

## MALware Technical Report

Heyer Inc. Conqueror Stencil Duplicator 1777

libi rose striegl

PhD Candidate, University of Colorado at Boulder (USA)

[libi.striegl@colorado.edu](mailto:libi.striegl@colorado.edu)

### Abstract

This document serves as a brief look at the history of mimeography generally and of the Heyer Inc. Conqueror Stencil Duplicators specifically. In addition, it serves as a technical manual for the operation of the Conqueror Stencil Duplicators that are housed in the collection at the Media Archaeology Lab and a record of the sensory experience of interaction with them. Finally, it offers some speculative propositions for revitalizing the machines for present-day use.

### About the Author

Libi rose striegl is a PhD candidate at the University of Colorado at Boulder, where her research pursuits include investigations of obsolete technologies and interrogations of convenience, productivity, and dysfunction. Her work can be viewed at [libirose.com](http://libirose.com) and she can be reached on Twitter by the handle [@libi\\_rose](https://twitter.com/libi_rose).



A MALware Technical Report  
the Media Archaeology Lab  
University of Colorado at Boulder  
1320 Grandview Avenue  
Boulder, CO 80302  
<http://mediaarchaeologylab.com>

## **Introduction**

The Media Archaeology Lab is home to two Heyer Inc. Conqueror 1777 stencil duplicators . These machines were donated in new, unused condition with packages of stencil paper and ink, as well as two spare impression rollers and an instruction and maintenance booklet that appears to have been produced on a similar machine. Their mechanical function was tested prior to use, and all gears and belts are in excellent condition. The machine casings are clean and unblemished and the extra parts are all present. These machines can be considered fully obsolete or functionally extinct, because the stencil paper required to operate them is no longer produced nor is it easy to acquire - unlike the expendables for some semi-obsolete technologies such as typewriter ribbons it has not been hoarded and there are no suppliers in evidence on eBay, likely due to the fact that waxed paper does not keep well in rooms that are not properly climate controlled. As such, the intention of this project is to serve simultaneously as a historical summary, a hands-on investigation of the native workings of the machines, and a speculative document regarding potential reinvigoration of the machines using modern digital production tools.

## **A Brief History**

The technical processes that led to the mimeograph were developed in the 1800s - namely the rotary press, the papyrograph, the flatbed duplicating press and the electric pen. The electric pen and flatbed duplicating press were part of an Edison patent titled 'Autographic Printing' issued in 1876. That patent was licensed to A.B. Dick in 1887, who developed it into a printmaking system that used ink forced through wax paper stencils cut with a stylus and coined and trademarked the term 'Mimeograph'. The mimeograph - a genericized trademark name - was then produced and sold using the Edison brand. The basic process involved a drum filled with ink over which a stencil was stretched, which was then pressed to a piece of paper to allow ink to press through the holes in the stencil. The initial system involved a flatbed that permitted a single page at a time to be pressed. It evolved to a system that moved paper beneath the rotary drum using rollers - a process initially patented in 1891 by David Gestetner under the name 'Automated Cyclostyle'. Further steps included motorizing the rotation of the drums and the paper feed so that many sheets could be fed through very quickly, as well as stencils made of wax impregnated fiber paper rather than simply wax paper to allow for more detailed stencil creation. Stencils were created using a variety of modes but the most common was the use of a typewriter with the inking ribbon disengaged.

The mimeograph and similar systems became popular extremely quickly because they did not require special skills or a large amount of space. A single person with a typewriter and a mimeograph could function as a small press relatively easily. This led to widespread growth of

self-published newsletters and booklets, especially in the form of zines and fan fiction magazines. They were widely used through the 60s, 70s and 80s until Xerox copy machines became widely available and their convenience and low cost priced out the mimeograph. Mimeographs could still be found in the wild in public schools and libraries through the early 90s, due to the budget constraints of public school districts and the slower adoption of new duplication technologies. However, the lack of access to stencil paper ultimately doomed the machines.

From the issue 33/34 of the S&H Letterzine in 1982, Barbara Green Deer described the advantages and disadvantages of the mimeograph as follows:

Mimeography, like spirit duplication, is a process where you must provide much of the labor involved in the printing. Many of the same drawbacks are also true of mimeo, although the general quality of mimeo reproduction is higher, and long runs are possible with mimeo masters. In mimeo reproduction, ink (usually black, but can be other colors) is forced through a screen which has been cut out in the area of the copy, generally by being typed on. The ribbon of your typewriter is disengaged when you cut a mimeo stencil, so that a crisp, clear image is cut into the stencil. Some schools and churches (or fans really into mimeo) own electrostencil machines. This machine will produce a mimeo stencil from black on white copy much as a Thermofax produces a ditto stencil. This allows for the use of original artwork instead of art which must be drawn directly on the masters.

Mimeo machines are either hand-cranked or electric. Mimeo is also a rather messy process, and the ink has a tendency to stick to and rub off on the next sheet out of the machine. It's common practice to slipsheet, or insert a blank sheet in between mimeographed sheets to prevent this transfer of ink. A knowledgeable, careful mimeo operator can produce a fine-looking zine for the cost of the masters, paper and ink....and a lot of your time. Multiple color runs are also possible, can look very classy but add greatly to the time and mess.

One major drawback of mimeography, regardless of the way the finished pages look, is that the paper which must be used is quite heavy and porous. This makes a rather bulky zine for the page count and adds considerably to your mailing costs. Be sure you have access to the proper equipment in good working order, and know exactly how to operate it before attempting a mimeo zine. Expect to put in a great deal of time on the reproduction.

The machines in the MAL are of the variety that would have been prized by fanzine communities. Heyer Inc., the manufacturer of these units, was a general purpose office machinery manufacturer specializing in duplication systems. In addition to stencil duplicators or mimeograph machines, Heyer also produced Spirit Duplicators. Heyer Inc. was originally a producer of hektograph systems, which was a gelatin transfer system developed concurrently with the mimeograph process and the spirit duplication system. The hektograph system was sold as late as 1974, and has recently been revived for artistic printmaking purposes.

## Tactile Interaction

The machines are heavy in the way that not much is anymore, with a balanced weight that provides evidence of the stout machinery inside. They have a smooth, beige, black and stainless steel surface. Assembling the machines requires some initial disassembly in order to access the attachments to install the impression roller, a dense black rubber cylinder that is not quite smooth and feels as though it should give more under pressure than it does. The stencil drum must be removed and the machine inverted to properly access some of the adjustment points.

The stencil drum requires inking prior to use, and is covered in a heavy fiber paper that includes some instructions on proper use. The ink is thick and viscous, somewhat like acrylic paint and with a smell that belies some clear level of toxicity. Using the included dipstick to measure the ink level, the machine is then turned on in order to ink the fabric stencil pad that surrounds the drum. Several rotations of the drum press ink through the perforations in the stainless steel drum and then onto the fabric pad. Removing the protective cover from the drum proves messier than expected and some ink oozes out onto the table.

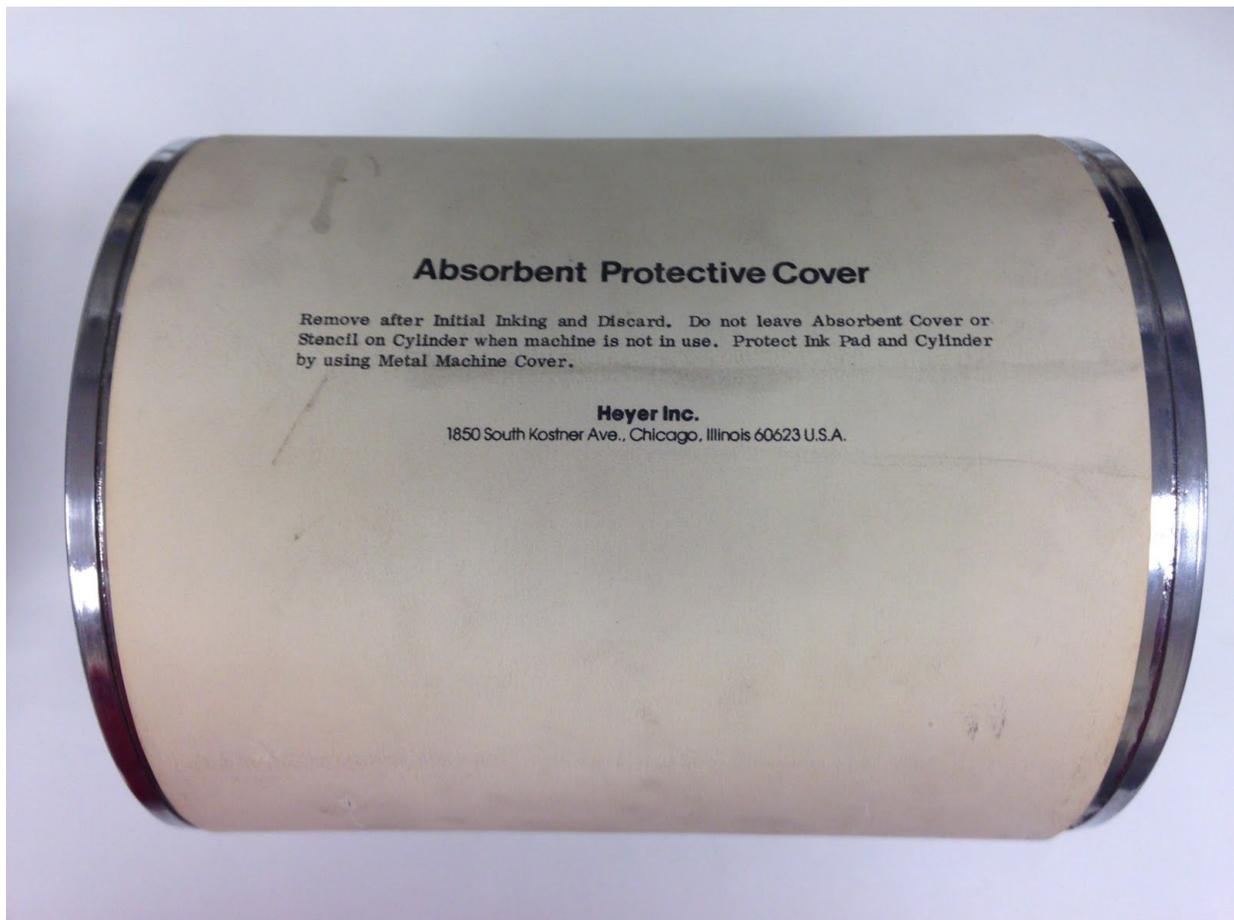


Fig. 1: Stencil drum with protective cover



Fig. 2: Protective sheet from stencil drum, after initial inking

The stencil feels and smells like an old, slightly warm crayon. The wax scrapes away from the fiber paper beneath with some effort. The stencil itself is very thin and the fiber paper tears easily.

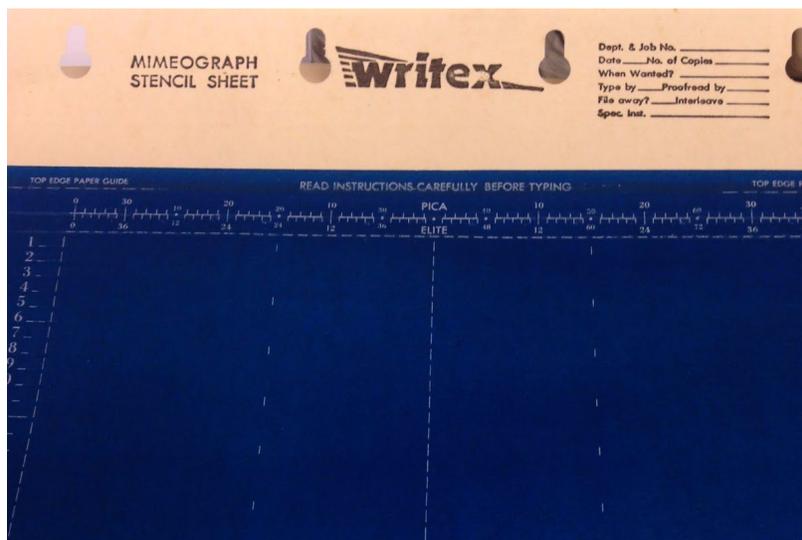


Fig. 3: Stencil Sheet

When the drum is in operation, it makes a heavy thudding with each rotation of the drum and quickly shoots pages through from the feed tray to the collection tray. The machine vibrates but is quieter than expected with such heavy gearing. While much has been made of the smell of mimeograph ink, it does not seem different to me than any other printmaking ink - somewhat oily in smell and texture and a bit acrid as it dries.



Fig. 4: The view from the feed tray

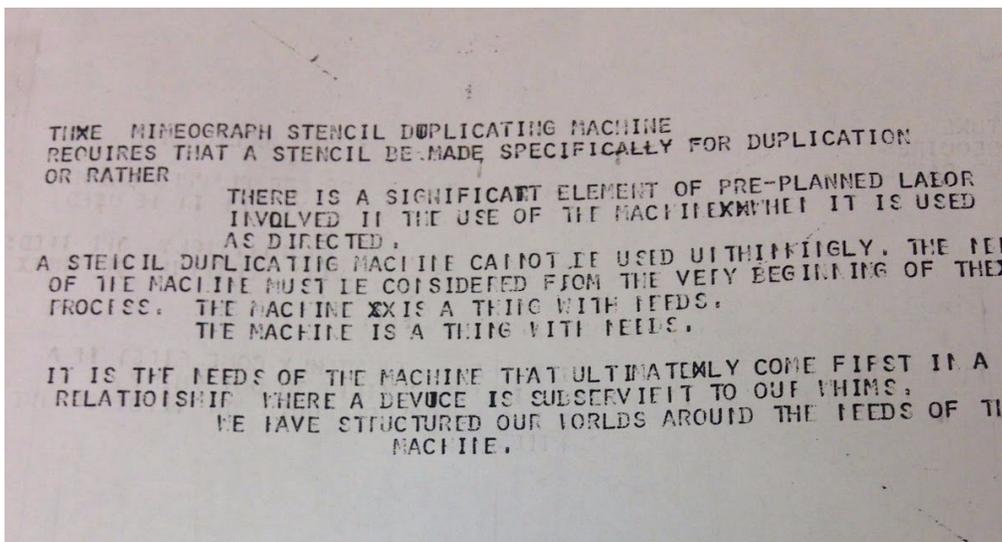


Fig. 5: Initial test print

## **Requisite steps for use**

- Stencil creation, either using a typewriter or drawing directly onto the stencil (or on a cover sheet, to better pull wax from the fiber paper)
- Stencil installation, carefully placing the stencil onto the stencil drum
- Checking the ink level
- Inking the stencil, by allowing the drum to rotate a few times with no paper in the feed tray
- Feeding paper and counting impressions
- Allowing pages to dry - a slip sheet between pages may be desired
- Removing stencil and storing between sheets of blank paper
- Storing the stencil drum with cap up
- Clearing interior works of lint and paper debris

## **Potential for Reanimation**

Stencils for mimeographs, as stated above, are not easy to source and are no longer in production. There may be some stockpiles that are possible to access but further research is required to determine a regular supply. For this reason, research is being conducted into methods for reinvigoration of the machines for continued use in their present, mechanically sound state.

There are two possible avenues for reanimation of the mimeograph once the supply of stencils in the lab is exhausted. The first and most promising is the use of a laser engraver to cut digitally produced stencils into vellum. The advantages of this method, once testing has been completed, include speed of production as well as level of achievable detail. This method would also be extremely cost-effective. The initial tests have proved nearly but not completely successful, so further iterations are necessary. The second potential method that is being explored is to use screen print screens cut to fit the drum. This method would be time consuming and not particularly cost effective, but would provide very detailed and extremely durable stencils. Further testing will be conducted on both methods to determine a sustainable protocol for future use of these machines, primarily for art making.

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