GEMINI 4

3 - 7 JUNE 1965

an essay by

HAMISH LINDSAY

Alternate mission logo

“Gemini 4 … Get back in.”

Gus Grissom, astronaut Capcom

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Extracted from content available on the
Honeysuckle Creek Tracking Station
website, developed by Colin Mackellar

www.honeysucklecreek.net

Click or scan the QR code below to see the website's
Carnarvon Tracking Station section.

GEMINI 4 (GT-4)

Ed White floats beside Gemini IV, over the Gulf of California, in the first US Spacewalk. Image: NASA 16mm

Mission Fact Box

Launch
Launch Complex – 19, Cape Kennedy
Thursday, 3 June 1965
1015:59 US EST / 1515:59 UTC
[Friday, 4 June 1965, 0115:59 AEST]

Spacecraft
Rocket: Titan II GLV, S/N: 62-12559
Capsule: Gemini SC4
Callsign: *Gemini 4*

Mission duration
4 days 1 hours 56 minutes 12 seconds

Distance travelled
2,590,600 kilometres

Earth orbital data
Orbits: 66 | Revolutions: 62
Apogee: 289.0 kilometres
Perigee: 165.0 kilometres

EVA
21 minutes by Pilot, James McDivitt

Splashdown
7 June 1965, 1712:11 UTC [8/0312:11 AEST]
Northwest of The Bahamas, 27°44'N 74°11'W
Recovery ship: USS Wasp

EDITORIAL NOTES

This description of Carnarvon and the Gemini 4 mission comes from essays and content on the honeysucklecreek.net website, which is regularly updated with new content, including additions to the subject matter of this essay.

Indented & italicised quotes includes comments, interviews and air-to-ground communications.

- ONLINE CONTENT -
AUDIO – VIDEO – WEBSITE

This essay contains additional content which includes audio, video and website material, available via the internet. Click the icons or scan the QR code using your phone or tablet.

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The Gemini 4 crew, James A McDivitt and Edward H. White II. Image: NASA

Gemini 4

America's first EVA

Originally the first Gemini EVA (Extra Vehicular Activity, commonly called a spacewalk), was scheduled for Gemini VI.

Due to the Russian Aleksei Leonov's walk on 18 March 1965, and the American spacewalk suits and systems being announced as ready for use ahead of schedule, NASA began looking at bringing the spacewalk forward.

Although Grissom and Young were unsuccessful in depressurising the cabin and opening the hatch during one of their Gemini III simulations, the NASA hierarchy did reluctantly agree to have White stand up on his seat.

However, after Leonov's walk, President Johnson is supposed to have snarled,

"If the guy can stick his head out, he can also take a walk. I want to see an American EVA."

The EVA plan was kept secret

Although there had been references to an EVA in Gemini IV, first stated in January 1964 and it was publicly mentioned by Gemini Deputy Manager Kenneth Kleinknecht at a press briefing in July 1964, NASA management were not committing themselves:

"… we shouldn't be putting guys in a vacuum with nothing between them but the little old lady from Worcester and her glue pot,"

…they warned, referring to the seamstresses at the suit manufacturing plant of the David Clark Company, in Worcester, Massachusetts.

So, a Gemini IV EVA was kept a secret with only people directly involved in the know. Flight Director Gene Kranz went into overdrive and worked his normal day preparing for the mission, but in the evening he returned to work in secret

Artist Robert McCall's rendering of the Gemini 4 spacewalk. Image: R.McCall via NASA

on the EVA procedures. Kranz planned to have the hardware qualified and procedures for the EVA ready fourteen days before the launch.

The remote tracking station Capcoms were given double-sealed envelopes and told to only open them on instructions from Flight Director Gene Kranz. If no instruction was issued, the envelopes were to be returned unopened. Inside was another envelope marked Plan X detailing procedures for an EVA.

It wasn't until the final week of training, on 25 May 1965, that the message from HQ arrived,

"We are GO for EVA,"

…and the media were informed.

Carnarvon Capcom Ed Fendell, writing in 2012:

"I carried with me to the site, unknown to anyone, including my own team, a secret flight plan called Flight Plan X that I and several others had worked on in secret back in Houston. It was the Flight plan for our first EVA, which we then used on that mission. Over CRO I gave the crew the go to commence with the EVA and for Ed White to exit the spacecraft. Very exciting."

The crew

The crew for Gemini IV was announced on 27 July 1964. Command Pilot James McDivitt and Pilot Edward White had known each other since their college days and had been in the same class at the Air Force Test School.

Backup crew Frank Borman and James Lovell (**below**), both 36, first met when undergoing testing by NASA. All four were second generation astronauts, selected by NASA in September 1962.

James Alton McDivitt
Aged 35 for the mission, was born in Chicago, Illinois, on 10 June 1929 and went to school in Kalamazoo, Michigan.

He received his BSc. in aeronautical engineering from the University of Michigan (first in class) in 1959, and an Honorary Doctorate in Astronautical Science from the same University in 1965.

He joined the Air Force in 1951, fighting in the Korean War, and retired with the rank of Brigadier-General when he retired from NASA in June 1972. He logged more than 5,000 flying hours.

He joined NASA in the second intake in September 1962, and this was his first space flight. He commanded the Apollo 9 Earth orbiting mission, and was Program Manager for Apollos 12 through 16. He regards his highlight in space was getting Apollo 13 home safely.

Edward Higgins White II
Aged 34, was born in San Antonio, Texas, on 14 November 1930. In 1952 he earned his BSc. at the US Military Academy at West Point. He attended the Air Force Test Pilot School at Edwards Air Force Base, California in 1959 and later was assigned to the Wright-Patterson Air Force as an experimental test pilot. White logged more than 3,000 hours flying, 2,200 in jets.

He joined NASA in September 1962 in the second intake of astronauts.

White was ideal for the first American attempt to walk in space; a fitness fanatic and superb athlete, he just missed out on the US team for the 400 metre Olympic hurdles by 0.4 of a second. He died in the tragic Apollo 1 fire on 27 January 1967.

The new Mission Control Center in Houston (MCC-H) opens for business
This mission was the first time the new Mission Control Center in Houston, Texas, was used. New technology was to be tried, and it was the first time Houston had three 8 hour shifts covering 24 hours a day. Chris Kraft, as well as Mission Director, was Flight Director of the Red Team covering the working day operations; Gene Kranz and his White Team was the Systems Shift,

The brand new Mission Control Center in Houston during GT-4. Image: NASA

checking the status of the ship and its consumables and put the astronauts to sleep; while John Hodge's Blue Team was the real-time planning shift.

Gemini IV, with Houston as the Flight Control Center, served as a training ground for astronauts, flight controllers, technical staff and tracking stations, setting the style for the later Gemini missions, as well as for future Apollo flights.

At the tracking stations we were used to *"This is the Cape…"* coming down the line; now we heard this new identification, *"This is Houston…"*, in our earphones when Mission Control called us.

The Flight Control Team at Carnarvon

This was the first time an astronaut was not the Capcom at Carnarvon, but an observer. Dave Scott (Gemini VIII, Apollos 9 and 15) was our astronaut/observer for Gemini IV. After the Capcom fracas of Gemini III, we settled down to follow our leader and Capcom, Ed Fendell.

Ed Fendell, writing in 2012:

> *"Carnarvon was an unbelievable place in those days. … The Capcom job was the best job I ever had in my life, and the memories that went with it stay with me to this day."*

Ed was a stickler for intercom protocol and discipline, and drilled us mercilessly until we reached his high standard of prompt, efficient reporting.

Ed had a streak of humour, which surfaced sometimes on the intercom. He and Monte Sala, our Digital Command System engineer, working closely together during the mission, would mock each other's accents on the loop – Ed's American and Monte's Italian. Then one night (we always worked at night as it was the Americans' day) Ed suggested Monte go outside and have a wash. The humour of that suggestive remark wasn't explained until we walked outside and saw that Ed had poured a packet of detergent into Monte's fountain and the suds foamed up all over the spacecraft model.

Ed later became famous as 'Captain Video,' remotely controlling the Lunar Rovers' television cameras during the later Apollo missions.

It was Ed who received the Plan X secret instructions for an EVA just before launch.

The Gemini 4 Flight Control team at Carnarvon. Photo: Hamish Lindsay

Back row (left to right): Dick Simons (M&O); Fred Mitchell (AWA Company Manager); Lewis Wainwright (Station Director); and Dave Scott (NASA Astronaut, Observer).
Front row (left to right): Dr Bill Walsh (RAAF Flight Surgeon); Harry Smith (Gemini Systems Engineer); Dr Michael Murray-Alston (RAAF Flight Surgeon); John Ferry (NASA Simulations Engineer); Ed Fendell (Capcom); Joe Fuller (Gemini Systems Engineer); and Dr Dick Pollard (NASA Flight Surgeon).

New shifts for tracking stations to cope with long duration missions

This mission was our first taste of long duration missions where our shifts cycled with the spacecraft's cluster of station overhead passes. It would then drift away from us and fly over India and South America with minimal tracking facilities, when we could get some rest, though some critical personnel had to sleep on standby on site.

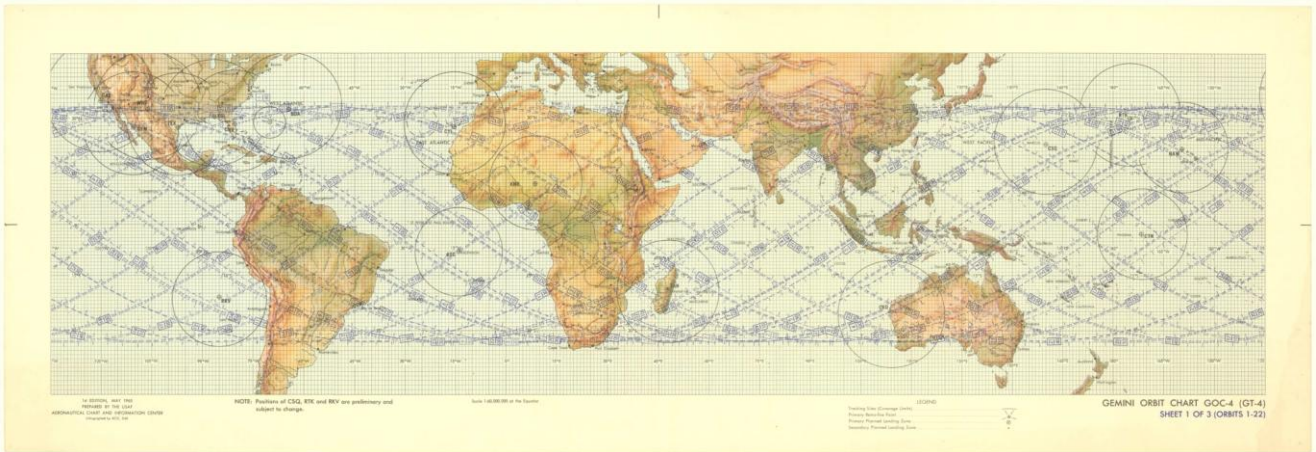
For example, we could be busy tracking through a group of 7 station passes, say orbits 13 through 19, then we would go home to sleep for 9 orbits and return to the station to support passes 28 through 34, and so on through the mission. It was a 14-hour day at work followed by a 10 hour break, sliding forward 1 hour earlier each shift for the length of the mission.

The passes would begin in the north-east with a short glimpse of the spacecraft for around a minute, peak overhead with longer passes of up to 12 minutes and then fade out in the north-west with short passes again before it disappeared below the horizon to go through the whole cycle again.

Four days in space were planned – longer than all the NASA Mercury and Gemini flights combined at that point. Objectives of the mission were to trial the first American spacewalk, evaluate the prolonged effects of spaceflight over 4 days on the crew and the spacecraft, looking at crew rest and work cycles, eating schedules and real time flight planning. In addition, they planned to try station keeping with the second stage of the Launch Vehicle, and in-and-out of plane manoeuvres. There were 11 experiments scheduled.

At T-35 minutes before launch, the erector stuck at 12° while being lowered. It was raised and lowered again, but still stuck. After an hour of investigation, technicians found a faulty connector in a junction box. It was replaced and after a delay of 1 hour 16 minutes the count continued to launch.

Station engineer Monte Sala with the fountain he designed for AWA. Photo: Hamish Lindsay



Above: A Gemini IV groundtrack chart for Orbits 1-22. Preserved and Scanned: Hamish Lindsay.

See a larger version of the chart

A larger (1.0mb .jpg) version of this chart is available on the honeysucklecreek.net website.

WEBSITE

John Ferry, a member of the Gemini flight control team, monitored communications and station operations from the Capcom console when the spacecraft was on orbits which were not visible from the station, allowing others to get some sleep. Photo: Hamish Lindsay.

James McDivitt and Ed White, walk from the transfer van to the launch vehicle. Image: NASA/KSC

Launch Complex 19 at the Kennedy Space Center, with the Gemini-Titan IV vehicle. Image: NASA/KSC

Gemini 4 roars off the launch pad on 3 June 1965 (US time). Image: NASA/KSC

Launch

At 1015:59 USEST on Thursday 3 June 1965 the 27 metre tall GLV Titan II rocket thrust the Gemini IV capsule into the sky from Launch Complex-19 into an initial elliptical orbit of 163 by 282 kilometres. It had the first international television audience, 12 European nations watching it through the Early Bird satellite.

McDivitt reported booster cut-off 5½ minutes after lift-off and waited before backing off, using his thrusters. Then, once in orbit, McDivitt and White tried to catch up with their discarded booster rocket. White saw the rocket venting, with propellant streaming from its nozzles. McDivitt estimated it was 120 metres away, while White thought it was more like 75 metres.

McDivitt called down 7¼ minutes after launch,

"Okay, I got the old second stage. It's spinning away and looks pretty."

Grissom, *"Roger. You say it's spinning away?"*

McDivitt, *"Roger. It's starting to tumble a little."*

Grissom,
"Hey Jim. How fast is that booster tumbling?"

McDivitt, *"I can't give you that… going around."*

Grissom, *"Is it just slowly rotating?"*

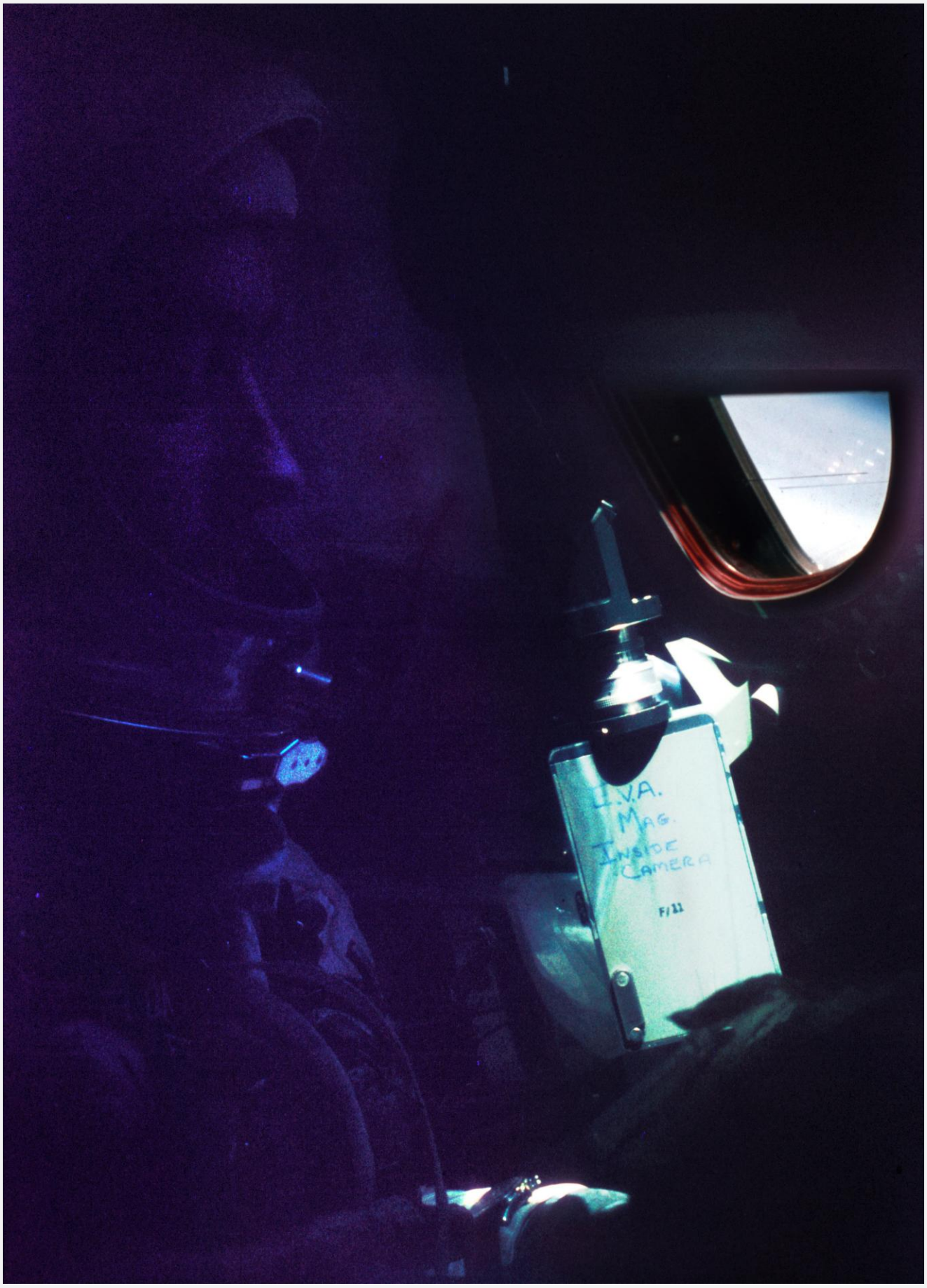
McDivitt, *"Roger. It's slowly rotating."*

McDivitt aimed the spacecraft at the booster and thrust forward towards it. After two bursts from his thrusters the booster seemed to move away and downwards. McDivitt pitched the nose downwards and they saw the rocket again, apparently on a different track. He tried several times to reach the booster but with no luck. They couldn't approach the target.

By nightfall the booster appeared to be about 600 metres away, and with the dawn it was 3 to 5 kilometres away. As the flight engineers were still learning orbital mechanics and rendezvous techniques, McDivitt, who was only eyeballing his manoeuvres, gave up when their Orbital Attitude Manoeuvring System (OAMS) fuel quickly ran down to half. Gemini IV had a limited fuel supply – its tanks were only half the size of later spacecraft.

The reason McDivitt failed to reach the booster was an ignorance of orbital mechanics.

Chris Kraft at his console during Gemini IV. Image: NASA/JSC



Taken using a Zeiss Ikon Contarex 35mm camera, this image has been processed to bring out detail of Jim McDivitt inside the Gemini 4 spacecraft. During White's EVA, McDivitt used a Hasselblad 500C 70mm to take photos. In front of him is likely the 16mm camera, marked 'EVA Mag. Inside Camera'. Image: NASA

Ed White in a contemplative moment inside Gemini 4. Image: NASA

On Earth to reach a target you can accelerate in a straight line towards it. In orbit adding speed raises altitude, moving you into a higher orbit, so you are travelling further away and slower than the target, which is what happened to Gemini IV. McDivitt should have slowed into a lower orbit, thus speeding up and passing the target, then at the appropriate moment speeding up to join the target's plane. Once next to the target all relative motion between them is eliminated and the spacecraft can approach the target directly.

Carnarvon First Pass

During the first pass over Carnarvon at 0:43:41 GET (0159:40 AEST) McDivitt explained,

"The booster fell away quite rapidly and got below us like there was a considerable difference in our velocity, and I let the thing get too far from me."

Over the tracking station at Kano, Africa, into the second orbit the spacecraft was travelling sideways as they entered the night;

White called down,

"A very interesting thing – Jim's got full daylight out his window, and I have full night out of mine. It seems very strange for me to look out Jim's side and see daylight and look out my side and it's just pitch black."

Down among the consoles in Mission Control, John Aaron, the Red Team's leader in charge of the Gemini life support, electrical and communications systems, looked at Chris Kraft and said, *"We're go for EVA, Flight."*

The Nile Delta and Sinai Peninsula as seen from Gemini 4. Image: NASA

Carnarvon Second Pass

On the second pass over Carnarvon, at 2:24:22 GET (0340:21 AEST) the astronauts were finding conditions very difficult, and McDivitt called to the Carnarvon Capcom, Ed Fendell:

"Listen, you might advise Flight that we are running late on this thing. There's a lot to do and we are having trouble keeping track of all this stuff. I'll give you a blood pressure as soon as I get around to it."

Fendell: *"Full scale on your blood pressure."*

McDivitt: *"I don't think you got a good blood pressure the bulb popped off."*

Fendell: *"Gemini 4 you are GO for EVA and decompression. Disregard the blood pressure unless you have got some minutes and then try and get it for us. We'd appreciate it."*

McDivitt snapped back: *"We don't have any time at all. We're really pressed here."*

Fendell: *"We're not going to say anything here on the ground. If you need anything we'll wait."*

McDivitt: *"Okay. Listen, has Houston been advised yet we're runnin' a little late and we might not be ready at Hawaii?"*

Fendell: *"Okay. He's ready he knows that. Houston advises you can use any attitude you like for your extra vehicular activity."*

With the cabin rather a jumble of items, and McDivitt feeling they would be too rushed this time around, he decided to delay the EVA until the

The Hadhramawt Plateau in southern Yemen. Image: NASA

next orbit, so we had to wait for another pass before the big event.

At 3:00:19 GET (1316:18 USEST) the Houston Capcom told the crew,

> *"Jim, you're going to be live* (on television) *as you make your pass across the States this time."*
>
> McDivitt, *"Okay. Anything in particular you want me to say?"*
>
> Grissom, *"Suit yourself."*
>
> McDivitt, *"Okay."*

Four minutes later, approaching the American coast, Grissom asked,

Listen to the pass over Carnarvon

GET 03:57:34 – Orbit 3 – as recorded at Carnarvon (CRO). Ed Fendell is Capcom.
Preserved: Hamish Lindsay. Edit: Colin Mackellar

LISTEN

2.1mb mp3 file. Running time – 3m 47s

The colourful and complex terrain of the Atacama Desert in Chile. Image: NASA

"How about describing the way the cockpit is laid out now, with all of your gear out?"

McDivitt, *"Okay, well we've got to the get-out position here. Ed has most of the equipment on him right now. I've got the gun and the camera and the hatch fitting – the fitting to tie the two suit hoses together. Ed has all the paraphernalia on him right now, but he's on the suit circuit. I think when we get over Africa we're going to go through the checklist again and when we get to Carnarvon we'll be all set."*

Grissom,
"Roger. Have you taken any pictures yet?"

McDivitt, *"No. As a matter of fact we really haven't had the time to do much."*

Grissom,
"You haven't had any time yet, have you?"

McDivitt, *"It's a nice spacecraft though, Gus."*

Carnarvon Third Pass

On the third pass over Carnarvon at 3:57:34 GET (0513:33 AEST) McDivitt checked:

"We have a GO to start the decompression, is that right?"

Fendell: *"That's affirm, a GO for decompression and a GO for EVA."*

McDivitt: *"Roger. We expect to be out by the time we get near Hawaii."*

At 4:07:42 GET (0523:41 AEST) McDivitt announced to White on the on-board recorder,

"We're going to vent the cabin now."

White answered, *"Yes."*

Just over three minutes later White said,

"We're in a vacuum now and the right suit is holding at 4 (psi = 27.6 kPa) *and the flow is satisfactory. I'm not overly warm."*

McDivitt, *"Roger. We've got the cabin vent valve open….. cabin* (pressure) *at zero. Time to unlock the hatch."*

The astronauts began preparations for the first American spacewalk after they were given the GO for EVA over Cape Canaveral by Capcom Gus Grissom. After depressurizing the cabin, they had trouble opening the hatch – it would not unlatch because a spring failed to compress. After yanking and poking around the hatch ratchet it suddenly cracked open. Then White found it as hard to open wide in zero-g as it was on the ground back on Earth.

As White prepared to climb out he asked,

"Am I clobbering the switches, Jim?"

McDivitt, *"Yes, you're really all over 'em, Ed."*

Listen to the full EVA

GET 04:23:01 – as recorded at Carnarvon (CRO).
Starts with Hawaii Capcom calling Gemini 4.
Preserved: Hamish Lindsay. Edit: Colin Mackellar

LISTEN

16.0mb mp3 file. Running time – 33m 41s

Gemini IV was 193 kilometres above Hawaii at 4:23:19 GET (0539:18 AEST) when McDivitt said,

"We're going to put you on record so the whole world can hear this later on."

White, *"All right."*

The smooth Public Affairs voice announced,

"This is Gemini Control. Four hours and twenty four minutes into the mission. The Hawaii station has just established contact and the pilot; Jim McDivitt advises the cabin has been depressurised. It is reading zero. We are standing by for a GO from Hawaii to open the hatch… White has opened the hatch… he has stood up. McDivitt reports that White is standing on the seat."

Author (Hamish Lindsay):

"At Carnarvon we were all getting ready for the next pass, but hanging onto every word coming down the voice channel from Houston. To us this first spacewalk was one of the supreme moments of the Gemini Program, and we were agog to hear how it was going, and what we would find when they came up over our horizon. There was so much to go wrong."

White,

"I was waiting for the GO, and it came a little earlier than I expected. I was expecting it over Guaymas. I thought maybe I had lost track of time up there – it was going faster than I had anticipated. Chris Kraft had thought we were ready to go over Hawaii, and since we were going to lose a portion of the night time on the other end of the EVA due to the late launch he decided to let us go over Hawaii."

The Spacewalk EVA Begins

While the spacecraft was travelling between Hawaii and Mexico, White eased himself out of the hatch with the manoeuvring unit, or gun. A glove he had left on the seat seemed to acquire a mind of its own – it rose off the seat and gently drifted out of the hatch after him to waft off into space.

White called, *"I'm outside the spacecraft, as a matter of fact."*

McDivitt, *"He has the hatch open. He's standing in the seat."*

Hawaii Capcom, *"Roger. Houston will give you a GO/NOGO to exit spacecraft over Guaymas."*

Capcom, *"Roger. Everything looks good here. What do you think?"*

Capcom, *"We're happy with it. Everything looks good on the ground, Gemini 4."*

View of the open Pilot-side hatch taken by Ed White during his spacewalk. Image: NASA

McDivitt, *"When he's moving around out there he's really rocking the spacecraft around."*

At 4:28:14 GET (0544:13 AEST, Friday 4 June) the Hawaii Capcom told the spacecraft,

"We just had word from Houston. We're ready to have you get out whenever you're ready. Give us a mark when you egress the spacecraft."

McDivitt,
"Okay. We've got our GO now. Is that right?"

Capcom, *"Affirmative. Be sure and give us a mark when he egresses."*

At 4:30:19 GET (0546:18 AEST) White announced,

"Okay. I'm separating from the spacecraft."

McDivitt, *"He's separating from the spacecraft at this time Hawaii."*

White, *"Okay. My feet are out."*

White, *"I think I'm dragging a little bit, but I don't want to fire the gun yet."*

White soars into space

At 4:30:36 GET (0546:35 AEST) came the moment White drifted clear of the spacecraft with,

"Okay. I'm out."

McDivitt, *"OK, he's out. He's floating free."*

White spoke later of his feelings of the moment,

"There was absolutely no sensation of falling. There was very little sensation of speed, other than the same type of sensation that we had in the capsule, and I would say it would be very similar to flying over the Earth from about 20,000 feet. You can't actually see the Earth moving underneath you… I think as I stepped out, I thought probably the biggest thing was a feeling of accomplishment of one of the goals of the Gemini IV mission. I think that was probably in my mind. I think that is as close as I can give it to you."

There were some communications problems, but the Cape could hear White through McDivitt's communication system.

White, *"Am I in your view, Jimbo?"*

McDivitt, *"Well, you know I can't see…"*

White, *"Don't sweat it. I'll come to you."*

McDivitt, *"Oops – there goes your glove… well, we'll just let it go."*

White, *"All right."*

A thermal glove floats free in this frame from the movie camera mounted on the hatch. Image: NASA 16mm

White, *"Okay, I rolled off and I'm rolling to the right now. Under my own influence. There goes a… looks like a thermal glove, Jim."*

McDivitt, *"It is, Ed."* …

White, *"It really looks funny to see my glove out there, Jim."*

McDivitt, *"Does it?"*

White commented later,

"I tried to use the gun very sparingly. I just used it enough to satisfy myself that I could make manoeuvres, so in my own mind that I could control myself in both pitch, yaw and translation. If you can control your pitch and yaw and translate fore and aft you can go from point A to point B – the roll isn't very important. I wasn't trying to control myself in roll."

White, *"See me yet?"*

McDivitt, *"No. Sure don't."*

White, *"Huh?… oh, there you are. I can spin around now."*

McDivitt, *"Okay. Just a second … you're right in front, Ed. You look beautiful."*

White, *"I feel like a million dollars. All right, we'll pitch up and yaw left. I'm coming back to you."*

Initially McDivitt held the spacecraft steady, but as White began floating around he let it drift. Using his gun, White propelled himself down to the nose of the spacecraft, then back to the adapter end, but soon ran out of fuel, and reported:

"It's very easy to manoeuvre with the gun. The only problem is I haven't got enough fuel. I've exhausted the fuel now and I was able to manoeuvre myself around the front of the spacecraft, back, and manoeuvre right up to the top of the adapter. Just about … came back into Jim's view. The only thing I wish I had more fuel. This is the greatest experience I've … it's just tremendous. Right now, I'm standing on my head and I'm looking right down, and it looks like we're coming up on the coast of California.

Above: Ed White floats away from the spacecraft, attached to his tether.
Images: NASA
Below: Ed White floats beside Gemini 4 in the first American EVA.

Ed White with the Hand-Held Manoeuvring Unit or "zip gun" that used pressurised gas for thrust. This photo was taken when the spacecraft was near Hawaii, with the Pacific Ocean as the backdrop. Image: NASA

I'm going into a slow rotation to the right. There's absolutely no disorientation associated with it."

McDivitt observed: *"One thing about it, when Ed gets out there and starts wiggling around it sure makes the spacecraft tough to control…"*

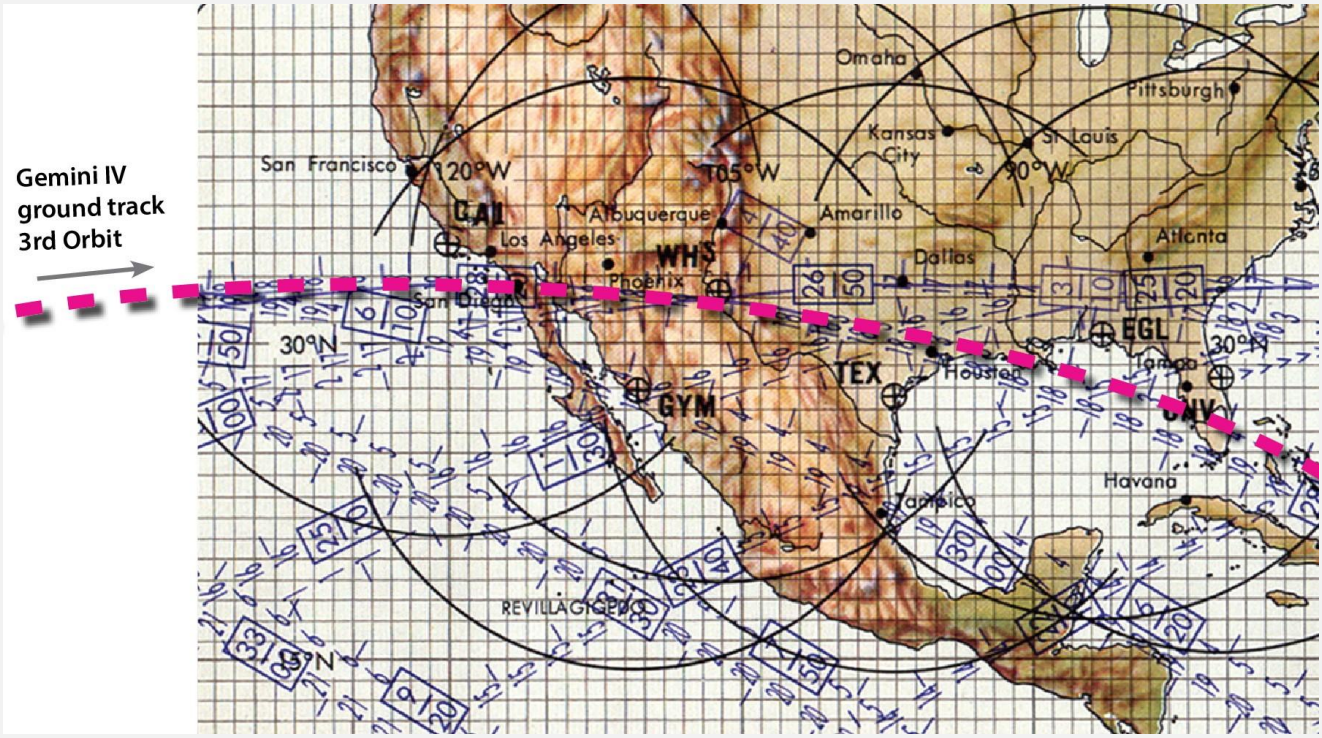
White then began to use the umbilical tether to move around. He later recounted,

"The tether was quite useful. I was able to go right back where I started every time, but I wasn't able to manoeuvre to specific points with it… I also used it to pull myself down to the spacecraft, and at one time I called down and said, 'I am walking across the top of the spacecraft' and that is exactly what I was doing. I took the tether to give myself a little friction on the top of the spacecraft and walked about three or four steps until the angle of the tether to the spacecraft got so much that my feet went out from under me. I also realised that our tether was mounted so that it put me exactly where I was told to stay out of."

While McDivitt sat at the controls keeping the spacecraft as steady as possible with its nose pointing down at the bulk of the continental United States spread out below, White moved around while they both took photographs and discussed the view.

Ed White’s photo of the nose of the Gemini 4 spacecraft. Image: NASA

Ed White floats high above the clouds off the coast of California. Image: NASA



Detail from the groundtrack chart seen earlier in the essay, showing Gemini 4's groundtrack, with White's EVA denoted by the dotted line. Preserved: Hamish Lindsay. Annotated: Colin Mackellar

In this camera view facing southwest, Gemini 4 has passed over San Diego and is heading towards a point just south of Phoenix, Arizona. On the right is California, and visible over Ed White's left shoulder is the Gulf of California and Baja California. Image: NASA

Grissom, *"Take some pictures."*

White, *"Okay. I'm going to work on getting some pictures, Jim."*

McDivitt: *"Get out in front where I can see you again. I've only got about three* (pictures) *on the Hasselblad. Where are you?"*

White, *"Right out in front now. I don't have the control I had any more without the gun."*

McDivitt, *"Yes, I noticed that."*

In Houston, Flight Director Chris Kraft was beginning to look anxiously at the time.

The Flight Plan called for a spacewalk of 12 minutes, and it was already well past that with no signs of White returning.

Grissom, *"You've got about five minutes."*

White, *"But I want to get out and shoot some good pictures. I'm drifting down under the spacecraft."*

McDivitt,
"I'm going to start firing the thrusters now."

White, *"There's no difficulty in recontacting the spacecraft. It's all very soft, particularly as long*

Ed White with the Gulf of California and Baja California behind him. Guaymas Tracking Station is somewhere behind his left knee. From a viewpoint near White Sands, New Mexico. Image: NASA

as you move nice and slow. I'm very thankful to have the experience. It's great, Gus. Right now, I'm right on top of the spacecraft – just above Jim's window. I'll bring myself in and put myself out of your view, Jim."

McDivitt,
"Okay… hold it and I'll take your picture."

White, *"Right now I could manoeuvre much better if I didn't have the gun with the camera on it because I have to tie one hand up with it."*

McDivitt, *"Stay right there if you can. Do you want me to manoeuvre for you now, Ed?"*

White, *"No… I think you're doing fine. What I'd like to do is get all the way out, Jim, and get a picture of the whole spacecraft. I don't seem to be doing that."*

McDivitt, *"Yes, I had noticed that. You don't seem to get far enough away."*

White, *"No."*

McDivitt, *"Where are you now? Am I clear to thrust a little bit?"*

White, *"No – don't thrust now."*

He didn't want any accidents from the spacecraft thruster propellants.

McDivitt, *"Okay, Ed. Just free-float around. Right now, we're pointing just about straight down at the ground."*

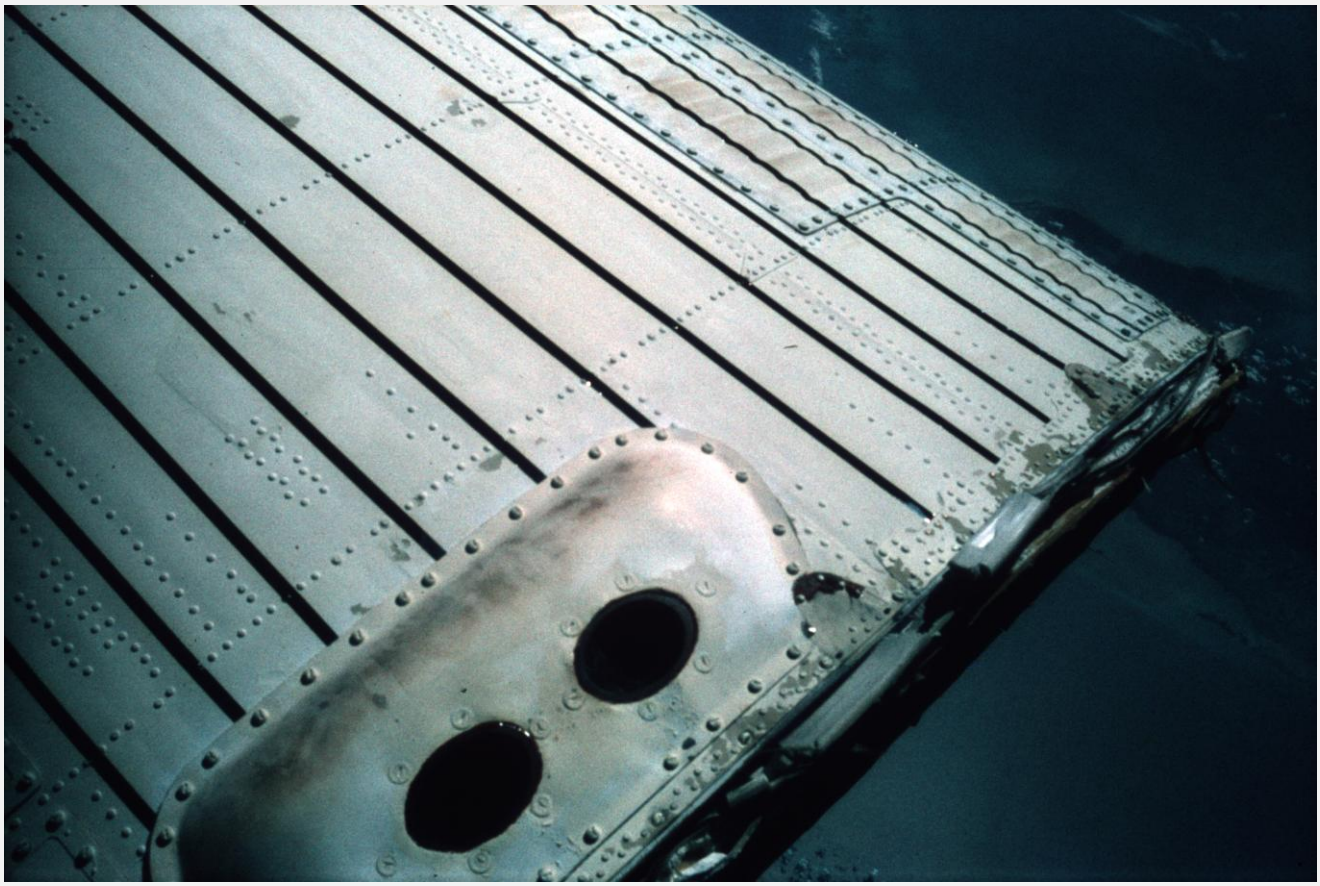
White,
"I'm coming back down the spacecraft. I can sit up here and see the whole California coast."

White, *"How you doing old buddy?"*

McDivitt, *"Pretty good… how about you?"*

White, *"Good. Looking right in your window."*

McDivitt, *"Where? You're not even there… are you there, Ed?"*



One of Ed White's photo of the outside of the spacecraft. Image: NASA

White, *"No. I'm moving out now."*

An increasingly anxious Grissom,
"You've got 4 minutes and 30 seconds left."

White,
"Okay, I'm going to free drift and see if I can drift into some good picture taking positions."

McDivitt, *"Ed… smile."*

White, *"I'm looking right down your gun barrel. All right."*

McDivitt, *"You smeared up my windshield, you dirty dog."*

White,
"Well… hand me a Kleenex and I'll clean it."

McDivitt,
"Ha! See how it's all smeared up there."

White, *"Yes."*

McDivitt, *"We've been tumbling around. I don't even know exactly where we are, but it looks like we're about over Texas. As a matter of fact, you know, that looks like Houston down below us."*

White, *"I believe it is, Jim."*

McDivitt,
"Gus, this is Jim. Got any message for us?"

Grissom, *"Gemini 4 – Get back in."*

McDivitt, *"We're coming over the east now and they want you to come back in now."*

White, *"Back in?"*

McDivitt, *"Back in."*

Grissom, *"Roger. We've been trying to talk to you for a while here."*

White,
"Aw, Cape, let me just find a few pictures."

McDivitt, *"No, back in. Come on."*

White, *"Coming in. Listen, you could almost not drag me in, but I'm coming."*

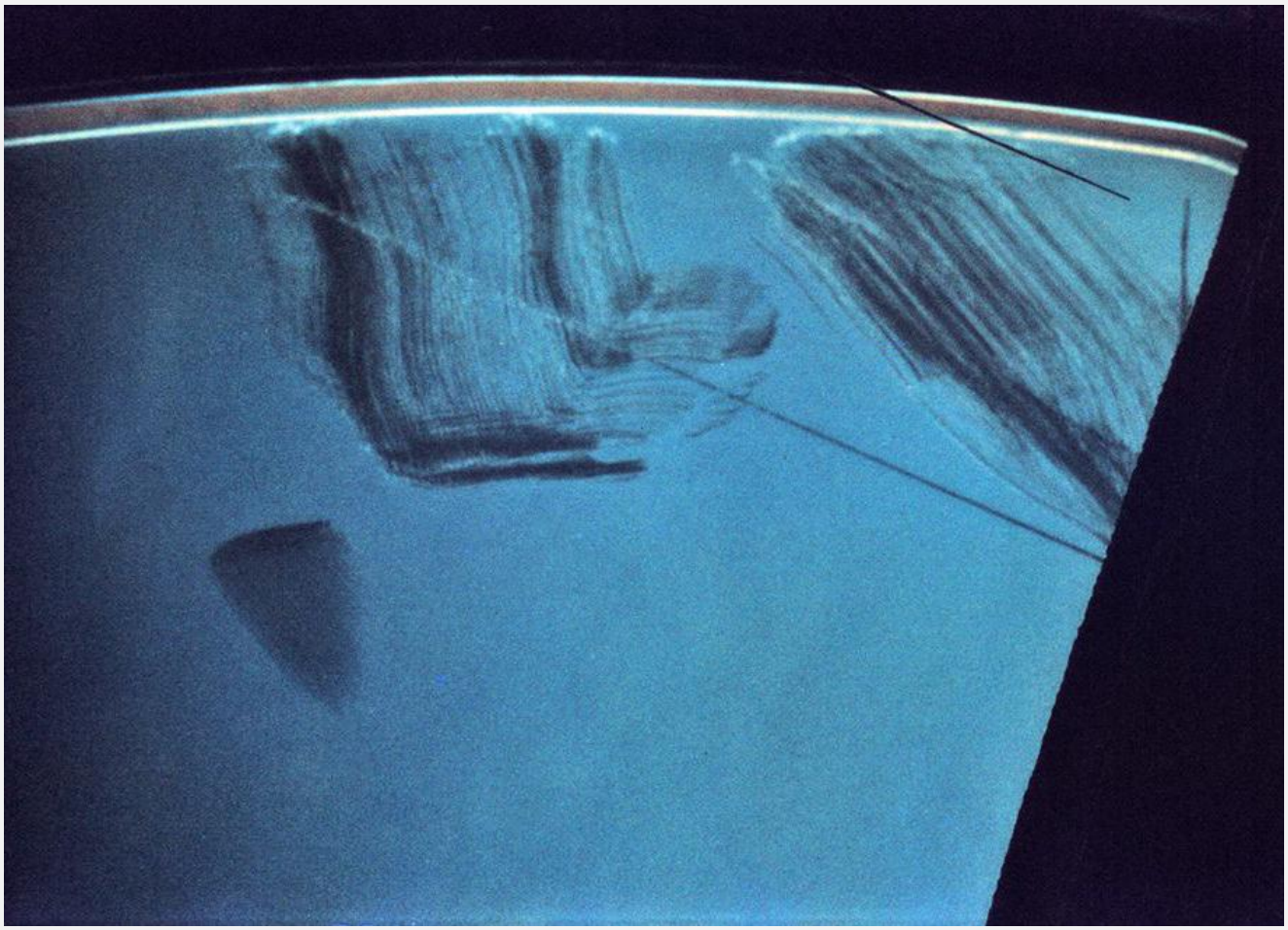
Grissom, *"You have 4 minutes till Bermuda LOS* (Loss of signal)*."*

McDivitt, *"Okay. Okay. Don't wear yourself out now. Just come on in."*

White, *"I'm trying to get a picture of the spacecraft now."*

McDivitt, *"Ed, come on in here. Let's get back here before it gets dark."*

White sighed, *"Okay. This is the saddest moment of my life."*



In this photo, taken after the EVA, the smearing is evident. Image: NASA. Processed: Colin Mackellar

McDivitt, *"Well, you're going to find a sadder one when we have to come down from this whole thing."*

White, *"I'm coming."*

McDivitt,
"Have you any messages for us Houston?"

Grissom, *"Are you getting him back in?"*

White's boots thumped on the spacecraft as he reluctantly worked himself to the top of the capsule hatch, handed back the camera, and again stood on the seat. Savouring the moment, he stood briefly on the seat, looking at the stunning view of Earth spread out below them.

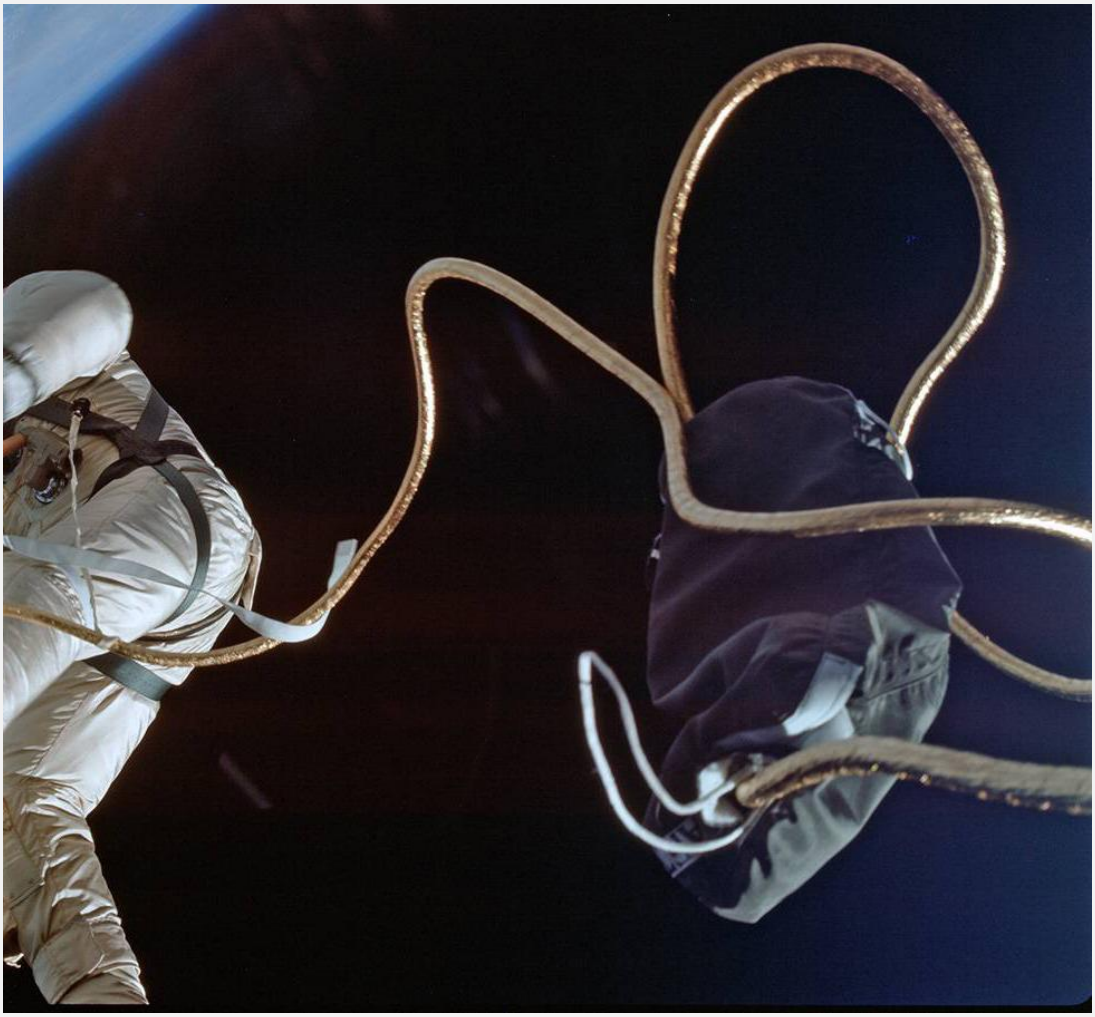
At 4:50:04 GET (0606:03 AEST) McDivitt announced the end of the spacewalk,

"He's standing on the seat now. His legs are down below the instrument panel."

Capcom, *"Okay. Get him back in. You are going to have Bermuda LOS in about 20 seconds."*

The handheld "zip gun" and camera. Image: NASA

Above and Below: Views of Ed White outside the spacecraft. Images: NASA



Close encounters – Ed White during his spacewalk across the USA. Image: NASA

End of the EVA

After White struggled to get back into his seat in the spacecraft they closed the hatch and grabbed the ratchet handle to secure it. To White's shock it failed to catch, so the fastenings had to be manoeuvred into place by hand and secured, McDivitt trying to hold him down in the seat. Throughout the EVA the hatch seal had been exposed to the vacuum of space, and the intense cold had stiffened the seal material making it extremely difficult to close tightly.

McDivitt explained what happened with the hatch from his point of view to the Houston Capcom,

"As he got back into the spacecraft, we had a considerable amount of difficulty with the hatch. First we lifted the ratchet portion of the hatch to engage. After we got that engaged, we couldn't get the hatch closed down far enough. Actually, we started pulling down on the locking handles to get the dogs out. So, we had a rather exciting time.

It went on for – I think we were 44 minutes after we started the EVA. I was looking at my event timer, which I had started when Ed exited the spacecraft. At 44 minutes we still didn't have the hatch closed. We were trying to take things calm, cool and collected so we didn't get things all screwed up. Finally, by my pulling as hard as I could to get the hatch-closing device, and Ed pulling down as best he could we were able to

Gene Kranz is pictured during a simulation prior to the Gemini-Titan 4 mission, at the Flight Director's console in Houston's Mission Control Center on the Manned Spacecraft Center site.
GT-4 was the first mission to be at least partially controlled from the Houston site. Image: NASA/JSC

force him down into the seat and get the hatch closed fully. Ed seemed to be up much higher today than he had been in any of our zero-g EVA's in the airplane."

White, *"I don't believe we were actually having difficulties with my head clearance. I felt like I had plenty of head clearance and I could actually reach down and manipulate the dogs. We just seemed to have a little more effort in closing than we have ever experienced before."*

They both collapsed back into their couches, physically exhausted, with sweat streaming into their eyes, and fogging their faceplates. White became so overheated from the struggle to get back in it took him a few hours to return to normal.

The EVA equipment was supposed to be dumped out in space to give the astronauts more room in the cramped cabin, but the hatch was never opened again, so all the EVA suits and associated gear had to be carried around for the rest of the mission.

White had been outside the spacecraft for an exhilarating 21 minutes.

After they settled down out of range of any tracking station, we pick up their conversation off the on-board tape recorder, White saying,

"That was something. That was the most natural feeling, Jim."

McDivitt, *"Yeah, I know it. You looked like you were in your mother's womb."*

McDivitt then asked, *"You get the flight plan out and see who we can talk to."*

McDivitt announced the time, *"Five fifteen."*

White, *"Shoot. We don't talk to anybody until we get to Carnarvon at 5:35?"*

McDivitt called into the ether, there being no tracking station within range,

"Gemini 4 transmitting into the blind. We're back in, the cabin's resealed, We're all set and all safe. We're going to do a delayed tape time playback over Carnarvon at about 5:35… just about 13 minutes."

White, *"We're starting to get cleaned up, Jim."*

McDivitt, *"Yes, we are. One thing, Ed. Just be slow, cautious and thorough."*

White, *"Roger. I'm slow…"*

McDivitt,
"I know you are. I'm amazed. I never thought I would see the day you would be so slow."

They began discussing the hatch problem, in particular the pre-mission training.

White, *"You know that was just… we rehearsed this so many times."*

McDivitt, *"Boy, it really paid off."*

White, *"It's paid. Big dividends."*

McDivitt, *"As a matter of fact I think I'm going to tell* Chris (Kraft) *that on the radio."*

White, *"Don't alarm them."*

McDivitt, *"No. I'm just going to tell them that training just paid off. We could get the hatch closed. You knew how hard you could hit it without hurting it."*

A little later McDivitt mused,

"I tell you the day side just isn't long enough for EVAs. You know that?"

White, *"No. You have to go like gangbusters."*

Hamish Lindsay at the Gemini voice receivers at Carnarvon.

Listen to the 4th pass over CRO

GET 05:31:50 – Orbit 4 – as recorded at Carnarvon (CRO). Ed Fendell is Capcom.
Preserved: Hamish Lindsay. Edit: Colin Mackellar

LISTEN

3.6mb mp3 file. Running time – 6m 54s

Carnarvon Fourth Pass

Gemini IV came up over our horizon at Carnarvon at 5:32:04 GET (0648:03 AEST), the crew anxious to tell somebody about their status. It had been an exciting long night and early morning for us on the ground.

Author, *"I had 20 centimetre speakers to listen to the astronauts' voices, and will always remember clearly sensing the tension and excitement in their voices as well as the atmosphere of the confined cabin that came through those speakers."*

McDivitt: *"Carnarvon. Carnarvon. Gemini 4."*

Fendell: *"Gemini 4… Gemini 4… this is Carnarvon Capcom."*

McDivitt: *"Gemini 4. I read you loud and clear. It's nice to have somebody to talk to again."*

Fendell: *"Roger it's good to hear you. How are thing's going?"*

McDivitt: *"Okay. We're back inside the spacecraft; we are repressurised to 5 psi. We are not – I say again, we are not, going to depressurise the spacecraft again."*

Fendell:
"Roger. Understand. How are you feeling?"

McDivitt,
"Everybody's fine… we're feeling great."

Fendell, *"Roger. Can you give me battery readouts please?"*

And the rest of the pass over Carnarvon followed a technical exchange on updates and spacecraft status, with not a word about the big event just experienced. Discussions about the event began over Hawaii.

White tells of his spacewalk experiences

At 5:59:29 GET (0715:28 AEST) over Hawaii White began to talk about his experience,

"While I was outside I noticed on Jim's window – he's got a coating on the outside of it. One time when I brushed up against it with either my shoulder or arm it actually smeared right over on it, and it smeared the upper part of his window so he couldn't see out. When I look out from this side, I can see that it is rather heavily coated with some type of material. When I was outside looking in it looked like a … it looked like almost a greasy film on the outside of it. My window doesn't seem to have so much on it."

Six minutes later White continued,

"The tether – the location of the tether, or the umbilical restraint on the outside hatch made it rather difficult to do any EVA work as far as from tether aerodynamics out in front of the spacecraft. Whenever I operated in that area the tether would… when it would come to its end would start me back and the reaction would carry me back up towards the… over the spacecraft and back towards the adapter section. That's why I kept going out of sight during my manoeuvring out there up above the windows, and then drifting back towards the back of the spacecraft. I had to continually keep pulling myself to get out in the front of the spacecraft.

I wasn't satisfied with the pictures I was getting. It was rather difficult to keep any of the lanyards that I had on… I had the lanyard on the gun and the tether and umbilical that I was on and several other miscellaneous type lanyards flailing around and it was difficult to keep them from in front of the camera lens. I kept trying to move them out of the way so I could take a picture. I'd say they were in front of me probably 50 or 60 per cent of the time and the other percent of the time I was not in a good position as I would like to be. I think I took in the neighbourhood of a dozen pictures.

Ed White onboard Gemini 4 during the mission. Image: NASA

I felt no tendency to bang into the spacecraft. I was able to approach the spacecraft just about from any attitude I came back in.

There was no disorientation whatever. I felt that I could either look down at the ground – I felt perfectly at home looking down at it – and I could roll around on my back and look up and it was not disorienting me in any way. The spacecraft was my best reference. Any time I saw it I immediately had a good reference and, in fact, at times near the end I was using my tether and actually walking up and down on the surface of the spacecraft, using it to hold me down as an anchor."

At 6:19:31 GET (0735:30 AEST) Grissom summarized the moment,

"Looks like we won one after all!"

McDivitt, *"Ha! Ha!"*

At 7:35:40 GET, nearly 5 pm spacecraft time, (0851:39 AEST) over Hawaii, White began to think of getting some sleep,

"Bacon and egg bites, toast and orange juice, and I'm about to go to sleep."

He managed to get about four and half hours of restless sleep.

At 17:24:35 GET (1840:34 AEST) over the ship Rose Knot Victor off the west coast of Peru in South America Houston wondered how the astronauts were getting on with all the EVA clobber they weren't able to dump into space.

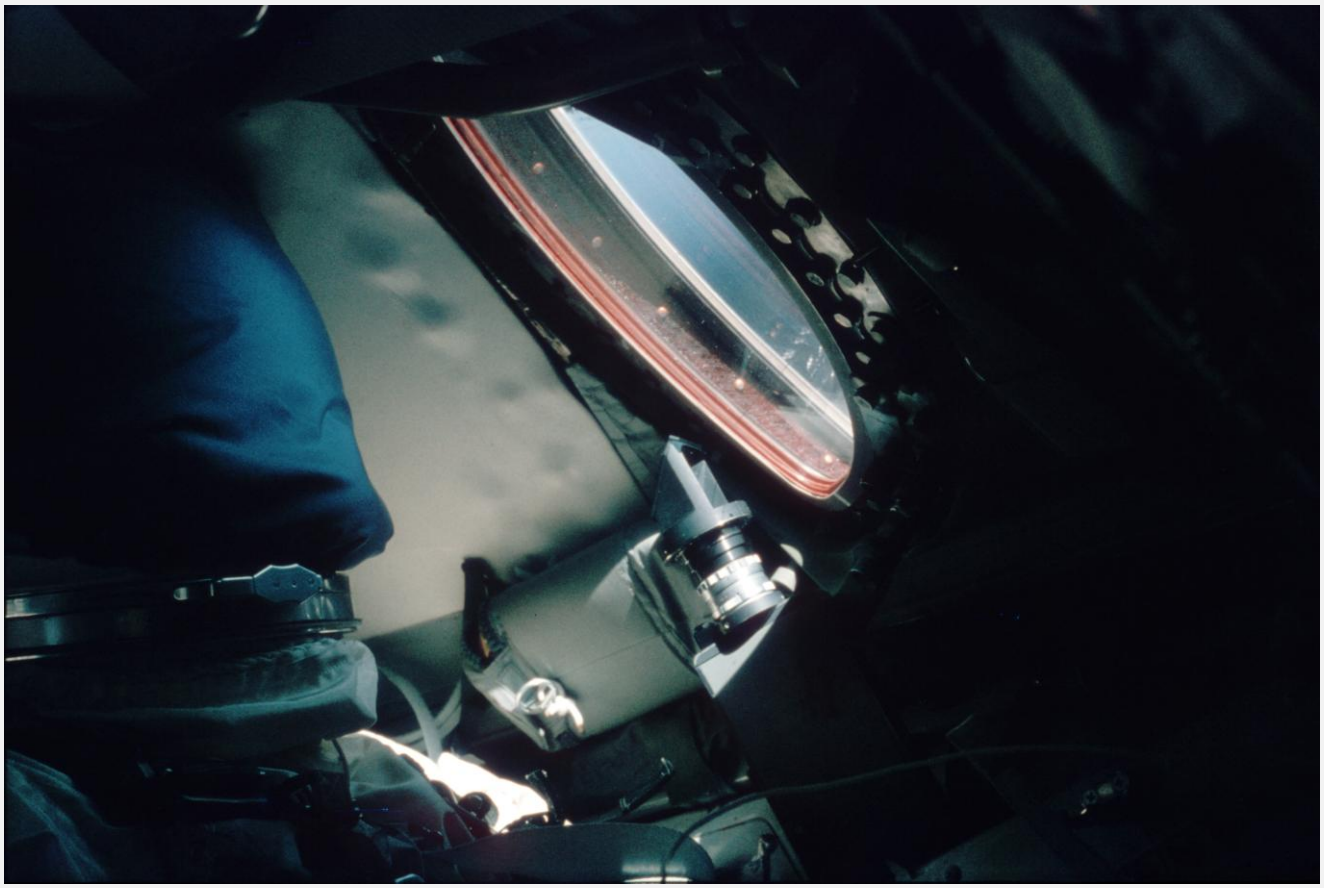
RKV Capcom asked,

"Gemini IV, Flight asks how you are doing at getting things stowed away and if you are getting a little crowded up there?"

McDivitt, *"Indeed we are crowded. We have got most of that junk down in the foot well, and I guess we are going to have to hold some of it during re-entry."*

Capcom, *"Oh Boy – that sounds like a lot of fun."*

McDivitt, *"We are trying to figure out what to do with all the stuff we've got."*



Jim McDivitt getting some sleep. Both astronauts used a dark cover over their spacesuit helmets. Image: NASA

Capcom, *"Well, let's see – there's a lot of empty space up there around you."*

McDivitt,
"Yes, and I sure wish we could get to it."

Houston Capcom Gene Cernan then asked,

"You might ask him to go briefly over the trouble he had closing the hatch."

RKV Capcom, *"Flight advises they have good communications on this air-to-ground remoting – and would like you to go over the problems you had with the hatch closure."*

McDivitt, *"Roger. There are two gears that we have that go around when you pull the handle back and forth. One of them is the gear that sort of acts as a ratchet – a little cylinder with a piston in it and a spike behind it that engages the ratchet. We were having a little trouble with that before we got it (the hatch) open and after we got it open we had difficulty getting this ratchet to work.*

Also, we had a great deal of difficulty in getting the hatch to close far enough so we could even start latching it. Then Ed had to push the ratchet in with his hand on every go until it started. And I was pulling on the thing until I thought I was probably going to break a lug right out of the hatch. We finally got it going, and it finally came forward. So, I don't think we ought to try opening it up any more."

Capcom, *"Roger. Sounds like a good idea to keep it closed."*

At 22:15:23 GET (2331:22 AEST) Houston Capcom Gus Grissom read up the newspapers headlines about their EVA, and White responded,

"It was tough to get in, real tough to get back in. That was sure something out there. Were y'all reading us? We never knew when y'all were reading us or not."

Grissom, *"Yeah, your VOX* (voice operated microphone) *was keyed all the time … we couldn't get in or try and tell you that your time was up and to get back in. Never could get through to you at all."*

White, *"Oh is that right? I'm glad you didn't."*

Grissom, *"Yeah – I could tell that."*

A few minutes later Grissom suddenly asked,

"Hey, Ed, you were talking about walking on the spacecraft – were you actually walking on it?"

White, *"Yes, I was. I was using the tether to pull myself down towards the spacecraft and I was right on top of it. The next time I get into a tether type of operation it looks pretty good but is still hard to get any traction on the top. But if you pull yourself down you can get a little bit."*

Grissom, *"You forgot your magnets, I guess."*

At 66:29:10 GET (1945:09 AEST 6 June) over Corpus Christi, Texas, Capcom Grissom asked the pilots,

"Gemini 4, Houston. Can you give us any idea of where you've got some of your gear stored? We're concerned about CG (centre of gravity)*, Over."*

McDivitt, *"It looks like we're going to end up with ECM on the floor, and we're going to have the cable in Ed's lap. And we're going to have the gun stowed in the centre food box where it was. We're going to have the film in the centre food box. We're going to have the camera equipment in the side food box."*

Grissom, *"Roger – we got it."*

Then, just after passing over Carnarvon, at 67:40:52 GET (2056:51 AEST) 6 June the crew saw a shooting star enter the atmosphere below them, White,

"I just saw a falling star trail down not too far in front of us and it burned out considerably below us. The whole tail was quite long, which was actually below our level. It burned up considerably below us."

McDivitt, *"Yes."*

How we helped to put Gemini IV in space

By JACK PERCIVAL

MORE than 100 specially trained Australian engineers and technicians are playing a part in tracking America's Gemini two-man space vehicle now orbiting the earth.

They are employees of Amalgamated Wireless, operations contractor to the Department of Supply which manages the NASA (National Aeronautics and Space Administration) tracking station at Carnarvon.

The Carnarvon site in Western Australia was chosen as the result of experience at the first Australian-based tracking station at Muchea, near Perth.

It was necessary to establish the Australian Gemini tracking station closer to the Equator at about the same longitude to cope with the particular orbital requirements of the Gemini program.

The Australian staff, which includes a large percentage of Sydneysiders, was recruited by Mr. W. W. Honnor, A.W.A.'s chief engineer.

The "colony" is living in a new village of more than 40 specially built homes. "Governor" of the "colony" is Mr F. Mitchell, appointed manager by A.W.A.

Gemini control room at Carnarvon: British engineer Mr B. Simons (right) at the controls of technical equipment associated with the Gemini project. With him are Australians John Fletcher (centre) of Caringbah, and Dave Brooks, of Sydney.

The Black One'

The trackers have established their own vegetable and flower gardens, and they have been netting tiger, king and banana prawns by the ton.

They also have been catching giant mangrove crabs.

Engineers who have visited some of the large pastoral properties in the area have brought back dressed wild goats and kangaroo tails to vary the village's diet.

Sport and horse-racing have been introduced. Three members of the staff, together with the mayor of Carnarvon, have acquired their own mount, Saint Mondray.

Its eight wins in 15 months have won recognition over the NASA world communications network.

Money has changed hands at major NASA tracking stations on all continents on the performance of Saint Mondray, known as "The Black One."

Right now the countryside around the station is a fairyland of pink, yellow, mauve and orange. Western Australia's famous wildflowers are in full bloom.

Data for U.S.

The A.W.A. team at Carnarvon is responsible for the efficient working of a maze of ultra-modern scientific equipment.

This includes a radar with a range of 32,000 miles, providing the accuracy required for space research particularly with respect to azimuth and elevation angles.

The radar equipment is housed in a two-storey concrete building, and it is operated by a team of seven engineers and technicians.

When it "locks" on to the Gemini space vehicle the angle and range data is transmitted via the station's communications centre to computers in America.

A telemetry system records vital medical data such as the astronauts' respiration rates, heartbeats and blood pressures.

It also records temperatures and radiation inside and outside the capsule, fuel levels and special data for the U.S. Department of Defence.

The Carnarvon command system sends instructions by

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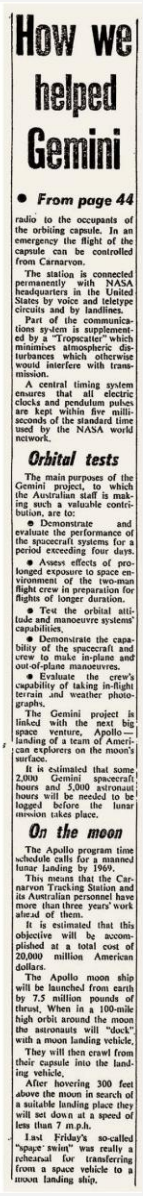

How we helped Gemini

● From page 44

radio to the occupants of the orbiting capsule. In an emergency the flight of the capsule can be controlled from Carnarvon.

The station is connected permanently with NASA headquarters in the United States by voice and teletype circuits and by landlines.

Part of the communications system is supplemented by a "Tropscatter" which minimises atmospheric disturbances which otherwise would interfere with transmission.

A central timing system ensures that all electric clocks and pendulum pulses are kept within five milliseconds of the standard time used by the NASA world network.

Orbital tests

The main purposes of the Gemini project, to which the Australian staff is making such a valuable contribution, are to:

- Demonstrate and evaluate the performance of the spacecraft systems for a period exceeding four days.
- Assess effects of prolonged exposure to space environment of the two-man flight crew in preparation for flights of longer duration.
- Test the orbital attitude and manoeuvre systems' capabilities.
- Demonstrate the capability of the spacecraft and crew to make in-plane and out-of-plane manoeuvres.
- Evaluate the crew's capability of taking in-flight terrain and weather photographs.

The Gemini project is linked with the next big space venture, Apollo—landing of a team of American explorers on the moon's surface.

It is estimated that some 2,000 Gemini spacecraft hours and 5,000 astronaut hours will be needed to be logged before the lunar mission takes place.

On the moon

The Apollo program time schedule calls for a manned lunar landing by 1969.

This means that the Carnarvon Tracking Station and its Australian personnel have more than three years' work ahead of them.

It is estimated that this objective will be accomplished at a total cost of 20,000 million American dollars.

The Apollo moon ship will be launched from earth by 7.5 million pounds of thrust. When in a 100-mile high orbit around the moon the astronauts will "dock" with a moon landing vehicle.

They will then crawl from their capsule into the landing vehicle.

After hovering 300 feet above the moon in search of a suitable landing place they will set down at a speed of less than 7 m.p.h.

Last Friday's so-called "space' swim" was really a rehearsal for transferring from a space vehicle to a moon landing ship.

Left: Carnarvon's role was featured in Sydney's Sun-Herlad newspaper on Sunday, 6 June 1965.

An amusing excerpt from the article, **'How we helped to put Gemini IV in space'** *by Jack Percival*

'The Black One'

The trackers have established their own vegetable and flower gardens, and they have been netting tiger, king and banana prawns by the ton.

They also have been catching giant mangrove crabs.

Engineers who have visited some of the large pastoral properties in the area have brough back dressed wild goats and kangaroo tails to vary the village's diet.

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The lights of Melbourne as seen from the International Space Station in October 2024.
Photo: NASA/Don Pettit

Melbourne, Australia,
turns on its lights for Gemini IV

After that frantic start, the rest of the mission was much quieter. On the 44th orbit the city of Melbourne, in Victoria, Australia, turned its lights on for the astronauts.

At 68:43:28 GET (2159:27 AEST) on 6 June, two days into the mission, Carnarvon Capcom Ed Fendell called up,

"I'd like you to take a look to see if you can see the lights of Melbourne. That'll be about 8 minutes from now."

McDivitt, *"Okay. At 00:08?"*

Fendell, "*Ought to be a pretty good time. They should be just a little to the right of you – just about underneath you – just slightly down."*

McDivitt, *"Okay. To the North?"*

Fendell, *"Negative. To the south."*

McDivitt, *"To the south. Okay."*

Fendell, *"I don't know whether you will see it. It's raining here real bad. I don't know whether the weather is clear over Melbourne, or not."*

McDivitt, *"Yes, every time I go over Australia all I ever see is thunderstorms."*

Fendell, *"Had three inches today."*

McDivitt, *"Wow!"*

Fendell, *"They need it."*

McDivitt, *"Do they need it all in one day?"*

Just over 6 minutes later McDivitt called back,

"I see some lights shining on the clouds down below me at this time."

Fendell, *"All right. That should be Melbourne."*

McDivitt, *"Okay. Very good. Tell them I thank them for lighting the night for me."*

Fendell, *"Very good. They'll appreciate that."*

McDivitt, *"Tell them the next time, though, to get those clouds out of the way so I can see the city, and not just the clouds."*

Fendell,
"That's the same way I feel. I'm all miffed."

HELLO SYDNEY!

They're 'nuts,' says astronaut

HOUSTON (Texas)—Saturday (A.A.P.).—"You might be amazed at the Australians—they sure are nuts on electricity," astronaut Major Edward White broadcast from space yesterday after he had passed over Sydney.

"As we came over on this last pass I could see the lights of Sydney loud and clear," he said.

White, who went space walking on Friday, described his view of Sydney and Perth.

The two Australian cities turned on their lights so that White and his "space twin" Major James McDivitt, in their capsule Gemini 4, could see them.

White told fellow astronaut Gus Grissom, one of the key figures in control communications from the mission control centre in Houston:—

"You might say there was sure lots of electricity on that last pass.

"I could see the lights of Sydney and Perth and the usual thunderstorms up north."

The conversation between Major White and Grissom took place as the Gemini capsule sped over the United States on the fourteenth of the 62 revolutions of the earth that White and McDivitt are to make.

During the 20th revolution, McDivitt and White received the go-ahead to try

Florida, the island of Cuba, Puerto Rico and Santo Domingo . . the blue as the water deepened was quite a view."

Major White said he was munching one of his bite-sized chicken salad sandwiches, and drinking orange-grapefruit juice.

Their menu on Friday called on McDivitt to eat both chicken and beef—even though he is a Catholic. He got a special dispensation before the flight.

Both men slept only

Left: While Melbourne was under cloud, McDivitt and White had seen Perth and Sydney clearly on their 14th orbit.

Page 2 article from the Sydney Sun-Herald newspaper, 6 June 1965.

Above: Sydney from ISS taken in 2012.

Towards the end of the mission, at 75 hours into the flight, the spacecraft computer was updated, and McDivitt was told to turn the computer off. But he found he couldn't, and after much analysing and attempts the computer quit completely, so instead of coming back under control of the astronauts, the spacecraft had to make a ballistic re-entry, which meant that the capsule would behave more like a projectile, instead of a spacecraft under control doing a lifting bank angle re-entry.

As they rolled in, they saw their just discarded adapter (the unit attached to the back carrying the power units and consumables) trailing behind, turn into an orange mushroom as it burned its way back into the thickening atmosphere.

The coastline of Florida and the Kennedy Space Center are seen in this view from Gemini 4. Image: NASA

A United States Navy frogman team participates in the recovery of the Gemini-Titan 4 (GT-4) spacecraft. The USS Wasp was the prime recovery ship for the Gemini-4 mission. Image: NASA/US Navy Recovery

Splashdown

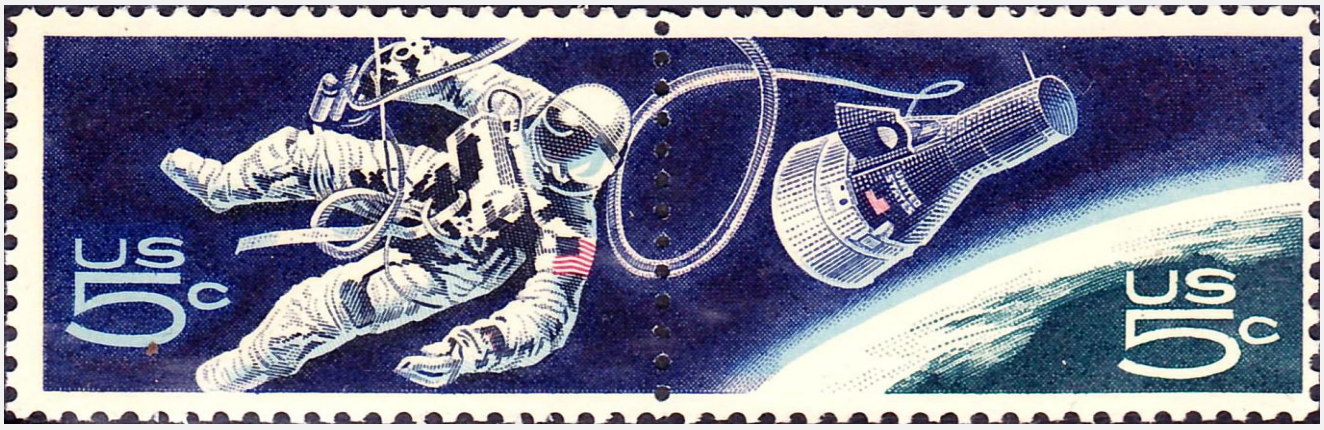
At 3,230 metres the main parachute burst out, and the two astronauts braced themselves for the 1,500 metre two-point suspension mark when the Gemini III crew were flung forward to crack their helmets on the windows.

This time the crew lurched forward, but neither knocked their helmets against anything.

The recovery ship, the carrier USS Wasp, had to move 238 kilometres to the west of the original position, to accommodate this change. Gemini IV dropped into the Atlantic 81.4 kilometres from the target at midday (12:12 pm USEST) on Monday 7 June (0312:11 AEST 8 June 1965) watched by one of the recovery helicopters.

Gemini IV went around the Earth 66 times in just over 4 days, covering a distance of 2,590,561 kilometres.

Ed White and Jim McDivitt on the deck of the USS Wasp after the end of their successful Gemini 4 mission. Image: NASA/US Navy Recovery



US stamp commemorating the Gemini 4 spacewalk. Image: US Postal Service via NASA

Summary

This mission was declared a great success, the doctors were elated, and the critics who predicted that the astronaut would become unconscious, experience vertigo, or disorientation as soon as he stepped out of the spacecraft were silenced.

White said that his desire to do strenuous work, such as using the exerciser, dropped as the flight progressed. McDivitt reckoned this was probably due to lack of proper sleep due to the disturbances from the companion's activities. They should have slept at the same time instead of alternately. It was a good thing they did the spacewalk at the very beginning of the flight when everyone was fresh.

All the systems, computers and procedures in the new Mission Control in Houston had worked to perfection. And the Americans had caught up with the Russians.

Essay by Hamish Lindsay, 2012-2014.
Images, illustrations and captions by
Hamish Lindsay, Colin Mackellar, and Glen Nagle.
Onboard images courtesy Arizona State University School of Earth and Space Exploration's 'March to the Moon' Image Gallery.
Unless specified, audio and video recorded, edited and encoded by Colin Mackellar.
PDF formatted by Glen Nagle.

More Gemini 4 audio from Carnarvon

Hamish Lindsay worked on the Voice Receivers at Carnarvon and preserved audio recorded during the Gemini 4 mission. Digitised and edited by Colin Mackellar - the audio files of each pass are unaltered, however periods of silence between passes have been removed or reduced.

WEBSITE

28 x mp3 files + transcript. Run time: 162m 27s

References

Quote

Quotes from a 2012 email from Ed Fendell to Colin Mackellar, used with permission.

Books

Tracking Apollo to the Moon
by Hamish Lindsay

Carnarvon and Apollo
by Paul Dench and Alison Gregg

Failure is not an Option
by Gene Kranz

On the Shoulders of Titans:
A history of Project Gemini (NASA SP-4203)
by Barton Hacker & James Grimwood

A Walk in Space
NASA booklet. US Govt Publication.

Internet

NASA websites

ABOUT THE AUTHOR

Hamish Lindsay (1937-2022) worked at the Muchea, Carnarvon and Honeysuckle Creek space tracking stations between 1963 and 1981.

He wrote many essays on the history of human spaceflight, and was the author of the book, Tracking Apollo to the Moon.