



1  
00:00:00,000 --> 00:00:08,008  
[ music ]

2  
00:00:08,008 --> 00:00:10,410  
On December 24th 1968,

3  
00:00:10,410 --> 00:00:14,448  
Apollo 8 astronauts Frank  
Borman, Jim Lovell, and Bill  
Anders

4  
00:00:14,448 --> 00:00:16,917  
became the first humans to orbit  
the Moon.

5  
00:00:16,917 --> 00:00:21,321  
and the first to witness the  
magnificent sight called  
"Earthrise."

6  
00:00:21,321 --> 00:00:26,026  
Now, we can see this  
historic event exactly as  
the astronauts saw it,

7  
00:00:26,026 --> 00:00:31,265  
thanks to new data from NASA's  
Lunar Reconnaissance Orbiter, or  
LRO.

8  
00:00:31,265 --> 00:00:37,104  
LRO's superb global lunar maps,  
combined with the astronauts'  
own photographs,

9  
00:00:37,104 --> 00:00:40,274  
reveal where Apollo 8 was over  
the Moon,

10  
00:00:40,274 --> 00:00:43,343

and even its precise orientation  
in space,

11

00:00:43,343 --> 00:00:48,248

when the astronauts first saw  
the Earth rising above the  
Moon's barren horizon.

12

00:00:48,248 --> 00:00:52,152

[ music ]

13

00:00:52,152 --> 00:00:56,223

It happened a few minutes after  
10:30 am Houston time,

14

00:00:56,223 --> 00:01:01,662

as Apollo 8 was coming around  
from the far side of the Moon  
for the fourth time.

15

00:01:01,662 --> 00:01:04,698

Mission Commander Frank Borman  
was in the left-hand seat,

16

00:01:04,698 --> 00:01:08,502

preparing to turn the spacecraft  
to a new orientation

17

00:01:08,502 --> 00:01:10,337

according to the flight plan.

18

00:01:10,337 --> 00:01:14,675

Navigator Jim Lovell was in the  
spacecraft's lower equipment  
bay,

19

00:01:14,675 --> 00:01:19,346

about to make sightings on lunar  
landmarks with the onboard  
sextant,

20

00:01:19,346 --> 00:01:24,017  
and Bill Anders was in the  
right-hand seat, observing the  
Moon through his side window,

21

00:01:24,017 --> 00:01:30,023  
and taking pictures with a  
Hasselblad still camera, fitted  
with a 250-mm telephoto lens.

22

00:01:30,023 --> 00:01:36,830  
Meanwhile, a second Hasselblad  
with an 80-mm lens was mounted  
in Borman's front-facing window,

23

00:01:36,830 --> 00:01:39,199  
the so-called rendezvous window,

24

00:01:39,199 --> 00:01:42,102  
photographing the Moon on an  
automatic timer:

25

00:01:42,102 --> 00:01:44,438  
a new picture every twenty  
seconds.

26

00:01:44,438 --> 00:01:48,875  
These photographs, matched with  
LRO's high-resolution terrain  
maps,

27

00:01:48,875 --> 00:01:53,347  
show that Borman was still  
turning Apollo 8 when the Earth  
appeared.

28

00:01:53,347 --> 00:01:58,051  
It was only because of the  
timing of this rotation that the  
Earthrise,

29

00:01:58,051 --> 00:02:03,323

which had happened on Apollo 8's  
three previous orbits, but was  
unseen by the astronauts,

30

00:02:03,323 --> 00:02:07,227

now came into view in Bill  
Anders's side window.

31

00:02:07,227 --> 00:02:13,333

Here's what it looked like, as  
recreated from LRO data by  
Goddard's Scientific Visualization Studio.

32

00:02:13,333 --> 00:02:18,839

You'll hear the astronauts'  
voices as captured by Apollo 8's  
onboard tape recorder,

33

00:02:18,839 --> 00:02:22,743

beginning with Frank Borman  
announcing the start of the roll  
maneuver,

34

00:02:22,743 --> 00:02:28,048

and you'll see the rising Earth  
move from one window to another  
as Apollo 8 turns.

35

00:02:30,017 --> 00:02:36,623

Borman: All right, we're gonna  
roll.

36

00:02:36,623 --> 00:02:40,027

Ready...

37

00:02:40,027 --> 00:02:49,036

Set...

38

00:02:49,036 --> 00:02:58,045

Anders: The impact crater with  
uh - at uh - just prior to the  
subsolar point on the south side, in the floor of it, uh,

39

00:02:58,045 --> 00:03:03,984  
[unintelligible], there is one  
dark hole.

40

00:03:03,984 --> 00:03:33,847  
But I couldn't get a  
quick enough look at it to see  
if it might be anything volcanic

41

00:03:33,847 --> 00:03:40,854  
Anders: Oh my God, look at that  
picture over there! There's the  
Earth comin' up. Wow, is that pretty!

42

00:03:40,854 --> 00:03:45,358  
Borman: Hey don't take that,  
it's not scheduled.

43

00:03:45,358 --> 00:03:47,260  
[shutter click]

44

00:03:47,260 --> 00:03:51,031  
Anders: You got a color film,  
Jim? Hand me a roll of color,  
quick, would you?

45

00:03:51,031 --> 00:03:51,998  
Lovell: Oh man, that's great.  
Lovell: Where is it?

46

00:03:51,998 --> 00:03:59,206  
Anders: Hurry. Quick.

47

00:03:59,206 --> 00:03:59,973  
Lovell: Down here?

48

00:03:59,973 --> 00:04:09,983  
Anders: Just grab me a color. A  
color exterior. Hurry up.

49  
00:04:09,983 --> 00:04:11,885  
Anders: Got one?

50  
00:04:11,885 --> 00:04:15,322  
Lovell: Yeah, I'm looking' for  
one. C 368.

51  
00:04:15,322 --> 00:04:17,724  
Anders: Anything. Quick.

52  
00:04:17,724 --> 00:04:22,629  
Lovell: Here.

53  
00:04:22,629 --> 00:04:36,042  
Anders: Well, I think we missed  
it.

54  
00:04:36,042 --> 00:04:37,711  
Lovell: Hey, I got it right  
here.

55  
00:04:37,711 --> 00:04:40,814  
Anders: Let me get it out this  
one, it's a lot clearer.

56  
00:04:40,814 --> 00:04:42,482  
[shutter click]

57  
00:04:42,482 --> 00:04:45,685  
Lovell: Bill, I got it framed,  
it's very clear right here!

58  
00:04:45,685 --> 00:04:46,086  
Lovell: Got it?

59

00:04:46,086 --> 00:04:47,287  
Anders: Yep.

60  
00:04:47,287 --> 00:04:49,623  
Lovell: Take several, take  
several of 'em! Here, give it to  
me!

61  
00:04:49,623 --> 00:04:51,558  
Anders: Wait a minute, just let  
me get the right setting here  
now, just calm down.

62  
00:04:51,558 --> 00:04:51,625  
Lovell: Take -

63  
00:04:51,625 --> 00:04:53,393  
Anders: Calm down, Lovell!

64  
00:04:53,393 --> 00:04:56,363  
Lovell: Well, I got it right -  
aw, that's a beautiful  
shot,

65  
00:04:59,299 --> 00:05:02,969  
Two-fifty at f/11.

66  
00:05:09,409 --> 00:05:11,645  
[shutter click]

67  
00:05:11,645 --> 00:05:12,812  
Anders: Okay.

68  
00:05:12,812 --> 00:05:14,814  
Lovell: Now vary-vary the  
exposure a little bit.

69  
00:05:14,814 --> 00:05:16,216  
Anders: I did, I took two of 'em  
here.

70

00:05:16,216 --> 00:05:17,450

Lovell: You sure you got it now?

71

00:05:17,450 --> 00:05:20,453

Anders: Yeah, we'll get - well,  
it'll come up again, I think.

72

00:05:20,453 --> 00:05:22,322

[ music ]

73

00:05:22,322 --> 00:05:27,994

For the astronauts, seeing the  
Earthrise was an unexpected and  
electrifying experience,

74

00:05:27,994 --> 00:05:34,000

and one of the three photographs  
taken by Bill Anders became an  
iconic image of the 20th century.

75

00:05:34,000 --> 00:05:39,239

In 2018, the International  
Astronomical Union commemorated  
the event

76

00:05:39,239 --> 00:05:44,444

by naming a 25 mile diameter  
crater . "Anders'  
Earthrise".

77

00:05:44,444 --> 00:05:49,015

A smaller crater was given the  
name, "Eight Homeward".

78

00:05:49,015 --> 00:05:53,153

Both craters are visible in the  
iconic Earthrise photograph.

79

00:05:53,153 --> 00:05:56,756

I'm Andrew Chaikin, author of "A  
Man on the Moon."

80

00:05:56,756 --> 00:06:33,393

[ music ]