**Card Model Building Instructions for:**
**Mercury-Atlas**
**MA-6 through MA-9 Missions**

Carl Hewlett March 4, 2007
(Edited by Mike Vink)

1st, a look at the Mission History:

Mercury-Atlas was a subprogram of Project Mercury which comprised most of the flights and tests using the Atlas launch vehicle. The Atlas was also used for one Mercury flight under the Big Joe subprogram. The official Mercury mission numbering designation was a two letter designation which corresponded to the launch vehicle type, followed by a dash then a 1 or two character designation of the flight/test number. So the official designation for the first U.S. manned orbital spaceflight was MA-6. The Atlas launch vehicles use for Project Mercury were numbered using a 2 or 3 digit number followed by a -D indicating that the missiles were the "D" version of the Atlas.

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MA-6 Manned Mission, 1962 February 20 - 14:47 GMT

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|---|---|---|---|
| Launch Site: | Cape Canaveral. | Program: | Mercury |
| Launch Vehicle: | Atlas #109-D | Agency: | NASA. |
| Capsule: | #13 (Friendship 7) | Duration: | 4 Hr, 55 Min, 23 Sec |
| Astronaut: | John Glenn | Distance traveled: | 75,679 Miles |

The Mercury 6 mission was the first attempt by the U.S. and Mercury program to place an astronaut in orbit. The MA-6 mission was launched on February 20, 1962, from Launch Complex 14 at Cape Canaveral, Florida. The flight used Atlas # 109-D and Mercury spacecraft # 13. The spacecraft was named Friendship 7. It made three earth orbits, piloted by astronaut John Glenn, the first American to orbit the Earth.

MA-7 Manned Mission, 1962 May 24 - 12:45 GMT

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|---|---|---|---|
| Launch Site: | Cape Canaveral. | Program: | Mercury |
| Launch Vehicle: | Atlas #107-D | Agency: | NASA. |
| Capsule: | #18 (Aurora 7) | Duration: | 4 Hr, 56 Min, 15 Sec |
| Astronaut: | Scott Carpenter | Distance traveled: | 76,021 Miles |

Mercury 7 was a manned space mission launched May 24, 1962. The Mercury capsule was named Aurora 7 and made three earth orbits, piloted by astronaut Scott Carpenter. A targeting mishap during reentry took the spacecraft 250 miles (about 400 km) off course, delaying recovery of Carpenter and the craft. The mission used Mercury spacecraft #18 and Atlas #107-D.

The original prime crew for Mercury Atlas-7 was Deke Slayton, however Slayton was controversially removed from all flight crew availability after the discovery of cardiac arrhythmia during a training run in the g-loading centrifuge. If Slayton flew Mercury 7, his spacecraft would have been named Delta 7, as this would have been the fourth manned flight and Delta is the fourth letter in the Greek alphabet.

MA-8 Manned Mission, 1962 October 3 - 12:15 GMT

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|---|---|---|---|
| Launch Site: | Cape Canaveral. | Program: | Mercury |
| Launch Vehicle: | Atlas #113-D | Agency: | NASA. |
| Capsule: | #16 (Sigma 7) | Duration: | 9 Hr, 13 Min, 11 Sec |
| Astronaut: | Wally Schirra | Distance traveled: | 143,983 Miles |

Mercury 8 was a manned space mission launched on October 3, 1962. The spacecraft was named Sigma 7 and completed six earth orbits piloted by astronaut Wally Schirra. It was the first flawless Mercury mission.

Schirra's was the first of two longer-duration Mercury missions. After Carpenter's flawed reentry, the emphasis returned to engineering rather than science (Schirra even named his spacecraft "Sigma" for the engineering symbol meaning "summation.") The six-orbit mission lasted nine hours and 13 minutes, much of which Schirra spent in what he called "chimp configuration," a free drift that tested the Mercury's autopilot system. Schirra also tried "steering" by

the stars (he found this difficult), took photographs with a Hasselblad camera, exercised with a bungee-cord device, saw lightning in the atmosphere, broadcast the first live message from an American spacecraft to radio and TV listeners below, and made the first splashdown in the Pacific. This was the highest flight of the Mercury program, with an apogee of 283.24km (176mi), but Schirra later claimed to be unimpressed with space scenery as compared to the view from high-flying aircraft. "Same old deal, nothing new," he told debriefers after the flight. During the course of the mission, Schirra revealed his membership in the “Ancient Order of Turtles”.

MA-9 Manned Mission, 1963 May 15 - 13:04 GMT

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|---|---|---|---|
| Launch Site: | Cape Canaveral. | Program: | Mercury |
| Launch Vehicle: | Atlas #130-D | Agency: | NASA. |
| Capsule: | #20 (Faith 7) | Duration: | 34 Hr, 19 Min, 49 Sec |
| Astronaut: | Gordon Cooper | Distance traveled: | 546,167 Miles |

Mercury 9 was the last U.S. Mercury spaceflight manned space mission, launched on May 15, 1963 from Launch Complex 14 at Cape Canaveral, Florida. The capsule was named Faith 7 and it completed 22 Earth orbits piloted by astronaut Gordon Cooper. The Atlas rocket was #130-D, and the Mercury spacecraft was #20.

Manned Spacecraft Center officials believed that the Mercury team should be given the chance to test man in space for a full day. In addition, all of the Soviet single-seat Vostok spacecraft launched after Vostok 1 lasted for more than a day, thus the Mercury 9 flight would bring the Mercury spacecraft up to the same level as that of the Soviets.

After the MA-9 mission, there was another debate to fly one more Mercury flight, Mercury-Atlas 10 (MA-10). It was proposed as a three day, 48 orbit mission to be flown by Alan Shepard in October 1963. In the end, NASA officials decided it was time to move on to Project Gemini and MA-10 never flew.

The Mercury program had fulfilled all of its goals.

*(The preceding info was blatantly plagiarized from Wikipedia ☺ - Mike)*

Please note: This is (I believe) the first attempt from Carl to design a model bridging two modeling genres – Paper modeling and model rocketry. The instructions will try to cover both areas completely. Have some patience, will you?

Mike

You will need the following items:

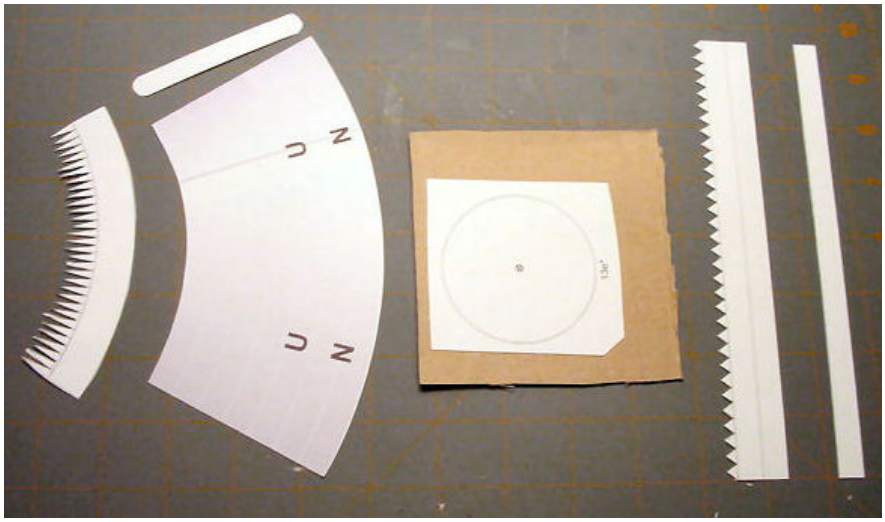
1. PDF reader software
2. Computer Printer, Color, with an 8 ½"x11" media carriage
3. 8 ½"x11" bond copy paper
4. 8 ½"x11" card stock paper
5. Thin cardboard or box stock (breakfast cereal or snack cracker boxes for example)
6. Clear drying PVA Glue (Elmer's Glue All ® or equivalent)
7. Clear drying Glue Stick
8. Epoxy or "5-Minute", 2-part Glue
9. Hobby Knife
10. Scissors
11. Straight edge, (For cutting guide).
12. Paperclips or stiff wire to hold the rocket motor.
13. Elastic strap, ¼" wide minimum by 20" long for parachute bungee (From Wal-Mart or your dad's old underwear – as long as they still have some stretch to them).

Prepare for the build by doing the following steps:

1. Plot or print the Parts PDF file, following the printing notes on each page.
2. Plot with the "fit to page" scaling feature turned off.
3. To make Model 1:96th Scale, plot/print pages with the scale reduced by 50%.
4. Cut parts out on a cutting surface, (i.e. cutting board or mat). This protects the table and prolongs the life of your knife blade.

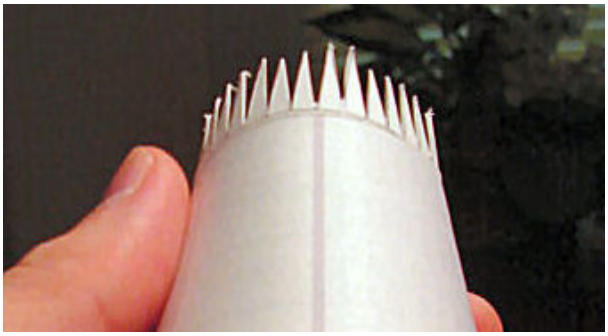
Steps for Build:

1. Glue part 13e to heavy card stock or light cardboard and set aside to dry.
2. Cut out parts 13a, b, c, d and f as shown below.



3. Glue part 13b to the blank, unfinished side of part 13a. Roll, fit and glue part 13a into a cone, gluing the other end to the exposed half of part 13b.

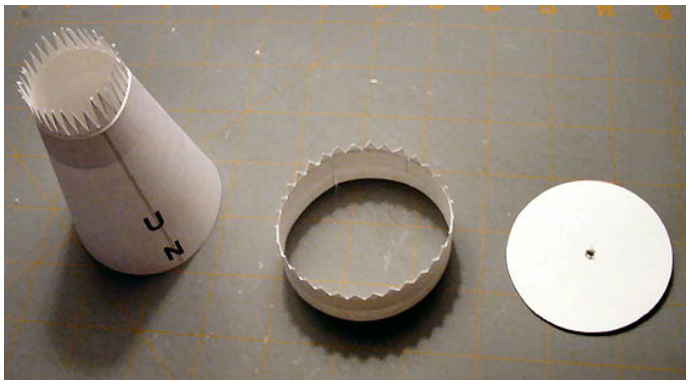
4. Roll part 13c in a conical shape. Spread glue on the solid, lower half of part 13c and insert it into part 13a from the large end until the fingers of part 13c protrude through the small opening at the top of part 13a. The line at the bottom of the fingers of part 13c should align with the top of part 13a.



5. Retrieve and cut out part 13e. Punch hole in center at marked location with straightened paper clip.
6. Roll part 13d into a loop and glue a piece of scrap paper to the back side to close the loop.

*Steps 7 – 10 are for the model rocket version and can be disregarded for a static display model*

7. Glue part 13f to the inside of part 13d as a stiffener on the side away from the teeth.

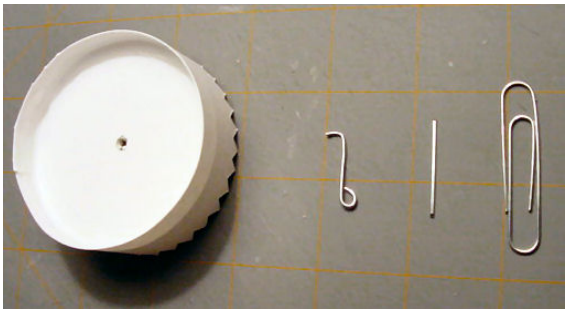


8. Glue part 13e to the inside of part13d above part 13f and create a glue fillet as shown below.

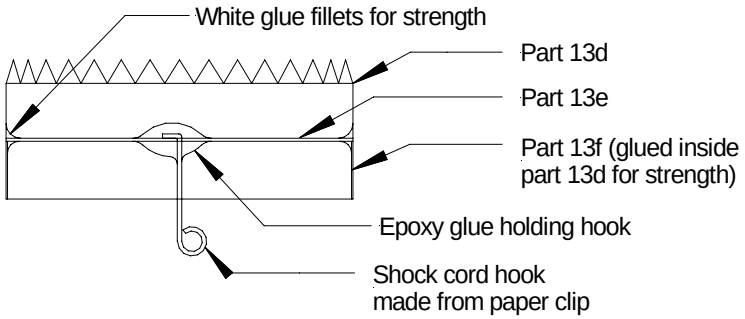




9. Take a paperclip, straighten it out and shape it as shown below. The length is not critical.



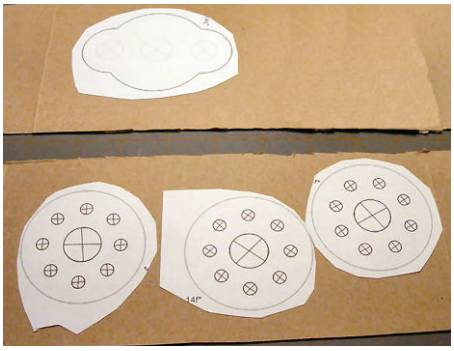
10. Glue the paperclip hook as shown in the diagram below using epoxy glue for strength. Set aside to dry. This hook will be used to tie the shock cord and parachute to the upper portion of the rocket.



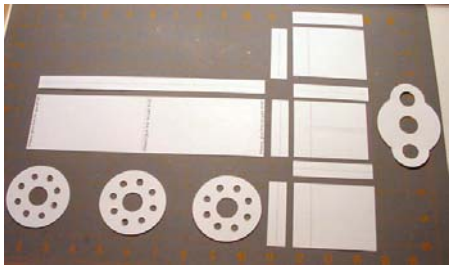

11. When the epoxy glue has dried, spread glue on the upper teeth of assembly 13d-f and insert it into the wide end of the part 13a-c assembly as shown below. Set aside for now to fully cure.

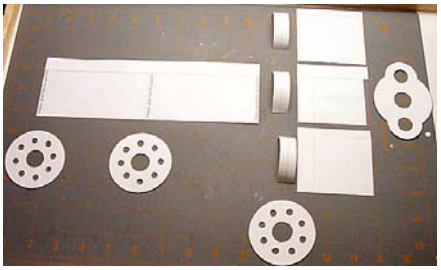



12. Cut out and glue 3 parts 14f and part 14q to heavy card stock or light cardboard and set aside to dry. When dry, cut out all marked circles.

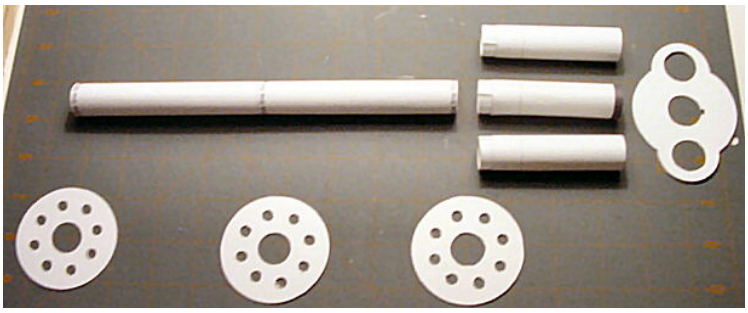


13. Cut out parts 14g and h, parts 14i, j and k and two parts 14m, o and p as shown below.

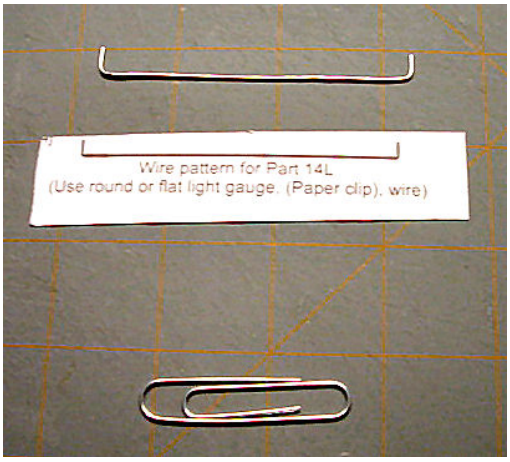




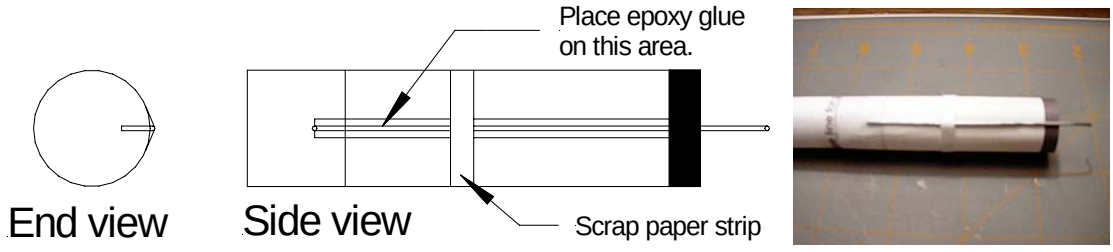
14. Glue part 14h to the blank, unfinished side of part 14g. Roll, fit and glue part 14g into a cylinder, gluing the other end to the exposed half of part 14h. Be sure that the markings are on the outside of the cylinder.
15. Do the same for parts 14i and j, as well as both parts 14o and p.
16. Roll part 14k and both parts 14m into cylinders with the lines on the outside of the roll. Spread glue on the lower end of the cylinder and insert part 14k into part 14j, placing the mid-point line flush with the top of the part 14j cylinder. Do the same to both part 14m-p assemblies. These should look like the parts in the photo below.



17. Using the wire pattern for part 14L, found on the lower right of page 11, shape a paperclip to the dimensions shown.




18. Locate the marked, rectangular area on part 14j. With the black stripe on the right end, punch a hole at the left end of the rectangle and insert the paperclip motor retainer into the hole and lay it down the length of the marked rectangle. It should hang over the end of the tube past the black stripe. Glue a strip of scrap paper, as shown, below around the mid-point of the tube, over the paperclip retainer, locking the retainer into place. Place a layer of epoxy glue over the retainer clip to the left side of the paper strip to hold the retainer clip securely.




19.