

# Spy Screen

Only you can see the pictures hidden on this computer screen.

## WHAT TO DO

Simply put on the special glasses to reveal the hidden pictures on the blank white computer screen.

## WHAT'S HAPPENING?

Examine the two plastic films that look like sunglasses lenses. Now place one film in front of the other and look through both pieces together while rotating either one. The amount of light passing through depends on the rotation angle, and at just the right angle you won't see anything at all. They seem to act like adjustable sunglasses. These are called polarizing filters, and they only allow light waves that vibrate in a certain direction to pass through completely. Think of light waves like shaking a jumprope. You could shake it vertically, but you could also shake it horizontally or any other angle in between. Suppose one film only lets the vertical waves pass through, then a second polarizing film could let all, some or none of those light waves pass, depending on its angle. Each pixel in an LCD computer display acts just like this polarizing filter, and its angle can be turned by a unique voltage signal to that pixel, just like when you turned one filter. But you still need a second filter to adjust the brightness. For our "spy" screen, we peeled off the polarizing filter that normally covers the entire screen, just like taking away one of your filters. No matter how you turn only one filter, the brightness never changes, and no matter what signals are sent to each pixel, they all look the same (white) to our eyes. When you put on polarized glasses, however, you effectively replace the film we peeled off the display, and now only you can see what's really there.