SEIKO

Thursday 3rd April, 2008

SEIKO Spring Drive Spacewalk: The Quiet Revolution goes into space

In October 2008, Richard Garriott, the renowned video game designer and adventurer, will become the sixth private space explorer. Richard will conduct his space mission aboard the International Space Station, and during his flight, he intends to conduct a spacewalk, which would make him the first private individual to do so. As steps out into free space, he will be wearing a SEIKO Spring Drive watch, specially designed and built for this purpose.

The Spring Drive *Spacewalk* as Richard Garriott plans to wear it when he goes into free space .

The SEIKO Spring Drive *Spacewalk*

Three years ago, the "Quiet Revolution" of Spring Drive started, and all over the surface of the earth, Spring Drive is increasingly accepted as one of the most important new developments in luxury watch-making. In 2008, the revolution goes into space.

This unique watch, the Spring Drive *Spacewalk*, is presented for the first time at Baselworld 2008 and takes pride of place in the new SEIKO Stand.

SEIKO WATCH CORPORATION
International Advertising Dept.
2-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8467, JAPAN
Telephone: +81-3-6401-3478 Facsimile: +81-3-6401-3540 http://www.seikowatches.com

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The second generation in space

Richard Garriott is not only a remarkable entrepreneur and adventurer (see biography below) but he is also the son of a NASA astronaut. Richard's father, Dr. Owen Garriott, made two space flights, aboard Skylab in 1973 and aboard STS-9/Spacelab-1 in 1983. In total, Owen spent 70 days in space and he carried SEIKO watches on both of these flights and wore one continuously during his Spacelab mission. His trust in SEIKO was inherited by his son, and so it was natural that Richard should contact SEIKO as soon as his mission was arranged. Richard and SEIKO will be the first "second-generation" space partnership.

The International Space Station,
from which Richard Garriott will conduct his space mission.

Why SEIKO Spring Drive?

The challenge of making a watch that could operate not only during a space flight but also outside on a spacewalk is a daunting one, and is precisely the kind of challenge that brings out the best in SEIKO's engineers. The first decision to be made was on the type of movement to be used. Without special treatment, battery-operated instruments are not appropriate for a spacewalk for safety reasons. Thus, quartz movements were not considered. The choice was therefore between mechanical and Spring Drive. The choice was decided by the need for safety and accuracy. As the watch will be exposed to a range of temperature from minus 20 degrees Celsius to plus 70, accuracy at extreme temperatures was the critical factor, and no mechanical watch can retain its accuracy in these conditions, because of the inherent instability in these conditions of the traditional escapement which regulates the time in all mechanical watches. Instead of a traditional regulator, Spring Drive has a Tri-synchro Regulator, an entirely new regulator that uses and generates mechanical, electrical and electromagnetic power, and is less affected by temperature variations. Thus, Spring Drive was selected as the perfect mechanism for the task.

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The Spring Drive *Spacewalk*

The SEIKO Spring Drive *Spacewalk* has been custom designed and built with Richard's mission in mind. The mission of SEIKO's engineers was to build a watch that was light, air-tight, strong, easy to read and easy to use, as well as safe and accurate.

Lightness: The recesses on the sides of the case save weight

Readability: The unique dial and special Lumibrite treatment ensure maximum legibility in bright or dark conditions

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Maximum ease of use:
Uniquely shaped crown and buttons at 12 o'clock position.

(i) The air-tight case
Because of the vacuum of free space, the watch case needs to be completely air-tight. Based on SEIKO's long experience with Divers watches that can withstand pressures up to 1,000 meters, *Spacewalk* was designed with special features that will guarantee air-tightness. In addition, to maintain the air-tightness in the huge temperature changes that occur in the vacuum of free space, and especially in cold temperatures, it was necessary to develop a new type of gasket using a rubberized material.

(ii) The lightness of High-intensity titanium
Everything to be taken into space needs to be as light and as strong as possible. High - intensity titanium was chosen as the case material because it is 40% lighter than stainless steel.

(iii) The optimum balance of lightness and wide dial-opening
The next challenge was to make the watch both as light and as large as possible. The case was designed for minimum volume but maximum dial opening size, to ensure quick readability. The solution was to build a case with recessed sides, but this required a new engineering solution, using a CNC machine that SEIKO developed in-house. This process reduced the volume of the case material by 30 %. With this process, a case was created that has the optimum balance of strength, lightness and wide dial opening.

(iv) The most readable dial.
Richard needs to be able to see time and elapsed time at a glance. After many dial designs were tested, a new layout, with the chronograph dials at the top, was selected. The hands and hour markers were designed expressly for this watch, and additional layers of SEIKO's Lumibrite material were used. The dial is now at least three times brighter than a normal luminous watch.

(v) Maximum ease of use
Richard's hands will be protected, of course, by thick gloves. He therefore needed the buttons to be over-sized so that they can easily be used and they are placed at the top of the case to be more readily accessible.

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The harmony of space travel and Spring Drive

In addition to all the technical attributes which make the Spring Drive *Spacewalk* the prefect watch for the mission, there is a profound harmony between the essence of Spring Drive and the whole arena of space and space exploration. With its glide motion hands, SEIKO Spring Drive is the only watch to reflect the true, continuous nature of time. It measures time without 'ticks', and the perfect, uninterrupted motion of every part of the movement is in perfect harmony with the eternal, continual and precise motion of the planets. There can be nothing more appropriate than the arrival of the "quiet revolution" of Spring Drive into space. SEIKO is deeply grateful to Richard Garriott and to the Space Adventures Company for the opportunity to contribute to this thrilling mission by bringing the beauty of glide motion closer to the stars.

Meeting the challenge and the future

The task of creating this remarkable watch was difficult, and it has involved new developments in every aspect of SEIKO's watchmaking skills. It has taken a dedicated team over three years to create and to test the Spring Drive *Spacewalk* and new skills, materials and ideas have been generated as a result. SEIKO's history is replete with examples of how watches like *Spacewalk* later inspire future generations of SEIKO watches. That is the spirit that inspires SEIKO. Perhaps, the SEIKO Spring Drive *Spacewalk* will be another example. We are going to create just 100 watches. Among them, three pieces will go with Richard on his mission and the remaining watches will be marketed worldwide in December this year.

The Mission - October 12 to 19, 2008

Richard will spend approximately a week in space, blasting off from the Baikonur Cosmodrome in Kazakhstan aboard the SOYUZ TMA-13 spacecraft. The launch is scheduled for October 12, 2008.

Richard's mission is more than a joy ride! He will be conducting a series of scientific experiments and his father, who is his mission scientist, is now developing the program. One experiment already in place concerns the growth of protein crystals in space, which may be used in researching cures for diseases on Earth. In addition, Richard will seek to use his mission to highlight the future commercial possibilities of manned space flight.

We wish Richard the very best of luck with his mission.

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Richard Garriott Biography

Born in 1961, in Cambridge, England, Richard is one of the leading designers of video and on-line games. He created his first game, Akalabeth in 1980 but his major success was the Ultima series, which is still popular today in its MMOG form. His latest game, Tabula Rosa, has just been released. In addition to his work in the gaming industry, Richard is a serial adventurer. He has trekked across Antarctica in search of meteorites, tracked mountain gorillas in Rwanda, and led a research mission to investigate the hydrothermal vents deep on the Atlantic Ocean sea floor. Richard now lives in Austin, Texas, where he supports a variety of cultural and environmental charities, including a Shakespeare Festival which takes place in a replica of the Globe Theatre that is on his Britannia Manor estate.

About Space Adventures

Space Adventures, the company that organized the flights for the world's first private space explorers: Dennis Tito, Mark Shuttleworth, Greg Olsen, Anousheh Ansari and Charles Simonyi, is headquartered in Vienna, Va. with an office in Moscow. It offers a variety of programs such as the availability today for spaceflight missions to the International Space Station and around the moon, Zero-Gravity flights, cosmonaut training, spaceflight qualification programs and reservations on future suborbital spacecrafts. The company's advisory board includes Apollo 11 moonwalker Buzz Aldrin, Shuttle astronauts Sam Durrance, Tom Jones, Byron Lichtenberg, Norm Thagard, Kathy Thornton, Pierre Thuot, Charles Walker, Skylab/Shuttle astronaut Owen Garriott and Russian cosmonaut Yuri Usachev. For more information, please visit www.spaceadventures.com.

SEIKO Spring Drive *Spacewalk*

Specifications:

- Caliber: Spring Drive Chronograph 5R86
- Case: High-intensity Titanium
  Diameter 53.0 mm (12-6h) , 48.7 mm (3-9h)
  Thickness 15.2 mm
  Weight 92.5 g
- Glass: Sapphire crystal with anti-reflective coating
- Water resistance: 10 Bar
- Bracelet: The final specification is yet to be decided. SEIKO is now working with the Russian Federal Space Agency on the optimum design.

Spring Drive Chronograph Caliber 5R86:

- Hour, minute and second hands with calendar
- GMT hand
- Power reserve indicator
- 50 jewels
- Movement Diameter : 30.0 mm
  Thickness: 7.6 mm
- 416 parts
- Power reserve: 72 hours with/without chronograph function in use
- Chronograph to 12 hours

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