

Alone, he braved the terrors of the unknown, planted the first human footprint on the ageless surface of the moon . . . came back to tell the waiting Earth about it—and no one believed him!

HIGH FLIGHT

By **KATHERINE MacLEAN**

AT SIX years old Mike Berganholm wanted the moon. People say you get over things like that.

When Mike was in college he was a pretty bright student, but he graduated into a war. For six years he saw nothing mach but shells, pontoon bridges, the entrails of stalled graders and the hind end of his monkey wrench.

There was a business slump going on when he came out of the Army. Jobs were scarce. Instead of waiting he took a high pay job as a mechanic and married on it. Then the slump passed and fresh green batch of students began graduating from colleges and getting first crack at the jobs. By that time Mike couldn't remember much engineering, and who would trust an engineer whose last job was as a mechanic?

He couldn't get anywhere that way, so he scraped up a loan and opened up a small machine chop. There he settled down, enjoying a reasonably happy life with a pretty wife, two young kids, and not much money.

NAVY MEN PREPARE TO REACH MOON—

"aren't you going to eat, Mike?"

Her voice seemed to come from a great distance. The last Mike had noticed, the kids had finished breakfast and Sally was shooing them off to school. They seemed to be gone now. It was time for Mike to be finishing breakfast. He glanced at an untouched platter of scrambled eggs and shoveled a few savory forkfuls into his mouth. His eyes wandered back to the newspaper item and he began reading it again.

NAVY MEN PREPARE TO REACH MOON

Tonight Navy officials declared that –

It was a Navy release on Project Moon Rocket and, like most Navy releases, was a mixture of glamor and secretiveness, but this much fact came through—the rocket was ready at last, and would go at the next favorable opportunity.

The rocket was ready. The next favorable time? Mike usually kept vague track of the relative positions of moon and earth. The next favorable time would be tonight at five-forty-five—he could calculate that much from the almanac item in a box on the same page. The rest of the week would be cloudy. This would be the only opportunity. This was the night of the take-off.

The rocket flight. Suddenly Mike wanted to see it, and the wish drowned common sense. One hundred miles up the ship would shed its step rockets. That sudden strange splitting into two parts; the last spurt of strength to hurtle the ship upward at escape velocity and then the dying and detaching of that huge belt of jets would be the most awesome sight, and the most delicate technical feat of the climb. Mike wanted pictures of that. No one was supposed to be able to take them, but he wanted them. He had a movie camera and an old Army surplus jet fighter plane. If he could make them do, the pictures might sell to a newsreel company. Could he make them do it?

"Aren't you going to work, Mike?" Sally's voice again.

He had the breakfast plates shoved aside and five hasty sketches roughed out along the edges of the newspaper. The old jet job, the Army F-180 war surplus, had come with auxiliary jets thrown in for a few dollars extra, boosters for high climbing. They were down in the cellar. He had the slide rule out of

his pocket and was working the fuel weight-height formula. According to the computations he might be able to do it if he lightened ship, dropped his auxiliaries two thirds of the way up, used up all fuel on the climb and come down from the stratosphere dead stick.

It was almost suicide. Just barely possible by the slide rule . . .

"Better hurry Mike, you'll be late." Sally standing beside the table, looking very pretty, very curious about what he was planning, pretending not to be interested. "Better hurry."

"Not going." He stood and stretched, "Call Jack for me, and tell him I won't be in today, will you, baby?" He headed for the hack door, beginning the race against time.

In the back yard the old F-180 pointed its long shiny nose at the sky. Wheel-marked grass grew lushly around it, testifying that the plane was not used very often. Mike circled it, plans taking shape and solidity in his mind. There were things to buy and things to rent, and a pressure suit would be lighter than the air pressure and heat controls of the cabin. He could rip them out. There was emergency wiring already built in to take care of heating the control panel.

THE MAN who rented him the suit was friendly and conversational, and overly interested in what Mike wanted it for.

"Going up to take pictures," Mike said. "What's the suit's pressure range? How much can it take?"

"Eight pounds to the square inch, I calculate. Enough for vacuum if you want. Want me to look up the safety factor?" The man's eyes glittered. "No chance of you wearing it near vacuum is there?" If he found out Mike's plans, he would probably not rent the suit.

"Not much," Mike said laconically, stowing it hastily in the back of his car and climbing into the creaking front seat. "Thanks anyhow."

He drove away hurriedly to pick up oxygen and helium breathing cylinders and fuel. He would have to test the suit himself. The soap-bubble test was old and simple. When he arrived home he took down Jimmy's bubble pipe solution from the kitchen shelf and diluted it with two quarts of water. Upstairs he could hear the sound of the vacuum cleaner.

Sally came down stairs and looked into the kitchen when he was half through testing the suit. "You're dripping water on the floor," she said. Her voice sounded distant and tinny through the earphones and again he saw that she was restraining her curiosity from questions, not wanting to butt in, and he was grateful.

He smiled at her through the narrow face plate. "Pour some on my back and watch for bubbles." Slowly he ran the pressure to seven pounds relative. His eardrums tautened and he swallowed steadily to keep his eustachion tubes open and pressure-free. As the pressure climbed, the sound of his breathing and moving grew abnormally loud within the helmet, while the joints in his arms and legs tended to stiffen out, all except the left knee, which perversely showed a tendency to bend. The suit's joints were accordion pleated evenly in both sides to balance pressure push, but no pleating ever balanced perfectly. Mike walked up and down a little, getting used to the oddity. Sally sloshed water on the outside and watched carefully.

"No bubbles," she reported.

He released a valve, and pressure began to fall slowly.

"Anything else I can do, Mike?" Her curiosity surged up. "Where are you going in that thing?"

"Up to get some pictures of the space ship take-off." He smiled cheerfully, listening to his voice—too loud and close inside the helmet—and hearing the sudden, irregular catch in the regular hiss of the filter bellows as they registered the telltale catch and shift in the regular rhythm of breathing which instinctively accompanies a lie, or a fear of the results of one's words. "I want some shots of the ship dropping its step rocket."

She knew more than he had expected. "That's pretty high, Mike, past the bottom of the ionosphere. It's hot up there, isn't it?"

"Not very," Mike mumbled, hoping she wouldn't remember radiation and ionization. "Atmosphere's pretty thin up there. Not much gas around to get hot."

She smiled. "Well look out for that first molecule—it's a scorcher!"

He saw with relief that she was kidding; she didn't think that there was anything to be afraid of.

As the pressure dropped the last few ounces to normal he felt a slight dizziness. Then the suit collapsed, deflated and draped in baggy folds around his wrists and ankles, and Sally helped him take it off. Mike knew how a pressure suit would feel now. He set to work on the F-180 with a slight queasiness in his stomach.

The ionosphere would be *hot*. Not just temperature but ionization to build up unpredictable electrical charges within the instruments and upset their readings, and not just ionization, but hard radiation from the sun and space, cosmic rays to pierce his ship and generate secondary and dangerous radiation in the metals of the motor—and all he wanted was a few measly pictures just up a hundred miles. The guys he wanted to take pictures of were trying to go all the way. He would be a fine yellow-livered explorer if he couldn't even get high enough to watch.

He was working hard, loosening bolts and stripping off superfluous parts, removing unnecessary weight, trying to save every ounce of fuel. As he worked he weighed what he took off and entered it carefully in a notebook. The morning passed swiftly.

Sally came out and sat on the back steps watching his hair. When Mike leaned on the ship his hair rose abruptly and stood stiffly on end. When he stepped back it subsided.

After a while she spoke. "Lunch is out. Don't look now but your hair is standing on end."

"If it were dark I'd have a halo," Mike told her. "Honest Injun." He climbed meekly down, switched off the high voltage surface film that was playing tricks with his hair and went in to eat.

He ate hurriedly, avoiding Sally's eye, and went back to work without lingering. The kids came home for lunch and hung around the ship chanting, "Take us for a ride, huh pop, take us for a ride."

"Go to school," he answered absently without looking up, "Go to school." They chanted into the house to tease Sally for something and left him alone. He was working faster. The deadline grew closer but the work was almost finished.

In late afternoon, a few minutes before deadline, it was finished. He rolled the plane to the midblock runway, and Sally helped him into his pressure suit and gave him a boost as he climbed at last into the cabin of the curiously bare and changed plane.

He waved Sally to stand clear, and she moved back calling, "Good luck Mike! Get some good—"

The jets caught and the hissing rumble drowned the rest of what she said, though he could see her lips still moving as she waved. He threw her a kiss and then concentrated on the plane as it began to roll. He needed a good smooth take off. Every drop of fuel would count.

THE long line of familiar landmarks flashed by, gaining speed, then dropped out of sight as the F-180 lifted. Houses ahead and below dwindled to toy houses, brown and green fields shrank away below him. Far below and small he saw route thirty-six, a long highway of cars crawling in a glinting beaded chain towards the city. Farther away the city, its toy buildings sharp-etched in sunlight and late afternoon shadows, and all around him, swinging to gigantic distance, the wide curve of the blue and green clouded earth

The naval station was to his right and below, crisscrossed runways of white concrete showing up dimly, like chalk marks on slate. The plane passed up through a thin layer of fog marking a temperature edge, and the landscape was obscured from sight.

Mike pressed the stud that fired the auxiliary rockets. There was a moment's lag, time enough to remember that they had been growing dusty in his cellar for eight years, and then the rockets coughed into action with a welcome roar, and the plane surged forward, climbing faster, acceleration pressing him against the back of the seat. The air grew colder and thinner in the cabin, and he clamped the air helmet over his head and turned on the wiring of his suit. It answered with a wave of warmth.

Time passed.

The shutter of the movie camera clicked mechanically, taking -a frame of Earth below every second. The normal speed play back would exaggerate his speed of climb to an incredibly swift upward rush, giving a feeling of having been taken from the moon rocket itself.

Air thinned to a curve of faint blue arched across the nearing blackness of space. Somewhere in the clouded vase curve of the planet below was the naval station where the men who were to reach the moon said their farewells and went aboard to their stations.

Mike checked his height and position again against the local radio directional signals and satisfied himself that he was on course. The great rocket ship would pass within a mile of him. It would make a good movie—the swift upward rush of the camera eye from earth, the sudden sight of the moon rocket climbing, gaining, rushing closer, looming hugely and suddenly separating into two parts, the great bell of booster rockets falling and the slim rocket remaining, darting onward and dwindling out of sight.

Carefully he set the movie camera to a whirl of normal speed, shifted the angle of the camera lens and sighted it along the way the great rocket would come. He had mounted the camera in an old universal gun mount. Its automatic controls would do the rest, and the corrected radar gunsight would swing the camera eye to follow as the ship rushed by.

The instruments were beginning to waver and the color of the sky began to shimmer slightly. This was the ionosphere, a place of charged, stripped, fast moving atoms under bombardment from the hard radiation of space. Mike picked up an improvised switch at the end of an extension cord and turned on a generator transformer which would create—he hoped—a skin of high voltage electricity over the surface of the ship, to fend off outside electrical disturbance. It was a homemade gimmick, and he switched it on with a small prayer and a kick in the shins for himself, for he included some extra coils on a half worked out idea of polarizing the ion flow, and he realized now that the coils could work backward and polarize or disturb the ship instead. He had chosen a poor time to experiment. It could bollix everything.

A miniature, gasoline motor began a steady *pfut pfut* behind him as it began to spin the generator wheel. Above and almost ahead, shining through the cowling, was the half moon, growing brighter and clearer as the air thinned and the sky darkened. For a moment Mike's heart leaped, and then he made himself remember that if he were one of the crew, piloting the navy rocket to the moon, he would not aim towards the moon, but point farther east to a blank space in the sky where the moon would be in three and a half more days.

The gasoline motor *pfut-pfuted* steadily and its heavy generator wheel spun faster, accelerating slowly upward from a hum to a shrilling whine. As he noticed it, the whine separated slowly from the background noise of the rocket jets and sounded its smooth high note as if it were right inside his helmet. The note climbed, hung for an instant at the limit of audibility in a thin note that vibrated his skull and then passed upward out of hearing range leaving his ears buzzing.

MIKE shook his head uneasily as if a bee had been flying inside his helmet and glanced at the instrument panel.

It was all wrong.

For an instant he studied it, trying to make sense and pattern out of the changed readings. The sky seemed to have darkened suddenly. A harsh lance of sunlight struck through the canopy and splashed across the panel. He blinked dazzled, and adjusted the rotation of his polaroid face plate to see clearly dials whose pointers still swung slowly at insane readings. From the corners of his eyes he noticed that some large object seemed to be approaching.

Something approaching?

Mike glanced up at, jet black nothingness studded with blazing stars. Black! To one side hung a huge sunlit object. He was passing it.

It was hanging in space, white and sunlit and very jagged and beautiful, like the enlarged photograph on Mike's study wall at home.

The moon.

While Mike looked he passed the moon on the left.

AUTOMATICALLY he pushed left rudder. Rudders don't work in space. He groped and grabbed a handle that was the unused jet deflector. It was stuck. He yanked again. It wouldn't budge. Mike remembered theoretical space technique. He cut the left auxiliary.

Without any feeling of the ship turning, the vista of stars began to turn slowly, spinning around him until the bright moon came into view again on his left—until it was almost directly before him. The sun came into sight again from below the edge of the cockpit and shone blindingly into his eyes, so that he shut them for the moment. The sun wiped a burning hand across his face. Eyes closed, Mike counterspun the double layered polaroids of the face plate to where they cross-filtered out almost all light. When it clicked into the setting he opened his eyes again. Everything was deep purple through the face plate and a deep purple moon expanded directly before him, growing tremendous. His turn seemed to have straightened out.

Mike made no estimate of his speed. That way lay insanity. He mused. If the main jet were cut, the right auxiliary could have a chance to swing the ship in a tighter curve that might miss the moon. Mike cut the main jet. The right auxiliary was left operating alone. It chose that moment to cough and then catch on again, threateningly.

Like an expanding picture on a screen the moon exploded, coming at him with incredible speed. He was sweeping in at an angle now, passing mountains, craters, cliffs, closer and larger, a great bright plain sweeping by dizzyingly, crevices, boulders, juts of rock. He was going to crash. The ground blurred and Mike closed his eyes. One second left.

Now he'd never find out what the hell was going on.

The auxiliary coughed again and stopped. Nothing else seemed to happen. He should be dead now. Mike opened his eyes, and understood the odd sensation around his waist, he was hanging forward by his belt strap. The ship was stopped almost vertically, nose down on the moon. It didn't look especially dented. Something small was swinging in front of Mike's face, hard to identify in the deep purple light. He grabbed and captured it. It was the generator switch, swinging at the end of its extension cord. The *pfut-pfut-pfuting* still sounded in his ears.

"Drink me," Mike said. He switched it

The F-180 began to shift balance, and slowly, gracefully toppled onto its back and lay upside down with the canopy denting slightly.

"One-Sixth gravity," said Mike, upside down, though he knew he shouldn't talk to himself.

He extricated himself, his air hose, and its gas cylinders and climbed out. He stood on rocky ground. There was a whitish film of dust over the rocks and the film rose in a slight cloud when he moved his feet and then settled, sifting down into crevices among the broken rocks. He looked up. Before him, cold lava plains rippled into a distance, where, starkly black and white upthrust the cliffs of a crater.

"Moon," said Mike inside his helmet.

Outside he knew there was no sound—could be no sound. He kicked a stone. It felt heavy and solid, but it flew away in dew rising curve as if he had thrown it, and landed without sound.

"One-sixth gravity," Mike said. The sun was burning into his back through the padded suit.

He stepped back into the shadow of the F-180 and began working to take off the detachable auxiliaries. In a few moments to had them free and was using them to hatter and free the fused jet deflection vanes. He didn't believe he could do the next thing, but it was easy—he heaved the plane right side up and pointed it towards a small slice of earth that showed in the western sky between two monstrous spires of moon mountains.

He tossed his air cylinders into the cabin, climbed in after them fast, and turned the switch on the extension cord before settling into the pilot's seat. Ahead was the Earth, hard to miss because of its snaring gravitational field. In the tanks, according to the gauges, were twelve minutes worth of fuel.

Ridiculous!

MIKE was late to dinner. The kids were upstairs watching television and Sally had switched on

the landing lights and was washing the dishes when she heard the F-180 whistle in gently.

She had his place laid at the kitchen table when he came in and kissed her.

"Evening Mike, what's wrong with your face?"

He realized it was throbbing. "Sunburn." He thought and modified that. "Hard sunburn, radiation burn."

"I'll take care of that after you have supper. Any pictures of the rocket, Mike?"

"Not a one." He sat down and began to eat slowly, thinking.

He visualized himself reporting what had happened. Disbelief, laughter, experts dismissing his movie film as a fake, patent engineers asking him how and why, and himself, unable to answer, standing tongue-tied and baffled before the assembled cameras of the world, Not on his life!

Mike finished dinner and went to bed with an electronics text, while Sally rubbed ointments on his throbbing skin and made soothing noises.

After work the next day he took photographs and measurements of his coils and that night went to the library and attacked the latest reports on atomic structure and field theory. His mathematics was rusty and the books were baffling at first, but he came back the next night and the next, and gradually; with the books and reports stacked around him, the rusty theoretical training began creakingly to come alive again, and a theory began to grow. Inertia had something to do with the swirl of motion within the atom. Gyroscope effect was more basic than had been known.

He was writing down ideas and tentative formulas. It was the fourth day and his face still throbbed with sunburn.

A stir and whisper was running through the reading room of the library, in covert defiance of the silence signs. The man reading next to him leaned over and whispered:

"Radio report. The Navy rocket crashed on the moon."

Mike leaned closer. "Anything else known?"

"Four survivors. Not enough intact air tanks. Six hours to live."

There was nothing else to the report. Mike sat still for a minute, then gathered up his books, deposited them at the return window and left. In a drug store he looked up the phone number of the chief physicist on the Navy project and dialed. Someone answered.

"Yes?"

"Doctor Fishberg?"

"Yes."

"Sorry to disturb you, but it's important. Life or death. What would you say if I told you that I have a way of reaching the moon in time to save those men?"

He was answered by the click of the connection being cut.

"That's what I thought you'd say," Mike said gently, hanging up.

He stepped out in the street again and looked up. It was nine P.M. and dark on the east coast of the North American continent of the Earth upon which he stood, but out there in space the bright glare of daylight bathed three quarters of the near side of the round moon, and in that bright daylight four men waited to be rescued, listening hopefully to the dim, wavering radio voices of Earth.

He liked those guys.... He should have been up there with them, or part of their team on Earth, kidding with them over the radio. That reminded him of his own team, the mechanics who worked with him in the machine shop, and of the small amount of time he had left, so he stepped back into the drug store and phoned them, Jim first, then Smokey, then Jack.

"I've got a way to save those Navy guys on the moon," he said, each time. They believed him. He gave them a list of things to get for the F-180, some of them impossible to get at that hour of the night without theft, and he gave them a list of things to do. Then he called Sally and told her what he had done four days ago. She was silent a moment.

"So that's it. I was wondering when you'd tell me, Mike."

She, too, believed him.

When he got home she had the sun-filtering salve ready, and Jim, Smokey and Jack were installing a triple row of auxiliaries with great banging and grinding.

Then it was eleven-ten, and everything was ready.

Sally kissed him and put his helmet over his head. He was boosted into the plane and settled himself at the controls while the whole bunch wheeled it to the runway. He flipped the switch, the generator began to *pfut-pfut-pfut* in his ears. The floodlights went on, showing the long white concrete runway. Mike pressed all studs and the thunder of all the rocket jets blared out at once deafeningly. A wrenching acceleration shoved him into the back of the seat. The long line of lighted houses whipped by, dropped below in an instant. He was airborne. Mike didn't need to check any dials this time. He swung the ship, pointed it west, straight at the moon.

The transformer hum came into his helmet again the same odd sourceless sound to it, moved slowly up through the high reaches of pitch, growing thinner and thinner, and then suddenly passed beyond hearing, like a bubble blown up to ultimate tension, scattering to invisibility.

HE DIDN'T have his new technique perfect as yet. He landed a little distance away, out of sight of the wreck, and walked over, carrying his air tanks under his arm."

He walked around an upthrust of rock and stood for a while watching them. They sat in the shadow of the huge, wrecked spaceship. One was reading a comic magazine that was yellowing and curling as he turned the pages Mike liked that. Another was using up his small store of oxygen idly chipping "Kilroy" onto a rock, and a third probably the skipper, was entering observations neatly in a log book.

They saw him.

"Hello boys," he said and walked forward. He could say anything he liked, they couldn't hear him: They had helmet radios and he didn't. "I'm glad to see you."

When he had landed at LaGuardia Field the reporters were flashing bright bulbs in his face and shouting questions. "Name? What happened? How did you do it?"

"Berganholm," he answered slowly, beginning the long session of bright lights and attention, and then the changed and new life as an engineer, "Michael Claud Berganholm."