

USE OF COLOR FILM IN MAKING ANAGLYPHS FROM BLACK AND WHITE PRINTS

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THE December 1952 issue of PHOTOGRAMMETRIC ENGINEERING contained an article by the present author entitled: "Three-dimensional prints from color film" (Vol. 18, pp. 827-830). In the course of reviewing that paper for publication, correspondence between Mr. George P. Tyson of the U. S. Naval Photographic Center and the writer brought forth certain minor corrections and additional points that should be mentioned. Due to a misunderstanding for which the editors are not responsible, these corrections and additions were not made, and are herewith appended to the original article.

First, the original title should not be construed as indicating that three-dimensional prints in full color can be made by the anaglyph method from color photographs. The title of the present discussion is more precise in covering the nature of the suggested technique. Color film is used as the basic material by use of which anaglyphs can be prepared from black and white aerial photographs.

Second, the use of the term "print" with regard to the anaglyph produced is not strictly correct. As with most uses of commercially available color film, *transparencies* rather than *prints* in the strict photographic sense were produced.

Third, it should be realized that the value of the method is that it can be carried through by anyone simply by using materials that are readily available in any photographic laboratory. While the quality of the resulting anaglyphs may be good, it will probably be impossible to eliminate a ghost image completely in the anaglyph transparencies. This is due to the nature of commercially available color films, in which the three dyes used overlap in their spectral reflectance. The anaglyphs, nevertheless, are of sufficiently good quality to be used in the field by personnel who are not trained in stereoscopic study of the separate prints, or under conditions where such study is impractical.

Fourth, although the best stereoscopic effect is obtained when the same filters are used for viewing as were used when the anaglyph was prepared, this is not always practical. In some cases, the difference in light transmittance of the two filters is such that it is difficult to adjust the spectral quality of the light source so as to balance the amount of light transmitted by the two filters, especially under field conditions. For example, the current (18th) edition of "Kodak Wratten filters for scientific and technical use" recommends that Wratten filters Nos. 24 and 60 (or 40) be used for two color separations with tungsten light source. For general viewing, however, the use of filters Nos. 25 and 44 is recommended.

Tests of these filters resulted in anaglyphs of good quality. Faint ghost images were present, but these did not interfere noticeably with the viewing of the anaglyph. Pending tests of filters 21 and 39 previously suggested together with suitable viewing filters, the published Eastman Kodak recommendations for two-color separation probably should be followed.

Fifth, the previously published statement with regard to the taking of direct anaglyphs is probably unduly optimistic. Further tests have indicated that satisfactory results can be obtained only when the objects being photographed have a spectral reflectance such that images of comparable density can be registered through the two taking filters.

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Finally, it is hoped that the preliminary tests described in the previous paper will stimulate further work along the indicated lines. A very real need exists for low-cost three-dimensional prints suitable for field use, and the use of readily-available color film seems to be very promising in this regard.

NEWS NOTE

INTERNATIONAL TRAINING CENTRE FOR AERIAL SURVEYS—DELFT

The Centre intends to organize a summer course of advanced photogrammetry for a limited number of technicians, desiring more knowledge of special problems. The planned time is June 22 to July 25, 1953.

The planned program includes

1. *Problems of aerial photography*: Quality of aerial photographs as basic material for photogrammetry, calibration and testing of cameras; Camera stabilization, Air Navigation—F. L. Corten (15 hours)
2. Comparison of various *methods of relative orientation*, including mean square errors in the elements of orientation and deformation of the model—A. J. v.d. Weele (10 hours)
3. *Various types of plotting equipment*, their principles, qualities and limitations and Test of plotting machines, demonstration of the use of these instruments—Prof. Dr. W. Schermerhorn (20 hours)
4. *Methods of aerial triangulation*: Computation and adjustment of aerial triangulation—Prof. R. Roelofs (10 hours)
5. *Application of photogrammetry* to various engineering projects, cadastral surveys, town planning, soil survey, exploration, etc.—B. Scherpbier, A. J. v.d. Weele, and the permanent staff of the Training Centre (10 hours)
6. *Lectures by specialists*: Prominent photogrammetrists of other European countries have been invited to lecture on their special subjects. These will be later announced to the members of the course.
7. *Discussions*: There will be sufficient opportunity to discuss subjects of special interest to the whole or part of the group, or for members of the course to read about special problems or experiences.
8. *Practical Exercises* (100 hours)
The following equipment is available: *Stereoscopes* for transfer of points; *Multiplex*, Williamson, including projectors Bausch & Lomb; *Kelsh Plotter*; *Wild Autographs* A4, A6, A5, and A7; *Santoni Stereocartograph* IV and Stereotopographs type B; *Zeiss Stereoplaniograph* C8; *De Koningh* Kuipers plotter; *Radial triangulators*, Zeiss and De-Koningh. *Rectifier* Wild E2.
9. *Excursions* to: Aerodrome Amsterdam and KLM Aerial Surveys; Military Topographic Service at Delft; Survey Dept. of the Ministry of Public Works at Delft and to its field parties.
Working language: All lectures will be given in English. Instructions during practical exercises either in English, French or German.
Conditions: Tuition fees \$60 or its equivalent of Dutch Guilders 230.-. Latest date for sending in applications for attendance, June 6, 1953. Maximum number of members, 30. Applications will be accepted in order of application date. The Centre offers help in reserving board and lodging for members sending in their application before May 15. Estimated cost for board and lodging in private rooms in town for the 5 weeks is Fl. 270.—(\$70). Excursions will be paid by the Centre.

For applications and all information write to the Registrar, International Training Centre for Aerial Survey, 3 Kanaalweg, Delft (Netherlands).