40 years later, moon still giant leap for mankind

July 19 2009, BY SETH BORENSTEIN , AP Science Writer

FILE - In this July 1969 file photo, Astronaut Edwin Aldrin walks by the footpad of the Apollo 11 Lunar Module. (AP/Photo, NASA, file)

(AP) -- The measure of what humanity can accomplish is a size 9 1/2 bootprint. It belongs to Neil Armstrong, the first man on the moon. It will stay on the moon for millions of years with nothing to wipe it away, serving as an almost eternal testament to a can-do mankind.

Apollo 11 is the glimmering success that failures of society are contrasted against: "If we can send a man to the moon, why can't we ..."

What put man on the moon 40 years ago was an audacious and public effort that the world hasn't seen before or since. It required rocketry that hadn't been built, or even designed, in 1961 when President John F. Kennedy declared the challenge. It needed an advance in

computerization that had not happened yet. NASA would have to learn how to dock separate spaceships, how to teach astronauts to walk in space, even how to keep them alive in space - all tasks so difficult experts weren't sure they were possible.

Forty years later, the moon landing is talked about as a generic human achievement, not an American one. But Apollo at the time was more about U.S. commitment and ingenuity.

Historian Douglas Brinkley called the Apollo program "the exemplary moment of America's we-can-do-anything attitude." After the moon landing, America got soft, he said, looking for the quick payoff of a lottery ticket instead of the sweat-equity of buckling down and doing something hard.

In years since, when America faces a challenge, leaders often look to the Apollo program for inspiration. In 1971, when President Richard Nixon declared a war on cancer, his staffers called it "a moon shot for cancer." Last year, then-candidate Barack Obama and former Vice President Al Gore proposed a massive effort to fight global warming, comparing it to Apollo 11. An environmentalists' project to tackle climate change and promote renewable energy took the name "Apollo Alliance."

Those still-unfinished efforts recall May 25, 1961, when President Kennedy, fresh from a disastrous Bay of Pigs invasion of Cuba, announced that America would land a man on the moon by the end of the decade and return him safely home.

"I thought he was crazy," said Chris Kraft, when he heard Kennedy's speech about landing on the moon.

Kraft was head of Mission Control. He was the man responsible for guiding astronauts to orbit (which hadn't been done yet) and eventually

to the moon. Kraft first heard about a mission to the moon when Kennedy made the speech.

"We saw that as Buck Rogers stuff, rather than reality that would be carried out in any time period that we were dealing with," Kraft recently told The Associated Press in a telephone interview from Houston.

Less than three months later, Kraft was in the White House explaining to the president just how landing on the moon would be done. Kraft still didn't believe it would work.

"Too many unknowns," he said.

It was the Cold War and Russian Yuri Gagarin had just become the first man in space. Kennedy chose landing a man on the moon because experts told him it was the one space goal that was so distant and complicated at the time that the United States could catch up and pass the Soviet Union, Kennedy adviser Ted Sorensen said.

The idea in a world where American capitalism was pitted against Soviet communism on a daily basis was "to prove to the world which system was best, which one was the future," Sorensen said.

"It's not just the fact that the president wanted it done," Sorensen recalled. "It was the fact that we had a specific goal and a specific timetable."

In another speech, Kennedy famously said America would go to the moon and try other tasks "not because they were easy, but because they were hard. Because that goal will serve to organize and measure the best of our energies and skills."

They weren't just skills with rockets and slide rules. Bringing together

countless aerospace companies, engineers, scientists, technicians, politicians and several NASA centers around the nation was a management challenge even more impressive than building the right type of rockets, said Smithsonian Institution space scholar Roger Launius.

And it cost money. The United States spent $25.4 billion on the Apollo program, which translates to nearly $150 billion in current dollars - less than the U.S. spent in both wars in Iraq and Afghanistan in 2007.

Yet, in the view of those heavily involved in the challenge, what made Apollo work was two tragedies: the assassination of Kennedy in 1963 and the fatal Apollo 1 fire in 1967.

The assassination of Kennedy made the Apollo program and its budget politically nearly untouchable. The moon-landing goal - which Kennedy later talked about modifying and even including the Soviets on - became a symbol of the martyred president. NASA's launch center was renamed from Cape Canaveral to Kennedy.

The Apollo fire, which occurred during ground testing, killed three astronauts, including Armstrong's neighbor. The main problem was that there was 100 percent oxygen in the capsule, which made fire spread rapidly.

Kraft, in a July interview said he is convinced that NASA couldn't have reached Kennedy's target were it not for the Apollo 1 fire and the way it made the space agency rethink everything: "We were building inferior hardware at that point in time.

"The whole program turned around, both from a hardware and management point of view," Kraft said. "You really learn from failure."

So NASA drilled astronauts and flight controllers ceaselessly with

simulations. Failures kept being thrown at the astronauts and the controllers, some just plain unsolvable.

One of the last failures simulated before Apollo 11's launch was an alarm on the lunar lander that signaled the computer was overloaded. During the simulation, Mission Control in Houston aborted the landing. But controllers were later told it was just an "indication" signal and that if they had thought about it, the computer really was working fine. Controllers thought the test was unfair, according to an account in the new book, "Rocket Men: The Epic Story of the First Men on the Moon" by Craig Nelson.

But during the real mission, as the Eagle lunar lander approached the moon, that test-run computer signal appeared. This time controllers knew everything was OK. They didn't abort the moon landing.

Still, there were more hurdles to come. In another example, experience and nerves paid off. As Eagle neared the landing area in the spot called Sea of Tranquility, Armstrong saw too many boulders and craters to come down safely. So he kept flying horizontally, 100 feet off the ground, scouring the moonscape for a smooth place.

Eagle's fuel tank neared empty. Alarms went off. Mission controllers in Houston fretted.

"We still needed to get down," recalled Edwin "Buzz" Aldrin. "I'm not telling Neil, 'Hey Neil, hurry up, get on the ground.' I'm sort of conveying this with body English."

There were only 17 seconds worth of fuel left.

Finally, the radio at Mission Control crackled with Armstrong's voice: "Houston, Tranquility Base here. The Eagle has landed."

Two hours later, humans walked on a place other than Earth, a place truly foreign.

"This is a very desolate place," recalled Aldrin, second to step on the moon. "It's just boring. It's all one color that varies depending on the sun angle. But the sky is black, it's all black except the one object there, the Earth, and the object behind us, the sun."

The world watched on television as the first two men walked on the moon. But one person close to the action couldn't. He was the third crew member of Apollo 11, command module pilot Michael Collins, who was orbiting the moon alone. He didn't get to see what was happening. But he could hear Neil Armstrong say his famous first words.

Decades later, Armstrong called his first words on the moon "a pretty simple statement, talking about stepping off something."

But Armstrong wasn't merely talking about that small step of his. What came next was the big deal. It was, as he said on the moon 40 years ago, "a giant leap for mankind."

It still is.

Multimedia journalist Kevin Vineys in Washington and television producer Sara Gillesby in New York contributed to this report.

On the Net:

NASA's Apollo anniversary site:

http://www.nasa.gov/mission(underscore)pages/apollo/40th/index.html

NASA interactive site showing Apollo high points by state:

http://www.nasa.gov/externalflash/ApolloNearYou/index.html

NASA video of Apollo 11 landing on the moon:
http://history.nasa.gov/alsj/a11/A11Landing.mov