**Main Tasks:**  
The CDHS is the main board of the COMPASS-2 satellite. It is responsible for managing all general and system data. It is also responsible for forwarding commands from the ground station and at requesting sending internally generated data back to earth. Using an RTC and PLL compatible Microcontrollers, a universal clock signal is generated, which is forwarded to all systems. The satellites internally generated data is divided primarily into 2 categories; the individual internal subsystem information and general system information.  
  
**Redundancy:**

* Firmware update:  
  To allow further improvements after the launch of the satellite, it is wise to allow reprogramming the main controllers of the subsystems. This however implicated many difficulties mainly being the redundancy of the firmware sent from the ground station to the satellite.Multiple firmware storage modules are implemented in the design to allow a comparison process, which is realized with software. For more security in worse case scenario, the default firmware, which is stored previously on the satellite will be recalled and the controllers of the satellite will be programmed as prior to launch.
* Log data:  
  All data being transferred via the I2C bus system, which is dedicated to the command transfer of the system will be stored for monitoring and error correction purposes.
* Alternative communication paths:  
  In order to all constant communication in emergency or after error encounter, alternative communication methods must be possible. Although this is manly realized with software, the hardware must provide the platform and the flexibility of the software. In other words, multiple possibilities via multiple bus systems.
* Routine check of HK data:  
  Although the command bus system is essential for the operation of the satellite, the CDHS should be capable to read the HK data of the individual subsystems and decide upon this data if an error is encountered.
* Trigger signals:  
  Trigger signals are rawest form of communication on-board. It insures direct, robust, and quick responses in worse case scenarios.

**Storage Mediums:**  
Out of many storage medium technologies the CDHS picks out the most suitable technology for the application it is intended to be used for.

* FRAM *(Ferroelectric RAM)*
* Flash *(CMOS Technology)*
* MRAM *(Magnetic RAM)*
* EEPROM *(Electronically erasable programmable ROM)*

**System Architecture:**

* Multiple SPI bus systems:  
  The satellite provides multiple SPI bus systems for designated data routes. The following are the groups of data an SPI bus is designated to.
  + HK Data
  + Payload Data
  + Positioning Data
  + Image Data
* Command dedicated bus system:
  + The command dedicated bus system is an I2C bus system due to the flexibility of the bus system and easy development process and quick integration.
  + The system information transfer is allowed via the I2C but not preferred. It is an alternative path for important satellite information.

**Realizing CDHS:**

* Electrical CAD software is used to realized the PCB. Schematics in digital format are shared within the team as portable project files. PCB files are generated out of the schematics and forwarded to the PCB machine for fabrication.
* Due to budget reasons, a consideration as to whether a 2 layer or 4 layer PCB board is suitable for the tests, have to be made.
* The CDHS board is the main board (motherboard) of the satellite. It is therefor practical to locate it at a convenient location inside the satellite. Robust anti-vibration connectors are to be used in the final version of the CDHS, after soft- and hardware testing with the test boards is successfully conducted.
* All functions of the CDHS are realized primarily through software. Extremely vital functionalities could be implemented through hardware too. The programming language used is C.

**Testing:**  
During the first stages of development it is important to have the possibility to emulate other subsystems, since they are most likely at the same stage of testing. A computer and an interface with a multiple purpose protocol engine is then used to achieve this.  
After some more mature tests, it starts to become interesting and practical to test the CDHS board with the other boards of the satellite, testing the full functionality of the satellites operation.  
Before finalizing the CDHS board, it will have to be tested in a vacuum chamber and on a shaker, together with the other system.