

# **“Riding the Rails” to Efficiency; a Production Line for 25,000 Glass Negatives**

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While planning the digitization of the *Milwaukee Polonia* project, it was clear very early in the process that unless 25,000+ 5x7 glass negatives could be handled efficiently and safely, the project was in for a long haul. Once a digital camera was selected as the most efficient method of digital capture, which reduced the ‘scan time’ to about 1/30<sup>th</sup> of a second, the next issue was “How can we keep the camera busy safely and efficiently?”, as a camera that’s waiting for work loses its speed advantage.

The main component of our solution is a simple system of low friction rails which allow the negative to proceed from their storage box, under the camera, and back into their archival envelopes and boxes in order and without excessive handling.

The rail system provides a number of advantages;

- Consistent registration of the negatives
- The order of the negatives is easily retained
- The archival envelopes can be slid along with the negatives, reducing possible errors
- The operators can see the negatives in sets instead of individual items
- It allows for variations in the process, i.e. items can be held at either end if needed
- To a limited degree, the process can be ‘backed up’ to check or correct issues
- The setup is very inexpensive, and therefore can be tailored for single-project use

From the beginning, it was assumed that an ‘imaging team’ was the best solution for efficiency. The project was designed to have scheduled team sessions which could produce very high output, rather than grinding away day after day in solitude.

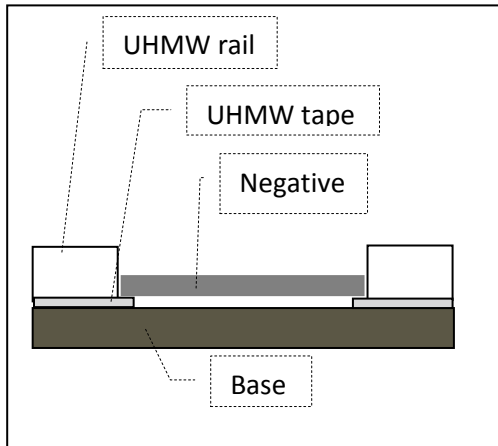
## **The Rails**

The base of the rails is standard laminated shelving, in this case a total of 18 feet of 12” wide white shelving. White was chosen because it allows viewing of the negatives and the only area to be concerned with glare is about 1 foot nearest the camera. 3 lengths of shelving are connected with joining plates and securely fastened to underlying tables with clamps and screws, all of which is leveled and squared.

A cutout in the approximate middle of the base allows for a standard light box/copy stand setup, with the light box placed on a lower table so that the rail base passes over it with minimal clearance.

After a pilot project using a prototype of the rails with wood strips and art board determined that all functioned as advertised, the production system was built using more specialized components (see diagram below). The rails are 1.5”x1” ultra high molecular weight (UHMW) polyethylene bar material, which is a very dense, low friction material used for commercial package handling systems and

woodworking shops for jigs and fences. The UHMW was purchased in 10' lengths. The other UHMW



component is thin tape, also used for woodworking applications. This is 1/32" thick, sold in 3" widths which was re-cut to 1" strips. The combination of the rails and the tape insure that the items can be moved along the rails with minimal friction and minimal contact. The negatives touch only the thin edge strips of UHMW tape, with the rails serving as horizontal guides.

The rails, set parallel at approximately 5 1/8" apart, were secured to the base with wood screws every 6" to minimize any gaps, but first the UHMW tape was put down underneath to provide roughly a 3/16" lip so that the

negatives ride only on the non-exposed margins. The tape was then trapped under the rails when secured. As the negatives pass over the light box, the tape is the only support, and the tape adhesive was removed from this area with solvent which allows any stray details on the extreme edges of the negative, such as a hand-written serial number, to be captured with only a slight reduction in transparency. To strengthen the tape while over the light box, additional UHMW pieces were secured from underneath to trap the tape from the bottom. The white UHMW also reflects the edge light to some degree.

From the prototype, we saw that any gaps, joints, or burrs were very obvious as the sharp glass edges moved along the rails, as well as impeding the envelopes as they slid on top of the rails. Therefore, the production system was made much more precisely, with the longest pieces of rails and tape possible to avoid joints and seams. All screws were countersunk and the holes shaved with wood chisels, and any joint or edge was similarly shaved, tapered, and eased. We have found that after several thousand items, despite the density of the UHMW, the rails and tape benefit from a session with a fine sanding block to smooth nicks inflicted by the glass edges and corners. The rails and base are also wiped and dusted before each use.

The other component of the setup was lighting and camera control. The processing room has traditional bad quality recessed fluorescent lighting, and in order to avoid turning all room lights off, we located sheets of black cardboard and form core at strategic spots, using wire from the suspended ceiling and on computer monitor edges. This basically isolates the small camera area while avoiding the tomb-like ambience of many digitizing areas. The input and output areas of the rails remain normally lit.

The camera was remotely operated from a nearby computer and a second monitor was installed so the process was more visible to the digitizing team.

The rail system and lighting were developed to address a specific production issue, and has a limited life expectancy. With the 5x7s finished, other sizes such as 4x5s were sent along the rails vertically. When it came time for several hundred 8x10s, we modified the system by enlarging the cutout and moving the lower rail and tape to provide an 8 1/8" path.

Now that the project is finished, the remarkably low-cost system will be retired. When testing, a more flexible and adjustable system was considered, but time was a factor, and we chose to address the most obvious need, which were the 5x7 negatives. Possible improvements include a more portable system with an adjustable lower rail perhaps sliding in milled keyhole slots, non-adhesive strips which can adjust more easily, and inserts for different negative sizes. Maybe next time....

More information on the *Milwaukee Polonia* project and other UWM digital collections can be found at <http://uwmdigitalcollections.wordpress.com/author/uwmdigitalcollections/>