
MANIKINS
IN SPACE

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00:00:01,159 --> 00:00:06,580
Inside the Orion spacecraft, as we fly around\h
the Moon, we have some cool experiments going on

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00:00:06,580 --> 00:00:08,615
to help us understand what the environment is like.

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00:00:09,246 --> 00:00:13,462
Although there's no humans aboard Artemis I, we do have a few special passengers aboard

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00:00:13,462 --> 00:00:16,092
that will help us pave the way for future Artemis missions.

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00:00:16,392 --> 00:00:20,515
So there's basically three occupants riding. You can kind of think about it like three astronauts.

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00:00:20,515 --> 00:00:21,538
We have a Moonikin.

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00:00:21,930 --> 00:00:26,180
We will also have two torsos that are learning about the Moon

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00:00:26,180 --> 00:00:29,184
and learning about the environment for our astronauts before they go.

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00:00:29,184 --> 00:00:33,382
We have a manikin on Artemis I. We call him our Moonikin, for short.

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00:00:33,382 --> 00:00:37,585
That Moonikin is called Commander Moonikin Campos.

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00:00:37,585 --> 00:00:40,538
The name is actually in homage to Arturo Campos,

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00:00:40,538 --> 00:00:45,161
who was an important person who helped bring the Apollo 13 capsule home.

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00:00:45,161 --> 00:00:51,384
The Moonikin will sit in the Commander's seat and it will wear a suit, just like our astronauts will wear.

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00:00:51,384 --> 00:00:57,526
Moonikin Campos is actually weighted to simulate an actual human aboard the Orion spacecraft.

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00:00:57,526 --> 00:01:02,595
So it will help us understand what our astronauts will experience as they go to the Moon and home.

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00:01:02,595 --> 00:01:09,118
The Orion crew survival system suit and the Orion seat were designed simultaneously to fit together as a seam

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00:01:09,118 --> 00:01:16,704
The actual design of the suit was built into the Orion seat, such that when they're in the suit, in the seat

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00:01:16,704 --> 00:01:19,673
is a true cocoon of protection for them.

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00:01:19,673 --> 00:01:23,186
During this test flight, the seat will actually be instrumented with accelerometers,

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00:01:23,186 --> 00:01:26,836
sensors that tell us how much the chair is shaking during launch and re-entry

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00:01:26,836 --> 00:01:30,706
and how many G forces, or gravitational forces, it experiences.

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00:01:30,706 --> 00:01:35,671
We expect Commander Moonikin Campos to have a very exciting ride on his way to orbit —

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00:01:35,671 --> 00:01:39,630
the thrill of launch, the experience of weightlessness, the excitement of landing.

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00:01:39,630 --> 00:01:43,940
What we learn on Artemis I with our manikin's assistance will help us better understand

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00:01:43,940 --> 00:01:48,290
how a human will actually behave in the seat, both for landing and for launch,

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00:01:48,290 --> 00:01:50,290
to allow us to ensure their safety.

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00:01:50,290 --> 00:01:56,270
In addition to the Moonikin, we'll have two seats that have basically what's like a human dummy —

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00:01:56,270 --> 00:02:00,578
an upper torso — that are detecting how much radiation they're experiencing.

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00:02:00,578 --> 00:02:04,759
It's called a Matroshka AstroRad Radiation Experiment (MARE).

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00:02:04,840 --> 00:02:11,097
MARE is an international collaboration with German Aerospace Center, DLR, and with Israel Space Agency.

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00:02:11,097 --> 00:02:17,551
The MARE experiment consists of two anthropomorphic phantoms called Helga and Zohar

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00:02:17,551 --> 00:02:23,209
that are simulating a female body in a space radiation environment.

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00:02:23,209 --> 00:02:27,922
One of those will be wearing a safety vest (the AstroRad radiation vest)

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00:02:27,922 --> 00:02:31,418
that we hope will help protect our astronauts from radiation.

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00:02:31,418 --> 00:02:38,229
Each one of the two phantoms will be equipped with about twenty battery operated radiation instruments.

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00:02:38,229 --> 00:02:44,371
So between the two, we'll be able to determine how well we can protect our astronauts from radiation events.

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00:02:44,371 --> 00:02:50,582
Space radiation, it's a mix of high energy heavy charged particles that originate from the Sun.

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00:02:50,582 --> 00:02:55,516
To put things in perspective, one year of Earth exposure to cosmic rays

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00:02:55,516 --> 00:03:00,601
is equivalent with one day of space radiation exposure in deep space.

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00:03:00,601 --> 00:03:06,639
The purpose of the MARE experiment is to learn more about the radiation exposure

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00:03:06,639 --> 00:03:10,889
as well as the biological effects of different organs.

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00:03:10,889 --> 00:03:14,839
So basically it's like we have three occupants inside Orion

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00:03:14,839 --> 00:03:19,866
that are learning about the Moon and learning about the environment for our astronauts before they go.

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00:03:20,000 --> 00:03:24,000
Going back to the Moon with new exploration goals and new technologies

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00:03:24,000 --> 00:03:29,842
will help us gain better understanding of the challenges we encounter with deep space exploration.

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00:03:29,842 --> 00:03:35,407
We will have to develop new technology and solutions to meet really difficult challenges.

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00:03:35,407 --> 00:03:38,425
But that's what NASA does. That's what Artemis is all about.