

MJ Harden
A GeoEye Company

High Performance Digital Aerial Imaging

MJ Harden's aerial imaging system elevates image quality to new heights.

The standard of quality for aerial imagery has been raised with MJ Harden's world-class digital aerial imaging sensor, the *Digital Mapping Camera (DMC™)* system by Z/I Imaging (Zeiss/Intergraph).

Not just an aerial photo camera, the DMC is a complete digital image capture and data management system designed to support photogrammetric missions that demand high resolution and geolocation accuracy. Designed from the ground up as the next generation in photogrammetric mapping cameras, the DMC features breakthrough technologies that produce successful results - from small-scale mapping assignments to precision, high-resolution corridor engineering projects.

The quality and accuracy of the image capture process is fundamental to the quality of the map products subsequently produced from it. For this important reason, MJ Harden utilizes DMC technology to dramatically extend aerial imaging capabilities.

The Highest Radiometric Resolution Available in the Market

In aerial imaging there is no such thing as too much clarity. The DMC improves clarity over film and other digital technologies, and is capable of capturing imagery with ground resolutions as small as 1.5" per pixel. The advanced 12-bits per pixel data capture provides dramatically higher radiometric resolution (4,096 levels of grayscale vs. the 256 levels in standard 8-bit), yielding a wider tonal range. In practice, this means better visual detail throughout the image, and most noticeably at the extremes of highlight and shadow. This makes the images better suited for photogrammetric interpretation and analysis processes, orthophoto production, and general viewing.

Another advantage of the improved radiometry is that, because of the expanded tonal range, images exposed in less than ideal flying conditions can provide useable information, including in marginal light situations. This effectively extends both the flying day and the flying



"season," the window when natural sunlight provides adequate illumination of the features on the terrain.

Improved Accuracy

Just as tonal depth increases the visual accuracy of an image, so does the quality of the image capture process. The DMC features stronger internal geometry, which means better geometric resolution, and thus more accurate map products.

The DMC is designed around a matrix array of multiple Charge Coupled Device (CCD) camera heads, each with its own lens so that both panchromatic and color performance are optimized. The rigid image geometry ensures accuracy in a fashion analogous to a precision film platen. Even with weak GPS signals, turbulent flying conditions, and minimal light, the DMC is usually still within its performance envelope and capable of capturing useable imagery.

Features such as electronic Forward Motion Compensation (FMC) and 12-bit per pixel radiometric resolution ensure image quality that is visually superior to scanned film imagery. In addition, the images produced by the DMC offer far better characteristics for 3-D stereomodel viewing and image matching.



4-Band Multispectral Capability

Because of the multiple camera head design of the DMC, multiple image products can be captured in a single flight, including panchromatic (grayscale), natural color (RGB) and color infrared (CIR). Each band features full 12-bit radiometric resolution along with the DMC's signature high spatial resolution.

In addition to using these three primary image products in their native form, an additional process called "pan-sharpening" can be applied to combine the higher resolution panchromatic with the corresponding natural color image to create a new, higher detail color image.

Streamlined Processing and Delivery

The technology built into the DMC system offers several unique advantages over other image capture-to-delivery workflows. Due to the large format of the camera component, image acquisition is more rapid and efficient. The system allows for in-flight QC review of the imagery to verify data capture. And, back on the ground, downstream image processing is automated, eliminating many time-consuming steps. This means imagery can be available for delivery sooner.

Put This Technology To Work for You

MJ Harden is proud to offer this leading-edge image capture technology to our customers. The power and versatility of this unique imaging system allows us to provide a premium quality product and a higher level of service and performance, with your organization enjoying the benefits.

For more information on MJ Harden's full range of geospatial products and services, contact us at **913.981.9600** or email mjharden@geoeye.com.

The technology built into the Digital Mapping Camera (DMC®) system combines superb optics, computer logic, and advanced sensor technology to produce unmatched clarity, accuracy, and multispectral imaging capability.



Panchromatic (Grayscale)



Natural Color (RGB)



Color Infrared (CIR)

About MJ Harden

Located in Mission, Kansas, M.J. Harden Associates, Inc. (MJH) is a wholly owned subsidiary of GeoEye. MJH offers a wide range of high quality photogrammetry and geospatial data management services, and is ISO 9001:2000 certified. Services include: aerial image acquisition, LiDAR acquisition and processing, digital planimetric and topographic mapping, digital orthophoto-graphy, and GIS Consulting / Implementations. With a 50 year legacy of geospatial experience and expertise, MJH provides outstanding value to its customers — from planning to deployment, maintenance and support.

About GeoEye

Headquartered in Dulles, Virginia, GeoEye (NASDAQ: GEOY) is a leading producer of satellite, aerial and geospatial information. Clients include the national security community, strategic partners, resellers and commercial customers to help them better map, measure and monitor the world. GeoEye operates Earth imaging satellites and possesses an international network of ground stations, a robust image archive, and advanced geospatial imagery processing capabilities. For more information, visit www.geoeye.com.



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