7 Special Onboard Computers

Mass memory units © Astrium GmbH

Inside a satellite the central OBC is usually not the only computer. Besides computers in instruments there are typical AOCS equipment components which include considerable computational power. The most obvious components are navigation receivers for GPS, Galileo and / or GLONASS. Another class of equipment requiring significant CPU performance are star trackers. Modern star trackers are equipped with their own ERC32 or even LEON processor for fast star map identification and quaternion computation. These units however are very specific electronic equipment.

A further class of electronic components, the “Mass Memory and Formatting Units”, (MMFU), also called “Solid State Recorders”, (SSR), are nothing else than OBCs with

- extremely large storage memory areas,
- very performant data input channels from payload side for science data storage
- and fast data output channels to science data transponders for downlink to ground via X-band or Ka-band.

Memory is organized in memory banks and management is performed by SW such that even failure of an entire bank does not lead to immediate data loss (cf. [71]). Some recorders provide integrated data compression units, some suppliers offer external separate units.

Figure 7.1: TerraSAR-X Solid State Recorder and memory board. © Astrium GmbH