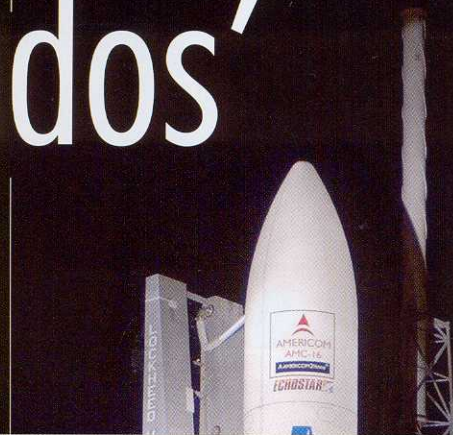


Multiple 'Tornados' in Florida



'Tornado' cameras covering Atlas V rocket launch

At 07.07 on Friday morning, December 17th 2004 a Lockheed Martin Atlas V 552 rocket launched a Direct Broadcast telecommunications satellite into geosynchronous orbit from Cape Canaveral, Florida. The event, one of a series of commercial launches now undertaken each year by both Lockheed Martin and Boeing was recorded by multiple film, HD and stills cameras. Uniquely, this launch was also covered by three 'Tornado' High Speed digital cameras supplied by the ARRI Group. As such it represented the first use of the new 'Tornado' system in the United States.

In a unique collaboration between ARRI CSC in the U.S., ARRI Media in the UK, NAC, Japan, and Quantel, an internationally renowned British post production equipment provider, cameras and editing hard and software came together at Cape Canaveral from London, New York and Fort Lauderdale, Florida. ARRI Media provided a Tornado camera and their Head of Digital Department Bill Lovell. Quantel supplied an eQ editing system from New York, their Head of Special Applications David Throup, and the freelance editor Simon Jacobs, a British ex-pat living in the States. ARRI CSC New York and Florida added their Tornado camera, lenses, accessories, heads and tripods as well as



two ARRIFLEX 435 Advanced film cameras with 8mm wide-angle lenses for launch pad footage. In addition Stanley Fernandez, a senior electronics engineer from the New York office provided technical support on location. Subsequently a third Tornado camera body was brought in at short notice thanks to the swift response of the Japanese manufacturer NAC and their U.S. based Manager of Business Developments Bill Cambell and his colleagues.

All of this equipment joined HD cameras from the Lockheed Martin Digital Media Services department, the renowned Woods Hole Oceanographic Institute and the

NASA Jet Propulsion Laboratory. The entire project was coordinated by Lockheed Martin Producer/Director John Baker, Senior Software Engineer Michael Simon and their production team. John had seen a demonstration of the Tornado camera's potential when he was shown a showreel by Quantel at a demonstration in Denver and realized how the unit's capability of speeds of up to 1000fps, combined with the swift turnaround offered by the eQ system could contribute to the launch coverage.

"My colleagues and I saw the benefits of the 'Tornado' system during a screening of a horse's hoof clipping the top of the steeplechase jump at 1000fps." said Mr. Baker. "It's critical for Lockheed engineers to get immediate visual results after a rocket launch for technical and performance reasons. Until now we have had to rely on low-resolution 30fps Standard Definition video or slow turnaround high-speed film footage.

The 'Tornado' system gives our engineers a near real time opportunity to critically review footage. Additionally we have the ability to supply pristine high speed video to both our public relations and news media clients immediately."

The 'Tornado' camera delivers digital images in a high quality format that, when combined with the eQ editing system can allow broadcasters to replay televised action in slow motion within minutes of the event occurring. This has led to British sports enthusiasts being treated to a unique insight into the swing of a golfer, the stride of a race-horse, the accuracy of a David Beckham goal in soccer or, in one case, the flawed technique of a world-class

competitor at the Wimbledon Tennis Tournament. However use of the 'Tornado' is not restricted to sport. Since the camera is capable of recording up to 14,000 frames of material in its own RAM drive for subsequent downloading it is being used for television commercials, natural history documentaries and industrial analysis ... and rocket launches.

John Baker and his creative team of Leif Heimbold and Will Blakely decided that, thanks to the Tornado camera's PL lens mount allowing the use of the cream of cinematography long zoom lenses they would position the 'Tornado' cameras in two key locations. One, fitted with an Angenieux Optimo 24-290mm zoom was mounted high up on the top of the multi storey hanger (the V.I.F.) that houses the rocket in the final stages before it is launched. It is from this hanger that the mobile launching base transports the rocket to the launch pad half a mile away. The camera was therefore operated by remote control via an Ethernet connection, for safety purposes.

The second, and subsequently third 'Tornado' camera was mounted on a unique optical tracking platform provided by the contractor Indyne and operated by Rick Wetherington, a veteran of over 24 years of launches at Cape Canaveral. The 'Tornados' joined three other cameras positioned on the tracker, which resembled a swiveling gun turret and was positioned at a sufficient distance to allow the rocket's launch to be tracked accurately. The 'Tornado' cameras were fitted with, respectively a Hawk 150-450mm zoom (and using a X2 range extender) and a Canon 400mm. Both cameras were operated on site by Bill Lovell, who not only monitored the units from a laptop but altered the lens iris' during take off via ARRI LCS systems.

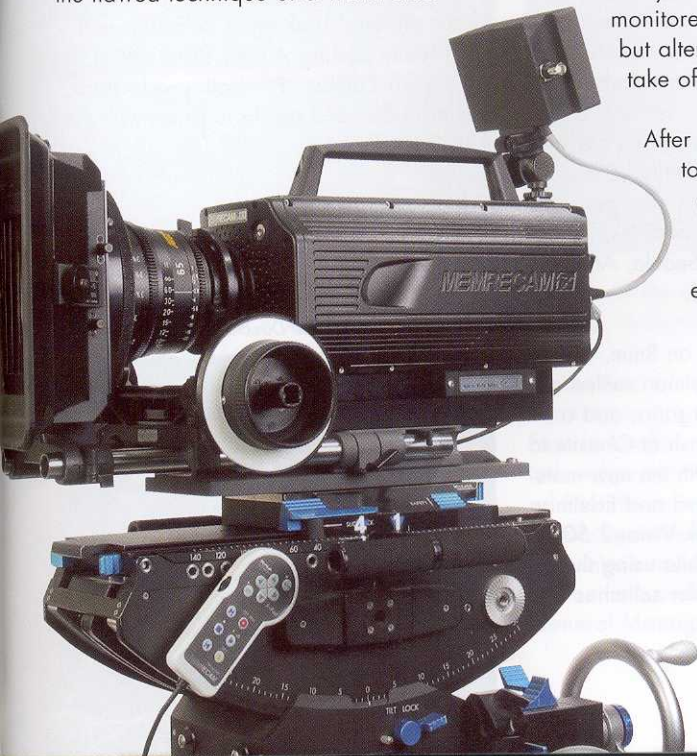
After interminable delays due to unseasonably bad weather and various technical issues the count down commenced and the rocket launched successfully.

Sadly the persistent low cloud restricted the amount of coverage possible, but all the cameras involved operated without fault.

The footage was then taken back to the waiting eQ and the editing crew located in Lockheed Martin's production trailer and within 4 hours a rough assembly from 8 cameras utilizing many different formats was available for John Baker, Michael Simon and their team to view. As well as material from the 'Tornado' cameras, other footage at different resolutions and frame rates from Woods Hole's proprietary HD cameras and Panasonic Varicams was ingested and edited using eQ's unique Resolution Coexistence TM technology.

The Atlas V launch coverage demonstrated the unique potential of the ARRI Group, providing equipment, service and support from across the world. It would not have been possible without our ongoing relationship with Quantel, nor the energetic commitment of John Baker, his production team of Leif Heimbold, Will Blakely, Michael Simon and Kristin Zick and the Lockheed Martin Space Systems Company.

Simon Broad



Stanley Fernandez



Bill Lovell