MAPPING WITH THE LARGE FORMAT CAMERA
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ABSTRACT

Four cloud-free frames from Orbit 102 cover the area of the Black Hills, Rapid City, and Ellsworth Air Force Base in South Dakota. The National Mapping Division of the U.S. Geological Survey is evaluating the applicability of these photographs for mapping two 15-minute quadrangles at scale 1:50,000. The original scale of the photographs is approximately 1:750,000 thus requiring an enlargement factor of about 15X. The two quadrangles are included in an area of less than 4 x 6cm on the original film. The following tasks are in work:

1. **Triangulation.** Ground control has been identified sufficient to absolutely orient the four frames, to provide check points for the whole area, and to produce orientation points within the selected quadrangle. The triangulation is being computed with various combinations of 2, 3 and 4 frames to evaluate the effect on horizontal and vertical accuracy.

2. **Detail compilation.** Enlargements at 2X of the quadrangle areas are being compiled on the analytical plotter AS-11 using reseau points for interior orientation, and triangulated control for absolute orientation. Planimetry and contours at 50 ft interval will be compiled. Profiles for ortho-photo preparation will also be manually compiled.

3. **Image map.** Both orthophotos and rectified image maps are planned. These will be overlayed with the annotated line data, and printed as experimental maps.

4. **Map revision.** An enlargement to 1:24,000 scale of the area covered by a standard 7½ minute quadrangle will be used to evaluate the utility of the photography for planimetric map revision.

5. **Digital mapping.** Appropriate portions of the stereo LFC frames are being digitized. Digital terrain models and contours will be derived by computer. In addition the digital LFC data will be registered with multispectral Landsat TM data to produce a high resolution (LFC) color (TM) image map.

6. **SPOT comparison** Stereo coverage of the same area has been requested from the SPOT satellite, and similar products will be generated.

7. **Metric Camera comparison** Stereo pairs from the ESA Metric Camera on Spacelab cover the same area. A comparable set of experiments will be performed on these photographs.

8. **Accuracy evaluation.** The accuracy and completeness of planimetric and elevation data compiled from the three sources will be evaluated by comparison with existing 1:24,000-scale topo maps.