CHAPTER TWO

Katherine Johnson sits at her desk with a globe, or "Celestial Training Device." NASA

KATHERINE JOHNSON

PIONEER NASA MATHEMATICIAN

OBJECTIVES

- Discuss Katherine Johnson's early work in mathematics.
- Discuss what the term "computer" meant in the 1950s as it pertains to Johnson's story.
- Describe Johnson's contributions to the early space program.
- Build the Redstone rocket.

STANDARDS

NGSS

SCIENCE

- MS-ETS1-1
- MS-ETS1-2
- MS-ETS1-3
- MS-ETS1-4

ELA/LITERACY

- RST.6-8.1
- RST.6-8.3
- RST.6-8.7
- RST.6-8.9
- WHST.6-8.7
- WHST.6-8.8
- WHST.6-8.9

NCSS

- IV.f.
- V.c
- V.d
- X.e

"Get that girl."

Those are the words mathematician Katherine Johnson remembered astronaut John Glenn saying prior to his Friendship 7 mission in 1962, the first mission to orbit Earth. In fact, Johnson was "that girl."

Specifically, she was a skilled human "computer," or research mathematician, working at NASA's Langley Research Center in Hampton, Virginia. At the time of the mission, she already had done trajectory analysis for astronaut Alan Shepherd's May 1961 Freedom 7 mission, America's first human spaceflight. She was one of a group of women "human computers" who worked in calculations at NASA and its predecessor, the National Advisory Committee for Aeronautics (NACA). They were African-American women in a predominantly male and white workforce.

Glenn personally requested she recheck the electronic computers before the Friendship 7 flight.

The Glenn story and the larger story of the African American women "computers" were captured in the Margot Lee Shetterly novel "Hidden Figures," which was also made into an Academy Award-nominated movie in 2016. Shetterly said the computers were "hidden" because the African American women were relegated to a separate office and because calculations were considered "women's work."

Johnson achieved these heights despite living in a time when education beyond eighth grade was not a privilege for her as an African American, and pursuit of it for her required her family to move.

Among her many honors is a 2015 Presidential Medal of Freedom. President Barack Obama presented Johnson with the nation's highest civilian honor in November 2015.

Then, in September 2017, at age 99, Johnson was honored by NASA with the dedication of a new research building named after her – the Katherine G. Johnson Computational Research Facility, a part of Langley. Katherine Johnson and her colleagues are no longer "hidden."

HER STORY

Katherine Johnson was born in White Sulfur Springs, West Virginia, on August 26, 1918.

In her early years, she was fascinated by numbers. "I counted everything," she said. "I counted the steps to the road, the steps to church, the number of dishes and silverware I washed … anything that could be counted, I did."

By the time she was 10 years old, she was a high school freshman. White Sulphur Springs did not offer classes beyond eighth grade to African-Americans. To allow Johnson to be able to continue school, her father moved the family 120 miles away to Institute, West Virginia, so that she could enroll in high school. Johnson's academic achievements proved her father's decision was right. She skipped though grades to graduate from high school at age 14.

At age 18, Johnson graduated with highest honors from West Virginia State College (now West Virginia State University) in Institute. Dr. William W. Schieffelin Claytor, a math professor at the school who was himself the third African-American to earn a Ph.D. in mathematics, became a mentor. She began teaching after graduation.

Then, in 1939, West Virginia University's president selected Johnson and two male students to integrate the school, and she left her teaching job to enroll in the graduate math program. She did not complete the program, deciding, instead, to start a family with her husband.

In 1952, a relative told Johnson about openings for "computers" at the all-African American West Area Computing section at the National Advisory Committee for Aeronautics' (NACA's) Langley laboratory. But these "computers" were not electronic. They were people who "crunched" the numbers and did the mathematical calculations for aircraft and space missions.

NACA, a precursor to NASA, had begun hiring women for measuring and calculating the results of wind tunnel tests in 1935, work that required precision. During World War II, NACA broadened its computer staff to include African-American women, who were retained after the war ended.

Johnson, who had returned to teaching when her children were older, decided to work at Langley in the summer of 1953. She and her husband, James Goble, moved the family to Newport News, Virginia, to work at the research facility. Specifically, she worked in Langley Research Center's Guidance and Navigation Department.

It was at Langley that she had the opportunity to calculate the spacecraft trajectories for Alan Shepard, the first American in space, and for John Glenn, the first American to orbit Earth. Even after NASA began using electronic computers, Glenn requested that she personally recheck the calculations made by the new electronic computers before his history-making orbit aboard Friendship 7.

Continued on PAGE 27

> *"They needed information and I had it, and it didn't matter that I found it. At the time, it was just a question and an answer."*
>
> **— Katherine Johnson**

NASA/Bill Ingalls

President Barack Obama presented Katherine Johnson with the Presidential Medal of Freedom, Nov. 24, 2015, during a ceremony in the White House.

Achievements include

- Received the Group Achievement Award presented to NASA's Lunar Spacecraft and Operations team – for pioneering work in the field of navigation (1967)
- Named West Virginia State College Outstanding Alumnus of the year (1968 and 1999)
- Awarded honorary doctorates – Capitol College (Maryland), Old Dominion University (Virginia), and the State University of New York at Farmingdale
- Received the De Pizan Honor from the National Women's History Museum (2014)
- Received the National Center for Women in Technology Pioneer in Tech Award (2015)
- Awarded a National Medal of Freedom (2015)
- Honored by NASA with the naming of its Katherine G. Johnson Computational Research Facility at Langley in Virginia (2017)

HER STORY (continued from Page 26)

For Johnson, calculating space flight came down to the basics of geometry: "The early trajectory was a parabola, and it was easy to predict where it would be at any point," she said. A parabola in mathematics is an open curve and represents the graph of an equation.

Even though NASA had begun using electronic computers by Glenn's flight, the calculations weren't considered complete until Johnson was summoned to check the work of the machines.

At the end of the day, "color didn't matter" at NASA, Johnson told the *Washington Post*. "They never asked me to go back over [my calculations] because when I did it, I had done my best, and it was right," she told the *Post*.

At her retirement in 1986, Johnson had worked on John Glenn's flight, the Moon landings, and the 1970 rescue of Apollo 13. She also helped write one of the first textbooks on space.

Her math calculations, NASA reports, were as important to the Apollo Moon landing program and the start of the Space Shuttle program, as they were to those early steps on America's quest into space.

As a NASA mathematician she computed Earth orbit parameters for space flight, before space flight had even been attempted. She helped make space flight possible, because she was fascinated with numbers.

Johnson's grandson, Troy Hylick, described his grandmother and other "hidden figures" as "superhuman." "Because of all the roadblocks that were put in their place, and they had to get over and get around and get under," Hylick told the *Washington Post*. "They became superhuman because all of those things that they had to do, just to do the job they were in there to do."

Katherine Johson died at age 101 on February 24, 2020.

EXTENSION EXPLORE NASA'S MODERN FIGURES WEBSITE (INCLUDES VIDEO LINKS)

NASA's Modern Figures website, https://www.nasa.gov/modernfigures, honors Katherine Johnson and her fellow 1960s team of African American women known as human computers that provided math calculations that helped the U.S. space program in the 1960s. These women were the subject of the popular book (2016) and movie (2017) "Hidden Figures." It also honors the NASA women today who are continuing the human computers' legacy of courage and excellence.

One of the features of the site is a collection of lesson plans and educational activities for K-12 students called Modern Figures Toolkit. These lesson plans on a variety of subjects – including algebra, physics, geometry, problem solving, and more -- bring Katherine Johnson's inspiring story to the classroom.

Find these at: **https://www.nasa.gov/stem-ed-resources/nasa-modern-figures-toolkit.html**

Another highlight on the site is the Modern Figures Video Series, which features interviews with Johnson and her modern-day counterparts at NASA. Students can explore these videos. Here is a sample worksheet for students to use while watching one of the videos.

MODERN FIGURES VIDEO WORKSHEET

Go to the site **https://www.nasa.gov/modernfigures/videos** and find the video titled Katherine Johnson Interview, Sept. 2017. Watch the video to get answers to the following questions.

1. What was Katherine Johnson's reaction after learning that NASA was opening a new facility, the Katherine G. Johnson Computational Research Facility at NASA's Langley Research Center in Hampton, Virginia?

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2. Katherine Johnson's advice to young engineers is to "Do your best --

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3. What does Katherine Johnson say is her theory?

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4. How did Katherine Johnson say she would feel if the calculations for flight to Mars were done in the building named after her?

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Answers on following page

QUICK BOX

Overcoming Barriers

NASA mathematician, Katherine Johnson said she was one of the first women to attend an editorial meeting at the research agency. She told Victoria St. Martin of the *Washington Post* how that happened.

"She said she 'wanted to know what they talk about.' So she asked. And when someone noted that women didn't attend those meetings, she followed up with: 'Is there a law that says I can't go?'

And her boss said, 'Let her go,' Johnson said. "No big thing. I hadn't given it any thought. And the first time I went into one, a fellow asked a question and he said: 'Katherine is here, ask her. She did it.'"

MATTEL

Mattel included a Katherine Johnson Doll in its Barbie® Inspiring Women TM collection in 2018.

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MODERN FIGURES ANSWER SHEET

1. "If you want my honest answer, I think they're crazy," she laughed. "I was excited for something new, always like something new. But give credit to everybody who helped. I didn't do anything alone, but try to go to the root of the question and succeeded there."

2. "Do your best, but like it. Like what you're doing. Then you will do your best. If you don't like it, shame on you."

3. "That's my theory: Do your best all the time."

4. "I'll be exceedingly honored, greatly honored."

BUILD A REDSTONE ROCKET

Katherine Johnson helped calculate trajectory analyses for America's first human spaceflights. This activity lets students build the Mercury Redstone 4 Rocket.

BACKGROUND

NASA

Astronaut Gus Grissom climbs into "Liberty Bell 7" spacecraft before launch on the morning of July 21, 1961. Astronaut John Glenn, Grissom's back up, helps him into the capsule.

The Mercury-Redstone launch vehicle was the first crewed launch vehicle in the U.S. space program. The Redstone missile, dubbed "Old Reliable" by the Army for its accuracy, was chosen as the booster rocket to propel the first Americans into space.

This liquid-propelled surface-to-surface missile was capable of transporting nuclear or conventional warheads to targets approximately 200 miles away. It was developed at the Redstone Arsenal near Huntsville, Alabama.

On January 31, 1958, the Redstone was used as the first stage in the launch vehicle used by the Army to orbit the Explorer I, the first U.S. satellite into Earth orbit. On January 31, 1961, the second Mercury Redstone test flight carried a chimpanzee named Ham into space.

The Mercury-Redstone was then used for the first two manned spaceflights of NASA's Mercury program. On May 5, 1961, Alan Shepard became the first American in space in Mercury-Redstone 3. A little over two months later Virgil "Gus" Grissom became the second American in space on July 21, 1961. Both achieved suborbital flight, however Grissom's capsule door malfunctioned when he landed in the Atlantic Ocean, causing the door to eject and the capsule to flood. Grissom survived, but his capsule sank. The capsule, the Liberty Bell 7, was recovered in 1999. In this activity, students will build the M-R 4.

With the deployment of the faster Pershing missile system in 1964, the Redstone missile system was retired at Redstone Arsenal October 30, 1964.

ABOUT THE ROCKET

GENERAL CHARACTERISTICS

- **Crew:** 1
- **Height:** 59 feet (17.9 meters), 83 feet with spacecraft (25. meters)
- **Diameter:** 5.9 feet
- **Launch Weight:** 65,987 lbs. (29,931 kg)
- **Stages:** 1
- **Powerplant:** Rocketdyne NAA 75-110 (A-7 version)
- **Thrust:** 78,000 lbs. (35,380 kg)
- **Propellant:** LOX/RP-1

PERFORMANCE

- **Speed:** 5,134 mph (8,262.4 kph)
- **Orbit Altitude:** 118.3 statute miles

PAYLOAD

- **Payload:** Spacecraft No. 11, Launch Vehicle MR-8
- **Payload Capacity:** 4,000 lbs. (1,814 kg) to an altitude of 117 miles on a ballistic path

THE MERCURY PROGRAM

The Mercury program, using first Redstone and later Atlas rockets, introduced the nation to its first astronauts. There were six total flights with six astronauts flown. Total flight time for these missions was 53 hours, 55 minutes and 27 seconds.

Mercury-Redstone 3

- Spacecraft: FREEDOM 7
- Mission Date: May 5, 1961
- Astronaut: Alan B. Shepard, Jr.
- Flight Summary: 15 minutes, 28 seconds - Suborbital flight that successfully put the first American in space.

Mercury-Redstone 4

- Spacecraft: LIBERTY BELL 7
- Mission Date: July 21, 1961
- Astronaut: Virgil I. Grissom
- Flight Summary: 15 minutes, 37 seconds - Suborbital flight, successful flight but the spacecraft sank shortly after splashdown.

Mercury-Atlas 6

- Spacecraft: FRIENDSHIP 7
- Mission Date: February 20, 1962
- Astronaut: John H. Glenn, Jr.
- Flight Summary: 4 hours, 55 minutes, 23 seconds - Three-orbit flight that placed the first American into orbit.

Mercury-Atlas 7

- Spacecraft: AURORA 7
- Mission Date: May 24, 1962
- Astronaut: M. Scott Carpenter
- Flight Summary: 4 hours, 56 minutes, 5 seconds - Confirmed the success of the Mercury-Atlas 6 by duplicating the flight.

Mercury-Atlas 8

- Spacecraft: SIGMA 7
- Mission Date: October 3, 1962
- Astronaut: Walter M. Schirra
- Flight Summary: 9 hours, 13 minutes, 11 seconds - Six-orbit engineering test flight.

Mercury-Atlas 9

- Spacecraft: FAITH 7
- Mission Date: May 15-16, 1963
- Astronaut: L. Gordon Cooper, Jr.
- Flight Summary: 34 hours, 19 minutes, 49 seconds - The last Mercury mission; completed 22 orbits to evaluate effects of one day in space.

Source: NASA

PROCEDURE — Build a Redstone Rocket

MATERIALS

- Cardstock for templates
- Flat, level, stable, and easily cleaned surface to work on
- Rocket template (in this chapter)
- Cardstock
- Sharp-pointed (X-acto-type) hobby knife ALWAYS cap it when not in use
- Sharp, precision sewing-type scissors
- A ruler or any other (truly) straight edge
- Toothpicks, round (and flat, if available)
- Aleene's Fast Grab Tacky Glue, Elmer's glue, or super glue
- Eyebrow-type tweezers, having a straight edge of comfortable angle
- Stylus of some kind, to make indented lines for folds
- Paper clips
- Some old books or similar object to act as a weight/press to keep the airplane parts completely flat while drying
- A trash can nearby to be neat

1 Print template onto cardstock. Cut out template.

2 Roll Parts 1 and 2 into tubes, and glue. Roll one edge under to the point it meets the gray line. Secure with paper clips and let dry.

3 Test fit of adaptor ring (Part No. 3). Before gluing, roll the ring.

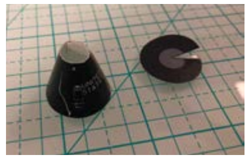
4 Place glue on one half of the exterior of the ring and the tab. Insert the ring so that the half with glue is inside the top of Part No. 2, and the tab is glued to complete the circle.

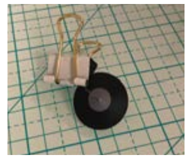
5 Place Part No. 1 over the ring to fit snugly into place against Part No. 2.

6 Take Parts No. 4, 5, 6, and 7. Fold and glue them as shown.

7 The colors of the fins match the rocket. Glue fins Parts No. 4, 5, 6 and 7 to the matching quadrant. Also, students can refer to the plan, which notes the placement of each fin.

8 Roll and glue Part No. 8. Trim any excess.



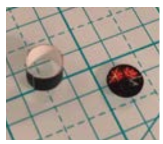


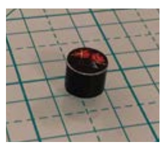
9 Cut along one side of the white "V" of Part No. 9. Overlap and glue Part No. 9 to achieve curve.

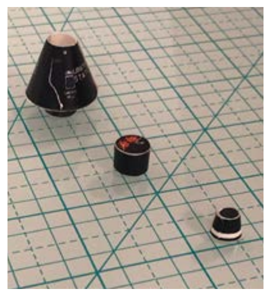
10 Attach Part No. 9 to the base of Part No.8.

11 Roll and glue Part No. 14; then glue Part No. 15 to the top of 14

12 Glue Part No. 14 to Part No. 9 (on the gray circle at the bottom of capsule body). Wait for it to dry.

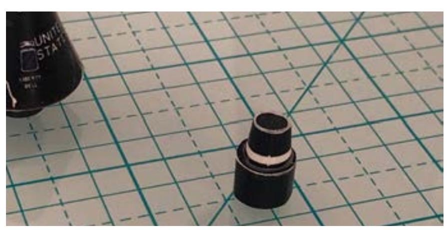






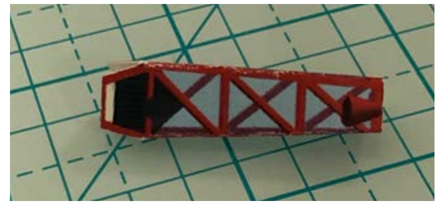
13 While Step 12 is drying, glue Part No. 11 (recovery tower top) to the top of Part No. 10.

14 Roll and glue Part No. 12 (antenna fairing); then glue to Part No. 13.

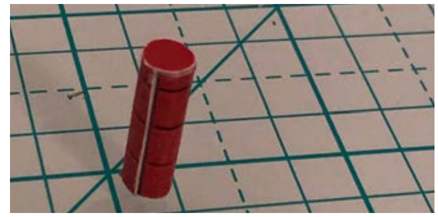


15 Take the assembled Parts No. 12 and 13 and glue to the top of Parts No. 10 and 11.

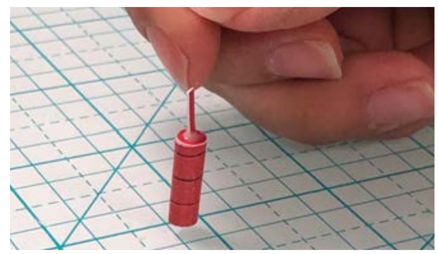
16 Take the sub assembly of Parts No. 10-13 and glue to the top of Part No. 8. Allow it to dry.



17 Fold and glue Part No. 17 (escape tower) into a triangle.



18 Roll and glue Part No. 16 (escape rocket).



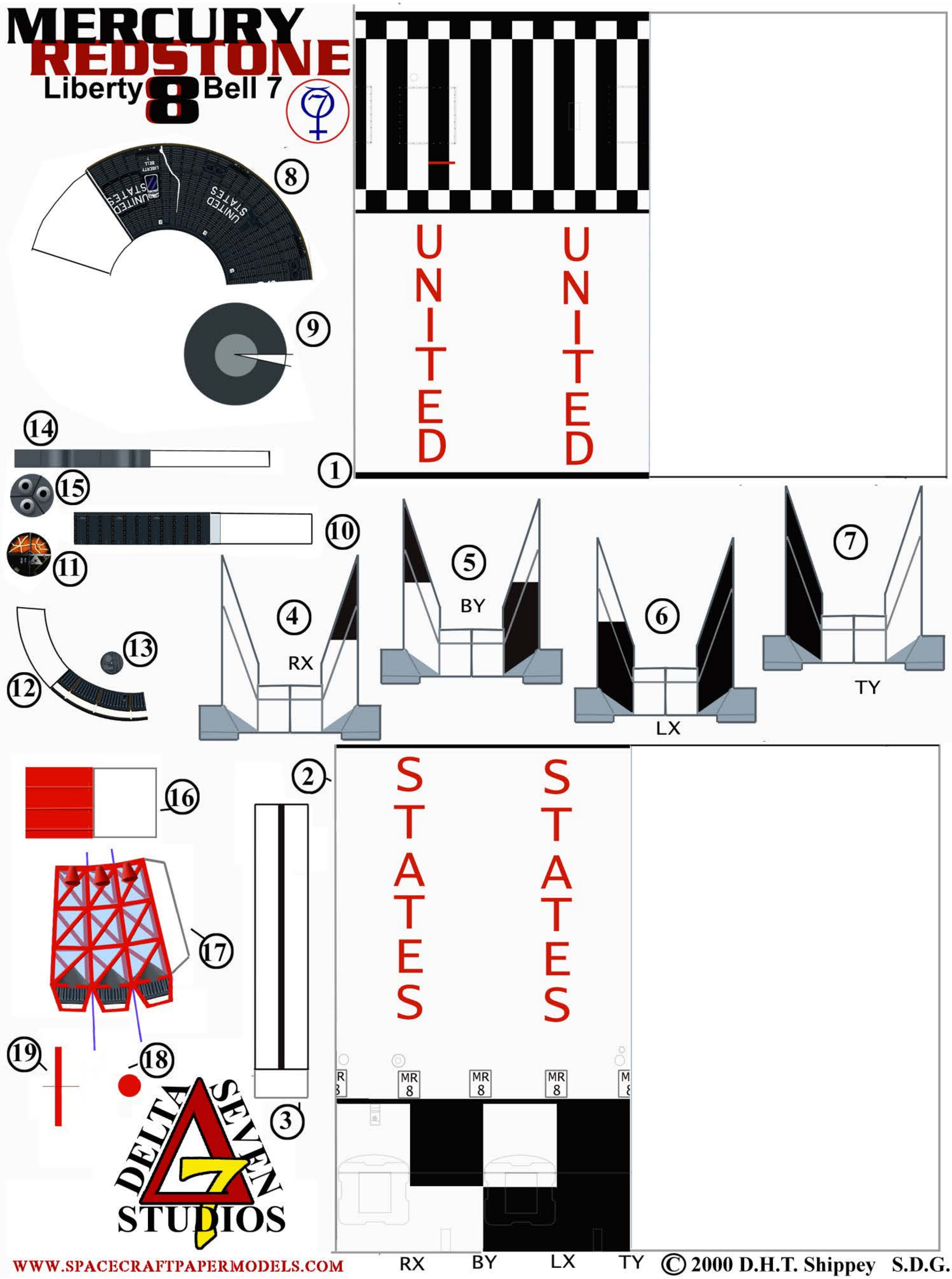
19 Glue Part No. 18 (escape rocket top) to Part No. 16.

20 Fold and glue Part No. 19 (aerodynamic spike). Then glue Part No. 19 to Part No. 18.

21 Glue and slide Part No. 16 into top of Part No. 17 until the first line is hidden. The pieces will fit snugly.

22 Slide Part No. 17 over Part No. 12. Glue is optional depending on display preference.

23 Place Part No. 8 (the capsule) atop the rocket body. Glue is optional depending on display preferences.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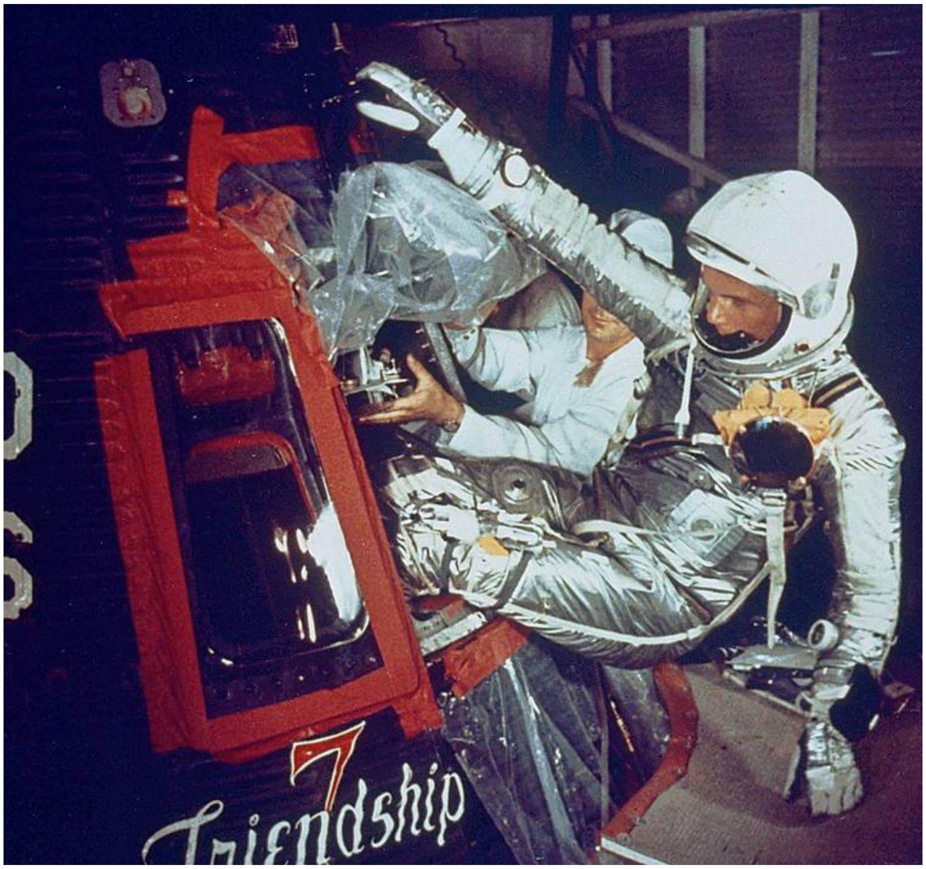
HANDS ON

BUILD A MERCURY SPACE CAPSULE

Katherine Johnson helped calculate trajectory analyses for both missions for America's first human spaceflights. This activity lets students build the Mercury space capsule, *Friendship 7*.

BACKGROUND



NASA

Astronaut John Glenn climbs into the *Friendship 7* capsule.

ABOUT THE SPACE CAPSULE

GENERAL CHARACTERISTICS

- **Crew:** 1
- **Materials**:
  - **Skin & structure:** Titanium
  - **Heat shield:** Phenolic resin, fiberglass
  - **Shingles:** Nickel-steel alloy; beryllium shingles removed
- **Orbit:** 4 hours, 55 minutes, 23 seconds
- **Display:** Can be seen today in the National Air and Space Museum in Washington, D.C.
- **Launch:** Capsule was launched on a modified intercontinental ballistic missile (ICBM)
- **Dimensions:** 6 ft 3 in by 7 ft 5 in (190.5 by 226.1 cm)
- **Weight:** 1,930 lb (875.4 kg)

Source: National Air and Space Museum

The Project Mercury program from 1958 -1963 was to get an American into space and back safely. The effort was originally an Air Force project that was taken over by NASA. The Mercury space capsule built by McDonnell Douglas was the first real space vehicle built for a human crewmember. It was packed with supplies of water, food, and oxygen for a 24-hour flight, if required.

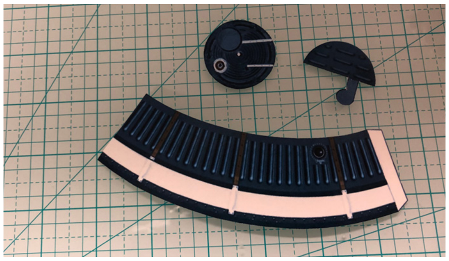
The goal of the program was to put the capsule into orbit. The first step was to get an American up into a high parabolic curve that would be in space for a very limited time and safely return him to Earth. Initially sub-orbital missions were envisioned in this project. On May 5, 1961, Alan Shepard was the first to accomplish a sub-orbital mission in the *Freedom 7* Mercury capsule. The first orbital flight was by John Glenn on February 20, 1962, and was a follow-on mission flying on a Mercury-Atlas missile combination. NASA research mathematician Katherine Johnson did trajectory analyses for both missions for America's first human spaceflights. John Glenn flatly refused to fly his mission without Katherine Johnson checking all the orbital calculations herself.

In 1958, a Belizean-born American mechanical engineer, Maxime Allen "Max" Faget, became one of the 35 engineers who formed the Space Task Group, creating the Mercury spacecraft. He contributed to the later Gemini and Apollo spacecraft, as well as the Space Shuttle.

PROCEDURE — Building the Mercury Space Capsule, *Friendship 7*

MATERIALS

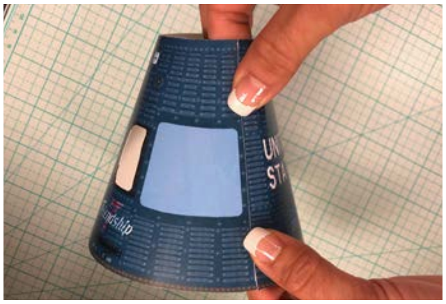
- Cardstock for templates
- Paper clips
- Flat, level, stable, and easily cleaned surface to work on
- Sharp-pointed ("X-acto"-type) hobby knife; ALWAYS cap it when not in use
- Sharp, precision sewing-type scissors
- A ruler or any other (truly) straight edge
- Toothpicks, round (and flat, if available)
- Aleene's Fast Grab Tacky Glue, "Elmer's" glue, or super glue
- Eyebrow-type tweezers, having a straight edge of comfortable angle
- Stylus of some kind, to make indented lines for folds
- Some old books or similar object to act as a weight/press to keep the spacecraft parts completely flat while drying
- A trash can nearby to be neat



1 Print template and carefully cut out the pieces of the capsule and organize into related parts or groups.

2 Begin the sub-assemblies. First, roll and glue the radio can by placing glue on the white tab.

3 Glue the radio can top to cap the radio can. Glue the spoiler to the radio can top, as shown. The spoiler is umbrella-shaped. Glue the "handle" of the umbrella to the top of the radio can.



4 Cut out the scope hatch and window before rolling and gluing the capsule body together. Apply glue to the white tab of the main body, roll, and attach.

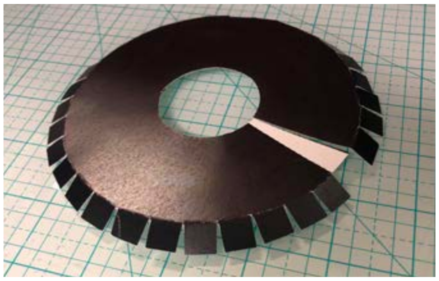
5 Building notes: the periscope and window should be glued to the inside of the main body before the heatshield or recover sections are attached.

6 Glue the base of the periscope (light blue rectangle with dark blue circle) inside the capsule (where labeled "scope hatch"). Glue the window inside the capsule at the space labeled window.

7 Roll and glue the recovery tower.

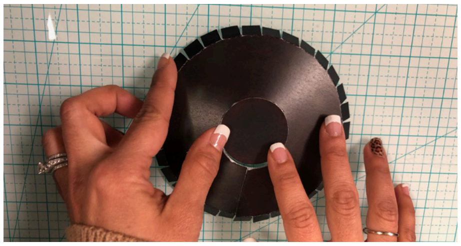
8 Roll and glue the recovery interior ring (long thin rectangle) inside the recovery tower at the top. This band will act as a lip.

9 Attach the recovery lid by inserting it from the bottom into the recovery tower until it reaches the interior ring.

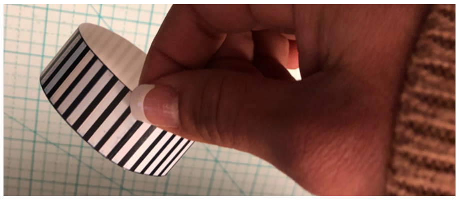


10 Cut out the heat shield (leave the white portion attached but slit one side to overlap).

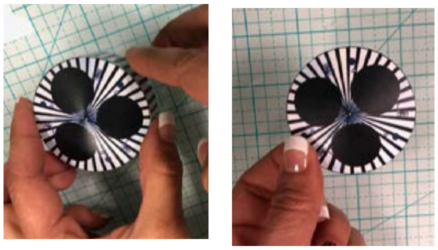
11 Roll the shield and glue.



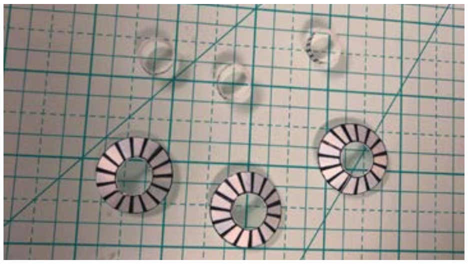
12 Add glue to the blue tab of the retro pack. Roll and stick together.



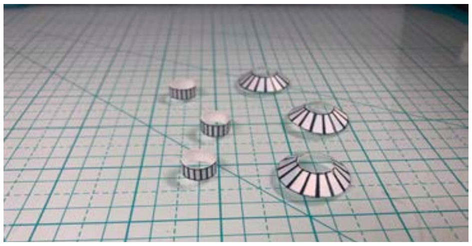
13 Glue the retro pack on the blue tab and roll to form a shallow cone.



14 Roll and glue retro pack base.



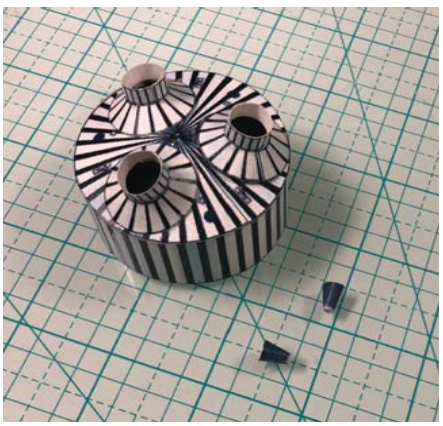
15 Glue retro pack base to the retro pack.



16 Build all three retro rockets. Roll and glue all 6 pieces for the retro rockets (3 striped C-shaped pieces and and 3 striped thin rectangles). Assemble into the three retro rockets by gluing the smaller rings on top of each base.

17 Glue the retro rockets to the retro pack base in the black circles indicated.

18 Press and hold each to be sure the piece is attached.

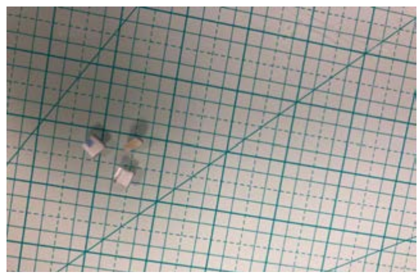


19 Roll and glue the posigrade rockets. Toothpicks, paper clips or tweezers will assist with these tiny parts. Glue the posigrade rockets to the retro pack base at the small, gray circles (small side down).

20 As the retro pack base attachments dry, assemble the adaptor. Roll and glue the adaptor into a ring. It will fit inside the recovery tower. Insert the adaptor ring until the blue line matches the edge of the recovery tower. Let dry.

21 Glue the recovery tower into the top of the main body.

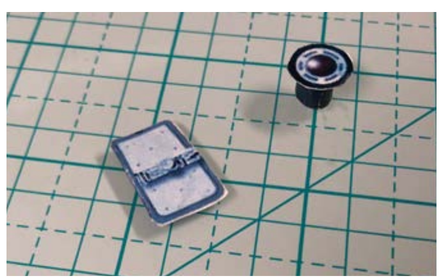
22 Glue the retro pack to the heat shield and let dry while the recovery tower is drying.



23 Fold and glue the strap brackets (located below the recovery tower on the plan) into rectangular boxes open on one end.

24 Roll and glue the periscope tube (it is located to the left of the periscope lens on the plan). Use a toothpick or end of a paper clip or tweezers to glue the tube.

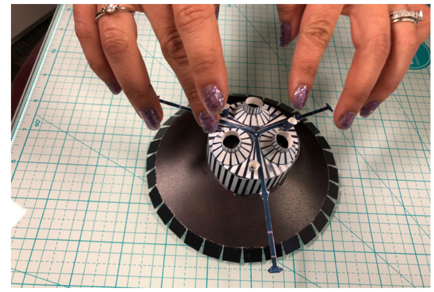
25 Fold and glue the periscope lens and attach to the perisope tube. Let dry.



26 Fold and glue the periscope door (scope hatch).

27 Glue the periscope onto the capsule at the designated spot.

28 Apply glue to the fold side of the periscope door and attach to capsule adjacent to the periscope lens and tube (hinge on the left side). Allow time for the periscope assembly to dry as it is delicate.



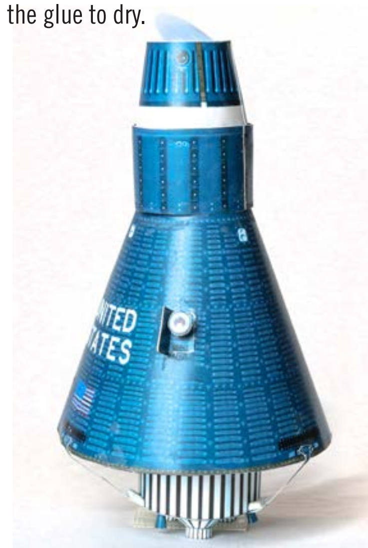
29 Glue the retro straps to the retro pack base.

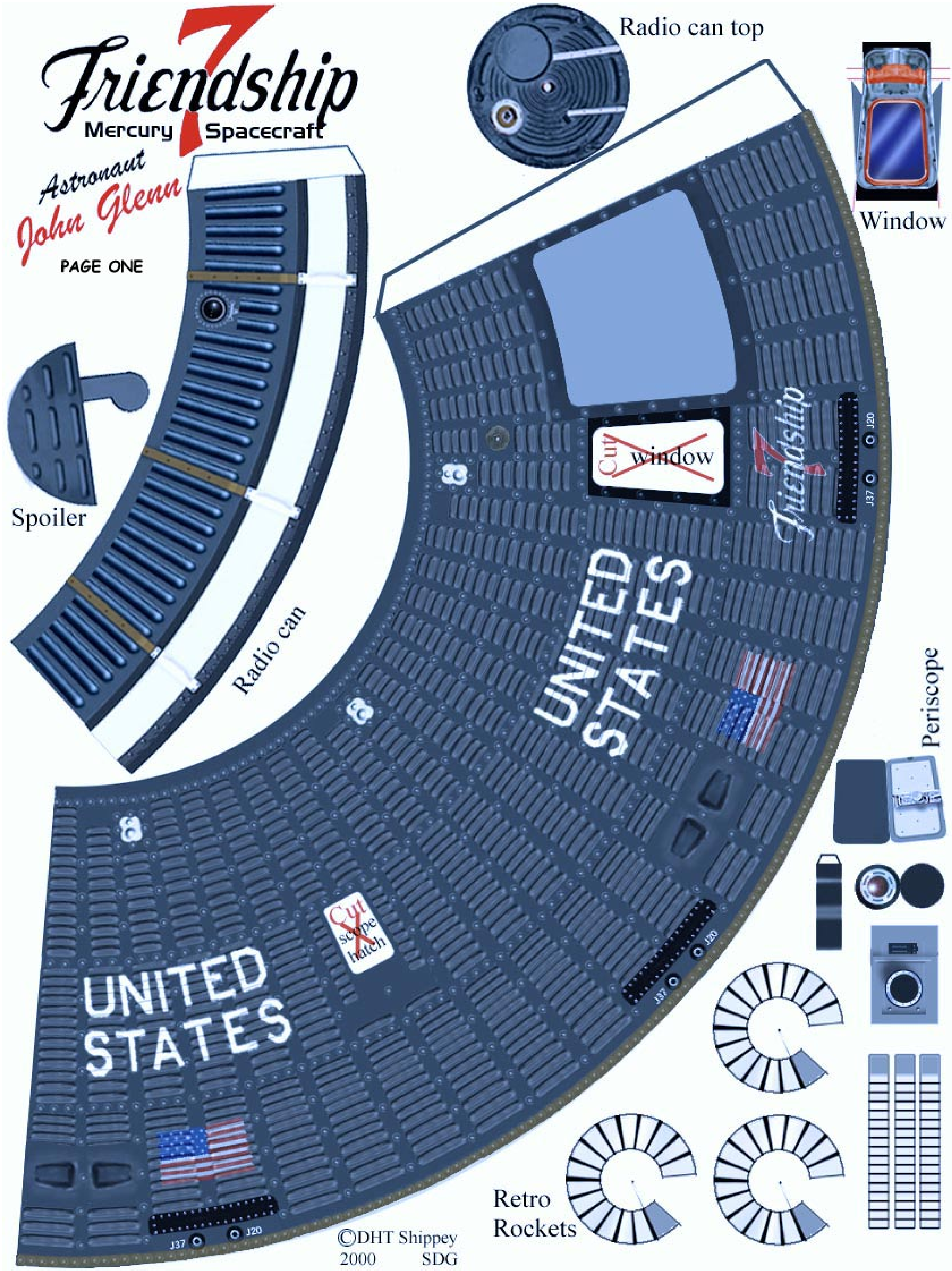
30 Glue the black side of the tabs of the heat shield, and attach to the inside of the capsule.

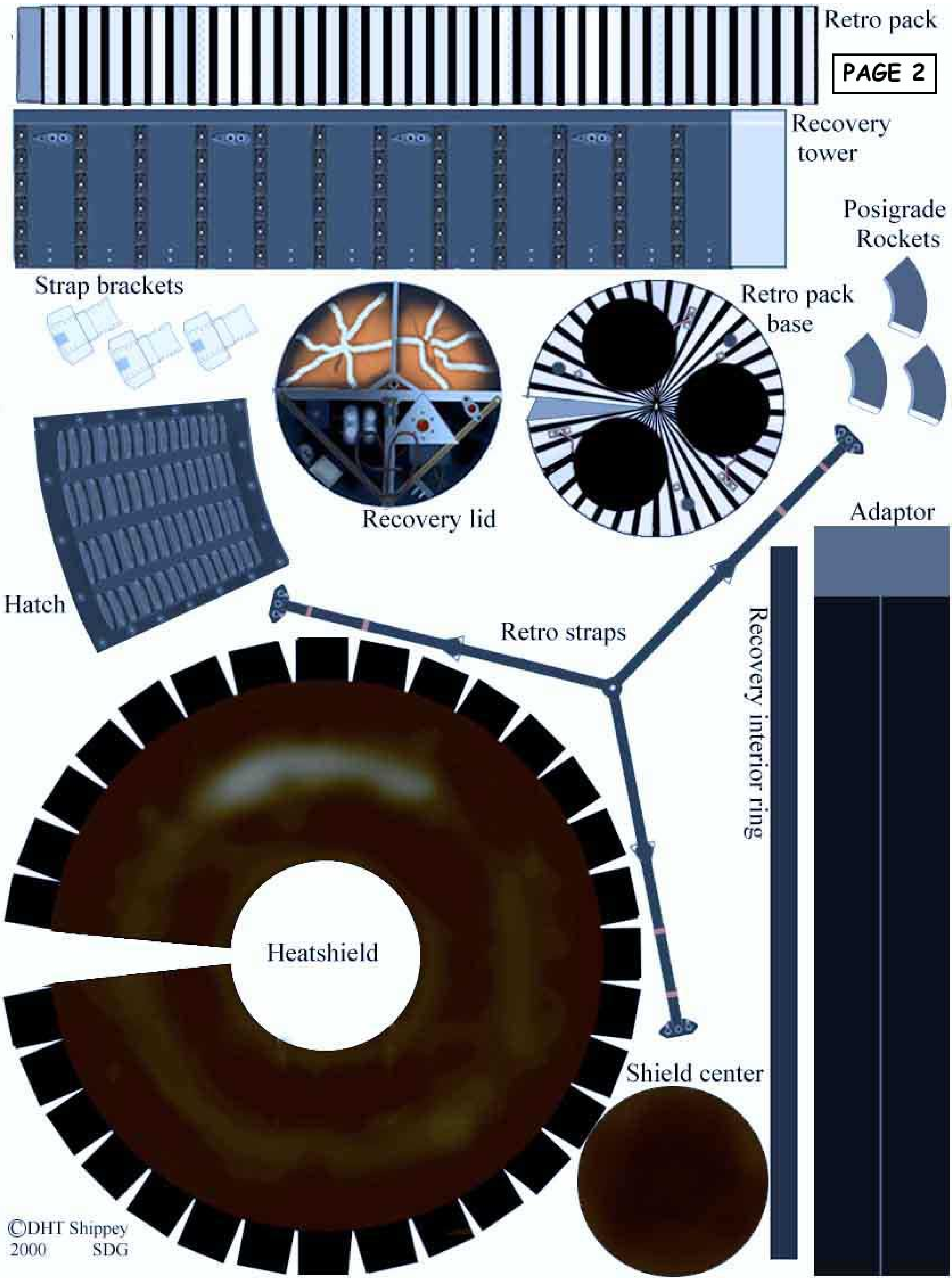
31 The tip of the retro strap will need to align with the markings around the base of the capsule.

32 Start gluing the retro pack base to the heat shield. The smaller thrusters (3) should be wound around a round tooth-pick to make them easy to handle.

33 As seen in the instruction sheet in this chapter, the final parts are the booster rocket straps and the window for the pilot, doors, and a viewing periscope. These are added when everything is glued into place and the glue is well-dried. When everything is glued to-gether, square the top of the capsule in the main body. Leave it alone, and allow the glue to dry.




Friendship 7
Mercury Spacecraft
Astronaut
John Glenn
PAGE ONE
Radio can top
Window
Spoiler
Radio can
Cut window
Friendship 7
J20
J37
UNITED STATES
Periscope
Cut scope hatch
J20
J37
UNITED STATES
J37
J20
©DHT Shippey
2000 SDG
Retro
Rockets



Retro pack
PAGE 2
Recovery tower
Posigrade Rockets
Strap brackets
Retro pack base
Recovery lid
Adaptor
Hatch
Retro straps
Recovery interior ring
Heatshield
Shield center
©DHT Shippey
2000 SDG

John Glenn's Friendship 7

On February 20th 1962 John H. Glenn lifted off to become the first American to orbit the Earth. He orbited the Earth three times in a flight lasting 4hrs. 55 min. and 23 sec. More than 30 years later he would return to space aboard the space shuttle Discovery. The Friendship 7 Mercury capsule can be seen today in the National Air and Space Museum.

MORE INFORMATION ABOUT THE MERCURY PROJECT AT: WWW.FIDDLERSGREEN.NET

VISIT THE ROCKET MAN'S WEB SITE AT:: www.spacecraftmodels.com AND CHECK OUT HIS ENTIRE COLLECTION OF MODELS

Building Notes: The periscope and window should be glued to the inside of the main body before the heatshield or recovery sections are attached.

Use a felt pen to darken the backside of the posigrade rockets and retrorockets before assembly.

You may want to leave the radio can un-glued so you can display the recovery section.