

Capabilities for Source Assessment

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Abstract

The Source Assessment System (SAS) is a newly developed photo interpretation system consisting of three computer controlled high resolution video cameras, a dual screen high resolution image processing system, and a minicomputer driven workstation. The high resolution cameras are integrated into two map stations and one film station. Software control of the cameras permit an analyst to remotely control magnification, position, focus, and rotation. A custom engineered video signal digitizer enables rapid conversion of analog video data to a 1024x1024x8 bit digital image file. Multicolor lithographic maps are digitized via use of color filters. The image display subsystem consists of a video switch, color and monochrome monitors, and a multiple memory image processor coupled with a geometric transformation unit for performing spatial transformations. The image processor offers the analyst control of image roam/zoom, image enhancements, image/graphic superimposition, and soft copy feature tracing capabilities. System output includes hard copy graphics recorded using a large format flatbed plotter, as well as textual reports. All hardware and software resources of the SAS are controlled by an analyst who utilizes a graphical interface at a minicomputer driven workstation.

The combined resources of the Source Assessment System provide photoanalysts and cartographers a set of capabilities to permit overlay and inspection of diverse image and map materials. The application of state-of-the-art video and digital technology combined with automated procedures permit visual change detection using diverse inputs. Vertical, oblique and panoramic imagery, maps of varying projections, scales, and formats are placed into a common frame of reference and manipulated such that the presence of new features can be rapidly detected, identified, and recorded.

Source assessment functionality can be partitioned into the following:

1. Data input capabilities, to allow input of vertical, oblique or panoramic imagery, maps of various projections, scales and formats in addition to textual information.
2. Digital and video display capabilities for high resolution images include digital/video mixing, superimposition, split screen and side by side displays.
3. Digital image manipulation, for video to digital data conversion, use of a hardware geometric transformation unit for image warping, color and monochrome viewing, roaming and zooming and image enhancements.

4. Human interaction is aided by utilization of a graphic interface for specification of commands, expandable help files, extensive error checking, and screen formatted keyboard data entry.
5. Input station capabilities include user control of magnification, focus, roaming, rotation, color filters, as well as coordinated movement between input stations
6. Graphical and reporting output provide hard copy plotting and assessment evaluation report

This paper will further detail these functional capabilities and describe the implementation of capabilities into operational procedures and system hardware and software components