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# MERCURY SPACECRAFT EXTERIOR DATA MARKINGS

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A FIRST ATTEMPT AT SORTING THEM OUT



*Figure 1 Recovery of Ham in MR-2*

# *Mercury Spacecraft Markings*

A FIRST ATTEMPT AT SORTING THEM OUT

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## INTRODUCTION

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I am a long-time manned space flight enthusiast, and amateur modeler. I have been trying for some time to gather sufficient reference material to build a large scratch-built model of a Mercury spacecraft. I guess this project goes back 40 years or so to when at the age of 9 or 10, I convinced my Boy Scout troop to build a mock-up capsule for the “Skills of Scouting” show, complete with a dummy astronaut dressed in football helmet and silver spray painted coveralls. I am still at it but striving for a bit more accuracy.

At this phase, I am trying to track down details of the external markings on the spacecraft. The “nose art” markings or spacecraft names are well known. This document focuses on the much more obscure data and technical markings. I've found this difficult because most photos concentrate on the area around the window and hatch, and the digital versions which do show stenciling or data markings are hard to read or unreadable. In addition, the markings did not stand up well to re-entry. The typical Plexiglas protection of the vehicles in museums makes photography of the even the visible markings difficult.

As an experimental craft, the markings varied as the program progressed. It appears that early unmanned craft had more markings than the early manned craft. Towards the end of the program, more markings appeared. The MA-9 vehicle seems to have been particularly well marked with cautions and labels, as does the unflown MA-10 spacecraft.

I still have many questions about the markings of these vehicles. Many of them are in museums, and I hope that publication of this draft will encourage some kind souls who have access to them to fill in the gaps.

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## LOCATION NOMENCLATURE

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In order to discuss markings it is useful to have a reference system for their location. It is common practice to refer to angular positions in terms of TY, RX, LX, and BY, where TY refers to the Top in the Y axis. This is not very precise. Instead I will use an angle in degrees, 0° is TY, and the angle increases as you go clockwise around the spacecraft. So 45° is LX, 180° is BY, and 225° is RX.

The location between the heatshield and the front<sup>1</sup> of the spacecraft is via the coordinate scheme used in David Weeks Mercury Spacecraft drawings. So the heatshield end is Z104.50”, the demarcation between the conical section and the recovery section is Z161.71”, and the top of the recovery section is Z 184.57”.

As an example the J37 marking at (10°, 108”) is to the left of the retro umbilical connectors at TY.

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<sup>1</sup> By front I mean the escape tower end. This might be considered backwards, since the heatshield is considered the forebody and the conical section is the afterbody. This is from the perspective of reentry. Not that any of this really matters.

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## GENERAL OBSERVATIONS

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- 1) It appears that most if not all of the Mercury spacecraft had markings J37 at (10°, 108'') and J20 at (350°, 108''). I believe that the other connectors were similarly marked. These would be J2 at (330°, 108''), J12 at (110°, 108'') and J28 at (130°, 108''). However Curt Newport sent me some post restoration photos of Liberty Bell 7, which only show J28 and J20, marked. He claims that the spacecraft was not painted during restoration, so either these marks were not there, or disappeared while the spacecraft was submerged.

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## SPECIFIC SPACECRAFT

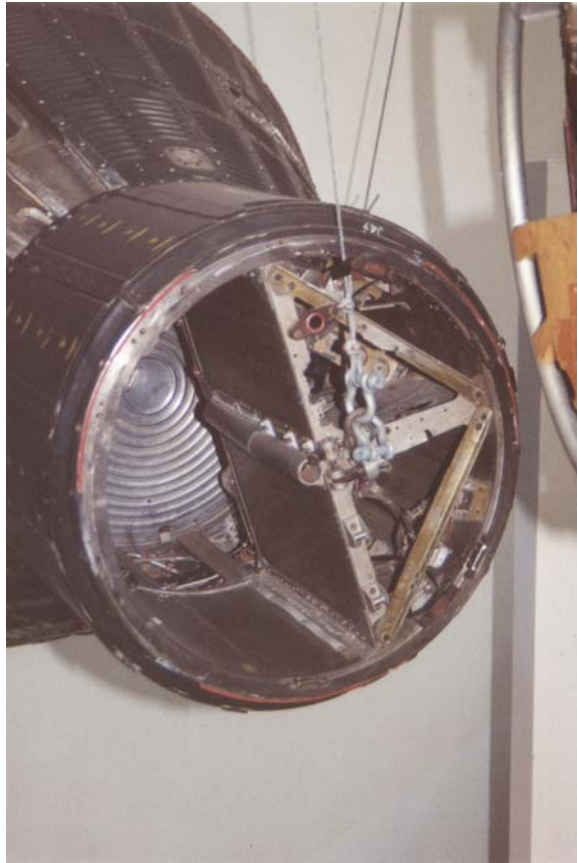
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The remainder of this document presents evidence about specific Mercury spacecraft

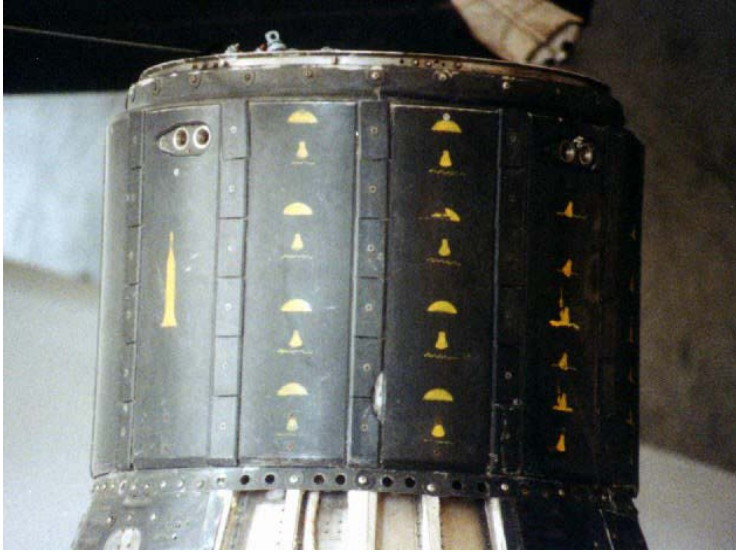
### MR 2 – SPACECRAFT #5

I know very little about these markings. Figure 1 shows some lettering in the area of (250°, 108''). According to [AFGASweb] this vehicle is in the California Museum of Science and Technology in Los Angeles.

Figure 2 Shows the marking J49 on the forward face of the recovery section.



*Figure 2 Recovery compartment of MR-2*



*Figure 3MR-2 Recovery Compartment Markings*

Figure 3 Shows markings which were added after the Ham flight for various drop and retrieval tests.

MA 2 - SPACECRAFT #6

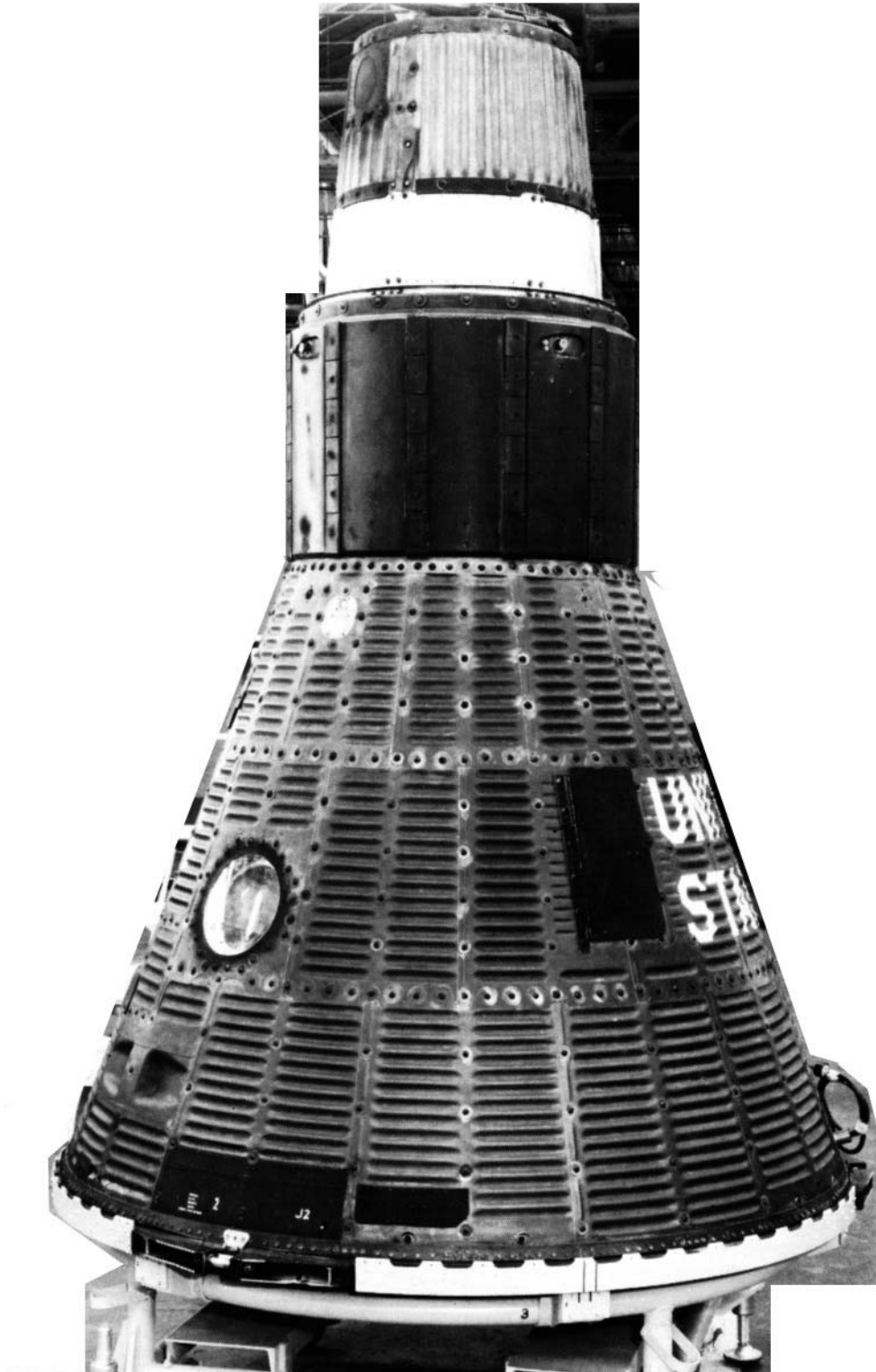


Figure 4 Capsule 6 (MA2)

Figure 1 appears on page 9 of [Mack99]. Notice the J2 marking at (230°, 108'') and a marking which seems to be a hoist/hook icon at (245°, 108''). I have not been able to decipher the wording of the marking at (250°, 108''). This museum is at the Houston Museum of Science according to the [AFGASweb] so perhaps some kind soul can decipher this. Figure 2 is a photo from the museum display which shows that the J37 and J20 markings.



*Figure 5 SC 6 - In Houston Museum of science.*

### MR-3 – SPACECRAFT 7 – “FREEDOM 7”



Figure 6 MR-3

I've been unable to find very clear information on the markings of the first manned Mercury spacecraft. Figure 6 indicates some wording near the heat shield, but nothing can be read. The vehicle is now on display at the US Naval Academy in Annapolis MD.

### MR-4 – SPACECRAFT 11 – “LIBERTY BELL 7”

I've found no useful photos showing the data markings for Grissom's vehicle. As noted post-restoration photos from the Kansas Cosmosphere show that it lacks some of the basic Jx connector markings. Whether or not these markings were there at launch is a question to which I have no answer.

### MA-5 – SPACECRAFT 9 – ENOS

Since this spacecraft is in the Museum of Life and Science in Durham NC, which is reasonably close to me, I've been able to document it fairly well. This craft has quite a few data markings.





*Figure 7 Recovery Section at TY*

The recovery section has markings which include some kind of numbering as well as the locations of thermocouples. Figure 7 shows the recovery section at TY (or 0°). Note the large T/C under the RCS nozzle, and the smaller CAUTION T/C markings as well as the number 26 and 27.



*Figure 8 Recovery Section at LX*

Figure 8 is similar except for the numbering.

Add more about MA-5

**MA-6 – SPACECRAFT 13- “FRIENDSHIP 7”**

John Glenn’s capsule seems to have not had too many extraneous data markings.

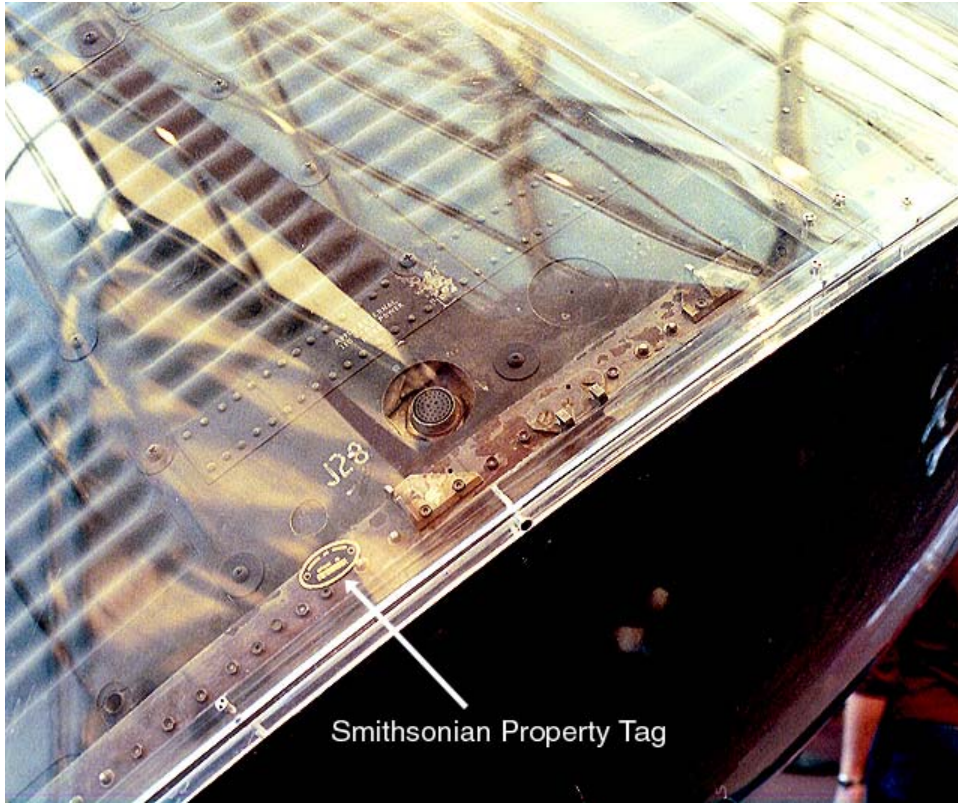


*Figure 9 Howard Perez and the US Flag on SC 13*

Figure 9 appears on Cece Bibby's web site; note the lack of markings similar to those on the Enos craft.

A photo of Glenn and Guenter Wendt practicing insertion shows that there was a stencil style "2" to the right of and slightly below the J20 marking.

[http://spaceflight.nasa.gov/gallery/images/mercury/mercury6/hires/s62\\_00994.html](http://spaceflight.nasa.gov/gallery/images/mercury/mercury6/hires/s62_00994.html) has a description of this photo, and a link to a high resolution scan.



*Figure 10 SC13 J28*

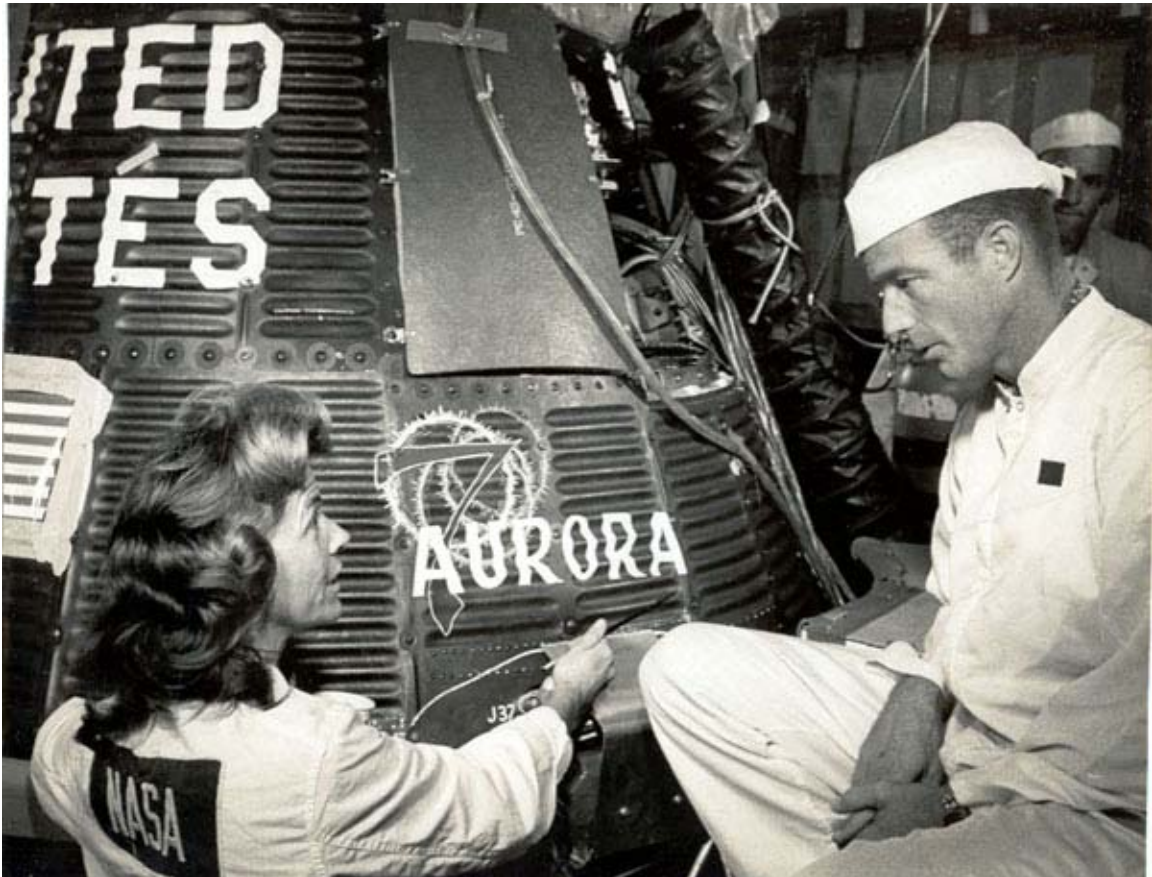
Figure 10 is one of several photos of SC13 posted to the Yahoo Spacemodeler's group by Drew<sup>2</sup> in October 2000. Note the J28 and J12 markings. Also of note is the label at (125, 110) above the J28 connector which reads

APPLY EXTERNAL  
115V AC POWER  
HERE

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<sup>2</sup> Sorry Drew, I forgot your last name.

MA-7 – SPACECRAFT 18 – “AURORA 7”



*Figure 11 Cece Bibby Showing Aurora 7 Artwork to Scott Carpenter*

Figure 11, also from Cece Bibby's site, bears close inspection. If you look carefully at the next to bottom bead on the shingle just above her head, just below and to the right of the S in STATES, there is some evidence of a data marking inside the bead. In comparison to photos of later spacecraft, I am inclined to believe that this is so, and that it is probably a thermocouple location. The wording is most likely CAUTION TEMP P/U which is the form which appears on later spacecraft.



*Figure 12 Color Photo of Aurora 7 "Nose Art"*

Figure 12, another from Cece Bibby's site, is included to show the actual colors of the Aurora 7 logo. The markings on the spacecraft did not stand up well to re-entry conditions. This applies both to the art markings as well as the data markings. Note that the 7 in the logo is blue, not red as it is sometimes depicted.



*Figure 13 Scott Carpenter practicing egress*

Figure 13 shows Scott Carpenter practicing egress through the parachute compartment in the recovery section. It is not clear whether this is actually SC 18, or another vehicle. Note the J45 marking in comparison to Figure 2.

MA-8 – SPACECRAFT 16 – “SIGMA 7”



*Figure 14 Cece Bibby and Wally Shirra - Sigma 7*

Figure 14 is very similar to Figure 11. In this picture the caution marking inside the bead is more legible. Note that it is now one bead lower.



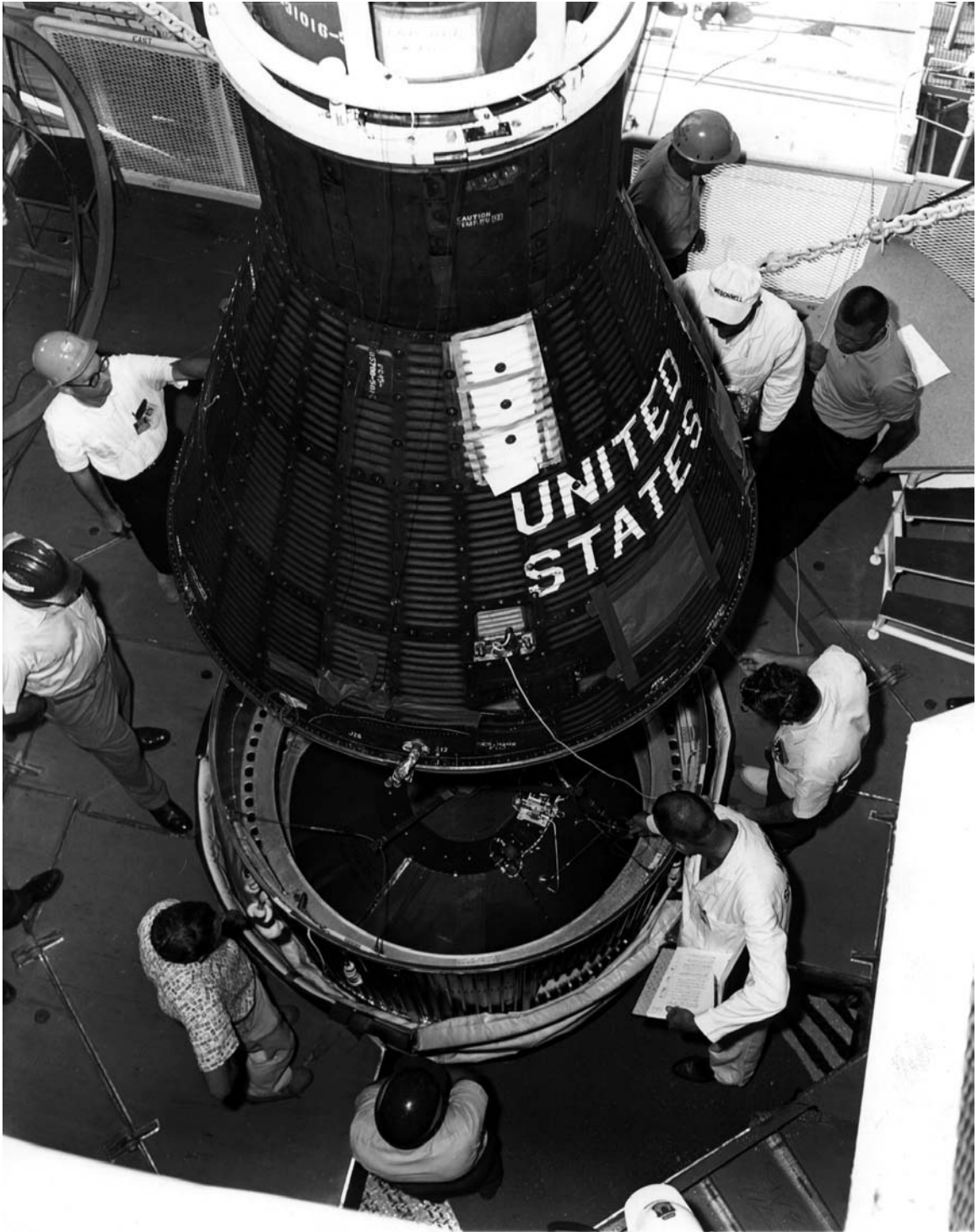


*Figure 15 Shirra insertion into SC 16*

Figure 15, shows the same data marking just discussed, as well as one at the same angular position just above the booster attachment ring. I cannot make out the wording by I believe that it begins with HYD. PEROXIDE and ends with SHINGLE.

#### **MA-9 – SPACECRAFT 20 – “FAITH 7”**

The final manned Mercury spacecraft appears to have carried a wealth of data markings.



*Figure 16 MA-9 Booster Mating*

Figure 16 Reveals quite a few markings.

We have the normal J26 and J12 markings. At (100°, 107'') we see the marking

RCS. H2O2

## FILL

The marking at (80°, 105'') are harder to discern. It appears that the top line says AUTO and the the bottom line ends with VENT.

The marking at (50°, 105'') is even harder to make out. The top line might read AUTO PURGE

At (100°, 184'') just below the RCS jets on the recovery section we see what appears to be

CAUTION

TEMP. P/U [12]

Where the 12 (or perhaps it is some other number) is in a box.

Some other markings appear to be on protective covers on the S/C band antenna and the dielectric window of the antenna fairing.

There are also some other markings near the base at 175 degrees and 185 degrees but these are very hard to read.

Also note that at 185 degrees high up on the conical section a data marking appears inside the sixth bead from the top. It appears to contain the words TEMP. P/U although this might not be the entire wording.



*Figure 17 MA-9 Being hoisted to top of the Atlas*

Figure 17 Shows the vehicle from another angle. A very good view from a similar angle is at <http://images.ksc.nasa.gov/photos/1963/high/63-MA9-61.jpg>

This view is from approximately 200 degrees. At (250°, 108") I see

MAN. H2O2  
FILL

There appears to be a symbol above this which might be a ? or a hoist mark, and some indecipherable text to the left of that. There are also markings in two beads below the roll RCS jets nearby. The J12 marking is there but in shadow.

At (220°, 110") we see what looks like

MAN. RC.  
VENT

Instead of RCS it might say H2O or H2O2 but I'm not sure.

At (200°, 110") I see

MAN. H2O2  
DRAIN, PURGE

There is another marking in the 3<sup>rd</sup> bead from the bottom at 185 degrees. At (175°, 111”) it looks like

AUTO H202  
DRAIN, PURGE

Another TEMP P/U caution seems to be in the bead at (200°, 147”) as well as a TEMP PU caution under the pitch RCS on the recovery section similar to that seen on the other side. It appears that these markings are under all four pitch/yaw thrusters on the recovery section.

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#### REFERENCES

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[Mack99] Mike Mackowski, Space In Miniature #5 Mercury

[AFGASweb] Jim Gerard, A Field Guide to American Spacecraft: Mercury  
<http://aesp.nasa.okstate.edu/fieldguide/pages/mercury/index.html>

David Weeks new Mercury drawings are an indispensable resource to modelers interested in this spacecraft.

Cece Bibby is the woman who painted the names on Glenn’s, Carpenter’s, and Shirra’s spacecraft. Her web site is