

INTEGRAL
Mission Report
INT-MOC-SYS-RP-1001-TOS-OF
No. 020
Week 06
07.02.03
Routine Phase

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1 General

The Flight Control Team at MOC has compiled this report considering a couple of inputs provided by the Flight Dynamics Team.

It addresses the activities from 01.02.03 until 07.02.03 (both dates inclusive) and covers the revolutions 37 & 38.

2 Summary of Activities

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

The targets of the revolutions were the TOO 4U 1630-47, an empty field (RA 07:30:00.0; DEC -40:00:00.0) and the OMC flat field target (RA 07:05:36.0; DEC -75:12:00.0). The observations included raster dither 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 extremely quiet from the AOCS point of view. All slews were performed according to the timeline and there were no losses.

No flickering of the OTF has happened during this week.

The fuel consumption over the last 9 days was 0.23 Kg. The remaining propellant is in the order of 179.27 Kg on the 4th of February.

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.

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.

A few RF link measurements have been performed in order to identify the available link margin. The analysis of the data is ongoing.

3.2 Payload

3.2.1 SPI

The status of the instrument is nominal. Annealing operations are currently on-going.

A new software patch (version 4.20) is planned for next week, preparations are on-going.

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

3.2.2 IBIS

A Gamma Ray Burst was detected on 4th February, which unfortunately lay outside the instrument Field of Views.

Status Nominal, the patch to reduce event with rise time<7 has been successfully installed during the night from 05/01/03 to 06/01/03.

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

3.2.3 JEM-X

During the reporting period, it happened again that JEM-X2 was set to SAFE mode by its own protection system before the "Critical Instrument Altitude Descending." After several instances of JEM-X being set to SAFE mode by its onboard protection system before the BCP radiation belt start time, it was decided to command the active JEM-X unit(s) to SAFE mode at higher altitudes. This will be achieved by planning newly defined EDs, consisting of SAFE TCs, in the timeline.

Also two PI change requests were implemented to set a new value for the Low-level Discriminator and to load the new DFEE S/W version 4.3. After the DFEE SW update, a set of diagnostic dumps were requested to assess (by the PI) the effectiveness of the new patches.

Note: Some more information concerning the JEM-X operations is provided in the Appendix.

3.2.4 OMC

During the reporting period OMC operations were driven nominally by the timeline. On DOY 36 in revolution 38, a set of OMC Flat-Field and Dark-Current calibrations were performed via the automatic timeline.

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

3.2.5 IREM

The status of the unit is nominal.

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

4 Ground Facilities

The overall performance of the ground segment was good, well above the required 95 %. This concerns the number of executed pointings with respect to the planned pointings and the provision of real-time data to ISDC.

4.1 Mission Operations Centre

The performance of the MOC was good in the reporting period.

The automatic update of the change of the guide star parameters and of the slew parameters failed once. The SPACON on duty recovered the operations quickly so that the execution of the Timeline was not impacted.

4.2 Ground Stations & Network

The performance of the operational network was in general good. The main problem concerns the link between the Goldstone station and the MOC, which shows frequent small data losses.

4.3 Science Ground Segment

4.3.1 ISOC

No ISOC Input has been provided

4.3.2 ISDC

No ISDC Input has been provided

5 Special Events

No special events this week.

6 Anomalies

The main remaining system problem concerns the frequent small data drops between the Goldstone station and the MOC. Though the overall performance is well within the specification the frequent drops impact significantly the evaluation of the science data. Some tests to improve the communications, in particular the one between the station and the data centre at JPL, are foreseen in week 7.

A list of the pending anomalies since Launch is presented in the Appendix. A summary of the new anomalies this week is shown below.

INT - 002217	2003/02/06	TC link drop	Ground	NASA Sta.	Pending
INT - 002218	2003/02/08	Loss of lock at DSS-16	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

7 Future Milestones

There are planned Instrument Application Software upgrades for the SPI instruments.

In addition the SPI annealing is on going.

8 Appendix

The appendix includes various detailed information.

8.1 Overview of Revolutions

Revolution 37

Revolution 37 consisted of a raster dither pattern around the transient black hole candidate 4U 1630-47 (RA 16:34:01.68; DEC -47:23:34.8), which was repeated throughout the entire revolution. This was a Target of Opportunity (TOO) observation, the first performed by Integral so far. The TM allocation was 59 SPI, 122 IBIS, 1 JEM-X1, 8 JEM-X2, 5 OMC throughout the science observation and all instruments except for JEM-X1 were in their nominal science modes.

Revolution 38

Revolution 38 began with a continuation of the raster dither pattern around the TOO 4U 1630-47 (RA 16:34:01.68; DEC -47:23:34.8), which was performed throughout revolution 37. The TM allocation during this observation was 59 SPI, 122 IBIS, 1 JEM-X1, 8 JEM-X2, 5 OMC and all instruments except for JEM-X1 were in their nominal science modes.

A staring observation was then performed on an empty field target (RA 07:30:00.0; DEC -40:00:00.0) during which the TM allocation was 39 SPI, 142 IBIS, 1 JEM-X1, 8 JEM-X2, 5 OMC. This staring observation lasted for about 6 hours.

Following this an OMC Flat Field calibration lasting approx. 4hours was performed at RA 07:05:36.0; DEC -75:12:00.0. TM allocation was 90 SPI, 45 IBIS, 1 JEM-X1, 9 JEM-X2, 34 OMC after which an OMC DC calibration lasting 2 hours was performed the same attitude. JEM-X2 was in data taking mode and JEM-X1 remained not used. During this OMC calibration, an IASW patch was performed on IBIS.

The remainder of the revolution consisted of a staring observation on the empty field (RA 07:30:00.0; DEC -40:00:00.0). The TM allocation was 90 S, 74 I, 1 J1, 9 J2, 5 O for the first 8hrs of this observation, changing to 5 S, 167 I, 9 J1, 9 J2, 5 O for the last ~12 hrs, starting at approx. 2003-02-06 08:00Z. At this time SPI was put in CONF mode and the annealing process was begun. The configuration of IBIS and JEM-X during this period was performed manually.

JEM-X2 was put into SAFE mode by the Timeline at 2003-02-06T18:36:57Z, corresponding to an altitude of 70000km descending.

8.2 Consumables

8.2.1 Detailed Fuel Book-keeping

2003-01-26T04:42:17.000Z	179.5025	F	Automatic TM processing.
2003-01-27T14:07:41.000Z	179.4836	F	Automatic TM processing.
2003-01-29T03:54:48.000Z	179.4257	F	Automatic TM processing.
2003-01-29T13:31:05.000Z	179.4083	F	Automatic TM processing.
2003-01-29T15:19:53.000Z	179.3632	F	Automatic TM processing.
2003-01-30T14:01:00.000Z	179.3520	F	Automatic TM processing.
2003-01-31T20:14:07.000Z	179.3370	F	Automatic TM processing.
2003-02-01T03:38:08.000Z	179.2903	F	Automatic TM processing.
2003-02-02T13:58:11.000Z	179.2864	F	Automatic TM processing.
2003-02-04T03:23:11.000Z	179.2690	F	Automatic TM processing.

This report was generated at Wed Feb 5 08:00:08 GMT 2003

Note: The 4.24kg pressurant has now been removed from the fuel-book - the above list shows ONLY the remaining propellant

8.3 Detailed Satellite Information

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

8.3.1 AOCs SUMMARY OPERATIONS REPORT 31/01/2003-06/01/2003

AOCs operations were executed from the Automatic Timeline.
During this period, 40 Open Loop Slews, 145 Closed Loop Slews and 6 Momentum Bias were executed. No slew was missed, and no flickering of the OTF has happened.

31/01/2003 (Day of Year 031, Revolution 36)

Automatic update of change of guide star parameters failed: At 21:49 the automatic update of the change of guide star parameters at the end of the revolution failed, due to the FDS not being able to reconstruct the attitude. The Spacon checked that the change of guide star was actually not needed in this occasion, and the operation was skipped without any impact.

01/02/03 (Day of Year 032, Revolution 37)

Automatic update of slew parameters failed: At 18:46 the automatic update of the parameters for slew 00370023 failed, due to the FDS not being able to reconstruct the attitude. The update was performed manually using the Recover Schedule tool, and there was no impact.

Nothing to report in the rest of the period.

8.3.2 SPI Operations

SPI was operated in Photon by Photon mode until DOY 2003.037.08.00Z with a nominal PST of 59 pkts/cycle except during the empty field reference observation, where the allocated PST was of 90 pkts/cycle (between 2003.034.16:52Z and 2003.035.23.50). The instrument was then put in Configuration mode with a PST of 5 pkts/cycle. At this point a suitable configuration was loaded on-board with ACS and GeD HVs off and IASW automatisms disabled. The cryo-cooler was then shut down and annealing operations started (at 2003.037.09.11Z). The CDMU On-Board Monitoring table was also updated with the entries required for annealing (heater switch off threshold at 113degC). The complete annealing cycle will last until rev.42. Until the shut down for annealing (at 2003.037.08.30Z), the cryo-cooler performances were nominal.

Two change requests (CR) have been submitted by the SPI PI in this initial phase of the annealing ops :

- CR to increase the duration of the annealing period at 104degC (34+/-2hrs instead of 24hrs). This change can be accommodated within the overall annealing schedule (rev.38 to rev.42).

- CR to formally request the operating temperature of 85K for the Ge detectors. When the cryo-cooler will be re-started during rev.41, the stroke should be in fact tuned for a target temperature of 85K instead of 90K. Detectors will be turned on at 117K at the beginning of rev.42 and by the end of this rev, SPI should be working nominally at 85K. In rev.43 SPI will be fully ready to start the observation of the Crab.

SPI IASW release 4.2.0

A new S/W release will be up-linked after the annealing period during the passive cooling phase (rev.41). It will be followed by a series of functional tests. The new release has already successfully gone through the acceptance tests on-ground using the DPE QM and the SPI simulator at CNES. Due to a problem in the test equipment at CNES, it was however not possible to perform any long duration tests (longer than 7hrs). The GS CCB authorised the uplink of the new version, taking into consideration the possibility to roll back to the current PROM version (4.0.0) by DPE reset.

The following corrections/optimisation are implemented by the new release:

- 1) Optimisation of the Spectra compression algorithm (less time required)
- 2) Optimisation of Spectra accumulation start logic (Spectra start conditions are memorised, minimising in this way the BCP manipulation at POS level)
- 3) Increase of priority in the Spectra TM downlink (Spectra transmission should be quicker, with less dead time for the Spectra data during observations)
- 4) OEM for Spectra start/stop reclassified from exception to event class type.

It must be noted that release 4.1.0 is also available as a back up version in case the change (3) does not work as expected in-flight.

8.3.3 IBIS Operations

Status Nominal, performed IASW patch to reduce event with rise time<7.

Reported the OEM ID 131 and 133 Class 2 <<IBIS IASW HSL/LSL TRANSFER FAIL REPORT>> with an average rate of 1/day, due to communications problems affecting the DPE/HEPI and the peripherals through the high speed line and low speed line. The problem is known to the IBIS team. The fix of this problem it is not included in the IASW patch.

On DOY 2003.31.20.50 has been performed the CR PI-OPS-218 in order to save the IBIS configuration before the incoming patch and dumping it on ground. the following files have been dumped and set under configuration control:

IBIS1_LUT1_reference_pre_patch
IBIS1_LUT2_reference_pre_patch
IBIS1_HEPI_reference_pre_patch
IBIS1_VETO_reference_pre_patch
IBIS1_PICslT_reference_pre_patch
IBIS1_ISGRI_reference_pre_patch

The differences found with the images up-linked during the launch/CP were expected (due to the fine tuning of the unit operated during CP) and have been sent to the IBIS PIs for a further evaluation.

Reported on DOY 2003. 32 the OEM ID 180 Class 2 <<IBIS1 VETO COUNTER LATERAL EXCEEDS ALERT VALUE>>. The relevant TM_para G6063 reported a value inside limits and therefore the problem has been disregarded, as suggested by the nominal reaction to this OEM.

Reported on DOY 2003.32.04.38 the OEM ID 183 Class 2 <<IBIS1 VETO +5V VECU VOLTAGE OUT OF RANGE>>. The relevant TM_para G6106 reported a value inside limits and therefore the problem has been disregarded, as suggested by the nominal reaction to this OEM.

On DOY 2003.34.20.03 IBIS has been switched OFF as reaction to the high-radiation automatism triggered by IREM unit. The switch OFF was performed few minutes before the nominal radiation belt entry.

On DOY 2003.035.14.52Z the following PICsIT real time counters were OOLs to 0:

TM parameter G5002-3-7-8-12-13-17-18-22-23-27-28-32-33-37-38

simultaneously an increase of the dead time counters read by the PDMs was noticed. The anomalous counts lasted until 14:54Z, when all the TM parameters went back in limits. An OEM APID 1280 ID 132 flagging a HEPI resynchronisation was also observed at this time. The status of the peripheral under this anomaly condition was nominal (except for the values of the counters) and investigation are on-going at MOC(see related AR) and Instrument team side.

On DOY 2003.035.12.45Z an increase in the count-rates was reported by the PICsIT and VETO detector modules. The event has been classified as a GRB by the observation of Ulysses and other satellites. The event lay outside the FOV of the IBIS instrument and it was not possible to get an image, but due to the increasing count rates of PICsIT PDM 1-5-6 it has been possible to determine that the event was coming from the -z axis of the satellite passing through the SPI instrument (masking the others PICsIT detector) with an aspect angle of ~135 deg. This very rough estimation is consistent with the pointing of the satellite at that moment and with the position supplied by Ulysses and other spacecraft.

On DOY 2003.36.09.40Z has been performed the CR PI-OPS-222 in order to fix the IBIS configuration for the Empty Field before the time foreseen for the IASW patch.

The ED GEBENT02 and GEBEXT01 have been modified accordingly to CR PI-OPS-221 in order to set ON the PICsIT PDMs during the Belt passage.

At time 9:40 the IBIS s/s was disabled in the timeline and the scheduled ED GESTAN02 was not executed as requested.

On DOY 2003.36.17.00Z has been performed the IBIS IASW patch in order to reduce event with rise time <7. the patch has foreseen the following activities:

- 1) IBIS deactivation (only IDPE ON)
- 2) IBIS patch/dump and comparison
- 3) IBIS nominal activation and transition to SCI mode

The patch operation has been successfully executed and further evaluation of the instrument scientific performance is on going (Crab calibration).

After the patch a control of the instrument temperature has been performed before starting any calibration/scientific activity.

On DOY 2003.037.01.55Z the TM_para P2019 (HLCL 4A1) was in OOL soft (3.59 A) due to dissipation on both IEB2 HTRA and IBIS Add Det HTRA. The reaction has been to leave open the IEB2 HTRA until the IEB2 temperature was >-1.94 degC.

On DOY 2003.037.14.00Z after the ISGRI MDU temperatures reached nominal operating values (~0 degC), has been performed manually the ISGRI calibration (GEISCL03) by using the TPF of the Rev 37. After the calibration, have been executed the CR PI-OPS-222 setting the configuration of IBIS after the patch for the next Empty Field.

At time 2003.037.19:56 the IBIS s/s was enabled in the automatic timeline in order to execute the reconfiguration during the radiation belt passage.

8.3.4 JEM-X Operations

31-Jan-2003, DOY 031, Revolution 36

- 17:08:00, JEM-X2 to SAFE mode because of high S/W trigger rates which reached above the onboard HV switch OFF threshold of 20000 cnts/8sec. This happened at an altitude of ~81000 km descending and about three hours before the BCP radiation belt start time. It was decided not to reactivate the unit and let it in SAFE mode for the remaining of the revolution.

03-Feb-2003, DOY 034, Revolution 37

- Two new JEM-X Event Designators KESAFE01 and LESAFE01 were generated to be planned by MOC or ISOC in the timeline to set the active JEM-X unit(s) to SAFE mode at a predefined altitude before entering the radiation belts. After several instances of JEM-X being set to SAFE mode by its own protection system at altitudes higher than the "Critical Instrument Altitude Descending", it was decided to plan these EDs in the timeline before the BCP radiation belt start time as a safety measure. These EDs will be in effect from revolution 37 onwards.
- 18:47:52, JEM-X2 to SAFE mode by LESAFE01 at ~70000km descending.

04-Feb-2003, DOY 035, Revolution 38

- Implementation of the change request PI-OPS-214 to change the nominal value of the Low-Level Discriminator from 2 to 5 on both JEM-X units.

06-Feb-2003, DOY 037, Revolution 38

- Implementation of change request PI-OPS-213 to upgrade the DFEE S/W of both JEM-X units to version 4.3 and to set the new values for S/W integer parameter #81.
- 13:53:00, both JEM-X units activated to their nominal HV settings after the DFEE S/W patch and a series of Diagnostic Data Dumps were requested until 16:37:00 when both units were set to SAFE mode before the radiation belt entry.
-

8.3.5 OMC Operations

05-Feb-2003, DOY 036, Revolution 38

- A set of OMC Flat-Field and Dark-Current calibrations were performed via the automatic timeline at the following times:

2003-02-05T16:51:49Z ED MEFFCA01

2003-02-05T17:46:11Z ED MEFFCA01
2003-02-05T18:40:33Z ED MEFFCA01
2003-02-05T19:34:55Z ED MEFFCA01
2003-02-05T20:29:17Z ED MEFFCA01

2003-02-05T21:12:44Z ED MEDCCA01
2003-02-05T21:26:33Z ED MEDCCA01
2003-02-05T21:40:22Z ED MEDCCA01
2003-02-05T22:14:23Z ED MEDCCA01
2003-02-05T22:32:59Z ED MEDCCA01
2003-02-05T22:51:35Z ED MEDCCA01

8.3.6 IREM Operations

On DOY 2003.34.20.23 Z has been performed the first attempt for dumping the IREM memory. The dump was lasting ~1:10 hours. Few TM drops of secs have been reported during the activity from DSS16. Due to TM drops 8 packets have been not received, requesting therefore to re-execute the dump at the following AOS.

On DOY 2003.35.03.45 Z has been performed the second attempt for dumping the IREM memory. No TM drops have been noticed with REDU station. the dump was completed at 4.56 successfully. Further evaluation by IREM PIs are on going in order to prepare the incoming IREM patch.

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 - 002003	2002/10/19	Command failure from TCE2 at Redu1.	Ground	ESA Sta.	Pending
INT - 002010	2002/10/22	Time correlation not applied correctly to time parameters in TM type 8 reports.	Ground	IMCS	Pending
INT - 002018	2002/10/22	Loss of TM and TC with Goldstone.	Ground	NASA Sta.	Pending
INT - 002024	2002/10/28	OEM: SPI1 Fixed print overflow	Space	SPI	Pending
INT - 002048	2002/11/08	TM Data Retrieval Jobs not executed	Ground	IMCS	Pending
INT - 002055	2002/11/09	IBIS VETO anomalous count rates.	Space	IBIS	Pending
INT - 002061	2002/11/12	TM Desktop performance collapses when de-selecting supercommutated procesing.	Ground	IMCS	Pending
INT - 002062	2002/11/13	Static PTV wrongly handled by IMCS when commands are copied	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 Rerievals cancelled	Ground	IMCS	Pending
INT - 002079	2002/11/14	Timing Problem with Telecommands	Ground	ESA Sta.	Pending
INT - 002083	2002/11/16	SPI DPE Crash	Space	SPI	Pending
INT - 002091	2002/11/18	A-Chain Frozen	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 supercommutated parameters	Ground	IMCS	Pending
INT - 002096	2002/11/19	Retrieval from the stations	Ground	IMCS	Pending
INT - 002097	2002/11/19	Unexpected dithering process when SPI spectra accumulation = 0	Space	SPI	Pending
INT - 002121	2002/11/26	ISGR1 countrates increase up to 8000 counts/sec in one module	Space	IBIS	Pending
INT - 002125	2002/11/29	Data loss between IMCS and ISDC	Ground	I/F to SGS	Pending
INT - 002128	2002/12/01	Wheel Speed monitor crashed	Ground	FDS	Pending

INT - 002122	2002/12/02	IBIS VDM4 HV broke down	Space	IBIS	Pending
INT - 002131	2002/12/04	Lost TC capability via GoldStone(Dss-16)	Ground	NASA Sta.	Pending
INT - 002132	2002/12/05	TM/TC loss via REDU	Ground	ESA Sta.	Pending
INT - 002137	2002/12/08	Handover to DSS-16 delayed due to hardware problems	Ground	NASA Sta.	Pending
INT - 002138	2002/12/09	Command failure	Ground	IMCS	Pending
INT - 002139	2002/12/09	Attitude determination Failed	Ground	FDS	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 - 002152	2002/12/18	NCTRS-A required resetting	Ground	NCTRS	Pending
INT - 002157	2002/12/20	Lost VC-7 from NCTRS	Ground	NCTRS	Pending
INT - 002174	2002/12/29	Wrong GuideStar selected.	Space	Spacecraft	Pending
INT - 002183	2003/01/01	Dyn PTV failure	Ground	IMCS	Pending
INT - 002169	2003/01/03	IREM sw local resets due to SEU (twice)	Space	IREM	Pending
INT - 002191	2003/01/11	FDS not able to update slew parameters	Ground	FDS	Pending
INT - 002194	2003/01/16	Wrong handling of the OTF after Open Loop Slew	Space	Spacecraft	Pending
INT - 002196	2003/01/17	Automatic Stack Needed to be restarted.	Ground	IMCS	Pending
INT - 002199	2003/01/17	Incorrect handling of CLCW wrapparound in CLTU mode	Ground	ESA Sta.	Pending
INT - 002197	2003/01/20	Lost Telecommanding via REDU	Ground	IMCS	Pending
INT - 002200	2003/01/20	TM/TC Link lost via REDU	Ground	ESA Sta.	Pending
INT - 002203	2003/01/21	Telemetry Drops from GoldStone	Ground	NASA Sta.	Pending
INT - 002202	2003/01/22	NCTRS log file writing takes all the CPU making the application fail.	Ground	NCTRS	Pending
INT - 002205	2003/01/24	Telemetry Drops from GoldStone	Ground	NASA Sta.	Pending
INT - 002206	2003/01/25	Link lost to ISDC.	Ground	I/F to SGS	Pending
INT - 002204	2003/01/27	Incorrect eclipse times in BCPKT.	Ground	FDS	Pending
INT - 002207	2003/01/27	TM and TC lost due to COMMS problems	Ground	COMMS	Pending
INT - 002208	2003/01/27	Autostack: Commands that fail release do not apply any further interlock.	Ground	IMCS	Pending
INT - 002209	2003/01/27	Loss of TM/TC via DSS-24	Ground	NASA Sta.	Pending
INT - 002210	2003/01/27	Telemetry loss via DSS-24	Ground	NASA Sta.	Pending
INT - 002211	2003/01/28	Manual Stack crashed on SUN-123	Ground	IMCS	Pending

INT - 002212	2003/01/29	TDRS Interval-by-Interval TM Retrieval Problem	Ground	IMCS	Pending
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 - 002215	2003/01/30	Occasional TM drops on DSS-16	Ground	NASA Sta.	Pending
INT - 002216	2003/01/31	TPF generation failed	Ground	FDS	Pending
INT - 002217	2003/02/06	TC link drop	Ground	NASA Sta.	Pending
INT - 002218	2003/02/08	Loss of lock at DSS-16	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