Space flight induces a cardiovascular deconditioning syndrome and requires cardiovascular monitoring during the mission and after return to earth. One of the most serious symptoms of cardiovascular deconditioning is represented by a decrease in orthostatic tolerance, along with a significantly reduced capacity for exercise and an increase of heart rate. The Cardiomed system (CNES-IMBP cooperation) records and analyses, in a non invasive way, the main cardiovascular parameters for medical monitoring and physiological studies.

**On board LAPTOP functions:**
- Operating medical instruments
- Implementing medical protocols
- Detailed procedure description
- Specific protocols (Mental stress, ...)
- Display and monitoring of instrument measurements
- Data transmission to ground (real time telemetry)
- Data stowage

**The DOPPLER measures the**
- Blood flow variation in 3 arteries simultaneously.
- Different probes (Cerebral, Carotid, Aortic, Femoral) are fixed on the subject via dedicated harness.

**LBNP (Lower Body Negative Pressure)**
- Test with Chibis suit.

**CARDIOPRES** is a device with 3 measurement functions:
- Continuous finger blood pressure wave using a finger cuff (200Hz)
- Surface ECG using a combination of electrodes on 1 up to 12 derivations at different sampling rates (200Hz-500Hz-1000Hz)
- Change in chest circumference using 1 or 2 respiration belt

**CENTRAL BLOC** has 3 different functions:
- Communication hub between the laptop and the medical instruments.
- Power for CARDIOPRES, PLETHYSMOGRAPH and DOPPLER
- Telemetry to Russian space segment and ground

**CARDIOMED** follows cardiovascular responses to physical effort during ergometer bicycle test:
- ECG
- Blood pressure (holter)
- Breath

**The combined recording of the main cardiovascular signals allows a complete monitoring of the cosmonaut and is necessary to study the multi-factorial cardiovascular deconditioning.** This system has been validated on ground and was used during long term bed rest (the WISE-2005 experiment). It will reach the ISS in 2008 to be integrated in the Russian medical rack.

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