The oral histories placed on this Website are from a few of the many people who worked together to meet the challenges of the Shuttle-Mir Program. The words that you will read are the transcripts from the audio-recorded, personal interviews conducted with each of these individuals.

In order to preserve the integrity of their audio record, these histories are presented with limited revisions and reflect the candid conversational style of the oral history format. Brackets or an ellipsis mark will indicate if the text has been annotated or edited to provide the reader a better understanding of the content.

Enjoy “hearing” these factual accountings from these people who were among those who were involved in the day-to-day activities of this historic partnership between the United States and Russia.

To continue to the Oral History, choose the link below.

Go to Oral History

JOHN E. BLAHA

August 24, 1998

Interviewers: Rebecca Wright, Paul Rollins, Andrea Hollman

Wright: Today is August 24, 1998. We're speaking with Colonel John Blaha in San Antonio, Texas. Rebecca Wright, Andrea Hollman, and Paul Rollins. We're here with the Shuttle-Mir Oral History Project, and we certainly thank you, sir, for taking time out of your schedule to visit with us.

Blaha: I'm happy to visit with you.

Wright: We know that it's not quite been two years since you returned home. What are your feelings now after being back on the Earth this amount of time? When you look back at that time up on the Mir, what are your first thoughts of being there?

Blaha: I thought it was a good program. I thought we probably completed one-half of the mission. The reason for the engagement, I thought we completed very well. Another half of the mission I don't think we got as much out of it as we could. That doesn't mean that's bad; that's just an observation. I'm a little sorry that the current Russian economy seems to be slowing down the start of Phase Two. I think the Russians have a lot of knowledge on long-duration space flight that either we didn't capture properly in Phase One, or somewhere in the political realm we didn't realize how to organize the Phase Two Project to capitalize on their knowledge. So I'm disappointed that a funding problem in Russia is holding up the start of Phase Two.

Wright: We know you spent many years training, and you spent many years as an astronaut. Was there something specific that caused you to move away from that career in search of a new one?

Blaha: Oh, yes. As far as that goes, no, I had always wanted to be an astronaut, served fifteen years in the Air Force flying airplanes, and then had the opportunity in 1980 to go to Houston, so I did. I look back at that and say I had seventeen wonderful years in NASA. I'm fifty-six years old this week. You can't continue to fly in space forever. I had five very good missions, I enjoyed my NASA career. I think nothing but the best for NASA and the space program, and I will always support it for years to come. But it was time to stop. Actually, my wife and I started thinking about moving to San Antonio in 1991. In fact, we traveled to San Antonio and looked

for homes for five or six years. We knew we were eventually going to make a move. We just didn't know when that would be.

So after STS-43 in '91, my third mission, we thought about it very seriously, but I hadn't had my fill Of space flight yet. We decided to fly STS-58, which was my fourth mission. After that, we thought about it again in November of '93. We seriously thought about moving to San Antonio. Then I thought, "No, I want to go fly on the Mir Space Station."

A year and a half ago, Brenda and I discussed moving to San Antonio again. This time we decided we wanted to make the change. We had enjoyed our 17 year NASA career, and now wanted to prepare for our future.

. *Wright*: What made you decide to pursue the route to the Mir?

Blaha: That actually started in 1991. In October 1991 Brenda and I went to an Association of Space Explorers Conference in Berlin--that was our first one--and there we ran into a number of cosmonauts. I did not speak Russian, but through interpreters I talked to the cosmonauts a little bit. I saw a video at the end of the conference on the Mir Space Station that some Russians showed. It wasn't a formal part of the program at the conference. When I returned to the US and met with Richard Truly in November (he was the NASA administrator at the time) I suggested we should explore the feasibility of flying on the Mir with the Russians. NASA could learn a lot about operations with a space station. For me, the idea of flying on the Mir began in October of '91.

Wright: And how did it evolve?

Blaha: I remember when Norm Thagard was leaving Houston in January of '94 to Star City to start training in Star City, Russia. At an astronaut office meeting I suggested that we also should let pilot astronauts take part on the long Mir flights, not just mission specialists. Therefore, I was continuing to suggest in Jan 1994 that I was interested. In July of '94 Hoot Gibson told me that if I really wanted to fly on the Mir, I could. August of '94 then that's when NASA sent Shannon Lucid and me to Monterey, California, to start learning the Russian language.

Wright: You spent quite a bit of time with Shannon for the next few years, or a couple of years, training together?

Blaha: Yes. As it turns out, I spent a lot of time with her. The summer of '90 we started training for what turned out to be an August of '91 Space Shuttle flight (my third flight: it was also her

third mission). We trained for a year and flew STS-43 together. When we completed that flight we were both assigned to train and fly on STS-58 together. One year after completing STS-58 we both started the Russian training program at Star City. She and I had actually been together since the summer of '90 training on the same crew together and in the simulators together.

Wright: How does the training differ at the Gagarin Training Center compared to what you've done for Shuttle flight?

Blaha: Maybe I should categorize three major differences. Every time I trained for a mission for a Space Shuttle, I did it in the English language, which is my native language. When I trained to fly on the Mir, I did it in the Russian language. It wasn't a Russian course; it was a course in the Mir communication system , the reaction control system of the Soyuz, etc. Therefore a difference was the language and culture used to teach the course. I learned the Shuttle in the English language from 1980 to 1994, and I learned the Mir and Soyuz in the Russian language in 1995 and 1996.

The second difference was the Russian philosophy of education. In America we do things the easy way, and we do it at a cost. We pay more dollars to train the easy way. Since we have money, we can do it that way. Specifically, we use a lot of simulation/technology to train. We go and sit in lots of simulators for year after year. I've been in the Shuttle mission simulator since 1981. We sit in the simulator for hours and hours. It's a very good training program, but the approach is to use simulators. This is an expensive approach compared to the methodology I witnessed in Russia. I'm not saying it's wrong, I'm just saying that's our program. In addition, we did not have examinations at NASA. You, as a crew, have to perform, but I've never seen anyone fail in my seventeen years at the Johnson Space Center.

I'm not criticizing it. It's just an easy way to learn. This is my second major difference. One was language - English-Russian; and the second difference is what I call the philosophy of education. In America, we do it with money, and we do it easy. In Russia, they do it the old-fashioned way. A person takes a piece of chalk and they go to a chalkboard, and you're sitting as one student or two students, no more. That piece of chalk goes to the chalkboard, and a man starts teaching you a particular system in a Soyuz or on Mir, and you take notes and you ask questions. When a course is complete, the Russians have another team administer an oral exam to the student. The team are the experts who designed that particular space vehicle system. For example, the Mir com system. The communications experts from Energia come about a month after that course is completed and administer an oral exam in the communication system of the Mir. Of course, again, the media for all of this is the Russian language. The experts grade the

student; there's a pass/fail. So you're under a lot of pressure in that system for two reasons. One, you're doing the whole thing in your second language, and, two, you're an American in Star City, Russia, and you don't want America to look bad. So what does that mean? That means that individual person going through that training in Star City is under significant stress and pressure. That's a second difference. In the end, both systems end up with a highly trained crew. Both completely different training systems result in the Russians performing very well flying on their Mir Space Station and we perform very well flying our Space Shuttle.

The two missions are also very different. One is a continuous space station flight; the other is a shorter Apollo or Space Shuttle flight (NASA had a short exposure to a long flights with 3 Skylab missions). The difference between long and short duration space missions is the 50 percent I think NASA did not fully appreciate or learn during the Phase One Program. NASA will learn the difference during Phase Two with the International Space Station.

There is a third difference. The third difference is the way you train and the way you operate the mission control center for a space station is different than when you are operating a 2 week space shuttle mission. In the Mir-Shuttle Program, NASA learned a tremendous amount of information on how to manifest a Space Shuttle to train a crew on a Space Shuttle to go to a space station, do a rendezvous, dock, transfer equipment over, transfer equipment back. The scientists learned some insights into experiment training and experiment design on a space station. So we learned, because we were used to the Shuttle, and the Shuttle was controlled from Houston, Texas. So that whole 50 percent of the Phase I mission we learned well, and everything we learned will help us plan that 50% of the mission for the Phase II program.

We didn't learn a lot from the time the hatch closed on a Space Shuttle, and one American was on the Mir with two Russians for a four-, four-and-a-half-month, five-, six-month mission on a space station controlled from Russia. The vast majority of that whole portion of the mission was trained in Russia, not at the Johnson Space Center. We [NASA] didn't learn as much about that 50% of the mission. The 7 Americans who flew on the Mir did. Maybe the reason is because that portion of the joint venture controlled in Russia. The training part was controlled in Russia, the vehicle was a Russian vehicle, and the command and control during the mission was out of Russia, out of their control center. So overall I feel that we learned 50 percent very well [the Space Shuttle part of the mission to Mir]. The other 50 percent [the long mission on the Mir] I don't think we learned anywhere near as much. I don't even know what to say, maybe 5, 10 percent of what we could have learned. NASA of course will learn when we are in the International Space Station.

So when you asked me about training, let me just emphasize. Russian-English; the old-

fashioned way of teaching versus a little costlier simulator, easy way, no test [no oral examinations]; and the third major subject is there's a significant difference to training and flying a long-duration space flight from a short one.

For a number of years, from [19]91, '92, '93, '94, I attended Association of Space Explorers Conferences, and I listened to Russian[s], and I listened to them during my training in Star City. I couldn't wait to return from my mission, go back to Star City, which I did a year ago March, and debrief with my two crewmates, and tell them there wasn't anything that much different about a short flight and a long flight. I used to think they were saying, "We're Russian. We know something you Americans don't know."

I now very much understand why many Americans still don't understand that. NASA has a lot to learn about the training and execution of a long duration space flight. The seven people who trained in Russia and flew long missions on the Mir gained valuable information and understand the implications to training and operation of a long space flight. We have a small group of people on a little island who know something, but they are in a minority, and some of the things they say challenge the time tested, and well understood philosophies of short duration (2 week) space missions. I don't feel that the people who don't know this are bad. I used to think like them.

Wright: Was Shannon able to provide you some valuable information before you took her place on Mir?

Blaha: Some. But all through my debrief--and this I never understood, to this day I don't understand it --in my view, I didn't get a real good handover. When I was halfway through my Mir flight and I realized I didn't get a good handover, I never understood it. I don't mean that's bad, I know everybody's different, but I've been with Shannon for a long time on 43 and 58. As you know, I was the STS-43 and STS-58 mission commander. She was a crew member who I helped; and she helped me on those missions. I would use the word I'm "disappointed." I'll never quite understand why she did not give me all the information she had learned during her long stay on the Mir. She gave me a handover, but it was not a complete handover. It's not what I would do for my brother or sister if I were living in a cabin on a mountaintop. I would give them a thorough checkout of the cabin before I left. My goal would be to help them start with the knowledge I had when I was finishing.

You can ask Jerry Linenger how his handover was. As I flew on my mission I made it a priority to help those who would come to Mir after me. I started writing training memos to the ground to Jerry, to Mike [Foale], to Dave [Wolf], to Wendy [Lawrence]. Approximately every

three weeks I sent the information in an email to the ground. I felt the information was timely, and would allow the next crew members to learn information that we were not taught during training that I was learning during my mission. This way the next crew members would be better prepared than me. I started talking to NASA from the Mir through e-mail saying, "You must give me time to have a handover with Jerry Linenger when he gets here. Remove these items (I would provide specifics from the five day docked timeline), so that Jerry and I have time, because I have so much I need to show him."

In the end, I was even disappointed when the real five days came for Jerry and I to hand over. I didn't think we had enough time. We had a lot more time [compared to my experience with Shannon], and I was able to tell him a lot of things. But I still didn't think it was adequate. When I landed, I got together with our flight-planning people, and I showed them, "When Jerry hands over to Mike, delete this item in Jerry or Mike's timeline. Assign this item to the Space Shuttle commander. Don't assign Mike this item. Mike and Jerry can use this time for their handover. I had sent the ground a detailed list of the items and time I felt I had needed to handover to Mike. They tried to comply, but as I stated earlier, it still wasn't enough. I was happy to spend time with the mission planners to help them develop their flight plan to allow even more time for Jerry and Mike to handover on orbit.

By the way after the Shuttle and Shannon undocked in Sept 1996, the two Russian cosmonauts on the Mir with me said, "John, you Americans should have a better handover. You Americans don't seem to have caught up with what you ought to do on a space station with a handover." They told me all the things they did when a Soyuz crew came up, and how they handled it. An on-orbit handover is an area in long-duration space flight that NASA could learn a lot about , and plan for the new international space program. The handover time is like gold. If you optimize the handover for the long person who is going to be there, you could even save money in training on the ground. I could go into it in detail, and I debriefed NASA lot on this, but I don't think anything ever happened. But anyway, you asked me about my handover with Shannon. I didn't think it was good, and I told you what I tried to do to fix it after that.

One day NASA will learn when it is flying the new international space station. We will learn, just like NASA learned to operate the Shuttle very good, just like NASA learned to fly Apollo to the moon. It's a shame, in my view, though, that we couldn't capitalize more from the Mir-Shuttle Program in that area. That's one example in a long-duration space flight that I don't think we capitalized on.

Wright: Speaking of learning when you were aboard the Mir, a lot of it, I'm sure, was on-the-job

training, because you were watching these cosmonauts do what they were doing. Did that affect what you were doing?

Blaha: During my flight, we had two Russians (Valeri and Sasha)and myself. All three of us were busy from eight in the morning until ten in the evening, and they were even busy up until midnight. The only reason I wasn't is I quit at ten or ten-thirty if I could, so that I could wind down and get a good night's sleep. I never just watched them do stuff, because I never had any time to do that. I was either busy with all of the things I was doing, which predominantly was science experiments. If I had a free moment, I was working to improve the handover process, amongst many other things I could go into but I won't. or I was writing notes to Randy Brinkley's team on the Phase Two and telling them some things I thought they ought to know. I spent about thirty minutes in my free time writing e-mails to five people and reading the e-mails I was getting from those five people. So I didn't feel like I had a lot of free time. All 3 of us worked seven days a week, including Thanksgiving Day, Christmas Day, and New Year's Day.

The only time I ever watched them was during the comm calls. In effect, whenever we would get a phone call (a way of thinking about the comm calls we received) from the Russian Control Center. In essence, we received a phone call every hour and a half, and that phone call could last five minutes, fifteen minutes, ten minutes, twenty minutes, depending on the comm coverage. So it was like an interruption of ten, fifteen, or twenty minutes. The time was valuable though, because I listened to all of the Russian discussions with the ground. One benefit was to know what was the configuration of the Mir Space Station. In fact, by the end of the mission, this got to be funny, because when I listened to the Americans when they got on the radio telling me in English what I already had heard in Russian five hours earlier, I used to think it was funny. Or maybe their English version wasn't exactly right. I would just answer, "Fine. Thanks."

Every now and then I would do something with one of the cosmonauts, but not often. I could probably count the times I did something with either Valeri or Sasha together; maybe there were fifteen, twenty times in that four and a half months. The reason was, we all were too busy. We couldn't be together. All three of us had to be working on things to accomplish all of the work.

Now, going back to my overall point, I am sure, and I'm trying to tell people this at all levels, that they hear a different message from different people who flew on long flights. I'm convinced, myself, right now, that the reason for that is each one of the 7 long Mir flights really were different. For example, if Norm Thagard flew the mission I flew, what I'm saying today Norm would be saying. And what Norm is saying, I would be saying. Or if I flew on Jerry's

flight, and Jerry flew on the mission I flew, he would be saying what I'm saying today, and I would be saying what he's saying. In other words, instead of looking at the seven people who flew these missions as different people, realize that the missions were different. I think the people are actually more similar. We were all trained the same way in Houston, we all have the same basic education, background, etc. The missions were different.

Jerry had a fire on his mission. I think it got his attention, and I'll bet you any other person who was on that as an American living in a foreign language would be thinking everything Jerry thinks today. Mike a decompression. Shannon didn't get half her science experiments until the last two months of her six months, because the Priroda was very late getting there. Norm missed almost all of his [science experiments] because his module didn't arrive with all of his life science on it until three weeks before he left. All of those factors made the missions different.

As it turns out, the one person who was not a scientist, i.e., me, was the only person who actually was able to perform a complete science mission. Norm's experiments arrived three weeks before he left. The Priroda module arrived two months into Shannon's mission. Jerry had the fire. Mike had the decompression which effectively reduced the electrical load by 50%. I had left NASA when Dave and Andy flew their missions - so I won't comment about their missions.

I know each of the missions were very different missions. The Russian commander each of us flew with was a different human being. We know from our Apollo and Shuttle missions that the commander has a lot to do with a tone of a mission in orbit. The commanders are all different human beings. Anything that occurs on a short Shuttle flight is magnified on a long flight, and is magnified again if it's in a person's second language. So the difference in commanders that each of the seven people flew with was a factor. There were lots of factors that made each mission different. As a result, the human being, and we tie names to them now, who flew on those missions, had a uniquely defined mission to fly.

Wright: On a personal basis for you, you were the pilot, and you've had many years of military training, and now you have a Russian commander. In the training that you did, did you have to make a lot of adjustments personally from all your training before?

Blaha: No, I trained at Star City in my second language. Therefore, I could not learn the Mir and the Soyuz as well as I had learned the Shuttle. When I went to the Mir Space Station, I knew the Mir Space Station at 5 percent of the level I knew the Shuttle. So, of course Valeri knew more than me.

Wright: What about your time in Russia in the beginning? Can you share some of the

experiences that you had there?

Blaha: My wife Brenda and I arrived in Star City, Russia in January, 1995. We moved into an apartment building on the 5th floor. We spent the first couple of months acclimating to our new environment. We became friends with the Zudov family who lived on the 7th floor of our apartment building. This relationship continued to grow during our 1 and ½ year stay at Star City. Brenda spent a lot of time with Nina Zudov. Elena Zudov (24 years old) spent 1 month in our home in Houston with Brenda while I was on the Mir. During our time in Star City we would get together in the evenings at their home or our apartment, eat dinner, share family stories, etc. We went to their Dacha a number of times during the two summers we spent in Russia. We learned a lot about the Russian people from our friendship with the Zudov family.

We also became friends with Nina Selskaya, a teacher in the Star City school. Nina started helping Brenda learn the Russian language. Soon afterwards, in June 1995, I asked Nina to help me. We would meet twice a week (in our apartment or in Nina Selskaya's apartment (she lived in a different apartment building) to study Russian. She was very helpful. Brenda and I learned a lot about Russian history, culture, and language from Nina.

During one 8 month period at Star City, we had our dog Duchess with us. Duchess really enjoyed walking with Brenda and I in the wooded areas at Star City. Duchess loved Russia and the people.

Every Saturday evening Brenda and I would go into Moscow to dine at a restaurant or go to a theater. We especially enjoyed the concerts, ballets, and plays. We also made 2 overnight trips to St Petersburg, spent the weekend, and returned to Moscow Monday morning. We felt like real tourists during these trips. Brenda, of course, had a lot more time to learn about Russia than me (I was having to study all of my courses in the Cosmonaut training program). Therefore Brenda and I saw Russia a little differently. The way I could explain this best is by describing what occurred when I returned to my home in Houston, Texas in January , 1997 after I concluded my mission on the Mir. Brenda said, "John, look at these two beautiful books I've put together on our experience in Russia." I thought, "Man, that's great, Brenda." So I opened them up. I started looking through the albums. There were pictures and there were words written below the pictures. After I looked at the albums I said, "Brenda, these are really great books, but that's not what I saw of Russia." I saw a desk in a small little room in my apartment, where I was studying my lesson material.

On a typical workday in Russia I would get up in the morning, sometimes at four-thirty in the morning or five, to study for my classes that day, sometimes six-thirty if I was tired, but not

much later than six-thirty. I would, at a minimum, do a little studying. Somewhere around eight or eight-fifteen, Brenda would walk into my little study room, she would say, "Your breakfast is ready." I'd go around and I'd eat breakfast with her, and talk, and eat my breakfast. Then I would go off to class. Starting at nine o'clock was the class. So I'd leave at quarter of nine. I would arrive home in our lunch break after two classes in the morning. There was a class from nine to eleven, a class from eleven to one. A one-hour lunch break. Class from two to four, class from four to six. It was like going to college. The instructors used a blackboard and a piece of chalk. Then I'd arrive home for lunch. I'd run home real quick, and I'd eat lunch with Brenda. I did that so that Brenda and I would have some time together. She would have lunch ready for me, I'd come in, we'd eat lunch together, we'd talk a little bit, I'd go back to class. At six o'clock I would arrive home, I'd walk in, I'd relax a little bit, I'd start studying until ten-thirty, eleven o'clock at night. Somewhere in between, she would say, "John, dinner's ready." And we'd go and sit down, and we'd eat dinner together, and talk.

A typical weekend would be as follows. On Saturday I would study until four. At four o'clock Brenda would knock on my door and say, "It's time." And what that meant to both of us was, I would go take a shower, and at five o'clock a vehicle was arriving, and we went to Moscow to do whatever Brenda had planned. A real nice thing in Russia is that you can arrive at a theatre thirty minutes before the performance, pay your one dollar a person for a ticket, and at seven o'clock the concert starts, and at nine o'clock it's over. So we did that a lot. The only rule I had on Saturday night was I had to be back by eleven, eleven-thirty so I could get a good night's sleep, because I knew I needed to study on Sunday. So that was essentially the way we spent a lot of our time in Russia.

We, of course, had a lot of friends and our children visit us during our 1 and ½ years in Russia. They would stay in our apartment, and Brenda would do a lot of sightseeing with them.

Wright: How well were you able to communicate with her once you were on board the Mir?

Blaha: Our communication was very good. The Russians would set up some periods where you could talk through their com system effectively. You could also talk through the ham radio. I did that with Brenda some. I didn't do it as often, because I didn't have time. I was either very busy with my daily work, or I preferred to watch America passing by under our ground track. On the Mir the Ham radio equipment is located in an area where there is not a window.

Wright: How was the communications support with the ground?

Blaha: I thought it was outstanding.

Wright: And you could understand in Russia as well?

Blaha: Yes, I could understand the conversations in Russia. By the way, about 95% of the communication with the Mir uses the Russian language.

Wright: Tell us more about the window views. Was there one in particular that you remember more than the others? Surely they didn't become routine.

Blaha: There were lots of windows in the Mir that you could look out of. Some windows in the Mir that were very good for viewing time to look out of. They had covers over them, and to use those windows you had to go over to the command post in the base block and issue commands to open the covers to those windows. Then go to the window and look out it, and when you're done, come back and give a command to close that cover.

Wright: Were there any spectacular views--

Blaha: Sure.

Wright: --that sticks out in your mind?

Blaha: There were lots of views that were spectacular. For example if the Mir ground track were over America at night, I remember viewing Houston, San Antonio, Dallas, Denver, Minneapolis, Chicago, all the way down the East Coast of the U.S, over into Florida, all these little golden spots (the cities) passing by in four and a half minutes. Another view would be a ground track from Seattle towards Houston. I used to love that one.

I enjoyed using a ground track map that NASA had loaded on one of our computers. This map would allow you to see ahead what you ground track would be for the day, and note the times you would pass over the locations. I used to note the times and places I wanted to view on my daily plan so that I could take a break from work to view planet earth, and see some specific locations. I had planned viewing sites prior to the mission during preflight preparation. I knew from my previous space flight experience, that if I planned viewing opportunities, I could accomplish my work and have time to view the planet.

Wright: The prep time that you took to prepare for your trip, and then, of course, your trip itself, you had mentioned earlier that you were even at that time maybe thinking of moving and starting

a different life, but yet you chose to do that. Do you have any regrets of spending all that time doing that?

Blaha: No. The only regrets I have are financial. If I'd made the switch earlier, I would have more money in the bank now. However, I enjoyed all of my spaceflights. I wouldn't change anything I did.
It was an experience that I'll always remember.

Wright: Each of you had a different mission, but as you mentioned, just seven people have done this. Are there certain characteristics that you feel are necessary to be able to do these missions?

Blaha: I don't know the answer to that. I honestly don't know the answer to that.

Wright: Because everyone of you are so different?

Blaha: Yes.

Wright: Do you think being a pilot helped you?

Blaha: No, I don't think it made any difference. In general I always viewed any space crew(even when I was a commander) as all crew members are the same and everybody needs to pitch in and help, kind of like everybody pitches in and helps on a camping trip. So I used to try very hard to break down what I'm going to call the stereotype of the commander and the pilot do only flying things with the spaceship, and the scientists only perform science. I used to like the idea that everybody shares, including letting the scientist do spaceship things. Because I think an astronaut's an astronaut, they're not a scientist and a pilot. Of course, there's a time during a space flight for a scientist to do a specific task and a time for a pilot to do a certain task. But, a lot of the work can be done by scientists and pilot. That was my philosophy whether I was on a Shuttle or Mir space mission.

Wright: Is there one area that you feel to prepare for long-duration flight is more important than the other, something in your training that you felt was more valuable than the other?

Blaha: No. I know a lot of people have ideas on that. The Russians would probably say psychological. Maybe that's true, maybe that's not true. One thing that I would have thought would become a requirement on a space station crew, is to make sure you always had a crew member on a space station all the time who had been a doctor in their life. We have enough

astronauts who are doctors by profession before they became an astronaut. If we don't have enough, we could certainly hire a few more. We train everybody to be able to react to medical emergencies. That's okay for the Space Shuttle -a short flight. In my judgment one space station crew member should have a medical background. They would react to a medical emergency better.

Wright: The folks that will be going to work and live on our Space Station, of course, their lives will be totally different than they are here on Earth, because a new routine begins. What is the most out-of-routine thing that you missed while you were on the Mir?

Blaha: The only thing I missed was my wife. It's the only thing I missed, and I told people that all the time. If I had the choice I would go to the Mir to work (if you could beam me up on Monday morning and beam me back on Friday evening). I would go there and it would be like going to any job that anyone goes to in America. I would do it as a profession forever. I myself found that I didn't enjoy the separation from my wife for that four and a half months. I've been separated from her once when I was a pilot in Vietnam for almost a year. I was a young man then and she was a young woman, and for some reason that didn't affect either one of us as much, but now, thirty years later, when we had this separation it did. Neither one of us liked it. Brenda did take time to go on a one month vacation to visit family and friends when I was on the Mir.

Wright: She got a vacation.

Blaha: She got a vacation, and she got to go do a whole lot of things I guess she's been wanting to do.

Wright: Did either one of you have a hesitation or a fear about you being on the Mir at that time?

Blaha: No. If she were here she'd tell you the same thing.

Wright: You've had a life as a military pilot, astronaut, now you're an executive in research with this company [USAA]. Would you classify yourself as a space explorer as well, since you were on the Mir? How do you classify that time in your life?

Blaha: I don't know. I don't know the answer to your question. I was going to say something else, but it's not related to your question.

Wright: Well, you can say that anyway.

Blaha: Okay. Well, it's a different thing. It's okay, isn't it?

Wright: Sure.

Blaha: I've realized, and this is something I didn't really know, but a lot of retired astronauts I know had told me that when you retire you will probably get involved in the community. Well that did happen to me. I'm very involved in a community project in San Antonio. They asked me to be the chairman of a board to bring a Challenger Learning Center to San Antonio. I started that in August. Here is the plan that we put together, and our fundraising process we're about ready to kick off. So I'm spending a lot of time right now on that particular community effort here in San Antonio.

I am also a member of a committee on engineering challenges to the long term operation of the International Space Station. Therefore, I still feel I am involved with the Space Station and in the space program.

About once a week I have either a luncheon or a dinner or speech somewhere here in San Antonio, or I visit an elementary school and put my flight suit on and talk to children.

Wright: It sounds like you're making an investment for that if you're talking to the school children, you want them to understand what you feel about it as well.

Blaha: I use space as a way to open up their minds and their hearts. My basic message to children in elementary schools is that each one of them is a very important person, each one of them has a talent and a skill. It may be to be the best mother in the world one day, it may be to be the greatest carpenter and build nice homes for people, it may be to be a terrific car mechanic, etc. Or I tell them things like, "Maybe one of you one day will learn how to fix my eyes so that my eyes would work perfect without these glasses on."

I tell them there are millions of things that they can do in their life, and each one of them has a unique talent. There's plenty for each one of them to do. My message to children is not space, but I use space as a way to open their hearts and minds.

Wright: I think it's a valuable one as well. I was going to ask Paul Rollins if he has a question for you.

Rollins: I think you answered this in your own way, but of the seven people, with all the folks that would have liked to have had that opportunity, what was NASA's criteria for picking the

seven?

Rollins: Were you the only pilot that volunteered, or were there other pilots?

Blaha: I don't know that. I don't think the volunteer list to go fly on the Mir was very long. I don't know if that's true; that's my supposition.

Rollins: Some other people we talked to have indicated that the volunteer list for the Mir, or just even to go to Russia and work over there is short.

Blaha: It's pretty short. Initially, I think some people wanted to go, but as people started hearing reports back, I think the volunteer list diminished.

Rollins: This glorious adventure didn't seem so good.

Blaha: No that is not correct. For Brenda and I it was good. We were glad to have the experience. I had wanted to fly on the Mir since I had viewed the Mir at an Association of Space Explorers conference in Berlin in 1991. Other people may have a different opinion. I think it was hard on people who either did a short tour in Russia or were over there by themselves. Therefore, a lot of people may have elected not to volunteer for a long tour in Russia.

As it turned out for me (and this is true whether I was living in Star City, Russia, on the Mir, or living at my home here in San Antonio) it wasn't any different. Except, of course Brenda was not on the Mir with me. At first I thought Russia was different, but the longer we lived in Russia, the more we felt it was very similar to other places we had lived.

I remember when Brenda and I left there, we actually felt we were leaving a home just like we had felt when we left any other home. We were kind of sad we were leaving. We were looking forward to me going back and going to the Mir, but we were kind of sad we were leaving the apartment we had lived in for 1 and ½ years. We were sad that we would not be with the Russians we had met. At the end of our tour, we felt very comfortable in Russia. The reason you don't feel as comfortable at the beginning of your tour is the language barrier. In my view, and you didn't ask me this question, but in my view, and I've told every senior person at NASA this (I started telling them this when I was in Star City and I kept telling them this when I returned) the biggest mistake NASA made in the Russian-American Mir program was inadequate Russian language training before we arrived in the training program in Star City. The Russian language teachers in Monterey, California told me something I'll never forget. They said, "John, we advised your people in NASA that from our language experience for the previous fifty years in

the Cold War, we knew that it took two years--two years of concentrated Russian training for you Astronauts to enter a Cosmonaut training course in Star City, Russia." And your people at NASA said to us, 'These are astronauts. They're smarter than normal people. They only need five months." So the Monterey instructors tried very hard to compress their Russian language course from a two-year program to a five month program. Eventually NASA decided they could have a better training program in Houston. As it turned out all seven crew members had different Russian language preparation before they went to Russia.

Therefore, one of the largest failures by NASA management, in my view, was to not adequately prepare people in the Russian language before they went through the gates of Star City and took the Cosmonaut training course in the Russian language. The human beings who paid for that in spades were the seven human beings (Norm, Shannon, Jerry, etc.) who had to use the Russian language media to take the courses, learn the information, and take course exams. In my view, this management error made everything for each crew member three, four, five times as difficult as it needed to be.

Wright: Do you have any chance to use your Russian language now?

Blaha: [Responds in Russian]. The last time I used my Russian language was last March when I went to the Russian Embassy in Washington DC. Boris Yeltsin had awarded me a Russian medal, and Russian Prime Minister Chernomyrdin was presenting the award. I spoke Russian for a couple of hours that evening. No, I don't have the opportunity to speak Russian in San Antonio.

Wright: We certainly thank you for your time today visiting with us so we can get the true history down as you experienced it.

Blaha: You have asked me a lot of questions today. I wrote a short summary of the accomplishments of the Mir 22 mission which includes a few short stories that I wrote during my four and ½ months on the Mir. I would like you to include this in the history. These were some of my real feelings as I was flying the mission.

Mir 22 Space Mission

by Astronaut John Blaha

In August 1994 I departed my Houston, Texas home for Russian language training in Monterey, California. In January 1995 my wife and I moved into our apartment in Star City on the outskirts of Moscow. We thoroughly enjoyed our one and a half year training course at the Cosmonaut Training Center.

The Mir 22 mission was highly successful. Cosmonaut Valeriy Korzun, Cosmonaut Sasha Kaleri and I advanced space station operations in these areas:

1. Transfer procedures for a docked space shuttle.
2. Long duration American crew member handover procedures.
3. Communication with amateur radio operators around the world.

In addition, we successfully completed many life science and material science experiments. A few example are as follows: the Binary Collodial Alloy test results increased our knowledge for liquid crystal displays; drugs that dissolve over time in the human body; and treatment of oil spills with micro organisms. The Cartilage in Space experiment (which used a bioreactor) had very significant results. One Hundred-Eleven scientists are using the three dimensional tissue growth results in applications to human tissue transplant and as a cancer research tool. The Greenhouse experiment proved wheat will grow in space for a complete life cycle, and demonstrated photosynthesis was very successful. The Muscle Performance experiment (in conjunction with the Russian exercise protocol) demonstrated that exercise in space minimized muscle volume loss, bone density loss, and muscle strength loss.

Two space walks were performed during the mission. The first space walk removed electrical power connectors from a 12-year old solar power array on the base block, and connected electrical power to more efficient new solar power arrays. The second space walk installed a new docking antenna and repaired the amateur radio antenna.

We had many more accomplishments on the mission. Detailed Russian Space Agency and NASA documentation can provide you additional information. I would like to provide you with a view of the human side of the mission by reprinting three short stories which I e-mailed to my wife during the mission. (Docked Operations with a Space Shuttle, Arrival of a Progress Resupply Vehicle, and Space Walks From the Mir.)

Docked Operations with a Space Shuttle

On September 16 I launched aboard the Atlantis spaceship; destination -- the Russian Mir Space Station. I felt our three main engines roaring. Six seconds later the solid rocket boosters ignited and off we went, up the familiar hill to space. I could feel the vibrations from all the engines as our four million pound vehicle accelerated towards space. Eight and a half minutes after liftoff, the main engines cut off and we were in Orbit. Incredible!

Four days later, I watched the STS-79 crew skillfully dock with the Mir Space Station. They were a very professional crew, paying attention to every detail. When we were 20 miles from the Mir it appeared as a bright glowing star. From five miles out to docking I looked at this absolutely beautiful, shining Mir Space Station. For 18 months I had studied many things at the Russian Cosmonaut Training Center in Star City. I really misjudged the beauty that was now in front of me. It looked like a very new Space Station.

After docking we spent five days transferring about 4,000 pounds of supplies and science equipment to the Mir, and about 2,000 pounds of supplies and equipment to the Shuttle. Again, I was really amazed at the incredible skill of the Mir and Shuttle crew as it worked 18-hour days to accomplish all the work. Each evening the 79 crew and the Mir crew met for dinner either in the Mir or in Atlantis. These were unforgettable times. I will always remember Bill, Terry, Jay, Tom, Elvis, and Shannon as they all helped me move into my new home.

I will also always remember the incredible sight as the Atlantis undocked and flew around the Mir. The views of Atlantis silhouetted against the darkness of space, the horizon of the Earth, or zooming over the top of Russia and China will never leave my

memory. Wow, what an incredible space ship America built. Boy, was I proud to see that.

I have been in space for 31 days now; almost equaling my time from four Shuttle flights. Amazing how the time has flown. Valeriy, Sasha and I have been getting acquainted with each other. I had trained with the Mir 22 and Mir 23 crews at Star City; I was now flying with what used to be the Mir 24 crew. Our personal and working relationships continue to grow as the days go by. I am really grateful to the excellent Russian language teachers I had for the past two years. Lisa Kramer in Houston and Nina Sarskaya in Star City were fantastic - they prepared me well. My Russian language is rapidly expanding. I never thought that would happen.

I told you the outside of the Mir looked like a new Space Station. Two of the modules, Priroda and Spektra, look new from the inside. The base block, KVANT, KVANT 2, and Kristal look well used on the inside. I am very impressed with the Russian engineering that built this beautiful Space Station. This Space Station has been in Orbit for almost 11 years and is still functioning - INCREDIBLE! Valeriy and Sasha spend about 50% of their day maintaining the Mir. They are fascinating people - working tirelessly 16 hours a day. The Russian people can be very proud of them. They are very industrious, have a good mechanical sense, and can repair anything.

I wake to an alarm clock every morning at 8:00 a.m. By 8:30 I am talking to folks all around the world on the Ham radio. This is a great way to meet folks and receive news from planet Earth. I usually am finished with breakfast at 9:30 a.m. I have a lot of exciting experiments that I perform until 12:30 p.m. Then I run on the treadmill and use expanders to maintain my muscle strength. After cleanup, we eat lunch together, talk about what we have been doing in the morning and what we will be doing in the afternoon. We do science experiments for another four hours; then have another hour of riding the bicycle before dinner. After dinner I usually spend one to two hours preparing for the next work day. It now is 10:00 p.m.

I spend the next two hours looking at our beautiful planet, looking at the stars, finding planets, and watching movies . I have 50 fantastic movies, a few Dallas Cowboy games, etc., as selections.

I am really enjoying this mission. The work is very challenging. This Space Station is amazing. The views from the different windows are fantastic. There are four windows in the KVANT 2 module that provide great Earth and space viewing. From two of these windows you can see the Soyuz space ship docked to the Mir. There are two windows in the Kristal module where in addition to Earth and space viewing, one can see the base block and the KVANT module.

Before I launched I had many questions related to boredom, or what I would do to pass the spare time. There is no boredom here. There is always something to do. Assigned work, trash, cleaning, repairing, packing, unpacking, etc.

The food has been good. I have a number of Russian foods that I really like. Their food is prepared a little differently than ours; I enjoy the variety.

We have a packet mail system to correspond with friends and family. It is always nice to receive notes from home. I have really enjoyed sharing my experience with these folks. I look forward to the rest of my mission. I hope we can continue to get good data for the scientists and continue to build our relationship with the Russians.

Arrival of a Progress Resupply Vehicle

In mid-November we started preparing for the arrival of a Progress resupply vehicle. Two days before the launch we started loading up the old Progress docked to the KVANT Module. We put all our dirty clothes, trash, equipment nobody wanted, 600 liters of urine, many containers of solid waste, etc,. into the cargo bay.

We started sleep shifting two days before the launch, because we planned to undock the old Progress at 2 a.m. and dock the new Progress approximately 26 hours later. We, of course, waited until we knew the new Progress launch was successful and the space ship was going to have a good chance of docking with us before the old Progress was undocked.

At midnight, Valeriy, Sasha and I worked with engineers on the ground to ensure we had a good seal with the hatch leading to the old Progress. When everyone was convinced we had a good seal, the Moscow Control Center sent commands to automatically undock the old Progress. Valeriy installed a special control system near the base block control station and was ready to fly

the Progress manually, if required. He had a TV monitor which displayed the Mir as seen from the Progress.

About 10 minutes after the Progress undocked, we could visually see it at about 100 meters through a large window in the floor of the base block. It was awesome to watch this big beautiful machine with solar panels -- they looked like airplane wings -- pull away and finally disappear.

Twenty-four hours later we were eagerly awaiting the arrival of the new Progress. I was in the KVANT 2 module looking through one of the small windows. I finally saw the Progress at a distance of 30 kilometers. It was a shining star rising towards us at great speed from beneath the horizon. This was an incredible sight. There we were, approaching the terminator on planet Earth, and this "beaming" shining star was roaring towards us. Then all of a sudden, the light from the Progress extinguished as we passed into the shade of the Earth. Five seconds later, four lights on the Progress were turned on. I watched the remainder of the rendezvous through a tiny window in the aft end of the KVANT module, right at the point where the docking would occur. Again, Valeriy was monitoring the event with his backup control system in the base block of Mir.

The docking felt quite firm - five times stronger than I remembered the shuttle docking with Mir felt over two months ago. The Progress rendezvous approached from behind, passed the Mir radius vector, then performed an approach on the velocity vector. We verified we had a good seal before opening the hatch at about 5:30 a.m. We were supposed to go to sleep at 6 a.m. Of course, we stayed up a few extra minutes as we searched for our crew packages. Once we found our packages, it was like Christmas and your birthday all rolled together when you were five years old. We really had a lot of fun reading mail, laughing, opening presents, eating fresh tomatoes, cheese, etc. It was an experience I will always remember. The Progress brought us a lot of food, fresh water, fuel for the reaction control jets, oxygen, spare parts needed to repair systems, equipment for a space walk, science equipment, towels and clothes.

Space Walks From the Mir

In December the Mir 22 Crew prepared and performed two space walks. Valeriy and Sasha walked in space while I remained inside the Mir. The goal of one space walk was to disconnect electrical cables from an 11-year-old solar panel on the base block;

connect these power cables to an extension cable; then connect the other end of the extension cable to a new solar panel on the KBANT 1 module. The 11-year-old base block solar panel had lost a lot of efficiency.

The goal of the second space walk was to place a new antenna on the end of the Kristal module. This antenna would allow rendezvous with a Progress or a Soyuz vehicle without having to maneuver the Mir Space Station into a special rendezvous attitude.

I will forever have images implanted in my brain of Valeriy and Sasha working 18 hour days, preparing for the space walks, asking many questions to specialist on Earth, and probing every possible scenario. I will forever remember the incredible views of these two Cosmonauts floating in space, silhouetted against the black of space, with planet Earth rotating by us below. I will forever remember the sounds of strain in their breathing when the workload was intense. And finally, I will never forget the incredible feeling of accomplishment after the job was complete, and everyone was safely inside the Mir Space Station.

Four days prior to the space walks we started preparing, rehearsing, and verifying all of our procedures and actions. Valeriy and Sasha spent a lot of time in the airlock located in the KBANT 2 Module. I spent time in the base block, Soyuz, KBANT, and KBANT 2 reviewing computer displays, switches, panels, checklists, etc., that I would use during the space walk. I also prepared two video cameras and one 35mm camera that I would use to document the activities of Valeriy and Sasha. I thought about where Valeriy and Sasha would be located at various times throughout the space walk, and planned which windows would be best to obtain good photography. I also spent some time thinking through my actions in case there was a malfunction with any of the life support systems of the Mir, a fire, or an atmosphere leak. When the day of the space walk arrived we were all very confident and prepared.

Valeriy and Sasha entered the airlock, closed the hatch, donned their space suits, depressurized the airlock, and opened the outer hatch. Sasha and Valeriy then used a pole (the Russians call this system Strella) to transport themselves from the end of the KBANT module to the base block. They began the difficult task of locating the correct connectors, disconnecting power lines, and connecting the extension cord. Then they

took the other end of the extension cord across to the KBANT module and connected it to the new solar panels that had been installed in May. I was able to film this activity through a small (12-inch diameter) window in the Kristal. I also had installed an extension cord to my communication equipment so that I could talk with them and to the Russian Control Center. Every now and then I would go to the base block and enter commands into the computer or recover information the Control Center needed. Valeriy and Sasha worked very hard on this space walk which lasted six hours. I was very proud of their hard work and attention to every detail. After they completed the space walk, we celebrated with lots of great food, conversation, and downlinked the video to the Moscow Control Center. All were in a great mood. We later realized that during the space walk the connector to our amateur radio antenna had been inadvertently disconnected. No problem, we just added the reconnection of the antenna cable as a second task in the next space walk.

We prepared for the second space walk just like we had prepared for the first space walk. On this space walk Sasha translated down the pole to the base block. Then Valeriy climbed onto the end of the pole, and Sasha moved the pole (with Valeriy on the end) across the open space to the end of the Kristal Module. I filmed all of this activity from a small 9-inch window inside Sasha's living compartment. Valeriy then mounted the pole to the end of the Kristal module and Sasha climbed across to join Valeriy. Four hours later they completed the difficult task of mounting this new antenna, and connecting the electrical hookups to a panel on the outer surface of the Kristal. This was very difficult because they were working a lot with little screws and bolts. This type of task is very difficult inside a bulky space suit. I could tell by the tone of their voices that they were both very tired as they started to transfer back across the pole to the base block.

Then they connected the amateur radio antenna and I verified that we had good transmission and reception on our radio. Valeriy and Sasha then climbed back on the pole and slowly moved back to the airlock entrance of the KBANT 2 module. They secured the hatch and repressurized the airlock. Then they opened the inner hatch to the Mir and the celebration started. Warm food, good drink, great music, and a lot of incredible conversation.

After four and a half months in space, I landed at the Kennedy Space Center, FL aboard the Space Shuttle *Atlantis* on January 22, 1997. For seven weeks I debriefed the mission and was a “guinea pig” for life science research. In March, I debriefed the Mir 22 mission at the Moscow Mission Control Center and at the Cosmonaut Training Center in Star City, Russia. My wife, Brenda, and I will always remember this two and a half year adventure. We have fond memories of Russia and the Russian people.