

Ref: PT-MM-02591

FIRST/ESA | M | 0004.1 26 June 1996

SPIRE-ESA. MOM. 000095.1

MINUTES OF THE THIRD FSODG MEETING

The third meeting of the FIRST Science Operations Definition Group (FSODG) was held in MPE-Garching on June 10-11, 1996. All members were present.

AGENDA

The agenda (attachment 1) was adopted.

1. APPROVAL OF MINUTES OF THE SECOND MEETING

- Page 2: first paragraph: the sentence "This should lead to a total of about 10 ICSs per instrument" (too specific) is replaced by "... to a limited number of ICSs per instrument"
- Page 3: paragraph 3.1; 2nd bullet: Configuration Control problems can be avoided if latest version of S/W is automatically downloaded.
- Page 6: chapter 4: upon request from a FSODG member the "draft" minutes concerning scenario # 2 (and the corresponding AIs) were updated. The updating was disapproved by the majority because contrary to what was agreed (or thought to be agreed) at the meeting. Chairman will be more careful in the future: **Note:** the "incident" turned out to be very useful in that it allowed to clarify the various scenarios in the course the meeting
- It was agreed that, to avoid confusion, acronyms with a strong (e.g. ISO-like) connotation should be avoided. AOTs and ICSs are kept however. *No* restriction is set on the size of an ICS. The Acronym MOCC used in the first meeting is replaced by MOC (Mission Operations Centre) An FSODG acronym list will be compiled (AI # 3/1)

2. OVERALL DEVELOPMENTS SINCE SECOND FSODG MEETING

- The new FIRST launch date is now mid-2007.
- Cryo-coolers and cryostat options studies progressing satisfactorily for presentation to SAG on June 25-26, 1996 and completion end-October 1996. Study on possible re-use of XMM bus (with 3 orbit options) to be completed also end-October 1996. It is expected (from the FSODG point of view, very desirable) that the choice of options will have been made (after consultation with SAG) *before* the issue of AO.

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- It was noted that if the XMM solution is adopted the overall concept w.r.t. pointing capabilities and performance will need to be evaluated (XMM AOCS only provides Fine Pointing Mode and slewing).
It was also noted that in the absence of an ISO-like "raster" mode, rastering could be emulated by the Ground Segment. This would make the corresponding ground S/W more complicated but would add flexibility (distance between points and dwell time no longer required to be fixed), would simplify the AOCS, and simplify on-board synchronisation of instruments.
Similarly "position switching" could be emulated by the ground provided the required accuracy could be guaranteed.
In view of the fundamental importance of this topic a (long-term) action has been placed on the Instrument representatives (AI # 3/2).
 - It was noted that a similar (long-term) action (AI # 3/3) needs to be placed on the Instrument representatives in order to establish if any requirement on orbit *accuracy* do exist for some of the FIRST instruments (Note: No such requirements were made on ISO)
 - It was noted that depending on the pointing accuracy needed, specific requirements might need to be put on the STR (e.g. In-flight calibration mode allowing the equivalent of the ISO 5-star acquisition procedure to be carried out, with corresponding data available in the TM)

The FSODG will follow up all these issues in due time.

- It was re-stated that the operational baseline w.r.t. eclipses was the following:
 - No scientific observations during eclipses but the rest of the orbit is usable (in the case of short eclipses).
 - Instruments off for the entire orbit on orbits affected by long eclipses.
- It was stated that the instruments should have the necessary autonomy to be able to ensure their health and safety during the periods when coverage from the ground is not available. For example monitoring of detector saturation should be carried out on board. All the parameters required to assess health and safety must be stored in the Science HK TM (accessible to the MOC).
- It was agreed that *no* Quick Look Assessment (QLA) software would be running at the MOC.
- The distinction between SPACONS and INSCONS is removed since the FSODG operations concept relies on an integrated operations team.
- Instrument Simulators were briefly discussed. Their ultimate usefulness is questioned by the instrument representatives. Integration and Test Team view is that they were invaluable on ISO. Needs further discussion.

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- OLP (scientific) validation was discussed based on practical ISO experience. The users' community cannot help much since software is not publicly available. The ideal case (proposed for FIRST) would be to make two versions available:
 - The "official" working version guaranteed to produce reasonable results
 - A more "experimental" version, more risky but likely to produce better results. This version available at the user's own risk.

3. REVIEW OF ACTION ITEMS FROM SECOND MEETING

- AIs # 2/1, 2/2, 2/3 and 2/5 were not yet due.
- All other AIs were completed with the exception of the MOC costing which was part of AI # 2/7.
- Operations scenario # 1 was discussed in detail. It will be updated according to the discussion (AI # 3/4).
- scenarios # 1 and # 2 have been costed (Attachments # 2 and # 3). The MOC costs are outstanding. Costing for both the ICCs (Instrument Control Centres) and the FIRST Science Centre (FSC) is based on the assumption that work will start early 98, for a Launch in early 2006 and operations duration of 3 years.
 - ICC cost (without Archive) = 10.5 MAUs
 - FSC cost (without Archive) = 11.0 MAUs
 - ICC cost (with Archive) = 13.0 MAUs
 - FSC cost (with Archive) = 16.0 MAUs

Note: The FSC Archive is the *complete* Archive for all instruments. ICC Archive(s) only contains data relevant to the corresponding ICC instrument. It must be understood that these numbers are very preliminary.

- Scenarios # 1 and # 2 were further discussed. Finally two main scenarios emerged; scenario B1 (the old scenario # 1) and scenario A1 (the old scenario # 2 but with archives located at each ICC). For each of these main scenarios one variation was further considered (respectively A2 and B2). The corresponding diagrams, main features and cost elements are attached as Attachment # 4.

4. INSTRUMENT ISSUES

- For the purpose of FM and TC data transfer both INTEGRAL and XMM follow the same concept of a bus-structure via DBU/RBI interface circuits. In addition for INTEGRAL the instrument computer will be part of the DBU/RBI circuits.

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The meeting felt that for FIRST the INTEGRAL approach should not be followed, as it over complicates the interface issues.

- There are no basic "AIV implementation" problems with any of the four scenarios considered by the meeting.

5. PREPARATION OF THE PRESENTATION TO SAG

- One hour is set aside for the presentation to the SAG on 25 June, 1996. Time will be available in addition for discussions.

P. Estaria presented DRAFT viewgraphs which were reviewed and updated by the group. The updated viewgraphs will be complemented by material generated at the meeting.

Note: The updated set has been circulated to the group for comments on June 18, 1996.

- It was anticipated that the SAG might want additional material to supplement the viewgraphs to be presented on the 25th June. (see AI # 3/5)

6. CONCLUSIONS

- The objectives set to the FSODG up to now have been achieved. Several scenarios, with rough costing are available for presentation to the SAG and preliminary guidelines for instrument design and testing have been compiled. Further progress will require resolution of open points and SAG's feedback to the preliminary FSODG work.

- The next meeting will take place at RAL on 22-23 July 1996 starting on the 22nd at 11:00h.

7. A.O.B.

There was no AOB.

8. LIST OF ACTIONS

The following actions have been allocated as a result of this meeting:

- **AI 3/1: Estaria: Due date: 22 July '96**
Start compilation of an FSODG acronym list (on-going activity)

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- **AI 3/2: Instrument reps.: Due date: long term**
Investigate if all required instrument observing modes could be supported via AOCs Fine Pointing Mode only (with suitable ground support). Specify pointing accuracy required.
 - **AI 3/3: Instrument reps.: Due date: long term**
Investigate if any instrument observing modes would put any specific requirement on FIRST orbit accuracy determination.
 - **AI 3/4: Estaria: Due date: 22 July '96**
Update scenario # 1 (now B1) write-up
 - **AI 3/5: FSODG: Due date: 25 June '96**
Provide a one page summary of the main features for:
MOC: A. Robson
Archive: P. Roelfsema
ICC: O. Bauer
FSO (i.e. FSC w/o Archive): P. Estaria



P. Estaria

27 JUN '96 13:33 ESA FIRST PROJECT

P.7/17

From: PESTARIA--ESTEC

Date and time 96-06-05 12:32:23

To: HSCHAAP --ESTEC

AROBSON --ESOC

BAUER --EXTERNAL bauer

KJK --EXTERNAL Ken King RAL

PJOTR --EXTERNAL Peter Roelfsema

PILBRATT--EXTERNAL Goeran Pilbratt

FROM (my name)

Subject: AGENDA for FSODG meeting # 3

(Attachment 1)

Please find attached a "proposed" agenda for our meeting in Garching (June 10-11).

AGENDA

- 1) Approval of minutes of 2nd meeting + Approval of agenda.
- 2) Overall developments since 2nd meeting: (Estaria/Pilbratt)
- 3) Review of AIs from 2nd meeting leading to;
 - discussion/revision/finalisation of scenarios 1 and 2 including cost estimates.
 - any new scenario ?
- 4) Instrument issues (Schaap)
- 5) Preparation of the presentation to SAG;
 - main points and structure of presentation
 - practical organisation
 - required supporting documentation (in addition to viewgraphs)I will propose a structure + contents to be discussed at the meeting
- 6) Conclusions
- 7) AOB

Regards

End of Message

(Attachment # 2)

From : O.H. Bauer, MPE Garching, P. Roelfsema, SIDT-VILSPA
 To : P. Estaria
 Date : 10-Jun-1996
 Ref : FSODG/96-003/Em

 Subject: Action Item 2/4 : Provide cost estimates for ICC
 ----- scenario #1 and #2

Dear Pierre,

please find enclosed our cost estimates for a FIRST ICC for
 scenario #1 and #2

Best regards, Otto and Peter

 Manpower deployment and cost estimates:

	Manpower	Overhead	Costs
1998	3	10%	247,5 kAU
1999	5	10%	412,5 kAU
2000	7	10%	577,5 kAU
2001	10	10%	825,0 kAU
2002	10	10%	825,0 kAU
2003	12	10%	990,0 kAU
2004	15	10%	1.237,5 kAU
2005	15	10%	1.237,5 kAU
2006	15	10%	1.237,5 kAU
2007	15	10%	1.237,5 kAU
2008	15	10%	1.237,5 kAU
Computer equipment ...			500,0 kAU

 10.565,0 kAU
 =====

(Attachment # 3)FSC Costing:

Source: K. D. KING (RAL)

Costing:

This covers the time from selection to the end of mission operations assuming a three year mission. Thus no extended mission or post mission costs are included. Also no rundown costs have been included.

I have based costs on the following schedule:

1998, 2nd qtr: Selection of contractor for FSC
 1998 - 2004 : development of FSC
 2004 - 2005 : Call for proposals, proposal selection and observation input
 2005 : test and simulation campaign
 2006, 1st qtr: Launch
 2006 -2008 : Mission operations
 2007 : Second call for proposals, selection and observation input

	Staff (yrs)	Other costs (KAU)	Total Cost (KAU)
1998	6.1	122	580
1999	6.1	122	580
2000	6.1	122	580
2001	8.2	214	829
2002	10.0	1,280 *	2,030
2003	10.2	486	1,251
2004	13.1	567	1,549
2005	21.2	594	2,184
2006	20.9	585	2,153
2007	19.2	538	1,978

Total: 140.1 5,161 15,668

* includes 1 MAU for the buiding costs in 2002

For the revised scenario 2 I assume that JSOC and Archive are in different locations and so the management, support and infrastructure costs are repeated.

JSOC

	Staff (yrs)	Other costs (KAU)	Total Cost (KAU)
1998	6.1	122	580
1999	6.1	122	580
2000	6.1	122	580
2001	8.2	164	779
2002	8.0	1,160 *	1,760
2003	8.2	164	779
2004	11.1	222	1,055
2005	15.2	304	1,444
2006	14.7	294	1,397
2007	13.7	274	1,302
2008	13.4	268	1,273
Total:	110.8	3,216	11,526

* includes 1 MAU for the buiding costs in 2002

ARCHIVE

	Staff (yrs)	Other costs (KAU)	Total Cost (KAU)
1998	2.1	42	200
1999	2.1	42	200
2000	2.1	42	200
2001	4.2	134	449
2002	4.0	712 *	1,012
2003	4.2	318	633
2004	5.1	343	725
2005	11.2	314	1,154
2006	10.7	300	1,102
2007	9.7	272	999
2008	9.4	263	968
Total:	64.8	2,780	7,640

* includes 600 KAU for the buiding costs in 2002

Ken

End of Message

===== REST OF RFC822 HEADER =====

Received: from bcserver.estec.esa.nl by vmprofs.estec.esa.nl (IBM VM SMTP V2R2) with TCP; Thu, 23 May 96 16:49:54 MET

Received: from mailbox.rl.ac.uk by bcserver.estec.esa.nl (AIX 3.2/UCB 5.64/4.03)

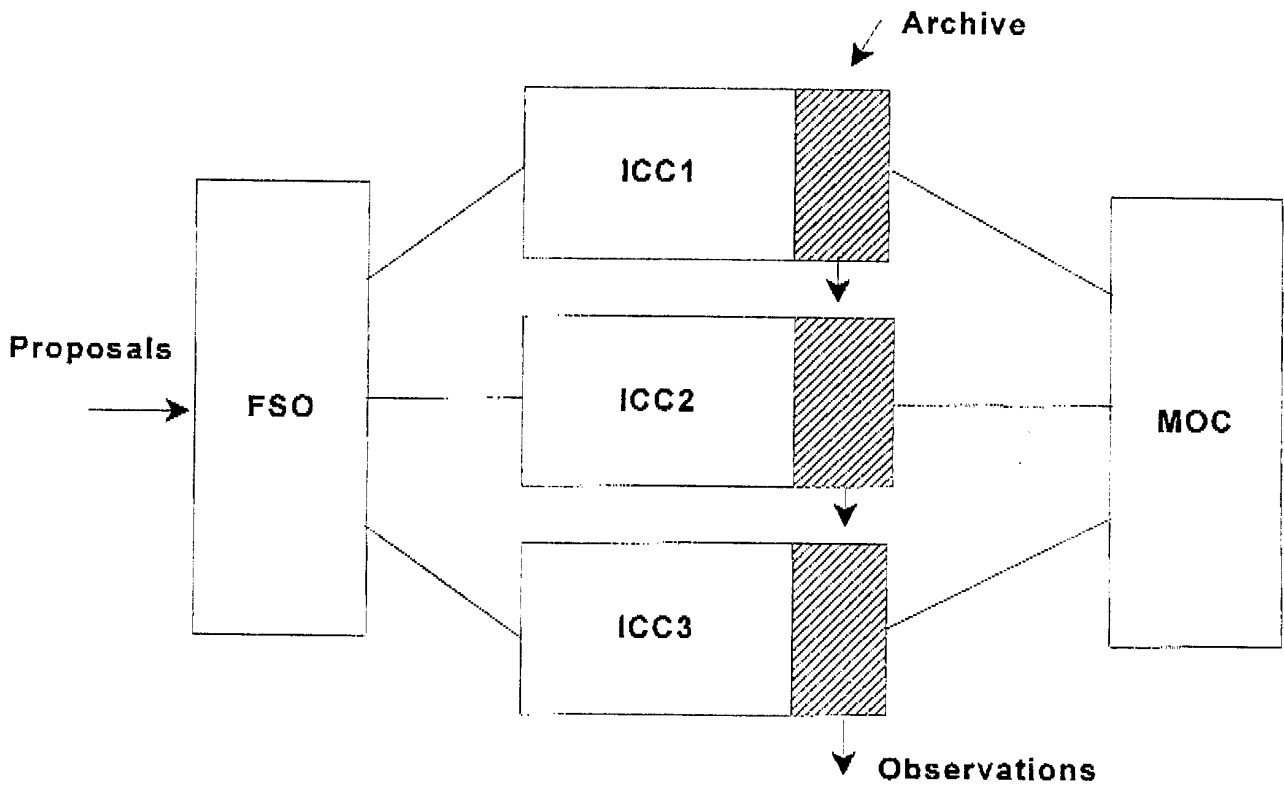
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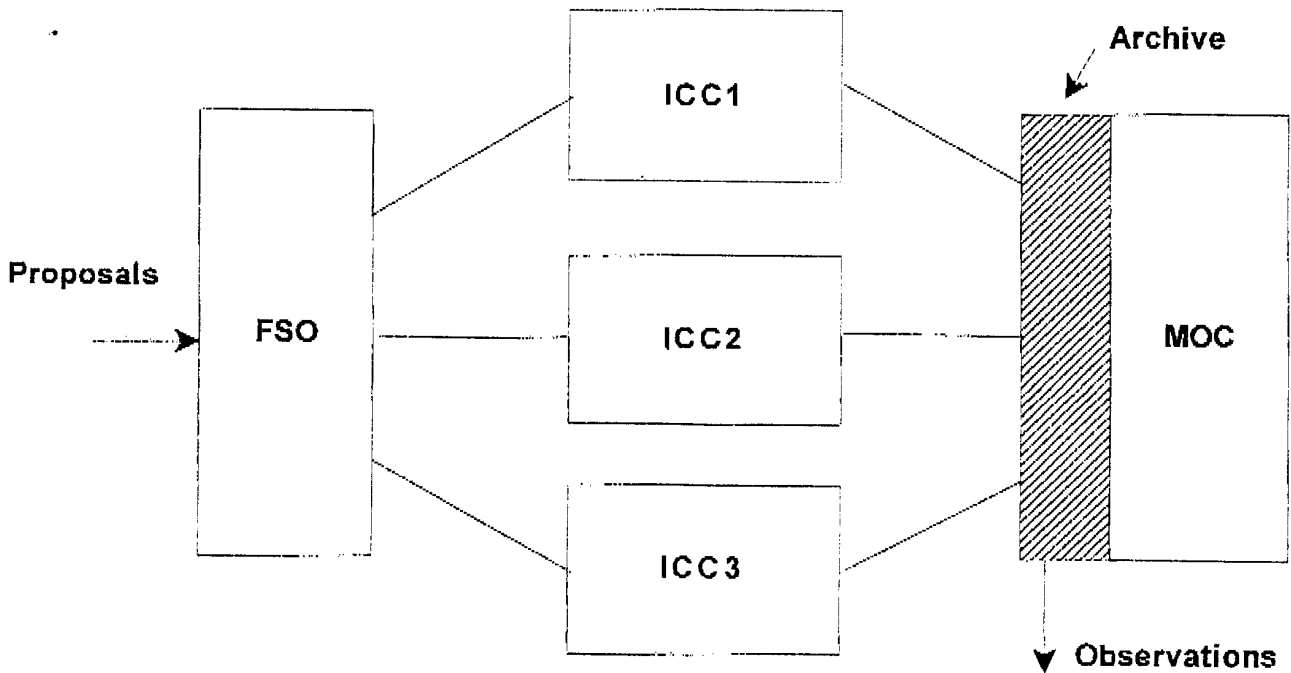
(Attachment # 4)

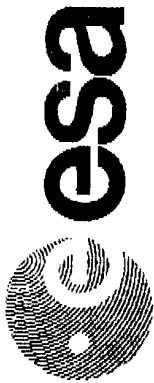
OPERATIONS SCENARIO

A1



A2





FIRST

Operations Scenario Features (1)

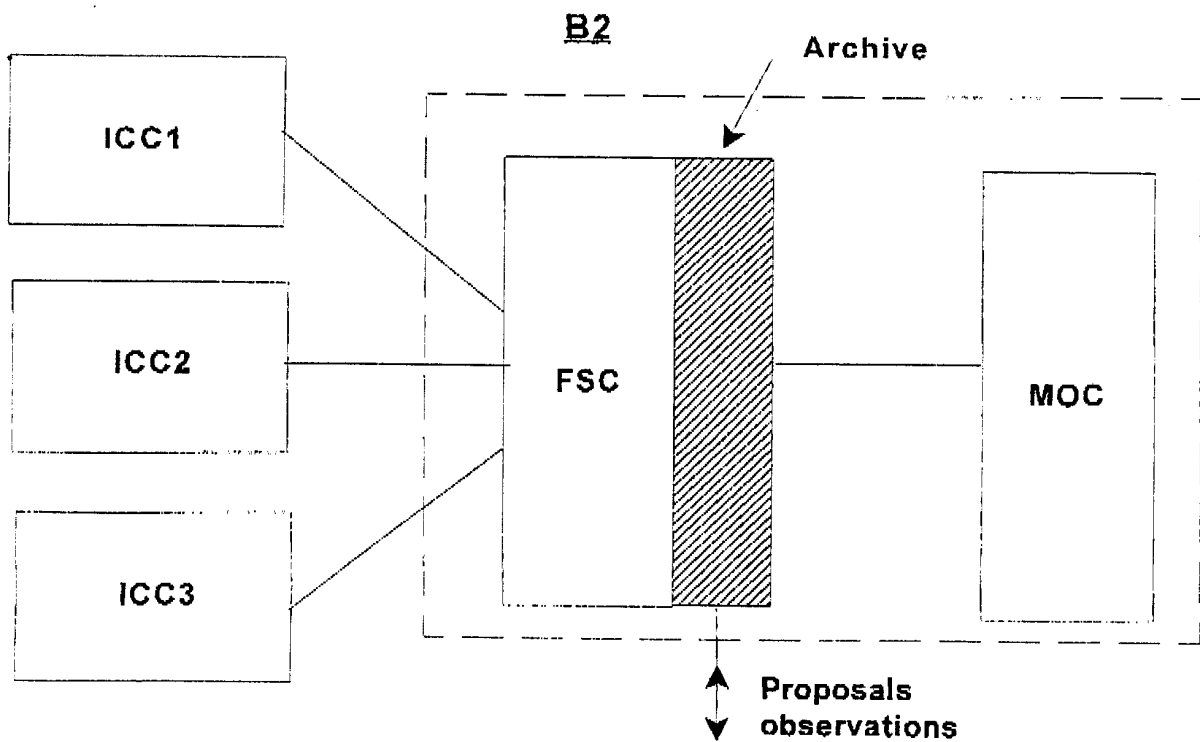
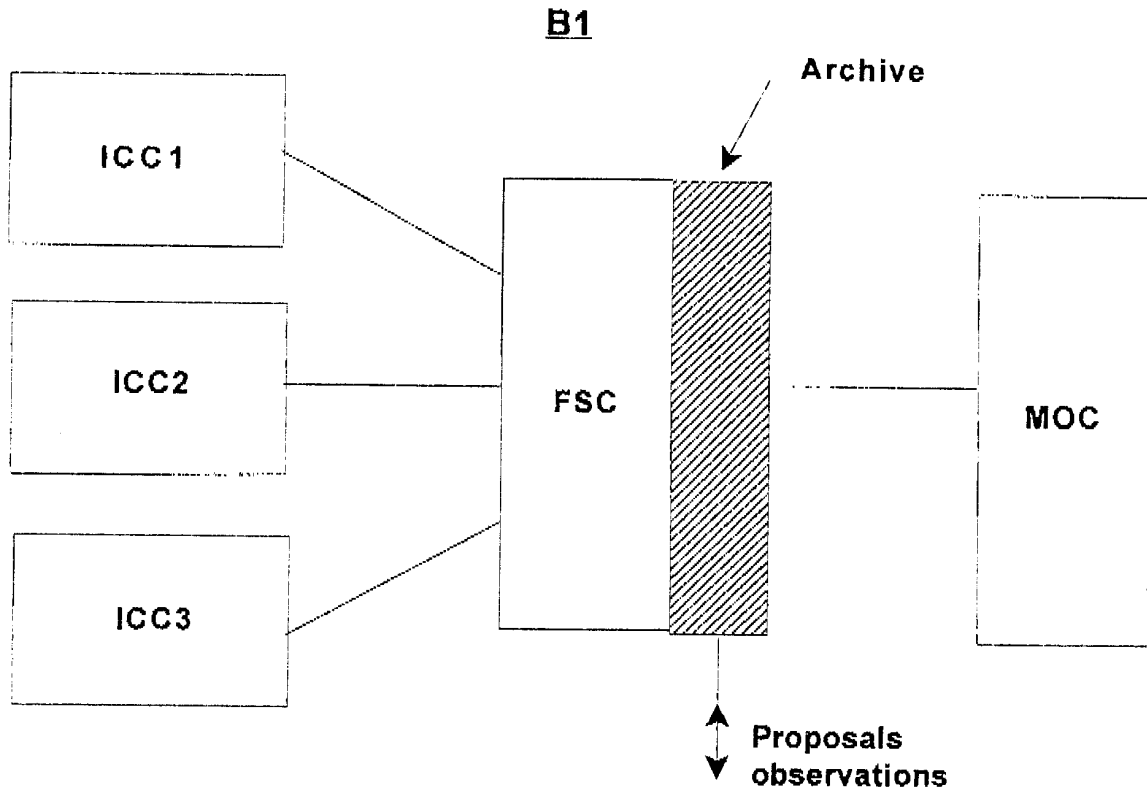
A1:

- ESA COORDINATION OF THE SCIENCE PROGRAMME PREPARATIONS
- ICC HAVE COMPLETE CONTROL OF THEIR INSTRUMENT OPERATIONS
- ICC HAVE COMPLETE CONTROL OF THE DATA MADE AVAILABLE TO THE COMMUNITY
- SEPARATE ARCHIVING SYSTEMS, HOWEVER SAME DESIGN
- SCIENTIFIC COORDINATION DIFFICULT DURING THE MISSION

A2:

- AS 'A1' WITH A CENTRALISED ARCHIVE AT ESOC
- SCIENTIFIC COORDINATION LESS DIFFICULT DURING THE MISSION
- ARCHIVE DEVELOPMENT BY ESOC
- CENTRALISED ACCESS FOR SCIENTIFIC DATA

OPERATIONS SCENARIO



Operations Scenario Features (2)**B1:**

- EXISTENCE OF A FIRST SCIENCE CENTRE WITH A CENTRAL ARCHIVE SYSTEM
- SINGLE INPUT / OUTPUT INTERFACE FOR ALL USERS
- POTENTIAL 4th PI / INSTITUTE FOR DEVELOPMENT / OPERATIONS
- EFFECTIVE SCIENCE COORDINATION BEFORE AND DURING MISSION
- ONLY OFF-LINE TASKS FOR THE ICC'S
- ICC HAVE NO DIRECT CONTACT WITH OBSERVERS
- ICC DO NOT PRODUCE TARGET LISTS
- ICC NOT RESPONSIBLE FOR MAKING SCIENCE DATA AVAILABLE TO USERS

B2:

- AS 'B1' WITHOUT A 4th PI / INSTITUTE
- FSC IMPLEMENTED AND OPERATED BY ESA
- SCIENCE COORDINATION WITH ESA THROUGHOUT THE WHOLE MISSION

Costing of the various Scenarios

- ▣ POST OPERATIONAL AND ARCHIVE PHASES NOT COSTED
- ▣ COMMUNICATION LINES NOT INCLUDED
(30 KAU/YEAR FOR A 64 KBS DEDICATED LINE)
- ▣ ESTIMATES ARE VERY PRELIMINARY
(NOT BETTER THAN 30% ACCURACY)
- ▣ ESTIMATES BASED ON ACTUAL FIGURES
FOR ROSAT, CLUSTER JSOC, ISO
- ▣ ASSUMPTIONS - START OF WORK MID 1998 -
END OF OPERATIONS END 2008
- ▣ COMPARISONS / EXTRAPOLATIONS EXTREMELY DIFFICULT

Costing of the various Scenarios (2)

- ▶ **COST FOR ALL SCENARIOS ARE ROUGHLY THE SAME (EXCEPT B1 = CHEAPER)**
- ▶ **MORE ACCURATE COSTING REQUIRES :**
 - **RESOLUTION OF OPEN POINTS**
 - **DEEPER LEVEL OF DEFINITION**
- ▶ **COSTS INCLUDE INFRASTRUCTURE, HARDWARE, SOFTWARE, MANPOWER, OVERHEADS, ETC.**
- ▶ **ICC COST (WITHOUT ARCHIVE) ≈ 10.5 MAU**
- ▶ **FSC COST (WITHOUT ARCHIVE) ≈ 11.0 MAU**



Costing of the various Scenarios (3)

	A1	A2	B1	B2
ICC	35*	35*	32*	32*
FSC	-	-	11	16
FSO	12	12		
ARCHIVE(S)	7*	11	5	8
TOTAL	54	58	48	56
ESA	12	23	-	24
per PI	14	12	12	11
# PI's	(3)	(3)	(4)	(3)

* 1/3 PER ICC
FSC AND FSO INCLUDE ≈ 1 MAU FOR BUILDING
IMPLEMENTATION IN ESOC; SCALING FACTOR = 1.5

MOC COSTS TO BE DETERMINED