

# TECHNOLOGY DEMONSTRATION

## PROJECT

### FEELING AN **ASTRONAUT'S** **PULSE**

BLOOD  
PRESSURE  
MEASUREMENT  
INSTRUMENT  
SUCCESSFULLY  
TESTED ON  
THE **DELTA**  
**MISSION**

During his stay on the International Space Station (ISS) with the Delta Mission, ESA-Astronaut André Kuipers successfully performed the CIRCA experiment, a technology demonstration with the Boso TM

2430PC, a Blood Pressure Measurement Instrument (BMI) manufactured by German BOSO GmbH and provided by Kayser-Threde GmbH.

The experiment aimed at monitoring the pattern of blood pressure and heart rate of an astronaut during a 24-hour period. In fact, it was the BMI's third research application on the ISS: it was used already in missions in 2002 and 2003.

Most of the well-established means for blood pressure measurement are big and bulky, limiting the patient's freedom of movement by forcing him to stay in one place until the measurement is done. This makes 24h-monitoring extremely difficult. The BMI was designed especially for the purpose of measuring blood pressure around-the-clock.



ESA Astronaut Roberto Vittori working with the BMI on the ISS

Therefore it is very light and small, so it can be carried on the body during normal daily duties without being an encumbrance to the monitored person.

That is why the BMI is perfect for space research: astronauts are not only exposed to the hostile environment of weightlessness on a daily basis, they also have to work with top efficiency.

The BMI allows them to have their heart rhythm

SMALL,  
LIGHT AND  
EXTREMELY  
ROBUST - THE  
**BMI IS**  
PERFECT FOR  
**SPACE**  
**RESEARCH**

The outermost research laboratory  
in the world: The ISS



monitored and at the same time perform their duties without hindrance.

BENEFITS OF  
BMI RESEARCH  
IN SPACE  
FOR LIFE  
ON EARTH

The CIRCA experiment intended to research the reaction of the blood circuit to the unique circumstances in space. On Earth, the blood pressure and heart rate are about 20 percent lower at night than in daytime.

The experiment was dedicated to finding out if and in which way this pattern changes in weightlessness. The repeated use of the BMI by astronauts on the ISS successfully showed that permanent monitoring of cardiovascular

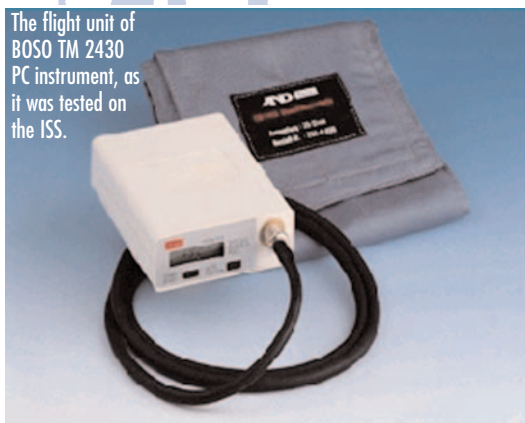
activities can be achieved without major interference in your daily life, even performing a highly demanding job.

This could benefit a broad spectrum of people: continuous records of blood pressure contain much more information about the state of the heart or the peripheral vascular system, both of which are difficult to obtain from routine blood pressure measurements. Therefore cardiovascular disorders can be detected by the BMI in a more efficient way.

Additionally, the portable BMI can be used by a group of patients unlikely to submit to 24h blood pressure measurement as a result of their job constraints. ■

EASIER AND  
MORE  
EFFICIENT  
AROUND-  
THE-CLOCK  
BLOODPRESSURE  
MONITORING

The flight unit of BOSO TM 2430 PC instrument, as it was tested on the ISS.



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