

Our Missouri Podcast

Title: Summer Series, Part 2: Mr. Mac & the Race to the Moon

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KEVIN WALSH: Welcome to *Our Missouri*, a podcast about the people, places, culture, and history of the 114 counties and independent city of Saint Louis that comprise the great state of Missouri. Each episode focuses on a topic related to the state ranging from publications about Missouri's history to current projects undertaken by organizations to preserve and promote local institutions. The *Our Missouri Podcast* is recorded at the Center for Missouri Studies in Columbia, and is generously provided to you by the State Historical Society of Missouri. And now, here's your host, Sean Rost.

SEAN ROST: Good morning, good afternoon, and good evening, or at whatever hour you are tuning in to listen to the *Our Missouri Podcast*. My name is Sean Rost and I will be your guide as we explore the memories, moments, and misfortunes from our Missouri. Fifty years ago this summer—1969 to be exact—the space race pitting the United States against the Soviet Union was reaching the proverbial finish line. The only question that remained was: Who would land on the Moon first? Over the next four episodes, we will explore the history behind the contributions made by Americans—and more specifically, Missourians—to not only explore the far reaches of space, but also to land a person on the Moon. So, let's prepare for launch.

[Mission Control Opening Sequence]

SEAN ROST: Today's episode takes us to the heart of what became known as the Space Race. With the successful launch of Sputnik by the Soviet Union in 1957, the United States felt it had fallen far behind its Cold War rival technologically. Though the U.S. was in the process of developing its own satellites at the time, Sputnik ushered in an era where space dominated the world's attention. In the midst of the space race, companies around the United States vied for the opportunity to lift the nation out of its assumed technological inferiority and into the stratosphere. Yet, for two of the first major projects of the space race, Mercury and Gemini, NASA and the United States government turned to Saint Louis-based McDonnell Aircraft Company.

Despite its base of operations being located in the state, McDonnell Aircraft's founder, James Smith McDonnell, Jr., was not a native Missourian. Born in Denver, Colorado, in 1899, he spent much of his early life in Arkansas. In fact, according to the census, James, Jr., was the only member of his immediate family born outside of the South. His father, James Smith McDonnell, Sr., was a successful businessman in and around Little Rock in the first two decades of the 20th Century. After graduating from Little Rock High School (now Little Rock Central High School), McDonnell enrolled briefly at Princeton University before serving for a short period of time in

the U.S. Army during World War I. Upon being discharged, McDonnell re-enrolled at Princeton and completed a bachelor's degree in physics in 1921.¹

Inspired by some early experiences with airplanes, McDonnell saw two paths forward. First, he could continue his education through graduate work in aeronautical engineering. Second, he could re-enlist in the U.S. Army to join the Air Corps. Interestingly, he took both paths. He initially re-enrolled for graduate work at MIT before leaving the school to move to Texas to attend the Army Air Corps Flying School. This brief sojourn into the Southland introduced him to the growing field of aeronautics as well as up and coming aviators like Charles Lindbergh, but he opted to return to MIT to complete his master's degree. Upon earning his degree, McDonnell spent most of the remaining 1920s bouncing around between various airplane companies, including Huff Daland, Consolidated Aircraft Company, and Stout Metal Airplane within the Aviation Division of the Ford Motor Car Company. After being fired from Ford for the alleged crime of wearing knickers to work, he was employed by one more company, Hamilton Aero Manufacturing Company, before venturing out on his own to form J.S. McDonnell and Associates.²

James McDonnell's decision to go out on his own coincided with a nationwide competition put on by Harry F. Guggenheim to design and build newer and safer airplanes. McDonnell's "Doodle Bug" showed immense early promise in its testing around Milwaukee, but mechanical setbacks plagued the project. McDonnell had to ask for a time extension just to get the Doodle Bug to the site of the competition in New York. The Doodle Bug was well on its way to a strong showing in the competition when it suffered major damage on an emergency landing. The airplane was quickly sent back to Milwaukee for repairs, but it again suffered mechanical issues and was forced to withdraw from the competition. Not long after the Doodle Bug's disappointing showing, and with the Great Depression setting in, J.S. McDonnell and Associates disbanded.³

J.S. McDonnell spent the dark days of the Great Depression moving around as he had in the 1920s between aircraft companies. He first joined Great Lakes, but quickly moved to Glenn L. Martin Aircraft Company. He rose through the ranks of Martin Aircraft to become Chief Engineer by the end of the 1930s. Yet, the hope of owning his own company remained in the back of his mind. With war in Europe on the horizon, the now forty year old pilot engineer made plans to venture out on his own once more. In 1939, he started McDonnell Aircraft Corporation. His decision to start his own company was not surprising, but the location of its headquarters—Saint Louis—was. To McDonnell, Saint Louis just made sense. It's location in the Midwest

¹ James Horgan, *City of Flight: The History of Aviation in St. Louis* (Gerald, MO: Patrice Press, 1984), 338; Douglass J. Ingells, *The McDonnell Douglas Story* (Fallbrook, CA: Aero Publishers, Inc., 1979), 29-30; Bill Yenne, *McDonnell Douglas: A Tale of Two Giants* (New York: Crescent Books, 1985), 8-9.

² Horgan, *City of Flight*, 338-339; Ingells, *The McDonnell Douglas Story*, 30-38; Yenne, *McDonnell Douglas*, 8-9.

³ Horgan, *City of Flight*, 338-339; Ingells, *The McDonnell Douglas Story*, 30-38; Yenne, *McDonnell Douglas*, 8-9.

allowed it a cushion from eastern and western aircraft companies. Additionally, the city had a large population as well as a sizable airport at Lambert Field.⁴

The origins of the McDonnell Aircraft Corporation were humble to say the least. Located in a building rented from American Airlines, the company had less than ten employees for its first few years. Yet, the dawn of World War II brought a dramatic increase in business through military contracts. Though it had not yet sold a significant airplane prototype, the company emerged from World War II as the largest supplier of airplane parts in Saint Louis. It also became a significant employer in Saint Louis as its employee population topped 5,000. Producing parts for the war proved so lucrative that McDonnell soon opened a second factory in nearby Memphis, Tennessee.⁵ With its quick growth, McDonnell was soon invited to participate in projects designed to develop new jet-propelled aircraft through the U.S. government. McDonnell's first notable jet aircraft was the XFD-1 *Phantom*. The *Phantom* was followed by *Banshee*, *Demon*, and *Voodoo*. This increase in jet production led the company to increase its workforce to roughly 14,000 employees by the early 1950s to meet the demands of the new Cold War.⁶

The efforts of the U.S. military to compete with the Soviet Union impacted McDonnell's jet aircraft program as well as its up and coming rocket program. Yet, the greatest impact was felt through NASA's decision to select McDonnell as the main contractor on the new Project Mercury. Begun in 1958, Project Mercury was the United States' first substantial attempt at manned spaceflight. Launched soon after Sputnik, NASA hoped that each mission of Project Mercury would put an astronaut into space and return them safely back to Earth. Over the first three years of the program, rocket tests and experiments dominated the agenda. Yet, when cosmonaut Yuri Gagarin completed the first orbit of Earth in a manned capsule in April 1961, the pressure on NASA and the Mercury 7 astronauts intensified. Less than a month later—May 5, 1961—Alan Shepard, a thirty-seven year old naval aviator, became the first American in space during his suborbital flight aboard Freedom 7. Gus Grissom soon followed with his own suborbital flight in July 1961. By early 1962, thanks to John Glenn's three successful trips around the Earth, the American space program was catching up to the Soviets and Project Mercury was a resounding success.⁷

In Saint Louis, the entire city—including within the halls of McDonnell—was abuzz with news of Mercury.

⁴ Horgan, *City of Flight*, 339-342; Ingells, *The McDonnell Douglas Story*, 38-42; Yenne, *McDonnell Douglas*, 8-9, 70-72.

⁵ Horgan, *City of Flight*, 342-343; Ingells, *The McDonnell Douglas Story*, 38-42, 65-71; Yenne, *McDonnell Douglas*, 70-72.

⁶ Horgan, *City of Flight*, 345-359; Ingells, *The McDonnell Douglas Story*, 78-90, 103-113; Yenne, *McDonnell Douglas*, 72-83.

⁷ Horgan, *City of Flight*, 359-363; Ingells, *The McDonnell Douglas Story*, 225-240; Yenne, *McDonnell Douglas*, 198-203.

TONY ANDERHUB: When you went out to a party anywhere, and you said you worked on the Mercury Program—wow—you were the center of attention. They all asked you about the astronauts and what you do now and that stuff.⁸

SEAN ROST: At McDonnell, as they had done since the start of the project, employees worked to design, build, and test the capsules that would carry each Mercury 7 astronaut into space.

TONY ANDERHUB: It was a team effort and everybody was always gung-ho to get the job done and get it done right and on-schedule. That was the primary effort, and, of course, the schedule was very important, especially on Mercury Program, we were under the gun to try to get a man in space because of the Russians beating us in that attitude.⁹

JIM KOHLBERG: I saw a lot of things. They were doing the pig tests. The monkeys were around. They had altitude chamber runs. This is all new stuff. Greek to us, kid. We didn't know anything. But, we learned as we went along. We saw how they made the inner skin of the pie sections. They made the outer skin of pie sections. They riveted these two together and those were like two, I think they're O-16, each one of them thick. I can remember the inner skin. We set it on a big table with a bunch of what they called dum-dum. It's like a big bunch of mud and we set it into that and then put a plate on the top and screwed it down and pumped air in there and put soap on the outside to see if there were any leaks in this spacecraft. All kind of weird stuff like that.¹⁰

SEAN ROST: When the capsules were ready for testing, the astronauts arrived at McDonnell and quickly got to work familiarizing themselves with the equipment.

BOB CORTONOVIS: I think that probably my work with the astronauts was probably one of my most interesting at times. I enjoyed working with the astronauts and making sure that they understood what we were doing in the way of making the spacecraft. So, I enjoyed that very much working with them. They were a good group of young men who really were dedicated to making that a successful program, which they did, of course.¹¹

BOB CORTONOVIS: They watched the progress of the program very carefully. I don't blame them. They were going to fly those things. They wanted to make sure that they knew what was

⁸ *McDonnell Space Program In St. Louis* (S0759), T759.8, Tony Anderhub Interview, The State Historical Society of Missouri Research Center-St. Louis.

⁹ *McDonnell Space Program In St. Louis* (S0759), T759.8, Tony Anderhub Interview, The State Historical Society of Missouri Research Center-St. Louis.

¹⁰ *McDonnell Space Program In St. Louis* (S0759), T759.7, Jim Kohlberg, The State Historical Society of Missouri Research Center-St. Louis.

¹¹ *McDonnell Space Program In St. Louis* (S0759), T759.12, Bob Cortonovis Interview, The State Historical Society of Missouri Research Center-St. Louis.

going into them and how they were operating. So, they spent a lot of time at the plant and with the engineering department, too, to make sure that the engineering was as they liked it.¹²

SEAN ROST: As the original Mercury 7 astronauts prepared for their inaugural spaceflights, NASA was already thinking of the next steps in the race to the Moon—Project Gemini and Apollo. While Apollo would ultimately be the series of missions that landed humans on the moon, Gemini was meant to serve as a bridge between the orbital flights of Mercury and the landing procedures of Apollo. As it had done for Mercury, McDonnell Aircraft was selected to design the Gemini capsules. Project Gemini had several important goals on its checklist, and McDonnell employees knew that their work would be a little different this time around.¹³

BOB CORTONOVIS: The Gemini program was a specific program designed to assure that two spacecraft could rendezvous and dock together in space. This was in preparation for the Moon landing, where the moon lander, after performing its duties on the moon, would transfer back and rendezvous with the mother ship—rendezvous and dock with it and bring the astronauts back home.¹⁴

LYNN MUTCHLER: I was responsible for the strength of the cabin section on the Gemini spacecraft. I worked on Mercury before and got some experience. Then, on the Gemini spacecraft, I remember that the hatches were quite a problem. Hatches had to pop open in a quarter of a second to allow the astronauts to eject and come down on a parachute in case of trouble on the launching pad or during early flight.¹⁵

SEAN ROST: In addition to docking and ejection tests, the Gemini capsules would also need to withstand a longer duration in orbit. While all the Project Mercury missions had lasted less than thirty-six hours, Gemini missions were scheduled to last at least a week. It was also expected that astronauts would exit the capsule while in orbit and perform spacewalks.¹⁶

In 1965, Gemini 3 lifted off from Cape Kennedy with Gus Grissom and John Young aboard. Over the next year and a half, nine more missions successfully launched and checked key items off the list in preparation for Apollo. Having served as the Command Pilot of Gemini 3, and as the second American in space aboard Liberty Bell 7, Gus Grissom was selected to lead the Apollo 1 mission in 1967. Apollo 1, however, would be a tragic start for what was supposed to be the final step leading to the Moon. Its crew of Roger Chaffee, Ed White, and Gus Grissom

¹² *McDonnell Space Program In St. Louis* (S0759), T759.12, Bob Cortonovis Interview, The State Historical Society of Missouri Research Center-St. Louis.

¹³ Horgan, *City of Flight*, 363-367; Ingells, *The McDonnell Douglas Story*, 231-242; Yenne, *McDonnell Douglas*, 198-203.

¹⁴ *McDonnell Space Program In St. Louis* (S0759), T759.12, Bob Cortonovis Interview, The State Historical Society of Missouri Research Center-St. Louis.

¹⁵ *McDonnell Space Program In St. Louis* (S0759), T759.11, Lynn Mutchler Interview, The State Historical Society of Missouri Research Center-St. Louis.

¹⁶ Horgan, *City of Flight*, 363-367; Ingells, *The McDonnell Douglas Story*, 231-242; Yenne, *McDonnell Douglas*, 198-203.

were killed during a launch run-through when a fire destroyed the command module's cockpit. News of the three astronauts' deaths sent shockwaves around the nation, particularly at McDonnell where White and Grissom had visited prior to their Mercury and Gemini missions.¹⁷

TONY ANDERHUB: I worked the most with Gus Grissom, even though I met all of the Mercury astronauts and worked with some of them on simulated flights, but Gus was the engineering representative of the seven astronauts and because our procedures were not exactly the same as Cape's, I did work a little with him in running through our procedures and ensuring him that we were duplicating what Cape was doing. So, he came in on spacecraft 11 which is the one he flew in the infamous hatch-blowing incident. He was riding—all the astronauts liked to ride the spacecraft in simulated flights as soon as they could. So, they used to come in. So, Gus was in there and we ran our simulated flight which was a selling point for the spacecraft. We went through the whole thing, it was really great, and at the very end, there are three modes of aborts—a hand abort, a UHF, and a VHF abort. We said, "Well, Gus, we just have to go through the abort sequence and we're finished." So, we asked Gus to initiate the hand abort. Nothing happened. And I told the communications people to use the UHF. Nothing happened. The HF. Nothing happened. He would have crashed. So, I told Gus we have to do some troubleshooting and he'll have to come back and do these modes after we figure out and fix it. So, as he stepped out of the spacecraft, he said, "Well, that's why we have seven of us." And I think that showed the attitude of most of these astronauts. They knew they were at risk and things would happen. And unfortunately, he ended up in the Apollo fire.¹⁸

SEAN ROST: The deaths of Grissom, Chaffee, and White would not be the only fatalities to mar the efforts of the United States to land on the Moon. On February 28, 1966, astronauts Charles Bassett and Elliot See were scheduled to visit the McDonnell facility in Saint Louis for routine spacecraft evaluations in preparation for Gemini 9. As morning rush hour traffic dissipated along nearby Interstate 70, the Northrop T-38 Talon carrying both men crashed in low visibility as it came towards Lambert Field.¹⁹

TONY ANDERHUB: Our offices were on the balcony of 101, in the northeast end of the building, whereas right across the building in the northwest was the clean room and the control room. Elliot See and Charles Bassett were flying in to run one of our altitude chamber tests. They stalled out and hit the 101 building. They hit it right on the area of the white room, but fortunately, when they impacted the building, as I looked at it after the accident, they hit right over a column, which I feel kept them in the truss structure of the ceiling and the airplane just penetrated the ceiling and actually I had a view when I heard the impact. I looked back over my shoulder and I saw Rex Barnes who was working for me running to the east with a fireball close behind him and all of the sudden a huge deluge of water came in and put out the fire. The

¹⁷ Craig Nelson, *Rocket Men: The Epic Story of the First Men on the Moon* (New York: Viking, 2009), 180-185; Ingells, *The McDonnell Douglas Story*, 240-242.

¹⁸ *McDonnell Space Program In St. Louis* (S0759), T759.8, Tony Anderhub Interview, The State Historical Society of Missouri Research Center-St. Louis.

¹⁹ *St. Louis Post-Dispatch*, 28 February 1966.

airplane continued through the building and into the parking lot, almost to the end of Building 105. It was about thirty feet from 105, and, of course, it damaged a lot of cars or destroyed a lot of cars. But, fortunately, no one was hurt. If they would have been ten feet lower, they would have wiped out the white room, the p personnel, and about three spacecraft. Probably would have proceeded into our area. And if they were thirty feet over, they would have wiped out 105 which contained the central computer system for the whole company.²⁰

NORBERT PLASSMEYER: We had office space in this Building 101 on what would be the second floor of that part of the building. There was a preference for the coffee that was available in a coffee machine a short distance away in the other building. So, I went there to get a cup of coffee. I was in this passageway and I saw this smoke coming up out of the building I was about to go in to—that is what came to my attention. So, I walked into the office—the office space that they had. I mentioned to some people that, "I don't know what's happening here, but it looks like this building is on fire." Then, a guy had a call on the phone from somebody way across the airport that said, "Hey, your building is on fire." There weren't any alarms or anything like that that I remember. But, I said, "Well, look, I don't know about you, but I'm getting out of here." I made my way to the nearest exit until we could find out what was happening. I do not remember how long it took to know what actually happened...It was a big deal—anything would be a big deal if it hits your building. These individuals were—they were special people, put it that way.²¹

SEAN ROST: In the aftermath of Bassett's and See's deaths, the crews of the remaining Gemini missions were reshuffled. Thomas Strafford and Eugene Cerman now headed Gemini 9, with Jim Lovell and Buzz Aldrin moved into position as the backup crew. Lovell and Aldrin served as the lead crew for Gemini 12 which put them in prime position for the Apollo program. Lovell served on Apollo 8 and the ill-fated Apollo 13. Aldrin served on Apollo 11 and was the second person to step foot on the moon.²²

Though the Apollo missions served as the successful culmination in the race to the moon, McDonnell Aircraft was not selected for the project. Instead, McDonnell, which merged with the California-based Douglas Aircraft Company in 1967 to form McDonnell Douglas, was contracted to work with NASA on Skylab, an ambitious project that ultimately launched the United States' first space station into orbit in the 1970s. Outside of its space program, McDonnell Douglas spent the 1970s developing commercial airplanes like the DC-10 and major military innovations such as the F-15 Eagle, F/A-18 Hornet, and the Harpoon missile.²³

Having taken his company from a small rented building on the grounds of Saint Louis' Lambert Field to the far reaches of the Earth's orbit, James S. McDonnell, Jr. became a revered

²⁰ *McDonnell Space Program In St. Louis* (S0759), T759.8, Tony Anderhub Interview, The State Historical Society of Missouri Research Center-St. Louis.

²¹ *Missouri Innovation & Exploration Oral History Project* (C4352), Norbert Plassmeyer, 8 April 2018, The State Historical Society of Missouri Research Center-Columbia.

²² Nelson, *Rocket Men*, 190; Ingells, *The McDonnell Douglas Story*, 240-242.

²³ Horgan, *City of Flight*, 363-367; Ingells, *The McDonnell Douglas Story*, 242-291; Yenne, *McDonnell Douglas*, 184-189, 203-251.

figure not only within the halls of McDonnell and McDonnell Douglas, but also in the larger aerospace community. When he died in 1980, McDonnell Douglas was considered the largest private employer in Missouri. In his obituary in the *Saint Louis Post-Dispatch*, McDonnell was credited with founding "the aerospace giant that advanced the Free World into space exploration."²⁴ Though he would not live to see the growth of his company through the remainder of the 20th Century and the eventual merger with Boeing, James McDonnell's legacy can still be seen throughout Saint Louis, including McDonnell Park, McDonnell Planetarium at the Saint Louis Science Center, McDonnell Hall at Washington University, and James S. McDonnell Blvd on the north side of St. Louis-Lambert International Airport.²⁵ He is also memorialized with a bust in the Hall of Famous Missourians at the state capitol in Jefferson City.²⁶ To this day, former employees of McDonnell, McDonnell Douglas, and Boeing who worked under him fondly remember the boss they called "Mr. MAC."

LYNN MUTCHLER: Everybody liked him. He'd come out and talk to you. I remember riding on the airplane down to Florida with him that day that he took the four of us. He had looked up something a little about each person that was his guest and come over and talk to you about it like he knew who your children were and what their names were or something else. He put those things away. He had somebody look it up and he'd memorize it and come over and make some comments. He was a very thoughtful man.²⁷

DONALD AMES: I had meetings with him every Friday. I came over, picked him up from his office every Friday, and I had lunch with him after that many times. Usually, once or twice a month, to explain what was going on in the laboratory. He'd come over to the laboratory to talk to other people. I was not necessarily involved with his discussions with other people. He was really a smart man, very smart. He understood a lot of things that the normal people with engineering backgrounds do not understand. He understood them. He'd listen to you.²⁸

BOB CORTONOVIS: Mr. MAC was a tough taskmaster. So, he was a pretty hard man to work for. He expected the impossible and got it.²⁹

²⁴ *St. Louis Post-Dispatch*, 22 August 1980.

²⁵ *St. Louis Post-Dispatch*, 22 August 1980; "McDonnell Park," St. Louis County, Missouri, 26 June 2019, <https://www.stlouisco.com/Parks-and-Recreation/Park-Pages/McDonnell>; "James S. McDonnell Hall," Washington University in St. Louis, 26 June 2019, <https://wustl.edu/about/campuses/danforth-campus/james-s-mcdonnell-hall/>.

²⁶ "Hall of Famous Missourians: James Smith McDonnell," Missouri House of Representatives, 26 June 2019, <https://house.mo.gov/famous.aspx>.

²⁷ *McDonnell Space Program In St. Louis* (S0759), T759.11, Lynn Mutchler Interview, The State Historical Society of Missouri Research Center-St. Louis.

²⁸ *McDonnell Space Program In St. Louis* (S0759), T759.13, Donald Ames Interview, The State Historical Society of Missouri Research Center-St. Louis.

²⁹ *McDonnell Space Program In St. Louis* (S0759), T759.12, Bob Cortonovis Interview, The State Historical Society of Missouri Research Center-St. Louis.

EARL ROBB: I think had it not been for—if Mr. MAC had not have been there, I don't think the space program would be where it is today—to be very honest. So, I have a great respect, and feel very lucky to have been chosen to work on that program.³⁰

SEAN ROST: Thanks for listening to this week's episode. As always, I am your host, Sean Rost. The show's producer is Brian Austin. The opening and concluding credits are narrated by Kevin Walsh. Special thanks also goes to the staff of the State Historical Society of Missouri-Saint Louis Research Center for providing digital copies of oral history interviews from their McDonnell Space Program In St. Louis Collection for this episode. If you are a former employee of McDonnell, McDonnell Douglas, or Boeing, and would be interested in recording an oral history interview about your life and career, please let us know. We would also be interested in recording oral history interviews with former employees of Rocketdyne in Neosho. Oral history interview inquiries can be emailed to "ourmissouri@shsmo.org." Stay tuned for Part 3 of the Summer Series when we explore Walter Cronkite and the story of the Moon Landing.

KEVIN WALSH: Thank you for listening to the *Our Missouri Podcast*. If you would like to learn more about the podcast, including past and future episodes, information about guests, and upcoming events, please visit our website at shsmo.org/our-missouri.

³⁰ *McDonnell Space Program In St. Louis* (S0759), T759.5, Earl Robb Interview, The State Historical Society of Missouri Research Center-St. Louis.