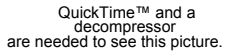
Team Project 3 William Murray
Addendum

Image Intent:

Detailed two dimensional view of the toroidal vortex to complement the three dimensional images. This vortex ring was created using the smaller vortex generator, the Zero Launcher[1]. Capturing rings created with the larger generator proved to be difficult with the high speeds at which they traveled.

Flow Apparatus:



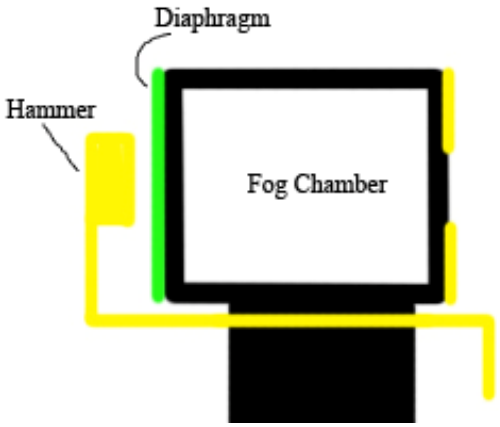


Figure 1: Zero Launcher

Figure 2: Zero Launcher Schematic

The vortex rings were created with the Zero Launcher. In the handle is a fog machine which empties into the fog chamber. When the hammer strikes the diaphragm, fog is forced out creating the vortex rings. The exit diameter is approximately an inch and a half in diameter. This creates rings of various sizes from one inch to two inches.

Photographic Technique:

A Canon Rebel XSi was used to capture this image. The camera was set-up next to the Zero Launcher and pointed towards the rings approximately 20 inches from the end of the launcher and 18 inches from the end of the camera at about 30 degrees. The field of view in the image is 12.5 inches, and the ring is approximately 1.75 inches in diameter. The lens used is an EF-S18-55mm f/3.5-5.6 IS from Canon. The focal length is 9.8 inches. The original digital file is 4272 by 2848 pixels, and the final image file is 2976 by 1974 pixels. The ISO setting was 100, aperture at 4, and a shutter speed of 1/400th of a second.

For lighting, a Nikon Speedlight 240 was used. The filter was set on wide (W), and power was on the lowest setting. The flash was mounted to the top of the camera in the hot shoe.

[1] www.zerotoys.com

Using Photoshop, a ring out of focus in the foreground was removed, and the image was cropped down. Also the exposure setting was increased to 0.5 when converting from the RAW format.

Image Assessment:

The image gives you a good representation of the toroidal shape or the vortex ring. You can even see some layering about the ring. Also the smoke trail caused by fog being subjected to shear forces from the surrounding air are visible. I feel this image fulfils the intent, and is a good representation of a vortex ring. In the future I would like to attempt to capture a quality image from the larger generator. I feel the larger rings would give greater detail and better insight into the physics of the vortex.