



Long Term Resource Monitoring Program

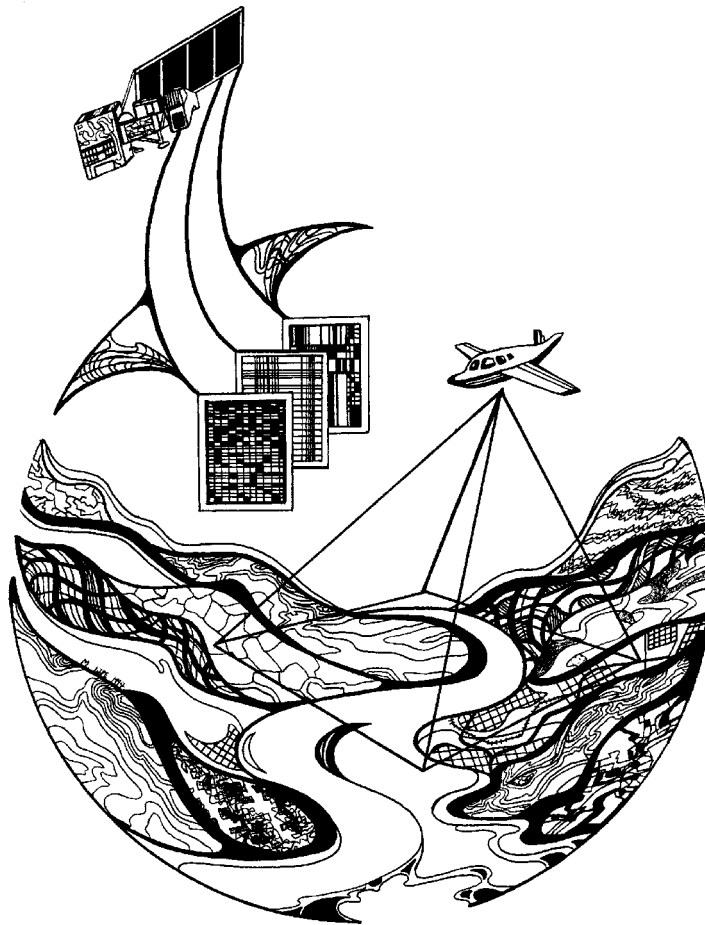
# Program Report

95-P008-5

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Long Term Resource Monitoring Program  
Standard Operating Procedures:

## Manual Zoom Transfer Scope



December 1996

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**Long Term Resource Monitoring Program  
Standard Operating Procedures:  
Manual Zoom Transfer Scope**

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December 1996

Additional copies of this report may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (1-800-553-6847 or 703-487-4650).

This report may be cited:

Owens, T., and L. Robinson. 1996. Long Term Resource Monitoring Program standard operating procedures: Manual zoom transfer scope. U.S. Geological Survey, Environmental Management Technical Center, Onalaska, Wisconsin, December 1996. LTRMP 95-P008-5. 3 pp. + Appendix.

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## Preface

The Long Term Resource Monitoring Program (LTRMP) was authorized under the Water Resources Development Act of 1986 (Public Law 99-662) as an element of the U.S. Army Corps of Engineers' Environmental Management Program. The LTRMP is being implemented by the Environmental Management Technical Center, a U.S. Geological Survey science center, in cooperation with the five Upper Mississippi River System (UMRS) States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The U.S. Army Corps of Engineers provides guidance and has overall Program responsibility. The mode of operation and respective roles of the agencies are outlined in a 1988 Memorandum of Agreement.

The UMRS encompasses the commercially navigable reaches of the Upper Mississippi River, as well as the Illinois River and navigable portions of the Kaskaskia, Black, St. Croix, and Minnesota Rivers. Congress has declared the UMRS to be both a nationally significant ecosystem and a nationally significant commercial navigation system. The mission of the LTRMP is to provide decision makers with information for maintaining the UMRS as a sustainable large river ecosystem given its multiple-use character. The long-term goals of the Program are to understand the system, determine resource trends and effects, develop management alternatives, manage information, and develop useful products.

The strategy of developing and adopting standard operating procedures is included in the LTRMP Operating Plan (USFWS 1993) as Strategy 4.1.1, *Develop and Update Information Management Guidance Documents* under Objective 4.1, *Provide Direction for Automation Activities*. This report was developed with funding provided by the Long Term Resource Monitoring Program.

# Long Term Resource Monitoring Program Standard Operating Procedures: Manual Zoom Transfer Scope

By Thomas Owens and Larry Robinson

## Abstract

The manual zoom transfer scope is a device that allows for simultaneous viewing and scale matching of a variety of sources (such as aerial photos, plats, and surveys) to a georeferenced base map, such as a U.S. Geological Survey topographic map. After the zoom lens is used to adjust for scale differences, data can be transferred (traced) to a stable base overlay (such as mylar or acetate) and digitized by using a geographic information system.

## Introduction

We describe the procedures used to manually transfer linework from interpreted aerial photography to a mylar base map overlay in preparation for manual digitizing.

## Initial Project Meeting

Meet with the client to determine requirements. Are needs well defined? Does the client need help in determining the best mapping approach? Some of the following questions may be relevant: What is the client's objective? What information does the client want? What base map is best suited to meet the client's needs?

- a. Determine the best method and materials to meet the client's requirements.
- b. Define the study area boundary.
- c. Determine the data themes to be mapped.
- d. Estimate project time and materials.

## Acquire and Prepare Source Materials

- a. Ensure that base maps, photography, and cartographic supplies are available or on order.
- b. Obtain or prepare a flight line index, photography, and base maps.
- c. Obtain source materials (photos, orthophotos, base maps, or other items) and make certain there is adequate coverage to complete drafting.

## Zoom Transfer

- a. Use a Zoom Transfer Production Log form (Appendix) to record photos and track progress.
- b. Review the Zoom Transfer Scope (ZTS) manual if necessary (Image Interpretation Systems, Inc. 1992).
- c. Determine which ZTS lens (.7×-1×, 2×, 4×) is best suited for the project. This will depend on the scale of the base map and source material and the complexity of the source data. Select the lens that displays the greatest work area, while maintaining ease of drafting and minimum eye strain.
- d. Turn on the ZTS stage and table lights. Adjust to desired intensity and location.
- e. Locate the area of the source photo or map on the base map.
- f. Tape the interpreted overlay to the source photo or map, taking care to register the overlay. Tape clean mylar overlay to the base map, marking fiducials and writing the base name on the overlay.
- g. Place the source photo or map on the glass stage, upside down. If roll film is used, obtain and attach the reel brackets to the ZTS.
- h. Place the base map on the table under the ZTS.
- i. Look through the eyepieces and adjust the focus so that the source map and the photo are sharp and easily read. If focus cannot be achieved by adjusting the eyepieces, it may be necessary to adjust the stage height up or down by slowly loosening the large black knobs on either side of the ZTS and tightening at the height where the photo image is sharpest. The base map focus can be adjusted by moving the optical lens in or out of its threaded housing.
- j. Rotate the source map or photo using the image rotation knob so that the base map is in a convenient position for transfer.
- k. Pick several readily identifiable points (road intersections, lakes, towns) that can be seen on both the source material and the base map, preferably at the same general elevation.
- l. Maneuver the source material until the points are visible and clearly viewed through the ZTS lens.
- m. Manipulate the light switch to provide a simultaneous view of the source material and base map.
- n. Adjust the zoom control knob to match the scales of the source materials and base map. Use as many natural and human-made features (such as streams, valley, and roads) as possible to ensure accurate alignment.
- o. Using weights or drafting tape, fasten the base map on the table when the scale and viewing area coincide with the source map or photo on the stage.
- p. Confine all work to an area covering roughly two-thirds of the radius of the area of view. Images become distorted toward the edge of the viewing area.



- q. Transfer lines from the source material to a base map overlay using a black film lead pencil. Lines should be distinct and uniform. Avoid soft leads since they tend to smear easily.
- r. When the area of view has been completed, move to an adjacent area, realign, and repeat the procedure.
- s. When line drafting is completed, remove the source material from the stage and label the map features with their attribute codes.
- t. When drafting and labeling are completed for each source material item, enter the completion date in the Zoom Transfer Production Log form (Appendix).
- u. When finishing one map overlay and beginning another, match all lines and attributes that extend across the map edges to adjacent maps.
- v. When the entire base map overlay is completed, submit the base map, map overlay, and production log to your supervisor. The supervisor will cross-check the overlay against the source materials for errors, including smudged or sloppy work, unclosed or missing polygons, improper alignment, and incomplete or missing labels.
- w. The base map and final overlay are ready for digitizing.

## **References**

- Image Interpretation Systems, Inc. 1992. Zoom Transfer Scope Manual. Rochester, New York. 65 pp.
- U.S. Fish and Wildlife Service. 1993. Operating Plan for the Upper Mississippi River System Long Term Resource Monitoring Program. Environmental Management Technical Center, Onalaska, Wisconsin, Revised September 1993. EMTC 91-P002R. 179 pp. (NTIS #PB94-160199)



REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, D.C. 20503			
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE December 1996	3. REPORT TYPE AND DATES COVERED	
4. TITLE AND SUBTITLE Long Term Resource Monitoring Program standard operating procedures: Manual zoom transfer scope		5. FUNDING NUMBERS	
6. AUTHOR(S) Thomas Owens and Larry Robinson			
7. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Geological Survey Environmental Management Technical Center 575 Lester Avenue Onalaska, Wisconsin 54650		8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Geological Survey Environmental Management Technical Center 575 Lester Avenue Onalaska, Wisconsin 54650		10. SPONSORING/MONITORING AGENCY REPORT NUMBER 95-P008-5	
11. SUPPLEMENTARY NOTES			
12a. DISTRIBUTION/AVAILABILITY STATEMENT Release unlimited. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (1-800-553-6847 or 703-487-4650)		12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The manual zoom transfer scope is a device that allows for simultaneous viewing and scale matching of a variety of sources (such as aerial photos, plats, and surveys) to a georeferenced base map, such as a U.S. Geological Survey topographic map. After the zoom lens is used to adjust for scale differences, data can be transferred (traced) to a stable base overlay (such as mylar or acetate) and digitized by using a geographic information system.			
14. SUBJECT TERMS Edge tying, lens selection, photo/map alignment, project definition, quality control, scale matching, source materials		15. NUMBER OF PAGES 3 pp. + Appendix	
		16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT

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The Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System was authorized under the Water Resources Development Act of 1986 as an element of the Environmental Management Program. The mission of the LTRMP is to provide river managers with information for maintaining the Upper Mississippi River System as a sustainable large river ecosystem given its multiple-use character. The LTRMP is a cooperative effort by the U.S. Geological Survey, the U.S. Army Corps of Engineers, and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin.

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