

REMEMBER, WE'RE PIONEERS! **The First School Contact with the International Space Station**

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Introduction

Those words came floating back to me as I watched the rocket being launched to Mercury. "Remember, Mrs. Wright, we're pioneers" said one of my eighth grade students as we stood on the stage at Burbank School, Burbank, Illinois shortly after our failed attempt to contact Comdr. Shepherd on the International Space Station. The date was December 19, 2000. Our gym was filled with students, parents, teachers, and dignitaries, along with various news media. It had been a long and sometimes wild ride up to that point. But I was soon to learn, it wasn't over yet!

How do you fill your time from application to contact?

Memories...I would have to go back to 1988 when I first attempted to involve my students in a NASA project. At that time we were trying to come up with a name for the new shuttle. Too bad the student who said "Endeavor" was out voted by his classmates. But we had fun investigating the history of various sailing ships and developing a board game about a lost treasure in Burbank.

It was shortly after that I heard about



Eighth graders try to pick a name for the new shuttle. (1988)

SAREX and the opportunities being offered for school children to communicate with astronauts on the Shuttle. I was so impressed with the program that I finally sent in my application in 1996. And so the wait began.

A waiting period can be boring as when you are sitting in a doctor's office watching mold grow on the fish in the fish tank. Then again, it can be an exciting learning and sharing time. I was once asked, what did I do during those years between application and contact? My answer was, I kept the dream alive. We did projects on space that involved designing and building spaceships of the future, art work showing the students ideas as to what they would see if they were in deep space, and research work involving discovering earth's problems and designing a solution.

We became involved with Argonne National Laboratory's Junior Solar Sprint. Students designed built and raced solar powered cars. We were lucky to race in the National Solar Sprint held in Washington D.C. where we placed 5th in the nation. We went on to win several 1st and 2nd places in Argonne's races over the years.



Receiving a trophy at the Junior Solar Sprint National Championship race in D. C.

Speaking of racing, every year students had to design a car with as little friction as possible and one that was aerodynamically sound. Students raced these down a 5cm high ramp in the classroom. No motors, batteries, or flywheels were allowed. The students ran the entire race themselves. That included weighing and measuring the vehicles, measuring the distance traveled by the vehicle, and deciding upon a fair grading system.



Students participate in the Wheeled Vehicle race

Then my students became part of a project designed by Adler Planetarium. This project involved research, writing, designing, building, and artwork, but also involved children from different schools in the Chicagoland area sharing and critiquing each others projects using computer technology. One of the nicest things that came out of this project was the 30 robotic kits we received from Adler. That, of course, led to another fascinating project on robotics and the exploration of Mars.

From Newton's laws to the theory of flight to the building of rockets and looking into the Universe with help from Hubble photos. We researched, studied, wrote, designed, built and thoroughly enjoyed our adventure. We especially liked the trip to the space center in Woodstock, IL where students flew in a 737 simulator! Among all of that were trips to Argonne National Lab, Fermi Lab, and even appearing with Bill Kurtis on the show "Different Drummers".



Burbank's Robotics ready for Mars

And we waited. Time passed, students moved on to high school and then college. Teachers retired and a new group moved into their places. We waited for a Shuttle contact. Next it was Mir. I remember visiting Jerling Jr. High when they had their contact with Capt. Jerry Linenger (KC5HBR) on board the Mir space station. I kept pushing the dream, while we waited longer. My room was always filled with Hubble photos, NASA posters, and standing in the corner, was the life size trio from the movie Apollo 13.



The Apollo 13 movie crew

We get the call!

Finally in August of 2000 we received the call! Once school started, we hit the deck running. Our contact would be handled by Charles Sufana, AJ9N, with assistance from the Commonwealth Edison Employee Amateur Radio Society and the Lake County Amateur Radio Club. We were in good hands!

At our first teachers' meeting of the new school year, we set about explaining the opportunity and educational value afforded us and defining and describing the tasks we had to accomplish by December. We were met with school wide enthusiasm and cooperation. We were a team! We designated our school as Earth Station Burbank School, and the entire staff and students became our crew. Our very capable secretary, Colleen Sopkin, headed Mission Control.

We began by putting together a judging team composed of parents and teachers. Next, we sent out a call for students to audition for a position on our ISS team. Eighty students auditioned and from that group we selected 14. The students were from grades one through eight.

Our next task was to design a mission patch. Our entire school population participated in an art contest involving the creation of our Burbank School/ISS mission patch. This patch was to represent our school's contact with Commander William Shepherd, KD5GSL, on the International Space Station Alpha. After narrowing down the contestants to a manageable few, we held a general election. Burbank students selected our mission patch.

Of course we had to have questions. Once again we sent out a call to all students asking them to write questions for our contact. Each teacher helped by evaluating all of the questions from her/his own class and then submitting the best. From that group, our Language Arts teachers helped select the questions our team would ask.



Burbank/ISS mission patch

In the weeks and months that followed our initial notification, teachers and students in

every classroom began working on a wide variety of "space topics". Our first graders



The Burbank/ISS team

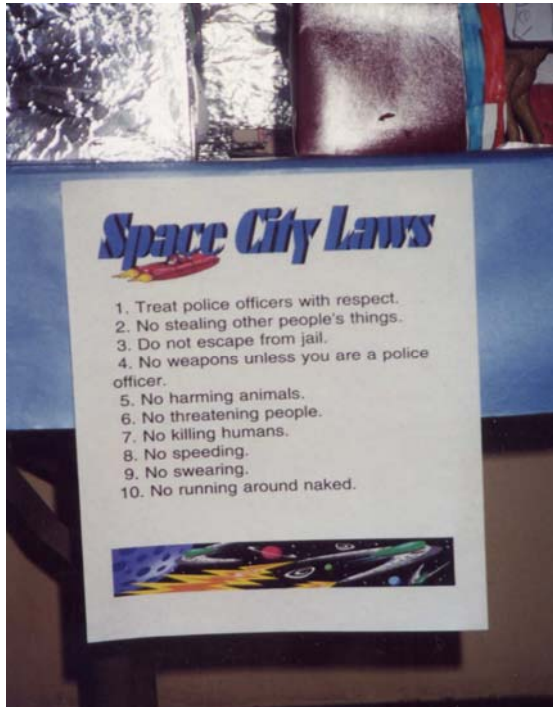
created space people and space capsules. Their themes were "Flying High in Grade One" and "Adventures in Space". Their bulletin boards reflected the imagination and creativity only a first grader can have. They even had Winnie the Pooh in a space suit.

Second graders wrote stories about why they would like to be an astronaut and then made shuttles out of Pringles chip cans. They colored pictures of astronauts and put their own photos in the helmets. Their work decorated the hall outside their classroom.



Second graders shuttle to the Space Station

Fifth graders did one of the more spectacular displays. They created an entire Space City. It included cafes, laundromats, theaters, a water tower, shuttle station, and more. They even wrote laws for their Space City!



Fifth graders write laws for their Space City

Other students in middle grades created a Cosmic Café. Some of the items offered were Moon Popsicle's, Lift-off Lemonade, Space Station Steak, and Pluto Pudding. Their work also decorated the hall outside of their classroom.

Students in other classes were busy imagining they were astronauts working on the space station. They wrote their own biographies and included future missions they would like to be involved with. They tracked the ISS on the web and plotted on a map where the space station was every 45 minutes. They wrote time lines comparing our school day to the ISS. Some children wrote poems and made chalk drawings to accompany their poems.

To prepare for our ISS contact, the junior high students searched the web for information on the space station. After much discussion, the students created power point presentations. They made a ten-slide show,

which consisted of one slide telling what the ISS is, one slide for the astronaut, and one for each cosmonaut on the ISS. The remaining slides contained information about space and the space station. Students presented this to our audience on the day of the contact. Our Special Education students in junior high did the power point work.

Students in a junior high Math class used the distance formula to calculate the distance to the ISS from Burbank School. This was done over a period of several days so those students would understand the idea that the station was moving constantly. In addition to distance, they considered time. They thought about their own future and where they would be in the year 2030. By then we will need a new ISS, so some of our future engineers designed and built the station of 2030. They also wrote a paper describing how and where it would be built. Our more artistic students decided to be scientists on the space station. They used their creativity and imagination to draw what they saw when they looked through a telescope while out in deep space. Our computer oriented students researched various Earth problems and developed plans for solving the problem using the technology on the space station.

All classes at all levels spent time using many of the websites that Charlie Sufana shared with us. As our students continued their search, one site led to another and their enthusiasm grew proportionately. If you were lucky enough to walk down the halls of Burbank School during those months you would hear students and teachers alike talking about space, shuttles, space stations, and what the latest information was about the ISS. You would be surprised at the variety of the topics, activities, and displays of work all centered around the ISS mission. Our school was vibrating with excitement and activity!

It's lovely weather in December. Time to put up the antennas!

December was soon upon us. The weather hit with a vengeance. Charlie Sufana and his

team began setting up for the contact on December 10th. One of the biggest challenges had to do with setting up the antennas. The system had to be placed on top of a 2-story building. According to Charlie, they had to carry up 12 concrete blocks, five 35-pound sandbags, 4 sheets of plywood, 2 tripods, and 2 antennas with their associated azimuth and elevation rotors, control cable, and coaxial cable. All of this was done with about 10 inches of snow on the roof and temperatures at the start of the day at about 34 degrees and falling, wind-chills were about zero. Charlie said it took about 8 hours to do the job. During the following week and a half Burbank was hit with 2 full-blown blizzards and 4 additional snows. Temperatures were mostly in the 20's and usually had below zero wind-chill factors. Charlie would stop by the school occasionally to see if everything was still in one piece.

On December 11th, Charlie Sufana met with the ISS student team and their parents at Burbank School. It proved to be a very informative meeting. Mr. Sufana shared with us his experiences with other school contacts. He went on to describe how we would make the contact and what was expected of the students. There were many questions from students, parents, and teachers. He did a tremendous job in responding to them and explaining in detail that what we were about to do was an experiment. There were no guarantees as to the outcome.

Contact! Or, Houston, we have a problem!

Which brings me back to the beginning of this paper. Contact day was December 19th. Yes it snowed the previous night. After re-hooking all of the cables and getting everything in place on stage, his team was ready. Our students were nervous and excited as they stood on the stage looking out at our capacity filled auditorium. A state senator and our mayor were sitting in the front row. A TV station was filming and reporters were making the rounds. Along one wall the audience could watch a map showing the exact position of the space station as it

neared our contact window. Suddenly, the exuberant audience hushed. At about 2:59pm CST Charlie Sufana gave our first call to NA1SS. Nothing, we called and called but we were never able to establish contact. After a second attempt an orbit later, it became obvious that today was a “no go”. I’m not certain what went wrong. Mr. Sufana said it was a technical problem. I think I crashed further down than my student team members. I was so disappointed for all of them. But then, they spoke to me.

A disappointment, certainly. A defeat, never! After all, we are pioneers!

Alpha Juliet 9 November NA1SS we have you readable. Go ahead.

To our great surprise and delight, we were given another chance. December 21st was our new contact date. And yes, it snowed again! The temperature was about 13 degrees - what else? Once again our audience was filled to capacity. They did not give up on us... but the media? Where were they? We had reporters from a few local papers, but nothing more. Once again we used the computer program to show the audience where the space station was and once again the audience hushed when the station came within our contact area. Then at 20:28 UTC, Bill Shepherd and the ISS came up over the horizon for what turned out to be a near direct overhead pass! Charlie and his team made a connection within seconds and continued up to 20:39 UTC. Upon hearing Bill Shepherd’s voice the audience let out a loud cheer! At that moment I was saying a



Charlie Sufana, AJ9N, makes the call

prayer of thanks! Soon Jessica Lehocky was at the mike asking the first question. We had 14 students and everyone had their turn at the mike. Jessica, in fact, was able to ask an additional question. Charlie had a chance to ask a question and then at the end of the contact, I was handed the mike. I simply thanked Commander Shepherd for taking his time to talk to the students of Burbank School. The entire team said “73” and it was over. What a ride! The audience cheered.



Alex Bandyk asks a question

Some time later our principal wrote the following insightful statement. “Rita Wright’s letter (to Commander Shepherd) pretty much summed up what the school did to make the contact an interdisciplinary learning experience for all grades across a variety of academic concentrations that included math, science, reading, writing and art...Howard Gardner would be proud of us for engaging multiple intelligences. Making the contact such an experience is a must for others who follow because the transformation that took place was quite revolutionary. We came closer together as a school. Teachers who might otherwise have stayed in their own worlds didn’t. They wanted to be part of the experience. Junior high students who ordinarily trudge their way to school day in and day out hardly taking time to say hello were walking into school talking about why they thought the experiment failed the first time. Parents pitched in and helped because they sensed how special the event was and because they genuinely wanted to be a part of it. The community at large read about us in the papers...The excitement of the event will

fade in time but some of the changes will endure to our benefit.”

A lot to show, a lot to share

Christmas 2000 is over and we’re back at school. Time to kick back and relax? Hardly! The school was still vibrating with excitement. We had another power point put together depicting our contact with Commander Shepherd and the ISS. A video was edited and offered to students and their parents. We had a big demand for more t-shirts and buttons displaying our mission patch. All of us were collecting photos for a memory album. One of our parents began sewing a huge banner commemorating the contact. And we had many people to thank. We were getting ready for parent conferences and we certainly had a lot to show them and a lot to share.

It was an exciting time for all of us. Our ARISS contact awakened our community to the adventures and thrills found in space exploration. The contact sparked an interest in careers in space-related subjects and a sharper interest in the study of astronomy and the design and building of the tools of exploration. The event did bring this K-8 school together as no other event ever did. We participated in an interdisciplinary learning experience for all grades across a variety of academic concentrations. All of us here at Burbank School believe that this type of experience is a must for all other schools who participate in a contact. As our principal pointed out, the transformation that took place in our school was revolutionary. Students, teachers, parents and community worked together to make our contact a success.

We send an invitation to a friend

In February our school extended an invitation to Commander Shepherd to visit our school and community. He is a positive role model for all young people. It seems a lifetime ago when young people had many positive role models to look up to, to help guide them

through some of life's trials and to teach them some basic life lessons. Like the lesson of perseverance. There were fliers like Lindbergh, Earhart, Glenn, and Yeager, ball players like DiMaggio and Ruth. Today young people have to search to find positive role models. Here at Burbank our students found a treasure in Commander William Shepherd, who took the time to talk to a group of junior high and elementary students in a small school in a small community. He touched their lives and opened their eyes to a whole New World a world of new opportunities and new career possibilities.

Commander Shepherd comes to Burbank School!

If we thought for a moment that the contact of December 21st was the only time that our students, teachers, parents and community would come together to accomplish a single goal, we were wrong. May rolled around and along with sunny skies and warm temperatures came another momentous phone call! Commander William Shepherd was coming to our school! The date of his arrival was to be May 10th!

Suddenly we were back in action! News items and invitations were immediately sent out. By now we had a teacher who handled all public relations. Meetings were held and tasks were divided among our team members. In no time we had our school organized and ready! Burbank's Mission control team was operating on all cylinders.

May 10th, Commander Shepherd walked into our building greeted by a line of teachers, staff, and parents. The halls were decorated with signs of welcome and a power point display was being shown on a screen in the foyer. A team of 8th grade students proudly exhibited their robotics and delivered an invitation to the Commander via one of their robotics. It was lunchtime and our parents had a surprise for Commander Shepherd. He was taken to the lunchroom where Burbank parents had worked tirelessly to decorate the room and then prepare a wonderful lunch for



Commander Shepherd greets the students at Burbank School

all. Shepherd was introduced to parents, staff, teachers, our ham radio team, and to three young ladies from the education department of Adler Planetarium.

After lunch it was on to the gym where about 500 students waited. After introductory ceremonies, everyone sat spellbound as Commander Shepherd described his days on the ISS. He even had a "home video" that showed Shepherd and the two cosmonauts at work on the ISS. This was the first showing of the video. Throughout his talk he



Commander Shepherd and Mrs. Wright



Cmdr. Shepherd signs autographs for the Burbank/ISS team

answered questions from students. What he really wanted to talk about was the kids and what was available to them if they just worked hard. “The first crew for the Mars mission already exists,” Shepherd told a rapt audience as he explained what big step was next for NASA. “We just don’t know who they are yet. That’s the problem. I’ll leave it up to you to do what needs to be done to get there.” Shepherd told them that the choices they make, even at an early age, could have consequences that ripple throughout their lives. Upon leaving the gym we headed out to the front of the school where a group of kindergarten through second grade students sat in the grass anxiously awaiting the astronaut from the space station. After sharing some thoughts with them, he answered some of their questions. He was surprised when our music teacher led them all in a song entitled “Mission Control”. Then it was back to the gym where he graciously gave numerous autographs and



Cmdr. Shepherd meets the Ham Radio team



K-2 students sing “Mission Control” to Cmdr. Shepherd

posed for many pictures.

Our principal, Bob Mocek, later remarked that there probably is no such thing as a perfect day in a school, or anywhere else in this world, but that day (May 10th) was about as close as he could remember ever coming to that point. The harmonious spirit of cooperation throughout the building, the special efforts to show support for space exploration, more special efforts to decorate hallways and the gym, getting the best behavior out of our students all set the scene for an exceptional experience, one that held the power to inspire greatness.



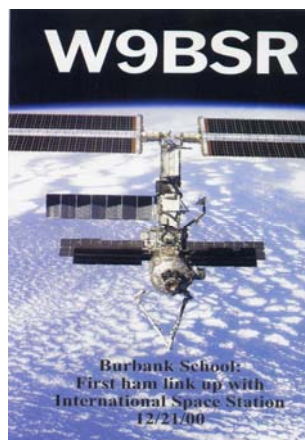
**A perfect day!
Bob Mocek Principal**

The antenna challenge and the birth of W9BSR

We were inspired enough to decide we wanted a Ham Radio Club in our school. Mr. Mocek and I enlisted the help of three other teachers and set out to put together a club.

Personally I felt confident that this would be an easy task to accomplish since our ARISS contact and the visit by Commander William Shepherd. I worked on getting my Technician's license and in the process was able to get help from Hamfesters Radio Club in guiding us in setting up a station. We needed, of course to get an antenna on our school. And that is when we hit a brick wall in the form of the building commissioner of the city of Burbank. Months went by. Mr. Mocek sent many requests to the building commissioner asking for an appointment. He ignored all of those requests. Not depending on any one avenue of attack, I wrote letters and/or spoke to our assistant superintendent, the superintendent, to the director of curriculum, and to the mayor of Burbank. I was about to give up when one day the Superintendent of our schools walked into my classroom while I was teaching, asked me a few questions about our proposed radio club and then promptly said OK! Great, but it still didn't happen until one summer's day I was called back to Illinois to speak to the school board during a general meeting. After explaining to them what we intended to do and how it would benefit the children of Burbank, the board gave their OK. Finally, our principal went to the mayor of Burbank and enlisted his help. The antennas went up! W9BSR was born!

We just ended the second year of our club. It has not been easy. I personally have a lot to learn about operating a station and getting students interested in getting licensed. I find that they enjoy learning Morse code and so we had them build their own keys and learn how to spell out their names. We started out our first year with about 8 members. The second year of operation we had 25. We have



W9BSR OSL card

made some good contacts but it is becoming more and more apparent that we need more antenna power. I finally passed my code test and am now a General. So we are making progress.

Final thoughts

Our ARISS contact and subsequent visit by Commander Shepherd was like tossing a pebble into a stream. The ripple effects are still occurring and I suspect will continue to occur for a long time. We have a young staff and witnessing these events has inspired some to look for other interdisciplinary projects. They are beginning their dream. Many of our students are looking forward to careers associated with the space industry. As for myself, I keep looking up. I know we can put a bigger antenna on that school!



The antennas on Burbank School