Human Computers and the People Behind Them

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 The National Aeronautics and Space Administration, also known as NASA, was established in 1915 as the National Advisory Committee for Aeronautics, also known as NACA. NACA was put to an end and NASA was officially established in 1958. The first computers at NASA were made of regular human beings. These certain human beings had experiences in mathematics and physics because their job was to figure out certain number problems that went with the creation and help of getting an object or human in space.[[1]](#footnote-1) A group of African American women played a big part for NASA for their help with calculations because the computers in that era were slower and had less computing capacity than modern computers. Katherine Johnson, Mary Jackson, and Dorothy Vaughn were some of the important people who helped NASA send the first few people into space.

 African American women were a huge help for NASA’s space mission to send a man into space. The computing work at NACA is done almost entirely by women who were specifically trained to do so. [[2]](#footnote-2) Many African Americans were human ‘computers’ who could solve or check mathematical calculations. World War II made opportunities for African American women to become computers in NACA.[[3]](#footnote-3) It was a hard time for African American women because they were still being discriminated against for being women and African American during this timeline.[[4]](#footnote-4) In May of 1943, there were five African American women that were a part of Langley’s segregated west side who were later known as the “West Computers”.[[5]](#footnote-5) The first computing pool of women at Langley started in 1935 and all the men were not happy about it. In reality, women were better at computing than men were.[[6]](#footnote-6) It was also know that the clerical aptitude rating of women was a little higher than the general average for men.[[7]](#footnote-7)

 Katherine Johnson was only 15 years old when she started college at West Virginia University with a full ride. Johnson met Jimmy Goble while she was teaching at Marion and married him before she left for West Virginia.[[8]](#footnote-8) In1955, Goble became ill because of a tumor in his skull that could not be helped. She got remarried to Jim Johnson in August of 1959.[[9]](#footnote-9) Johnson got a job at Langley as a West Computer but was later transferred to temporarily work for Henry Pearson but he soon kept her and hired her for his group of computers.[[10]](#footnote-10) Johnson helped calculate the launch windows for the first astronauts to be sent into space. She described the orbital trajectory of astronaut John Glenn’s flight into space.

 Mary Jackson graduated in 1938 from Phoenix High School.[[11]](#footnote-11) She enrolled into Hampton Institute where a lot of her family went for college. At Hampton Institute, Jackson majored in mathematics and physical science.[[12]](#footnote-12) A lot of women from the West Computers were members of the sorority Alpha Kappa Alpha including Jackson, Vaughn, and Johnson.[[13]](#footnote-13) She got a teaching job at a Negro high school in Maryland. In 1944, Jackson got married to Levi Jackson. When her son turned four years old, she applied for a job as a computer at Langley and a clerical position for the army.[[14]](#footnote-14) She got the job for Langley and started on April 5, 1951.[[15]](#footnote-15) Jackson had an understanding of the physical phenomenon behind the calculations she had to work on because of her background in physics and math. Kaz Czarnecki offered Jackson to join his Four-Foot SPT group because he thought that she had a soul of an engineer.[[16]](#footnote-16)

 Dorothy Vaughn started as a math teacher at Robert Russa Moton in Farmville, Virginia. Vaughn had applied for a summer job at Camp Pickett and applied to a job at an aeronautical laboratory in Langley.[[17]](#footnote-17) She took up a job at Camp Pickett for the summer to get extra money. She worked as a math teacher for a couple more years until she got a letter from Langley saying that she got hired. Vaughn started working at Langley in 1944 as a Mathematician for World War II. She worked with the white “East Computers” to write a book on the algebraic methods for the mechanical calculating machines.[[18]](#footnote-18)

 The work place at Langley was very segregated. There were bathrooms for black women and bathrooms for white women. There were signs on lunch tables for the black women at the back of the cafeteria.[[19]](#footnote-19) There were dormitories that separated the white and black women. The white women, also known as the “East Computers”, were moved to bigger laboratories but black women, also known as the “West Computers,” stayed where they were. White and black people were so segregated that a lot of white laboratory employees did not know that there was an all black computing group at Langley.

 The United States’ most powerful secret weapon was NASA. During the war, many women around the United States took up computing jobs.[[20]](#footnote-20) In 1947, Langley had bought from Bell Telephone Laboratories an “electric calculator” for flight research.[[21]](#footnote-21) When the Bell was used to solve engineers’ questions, it ran sixteen times faster than any human computer.[[22]](#footnote-22) All the women who were mathematicians were not fazed by the new invention from taking their jobs. With the new technology around, many West Computers found other new positions at the lab. This had also helped end the segregation with the West Computers and everyone else.

 The controversy about getting a man in to space was thrown in to the air. “-Humans pined to go into space because of their longing to know what lay beyond the confines of their own small world..”[[23]](#footnote-23) Johnson and everyone in Building 1244 were curious on how they were going to get a man up into space. They found a textbook called *Introduction to Celestial Mechanics* and Pearson chose to have a teaching lecture having one engineer for every topic that related to space technology. Johnson was not allowed inside the room for these lectures because it was a rule of thumb that the computers couldn’t sit in these meetings but she waited outside the door and listened to every single word that was said and used it to her advantage and knowledge.[[24]](#footnote-24) After asking many times, she was finally allowed to attend the editorial meetings.[[25]](#footnote-25)

 NASA had decided to put a man in to space; it should be a ballistic fight.[[26]](#footnote-26) Many equations and decisions were considered. “Capsule goes up, capsule goes down, it path like a parabola, its landing place the Atlantic Ocean”.[[27]](#footnote-27) The reason they want it to land in the Atlantic Ocean is because they would need the ship to land near Navy ships for them to be able to pick it up and take it out of the water safely.[[28]](#footnote-28) Johnson, eager to get the job done said, “Tell me where you want the man to land, and I’ll tell you where to send him up,”[[29]](#footnote-29) She was very reliable with numbers as a human computer. The Project Mercury’s launch date was in 1961. “I think that those of us in the bio-medical community who are involved in meeting some of the torrent problems of manned space flight are fully aware of both our responsibilities to… And I certainly think that this has been improved with - almost in a linear fashion with the growth of NASA”.[[30]](#footnote-30)

 World War II was going on during this point of time. The United States was an isolated country during most of the war. The United States did not officially join the war until the bombing of Pearl Harbor on December 7th, 1941. The bombing of Pearl Harbor was when Japan chose to destroy or damage U.S. war ships. The United States then declared war on Japan and then Germany and Italy declared war on the United States. The United States continued to be in the war until it ended in 1945.

 Human computers were a huge part of NASA because if it was not for them, the United States would not be able to put a man in space or have the first man on the moon. The human computers were still needed even if there were new technology being developed. All of the human computers were all women who got their jobs through the Civil Service.[[31]](#footnote-31) The West Computers were a huge help as well as the East Computers on figuring out the calculations that would help with the modernization of space technology and computers.

Bibliography

Cramer, R.H. *Computing Group Organization & Practices at NACA.* 242 Annals of the History of Computing, 1991 Vol. 3.

Leeper, Angela. *Hidden Human Computer: The Black Women of NASA.* 38 American Association/Booklist Publications, 2017.

Shetterly, Margot Lee. *Hidden Figure.* William Morrow and Company, 2016.

N.A. *Technical Session 1; 'Reliability: The Achilles Heel to the Space Program.*54 Washington Post, 1963.

1. Angela Leeper, *Hidden Human Computer: The Black Women of NASA* (American Library Association / Booklist Publications), 38. [↑](#footnote-ref-1)
2. R.H. Cramer to R.A. Darby, "Computing Groups Organization and Practice at NACA” April 27, 1942 [↑](#footnote-ref-2)
3. Ibid., 38. [↑](#footnote-ref-3)
4. Ibid., 38. [↑](#footnote-ref-4)
5. Margot Lee Shetterfly, *Hidden Figures,* (William Morrow and Company), xiv. [↑](#footnote-ref-5)
6. Ibid., 4. [↑](#footnote-ref-6)
7. R.H. Cramer to R.A. Darby, "Computing Groups Organization and Practice at NACA” April 27, 1942 [↑](#footnote-ref-7)
8. Margot Lee Shetterfly, *Hidden Figures,* (William Morrow and Company), 74. [↑](#footnote-ref-8)
9. Ibid., 192. [↑](#footnote-ref-9)
10. Ibid., 122-126. [↑](#footnote-ref-10)
11. Ibid., 94. [↑](#footnote-ref-11)
12. Ibid., 95. [↑](#footnote-ref-12)
13. Ibid., 94. [↑](#footnote-ref-13)
14. Ibid., 98. [↑](#footnote-ref-14)
15. Ibid., 93. [↑](#footnote-ref-15)
16. Ibid., 109. [↑](#footnote-ref-16)
17. Ibid., 16. [↑](#footnote-ref-17)
18. Ibid., xvii. [↑](#footnote-ref-18)
19. Ibid., 43. [↑](#footnote-ref-19)
20. Ibid., 82. [↑](#footnote-ref-20)
21. Ibid., 137. [↑](#footnote-ref-21)
22. Ibid., 138. [↑](#footnote-ref-22)
23. Ibid., 176. [↑](#footnote-ref-23)
24. Ibid., 178. [↑](#footnote-ref-24)
25. Ibid., 182. [↑](#footnote-ref-25)
26. Ibid., 189. [↑](#footnote-ref-26)
27. Ibid., 190. [↑](#footnote-ref-27)
28. Ibid., 190. [↑](#footnote-ref-28)
29. Ibid., 190. [↑](#footnote-ref-29)
30. *Technical Session 1; 'Reliability: The Achilles Heel to the Space Program*, (Washington Post), 54. [↑](#footnote-ref-30)
31. R. H. Cramer, Computing Group Organization & Practices at NASA, *Annals of the History of Computing*, 3, (1991). [↑](#footnote-ref-31)