Imagery project maintains quality of historic spaceflight photos

by Kendra Phipps

The images of the Apollo Program, and of Apollo 11 in particular, are unmistakable. The picture of Buzz Aldrin facing an American flag, dazzlingly colorful against the bleak surface of the Moon, is part of America's national consciousness. That photograph documents one of the greatest accomplishments in human history and is a source of national pride.

True colors

NOW IMAGINE if the film that produced that photograph, and thousands of priceless others, was allowed to deteriorate in a vault. After a few decades, it could become completely unusable.

A team at Johnson Space Center is working to prevent that from happening.

Ed Wilson, NASA Technical Monitor for Imagery Operations, and Maura White, IMPASS Photography Lab Supervisor, are part of an Information Resources Directorate team working to scan historic spaceflight imagery into a digital format.

"These are NASA records, and we need to maintain them in the best possible way," Wilson said.

One advantage of this project is that the quality of the images is noticeably better in digital format.

"Any Apollo image you see right now is made from a duplicate – for example, a Xerox from a Xerox – so you lose quality," White said. "With digital files made from the original, we'll have greater dynamic range, which means more detail in the shadows and highlights and much higher quality in general."

"You can really see the difference between a duplicate and a new digital scan," she said.

The digital scanning process will not only help preserve the images for future generations, but make access to the imagery much easier via the Imagery Online Web site. It will also expedite the process of retrieving the images when they are requested for printing.

"In the past, if somebody requested an Apollo frame and we didn't have it scanned, we pulled the cut duplicate negative and scanned it in one frame at a time," White said. She said that while the old process was "costly and time consuming," the new digital format will "make it easy to retrieve the file from digital storage and produce products such as prints, slides and CDs for the NASA community and the public."

Currently, JSC's Building 8 houses all of the original spaceflight imagery except for that of the Mercury and Gemini programs, which has already been transferred to the National Archives and Records Administration (NARA).

"We keep it in a 10-degree cold vault with low humidity to help preserve it," Wilson said, "but some of it is in unstable film bases and is going to deteriorate eventually."

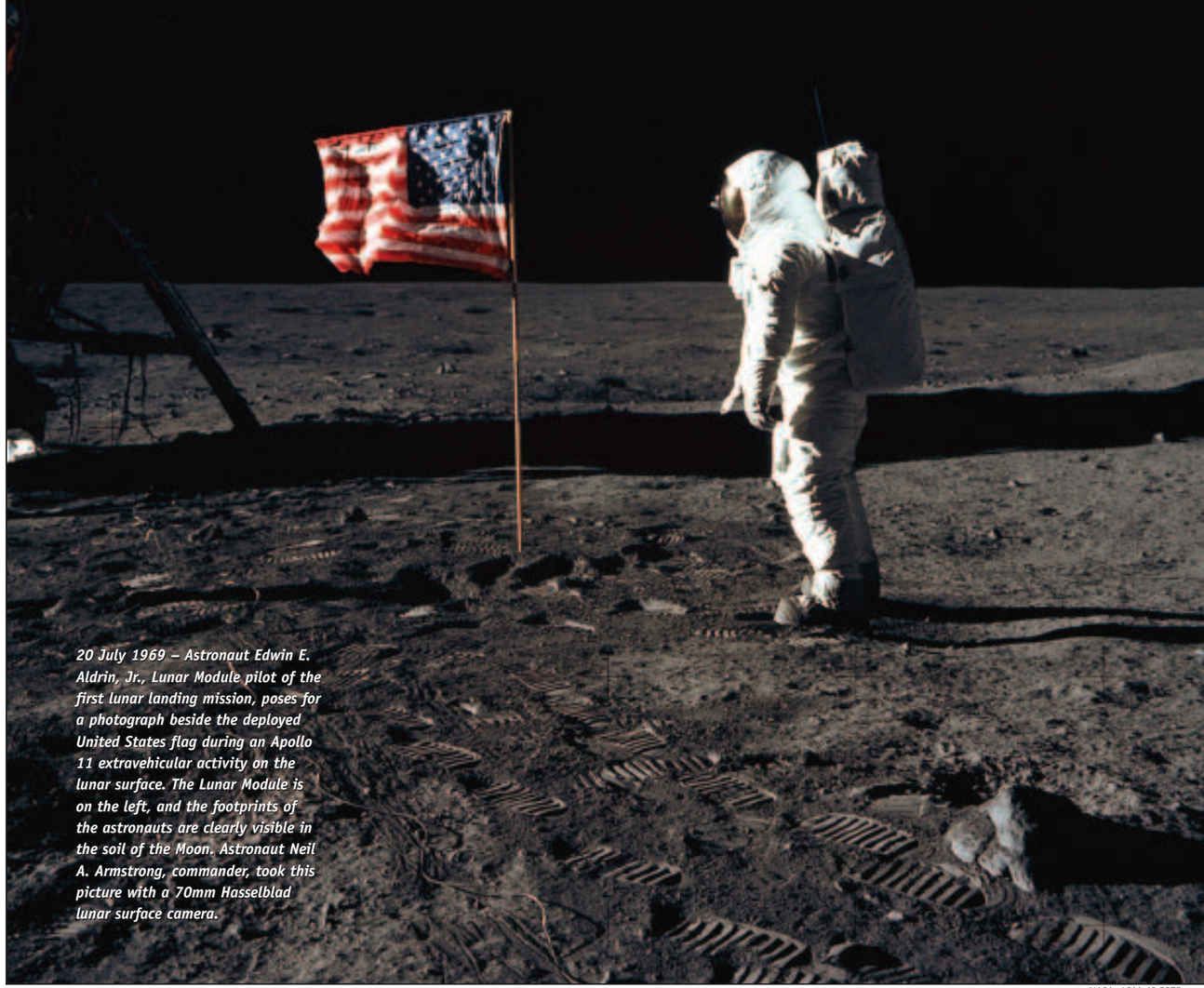
Scanning the original film is a multistep process.

"First, we prioritize the missions that people request the most," White said. "Then we remove the actual film from the cold vault, let it thaw, scan the original in a high-speed, adapted motion-picture scanner, archive the scans on CDs, and put the original mission film back in the cold vault."

The effort to scan the historic imagery began in 2003. So far, 8,500 frames of original flight film have been scanned, and approximately 32,000 frames are left.

"Eventually, once all these are scanned, the goal is to transfer it to NARA so that it is maintained in the national archives as a federal record," Wilson said.

Thanks to the team's efforts, future generations will still see these unique photographs in their true colors.



20 July 1969 – Astronaut Edwin E. Aldrin, Jr., Lunar Module pilot of the first lunar landing mission, poses for a photograph beside the deployed United States flag during an Apollo 11 extravehicular activity on the lunar surface. The Lunar Module is on the left, and the footprints of the astronauts are clearly visible in the soil of the Moon. Astronaut Neil A. Armstrong, commander, took this picture with a 70mm Hasselblad lunar surface camera.

NASA AS11-40-5875

"The digital scanning process will not only help preserve the images for future generations, but make access to the imagery much easier via the Imagery Online Web site."

Pat Rawlings

THE MARS AND MOON GENERATIONS

Together at last

by Debbie Nguyen

NASA's Apollo Program tackled President John F. Kennedy's challenge to make Americans the first to land on the Moon. Thirty-five years later, some of those young Apollo engineers returned to the consoles in the historic Mission Control Center (MCC) – this time, to join another young group of engineers, whose mission will be to return to the Moon and venture on to Mars.

Johnson Space Center cooperative education students recently ventured to Flight Control Room 2 of the historic MCC to watch "Apollo 13," a co-op tradition that began several years ago. What they didn't know was that they were going to have some special guests that night – Apollo-era flight controllers. Those present were:

- Sy Liebergot, Apollo EECOM (Electrical, Environmental and Communications), who was played by Clint Howard in the movie
- John Jurgensen, who sat on console for the Apollo guidance computers and who worked mainly on Apollo 8
- Robert Nute, who had the console position for Flight Crew Experiments and worked in the Missions Support Room for the Flight Activities Officer
- Jack Knight, Telcom for Apollo 11 and Telemu for Apollo 12, who was responsible for the Lunar Module Electrical Power Systems, Environmental and Thermal Control Systems, Communication Systems (Apollo 11 only) and Mechanical Systems, and for Apollo 12 and subsequent Extravehicular Suit and Life Support Systems
- Frank Hughes, who trained the first Apollo astronauts as Chief of Space Flight Training

All are still working at JSC except for Hughes, who has retired and is now Vice President of Tietronix, a production company for training products.

"It's people like you who are going to make this happen," said Liebergot about the Vision for Space Exploration before the movie began.

After the movie ended, the "Apollo men" answered questions and reminisced about how they overcame obstacles during the Moon missions. "Apollo 11 was a culmination of carefully planned, incremental steps," Liebergot said.

When asked how they celebrated after Apollo 13 "splashed down," the flight controllers all answered with "sleep."

"There was this huge sigh of relief, of course, but almost everyone had been working with little or no sleep, so when you heard that they were home and safe, you just slept," Jurgensen said.

"After watching the movie and then hearing the Apollo guys share their stories, it was like I was sitting in the middle of a haunted MCC," said first-time co-op Priscilla Celaya, who works in EVA and Spacesuit Systems and had never seen the movie before. "I felt like the room was haunted with a heroic story of brave space men traveling out of this world, their mission gone all wrong, and the persistent and determined flight control team to bring them home."

The 1995 film portrayed how NASA, through the dedication and leadership of people like Flight Director Gene Kranz, was able to bring home the crew of Apollo 13 – Astronauts James Lovell, Fred Haise and Jack Swigert – after their spacecraft suffered an explosion in orbit. Apollo 13 never landed on the Moon, but the crew was brought home safely through the determination and ingenuity of countless people on the ground. "Failure," as actor Ed Harris' Kranz said in the film, was simply "not an option."

As future generations of explorers are challenged with the Vision for Space Exploration to go to the Moon, Mars and beyond, they can look to the Apollo Program for inspiration, for it made the dream a reality when humans landed on the Moon more than 30 years ago.

NASA/Markowitz JSC2004E21283

A lunar reunion: Apollo Console Operators John Jurgensen, Robert Nute and Seymour (Sy) Liebergot reminisce about the Moon missions.

NASA/Markowitz JSC2004-00005

Co-ops Kenneth Armijo, Laura Brower, Chris Tanner and Jennifer Beall wait anxiously in the historical Mission Operations Control Room in Mission Control Center for "Apollo 13" to begin.

For more information on the Apollo Program, visit:
http://spaceflight.nasa.gov/history/apollo/index.html

Where were you?

20 July 1969

Astronaut Neil A. Armstrong, Apollo 11 commander, descends the ladder of the Apollo 11 Lunar Module prior to making the first step by a human on another celestial body. This view is a black-and-white reproduction taken from a telecast by the Apollo 11 lunar surface camera during extravehicular activity.

On July 20, 1969, the human race accomplished its single greatest technological achievement of all time when a human first set foot on another celestial body.

Six hours after landing at 4:17 p.m. Eastern Daylight Time (with less than 30 seconds of fuel remaining), Neil A. Armstrong took the "Small Step" into our greater future when he stepped off the Lunar Module, named "Eagle," onto the surface of the Moon, from which he could look up and see Earth in the heavens as no one had done before him.

He was shortly joined by "Buzz" Aldrin, and the two astronauts spent 21 hours on the lunar surface and returned 46 pounds of lunar rocks. After their historic walks on the Moon, they successfully docked with the Command Module "Columbia," in which Michael Collins was patiently orbiting the cold but no longer lifeless Moon.

Johnson Space Center employees reflect on where they were when the Eagle landed.

THAT SUMMER I was in between third and fourth grade and my family lived in southwest Houston. I had been following every Moon mission on TV and in the newspaper. I even put up a big picture of the Moon on the wall in my bedroom. On July 20, my parents, my brothers and I spent the day at Surfside Beach near Freeport. We all knew that this was the big day that Apollo 11 would attempt the first lunar landing. My father called us in from the water in the afternoon and we all gathered around the car and listened to the landing on the radio. That made us really look forward to the EVA coming up later that evening. We watched the first Moon walk that night on TV. I remember wishing that the TV picture from the Moon was better, but even so it was unforgettable. I had a real feeling of pride that our country had been able to achieve the goal we had set out to accomplish. It was incredible to watch men actually walking on another world. I guess I was pretty well hooked on the space program after that.

Bob Doremus
Space Shuttle Program Safety & Mission Assurance Office, NASA

16 July 1969, 9:32 a.m.

On schedule to within less than a second, Apollo 11 blasts off from Launch Pad 39A at Cape Kennedy, Fla., to start what is looked upon as the greatest single step in human history – a trip to the Moon, a manned landing and a return to Earth.

Strapped to their couches in the Command Module are Commander Neil A. Armstrong, civilian and ex-test pilot; Command Module Pilot Michael Collins; and Lunar Module Pilot Edwin E. (Buzz) Aldrin, Jr., the latter two officers of the U.S. Air Force.

From Launch Control the last words were: "Good luck and Godspeed."

(Inset) Members of the launch control team view the liftoff.

I was six years old when my parents woke my sister and me to watch the landing. Of course, I wanted to be an astronaut...

John Jurgensen, JSC-IM

I came here, to the "Manned Spacecraft Center," in 1967. Less than two years later, I was on the Apollo Guidance Computer Support console in the Mission Control Center during the Apollo 11 landing.

I remember my emotions during Lunar Descent very clearly, but I would have had a hard time articulating them even then, for they were like nothing I had felt before…or have felt since. It was simultaneously real and surreal. We had simulated descent many times; we knew what to expect; yet it was different this time. It felt unreal, as if I was observing myself, and the rest of us on console, as actors on a stage following a script. Then, when events did not follow the script, the right people quickly responded in the right way, and we continued with the script and landed.

We accomplished not only my lifelong dream (well, almost… the footprints would be Neil's and Buzz's, not mine) and achieved what had been viewed as impossible since the first humans looked up at the Moon. We knew that humans would never view the Moon, or ourselves, in the same way again. We knew that we had made history. Emotions? Joy. Disbelief. Belief. Pride. Elation.

Matt Abbott, NASA, Flight Director

I was six years old when my parents woke my sister and me to watch the landing. Of course, I wanted to be an astronaut, but the other thing that I very clearly remember was wanting to work in Mission Control. The seed was planted that night and sixteen years later I worked my first console shift in "that room" during STS-61A. After many Shuttle flights as a Flight Dynamics Officer, I'm currently the Lead Flight Director for ISS Expedition 9. I guess that seed really took hold!

Joe Maloy, EX/Exploration Systems Engineering Office

During the Apollo Program I was working at Lewis Research Center (now Glenn Research Center) in Cleveland, Ohio. I was living in a small two-bedroom apartment with my wife and our newborn son. The evening of the Moon landing my wife fell asleep while watching the TV coverage of the landing and I was taking care of the baby of six weeks. When Neil stepped onto the Moon I was holding my son and feeding him his bottle while watching TV. I recall holding my son so to face the TV and telling him that he was born in time to see one of the greatest events in history. Today and often at other times I can still remember that moment.

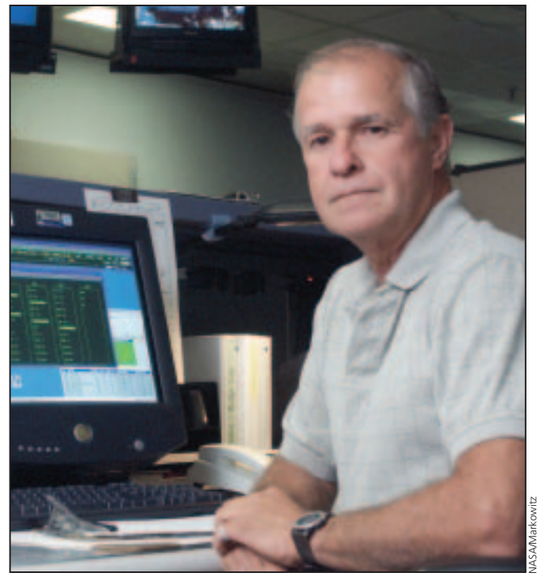
Stephen Vrana, JSC-NE

I was almost 13. I realized this was once in history, to see men on the Moon for the first time. We had visited JSC earlier. Mom's friend, Phyllis Ransdall, Gene Kranz's secretary, gave us Apollo training manuals. That and stories of space travel planted the

Mike Krueger

United Space Alliance
Simulation Controller

I was a 20-year-old Army helicopter pilot in Vietnam. I was flying Medevac missions in support of the 199th Light Infantry Brigade in an area in the Third Tactical Corps area know as the "Iron Triangle." I was listening to the radio commentary on a navigational radio that would pick up the Armed Forces Vietnam radio station. I just happened to be looking at the ground as Neil Armstrong was making his way to the surface of the Moon and saw a soldier step on a land mine. I immediately changed course, landed and picked up the one that stepped on the mine and another trooper that was close to him that was also injured. As I was taking off with the seriously injured soldiers on board, I could hear Armstrong in my earphones saying his one small step thing, and I couldn't help but think about the one small step that the young man I had just picked up would never forget. He lost a leg and a hand, and never had any idea of what was taking place a world away.



NASA/Markovitz

I just happened to be working at Mission Control the evening when the Eagle landed. Astronaut Glenn and I were chatting while...

desire to "reach for the Moon," to set out on a voyage of exploration as did Columbus centuries before.

As I awaited their exit from the LEM, Mom said "OK, time for bed!" I couldn't believe it. Here it was, the first ever lunar landing, and she was telling me to go to bed. Dad told her "Oh, let him watch it. This happens only once." Fortunately, the voice of wisdom prevailed. The ghostly images of people on another world for the first time were a marvel, and no other generation had, or would, experience them again. It was a great time to be alive.

Eileen Smith, SAIC

I was 18, living in Dickinson, Texas. We moved here in 1963 from Cape Canaveral. My father transferred for the opening of MSC. He worked in Flight Acceleration, Building 29 centrifuge.

On that day he said, "This is it – the big one." We huddled around the TV, watching the capsule land – waiting what seemed an eternity for someone to emerge. When Armstrong finally appeared, this was history but little did I know what was on the horizon, yet to come. His words, "one small step," give me goosebumps to this day.

It was an exciting time in aerospace. I remember admiration that my father worked in the hub. I have photos of him taken with the early astronauts during testing. After he retired, I began my "hereditary" career in 1974 with Philco Ford. It's been a magnificent ride – one I wouldn't change for any other career.

Ron Lerdal, NASA White Sands Test Facility

When the Eagle landed I had sat our then 4-month-old son in front of the television so he could eventually tell folks that he was a witness to this most momentous event in all of recorded history. Since then his love of history has taken him to the other side of the world, but he cannot seem to remember watching the lunar landing. Thanks for helping me to make the connection. Some day I will have him convinced that the lunar landing was not filmed in Arizona and that we really did go to the Moon.

Interesting that at the time the Eagle landed I was teaching Air Force officers how to operate Minuteman missile systems, and now as a NASA engineer I am participating in some testing of a Minuteman system component.

Harold Ferrese, Facility Manager, NACA/NASA

In 1962, I was working in the Administrative Division at the Temporary Headquarters in Houston, Texas. I just happened to be working at Mission Control the evening when the Eagle landed. Astronaut Glenn and I were chatting while walking down one of the aisles in Mission Control. I wondered what an opportune time it would be to ask John Glenn himself what he thought about the landing and that he was not a part of it. After all, he was the first American in orbit.