
EUROPEAN SPACE AGENCY
DIRECTORATE OF TECHNICAL & OPERATIONAL SUPPORT
MISSION OPERATIONS DEPARTMENT

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-TOS-OF
No. 035
Week 21
26.05.03
Routine Phase

Prepared by: M. Walker (TOS-OFI)

LIST OF CONTENTS

1	General	3
2	Summary of Activities	3
3	Satellite Status	3
3.1	Platform	3
3.1.1	AOCS	3
3.1.2	Power	3
3.1.3	Thermal	4
3.1.4	OBDH	4
3.1.5	RF	5
3.2	Payload	5
3.2.1	SPI	5
3.2.2	IBIS	5
3.2.3	JEM-X	5
3.2.4	OMC	6
3.2.5	IREM	6
4	Ground Facilities	6
4.1	Mission Operations Centre	6
4.2	Ground Stations & Network	6
4.3	Science Ground Segment	7
4.3.1	ISOC	7
4.3.2	ISDC	7
5	Special Events	7
6	Anomalies	8
7	Future Milestones	8
8	Appendix	9
8.1	Overview of Revolutions	9
8.2	Consumables	10
8.2.1	Detailed Fuel Book-keeping	10
8.3	Detailed Satellite Information	10
8.3.1	AOCS Operations	10
8.3.2	SPI Operations	12
8.3.3	IBIS Operations	13
8.3.4	JEM-X Operations	14
8.3.5	OMC Operations	14
8.3.6	IREM Operations	16
8.4	List of Anomalies since Launch	17

DISTRIBUTION LIST

Addressees	Copy	Addressees	Copy
D/TOS		ESA HQ	
G. Winters D/TOS	1	D. Southwood D/SCI	1
W. Frank TOS-O	1		
A. Smith TOS-OF	1	ESTEC	
J. F. Kaufeler TOS-G	1	J. Louet SCI-P	1
N. Bobrinsky TOS-ON	1	A. Gimenez-Canete SCI-S	1
R. Münch TOS-GF	1		
		ESTEC / PG	
M. Schmidt	1	K. Clausen	1
J. Pineiro	1	P. Jensen	1
R. Southworth	1	P. Strada	1
F. Di Marco	1	G. Sarri	1
F. Cordero	1	R. Carli	
M. Walker	1		
M. Rezazad	1	ESTEC/RSSD	
J. Houser	1	M. Kessler SCI-SD	1
P. Lippi	1	C. Winkler	1
SPACONs	1	A. Parmar	1
S. Fahmy	1	R. Much	1
I. Bayliss	1	L. Hansson	1
G. Di Girolamo	1	R. Kuulkers	1
F. Dreger	1	Nicola Rando	1
G. Gienger	1		
S. Pallaschke	1	ISDC	
W. Hell	1	T. Courvoisier	1
K. Capelle	1	R. Walter	1
M. Butkovic	1	N. Mowlavi	1
D. Heinzer	1	ISDC Shift Team	1
A. Pena	1	D. Texier	1
Shift - Coord	1		
Scheduling Office	1	ALENIA	
T. Beck	1	C. Cassi	1
B. Smeds		F. Ravera	1
S. Scaglioni	1		
J. Wardill	1	PI / Instrument Teams	
		C. Larigauderie – SPI	1
		G. La Rosa – IBIS	1
		S. Brandt – JEM X	1
		E. De Miguel - OMC	1
		W. Hajdas – IREM	1
		JPL / Goldstone	
		D. Holmes	1
		T. Horton	1
		Redu	
		J. Mac Lauchlan	1

1 General

The Flight Control Team at MOC has compiled this report with some input provided by the Flight Dynamics Team.

It addresses the activities from 17.05.03 until 23.05.03 (both dates inclusive) and covers the revolutions 72, 73 and 74.

2 Summary of Activities

The operations were performed according to the planning inputs from ISOC combined with some manual commanding of the instruments by MOC.

The targets of the observations were Mrk 273 (RA 13:44:42.11; DEC +55:53:12.7); an OMC Flat Field target (RA 11:54:0.00; DEC +28:23:60.0); Mrk 231 (RA 12:56:14.00; DEC +56:52:25.0); NGC 4736 (RA 12:50:53.06; DEC +41:07:13.6); the Galactic Plane; NGC 4736 (RA 12:50:53.06; DEC +41:07:13.6) and NGC 4151 (RA 12:10:32.58; DEC +39:24:20.6). The activities consisted of raster dithering, GPS and staring observations.

Note: Some further information concerning the activities is provided in the Appendix.

3 Satellite Status

3.1 Platform

The performance of the platform was good. No unexpected behaviour / malfunction was identified.

3.1.1 AOCS

The week was relatively smooth.

The fuel consumption over the period between 14/05/2003 and 21/05/2003 was 0.126 Kg. The remaining propellant is in the order of 177.38 Kg on the 21st of May.

Note: Some more information concerning the AOCS operations and the fuel budget is provided in the Appendix.

3.1.2 Power

The power subsystem is working as specified. The available power is in the order of 2380 W as since the beginning of the mission, i.e. no degradation has been identified so far.

3.1.3 Thermal

The thermal control of the satellite is working well. The temperatures are currently all within the specified operational limits.

3.1.4 OBDH

The OBDH subsystem is working flawlessly. No on-board communications problem identified.

The upgrade of the Telemetry Bit-rate took place on DoY 141, the actual switch took place at 07.15z.

The switch was executed nominally, no anomalies were noted either at the Ground station or on-board the Satellite.

The bit-rate was increased from 104857.6bps to 131072bps, all this increase in bandwidth will go to PLM Instruments.

Following this, a PST compatible with the increased TM bit rate was loaded on-board, the Instruments TM allocation in this PST was SPI=91, IBIS=130, JX1=10, JX-2=10, OMC=5, a compatible BCPKT Group 2 was also loaded.

Following this, a maximum TMSP rate of up to 242 TMSP / cycle was observed, the previous maximum was 199. The absolute maximum with the new bit rate is 256 TMSP / cycle, however, to achieve this rate the instrument configuration must also be updated.

The TM bit-rate will remain permanently high from now on.

On the subsequent Goldstone pass, it was noted that some commands were failing at CLCW level.

As Goldstone does not have a TMP installed the CLCW loop must be closed at ESOC by extracting the CLCW from the VC-0 TM frames only which are processed on IMCS.

After investigation it was seen that the ratio of the number of CLCWs applicable to VC-0 TCs compared to CLCWs applicable to VC-7 on the IMCS had changed from approximately 1.14 to 3.5 (with the high rate PST loaded the ratio was about 4.5). This meant that the mean time between VC-7 TC CLCWs had increased substantially, occasionally this time was more than 15 seconds.

TC sequences generally have a time between commands Interlocked at CLCW level of 15 seconds.

After switching tele-commanding to VC-0 no further CLCW failures were observed, this is the current configuration.

Further investigation to fully understand the behaviour is on-going, it is expected that some solution will be found by manipulation of the PST AR INT-002327 is applicable.

3.1.5 RF

The RF subsystem is working properly. The link margin is sufficient to ensure proper TM reception and execution of commands with the ranging channel enabled.

Following the increase in TM bit rate on day 141 between 08:22 and 08:54Z interference / weak signal caused frame loss from REDU. At these times the S/C elevation from REDU was between 9 and 3 Degrees.

The OM reported that this could possibly be caused by a previously insignificant masking problem, which following the decrease in the RF link margin implied by the increase in TM bit rate had become significant. In the subsequent REDU pass with a different azimuth no such problems were noted at low elevation. This supports the theory that the problem may have been due to a masking feature.

As yet no figures are available from TOS-ON regarding the effect of the change in TM bit rate on the RF Link Margin.

3.2 Payload

3.2.1 SPI

The status is nominal.

The instrument is operating in photon-by-photon mode with Spectra telemetry disabled. The TM bandwidth assigned to SPI has changed from 74 to 91 pkts/cycle in rev.73 (21st May).

The Cryo-cooler is working nominally maintaining 85K temperature in the detector cold plate.

Note: Some more information concerning the SPI operations is provided in the Appendix.

3.2.2 IBIS

Status Nominal.

Note: Some more information concerning the IBIS operations is provided in the Appendix.

3.2.3 JEM-X

During the reporting period, JEM-X2 operations were performed as planned in the timeline and JEM-X1 was dormant.

At 07:04z on 21/05/2003 (DoY 141) JEM-X2 was commanded to SETUP mode in preparation for change of TM Bit-Rate. At 07:40 after completion of the operations, the unit was commanded back DATA TAKING mode.

3.2.4 OMC

During the reporting period, OMC operations were interrupted a few times due to different problems, which resulted in stopping of the timeline or missing of slews. A set of OMC Flat-Field and Dark-Current calibrations were performed during revolution 73.

Note: Some more information concerning the OMC operations is provided in the Appendix.

3.2.5 IREM

The status of the unit after the patch is NOT Nominal.

A problem has been reported from IREM PI regarding a delay in the generation of the Scientific files due to an overrun of HK files during long 'Ground Link Off'. The problem affects only the accumulated files and not the TDB distributed via the BCP. A corrective action is foreseen for revolution 75 to reset the scientific files buffer resynchronising the unit.

Note: Some more information concerning the IREM operations is provided in the Appendix.

4 Ground Facilities

The overall performance of the ground segment was relatively good this week.

4.1 Mission Operations Centre

A new problem occurred this week, which caused a Command Verification to fail erroneously, when the IMCS was not able to retrieve the necessary TC packet from the archive. The relevant ARTS has been created.

4.2 Ground Stations & Network

During this week, there were the following problems related to the ground stations:

- On DoY 138 at 08:45 there was a brief TM drop due to Reed Solomon errors from Redu, there was no impact. Later at 15:20 there was another TM drop from Redu, which caused pointing 66 of revolution 72 to be lost, with 67 manually recovered..
- On DoY 139 from 11:47 to 12:02 there was a TM drop from DSS-16, this caused pointing 99 of revolution 72 to be lost, with 100 manually recovered.
- On DoY 141, after the handover to DSS-16 the station was unable to establish the uplink modulation. The impact was pointing 63 of revolution 73 was lost, 64 being manually recovered.

- On day 142 between 18:22 and 18:24 there was a drop in the VC0 TLM from Redu, no impact was reported.

Other points to mention are:

- On DoY 141 at 07:15, the switch to the high bit-rate took place, this caused a brief expected drop in TM, later there were Reed Solomon errors from Redu, perhaps due to masking.
- On DoY 142 at 09:01, the commanding was switched from VC7 to VC0 as there had been a number of failed telecommands due to missing Command Link Control Words, after the switch, the commanding was much better.

4.3 Science Ground Segment

4.3.1 ISOC

No ISOC Input has been provided

4.3.2 ISDC

There was only one very brief problem this week concerning the TM connection to ISDC.

- On DoY 143 at 13:11 the ISDC reported they were not receiving TM, the ISDS & IFRD were rebooted, but it was not until 13:34 when OSC performed a complete application restart that the link was restored. The data missing from this interval will be recovered by ISDC from the CDs produced by ESOC.

The link between the MOC and the ISDC was upgraded on 16th May to cope with the increased bit-rate due to be implemented on 21st May.

5 Special Events

The TM bit rate increase took place as planned, on DoY 141. The operations started at 0630 Z. The upload to the S/C took place at 0715 Z over Redu. Though there was a small interruption of the TM / TC at the IMCS the operations went rather smooth. There were no problems at the IMCS and the data could be routed with the higher rate to ISDC. ISDC reported no problems to process the data at their end.

When a low elevation at the station was reached (about 8 degrees) a lot of data gaps were identified. The station reported bad frames and data were lost until the hand-over to Goldstone that occurred about half an hour later.

The hand-over to Goldstone unfortunately did not work properly due to an equipment problem at the Goldstone station, which was not related to the TM increase. Since the TM / TC links were not available in time the Timeline was stopped and had to be recovered later. When the link was re-established the higher data rate could be supported. A few data gaps due to bad frames have also been noted over Goldstone (elevation at about 68 deg) though the situation was more stable compared to Redu .

Since the change, a test PST that allows to route science data with a higher data rate has been used for most of the time. The OMC FF calibration was nevertheless executed with the PST planned by ISOC in the timeline.

The behaviour of the system is being monitored in order to get some statistics concerning the data losses and the available link margin. If we notice further problems we will also check whether the situation will improve significantly when the ranging channel is disabled. We would like to avoid the switch on / off of the ranging channel because this creates additional operational complexity.

Summarising, it can be stated that the space and ground segment can support functionally the increased data rate. However, it seems that the link budget is becoming marginal. If this is confirmed it might be necessary to reduce the data rate to avoid frequent data losses. In this case we have to perform a few tests in order to identify the data rate that can be safely supported by the system, e.g. 80 % of the envisaged data rate increase. This is important because we need a system that can support the TM / TC links also at unfavourable attitudes. It must be avoided that data are lost for example after a long slew.

In addition we have to monitor the long term system performance, e.g. archiving the data and generation of the CD ROMs, to verify whether some adaptations of the current operations are needed.

6 Anomalies

The problems related to the ground segments are already mentioned in chapter 4.

A list of the pending anomalies since Launch is presented in the Appendix. New anomalies raised during the past week are listed below:

ARid	Date Occurrence	Subject	Segment	Element	Status
INT - 002321	2003/05/18	Drop in telemetry from REDU	Ground	ESA Sta.	Pending
INT - 002323	2003/05/19	Telemetry Drops from Goldstone (DR 109346)	Ground	NASA Sta.	Pending
INT - 002324	2003/05/19	Command A3084 not verified	Ground	IMCS	Pending
INT - 002325	2003/05/21	Telemetry drop from Redu	Ground	ESA Sta.	Pending
INT - 002326	2003/05/21	Hardware failure at DSS-16 during handover DR: GI02772	Ground	NASA Sta.	Pending

7 Future Milestones

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 73

The observations in revolution 73 consisted of the following:

- Raster dithering observation of Mrk 273 (RA 13:44:42.11; DEC +55:53:12.7) lasting ~15 hours. During this observation, the TM allocation was 74 SPI; 107 IBIS; 1 JEM-X1; 8 JEM-X2; 5 OMC and all instruments were in their nominal science modes, except for JEM-X1, which was in Safe mode.
- Staring observation at the OMC Flat Field target (RA 11:54:0.00; DEC +28:23:60.0) during which the OMC Flat Field and Dark Current Calibrations were performed. This lasted about 3 hours and the TM allocation was SPI 74; IBIS 52; JEM-X1 1; JEM-X2 8; OMC 60. SPI, IBIS and JEM-X2 were in their nominal science modes, JEM-X1 was in Safe mode and OMC was in FF Calibration and then DC Calibration mode.
- Raster dithering observation of Mrk 231 (RA 12:56:14.00; DEC +56:52:25.0) lasting ~30 hours. At the start of this observation, the TM allocation was 74 SPI; 107 IBIS; 1 JEM-X1; 8 JEM-X2; 5 OMC and all instruments were in their nominal science modes, except for JEM-X1, which was in Safe mode. In preparation for the upgrade to higher TM bit rate, at just after 2003-05-21T07:00Z, the instruments were put into their standby modes. A PST with total allocation of 91 SPI, 130 IBIS, 10 JEM-X1, 10 JEM-X2, 5 OMC was loaded after the upgrade and this allocation was maintained for the rest of the observation. All instruments, except for JEM-X1, were returned to their nominal science modes following the upgrade to higher TM bit rate.
- Raster dithering observation of NGC 4736 (RA 12:50:53.06; DEC +41:07:13.6) lasting about 12 hours. The TM allocation was 91 SPI, 130 IBIS, 10 JEM-X1, 10 JEM-X2, 5 OMC and all instruments were in their nominal science modes, except for JEM-X1 which was in Safe mode.

Revolution 74

The observations in revolution 74 consisted of 13 pointings of a GPS, followed by a raster dithering observation of NGC 4736 (RA 12:50:53.06; DEC +41:07:13.6) lasting about 17 hours. An amalgamated staring observation of the galaxies NGC 4151, NGC 4258 and NGC 4395 was then performed at (RA 12:10:32.58; DEC +39:24:20.6) for the remaining ~34 hours of observation time.

Throughout these observations, all instruments were in their nominal science modes, except for JEM-X1, which was in Safe mode. The TM allocation commanded by the Timeline (and reported in the BCP) was 74 SPI, 107 IBIS, 1 JEM-X1, 8 JEM-X2, 5 OMC. However, a PST with a TM allocation of 91 SPI, 130 IBIS, 10 JEM-X1, 10 JEM-X2, 5 OMC was loaded manually.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2003-05-07T11:26:52.000Z	177.7509	F	Automatic TM processing.
2003-05-07T20:21:49.000Z	177.7366	F	Automatic TM processing.
2003-05-10T12:55:00.000Z	177.7122	F	Automatic TM processing.
2003-05-10T20:06:28.000Z	177.6890	F	Automatic TM processing.
2003-05-11T05:15:17.000Z	177.6630	F	Automatic TM processing.
2003-05-12T06:22:00.000Z	177.6465	F	Automatic TM processing.
2003-05-13T12:37:32.000Z	177.6005	F	Automatic TM processing.
2003-05-13T19:53:33.000Z	177.5590	F	Automatic TM processing.
2003-05-14T04:59:58.000Z	177.5331	F	Automatic TM processing.
2003-05-14T06:47:34.000Z	177.5019	F	Automatic TM processing.
2003-05-16T12:55:15.000Z	177.4809	F	Automatic TM processing.
2003-05-16T19:29:08.000Z	177.4628	F	Automatic TM processing.
2003-05-18T06:09:03.000Z	177.4231	F	Automatic TM processing.
2003-05-19T19:13:55.000Z	177.3963	F	Automatic TM processing.
2003-05-21T05:32:39.000Z	177.3764	F	Automatic TM processing.

This report was generated Wed May 21 08:00:12 GMT 2003

8.3 Detailed Satellite Information

This section contains some detailed information concerning the various subsystems of the satellite and instruments.

8.3.1 AOCS Operations

AOCS operations were executed from the Automatic Timeline. During this period, 117 Open Loop Slews, 119 Closed Loop Slews and 7 Momentum Bias were executed. 8 slews were lost or executed manually, this is equivalent to a 3%.

17/05/03 (Day of Year 137, Revolution 72)

Nothing to Report.

18/05/03 (Day of Year 138, Revolution 72)

Slews lost due to Ground Station problem (Redu): At 15:20 there was a drop in the TM from Redu, and due to this the uplink of slew 00720066 failed. The impact of this problem was the loss of 00720066, and the manual execution of the slew 00720067.

19/05/03 (Day of Year 139, Revolution 72-73)

Slews lost due to Control System problem: At 13:30 the Command Execution Verification of TC A3084 failed, apparently due to the control system not being able to retrieve the necessary TC packet. This is a new problem. Due to this problem the uplink of slew 00720099 was lost, and 00720100 was performed manually.

20/05/03 (Day of Year 140, Revolution 73)

Nothing to Report.

21/05/03 (Day of Year 141, Revolution 73)

Slews lost due to Ground Station problem (Goldstone DSS-16): At the handover from Redu to DSS-16, DSS-16 was unable to establish the uplink modulation. This delayed the start of operations by around 20 minutes. The impact of the problem was that slew 00730063 was lost, and slew 00730064 was executed manually.

Slews lost due to TC verification delay induced by the new Bit Rate: At 13:15 TC A3192 was not released by the control system, due to the previous command not been verified on time. The reason seems to be that due to the change of TM bit rate, the distribution of the CLCW between the two TM virtual channels has become such, that the information for the TC channel VC-7 tends to come in the TM VC-7 frames, and TC VC-0 information in the TM VC-0 frames. Since the control system only processes VC-0 frames, and the command channel in use was VC-7, CLCW based verification had become very slow. The impact of this problem was that slew 00730070 was lost, and slew 00730071 was acquired manually.

22/05/03 (Day of Year 142, Revolution 73-74)

Guide Star lost shortly after AOS (SEU Filter): At 18:26:16 the ACC STR SEU Filter was exceeded, and the guide released. The lost guide star was a magnitude 7.35 at coordinates (18861, -156). In the TM it can be seen that in the cycle before the first detected False Event, there was an undetected False Event that gave a modified magnitude reading of 7.0. During the autonomous mapping, the ACC found a new guide of magnitude 7.3 and coordinates (-8689, -14930), but it went to False Event immediately and stayed like this for 55 cycles. Note that this star was initially not found in STR slot 1, but moved there from slot 2 when slot 1 became free. It is known that in these cases the STR SEU detection might not be correct for the first cycle, since the comparison is performed against the value calculated on a different STR slot (the CCD window used has a different size in STR slot 1). After the 55 cycles, the star was declared again Full Accuracy (with mag. 8.25), and in the following cycles the magnitude went to 7.7 and the position went back to the original position. The altitude in the orbit was around 15500 Km. This problem had no impact, since the new star found was adequate for the RWB that was the next AOCS activity.

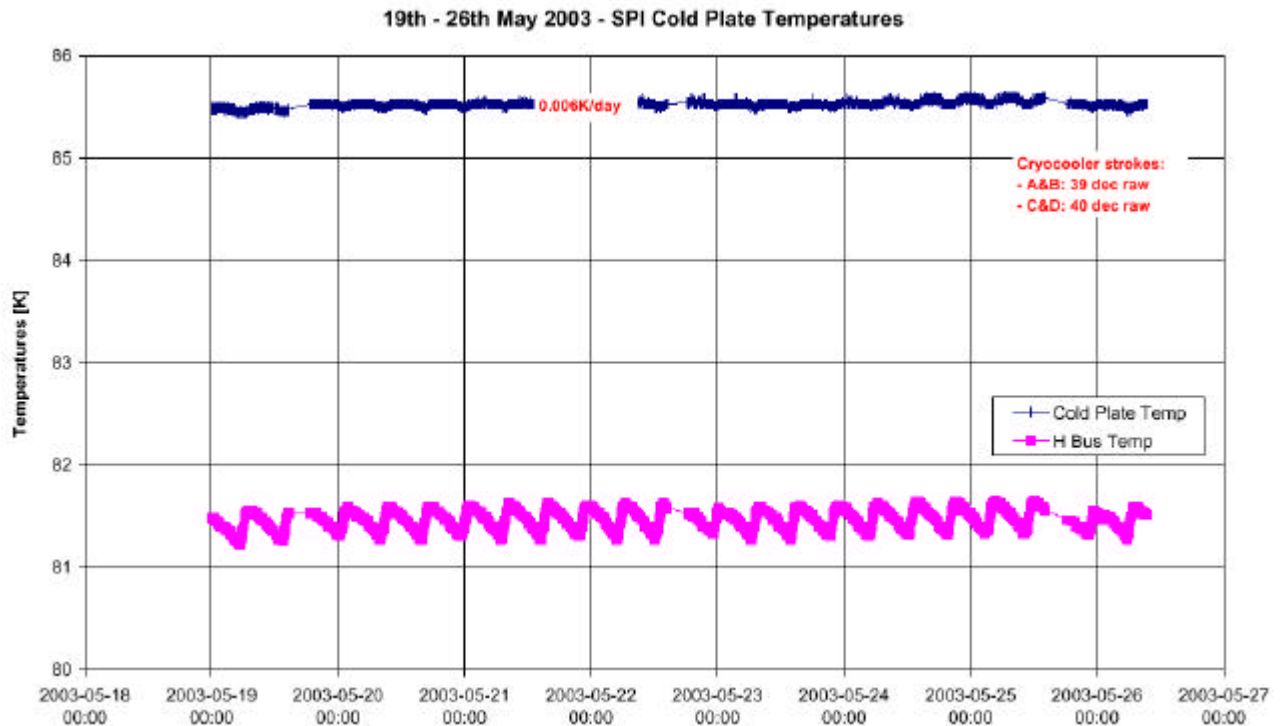
23/05/03 (Day of Year 143, Revolution 74)

Void Corrective OSL due to Flight Dynamics System problem: The corrective OSL 00740016 was not updated by the FDS. The reason was that the FDS machine ran out of disk space, and the TPF could not be generated. Due to this, the corrective OSL was a zero length slew, i.e. did not correct anything. The following corrective CSL, was executed without a problem (the whole sequence is OSL-Corrective OSL-Corrective CSL), there was no impact.

8.3.2 SPI Operations

Cryo-cooler:

The performance of the 4 compressors is nominal and the cold plate temperature is maintained at around 85.5K almost constantly. The drift phenomenon in this week is much less evident than in the past: only 0.006K/day average in 1 week (see plot)

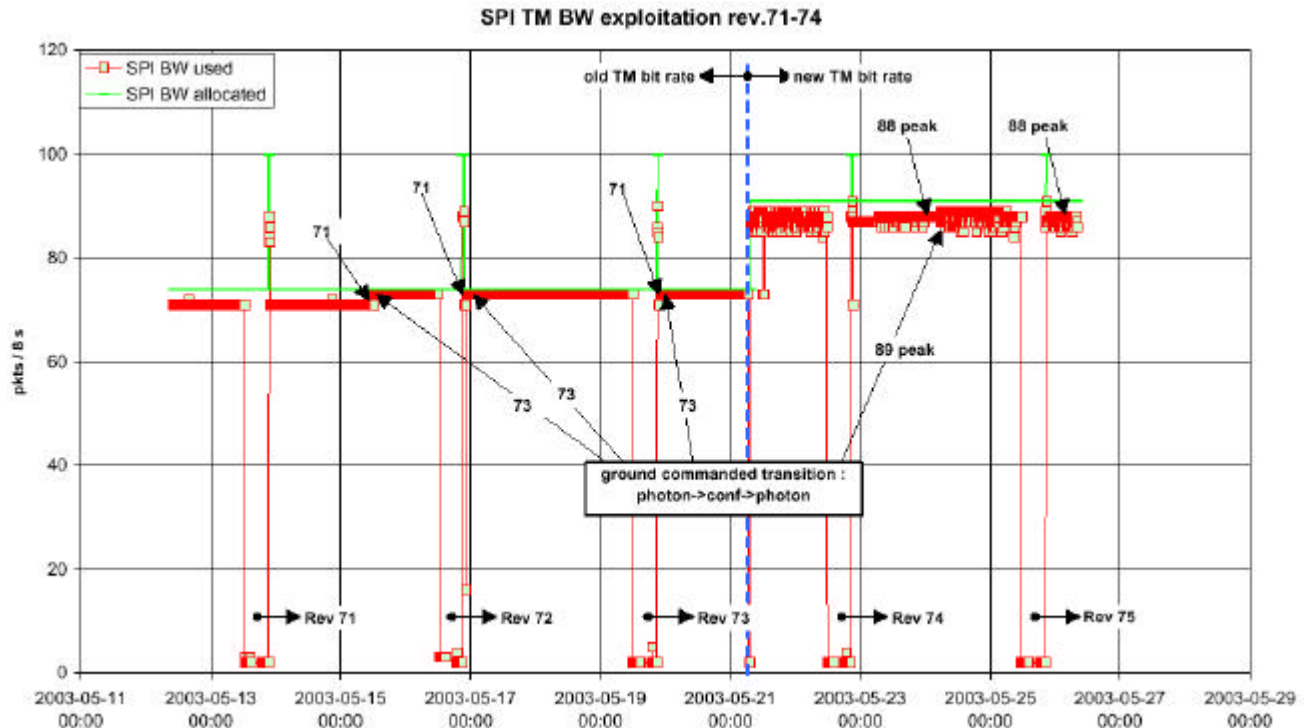


IASW/DPE:

1) During the reporting period the TM bit rate of the S/C has been increased from 204pkts/8s to 256pkts/8s (implemented on 21st May 06:30Z – 09.00Z). Thanks to the change, it was possible to increase the TM bandwidth allocation for SPI, from 74 to 91pkts/8s.

The IASW/DPE has so far responded nominally to the change in bandwidth.

2) The Change Request FCT-OPS-080 - Investigation on SPI TM drop: effects of mode transitions & DFEE spectra en/dis - has been iterated a few more times, also with the increased TM bandwidth (see the following plot for the results).



As a conclusion of this investigation it is suggested to include the ground commanded transition photon→configuration→photon regularly in the EPOS after each belts exit. The proposal is to schedule the ED EPM-02, which makes the transition, in the JX_HVON1 EPOS window, about 10 minutes after belts exit. Details are being discussed with ISOC and SPI team.

ACS: During the change of the S/C TM bit rate (21st May), the ACS High Voltage power supplies were switched off for safety reasons (total off duration about 2.5hrs).

DFEE, PSD AFEE: Nothing to report.

8.3.3 IBIS Operations

On DOY 2003. 139 at 01.22Z the OEM ID 183 Class 2 <<IBIS1 VETO +5V VECU VOLTAGE OUT OF RANGE>> was reported. The relevant TM_para G6106 showed a value inside limits and therefore the problem was disregarded, as suggested by the nominal reaction to this OEM.

At 21.50Z the OEM ID 179 Class 2 <<IBIS1 VETO COUNTER BOTTOM EXCEEDS ALERT VALUE>> was reported. The relevant TM_para G6062 showed values inside limits after few TM cycles and therefore the problem was disregarded, as suggested by the nominal reaction to this OEM.

On DoY 2003. 140 at 00.55Z-04.15Z- 8.38Z-10.26Z-11.23Z-17.23Z-22.25Z the OEM ID 179 Class 2 <<IBIS1 VETO COUNTER BOTTOM EXCEEDS ALERT VALUE>> was reported. The relevant TM_para G6062 showed values inside limits after few TM cycles and therefore the problem was disregarded, as suggested by the nominal reaction to this OEM.

At 8.59Z-16.20Z the OEM ID 180 Class 2 <<IBIS1 VETO COUNTER LATERAL EXCEEDS ALERT VALUE>> was reported. The relevant TM_para G6063 showed a value inside limits and therefore the problem was disregarded, as suggested by the nominal reaction to this OEM.

At 12.43Z the requested INT_OR_0070 (first part) to set the configuration for the reduced TM allocation during the OMC FFC (TM 52) was executed.

At 16.43Z the second part of the INT_OR_0070 was up-linked to reset IBIS back to the original configuration (TM 107).

On DoY 2003. 141, during the test with High Bit rate TM (at 7.15Z), the unit has been set in a safe condition (by up-linking the sequence GEBENT01). To set the IBIS configuration back to Nominal , after the test, part of the sequences GEISCL03 and GEBEXT02 were used.

At 7.46Z a new PST with TM allocation for IBIS set to 130, was up-linked. To verify the correct utilisation of the new PST , it was decided to set IBIS in PPM mode using the default configuration table (by up-linking the sequence GEPPM_02) and by sending an ISGRI CTX tables memory dump. During this period the complete saturation of the TM allocation for the unit was observed, as foreseen. At 8.20, the CCCF has been re-enabled to set the nominal configuration for the following observations. Due to problems in the DSS 16 station, the effective reconfiguration of the unit in nominal observation was not executed before 12.00Z.

At 17.10Z the following SCCs failing: TM_paras G5084-88-100-104-132-164-180-184 (PICsIT FIFO error flag) was reported. The responsible engineer was informed accordingly to the FDIR doc and no further action has been taken.

On DoY 2003. 142 at 11.07Z the OEM APID 1280 ID 9 Class 3 <<IBIS1 TC REP TCEXEC FAIL4>> was reported. This OEM was generated by the CSSW dumping the ISGRI CTXs during an additional test on the new PST (TM 130). The reason for this OEM was due to the short release time set during the uplink of a few TCs (GU9050) to dump the ISGRI CTXs. The test was performed during radiation Belt passage with the unit in safe mode.

8.3.4 JEM-X Operations

Nothing to report

8.3.5 OMC Operations

During this period 4 out of the 224 originally planned OMC image acquisitions were missed.

17/05/2003, DOY 137, Revolution 72

Nothing to report

18/05/2003, DOY 138, Revolution 72

Loss of pointing 00720066: Due to a drop in telemetry after station handover from Goldstone to Redu, slew 00720066 failed execution. After reestablishment of the link, manual slew was done to the attitude of pointing 00720067. This attitude was reached before the execution time of OMC imaging TCs for this pointing. OMC Science operations resumed at 16:06:17 with the start of pointing 00720067.

19/05/2003, DOY 139, Revolution 72-73

Nothing to report

20/05/2003, DOY 140, Revolution 73

Execution of OMC Calibration: OMC Flat Filed and Dark-current Calibrations were performed from 13:08 to 16:16. For these calibrations, 60 PST windows were allocated to OMC. No loss/corruption of calibration packets were reported.

21/05/2003, DOY 141, Revolution 73

OMC in Standby Mode because of change of TM Bit-Rate: In preparation to change the TM Bit-Rate, commanding to OMC was disabled at the beginning of slew 00730060. This caused the instrument to remain in STANDBY mode during pointing 60. OMC commanding was enabled before slew 00730061 and OMC science operations resumed from this pointing.

Loss of pointing 00730063 and 00730064: Because of a technical problem at Goldstone ground station, which was reported as “Exciter Error”, the TC link was disconnected. Slew 00730063 failed execution and the timeline was stopped. After reestablishment of the TC link, manual slew was done to the attitude of pointing 00730064. Since the timeline had been stopped, OMC remained in science mode during the slew and during stay in the attitude of pointing 64 with the imaging parameters for pointing 62. This caused rejection of the commanded centering cycle windows and repeated generation of On Event Message ID 171. At 09:54 the timeline was restarted and OMC resumed its normal operations with the start of pointing 00730065.

OMC to Standby mode because of CCCF: In order to set the correct instrument modes after the instruments were set to their standby modes for the change of TM Bit-Rate, the CCCF which was scheduled at 12:12:47 was enabled. This CCCF was not planned inside a pointing and caused transition of OMC to Standby mode at 12:13:33. OMC remained in standby mode for the rest of pointing 00730068 and resumed its normal operations from the next pointing.

Loss of pointing 00730070: Late AD verification of an AOCS TC caused execution of slew 00730070 to fail. Manual slew was performed to the attitude of pointing 00730071 and parameters for slew 72 were updated manually. OMC started nominal

operations from pointing 00730071 as the attitude was reached before the execution time of OMC imaging TCs.

22/05/2003, DOY 142, Revolution 73-74

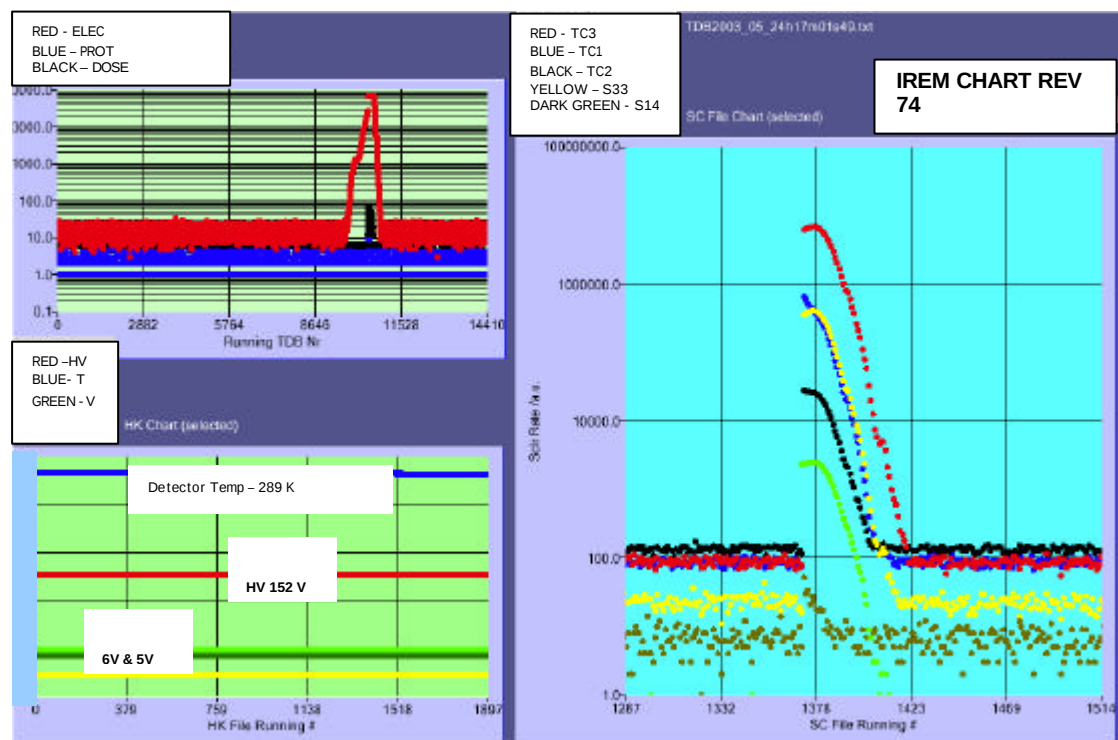
Nothing to report

23/05/2003, DOY 143, Revolution 74

Nothing to report

8.3.6 IREM Operations

An example of the delay on the SCI files is well represented by the perigee passage for rev 74.



8.4 List of Anomalies since Launch

The following table presents the list of all identified anomalies that have been registered since Launch and that are still pending. Though these Anomaly Reports still have a pending status most of the problems have been analysed and solutions or at least workarounds are already in place.

ARid	Date Occurrence	Subject	Segment	Element	Status
INT - 002010	2002/10/22	Time correlation not applied correctly to time parameters in TM type 8 reports.	Ground	IMCS	Pending
INT - 002024	2002/10/28	OEM: SPI1 Fixed print overflow	Space	SPI	Pending
INT - 002061	2002/11/12	TM Desktop performance collapses when de-selecting super-commutated processing.	Ground	IMCS	Pending
INT - 002066	2002/11/13	Data routing to ISDS	Ground	I/F to SGS	Pending
INT - 002082	2002/11/13	TM packet production lower than allocation.	Space	SPI	Pending
INT - 002070	2002/11/14	TDRS: data Retrievals cancelled	Ground	IMCS	Pending
INT - 002092	2002/11/19	Load-Dump comparison uses also non-released load commands	Ground	IMCS	Pending
INT - 002094	2002/11/19	TDRS does not work with super-commutated parameters	Ground	IMCS	Pending
INT - 002142	2002/12/11	TDRS Time Interval Setting	Ground	IMCS	Pending
INT - 002145	2002/12/15	Commands failing PTV for no reason	Ground	IMCS	Pending
INT - 002194	2003/01/16	Wrong handling of the OTF after Open Loop Slew	Space	Spacecraft	Pending
INT - 002199	2003/01/17	Incorrect handling of CLCW wraparound in CLTU mode	Ground	ESA Sta.	Pending
INT - 002197	2003/01/20	Lost Tele-commanding via REDU	Ground	IMCS	Pending
INT - 002208	2003/01/27	Autostack: Commands that fail release do not apply any further interlock.	Ground	IMCS	Pending
INT - 002212	2003/01/29	TDRS Interval-by-Interval TM Retrieval Problem	Ground	IMCS	Pending

Doc. Title : INTEGRAL Mission Report # 35
 Doc. Ref. : INT-MOC-SYS-RP-1001-TOS-OF
 Date : 26/05/03

Issue :1
 Rev. : 0
 Page : 18

ARid	Date Occurrence	Subject	Segment	Element	Status
INT - 002213	2003/01/29	SCOS 2000 Interval-by-Interval TM Retrieval Problem	Ground	IMCS	Pending
INT - 002214	2003/01/29	Drop in telemetry from REDU	Ground	ESA Sta.	Pending
INT - 002217	2003/02/06	TC link drop	Ground	NASA Sta.	Pending
INT - 002219	2003/02/10	IBIS: PICsIT PDMs counters SET to 0 (twice) during nominal operation	Space	IBIS	Pending
INT - 002220	2003/02/10	Wrong Scrolling Display definitions on IMCS following Import	Ground	IMCS	Pending
INT - 002221	2003/02/10	IBIS: SCI sub-mode table loaded only if forcing the sub-mode	Space	IBIS	Pending
INT - 002228	2003/02/21	STR 1750 Processor Fault in the presence of Saturn in the FoV	Space	Spacecraft	Pending
INT - 002233	2003/02/24	Time Calibration not Coherent among Ground Stations	Ground		Pending
INT - 002234	2003/02/24	S2K unable to access READ ONLY disk in IDDA.	Ground	IMCS	Pending
INT - 002235	2003/02/25	Too narrow window for RMU cal in PSF of rev 49	Ground	I/F to SGS	Pending
INT - 002242	2003/03/02	TM & TC Drop on DSS 16	Ground	NASA Sta.	Pending
INT - 002243	2003/03/04	CDS Failed to Lock at Redu - H/O Postponed	Ground	ESA Sta.	Pending
INT - 002246	2003/03/05	Loss of Telemetry from DSS16	Ground	NASA Sta.	Pending
INT - 002245	2003/03/06	TDRS: Retrieval of packet 60602 or contained parameters does not work	Ground	IMCS	Pending
INT - 002252	2003/03/10	CDS out of Lock at Redu - TM&TC Loss	Ground	ESA Sta.	Pending
INT - 002253	2003/03/10	RX1 and RX2 Locked at the same time	Ground	NASA Sta.	Pending
INT - 002255	2003/03/10	Late AOS at DSS-24	Ground	NASA Sta.	Pending
INT - 002256	2003/03/14	Late AOS at DSS-16	Ground	NASA Sta.	Pending
INT - 002257	2003/03/17	Late AOS at DSS-24	Ground	NASA Sta.	Pending
INT - 002258	2003/03/20	IBIS: stop downloading HIST during GCDE	Space	IBIS	Pending
INT - 002259	2003/03/21	TDRS: Retrieval log is Meaningless.	Ground	IMCS	Pending
INT - 002260	2003/03/21	Monitoring task Printout, sample time	Ground	IMCS	Pending
INT - 002262	2003/03/21	TDRS: FEN Retrievals containing status parameters always fail.	Ground	IMCS	Pending
INT - 002265	2003/03/24	Loss of TC & TM Link	Ground	ESA Sta.	Pending
INT - 002267	2003/03/25	Drop in link from ISDS to ISDC	Ground	I/F to SGS	Pending

Doc. Title : INTEGRAL Mission Report # 35
 Doc. Ref. : INT-MOC-SYS-RP-1001-TOS-OF
 Date : 26/05/03

Issue :1
 Rev. : 0
 Page : 19

ARid	Date Occurrence	Subject	Segment	Element	Status
INT - 002268	2003/03/25	No bit lock via DSS-16	Ground	NASA Sta.	Pending
INT - 002270	2003/03/26	Late uplink via DSS-16	Ground	NASA Sta.	Pending
INT - 002271	2003/03/26	Drops in telemetry from DSS-16	Ground	NASA Sta.	Pending
INT - 002272	2003/03/26	TC link via DSS-16 lost	Ground	NASA Sta.	Pending
INT - 002273	2003/03/27	Drop in VC7 via REDU	Ground	ESA Sta.	Pending
INT - 002274	2003/03/28	IFTS MCS instance not working	Ground	IMCS	Pending
INT - 002276	2003/03/28	Crash of OMCAS on DOY083	Space	OMC	Pending
INT - 002279	2003/03/29	Telemetry lost from DSS-16. DR N109197	Ground	NASA Sta.	Pending
INT - 002280	2003/03/30	Telemetry lost from REDU	Ground	ESA Sta.	Pending
INT - 002281	2003/03/31	TC outage via REDU	Ground	ESA Sta.	Pending
INT - 002283	2003/04/01	ISDS-A and IDDA services stopped	Ground	IMCS	Pending
INT - 002284	2003/04/01	Reed Solomon alarms from REDU	Ground	ESA Sta.	Pending
INT - 002285	2003/04/02	Redu Antenna Uplink switch goes off bus	Ground	ESA Sta.	Pending
INT - 002286	2003/04/02	Reboot of ESOC Firewall	Ground	I/F to SGS	Pending
INT - 002288	2003/04/03	TM/TC lost via REDU	Ground	ESA Sta.	Pending
INT - 002290	2003/04/03	Bad frames and TLM drop from DSS-16. Possible RFI	Ground	NASA Sta.	Pending
INT - 002291	2003/04/08	Archiving lost on A chain	Ground	IMCS	Pending
INT - 002292	2003/04/09	Telemetry Drops from Goldstone (DR 6102621)	Ground	NASA Sta.	Pending
INT - 002293	2003/04/13	Science data CDs produced with no TM inside.	Ground	IMCS	Pending
INT - 002295	2003/04/15	Telemetry Drops from Goldstone	Ground	NASA Sta.	Pending
INT - 002298	2003/04/20	ISDS - ISDC link outage	Ground	I/F to SGS	Pending
INT - 002299	2003/04/21	Telemetry loss from DSS-24	Ground	NASA Sta.	Pending
INT - 002297	2003/04/23	Star Tracker 1750 Processor Fault on 21/04/2003 (DoY 111)	Space	Spacecraft	Pending
INT - 002300	2003/04/23	ISDC not receiving ASF files.	Ground	IMCS	Pending
INT - 002301	2003/04/23	Link between NCTRS-A and IMCS-A down for 10 seconds	Ground	NCTRS	Pending
INT - 002302	2003/04/24	Telemetry loss via DSS-16 due to RFI	Ground	NASA Sta.	Pending
INT - 002304	2003/04/26	IFTS MCS instance not working	Ground	IMCS	Pending

Doc. Title : INTEGRAL Mission Report # 35
 Doc. Ref. : INT-MOC-SYS-RP-1001-TOS-OF
 Date : 26/05/03

Issue :1
 Rev. : 0
 Page : 20

ARid	Date Occurrence	Subject	Segment	Element	Status
INT - 002305	2003/05/04	Telemetry Drops from Goldstone. DR GI02720	Ground	NASA Sta.	Pending
INT - 002308	2003/05/05	Loss of TM/TC link due to hit on line	Ground	COMMS	Pending
INT - 002307	2003/05/06	Wrong sign applied in the S/C delay in the correlator.	Ground	IMCS	Pending
INT - 002309	2003/05/06	Command release delayed	Ground	ESA Sta.	Pending
INT - 002310	2003/05/06	TC-1 dropped off line at REDU	Ground	ESA Sta.	Pending
INT - 002311	2003/05/06	Drop in TM on MADDS-ISDSA link	Ground	ESA Sta.	Pending
INT - 002312	2003/05/06	Static PTV in "No Go" State for command A3189	Ground	IMCS	Pending
INT - 002313	2003/05/09	FDE IMU Selection Spurious Change	Space	Spacecraft	Pending
INT - 002315	2003/05/09	Late handover to DSS-16, DR G102733	Ground	NASA Sta.	Pending
INT - 002316	2003/05/09	Loss of TM and TC link via DSS-16. DR G102735	Ground	NASA Sta.	Pending
INT - 002317	2003/05/09	Late handover to REDU	Ground	ESA Sta.	Pending
INT - 002318	2003/05/09	SUN workstation 128 rebooted itself.	Ground	IMCS	Pending
INT - 002319	2003/05/10	TM drop via DSS-16 DR number: G102736	Ground	NASA Sta.	Pending
INT - 002314	2003/05/12	Wrong file displayed for Timeline Summary File	Ground	IMCS	Pending
INT - 002320	2003/05/15	Lost TC link to Goldstone. DR G102748	Ground	NASA Sta.	Pending
INT - 002321	2003/05/18	Drop in telemetry from REDU	Ground	ESA Sta.	Pending
INT - 002323	2003/05/19	Telemetry Drops from Goldstone (DR 109346)	Ground	NASA Sta.	Pending
INT - 002324	2003/05/19	Command A3084 not verified	Ground	IMCS	Pending
INT - 002325	2003/05/21	Telemetry drop from Redu	Ground	ESA Sta.	Pending
INT - 002326	2003/05/21	Hardware failure at DSS-16 during handover DR: GI02772	Ground	NASA Sta.	Pending