FURBALLS FROM OUTER SPACE

Hi, my name's Erin Mc Farlane, and I'm an engineer in aerospace systems for Northeastern Aerospace, the builder of the spacecraft Starlight Messenger and the carrier rocket Starchaser. My job there ? To conceive and make working all the systems you usually find aboard a spacecraft : propulsion, navigation, life support and so one. I had done this job before for the NASA, and I went twice in space for an in-flight survey of some payloads for the Space Shuttle and the International Space Station. When a friend of mine founded Northeastern Aerospace in 2004, I resigned from NASA and followed him with the Starchaser/Starlight Messenger program. And it worked.

We started with the Starlight Messenger recoverable capsule, designing a spacecraft that would allow sending a payload in orbit, and recover it after several orbits. And, also, this spacecraft would be fitted with an automatic docking system, providing it the ability to bring cargo to the ISS, and bring back equipment, samples, or any kind of hardware that could be put inside. The prototype of the cargo version went in space for the first time in march 2008, preceded by several test flights of the boilerplate crafts, built to test some parameters of the flight, like reentry, parachute braking and recovery after landing. It was also at this period that our company was awarded a contract to develop a manned version of Starlight Messenger.

From the beginning, Starlight Messenger was conceived with the possibility to use it as a vehicle that can carry astronauts into space. I volunteered from the start to plan the possibility to use this spacecraft as a manned vehicle, and my proofs of concepts were finally selected for the manned version of the spacecraft. I was then putted in charge of the design and building of the passenger's version of the spacecraft.

The two prototypes of the cargo version, built to made all the test flights scheduled before the entry in service of the serial cargo capsules in 2013, helped me to design the systems that would be used for the manned version. For instance, the four-pack command module built-in powder rockets, which are used on the cargo version fired two by two to brake the craft before ground-

landing, were reinforced in power to be used as an escape system in case of launch incident. With the planned increase of thrust, they can also be used as a backup deorbiting system, at the expense of a splashdown instead of a ground-landing.

Like the cargo version, two prototypes of the manned spacecraft were planned and build. The first one had to be a basic version, used for test flights of the entire manned system, one remote-controlled and two piloted, with the maximal passengers capacity of six astronauts aboard. The second prototype is a complete version, which includes the docking system, which is a manual-switchable version of the automated system developed on the second cargo prototype. As of 2010, the two cargo prototypes had flown twice each, without noticeable problems but a few glitches to iron up before building the operational versions.

As the most advanced program of NASA's post-shuttle Commercial Orbital Transportation Services, Starlight Messenger Manned Prototype was ready for its first manned spaceflight as of June 2010. A one-week orbital test flight was scheduled with XP-1, the first prototype of the manned version. The fifth flight of the cargo version had seen a mock mission been completed with the ISS, without any problem, in March 2010. This mission was completed by the second prototype, the one with the docking systems. It included a real docking with the ISS, a visit of the empty craft by the ISS crews and a return of the craft back to earth.

This year 2010 had put the Starlight Messenger program on a busy schedule : manned flight test of a basic-features XP-1 in June, flight of XC-1, the first cargo prototype, in October with a scientific payload, and with a planned splashdown landing to test the ability of the craft to land on water and stay afloat before recovery, and first remote-controlled unmanned flight of XP-2, the passenger version with a complete on-board equipment, for December 2010. Four flights in one year, a good planning.

I should precise now that the Starlight Messenger spacecrafts are reusable capsules. By design, they are rated for at least ten flights. I'm expecting to put this limit up to 15, or maybe 20, after having a substantial knowledge of the wear of the craft with the operational use of the prototypes. Those ones would be downgraded to automated platforms for space experiments after the entry in service of the serial versions of the crafts. That's when I was put on scene by my company. From 2008 onward, Northeastern Aerospace had also developed a man-rated rocket launcher, Starchaser, with the basic ability to put on low earth orbit the 6,5 metric tons of the Starlight Messenger crafts, both cargo and manned versions.

Until the first manned flight of the passenger version, all Starlight Messenger crafts were send in orbit by classical Delta IV rockets, too powerful for our crafts with their minimal LEO ability of 8,6 metric tons. That is why the Starchaser was conceived : less expensive by 35 % for a standard Starlight Messenger flight, it had flown seven times before being used as a carrier for the XP-1 manned mission. The XC-2 mock mission to the ISS used a Starchaser as a launcher for the first time with a Starlight Messenger craft, and everything went good. For the XP-1 manned flight, a Starchaser was chosen, due to its built-in man-rating. And the problem was to select a crew to fly the craft.

With my astronaut training with the NASA, I was the obvious choice, as flight engineer, for the XP-1 manned mission. Garfield Ahrenfeld, Northeastern Aerospace CEO, had put me on the roster list but he did not indicate who was chosen to be the pilot of the craft. It was at the beginning of April 2010, after the successful flight of the XC-2/Starchaser combination, that the name of the pilot was dropped. In our headquarters at Stamford, CT, I was presenting the report of the last mission, numbered 105, which was a complete success, beyond our expectations. The complete

crew of engineers I worked with was carefully listening to the mission report. The great unknown was the ability of the docking system to do its task, and we still have some teething problems with it :

"…I had already discuss this point with the software engineering department, which had decided that it was a minor issue that shall not force us to scrub a mission, but the bug of the radar metering system should be cleared for the next mission, because it involves a docking. Mission control had to reboot the software system to allow the craft to perform its docking in an automated way. The next mission with a docking procedure will not occur before December 2010, you have enough time to correct this point. I shall insist that it is a top priority, we had sold a docking-able craft to the NASA, and we shall deliver it with this specification operational.

— That won't be an issue for the 107 mission, told us Dennis Ridger, the head of the software engineering department. We have all the parameters of the bug now, in real conditions, and we can simulate it on the ground. It's a memory overflow, we will correct it by increasing the refreshing rate of the trajectory data in the working memory of the on-board computer.

— Dennis, we can also increase the amount of RAM of the dedicated trajectory control computers, said Garfield Ahrenfeld, our boss. For less than five hundred bucks, we can double the amount on RAM available in all computers.

— That will help, answered shortly Dennis. Except if we detect any new bug, the docking mechanism would be hundred pro cent operational for mission 107.

— Nice job ladies and gentlemen, concluded Garfield. We have something positive to tell to the NASA, and that would help us to have the contract for the four serial crafts signed for fiscal year 2011. Oh, one last thing… I have the name of the pilot for the 202 mission, it would be confirmed by the NASA executive in charge of the Starlight Messenger Program tomorrow. Erin, you're in for the meeting, in my office at 10 AM.

— I'll be there Garfield. No problem."

Mission code 202 was assigned for the first piloted flight of the Starlight Messenger craft. At Northeastern Aerospace, we have no resident test pilot, lacking enough piloted crafts to test, and we rely on professionals from different origins. For the mission 202, the NASA, as our main customer, would have to provide us a skilled test pilot. My boss had already manned this mission with me as the flight engineer, and he was waiting for a pilot. I met him the next morning in his office, with Walther Podrowsky, the NASA executive in charge of the Messenger program. Mission 202 was ready for launch, and NASA had found us a pilot :

"Erin, I don't have to present you Walt, from the NASA, he had confirmed me a go for your position as flight engineer on mission 202.

— Thanks for the clearance Walt. I hadn't flown since 2002 and my last Shuttle mission, I was expecting more a no-go than any other decision.

— You're the best choice available for a mission like this one Erin. Garfield told me that you did a pretty fine job for the conception of the inboard systems of the craft. You just have some minor issues with the computerized flight system, I've been told…

— Essentially on the docking systems, which are more demanding of computer power that we were expecting first. Walt, don't be afraid about any kind of budget override. Dennis, our computer man, told me that we just need to ad more RAM to the on-board computerized system. You're here to tell me who's our pilot for Mission 202. Is it someone I know from the NASA ?

— No, somebody new who will made her first flight in space with Mission 202, answered Garfield. But not a rookie in piloting, somebody with a great experience.

— You said *her*, you mean a female pilot ? There's just a fistful of them in this country, and I know all of them. Especially if they are rated for test-piloting and astronaut-able.

— It's someone from the blue, an USAF officer with 12.000 flight hours logged, 4.000 in combat mission since the Gulf War, and an active participation to the F 22 and F 35 in flight test programs, said Walt. New to astronautics but a truly licensed test-pilot. Her name is Ayleen Messerschmidt.

— Uhhhh… That's our corporate attorney's name, the little lady from New York City who's in charge of our legal affairs, and she's doing it fine. Is it someone of her family with the same surname or some homonym ?

— Neither… replied Garfield. It's Ms. Ayleen Messerschmidt herself, both attorney in law *and* test pilot."

Ayleen Messerschmidt looks like more a corporate attorney in law than a USAF pilot. She is a slim 5' 5'' tall, curly-haired brunette with a round Afro-American like face, with a pale skin and water-blue eyes, a soft but firm voice with a strong accent from Chicago. I saw her like a living, interactive and sympathetic version of the US Code, not like anyone who can sit in an airplane cockpit and fly the machine.

When my boss told me that she would be Mission 202 pilot, I can't prevent me from laughing, thinking immediately to a prank made by my boss and our NASA mission controller. Sometimes, she had discretely spoke about some little things about aviation. I know she owns a private airplane, a vintage Italian trainer of the late '40s, but I didn't know more about her piloting skills. Garfield and Walther were expecting me to not believe this, and they had planned to tell me more about what I did not known about the attorney in law :

"I have here her personal file from the USAF, and you can believe me, that's not a fake, told me Garfield. I knew this would looks like an April fool's joke, and I had asked for more… Here's official data about miss Messerschmidt. Look at it by yourself.

— Thank you Garfield, I cannot imagine Miss Messerschmidt doing something else than legal affairs… Mmmmm ! USAF personal file, like my husband's one… Second surname Cornelia, a pretty one… Ayleen Cornelia Gertrude Messerschmidt, born July 5th 1967, in Spokane, WA, one year older than me… Mother Gabrielle Fiona Blacksmith, spouse Messerschmidt, doctor in medicine and CEO of Meltner Medical Corporation, father Neville Aaron Messerchmidt, Ph. D. of sociology, psychology and philosophy, currently professor of sociology at the university of Chicago… Graduated from the Air Force Academy in 1988, first assignment to the 475th FS, Trawley Field, Oregon… Rank : Lieutenant-Colonel, USAF Reserve, currently in position with the New Jersey Air National Guard as commanding officer of the 611th fighter squadron… 17 kills in air to air combat, more than 4.000 flight hours in combat mission, and double on F-16 fighter aircraft… Qualified test pilot for the Wright Patterson flight test center, F-22 and F-35 programs, qualified as pilot in command for heavy bombers, with 500 flight hours logged on B-52 and B-1, and a dozen on B-2 stealth bomber… Qualified for deck landing with the US Navy, 25 landings on aircraft carrier… Damn ! Medal of Honor in Gulf War, Silver Star, and a nice-looking batch of decorations… My hubby didn't get anyone of these in spite of his 15 years of service with the USAF !

— You've missed something important Erin…

— What point Garfield ?

— Graduations. She's not only a test pilot.

— NASA requires their pilot to be more than stick shakers and throttle pushers… told me Walther. Look at her graduations.

— Well… Master in Law at the Air Force Academy in 1988, logical, she won't be able to be an attorney without it… Ph. D. in law, university of Chicago, 1994. Subject of her graduation work : *Civil liability in transportation industry : comparative study of customer's claims against airlines*… College Graduation in astrophysics at the Air Force Academy, completed by a Master at the University of Chicago in 1997. And a Ph. D. in astrophysics, specialized in relativity and quantum physics, University of Columbia, New York City 2003… She is also fluent in French, Spanish, German, Russian and Japanese language… With such a résumé, what the hell she's not able to do ?"

Miss Messerschmidt, discrete and efficient attorney in law, expert in civil liability, is also a skilled military and test pilot, and doctor in astrophysics… And I was scheduled to fly with her. At this time, I didn't know her more than half a dozen meetings for professional reasons at Northeastern Aerospace. She wrote our program contract with the NASA and I was the reference engineer. I never heard her talking about something else than legal issues. Trying to imagine her as a test pilot was the kinkiest thing I've never done…

As an ex-USAF mechanic, my husband, Leroy, knows Ayleen Messerschmidt by name. One evening, the day of march 2010 before she went to see us at our factory for the preparation of our first manned mission, he told me about her. She was an enlisted officer in the US Air Force and her eccentric behavior, highly intellectual background and timidity. Leroy and I, as we use to do, were both in bed after 10 pm, reading books or newspapers before going to sleep. My husband went back from our children's rooms, having a look at our 6 years old daughter and her 3 years old brother, and everything was fine :

"They're both sleeping now honey, you're still on Joyce ?

— Yep. I'm hooked on his books, I have started *Finnegan's wake* and it's delightful. Honey, you told me that Ms. Messerschmidt is a kinda legend in the Blue ?

— She is. Granddaughter of Pacific and Korea war ace Wayne Messerschmidt, nephew of Vietnam war ace Roger Messerschmidt, a born-to-be-military girl, very pleasant to know. One of my coworker at GE[1] was her mechanic in Japan, and he told me that you're a lucky one to fly with her.

— What does it means ?

— Ayleen Messerschmidt is very respectful with people having technical knowledge, even the lowest ranked mechanic, she is very careful with the hardware and she's really listening to what she's told, and taking account of it.

— I had already see this with her attorney's work for NE Aerospace. She's got a hell of memory, always knowing exactly the slightest details of the files she's managing. And she's able to get the whole picture of any kind of situation with the slightest details she's aware of. That does not surprise me if she had been qualified as a test pilot, she made the Air Force doing millions of bucks of cost-cutting by flying the F-22 and F-35, and pointing precisely all the glitches she'd found in flight. Impressive… And I have her as my mission commander.

1 *Short for General Electric Corporation.*

— That's great for you ! Lieutenant-Colonel Messerschmidt is very popular all around the military. As a professional pilot, of course, but also as a very skilled attorney. She's licensed to pledge in any military court, and she had dealt with some complicated cases.

— She's more looking like the best girl in college, the one who's always shy and lonely… Damn ! Test pilot…"

Before my boss told me such an unbelievable thing, Ayleen Messerschmidt was for me the least credible person to act as a mission commander for the Starlight Messenger 202 mission. The next morning, I saw her for the first time as the pilot in command of this spacecraft. At our facility in Stamford, we have build a training center with a flight simulator of the piloted version of the craft. And, for development purpose, we have what we call in the industry a test article. It is a nearly completed near ready-to-fly version of our piloted craft, and it is used for the final integration and testing of all systems, the last step before the flyable prototypes.

I should tell you now how the spacecrafts are usually conceived and put in flight from the drawing board to the launchpad. First step is the theoretical definition of the craft : we had received a technical bill from our customer, the NASA, with what they are expecting from us in terms of mission, operational capacity and cost. With this bill, we, engineers, had to put this in form of a draft of what the future craft would look like, which rocket she would be fitted on, which kind of systems she would have on-board, and so one. And you show it to the customer to see if it suits his needs.

When the customer gives you a go, and the funding necessary for the development, the next step is to go from the draft to the blueprints of your craft. It involves thousands of hours of computerized testing and industrial drawings, where you put everything in order, from the shape of the craft to the bolts fixing the astronaut's seats to the hull. My work there was to put in order all on-board equipment, from navigation systems to life support equipment.

Then, before going with the blueprints to the assembly line, the design bureau makes a mock-up. It is a 1 to 1 model of the future craft, not functional but with all the shapes and the volumes of the real craft, and marks for the place of the on-board equipment, including wiring and piping. Its purpose is to see, with a near to real craft, if you don't have mess up something on the drawing board. For my own, I had seen some glitches in the power wiring, and a misplaced computer screen on the pilot's dashboards.

Changes on the mock-up are fast and cheap, and prevent doing costly mistakes on real crafts. It's when you really see if your blueprints gave you something usable, or should be redrawn to correct some details you did not see before. Corrections are made on the mock-up, tested in real material condition and, then, translated into modifications of the blueprints.

Next step, it's the boilerplate. It is one step further because they're real articles made from the blueprints of the craft. Basically, they are used to test some critical phases of the mission, usually aborted liftoffs and all-conditions landings. Boilerplate crafts have the shape and the weight of the real craft, but they have not all the devices needed for a real flight. For the Starlight Messenger Program, we had build three of them, for testing the craft ejection system in case of an aborted liftoff, the normal landing procedure on solid ground with the retro-firing rockets, and the splashdown landing in case of landing rockets malfunction or emergency.

When the tests are done with the boilerplates, they are used for training by the recovery crews. Northeastern Aerospace had lend the three boilerplates to the US military for training their crews in case of splashdown, and the helicopter's crews for transporting the craft after her landing, below a heavy-lift helicopter, to the closest airport where she would be loaded on-board a cargo

plane. Due to the weight of the craft, a Boeing CH-47 or a Sikorsky CH-53E is mandatory to do the job, but a Russian Mil Mi-26 can also do it, and Northeastern Aerospace plans to wet-lease one for private venture missions of the Starlight Messenger craft.

And the last step before the flight of the prototypes is the test article. As I said before, it is a near-complete craft, with everything operational in it, or nearly everything. It is use for final development before prototyping, ground training of crews, flying and ground, mating tests and trainings for the crews who are dedicated to put it atop the launching rocket.

TA-2, the factory's code for the manned version of the test article, was used at our facility for training purposes. That's where I met Ayleen Messerschmidt, already at work, installed into the commander's seat, and carefully checking the position and the function of every flight instruments, with the help of the technicians of the facility :

"Okay, we have the attitude thrusters status on this screen, included the status of the service module's main thruster. Does somebody have the checklist before reentry ? I don't see any command on the touchscreen for jettisoning the module after the braking burn.

— It's a mechanical manual lever ma'am, the one on the central upper panel. It has a light bulb wired with which indicates a proper operation.

— I see it, near the rotating lever engaging the braking rockets at landing… Hi, nice to see you Erin, you're here for the training ?

— Ayuh… That's a real surprise for me to see you here… Not too confused with the dashboard ?

— No, it looks likes the one of the F-35, same manufacturer ?

— Yes, cost-cutting without corner-cutting. I had taken the blueprints from Lockheed Martin and redraw them for spacecraft use, removing all the military stuff and keeping the rest.

— I see you had left a TACAN on it, not a civilian use system.

— Well, intelligent cost-cutting once again. This system is reliable, cheap, and widely used since Vietnam War. It can both indicate to the crew how far the recovery team is from their position, and help to guide them to the landing site. And it is also usable as a beacon by the recovery team.

— Well done, that's a clever thought.

— Everything on this craft has been done in this logic. The idea of using the escape rockets for braking before touchdown, it's also an idea to cut cost without compromising the security or the functionality of the craft. With the first draft, we have decided to scrap the usual escape tower that was used from the first Mercury missions to the last Apollo flights. Simplicity and weight-saving, but if you put the ejection rockets into the spacecraft instead of a tower, jettisoned when the craft reaches LEO, you have this dead weight to brake and land safely.

— So, why not use it as a rocket-braking system before touchdown ? That's why there is a dual-use of it. If you have to carry this weight on orbit, why not use it to land safely on ground, instead of discarding it on orbit ? Well done again.

— A minimal mass penalty, but an important source of cost-cutting. When landing on the ground instead of making a splashdown, from the closest airport, you can go with a single helicopter to recover the craft and her crew. And, if the terrain is fairly accessible, discard the helicopter and use instead a cheaper to operate all-terrain truck. The maximal landing mass of the craft is four and a half metric ton. That fits on any ordinary flatbed truck.

— So, if we land in Central Park, you just have to call a cab for the crew and a truck for the craft, a good thing.

— Well, the planned landing site is the Canadian Prairie, western Ontario or southeastern Manitoba, depending on crop season. In winter, there's a snow layer on the fields there, no problem to land. But in summer, we are limited to the grassy areas of Manitoba, or others places like this. Rocket blast can damage crops and cost money to compensate property loss. We have alternate landing sites in other places, you'll get a complete map with your mission order.

— Great ! So, I'm here all day long and I've been told that you'll work with me, why not start with a step by step mission review ? I have read the flight memos of the NASA and I feel confident to check it out aboard the real craft.

— I have to take my own papers and I'll join you. They're in my office, in the corporate building, ten minutes by road from there.

— Don't be hurry, I'll have to make an external overview of the craft to see what's what, and where it is. I also have to find someplace where my pets can sleep without be disturbed.

— Your pets ?

— Yes, I have brought them here, I'd found nobody to take care of them. Sorry for the disturbance, I had no other solution.

— That's a minor problem, we'll find somewhere to put them. There's lot of room there, that would be a pity if we don't find a place for them. Dogs ? Cats ?

— Uh… Something not so casual : skunks.

— What ? Pet *skunks* ? Uh… You *really* mean the furry pests that sprays you with some kind of stinky oil when they're pissed of you ?

— Not pests anyway. Scent glands is a self-defense weapon for them…

— My GOP-fanatic NRA enlisted neighbor says the same about his AR-15, the one he sleeps with under his pillow… Honestly, I wont get close from a skunk under 200 yards.

— Don't listen to the usual clichés about those animals. Mine are really cute, they're seated on the first officer seat now.

— Uh… What ?"

Surprisingly, Ayleen did not joked : she opened the copilot hatch of the craft and I saw two of those animals, all black with their typical white stripe on the back, sleeping together on the seat. When she opened the door, the two skunks pricked their ears and looked at the opening. Ayleen immediately warned them :

"It's mummy now, sorry to wake you up, we'll have to move. Erin, let me present you Shalimar, and her daughter Opium, my two pet skunks. I'll unleash you and we'll go somewhere else, and I won't forget your apple… Don't worry Erin, they're friendly…"

Honestly, I was reluctant to get closer to those animals, in spite of the fact that they'll both let Ayleen carry them in her arms like plush, one on each side, their head on her shoulders. We had been able to find a quite place in the park behind the facility where Ayleen had been able to stretch a kind of long range leash for them. She explained to me :

"Trees, grass, spots of sun to play, they've got everything they need to have fun all day long… Here's your apple, one for each. I'll be back later… You don't seem to really appreciate them, do you ? Sprayed once by one of their wild cousin ?

— Not at all… Hem… I'm not a pet lover, I've got none at home.

— Well, I was like that before discovering Shalimar caught into one of the rat traps the cook of Strawberry Field AFB had laid around his kitchen to get rid of the raccoons who used to spread havoc all around his garbage cans. This poor wounded animal was so pleased to see me helping her that I finally adopted her. Skunks are lovely, and highly intelligent animals, you know ?

— Well, you know them, I trust you…"

Honestly, I can't barely get close from anything with fur and claws, also friendly to human beings they are supposed to be. That includes cats and dogs without any debate. And having a mission commander whose pets are skunks was something weird for me. Except this, everything was going to be fine between Ayleen and me. And that was only a beginning.

I spare you the intensive training we've got before the flight, Ayleen and I, and I just have to mention that it was really a fun ride for both of us. I have a full civilian background as an aerospace engineer and an ex-USAF hubby and, for me, I see military people as narrow-minded, trigger-happy, Rambo-like people who use to bark orders at submissive subordinates, and happily slaughter everything spotted as "the enemy". That's exactly what Ayleen is *not*. Always in good mood, never using her authority as the mission boss at all, carefully listening to what she's told, whoever told her about anything, and taking great care of the other workers advice, regardless of rank and professional position. She had become one of the best coworker I ever had in my professional path of life.

And on the twenty-first of June 2010, we were both ready for the first piloted flight of an American piloted capsule since the last Apollo mission in 1975, the famous Apollo-Soyuz joined mission. We also added some firsts in space exploration : first all-female space crew (Ms. Tereshkova was alone aboard her Vostok-6 capsule in 1963), first private-venture manned spacecraft in orbit, first non-Russian piloted capsule to land on solid ground instead of water, and first space piloted mission designed to land in Canada.

We were scheduled to lift-off from the Mid-Atlandic Regional Spaceport, on the eastern shore of Virginia, for a five days test flight that would includes a complete test of nearly all of the capabilities of the craft from liftoff to landing, except docking to a space station. Honestly, that was a great moment of fun. In five days, we had tested the automated flight systems and their manual backup systems in real flight conditions, monitored the operations of all the on-board systems, including failures and manual recovery tests, and completed a navigation test that would made us succeed an orbital rendezvous with a LEO satellite previously launched by a Starchaser carrier rocket : the Vegesat-I, a scientific orbiting satellite dedicated to the survey of wild and cultivated vegetation of the planet.

We had successfully rendezvous with Vegesat-I, fly around it at a safe distance of 300 meters and took pictures of it before changing orbit. It was also, for Northeastern Aerospace, some kind of proof of concept for a commercial service we intended to offer : in-flight repairs or maintenance of satellites, space debris cleansing, servicing satellites with changes to modular components in flight, for instance experiments, refueling, and even small satellites recovery or launch, using automated or piloted versions of Starlight Messenger, depending on the mission.

All our mission goals were reached after the fifth day, and we just had to expect a reentry clearance from Mission Control. Our main problem was thunderstorms over central Canada. NAV Canada, the equivalent of our air traffic control branch of the FAA, issued a SIGMET that prohibited all flights over Manitoba and western Ontario due to thunderstorms six hours before our reentry. That was not a problem, we had an extra capacity of five days in orbit in case of such delays, and alternate ground landing sites, which were all clear for landing at this time. From Mission Control, we had the good surprise to have a go for main landing site just three hours after our initial no-go :

“Messenger Two Zero Two, this is Mission Control, do you receive me ?

— Loud and clear Mission Control, you’ve got something from Canada ?

— Affirmative madam. NAV Canada had just confirmed that the thunderstorm line would have left the landing site in three hours. You are cleared for a landing after sixteen orbits.

— No incoming bad weather within the landing window ?

— Negative. All clear for twenty-four hours at least. All weather conditions within safety limits, reentry and landing at your discretion.

— Great ! Erin, we can go back to earth after the next sixteen orbits. All clear with the on-board systems ?

— Last check-up gave me all systems on nominal parameters, all clear for reentry.

— So, let’s do it. Mission Control from Messenger Two Zero Two, all systems on nominal, request clearance for reentry and landing on main site.

— Clearance granted Messenger Two Zero Two, I call the recovery team right now, call back at reentry minus five orbits for confirmation.

— Copy Mission Control, clear for reentry, confirmation call at reentry minus five orbits, from Messenger Two Zero Two, over and out… Well, we will have time before the reentry checklist to enjoy the ride. Baltic sea and Polish coastline in view, I can see Gdansk lights now.

— That’s great ! Everything running fine, that would be a minor task to iron out all the glitches and bugs we had found. Your impression as pilot in command ?

— One word : wow !… I don’t regret to have spend money and years to get my Ph. D. in astrophysics. You’ve got a fine craft here, she’s softly and precisely responding to pilot’s inputs, and the video game like dashboard is the best thing I had never seen in anything airworthy since I had flow as a pilot for the first time.

— You were aged twelve, what a vocation ! At the same age, my main concern was to have big boobs to get a boyfriend easily. I stepped into the aerospace world nearly by accident.

— Studying aerospace engineering at the Boston University ain’t an accident.

— My parents didn’t get enough money to pay me the Ph. D. in chemistry I had wanted to do, and I have a cheapest alternative with the college of aeronautical design. I was highly interested by man-machine interaction, that’s what made me chosen on-board system design. I get my first job at the NASA on the Space Shuttle and I even didn’t think about being an astronaut.

— Well… How did you get this job ?

— Also by accident. Before an important mission in the early nineties, the military girl who was planned to be the system specialist aboard a shuttle flight went amok when her husband asked for divorce. She tried to kidnap her man’s then-girlfriend –they married later, after a court pronounced the divorce– and was arrested by the police, somewhere in Florida. The guy of the backup crew who should have replaced her was not available too : appendicitis with bacterial complications, three weeks at the hospital needed for him to get rid of his septicemia. I was the only one at the NASA with the qualification needed, I volunteered and I had the training as an astronaut. That’s how I flew three Space Shuttle missions…

— What a chance ! Since I’m a kid, I always wanted to be a pilot, and my own mother did everything to prevent it. Aviation and her, that’s far away from a love story.

— That’s not a reason to thwart your own child’s professional abilities.

— That was a subject of much painful debates between my parents, both of them doesn't work anyway for civil or military aviation. My dad is a university teacher, and my mom is doctor in medicine, and CEO of Meltner Medical Equipment now.

— You have a grandfather and an uncle who are military pilots, don't you ?

— Yes, they are. And my cousin's from my father's side too. My mother made an allergy to aviation after having survived the crash of Eastern Airlines flight 401 in December 1972. She took this flight to pay a visit to one of her aunt living in Miami for the new year. The plane crashed in the Everglades, following a pilot error, and she suddenly found herself thrown out of the plane by the crash, and landing on a sawgrass patch of swamp, uninjured by miracle. She was unable to do anything else than sit there and wait for the next hours and when she was hospitalized, my mom was unable to speak. Typical post-traumatic stress disorder…

— Ouch ! A good reason to hate airplanes !

— And not the only one. Five years later, my aunt Mavis, the well-known blues singer Mavis Blacksmith, had flown a charter plane hired by her producer. A cheap one… Aunt Mavis was touring in the east coast with her musicians and she took off with this plane from Buffalo to Boston. Over the Appalachian mountains, the plane ran out of fuel and crash-landed, due to poor maintenance and low professional skills of the two pilots. No one was killed but my aunt had a broken leg, and all other passengers and crew aboard were injured. That was a sad year for my mom because the USAF had his first enlisted women admitted to the Air Force Academy this year, opening up her worst nightmare about my future career : air force pilot. Last but not least : two years later, my mom was professionally obliged to fly from Chicago to Los Angeles. She booked a place aboard an American Airline flight, and she missed the plane due to traffic congestion. Waiting for American Airline to change her reservation to another flight, she saw the plane she missed rolling on the taxiways, taking off, losing an engine and crash… That was the American Airline Flight 191 disaster, 273 people killed, and my mom was hospitalized one month in a specialized clinic, following a nervous breakdown.

— Ouch ! And that would have drove her cuckoo to see you succeed at the Air Force Academy entrance exam.

— Well… She had finally managed to live with it. Her company have its own corporate jet, and she use to fly it for her professional needs. Here's northern Canada…"

We were then overflying the Canadian arctic, lined straight ahead southward, with the Hudson bay in sight. Five orbits before reentry and landing, Ayleen called the mission control in Houston to get our final clearance for landing. That was OK :

"Mission Control to Messenger Two Zero Two, you are clear to land. Weather conditions optimal above the main landing zone, all recovery teams ready. You can apply the reentry sequence now.

— Thank you control, from Messenger Two Zero Two, we are beginning the reentry checklist, over. So, first step Erin, what do we have to do ?

— Confirm the actual position of the craft and confirm the landing zone in the navigation system computer. Then, check-up of all systems of the craft, and general status of it. And finish it two orbits before reentry.

— So, we have nearby four and a half hour to do it. Let's go !… Navigation systems : on-board computer first.

— Self-diagnostic engaged, results in five to six minutes…

— Good… Communications ?

— Space to ground radio functional, no transmission or electrical problem now.

— Fuel and oxygen levels ?

— I check the gauges… Everything OK, levels optimals.

— Life support systems ?

— Functional and running. CO2 regulation system running, oxygen control running, craft atmosphere optimal, composition, pressure and temperature within norms… The computer diagnostic is close to completion.

— Let's wait for it…"

Pre-reentry checklist is an important task that ensures the functional integrity of the craft, and detect possible faulty systems. Everything is double-checked before anything else is done. After our check-list, we were technically clear for reentry and landing, so Ayleen called our mission control for the next operations :

"Messenger Two Zero Two to mission control : Pre-reentry checklist completed, we are clear for landing, repeat : clear for landing.

— Mission Control to Messenger Two Zero Two : confirm clearance for landing. All mission parameters are optimal, proceed to switch to reentry mode.

— Roger Mission Control, we're proceeding now… Ready for the great dive ?

— Aye aye skipper. Ready to engage attitude modification on your mark.

— Attitude modification now."

This maneuver is just turning our craft bottom forward, to have the main rocket facing our destination, instead of being at the rear of the vehicle. It's purpose is to make a final burn with the main engine to deorbit the craft and, then, jettison the service module, the part of the craft that carries the main rocket engine, its fuel tanks and the solar arrays that provides electricity in-flight. There is an automatic mode into the piloting computer to get the job done properly, and that was what Ayleen had done. Then, with the flight parameters computer, she just had to let the software calculates and plans for her the moment of the burn and the reentry parameters :

"That's just like a video game. I have the same kind of flight controls on the C-40[2], they can fly the plane even if you're on strike. Erin, ready to engage the reentry sequence.

— I call Houston… Mission Control, this is Messenger Two Zero Two speaking : we are ready for reentry, I repeat : we are ready for reentry. Please confirm clearance.

— Clearance confirmed Messenger Two Zero Two. All clear over the reentry site, you are cleared to proceed.

— Understood Mission Control, replied Ayleen. Reentry sequence engaged now !"

On the touchscreen, the menu that permits the pilot to engage the automated reentry sequence had three touchscreens inputs : one green for *GO*, one red for *ABORT* and one orange for *MANUAL*. Put your finger on the proper one, and the computerized system will do what you tell it to do. Ayleen pressed the green zone and the screen changed : a blinking *CONFIRMED* sign appeared and, five seconds later, a drawing of the craft with text boxes indicating the actual flight parameters was on screen. And a countdown box indicating time before reentry burn, which was over fifteen minutes then. We just had to let George fly the craft, as Ayleen said.

"I don't know who gave the autopilot the name of George, did I said, that's pretty funny to have such a name. My father's name is George too.

— Well, I don't know where it comes from. There is a lot of slang in aviation's lingo that usually comes from acronyms, company names or origins like that. It reminds me one thing. When I

2 *Boeing C-40 Clipper, a military cargo version of the Boeing 737.*

was a little girl, my uncle, who was then an USAF fighter pilot, brought me to the TRACON of his airbase.

— TRACON ?

— Terminal Radar Approach CONtrol, acronym for the part of the control tower of an airport dedicated to monitor take-offs and landings. Then, I saw all the flight controllers behind their radar screens for the first time, talking by radio to the pilots in their plane, on the tarmac, on the runways and in the air. I was seven years old, and my first question to my uncle about the traffic control was : who is the *Clarence* the controllers are always talking about ? I'd misheard the word *Clearance*…

— Mmmm… Accurate dyslexia, like my daughter, do you ?

— You said so. Don't ask me to write properly words like school or schedule. Even now, I make mistakes one time out of three… Messenger Two Zero Two to mission control, five minutes before burn, all clear on-board.

— Copy Messenger Two Zero Two, all clear there…

— Countdown still running here, every system on green… So, ready for the last ride ?

— Ayuh… One last word before the reentry, who gets you the nickname of Tiny ?

— Air Force Academy. I was the shortest student there with 5' 5'' tall, the minimum height for a military pilot. Shorter, I would have to embrace a civilian pilot career.

— Well, I don't have this kind of problem with my 5' 9''.

— One of my associate at my attorney's business is 6' 3½'' tall. With me, that makes a good average.

— Well, your associate, he have to bend over to talk to you.

— She… Her name is Linda, and she's also in the military reserve like me. USMC, to be precise.

— Ouch ! And you get the nickname of Tiny in the military…

— That's my callsign now in the Air Force and the National Guard. One of my professor at the Air Force Academy call me like that once by mistake, cadet *Tiny* Messerschmidt, and that was adopted. He might have dyslexia like me… Before that, I was known as the class of 55, the highway speed limit, or corny things like that… One minute before burn.

— Get it… Mission Control from Messenger Two Zero Two, one minute before burn, all systems go here, please confirm clearance.

— Clearance confirmed Messenger two zero two, you're expected down there.

— Thank you Mission Control, replied Ayleen. Deorbit burn minus twenty seconds… Ten… Five, four, three, two, one, burn !"

Then, the retro braking rocket fired, and slowed us enough to made us plunge into the earth's atmosphere. The craft tilted down and entered into a controlled dive. I was monitoring the on-board systems while Ayleen was piloting the craft, with the use of the on-board computers :

"Service module ready to be jettisoned, automated sequence engaged.

— I let my hand on the manual system Ayleen…

— Wait… Service module jettisoned. Automated parachute sequence engaged, I get a system confirmation. Messenger Two Zero Two to Mission Control, reentry engaged, all systems on green.

— Copy Messenger Two Zero Two, telemetry on green here, get ready for the ionospheric radio blackout[3].

3 *When a spacecraft reenters the Earth atmosphere, it passes through the ionosphere, an electrically-*

— Roger Mission Control, ready for the ionospheric blackout."

Outside the craft, the first glimpses of ionized air streamed alongside the hull. We were entering the upper atmosphere, using the thin air pressure to slow us down from the orbital speed of mach 28 to a subsonic speed, giving us a constant deceleration of 3 G. Behind us, the heat shield was cooked up to 2.500°F, leaving us a normal cabin temperature of 75°F. We were going down toward the landing zone from an altitude of 200 miles, slowing below supersonic speeds.

The reentry sequence was programmed to change us from ballistic mode to parachute braking at a level of 30.000 feet above sea level. Ayleen was monitoring the system, ready to engage the manual drogue parachute opening at level 300 if the automated system would have failed. That didn't happened. At level 300, a chime indicated us that the drogue parachute had deployed, slowing us from 560 to 125 mph. Then, another chime indicates us that the automated system had successfully deployed the three main landing parachutes at level 150, 15.000 feet above sea level. Then, we didn't just have to hang down below the parachutes before landing, we had a final check-list before touchdown to do :

"Okay, the main parachutes are deployed… Erin, get ready for touchdown checklist… Mission Control, Messenger Two Zero Two speaking, main parachutes deployed, we are proceeding to touchdown checklist. Do you have us on radar ?

— *Affirmative Messenger Two Zero Two. Winnipeg ARTCC had confirms us that they've got your squawk and your radar contact, recovery team on the way.*

— Thank you mission control. We're switching to the recovery team frequency, from Messenger two zero two, over and out.

— ARTCC ? Squawk ?

— The first is the air control center for our landing region, Winnipeg's one covers all Manitoba. The second is the name given to the identification number of our craft the traffic control can read besides our position on their radars. This number is given by the transponder of the craft.

— And that's called a squawk… Touchdown checklist ?

— Affirmative. Localization devices ?

— TACAN, light strobe and beacon engaged, settings OK.

— On-board propulsion systems ?

— Set on safe, tanks sealed ready for landing.

— Drogue rockets ?

— System set and engaged, automated landing firing sequence engaged…"

Due to the fact that the Messenger craft lands on solid ground instead of splashing down in the ocean, like Apollo crafts of the late '60 and early '70, she needs a more powerful braking system than any ocean-landing craft. That was an idea of mine to get a dual-use equipment on-board to get this job done. Every manned spacecrafts set atop a carrier rocket have a safety ejection device to get them out of the way of a malfunctioning rocket, and save all hands on-board. Usually, it is a tower with ejections rockets, set atop the craft. It fires in case of emergency and pulls the craft in one piece away from the rocket. When the craft reaches the orbit, the tower is jettisoned, saving weight for further operations, including reentry and landing.

On Starlight Messenger, a craft built from scratch with simplicity and reliability in focus, the ejection tower was scrapped on the drawing board because it was too complicated and too expensive : you're jettisoning one in space for every flight. With the intelligent low-cost policy we had, at Northeastern Aerospace, that left us with nothing but the need to put the ejection rockets on

charged layer of the upper atmosphere where radio communication cannot pass through.

the nose of the craft, solving one problem but creating another one : the weight of the ejections rockets had now to be carried back on earth.

The craft was designed first for splashdown only, the waters of the landing zone acting like a natural damping system. But, with an active braking system on-board, you can use it to slow down harder and safely land on solid ground, which is more interesting : no need for a fleet of ships for recovery, the craft can be recovered with a minimal team, and even carried away from the landing site on a flatbed truck, saving more money, and limiting corrosion because the craft did not have to float on water before recovery.

To achieve this, the ejections rockets on-board needed to have their firing system tweaked. For emergency separation with the carrier rocket, the four solid-fuel rockets are fired simultaneously, giving enough thrust to safely carry away the craft from a doomed rocket in case of liftoff abort. But, for landing, that would be too much, and make the craft fly instead of just slowing down, not really what's suited for a safe landing.

The solution is to fire them two by two : you've got enough thrust to slow the craft and you've got it twice the time to get a very gentle touchdown. With this system, the craft is slowed from 20 mph to less than 2 mph before touchdown. That requires to set the braking rockets in the proper configuration in flight. The system used is a simple rotating lever, set by the crew, which changes the firing system used, from the automated all-rockets ignition for aborted liftoffs, to automated sequential firing for landing. It just switch a different firing system, activating another electrical system by powering the good wiring with a simple system of rotating bolt and mechanical pins, the latter used to get a proper electrical contact.

On the dashboard, a yellow blinking light indicates that the rockets are set for landing. I have invented another simple system to fire the rockets on touchdown : when the pilot engages the rockets for touchdown active braking system, a dead weight is pushed out by compressed nitrogen from the craft through a hatch, and tight an external sprung lever by hanging down the craft using a hundred feet long steel cable. When the weight touches the ground before the craft, the lever is pulled upwards by his springs and lights the rocket's firing fuses. The dead weight used is the waste water tank of the craft, sealed and full on landing.

For the final step of our journey, we met the landing party. Below level 100, 10.000 feet above sea level, the pilot plane comes to reach us. Is is a simple Cessna 172 with a crew of two aboard. Our craft is equipped with several beacons : two aviation safety beacon, digital on 406 Mhz range, one main and one backup, a TACAN military on-board beacon, allowing us to be recovered by any military aircraft, and a marine beacon with a backup, only used in case of splashdown, but it can be used in case of failure of the other ones for non-maritime landing, if necessary. After reentry, it is mandatory to switch on the aviation transponder and the TACAN, and make radio contact with the recovery team. While we were still hanging below our parachute, that was what was done by Ayleen :

"Messenger Two Zero Two calling Chaser, are you receiving me ?

— Chaser to Messenger, five on five, we've got you on TACAN, visual contact expected soon. Is everything OK on-board ?

— All systems green Chaser. I have a visual reference now[4]. Can you call me when you get a Judy[5] on me ?

4 *Expression that means that the pilot can see the ground from his craft.*

5 *Visual or radar contact of the pilot with another flying vehicle.*

— Affirmative Messenger, I'm cruising at level one hundred, I would get you on my zero heading in one minute or less.

— That would put you on my nine o'clock position. Am I within range ?

— Affirmative Messenger, you're right in the planned landing zone… Messenger : Judy ! I got your craft at twelve.

— Ayleen, can you seen the chasing plane ?

— Not yet… Chaser, Judy, You're on my nine !"

Then, through my window, I saw a red spot in the sky near us, the tiny Cessna which was circling around us at a safe distance, monitoring the last leg of our flight. The two helicopters of the recovery team would have took off then, and would have been flying towards the landing zone. We kept on flying downwards, hanging below the three parachutes. Then, the lever/spring system fired the rockets at one hundred feet above the ground, surrounding us with a thick could of smoke. I knew that we had touch down when the craft bumped on the ground, gently shaking us on our damped astronaut's seats. While the cloud of the braking rockets was dissipating, Ayleen engaged the final checklist, the post-landing checklist :

"Messenger to Chaser, landing complete, we're preparing the craft for recovery, over.

— Understood Messenger, recovery team on approach, ETA[6] plus ten minutes, I've got a visual contact with the helicopters. Have a nice day, over and out !

— Messenger, this is Reco one, we have a visual on you, we're proceeding for landing. Got nothing to report ?

— Negative Reco one, all green, we're proceeding to post-landing checklist, over… Erin, let's do it… Craft environmental system ?

— Set on off, system offline now.

— Pressure equalization valve ?

— Pressure equalization valve open.

— Ground position lights, radio beacon and TACAN ?

— Ground position lights and radio beacon engaged. TACAN off.

— Okay, all on-board electrical systems ?

— Systems shutdown except beacons and ground position lights.

— Good… What's the procedure now ?

— Open the hatches and wait for the recovery team to pull us out of here.

— Great to land on a sunny summer day, ain't it ?

— Yep…"

We opened the two crew hatches that permits us to come in and get out of the craft, and the weather outside was fair. I remembered now that I had made the installation of a methane heating system aboard the craft mandatory, saying that, for it, we can use the unburned fuel of the craft for heating it in cold winter nights, in case of an emergency landing far away from the recovery teams. The two Super-Puma helicopters of the recovery team landed a few minutes after, and the recovery team had just to pull us out of the craft, mission accomplished.

Our landing zone was on a flat and grassy piece of cattle farming grass, not far away from a gravel road, and the recovery truck of our company came directly on the landing site to pick up the craft and bring it to the next airport, Winnipeg airport, where a cargo plane would fly her back to Connecticut. We had a debriefing there with the NASA representatives and my engineers

6 *Acronym for Estimated Time before Arrival.*

coworkers of Northeastern Aerospace. The mission was a complete success and I was very pleased to have flown with Ayleen Messerschmidt as mission commander.

For the next piloted mission, we had to wait one year, and fly two other automated test mission before, one full cargo with splashdown, and one of the second manned prototype in automated mode. The crew for the second piloted mission was not assigned yet, and we were both expecting, Ayleen and I, to be members of its backup crew. But that was before some strange things happened, changing all our plans…

With the complete success of the mission 202, Northeastern Aerospace had a full clearance by the NASA for further developing. The next mission, mission 106, was a cargo mission with a scientific payload on-board. Scheduled on October 2010, it was designed to be a complete demo of the capacities of the craft as a recoverable satellite for scientific experiments. And, extra feature, a mini satellite was also scheduled to be launched from the cargo bay of the craft.

This mission was more a demo scene for the potential customers of the commercial flights of the craft rather than a test flight for our main customer, the NASA. But a final performance into the mission plan was highly interesting for the space agency. Instead of a ground landing in the Canadian Prairies, mission 106 was due to end in a splashdown into the Atlantic ocean, right off the coasts of Maine. All the systems needed for this scenario would then be tested in real conditions for the first time. XC-1, the remote-controlled cargo prototype, was the craft assigned to this flight.

Then one week prior to Halloween 2010, I was aboard the USCGS *Dallas*, from the US Coast Guard base of Charleston, SC. This ship was assigned to this mission because it had a helicopter platform on-board, allowing the use of an USCG HH-60 helicopter as a chasing aircraft for monitoring the reentry. Our recovery ship was a leased Canadian deep water tugboat, the M/V *Saguenay*, a basic no-frills ship, with a rear platform and a crane, the only things needed to recover a floating spacecraft like the Starlight Messenger series. Also, the use of off-the-shelf ships, instead of specialized vessels, would also be a cost-cutting feature for our customers, including NASA.

For this operation, I was aboard the Coast Guard cutter, send there as mission specialist. The main concern for me was to check carefully if all the internal systems of the craft can withstand a splashdown. The craft is designed to be flown several times, and having sturdy on-board systems that does not require replacement after a flight is an absolute necessity to get an inexpensive craft, the manufacturing overprice due to the multiple use configuration shall be at least recovered by the possibility to use several times the on-board systems without replacing them. That is our main marketing argument, and that was this main feature that allowed us to be chosen by the NASA for its COTS program.

NASA Mission Control had relayed us the on-board videos of the craft's cameras and all the telemetry. By this time of fall, we had a relatively calm sea, but an overcast sky, with six oktas of clouds, according to Ayleen Messerschmidt, who was aboard the cutter with me. She was sent by the New Jersey Air National Guard as a specialist for all aspects of aeronautical duties for this mission. She knew the craft, of course, and she had a pretty good experience as a flight test pilot. She gets in touch by radio communication with the Boston ARTCC, which had the descending craft on its radars.

On the deck of the *Dallas*, she had a radio console to do this. Captain Winston Jablowsky, the commander in chief of the *Dallas*, had called all hands to watch for the craft by every means available, from binoculars to radar. And the final leg of the craft's journey was a quiet one. The

telemetry at mission control confirmed that the craft was descending below her drogue parachute at the nominal rate of descent. And Boston ARTCC had confirmed that they had her on screen :

"Boston traffic to Coast Guard Dallas, we have a positive squawk on messenger one zero six, heading zero three five, level 280, descend rate twelve thousand feet a minute, decreasing.

— Copy Boston, that's really our craft performing fine. Can you confirm the squawk number please ?

— Squawk six seven one five on screen, as assigned on the flight plan.

— Thank you Boston, stay in touch… Erin, we shall have it on our radars very soon.

— Sir, I've got a positive contact at level 210, indicated the radar officer of the Coast Guard cutter. Madam, I also have the same squawk as reported by Boston ARTCC.

— Thank you Henry… answered captain Jablowsky. Miss Mc Farlane, your spacecraft is coming back to earth, and we can spot it now. Kyle, tell the helicopter crew to take off now, Henry will give them the proper heading.

— Aye aye Skipper ! Bridge to Watchbird one : scramble, scramble, scramble, target on approach.

— Copy Bridge, Watchbird one scramble…

— Tell them that the on-board TACAN is on, did I told the captain, and they can use the one they've got aboard their HH-60 to have a contact with the craft.

— You get that Watchbird one ?

— Aye aye sir ! We'll report TACAN contact with the target ASAP. No change in frequency ?

— Negative Watchbird, miss Mc Farlane had changed nothing.

— Boston Control to Coast Guard Dallas, the craft had slowed its descend rate below two thousand feet per minute. It is below level 100 now.

— Watchbird one to Bridge : Judy. TACAN positive at twenty miles, the craft had entered the upper cloud layer.

— Get close to five nautical miles, same flight level, and follow the craft with your TACAN, said Ayleen. Report visual contact when you get one.

— That's pretty good… said captain Jablowsky. *Dallas* to *Saguenay*, you are clear to position yourself within the standby area.

— Copy Dallas, we are cruising now towards the standby zone…"

Both ship sailed apart, one on each side of the recovery zone, spaced by two nautical miles each. Then, the helicopter confirmed a visual contact, soon followed by a lookout on the *Dallas*. Hanging below her three parachutes, her beacon lights blinking, XC-1 was flying downwards the ocean. She splashed perfectly at three nautical miles on our port side. The Canadian tugboat then sailed straight to the landing spot, where the helicopter was overflying the craft. A dinghy with a recovery team was put afloat by this ship then, with the task to hook the craft to a sling, and tow it back to the tugboat. While the recovery team was performing this task, the helicopter flown back to the *Dallas*, and I talked to mister Evans Gardener, NASA's representative aboard the *Saguenay*, by radio. He was very satisfied of what he saw :

"You've done a pretty decent job at Northeastern Aerospace, miss Mc Farlane. XC-1 is slung to the ship now, and it looks in a fair shape.

— We have to check it completely at the factory now, our main concern is to see if the pressure vessel had withstand the splashdown without significant damages. If you can't fly back the craft after a splashdown, that would mean you'll have to build a new one, instead of refurbishing an already flown one. And that would have an extra cost.

— Well, we'll see that later, your crew is hooking the craft to the crane now. I'm optimistic about the capabilities of the craft to make a landing on water and fly again after such an ordeal. The boilerplate tests had been very positive.

— For the pressure vessel, this might not have changed on the flying prototype, but we'll need a complete X-ray scan of the structure to have this point ruled out. My main concern is all the on-board equipment. Physical conditions of a splashdown are quite different from a ground landing, and this might have damage some equipment aboard the craft. We'll see that together when I'll come aboard the *Saguenay* with miss Messerschmidt."

After the recovery, we were transferred with a dinghy from the Coast Guard cutter to the tug, Ayleen and I. Starlight Messenger Cargo Prototype one was hooked on the rear flat end of the tugboat, protected from seawater by a tarpaulin. We had to sail now to New Haven, before having the craft driven back to the factory on a flatbed truck. We had a day at sea before entering New Haven harbor, and we had some work to do, Ayleen and I. As a test pilot, she had volunteered to check the flight parameters of the craft with my coworker in charge of the flight control systems.

They both pulled out the flight parameters recorder from the craft, and made simulations on a laptop computer, analyzing every phases of the flight. My job was to enter into the craft and made a first visual check of every reachable system, searching for something broken, bent or disconnected. My visit was very positive : everything looked fine. My calculations, which included over-provisioning for the mechanical resistance of the avionics, were confirmed to be right.

Now, the craft was planned to be completely taken to pieces to check completely all her components before being refurbished for another mission. A D-check in aviation slang, as Ayleen told me. On the evening, in the galley of the tugboat, with an excellent vegetable soup as our dinner, we spoke about the next mission, Ayleen, mister Gardener and I. Flight 203 was a milestone : the complete XP-2 craft, which have all the bells and whistles, was scheduled to be flown in an automated mission copying all the steps of a manned mission to LEO and back. Ayleen was interested by this mission, which includes a docking maneuver :

"XP-2 is planned to be docked to your visitable satellite, as you call it. It's a kind of small space station, you told me.

— The project EXPESAT, said mister Gardener, a mid-term between a complete crewed space station and a full automated unmanned spacecraft. We have Calspace as contractor for this project. It is scheduled for launch next week, from the Cape.

— I've heard from the grapevine about this concept, told us Ayleen. It's a kind of modular satellite, with the ability to host some astronauts for a short while, ain't it ?

— That's the point, did I said. On EXPESAT, you have three zones : a docking area where you can dock up to three crafts like Starlight Messenger, or add-on for specials experiments, a pressurized area, where you can make experiments requiring a complete atmosphere or the presence of human lab techs, and a platform for automated packages outside. With the possibility of visiting the satellite, you can perform manned experiments, of course, but you can send someone outside to change the packages, or repair the satellite. Everything is modular, with one manned flight, you can add and replace modules as you need. There is some features aboard to provide an EVA ability to the satellite, including a trunk dedicated to store an EVA suit.

— And one thing which is very important : this satellite have a longer lifespan than an automated version, told us the NASA representative. Of course, if something is broken, you can send astronauts aboard to fix or replace it. And you can also refuel EXPESAT with an automated cargo flight, like the cargo version of Starlight Messenger.

— Mmmmm, I see the interest of this device now… Erin, about the next mission, you have planned a docking of the manned Messenger with EXPESAT.

— Me, no, but the direction board of Northeastern Aerospace, yes. Mission 203 will do the complete operations of a shuttle flight to LEO : liftoff, flight, docking, undocking, reentry and recovery, all in automated mode. First validation flight for the NASA is scheduled for April next year. That will be a cargo flight to the ISS, prototype XC-2 will do the job. Piloted validation mission 205 is scheduled for the end of the year 2011. First serial craft mission will be done for the first half of 2012, we're expecting the money for it.

— You'll have to wait for the end of FY 2011 to have the go, said mister Gardener. Good point for you, you're not behind schedule, and you're still on the planned budget. Block 3 crafts are on the assembly line for one of each type as confirmed contract. For FY 2011, we had not voted for the change on the two options. But if it's done, you'll get an additional order for two crafts to be delivered for 2013.

— That's a pretty good occasion for me to do some business with Northeastern Aerospace for all their legal affairs with the NASA, said Ayleen. All the legal paperwork for their contracts with NASA, it's my job as their attorney in law.

— No, really ? asked mister Gardener, surprised. I have seen a miss Messerschmidt as their legal counsel on all the documents they provided as a NASA's contractor, but I haven't thought it was you.

— She's not only a test pilot for the military, did I answered. Miss Messerschmidt had multiple credential. If you like Japanese cuisine, she's also doing veggie sushi.

— Vegetarian sushis ? This recipe is supposed to be done with fish, ain't it ?

— Sushi is, in fact, the vinegar-cooked rice used for this dish, explained Ayleen. You can do sushis with everything, and not only fish. Sushi rice is the only mandatory ingredient, and there is lots of variations of vegetarian sushi dishes.

— Well, thanks for the recipe miss Messerschmidt. My son is garrisoned at Kaneda AFB, I'll have some culinary idea for local cuisine to share with him next time I'll go to see him…"

At this time, mission 203 was prepared to be launched from the usual spaceport at Wallops Island. When we arrived in New Haven, I was only thinking about the next milestone mission, the last to be experimental. But there would be some changes about it…

With the milestone mission 203 planned for mid-December, we had enough time at Northwestern Aerospace to make a complete check of the XP-1 and XC-1 crafts before sending them again in space. Our main sales argument was the ability to fly them at least for ten missions, reducing cost per mission. XC-1 had flown three times and withstood one splashdown, and XP-1 two times, the priority work on them was to make a complete check of all components before flying them once again. As block 1 prototypes lacking the ability of docking, only fitted on block 2 preseries and forthcoming block 3 operational series, they were only useful as development crafts, and future vehicles for automated commercial flights.

With the validation missions requiring mandatory docking maneuvers, they were left behind. And that was a good occasion to take them to pieces to see if something went wrong, and meter their wear in real operational conditions. Especially potential corrosion due to seawater on splashdown, for craft XC-1. My main concern was the stainless steel piping, for all fluids aboard, including liquid oxygen and methane for the directional rocket engines.

Using stainless steel is also a cost-cutting measure : twice the weight but tenth the price of carbon-fiber pipes, reliable and real-use proven material since decades, inexpensive and easy to use and repair, Jack of all trades for everything liquid or gaseous, and you've got dozens of manufacturers in the country and worldwide, no problem for pricing and availability. It was one week before launch of mission 203. I was checking dozen of yards of pipes on XC-1, visually and with x-ray and endoscopic systems. I had to find the source of parasite vibrations on the fuel lines and that had taken me a complete day to finally get the point :

"Dan, I've got it ! That's the dampening gaskets on the fixation brackets, they are wearing off faster than we thought, you can add a mandatory replacement every two flights instead of five.

— Mmmm… Sounds like a quality problem with our contractor, answered Daniel Collins, the maintenance engineer for the Messenger program I was working with today. Can you get me a sample ? I'll send it to the material labs for further analysis.

— I take three from fuel line PF3, reference G5 to 6.

— PF3 ? Starboard yaw main control engine ?

— Yep, that's this one, main thruster. PF 5 and 7 are for secondary/backup ones. And their gaskets seems pristine.

— Get me the PF5-G4 and PF7-G6 for comparison. Same Torx screws, powered disassembly with standard torque-controlled tool.

— Gotcha… I'll have to check what is the difference in vibrations between those two lines. PF5 and 7 are longer, but the secondary thrusters requires less fuel pressure than the main one. It changes everything about the in-flight vibration pattern.

— You don't fire those thrusters the same way. Secondary are used in frequent, slow, low-power burns for in-flight attitude control, and main is used for higher-energy maneuvers, here lateral stabilization and heading control of the craft before reentry.

— Hi there, is Erin here ?

— She is boss, you need to ask her something ?

— That's for something important. Erin, can you see me in my office as soon as you can ?

— Yes, I have five gaskets to remove and I'll be free…"

Garfield Ahrenfeld, our CEO, does not go to call personally one of his engineers at work in the maintenance facility for futile reasons. As my boss, he's only on the assembly line to have a direct point by his employees on a precise critical thing to see, or when he's touring our facilities with customers or contractors. Wishing to see me right now means that there is a real great problem with our job. His secretary told me to enter directly into his office. I found there my boss talking to some brass on the phone, and a military high-ranked officer I had the description before by Ayleen :

"…have this complete crew that had already flown the craft in LEO, my flight engineer is just entering now, I'll asked her… Yes, the NASA have my go, the launchpad crews are furbishing the craft for a manned flight now, that would be done in three to four hours. I'll get you her answer in one hour, I bet she'll be pleased… Yes, you can call me back, see you later Sir… Erin, excuse-me for the disturbance, but this is a matter of national security. Let me introduce you lieutenant-colonel Linda Patterson, the national security referent for the New York region…

— Nice to meet you madam, you're the associate of miss Messerschmidt ?

— Yes, I am, and I see that she had already told you about me.

— Garfield, what's the problem ? Which terrorist threat will attack our facility ?

— Not the PETA's silly cow you'd told she was a fucking retard for complaining about the guinea pigs one of our customer had planned to send in space for an experiment about comparative nutrition patterns between normal and zero-G situations…

— It is not about a security threat Northeastern Aerospace is been called for, told us miss Patterson. It is a mission that would require qualified personal and equipment only available here. Everything else is classified and requires you to volunteer for a DoD mission right now, with immediate effect…"

I've just sat down, stunned by such a surprise. DoD needs a spacecraft and a crew to man it, and we are the only one in the US to have both available within immediate notice. That means I have the opportunity to fly again in space aboard Starlight Messenger. I had no hesitation, my answer was straightforward :

"Book me in for the ride, you get your flight engineer for this mission right now colonel Patterson.

— I knew you were not the kind of people reluctant to do an extra job for Uncle Sam, told me Garfield. You're in the loop now, I just had to tell it to the Pentagon when they'll call me.

— Colonel Patterson, if you are authorized to tell me that, I presume that this mission requires a manned spaceflight.

— Yes, it is. I can tell you now that it's not a military mission. I mean a mission set for national defense purposes.

— Miss Patterson, the DoD asked me to tell you to find a physician, with a good knowledge of emergency and aeronautical medicine, without medical counter-indication for spaceflight and, if possible, a FAA flight license for general aviation.

— I've got one on hand, he's already volunteered for this mission, and he's already got a go from his employer for this job. He's also FAA-licensed for aeronautical medicine and member of the CAP, I'll drop his name to the Pentagon to get him a clearance for this mission, they just have to check with the FAA.

— Mmmm… Space Rescue Mission ?

— You've been told of nothing about it yet miss Mc Farlane, you'll get a complete point of all parameters at the launch site later…"

No denial, neither confirmation from lieutenant-colonel Patterson… The Pentagon guy who called us later was the commander in chief of the USAF himself, and he was very pleased to see that everything was going fine with this mission. Miss Patterson drove me with a military service car straight to the main public hospital of New York City, the Bellevue Medical Center. We went there straight to the patient admission service, where our physician was expected with a patient from New Jersey. The hospital's employee was also expecting us :

"Ah, miss Patterson, you're here for doctor Peyreblanque ?

— Yes, I am. Marty had finally found a way to bring economically his patient here ?

— Not his patient miss Patterson, mine… Doctor Donovan Anderson, geriatrics, miss, you're a member of the military ?

— Not at all, I am working for a contractor of the DoD. My name's Erin Swanson, I have some defense affairs to see with miss Patterson…"

I partly lied there. Swanson is my husband's name, I never use it at all. I don't want to be easily recognized as a NASA astronaut. Fortunately, someone entered there, a short man pushing an old lady sited on a wheelchair :

"Here we are madam, we shall now book you as an entrance… Good evening Donnie, I've got your patient here. I present you miss Hannah Rosenfeld, 75, incoming patient for surgery, needing an ankle prosthesis following a domestic accident two month before. No complications, ready for the job, I leave her to you after she will be booked here. Miss Rosenfeld, I've got some hot black tea ready to drink in the doctor's lounge, if you want to drink a cup with me…

— What a delightful attention you have doctor Peyreblanque, answered the senior lady. You know how to treat well your patients.

— With such a cold weather, that would be a pity to skip a good cup of tea for arrival. Sugar, honey or nothing ?

— Honey please. I'm fond of tea with honey.

— I'm going to prepare you a cup, I won't be long. You can do all the paperwork now, I will be back in ten minutes… Excuse-me darling, I'm very busy right now, I'm still on duty, you're with the person you told me about on the phone ?

— Yes, I'll present her to you later.

— Well, let's have the things done, I'll bring a tea for you too, miss, a cup for you ?

— Thank you doctor, I'm a coffee drinker…" did I replied.

Before doctor Peyreblanque left the room, doctor Anderson asked him some details about the way he brought miss Rosenfeld here :

"Marty, you told me that you would follow the policy… You did not hire an ambulance for her, didn't you ?

— No taxicabs and no doctor's private cars, I know. Public transportation was not off limits, so I used it.

— WHAT THE HELL…

— Do it a little bit louder, they don't hear you properly in Newark… Well, miss Rosenfeld volunteered for this, and there were no medical contraindication. A short ride from her flat to the next bus station, the PATH train to 14th street and then, the L line subway to the 1st avenue station. Less than $10 in fares, that one is for me.

— Jesus Christ ! Marty, don't do me such a thing like that again !

— Well, only if you can pay the $1.500 bill of the ambulance… The private insurance of miss Rosenfeld didn't want to pay her the ambulance needed to bring her there, so I have to improvise... Excuse-me, I'm late for the tea…"

Doctor Peyreblanque swiftly went away to bring us some tea and doctor Anderson, clearly puzzled, went to check the paperwork needed for ms. Rosenfeld's admission :

"He's unbelievable ! Public transportation…

— That's a good occasion for me to go outside my home doctor, replied miss Rosenfeld. And even it's freezing outside, I have my coat and my blanket with me. People in the bus, the train and the subway were very kind with me, and the first avenue is a nice-looking street here.

— Uh… Don't tell me he pushed you down the way from the 14th street subway station to the hospital, didn't he ?

— Oh yes, he did doctor, I'd asked him to do so… That's not really slower than the bus, accounting the waiting time, and I really needed to have a good hike downtown.

— What a hike you've got, miss Rosenfeld…

— Well, bus, train, subway and street walk, that's pretty more entertaining than get stuck in the traffic jams between Paterson and here, don't you think ?"

Doctor Peyreblanque had borrowed a trolley to a nurse and he used it to bring us a teapot and some cups. Ms. Rosenfeld had finished to file for admission and she was pleased to share a cup with us. Doctor Anderson left us after having called the nurse to bring ms. Rosenfeld in her room. Doctor Peyreblanque served us and colonel Patterson presented him to me :

"My companion, working as a surgeon here. I had been required to look for someone with emergency and aeronautical medicine abilities, and I though about Marty.

— The hospital gave me a clearance, my boss is very pleased to have me as a publicity stunt for high-tech medicine, told us doctor Peyreblanque. I had worked recently with the NASA to set an evaluation program about medical needs in space travel, including emergency situations. I wrote a paper about it on the last issue of the JAMA, if you're interested about it.

— Well, maybe to get an idea about what kind of hardware I have to put for this job inside the spacecrafts I design, did I replied. I'm an aerospace engineer, on-board systems specialists.

— I've got a name at the NASA, the head of the program, I'm in touch with him and I can drop him a word about you if you're interested.

— Marty, I think our plane is ready… Colonel Patterson speaking… Yes, Bellevue, I've got a car and Marty is ready…"

After this tea break, we took the car and drove to Teterboro Airport, where a plane was waiting for us. That was an USMC C-37A Linda Patterson had provided us with a crew, to fly us directly to the Mid-Atlantic Regional Spaceport, where Starlight Messenger mission 203 was intended to lift off in the forthcoming week. One hour later, we were at the facility. Northeastern Aerospace use the MARS for all Starchaser carrier rocket flight, including Messenger missions, and the Starchaser rocket, which was assigned to Messenger mission 203, was already on her pad, ready to be fueled and fired.

We landed at the Wallops Flight Facility, a NASA complex on the shores of Virginia, adjacent to the MARS on its northern side, used to test all kind of airplanes and aeronautical equipment, especially remote controlled and automated drones. Our real mission was under a high level of secrecy, and we were told for the first time about what we have to do. NASA deputy administrator Lori Garver, and USAF special operations head brigadier-general Wallace Simmons were the people who made us the mission briefing. And we met there Ayleen Messerschmidt, who made the presentations :

"Sir, I think you already know miss Mc Farlane, my flight engineer on mission 202. You told me you met her on the Blue Messenger project… I have to introduce you doctor Martin-Georges Peyreblanque, surgeon at the Bellevue Medical Center, occupational medicine for the FAA, member of the Civil Air Patrol with the rank of captain, and NASA consulting specialist on space medicine.

— Nice to meet you doctor. Miss Garver told me about your work on the Advanced Diagnostic Ultrasound in Microgravity program, and the planning of the space emergency medicine program. That's a chance for us we've got your medical file from the NASA to get you an astronaut clearance for this mission.

— Well, that is a circumstantial chance, Sir. I volunteered as a test dummy for training astronauts to use their hardware aboard the ISS. That was how the NASA got my medical record.

— We have to hurry if we want to send the rescue mission in the next 48 hours, cut miss Garver. General, if you mind, I'll do the briefing.

— Spaceflight is your job, I'll would only drop a word when matters of national security would be seen."

The briefing was very simple. Obviously, it was a space rescue mission, but on a secrecy basis due to some unknown factors about the craft we had to rescue. Miss Garver told us the tale, but it had some missing parts :

"Doctor Peyreblanque, as a FAA-licensed private pilot, also having an IFR license and more than a thousand flight hours, is accustomed to aviation terms, I won't have to translate them, and I will use some of them in this briefing. Doctor, I'm sure you know what is Cheyenne Mountain.

— I do. It is the USAF air and space defense headquarters, in Colorado.

— It is the starting point of our story. Cheyenne Mountains monitors air and space over northern America, in behalf of the NORAD. Everything passing over us is detected, identified and monitored there, from private planes like your own, doctor, to airliners and military planes. And it is the same for everything orbiting around Earth, from pieces of junk to active satellites. Miss Mc Farlane knows it, she had worked with us on a project of an automated system to recollect space junk in orbit. That is when a national security affair began. General, your turn.

— Thanks miss Garver. On the 29th of November, NORAD had detected an unidentified space vehicle, roughly the size of a double deck railroad car, on LEO, appearing out of the blue, and never seen before. As per with the standard procedure, we checked for a launch from the other nations able to build and send in space such a vehicle. First, the Russians denied having launch such a thing, thinking first it was one of our military classified satellite when they saw it from their space monitoring center in Kaliningrad. Chinese government also told us that the craft was not one of their own, and the European Space Agency confirmed that this was not one of their vehicle, like the JAXA, the Indian, the Brazilian and the Israel Space Agency. North Korea and Iran does not have the possibility to launch such a huge system in space, they were ruled out.

— And that was when the US government was looking around for clues that NORAD received a mayday from this facility, told us miss Garver. That was a short message in English, and, curiously, sent using Morse signal on a legacy NASA space frequency. The message said : *Help, need craft to go down, three aboard, supplies low, three weeks available, expecting answer*… Message sent several times, and confirmed by China and the Guyana Space Center in Kourou. The decision was made to send a rescue team as soon as possible. Starlight Messenger mission 203 was ready to take off soon. With the clearance from the government and the NASA, I was assigned to this mission, with general Simmons as second in command.

— The monitoring of this mission would be made by the NORAD in Cheyenne Mountain, told us the general. We will use Starlight Messenger, with a crew of three, to go up there and pick up the three crew members of this unidentified craft. That will require flying a spacecraft, and giving medical aid in space.

— That will also require performing an EVA, and that is why doctor Peyreblanque had been chosen. He knows how to fly an airplane, and that is mandatory to fly a SAFER.

— You mean the Simplified Aid for EVA Rescue, the lightweight version of the Manned Maneuvering Unit ? asked doctor Peyreblanque. If there is a throttle and a flightstick, I can use it, no problem.

— You'll get a training doctor, we've got a flight simulator for EVA simulations here. That is less complicated than an IFR flight with an ILS landing.

— So, miss Garver, can you tell us what is the mission profile ?

— You will lift off in less than 48 hours miss Messerschmidt, with miss Mc Farlane as your flight engineer, and doctor Peyreblanque for the EVA. The first leg of your mission will lead you to the EXPESAT for a docking. The Japanese Space Agency had flown there their experimental space tug Karigane, which shall be docked to the station within a few hours. Starlight Messenger will use it to go to a higher orbit to reach this spacecraft. Then, the crew stranded aboard this craft would be transferred to Starlight Messenger, and brought back to Earth.

— That is a more complete mission profile than the 203 mission initially planned, did I noted. I know nothing about the Japanese tug, does her control system fits with our own ?

— Completely, Starlight Messenger Profile had been downloaded on the computerized navigation system of the tug. You'll just have to dock with it, and you'll be in control, replied miss Garver. This mission would have two manned docking instead of one automated, the craft to rescue is on a 500/1.000 kilometers orbit, and use of a space tug is mandatory to reach it."

Now, we had the complete mission profile. I was highly interested to have the possibility to fly the Karigane tug in a real operational mission, and check by myself the docking abilities of the Starlight Messenger craft. But the unknown part of the mission was puzzling : which organization can send into orbit such a huge satellite with people aboard, and not being able to recover them ? That was the mystery part of our mission…

We were assigned to a liftoff 48 hours ahead, and we had only a complete day for basic training and mission planning before going to space. Doctor Peyreblanque had to trained to use the SAFER device and proceed correctly to an EVA with tethering procedures and free flight. He used the basic EVA simulator, a mock spacesuit on a robotic arm, with all the controls needed on it an a monitoring room with a controller. With his knowledge of piloting, it was not difficult for him to pilot correctly the SAFER.

Ayleen and I, we trained for our mission with a wooden mock-up of the Starlight messenger cabin, with photographs of the commands, and two laptop computers simulating the navigation and on-board systems monitoring computers. Following the previous flight Ayleen had suggested some minor tweaks to the controls, but they were not implemented yet on XP-2, Northeastern Aerospace having planned to do it on XP-1 first, because this craft was previously scheduled to go back to space with a crew sooner than XP-2. So, we had the original version on XP-2, the craft scheduled for mission 203, previously unmanned.

On the evening of our day of preparation, we learned from Linda Patterson that everything was OK for our flight. The Karigane tug had been docked with the EXPESAT and the first reports from the Japanese flight control center indicated that everything was into the optimal flight parameters. Linda Patterson gave us her report on the situation :

"The JAXA had confirmed that the Karigane tug was waiting for you, ready to go, on the docking port 3 of the EXPESAT. The NORAD had a radio contact with the unknown craft, saying that the crew was expecting you, ready for the transfer. The crew told the NORAD that no one was sick of injured, they just need a good meal, with *wafers*. Honey, what do you think about that ?

— If they are not reporting environmental problems, the main problem for them would be food and water, replied doctor Peyreblanque. I had asked to have some emergency protein tablets aboard Messenger for them, the same kind used by NGO operatives in the third world for emergency relief of populations. And also wafers designed for zero-G meals, of course. They are

still able to send Morse-code messages, that means their life support system is still operational. Darling, did you get me the first aid kit for space rescue I had asked to the NASA ?

— They've put one on the craft with the EVA suit Marty. Ayleen, Erin, I trust you for taking care of him. Always have in mind that he have a slight tendency to forget he's a family man with three daughters.

— Don't worry Linda, replied Ayleen. That's not a combat mission, risks are low, especially with a fine-tuned craft like this one. Erin and I, we're not rookies with Messenger."

On the 7th of December 2010 in the morning, we were ready for liftoff. We had to put on our pressurized flightsuit before being installed on our seats into the craft. The carrier rocket was fueled on the launchpad and we were waiting for the go from the weather service of the MARS. The weather was cold, with a thin layer of clouds at 10.000 feet ASL and a north wind blowing at five knots. We had to wait for a clearance before flight to have our mission confirmed, clearance based on meteorological forecast for the next 48 hours. After having put our pressurized suits on, doctor Peyreblanque had a phone call on his GSM from his stepdaughter in New York City. His family was entrusted to a cousin of his companion, Linda Patterson, and he had to solve a domestic problem :

"…No, I confirm, cousin Carrie is right to prohibits you from seeing *Heaven's Gates* with your cousin and your youngest sister, this motion pictures contains firearms fight scenes and that is a no-go for your youngest sister, she's only seven years old… No, no, and no ! This is not a relevant argument ! Galina enjoys slaughters, that is a fact, but she is twelve like you, and she had not been granted to see motion pictures like *The Wild Bunch* before she was ten, and only with Louise sleeping and in my presence ! You do not remember, but that was close to be vetoed by your mother… Please, leave this comment about the notion of dominant female and submissive male to your forthcoming psychoanalyst, I am you stepfather now, and Linda is your mother, and if it is no with me, that would be the same with her !… What do you mean by making a sissy out of Louise ? Shall I remind you that you could not see *Bambi* without crying until you were eight, and you always go away when Galina wants to see a war movie ?… That is a fact : your youngest sister does not even stand the vision of a live performance of Jerry Lee Lewis, you had used it many times to silenced her about the foolish tricks you did not want her to tell me. If she cries when she sees a burning piano, what would it be with the vision of a character being killed in action ?… Find something else for tonight, sorry to say that. Ask Carrie, she have some general audience cartoons on DVD… Yes, you can call your mother this evening, she is not on duty. Good afternoon sweetie, and enjoy yourself…

— Motion picture choice for the evening, did I commented. I know what the problem is. My husband is a fan of football on TV, and I ain't…

— My stepdaughter is a western fan and my second daughter never misses a war movie. Ayleen is a sci-fi addict, she also writes some good short novels in this genre.

— If we find some kind of alien up there, that would make me a good idea for a story, replied Ayleen. The weather is pretty fine for this period of the year, I'm expecting a go… Come in, we're all ready !"

Arthur Goldoni, the launch manager for Northeastern Aerospace, our corporate launch crew's boss, came into the dressing room with the good new we were all expecting : we had a go from the weather service :

“I have checked it with the latest data from the NOAA, everything OK, you have a go. The rocket would be completely fueled in one hour, you will embark as previously planned. The experiment packs for EXPESAT are aboard the craft now.

— Experiment packs ?

— EXPESAT had been launched with some experiment racks empty doctor, did I explained. The NASA had planned to put into it some experiments into the pressurized section. It was scheduled for a latest flight of Starlight Messenger, but with only three people on takeoff instead of a full capacity of six, we can bring three experiments packs up there. We have a docking scheduled with EXPESAT, this would give us the occasion to deliver some payload there.”

With the go from the weather service for the liftoff, we had to go to the spacecraft for embarking at liftoff minus one hour. The rocket was fueled, the ground crew had made a final check and gave their technical go for launch. The spacecraft crew is then driven to the launch pad, wearing its cabin spacesuit, aboard a minibus. Starchaser rockets use the 0B launchpad of the MARS for all flights, with minimal adaptations for manned flight : a mobile platform on a crane is used to lift the crews atop the 150 feet high carrier rocket. It is an off-the-shelf system from Komatsu, usually designed for high height works like medium-sized buildings maintenance, shipyards works and other activities requiring up to ten people being lifted to heights up to 200 feet.

With our rocket, the launchpad does not requires a full-features tower, just a ground pad with mobile arms for fuel and electricity, and a holding system for the base of the rocket. This facility had been designed to be easily used on any launch facility in the US and aboard, requiring just a flat concrete surface of a minimal size of one acre, enough place to put away at a safe distance the launch control facility, a truck trailer with all the bells and whistles needed for such a job, roads or railroads to bring here LOX and methane to fuel the rocket, and an industrial power supply. Of course, the whole equipment can be transported by road, train, plane or ship, increasing the operational abilities of the whole system.

At MARS, the mission control is provided by the NASA, as is the facilities for manned flight. As contractor of this federal agency, we have no need to bring the mission specialists for manned spaceflight, NASA do the job. It is two of their guys that put us into the Messenger craft. Their task is to strap us on the chairs, beginning with the pilot and flight engineer in the “upper” seats, in fact the front seats of the craft while in flight. There is a hatch for each seat, and we have to slide into them, before being strapped with the safety harness and have our flight suit being plugged to the craft’s environmental systems, for air supply and temperature control. Then, the hatches are closed, and the passengers are set in place through the wide rear hatch.

This hatch have a dual-use : of course, to provide access to the rear seats for the four passengers, and also grant an access to space for a crew member who needs to perform an EVA from the craft. And, on the automated cargo version of the craft, to give access to a payload that needs to be delivered in orbit, from modular racks to small satellites. Doctor Peyreblanque was strapped and plugged for flight on seat number two, seats are numbered from one to four from port to starboard side of the craft. Seat two is behind pilot’s seat, right in view of the “aisle” that goes from the rear to the front end of the craft, giving access to the docking coupler and its access hatch, hence giving the ability to all the occupants of the craft to leave it easily when docked to a space station.

With the access hatches closed, our work as a crew began. The pre-flight checklist schedules a mandatory control of all on-board devices before giving the flight clearance. That’s the job of the pilot and the flight engineer :

"Messenger Two Zero Three to Mission Control, do you read me ?

— *Loud and clear Messenger, radio link and telemetry are green, you can proceed to cheklist.*

— Copy mission control, proceeding to checklist… Erin, let's go.

— Flightsuit environmental control.

— All three systems switched to on-board power and control… Parameters ?

— Nominal for all crew members, no alarms, all green. Doc, that's good for you ?

— Affirmative. Give my regards to the engineers who had designed the seats, it is like being relaxing into a luxury armchair. Excellent head and spine holding, a good work done.

— The Northrop Grumman team, who's our contractor, will be pleased to have your point of view doc, don't hesitate to point everything right or wrong, a medical input is highly welcomed on such a design. Ayleen, next step ?

— Next step : on-board energy systems.

— Power batteries 100 % capacity, no breaker tripped.

— Navigation systems.

— Self diagnostic on green, all systems functional…"

Then propulsion, cabin environmental systems and pressure vessel integrity, with the shutdown of the atmospheric release valve and powering on the pressurization system, thrusters systems control and, for a final clearance, self-diagnostic of the docking system, control of the rocket piloting system and, after a final control and the arming of the craft's emergency escape rockets, that gave us the final launchpad clearance for liftoff at 15 minutes minus liftoff. Five minutes later, the final go had to be given by the ground control, based on weather conditions. With such a fine winter blue sky and absence of wind, everything was green :

"Messenger Two Zero Three from Mission Control : you have a green, weather conditions nominal.

— Copy control … Can you give me the parameters please ?

— *Affirmative : pressure 1.021 hectopascals, wind three to five knots from heading zero six five, cumulus from level 100 to level 150, sky clear five oktas.*

— A nice weather for a walk in the park… Okay Erin, next step.

— Craft on autonomous power, after ground power system disengaging.

— Let's proceed…"

Now, the craft runs on its own power, drawn from the on-board batteries, rather than the power network. And Ayleen engaged now the automated liftoff sequence. Five minutes before liftoff, it is the last step before running the carrier rocket, or making an abort on pad, canceling the liftoff. The firing of the engines would be initiated by mission control ten seconds before liftoff, engaging an automated procedure that will fire the four engines, set then to full throttle, check in a few tenths of second if they are running correctly, and release the rocket from the pad, initiating the flight itself. In case of malfunction, the automated sequence will proceed to an abort before liftoff, shutting down the engines, or ejecting the craft from the rocket in case of an explosion.

For mission 203, everything was going fine. All systems were green for liftoff, and we were ready for the ride. I have to precise now that, for the manned flight configuration of Starlight Messenger, the Starchaser rocket use what is called in engineering as a "dumb tank" configuration. To fly a rocket, you need electronic systems to control the course, the engine thrust and the on-board systems. On every rocket, those systems are set into a ring between the last stage and the payload fairing, and are lost when the last stage is spent.

For manned flights, we have the possibility to used something that is always recovered : the spacecraft herself. When a Starchaser rocket is used to carry a Starlight Messenger craft, the usual electronic systems for automated flight are not mounted atop the third stage, and that's the on-board electronics of the craft which performed the tasks of controlling and guiding the rocket, saving weight and bucks. A quadrupled computer bus links the craft with the rocket. And that is how the pilot and the flight engineer can see, on the dashboard, all the flight parameters in real time. On screen, all systems were green, and the countdown was going on without any hiccup :

"Messenger two zero three, one minute before liftoff.

— Copy control, we are ready. Pilot to crew members : relax, sit down, and enjoy the ride !

— Thirty seconds… Ground power disengaged, rocket ready…

— Erin, rocket parameters ?

— Nominal. All green.

— Fifteen seconds… Ten, nine, eight, seven, six, five, four three, two, one, ignition and liftoff !"

Then the big ride is starting. With its four 945 kilonewtons liftoff thrust Comet LOX-Methane engines, the Starchaser really gives you a kick in the pants at liftoff, reaching 40.000 feet in 50 seconds, with an acceleration of 3 G. The propulsion guys who had engineered the rocket had decide to have a fast-and-high flight for the first stage, giving the rocket the ability to cross the most turbulent part of the atmosphere as fast as possible. Over level 400, as airmen use to say, you are entering the Max-Q zone. It is the point where the aerodynamic forces on the rocket are the highest possible during the flight, due to the combination of speed and air pressure. Below, you've got an increase, and over, a decrease.

To avoid an aerodynamic structural overstress to the rocket, the first stage engines are throttled back to 70 % at level 360, reducing the acceleration rate (the rocket keeps on pushing, getting lighter because of the propellant burned for ascent) and keeping the speed behind the safe limit. An electronic device, piloted by the on-board computer of the craft, called FADEC, throttles the engines automatically to the optimum speed. And, on our dashboard, the navigation screen indicates when you're at the top point :

"Pilot to engineer : Max-Q !

— Copy, indicator on green. Hang on, we're increasing thrust now !"

We had reached the speed of Mach 2 at level 400, and we kept on accelerating and gaining altitude, to finally reach the altitude of 220.000 feet with a velocity of 5.400 knots, or Mach 10, one minute and a half later. The first stage is now spend and have to be jettisoned. First stage engines are shut down, then explosive bolts separates the fairing between the two stages, leaving free the top of the rocket. Petals atop the first stage are open, acting as air brakes to slow down the spent stage, a feature planned for future reusable first stages. In five seconds, the first stage is jettisoned, the second and third stages are separated and the two Comet engines of the second stage are fired, giving each a thrust of 1.080 kilonewtons, higher than the same ones at sea level because the air pressure is lower at 220.000 feet ASL, increasing the thrust of the engines by differential pressure. And then, the ride continues :

"Messenger Two Zero Three to Mission Control : first and second stage separation complete, second stage at 100 % thrust, we're on the run !

— Copy Messenger, telemetry OK there, trajectory optimal. No problems with your passenger ?

— Negative control, this is number three aboard Messenger Two Zero Three, replied doctor Peyreblanque. There is such a beautiful view from here, I do not regret to have signed for this mission !

— And that's just a beginning Marty ! replied Ayleen. That would be a real pleasure on the LEO insertion. Optimal trajectory… Erin, parameters within limits ?

— Affirmative, all systems performing well."

The separation between the second and the third stage occurred six minutes later, at a speed of 13.600 knots, or Mach 25. Or better said : 7 kilometers or 4,3 miles per second, and an altitude of 580.000 feet, now 175 kilometers, or 109 miles. Then the same sequence occurred for the second to third stage separation, without the petals on the second stage, dropped behind. The last stage have a single Comet engine, now pushing the craft with his 1.120 kilonewtons of thrust. The last leg of the launch provides orbital velocity of 8 kilometers per second, and an altitude of 250 kilometers. 5 miles per second and 155 miles high, if you prefer.

We were now over South Africa, and cruising toward the southern Indian Ocean and New Zealand. With geostationary satellites, we still have a radio and telemetry contact with mission control at the MARS. Having finally reached the proper orbit, we have to made the separation with the third stage, and put the craft in proper condition for orbital operations. The separation with third stage is automated, separation fairing is jettisoned first, and the four data lines are separated after, giving back the manual flight controls to the pilot by disabling the automated launch control system. Then, the third spent stage is pushed away from the craft by small powder rockets, and it's time for the crew to perform the orbital insertion checklist :

"Okay Erin, here we are… Messenger Two Zero Three to Mission Control, third stage separation complete and orbital insertion done. We're putting the craft into service now.

— Copy Messenger, we let you proceed to the next steps, telemetry OK for us.

— Ayleen, I'm ready for the checklist.

— Okay, let's go… Environmental systems ?

— Air and climate nominal, everything running. Engaging orbital pressurization now.

— Propulsion system diagnostic ?

— Engaged… Done, all propulsion systems are green.

— Two done… On-board power systems ?

— Engaging deployment of solar arrays…"

On Messenger crafts, you have a rear part that contains a rocket engine for maneuvering in orbit and deorbiting the craft for reentry, the fuel needed to use it and folded solar arrays that are deployed in space by electric motors to provide electrical power to the craft. When the craft was on the drawing board, it was first planned to use a manual crankshaft to deploy the solar arrays : astronauts would had to turn a crank by hand to pull out the arrays from the service module.

This proposal was soon discarded as it offered no advantages upon cranking out the arrays with electrical motors. Of course, motors can fail, but a mechanical crankshaft can break or jam, and it is heavier. There is a backup system on the side of the service module : two fixed solar panel that can provide enough power for a minimal operation flight. On our mission, the four solar arrays, like windmill blades, were successfully deployed, giving the craft the power she needed for this flight. And Ayleen then gave the good new to Mission Control :

"This is Messenger Two Zero Three speaking : craft in perfect flight conditions, all systems engaged and working. We are ready for the next phase.

— Copy Messenger, we have your position, we'll send you the flight parameters for the rendezvous with EXPESAT…"

Mission control sent directly on the memory of the on-board computer all the orbital data needed by a digital radio link. The calculations were made by our on-board cluster of four computers, and the automated pilot was then engaged by Ayleen, letting the craft find by herself the targeted visitable satellite EXPESAT for the next 48 hours. As a real-condition test, this mission was a good one for us. Unexpected first, but highly profitable.

To make an orbital rendezvous, that's a little bit complicated than just steering towards the meeting point and plug to the target on arrival. You have two spacecrafts orbiting around the Earth, one waiting to be reached by the other. That's a question of astrophysics, you have to orbit on the same trajectory than your target, and to do that, you should synchronize it in altitude, equatorial incline, and position.

Roughly explained, you have to be sent in orbit first on a trajectory that can match the one of your target. You'll have to maneuver up there to get to the proper position, and, to do that, use as less fuel as possible. Main physic reality of orbital flight : accelerate and you get altitude, slow down and you loose it.

To catch your target, which is moving around the Earth on a predictable pattern, the first thing is to get the same orbit as it. To do that, you change your own orbit on two parameters : speed, that means higher or lower altitude, and equatorial inclination. Space pilots and automated systems (a computerized Honeywell Aerospace autopilot with quadruple redundancy and remote-control ability on Starlight Messenger) do the job by fine-tuning the orbit and carefully calculating the changes in position.

On our mission, Ayleen was piloting the craft by hand, calculating herself the parameters with a legacy TI-58 hand-held scientific calculator she had been offered by her uncle for her fourteenth birthday, near than thirty years ago ! She made with it trigonometry and delta-v calculations with the same accuracy as the on-board computers, and used the manual parameters input system, which was designed to be used only as a backup system, to pilot the craft. On our first 24 hours of maneuvering to be on the same orbit, she performed well in piloting. And she'll get us on the right orbit within the next 18 hours :

"We're flying towards the EXPESAT now on a 90 degrees R-bar approach, we've got the station on our starboard side. Erin, still correct on radar ?

— Radar confirmation clear, no drift. Crossing trajectories in thirty minutes from now. What's your changes in orbital inclination ?

— Let's do a 45 degrees on port side, I'm calculating the optimum point for a burn… That's it ! Orbital angle correction optimum in 245 seconds, without two minutes of programming. Erin, you get the parameters ?

— Entering the course correction, you'll get the figure on your navigation screen, initiating correction sequence at your initiative.

— Got it. I make the time correction with the on-board clock and I launch the program… Time set, correction… Program engaged, I have to calculate now the correction to get the craft on a parallel orbit…"

To catch a spacecraft, you've got two elementary styles of maneuvers, V-bar and R-bar. V-bar is the most obvious, you get your craft on the same orbit as your target, get the same trajectory

in altitude and equatorial inclination and then, you tune your orbit to get you moving in the same direction, close to your destination and ready to dock it. Pros : you are straight in front, behind or beside your target after having done all the orbital corrections, and you have no final high-change heading maneuver to do to dock to your destination. And it is less costly in fuel. Cons : requires a high calculation input from the pilots, on-board navigation systems and mission control, and reduces the size of the launch window because you have to be put on an orbit that matches the target's orbit as close as possible.

That is why the alternative method, called the R-bar, is employed. With R-bar, you have to go in an orbit that crosses the one of your target, usually at a 90 degrees angle. Pros : larger launch window, you can see your target coming towards you from port or starboard side, get its trajectory precisely calculated with the possibility to match it on the final leg precisely by making final trajectory adjustments with all the relevant parameters metered precisely. Cons : requires more fuel, and you can miss your target more easily than with the V-bar, hence having to wait a longer time, and making more extra maneuvers to do a second attempt, if possible.

On this mission, we used the R-bar method, our launch was anticipated, with less possibility to fine-tune the trajectory from the liftoff, and the need of an extra tug to go to the second rendezvous, on a higher orbit. With her vintage calculator, Ayleen drove us precisely to a rendezvous point with the EXPESAT. I had a radar contact and the on-board computer made all the calculations with the actual orbit of the target to put us on the right position, and being overridden by Ayleen with her calculator and manual input for exactly the same result.

On the rear seat, doctor Peyreblanque was helping us by trying to get a visual contact with our target, using an on-board telescope and his electronic imaging system. This device had been added at my initiative as an autonomous and backup optical telemetry system to provide a fail-safe equipment ready to use for manned docking in case of radar or computerized navigation system malfunction or failure. As a CAP and (excellent) general aviation pilot, doctor Peyreblanque got us a Judy on the EXPESAT :

"Ayleen, I've got a conflict at two o'clock, it looks like our destination.

— Copy Marty, it matches our radar, can you get us the picture ?

— Affirmative, here it is, at maximal magnification…"

Doctor Peyreblanque send us the image of his scope on the backup systems screen, showing us a white spot in space, getting closer from our position. Keeping an electronic eye on it, doctor Peyreblanque show us this white spot getting bigger, and changing in shape to become the EXPESAT, with its front truss platform for outer space experiments, central pressurized cylindrical module, lateral pair of solar arrays, and rear-side coupling module, with the long cylinder of the Karigane space tug attached to it on the coupling port that faces the Earth surface, leaving us the opposite and the rear-side axial coupling port.

With a few fine-tuned burns, Ayleen flew us aside the EXPESAT at a 900 meters distance, on its port side. Then, in three orbits, she put us behind the station, straight in the axis of the rear-side coupling port, at a distance of 150 meters. And for the last hour of the maneuver, she let the automated docking system do the job, and finally get us docked with the station. After having let the mechanical docking system safely locking our craft into the proper position, Ayleen called the Mission Control to confirm the maneuver :

"Messenger Two Zero Three to Mission Control, docking complete. We're docked now to EXPESAT, doing post-docking checklist before entering the station. Karigane in place and ready to fly, we're following the flight plan as scheduled.

— *Copy Messenger, call us back for report after having entered the station…*

— Wilco Mission Control, from Messenger, over… Erin ?

— Automated coupling diagnostic complete : all green.

— Okay, power and data link ?

— Engaged… and working.

— Entrance tunnel pressurization ?

— Engaged… Done. Coupling ready for manned transfer. No pressure loss.

— Pilot to all hands : put your helmet on, I'm going to open the hatch."

Starlight messenger have a hatch on her nose, built into the coupling mechanism, to provide safe pressurized access to another space vehicle docked with it. Ayleen opened it, and then having the opening mechanism of the EXPESAT docking port in front of her. Those hatches are fail-safe : they opens inwards and are pushed in closed position by the pressure of the air inside the space vehicles. Latches locked by a vacuum-activated system are another security system that prevents them for being open without a pressurized craft docked on the outer side.

Our next task was to deliver and plug in place the three experiment packages we had brought there on the unoccupied passenger seats. Those are automated scientific experiences set by universities, research agencies or private ventures, that needs microgravity, or an orbital position, to get experimental results. We passed the three packs from our craft to the EXPESAT by making a chain gang, Ayleen in the EXPESAT, doctor Peyreblanque in the tunnel and the upper part of the Messenger craft, and me, unfastening the packs from the passenger's seats. They were three experiment : one automated lab designed for making metallic alloys in zero G, brought there for Alcan corporation, a special camera for ozone layer measurements brought us by the MIT, and a special experiment sent by the Center for Disease Control that interested a lot doctor Peyreblanque :

"Fluid test one, CDC Atlanta, does anyone knows what is the purpose of it ? CDC makes epidemiology studies and medical lab experiments, what does they have to do there ?

— It's a contract we have with them, did I replied. They have a research program of vaccine optimization by using different manufacturing techniques, some of them requiring microgravity. This one is an experiment to measure if microgravity facilitates dissolution of drugs into an alcoholic solution.

— Alcoholic solution ? Nice, they packed a *porch climber* for space use !

— A… What ?

— Marty means a *moonshine*, specified Ayleen. That's a Canadianism."

Doctor Peyreblanque have a Canadian mother and a Canadian branch to his family, while being French citizen through his father. And, sometimes, you have clues of it when he speaks… We finally set in place all the three experiments and make them functioning. The last one to be activated was the MIT ozone layer camera, which necessitates the opening of a porthole with a flat optical window. We had to unlatch a metallic panel and store it at the bottom side of the fixation rack of the experiment, then put the camera in place, tie around the lens its optical muffling device to avoid parasite light to disturb the camera (a mat black piece of velvet, cut to fit the opening and the lens front end), and connect the data and power link of the experiment :

"Here we are… said doctor Peyreblanque. The MIT camera is finally set, as the Alcan experiment and the zero-G cocktail machine of the CDC.

— Well, I don't have the list of the other contractors, did I say, but I think that we won't have other customers who wanted to change this outpost into a packie.

— A packie ? asked Ayleen.

— That's a word from my homestate of Maine that means a liquor store. You've got a specific word for that in Chicago, Ayleen ?

— Not at all. Marty, no equivalent in Canada ?

— Not of my knowledge."

Then, it was time for dinner, and we went back to our craft. The next day, we will have to leave the EXPESAT, get the Karigane space tug and go to rescue the unknown crew of the unidentified space station. And that would be the best part of the journey…

On the morning of the next day, we had a video conference with the commander in chief of the United States Air Force, in charge of our mission with the NASA. We had the privileged to speak directly to the most higher-ranked specialists of aerospace in the USA, general Norton Schwartz, head of the USAF, and NASA administrator Charles Bolden. It is important to know that mister Bolden had been, during his career, a military pilot and, later an astronaut on space shuttle missions. They were both at the NORAD control center in Cheyenne Mountain, with lieutenant-colonel Patterson acting as a staff officer in charge of security. Martin-Georges Peyreblanque, companion of LTC Patterson, had a conversation with her prior to our conference :

"…I am just acting now as a passive payload, the great stuff would be done in the next days with the rendezvous with the unknown craft. From now, everything is going fine. You looks tired darling, something wrong ?

— I didn't sleep last night honey… This is the first time you sat on nearly one million pounds of fuel, that was just waiting for a sparkle to blow off, and get thrown upwards with a non-zero chance to be shattered in pieces, the first occasion you fly in space and the first time you go out in vacuum to rescue an unidentified spaceship… That's enough to prevent me from sleeping.

— Trust Ayleen darling, she has not drop my name for this assignment if she wasn't sure that everything was safe with this mission.

— Ayleen had a great power of persuasion, and she is a real pain in the neck when she wants to get something from someone else. She's as stubborn as I can be, that's makes the best attorneys.

— Hey Marine Corp, you forget that I'll never lie to you, cut Ayleen. I'm sure you'll get your sleep back in a few days when I'll bring back your man at home.

— Air Force, I just have to warn you : just try to get killed if you have an accident that even only harms Marty, that would spare me the task to do it by myself !

— Wow, she really loves you ! did I said. Colonel Patterson, I can confirm you that the craft is in pristine condition, and you don't have to worry about it.

— Thanks for the good new Erin, I'm expecting to have all this stuff over in a few days, and having nothing more important than worry about when would our cats stop fighting against each other to be the sole occupant of the left armchair of our Davenport… Sir, communication with the craft operational, all hands on line.

— Thanks colonel, we'll be short, they'll have to depart from EXPESAT in two hours.

— Lieutenant-colonel Messerschmidt at the report Sir !

— At ease colonel… Mister Bolden told me that you are a fine crew. I can see that you're performing well. Doctor Peyreblanque, everything fine for you ?

— Yes, it is general. Honestly, I'm waiting for my EVA, and making the first space rescue mission after the Apollo 13 flight. Mister Bolden, I should thank you for the go.

— I'm delighted to see that Ms. Messerschmidt choice was the most relevant for this mission. We had a radio contact with the unknown craft one hour before, still a Morse-code signal. The crew is OK, they're waiting for the rescue mission. No wounds or disease signaled, we asked them with an ER specialist to get you a complete picture in case of any medical problem. They're just a little bit hungry, they had insist to have wafers to eat.

—I would also bring them something to rehydrate, in case of need, replied doctor Peyreblanque. I guess they have something to drink aboard this spacecraft, but I don't know if they have a hydration problem. If they don't mentioned it, that would prove they have what they need to drink.

— Mister Bolden, I can guess they used recycled water from the environmental control system, did I said. Water in the cabin's air is monitored and recycled for moisture control, and excess water can be recovered and used for drinking. We have such a feature on Starlight Messenger. If those people have the technology to travel in space, they might have such a system aboard their craft.

— It's a relevant hypothesis miss Mc Farlane. General Schwartz and I have studied the possibility that this device might be a secret project from a nation that had disguised its launch as a classical satellite. Something goes wrong with it, and the crew is asking now for a rescue.

— Mmm… That does not explain *how* the potential customer for the launch of such item gets a crew up there without no one noticing it, mentioned doctor Peyreblanque. Even Roscosmos is picky about what they put atop their rockets, and the Russian government would have blown up the entire thing into pieces with all hands lost rather than have a secret project thwarted.

— That leaves only the Chineses and a European system, replied Ayleen. Chinese, same fate as Russian : destroy the evidence and leave no witnesses behind. For Europe, any European nation would have made an official classified request to have their space travelers removed from there in one piece.

— What puzzles me is the use of Morse-code for radio communications, did I noted. If they cannot speak for any kind of medical reason, they would have already mentioned it to you. Why cannot they talk ?

— That's also a weird thing we have no answer to, mister Bolden and I… We're only talking to them by Morse-code, and we suppose they have no voice radio available, or functional… So, we have to leave you now, you will be busy with your next mission leg. We're linked to your mission control here, at Cheyenne Mountain. Now, we leave you to your mission, you'll have to prepare yourself for the next leg of your flight. Have a nice journey !"

We ended the transmission there, and went back to work. Two hours later, we undocked with EXPESAT, and took the Karigane tug with us by docking with him with the front docking port of the Starlight Messenger craft. The Japanese tug, a long 30 ft long by 12 ft diameter cylinder with a docking port at one end, and two rocket engines at the other, was needed to reach the mysterious

space station, much higher than the Messenger craft can fly on her own power. Then, we flown rear-end first toward the craft in distress, calculating another R-bar encounter to save the non-talking crew. And that wasn't the more extraordinary part of our journey…

The next leg of our flight was done without any further event. With the help of the Karigane tug, we were boosted on a higher orbit, and we had enough power to chase the mysterious satellite, with his wafer-eaters Morse-talkers on-board. Marty Peyreblanque was checking his EVA procedure, carefully looking at the way to user properly a tether and the SAFER individual propulsion device, Ayleen was concentrated on flying the craft upside down, with the Karigane tug at the front end, pushing us backward, and I spent my time by making every checks I could on the systems. Our previous manned flight had revealed some minor bugs, and I have to see in real conditions if they were solved :

"Okay, the display bug #45127 is over, that's one less on the list. Ayleen, if you can, could you show us the fuel tank status menu ?

— Here it is… You have solve the problem with the individual gauges menu ?

— Already done on the ground, but I must check the bug correction result in real conditions… Doc, you're OK with the EVA suit controls ?

— Yes, I am. It is not more complicated than my Piper Cherokee.

— Marty, I didn't asked it to Linda : you finally get your second-hand TCAS ?

— Uh ? A TCAS on a Piper Cherokee ?

— It is a good deal from my stepbrother Stan, Linda's sister husband, said Marty Peyreblanque. He's an aircraft mechanic in charge of managing the spare parts for the USA Express maintenance center at DEN. Sometimes, he had good deals. My Cherokee is equipped with IFR devices, including an ILS IIIb capable system, one good deal from Stan. In September, he told me he can get me an FAA-certified TCAS ready to use at a fifth of its catalog price, five thousand piastres. I told him I was interested, but I needed to borrow one thousand piastres from Linda to make the deal…

— Of course, Linda told me about that one morning at our attorney's office, followed Ayleen. She was upset to see Marty spend another important amount of money for his private plane, and she had barred him for having money to buy his TCAS. I'll lend him the thousand bucks missing instead of Linda, and my associate wasn't pleased with the deal.

— Unless this TCAS save our life in November over Denver by warning us of an incoming corporate jet on a collision course with our Piper… said Marty Peyreblanque. It was a close shave, the jet missed us by a hundred meters, we were close enough to read his tail number. Pilot error from the other plane, without the TCAS, we would be dead right now, Linda, my daughters and me.

— Gee ! On your Piper, you've got all the bells and whistles an airliner have, doc ! And your lady complains that you're taking care of her safety ?

— Erin, I have to tell you that Linda is always anxious to fly on a small single-engine plane, regardless of the pilot's skills, said Ayleen. Her sister Siobhan, who is an airliner professional pilot, had told we once that she had abandoned the idea to fly her aboard anything smaller than a Q-400 airliner. She made only two flights with her as a passenger on a single-engine rented Cessna, and twice, she was close to land for medical emergency because Linda was close from having a panic attack.

— She have to swallow a panic-prevention medication before each flight I make with her, specified Marty Peyreblanque. And she is suffering from spatial disorientation. Each time we lose visual reference, she is always thinking we are flying upside down… Erin, just one question, on the craft's boot, I have seen a box with the mention *Pyrotechnic device – Keep closed and open only for emergency use* on it. What is its purpose ?

— Ah, it is the anti-Hotel California thermite cord.

— Anti-Hotel California ? What the hell you have against the Eagles ? asked Ayleen. I already have my associate Sarah Jane who makes a complete allergy to Fleetwood Mac, don't tell me you would fly another plane rather than be into the same pressurized volume as Don Henley[7] !

— Uh… It ain't something against this band and its members, and it has its name because I'm an addicted fan of the Eagles. Its technical designation is FSPD, for *Forced Separation Pyrotechnic Device*. It is supposed to be used in case of docking mechanism malfunction. It can separates you from another vehicle by simply cutting off the tunnel walls between the two crafts, and doing it on the Messenger side. To do it, you have a groove in the tunnel's wall where you pushed into it the thermite cord. Then, you have a five-minutes delay ignition device to light before closing both hatches. You then overpressure the tunnel and the thermite cuts through, pushed outward by the inside pressure. And when the job is done, both craft are separated.

— It prevents the need to send a rescue mission to save the crew of the craft stuck up in orbit, specified Ayleen. A Messenger craft with a faulty coupling mechanism can fly back to Earth, and have his docking device replaced by a new one for the next flight. For the part left on orbit, you can put it apart with some basic tools by doing an EVA from the other vehicle, if needed. And if the Messenger mechanism is faulty, you just have to simply jettison the faulty half from the docking port previously used, just by engaging the manual separation system of the docking port.

— That's just the opposite of the song's lyrics, hence the name : you can check anytime you want, and you can always leave. Ayleen, what's that story with your associate, the plane and Fleetwod Mac ?

— That's a corny story, Marty already knew it. When we were working as waged attorneys for a great New York City attorney's office, Linda, Sarah Jane and I, Sarah was on mission in San Francisco for one of our customers, a corporation. She's an expert in legal acts for business, I have to say. The evening she was supposed to take a red-eye flight to go back to New York, she phoned us from San Francisco, telling us that she had to fly another plane and she would not be back in NYC until one PM at first next day, instead of the early morning. She called me because I had volunteered to pick her at Kennedy Airport. She finally arrived in Newark by the 3 PM flight. I drove her back to Manhattan and I asked her why she had such a change. It sometimes happens with overbooking, or reservation problems. She told me that she had seen Stevie Nicks, the Fleetwood Mac singer, boarding the plane she was supposed to fly. And, to prevent her for traveling with her, Sarah asked the airline to change her reservation for any flight to NYC following the one she had booked before ! Only to avoid flying with a member of a rock band she cannot bear…

— Gee ! What a kinky decision !

— Oh, oh… I've got a radar contact with our target, it just popped within range now… All hands on duty stations, we're entering rendezvous procedures. Messenger Two Zero Three to Mission Control : Judy, Judy, Judy ! Bogey within radar range, distance one hundred and thirty nautical miles, heading zero thirty horizontal, nadir zero zero five vertical, and closing.

---

7 *The Eagles rock band's lead singer, now a solo artist.*

— Copy Messenger, stay in touch, we're monitoring its motions. We're calling the crew aboard for further instructions…"

We R-barred the path of the unidentified craft and performed an orbital rendezvous without docking, flying aside our target. It was some kind of small space station, roughly 60 feet long by 20 feet diameter white cylinder, without porthole or any other marking than what seemed to be some kind of tail number, reading NE1537S. The craft was in pristine condition, and looked unfinished, clearly missing parts. She had two large flat solar arrays fixed on each side, and two truss masts perpendicular to the arrays on the same diametrical position, but without any devices fitted on them. They were carrying only unconnected wiring coming from the station, stopping at different length, and finishing with some kind of connecting devices.

On one side, there were four truss girders, around twenty feet long, pointing outward from the end of the cylinder, and some kind of cubic white box, around 20 feet for each side length, at the opposite side. On the outer side of this box, we could see what looks like a coupling port for docking a spacecraft. It was nearly ten feet wide in diameter, something never seen on any space system manufactured from now. And, on each side of the cube, we could see opening doors wide enough to permits the passage of a standing adult man wearing an EVA spacesuit.

Without portholes on their craft, the crew inside cannot see us. We had a direct contact with them with the Morse-code radio link. Ayleen used the craft's main radio to communicate with Mission Control, and I used the secondary radio for Morse-code communication with the craft. Maneuvering around it at a safe distance, Ayleen flown us around, searching an entry point, and finally idling at fifty feet in sight of the cube with the doors and the oversized docking port :

"Well, we'll have to do an EVA to recover the crew. Marty, you're clear for the job, get dressed with the proper outfit, we'll begin the preparation sequence as soon as you're ready.

— Understood, I'm pulling the proper device out of the boot…

— The boot ?

— Marty means the *trunk* of the craft. That's Oxford English, the one French speaking people use to learn as a foreign language.

— Hem, Ayleen, how far away are we from the other vehicle ?

— In metric system, roughly fifteen to twenty meters away. I won't get closer for safety reasons, and you'll have to use the SAFER to fly there. Be gentle on the throttle, you ain't need a huge delta-v to do such a small leap.

— Understood, I will proceed as I do with my profession : high precision touch. Ask the crew if they have hooking points besides the entrance. If I can tether up there, that would simplify the transfer.

— I'll ask them, did I replied. They told we they were happy to see us. I'll unpack the wafers for them when they'll be aboard Messenger."

Doctor Peyreblanque had to fly toward the station with a power EVA pack call SAFER, for *Simplified Aid For EVA Rescue*. It is a small box with rocket engines that is wear with an EVA spacesuit, and provides the ability to the astronaut to make a powered flight in the proximity of his craft. And eventually helps him to go back to his craft if he's untethered accidentally and drifts away. For now on, doctor Peyreblanque had to do an EVA to go from our craft to the other. The crew had indicates us that they're putting their pressurized suits on, and they were waiting for doctor Peyreblanque to enter via the starboard side door of their airlock. Before depressurizing the craft, I made a final check, with doctor Peyreblanque, of his EVA suit :

"Okay doc, you have fasten everything right, we can close your helmet and check the pressure integrity of your suit.

— Let's proceed… Ayleen, you have the radio frequency for my radio ?

— Affirmative, we'll do a check as soon as you have shut your helmet.

— Helmet shut, no visible leak or puncture…

— Marty, this is Ayleen, are you receiving me ?

— Five on five Ayleen, radio operational. I'm increasing the suit pressure for the integrity test. Ten hectopascals above working pressure and automated test engaged, everything is working well until now…

— Nothing more to say Ayleen, no leaks visible…

— Integrity test over : I have a positive indication : no leaks, environmental control working within nominal parameters, ready for EVA.

— You have my go Marty, put back your suit on its working pressure of 325 hectopascals, you'll be in balance with the craft internal pressure until we depressurized it. Erin, let's do a check of our own flight suits before the depressurization sequence begins.

— Okay, ready to proceed…"

For this EVA, we used the pure oxygen standard method : we have progressively replaced the 80/20 nitrogen/oxygen mix at 750 hectopascals pressure of the Messenger cabin by a 325 hpa pure oxygen atmosphere, the same used by doctor Peyreblanque's EVA suit. Using pure oxygen in an EVA suit means less pressure, hence less stiffness of the suit, permitting more precise movements of the astronaut, with less body energy spent to do them. Cons : the astronaut had to breathe pure oxygen 24 hours before the EVA, to clean his blood from nitrogen bubbles that can kills him. NASA's standard Extravehicular Mobility Unit, the one we had on this mission, is a pure oxygen suit.

With a craft like Starlight Messenger, you have to depressurize all the pressure vessel of the craft because there is not enough volume in it to have a separate airlock. So, before an EVA, the whole cabin is pressurized like an EVA suit, with 325 hectopascals of pure oxygen. Before shutting down the oxygen supply of the cabin and reducing the pressure inside to zero, we had to put our pressurized flight suits on, Ayleen and I, and check their integrity. With everything OK, we could engage the EVA :

"Mission Control from Messenger Two Zero Three : we are ready for the EVA. We're proceeding now. Marty, switch your helmet camera on, I'm unlocking the hatch… and please, my butt is not a video test card…

— What do you… Ooops ! I did not noticed that there is a zoom on this device… I have found the control, OK.

— I'll tether you to the first outer fixation Marty… Ayleen, you're ready for the EVA monitoring ?

— Affirmative, I'm back on my seat. Marty, you can go now.

— Rear door open, I'm going now from the known toward the unknown, were the day divides the night, and the night divides the day… There is a fascinating view outside, we're over an ocean… That is the Pacific Ocean, I can see the coastline of South America ahead…"

Ayleen and I, we had to leave our seats to help doctor Peyreblanque to be ready, Ayleen opening the hatch, and I have to latch his tether with a carabiner to an eyelet inside the craft, in line

with the opened hatch, designed for this use and having a retractable pulley fitted to hold the tether while used and preventing it from getting jammed with the hatch opening, and damaging the air tight seal. Doctor Peyreblanque had first to float to the head of the craft and tether there on an outer eyelet before performing a flight toward the unknown vehicle.

"That is good for me now Erin, I'm hooked to the bonnet, you can unfasten me from the cabin's eyelet, and tell the crew of the other craft that I will reach them in five to ten minutes.

— Copy Marty, I'm unfastening the carabiner, uh… You tell me you're hooked to what ?

— He means the hood of the craft Erin. Marty, try to simply jump from the craft, with inertia, you will do it easily, and spare fuel from your SAFER.

— Let's do it… One small leap for a physician… It's working !… Done ! I have a handrail to grab besides the door, I am fixing the tether here for the return trip."

I sent by radio a Morse sentence telling that doctor Peyreblanque was waiting for a way in at the starboard airlock door. I get an *"understood – proceed"* reply and we were able to see the airlock door opening inwards. Marty went into the satellite and the door was shut behind him. We were still in touch with him, both by radio contact and video link. We had the pictures on our main control screen, and Ayleen had a secondary device to get them : a small computer used as a back-up she had booted before preparing Marty fort the EVA. That's how she had seen he was monitoring a part of her anatomy… The pictures we had were puzzling :

"Ayleen, it is looking like a man-made system, but everything here is written in German ! There is the usual security signs, with the usual color code of the industry, like the yellow and black zebras on the door's opening to indicates a moving system with open and close ability, but nothing else matches something already built I know. From where does this thing comes ?

— We'll have to ask the crew… Marty, there's an indication on what looks likes an LCD screen, can you see it ?

— Affirmative… It is the airlock operation monitoring system. Also written in German, it indicates that the room is going to be filled with a 325 hectopascals full oxygen atmosphere, like you had requested to the crew… That goes fast, its done… Checking on my atmosphere indicators on my EVA suit… All clear, I open my helmet… Mmmm ! Still breathing, in good condition, the inner door is opening, we will meet the people there… [long silence] …EVA operator to Messenger Two Zero Three, hem… Can you make me a description of what you are seeing now on screen, please ?… I have to rule out some… possible medical problems with my sight…"

And that was the point when things went from strange to completely screwy…

Floating on the door opening, there were three *non-human* lifeforms, looking like dogs, or bears, two with a black and one with a clear brown fur, having an oversized round nose, maybe seven or eight inches in diameter, a round body around two feet in diameter, four legs with feet which looked like hands for the front ones, a round head four inches wider in diameter than the nose, with two strip-like stiffed ears pricked on top, and a round ball on the top of the lifeforms that might be a tail. They looked both sympathetic and happy to see doctor Peyreblanque coming for rescue. But that was not what we were expecting first :

"Woopee, we're going to rescue Dark Vador's teddybears ! did I said. Ayleen, the crew of this craft did not mention they had pets with them, what's the fuck about it ?

— I cannot tell you what's going on here, I'm going to enter this craft if those sympathetic lifeforms let me come in… Ayleen, you'll had to check if we can add the weight of these animals to the one of the crew, whatever it looks like. Excuse-me, I think they are trying to write us something, they've got a hand-held whiteboard."

Apparently, those lifeforms were intelligent enough to be able to write, and in a good English. They put the whiteboard facing the camera, and we could read on it a simple sentence :

"WE ARE THE CREW"

Then, we have two solution : consider ourselves as being the first human to met an alien life form, fortunately cuddly and cute, or check all three for an intoxication with any kind of hallucinogenic substance before booking for a rubber room in a psychiatric ward. The alien teddy bears invited then Marty to follow them into the spacecraft. This long cylinder was some kind of industrial plant, but not a ready for operations one. Marty's camera gave us a view inside : they were dozen of empty 19 inches industrial racks, ready with what looks like an optical wiring, maybe for data, and power plugs :

"Ayleen, Marty, it looks like an orbital data center, or some kind of things like that.

— I recognize some brands on the hardware… Huawei, D-Link, Netgear, Cisco, that's networking devices. But I had never heard about brands like Screaming Silkworm or Ural, there is some black boxes here that comes from those manufacturers.

— Never heard of them too, unknown in aerospace engineering. Ayleen, some clues from a legal perspective ?

— Nope. As an attorney, I am sometimes a legal contractor for a networking company, from a small three-people business to a NASDAQ corporation, but none of those brands are names known in this kind of industry. Marty, can you point your camera to this sign, please ? The one I had seen on your right five seconds before.

— You mean this one ?

— Affirmative. This looks like a manufacturer's plate…

— Uh… I'm not reading German language, can you make me a translation ?

— I do it for you Erin. Orbital Proxy-Server – Lokale Datenspeicherung Neumecklemburg – System 5, it means that this station is a local network proxy with a localized data-storage ability. The geographical point indicated is New Mecklemburg, and this system might be the number five in a series. Mecklemburg is the part of the name of a Land in Germany, Mecklemburg-Vorpommern, a land that includes the coastline of the Baltic Sea on the northeastern part of the country. That's Ayleen's German ancestors homeland, they came from Anklam, a small city located between

Berlin and the coastline. A new version of this Land, I don't know where it could be located.

— Grunt !

— Yes, I'm coming. One of the, let's say crew member, indicates me to follow him to the bottom of this station. Do you still read me ?

— Affirmative Marty, we still have you on screen, Ayleen and me. It seems that this station have some kind of internal radio relay system.

— Grunt !"

The brown animal pointed something in a direction above is head, and Marty pointed the camera to it by looking on this direction. It shows some kind of flat strip tacked to the bulkhead of the station. It looks like some passive flat antenna used for GSM transmission inside tunnels, and that would explain why we still have a loud and clear signal from Marty's EVA suit, with no difference from the outside. And we had then a better view of the crew members : they are animals with a spherical body, roughly two feet in diameter, four two feet long legs with what is on a biomechanical description, hands on the front ones and feet at the rear, a furry tail at the upper side of their body, covered by a fur that makes it looks like an eight inches black fur ball, a round head one foot in diameter at the front, with two whip antenna like ears, ten inches long, atop it, bended at a right angle for their last third of length, and a real huge nose, eight inches in diameter. As Marty said, animals not to show to young children :

"My youngest daughter would beg me to have one at home if she would see that ! They're not aggressive and they seems to have an intelligence comparable to human beings.

— Marty, I'm hearing some king of humming noise in the background, it sounds like some kind of motor buzzing near you. Do you have the same on radio ?

— No, it's not on the radio, it's the animal seated on my knees : he is purring when I am scratching him behind the ears.

— Grunt !

— Here is the other members of the crew with… You would better have a look at this, you would not believe me.

— Show us the picture Marty. It's such a weird situation that anything else cannot be more astonishing that everything we had seen yet.

— Understood Ayleen. Here we are."

The two black furry animals were carrying empty spacesuits, clearly designed for EVA, and fit to be used by them. They were names labeled on them, with stickers put on the sides, and that was clearly the surnames of the animals :

"Ayleen, Erin, we can call them by their names : one is Frantz, the two other are Julia and Iveta.

— Grunt !

— Grunt !

— Grunt !

— Seems that the black ones are the ladies, and the brown one the gentleman, said Ayleen. *That's weird to leave such animals alone here, only with an EVA suit.*

— Wait a minute Erin, they're giving us some explanations…"

On the hand-held whiteboard, the animal called Iveta wrote a short note that gave us another weird explanation of the situation :

"We are grunts, we had been transported here to do some checking and assembling, that's our job. We've lost contact with our monitoring station and we had to call for rescue. We cannot talk and our written message link does not work. We call you with this."

Iveta show us what looks like an emergency do-it-yourself modification to a radio emitting device, using a push-button contact to improvise a Morse-code system. I've also seen minimal life-support systems, a trunk with what looks like emergency rations, and a tap on the wall with the mention of drinking water availability above it. This data-storage facility had been equipped for a short stay for a maintenance or assembly crew, not for long-time duration missions. The three animals, called grunts, were putting on their spacesuits and it was time for them to leave and come with us, shelving what we had to report to Mission Control :

"Marty, I'm short of rational explanations. If we tell mission control that the crew up there is composed with three teddy bears acting as aerospace mechanics, they'll immediately put us on straight jackets after landing.

— You're the sci-fi writer here Ayleen, you can imagine a scenario with the first meeting with alien lifeforms. And they'll have the grunts to check what we are telling them, with the pictures.

— The best way for us to cope with Mission Control, it is to tell them what is really happening here, and show them the pictures. For the straight jacket, I'm a long M, or tight L in size.

— In spite of the fact that I am not a veterinarian, I have to do some basic medical check on those animals before giving them a clearance for an EVA. I have brought with me two litres of emergency beverage to cure dehydration, and the wafers they had asked for…"

The evocation of the immediate availability of the sweet delicacy had immediately triggered a joyful welcome by the three grunts, who were happily barking and jumping around. Then Mission Control called us, and they were surprised to hear that this satellite seems to be an orbital kennel, asking us to stop such a lousy joke right now. When they get the pictures and the live footage, they were clearly astonished. Then, we had the order to bring down those animals as soon as possible. Mission Control told us they were maintaining a radio blackout before having further instructions from national security services in Washington DC. Things were going pretty weird…

The last leg of our mission was a set of orbital corrections needed to put back the Karigane tug on his parking orbit. The JAXA had built this automated craft to be used as an expanded satellite recovery utility, able to be plugged to an automated recovery system, tug it on geostationary orbits to recover phased-out satellites, and tug them down to a junkyard orbit before having them recycled or scrapped. With Mitsubishi Heavy Industries, they had an experimental program of manufacturing satellite parts in orbit, reducing cost of new satellites by launching them uncompleted and finishing them on orbit with materials or parts recovered on derelict satellites.

From now on, the Karigane tug had to be left on LEO before refueling, and our task was to put in on the proper orbit and leave. We just have to do the reentry to end our mission and, to perform this, we have to be on the proper orbit and wait for a weather clearance from Mission

Control. Three days after having reached the grunt-occupied unknown station, we were undocking from the Karigane tug :

"Erin, I'm ready to disengage the tug, all systems aboard on idle mode.

— I'm checking the docking system Ayleen… All green, you can proceed.

— Separation check-list, please.

— Data link control ?

— Shut down, plugs unfastened.

— Access tunnel ?

— Hatch shut and sealed, zero pressurization.

— Delta-v programming of Messenger's thrusters ?

— Craft on positive line of flight, secondary braking rockets set for a 10 meters per second negative delta-v.

— Mechanical locking system ?

— Set on safe now, engaging pre-unlocking position before separation. Can you give me a green ?

— Affirmative, system functional, diagnostic positive, green for separation.

— Engaging unlocking sequence now."

The autopilot had the needed confirmation set in from Ayleen to perform the separation sequence. The Karigane tug was unfastened from our craft and left aloft, then we performed a burn with the command module engines to slow us down a little, separating us from the Japanese automated craft, which was then flying higher and faster than us. On the rear seats, Marty Peyreblanque was monitoring the grunt's biological parameters. Iveta and Julia were sleeping on their seat, and Frantz was purring while combed by the doctor :

"Marty, no problem with our passengers ?

— None Ayleen. I'm setting correctly the fur of the gentleman. Those animals are someway like my cats, they like to have their fur combed.

— Grrrrrunt…

— He's cute, isn't he ?

— Well… Marty, I'm not a pet lover like Ayleen and you. That's a great deal of work to take care of a domestic animal, it is not something I want as a hobby, in spite of my kid's wish to have a pet.

— Ayleen will agree with me, but having a pet is like having a child. Those are the two things I dot not discuss with people not wishing to have either a child or a pet, it is a responsibility. And it is more responsible to not take it, if you feel that you are not able to face it. I've got two daughters, one stepdaughter and two cats at home, and it is sometimes a great deal to avoid this situation to turn into a great mess !

— I'm always amazed by what kind of funny trick my pet skunks have found by themselves, said Ayleen. Last thing they've done was to drink the milk pack into the fridge without spilling a single drop anywhere. I wondered why it was always empty on the morning until I found what they were able to do, Opium and her mother Shalimar… Messenger Two Zero Three to Mission Control : separation with Karigane completed, we are entering orbital corrections. Do you have a spot of land where we can go ?

— *Affirmative Messenger. You have a spot in southwestern Kansas, the landing site K-3. It is the only one spot in north America where you will have a clear weather for*

the forthcoming four days. Otherwise, you have the Australian sites which are OK, the choice is yours.

— Thanks Mission Control, we're trying the K-3 site unless having a no-go from you. Erin, you got the map ?

— Let's see it, Kansas three… Thirty miles west of Dodge city, flat prairie south of Arkansas river, closest town Cimarron, northeast of landing zone. Closest routes : US 400 north and KS 23 east. Cimarron Municipal Airport available for airborne recovery team. ARTCC for operations below level 500 : Kansas City.

— That's not bad, we have to made the calculations for the orbital changes. That would makes us the retro-firing burn over the Pacific Ocean. Marty, you'll have to find a way to secure the grunts for reentry.

— Grunt !

— Frantz had already found a way to use the safety harness with his pressurized suit Ayleen, that wont be a problem anyway…"

The final leg of our journey was the reentry. We had first to separate the service module, then turn back the command module upside down to have the heat shield first, correct the reentry angle and the heading, and engage the automated landing sequence. Starlight Messenger have a reentry pitch angle limits from 7 to 5 degrees positive over horizontal line, and it can be fine-tuned to land precisely on the right spot with a 10 nautical miles precision. We separated the service module over Tasmania and prepare ourselves for the reentry when everything goes wrong :

"Okay, craft turned on the right side, we need a 6,8 degrees angle for K-3. Can you read me the actual angle Erin ?

— Affirmative. ADI indicates a pitch angle of plus 5,2 degrees, we are within safe parameters and… Damn ! What's going on ? All flight instruments are shut down !

— Great, the worst moment possible, my dashboard have a brownout too… Erin, which breakers are tripped ?

— Goddammit ! NONE !… Every breaker is in engaged position, I'm checking the primary circuit breakers.

— Get me the controls on line ASAP, or we're going to do a splashdown into the Hudson Bay ! Marty, you know the procedure for emergency power backup ?

— Affirmative ! Shall I open the relevant boot ?

— Do it. Prepare yourself to unplug the CEPS one on my mark, we will try to have battery power back on line…"

The command module of Starlight Messenger have twelve dry nickel-cadmium heavy duty batteries, each with his separated quadrupled power line and individual circuit-breaker for safety. I designed this to avoid a complete brownout of the craft in case of a single battery malfunction, each one is autonomous, and the power they store is shared and divided between all on-board equipment. You can still have full operational power with only two batteries working. And then, we have nothing, a near-impossible situation :

"Ayleen, the primary circuit-breakers are on line, I don't understand how we have a power failure like this ! All the batteries are DRAINED ! Amps and volts are on zero !

— Get me the push-button thrusters on line now. Marty, plug me in CEPS one now.

— Understood. CEPS one engaged !"

Of course, the worst case scenario of a complete power failure had been planned, and a fail-safe system called CEPS, or *Chemical Emergency Power System*, which is a kind of

chemical electrical battery activated by unplugging a safety device to start a mixing of chemically reactive components, giving us one hour of electrical power per CEPS canister to run the primary systems : pressurization, primary flight instruments, automated landing sequence control and radio. There is four of them, and Marty Peyreblanque had run the first one.

As primary navigation systems, we had an ADI and a radar altimeter. To perform a safe reentry in FUBAR mode, Ayleen had to put in front of her lateral pilot window a transparent plastic ruler with black marks indicating Earth curvature and pitch angles. I've been laughed about this device, inspired by the method used by the Mercury astronauts to carve a groove on the plexiglass window of their craft to get an estimation of their reentry angle, but this thing will save my life now, with all hands aboard the craft.

To get thrusters, there is another fail-safe device. Methane rockets of the craft for heading, yaw and sink angle control are lighted by an electrical spark plug in normal operation. I had opposed to the use of hypergolic fluids like UDMH for safety reason because they are highly toxic and more expensive than methane. A combination of UDMH and nitrogen tetroxyde burns spontaneously when mixed, and does not requires a lighting device like LOX-methane mix does.

Thrusters with hypergolic fuels would have still been online in our present situation, and there is no emergency spark plugs for rocket engines. Instead, you just have to vent the pressurized methane through backup nozzles to have directional thrust. Without burning, it gives only a limited amount of newtons, but enough to have a crude directional control of the craft. To get it, you just have to open manually emergency valves, and have an unthrottled on-off style reaction control by opening and closing manually gas taps on a pipe panel :

"Ayleen, I'm on the monkey motion thrusters controls.

— Copy, gimme down sink.

— On !

— Going… Going… Stop !

— Get better ?

— One half degree steeper, once again !

— On !

— That's it… Keep on venting… Stop ! We're at 6,1, we can…

— Too late ! said Marty. I'm seeing plasma glows through my window, we are too low for a reaction control !

— Fuckin' shit ! replied Ayleen. We're gonna overshoot the landing zone by a thousand miles ! Mayday, mayday, mayday, this is Messenger Two Zero Three, we have lost all electrical power on-board, manual trajectory control sole option available, we shall be beyond range for landing, proceed to emergency recovery procedure, I repeat : we shall be beyond range for landing, proceed to emergency recovery procedure.

— Copy Messenger, we are proceeding now to emergency recovery procedure, you are on radar and…"

We were entering into the ionospheric radio blackout zone, and no further communications would be possible before the opening of the drogue parachute. For safety reasons, the parachute opening systems have a fully independent electrical power of its own, with chemical one-shot batteries like the CEPS emergency system. In case of crew negligence or incapacitation, a barometric switch plugs it on automatically below 60.000 feet ASL. This time, the parachute sequence was executed perfectly, the control system had been activated by me before the reentry.

Finally, the three main chutes were deployed on time, the new step would be firing manually the braking rockets for touchdown :

"Marty, does everything goes right with the grunts ?

— Affirmative Ayleen, they are quiet by now.

— The most difficult part is done, and still no power back, did I said. Ayleen, get your hand on the manual override of the braking rocket, I'll give you the got at 100 feet above ground level.

— I'll get it. Marty, can you see something ?

— A huge blanket of thick white clouds, noting more.

— Wopee, we're doing an IFR class III landing aboard a craft that cannot do more than a VFR landing, said Ayleen. Hope we're gonna land on solid ground !

— I can activate the floating bags if you want.

— Not yet, only if we're effectively doing a splashdown. I want to use the rockets instead, we have a good chance to do a ground landing… We're in the cloud layer, and it is snowing…"

The clouds were snow clouds, dropping a thick and dry snow, lowering the visibility outside to less than a quarter of mile. I kept my eyes on the radar altimeter indicator, and the ground was closing :

"Twelve hundred… Eleven Hundred… Hope it's flat and clear below… Thousand…

— Hope we're not above a river or a lake…

— I'm still seeing nothing but a whiteout…

— Thanks for the good new Marty.

— Five hundred… Four… Three… Two… Now !

— Ignition !"

Ayleen pulled down the first lever, firing the first pair of rockets, then the second one five seconds later, firing the pair left. With the puff of smoke from the powder rockets surrounding us, we cannot see where the hell we were landing. A light shock gave us the indication that we won't go down anyway, and the lack of any motion thereafter was a good new : we were on solid ground. With a landing on water, a rocking motion would have told us that there was only liquid below the craft. Mission complete, and we had now to wait for the rescue :

"Great, we're alive and in one piece. Erin, you have the mechanical override of the pressure valve to release, get your wrench and to it.

— Aye aye skipper ! Marty, you know where the switches of the radio and light beacon are installed on the craft ?

— I do. I'll need your *spanner* to open the access panel outside.

— My… What ?

— Your *wrench* Erin, he use the English word for it.

— So… I'm on the release pressure valve, in a dozen minutes, we would be able to do a walk outside… Seems its snowing there… Hey ? What the…"

Before we all had been able to do something, the entire inside of the craft had been filled with electric arcs, like if we were trapped into a giant Jacob's ladder. That was a really weird thing, and Ayleen immediately took the right decision :

"Emergency evacuation ! Lets get outta here now !"

But before we could open the doors, we were all stunned by a white flash that blinded us. We might have been passed out for a dozen of minutes and, when I got my sight back, the phenomenon had stopped. I immediately thought about my crewmates :

“Ayleen, Marty, are you here ?

— Uh ?… Erin, what the hell it was ?

— Dunno… Everything looks normal now…

— Ayleen, Erin, are you OK ? Can you move your limbs, and do you feel any kind of burns ?

— Nothing for me Marty.

— Same as Ayleen, I’m feeling OK.

— I have to see if you have electric burns on you, take off your suit and your clothes, I’ll make an immediate examination.

— Marty, where the hell are the grunts now ?”

I turned myself down to the passenger’s seat when Ayleen made her remark and I saw then a complete screwy situation : with all doors closed, the grunt had vanished in thin air without any explanation. They were there on touchdown, and they had disappeared after the electrical unknown phenomenon. And at our greatest surprise, all the systems that were not powered because the batteries were presumed drained went back on line at full power, batteries loaded again… For a special mission, this was really a corny ending !

With the cold weather outside, and the rescue having not found us, the idea I had to put some radiators that can use leftover rocket fuel unburned to heat stranded astronauts inside the landed craft proved to be an excellent idea. We were stuck out of nowhere, in a cold and snowy weather, and we had to wait for the recovery team inside the craft, in a warm environment due to the radiators burning the leftover methane of the command module thrusters. Ayleen had made a rough reentry trajectory calculation that placed us near the Canadian border. With the landscape we were able to see outside, we might be anywhere :

“Looks like Northern Dakota or southern Manitoba, she said. It’s an unplowed land that might be a grassy flatland used for ranching.

— When I was outside trying to anchor the parachutes with stones, I saw a bluff shadowing against the white foggy background, said Marty. That looks like we’re somewhere in the Prairie.

— What does a poker game have to do with us now ?

— A bluff is a Canadian word for a grove Erin… We have the orange parachutes laid over there as a visual clue for airborne rescue teams, and the radio beacon on. I had not switch on the blinking light beacons, with such a thick snow and fog, that would be useless.

— Thanks to have provide us enough food for the mission, in spite of the fact that, with all the methane available, I’m missing a good old teapot and a pack of bulk Russian taste bergamot tea, said Marty. We’re too far away from a *dépanneur* to get the complete kit needed for a good tea break, what a pity…

— Uh… Ayleen, I’m missing something.

— By *dépanneur*, he means a convenient store to buy some tea, that’s a French Canadian word passed into Canadian English.

— Ayleen, tell me, how did you get such a practical knowledge of Canadian vocabulary ?

— When I was a child in Chicago, my best friend was a French Canadian living in the corner of the street. We’re still in touch today, she lives in Toronto.

— Ahem, ladies, I think I am hearing something that sounds like a good new for us… Just listen, it seems to be coming towards us…"

Marty was right. I was able to hear a light whistle and the flapping of some kind of rotary thing far away, coming right in our direction. Ayleen had immediately identified the source of this sound :

"That's a chopper coming to see us ! With such a fog, the pilots won't be able to see us.

— Shall I go outside with the flares to give our position to this helo when it will overfly us ?

— Do it Marty, I try to call them on the radio.

—What the hell are you talking both of you ? You mean the incoming *helicopter* ?"

This time, it was USMC and USAF slang that was the problem… There really was a helicopter above us, and Ayleen get a radio contact with it :

"Messenger Two Zero Three to the chopper above us, do you read me ?

— *Affirmative Messenger two zero three. This is Minnesota National Guard Mike twenty-five speaking, we get your recovery beacon signal while patrolling near the Red River, is everything OK with your craft ?*

— Affirmative Mike 25, all hands in good condition, craft in one piece with all survival systems operational, including heating. I guess you cannot land safely with all this fog.

— *Affirmative Messenger Two Zero Three, with the dusk coming, we'll have to go back to your base. We have seen your flare and we have your position, we'll send you a ground rescue party, they'll be here tomorrow in the morning.*

— Thank you Mike 25. Can you tell me roughly where we are ?

— *Near the border with North Dakota, approximately at the same latitude as Duluth, ten miles north of Moorhead and eight west of the Red River…*

— Let me check on my map… Got it ! Tell Northeastern Aerospace that we are on landing site M-4, they'll get the picture. Thanks you for coming, from Messenger Two Zero Three, over and out."

Minnesota… That what's called widely overshooting the landing zone ! We were expected in southwestern Kansas, not in northwestern Minnesota… For us, things were going fine for the first time since the reentry sequence was initiated. As doctor Peyreblanque said, we just have to be patient :

"Now, they know where we are, and that everything is fine for us. We still have enough methane to avoid freezing this night, and I hope that the *blokes* with their *lorry* would not have forget the croissants for the breakfast, tomorrow in the morning !

— Uh… Ayleen, got the translation ?

— He means the *guys* with their *truck*. One good thing for you Marty, it's that Linda would had stopped worrying about you by now.

— That's a good thing for her. She is always anxious when something goes wrong with our girls or me.

— I'd rather call that getting hysterical and going postal. Linda lacks emotional distance when someone from her family have problems.

— Ayleen, don't tell me that Linda, Marty's companion, drives cuckoo anytime something goes wrong with her beloved ones ?

— Oh no Erin, she's just getting out of her head and pissing off everyone, including the whole US military, until she gets good news about Marty, for instance. Six years ago, at the same

period, Marty had been forced to perform a crash-landing with the airliner he had flown to go from Chicago to Seattle.

— No ? You did that ? What the hell happened to the pilots ?

— Both were, hem, incapacitated by alcohol abuse. The flight attendant who asked me medical help for them had the same face as the captain of the *Titanic* had while telling his crew that the ship had a problem with an iceberg. I took the controls, asked to the ARTCC a clearance for an emergency landing to the closest airport, Casper Natrona in Wyoming…

— Wow ! You did it ?

— Not exactly. Engine two had burst in flames, and engine one was overheating, just two minutes after I took the controls. I went down to look for anyplace flat and wide enough to sustain a crash landing, I found a frozen lake with an interesting snow cover and I used it for a belly landing with engines shut down. Casualties : a few bruises and two hangovers, airplane in one piece but written off. The next morning, we had the visit of a rescue team, and we were evacuated the day after. The most hilarious part was my testimony to the NTSB, and the reenactment in a flight simulator. A professional 737 pilot told me that I had done a decent job this day.

— My wingmate used the words 'fucking top-level with steel balls ace piloting' for your performance Marty, and Shannon is someone you can trust for that, she's a 737 pilot when not flying a F-16 for the New Jersey ANG.

— Marty, if your USMC girlfriend won't object, you're in next time we need to send a doctor in LEO. Ayleen, I'll call you at your office next time I need someone for a spaceflight…"

We spent the night inside the spacecraft, heated by the last drops of methane burned from the truster's fuel tank. That's funny to think that three fifty bucks appliances you can buy in your local supermarket had been fitted into a dozen millions dollars state-of-the-art spacecraft to provide a thermal security for the crew in case of emergency landing. Methane is the casual cooking and heating gas you get from your local network.

We have chosen it as a propellant for all engines on both the Starchaser carrier rocket and Messenger spacecraft because it is more easy to handle as hydrogen or hypergolic fluids, increasing security and reducing cost. And having it at a low price from a company that makes it out of plant life agricultural waste, and experimental atmospheric extraction. A good deal for everyone.

The morning after, the recovery team was a little late for breakfast. They told us we had landed at only two miles west of a gravel road daily used by the local farmers all year round to go in and out of their farmhouses. Mission 203 had been completed, but with a remaining problem : what shall we say about the grunts and their disappearance ?

The following week, the news about the successful mission of Starlight Messenger had been released to the press, with video footage from the craft, laid on the Minnesota's snowy prairie, and portrait of the crew assigned to this mission. The challenge now was to explain to the general audience the details of the mission, without the part with the grunts. We were all convened to the White House, the space crew, my boss and lieutenant-colonel Patterson, acting as an intelligence officer. With the president himself, there were mister Bolden, the NASA administrator, and general Schwartz, head of the USAF. We had our meeting in a special room of the White House, dedicated to such a task. Mr. Obama welcomed us and went straight to the punchline :

"Please, have a seat, ladies and gentlemen. I had the general situation report from colonel Patterson, and I think there is nothing to add. General Schwartz, I think you are the best among us

to tell us the purpose of this meeting. Our goal now is to set a proper cover-up for the part of the mission that would be used by idiots against our space program.

— It is mister president. The point is that the unknown lifeform called grunt had left behind no clue of its existence. If we tell this part of the story to a general audience, you'll be sure that every wacko in this country will poison our space policy with his lunatic theories and irrelevant investigations.

— And fuel the conspiracy theories about space with real facts this time, a thing we all want to avoid in the NASA, said mr. Bolden. General, thanks to have classified this file to avoid giving to all the cranks down here a good lever to turn NASA and USAF upside down.

— Now, the point is how to hide the whole thing, said Garfield Ahrenfeld, my boss. That would be difficult, I had to pay extra hours for the guys on the launchpad and in mission control, and I've got the GAO at home every month to check the whole accountability of the Messenger program to prevent costs overrun. At least, I've got five dozen of people that would tell the tale and won't be silenced. And that does not includes their relatives, who cannot hide the fact that their wife, husband, son, daughter or whatever else had been called for the job in an emergency. And I am only telling the corporate part, you have to add NASA and USAF people, the guys from the Minnesota National Guard, who cannot deny the fact that they found people aboard the craft, FAA people who had monitored the reentry, and so one.

— This is why we will deny *nothing* about the reality of the manned nature of mission 203, replied Linda Patterson. There is too much things to hide, and the best way with it, it's to show everything you can. The best cover-up possible, it's the one that's done with 100 % of the real facts. You won't prevent schliemiels to dig around for any kind of hidden truth. So, the best thing to do to prevent them from spreading the usual chazaral they fond of, it's to cut off from the start every possibility for them to find something real we want to hide.

— Uh, excuse-me Linda, but I am missing some of your words.

— Schliemiels means lousy idiots and chazaral is synonym of a huge bunch of baloney, explained Ayleen. That's Yiddish words.

— So, colonel, what do we have to give public in this affair ? asked general Schwartz. You made the point on it, we're listening to your proposal.

— Thank you Sir. I have a military training as an intelligence officer, you can trust me on this part. First, when you're doing a cover-up, the first thing to do, is the list of facts you cannot hide or deny, based on possible witnesses, potential information leaks, public scrutiny and so one.

— That's quite simple with mission 203 : the launch of the rocket, the manned last-minute mission, the docking with the EXPESAT, the use of the Karigane tug to reach an higher orbit, and the landing problems, listed Ayleen. Let's start on all those facts with the aim of giving them 100 % public with zero secrecy.

— So, we have to find a scenario to justify all those things, without giving any clue on the existence of the grunts, and the real goal of the mission, said Marty. For my presence, mister Bolden knows that I am working on a project which aim is to define standard procedures for space medevac. The opportunity to have an unplanned manned flight at short notice means that my presence could be justified by the possibility to use an empty seat to give me the opportunity to perform the first part of my work on LEO : have a physician's eye on the casual space activity, and list all possible medical problems in real flight conditions. That was a part of the agreement between the New York City Health and Hospitals Corporation and the NASA.

— One point solved, and with real results, replied mister Bolden. For the flight crew, it is logical to call back flight 202 crew to do the job. We have to find a reason why.

— Remote control malfunction, that's the simplest thing to say, did I answered. It is a computerized system, and we can invent, or even find, a critical bug that prevents the use of the hardware without monkey motion to push the buttons. One point for us, it's that such a mission profile had not been executed before. I suggest a critical bug on the software that controls the docking mechanism, simple, very easy to dissimulate and serious enough to jeopardize the complete mission if not corrected.

— Then, for the next leg, no problems, it was already scheduled for the automated mission, told us general Schwartz. We need now a good reason to use the Karigane tug to climb to a higher altitude.

— Sir, don't you have some kind of old satellite up there ? asked Marty Peyreblanque. I think any kind of, let's say, out of order Keyhole, or anything military, derelict and having a nuclear power source or something like that. The US Navy had shot down a lost spy satellite two years before, based on security concerns. Why not pretend we had been sent to monitor potential radioactive leaks from a phased-out spy satellite ? That will also justify my presence aboard, I have the ability to monitor the potential health hazards of a radioactive device, whatever it could be.

— I buy it doctor, replied general Schwartz. I will find you some old wreck up there to justify a mission like operation Burnt Frost, the shooting of USA 193 in February 2008 you've mentioned. I'll even get you one with an orbit that can roughly match your mission.

— Sir, if it is not classified, may I ask you what became the real mission target ?

— It has mysteriously disappeared on our radar screens, a few hours after mission 203 landing, colonel. That solves another problem.

— Now, we have the landing failure to justify, resumed Ayleen. We missed our Kansas landing zone by roughly 700 nautical miles, I would look like a silly twit if I pretend to have done a miscalculation.

— Don't look to far for an explanation, I've got the right one for us, did I replied. On flight 202, a plumbing design failure was discovered : a pipe designed to carry water from the main tank to the drinking water supply faucets was subject to abnormal vibrations in flight, due to the proximity of a fuel tank used for the directional control of the command module prior to atmospheric reentry. Let's say it has broken on this flight, and the spilled water had entered into the electrical system, shutting down everything but the emergency backup.

— Looks completely idiotic as an explanation, replied mister Bolden. Systems are supposed to have enough redundancy to avoid such an idiotic failure.

— The early DC-10 airliners had a triple redundancy on hydraulic control lines, this had not been sufficient to prevent the crash of Turkish Airlines flight 981 in 1974, near Ermenonville, in France, said Marty. The triple pipes were cut off when the passenger's cabin floor collapsed due to decompression caused by a faulty cargo door which had opened in flight. Pressure equalization vents on the cabin floor, which would have been sufficient to avoid the disaster, had not been planned by Mc Donnell Douglas… So, any kind of design failure is always possible, this is why test flights are done to detect them.

— And the piping on craft XP-2 had not been corrected, because it was supposed to fly without anyone on-board, did I said. It is scheduled to be rectified on craft XP-1 for her next flight, and XP-2 will be fixed later, she shall not fly again before next year's November. You can understand why we did not fix it for a remote-controlled flight. For an aerospace engineer, this

explanation would looks like a hoax, but non-specialists will buy it. And even for a specialist, if you don't have access to the craft's blueprints and the in-flight malfunction reports, you cannot see the trick.

— So, we have all we need, ended president Obama. Mister Bolden will be in charge of the official press release, and we just have to wait for any conspiracy kook to have a lousy theory about what NASA does not tell. It would be a good idea to trigger this innocently.

— If my commanding officer authorizes me to do so, I have a simple and straightforward idea that would provides us the starting point for every conspiracy theory we need to act as a diversion debate and a cover-up, said Ayleen.

— Colonel, you just have to submit me this idea here now, and you'll get my go or not, told general Schwartz. No need to have paperwork done, no traces left behind. Let's do it simply.

— At your orders Sir ! Here is my proposal…"

Ayleen's idea was extremely simple and imaginative, and it was no more than just dropping a few words about a conspiracy meme, and let the jerks do all the disinformation work for us. Permission granted, and meeting over. Mister Bolden had an official press release to do the forthcoming day, explaining all the whereabouts of mission 203. Of course the fine-tuned version we had set this day… We had to wait now for a helicopter to fly us back to New York City directly from the White House, and we were waiting for it to be ready to fly. As Ayleen told us, Garfield, Marty, Linda and I, everything was fine now :

"So, the mission is completed, and we just have to follow the indications, as defined here. Linda would tell us that this is what is called a plausible denial method, in secrecy control. The best part would be when all the conspiracy cranks will be lured to the wrong direction by both the use of their lunacy and a coarse trigger. That had perfectly work with Bush's government for 911 when they had classified the three crystal-clear and resolution-sharp professional videos showing, in full screen and with a duration of several minutes, flight AA77 crashing into the Pentagon. And giving instead to the public a blurry CCTV view showing no more than the white silhouette of the plane during a few seconds. That was enough for conspiracy theorists to swallow the bait and invent a non-existent cover-up of an imaginary government plot, instead of seeing that they were the patsies of a real government plot set up to mask the institutional failure that had led to 911 by triggering a diversion debate on a non-existing inside job they had invented from scratch, or nearly… The less you do, the best it is.

— Those schmendriks have a binary view of the reality, and we just have to use it against them, pointed Linda. From their point of view, everything officials of any kind says is an obvious lie designed to cover-up a conspiracy, and the truth about everything is always hidden. It doesn't matter if it's true or not, they'll always invent something to fill the huge gaps of their narrishkeits. Gaps the size of the Grand Canyon, of course.

— Schmendrik means idiot and narrishkeit nonsense, told me Ayleen.

— Thanks for the translation, I ain't used to Yiddish vocabulary… So, the best way to hide them the reality, it's to told them from an official point of view, they won't believe it anyway.

— If you put them a real alien life form straight in front of them they won't believe it is coming from another planet anyway, said Marty. They are so narrow-minded that it is useless to try to have a point of view different from their own.

— That's a pity we cannot have the possibility to do an extensive scientific studies of those grunts we had found up there, did I reply. They are so fascinating that I missed them now…

— I have collected some of their hair on my comb, said Marty. I would give this evidence to a friend of Ayleen who is working on genetic engineering at Columbia University. That might be interesting to see what the DNA of grunts looks like.

— And the remaining mystery of all this story would be why did your mother write your given name with an Y instead of a I, did I said to Ayleen. The only girls with the Aileen given name I know does not have an Y in it.

— Another mystery I have found is why does the military pilots use to call by my given name the electronic device which told them that their plane or helo does not fly properly, I don't have the technical name of it, the USMC pilot of our helo told me that its nickname is a *Linda*…

— Ah, you're talking about the CAWS, Central Aural Warning System, the artificial voice that says nice things like pull up, too low terrain, engine flameout and other good news like that when you're flying…

— That's it Ayleen… and they call it a Linda ! No idea of its origin ?

— Uuuuuuuuuhhhhhhhhhhhhhh… It's the acronym for *Loud and Irritating Nuisance for Danger Alert*, an acronym that is easily understood and more easy to pronounce than CAWS…

— The version I've got from our pilot is a little different : he told me that an USAF pilot had made a pun on one of her friend, who's supposed to be an ill-tempered and bossy pighead… That's his version, you see…

— Well, replied Ayleen, this is an urban legend, you know, lots of slang words have an unknown origin, and legends arose sometimes about it, that does not mean the real origin of the word is there… You said one of HER friend ?

— It is supposed to be a female pilot who did such a lousy joke. And there is a version of this tale which says that the famous Linda is from Irish-American ascend…

— Well, you know Linda, ethnic clichés…"

Patterson is a typical Irish family name, to give you a clue… Our helicopter was ready to fly us back to New York City, and we went aboard for the ride home, or near-home for me. On the way home, I remembered what one of my university professor had jokingly told me about the CAWS. This system was designed in the '70s with a female voice especially for then full-male flight crews, because it is very humiliating for a male pilot to be publicly snubbed by a woman, especially while working, and that was supposed to trigger an immediate and swift reaction to a pilot error, or plane critical malfunction. And the female voice was left in use even with a growing part of airline pilots from female gender, because women at work finds it insulting to be criticized in public by a coworker of the same gender as them… Applied psychology is sometimes fun.

The specially tuned version of mission 203 did not trigger any suspicion among aerospace specialists, and it gave Ayleen, Marty and me a certain kind of celebrity. Especially, with the catastrophic reentry at the end of the mission, managed to end with a standard ground landing with nothing broken and no one injured. PBS TV series *Critical Decisions* have dedicated an episode of this documentary to our mission, with a reenactment of the flight and a CGI replica of the craft. And, of course, the three members of the crew had been interviewed by the PBS redaction teams. Sole weak point of this episode, the actress who plays my role have a longer nose than mine, black eyes instead of clear brown, and she's smaller than me. The episode is called *Powerless in space*, and it will be broadcast in January 2013.

And the most incredible thing about our official version of the orbital brownout we had, it is that it can REALLY HAPPENS ! With the test article of the piloted version of Starlight Messenger, a water spill had been done, with all the electrical systems of the command module working at full power. The result was a complete and irrecoverable safety shutdown of the four separate electrical power lines ! The reason : even if the batteries and the electronic monitoring systems are enclosed in watertight boxes, feature mandatory for a craft that could perform a splashdown landing, the connectors of the power lines are not…

And they are not designed to be working underwater, so a water spill on them causes a short circuit that triggers all the four main circuit-breakers, and leave the craft without power… The solution was as simple as the problem was so damn easy to identify : use water-resistant power connectors. A US Navy contractor sold us those products, designed for submarines and costing only 25 % more than the aviation-grade connectors we had previously used. A good security, with a reasonable price. As Garfield says : save lives is always cheap, and shall always be done.

And what about the conspiracy theories used as a cover-up ? That was very simple. Ayleen, Marty and I were invited, in January 2011, on TV to give an interview about our mission. The highlight was given on the emergency landing we have done, but we also have questions about our flight. The part with the military satellite was not put under the highlights, a simple radiation measurement on a wreck was not really an exciting milestone, and Marty was the one who spoke about this part of the mission :

"…This was a satellite of the Snapshot series, a test vehicle designed in the middle of the '60s as a prototype of the then-forthcoming Keyhole series. This was the first of its kind, with an electronic imaging system and a pictures transmission to earth by radio link. So, to get all the power needed, it had to carry a nuclear power unit aboard. With the studies made now on the way to recycle the derelict satellites on orbit, the main purpose of our mission was to determine if there is a possibility to operate an EVA on this device without safety concerns about radioactive materials.

— We have to say to our viewers that you have an expertise on occupational medicine.

— That is correct, I am an expert for the FAA for the New York City area, from pilot professional evaluation to prevention of repetitive strain injuries of the luggage handlers at Kennedy Airport. It also includes an expertise on professional exposure to toxic materials, including ionizing radiations. So, I had to monitor the levels of radiation on this satellite to determine if manned operations were possible, and which kind of extra precautions shall be taken.

— Doctor Peyreblanque you also have done a preparatory work on the procedures needed to perform emergency medical care during a spaceflight.

— Yes, it was my main mission in flight, and I have done a preparatory report for the NASA, on behalf of my employer, the New York City Health Corporation. You will get the complete text of my report published in the first week of February issue of the *Journal of the American Medical Association*, for peer review.

— Thanks doctor Peyreblanque, it's highly interesting what you are telling us… Colonel Messerschmidt, as the commander in chief of this mission, you told us that your crew and you have reached all the milestones originally scheduled for this mission, and go beyond with your emergency landing. Globally, what kind of results did you get ?

— On the piloting of the craft, especially the docking protocols, the use of the Karigane orbital tug and the orbital maneuvers, that was beyond all original expectations. On secondary missions, doctor Peyreblanque told you what he have done for the medical part. Other important thing, we have deliver experimental payloads to EXPESAT, increasing his abilities. And a last

minute mission : we had been able to make some measurements of the ionospheric radio transmission of some different types of digital signal, in touch with the High Frequency Active Auroral Research Program facility in Alaska. That would be very important for the following space missions, all radio transmissions are digitalized now…"

High Frequency Active Auroral Research Program, in short HAARP, is a meme for every conspiracy theorist. It is a facility designed to meter and locally modify the transmission of radio signals through the atmosphere, and make measurements of the ionosphere in different meteorological conditions. A scientific research facility, like the equivalent Tromso facility in Norway, and the Sura Facility in Russia, with the aim of making studies on and around the properties of the ionosphere, vital for civilian and military radio transmissions.

This explanation is quite simple and obvious, but the combination of radio frequencies, military input (The DARPA have a foot in the HAARP facility) and atmospheric experiment turns this facility into a Jack-of-all-trades for conspiracy theorists. Mention it in any official program, and you'll get a dozen of fringe theories in the next 48 hours. According to those kooks, HAARP is the source of all major natural disasters since 1998, the accidental in-flight explosion of the TWA 800 flight, the cause of the collapse of the World Trade Center on the September 11 attacks, every epidemic or suspicious disease of those last fifteen years, and had been linked to any kind of usual bullshit spread by the conspiracy theorists.

For the conspiracy theorists, HAARP does everything evil, including the disappearances in the Bermuda triangle, the sinking of the *Titanic* and the crash of the *Hindenburg*. Even the chemtrails and the election of Barack Obama had been linked to it with a conspiracy, and the new-age conspiracy kook Kathryn Dorsley had pretend that HAARP was designed to spread around a sex-orientation changing ray to turn every woman on earth into a lesbian…

In the days following the false innocent declaration of Ayleen, which was technically sound, every jackass that have some baloney to sell had turn mission 203 into a governmental conspiracy. Either the profession of doctor Peyreblanque, the visit to a military radioactive satellite and the near crash landing at the end of the mission were enough to fuel the most stupid scenarios ever invented about a space mission. Missing totally what we were really hiding.

What was really funny was to meter the level of ineptitude of the conspiracy theorists. They were monitoring all our résumés, inventing nonsenses totally cut from every possible reality from smallest meaningless facts, and missing all the major points of our cover-up. I had learned that one of my teacher in high school had a father who had been in trouble with senator Mc Carthy's comity against anti-american activities in the early '50s, that doctor Peyreblanque's flight instructor in his flight school in Denver, Colorado was an ex-Air America pilot for the CIA in Vietnam, and that Ayleen's aunt, the great Chicago blues singer Mavis Blacksmith, had been dated by a close friend of Malcolm X when she was 16. All obvious evidences of a government conspiracy that proves the existence of the invasion of communist vegetarians from outer space, with the help of the New World Order, Bildenberg group, Illuminatis and whatever crapspiracy junk you want.

As Ayleen told me once, this usual and pointless methods of cherry-picking by the conspiracy theorists is the equivalent of chasing fleas on the living room's carpet without seeing the elephant behind them. And there is three obvious points that proves that there is something wrong with this mission. First, most obvious and more easy to check : the orbital parameters of Starlight Messenger mission 203, EXPESAT and Snapshot NRO derelict experimental satellite are well-known, and you can make a calculation to see if their orbits match with the launch date of mission 203 (all of them publicly known and widely available to a general audience through Internet by a

dozen of specialized websites), and the reentry date and trajectory of Starlight Messenger XP-2 command module (also publicly known and given, with all details, on Northeastern Aerospace website).

And with a basic orbital calculation, you can see that Snapshot and Messenger orbits cannot match for the whole duration of mission 203… It's physically impossible, even with the most powerful orbital corrections. Newton's laws are mandatory, a fact that no conspiracy theorist had checked anyway. First elephant in the living room.

Second animal of this kind, Marty Peyreblanque's professional skills. His profession is surgeon, specialized in traumatology and accidentology, the kind of guy who stick back your parts together after a car crash. He's an expert in this matter, and he works not only for the NYC Health Corporation, but also for the FAA, the NTSB and other public services who needs an expert eye on everything that hurts. Apart his main professional skills, Martin-Georges Peyreblanque M. D. is also a prolific writer. Since 1997, he had published 47 articles in 15 years on several professional reviews, mainly on the *Journal of the American Medical Association*.

Of course, 80 % of his writings are dedicated to traumatology, surgery, accidentology and spin-off medical specialties, as nosocomial infection prevention, occupational medicine, emergency and legal medicine. The other 20 % of his writing are dedicated to medical subjects he's interested to : epidemiology, nutrition, medical education, professional training in medicine and public health policies. All his publications are available on the net, lots of them for free, and professional publications sites lists all of his writings, with all the relevant references to find them.

And no one has ever see that Marty had NEVER published anything about radiation poisoning, worker's safety in nuclear plants, or even toxicology. For someone who was supposed to monitor the safety of a nuclear-powered satellites, that's a real lack of professional abilities : radiation poisoning, a dedicated branch of toxicology, is as far away from trauma medicine as, in aerospace design, my engineer's profession of on-board systems specialist is from aerodynamics engineering. Don't ask me to calculate the Reynolds number of some kind of flying vehicle, that ain't my job, I only do it for piping.

Third and last elephant in the crowded living room : the famous HAARP we were supposed to work with while in flight. That is very simple about it : it was shut down for maintenance and overhaul the whole month of December 2010 ! Evidences ? (Yes, it's a plural !) First, a documentary made for PBS by the famous Meyssonier brothers. They had made an episode of their *Science in action today* at this famous facility. In this episode, titled *A HAARP for tuning skies*, they had been authorized to shot footage there because the scientific activity had been stopped during the works, and they said it clearly in the introduction of their TV episode !

There is also a public report of the General Accountability Office, available on the internet, or by mail order from the GAO, that states the financial monitoring of the works at this facility. You have all the expenses done to the last cent, the name of the contractors, and the complete bidding made by the DARPA and the University of Alaska, the main managers of this facility. All 100 % public, thanks to the FOIA.

And last evidence, the first public press conference of the 501(c) society founded by former senator Andrew Larkin senior, from Rhode Island, titled Science and Education for All, was held at the HAARP facility for Christmas Day of 2010. All the journalists who had cover this event had written that it was possible because the facility was closed for works since December the first ! With the mission 203 having been done in less than two weeks in December 2010, beginning with our liftoff on the 7th of December, having contact with HAARP for any kind of scientific work

would have been irrelevant… Fifteen days is the maximal autonomy of the Messenger craft in flight, I have forgot to tell you that.

So instead of telling a huge amount of baloney to invent a conspiracy, a simple basic check of the facts would have given some clues on the cover-up. But official sources are only lies for the conspiracy theorists, that is why they never check them… And made lousy errors like Marty Peyreblanque's graduation in medicine at the university of Berlin, *Connecticut* (there is no university there, and Marty had graduated in the Free University of Berlin, *Federal Republic of Germany*), my position at the NASA as copilot of the space shuttle (I was three times payload specialist, and I never had done something more with the space shuttle flight controls than have a look at the dashboard while off duty by personal curiosity), and Ayleen's graduation in astrophysics at the Air Force Academy (in fact, she gets her Ph. D. in astrophysics at the Columbia University).

Like the Y in Ayleen's surname, the grunts remains a mystery today. Mystery deepens by Marty's DNA sampling of their hair, picked from his comb. The DNA expert of the Columbia University, a friend of Ayleen, had been astonished to see that this sample had not the four Adenine, Thymine, Guanine and Cytosine usual nucleotides, but a fifth one : Xenorybine. This molecule, theoretically defined by genetic engineering, non-existing in nature and not even synthesized, is present into the grunt's DNA !

Finally, that's a pity to not being able to know more about those sympathetic wafer-eating furry animals. Honestly, even if I had never been interested in pets before, grunts are the kind of sympathetic life form I would not disagree to have at home. Remembering seeing them in Starlight Messenger scratching behind their ears with their back legs, drinking happily the rehydration liquid provided by Marty, an alcohol-free beer, purring by being combed, caressed and scratched, and having a great appetite towards wafers, that's the best memory I have from them. Someday, maybe, they might come back…

* * *

Olivier Gabin, October 2012 – July 2014
Version 2.0