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Efficiency in Stereocompilation

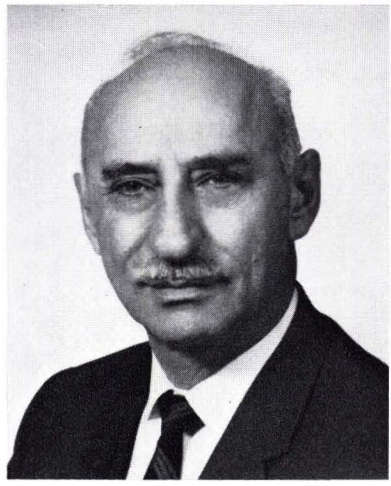
. . . not achieved by short cuts and gimmicks, but by approach, organization, experience, diligence, appreciation and attitude.

YOU MIGHT HAVE NOTICED that my subject has been changed to Efficiency in Stereocompilation from "Short Cuts and Gimmicks." The reason is that in preparing my words on the subject of short cuts and gimmicks, I've been trying to figure out which ones we use as a substitute for work and, as yet, I haven't been able to think of any. In fact I'm not familiar with anything magical that enhances the efficiency of stereocompilation. The basis of efficiency in this area, as in all areas of human production, is in the approach to the problem at hand, the organization of the routine, the experience and diligence of the compiler, his habits while compiling, his understanding and appreciation of the law of acceleration and deceleration which interrupts routines, his consciousness of the quantity element as well as the quality element, and his general attitude.

I think the basic routine of stereocompilation is the same for all types of plotting equipment; however, the physical size of a stereomodel determines to some extent the most logical approach. For example, the neat area of a Kelsh Plotter model is approximately 18 inches wide by 32 inches long. My own familiarity is with Kelsh and 760 Balplex equipment, and we don't use pantographs. We compile the entire model on the optimum 5× scale and obtain larger and smaller scales by use of our copy camera.

Stereocompilation actually begins with the setting up and orientation of a stereomodel and requires a definite skill on the part of the compiler. Nevertheless, since the client buys the map data compiled from the stereomodel, the orientation itself is a means to an end. It is important however that the compiler set up a model in a minimum of time because the set-up time is charged against compilation time. But since there is no real evidence of production other than the lead or ink on a compilation manuscript, let's assume that we have before us an absolutely oriented stereomodel and our immediate objective is to transfer the data from the model to the manuscript medium to which the model is oriented.

OUR APPROACH TO this objective is to visualize the whole compilation routine as a series of *phases* of compilation. Generally, the planimetric content is one basic phase, and the hypsographic content is another. The planimetric phase is compiled also in *phases* of planimetric compilation. Since it is incon-



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venient for a stereocompiler to compile all of an 18 by 32-inch model from one sitting position, our models are compiled in two halves so that an area of approximately 18 by 16 inches is compiled independently and completely from either side of the plotter. An organized routine used by many experienced compilers is as follows:

A. Planimetric Compilation

1. Outline in blue pencil the next area of the stereomodel.
2. Plot RR's, roads, streets, and driveways from all of the front half of the model without intensification of the tracing table lead.
3. Plot buildings by use of red lead in the tracing table. This precludes the necessity to intensify, except for buildings whose alignment must be clarified for the draftsman.
4. Intensify RRs, roads, and streets in ink. Double line RR pens are used when feasible such as for field or country roads.
5. Plot fences and intensify in pencil.
6. Plot sidewalks and intensify in pencil in dash symbols.
7. Plot power poles and intensify with drop bow pen in ink.
8. Plot drainage and drainage structures, such as culverts, and intensify.
9. Plot woods and intensify with green pencil.
10. Intensify control data in ink. This is done at this time to facilitate the placing of identifying names or numbers of control points with respect to cultural detail.

Since at this point the planimetric phase of the compilation is complete, the compiler edits the half model for completeness and clarity and is then ready for contouring.

B. Hypsographic Compilation

Since the plotting of contours is the most sensitive of all compilation, a recommended routine is as follows:

1. Reaffirm the absolute orientation of the model.
2. Plot all index contours in the front half of the model from bottom to top without intensification.
3. Intensify index contours in red pencil when they are definite, i.e., when they track properly, are not in wooded areas, and need no verification by plotting of intermediate contours.
4. Plot intermediate contours.
5. Alter, if necessary, index contours and complete intensification of index contours in red pencil.
6. Intensify intermediate contours in black pencil if photocopying is necessary before drafting. Intermediate contours need not be intensified if drafting involves no photocopying, except in congested areas.
7. Add spot heights as needed during the contouring process.

In the routine itemized above, it is obvious that the compilation by *phases* and the limited intensification and use of color pencil is designed to get the job done as efficiently as possible. Unless there is a density of detail, intensification is done only when all the features of a *phase* of the plotting are plotted. Ink is used in intensifying cultural data usually when photocopying is necessary in preparation for fineline drafting. Color is used primarily to facilitate the interpretation o the map features by the draftsman. Certain features such as power poles are inked also to insure that they aren't obliterated in the continuation of the plotting of planimetric and hypsographic features.

Abstract: *Efficiency in stereocompilation is not achieved by means of short cuts and gimmicks but rather on approach, organization, experience, diligence, appreciation of efficiency factors in all areas of human production, and attitude. It also depends on other operational phases of the whole mapping process. The compiler's approach to the compilation of a stereomodel is in breaking the routine down into "phases of work" doing certain phases primarily to facilitate the completion of subsequent phases.*

In photogrammetric contracting we are compelled by our professional commitment, as well as by the economic factor, to find ways and means to achieve greater efficiency. Indeed there are time estimates on which the contract fee is based and these estimates must be met, but not by means of *short cuts* that will be detrimental to the fulfillment of our commitment to the client. To this end, we attempt to keep our productive personnel aware of the times estimated for the various operations, and we attempt to influence a working atmosphere which is designed to create a compulsion in the minds of personnel to achieve high standards of workmanship in minimums of time.

Notwithstanding the procedures and the attitudes I have discussed, the efficiency of stereocompilation cannot be maximized by the stereocompiler alone. It takes team effort, as in many other fields, whereby each operational phase of the work affects the

(*Concluded on page 940*)

ciently with black-and-white imagery in a relatively high level of ambient light. Second, even before development of the SIA, photogrammetrists had come to realize that the isolated booth in near darkness was not necessary for efficient operation of the anaglyphic plotters. Today, these plotters are often installed in groups of 10 or more in large rooms where the general illumination is only subdued. Compilers freed from the confined environment of the dark booths have the feeling of being part of a team, with a beneficial effect on morale.

Solutions to the fading challenge in stereocompilation as proficiency increases are not easily found. One avenue is through emphasis on the creative aspects of the task of reducing the raw data imaged on the photograph to useful information in the form of a map. Without the creative efforts of the human, the images on the photograph are part of a picture—nothing more. Through his efforts the picture becomes related to a coordinate system on the earth's surface and the photographic images become map symbols, providing useful information for many important activities.

Apart from technological developments, what can be done to reduce the human problems in stereocompilation? These could be reduced to a considerable degree by careful screening of prospective employees. Restriction of employment to only those candidates with good visual ability, introversive self-discipline, dedication to individual performance, an appreciation for the creative challenge of reducing raw data to a useful form, and a willingness to exchange this rather rare combination of abilities for the relatively inadequate salaries paid to compilers would minimize the human problems we now encounter. In today's limited labor market, such screening is virtually impossible.

Since careful selection of candidates with all the desirable attributes is nearly impossible, management is faced with its own creative challenge—that of developing the personnel it is able to recruit into effective, efficient, and motivated employees. To this end the manager must employ the optimum mix of technological developments, aids to vision, and alleviation of undesirable environmental conditions, and then develop in his compilers an appreciation of the creative challenge in stereocompilation in order to reduce the human problems in his work force.

(*Continued from page 935*)

lights of current stereocompilation practices," items concerning the automated procedures have purposely been omitted, rather than impose on other presentations in this panel. I have also omitted any reference to the related uses of the stereoplotter, such as the determination of profiles or volume studies.

Stereocompilation Practices have chalked-up some definite highlights throughout the years. Those currently being achieved undoubtedly *out-shine* those of 10 to 20 years ago. The primary objective of this paper is to stimulate your interest and participation in the panel discussion to follow. We'll be awaiting your contributions.

(*Continued from page 937*)

efficiency of the succeeding phase. In photogrammetric procedure, it is imperative that the quality of the aerial photography be high to permit good stereomodels, that the field personnel fulfill their objective in a thorough and accurate manner and that the computations and the plotting of control data likewise be done accurately. If these operations are not done completely and accurately, it will have a detrimental effect on the efficiency of the stereocompilation which often cannot be overcome by the organization of procedures and proper attitudes. Finally, stereocompilers must accomplish their objectives also with the anticipation of what problems they might create for the draftsmen who must be able to interpret the compilation in order to maximize the efficiency of the drafting operation.