

Construction Details for N.I.R.E.
Type-2 Field-Expander Eyeglasses for People with
Left *Homonymous* Hemianopsia
or Bi-Temporal Hemianopsia ... or Hemianopic-Monocular Vision

This is Addendum No.1 to each of these three original papers, titled:
Vision Aids for People with *-* Hemianopsia
any of these types
Homonymous, Bi-Temporal or Monocular

(Please click on any of these links to see the original paper)

http://www.abledata.com/abledata_docs/Homonymous_Hemianopsia.pdf
http://www.abledata.com/abledata_docs/Bi-Temporal_Hemianopsia.pdf
http://www.abledata.com/abledata_docs/Hemi-MonoVision-Aids.pdf

Hemianopic FX Glasses, TYPE-2 have *almost* the appearance of ordinary eyeglasses, fit in most standard eyeglass frames, are light-weight and low-cost - but DO require special user intelligence, awareness or training. They can be made as single vision, bifocal or trifocal glasses and may accommodate just about any corrective lens prescription. **H-FX Glasses, TYPE-2 are recommended for some (but NOT all) people with Homonymous, Bi-Temporal or Monocular Hemianopsia. They expand BOTH central AND peripheral vision to the blind side and are beneficial for all outside activities, including bicycling and driving.**

Important Notes:

- (1) **TYPE-1 Glasses** - TYPE-1 Glasses for any of these three types of Hemianopsia should always be dispensed and used first, because they are easy to use and require no training, memory or special effort and do not endanger anyone's safety. They look like ordinary single vision lenses with no added prisms and are inexpensive to buy.
- (2) **PREPARATION** - TYPE-2 Glasses should be fitted to the patient as a second pair after the patient has become comfortable using the TYPE-1 glasses and when it is established that he will be able to learn to use the Type-2 glasses safely and usefully.
- (3) **TYPE-2 USER TRAINING IS REQUIRED** because of the special prism segment added on one lens which the user must learn to use. Learning to use the added segment is comparable to a person learning to use a bifocal add for the first time. TYPE-1 Eyeglass users require no training; the glasses are

effective even for stroke or brain damaged patients whose cognitive functions are impaired. On the other hand, TYPE-2 glasses require conscious judgment and reasonable cognition for use.

- (4) **TYPE-2 USER ACTIVITIES CAN BE DANGEROUS** – Most people desiring these glasses want them for potentially hazardous outside activities such as riding a bicycle, walking in high crime areas, or driving a car or boat. And, YES, they can be and usually are helpful for such activities. However, patients need to be cautioned as follows, for their own safety and for the safety of others:

(A) YES, these glasses do help in these situations because they expand, toward the blind side, BOTH central and peripheral vision. BUT, while expanding the vision, up to 6 degrees CENTRAL and up to 25 degrees PERIPHERAL, they do not restore the full, normal vision that was lost. Even with these glasses, hemianopic drivers must have and use appropriate inside and outside rearview mirrors and must follow careful defensive driving techniques.

(B) COGNITION and JUDGMENT by the user are most important for safety when using these glasses. Unfortunately, some hemianopes became so from a stroke or other brain damage. This same stroke or brain damage may also have caused changes in cognition or judgment and may even have affected arm or leg movements or physical coordination.

(C) FOR HEMIANOPES WHO WISH TO DRIVE, we recommend that they: (1) be fitted with TYPE-1 glasses and become comfortable using same; (2) they then be fitted with TYPE-2 glasses and learn to use them when walking outdoors; and that (3) they be referred to a rehabilitation center that does driving evaluation & training for post-stroke patients. The driver assessment and training staff at the stroke rehabilitation center will be able to:

- a. assess the person's physical coordination, arm, hand and leg functions as to safety and/or assistive device needs.
- b. assess the person's cognitive and judgment capabilities and help decide if the person can drive safely once licensed.
- c. assist the patient to learn to use glasses and mirrors properly for safe driving.
- d. assist the patient, when ready, to arrange a state road test so as to be properly licensed to drive with the special glasses, mirrors, training, etc. Or, if the patient should not drive, to convince him of the need for and wisdom of such a decision.

- e. assist the patient with any on-site assessments or retraining at his workplace, for using machinery or engaging in possibly hazardous activities, using the Type-2 glasses.

TYPE-2 EYEGLOSS PRESCRIPTIONS & SPECIFICATIONS - These glasses can be prescribed and/or dispensed by any eye-care professional, ophthalmologist, optometrist or optician. Retesting is needed at dispensing - so, if gotten from an optician, return visits for testing and evaluation by the prescribing doctor are advised.

TYPE-2 glasses are identical to TYPE-1 glasses in basic design and construction. The same Age Table data should be applied. An important difference is that, while TYPE-1 glasses can be bifocal or trifocal, **we recommend that TYPE-2 glasses be only single vision, or bifocal**, for easier use. This lessens the weight and fragility, and enhances the peripheral vision expansion characteristics of the TYPE-2 glasses. This is yet another reason why a hemianope should have *both* TYPE-1 *and* TYPE-2 glasses.

Please refer to the EXAMPLE information at the beginning of this paper. We assume the patient is a **LEFT HEMIANOPE** who is 30 years old and that he will have TYPE-2 glasses that are single vision, either plano or with a weak prescription. We assume he was tested and that 5 prism diopters were decided upon for his main or carrier lenses, both prisms to be BASE-LEFT for this patient who is blind to his left side.

This is how his glasses will be constructed:

1. EYEGLOSS FRAME: Plastic or metal eyeglass frame that is light weight but rigid, preferably with two or more connections, one across the nose bridge and the other at the top of the frame. The eye sizes should not be too large because the prism lenses could become too thick. The height of each lens should be moderate and the width should be greater than the height. The two lenses are either plastic or polycarbonate – not glass.
2. RIGHT LENS: plano or Rx single vision - with 5 prism diopters BASE-LEFT
3. LEFT LENS: plano or Rx single vision - with 5 prism diopters BASE-LEFT

A prism segment, made as described below, is cemented to the inside surface of the left lens, with its exact location being determined by trial fittings before it is cemented on. (Note: the Age Table does NOT apply to this add-on prism – it applies only to the prism carrier lenses in the frame.)

CAUTION - Do NOT use a fresnel lens (grooved plastic) as the add-on prism. Fresnel lenses are of such poor optical quality as to be entirely unsafe and unsuitable for this application.

Do order from an optical lab, a round plano plastic or polycarbonate lens having 15 or 18 or 20 prism diopters. Its diameter should be the same or only slightly greater than the height, in millimeters, of the eyeglass lens. The base curves

should be as close as possible for the eyeglass lens (e.g. 5 prism diopters) and the add-on lens (e.g. 15 to 20 prism diopters). The add-on prism lens does not need to be edge ground. (Note: most people prefer the 15 prism diopters add-on lens for its smaller thickness and lower weight)

For the example of our left hemianope, the add-on lens which will be cut on a precision power saw, so that a vertical segment is made of it.

The prism base is to the left. The thick protruding part of the prism is inward toward the person holding it, and the flatter side of the segment is toward or in contact with the inside surface of the left lens.



Figure 1: Rear View - Prism Segment Cemented to Carrier Lens

The vertical add-on segment is the height of the lens, or slightly less, and about ¼” to ½” wide. A belt sander may be used to smooth the edges which were rough from having been cut or sawed.

The eye doctor or refractionist can temporarily use putty, clay, rubber cement, or adhesive tape to temporarily secure the add-on segment to the left eyeglass lens, on the inside, near the left (outer) edge.

The add-on prism is moved very gradually toward the patient's nose with the patient looking straight ahead. If the patient sees the add-on while looking straight ahead, then the add-on is too close to the nose and must be moved away from the nose. Ideally, the patient will NOT see the add-on at all when looking ahead or just slightly toward his left. However, when he turns his eyes far left, as if to look behind himself, he will see through the add-on prism, to his left. He will gain 5 degrees from his carrier lens no matter where he looks, plus 15 degrees from the add-on, giving him a total of 20 degrees expanded peripheral vision to the left (blind side). He will be able to turn his head and look behind.

When the optimum location for the add-on segment is found by trial and error testing, the add-on is cemented to the carrier lens using a permanent epoxy or cement of a type commonly used by opticians for mounting adds and other types of lens segments.

Add-on locations vary from patient to patient, from eyeglass frame to eyeglass frame, and differ if there is or is not sparing of the macula.

The need for this trial and error testing and for manual cementing of the add-on is a major reason why this technique has not come into more widespread use. It is suggested that a local lab or optician in a given geographic area might be more interested in handling these needs if patients are referred regularly for this type of work.

The benefits to patients with Homonymous Hemianopsia are so great that it really is worth the effort to make available to all hemianopes, TYPE-1 glasses, and to those who might benefit even more, the additional TYPE-2 glasses.

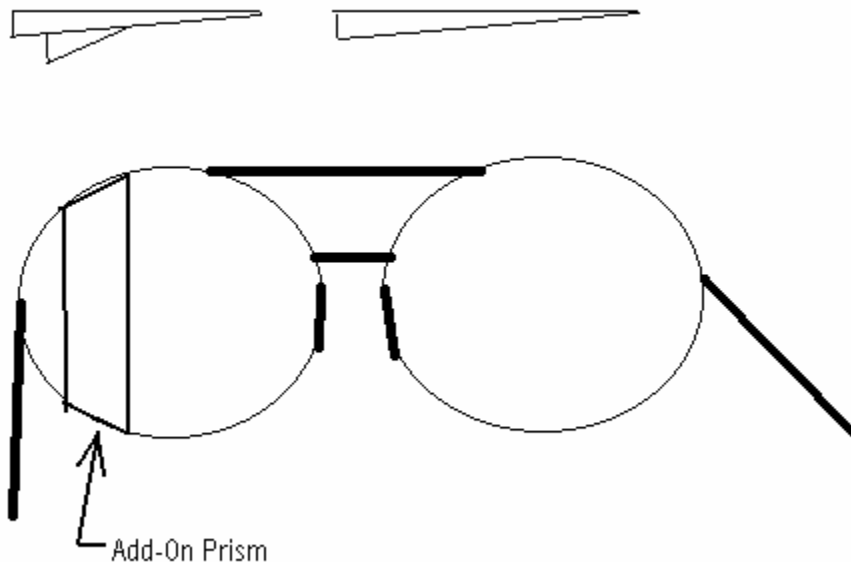


Figure 2 – Rear & Top Views of TYPE-2 Glasses

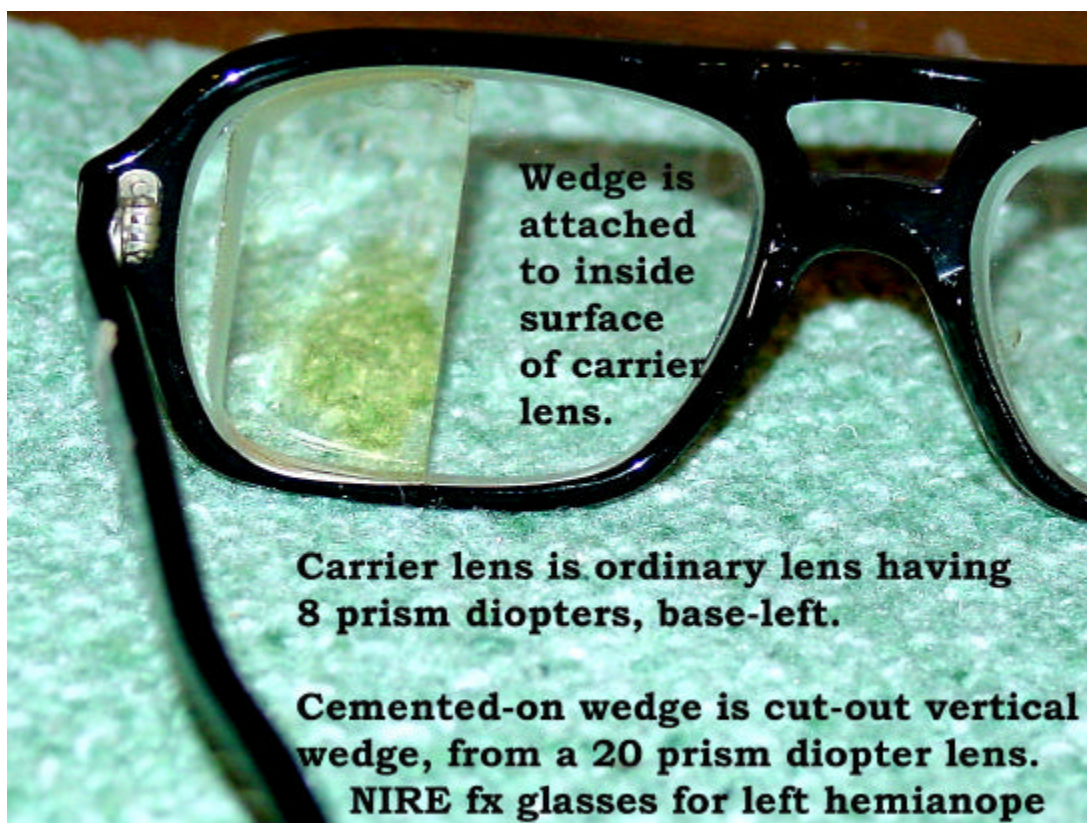


Figure 3: Rear Close-Up of Prism Segment Cemented to Carrier Lens

This view, Figure 3, shows that the Type-2 add-on prism segment was cut and still look crude and of less than professional quality. Even so, this segment and other like it, were fully useful because the front and back surfaces had been professionally ground to prescription specifications by the laboratory supplier from which purchased. Only the edge-shaping remained to be done by the dispenser. His equipment allowed for quality edge grinding of round or oval lenses - but not of a vertical lens or prism segment.

Is there a simple, affordable solution to this problem? Yes! At first, we permitted each patient to select any eyeglass frame that he or she desired. from a large assortment. This meant that the prism segments were different for every frame and had to be hand sized and shaped. Finally, we selected two basic frames - one for men and one for women and children. We made drawings of the segments we needed, showing size and shape, for each of the two frames. With these drawings, we were able to negotiate with several labs terms wherein they would make for us pre-cut, sized and shaped prism segments of professional quality. No prescription corrections were needed because those needed are provided in the carrier lens. The segments were standardized as to number of prism diopters (20), direction of prism (base-left or base right) and overall base curve. To obtain these pre-shaped and pre-sized prisms at low cost, we had to order a minimum quantity - usually 25 or 50 at one time.

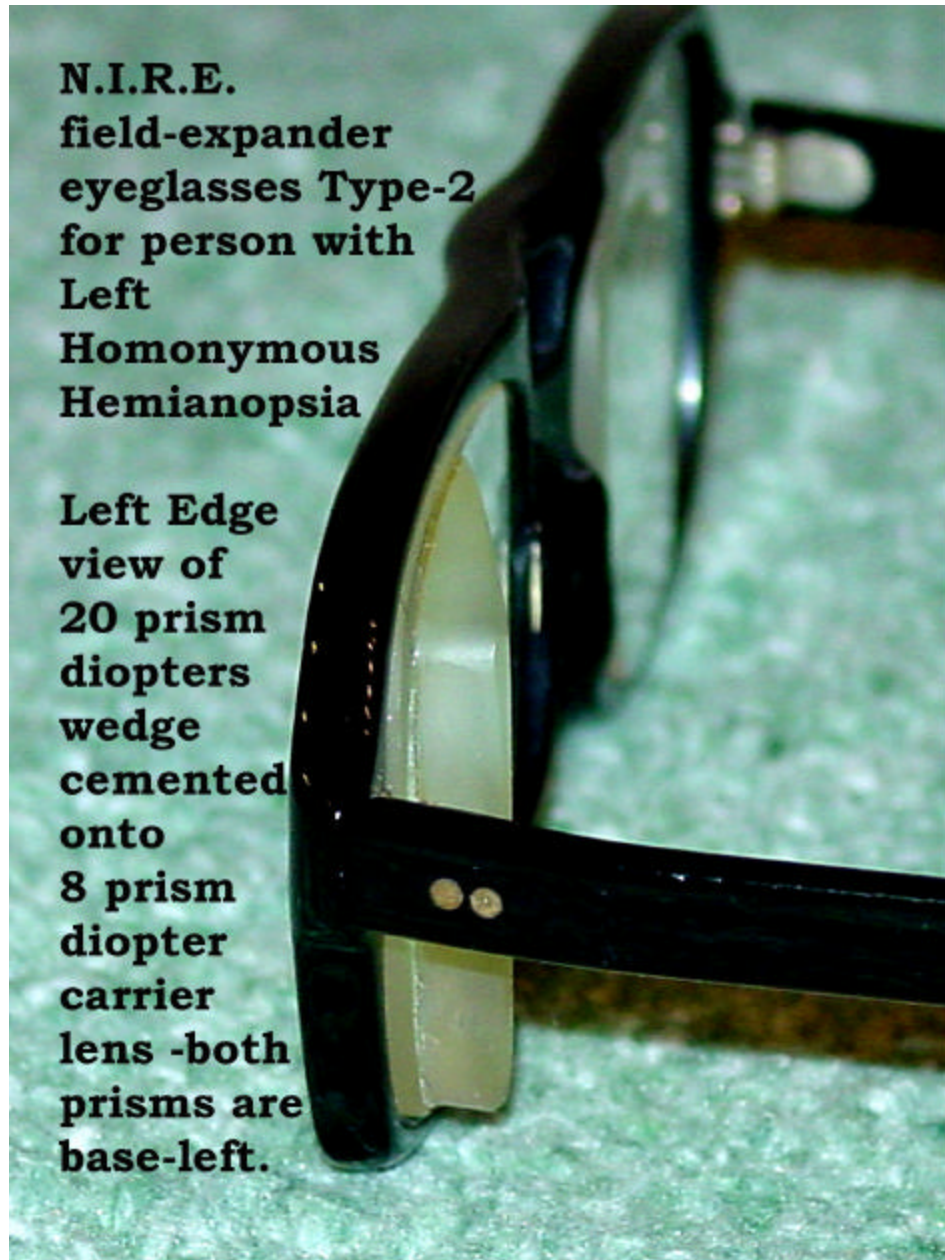


Figure 4: Edge Close-Up of Prism Segment Cemented to Carrier Lens

For additional information or free technical support, please email: nire@warwick.net or contact us by regular mail or telephone.

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