

OPTICS INSTITUTE TRIP REPORT  
5-20-59

Dr. P.E. Pashler and Dr. W.E. Glenn of the Research Laboratory, Dr. W.E. Good and H.J. Vanderlaan of TVRD were present at a meeting with Prof. R. Hopkins, Director of the Optics Institute, University of Rochester, Rochester, N. Y.

This trip was arranged by Dr. Pashler on a straight consultation basis with Prof. Hopkins to discuss the optics in a Schlieren system as may be used in projection color TV. Reference was made to a relative article in a recent issue (Nov. '58), of the Journal of the Optical Society of America. Observations and conclusions were as follows:

1. Prof. Hopkins is a quiet, good listener, who says no more than is necessary.
2. Suitable for the Schlieren lens in our present system will probably be an aspheric achromat consisting of two elements cemented together, one with an aspherical surface (the most curved one), the other with a spherical surface. The input and output slit systems will be cylindrical surfaces with radii of about  $3/4$  of the distance to the principal plane of the lens. The green bars and the magenta bars will each have a cylinder axis that is parallel to the corresponding slots, so that the two axes are perpendicular to each other. Spherical aberration is corrected by the aspheric surface. Chromatic aberration is corrected by the second element. Prof. Hopkins estimated a circle of confusion of 0.016 inches due to chromatic aberration before correction.
3. The Optics Institute has a program for their IBM 650 Computer which allows them to design lens systems for any specific requirement within a day or two. The estimated cost of designing our lens would be around \$1000.
4. An outside supplier, such as the American Optical Co. or Perkin-Elmer Co. would be needed to manufacture the lens. Estimated cost - \$1000. The large cost is due to the special tools that are required for the aspheric surface.
5. Plastic lenses are a long range possibility but the tools are expensive.
6. Fresnel lenses have definition limitation of about 0.1 inches.
7. A Schlieren lens can also be constructed from two spherical achromats (four lenses in all, two cemented doublets), the main disadvantage being reflections from the extra surfaces which would tend to spoil the dark field. This type of lens is easier to design and considerably cheaper to make, at least in experimental quantities.
8. Dr. Pashler suggested that we go ahead with the design and construction of the aspheric achromat for the present system. H. Vanderlaan is to take care of the required liaison, TVRD to pay, Research Laboratory to arrange, and Dr. Glenn to approve.
9. Secrecy. Prof. Hopkins stated that work done in the University is discussed throughout the Department. This has the advantage of more ideas and solutions but the problem and its source are no longer kept in confidence. If secrecy is required he can recommend a private consulting firm, of which he is a stockholder, which could probably do the job faster than the University, although it might be more expensive. They have access to the University computer.

10. We should decide the following:

- (a) Need for secrecy.
- (b) Design and build aspheric lens, now or later.
- (c) Design and build double achromat, now or later.

WEG

W. E. Good

HJV

H. J. Vanderlaan  
Advanced Development Engineering  
Television Receiver Department

WEG:HJV:REL

CC: GA Schupp

P Humeniuk

VC Campbell ✓

PE Sullivan

TT True

PE Pashler - Res. Lab.

WE Glenn - Res. Lab.