

Mitigating Newton Rings when scanning Jacketed Fiche

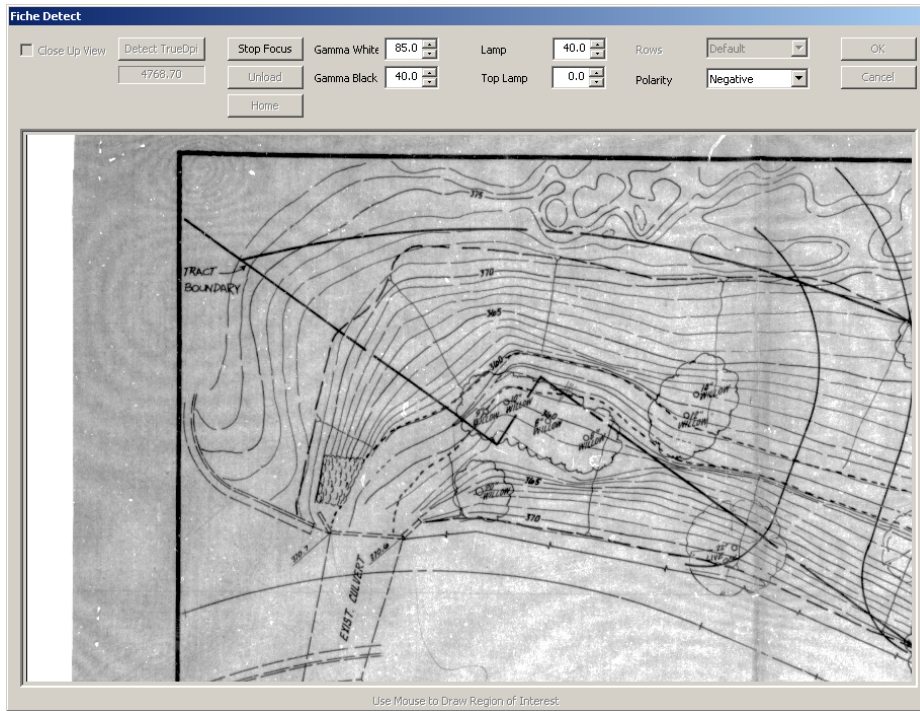
Newton Rings are caused by the reflection of light between a spherical surface and a flat surface and the interference it encounters. For a full discussion please visit the following [link](#). When a piece of film is inserted into a jacket, the thin clear film of the jacket will not adhere perfectly to the surface of the microfilm causing a slightly spherical surface adjacent to a flat surface. Newton Rings can be seen with the naked eye and appear as rainbow patterns similar to the ones shown in the picture below.



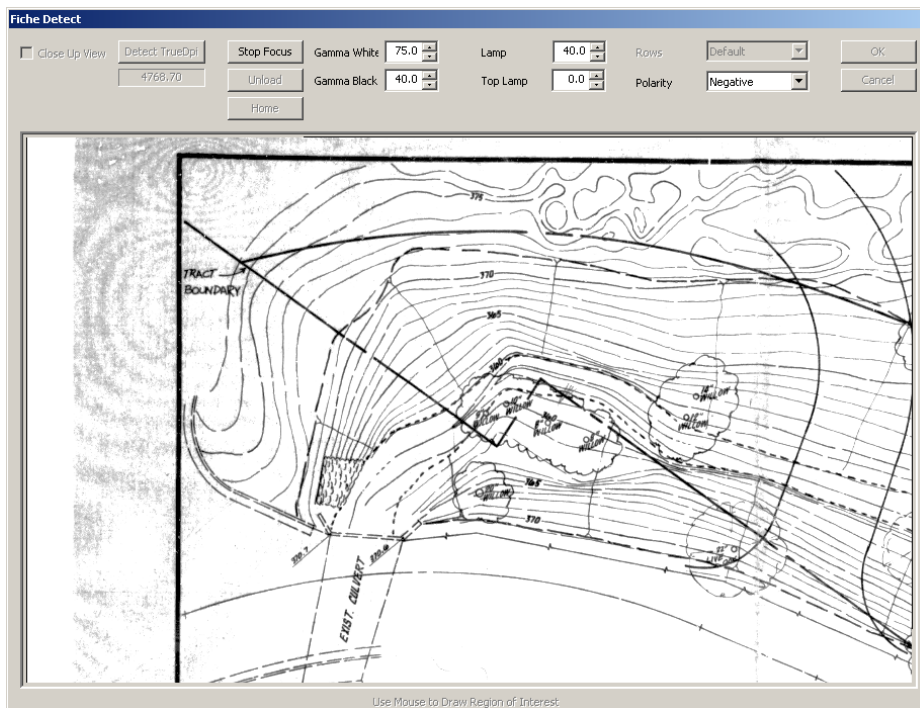
Newton Rings can be seen on the jacket

When the jacket is loaded into a scanner they are typically sandwiched between plates of glass. While the plates are designed to insure the film is flat (within the depth of field of the lens) for proper focus, it is not designed to insure that the jacket is adhered perfectly to the film. It would require a vacuum system to have the two surfaces flat or a roller system.

The end result is that the rings will show up in the scans like the picture below:



An attempt can be made to lighten the image to minimize the impact of the rings, but often it results in data being eliminated elsewhere in the scan.



Fiche Detect

Close Up View Detect: TrueDpi 4768.70 Stop Focus Gamma White 85.0 Lamp 40.0 Rows Default OK
Unload Gamma Black 40.0 Top Lamp 0.0 Polarity Negative Cancel
Home



Use Mouse to Draw Region of Interest

Fiche Detect

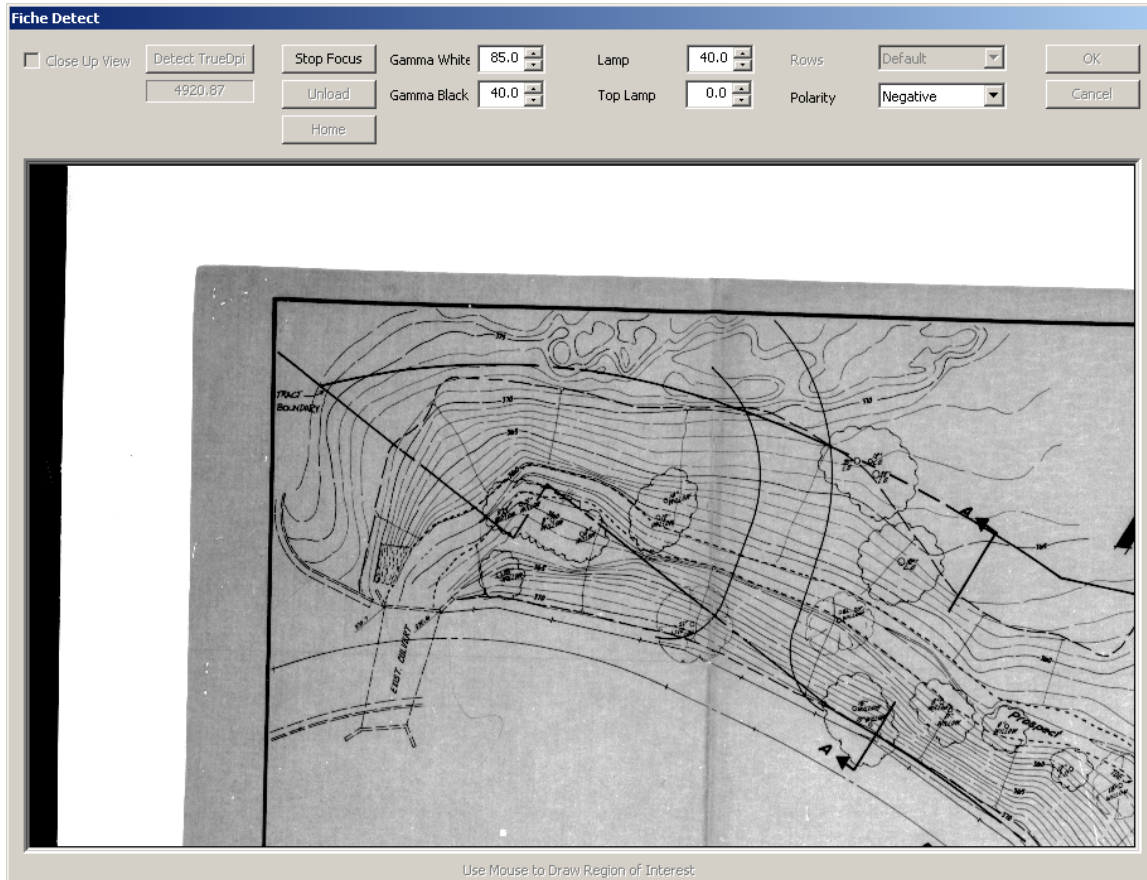
Close Up View Detect: TrueDpi 4768.70 Stop Focus Gamma White 75.0 Lamp 40.0 Rows Default OK
Unload Gamma Black 40.0 Top Lamp 0.0 Polarity Negative Cancel
Home



Use Mouse to Draw Region of Interest

There are two strategies for eliminating the Newton Rings and both can be expensive.

1. Remove the film from the jacket and load it by hand one strip at a time as in the following example:



2. Have the jackets duplicated prior to scanning. If the fiche are duplicated it uses a process where the film is sandwiched between rollers as it is exposed causing the film jacket to be completely flat (two parallel surfaces) and eliminate the rings. The dupe will not cause rings when scanned.

In the end most customers decide that the cost of mitigating the Newton Rings is too much and in practice it only affects scans of 35mm and when copy boards are used in filming.