

# DVTEL Technology Briefing

## Raising the bar: Quasar/Ariel HD cameras offer MPEG Motion Processing Standards

### History

In 1993, the Motion Pictures Experts Group (MPEG) approved the first MPEG standard. This standard included a recommendation for motion compensation, which was intended to control and reduce the bandwidth and storage requirements associated with motion and scene complexity in motion pictures. The following releases of MPEG-2 in 1995, MPEG-4 in 1999 and updates to MPEG-4 AVC (also referred to as H.264) in 2003, all included recommendations for motion compensation, however to this date, many manufacturers of video surveillance cameras still do not fully implement these recommendations. Why? Because motion compensation represents approximately 70% of the total MPEG processing load which has been too much to be managed by traditional video processors without experiencing significant performance issues such as dropping frame rates.

The reason the Experts Group recommended motion compensation was to permit video sequences with widely varying degrees of motion and scene complexity to fit into different media modalities such as:

- The allotted bandwidth of a satellite channel
- The storage capacity of a DVD
- Today's Blu-ray discs

It should come as no surprise that surveillance video also has widely varying degrees of motion and scene complexity in addition to tight bandwidth and storage constraints. Since many surveillance technology providers did not fully implement the recommended motion compensation, users found that frame-rates, bandwidth and storage costs are significantly impacted by scene motion and complexity. In fact, one security blog stated that the bandwidth and storage difference between a camera in a stairwell and a camera in a busy intersection (operating at the same profile) can be as much as 10X.

Imagine for a moment, if the same technology used in security surveillance was used in the motion picture industry. A film with lots of motion (Mission Impossible, for example) would require 10 discs to store while a film with less motion of the same duration would require only one disc. From a bandwidth perspective, this would also mean the number of channels available on satellite TV would be restricted during the airing of a high-action film as it would use the bandwidth of multiple channels. This is the reason why MPEG recommended motion compensation in every MPEG version released. Looking at the security industry and video surveillance technology, can you imagine the game-changing impacts if MPEG standards were fully adopted?

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### QUICK FACTS

- ✓ In 1993, Motion Pictures Experts Group introduces MPEG standard to reduce bandwidth and storage requirements associated with motion and scene complexity in motion pictures.
- ✓ Security industry does not fully implement the standards because motion compensation is too much for most security camera video processors to handle, without having performance issues.
- ✓ Without the MPEG recommendations, frame-rates, bandwidth and storage costs can be significantly impacted by scene motion and complexity.
- ✓ Quasar/Ariel HD cameras are the first security cameras to fully demonstrate the benefits of MPEG recommended motion compensation in the H.264 stream.
- ✓ Frame rates maintained using a fraction of the bandwidth in high motion / high complexity scene environments with substantially improved image quality.
- ✓ With Quasar/Ariel, security professionals need not be concerned about scene motion or storage capacity.
- ✓ Video System Total Cost of Ownership = Camera costs + storage they "burn".
- ✓ Quasar/Ariel delivers: Substantially reduces total system cost with Blu-ray image quality.

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## Enter Quasar/Ariel

Fast-forward to DVTEL's recently launched Quasar/Ariel HD cameras which are the first security cameras to demonstrate the broadcast quality benefits of the recommended motion compensation in the H.264 stream. Quasar/Ariel HD models maintain their frame-rates reliably in high motion/high complexity environments using a fraction of the bandwidth of previous generations' with substantially improved image quality. Why? Because Quasar/Ariel cameras do not waste the allotted bandwidth using inefficient motion processing methods and therefore, produce better quality evidence at significantly reduced storage costs.

## Let's review a common use case

A well-known HD camera provider recommends between 1900 and 6100Kb/s for HD1080 @ 30 FPS in an intersection application. Using the 1900Kb setting, the video exhibits significant compression artifacts including blockiness and pixilation, and these issues do not begin to clear up until the highest settings are applied, increasing storage usage and impacting the available bandwidth. Switching between various bit-rate modes (CBR, VBR etc.) also cause these cameras to drop frame rates when the bandwidth is limited.

By contrast, the new Quasar/Ariel HD models easily operate in a similar setting with even higher motion and scene complexity at only 1500Kb/s. In addition the Quasar/Ariel HD line maintains full frame rates during pan/tilt operations without introducing the compression artifacts that are commonly found in today's cameras using 'security grade' H.264.

## Will that be Blu-ray or security grade?

Quasar/Ariel HD cameras are truly a game-changer for those who must estimate the storage requirements for many cameras exposed to a wide range of scene conditions. Imagine if these security professionals could ignore scene motion as part of the calculations and the system actually met their expectations project after project.

## Let's talk Cost of Ownership

The Total Cost of Ownership (TCO) in any video security system is a combination of camera and the storage they "burn." As evidentiary retention times have increased along with the introduction of HD cameras, the cost of the storage system has become a more significant factor in the total cost. By deploying Quasar/Ariel's extremely efficient motion processing, security integrators and end users can substantially reduce overall system costs and at the same time benefit, from Blu-ray broadcast image quality, leading to stronger security and safety programs.

Why should security end users struggle with subpar quality video and increased system costs when Quasar/Ariel HD cameras are ready for the toughest security challenges right now, delivering the MPEG benefits that broadcasters enjoy today?

## About DVTEL

With thousands of installations spanning five continents, DVTEL is an innovator and world-class provider of state-of-the-art, open software & hardware products. DVTEL's suite of technologies manage and interpret video from the camera's lens to the human eye, over wired and wireless networks, to enable real-time and off-line surveillance. The company's product line includes video management systems, cameras, encoders, servers and high performance video analytics that increase security and safety, thus improving operational efficiencies. Through partnerships with industry leading suppliers and integration to third party products, DVTEL provides system integrators a flexible and cost-effective end-to-end solution enabling them the freedom and ease to run their business.

To find out more about Quasar/Ariel cameras, contact DVTEL at [www.dvtel.com](http://www.dvtel.com).

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