

4-19-2006

Camera for photofinish photography at racetracks

Andrew Davidhazy

Follow this and additional works at: <http://scholarworks.rit.edu/article>

Recommended Citation

Davidhazy, Andrew, "Camera for photofinish photography at racetracks" (2006). Accessed from <http://scholarworks.rit.edu/article/219>

This Technical Report is brought to you for free and open access by RIT Scholar Works. It has been accepted for inclusion in Articles by an authorized administrator of RIT Scholar Works. For more information, please contact ritscholarworks@rit.edu.

Camera for Photofinish Photography at Racetracks

Andrew Davidhazy
Imaging and Photographic Technology Department
School of Photographic Arts and Sciences

Photofinish cameras bear more than a simple resemblance to synchroballistic cameras. They are, in fact, identical in just about every respect.

Both cameras depend on forming an image of moving objects so that they pass over an open, shutter, slit at the image plane past which the film is also moved at the expected speed of the images of the participants in the race.

In this demonstration, the camera which is used is a slightly modified Polaroid Colorpack camera and the racers are model cars running down an inclined ramp. To make a photofinish photograph yourself all you need to do is to first secure the film clamp or grabber attached to the end of a wire which is wound onto the large plastic knob driven by the motor onto the white tab which is protruding from the right side of the camera. Make sure that the clamp is squarely and securely fastened using the allen wrench provided.

Now set the cars up at the top of the ramp and hold them back with the starting rod.

Then, turn on the stroboscope and the high intensity quartz halogen light source. Finally, start the race by releasing the cars and when they have moved half way down the track throw the switch on the Variac power supply to the [^]ON[^] position. This causes the film to be rapidly pulled through the camera at about the same speed as the images of the cars are moving.

PLEASE TURN THE POWER TO THE CAMERA
AND THE QUARTZ LIGHT OFF IMMEDIATELY
AFTER THE RACE

Taking reasonable care not to disturb the alignment of the camera, remove the Polaroid processing tab from the camera and wait 40 seconds for processing to be completed. Separate the negative from the positive at this time. If you timed the start of the running of the camera properly (that is if you were not too early or too late) you should find an image of the four cars in the race on the film with "timing marks" generated by the stroboscope below them extending accross the film. If there are less than four cars in the picture some of them arrived either too early or late given that the camera can only record the finish area for about 1 second or so.

From this photofinish record a number of things can be determined.

The order of arrival of each car at the finish line can be read off the film by simply "reading" the image from right to left. The car farthest to the right always beats any car behind it. This is because the images arrive sequentially at the slit in the camera and are similarly recorded onto the passing film.

The time between finishers can be determined from the knowledge that the time between flashes of the stroboscope is 1/100 of a second. Counting marks between fenders gives elapsed time in 1/100ths of a second between them.

The rate at which the film was moving in the camera can also be estimated in a similar way. Simply count the number of marks between the left and right edges of the print (or any other convenient measure) and divide the known distance by the number of marks within this distance to arrive at the film speed in mm/sec. or inches/sec.

You can even calculate the speed at which the cars on the track were moving by measuring the length of the real model car (not its recorded image!) and counting "timing marks" between its fenders. Divide the real length by the number of 1/100ths of a second from front to back and you have the speed of the car as it whizzed down the track.

An interesting question is: "How come the finish wire does not show up on the photofinish print?"

The Polaroid camera has been only modified to the extent that a mask was installed just in front of the film plane leaving an opening which in conjunction with the edge of the film pack makes a slit about 1 mm. wide at the edge of the camera farthest from the processing tabs. In addition, a lens was mounted directly in front of this slit. The lens is a shutterless enlarging lens since the camera has no standard shutter in it. The exposure is controlled by the rate at which the film moves and the width of the slit. Finally, a small DC gearhead motor was added to an extension the function of which is to pull, by way of a steel wire and clamp attachment, each of the white tabs extending from the camera. The speed at which this is done is regulated by varying the voltage driving the motor.

It should be noted that as the white tab is being pulled to the right as you look at the camera from the back, the film in the camera is actually moving towards the left and around a round edged separator built into each pack. This way the exposed negative ends up face to face with the receiver sheet or final print material. The film for this demonstration was generously provided by the Polaroid Corporation.

Should you have any questions about this demonstration specifically or about photofinish photography in general contact [Prof. Andrew Davidhazy](#) at the Rochester Institute of Technology, Imaging and Photographic Technology, P.O. Box 9887, Rochester, NY 14623 (716) 475-2592



