

REPORT OF COMMITTEE ON RESEARCH

AIM OF WORK

The principal efforts of this Committee, for the seven months of 1951 that it was in existence have been directed toward the problem of obtaining better photographs, or to state the problem more completely, to find out what factors from the time of taking aerial photographs to the time of their use, give optimum results. This problem, as pointed out by Dr. Macdonald, originates in the aircraft, follows through to the camera and its message, and to the final report of the interpreter.

METHOD OF APPROACH

The general approach of the Committee to this problem was first to solicit problems from the Committee members and then, through the pages of PHOTOGRAMMETRIC ENGINEERING, to solicit the whole membership of the Society for problems. The second approach was that of assembling a bibliography covering the subjects from aircraft to report.

WHAT HAS BEEN ACCOMPLISHED

The results of these solicitations have been that a substantial number of problems have been received with outlines for their solution, and suggestions as to what persons or organizations can best handle the work. The results in bringing together and indexing the bibliography are most gratifying. This is due to excellent work of Edward S. Wood in obtaining the data and to Stanley T. B. Losee for his vision and care in indexing. The bibliography, while not complete, is now mimeographed and available to those interested. It is hoped that those who have suggestions for additional information will be kind enough to send in these additions that they may be incorporated and a more complete listing obtained. The latest development that should aid those who will eventually work on different parts of the problems is in the development of annotations in this bibliography, by a graduate student at the College of Forestry, State University of New York. Just how much of this can be ac-

complished in the limited time available is questionable.

In addition to the foregoing, a preliminary report from Mr. Stanley T. B. Losee on a comparison of results in using transparencies and glossy prints indicates that better results are obtained from transparencies in measuring tree heights with both the parallax wedge and the parallax bar; that there is wide variation between operators in using both instruments, and that further work must be done before definite answers to the comparison can be obtained. The same type of problem was attacked by Joseph Zarembo using transparencies and semi-matte photographs and a parallax bar. The results showed a positive advantage for the transparencies. These findings can not, however, be considered as final until several other operators perform the same work. A similar project in which tree counts, on limited areas, on these same two media was performed by a graduate student without significant results.

A study was made of marking glossy aerial photographs. This was instituted as the result of a limited questionnaire which indicated that while glossy prints rendered superior detail, semi-matte prints were used almost exclusively because it was possible to write on the latter. The study disclosed that the only satisfactory means of marking glossy prints is by means of a wax pencil but this has the disadvantage of giving a very broad line. It was found, however, that by rubbing the surface of a glossy print lightly with a fine abrasive, as rubbing over with a semi-clean blackboard eraser, it is possible to write on this surface with either a soft pencil or most inks. What hasn't been tested yet, is the very important question of whether this dusting causes a serious loss in image detail; preliminary ocular examination indicates no serious loss.

An excellent report of projects both completed and in progress is the annual statement of the Geological Survey which should be handled as a unit instead of as a part of this report.

WORK TO BE DONE

To accomplish the original aims of the Committee on Research, a work program is to be set up which falls more or less along the lines of the topics listed in the bibliography. These are to be broken down into small projects. It is hoped that some organizations and individuals can give the answers to some of these points as the result of past experimentation. Others of these will have to be investigated as units in themselves. We expect to call on many members for assistance, advice and accomplishment.

RECOMMENDATIONS

It is hoped that the 1952 Committee on Research will look favorably on the beginnings that have been made and will aid in the completion of this work which can not be accomplished in a short period of time but which, with the cooperation of many individuals and companies, can be brought to a conclusion which will greatly advance the usefulness of our science.

JOHN C. SAMMI, *Chairman*
Committee on Research

BIBLIOGRAPHY: BETTER
AERIAL PHOTOGRAPHS

The Committee on Research for 1951 had as one of its principal objectives the assembling of this bibliography. The compilation is available to those who are interested and can be obtained by writing to John C. Sammi, Forestry College, Syracuse, New York. The committee realizes that this first effort will not be a "complete" compilation and will welcome any additional desirable references.

At the last Annual Meeting the Committee was gratified to learn that a number of the projects which it had listed as of importance in obtaining better photographs had already been analyzed by some organizations and in a few cases new instruments had been developed and are being perfected. At this meeting the group which had been working in rather close contact hoped to continue these relationships as a subcommittee on research. Mr. Earl Rogers of Northeastern Forest Experiment Station was elected as Chairman and Mr. S. T. B. Losee of the Abitibi Power and Paper Company, Vice Chairman.

JOHN C. SAMMI, *Chairman*

U. S. GEOLOGICAL SURVEY

PHOTOGRAMMETRIC RESEARCH PROJECTS—1951

1. *Kelsh Plotter*.—A number of U.S.G.S. 1951 model Kelsh Plotters have been procured and are now undergoing tests in map production. Engineering design, aimed at further refinement of the plotter, continues.

2. *Twinplex stereoplottling instrument*.—Field tests of the first map sheet compiled by Twinplex have been completed. The results indicate excellent performance by the instrument. Additional Twinplex mapping projects are in progress.

3. *New Type of stereo-projector*.—Construction of a prototype is under way for a new type of projector, having an improved system of illumination and a diapositive of approximately one-half negative scale, giving better visibility and scale in the stereoscopic model. This projector is designed for use with either vertical or Twinplex photography.

4. *Foreign photogrammetric equipment*.—The reconstruction and development of the

Bauersfeld Panagraph and other foreign instruments continues.

5. *Tracing tables*.—Tracing tables of a new design are now being procured in quantity. The new features include: A counter-type device for reading elevations directly in feet at various scales, increased range of vertical motion of platen, and elimination of shadows on the platen. A further development undergoing tests is a new height-reading device in which the image of the vertical scale is projected on a wall for ease in reading. Service tests are also being conducted on tracing tables having illuminated glass scales, interchangeable for various plotting scales.

Service tests have been conducted of a newly-developed floating mark consisting of a small illuminated sapphire which replaces the illuminated hole in the tracing table platen. The sapphire gives even visibility of the floating mark in all parts of the model, eliminates glare, and makes

reading from the back side of the table more reliable. This new type of floating mark has proved to be very satisfactory and is being put into general use.

6. *PK 9-lens photography*.—An experimental compilation of a one-degree quadrangle utilizing PK 9-lens photography has been completed. The compilation consisted of a slotted templet laydown for control, followed by Kelsh Plotter stereo-compilation. Accuracy tests by field methods are scheduled for 1952.

7. *Airborne Profile Recorder*.—Compilation tests are in progress using vertical control obtained by a profile-producing radar altimeter. The profiles are correlated with vertical and oblique photography and elevations of control points are read from the profiles. Preliminary comparison tests between APR profiles and profiles derived from Multiplex mapping indicate accuracy probably adequate for 200-foot contouring in areas such as Alaska.

8. *Shoran-Controlled photography*.—A test compilation is under way to determine the accuracy with which the exposure stations of aerial photographs can be recovered from Shoran measurements.

9. *Control extension by the photogrammetric means*.—Continued investigation is being made of the following methods of control extension:

- a. Use of terrestrial photography taken with a precise photo-theodolite for horizontal and vertical control.
- b. Photo-trig (determination of elevations by using photogrammetric distances scaled in the office and vertical angles measured in the field).
- c. Extension of horizontal and vertical control by means of a combination of a photo-alidade and high oblique photographs. Field testing of an experimental project is nearing completion.

10. *"Distortion-free" lens*.—A cartogon (Topogon V-type) high resolution lens of

negligible distortion has been mounted in a camera having a special cone constructed by the Geological Survey, and flight tested over a controlled area.

11. *Diapositive printer with correction plates*.—Performance tests are under way on a recently procured diapositive printer in which, among other features, distortion compensation is accomplished by the use of an aspheric correction plate in conjunction with a projection lens of high resolution and precision, resulting in superior qualities in the finished diapositive.

12. *Contact printer*.—Performance tests are in progress on a recently procured contact printer having a single adjustable light source of variable intensity. This printer has possibilities for use in making contact diapositives as well as contact paper prints.

13. *Compensating multiplex diapositive plates*.—Experiments are being continued with optically ground diapositive plates to compensate for distortion.

14. *Optical bench*.—A special optical bench suitable for a photogrammetric laboratory is nearing completion.

15. *Camera testing equipment*.—Design is completed and procurement has been initiated for a multi-collimator for the calibration of aerial cameras.

16. *Vision-testing*.—Instrumental methods of vision testing have been adopted as standard procedure for determining aptitude of prospective employees.

17. *Removable and simplified diapositive plate holder*.—The prototype of an improved removable diapositive plate holder for Multiplex and other plotting equipment has been completed. Operational tests are to be conducted.

18. *C-factor*.—Error-theory analysis of field tests of stereo-compiled sheets, for the purpose of C-factors for the compilation instruments used, is under way.

19. *Portable reflecting projector*.—A contract has been awarded for the development and construction of a small portable reflecting projector for field use.