

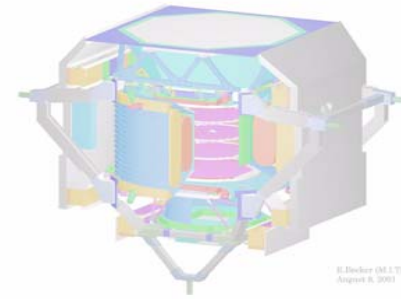
# AMS-02 Crew Operations Post (ACOP) Programs Review

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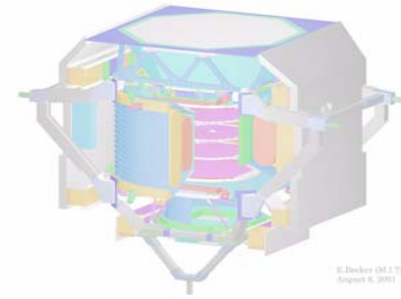
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# ACOP Requirements 1-7



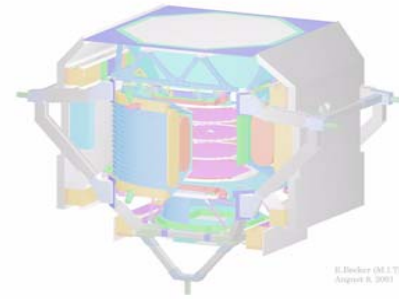
1. Operate effectively in the ISS space environment.
2. Create an on-orbit recording of all AMS-02 science data on removable media - explicitly hard drives, preferably SATA based.
3. Provide not less than 20 days of recording capacity without crew intervention (based on 2Mbit/second rates), longer would be better.
4. Provide not less than 120 days of recording media capacity within a single mid deck locker equivalent storage unit, longer would be better.
5. Recorded data is an archive. Disks must be provided for the entire 3+ year mission without overwriting (a total of ~23 TByte).
6. For recording ACOP must support an orbital average data rate of not less than 4Mbit/second with bursts of up to 20 Mbit/second.
7. Provide a continuous operations display of ad hoc AMS-02 data for the ISS crew to monitor .

# ACOP Requirements 8-13



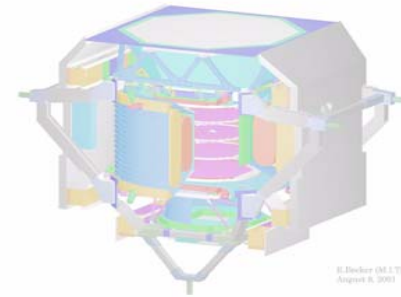
8. Provide a continuous means for the ISS crew to issue ad hoc predefined commands without external equipment.
9. Provide, as needed, an exhaustive diagnostic, monitoring and operations environment via the EXPRESS laptop computer.
10. Support the playback of recorded data to ground systems at selectable data rates up to at least 20Mbits/second sustained while simultaneously recording at prescribed rates.
11. Support ACOP to AMS-02 commanding at selectable data rates up to at least 20Mbits/second sustained. (No requirement for simultaneous recording or playback operations at higher rates.)
12. Support an alternate AMS-02 ground commanding and housekeeping report path via the HRDL interface.
13. Housed within an EXPRESS rack locker. CompactPCI based. Preferably 6U form factor.

# ACOP Requirements 14-16



14. Crew serviceable for upgrades and repairs - hardware and software.
15. Provide for upgrades and expansion to ACOP using COTS subsystems.
16. Provide support of ISS system upgrades (100bt MRDL follow on systems).

# The ASI ACOP Program

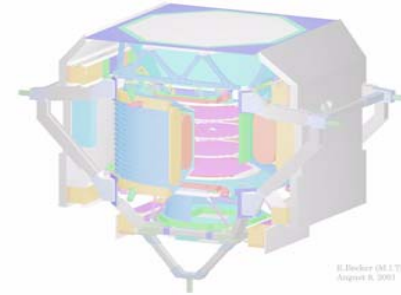


ASI issued commercial contract with CGS. Seems to be under funded.

In the reviewed contract:

1. There is no LCD for continuous display of AMS-02 data on ACOP,
2. The ISS radiation environment is explicitly ignored, this is of particular concern for the hard disk drives.
3. Only 2.8 TByte of recording media is being provided (as opposed to ~23TByte required),
4. The contracts ends with ACOP check out on ISS (before AMS arrives on ISS),
5. Meeting attendance is being strictly limited.
6. Testing with AMS-02 (such as FIT) has been omitted.
7. There is no indication of flexibility in the implementation to arrive at the best solution.
8. ACOP will be an Italian payload. Seemingly an insignificant detail this will have significant ramifications. ACOP will never be truly seamlessly integrated into the AMS-02 program. You certainly can imagine what AMS-02 would be like if it was a NASA payload and they had responsibility for mission success. Rules, rules, rules.
9. NASA has declined to discuss ACOP with ASI directly.

# The NCTU ACOP Program



NCTU lead academic program wherein NCTU becomes an AMS-02 Collaboration Member - Is adequately funded.

In the reviewed proposal:

1. Meets all ACOP requirements in a program completely controlled by the AMS-02 Collaboration.
2. Not a commercially based contract.
3. Basically double the funding.
4. Freedom for the AMS-02 Collaboration to make choices during the ACOP implementation without Profit/Loss considerations.
5. ACOP will be designed and built by the same team that designed and built the AMS-02 avionics (including our Italian friends at CGS).
6. ACOP becomes an integral part of the AMS-02 payload and is flown as a portion of the AMS-02/DOE payload.
7. Full support of the ACOP program throughout the AMS-02 mission.
8. All recording media, and it's ground to space logistics, provided.