The Moving Orb Photo 'Myth'

By Brian P James

In a previous article—***The Riddle of the Orbs?*** - I looked in depth at rationalizing and explaining the misperceptions over so-called 'orb' photos. After speaking to and engaging in email dialogue with a number of people, there is however still one misperception - namely the 'streaking orb' in still photos, which again is totally misinterpreted.

The image (right) shows the classic example of such an image. Let's have a little quiz, which way is the orb moving:
[A] Down, or
[B] Up?

The particle that made this trail is of course moving down, courtesy of the gravity discovered by Isaac Newton. So, if you said **[A]** award yourself 2 points, if you said **[B]** then no points, and please read on...

The reason for the trail as it appears is really quite simple, and is down to two factors:
1] The length of time the flash is illuminating the particle is out of synchronization with the shutter speed of the camera.
2] The light output of the flash is not constant.

The first point is easily understood when you look closely at the camera and its specifications.

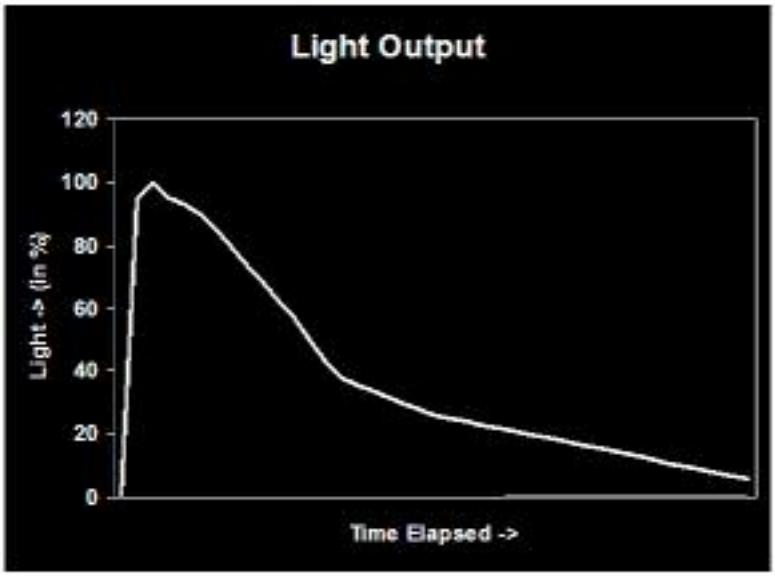
Most of these orb photos are being taken with cameras in 'automatic' mode; the camera's on-board computer is calculating various factors in an attempt to capture the 'perfect' photograph - this is equally true for film or digital cameras. The main factor the camera will work with is the available light, so it will adjust the lens aperture to the optimum, then set the appropriate shutter speed. In good light and with a reasonable ISO rating, the shutter speed will be less than 1/125 sec - well beyond the human eye's ability to see the same image. Most inbuilt camera flashes fire a burst of light for around 1/125 sec - so if it was being fired in the above scenario, the flash and shutter speed will be in synchronization.

However, let's consider the common conditions in which most orb photos are being taken, ie at night or in otherwise dark or gloomy conditions, with little ambient light. Now the camera is still seeking to capture the same sort of image (in terms of brightness and contrast) as in daylight, so it will open up the lens to its maximum aperture (remember from my previous article how the focus/depth of field is now also changing), and it will be selecting a slower shutter speed to compensate for the lack of ambient light, as well as triggering the flash. The shutter speed now may be 1/60 sec to 1/25 sec or slower, but the flash is still providing its light for 1/125 sec - the two are now unsynchronized. This is where the second 'reason factor' is coming in...

Even to the naked eye watching a flashgun firing, it is quite obvious that the light output is not

constant - try it and see (though you will of course see purple spots for a few minutes afterwards!)

The graph (right) illustrates the light output of the flashgun against time. The gun discharges very quickly, producing an initial bright burst of light - there's little point in having a flash that doesn't do this. However, the light output decreases slowly - though this of course is still occurring while the shutter is open. Let's put the two parts of the puzzle together...



As the flash fires, the particle is brightly illuminated, producing the main bright image return - often this will be exaggerated in size, particularly in digital photos, as the CCD or CMOS chip suffers its equivalent of the human eye's retinal burn.

The flash then starts to fade while the particle is still falling, but the light is constantly getting dimmer, so the image return of this moving object is getting fainter while the shutter is still open - the result being a 'moving still image' in which this particle is moving in relation to the rest of the contents of the image.

The result is not an anomaly or spirit orb photo, simply a misinterpretation by the unwary.

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