

## SPACE PLATFORM



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**MURRAY LEINSTER**



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I think I may add, though, that I worked on it too.

*MURRAY LEINSTER "Ardudwy" Gloucester, Va.*



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## CHAPTER 1

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There wasn't anything underneath but clouds, and there wasn't anything overhead but sky. Joe Kenmore looked out the plane window past the co-pilot's shoulder. He stared ahead to where the sky and cloud bank joined--it was many miles away--and tried to picture the job before him. Back in the cargo space of the plane there were four big crates. They contained the pilot gyros for the most important object then being built on Earth, and it wouldn't work properly without them. It was Joe's job to take that highly specialized, magnificently precise machinery to its destination, help to install it, and see to its checking after it was installed.

He felt uneasy. Of course the pilot and co-pilot--the only two other people on the transport plane--knew their stuff. Every imaginable precaution would be taken to make sure that a critically essential device like the pilot gyro assembly would get safely where it belonged. It would be--it was being--treated as if it were a crate of eggs instead of massive metal, smoothed and polished and lapped to a precision practically unheard of. But just the same Joe was worried. He'd seen the pilot gyro assembly made. He'd helped on it. He knew how many times a thousandth of an inch had been split in machining its bearings, and the breath-weight balance of its moving parts. He'd have liked to be back in the cargo compartment with it, but only the pilot's cabin was pressurized, and the ship was at eighteen thousand feet, flying west by south.

He tried to get his mind off that impulse by remembering that at eighteen thousand feet a good half of the air on Earth was underneath him, and by hoping that the other half would be as easy to rise above when the gyros were finally in place and starting out for space. The gyros, of course, were now on their way to be installed in the artificial satellite to

be blasted up and set in an orbit around the Earth as the initial stage of that figurative stepladder by which men would make their first attempt to reach the stars. Until that Space Platform left the ground, the gyros were Joe's responsibility.

The plane's co-pilot leaned back in his chair and stretched luxuriously. He loosened his safety belt and got up. He stepped carefully past the column between the right- and left-hand pilot seats. That column contained a fraction of the innumerable dials and controls the pilots of a modern multi-engine plane have to watch and handle. The co-pilot went to the coffeepot and flipped a switch. Joe fidgeted again on his improvised seat. Again he wished that he could be riding in back with the crates. But it would be silly to insist on perching somewhere in the freight compartment.

There was a steady roaring in the cabin--the motors. One's ears got accustomed to it, and by now the noise sounded as if it were heard through cushions. Presently the coffeepot bubbled, unheard. The co-pilot lighted a cigarette. Then he drew a paper cup of coffee and handed it to the pilot. The pilot seemed negligently to contemplate some dozens of dials, all of which were duly duplicated on the right-hand, co-pilot's side. The co-pilot glanced at Joe.

"Coffee?"

"Thanks," said Joe. He took the paper cup.

The co-pilot said: "Everything okay with you?"

"I'm all right," said Joe. He realized that the co-pilot felt talkative. He explained: "Those crates I'm traveling with----. The family firm's been working on that machinery for months. It was finished with the final grinding done practically with feather dusters. I can't help worrying about it. There was four months' work in just lapping the shafts and balancing rotors. We made a telescope mounting once, for an observatory in South Africa, but compared to this gadget we worked on that one blindfolded!"

"Pilot gyros, eh?" said the co-pilot. "That's what the waybill said. But if they were all right when they left the plant, they'll be all right when they are delivered."

Joe said ruefully: "Still I'd feel better riding back there with them."

"Sabotage bad at the plant?" asked the co-pilot. "Tough!"

"Sabotage? No. Why should there be sabotage?" demanded Joe.

The co-pilot said mildly: "Not quite everybody is anxious to see the Space Platform take off. Not everybody! What on earth do you think is the biggest problem out where they're building it?"

"I wouldn't know," admitted Joe. "Keeping the weight down? But there is a new rocket fuel that's supposed to be all right for sending the

Platform up. Wasn't that the worst problem? Getting a rocket fuel with enough power per pound?"

The co-pilot sipped his coffee and made a face. It was too hot.

"Fella," he said drily, "that stuff was easy! The slide-rule boys did that. The big job in making a new moon for the Earth is keeping it from being blown up before it can get out to space! There are a few gentlemen who thrive on power politics. They know that once the Platform's floating serenely around the Earth, with a nice stock of atom-headed guided missiles on board, power politics is finished. So they're doing what they can to keep the world as it's always been--equipped with just one moon and many armies. And they're doing plenty, if you ask me!"

"I've heard----" began Joe.

"You haven't heard the half of it," said the co-pilot. "The Air Transport has lost nearly as many planes and more men on this particular airlift than it did in Korea while that was the big job. I don't know how many other men have been killed. But there's a strictly local hot war going on out where we're headed. No holds barred! Hadn't you heard?"

It sounded exaggerated. Joe said politely: "I heard there was cloak-and-dagger stuff going on."

The pilot drained his cup and handed it to the co-pilot. He said: "He thinks you're kidding him." He turned back to the contemplation of the instruments before him and the view out the transparent plastic of the cabin windows.

"He does?" The co-pilot said to Joe, "You've got security checks around your plant. They weren't put there for fun. It's a hundred times worse where the whole Platform's being built."

"Security?" said Joe. He shrugged. "We know everybody who works at the plant. We've known them all their lives. They'd get mad if we started to get stuffy. We don't bother."

"That I'd like to see," said the co-pilot skeptically. "No barbed wire around the plant? No identity badges you wear when you go in? No security officer screaming blue murder every five minutes? What do you think all that's for? You built these pilot gyros! You had to have that security stuff!"

"But we didn't," insisted Joe. "Not any of it. The plant's been in the same village for eighty years. It started building wagons and plows, and now it turns out machine tools and precision machinery. It's the only factory around, and everybody who works there went to school with everybody else, and so did our fathers, and we know one another!"

The co-pilot was unconvinced. "No kidding?"

"No kidding," Joe assured him. "In World War Two the only spy scare in the village was an FBI man who came around looking for spies. The

village cop locked him up and wouldn't believe in his credentials. They had to send somebody from Washington to get him out of jail."

The co-pilot grinned reluctantly. "I guess there are such places," he said enviously. "You should've built the Platform! It's plenty different on this job! We can't even talk to a girl without security clearance for an interview beforehand, and we can't speak to strange men or go out alone after dark--."

The pilot grunted. The co-pilot's tone changed. "Not quite that bad," he admitted, "but it's bad! It's really bad! We lost three planes last week. I guess you'd call it in action against saboteurs. One flew to pieces in mid-air. Sabotage. Carrying critical stuff. One crashed on take-off, carrying irreplaceable instruments. Somebody'd put a detonator in a servo-motor. And one froze in its landing glide and flew smack-dab into its landing field. They had to scrape it up. When this ship got a major overhaul two weeks ago, we flew it with our fingers crossed for four trips running. Seems to be all right, though. We gave it the works. But I won't look forward to a serene old age until the Platform's out of atmosphere! Not me!"

He went to put the pilot's empty cup in the disposal slot.

The plane went on. There wasn't anything underneath but clouds, and there wasn't anything overhead but sky. The clouds were a long way down, and the sky was simply up. Joe looked down and saw a faint spot of racing brightness with a hint of colors around it. It was the sort of nimbus that substitutes for a shadow when a plane is high enough above the clouds. It raced madly over the irregular upper surface of the cloud layer. The plane flew and flew. Nothing happened at all. This was two hours from the field from which it had taken off with the pilot gyro cases as its last item of collected cargo. Joe remembered how grimly the two crew members had prevented anybody from even approaching it on the ground, except those who actually loaded the cases, and how one of the two had watched them every second.

Joe fidgeted. He didn't quite know how to take the co-pilot's talk. The Kenmore Precision Tool plant was owned by his family, but it wasn't so much a family as a civic enterprise. The young men of the village grew up to regard fanatically fine workmanship with the casual matter-of-factness elsewhere reserved for plowing or deep-sea fishing. Joe's father owned it, and some day Joe might head it, but he couldn't hope to keep the respect of the men in the plant unless he could handle every tool on the place and split a thousandth at least five ways. Ten would be better! But as long as the feeling at the plant stayed as it was now, there'd never be a security problem there.

If the co-pilot was telling the truth, though--.

Joe found a slow burn beginning inside him. He had a picture in his mind that was practically a dream. It was of something big and bright and ungainly swimming silently in emptiness with a field of stars behind it. The stars were tiny pin points of light. They were unwinking and distinct because there was no air where this thing floated. The blackness between them was absolute because this was space itself. The thing that floated was a moon. A man-made moon. It was an artificial satellite of Earth. Men were now building it. Presently it would float as Joe dreamed of it, and where the sun struck it, it would be unbearably bright, and where there were shadows, they would be abysmally black--except, perhaps, when earthshine from the planet below would outline it in a ghostly fashion.

There would be men in the thing that floated in space. It swam in a splendid orbit about the world that had built it. Sometimes there were small ships that--so Joe imagined--would fight their way up to it, panting great plumes of rocket smoke, and bringing food and fuel to its crew. And presently one of those panting small ships would refill its fuel tanks to the bursting point from the fuel other ships had brought--and yet the ship would have no weight. So it would drift away from the greater floating thing in space, and suddenly its rockets would spout flame and fumes, and it would head triumphantly out and away from Earth. And it would be the first vessel ever to strike out for the stars!

That was the picture Joe had of the Space Platform and its meaning. Maybe it was romantic, but men were working right now to make that romance come true. This transport plane was flying to a small town improbably called Bootstrap, carrying one of the most essential devices for the Platform's equipment. In the desert near Bootstrap there was a gigantic construction shed. Inside that shed men were building exactly the monstrous object that Joe pictured to himself. They were trying to realize a dream men have dreamed for decades--the necessary space platform that would be the dock, the wharf, the starting point from which the first of human space explorers could start for infinity. The idea that anybody could want to halt such an undertaking made Joe Kenmore burn.

The co-pilot painstakingly crushed out his cigarette. The ship flew with more steadiness than a railroad car rolls on rails. There was the oddly cushioned sound of the motors. It was all very matter-of-fact.

But Joe said angrily: "Look! Is any of what you said--well--kidding?"

"I wish it were, fella," said the co-pilot. "I can talk to you about it, but most of it's hushed up. I tell you----"

"Why can you talk to me?" demanded Joe suspiciously. "What makes it all right for you to talk to me?"

"You've got passage on this ship. That means something!"

"Does it?" asked Joe.

The pilot turned in his seat to glance at Joe.

"Do you think we carry passengers regularly?" he asked mildly.

"Why not?"

Pilot and co-pilot looked at each other.

"Tell him," said the pilot.

"About five months ago," said the co-pilot, "there was an Army colonel wangled a ride to Bootstrap on a cargo plane. The plane took off. It flew all right until twenty miles from Bootstrap. Then it stopped checking. It dove straight for the Shed the Platform's being built in. It was shot down. When it hit, there was an explosion." The co-pilot shrugged. "You won't believe me, maybe. But a week later they found the colonel's body back east. Somebody'd murdered him."

Joe blinked.

"It wasn't the colonel who rode as a passenger," said the co-pilot. "It was somebody else. Twenty miles from Bootstrap he'd shot the pilots and taken the controls. That's what they figure, anyhow. He meant to dive into the construction Shed. Because--very, very cleverly--they'd managed to get a bomb in the plane disguised as cargo. They got the men who'd done that, later, but it was rather late."

Joe said dubiously: "But would one bomb destroy the Shed and the Platform?"

"This one would," said the co-pilot. "It was an atom bomb. But it wasn't a good one. It didn't detonate properly. It was a fizz-off."

Joe saw the implications. Cranks and crackpots couldn't get hold of the materials for atom bombs. It took the resources of a large nation for that. But a nation that didn't quite dare start an open war might try to sneak in one atom bomb to destroy the space station. Once the Platform was launched no other nation could dream of world domination. The United States wouldn't go to war if the Platform was destroyed. But there could be a strictly local hot war.

The pilot said sharply: "Something down below!"

The co-pilot fairly leaped into his right-hand seat, his safety belt buckled in half a heartbeat.

"Check," he said in a new tone. "Where?"

The pilot pointed.

"I saw something dark," he said briefly, "where there was a deep dent in the cloud."

The co-pilot threw a switch. Within seconds a new sound entered the cabin. Beep-beep-beep-beep. They were thin squeaks, spaced a full half-second apart, that rose to inaudibility in pitch in the fraction of a second

they lasted. The co-pilot snatched a hand phone from the wall above his head and held it to his lips.

"Flight two-twenty calling," he said crisply. "Something's got a radar on us. We saw it. Get a fix on us and come a-running. We're at eighteen thousand and"--here the floor of the cabin tilted markedly--"now we're climbing. Get a fix on us and come a-running. Over!"

He took the phone from his lips and said conversationally: "Radar's a giveaway. This is no fly-way. You wouldn't think he'd take that much of a chance, would you?"

Joe clenched his hands. The pilot did things to the levers on the column between the two pilots' seats. He said curtly: "Arm the jatos."

The co-pilot did something mysterious and said: "Check."

All this took place in seconds. The pilot said, "I see something!" and instantly there was swift, tense teamwork in action. A call by radio, asking for help. The plane headed up for greater clearance between it and the clouds. The jatos made ready for firing. They were the jet-assisted take-off rockets which on a short or rough field would double the motors' thrust for a matter of seconds. In straightaway flight they should make the plane leap ahead like a scared rabbit. But they wouldn't last long.

"I don't like this," said the co-pilot in a flat voice. "I don't see what he could do----"

Then he stopped. Something zoomed out of a cloud. The action was completely improbable. The thing that appeared looked absolutely commonplace. It was a silver-winged private plane, the sort that cruises at one hundred and seventy-five knots and can hit nearly two-fifty if pushed. It was expensive, but not large. It came straight up out of the cloud layer and went lazily over on its back and dived down into the cloud layer again. It looked like somebody stunting for his own private lunatic pleasure--the kind of crazy thing some people do, and for which there is no possible explanation.

But there was an explanation for this.

At the very top of the loop, threads of white smoke appeared. They should have been unnoticeable against the cloud. But for the fraction of an instant they were silhouetted against the silver wings. And they were not misty wisps of vapor. They were dense, sharply defined rocket trails.

They shot upward, spreading out. They unreeled with incredible, ever-increasing velocity.

The pilot hit something with the heel of his hand. There was a heart-stopping delay. Then the transport leaped forward with a force to stop one's breath. The jatos were firing furiously, and the ship jumped. There was a bellowing that drowned out the sound of the engines. Joe was

slammed back on the rear wall of the cabin. He struggled against the force that pushed him tailward. He heard the pilot saying calmly: "That plane shot rockets at us. If they're guided we're sunk."

Then the threads of smoke became the thickness of cables, of columns! They should have ringed the transport plane in. But the jatos had jumped it crazily forward and were still thrusting fiercely to make it go faster than any prop-plane could. The acceleration made the muscles at the front of Joe's throat ache as he held his head upright against it.

"They'll be proximity----"

Then the plane bucked. Very probably, at that moment, it was stretched far past the limit of strain for which even its factor of safety was designed. One rocket had let go. The others went with it. The rockets had had proximity fuses. If they had ringed the transport ship and gone off with it enclosed, it would now be a tumbling mass of wreckage. But the jatos had thrown the plane out ahead of the target area. Suddenly they cut off, and it seemed as if the ship had braked. But the pilot dived steeply, for speed.

The co-pilot was saying coldly into the microphone: "He shot rockets. Looked like Army issue three point fives with proximities. They missed. And we're mighty lonely!"

The transport tore on, both pilots grimly watching the cloud bank below. They moved their bodies as they stared out the windows, so that by no possibility could any part of the plane mask something that they should see. As they searched, the co-pilot spoke evenly into the microphone at his lips: "He wouldn't carry more than four rockets, and he's dumping his racks and firing equipment now. But he might have a friend with him. Better get here quick if you want to catch him. He'll be the innocentest private pilot you ever saw in no time!"

Then the pilot grunted. Something was streaking across the cloud formation far, far ahead. Three things. They were jet planes, and they seemed not so much to approach as to swell in size. They were coming at better than five hundred knots--ten miles a minute--and the transport was heading for them at its top speed of three hundred knots. The transport and the flight of jets neared each other at the rate of a mile in less than four seconds.

The co-pilot said crisply: "Silver Messner with red wing-tips. The number began----" He gave the letter and first digits of the vanished plane's official designation, without which it could not take off from or be serviced at any flying field.

Joe heard an insistent, swift beep-beep-beep-beep which would be the radars of the approaching jets. He could not hear any answers that

might reach the co-pilot as he talked to unseen persons who would relay his words to the jet fighters.

One of them peeled off and sank into the cloud layer. The others came on. They set up in great circles about the transport, crossing before it, above it, around it, which gave the effect of flying around an object not in motion at all.

The pilot flew on, frowning. The co-pilot said: "Yes. Sure! I'm listening!" There was a pause. Then he said: "Check. Thanks."

He hung the instrument back where it belonged, above his head and behind him. He thoughtfully mopped his brow. He looked at Joe.

"Maybe," he said mildly, "you believe me when I tell you there's a sort of hot war on, to keep the Platform from taking off."

The pilot grunted. "Here's the third jet coming up."

It was true. The jet that had dived into the clouds came up out of the cloud formation with somehow an air of impassive satisfaction.

"Did they spot the guy?"

"Yeah," said the co-pilot. "He must've picked up my report. He didn't dump his radar. He stayed in the cloud bank. When the jet came for him--spotting him with its night-fighter stuff--he tried to ram. Tried for a collision. So the jet gave him the works. Blew him apart. Couldn't make him land. Maybe they'll pick up something from the wreckage."

Joe wet his lips.

"I--saw what happened," he said. "He tried to smash us with rockets. Where'd he get them? How were they smuggled in?"

The co-pilot shrugged. "Maybe smuggled in. Maybe stolen. They coulda been landed from a sub anywhere on a good many thousand miles of coast. They coulda been hauled anywhere in a station wagon. The plane was a private-type ship. Plenty of them flying around. It could've been bought easily enough. All they'd need would be a farm somewhere where it could land and they could strap on a rocket rack and put in a radar. And they'd need information. Probably be a good lead, this business. Only just so many people could know what was coming on this ship, and what course it was flying, and so on. Security will have to check back from that angle."

A shadow fell upon the transport ship. A jet shot past from above it. It waggled its wings and changed course.

"We've got to land and be checked for damage," said the co-pilot negligently. "These guys will circle us and lead the way--as if we needed it!"

Joe subsided. He still had in his mind the glamorous and infinitely alluring picture of the Space Platform floating grandly in its orbit, with white-hot sunshine on it and a multitude of stars beyond. He had been completely absorbed in that aspect of the job that dealt with the method

of construction and the technical details by which the Platform could be made to work.

Now he had a side light on the sort of thing that has to be done when anything important is achieved. Figuring out how a thing can be done is only part of the job. Overcoming the obstacles to the apparently commonplace steps is nine-tenths of the difficulty. It had seemed to him that the most dramatic aspect of building the Space Platform had been the achievement of a design that would work in space, that could be gotten up into space, and that could be lived in under circumstances never before experienced. Now he saw that getting the materials to the spot where they were needed called for nearly as much brains and effort. Screening out spies and destructionists--that would be an even greater achievement!

He began to feel a tremendous respect and solicitude for the people who were doing ordinary jobs in the building of the Platform. And he worried about his own share more than ever.

Presently the transport ship sank toward the clouds. It sped through them, stone-blind from the mist. And then there was a small airfield below, and the pilot and co-pilot began a pattern of ritualistic conversation.

"Pitot and wing heaters?" asked the pilot.

The co-pilot put his hand successively on two controls.

"Off."

"Spark advance?"

The co-pilot moved his hands.

"Take-off and climb?" said the co-pilot.

"Blowers?"

"Low."

"Fuel selectors?"

The co-pilot moved his hands again to the appropriate controls, verifying that they were as he reported them.

"Main on," he said matter-of-factly, "crossfeed off."

The transport plane slanted down steeply for the landing field that had looked so small at first, but expanded remarkably as they drew near.

Joe found himself frowning. He began to see how really big a job it was to get a Space Platform even ready to take off for a journey that in theory should last forever. It was daunting to think that before a space ship could be built and powered and equipped with machinery there had to be such wildly irrelevant plans worked out as a proper check of controls for the piston-engine ships that flew parts to the job. The details were innumerable!

But the job was still worth doing. Joe was glad he was going to have a share in it.

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## CHAPTER 2

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It was a merely misty day. The transport plane stood by the door of a hangar on this military field, and mechanics stood well back from it and looked it over. A man crawled over the tail assembly and found one small hole in the fabric of the stabilizer. A shell fragment had gone through when the war rockets exploded nearby. The pilot verified that the fragment had hit no strengthening member inside. He nodded. The mechanic made very neat fabric patches over the two holes, upper and lower. He began to go over the fuselage. The pilot turned away.

"I'll go talk to Bootstrap," he told the co-pilot. "You keep an eye on things."

"I'll keep two eyes on them," said the co-pilot.

The pilot went toward the control tower of the field. Joe looked around. The transport ship seemed very large, standing on the concrete apron with its tricycle landing gear let down. It curiously resembled a misshapen insect, standing elaborately high on inadequate supporting legs. Its fuselage, in particular, did not look right for an aircraft. The top of the cargo section went smoothly back to the stabilizing fins, but the bottom did not taper. It ended astern in a clumsy-looking bulge that was closed by a pair of huge clamshell doors, opening straight astern. It was built that way, of course, so that large objects could be loaded direct into the cargo hold, but it was neither streamlined nor graceful.

"Did anything get into the cargo hold?" asked Joe in sudden anxiety. "Did the cases I'm with get hit?"

After all, four rockets had exploded deplorably near the ship. If one fragment had struck, others might have.

"Nothing big, anyhow," the co-pilot told him. "We'll know presently."

But examination showed no other sign of the ship's recent nearness to destruction. It had been overstressed, certainly, but ships are built to take beatings. A spot check on areas where excessive flexing of the wings would have shown up--a big ship's wings are not perfectly rigid: they'd come to pieces in the air if they were--presented no evidence of damage. The ship was ready to take off again.

The co-pilot watched grimly until the one mechanic went back to the side lines. The mechanic was not cordial. He and all the others regarded the ship and Joe and the co-pilot with disfavor. They worked on jets, and to suggest that men who worked on fighter jets were not worthy of complete confidence did not set well with them. The co-pilot noticed it.

"They think I'm a suspicious heel," he said sourly to Joe, "but I have to be. The best spies and saboteurs in the world have been hired to mess up the Platform. When better saboteurs are made, they'll be sent over here to get busy!"

The pilot came back from the control tower.

"Special flight orders," he told his companion. "We top off with fuel and get going."

Mechanics got out the fuel hose, dragging it from the pit. One man climbed up on the wing. Other men handed up the hose. Joe was moved to comment, but the co-pilot was reading the new flight instructions. It was one of those moments of inconsistency to which anybody and everybody is liable. The two men of the ship's crew had it in mind to be infinitely suspicious of anybody examining their ship. But fueling it was so completely standard an operation that they merely stood by absently while it went on. They had the orders to read and memorize, anyhow.

One wing tank was full. A big, grinning man with sandy hair dragged the hose under the nose of the plane to take it to the other wing tank. Close by the nose wheel he slipped and steadied himself by the shaft which reaches down to the wheel's hub. His position for a moment was absurdly ungraceful. When he straightened up, his arm slid into the wheel well. But he dragged the hose the rest of the way and passed it on up. Then that tank was full and capped. The refueling crew got down to the ground and fed the hose back to the pit which devoured it. That was all. But somehow Joe remembered the sandy-haired man and his arm going up inside the wheel well for a fraction of a second.

The pilot read one part of the flight orders again and tore them carefully across. One part he touched his pocket lighter to. It burned. He nodded yet again to the co-pilot, and they swung up and in the pilots' doorway. Joe followed.

They settled in their places in the cabin. The pilot threw a switch and pressed a knob. One motor turned over stiffly, and caught. The second.