



# Capturing Endeavour's Final Mission: We Saw It First

by Mark August SOC

Photos by Chuck Null  
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Mark August SOC with Endeavour at LAX



After 25 missions to the Milky Way, the space shuttle orbiter Endeavour has officially retired, and her new home is the Samuel Oschin Pavilion at the California Science Center. Endeavour's journey was quite a significant challenge: from Florida to LAX, and through the neighborhoods of Los Angeles to Exposition Park. The Science Center wanted a record of the voyage that could be used in the exhibit.

Mark August SOC is a reservist in the military, working as a combat photographer for the US Navy, and has spent 23 years specializing in high profile shoots with no room for error.

Enlisting members from the SOC, the all-volunteer camera crews covered the landing, the preparation for travel, and the parade to the Science Center, which took a couple of weeks from start to finish. The results are currently on view at the Science Center for all to see.



The 3ality camera on the Ultimate Arm

### 3, 2, 1....

Several months before the shuttle landed, I got a phone call from a colleague. Geoff Reeves, whom I know from the Navy, left an urgent message to call him. When I did, he said that a friend of his, a producer by the name of David Knight, would be filming Endeavour's arrival in two months and they were looking for a camera operator/DP. When I sent in my résumé, apparently my military clearance appealed to them. This kind of job is something that I know better than most. It was second nature to say "no problem." I've done so many shoots like this in my career—if a missile blows up, it's only going to blow up once. No scripts, no second takes.

I asked the question any camera operator will ask: "What's the format? What camera will we be using?" David Knight replied, "We're still trying to figure that out because the Science Center has no budget and they're looking for volunteers." My jaw dropped.

He explained that they were trying to find the right volunteers who would understand what this entailed and how important it really was. Then he asked the inevitable question: "Do you know any other camera operators that are available?"

At this point I didn't know how big this project really was, but I understood that I could do one of two things: I could give him a list of my buddies, or I could take it to a different level and totally share it. And I thought, you know what, good karma is going to come back at me if I share this. As the Events Chair for the SOC, I thought very clearly that if I

took this to SOC as an event and invited every SOC member, I could then approach our sponsors for support. So I did.

At an SOC board meeting, I pitched the idea as a win-win project for the SOC. We'd have a nonprofit helping a nonprofit—and this is unheard of! With our skill set and what we do, it made a lot of sense to provide help to another nonprofit, and the beauty of it is that generations of children will visit the Science Center and see the footage we shot.

Once it was an official SOC event, I talked to a number of people about it. Bob Harvey at Panavision; Dan Perry and Reggie Watson at Sony. AJA was willing to provide digital recorders. And then we really got lucky. We were at 3eality Technica for a meeting to plan a 3D training event for January 2013. One of the heads of 3eality happened to overhear my pitch and asked, "Can we be a part of this?" Not only did they supply the cameras, but the camera support and the focus convergence pullers.

### Logistics

California Science Center President Jeff Rudolph had originally approached David Knight about documenting this event, and discussed the travel route, the arrival, the preparations, and the actual move. David quickly realized that just having a couple of his friends with some camcorders wasn't going to be enough, and he was talking about doing something historic.

David Knight brought in producer/director Haley Jackson, who had been shooting 3D shuttle missions for the past



I shot the removal of the shroud that protected the engines, the removal of the tail cone placed on the back of the Orbiter when it flies atop the 747 (covering the engines to make it fly aerodynamically), and the last opening of the hatch by technicians at the United Airlines hanger. What an awesome opportunity to shoot above, below and all around this 165,000 pound historical space vehicle. —Mike Frediani SOC

DAVID KNIGHT

several years. Haley and I were able to plan the camera shots and deal with the crew while David was dealing with the Science Center and all the logistics that came with it. In addition to having crew members checked and cleared, there was a lot of gear to organize, locations to scout and planning post production.

### Houston, We Have a Production

There were actually 3 phases of filming. The first one was the landing of the space shuttle, when she actually arrived into Los Angeles at LAX. There were 8 camera crews that day, all operated and assisted with SOC members. The second phase of filming was while the space shuttle was being prepared for its transportation. Before it left LAX it had to have work done, like having the nose and tail cone removed.

The 3<sup>rd</sup> phase of filming came two and a half weeks after Endeavour first landed. It was comprised of 4 crews working 12 hour rotating shifts. While the space shuttle actually took 5 days to travel from LAX to the Science Center, every 12 hours there would be a new camera crew. Kurt Nole SOC was operating the Ultimate Arm, which was on a 3ality rig filming in 3D. It was in front of the space shuttle in the street procession. The space shuttle's move was being sponsored by Toyota, so behind the orbiter during the move was a Toyota Tundra, which they allowed us to use as a camera car to shoot out of! We used a Genesis in there, recording to an AJA Key Pro mini, grabbing shots of the crowd and workers manning the move.

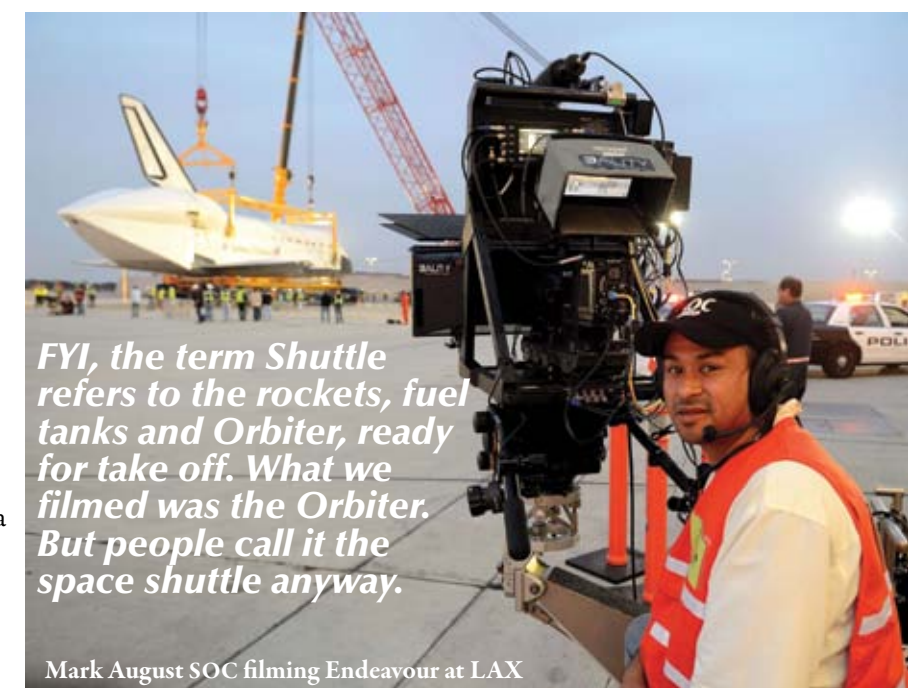
Other camera operators were sent ahead of the space shuttle about a half to 2 miles in order to film the crowd and get long shots using a Sony F3 camera on a tripod—some nice shots of the space shuttle coming towards the camera, all the way until they got into the Science Center. Matt Petrovsky SOC was filming handheld ENG style 3D with the Sony TD300 camera.

El Monte RV really helped us too—they loaned us a 47 foot RV, and with the coordination of the Science Center and the LAPD, we had that in the procession, literally 200 feet away from the space shuttle at all times. It was kind of our "camera production trailer." We'd stop the RV long enough for people to get safely on board, where they could take a rest, get something to eat, grab a cup of coffee, use the restroom—easy to do when we never traveled faster than 2 miles an hour.

Onlookers along the route were so excited, it was almost like they were giving energy away! Even at 2:00 or 3:00 in the morning! The camera crews felt it too. After a 12 hour shift, nobody was tired, everybody was too excited, saying "I'll stay, I'll help" or "Can I come back later in the day? I want to go home and get some sleep and come back." Since everybody was volunteering, I wouldn't tell anybody no, so we had camera crews coming back all the time.

The space shuttle maneuvered around trees very much like a camera dolly or a power jack. A power jack can move sideways and the wheels can turn any direction. The move is called crabbing, and that shuttle really could crab. It could move sideways. That's how they were able to get around the trees and not damage them. They would crab the space shuttle very slowly left to right and it would just slide left to right around the trees and poles and safely crab around buildings. That's one of the reasons the trip took so long.

We were able to establish shots and set a sequence in a very quick amount of time—one person getting a close-up, one person getting a medium shot, and then a long shot, and then with the crane you can get these really high shots—so we could establish, show the depth, and show the crabbing. Someone on the ground never sees her moving around, but on film you could actually see the wheels turning, and get a



*FYI, the term Shuttle refers to the rockets, fuel tanks and Orbiter, ready for take off. What we filmed was the Orbiter. But people call it the space shuttle anyway.*

Mark August SOC filming Endeavour at LAX



## From the Production Side

by Haley Jackson

The original concept of the project was to cover the move from beginning to end—on the ground, in the air—with on-board cameras. Contentwise, it didn't change. However, our level of production on the ground grew rather quickly. The SOC really stepped up and helped on this project.

Both David and I knew a lot of shooters that were begging to help, but when we were doing a site survey of LAX for the landing, I suggested that we try to get a couple of photographers from the Blue Angels shows we've shot in the past. We needed operators that could track. Geoff Reeves (former Commander of the Navy Seal parachute team) suggested we contact Mark August SOC and we suddenly had a lot more resources.

Covering the landing was incredibly complicated simply because we were at one of the busiest airports in the world. The security was insane. The first logistics meeting we went to was with 60 people, all separate entities of LAX, NASA, Homeland Security, TSA, FBI and the FAA. The request to have a helicopter track the SCA while landing got us a lot of laughs and negative answers.

David Knight was crucial to making that shot happen for me. He literally had the SCA change its flight plan and land on another runway and got the F-18s to peel off during the landing, allowing space for our helicopter to track the SCA.

I had a very detailed plan of the procession through Los Angeles. That plan had to be turned into the Command Center, which was the city mission control for the move. It was a 34 page document dissecting the route into small sections, including miles, ETA, zones, equipment in procession, cameras, desired shots, special considerations (such as power lines, daylight or no light, etc), helicopter shots and crew.

We had to dissect the shoot into zones. Zone 1 was the onboard cameras. No one had ever mounted cameras to a space shuttle before, so we asked Chris Gabriel, a Disney Imagineer, to figure out how to mount a camera to the shuttle safely. We ended up with 2 small Sony Prosumer cameras mounted to the hatch, one facing forward and one facing the rear, and a combination of Go-Pros and Ions mounted to the hauler.

Zone 2 was the procession and where we embedded the SOC. We had some huge constraints. Once a vehicle was placed in the procession it had to stay there for the duration. So I put the 3ality rig on the Ultimate Arm just in front of the Endeavour. We had a truck with a Panavision Genesis on sticks just in back of the Endeavour and one mobile ENG 3D rig and two other mobile rigs for crowd shots.

Zone 3 designated the crowd interaction. This was a donation from Toyota. They had 5 field crews covering the crowds. Zone 4 was the aerial unit—the helicopter shots of the route and the Endeavour on Crenshaw Drive were crucial. Helinet donated their helicopter and I can't emphasize enough how important those shots were to the story.

When Endeavour took off and flew over the country making her various stops along the way, something magical began to happen. People started to take notice and cheer her on! When she did her California tour, everyone stopped and watched and welcomed her home in a tremendous way. I got teary eyed when I saw an article in the *LA Times* and the photo of the crowds at the Griffith Observatory. I couldn't believe how many people were there.

Then what happened next was pure magic. Mark and I were embedded with Endeavour when she started her 12-mile trek across Los Angeles. When we emerged from the gate at LAX to join the support vehicles we were greeted by thousands of people—at 2:30 in the morning! People were everywhere, watching and cheering. Some people even dressed up in costumes and followed the procession for the next three days. It was incredible. An estimated 1.5 million people lined the route, and space and space travel were at the forefront of their minds in some form for a few days, and that's not counting all the folks that watched it on the news. That's powerful.

In many ways Mission 26 was Endeavour's most important mission. She brought hope and a feeling of accomplishment. The crime rate in Los Angeles went down significantly while Endeavour was headed home. Officers said they saw rival gang members standing near each other taking photos of Endeavour as she went by. Many people came up and told me that Endeavour changed their life. It was a very human, very humbling experience.

perspective. What it feels like, how they're doing it—it's all part of what you have to show for the story of her journey.

### A Big TO DO

When SOC and its sponsors first arrived to film, the people from the Science Center were really taken aback. They'd been given a gift of Hollywood—professional camera crew and gear, all generously donated. When everything actually hit the streets, the Science Center looked like they were putting on a million-dollar production. And that's when they looked around at me and said, "Wow! You really made us look good!" They knew they would have some amazing footage. We really showed what the SOC is capable of doing. We're not a union or labor organization, we're a



Crane operator Mike Pagan, driver Greg Preston, Mark August SOC, and Steve Blair.

TO PETER, ANDREW AND ALL OUR FRIENDS IN NEW ZEALAND



Congratulations on a Journey Well-Traveled!



“It just felt like I was shooting any other movie. I was able to move the cameras around however I wanted, putting the 3D cameras on a Steadicam or using them handheld.”

PETER JACKSON, Director/Executive Producer  
*Cinefex Magazine*

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Filming  
Endeavour  
at LAX



The 3ality camera mounted on the Ultimate Arm preceded Endeavour on her trip through the streets of Los Angeles. Crowds lined the streets as she went by.

bunch of volunteers coming together to support our charity. It's like any other volunteer organization; you can do good things with a lot of good people.

Accompanied by Science Center President Jeff Rudolph, Mayor Antonio Villaraigosa helped walk the the space shuttle in to where it's docked in Exposition Park. I had an opportunity to meet the mayor and share some information on the SOC with him.

### Mission Accomplished

All in all we captured over 200 hours of footage, easily 15 or 16 terabytes. Deluxe had been volunteering their time almost round-the-clock while we're filming, and they made their post facility available to Haley and David.

Any time that the space shuttle goes up in the air, they call it a mission. Endeavour had been in space 25 times; her last move from Epcot Center in Florida to LAX is considered

Mission 26. For every mission that they have, they make a mission patch, which is worn on their flight suits. It gives the number of the mission, and where it was to and from. The Science Center had mission patches made for Mission 26 and placed them inside the space shuttle at Epcot Center. After it had been inside the Science Center for five days, the Science Center CEO and the director opened the hatch, for what may be one of the final times it's opened at the Science Center other than checking for problems.

I had the honor to go inside the space shuttle and film them removing those two big packages with mission patches. Any volunteer that was helping with this project will receive one of the mission patches for being part of the mission crew.

### Thoughts

I filmed the space shuttle in 3D at the California Science Center using the Ultimate Arm Crane and the 3ality camera rig, and it was so surreal. I



Los Angeles Mayor Antonio Villaraigosa with an SOC sticker, Mark August SOC and producer David Knight

STEPHEN SILBERKRAUS





Scott Anderson, Jeff Amaral and Haley Jackson, with Tara Summers seen thru the window

## From the Producer

Endeavour's new residency is in the Samuel Oschin Pavilion at the California Science Center. Eventually she will stand upright in pre-launch position, when the huge exhibit-tower is completed.

Truly, this was a piece of history and we all had a part in it. From our awesome vendors who provided the best that the industry has to offer, to the incredible Society of Camera Operators who really stepped up and made the filming happen, to those who captured Endeavour at Kennedy Space Center and Edwards on her journey, the supportive companies taking this forward, it's been nothing less than spectacular. And we all have imagery that we will undoubtedly be showing to our grandchildren, some of which shows that We Were There.

I want not only to thank everyone, but to mention a few items: (1) for the volunteers with SOC and others who actually came on the journey, to include landing day and the overland transport, we are obtaining 'mission patches' from the California Science Center for you; (2) within the coming weeks there will be an event held at the Science Center to which you will receive an invitation to and should be able to bring a significant other; and (3) once the exhibit opens we can get you tickets for you and especially your kids (if you have them).

Haley and I worked feverishly to compile the staggering quantity of footage and log it. At some point 'behind the scenes' will turn into something that we can all share. Simultaneously we are liaising closely with the Science Center to develop exhibits using this great footage.

Best to All, this was truly wonderful. —David Knight

## The Volunteers and Sponsors

SOC active members involved in this project were Mark August SOC, Dave Frederick SOC, Michael Frediani SOC, Dan Kneece SOC, Bill McClelland SOC, Kurt Nole SOC, Matt Petrosky SOC, Chris Tufty SOC, Daniel Turrett SOC and Haskell Wexler ASC.

SOC associate and student members were Eddie Barber, Joshua Barrett, Rochelle Brown, George Feucht, Nicole Fleit, Peter Johnson, Brett Juskalian, Crystal Kelly, Rachel Lippert, Jeremy Parsons, David Ronser, Stephen Silberkraus, Mike Skor, Jeremy Sultan, Tara Summers, Satya Vanii and Lenny Walsh.

The wonderful companies who sponsored our work and donated equipment for our use were **3ality Technica, AJA, Deluxe, El Monte RV, IVP Media, J.L. Fisher, Panavision, Sony and Ultimate Arm.**

Also supporting us were Luke Babb, Ralph Burris, Chris Debiec, Joe Rios, George Peters SOC, Steve Schklair and Mark West.

thought to myself, "wow, I wish everyone could see what I was looking at," and then it dawned on me everyone could actually share what I was looking at. The finished film that you see at the exhibit is through the eyes of the Society of Camera Operators, through our eyes, and I love the fact that we see it first. It's really truly unbelievable to me to know that there are children not even born yet that are someday going to visit the Science Center and learn about space exploration through what we filmed. It's not just a movie or a TV show that can be downloaded online or purchased on a DVD—it's an experience.

It's a tribute to the support of our membership—without that support, this project couldn't have happened like this. It was a beautiful exercise in coordination, generosity, and skill. Without the SOC, the project would never have become the masterpiece it did.

Every member of the SOC was invited to the museum opening to go and see for themselves, including the ones that wanted to volunteer but couldn't because they were working. It really was a historic couple of months. Maybe after New Year's I can actually go inside the exhibit and watch people's reactions to seeing the footage. That's going to be a reward.

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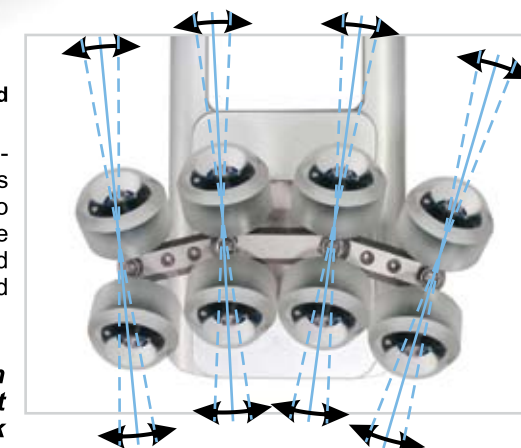
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