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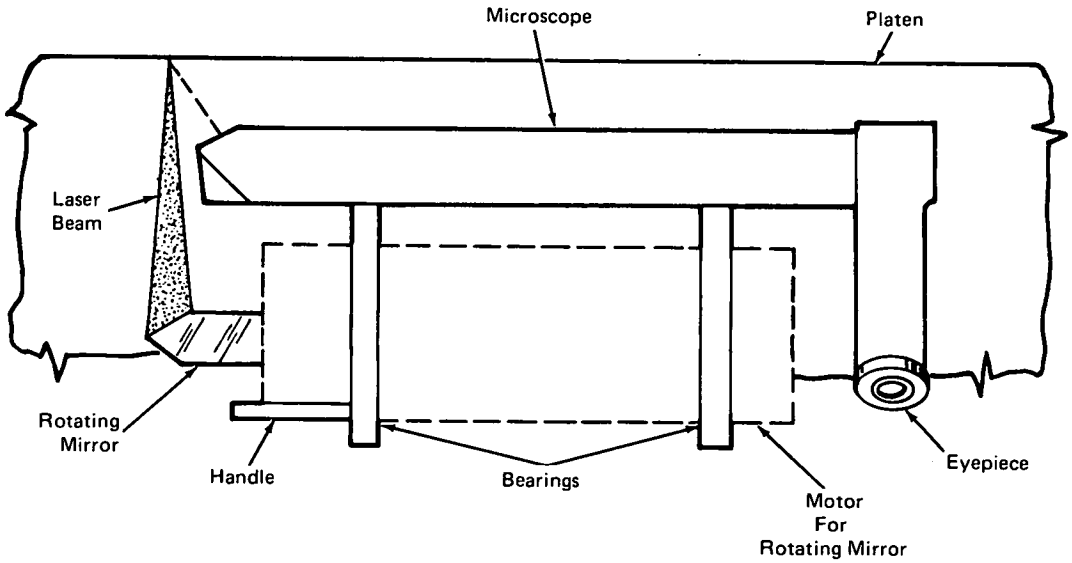
NASA TECH BRIEF

Manned Spacecraft Center

Alignment Microscope for Rotating Laser Scanner



The problem:

In rotary laser scanners, the alignment of the scan line relative to the points of interest on the film being scanned has been observed by one of the two methods. The first method, subject to translation errors, requires location of a film area outside the scanner. This area is then positioned in the scanner by use of an arbitrary reference point chosen on the film which will still remain outside the scanner. In the second technique, the scan line is observed at an angle through the rear of the glass platen. This method introduces distortions and makes the film backlighting somewhat difficult.

The solution:

An alignment microscope assembly has been developed which allows observation of the exact position of the scan line relative to the points of interest on the film being scanned. This assembly does not interfere with the system operation.

How it's done:

The microscope assembly, as shown in the figure, is optically designed to focus on a small area of the film along the laser scan line at an oblique angle, without significant keystoning effects. By suitable choice of angle and location of the optical components clear of the laser focusing cone, alignment of the laser scan line on the film is observed with the system in full operation. Under these conditions, the laser-beam line becomes the X-coordinate reticle. A single horizontal reticle line is included in the microscope to facilitate the Y-coordinate position indexing.

The entire assembly may be rotated about the center-line of the laser-scanner mirror which is coincident with the center of the radius of curvature of the film. The focusing eyepiece is placed in close proximity to the rotational axis of the assembly to minimize head translation during viewing of the full 72° scanned arc. In addition, a scale and index mark affixed to the rotating

(continued overleaf)

mirror support and microscope carrier, respectively, serve as a coarse viewing position locator. Variable backlighting of the film, accomplished in another assembly (not shown), further facilitates the microscope assembly.

Note:

Requests for further information may be directed to:
Technology Utilization Officer
Manned Spacecraft Center
Code JM7
Houston, Texas 77058
Reference: TSP72-10435

Patent status:

No patent action is contemplated by NASA.

Source: A. Maciel, Jr. and J. C. Beck of
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