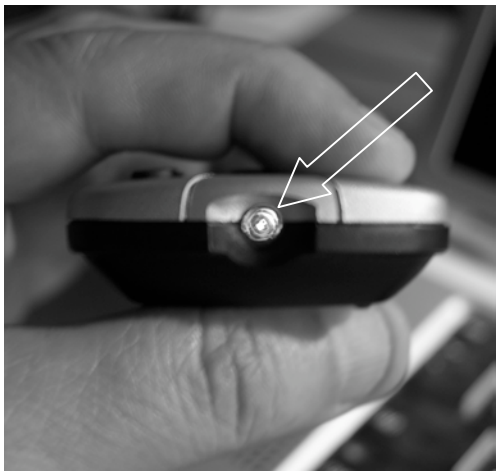
Infrared Photography with Consumer Digital Cameras

Siegfried Manietta *2007*

Background:
Digital cameras employ silicon based sensor arrays. As with silicon photo diodes used in light meters, silicon light detectors are inherently far more sensitive to infrared than visible radiation. This project shows how to use virtually any commercially available digital camera to produce stunning infrared images.

Camera Test:
To check the camera for suitability, obtain an infrared remote controller (TV channel changer) and produce an image of the IR emitting diode while the remote is being operated. The camera is suitable for infrared photography if the diode appears brightly illuminated in the image (white, pink or red). If the diode is recorded dark, the camera is unsuitable, as the manufacturers have installed (expensive) highly efficient IR absorbing filters in front of the sensor array.
It should be noted here that a camera's residual infra-red sensitivity actually *diminishes* its capacity to render saturated and accurate colour in visible light – encouraging commercial and "purist" amateur digital photographers to purchase expensive Infra-red excluding filters.



Infra-red Transmitting Filter:
To photograph in the infrared we need to exclude all (or most) of the visible radiation. We need an *Infrared transmitting* filter to block all or most of the visible light. The filter therefore appears completely black! Infra red transmitting filters can be purchased – they are not cheap. However we have the option to *make* a filter. The Yellow, Magenta & Cyan dyes used in conventional photography are designed to absorb visible light. However these same dyes are also remarkably *transparent* in the Infrared! This is *why* silicon based scanners sometimes show strong red colour casts in high-density regions when traditional photographic materials such as prints, negatives and transparencies are scanned. So we can substitute for an expensive Infrared blocking filter with conventional photographic dyes. What we need has to be *visually dense* and coated on a *transparent* base. The answer is a piece of *unexposed but processed* E-6 *colour transparency film.* The unexposed black ends of a 120 roll of E-6 film are perfect for our use. Check this by holding a piece of film close to the eye while looking at a bright light. The "filter" can be mounted in a Kokin or gel filter holder or carefully taped to a cardboard frame for temporary use. (To avoid scratching the filter)

Shooting in Infra-red light:
Select a subject. Including green foliage is a good idea as healthy green leaves reflect strongly in the Infrared region. Once the scene is composed place the black filter in front of the camera and allow the camera's light meter to respond to the (mainly) infrared light entering. As the metering and auto-focus sensors are also infrared sensitive, they will function perfectly – even through our "black" filter! The camera will re-set aperture and shutter speed. The auto-focus will probably also engage as the IR image is projected a little further from the lens than the visible image. Press the button and hey presto! Instant infrared image file!

Image Data Processing:
If the camera was set-up to capture in RGB, the image file will appear *extremely red*. This can be converted to B&W in PhotoShop or similar program. The image will appear to be rather flat and will require substantial contrast adjustment – best undertaken in curves. Given the need to increase contrast in processing it will be best to capture in RAW mode and work in 16-bit depth wherever possible – if quality prints are later required. Alternatively the image file may be processed in colour. This requires "stretching" the under-exposed blue & green histograms back to cover the full image luminance. Again contrast adjustment is required. Colour Infrared shot this way looks similar to transparencies shot with colour Infrared film. To mimic the "soft halo" effect of B&W Infra-red film it will be necessary to auto-focus the image in visible light – then switch to manual focus and light meter through the black Infra-red filter. This will ensure that the visible light component will be sharp while the Infrared image is slightly out-of-focus. The examples below were shot with a consumer Pentax istD and an infra-red transmitting filter made from Fuji RVP 100F colour transparency film as described above: Happy shooting!