TOM SWIFT
and the Three Requests

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The drag of the filling balloons forced the ship to a standstill in the air. Page 90

Chapter 1: Catastrophe

"Swift Enterprises air control tower, this is the Brighton Municipal Airport," a relatively cool voice came over the Swift's assigned radio frequency. "We have a medical mayday. Please respond on the emergency 406 MHz frequency." Patches O'Brian immediately reached over and started to rotate the frequency dial. At the same time he pushed in the alert buttons for both Security and the Airfield Rescue Response command center and tied them both into the incoming radio call.

"Brighton Municipal, this is Enterprises tower. You've got O'Brian at this end. How can I help you?" Patches was happy to see the orange response lights turn on from both locations he had notified.

"We have a Cessna One-Five-Zero—I.D. of November Foxtrot-66552—pilot only, who has called in a medical mayday. We think he's now flying on his aircraft's minimal autopilot and we're only getting sporadic communication responses from him. It sounds like he's having a heart

attack. He has overshot our location and is now over Lake Carlopa heading in your direction. We are hoping that you may be of assistance with your security drones and that you may be able to force land him."

"Brighton, this is Swift Security, are you sure this is a real emergency and not a ruse to get into our restricted air space?" asked Harlan Ames, who was the director of Swift Enterprise's security.

"This mayday is real. We've known the pilot for years. He has been flying that same old Cessna from this field for twenty years. Before he retired he was with the Brighton police force." The air controller was starting to sound exasperated because of the question.

"Patches do you have a radar fix on that plane?" the Swift's security man asked.

"Sure do, Mr. Ames."

"Send out drones four and five. Can you handle it few a few minutes until Jim shows up to help you? He's on his way over already."

"Can do, sir. Will redirect drones four

and five. Brighton, please stand by. Swift's Airfield Rescue, I'm going to take him down on runway four, coming from the North. Please proceed to that location." Patches walked over to one of the control chairs over at the far side of the control tower. Reaching the seldom used manual control units for the drones he activated the last two of the five units. Two wall monitors lit up to a blaze of colored static and quickly resolved to a sky blue color with a few high ceiling clouds. The drone's visual systems were on. A radar image formed on two small separate radar screens at each individual control panel.

A young runt of a man pulled up in the chair next to Patches and nodded his presence as he put on his headset and then reached for the manual joysticks of drone five. "We'll fly tandem, Mr. O'Brian. I'll lead if you don't mind?" Jim's eyes shined with excitement. Just out of the Air Force and one of the new group of military-trained drone operators now hitting civilian life, he had been itching to show off his expertise.

"Lead on, Jim. Land them at runway four by the outer wall. It's the furthest away from any buildings. The Cessna is an old

one and only has a very basic computer system, if one at all, and so we might not be able to override it electronically, we may have to physically lock onto the plane and force it down." Patches had performed practice runs with Jim and the other two remote pilots and they all worked well, but real life action could bring out unexpected performances, both good and bad.

Drone five headed north and the other quickly followed suit. In seconds they were circling the small, signal engine plane with its main wing attached over the top of the control cabin. Using the observation cameras, they could barely see the stricken airman slumped over at the controls under the wing. Once they appraised the situation they activated their electronic override systems and, as Patches feared, it did not work on the antiquated airplane. The Cessna was too old of a model for them to be able to get an electronic lock.

"Patches, what you think," Jim asked with a slight worry in his voice. He had only once before forced down a test plane manually and that had not gone well. His forehead was breaking out in little beads of

sweat.

Patches looking at him, smiled a little, and replied, “Kid, don’t sweat it. Once we lock onto him we’ll slave our drones together and only one of us will fly the whole shooting match down. If you think you can’t handle it, I’ll do it. But I think it should be you. It’s that or you better rethink your job choice.”

Jim shot him a look across the space between them and then nodded his head. “Yeah, I see your point. Thanks. I’ll do it!” He straightened out his back in his seat and flexed his fingers before taking a firm grip around the joystick. “Going to wing capture mode and pulling up along side of the Cessna’s main wing.” As he was doing that his wings split open along its horizontal center line, momentarily making it into a biplane. Both wings did this to keep the plane aerodynamically stable. “Let me know when you’re ready, Patches.” Jim’s voice sounded sure and resolute.

A few seconds later the air controller’s drone was similarly configured. “In position and switching controls over to you, as of...

now!" He flipped a toggle and was locked out of his controls. The two drones, as one, automatically maneuvered in, their two part wings slipping over and under the Cessna's wing and clamped tightly on them, locking all three planes together. The front flaps of each drone immediately swung down closing off the front edge of the wings. Jim now had only to slowly circle the newly formed tri-body plane around and align it to the runway approach and bring it down.

All was going well and they were just a few hundred feet above the runway. Two fire trucks were position on one side of the tarmac, one at each end. One ambulance and Doc Simpson's medical car were waiting on the other side.

Neither of the drone operators could see that the Cessna's pilot had regained consciousness. In his pained and befuddle state of mind he panicked when he saw the two other planes right on his wings. He grabbed the plane's yolk and pulled it back as hard as he could. It happened so fast that the body of the Cessna twisted, and ripped away from the wing that was attached above the cabin. The fuselage of the plane went

somersaulting through the air and came hurtling to the ground and right into the back section of a waiting fire truck.

Pandemonium broke out as flames, smoke and metal truck and plane parts exploded into the air. The passenger compartment of the fire truck was ripped from its back trailer half and thrown, spinning—and then tumbling as it hit the dirt—on the other side of the runway. The four occupants were repeatedly smashed into the walls, front seats, and dashboard. Bones and heads broke and crushed under the onslaught of the multiple hits.

Men, trained to work in emergency conditions froze for a moment as the horrific scene played out before them. Then as one, they mobilized into action. The far away fire truck came speeding forward. An all out emergency alarm was broadcast throughout Swift Enterprises, pulling countless numbers of extra people trained to help in this type of situation to the accident area. Others reported to assigned situation command centers to be available if needed. Countless hours of planning and training were speedily paying off.

By the time Doc Simpson had reach the mangled front half of the fire truck other rescue vehicles and personnel were showing up. Two of them were Tom Swift, famous inventor and son of the owner of Swift Enterprises, and Bud Barclay, Tom's best friend and top test pilot for the organization.

Luckily the fire truck did not catch fire. Moans and cries for help issued from the trapped occupants. Pairs of 'jaws of life' was brought into play and in seconds the crushed doors were being pried open and Doc Simpson was able to reach his first patient who was still seat belted in but who apparently had hit his head several times. Blood was flowing from deep lacerations and torn skin.

Doc Simpson triaged the first man, told his medics what to do and moved on to the next injured person—trying to treat all four of them in a super human effect to save their lives. But just eyes, hands and knowledge by themselves can only do so much no matter how good the doctor. One man—evidently caught unbuckling his seat belt at the moment of impact—died of internal bleeding on the way to the hospital and

another was to be a quadriplegic for the rest of his life. The other two lived to be with their families for many years to come.

As for the Cessna's pilot, it was going to be a hard search to find much of him in the burnt out, mangled, husk of the plane and back end of the fire truck.

In the end Tom and Bud walked over to the exhausted Doc Simpson, who was standing alone by the wrecked fire truck, his head bowed down looking at his hands, mumbling to himself. "Not enough! These hands were not enough!" He looked almost vacantly at the approaching teens and sadly shook his head.

Tom took him gently by the arm and the doctor responded by looked up into Tom's eyes. He said with tears in his own eyes, "I lost Enterprises two good men today, Tom. I just was not good enough." A sod broke from his lips. Tom was at a loss, so he looked at his friend, Bud, for help.

Bud stepped forward and put one hand on the medico's shoulder, giving it a gentle squeeze. In a quiet voice he asked the doctor, "What did you need that you did not

have to save those two men, Doc?"

A look came into the Doctor's eyes as he turned his head from Tom to Bud. "A pair of X-Ray eyes would have been a help. A way to see what kind of brain injury they might have had is another. But the best of equipment, in the best hospitals, have a hard enough time doing that never mind in an open airfield like this. It's a catch-twenty-two. I can't examine them thoroughly until I move them to a better place than the wreck, but I can't move them until I examine them." It was then that the doctor realized what Bud had really asked.

Doc Simpson took Bud by the arm and squeezed it. "Thanks, Bud. You made me realized that I'm not God, and that I did do all I could!" He sighed as he looked once more at the burned out wreckage across the tarmac. "It could have been worse, I guess. But, Tom, what went wrong? That captive system never failed before, so why now? What failed?"

Tom looked at the doctor and his best friend and with a sad voice simply replied. "I did… I went wrong!"

Chapter Two: Questions

Tom looked at the people seated around the table in the main conference room at the Administration building at Swift Enterprises. It was two days after the accident and an informal inquiry was being held by the FFA and its Safety Review Board. There were two men and a woman on the panel. The inquiry was on the use of the capture drones employed by the Swifts. Were they safe and reliable? Or were they a menace and were the fault known and passed over intentionally?

Mr. Swift, founder of Swift Enterprises, and Ned Norton, the manger of the Swift Construction Company that manufactured the drones were present. So were Patches O'Brien and Jim Littleton as the two pilots of the drones. John Jones, the air traffic controller from the Brighton Municipal Airport was also there with copies of his tapes of the incident. A lawyer for the dead pilot's family was also present to see if there was just cause to sue the Swifts for wrongful death. What started out as a request for help

was turning into a major inquiry and possible finger pointing session.

At the end of four hours of personal testimony from all the people involved, the government task force went into a private discussion for several minutes in another room. The day before the group had scoured through all the paper transcripts and listened to all available audio records. They even viewed the pair of video feeds from the two drones.

Only the woman came back out and faced the group of anxious people. Everyone except the lawyer sat calmly, waiting for her to speak. The lawyer licked his lips in anticipation and arranged his legal notepad and pen.

“As we expected when we went into this informal inquiry and heard all the testimony of all the people involved in this sad situation we find that Swift Enterprises did nothing wrong on their part in trying to help in that unfortunate man in this incident. As the videos showed, the pilot made a critical mistake in attempting to regain control of his aircraft. We feel, justifiably so, that the

pilot of that plane would have almost certainly died anyway when that plane ran out of fuel and crashed. The only question we cannot answer is, when he eventually crashed would there have been more unforeseeable deaths. There is no way we could ever tell."

She paused for a moment and then continued.

"The lost suffered by the Swift's organization is terrible and regrettable. We wish we had a way to soften that blow, but we don't. We can only give our condolences. This is the end of this inquiry. We have only one request for the future use of the drones. Use the manual forced landing procedure only on security intruders. Do not use it again unless you absolutely have to on private aircraft." With that said she bid them a good day and left the room and joined the other two committee members and left the premises.

The lawyer shut his briefcase with a loud bang and forcefully pushed his chair back. Looking at the people in the room he declared, "It sure must be nice to have the

U.S. Government in your hip pocket!" With that said he also left the building.

Tom was amazed at what he just witnessed. Looking at both his father and Uncle Ned he asked in a low, controlled voice not trusting it not to scream, "What just happened?"

"That my boy," Uncle Ned spoke up, "is one sore loser of a lawyer, if I ever saw one."

"No, not that!" young Tom replied forcibly. "The FAA and safety people—why did they bother to come? It was a waste of our time and theirs as far as I can see." Tom was really troubled by the results of the inquiry. What they had requested for them to do in the future was exactly what he had already discussed with his father and a small group of Enterprises aircraft engineers. They were also going to add new programming to take into account an aircraft integrity tolerance. The engineers were to look into the plausibility of adding rudder and tail flaps restrainers also.

"Tom, you must understand," his father replied to his troubled son, "the U.S.

Government has a vast interest in not seeing our captive drones systems being grounded. They have our drones in hundreds of installations both here and abroad. All of them are working beyond their wildest expectation. Not to brag, Son, but you did a marvelous job when you designed them. No one has come close to copying their abilities." Mr. Swift was proud that his son had added so valuable of a deterrent to safe guard the country without making it a lethal weapon.

"Tom, don't take it as a fault in your work," spoke up Patches O'Brian. "Nothing is one hundred percent fool proof. And I know from personal experience that I'll rather be taken down by your drones than by bullets like I once was!"

Tom could find no argument with that. So he left the building still in a quandary over all that had happened in the past few days. He decided that he needed someone else to talk to. Getting into his car he drove off to see a special friend, and possibly the girl of his dreams, Bashalli Prandit.

Bash, as Tom affectionately called her,

listened to Tom with all the passion and intelligence she possessed. She was going to night school to become a graphic artist. She possessed the ability to embrace both her original country's—Pakistan—ideals and mold them into her love for America and this made her extremely open minded and well versed in many things.

Gazing into her beautiful and enthralling face for an hour as he poured out the story had a calming effect on him. Although holding her hand and touching her arm had the opposite effect. Maybe it was just the two cups of strong, rich coffee causing his emotional upheaval!

"Now Thomas, let me see if I have this correct. The inquiry was to see if your people did anything wrong by using the drones?" Tom nodded his head 'yes'.

"But the government really does not want to find anything wrong because they would then have to stop using your drones?" Again, a nod 'yes'.

"So they politely ask you not to use the captive device on private planes unless it is for security reasons?" A third nod 'yes'.

“Then it is for show, to keep the public happy, and the money hungry lawyers out of your hair!” Tom was starting to feel like one of those bobbing car heads.

“And this makes you unhappy how?” Her eyes were wide open and he just wanted to dive into their rich dark color and get lost in them.

When the last question finally made it into his thinking mind he bolted straight up in his chair and murmured, “I don’t know?”

“I think you just want to be at fault because two people died and one is permanently injured by something you invented. This is not good, my dear, Thomas. All thing have unpleasant side effects to them, we cannot let that stop us or we might as will stop living. And Thomas, I do not want to stop living now!”

She took his hands into hers and she lightly kissed the tips of his long fingers. Looking back into his face she softly added, “These fingers and hands could not harm a person intentionally. They belong to too fine a person.” Tom was amazed at the thrill he received by her gently kissing his fingers.

His mind was in a whirlwind. For the first time in his life he knew that another person cared and wanted him for himself and not for what he could achieve.

"Bash, self pity is not a good thing, is it?" He final understood what she was trying to tell him.

"No, Thomas, it is not. Remember, what happened is not a failure of your security device. It just points out how fast things change in our world and what we take for granted today. *You* live in such a highly sophisticated electronic world that you forget that not all of us live at that pace. Some of us like the old and tried things in life." Tom was once again nodding his head in understanding and the sample truth she was stating.

"You are planning to make changes—upgrading—as they say?"

"Oh yes," he replied, "I have a team of engineers looking into improvements." He smiled back at her.

"Good!" She emphatically stated. "Now forget this ridiculous government thing and tell me something."

“Anything you want to ask, I’ll answer, Bash.” Tom was feeling like his old self again.

“This may sound dumb, but why do planes fall out of the sky?” She tilted her head and looked at him with a frown. “You said earlier that the plane would have crashed anyway when it ran out of gas.”

“Ah... what do you mean? They don’t fall out of the sky. Maybe you should rephrase that question.”

Bash laughed quietly to herself, realizing what she actually said. “I mean when the plane’s engine stops, why do they crash? I thought the motor was to give them speed and the wings held them up? The wings are still there, that had not changed, so why do they fall?”

This time Tom knew what she wanted. He explained to her, the best he could, about wing design, coefficient of lift, angle of attack and how the speed of the aircraft changes everything.

“Thomas, you must be joshing me! It takes all that to fly? No wonder it took man so long to achieve it. And to think birds do it

without thinking!" she laughed.

"So what does this have to do with anything, Bash?" Tom wondered.

"Oh, I was thinking that you could find of a way to keep planes from falling and crashing. You know, floating a plane down like it is a parachute or a balloon so it would land gently on the ground."

"Of course, you will want it to do this automatically in case the pilot is not able to, right?" he threw in as a tease.

"Yes, please!" She clapped her hand together in delight.

Tom just stared at her and slowly he broke into a grin. "Why not," he thought, "I've done the impossible before, so why not do this for you!"

Chapter Three: A Third Request

By the time Tom made it home that night, he was feeling on top of the world. The afternoon coffee and talk had turned into a nice dinner for two at the Shopton Yacht Club and a late night stroll on the beach under a full Moon. Although he tried to concentrate on his beautiful date, his mind was racing with the requests from two people he cared about. Doc Simpson's portable body and brain scan and Bash's floating planes.

By the time he reached the office that he shared with his father the next day, he was bursting with ideas. He went immediately to the hidden design computer and activated it. It was kept nondescript on purpose so others could not try to tap into it. As he pulled over a chair to it his phone rang and it was the front gate.

"Tom, this is Harold. Mrs. Trunbridge, from the Junior High School is here to see you. Did you forget to do some detention for her and she is now coming to collect it?" Tom had known Harold since they were kids

in preschool, not that Harold took any of Tom's classes, but they were friends never the less and Harold had been hired as an Enterprises guard as soon as he graduated.

"Oh, please have her escorted to the visitor lounge and I'll be there in a minute or two." Tom was at a loss as to why she of all people would want to see him. He had only taken a single class from her—a mandatory "Appreciation of Music" class—but fondly remembered her as a wonderful and enthralling teacher. She, too, recalled the young Tom Swift as a dreamer and not totally connected to the coursework, but also as a brilliant student who had challenged her for explanations about music that might only be expected from a college-level student. They had become friends.

But, if not something about himself, he then considered that his younger sister, Sandy, was in trouble with the teacher. Tom vaguely recalled reading that Mrs. Trunbridge was also teaching an advanced music class at the nearby Senior High School, and that Sandy was in that class. As Tom entered the lounge he immediately knew what table she was sitting at. She was

surrounded with past students that saw her sitting there and they just had to say 'hello' to her. She was by far one of the most popular teachers in the school. It took a full five minutes before the crowd of people stopped coming over and Tom had her full attention to himself.

"Mr. Thomas Swift," she finally greeted him with a twinkle in her eye and in her firm, controlled voice, offering her hand. Tom was taking aback by such formality, especial from and older person like her.

"Tom, please," he returned as he took her hand and sat down across from her. "How did I earn this pleasure from Sandy's favorite teacher?" he inquired still thinking it was about her.

"Now Tom, this is not about Sandy, even though she is a model student. I'm here under another capacity. Along with my school classes, I volunteer at the school of the deaf and learning impaired as a music teacher and I have a request for you." She stopped talking and tilted her head and waited.

Tom knew that she was waiting for his

question why, but he had a slight inkling of what she wanted. A little birdie named Sandy had approached him a month or two back and Tom told her it was out of his field of expertise. This must be another try for his help and support for the school.

"Mrs. Trunbridge," He started off diplomatically, "we at Swift Enterprises do support your school each year with a generous gift and scholarship program and I... "

She laugh and took one of his hands into hers. "My dear, young Tom," she spoke in a soothing voice, "I'm not here to get more money out of your organization, not that I would turn it down, if offered. I need an invention out of your vivid mind, one that would truly help thousand of impaired students the world over."

Tom was now total intrigued in what she had to say. "Sorry for my misunderstanding," he told her with a small smile. "Please tell me what you have in mind, and if it's possible, I'll see what I can do for you. But you must understand that I probably won't be able to work on it full

time. I already have two different projects going on at once right now and I doubt if I can add another one to the mix and get any of them done!"

"That's totally alright, Tom. I know you are very busy but once you hear of what I want I think you may change your mind on where I am on your list of things to do!" Added to the twinkle in her eye she now had a smile on her lips.

Tom took a second look at her and could tell that she meant what she said.

"With that type of confidence, Mrs. Trunbridge, you have my full attention. Please explain what you need." Tom sat back in his chair and gave her a nod to go ahead.

"Tom, you know the old adage that music soothes the angry *beast*? Not that I'm comparing my students to angry beasts, it is just that their minds are so locked in at times and they have no release for their frustrations in our world that they react violently as a discharge for their inner pain."

Tom nodding his understanding on this known behavior.

"Music is a key to unlock their doors—we found out that music does wonder with these poor trapped children and if we can get to them fast enough it's a tremendous help. But some of them have no way to express themselves, especially the hearing and physically challenged youngsters."

Tom was at a loss on how he could help so trapped a person. He was not a medical or physiological scientist; he could not fix their crippled minds or bodies.

Mrs. Trunbridge could see the 'why did you come to me' look in his face and she knew that she better explain quickly or all might be lost. "Tom, I know you are not a doctor and that you never studied medicine but what I need actually is up your ally. I need or want, if you will, an electronic device that can read muscle impulses and turn them into something that sounds like music, any kind of music. Something that doesn't have to be attached to the body, but can be nearby and not obtrusive. If it can make different sounding instrument it would be a plus. Can you do it?"

Tom could hear himself answering her

that he would definitely try and would have something for her in a week or two. She got up and thanked him profusely and left before he could reconsider it. Tom blinked and tried to refocus his eyes. But by the time he did, she was out the door.

"Now I know how it feels to be total hypnotized by someone." Tom spoke to no one in particular. He shook his head and went off to find his father. As he expected he would, he did find his father in their large, shard office and asked if he had a few minutes to give him. Mr. Swift nodded and both went over to the easy chairs in the corner of the office and sat down. Tom sat at the edge of his chair and, looking at his father, said two words. "Mrs. Trunbridge."

Tom's father broke out into a grin, shook his head, and asked, "When did you run into Olivia and what did she asked of you?"

"You know her, personally?" Tom asked in surprise. Even he had never heard the woman's first name and believed it to be some deep secret.

"Oh, we had an interaction a long time ago, Tom, and that one time was more than

enough for me!" He chuckled out loud.

With a quirky smile Tom said, "So, it's not only me? She has this way of drawing you in."

"No, Tom, it's not you. If she had the Brooklyn Bridge to sell you, you just might buy it. It's more like you want to help her, she is so sure of herself that you do not want to let her down. That is why she is so good of a teacher. Even her students want to please her." His father looked at him closely to see if he understood.

The young inventor told his father about the teacher's request and about the needs of these special students.

"Are you certain that you have enough of an understanding to help?" Mr. Swift asked. "I mean, from what I know there are about as many differences in their individual needs as there are individuals. But, there might be some common ground. I'm not the one to ask, though."

Tom nodded his head. "Humm… maybe I need to talk to Doc Simpson about her request. This may be more along his line of work."

"Good luck on that Tom. I know I don't want to undertake anything that involves Mrs. Trunbridge; somehow it always gets out of hand."

* * *

"And you want me," the astounded Doc Simpson was responding to Tom, "to tell you that musical ability is detectable by medical instruments, like EEGs and MRI's? Sure. We can now see a lot of the brain's activity with the newer MRI's scan machines, but to be able to point to a precise spot in a human brain and say, 'that spot will let you control a musical instrument,'… no way!"

"No, not that Doc. Can you detect the musical beat in the brain, not the ability to play the music?"

The young doctor thought for a moment before responding. "Oh, I see now, Tom, and the answer is still *no*. I may be able to show you what nerve endings are firing off to pay an instruments but to capture the creative process itself?" Doc Simpson shook his head 'no'.

"I was hoping that one of those squiggly

lines on an EEG tape might be something I could tap into," Tom said rather sadly.

"The EEG does nothing for what you want, Tom," explained Doc Simpson, "the MRI is the best imaging system in use right now and it can contrast certain area of brain activity while it is being used, but the size of the equipment involved makes it non-portable. And, prohibitively expensive! The patient's head has to be held perfectly still and the procedure is slow and loud. Sorry I can't help you out, Tom. If you want to pursue this I would suggest that you go on the Internet and look up the most recent research in the field."

"Can you tell me what's holding up the speed and size of the machine?" Tom finally asked as he walked to the office door and opened it.

"A couple of things I can tell you right off. The rare earth magnets are hard to get… it take oodles of power to run… and the computers are slow in correlating all the data. Other than that, they work great!"

Chapter Four: Information Overload

For the next two days and part of the nights Tom never left the office he shared with his father. He saw an immediate connection between Mrs. Trunbridge's request and the needs to tell if a pilot, or any other machinery operator, was in good enough health to fly or work. Now he had only had to decide if muscle impulse or brain activity was the way to investigate. Or, did he have to do both? The more he looked at it the more convinced he was that both were need.

As for his third problem the same device that watched over the pilot could trigger the safety landing system, if he could fashion one. That one he was going to leave on the back burner and let it simmer for awhile. Chow Winkler, his Texan cook, always told him that something's always tasted better after a long simmer, like chili. Tom loved his chili!

After all that time reading and studying he can to one conclusion—he had to find a

different way to accomplish it. There was no way that present technology could do it. That lifted a ton of weight off his shoulders. He did not have to reinvent the wheel and try to improve it, all the time living within any predetermined boundaries he might inherit in the process. He could be his own man, and that he liked!

Like what happened during the initial phases of development on all his past inventions, Tom had a way of seeing the world in a different light. He sat back in his chair and slowly swiveled it around, noticing various things about the office he shared with his father. Along the walls were models and paintings of their most famous inventions. Tom stopped moving his chair at one of his first major breakthroughs.

It looked more like a camera with an extra large lens on it. It was his Damonscope, a device he improvised when he needed to find a kidnapped scientist in South America when he was down there testing out his atomic powered, three decker Flying Lab aircraft. It worked on the principle of detecting the precise vibrations giving off by every know element. That

invention had proved to be the springboard of so many of his later inventions. Maybe, just maybe, there still was one more device or idea left to be squeezed out of that device.

"Think, Tom, think! What kind of relationship can you get with knowing the concentration of elements and compounds in specific areas of the brain? Can it be measured with the output of Alpha, Beta and other brain waves? Is there a correlation that can be found?" He drummed his fingers on the desk top near the keyboard. Tap, tap, tapping to the beating of his thoughts, his brain synapses firing off, muscles receiving signals and movement intensities, his finger reacting to the beat.

What drove this whole wonderful, mysterious brain machine? He knew it was a biological, wet electronic computer that was way beyond what man could hope to archive with solid state electronics. What was the common dominator between the two? Electrons... they both depended on the movement the electrons. And they were the hardest to detect, individual or in small groups. Sure, in large groups you had the magnetic field, but...

Even his Damonscope detected the combined vibrations of both the nucleus and electron field. But what was the individual vibration of each. Now he had to find a way to separate that into its two basic component wave fronts. The exact frequency of the protons and the electrons before they combined. He needed to establish a field with no interference in it and the only way to do that was with cryogenics, but that in itself threw out the possibility of a lightweight or portable detector. Unless he could manage to use room temperature...

Tom's fingers typed into the computer and called up the roster of scientists on the Outpost. "There," he spotted the name he wanted.

He touched his TeleVoc pin and spoke the name he found. "Doctor Hansson," he subvocalized and in a moment he received a response from the operations center.

"Transferring connection to satellite relay. Please stand by." Tom expected a short delay, but an answer came back very quickly.

"Ah, young Tom, what my I do for

you?" a male voice asked in his West German accent.

"How are your superconducting materials experiments doing, Doctor? Do you have a likely candidate?" Tom wanted to get right to the heart of the matter before the good doctor got wound up and started to talk on the most minute details of his new pet project.

"We are making progress, young Tom," as he always called him, "but if you seeking a dependable room temperature wire, I must then say we, or rather I have failed. We can do it if you're willing to run it at minus one hundred degrees Fahrenheit, in your temperature scale. But we are getting close. We have achieved millimeter dots, but a last…"

"Doctor!" Tom cut in excitedly, "Do they run true? Each dot is superconductive?"

"Oh my yes, young Tom, But we can't manage to stack or fuse them together to make a long line of them. The terminus of the dots just won't line up."

"Gee, will you be willing to send me several hundred of them to experiment

with?" Tom did not wish to force a request.

"Can't see any harm in that. It's just so frustrating. I was sure that moving this procedure off of Earth and into a microgravity environment would do the trick."

"May I make a suggestion?" Tom asked attentively.

"Of course, I'm always willing to listen to you," he replied.

"Ask Ken Horton to make available one of our micro lab satellites and try it again at one of the Lagrange locations, not one of the nearest ones. You still may be to near a gravity source."

"If you're willing to spend the money to get us out there, we are willing to go. My people and I have discussed this option once or twice before, but we did not think your organization would foot the bill. The Science Director at my home organization does not see the need—he is reluctant to authorize any expenses as our research has not led to the breakthrough we were hoping for."

“Let us just write it up as a dual effort on our parts and we’ll share the result if there is one. Does that suit you?”

“Very much so, young Tom, very much so.”

Tom ended the call after arranging the excursion with Ken Horton, the outpost administrator, out to a suitable Lagrange point and the addition of the project to the science contract with the West German University.

Tom now felt that he understood the missing part to detecting electrons individually. If electrons combined with the protons and this action set up the vibration that he measured for the repelatron beams, then he should be able to stimulate that vibration by using a correct ‘clean’ ultra-long frequency wave and pinpoint it with another wave ninety degrees off center. With the ‘X’ and ‘Y’ coordinates now established he could use his element vibration detection device for the third ‘Z’ coordinate and pinpoint it in relationship to its surrounding. Assuming it all worked together, he now could build a bit-by-bit

map of that electron's movement, or as some theories explained it, the cascade or forward bounce of one electron to the next.

In his mind's eye it all took shape, and he mentally took inventory of all the items needed to turn the intangible into reality. When he finally realized his surroundings again he was surprised at how many hours had passed. He quickly added his thoughts to his computer research file and called it quits for the day.

In a very happy frame of mind he picked up the phone and dialed Bashalli's number. He had a lot to tell her and he hoped to do it over dinner at one of their favorite restaurants.

Chapter Five: Making It Work

Even with his well thought-out plans, things had the possibility of going wrong. So Tom took the extra precaution of setting up his new 'Electron Locator' or El-Lo for short, behind his Tomasite blast screen. It could withstand the detonation force of several sticks of dynamite.

Bud was looking at the device's three piece arrangement. To achieve the measurement of 'Z' in the equation, a mini repelatron dish hung twenty-four inches above the chamber's work surface. Two more cube-shaped frames filled with electronic components were on the table the same distance away from under the Dish's downward center line and set at a precise ninety degree from each other. Directly under the dish ran a thin length of bare copper wire that was attached to a 9-volt battery and to a toggle switch on the control panel in front of the plastic shield.

In the thirty-two hours that it took for the superconducting millimeter dots to arrive from the Outpost Tom had rigged up the rest

of the equipment. He was just finishing linking fifty dots to the ‘X’, ‘Y’ and ‘Z’ wave generator output antennas on each separate piece of the El-Lo. When done he slip the three one-inch-wide cylinders in place and turned on the three guidance lasers. This last step allowed him to exactly align the two antennas with the now enhanced vibration sensor in the repelatron dish.

Tom flipped a few switches and turned on the small monitor that sat on a table next to him. A small green dot appeared in the center of the screen and expanded until it filled it and the wire was seen on the screen. Satisfied, Tom then reached out and slowly began to turn the first of the three rotary dials. A set of numbers started to flicker in the top right corner of the monitor. Tom stopped it when it registered the vibration frequency of the element of copper. He now had his ‘Z’ reading from the repelatron sensor.

Placing his finger on a touch pad under the first dial, Tom slowly magnified the view on the monitor until he was viewing the computer’s image of the copper wire’s

element structure. Although this was a computer simulation as not even the strongest electron microscopes could provide a real-time picture with this much detail, it showed hundreds of bumps that represented the nucleus of the copper element with blurry comet-like tracks of the electron field. This graphic was the closest that anyone had come to viewing the actual element configuration.

If Tom's theory was correct the nucleus of the element was vibrating at one rate and the electrons were at a different one. Combined together, they sent out the vibration that Tom was now detecting with the help of the repelatron dish. The major part of the vibrations should be coming from the protons in the center, so if he could match that frequency he could cancel it out and what was left would be the electron vibration. The 'X' and 'Y' antennae's sent out the ultra long, static-free frequency field to cancel the proton vibrations.

Bud, watching the whole procedure, was stymied. He could not see any difference with anything. Nothing moved inside the chamber and from what he could see,

nothing was changing shape or color. But the smile on Tom's face told him that something was working the way he wanted. And the way he was playing with the dials...

The explosion was tremendous. By instinct they both ducked under the clear plastic panel and fell to the floor. Shards of Tomasite plastic flew everywhere. Alarms were set off and fire doors slammed closed. Sections of the explosion proof chamber were flung outwards and into the walls with a few even piercing upwards and through the roof.

Miraculously either boy was hurt. Their ears were ringing and showing no signs of stopping. Bud's nose was bleeding from when he hit it on the floor as Tom fell on top of him. There was no fire or smoke, only plaster dust filled the air.

Tom reached up and over the edge of the bench to try to turn on the air exhaust fan but he couldn't. The control panel was a total wreck; the fan was hanging out from the ceiling in pieces. Before Tom had time to help Bud to his feet the fire door gave way as the Swift's Emergency Response

Team came rushing into the room.

"What happened?" Hank Sterling—filling in for the normal ERT manager—called out as he led the team of rescuers in. Tom was handing Bud a handkerchief for his nose and then shook his head pointing to his ears.

"Sorry," he responded in a very loud voice, not know what was said. "Can't hear a thing! My ears are ringing." Before the boys knew what was happening, Hank had them on their way out of the building, but Doc Simpson meet them at the front door as he raced from the ambulance he arrived in.

Doc loaded them into the vehicle, ignoring their protest that they were now alright and the ringing in their ears had practically stopped.

No matter what Tom said, Doc insisted that the "proper instruments to judge their condition," were back at the Infirmary. But, after peeking inside their ears and having them take a brief hearing test he declared them to be about as good as new as could be expected. "Just promise me to wear ear protection if you are going to do anything

that might go boom in the next forty-eight hours," he told them.

Hank show up at the Infirmary by the time the boys were ready to leave the examination room. Seeing them walking out with the Doctor behind them and a smile on everyone's lips he knew they were alright and with the sound of relief in his voice, he asked, "What the hell happened in the lab? What caused that explosion? We can't find a trace of chemicals anywhere… only electronic parts!"

"A small piece of copper wire," Tom explained with a laugh, "All that came from one very abused small piece of copper wire!"

* * *

It was some hours later that Tom and Bud sat before Mr. Swift and the in-house accident review board that was made up of several department heads.

"Dad, I goofed," was all Tom could say to everyone. "I thought that I was just canceling out the proton vibration—not stopping it! I guess we now know that the vibration helps hold the element together

and it's just not all magnetic force. All the energy was released at the point where I was exposing the copper wire to my beams. Whoosh!" Tom was still amazed at what had happened and the final conclusion it led to.

"So, Tom," inquired his father, "if I get the meaning of 'whoosh,' I would have to put down 'Cold Fusion' as your reasoning?" Mr. Swift could not believe that was the cause of the explosion.

"I don't know what else to call it, Dad. The electrons zoomed out of their orbits and the copper element fell apart. That caused a tremendous release of energy—cold fusion if you ask me because I can't think of anything else to call it right now. I can't think of a better term, can you?" Tom asked looking at his father with a half smile on his face.

"Well, Son, I suppose not. Can you control it the next time and not have it explode all over the place? If so, you and Bud may have stumbled upon something science has been searching for over a couple decades. And, if that is so, we're starting a whole new era in modern technology. The

'Holy Grail' of electrical power was born today right here at Swift Enterprises!" Mr. Swift believed that his son had just freed the world of one of its most sought after commodities. Jobs might be lost in the short term and the world's financial structure could be shaken, but in the end more jobs and prosperity would win out. No one had to be held back because of lack of energy and fossil fuel pollution would be a thing of the past.

"Congratulations, Papa Swift," Bud said with a big grin slapping his friend on the back. "What are you going to name it?"

Doc Simpson, one of the accident review board members, spoke up. "Tom, you say all this came about because you were trying to find a better brain scanning device?" With a chuckle he added, "Eliminating the brain does solve the problem, but it does raise a slew of other ones, especially for the patient!"

"Come on Doc," Bud quibbled, "with the top of the head blown off you can just look inside and see that there is no cause for any further examination."

* * *

This time Tom took his experiment out to the jet and rocket testing site known as the 'Pit' at the far northeast corner of Enterprises. It was not used much anymore, and it was on the verge of being demolished. The El-Lo was set up in the concrete-lined pit and next to it was Tom's cold fusion reactor. Tom, Mr. Swift, Bud and a few other were in the blockhouse several hundred feet away and had to be satisfied with watching the two experiments on video screens. An extra pair of cameras had been mounted providing six separate views. Tom had even updated the high-speed digital camera and could now be assured of thirty-thousand frames per second, enough to see anything going on.

"What is going to stop it from exploding this time?" Bud whispered to his friend as Tom started to power up the equipment for the El-Lo device.

"I won't be using both the 'X' and 'Y' coordinate units to cancel the vibrations. That is what did it. This time I'll only use one. Besides, the computer did register the

frequency of the proton vibration before the explosions the last time, so I will have a heads up this time." The simulation monitor held the same view of the copper molecules as before and—as the process began—all was stable to Tom's delight. The protons disappeared from the screen and only the comet-like orbits of the electrons could be seen.

Taking a deep breath, the young inventor muttered, "Now for the final test, to see electrons flow in the wire." He flipped the little toggle switch on the control board and the electric current was applied.

The screen went blurry as the outer most electrons were bumped and replaced by other electrons, only the trails could be seen of their lightning-fast movement. Tom reduced the magnification and an actual section of the wire could be observed. It looked surreal viewing it as streaks, or as fast disappearing lines, as they were replaced by others over and over again.

By changing the 'X, Y and Z' coordinates, Tom was able to see into any position in the wire. Next was to try it on

organic matter and then finally on the brain itself.

Tom turned off the El-Lo device with plenty of cheers and back slapping from his friends. He stepped over to the second set of controls that had been set up for the cold fusion reactor. He looked to his dad who nodded his head. Tom could see in his face that he was pleased with his son's achievements. He was certain that the reactor would be a success also.

Mr. Swift looked forward to the time of being able to shut down the Citadel atomic power plant for making electricity and devoting it to pure research. The atomic waste was becoming more of a hindrance than it was worth. "Maybe," Mr. Swift thought to himself, "the cold fusion reactor could be used to get rid of the atomic waste? Now that's a line of research worth looking into!" He pulled out a notebook and made a note to discuss this with Tom.

The cold fusion reactor was no more than a double-wall box with the three El-Lo components set in position and its beam field narrowed so it was only a few

molecules wide. An ultra thin wire was feed into the center of the field at an incredibly slow rate that allowed continuous disintegration of the wire. The controlled amount of heat released was used to turn the water that flowed between the walls into steam under pressure and that used to turn a generator that produced the electricity.

For now Tom was happy with this system, but he looked towards to a time when he would harvest the electrons directly into free flowing electricity.

Chapter Six: Dreams

Doc Simpson always wanted to work hand and hand with Tom Jr. Unfortunately, their fields of expertise very seldom allowed them to work together. But this time it did. Not that the doctor could assist with any of the electronics, but Tom was glad to have him helping with the biological specimen, the frog. Big, green and slimy looking, it was not what Tom was used to handling. In the end—following four weeks of non-invasion experiments—the frog was released back into the pond where it came from, no worse for the wear.

Tom had stripped away all the superficial gear he no longer needed. He no longer had to find the frequency of the electrons, which were always the same. He also did not need to read all the other substances of the brain, so he eliminated the frequency scanner too. He was down to the bare essentials, the reading of electron flow and the reading of oxygen that showed were the blood flow was and was not. It even showed where blood clots or hemorrhages

were located and how big they were.

The hardest obstacles to overcome were the placement of the three sensors. Being a head scanner, that did not allow them with the ability to use some type of head gear because that was where the damaged was and any motion to position the gear could cause irreparable additional damage. And mounting the sensors on three separate tripods would not work in an accident situation or confined space.

Tom threw out all the rule book applications and went to the only practical solution, the ‘X and Y’ sensors strapped to the palms of the operator’s hands and the ‘Z’ sensor on an extendable gooseneck rod coming from the monitor box that would need to be placed next to the patient anyway. By moving the hands around the head, rather than touching it in any way, a different portion of the brain would be viewed on the screen which could show the two available functions separately or combined.

In the end he devised a pair of adjustable gloves that incorporated the sensors along

with several control buttons easily manipulated by the wearer so they would not be called on to reach back to the central control box for such functional changes.

Greg Simpson's admiration for the capabilities of his young boss grew with each day. Tom had been able to absorb and seemingly master numerous complicated physiological concepts faster than any med student he had ever encountered.

As they discussed their initial success, Tom and the young doctor came up with several other uses for the system. If wider field sensors were used—easily interchanged on the sensor gloves—a portable body scan became one of them showing the blood flow which could tell so much of the body's condition.

Once sure that no ill effects showed up on the frog, Doc Simpson called in a few collogues and veterinarians he knew and respected and asked Tom for permission to pursue medical approval for the device.

By this time Tom fully realized that he could now step back and let the good doctor take over, the device was in good hands and

he would be called upon if need. Doc helped Tom out on one more thing: finding the best locations to read brain waves for the listening to, reading and playing of music.

This was not as easy as Tom earlier thought it would be, for there was no one location but several. In fact, the whole brain was used in various degrees and in overlapping duties. It was easier to set up the sensors for reading the muscle impulses after they left the spinal cord for arms, hands and fingers movements. The actions of the hips, legs, and shuffling of the feet came next. By now he had two of his most powerful Little Idiot laptop computers running simultaneously, and that was just for the body inputs, never mind the brain.

What Tom thought was going to be the easiest of the three projects was turning out to be the hardest. The worst was yet to come for him as it became evident that no two human brains held the working functions in the exact same spot. Sure, they would be located within the same general brain area, but the precise spot could move about with quite a bit of latitude. And with the physically impaired, it could be totally

skewed. And, in rare cases, missing entirely.

For his portable unit Tom final had to settle on the right cortex's temporal auditory area for the function of the musical beat. He then tied it in with the matching impulses coming down the spinal cord. It was the best he could do and he had some success using himself and Bud as guinea pigs for the system. But, as Doc pointed out, he needed real world testing. So, Tom packed up his prototype and visited Mrs. Trunbridge at the special needs school where he was allowed to work with one of the less-impaired children.

Five minutes after he started, Tom knew he was in trouble. In his own mind scans the computers had struggled to keep up, but with impaired children it became even more impossible to sort out all of the conflicting and missing data.. He now felt that he let Mrs. Trunbridge down.

Later that night he met with Bashalli as she got out of work at the *Glass Cat* coffee shop owned by her brother. Tom was at a low and she felt it right away. As they strolled to his waiting car he told her of his

findings and disappointments. She leaned over and kissed his cheek and asked him to take them both to his lab. She wanted to see what he had done.

Once back at the lab Tom turned on his computer terminal and plugged the weird-looking headset into the input jack. The current head set was more a beanie type cap with a tail that touched the back of the neck to sense the spinal cord. On seeing it she giggled and exclaimed, “It has the look of a handle on a tea cup, Thomas.”

He gave her a small grin. “That’s exactly what Bud said.” He tried to explain the entire set up. The beanie had hundreds of room temperature superconductive dots that allowed the whole brain to be read. Tom had another headset that consisted of just two contact points plugged into two Little Idiot laptop computer. This was his stripped down model that he used at the school. He want Bashalli to see both versions.

“Thomas, this does not seem to be as bad as you stated earlier. I do not understand. Even for a child who cannot sit still, adding a strap under the chin should

hold it in place." She was at a loss. The cap and wire was not bad at all to wear.

"Bash," he sighed, "it's not the cap or the wire. It's the computer that its need to run on. This terminal is part of the mainframe computer that helps run *all of* Swift Enterprises. I'm taking over fifteen percent of its computing power to run this music reader. Just so you know, that's no small number by any means. All of Engineering uses just eleven percent!"

She made an 'oh' sound with her lips, for she had seen the mainframe computer section at the Computer Science building.

"There is no way to shrink it into a smaller package. I've tried for the last two day. This," he pointed to the laptops, "is the best I could do. Now, we'll start you on the mainframe and then the portable so you'll know the difference."

He typed in a few commands into the computer and looked at Bashalli. He told her to think music. She looked at him like he was crazy and thought of a simple childhood tune. It flowed out of the speakers just as she remember it, then it want fluky as she lost

her concentration on it. She laughed and tried a harder tune. Once more it filled the air as she wanted it too. She even improvised a few notes into it and was delighted by the results. She had an ear for music and in a short time she had her own tune issuing from the speakers.

And when Tom told her that there was a built in sound synthesizer and she could make it sound like any instrument she knew of or, with time, make up her own sound, she loved it. She still could not figure out what Tom did not like about it.

He removed her cap and replaced it with the one he had hooked up to the laptops so she could experience the real difference between the two. “Remember what I told you. You now have only two points of reference to make your music with!”

Bashalli looked at him. After all, this was Tom who sat before her telling her this; she could not believe that it would make so much difference. When he made something he always did the absolute best he could for it. But, this time it did make a difference. A very large one. She was able to get a beat, as

long as it was not to complex, but it had no mood, no soul in it. It was flat and totally unnatural sounding.

"Thomas," she almost shouted out, "this will not do! You must fix it, please!"

"Bash, I just wish I could," he said sadly reaching out to take the apparatus from her head. "But like I said before there's just no way of getting the computer power and speed I need from a portable computer."

"Then don't use the laptops, use the mainframe. Do not carry the computer with you. Use it from a remote location just as you do with that tablet computer you always carry. That is what Wi-Fi is for, is it not?"

Tom was dumbfounded! Why did he not think of that? He could set up a super standalone computer just for the music program and hook it up to the internet and Wi-Fi systems. It would be a simple thing to do for his computer department and they could maintain it too. Unwanted use could be controlled by having each headset incorporate an authorization circuit.

Tom looked at Bashalli's face and she knew that somehow she had found the

solution for Tom. She was very glad for that. She was even happier after the long loving kiss he gave her as her reward. After the kiss Tom went silent for a minute while he went over all the small details in his mind. Finally, looking up and into her proud and happy eyes, he felt that he could handle the Show and Tell for Mrs. Trunbridge and he persuaded Bashalli to accompany him.

She agreed to do so only if he would make two special items for her—and when she told him what they were he readily agreed to do it.

Two days later Bashalli and Tom were meet by Mrs. Trunbridge at the front door of the school devoted in helping disable children. She took them to the music room where they set up the laptop to connect them to the Swift's mainframe and placed the three headsets Tom had made. Two were what Bashalli wanted.

Alone with Mrs. Trunbridge, Tom explained the device as Bashalli demonstrated it. Mrs. Trunbridge was ecstatic about it and in no time she too had the fundamental feel for it. With the sound

synthesizer, they could select just one instrument sound or a whole band and work it from there. They now had an air guitar, organ, drums or anything else the child wanted to pretend to play.

"Tom, this is better than I imagined it could be," Mrs. Trunbridge spoke enthusiastically, "but we need one other thing!"

Tom looked at her with a frown. "What did I forget?" he asked.

"We need one of those interactive screens to show the children what they are doing, what they are playing. Can you add that?"

Tom's face broke out in a smile. "That, Mrs. Trunbridge, will not be hard to do as long as you have a big screen television to watch it on?"

"That, Tom, we have."

"Then give me a few more days and you'll have it all. Now if you have a few students available, I would like to see what they can do with this device as it is."

"That would be a pleasure, Tom. I have

a couple of really gifted children that I'm sure this would work for just the way it is." She returned five minutes later with her two charges. A boy of twelve and a girl of eight years old.

Tom recognized the girl as the one he had worked with weeks earlier. She smiled at him.

As Mrs. Trunbridge reached for the beanie cap, Bashalli stopped her and reveal the two special caps Tom had made for her. A king's crown and a queen's tiara. "I thought," Bashalli explained, "that the children would like to wear crowns instead of just the plain old beanie!" And she was right, when offered, the children both reached for the crowns.

And after an hour spent learning how to use their "crowns," and practicing, the music they were making was not that bad. In fact it was getting better all the time.

* * *

Later after the Show and Tell, Tom told Bashalli about the airplane health system he was about to start constructing. He had planned it out with Doc Simpson as they

worked on the head scanner. That was turning out to be the simplest of the three projects.

As he explained to Bud one morning as the flier dropped by for a chat, “Now the second part of this anti-crash system is another thing altogether. To land an aircraft with no pilot and no remote controls, no matter how small, will be no mean feat.”

“But, you have a plan,” Bud told him, the tone of his voice implying his explicit faith in his friend’s capabilities.

Tom smiled. “I do, indeed, have a plan!”

The next day Tom handed the music program over to the Advanced Computer department and asked that they add the interaction animation to it and to design and construct the computer system to run it on. He also emphasized the need that it could handle internet access, for it had the probability of going worldwide. Finally, he instructed them that they could add the video to the Swift’s mainframe for now until they had the other system completed and that only one location would use the music program on the mainframe until the new

computer was completed and running.

The department was so eager over the prospect of this new system that they were at it before Tom left the building. That was the thing he loved about the people he worked with—they had a zest and zeal to achieve new things.

Back at his lab he diagramed the medical detection device that only had to monitor one region of the brain, the hypothalamus. It regulated body temperature, blood pressure, heartbeat, metabolism of fats and carbohydrates, and sugar levels in the blood.

It was a comparison between know healthy electrical levels against bad ones. This device only had to measure and compare between the two. When any one was off by a set margin an alarm would be given and the pilot would then make the decision to not fly or, if already in the air, hopefully land before it got to out of hand. If the plane was equipped with an auto pilot, the device would engage it and the radio would send out a medical alert.

Tom was happy with this part of the device, now to tackle the landing part in

which he still did not know how to handle. He looked at his watch and saw that another day was gone. It was long past five, so he decided to call it quits for the day and go home to a dinner prepared by his mother and maybe kick around ideas with his father.

Chapter Seven: It Never Ends

"Son," Mr. Swift said between bites of pot roast, "I hear that you gave the computer department quite a job to finish today. That is not like you, and so I feel that I must ask, what gives?" He was concerned for Tom as the boy never gave up on a project.

"Oh that," he chuckled as he bit into his mashed potatoes and gravy. "What I gave them is only animation work. The type you find in the video games these days. I figured it was more their line of work than mine. And I am giving them a chance to come up with a brand new mainframe computer to run it on. I was going to ask you if we need to get our lawyers on this one. We may be going into the internet gaming business with this item if it turns out right."

"Tom, we have never done anything like this before! Do you think it is wise?" He stopped eating, holding his loaded fork in front of his mouth.

"If the graphics come out right, and I'm sure they will, then I say 'yes.' I've asked

Bashalli to do the fundamental design sketches. We could make a killing. This is all part of Mrs. Trunbridge request and if it does catch on I would like to give her part of the profit. I'm sure she will use it for the school she volunteers at and at the junior high school. But for now I don't want to let her know. If it doesn't work out she won't be disappointed that way. But Dad, I thought it was good before she suggested the interactive video, now it's a shoe in." Tom also was holding his fork in front of his face.

Seeing them both in identical poses, Tom's mother and sister almost burst out laughing.

"Gentlemen," Mrs. Swift interjected, "is something wrong with my pot roast? You both stopped eating?" She had a twinkle in her eyes.

"Tommy's not eating," Sandy teased in a child-like voice. "No dessert for Tommy!" Tom gave her a little look, crammed the fork full of meat into his mouth and after a few bites he opened his mouth for his sister to see.

"Yuck, that's disgusting!" she shot back

in a loud voice, making a face.

"Children," Mrs. Swift scolded, "I thought you have both out grown this type of horse play. I don't want to see it ever again!" And she frowned at both of them.

"Tommy did a no-no," Sandy teased back as she picked up her plate and headed out to the kitchen where it was safe. She returned a minute later carrying the chocolate cake her mother had made for dessert. "Coffee, everyone?" she asked in her most pleasant voice and a smile on her lips. Everyone looked at her and laughed.

Over cake and coffee Tom asked his father about the airplane anti-crashing system. "I've even toyed with the notion of maybe morphing the plane into a better survival shape. What do you think?"

Mr. Swift finished his piece of cake before he answered. "Tom, if it was something other than an airplane I would think you had a chance, But a plane…" He never got to finished what he was going to say for Sandy cut in singing.

"Tommy's got nothing for his airplane… and his plane got nothing for him…" She

scooted out the dining room door, laughing.

Tom turned to his mother and said, “She being more of an airhead tonight than usual. Do you have any idea what’s up with her? She hasn’t acted like that in years.” *She has turned back into a preteen brat,* Tom thought to himself.

His mother shrugged and got up to go see what might be up with her daughter. As she left the room Tom looked over at his father.

“Ha-ha-ha, nothing for his airplane…” he said under his breath. He repeated the words to himself a few times. Then, aloud he said, “Nothing... plane... no plane? Why not!” He shouted out loud as he jumped up from his chair at the table. Mrs. Swift abandoned her attempts at talking with her daughter and rushed back into the room. Both parents looked astounded at him as they watch him punched the air above his head and flopped back down in his chair with a grin.

“Son, you better have a good reason for that behavior. Your sister first and now you?” His father told him.

"Dad, don't you see… '*Nothing for an airplane*'. What if there is no plane to crash? We can do it now! It's a bit radical, but what the hell… oops! What the heck!"

"Thomas A. Swift," his mother breathed, "this had better be good. I can still wash your mouth out with soap!"

"Mom, Dad, it's the plane hitting the ground, building or whatever that does the destruction. Remember the old saying that it's not the fall that kills you, it's the impact? What if there is no plane to hit the ground. What if there is only an escape pod with a parachute left. It might not work in all situations or even for all airplanes, but I bet it would help prevent a lot of losses. We can start by incorporating it into our own Pigeon Specials for starters. Think about it!" Tom was so happy that he even forgot about Sandy and her teasing.

"But how, Tom?" his mother asked with a look of dismay. She was a very smart woman but her men often said things that seemed so obvious to them, and went entirely over her head. "How do you get the airplane to just disappear?"

"Why, we disintegrated it. We can use cold fusion. The pod with the people in it gets shot out of the fuselage of the plane and the rest of the ship just turns into nothing. No— not nothing, but maybe into its component elements that just drift down as dust."

"But the plane, Tom? You just destroyed the plane?" Mrs. Swift was still not sure at what he was getting at.

"Mom, the plane is lost anyway. So, what makes the most sense. Destroy it in the sky as dust or would you rather have it hit the ground as an uncontrollable juggernaut?"

"Yes… your right, of course; dust is better than lost lives or property."

"Tom, you must go slowly on this one. It just may not work as you think. But, I believe it's worth the try. It's the *failsafe* that we must be sure of. It must not be able to go off by accident and it must be controllable. The plane can't hit a building and then start to disintegrate and take the building and everything inside with it." Mr. Swift was horrified about any possibility of

that occurrence.

He sighed. “You will get a lot of push back from the FAA and other Government agencies. If the plane disintegrates, what’s left to tell them what went wrong?”

Tom smiled. “The escape pod also contains the ‘black box’ for the aircraft. Far too many older models don’t have one so there is very little left to tell absolutely what caused a crash, especially if the pilot and passengers are dead. This way, everything about the flight is saved and ready to be downloaded and used immediately!”

“I’m still worried about this being absolutely safe,” Mr. Swift warned.

“I know Dad. There’s a lot to learn and a lot of risk if the process gets out of hand. So I don’t even think I’ll work on it on Earth. This sounds like a special space project to me and by robotic control until it is proven safe.”

Sandy had re-entered the room and now stood looking a little embarrassed by her previous performance. “If I can ask, what do you do until you can make that safe?” She had an interest in such things as she had

been flying planes on her own since she qualified at the age of sixteen, the summer before.

"Good question, Sandy. For now I will release the Health Alert Reader and let it go at that. Well, as far as airplane use goes. Doc and I are finalizing the field scanner units and Mrs. Trunbridge is getting her music devices for the in-need kids. And, I'm certain there will be uses for it in adults too, but later on." He looked right at his father. "You are right, Dad. To physical change or eliminate a plane with our current technology may be a bit premature. I'll take that one nice and slow, and when we are ready to do that... then we will."

He got up from the table. "Please excuse me, I have to call Bash and tell her that she got half her request. Maybe, later in the future, I'll get to tell her that her request is complete!"

Tom's mother asked one more question before he left—she had been thinking of something Tom had said before. "Whatever happened to the Balloon plane that you once played with, and why is the airplane industry

not using that?"

Tom told her how it was workable *if* the plane was made for it from the start, but it could not be developed into a conversion kit for all of the planes that were already manufactured. "It also included problems with space and weight issues of storing the helium and maintaining the systems."

She then innocently asked, "But, Tom, can't your new machine make the gas for you? If it can turn whatever element into gas or dust, can't it make helium gas?"

"Now Anne," spoke up Mr. Swift reaching over a patting her hand on the edge of the table, "Not even Tom can…"

"No wait, Dad," cut in Tom, "Mom may have something there! Let me think about it and I'll let you know." He went off to make his phone call and that was all that was said about the subject for the rest of the night.

* * *

Tom spent the next week out at the Citadel Nuclear Power Station the Swifts owned for atomic research out in the New

Mexico desert in the middle of nowhere. The native American's Zuni Pueblo and the town of Tenderly were its nearest settlements, and they were a half day's drive away in opposite directions.

Tom was well versed with the knowledge of nuclear energy and its explosive forces. But this time he needed a much tamer way to separate the atom's nucleus. He had to find away to finesse his way into the hub of the atom without tearing it apart and releasing everything else around it.

He had a good start because of his fusion reactor. It made him realize something that was not known before: the *Gluons,* as they interacted with the protons and neutrons, caused the vibration frequency that came out of the nucleus and combined with the electrons that he detected. Now, he had to go deeper still and find a way to separate the protons from the neutrons and control the sub-atomic Strong Force that held it together. Gluons had to be the answer, but he could not just neutralize them as he had done before—he had to get them to separate in groups of his own making and *not* use a

Cyclotron to do it. It had to be a small, neat device or it was useless for what he wanted.

In his small but complete laboratory at the Citadel he set up the original experiment… the one that blew up his other lab. This time he had only the smallest particle of lithium as his target, and it was set up in a vacuum chamber. This was the lowest number on the periodical table that was not a gas, and consisted of only three electrons and protons. It never occurs freely in nature, and it only appears in compounds. If he could separate the single elements, he would get hydrogen and helium molecules.

He also added two other wave frequency points, one at one hundred and eighty and one at two hundred seventy degrees. His thinking was if two waves separated the electrons and protons at ninety degrees from each other, would one or two more make a difference? This lead to the question, did the angle of the wave actually matter?

After a few frustrating days and countless failures he found his answer. It only took three waves and the correct startup combination. He needed the right frequency

of the molecule, Then, the second wave had to be set up at a precise angle, and that was the hardest to find and varied with each element—beyond ninety degrees, and finally the ninety degree one in that order. The lithium split apart into two elements.

But when he tried it on the next higher element, Beryllium, it did not work. It had a somewhat fizzy, popping disintegration that bewildered Tom. At least it didn't take out his lab, for which he was thankful.

He spent the next day burning the airwaves talking to his father and with several of the scientist at the research center. At the end of the day it turned out to be a casual remark by one of the scientist that turned the trick.

"Look, Tom, your element doesn't know what to turn into. With the lithium it had no choice, but the higher you go on the periodic table the more elements something can turn into. By the time you get to element six, simple old Carbon, you have the direct and unique possibilities, but you also have the six potential Hydrogens, or four Hydrogens and one Helium, and so forth. Somehow you

have to tell it what to become."

"How do you talk to an element?" That was the big question that the inventor posed with a rueful chuckle. "And if you do, will it pay attention?"

With that statement ringing in his mind, Tom made plans to catch a flight back home. To his surprise the next available transport out was three in the morning. Half asleep and with a headache, he climbed aboard and made his way to the jump sit in the flight cabin. That was the last seat still empty. Before they even get the plane off the ground he was back into a fitful sleep punctuated with erratic coughing.

By the time the plane landed at Enterprises he had a full blown head and chest cold. The trip made his condition worse. On landing, and with a red and runny nose and a wheezing, rattling sound deep in his chest, he went to see Doc Simpson.

Poking his head into the office he found it empty but he heard sounds coming from the back room where the Doc did some experimental medical research. Tom found him there working with some tissue samples

and Tom's new brain scanner.

Covering his mouth, while a fit of coughing racked through his body leaving him leaning against the doorway, Doc quickly turned and reach for Tom as he slid to the floor. Fifteen hours later he awoke in the infirmary with his family and girlfriend waiting outside and Doc sitting at his side.

"Young man, I'm glad you had the sense to come see me first instead of trying to go home." Doc was checking out his eyes, ears and mouth. Tom had a oxygen tube clipped to his nose, the tubes running back over his ears. On hearing the doctor talking, the family came rushing in led by Bashalli.

Seeing her, Tom raised one weak hand and wiggled his fingers in greeting.

Hours later when he once more opened his eyes it was a new day and he was feeling a hundred percent better. Only the docor was there with a tray of jello and juice waiting for Tom to eat.

"Try this first," he told him, "and if it stays down you can have something more substantial. And if that stays down I just might send you home to be smothered by

your mother, sister and possibly your girlfriend. Now eat and if all goes well I'll call them to pick you up."

After finisheing the diet delight he had for breakfast Tom and Doc Simpson started to talk. After a while, the conversation came around to what the medico was doing in his medical lab.

Doc laughed and explained. "Since I received the new scanner I've been trying it on everything that grows to see what it can show. And I tell you Tom, this device is going to change the face of medicine. The experiment I was doing was to watch the electrical process of bacteria growing in a sterile petri dish." Tom was very intent on what he was saying. Something was clicking in his brain. Doc continued with, "I seed the growth medium with one or two bacteria and in hours I… Hey!"

Tom tossed off his covers and made ready to jump out of bed.

Doc pushed him back. "Whoa there, mister. Where do you think you're going? My description of the experiment isn't so bad that you have to leave in the middle of

it."

"No, Doc, it's not that! You just solved my dilemma!" Tom was so excited that he tried to get up again, and was pushed back for his efforts. "I can now talk to the molecules. Don't you see I just have to seed the separated atoms to show them what to do? How stupid can I be?"

"Tom, if you leave that bed right now, you'll soon find out!" The doctor warned.

Epilogue: Eighteen Days Later

Bashalli was fidgety at Tom's side as he started up the modified Pigeon Special using his handheld remote controller and radio headset to communicate with the Swift's air traffic control tower. He asked for, and received, clearance to take the plane up.

Sandy was laughing at her from Bud's side. "Look at her, Bud," Sandy whispered. "You would think she invented it and not Tom!" Bud stepped back a little to see around Tom and stepped back into place.

"Yep, that there is one nervous Nelly for sure," he answered her in a country hick voice as he put on a dopey looking face. He was rewarded with a punch in the arm for his antics.

Mr. and Mrs. Swift finally made it back to Tom's side. They had become separated by the crowd of onlookers that always finds out when Tom was testing something new. His mother touched his arm and asked, "It won't disintegrate us all if it gets out of hand, will it?" She looked up into his calm, intelligent face.

"No, Momsie, it won't. In fact it can't. You see, when my lab exploded we should have known then that it could not happen." His mother made an 'OH' sound. "The proof was that Bud and I and the rest of the lab were still there. The short of it is that the breakdown of the atoms can only happen in the frequency wave field and not beyond it, and if the field is upset and any way it shuts down. So it's self containable. If you want a big frequency field you need to move the antennas farther apart and you have to square the power output for every foot of distance out. And when you get beyond a certain size, and that's not all that big, it gets unstable and explodes. So the relative size is very limited. But for once you do get a big bang from a small size if you're not careful, as I already proved." He took a quick glance at her and added, "Too much detail?"

She nodded, but smiled anyway.

Tom concentrated on flying the plane and lining it up for its test flight as he talked to his mother.

The crowed of people quieted down as the drone of the Pigeon Special became louder and they could see the airplane

approaching. Bashalli gripped Tom's arm as the plane neared and was only one thousand feet above the ground.

"Ready, Bash?" Tom asked. She nodded and Tom started a small countdown. "Three, two, one, now!" he told her. Her fingers flipped a switched on the corner of the controller and the droning noise stopped. Within seconds, the propeller of the plane almost stopped spinning; it turned, but at a leisurely pace.

The plane dipped for a moment and then a strange thing happened. The plane sprouted two balloons, one from each wing where it joined the fuselage of the aircraft. They inflated at a fantastic rate. Vents had opened on the bottom of the wing and high speed double-ended fans started to whine into action.

Air was sucked in and forced into the *Atomizer*, as the field chamber was called, separating the proton and neutrons and getting pulled forward past the minute flow of helium gas that acted as the seed and caused the particles to reform into more helium. Extra elections were drawn off and used to help power the whole operation.

Another set of fans filled up the balloons with the newly made gas. When the right pressure was obtained in the gas bags, the device shut down automatically.

The drag of the filling balloons forced the ship to a standstill in the air. Before the plane had a chance to fall even a few feet it started to drift sideways in the air, slowly being pushed by a light wind.

Its fall was arrested for only a moment before then the plane slowly sank to the ground. Bashalli was jumping up and down and clapping her hands in her excitement. When the wheels of the craft touched the ground, a twin popping sound was heard and the balloons deflated and fell in a tangle around the plane.

A rousing cheer went up from the crowed and in the moment of it all, Bashalli gave Tom such a long embrace and kiss that it was never equaled again in public until their wedding day.

But, that's another story!

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