

The background is a rich, multi-colored nebula or galaxy. It features a central bright area with a mix of blue, purple, and pink. Surrounding this are various colored spheres and rings. A large green sphere is prominent in the upper left, and a large purple and blue sphere is in the upper right. There are also several smaller spheres in red, orange, and yellow. The overall effect is a sense of cosmic wonder and depth.

"A radiant explosion of a novel."

—JAMIE QUATRO

# ORBITAL

A NOVEL

SAMANTHA  
HARVEY

## Also by Samantha Harvey

### Fiction

*The Wilderness*

*All is Song*

*Dear Thief*

*The Western Wind*

### Nonfiction

*The Shapeless Unease: A Year of Not Sleeping*

ORBITAL  
A NOVEL  
SAMANTHA HARVEY



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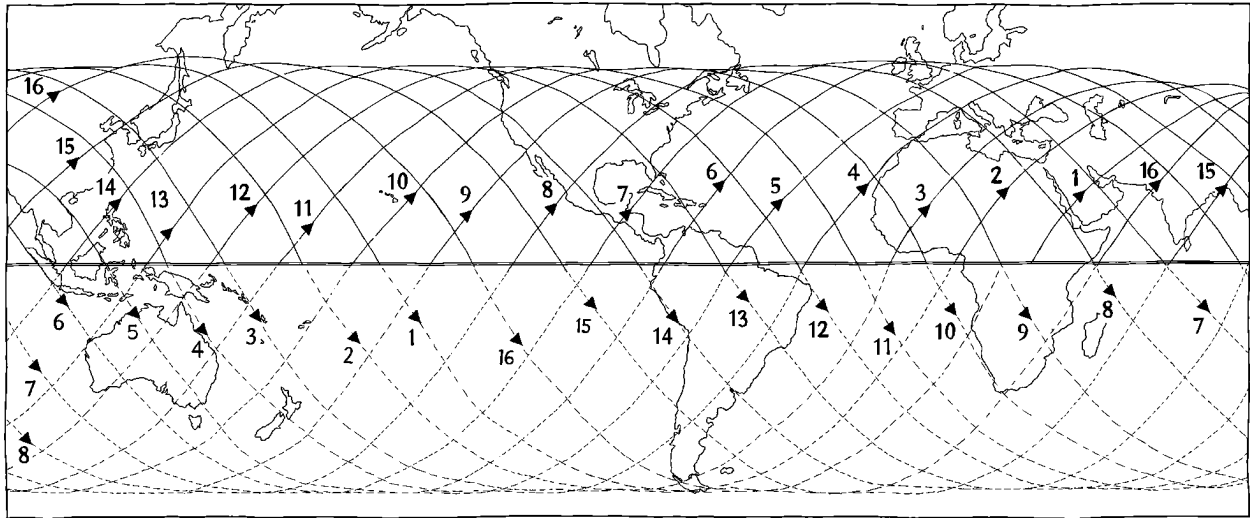
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# 24 Hours of Earth Orbits With Daylight in the Northern Hemisphere



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## Orbit minus 1

Rotating about the earth in their spacecraft they are so together, and so alone, that even their thoughts, their internal mythologies, at times convene. Sometimes they dream the same dreams – of fractals and blue spheres and familiar faces engulfed in dark, and of the bright energetic black of space that slams their senses. Raw space is a panther, feral and primal; they dream it stalking through their quarters.

They hang in their sleeping bags. A hand-span away beyond a skin of metal the universe unfolds in simple eternities. Their sleep begins to thin and some distant earthly morning dawns and their laptops flash the first silent messages of a new day; the wide-awake, always-awake station vibrates with fans and filters. In the galley are the remnants of last night's dinner – dirty forks secured to the table by magnets and chopsticks wedged in a pouch on the wall. Four blue balloons are buoyed on the circulating air, some foil bunting says *Happy Birthday*, it was nobody's birthday but it was a celebration and it was all they had. There's a smear of chocolate on a pair of scissors and a small felt moon on a piece of string, tied to the handles of the foldable table.

Outside the earth reels away in a mass of moonglow, peeling backward as they forge towards its edgeless edge; the tufts of cloud across the Pacific brighten the nocturnal ocean to cobalt. Now there's Santiago on South America's approaching coast in a cloud-hazed burn of gold. Unseen through the closed shutters the trade winds blowing across the warm waters of the Western Pacific have worked up a storm, an engine of heat. The winds take the warmth out of the ocean where it gathers as clouds which thicken and curdle and begin to spin in vertical stacks that have formed a typhoon. As the

typhoon moves west towards southern Asia, their craft tracks east, eastward and down towards Patagonia where the lurch of a far-off aurora domes the horizon in neon. The Milky Way is a smoking trail of gunpowder shot through a satin sky.

Onboard the craft it's Tuesday morning, four fifteen, the beginning of October. Out there it's Argentina it's the South Atlantic it's Cape Town it's Zimbabwe. Over its right shoulder the planet whispers morning – a slender molten breach of light. They slip through time zones in silence.

They have each at some point been shot into the sky on a kerosene bomb, and then through the atmosphere in a burning capsule with the equivalent weight of two black bears upon them. They have each steeled their ribcages against the force until they felt the bears retreat, one after the other, and the sky become space, and gravity diminish, and their hair stand on end.

Six of them in a great H of metal hanging above the earth. They turn head on heel, four astronauts (American, Japanese, British, Italian) and two cosmonauts (Russian, Russian); two women, four men, one space station made up of seventeen connecting modules, seventeen and a half thousand miles an hour. They are the latest six of many, nothing unusual about this any more, routine astronauts in earth's backyard. Earth's fabulous and improbable backyard. Turning head on heel in the slow drift of their hurtle, head on hip on hand on heel, turning and turning with the days. The days rush. They will each be here for nine months or so, nine months of this weightless drifting, nine months of this swollen head, nine months of this sardine living, nine months of this earthward gaping, then back to the patient planet below.

Some alien civilisation might look on and ask: what are they doing here? Why do they go nowhere but round and round? The earth is the answer to every question. The earth is the face of an exulted lover; they watch it sleep and wake and become lost in its habits. The earth is a mother waiting for her children to return, full of stories and rapture and longing. Their bones a little less dense, their limbs a little thinner. Eyes filled with sights that are difficult to tell.



## Orbit 1, ascending

Roman wakes early. He sloughs off his sleeping bag and swims in the dark to the lab window. Where are we, where are we? Where on earth. It's night and there's land. Into view edges a giant city nebula among reddish-rust-nothing; no, two cities, Johannesburg and Pretoria locked together like a binary star. Just beyond the hoop of the atmosphere is the sun, and in the next minute it will clear the horizon and flood the earth, and dawn will come and go in a matter of seconds before daylight is everywhere at once. Central and East Africa suddenly bright and hot.

Today is his four hundredth and thirty-fourth day in space, a tally arrived at over three different missions. He keeps close count. Of this mission it's day eighty-eight. In a single nine-month mission there are in total roughly five hundred and forty hours of morning exercise. Five hundred morning and afternoon meetings with the American, European and Russian crews on the ground. Four thousand three hundred and twenty sunrises, four thousand three hundred and twenty sunsets. Almost one hundred and eight million miles travelled. Thirty-six Tuesdays, for all that, this being one. Five hundred and forty times of having to swallow toothpaste. Thirty-six changes of T-shirt, a hundred and thirty-five changes of underwear (a fresh set of underwear every day is a storage luxury that can't be afforded), fifty-four clean pairs of socks. Auroras, hurricanes, storms – their numbers unknown but their occurrence certain. Nine full cycles, of course, of the moon, their silver companion moving placidly through its phases while the days go awry. But all the same the moon seen several times a day and sometimes in strange distortion.

To his tally kept on a piece of paper in his crew quarters, Roman will add

the eighty-eighth line. Not to wish the time away but to try to tether it to something countable. Otherwise – otherwise the centre drifts. Space shreds time to pieces. They were told this in training: keep a tally each day when you wake, tell yourself *this is the morning of a new day*. Be clear with yourself on this matter. This is the morning of a new day.

And so it is, but in this new day they'll circle the earth sixteen times. They'll see sixteen sunrises and sixteen sunsets, sixteen days and sixteen nights. Roman clasps the handrail by the window to steady himself; the southern hemisphere stars are fleeting away. You're bound to Coordinated Universal Time, ground crews tell them. Be clear with yourself on this matter, always clear. Look often at your watch to anchor your mind, tell yourself when you wake up: this is the morning of a new day.

And so it is. But it's a day of five continents and of autumn and spring, glaciers and deserts, wildernesses and warzones. In their rotations around the earth in accumulations of light and dark in the baffling arithmetic of thrust and attitude and speed and sensors, the whip-crack of morning arrives every ninety minutes. They like these days when the brief bloom of daybreak outside coincides with their own.

In this last minute of darkness the moon is near-full and low to the glow of atmosphere. It's as if night has no idea it's about to be obliterated by day. Roman has a sense of himself a few months hence staring from his bedroom window at home, moving aside his wife's array of dried – and to him unnameable – flowers, forcing open the condensated and stiff casement, leaning into the Moscow air, and seeing it, the same moon, like a souvenir he's brought back from a holiday somewhere exotic. But it's just for a moment and then the sight of this moon from the space station – lying squashed and low beyond the atmosphere, not really above them but across, like an equal – is everything, and that brief comprehension he had of his bedroom, his home, is gone.

There was a lesson at school about the painting *Las Meninas*, when Shaun was fifteen. It was about how the painting disoriented its viewer and left them not knowing what it was they were looking at.

It's a painting inside a painting, his teacher had said – look closely. Look here. Velázquez, the artist, is in the painting, at his easel, painting a painting, and what he's painting is the king and queen, but they're outside of the

painting, where we are, looking in, and the only way we know they're there is because we can see their reflection in a mirror directly in front of us. What the king and queen are looking at is what we're looking at – their daughter and her ladies-in-waiting, which is what the painting is called – *Las Meninas*, 'The Ladies-in-Waiting'. So what is the real subject of this painting – the king and queen (who are being painted and whose white reflected faces, though small, are in the centre background), their daughter (who is the star in the middle, so bright and blonde in the gloom), her ladies- (and dwarves and chaperones and dog) in-waiting, the furtive man mid-stride in the doorway in the background who seems to be bringing a message, Velázquez (whose presence as the painter is declared by the fact of him being in the painting, at his easel painting what is a picture of the king and queen but what also might be *Las Meninas* itself), or is it us, the viewers, who occupy the same position as the king and queen, who are looking in, and who are being looked at by both Velázquez and the infant princess and, in reflection, by the king and queen? Or, is the subject art itself (which is a set of illusions and tricks and artifices within life), or life itself (which is a set of illusions and tricks and artifices within a consciousness that is trying to understand life through perceptions and dreams and art)?

Or – the teacher said – is it just a painting about nothing? Just a room with some people in it and a mirror?

To Shaun, who, at fifteen, did not want to take art classes and already knew he wanted to be a fighter pilot, this lesson was the height and depth of all futility. He didn't like the painting particularly and he didn't care what it was of. Probably, yes, it was just a room with some people and a mirror, but he didn't even care enough to put his hand up and say that. He was drawing geometric doodles on his notepad. Then he drew a picture of somebody being hanged. The girl sitting next to him saw those doodles and nudged him and raised her brow and smiled, a small fugitive smile, and when she became his wife many years later she gave him a postcard of *Las Meninas*, it being, to her, an emblem of their first real exchange. And when, years after that, he was away in Russia preparing to go into space, she wrote in a cramped hand on the back of the postcard a précis of everything their teacher had said, which he'd entirely forgotten but which she'd remembered with a lucidity that didn't surprise him, because she was the sharpest and most lucid human he'd met.

He has that postcard in his crew quarters. This morning when he wakes up he finds himself staring at it, at all of the possibilities of subject and perspective that his wife wrote out on its reverse. The king, the queen, the maids, the girl, the mirror, the artist. He stares for longer than he's aware. There's the lingering sense of an unfinished dream, something wild in his thoughts. When he climbs out of his sleeping bag and puts on his running gear and goes to the galley for coffee, he catches sight of the distinctive northerly point of Oman jutting into the Persian Gulf, dust clouds over the navy Arabian Sea, the great Indus Estuary, what he knows to be Karachi – invisible now in daylight, but by night a great, complex, cross-hatched grid that reminds him of the doodles he used to do.

According to the arbitrary metric of time they use up here where time is blasted, it's six in the morning. The others are rising.

They look down and they understand why it's called Mother Earth. They all feel it from time to time. They all make an association between the earth and a mother, and this in turn makes them feel like children. In their clean-shaven androgynous bobbing, their regulation shorts and spoonable food, the juice drunk through straws, the birthday bunting, the early nights, the enforced innocence of dutiful days, they all have moments up here of a sudden obliteration of their astronaut selves and a powerful sense of childhood and smallness. Their towering parent ever-present through the dome of glass.

But now, more so. Since Chie came to the galley on Friday evening where they were making dinner, her face colourless with shock, and said, My mother has died. And Shaun let go of his packet of noodles so that it floated above the table, and Pietro swam the three feet towards her, bowed his head and took both of her hands with a choreography so seamless you'd have thought it was prepared, and Nell muttered something indecipherable, a question – what? how? when? *what?* – and watched Chie's pale face flush crimson suddenly as if the speaking of those words had given heat to her grief.

Since that news, they find themselves looking down at earth as they circle their way around it (meanderingly it seems, though that couldn't be less true), and there's that word: mother mother mother mother. Chie's only mother now is that rolling, glowing ball that throws itself involuntarily around the sun once a year. Chie has been made an orphan, her father dead a decade.

That ball is the only thing she can point to now that has given her life. There's no life without it. Without that planet there's no life. Obvious.

Think a new thought, they sometimes tell themselves. The thoughts you have in orbit are so grandiose and old. Think a new one, a completely fresh unthought one.

But there are no new thoughts. They're just old thoughts born into new moments – and in these moments is the thought: without that earth we are all finished. We couldn't survive a second without its grace, we are sailors on a ship on a deep, dark unswimmable sea.

None of them knows what to say to Chie, what consolation you can offer to someone who suffers the shock of bereavement while in orbit. You must want surely to get home, and say some sort of goodbye. No need to speak; you only have to look out through the window at a radiance doubling and redoubling. The earth, from here, is like heaven. It flows with colour. A burst of hopeful colour. When we're on that planet we look up and think heaven is elsewhere, but here is what the astronauts and cosmonauts sometimes think: maybe all of us born to it have already died and are in an afterlife. If we must go to an improbable, hard-to-believe-in place when we die, that glassy, distant orb with its beautiful lonely light shows could well be it.

## Orbit 1, into orbit 2

You aren't even the farthest-flung humans now, says ground control. How does that feel?

For today a crew of four is on its way to the moon and has just surpassed the space station's shallow orbiting distance of two hundred and fifty miles above the planet. The lunar astronauts are catapulted past them in a five-billion-dollar blaze of suited-booted glory.

For the first time ever you've been overtaken, say ground crews. You're yesterday's news, they joke, and Pietro jokes back that better yesterday's news than tomorrow's, if they know what he means. If you're an astronaut you'd rather not ever be news. And here's the thing, thinks Chie, her mother's down there on that earth. Everything that's left of her mother's down there. Better to be lassoing it like this than watching it disappear in the rear-view mirror. Anton just looks out of the space-viewing portal to where he knows the constellations of Pegasus and Andromeda to be, though his vision can't readily sift them out among the millions of stars. He's tired. Doesn't sleep that well up here, mind too constantly jet-lagged and staggered. There's Saturn, there's the aeroplane shape of Aquila. The moon's a stone's throw. One day, he thinks, he'll get there.

Mornings, a surge of sweat and breath and effort, weights and bike and treadmill, the two hours a day when their bodies are not suspended and are instead forced to comply with gravity. In the Russian segment of the craft, Anton on the bike shaking off what sleep he had, Roman on the treadmill. Three modules away in the non-Russian segment there's Nell on the bench press watching her muscles work under a sheen of sweat while the pistons

and flywheel simulate gravity. Her lean, firm limbs have no definition, no matter how you push and press and pedal for these two hours in the gym still there are twenty-two more hours every day in which the body has no force to work against. Next to her Pietro is harnessed to the US treadmill, listening to Duke Ellington with his eyes closed; here in his head are the wild mint meadows of Emilia-Romagna. Chie, in the next module, on the bike with her teeth clenched and the resistance up high, counting out the cadence of her pedalling.

Up here in microgravity you're a seabird on a warm day drifting, just drifting. What use are biceps, calves, strong shin bones; what use muscle mass? Legs are a thing of the past. But every day the six of them have to fight this urge to dissipate. They retreat inside their headphones and press weights and cycle nowhere at twenty-three times the speed of sound on a bike that has no seat or handlebars, just a set of pedals attached to a rig, and run eight miles inside a slick metal module with a close-up view of a turning planet.

Sometimes they wish for a cold stiff wind, blustery rain, autumn leaves, reddened fingers, muddy legs, a curious dog, a startled rabbit, a leaping sudden deer, a puddle in a pothole, soaked feet, a slight hill, a fellow runner, a shaft of sun. Sometimes they just succumb to the uneventful windless humming of their sealed spacecraft. While they run, while they cycle, while they push and press, the continents and oceans fall away beneath – the lavender Arctic, the eastern tip of Russia vanishing behind, storms strengthening over the Pacific, the desert- and mountain-creased morning deserts of Chad, southern Russia and Mongolia and the Pacific once more.

Anyone in Mongolia or those easternmost wildernesses of Russia, or anyone at least who knows about such things, would be aware that now, in their cold afternoon sky, higher than any aeroplane, a spacecraft is passing and that some human is up there hefting a lift-bar with her legs, willing her muscles not to give in to the seduction of weightlessness, nor her bones to birdness. Else that poor spacefarer will be in all kinds of trouble when she lands back on earth where legs, once more, are very much a thing. Without that hefting and sweating and pressing she would survive the blazing heat and tumble of her re-entry only to be pulled from her capsule and fold like a paper crane.

At some point in their stay in orbit there comes for each of them a powerful

desire that sets in – a desire never to leave. A sudden ambushing by happiness. They find it everywhere, this happiness, springing forth from the blandest of places – from the experiment decks, from within the sachets of risotto and chicken cassoulet, from the panels of screens, switches and vents, from the brutally cramped titanium, Kevlar and steel tubes in which they're trapped, from the very floors which are walls and the walls which are ceilings and the ceilings which are floors. From the handholds which are foot-holds which chafe the toes. From the spacesuits, which wait in the airlocks somewhat macabre. Everything that speaks of being in space – which is everything – ambushes them with happiness, and it isn't so much that they don't want to go home but that home is an idea that has imploded – grown so big, so distended and full, that it's caved in on itself.

At first on their missions they each miss their families, sometimes so much that it seems to scrape out their insides; now, out of necessity, they've come to see that their family is this one here, these others who know the things they know and see the things they see, with whom they need no words of explanation. When they get back how will they even begin to say what happened to them, who and what they were? They want no view except this view from the window of the solar arrays as they taper into emptiness. No rivets in the entirety of the world will do except these rivets around the window frames. They want padded gangways for the rest of their lives. This continuous hum.

They feel space trying to rid them of the notion of days. It says: what's a day? They insist it's twenty-four hours and ground crews keep telling them so, but it takes their twenty-four hours and throws sixteen days and nights at them in return. They cling to their twenty-four-hour clock because it's all the feeble little time-bound body knows – sleep and bowels and all that is leashed to it. But the mind goes free within the first week. The mind is in a dayless freak zone, surfing earth's hurtling horizon. Day is here, and then they see night come upon them like the shadow of a cloud racing over a wheat field. Forty-five minutes later here comes day again, stampeding across the Pacific. Nothing is what they thought it was.

Now as they track south from eastern Russia diagonally across the Sea of Okhotsk, Japan appears in the mauve-grey sheen of mid-afternoon. Their pass intersects the narrow line of the Kuril Islands that tread a worn-out path between Japan and Russia. In this indistinct light the islands seem to Chie to



be a trail of drying footprints. Her country is a ghost haunting the water. Her country is a dream she remembers once having. It lies slantwise and slight.

She looks out from the lab window as she towels herself off after exercise. Her weightless bobbing is steady and upright. If she could stay in orbit for the rest of her life all would be well. It's only when she goes back that her mother is dead; as in musical chairs when there's one fewer seat than there are humans who need it, but so long as the music plays the number of seats is immaterial and everyone is still in the game. You have to not stop. You have to keep moving. You have this glorious orbit and when you're orbiting you're impact-proof and nothing can touch you. When the planet is galloping through space and you gallop after it through light and dark with your time-drunk brain, nothing can end. There could be no end, there can be only circles.

Don't go back. Stay here ongoing. The creamy light off the ocean so exquisite; the gentle clouds rippling in tides. With a zoom lens the first fall of snow on the top of Mount Fuji, the silver bracelet of the Nagara River where she swam as a child. Just here, the perfect solar arrays drinking sun.

From the space station's distance mankind is a creature that comes out only at night. Mankind is the light of cities and the illuminated filament of roads. By day, it's gone. It hides in plain sight.

On this orbit, orbit two of today's sixteen, they can watch if ever they have such a stretch of time, and traverse the earth one whole round and see barely a trace of human or animal life.

Their transit approaches West Africa just as morning breaks. The vast spill of day blots out every obvious human landmark to the naked eye. They pass central Africa, the Caucasus and Caspian Sea, southern Russia, Mongolia, eastern China, the north of Japan in the blanching light. By the time night comes in the Western Pacific there's no land in sight, no cities to proclaim mankind. On this orbit the entire night-pass is oceanic and black, stealing down the mid-Pacific between New Zealand and South America, brushing the tip of Patagonia and back up to Africa, and just as the ocean runs out and the coasts of Liberia and Ghana and Sierra Leone creep up, sunrise blasts open the dark and daytime floods in, the entire northern hemisphere once again luminous and humanless. Seas, lakes, plains, deserts, mountains, estuaries, deltas, forests and ice floes.

As they orbit they might as well be intergalactic travellers chancing upon a virgin frontier. *It seems uninhabited Captain*, they say when they glance out before breakfast. *We believe it could be the remnants of a collapsed civilisation. Prepare the thrusters for landing.*

## Orbit 3, ascending

Why couldn't a spaceship be decked out like an old farmhouse, with flowery wallpaper and oak beams – fake oak beams, says Pietro at breakfast. Lightweight non-flammable ones. And tatty armchairs and all these things. Like an old Italian farmhouse. Or an English one.

At which everybody looks at Nell, who is English, and who shrugs and digs about in her sachet of *perlovka*, the pearl-barley porridge Roman and Anton let her take from the Russian food stores; she stirs the syrup around.

Or like an old Japanese house, says Chie. Much better – lighter, less stuff.

I'd go for that, says Shaun, who is floating above them like an angel. He cocks a teaspoon at Chie as if a thought has just grabbed him. I went to an awesome Japanese house once, in Hiroshima, he says. A B&B type thing, run by American Christians.

You American Christians get everywhere, Chie says, pinching a piece of salmon with her chopsticks.

Yep, you leave the surface of the earth and you still can't shake us.

We'll shake you soon, says Roman.

Ah, but you'll be going back to earth and that's our breeding ground, Shaun replies, and looks around, nodding. I could get to like this place done out as an old Japanese house.

Pietro finishes his cereal and secures his spoon to the magnetised tray. Do you know what I'll look forward to getting back to, when the time comes? he says. Things I don't need, that's what. Pointlessness. Some pointless ornament on a shelf. A *rug*.

Roman laughs. Not alcohol or sex or – just a rug.

I didn't say what I'd *do* on the rug.

True, Anton says. You did not, and don't please.

What would you do? Nell asks.

Chie winks. Yes, Pietro, what would you do?

Lie there, Pietro says. And dream of space.

Day comes at them in a barrage.

Pietro will go and monitor his microbes that tell them something more about the viruses, fungi and bacteria that are present on the craft. Chie will continue growing her protein crystals, and attach herself to the MRI to have one of many routine brain scans that show the impact of microgravity on their neural functioning. Shaun will monitor his thale cress to see what happens to plant roots when they lack the gravity and light to know when and how to grow. Chie and Nell will check the well-being of and collect data for their forty resident mice who are enlightening them about muscle wastage in space, and later Shaun and Nell will conduct experiments on flammability. Roman and Anton will service the Russian oxygen generator and culture heart cells. Anton will water his cabbages and his dwarf wheat. They will all report on whether they have headaches and where in the head and how acute. They will all at some point take their cameras to the earth-viewing windows and photograph each of the locations on the list they've been given, in particular those Of Extra-Special Interest. They will: change the smoke detectors, change out the Water Resupply Tank in slot 2 and install a new tank in slot 3 of the Water Storage System, clean the bathroom and kitchen, fix the toilet-that-always-breaks. Their day is mapped by acronyms, MOP, MPC, PGP, RR, MRI, CEO, OESI, WRT for WSS, T-T-A-B.

Today there is one item on the Of Extra-Special Interest list above all others, the typhoon moving over the Western Pacific towards Indonesia and the Philippines, which seems suddenly to have gathered force. Not visible yet on their current path, but in two more orbits they'll have shifted west and caught up with it. Can they take photographs and videos, can they confirm satellite images, can they comment on its size and speed? All of which they're used to doing, being weathermen and women, early warning systems. They note the orbits that will cross the typhoon's path – this morning's orbits four, five and six going south, and tonight's orbits thirteen and fourteen going north, though they'll be back in bed by the time those come.

Earlier that morning Nell had an email from her brother saying he was