate an infrared blocking filter which blocks the infrared and extreme red end of the visible spectrum from reaching the camera sensor. The cut off region of the standard IR blocking filter in the red end of the visible spectrum greatly reduces the camera's response to the astronomically important H-alpha emission line of hydrogen at 656 nanometers. Unlike film which seemed to have some variability, some films had better red response than others. Digital cameras all seem to have poor response to the 656 nanometer red area in the visible spectrum. The astronomically suitable films like Kodak 2415 (Technical Pan) and Kodacolor Professional 400 (PPF 400) had good response to the red end of the visible spectrum.

There are several web sites that provide detailed instruction for removing the IR blocking filters in digital cameras and information on where substitute filters can be obtained. One company, Hutech Astronomical Products, sells a number of standard DSLR cameras with clear filters and modified IR blocking filters that pass most of the light from H-alpha emission nebula. The camera being evaluated is a Hutech modified Canon 350D. The Hutech modification replaces the camera's IR blocking filter with one Hutech calls a type 1a filter. This type 1a filter, according to information on Hutech's web site, passes the visible spectrum from 380 to 690



Above: Hutech Canon 350D evaluation. Shown above is a full-frame raw unprocessed image centered on the Orion Nebula and taken with a Hutech modified Canon 350D. Photographed by Robert Price on 30 October 2006 with a Tele Vue NP-101 located near Blue Knob State Park, PA. Exposure was 612 seconds at 400ASA.



Above: Hutech Canon 350D evaluation. Shown above is a full-frame raw unprocessed image centered on the Orion Nebula and taken with an unmodified Canon 350D. Photographed by Robert Price on 30 October 2006 with a Tele Vue NP-101 located near Blue Knob State Park, PA. Exposure was 598 seconds at 400ASA.

nanometers (with more than 90 percent transmission). The clear filter modification provides a filter that passes light from 380 to 1000 nanometers. The replacement Hutech type 1a IR blocking filter exactly matches the light path of the standard Canon IR blocking filter that it replaces and enables the camera's autofocus (AF) to work properly. The author chose to purchase the Hutech modified Canon 350D because comparisons between the unmodified Canon 350D and several other unmodified Canon and Nikon cameras showed that the Canon 350D was superior to most and less costly that the Canon D5, which is a full 35mm frame DSLR.

The Hutech modified Canon 350D has the same characteristics as the author's unmodified Canon 350D. Just as with the author's unmodified Canon 350D, the Hutech modified Canon 350D shows a small area of increased noise in the lower right part of the frame during exposures of 15 minutes and longer. As expected, sky fog showed a redder tint with the Hutech modified Canon 350D when compared with the regular Canon 350D. This redder tint also showed up as an increase in density/exposure when viewing the red channel histogram. What the author did not expect was that the histogram of the blue channel also showed increased density/exposure with the Hutech modified Canon 350D when compared with the regular Canon 350D.

Images on pages 35 and 36 were taken under near identical conditions and show the increased red response of the Hutech modified Canon 350D when compared with an unmodified Canon 350D.



Above: Hutech Canon 350D evaluation. Shown above is a full-frame image centered on the Horsehead Nebula and taken with a Hutech modified Canon 350D. Photographed by Robert Price on 26 October 2006 with a Tele Vue NP-101 from a location 28 miles south of Washington DC. Exposure was 322 seconds at 400ASA.



Above: Hutech Canon 350D evaluation. Shown above is a full-frame image centered on the Horsehead Nebula and taken with an unmodified Canon 350D. Photographed by Robert Price on 26 October 2006 with a Tele Vue NP-101 from a location 28 miles south of Washington DC. Exposure was 305 seconds at 400ASA.



Above: Hutech Canon 350D evaluation. Shown above is a full-frame image centered on the Horsehead Nebula. Photographed by Robert Price on 30 October 2006 with a Tele Vue NP-101. Exposure was 21 minutes at 400ASA from a dark sky location near Blue Knob State Park, PA.



Above: Hutech Canon 350D evaluation. Shown above is a full-frame image centered on the Orion Nebula. Photographed by Robert Price on 30 October 2006 with a Tele Vue NP-101. Exposure was 20 minutes and 17 seconds at 400ASA from a dark sky location near Blue Knob State Park, PA.



Above: Hutech Canon 350D evaluation. Shown above is an image of Comet SWAN. Photographed by Robert Price on 29 October 2006 with a Tele Vue NP-101. Exposure was 552 seconds at 400ASA from a dark sky location near Blue Knob State Park, PA. The waxing quarter Moon was in the southern sky when this image was taken.



Above: M100 photographed by Lee C. Coombs on 21 April 2004 using a 10 inch F/5 Newtonian. Exposure was 35 minutes on Ektachrome 200 professional film.



Above: M106 photographed by Lee C. Coombs on 18 May 2004 using a 10 inch F/5 Newtonian. Exposure was 35 minutes on Ektachrome 200 professional film.

Astrophotography for December and January

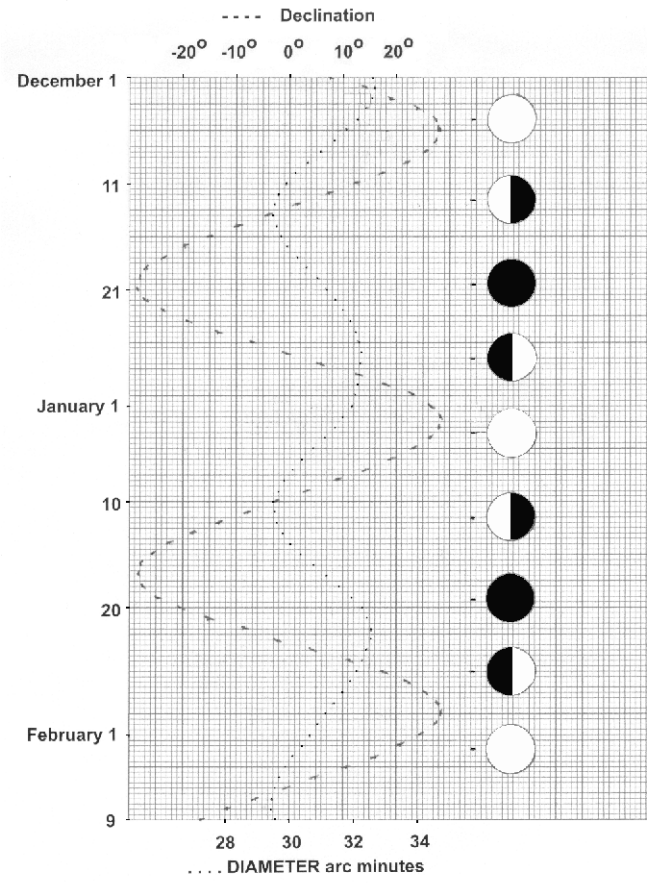
by

Ralph Proctor

Mercury begins December as a morning object high in the eastern sky. During December Mercury moves lower in the eastern sky, and by the end of the third week in December disappears into the Sun's glare. Mercury reaches superior conjunction with the Sun on 7 January and emerges from the Sun's glare in late January as an evening object low in the western sky.

Venus begins December lost in the Sun's glare but emerges from the Sun's glare in mid December as an evening object low in the western sky. During December and January Venus moves higher in the western sky, increases in brightness from magnitude -3.8 to -3.9, and increases in diameter from 9.9 to 10.9 arc seconds.

Lunar Declination and Diameter:



The Moon's full phase will be located high on the ecliptic and in excellent photographic position during December (December 6) and January (January 3 and 30), with an apparent declination of up to +28 degrees.

Mars begins December lost in the Sun's glare but emerges from the Sun's glare in mid December as a morning object low in the eastern sky in the constellation Scorpius. During December Mars moves into Ophiuchus, and in January into Sagittarius. During December and January Mars moves higher in the eastern sky, increases in brightness from magnitude + 1.6 to + 1.4, and increases in diameter from 3.74 to 4.19 arc seconds.

Jupiter begins December lost in the Sun's glare but emerges from the Sun's glare in early December as a morning object low in the eastern sky in the constellation Scorpius. Jupiter moves into Ophiuchus in late December.. During December and January Jupiter moves higher in the eastern sky, increases in brightness from magnitude -1.7 to -1.9, and increases in diameter from 31.0 to 33.9 arc seconds.

Saturn begins December as a morning object high in the eastern sky in the constellation Leo. During December and January Saturn moves higher in the eastern sky, increases in brightness from magnitude +0.4 to -0.12, and increases in diameter from 18.7 to 20.1 arc seconds.

Uranus begins December as an evening object low in the western sky in the constellation Aquarius. During December and January Uranus moves lower in the western sky, decreases in brightness from magnitude + 5.8 to + 5.9, and decreases in diameter from 3.52 to 3.35 arc seconds. Uranus is located at R.A. 22 hours 51.3 minutes declination -8 degrees 07 minutes on 15 December and at R.A. 22 hours 55.2 minutes declination -7 degrees 42 minutes on 15 January.

Neptune begins December as an evening object low in the western sky in the constellation Capricornus. During December and January Neptune moves lower in the western sky and by the end of the second week in January disappears into the Sun's glare. During December and January Neptune decreases in brightness from magnitude +7.9 to +8.0, and decreases in diameter from 2.25 to 2.16 arc seconds. Neptune is located at R.A. 21 hours 20.6 minutes declination -15 degrees 46 minutes on 15 December and at R.A. 21 hours 24.5 minutes declination -15 degrees 28 minutes on 15 January.

Pluto begins December as an evening object low in the western sky and is immediately lost in the Sun's

glare, reaching conjunction with the Sun on 18 December. Pluto emerges from the Sun's glare in mid January as a morning object low the eastern sky in the constellation Sagittarius. During January Pluto moves higher in the eastern sky and remains constant in brightness at magnitude + 14.0. Pluto is located at R.A. 17 hours 44.7 minutes declination -16 degrees 28 minutes on 15 December and at R.A. 17 hours 49.9 minutes declination -16 degrees 33 minutes on 15 January.

Events:

Saturn will be occulted by the Moon on 10 December (11 hours universal time) for Norway, all but the southern portion of the British Isles, Iceland, and Greenland; and on 6 January (18 hours universal time) for the northeastern Russia, the Arctic regions, northern Scandinavia, and northwestern Canada.

Spica will be occulted by the Moon on 15 December (11 hours universal time) for the southern portion of South America; and on 11 January (20 hours universal time) for most of Antarctica, and the southeastern Indian Ocean.

Antares will be occulted by the Moon on 19 December (04 hours universal time) for east Africa, southeastern Australia, and New Zealand; and on 15 January (13 hours universal time) for the southern tip of Africa, part of Antarctica, and the southern tip of South America.

Uranus will be occulted by the Moon on 25 December (21 hours universal time) for part of western and northwestern South America, northeastern Africa, and Portugal; and on 22 January (06 hours universal time) for Japan, the Philippines, Indonesia, the eastern Indian Ocean, and the southern tip of India.

Venus will be occulted by the Moon on 20 January (17 hours universal time) for southwestern Africa, most of Antarctica, and the southern tip of South America.

Regulus will be occulted by the Moon on 7 January (05 hours universal time) for eastern Europe, eastern Scandinavia, and western Russia.

The Pleiades will be occulted by the Moon on 27 January (17 hours universal time) for northern Europe.

MINOR PLANETS

position

		15 December		15 January	
Planet	Magnitude	R.A.	Decl.	R.A.	Decl.
Ceres	09.2 - 09.3	22 hr 06.0 min	- 21 deg 46 min	22 hr 45.2 min	-17 deg 14 min
Pallas	10.6 - 10.4	19 hr 36.0 min	+00 deg 47 min	20 hr 16.9 min	+00 deg 41 min
Juno	10.9 - 10.5	13 hr 11.4 min	- 05 deg 15 min	13 hr 39.4 min	-06 deg 15 min
Vesta	08.0 - 07.6	14 hr 21.4 min	- 08 deg 00 min	15 hr 17.3 min	-11 deg 37min

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Volume No. 9 issue 1, 4, 5, and 6
Volume No. 10 issue 2, 3, 5, and 6
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Volume No. 12 issue 1, 2, 3, 4, 5, and 6
Volume No. 13 issue 1, 2, 3, 4, 5, and 6
Volume No. 14 issue 1, 2, 3, 4, 5, and 6
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Volume No. 20 issue 1, 2, 3[1], 4, 5, and 6
Volume No. 21 issue 1, 2, 3, 4, 5, and 6
Volume No. 22 issue 1, 2, 3, and 4
Volume No. 23 issue 4 and 5
Volume No. 24 issue 5 and 6
Volume No. 25 issue 1, 2, 4, and 6
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Volume No. 30 issue 1, 2, 3, 4[1], 5, and 6
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Volume No. 32 issue 1, 2, 3, 4, 5, and 6
Volume No. 33 issue 1, 2, 3, 4, 5, and 6
Volume No. 34 issue 1, 2, 3, 4, 5, and 6
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Hutech Modified Canon 350D Color Balance

by

Robert Price

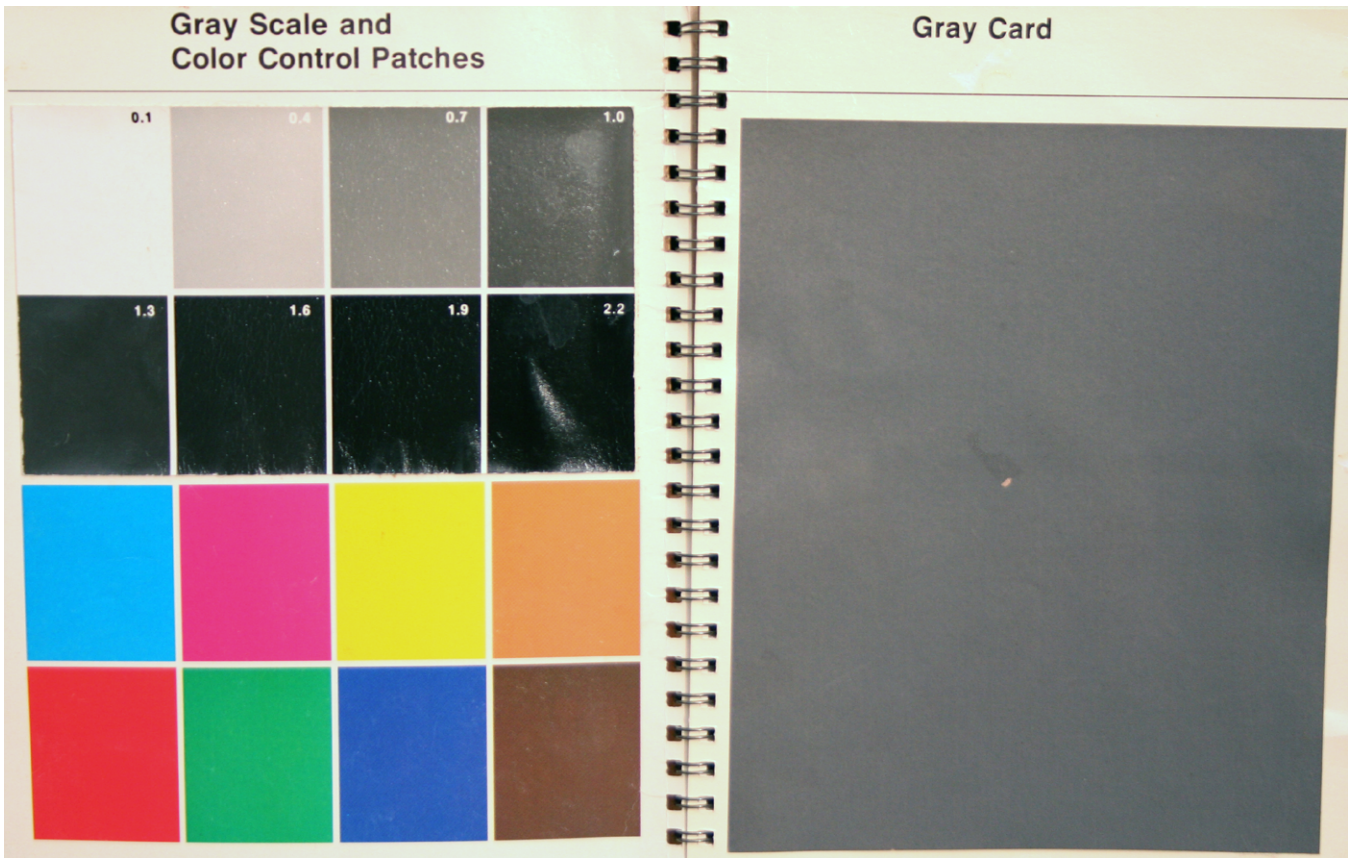
As discussed my evaluation of the Hutech modified Canon 350D on page 35, the type 1A filter used by Hutech extends the red response of this camera. The normal image of a Kodak gray card with color control patches is shown in Figure 1. As can be seen in Figure 2 the image taken of this same gray card with the Hutech modified Canon 350D has a definite red tinge caused by the filter letting in more red light. Processing the image in Figure 2 with the auto color correction feature of Adobe Photoshop 7 yields an almost perfect rendition of the gray card image, Figure 3. Using the Canon supplied program, "Digital Photo Professional", to examine the RGB histograms of the Hutech modified Canon 350D image of the gray card before and after auto color correction shows that the auto color correction function corrected the color imbalance by overlapping the red, blue, and green histograms.

Figure 4 is a screen capture showing the image of the Orion Nebula and its RGB histogram. This image is the same 612 second exposure taken with a Hutech modified Canon 350D and shown on page 35. Note how red this image appears when compared to the same image taken with an unmodified Canon 350D as shown on page 35. Figure 5 is this same image and RGB histogram after adjusting the position of the red, green, and blue histograms so that they overlapped. Note that the red tinge is gone and the background is more neutral or close to a gray type color. Figure 6 is a screen capture showing the image of the Orion Nebula and its RGB histogram. This is the same 598 second exposure taken with an unmodified Canon 350D and shown on page 35. Figure 7 is this same image and RGB histogram after adjusting the position of the red, green, and blue histograms so that they overlapped. Note that the background sky-glow tinge is gone and the background is more neutral or close to a gray type color.

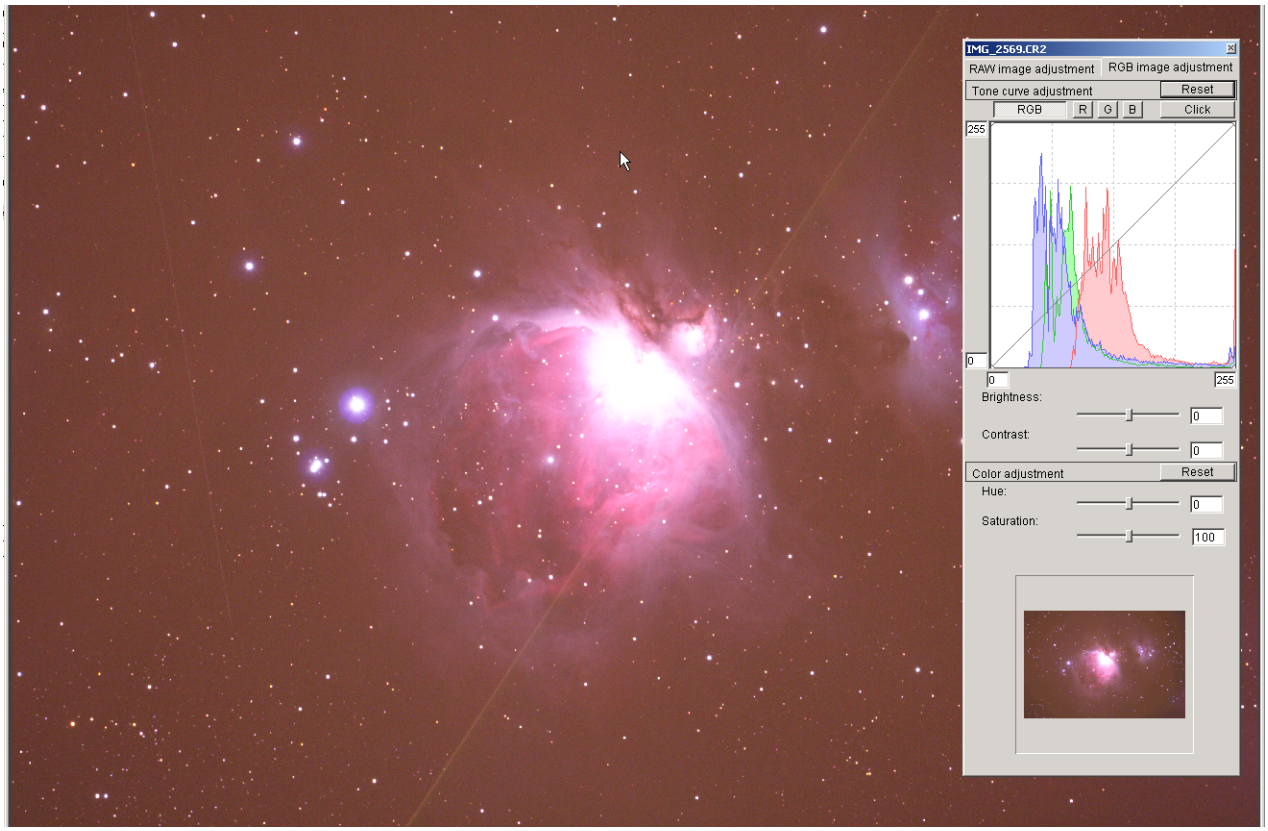


Above: Figure 1: Kodak gray card with color control patches taken with an unmodified Canon 350D.

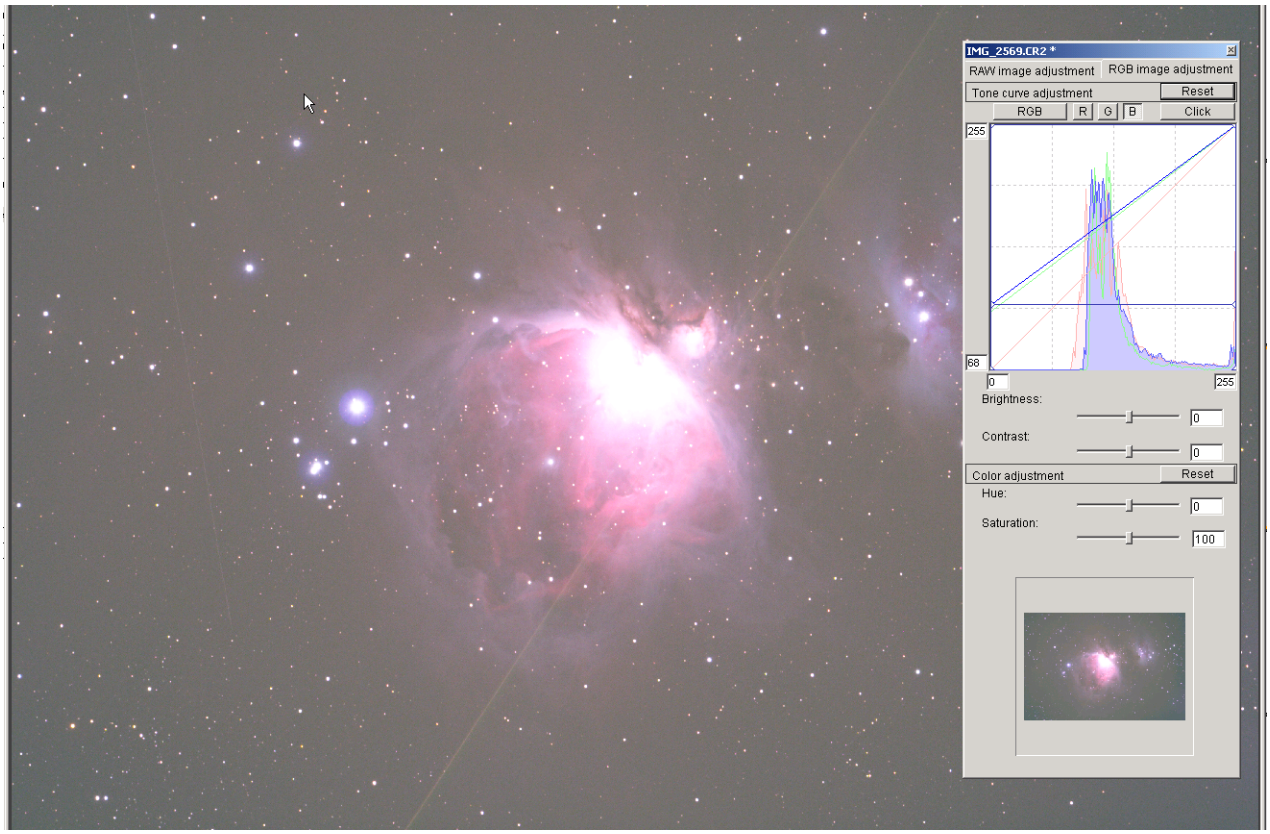




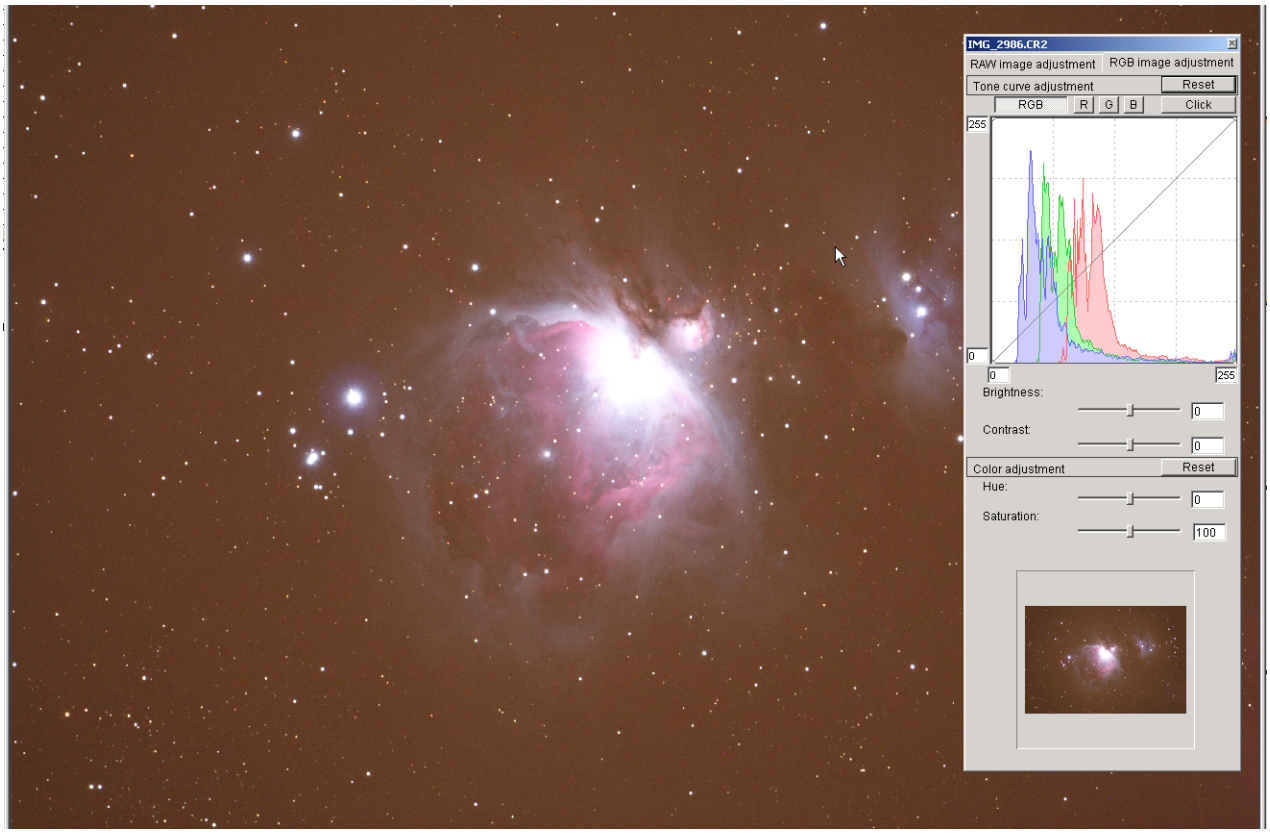
Above top: Figure 2: Kodak gray card with color control patches taken with a Hutech modified Canon 350D. No image processing was used.
Above bottom: Figure 3: Kodak gray card with color control patches taken with a Hutech modified Canon 350D. Image processing was limited to auto color correction in Adobe Photoshop 7.



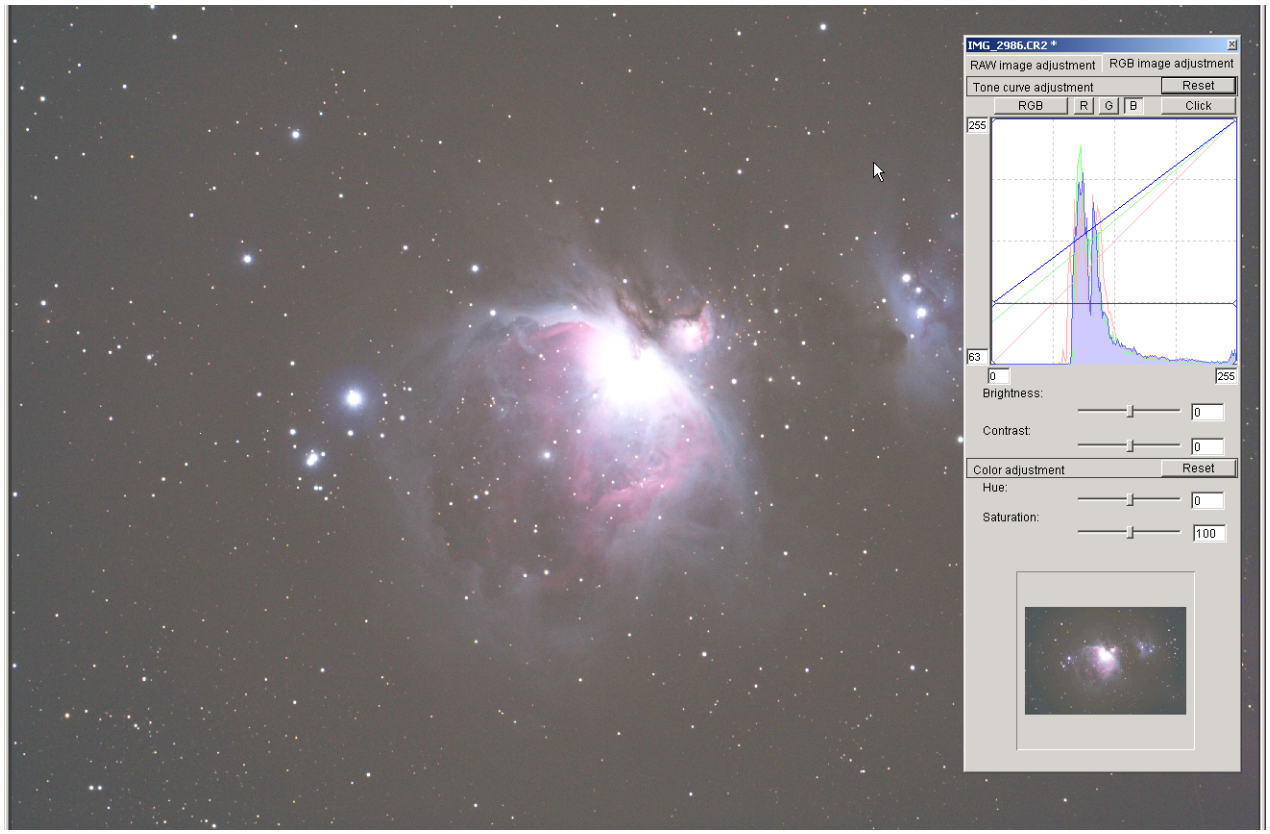
Above: Figure 4: Screen capture showing image taken with a Hutech modified Canon 350D and its RGB histogram as displayed in the Canon supplied program, "Digital Photo Professional". Other than opening the RAW image, no image processing was done.



Above: Figure 5: Screen capture showing image taken with a Hutech modified Canon 350D and its RGB histogram as displayed in the Canon supplied program, "Digital Photo Professional". RGB histograms have been adjusted to overlap but no other image processing has been done.



Above: Figure 6: Screen capture showing image taken with an unmodified Canon 350D and its RGB histogram as displayed in the Canon supplied program, "Digital Photo Professional". Other than opening the RAW image, no image processing was done.



Above: Figure 7: Screen capture showing image taken with an unmodified Canon 350D and its RGB histogram as displayed in the Canon supplied program, "Digital Photo Professional". RGB histograms have been adjusted to overlap but no other image processing has been done.



Above: M41, the Beehive Cluster, photographed by Lee C. Coombs on 17 January 2001 using a 10 inch F/5 Newtonian. Exposure was 30 minutes on Ektachrome 200 professional film.