Adaptive Appleseed
Assistive Technology for Visual Impairments

Modified Eyeglasses for Sharpening Focus of the Front Sight

Visual impairments can be caused by trauma, disease, congenital conditions, or simply through the aging process. Some visual impairments are correctable with prescription eyewear. Before undertaking the modification described in this document, the reader is advised to consult an optometrist and get a vision exam.

The eyeglass modification described was developed because the age 50 plus author was having a difficult time getting the front rifle sight in focus. Astigmatism was creating a situation where neither the rear sight, the front sight, or the target were particularly sharp, but most importantly, the all-important front site was fuzzy enough, even with prescription eyeglasses, that rounds could not be accurately delivered to the target.

After some research using Google, technology was discovered that promised a possible solution to this rather common problem. Two commercially available devices are:

1. EyePal http://www.myeyepal.com/

2. Lyman Hawkeye™ "Shooters Optic" Aid http://www.lymanproducts.com/lyman/sights/hawkeye.php

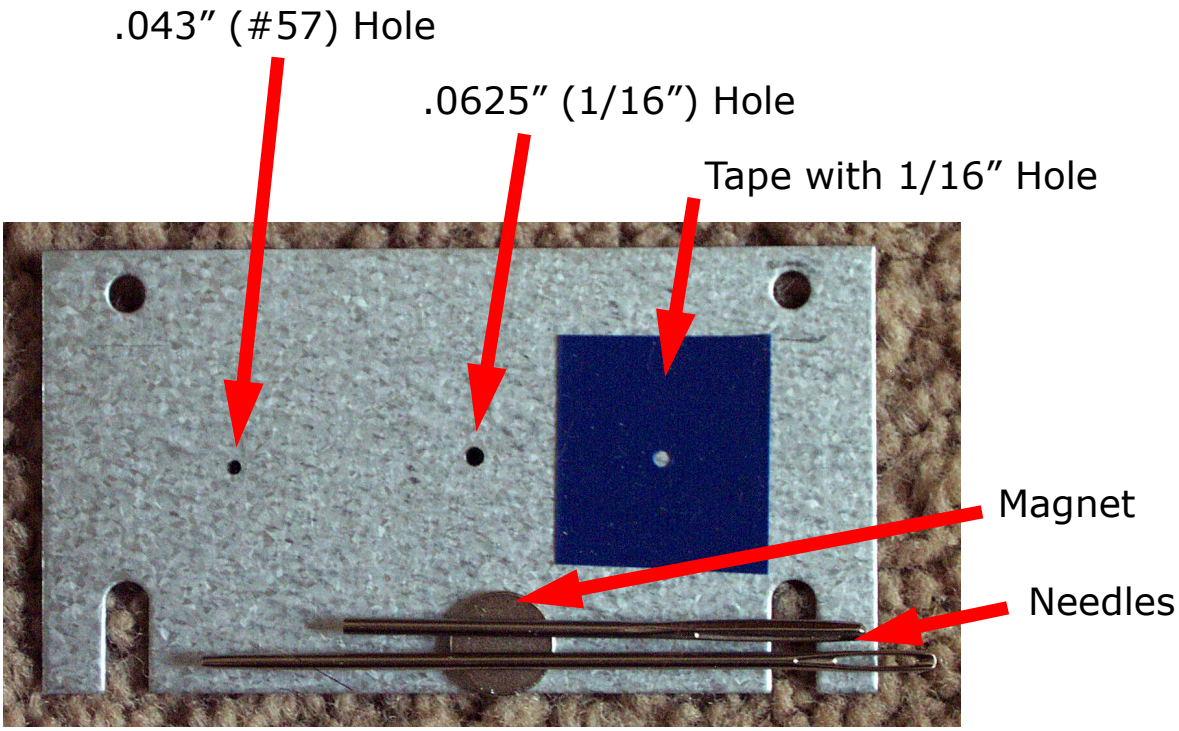
Since these devices seemed fairly pricey, and the effectiveness questionable, I sent my optometrist the above links and asked for his opinion.

He wrote the following *"...You could make your own by placing a small nail size hole in the center of any sticker and place it on*

your glasses. This is a simple pinhole which causes light to be "diffracted" rather than "refracted". Any small pinhole will give a larger depth of focus. This concept was used in pinhole cameras for years. (You can Google "diffraction" if you want to see how it affects light rays.) Bottom line, it will improve your depth of focus, but will decrease your peripheral vision and spatial awareness."

Creating Sharp Pinholes in Vinyl Electrical Tape

With the Docs encouraging words, I then began experimenting and found that a homemade pinhole sticker actually did work as long as the hole was small and the edges sharp. I came up with a cheap, simple pinhole cutting die and punches to create small holes with sharp edges in electrical tape. See Photograph 1 for details of the sticker die and punches.



Photograph 1. DIY Sticker Die and Punches.

This die can be used to create both .0625" (1/16") holes and .043" (#57) holes. The metal plate is a piece of scrap steel that is about 1/16" thick from an old computer. I started with the 1/16" diameter hole because that was the smallest drill bit in my arsenal. With that success, and wanting a slightly smaller hole, I ordered a #57 drill bit and drilled another hole in the plate.

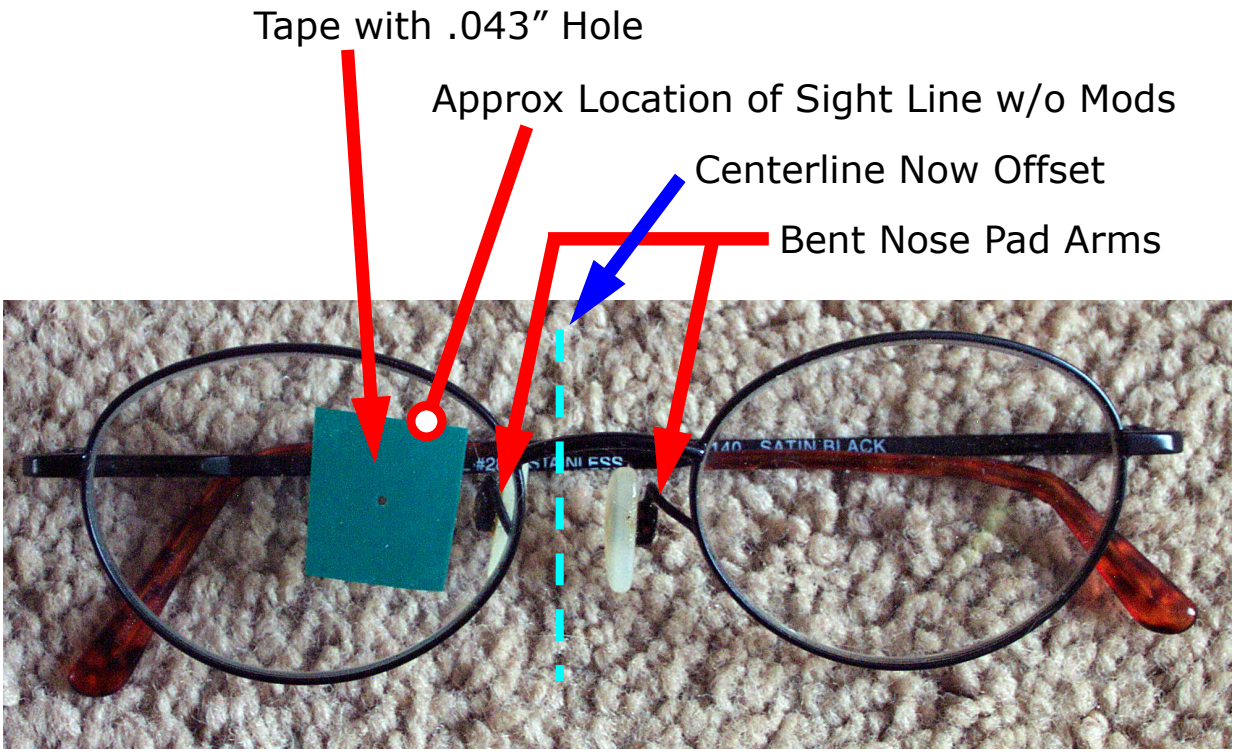
To make the punches, I trimmed the points off two heavy duty sewing needles. One needle is sized for the .0625” hole and one is for the .043” hole. The points were trimmed flat (using a stationary belt sander with a fine abrasive) until each needle just barely fit into its respective hole. When not in use, the needles are kept in place on the die plate with a magnet from an old sunglass case.

To create a pinhole sticker, I simply cut a square of vinyl electrical tape, place it over either of the two holes, and then push the matching needle through the tape and into the hole. Then, just peel the tape off and you have a pinhole sticker ready to attach to your shooting glasses. Hopefully the pinhole sticker will work fine on your shooting glasses without any modification to the glasses, but if not, read on.

Modifying a Pair of Prescription Eyeglasses

I needed to put the pinhole sticker on a pair of prescription glasses that I could use for shooting. I used an old pair of eyeglasses that correct for my astigmatism. They also happened to have a non-glare coating which seemed like a good idea for shooting glasses. But I discovered a problem when I used the glasses to look through an AR’s battle sights; my line of sight with a good cheek weld was very close to the top inside edge of the lens. As a result, I was getting a lot of optical distortion of the front post, the target, and especially of the rear peep.

This particular pair of eyeglasses were old and otherwise unused, so I decided to do some major modifications to the nose pad arms on the glasses in order to shift the lenses higher and to the left (I am right-eye dominant and shoot right-handed). This permitted my line of sight to fall closer to the center of the lens where there was no distortion. See Photograph 2 for the a description of the eyeglass mods.



Photograph 2. Modified Eyeglasses with Pinhole Sticker.

Bending of the nose pad arms was done very carefully with a small needle-nose pliers. This is a trial and error process. One thing you have to be very mindful of is metal fatigue; i.e. if you bend the nose pad arms back and forth too many times, the arms WILL break.

To reduce the possibility of this happening, just take it slow and easy. Make certain of which way you need to bend the nose pad arms BEFORE you start bending. Then, bend a tiny bit at a time and check the fit by getting a cheek weld on your weapon, getting your sight picture, and checking where the line of sight through the lens is. You might also have to slightly adjust the temple frames and tips to fit your ears more comfortably.

The objective is to shift the lenses so that the line of sight passes as closely as possible through the center of the lens, where there is the least optical distortion.

All that’s left to do is to shoulder your rifle, get a cheek weld and sight picture, and place the pinhole sticker so that the hole is lined up with your eye and the sights. It helps if you have some-

one either put the tape in place for you, or if you have them help hold the rifle in place while you place the sticker.

Happy (and accurate) shooting!

Using the Die and Punches at an Appleseed Shoot

The die and punches can be stored in an envelope or small Zip-loc® bag for transport to an Appleseed shoot. Don't forget the electrical tape! If you have a shooter who is having trouble getting the front sight into focus, just make a sticker for them to try. It may not be ideal without the eyeglass mods described above, but it should give them an idea if it will fix the problem or not, for zero cost.

Resources

Drill Bit Size Chart: http://www.carbidedepot.com/formulas-drillsize.htm

Here is a #57 bit 10-pack for $3.84 with free shipping: http://www.amazon.com/SE-Drill-Bit-57-Pkg/dp/B000O5JOS0/ref=sr_1_1?ie=UTF8&s=miscellaneous&qid=1280714562&sr=8-1

Here is a single #59 (.041") bit for $1.10 with free shipping: http://www.drillspot.com/power-tools-and-metalworking/machine-cutting-tools/jobbers-length-drills/?spc=Shank%20Dia.%20%28In.%29%3D0.0410

Tip: It should go without saying, but these small bits break very easily. When drilling with such small bits, use a drill press if you have one and set it to its highest speed. Lightly punch the hole location in the metal plate with a sharp center punch. This will help keep the tiny bit from wandering and breaking. Use a drop of oil to lubricate the bit, and drill slowly, especially if you are drilling into anything thicker than sheet metal.

I raided my wife's sewing box for the heavy duty sewing needles. I'm just kidding (I'm not stupid!); I told her what I was going to do to the needles and she kindly gave them to me anyway! You can get these at any sewing supply store such as Jo-Ann Fabrics.