

The Ultimate Code

“Now let me get this straight,” Mark was saying. “We’re supposed to rendezvous with the Ahmanyans where, exactly?”

Starmen Mark Seaton, Zip Foster, and Joe Taylor were sitting in a private conference room in the famous Starlight Tower on the Moon. Papers were strewn all over the mahogany table that was in the center of the room, and a large map of Europa was projected onto one wall. The oblong table was surrounded by six chairs, but the three Starmen were the only ones present. They had been discussing the final preparations for their return to Europa for several hours now.

“We’re supposed to meet Stenafi, Saadervo, and Stavri on a pocket world in the asteroid belt,” Zip said. “I don’t think the asteroid has a name or anything, but we have been given its expected location on the date of our rendezvous. The Ahmanyans have also promised to put a locator beacon on the asteroid to make it easier to find.”

Joe lifted a stack of papers off the table and shuffled through them. “I’ve got the coordinates right here,” he said. “I’ll program them into the *Bonny Swan* after we’ve left lunar orbit. October 15, 2153 is our launch date.”

“Which is exactly nineteen days from now,” Zip said. “I think we all understand how the mission is going to work and what we’re going there to accomplish. Does – ”

The phone rang, interrupting Zip’s train of thought. After checking the name to see who was calling, Joe reached over and pressed a button on the conference table. The projected map of Europa disappeared and was replaced with the image of Richard Starlight, the CEO of Starlight Enterprise.

“How are things going?” Richard asked. From what the Starmen could see he appeared to be sitting in his private office. “I’m sorry to interrupt you.”

“Very well, sir,” Zip said. “We were just wrapping up our discussion. How can we help you?”

Richard leaned forward in his chair. “A few minutes ago I received an urgent message from Alfred Nelson,” he began.

Looks of intense dismay appeared on the faces of all three Starmen. “Oh, please, no,” Joe groaned.

Alfred Nelson managed the L5 space station, which was the largest space station in the Solar System. A few months ago the three Starmen had been called out to L5 at Alfred’s request to investigate a problem, and the memory of that experience was still fresh in their minds.

“Please tell me he just called to say that everything was fine,” Zip said. “He can’t be having more problems.”

Richard shook his head. “I’m afraid not, Zip. He called to ask for help, and he specifically requested that I send you three to resolve the matter.”

“Isn’t there someone else that you could send?” Zip asked. “The last time we went out there – ”

“I know, Zip, but this is different. Alfred has received what he thinks is a distress call from a spaceship in the outer planets, and he wants some help decoding the message and responding to it. I’m sure it’s nothing that you can’t handle.”

Zip sighed and looked at Joe and Mark. The mere mention of Alfred Nelson’s name had cast a gloom over the entire room. No one was looking forward to making a return trip to L5.

“Ok,” Zip said. “We’ll go.”

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The trip to L5 was uneventful. Like last time, Richard had the *Red Tiger* waiting for them at the Amundsen City spaceport, and Joe piloted it to the L5 space station. The Starmen said very little on the trip there.

Mark was the first one to break the silence. "At least we have our uniforms with us this time," he said.

"And cash," Joe replied.

Zip shook his head. "I'm sure things will go just fine. Now that we've dealt with Alfred before we know what to expect. This time will be different."

"I sure hope so," Joe said. "Last time we almost got arrested, our ship was impounded, and we nearly made the news. It took Richard Starlight two weeks to get the mess straightened out."

"Come on," Zip said. "We've battled aliens on the planet Nyx. We've survived being torpedoed in the oceans of Europa. We escaped destruction in the skies of Mars. You can't tell me that you're intimidated by Alfred Nelson."

"They're probably still talking about us at that tiny seaside town," Joe mused. "I bet we'll go down in history."

"I'm sure you're right, Zip," Mark said. "But, all the same, if another robot takes over a spaceship and escapes, *you* can go and follow him. I'm going to stay home and keep out of trouble."

No one said anything else for another twenty minutes, when the L5 space station at last came within visual range. Joe contacted the space station's flight control center, which then automatically took control of the *Red Tiger* and brought it into a hangar.

As soon as the ship landed Joe peered out the cockpit window. "Haven't we seen those people before?" he asked, gesturing toward the three armed guards that were waiting by the wall.

"I think so," Mark said. "Aren't they the same ones –"

"Yup," Zip said.

The three Starmen disembarked from their ship. One of the armed guards stepped forward to greet them. "Mr. Howard, Fine, and Howard at your service," he said. "It's good to see you again. Right this way, please." One of the guards opened a door that led inside the station and the three Starmen stepped through it.

The guards escorted the Starmen down the hall and through the station. The inside lighting was set to simulate a pleasant mid-afternoon; the wide hallways were gently lit, and trees and shrubs were strategically placed. A few people that were going about their daily business stopped and stared at the Starmen as they walked by.

"I'm telling you," Joe said as they followed their armed escort down the hallway, "the uniform makes all the difference. Why, if we had had our uniforms with us last time –"

Zip shook his head. "We would have caught the probe right away, Joe, and brought it back to the station, only to find out that the hapless drone was just trying to repair the data core. We would have then made *another* trip to Earth, but given the delay we would have come back from Dr. Lowery too late to save the largest space station in existence from having to be completely shut down. Our pictures would have still been in the paper weeks later, and we would have gone down in history as the most inept Starmen of all time."

"That would have been a great day to have overslept," Joe said. "There's a lot to be said for strategic, targeted napping. It's really a lost art."

The group stopped at an elevator, and proceeded to take it fifteen stories up to the top of the station. The elevator was made of glass and was located in the outside wall of the station, offering its occupants a beautiful view of the bustle of traffic outside. A host of ships, old and new, was flying to their various destinations.

Ten minutes after their arrival the Starmen found themselves walking into a conference room. “The Thomas Starlight Conference Room,” Mark said aloud, reading the sign on the door. “Very nice.”

The room was elaborately furnished. A wide, rectangular table was in the center of the room; it was made of a beautiful dark wood and trimmed in gold. The walls were decorated with famous paintings depicting scenes from deep space, and one entire wall of the conference room was a window that offered a beautiful view of Earth. Mark could see that it was night-time in North America; the day/night divide was somewhere over the Atlantic Ocean. In a few hours daylight would reach the East Coast.

After the Starmen entered the conference room their escorts took up guard outside the door. “Just for security, just for security,” Alfred Nelson said, extending them a hand. “I’m pleased to see you! Thank you for coming so quickly.”

“You’re welcome,” Mark said, shaking his hand. “What seems to be the problem?”

“Please, take a seat,” Alfred responded. “This is Matthew Lewis and this is Vanessa Sloan,” he said, gesturing toward two people that were seated at the table. As he introduced them they rose and shook the Starmen’s hands. “Matthew and Vanessa are our two top cryptographic experts at L5.”

“Cryptographic experts?” Joe asked, as the Starmen took a seat. “I didn’t realize that L5 was involved in cryptography.”

“We’re involved in all sorts of things, young man,” the director replied. “There’s no more important space station in all of the solar system than this one right here! We’ve got departments in every field – biology, physics, chemistry, cooking, the works. Our supercomputer is one of the biggest in existence, and it’s used all the time!”

“I know,” Zip said. “I’m glad that your computer is behaving itself again.”

“Now where was I?” the director mused as he took a seat at the table. “Ah – right. Matthew, you may begin.”

Matthew stood up “Four months ago the spaceship *Luna Merchant* set out for the planet Neptune,” he began.

“That sounds familiar,” Joe said. “Isn’t that Dr. Bayard’s ship?”

“That is correct,” Matthew replied. “Dr. Maxie Bayard was undertaking an expedition to the planet Neptune. He believed that it had been visited by intelligent extraterrestrial beings at some point in the past and hoped that his expedition could uncover further evidence to support that hypothesis.”

“I read about that,” Mark said. “Neptune really hasn’t been the focus of many major expeditions, and Dr. Bayard felt that it had been unduly neglected. I think that Starlight Enterprise was partially funding his voyage and had provided some equipment.”

“That is also correct,” Matthew replied. “Starlight Enterprise provided Dr. Bayard the funds to purchase the most advanced artificial intelligence system ever made – the TB-9000. His plan was to use it to parse through any readings he took from Neptune for signs of intelligence. He hoped that a computer could spot patterns or signals that would otherwise be –”

“Wonderful,” the director said. “Please get to the point, Matthew. We don’t have all day, you know.”

“Two days ago,” Matthew continued, “this station received a message from the *Luna Merchant*. The message was a surprise for three reasons. First, the *Luna Merchant* did not depart from L5. Second, the *Luna Merchant* had barely had time to pass the orbit of Saturn and was not expected to arrive at Neptune for another six months, so no messages were expected. Third, the message was addressed to Melissa Nova – a person who did not live on L5.”

The director interrupted. “I found out about this when Cody – that’s the young man who delivers the mail on L5 – came into my office and asked to speak with me. He gets misdirected mail all the time, but usually he could just return it to the sender and be done with it. Since the sender was on a space expedition he didn’t know what to do, so he came to me.”

“I knew immediately that something was up, so I took the message from him and read it. One glance at the message showed that it was a code of some kind, and once I saw that I knew there was trouble. Coded message from deep space! All kinds of terrible things happen out there in deep space, and if the *Luna Merchant* was in trouble we needed to know immediately so we could dispatch a rescue mission. There was no time to waste! I immediately called in my experts and asked them to decrypt it.”

“We didn’t know what to make of the message at first,” Vanessa said. “I loaded the message into the central computer system and tried to decrypt it but made no progress at all. The encryption is very unusual; it doesn’t correspond with anything I have seen in the past. It does not appear to be a substitution cipher. It does not appear to use any modern or ancient encryption algorithm. We may be dealing with an advanced alien technology.”

“I don’t understand,” Zip said. “Dr. Bayard sent an encrypted message to L5, addressed to a non-existent person?”

“That’s correct,” Matthew said.

“But how do you know that it’s an emergency message?”

“Think, man!” Alfred Nelson said. “What else could it be? There they are, billions of miles from the Sun, and suddenly they send an encoded message to us. It must be a cry for help! What if their computer system went haywire? What if they were boarded by aliens? I think they were forced to encode the message to hide it from their attackers. They must have been afraid that their message would be intercepted. It’s vital that we find out what is going on!” He gestured over to Vanessa. “Please continue.”

“Wait a minute,” Joe said. “Have you tried contacting Dr. Bayard and asking him what the message meant?”

“Of course not!” the director said. “Use your head! If they’ve been boarded by aliens the very last thing we want to do is let the aliens know that we’re on to them. We’ve got to keep this hush-hush until we know what’s going on. Now Vanessa – please continue.”

“As I was saying,” she said, “it didn’t take us long to discover that the message was encrypted using a completely new algorithm. Matthew and I spent hours working on it before we suddenly had an idea.

“It was obvious, based on the message header, that Dr. Bayard had encrypted the message on his own computer before he sent it. He clearly meant for it to be understood. It is highly likely that he would have chosen a technique that would be meaningless to his attackers but easily understood to us at L5. We decided to take a step back and look at the entire message with fresh eyes.”

Vanessa stood up and pressed a button on the wall, dimming the lights. “This is the encrypted message that we received,” she said, pressing another button on the table.

Instantly a picture appeared floating in mid-air over the conference table. Inside the picture was a note with the following message:

From: Dr. Maxie Bayard
To: Melissa Nova
Timestamp: 09/24/2153 02:08:24 AM MST

x

The three Starmen looked at the note in astonishment. “You mean to tell me that *that* is the message?” Zip asked. “That’s it?”

“That’s right, young man,” the director said. “You can see why it grabbed my attention! You just don’t see coded messages from deep space very often. As soon as I saw that I said to myself, Alfred, now there’s some trouble, and no mistake.”

“When we first saw the message,” Matthew said, “we thought that the message had been cut off while in transit. After examining the logs, however, we saw that we had received the full message header and footer bytes; the message was not truncated. This does represent the entire message that was sent from the *Luna Merchant*.”

“After we verified that the full message had been received, we suddenly realized where we had made our mistake. The message was encoded using MST – Mountain Standard Time. Bayard lived on the L5 space station before he left for Neptune, and the L5 station uses Greenwich Mean Time. There was no reason for him to use MST unless he was trying to tell us something.”

“We knew that MST had to be an acronym for something,” Vanessa said. “We entered that phrase into our cryptographic system and tried to determine its meaning. The computer came back with many likely candidates, but one in particular caught our attention: Madison Symmetric Torus.”

“What?” Zip asked. “I’ve never heard of that before.”

“It’s a type of device that is used in advanced fusion research,” Matthew explained. “We thought that Dr. Bayard was trying to refer to nuclear physics – specifically, to nuclear fusion. We then noticed the time of the message: it was sent at 02:08:24. Two to the third power is eight, and eight times three is twenty-four. It seems unlikely that this was a coincidence; the time is too much like a formula. The solution was obvious: Dr. Bayard was talking about the top-secret formulas for plasma containment in nuclear fusion reactors!”

“Wow,” Zip said. “But – ”

“I knew right then what had happened,” the director said. “Dr. Bayard was trying to warn us that Xenobots were trying to steal his secret formulas for plasma containment! His ship must have been boarded after they crossed the orbit of Saturn and he was hiding out in the ship, trying to tell us before it’s too late!”

“What clinches the theory is that the message is addressed to Melissa Nova,” Vanessa said. “Stars can go nova under certain conditions, and stars are powered by nuclear fusion. It all ties together.”

“Ok,” Zip said. “But – ”

“The reason I asked you here,” the director said, “is because I need your help. If Dr. Bayard’s ship has been taken over by hostile aliens then we need to mount a rescue expedition immediately. You three have actually been out in deep space before; there’s no reason why you can’t leave immediately. I’m sure you could get there in a matter of weeks and send the Xenobots packing. There’s no time to waste, young man!”

“There are a few things that need clarification, though,” Zip said. “Can I ask the base computer a few questions?” When no one objected he took out his compad and connected it to a port on the table.

“Computer,” he said, addressing his compad. “Has a person by the name of Melissa Nova ever lived on the L5 space station?”

“Affirmative,” the computer responded. “Melissa Nova began living on the L5 space station on January 15, 2150. She left L5 on August 15, 2153 when her lease expired.”

Joe spoke up. “Was Melissa Nova any relation to Dr. Bayard?”

“Affirmative. She was his younger sister.”

“Do you know where Melissa Nova is living now?” Mark asked.

“Negative. She did not leave a forwarding address.”

The three Starmen looked at each other. “I think I know what is going on,” Joe said. He took a piece of paper out of his pocket, wrote something on it, and handed it to Mark and Zip. They both read it, nodded, and handed it back.

“What’s going on?” the director said. “I don’t understand.”

“The three of us have a theory,” Joe said, “but we want to test it first. If you’ll give me an envelope I’ll place this piece of paper into it and seal it, so that our theory can be preserved for posterity. After that I’d like to make a phone call.”

“I don’t understand this at all,” the director said, as Vanessa searched the room for an envelope. “It’s quite obvious! You’ve got to head out there immediately; there’s no telling how much trouble the Xenobots have already unleashed. There must be no delay!”

Vanessa was eventually able to find an envelope; she handed it to Joe, who took his piece of paper and placed it inside. He sealed it, wrote “Confidential” on it, and placed it on the table.

“Computer,” Zip said aloud, “I want you to locate Melissa Nova. See if you can find out her current contact information.”

“Please wait,” the computer replied. The three Starmen waited.

“I really don’t see how this will help,” Matthew said. “I doubt that Melissa Nova knows very much about cryptographic analysis.”

“She may know more than you think,” Zip said. “I believe that she alone has the key to this cipher.”

It took the computer a few more minutes to locate the phone number, but it was at last obtained.

“Great!” Joe said. “Call her up.”

The phone rang three times, and then someone answered. “Hello, this is Melissa.”

“Hi there,” Joe said. “This is Starman Joe Taylor, calling you from the L5 space station. I have with me David Foster, Mark Seaton, Alfred Nelson, Matthew Lewis, and Vanessa Sloan.”

“Wow,” she said. “I’m impressed! How can I help you?”

“We’ve got a question for you,” Joe replied. “Two days ago the space station received a message from Dr. Bayard, addressed to you. Since you no longer live at the station the computer could not deliver the message.”

“Oh, that’s right,” Melissa said. “I knew I forgot something. I’d better let him know that my address has changed.”

“The forces of goodness in the universe would greatly appreciate that,” Joe said. “Do you think you could do us a favor?”

“Sure,” she said. “What do you have in mind?”

“Due to the circumstances surrounding the arrival of the message, it has been classified as an encrypted distress call,” Joe said. “A team of cryptologists have been trying to decrypt it for two days now and have had no luck understanding it. We were hoping that you could tell us what it meant.”

“That’s odd,” she said. “I don’t think he’s ever sent his messages encoded before. In fact, I’d be surprised if he even knew how to do that. But, um, sure, just send it to me and I’ll take a look at it.”

Joe asked Matthew to send her a copy of the message. He shook his head, but when Joe pressed him he forwarded the note to Melissa. “It’s been sent,” Joe said, after receiving confirmation of this from Matthew. “You should have it in just a few moments.”

“I still can’t believe you would read my mail,” Melissa said. “Do you do that very often?”

“Fortunately, no,” Joe replied. “But in this case we made an exception.”

“Ah, there it is,” Melissa said. “I see it now. Let me read it.” She was silent a moment, and then burst out laughing. The director looked puzzled. “I don’t see anything funny about it,” he muttered.

“Thanks for sending this message to me,” she said. “It made my day. I’ll let my brother know that I received it and that my address has changed.”

“You’re welcome,” Joe replied. “Just for the record, what was Dr. Bayard trying to tell you?”

“Oh, well, you have to understand my brother. I saw him just before he left, you know, and told him to send me a letter after he got past the orbit of Saturn. No one in our family had ever gone out that far before, you see. So after he passed the orbit of Saturn, he did just that – he sent me the letter ‘x’.”

“Wonderful,” Zip said. “I’m glad your brother is safe and sound. Thank you for your time.”

“You’re welcome,” Melissa said. “Bye!” She hung up.

Alfred Nelson picked up the sealed envelope off the desk, tore it open, and read the note inside. He then threw it down on the table. “How could you possibly have known?” he asked.

“Call it a lucky guess,” Zip said.

“Based on past history,” Joe added.

“That’s crazy!” the director said, fuming. “How could we be expected to know that? It’s not fair!”

“That,” Mark said, “is exactly why you’re not supposed to read other people’s mail.”

With that, the three Starmen walked out of the conference room and back down the hall toward their waiting ship.