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THE OXBERRY 5117 OPTICAL PRINTER

THE NEW OXBERRY MODEL 5117 OPTICAL PRINTER

The new version of this famous piece of equipment makes possible a greater degree of creativity for the technical craftsman

By JOSEPH K. LANDSMAN

Creativity, originality, innovation, and other like terms are common in the film industry today. However, not only can these terms be applied to the directors, writers and others in similar categories, but also to the technical craftsmen who work behind the scenes in creating the masterpieces of the screen. The consideration of the technician as a "creative" craftsman is very evident in the field of the optical technicians—the men who create the vast array of new and intricate ways to take the celluloid and split it, crush it, segment it, overlap, dissolve, split screen it and on and on. The need for ever-increasing technical flexibility has created demands on the equipment itself, and the result of these demands has been the creation of the new Oxberry 5117 Special Effects Step Optical Printer.

This printer is not a revision or redesign of the previous models; it is a new printer that combines the features of the previous models, as well as offering the capability and flexibility of four projector heads, along with many other innovations. Since the new Oxberry 5117 is a symmetrical optical printer, it offers a precision control over its components and their integrated relationships never before attained in optical printing.

To better understand the value and precision of the new printer, let us first examine one of its prime features—the light valve and light source. Few people are aware that the size of the image formed by the lens is altered as the F/stop is changed. In precise printing, a change in the image size can result in a mismatch of mattes during a zoom. Previously, the way to minimize this problem was to use a complicated system of neutral density filters, or stop motion photography, so that mattes could be checked and resized as the zoom progressed. Even with these methods, there remains a vast optical prob-

lem. As the zoom progresses, the F/stop has to be changed, and having started with the lens wide open and ending with the lens at F/11 or F/16, we will have used the maximum optical performance of the lens. During operation, the negative will reveal that the optimum optical performance will be at approximately two stops down. Before and after this point there will be deterioration.

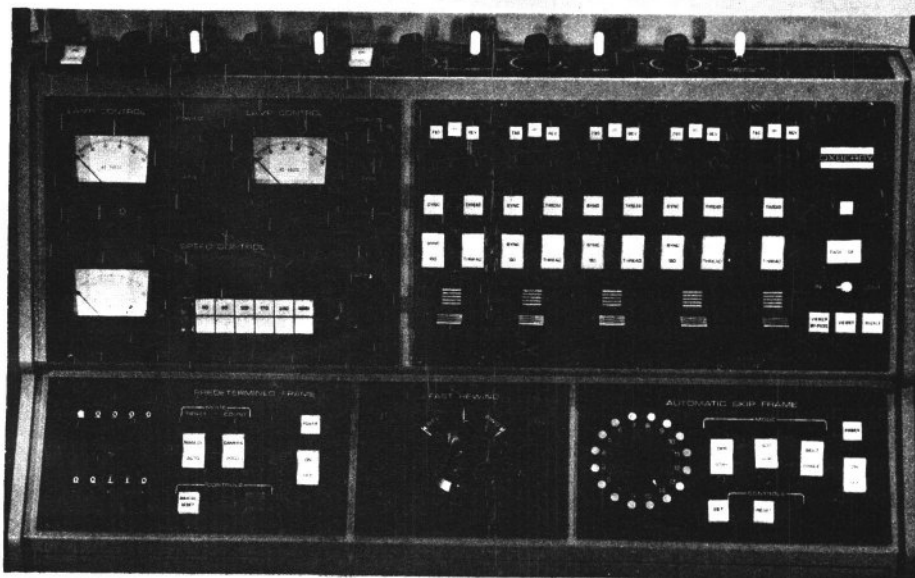
The solution to the problem of mismatching mattes is the development of the light valve. The valve senses and maintains the required light value regardless of the distance the light rays have to travel.

Variations in light value are achieved by changing the amount of light available to the optical system with the opening or closing of the valve. The operator chooses his initial setting—the proper intensity for a given scene. He

sets the density dial indicator, marked in 52 increments of .025 log E each, and proceeds to set up the various film planes. For example, the dial is set up at 26 for 1-to-1 of a given scene. By changing the camera and lens position, the operator goes to 2-to-1 enlargements in a continuous zoom. The light valve automatically opens, maintaining proper exposure throughout the zoom. If the zoom runs out of light, the printer will automatically respond, notifying the operator to return to his original position and reset his controls until he has reached the necessary requirements to make the zoom.

The electromechanical function consists of a transducer which electrically measures the distance between the film planes, feeds this information to an amplifier, which in turn is given to a nulling transducer. This transducer

Control console of the new Oxberry 5117 Special Effects Step Optical Printer. It is "human engineered" to insure efficient operation from a single central location. "Fail-safes" have been incorporated to prevent inadvertent damage from errors made while the printer is operating at high speeds.



physically operates the shutter in the light valve to accurately maintain proper exposure in relationship to the various film planes within 1-1/2%.

The standard 1500-watt lamp sources in the 5117 printer offer a marked increase in light with less heat. This new lamp house permits the use of color correction filters because the reduction in heat provides longer life for the filters and reduces warp action. Each lamp house has fifteen (15) filter slots and will take either 2" or 3" filters. The entire system is designed for easy access, maintenance, and cleaning.

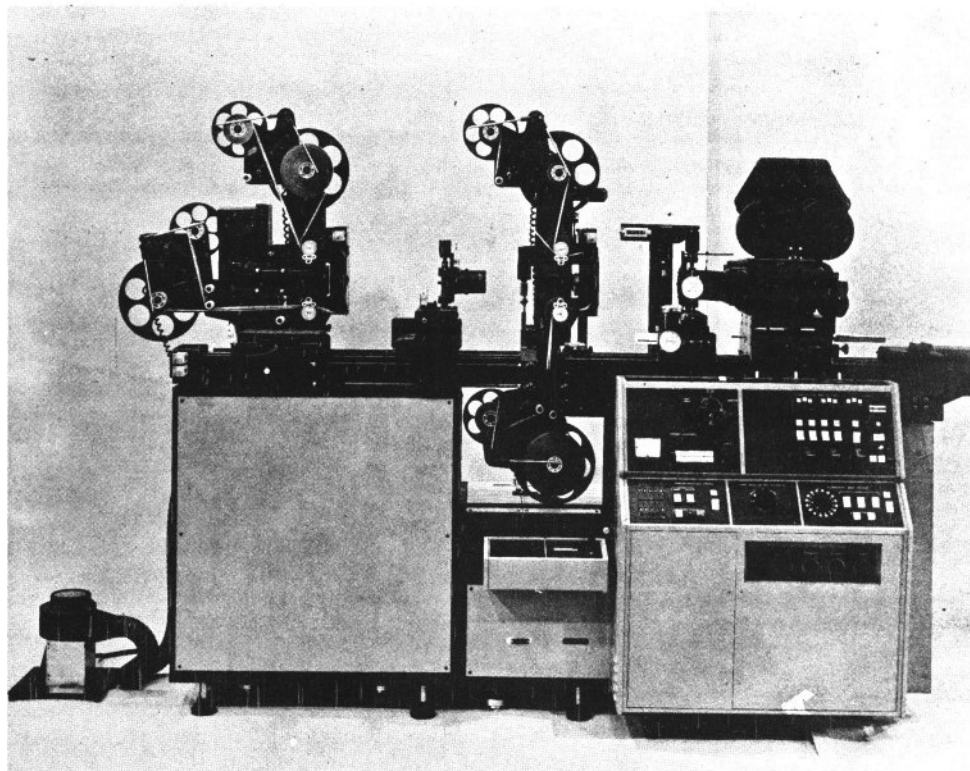
To effect more subtle changes in the process, a glass dichroic filter is mounted on a pivot in front of each lamp. By adjusting the angle of this dichroic filter, the color temperature from the light source can be subtly varied.

The importance of the precision and flexibility of the light valve and the light source cannot be stressed enough. One of the principal functions of a printer is the making of precision mattes. Mattes must match within .00002" of each other, for without this match, a black halo line or a double exposure will result. Blown up on the screen 10,000 times, the mismatch becomes unacceptable as professional film. The integration and control of the light system, in conjunction with the four heads, give the optical technician a new and diversified tool over which he has complete control.

The entirely new four projector head system of the Oxberry 5117 offers complete control of all films required for insert matte photography. The insert, the background, and both the male and female insert mattes can be carried in individual projectors, allowing for individual positioning. Since the four head system is optically symmetrical, the Printer provides a precision, and most important, *uniform* control over all the components and their integrated relationships.

The autofocus system is coaxially constructed for maximum response and stability. Integrated with the four-projector system and the automatic response of the light valve, the Oxberry autofocus system is the most responsive to date, from 3:1 enlargement through 1:1 to 4:1 reduction with the beam splinter in place. The integration of these elements provides the operator with a high degree of versatility and precision control never before attained in optical printing.

Sharpness and accuracy are additional considerations in optical printing which are directly linked with the overall stability and lack of vibration of the



The Oxberry Model 5117-20 Special Effects Step Optical Printer with main and aerial image projectors—35mm automatic focus. Modular construction permits addition of beam-splitter section (3rd projector) and 4th projector (aerial image beam-splitter) at a later time, as may be required.

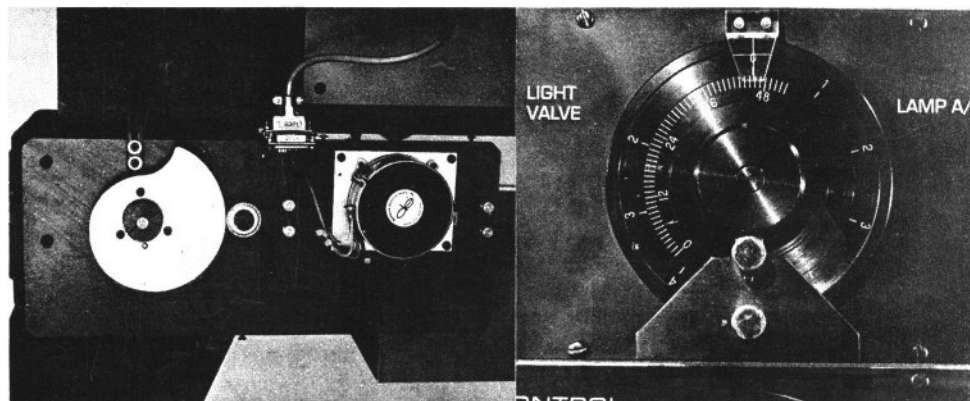
printer. In the new Oxberry 5117, a number of new improvements in design have added to the stability and deadness in the basic construction of the printer. The 5117 has a flat bed of mehanite cast iron and a low optical axis. The bed is 40" with greater stability and provides better tracking with minimum mechanical moving parts. The use of larger rather than smaller ball bearings, fewer universals and linkages, (only seven joints) reduces synchronization and flicker problems between single frame

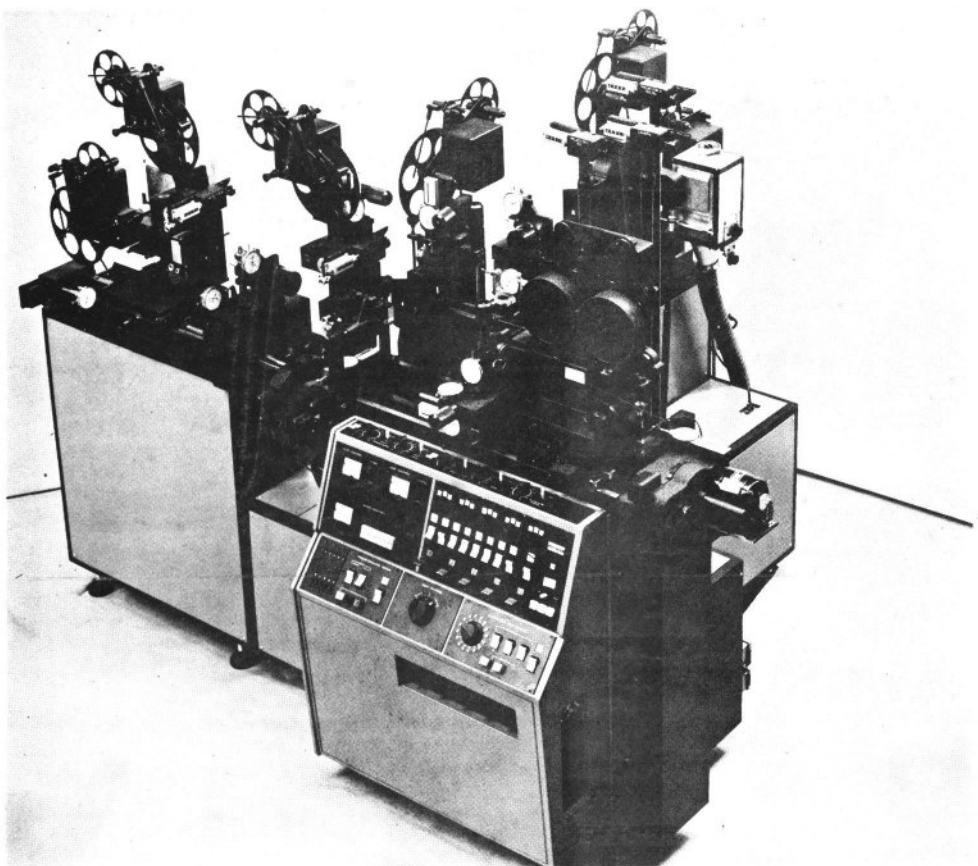
and continuous exposures.

The automatic focus system of the 5117—with the camera on a flat bed—offers the best bearing system, since the mechanism is coaxially designed and offers maximum responsiveness. One of the greatest improvements in the new electro-mechanical drive units is the design of the clutches. Previously, the pull-in spacing when open was .025 and .006 energized. This has been reduced to .010 open and .006 energized.

All leaf-separating springs have been

(LEFT) Automatic focus mechanism responds instantly to the light value, permitting continuous zooming while projectors are running (RIGHT) The light valve control, which may be pre-set to allow for 52 light variations, thus insuring continuous correct exposure while zooming.





The Oxberry Model 5117-80 Special Effects Step Optical Printer (35mm), featuring four projector heads: Main, Aerial Image, Beam-splitter and Beam-splitter Aerial Image. It is equipped with the new automatic light valve and solid state control system.

removed, and the viscosity of the lubricant has been reduced. The lubricant grooves have been changed from spiral to radial for quicker excretion when energized. There are accessible oil holes to the bearings, which, on each revolution, will keep them lubricated. The energizing coil has been changed from 90 volts to 24 volts; however, upon energizing, the 24 volt—through a resistor and capacitor—start at 90 volts and then reduce down to 24 volts. The pull-in time of the clutch is changed from 22 to 26 milliseconds down to 3 to 4 milliseconds. These various changes, which may seem minimal in the overall structure of the printer, result in greater initial speed, instant start, and greater stability as well as the ability of the printer to perform one function (180 degrees out of sync for full frame; forward and reverse; in or out of fast rewind speed, etc.) without more than one step—instantly.

In addition, there are a number of features which add to the total flexibility offered to the technician: The Printer has an automatic dissolve ranging from 8 to 128 frames; all projectors will take 35, 16, 8, and Super-8 components; all shuttles have a precision ad-

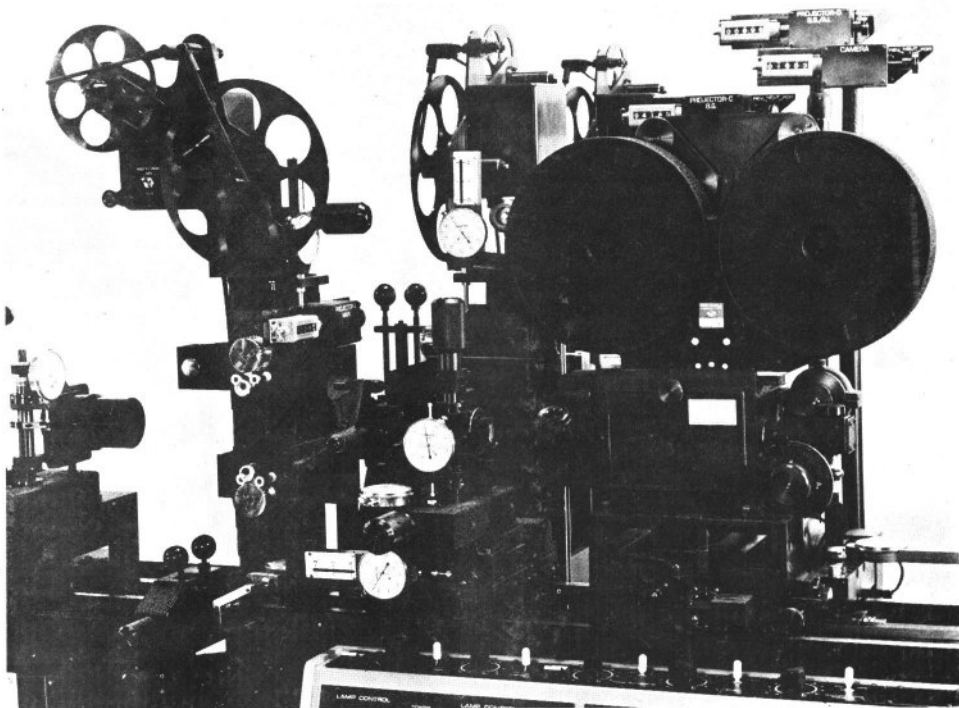
justment to take one or two films; the main projector lens mount receives anamorphic converter lenses. There are predetermined counters, automatic freeze-framing, skip-framing, and stop-motion, with manual control for the same operations.

The control console has been designed so that, while viewing, all controls are within the reach of the operator. In addition, there is a mirror and lens for the camera to project the composed image on a screen, enabling the operator to check his composition before exposing a single frame of film. This results in economy of operation, time, and materials for precision control in *single* pass optical printing.

The Printer is designed for easy maintenance. The control console swings out, exposing the electrical controls which are rack-mounted, printed circuit boards for quick service and replacement. Each circuit has its own circuit breaker located on a panel on the side of the console.

With an increased involvement in a rapidly expanding medium, the technicians, as well as the front-line craftsmen, must understand and be aware of capabilities and flexibility of the equipment upon which they depend. The standards of excellence and creativity that have been set by these craftsmen in the industry have resulted in the creation of the new Oxberry 5117 Optical Printer. ■

Closeup view of the Oxberry 35mm camera, as used on all models of the Oxberry 5117 series of printers. An interchangeable 16mm sprocket and shuttle module is available as an optional accessory. Printer provides total flexibility for a wide range of special effects.



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