Water drop macro photography

GETTING THE SETTINGS RIGHT

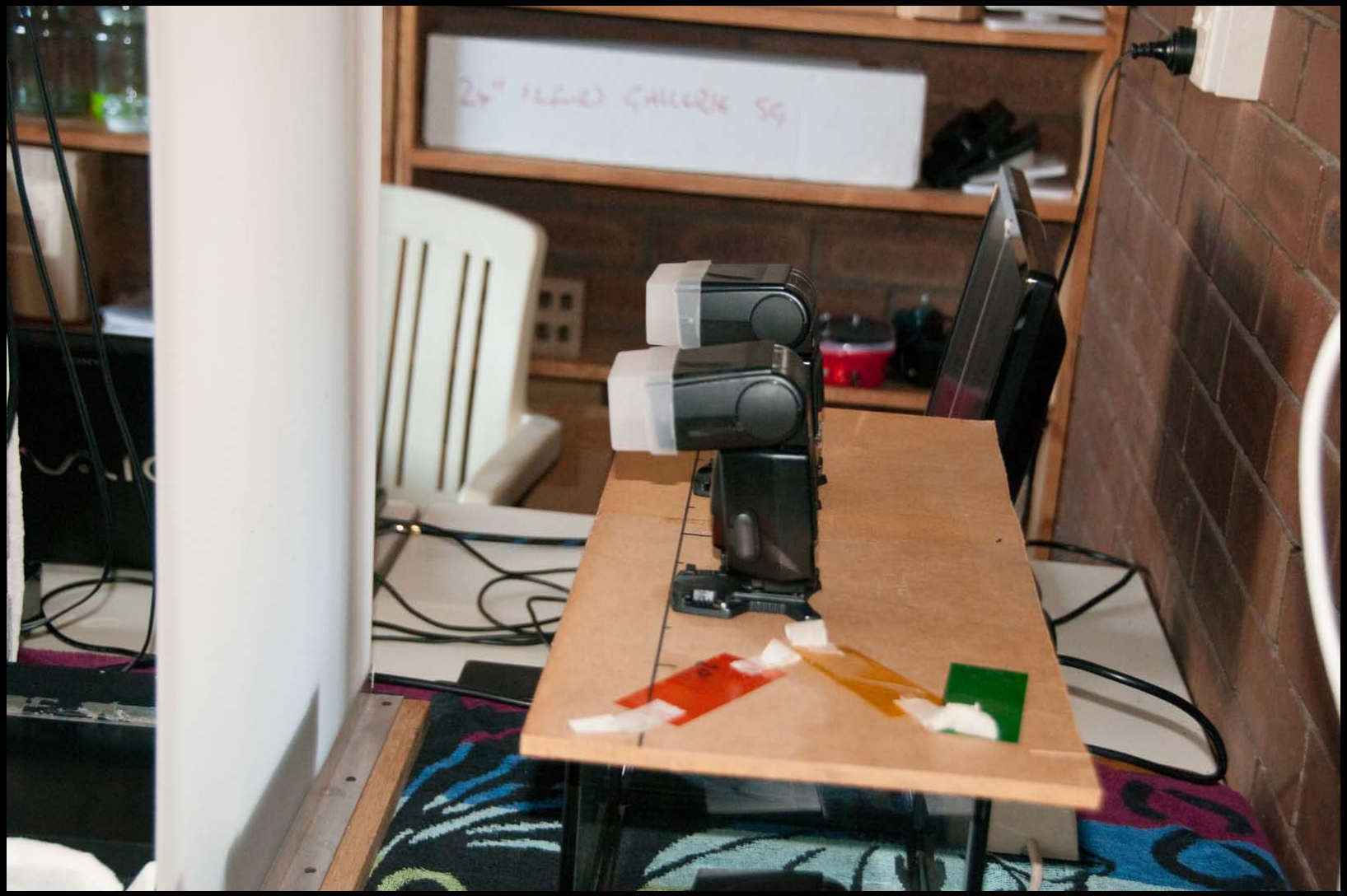
The objective

The equipment 1

The equipment 2

The equipment 3

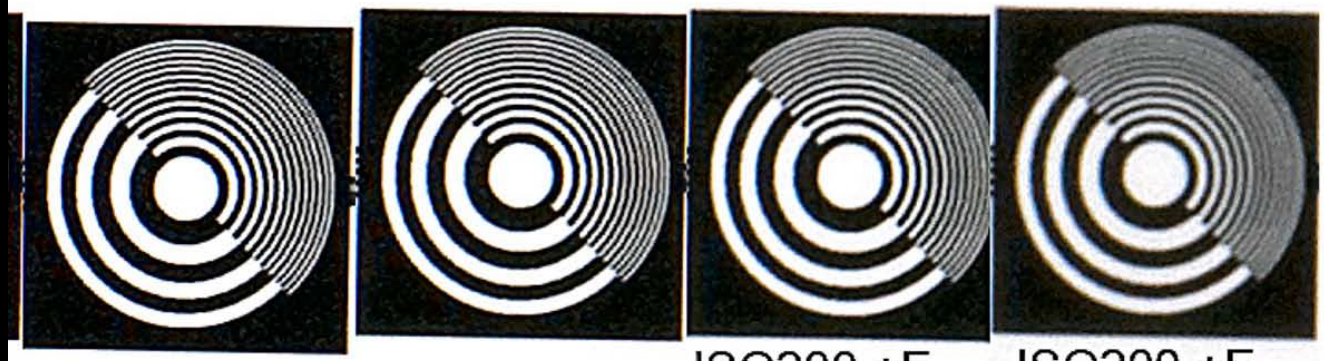
The equipment 4



The challenge

- Get images in focus
- Get the images as sharp as possible
  - Implies choosing the optimum aperture for the lens
- Get the maximum possible DOF
  - Implies choosing the smallest possible aperture
  - There is a conflict between sharpness and DOF because a very small aperture introduces blur due to diffraction. In this set up I chose f/20 as the best compromise.
- Get the exposure correct

Diffraction effect



ISO200 +F f/11 105mm

ISO200 +F f/16 105mm

ISO200 +F f/22 105mm

ISO200 +F f/32 105mm

ISO200 -F f/11 105mm

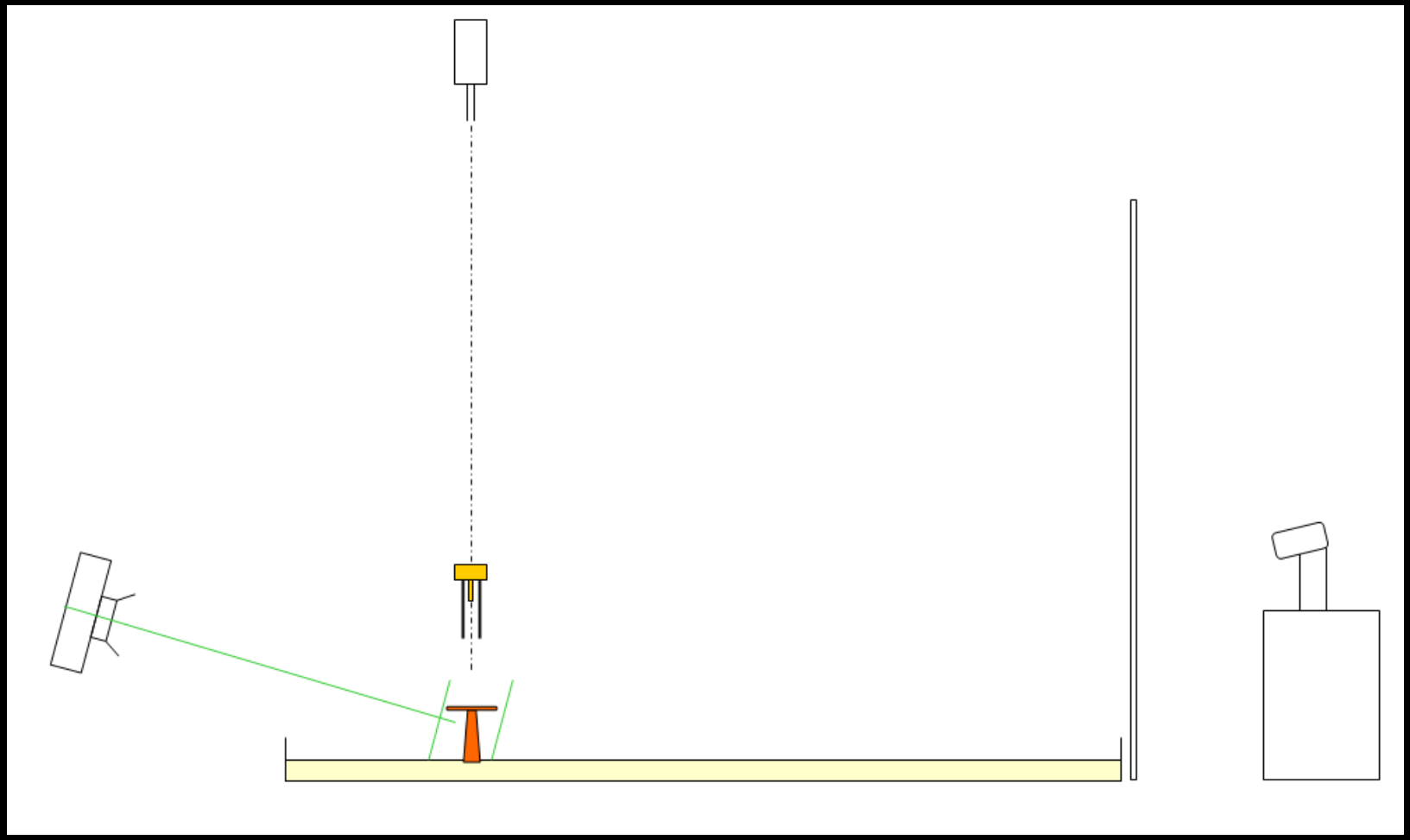
ISO200 -F f/16 105mm

ISO200 -F f/22 105mm

ISO200 -F f/32 105mm

ISO200 -F f36 105mm

Optical arrangement



Exposure triangle – Part 1

- The sharpness and DOF requirements have now led us to the first setting of the exposure triangle: - Aperture = f/20
- The next step is to look at factors affecting the choice of shutter speed

The light source

- Highly diffused backlighting was chosen after considerable experimentation
- Speedlights were chosen because they are capable of very short flash durations – this is what freezes the droplets
- Flash duration depends on the power output of the SB800 flash guns as follows:

Power	Flash duration
Full power	1/1000 sec
1/16	1/10,000 sec
1/32	1/18,000 sec
1/64	1/32,000 sec

Flash synchronisation 1

- SLR cameras have a maximum shutter speed at which flash synchronisation is possible. It's called the flash sync speed. You have to find it in your camera's manual. It's typically about 1/250 sec.
- Flash will work with any shutter speed at or below this value
- At first sight this gives you a wide range of shutter speeds to get the exposure correct – BUT……

Flash synchronisation 2

- In order to control motion blur (the water drops move fast), we want only the light from the high speed flash to light up the image
- In other words, we want to exclude ambient light from playing any part in the image
  - (The studio is just curtained from daylight. It isn't a fully darkened room)
- Therefore we choose the highest possible shutter speed – the flash sync speed itself

Exposure triangle – Part 2

- The aperture was defined to be f/20
- A shutter speed of 1/250 was chosen as the highest possible speed to maintain flash synchronisation and no contribution from ambient light
- Only ISO and the power output of the flash guns therefore control exposure

The result

- Aperture f/20
- Shutter speed 1/250
- ISO 800
- Flash output power 1/32 or 1/64

- The last two values were determined by experiment using the image histogram for guidance.