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Greetings From Mars!

By Diego Urbina, Mars500 Crew

Now that the Mars500 crew has been united, when the Marswalkers, 'returned' from the surface of the Red Planet to join the 'orbital' trio, Diego has again had time to send his thoughts. This diary was written on 21 February, before the last egress to the simulated martian surface.

The last few weeks have been truly exciting. As you probably know, Wang, Aleksandr and I, transferred to the landing module, have been living in further isolation, in a reduced room (about 50 cubic meters) for a couple of weeks, in order to represent the landing on Mars.

In spite of it not being the real Red Planet, it did mean so much in our 'microcosmos' that I think that even if it wasn't exactly the same emotion someone would feel on Mars, it did come quite close, at least for me.

After transferring, we initiated the operations that a crew would need to do on Mars. We used a software called 'Virtu' that simulates several environments and situations. One of the scenarios was this: imagine a pressurized rover that we had to drive from our base to the (purposely hidden and difficult to reach) landing place of a probe that had been sent to Mars before the manned mission. It was quite tricky, especially when coming back to the base, when a sandstorm and drained batteries made our road tougher.

The same software allowed us to play a marsonaut, stranded on Mars, who suddenly faced a meteorite shower that obliged him to seek refuge in a cave. I am not 100% sure you will need to run frequently from meteorites on Mars to save your life, but caves are certainly excellent places to escape from the more common threat of a peak in solar activity, from which the Martian atmosphere and lack of magnetic field do not shield you as well as on Earth! For this task we wore a virtual reality helmet, to make it more realistic.

We also drove two different rovers in this sort of 'advanced' video game. With the rovers, we obtained samples from the ground and got them to the base, often accompanied by several duties at the same time (listening to the radio signal, classifying information, etc) that challenged our multi-tasking capabilities. We often wore, as usual, a bunch of electrodes that recorded our bodiesâ€™ reaction to these all these simulations.

The 'games' were cool, yes, but obviously what everyone was looking forward to, was the REAL Extravehicular Activity (EVA) â€“ or a Marswalk.

EVAs on orbit can be incredibly challenging, you are packed in a spacesuit that is pressurized, so it doesn't allow you to move easily. Here the EVAs were on the ground, where to that difficulty you can add gravity, that is, having to carry this rather heavy suit on you. Astronauts on the moon moved somewhat more easily, because the gravity there is very low. On Mars it is about 38% that of the Earth, and that is still quite a bit for our current suit technology.

The engineers at the Russian suit manufacturer removed some of the weight of these spacesuits, that can weigh about 100 kilos, and they ended up weighing 35 kilos. This would be their weight if astronauts wear on them on Mars.

The spacesuits were fantastic, after 8 months of not having used them, we could still remember how to work with them. Like riding a bike!

In the first EVA, Sasha (Aleksandr) and I, went out and used a set of tools that were made for the (sadly ill-fated) Soviet Lunar program. I am talking here about the real tools! It was such an honor.

When Wang said "you are GO for EVA", that was the moment I had been anticipating for months. We picked samples of soil and stones from the ground , helped by Wang on the radio. Of course, not before having planted the ESA, Russian and Chinese flags. Whether you lived it or saw this scene from the outside, you couldn't avoid thinking of the first steps on the Moon, and this time there was in the environment some sort of cosmic projection of the moment, into the future. It felt very inspiring. I could say, beyond a simple simulation.

Besides the ample space of that room (keep in mind we had been living in small modules for several months) what also had an impact on me was the loneliness of the place. It was only us in there, working with, and listening to the only 2 people in the Universe that could communicate live with us. This contrasted a lot with the pictures and videos we got later of lots of people witnessing the EVAs in huge screens at the Mir station control Room in Mission Control Centre in Moscow.

After this first EVA that impressed so much our senses, came the second EVA, when Sasha and Wang ventured as well into this very big room that represented the surface of the Gusev Crater on Mars. I was on the radio,

helping them out when they needed. Communication over the radio is not easy either in such a multicultural crew.

I came to realize it is not rare for us to rely on hand language and facial expressions to fill some of our 'linguistic differences', which is of course impossible or very difficult with a spacesuit. Therefore I am very proud that in the end we managed to communicate almost flawlessly during all the EVAs thanks to the hard work pre-EVA: we spent long nights before each EVA to make sure the 'choreography' would be well executed, we discussed the best order of the tasks among ourselves and with the ground, key words we all needed to know, and other matters as well in order to make it very efficient and as realistic as we could. The orbital crew also watched our runs, and especially Romain took careful note of absolutely every step in the EVAs and then made suggestions for the next ones.

Image Caption: Diego Urbina used during the 'Marswalk' tools that were designed originally for the Russian manned Lunar missions in 1960's and 1970's. The missions were cancelled, but much of the hardware is remaining. Credits: ESA

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