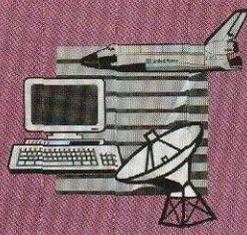


Alan J. Pierce



Eye Control

THE number of buttons on an electronic device is directly proportional to the number of functions built into the system. This statement perhaps provides insight into why most manufacturers have attempted to "out-button" their competition. Often, 10 fingers haven't seemed enough. Perhaps only a handful of highly skilled couch potatoes can fully

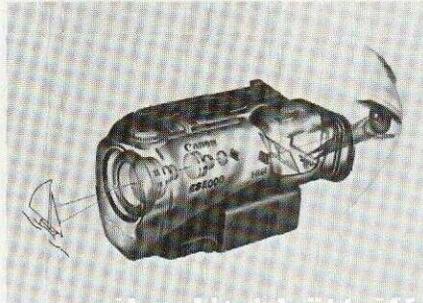


Photo and illustrations courtesy of Canon Inc.

The Canon ES 5000 Camcorder

control their multi-functioned remotes in a darkened room.

Eye Control is the name of a new optical control system that has been developed by the Japanese corporation, Canon Inc. Its principle of operation is about to revolutionize the machine control industry. As you look through the viewfinder of the Canon ES 5000 Camcorder to compose your scene, the camera electronically looks back at your eye to observe its movement. A momentary glance at points inside the viewfinder turns camera functions on and off.

The Eye Control feature includes camera focus, fade, tilting, review, zoom, and starting and stopping your recording. A quick two-second glance at a menu can also control digital special effects such as strobe, freeze, mosaic, art, overlap, scroll, close-up, and zoom to fade.

Up until this past year, all self-focusing systems used the area of the center of the viewfinder as a focusing target. On these cameras, when there is a small depth of field, objects

positioned in the center of the viewfinder are kept in focus. On the Canon ES 5000, a moving target box that is following your eye movement indicates the central point for focus. Since the focusing target matches the center of our vision, your subject would be kept in focus even if it is in motion or not in the center of the viewfinder.

At a baseball game, your camera image could include the pitcher, batter, and the outfield. Without moving the camera, your eye's very subtle movement would cause the center of focus to follow the ball from the pitcher to the batter and then perhaps to the outfielder's one-handed catch.

The conceptual framework of Eye Control isn't very difficult to understand. Building the system would be another matter. As you look into the viewfinder, two harmless light emitting diode (LED) beams bathe your entire eye with an invisible light. This light is reflected back into the viewfinder through a dichroic mirror and then the light is collected by a set of condenser lenses. (See Fig. 1.) At

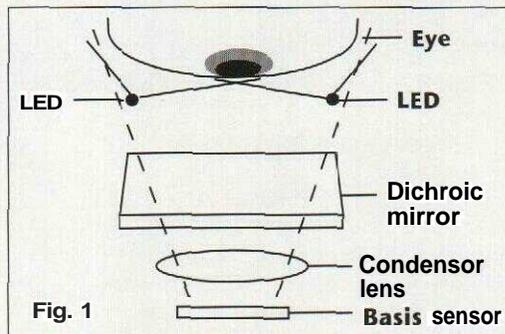


Fig. 1

In the system, the basis sensor compares the center of the eye (A, below) to the center of the LED beams (B and C) to calculate eye movement.

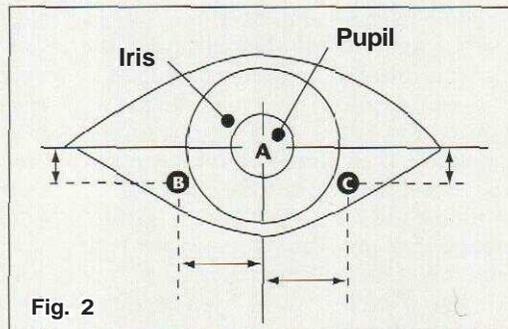


Fig. 2

this point, a *basis sensor* converts your eye's image into an electronic signal for microprocessing. (See Fig. 2.)

The tiny dedicated computer in the system marks the center of your eye and the center of the original LED beams. These locations, after processing, provide the camera with the exact point in the viewfinder that you are looking at as a continual stream of information. The camera responds to your eye's movement as quickly as you move your eye.

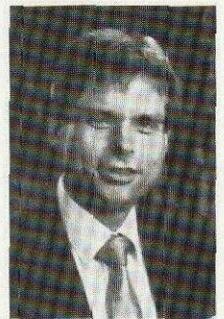
Recalling the Facts

1. Describe the location of the focusing target in a standard auto-focus camera.

2. Describe the location of the focusing target in the Canon Eye Control Camcorder.

3. Describe the conceptual framework of Canon's Eye Control system. **TD**

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