OBS Meeting #4
Rome, October 13th 2000

Attendance:

O. Bauer, H. Feuchtgruber, W. van Leeuven, H. Jacobs, S. Pezzuto, A. Di Giorgio, R.Orfei, D. Beintema, P. Roelfsema, K. King, S. Sidher, M. Benedetini, P. Saraceno (part).

1 Adoption of Agenda

Adopted

2 Minutes of last meeting

No comments

2.1 Review of Action Items

No	Actionee	Action	Due
OBS1-02	Orfei	to confirm whether it is possible, using Virtuoso, to change the OBS without completely changing the final code image	Closed – result will be presented at this meeting
OBS1-11	Cerulli	to provide a development Plan for the DPU/ICU	Closed – Version issued in May but not circulated to PACS SPIRE version was issued for SPIRE PDR
OBS2-01	King	to confirm whether SPIRE should be switched off when the hardware watchdog in the DPU is activated	Open – 27th Oct 00
OBS2-10	van Leeuwen Bauer King	to comment on the OBS PA Plan	Closed with issue of first version 1.0
OBS2-11	King	to provide an ICD, describing in detail the interface between the DPU/ICU and the instrument subsystems	Closed - to be discussed at WE summit next week
OBS2-12	van Leeuwen Bauer King	to provide an Instrument User ICD, describing in detail the interface used to command the instrument (Anna will issue a table of contents and scope for the document)	Open - 31st Dec 2000
OBS2-13	Bauer King	to comment on the Logical Model	Closed Updated version is available – see new actions
OBS3-01	King	to provide comments on hardware PA Plan to all groups	Closed – to be discussed at this meeting
OBS3-02	King or Di Giorgio	to present the instrument command concepts at the next	Closed

		CDMS meeting.	
OBS3-03	Bauer van Leeuwen King	to provide the DPU Acceptance Test Requirements.	Open - 30th Nov 2000

New actions arising

OBS4-01	Di Giorgio	to issue the latest version of the Logical Model	27th Oct 2000
OBS4-02	Bauer Van Leeuwen King	to comment on the Logical Model	10th Nov 2000

3 Interfaces

There are three layers of protocol to support: datalink layer (MIL-STD1553B), transfer layer protocol (PS-ICD appendix 9), protocol for formatting TC/TM (in PS-ICD) plus the hardware (electrical) layer (MIL-STD 1553B).

3.1 1553B Interface

IFSI will test the 1553B bus against the Mil-STD handbook using a PC + DDC card.

3.2 Transfer Layer protocol

Agreed plan for implementation:

1. (by 3rd Nov) Specification (in agreement with ESA)
2. (3rd Nov) Can/does RAL want to do it?
3. (mid Nov) Have meeting with potential bidders
4. (end Nov) Issue ITT (statement of work + specs) in agreement with ESA
5. (end Nov) Agree on acceptance test plan together with ESA
6. (before Xmas) Select Company based on cost and time
7. (March 2001) ESA to provide test bed
8. (Mid May 2001) Run acceptance Test, ESA witness this and sign it off

CDMS interface should allow testing of the transfer layer protocol according to the PS-ICD.

3.3 Tests at IFSI

AdiG presented test plan for testing DPU:

1. Test 1553B interface (hardware and datalink layer) – uses IFSI S/C simulator – see IFSI internal DPU TEST SET-UP viewgraph
2. DPU AVM S/S Level Test Setup: Test higher level protocols – uses EGSE : test can exchange TC/TM, test error handling, test performance. The DPU will contain the full OBS software.

HIFI is not delivering a software simulator. They expect only static testing at IFSI and will test dynamic functionality of the OBS when they get an instrument model.

3.4 Test Requirements (generated in real time)

DPU/ICU Interface Performance Tests

Objective of these tests is to verify the specification and interface requirements.
The following tests are expected to be defined in the IFSI Test Plan:

A. Checkout of the CDMS I/F functions

1. Data link layer and physical layer conform to MIL-STD-1553B

2. Transfer Layer protocol conforms to PS-ICD
3. Packet Utilisation Layer conforms to PS-ICD

B. Checkout of Instrument internal Interfaces (against instrument ICD)
1. Physical layer conforms to ICD
2. Data transfer conforms to ICD

C. Static OBS Functionality
1. Correct acceptance of instrument commands and their execution internally (expected outputs on instrument I/F)
2. Generation of all types of TM packets
3. OBS performance meets requirements (e.g. data rates)

D. OBS management functions
1. Boot up
2. S/W loading, patches etc.

Notes:
1. All tests will be carried out at IFSI.
2. Test A(1) will be carried out using IFSI provided S/C simulator (Test Setup 1)
3. All other tests require a CDMS simulator to be delivered from the instrument groups, capable of sending TC packets and displaying TM packets.
4. Instrument interfaces will be simulated by IFSI hardware for all tests.

A further set of (dynamic) tests will be necessary in order to complete the DPU/ICU acceptance:
HIFI will do these on the AVM (plus development models) at their own premises
SPIRE will do these using a DRCU simulator (place TBD)
PACS will supply instrument simulator software (running on the same system as the, IFSI provided, subsystem interface board) for the tests to be carried out at IFSI.

4 DPU Tests at IFSI using the EGSE Setup

OHB presented EGSE-ILT setup for Unit Functional Testing.

There was some discussion as to whether SCOS2000 was actually needed at IFSI for all instruments, given the restricted set of tests that can be carried out.

Delivery will be made from PACS to IFSI at end of April. The setup will remain at IFSI until delivery of AVM/CQM to ESA. After this it is the responsibility of other instruments to provide a test system to IFSI, if needed

IFSI also require:
- A MIB for each instrument.
- Test data and expected test results. These should be specified in the test plan.

5 Patching with DSP21020/VIRTUOSO

Pezzuto: It is possible to compile functions such that they are stored in a specific part of the programme memory. It is then possible to load new functions to this area if needed. The area of memory (start address and length) is specified in an ‘architecture file’. IFSI have not been able to achieve this yet in practice, though they understand other people have done this.

Analogue Devices is discontinuing the DSP21020 at end of year – it will continue to be built by another company. They are also discontinuing the development board and Virtuoso will not be supported after next year.

There was some concern about the ability of IFSI to maintain the OBS when the development tools become unsupported and whether it would be necessary to retain old hardware as a backup system. IFSI contend that once the OBS is written, it will not be necessary to have the hardware development system (Sigma board) operational. The development software (compiler etc) can run on any IBM PC compatible.

OBS4-03	Orfei	to elaborate their strategy to handle the discontinuation of the DSP hardware and software development tools	11th Jan 2001

6 OBS Maintenance

A proposal by IFSI is contained in the new version of the OBS PA Plan.

The OBS Maintenance facility will be provided as part of the IFSI ICC contribution, therefore it cannot be started until after delivery of the AVM OBS.

IFSI will, initially, maintain the software using the development facility. They will attend instrument integration and tests and will bring with them the development system (a Sigma PC card), which allows them to develop new software. In fact the development software can be run without the PC card, which is used for testing the software only, so instrument teams could compile new routines without the PC card.

It was agreed that configuration management must be implemented on the development facility to allow version control of patches, if these can be generated by the instrument teams. At some time these patches will be delivered to IFSI to be incorporated into the next official release of the OBS.

OBS4-04	Di Giorgio	to specify the PC required to host the OBS development facility when it is at the instrument test site.	11th Jan 2001

It was recognised that we need urgently to know whether the OBS management can be implemented in SCOS2000 for the AVM tests, otherwise we need the OBS maintenance facility to be able to generate patch commands – this is not planned at present.

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OBS4-05	Bauer	to contact project;/ESOC concerning the possible modification of the SCOS2000 OBS management system to suit the FIRST satellite. This is needed by October 2001.	20th Dec 2000

The deliverable OBS maintenance facility may require the Sigma card and a PC. There may be problems with maintaining the hardware over the lifetime of the mission (e.g. changes in operating system, PC hardware and maintaining the sigma board).

OBS4-06	Di Giorgio	to specify the hardware and software required for implementation of the OBS maintenance facility. Both for updating software and verification of the new	11th Jan 2001

		software.	

PACS want the OBS maintenance facility to maintain all the software for PACS – i.e. they want a single PC with, possibly, several cards in it.

7 OBS PA Plan and Software Development Plan

DPU/ICU PA Plan
This was signed, though King had some comments on the text. These will be added to the minutes for resolution in the next release.

OBS4-07	King	To add comments on the PA Plan to the end of the minutes of this meeting	

DPU/ICU On Board Software PA Plan
HIFI have made comments on the distributed version (draft 3). The next version will be circulated for furter comments.

OBS4-08	Di Giorgio	To issue version draft 4 of DPU/ICU OBS PA Plan	16 Oct 2000
OBS4-09	Bauer Van Leeuven King	To comment on the OBS PA Plan Draft 4	30 Oct 2000

DPU/ICU Development Plan
This needs to be updated.

OBS4-10	Orfei	To update the DPU/ICU Development plan	20th Oct 2000
OBS4-11	Bauer Van Leeuven King	To comment on the DPU/ICU Development plan	10th Nov 2000

DPU/ICD OBS URD
We are unable to go further in defining a common URD. It was agreed that the document will now be kept as three separate documents containing the common part and an instrument specific part. This will allow instruments to maintain configuration control over their URD.

PACS still need to check their URD to see if the use of bolometers in their instrument has any affect on the requirements

OBS4-12	Bauer	To check the URD to see if it is affected by the use of bolometers	30th Oct 2000

8 Common Instrument Commanding Scheme

Compatibility with PS-ICD:
Di Giorgio: There are some incompatibilities between the definition of ‘functions’ and ‘procedures’ in the PS-ICD and the use of these services by the instruments. It would be less work if all functionality were implemented through one service tailored to meet our requirements. This has been implemented in other missions e.g. Mars Express

It was agreed to try to obtain a new instrument 'command execution' service at the next CDMS meeting.

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OBS4-13	Di Giorgio	To define a 'Command Execution Service' for the PS-ICD	20 Oct 2000
OBS4-14	Bauer	to propose the insertion of the 'Command Execution Service' into the PS-ICD	3rd Nov 2000

Implementation Differences between instruments:
Each instrument has slightly different ways of using the PUS services. It would be easier if all instruments used the same way. It was agreed that di Giorgio should propose such a common way of using the PUS services.

OBS4-15	Di Giorgio	to propose a common method for the use of the PUS services identified in the PS-ICD	

Problems with PS-ICD:
Orfei is unhappy about the requirement to provide a connector on the DPU for the purpose of changing the units address.
It was agreed to raise this at the next CDMS meeting.

OBS4-16	Bauer	to raise the problem of having to provide an extra connector on the DPU to allow changes to the unit address	3rd Nov 2000

9 Housekeeping and Diagnostic Data Collection

Di Giorgio: The PS-ICD does not allow the changing of the housekeeping or diagnostic data TM packet structure. This would have to be done through a memory patch, which is very inconvenient.

It was agreed that a change in housekeeping packet structure would imply a change in the MIB, and possibly CUS and other FCSS systems. Therefore changes should be limited and the need to implement it as a memory patch is probably a good idea.

As a consequence it is necessary that the structure of all housekeeping and diagnostic packets are known before the OBS is delivered. IFSI would like to know detailed requirements on the housekeeping and diagnostic data packets – which parameters, maximum rate, timing accuracy etc.

OBS4-17	Bauer Van Leeuven King	to provide detailed requirements on the housekeeping and diagnostic data packets – which parameters, maximum rate, timing accuracy etc	31st Dec 2000

IFSI had further questions on the use of PUS services for instrument commanding (see attachments). This was considered to be 'normal work' and should be handled by email, teleconference etc. The information should eventually appear in the ICDs and telecommand definition documents and the PS-ICD.

10 Autonomy Functions & Housekeeping Tuning Procedures (HIFI)

Implementation of these is due to start late in the development programme and may not be in the AVM OBS. IFSI needs a definition of what sort of items will be monitored and the sort of actions that could be taken.
It was agreed that this should again be handled as 'normal work'. The instrument teams will attempt to answer IFSI's questions (attached to the minutes).

11 Peak-up procedure

HIFI would like to use PACS for peakup, but this implies operating both instruments in sequence and this may be an operational problem. PACS , at present, only intend to provide the interface between the SPU and DPU to carry this out, but will not provide any software to implement peaking up until it is definitely needed.

This is not a topic for this group – discussion closed

12 AOB

13 Date of Next Meeting

11th January 2001

Actions remaining at end of meeting

No	Actionee	Action	Due
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OBS2-12	van Leeuwen Bauer King	to provide an Instrument User ICD describing in detail the interface used to command the instrument (Anna will issue a table of contents and scope for the document)	31st Dec 2000
OBS3-03	Bauer van Leeuwen King	to provide an initial DPU Acceptance Test Requirements.	30th Nov 2000
OBS4-01	Di Giorgio Codella Pezzuto	to issue the latest version of the Logical Model	27th Oct 2000
OBS4-02	Bauer Van Leeuwen King	to comment on the Logical Model	10th Nov 2000
OBS4-03	Orfei	to elaborate their strategy to handle the discontinuation of the DSP hardware and software development tools	11th Jan 2001
OBS4-04	Di Giorgio	to specify the PC required to host the OBS development facility when it is at the instrument test site.	11th Jan 2001
OBS4-05	Bauer	to contact project;/ESOC concerning the possible modification of the SCOS2000 OBS management system to suit the FIRST satellite. This is needed by October 2001	20th Dec 2000
OBS4-06	Di Giorgio	to specify the hardware and software required for implementation of the OBS maintenance facility. Both for updating software and verification of the new software.	11th Jan 2001
OBS4-07	King	To add comments on the PA Plan to the end of the minutes of this meeting	
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SPIRE Comments on the DPU/ICU P.A. Plan

Section 1.1: The SPIRE PA Plan (SPIRE-RAL-PRJ-000017) should be added as an applicable document.

Section 2.3: I find this section confusing - e.g. the use of 'PA project managers', 'consortia PA managers' and 'instrument PA managers' for, I think, the same person. I suggest the following:

> **Section 2.3 Organisation**
> Each organisation responsible for deliveries within the project will appoint a local PA manager, who will be responsible for implementation of the PA activities in that organisation. These local PA managers report directly to the instrument PA Manager. For all pure PA matters, the instrument PA Managers are the single point of contact for ESA.
>
> **Section 2.3.1 IFSI PA**
> The IFSI PA Manager is responsible for the implementation of the PA requirements related to the deliveries for which IFSI is responsible. He is located at IFSI and reports directly to the instrument PA Manager. In case of conflict, the IFSI PA Manager has access to the Principle investigator and Project Manager, through the IFSI Co-investigator.
>
> **Section 2.3.2 Suppliers PA**
> IFSI will ensure that all suppliers, will establish their own quality organisation, responsible for the implementation and verification of requirements as defined herein, at their own facilities and at their subcontractors. Activities will be tailored to the specific needs and characteristics of the hardware involved and the supplier's organisation.
>
> The supplier's will report all PA activities through the IFSI Project Manager. In the case of conflict between the PA and Project management at the supplier, the IFSI Project Manager shall resolve matters. The instrument Project Manager and PA Manager shall be informed,

Section 2.4 replace first sentence with:

> Both ESA and the instrument PA teams shall have right of access to facilities of IFSI, their suppliers and subcontractors to carry out:

Section 8: This section is a copy of a set of requirements rather than a description of what will be done (i.e. a plan).

> Section 8.3.1 should state what the documentation will contain, not what it may contain.
> Section 8.3.2 should say whether IFSI will follow in-house standards (in which case give a reference to the relevant documents) or external standards (which?)
> Section 8.3.5 should say whether IFSI have their own plan or are using MIL-HDBK-263