

## ACETATE DRAWINGS

### U.S. COAST AND GEODETIC SURVEY

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#### INTRODUCTION

A major change in the basic medium used for compiling chart revisions, namely the replacement of buff drawing paper with transparent cellulose acetate, has recently expedited the nautical chart maintenance procedure of the U.S. Coast and Geodetic Survey.

No change of such magnitude has affected the Bureau's nautical chart program since the year 1925, when the following three critical changes took place. First, vellum was replaced by metal-mounted paper for use in the compilation and reconstruction of nautical charts. Second, negative engraving was started. Third, the smooth drafting of compilations was abandoned.

#### NAUTICAL CHART MAINTENANCE

Maintaining an adequate, up-to-date supply of all nautical charts has always been the primary function of the Bureau. This responsibility has become increasingly difficult since the Bureau published its first chart (for which copies are available) in 1839, a sketch of Newark Bay. Today, the complexity of this maintenance problem has reached an all-time high, caused primarily by the following conditions. There are currently over 800 nautical charts on issue. Electronic hydrographic surveying developments of World War II (fathometer, shoran and electronic position indicator) have tremendously increased the rate of receipt of information in the office for application to the charts. The new topographic mapping program of the United States has accelerated the receipt of topography. Loran, radar, and other modern electronic developments for navigation require nautical charts of greater hydrographic and topographic detail.

In order to assist the chart maintenance program in keeping pace with these increasing demands, new ideas, excellent but comparatively small, have continually been adopted. Recently, however, it became evident that a basic change was necessary. The primary need appeared to be in the type of medium used for revision work. For over 35 years chart revisions had been compiled in red on lithographic black prints on buff drawing paper, referred to as « Buff Drawings ». Erasures on Buff Drawings were made by time-consuming electric erasing machines, or in the case of large areas by pulling another lithographic print with the deletions made thereon by blocking out at the time of making the print. Source material was applied to the Drawings by burnishing transferable reductions (photographic bluelines or by pantograph) and then inking in red the burnished image. Next, because the revisions were on an opaque medium, it was necessary to use the camera to make a negative and, from that, a transferable redline positive to permit burnishing the revision onto the glass negatives for engraving.

## ACETATE DRAWINGS

After experimenting with numerous transparent mediums to replace Buff Drawings, it was determined that the most satisfactory results were obtained from a sheet of cellulose acetate, matte on one side, .005-inch thick, available in flat sheets (30" × 42" or 36" × 48") or in 40 inch by 10 foot rolls, Eastman Kodak, obtainable from the Cellutone Corporation, 23 East 26th Street, New York, New York. This medium proved so successful under actual working conditions that it was approved to replace Buff Drawings. Therefore, at the regular printing of each chart, a print from the black plate is now made on cellulose acetate, which print is henceforth referred to as an « Acetate Drawing ». The slight distortion in Acetate Drawings (as in Buff Drawing transferable redline positives) is negligible, in view of the fact that revisions are controlled by placing nearby unchanged data directly over the corresponding data on the negative. The principal advantages of Acetate Drawings over Buff Drawings are as follows:

1. Source material (including same-scale chart overlaps) can be traced directly in ink on the Acetate Drawings. Buff Drawings necessitate burnishing before inking;
2. Positions, etc. on Aid Proofs can be traced on the Acetate Drawing, thus eliminating replotting;
3. Unlike Buff Drawings, erasures are easily made on Acetate Drawings — small, with an Exacto Knife (or razor blade); large, with any lithographic ink solvent (Kleeno works well);
4. « Transfer Ink », described later in this article, when used on Acetate Drawings, allows the revision to be burnished directly onto the negative, thus eliminating both the camera (to make a negative) and the processing (to make a redline transferable print) described in item 4a;
- 4a. If, for some unknown reason, Transfer Ink is not used for indicating revisions on Acetate Drawings, redline transferable prints for burnishing the revisions onto glass negatives (for engraving) can be made by contact, thus eliminating the camera step required by Buff Drawings;
5. The transparency of Acetate Drawings facilitates the verification of chart revisions, negatives, and lith proofs;
6. When there is interest in comparing changes between different printings of a chart, Acetate Drawings will eliminate making hand tracings.

## TRANSFER INK

In conjunction with Acetate Drawings, a special ink has been developed by, and is obtainable at, the U.S. Government Printing Office, Washington 25, D.C. This ink, referred to as « Transfer Ink », not only can be easily applied with a pen onto Acetate Drawings, but it also has the phenomenal characteristic of permitting up to three excellent images to be burnished from the Acetate Drawing to the glass negatives without affecting the legibility of the image on the acetate. Transfer ink, at present available in red, orange and green, can be made in practically any desired color and consistency. The Coast and Geodetic Survey is currently using red to indicate revisions to be applied to the black printing

plate, and green to indicate revisions to color plates. At the time of this writing, other colors and modifications of the basic formula are undergoing extensive tests. Changes to something so new are inevitable.

In less than a week after the existence of Transfer Ink became known in the Bureau, two new uses were discovered. The first was for use in making hand tracings on a sheet of transparent plastic for burnishing an image from an opaque compilation onto a negative. The second idea was to use this ink for tracing on the under side of a film positive to permit burnishing shoreline from topographic sheets to hydrographic sheets.

### CONCLUSION

Acetate Drawings and Transfer Ink appear to have tremendous potential values to mapping and charting agencies throughout the world. It is hoped that by modifying ideas presented in this article, many uses will be found in the near future.

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