

ANOMALIES (01.01.2004 - 31.12.2004)

On June 22 2003 the ERS-2 tape recorder became permanently unavailable due to a technical failure. The ERS-2 tape recorders were used to record the ERS-2 Low Rate mission globally. After eight continuous acquisition, this service is discontinued. The ERS-2 Low Rate mission is continued within the visibility of ESA ground stations over Europe, North Atlantic, the Arctic and western North America.

Additionally the DLR Antarctic Receiving Station at the O'Higgins base is providing GOME data in near-real time since 22 October 2003, allowing the monitoring of the ozone hole over the South Pole to resume.

Special GOME operations such as the operational switch off/switch on in time tag (on calendar days 04, 14, 24 each month) are continued also after the unavailability of the tape recorders. Nevertheless due to the non completeness of data, analysis on cooler switchings and instrument switch-offs cannot be performed and detailed information is missing in the tables below.

GOME solar measurements data are not available for certain periods in 2003 (see yearly report 2003), because they were scheduled during non-visibility periods of the groundstations after June 22 2003.

GOME Lamp Failures did occur during nearly all lamp calibration sequences from January 2004 to June 2004. In the few cases, where no Lamp Failure occurred, a high instability in the voltage was noted. A sudden decrease of the voltage from a value of ~198 to typically 180/185V, afterwards remaining on this low voltage value for several products then increase again to the nominal value was observed frequently.

Therefore the Monthly Calibration sequences were reduced to only quarterly calibration. 5 Calibration orbits are scheduled for 28 January, 28 April, 28 July, 28 October each calendar year.

listed are:

- 1. single event upsets**
- 2. patches of the on-board software**
- 3. cooler switchings**
- 4. list of datagaps due to anomalies or special GOME instrument operations**
- 5. timeline interruption (operation in static nadir view)**
- 6. narrow swath timeline GMNNOT41**
- 7. commanding problems - incorrect timelines executions**
- 8. moon measurements**
- 9. lamp failures**
- 10. other events**

single event upsets:

Date	reason
07 - 08/01/2004	on-board software problem caused anomaly (orbits 45567 - 45581); ~09:44 (07/01/04) - ~10:53 (08/01/04)
	Level 0:
	loss of data, for each data segment only
	~3 packets are available instead of usually ~460
10 - 14/02/2004	on-board software problem caused anomaly (orbits 46051 - 46112); 04:57:42 (10/02/04) - ~10:53 (08/01/04)
	Level 0: Instrument status 1A: 3xNACK set continuously (usually not set)
	on-board software problem caused anomaly (orbits 46099 - 46112); 14:00 (13/02/2004) - 11:56:18 (14/02/2004)
13 - 14/02/2004	- instrument swath not nominal: Nadir Static View instead of 960 km swath
	- channel summation: intensity higher than usual for channels 1,2 & 3

on-board software problem caused anomaly (orbits 46120-46141);
00:33 (15/02/2004) - 12:08 (16/02/04)

Level 0:

- INSTRUMENT STATUS1A:

"Normal OPS"-flag not set,

"Checksum Failed"-flag always set

"FPA Latch-Up"-flag always set

"RTM Latch-UP"-flag always set

- INSTRUMENT STATUS1B:

"LED Drivers1"-flag always set

"CALIBRATION UNIT"-flag always set

"MIRROR HEATER 1"-flag always set

"MIRROR HEATER 2"-flag always set

"COVER ERROR"-flag always set

"COVER CLOSED"-flag never set

"COVER OPEN"-flag never set

- INSTRUMENT STATUS 2:

COOLERS 1 & 3 flag set to 253K

(however the temperatures are nominal)

on-board software problem caused anomaly (orbits 47451 - 47541)

Level 0:

- pixel readouts of channel 4 have low values

cured with switch-off/on in time-tag day 24/05

on-board software problem caused anomaly (orbits 47502 - 47541)

Level 0:

- anomalous values for FPA Temperatures (all channels) instead of stable value ~235 K, varying sinusoidal between 230 and ~238 K

- anomalous values for Peltier I, II, III and IV values varying between 0 and - 8419 (nominal would be ~-1)

15-16/02/2004

18-24/05/2004

21-24/05/2004

- anomalous values for

DDHU Temp increased from ~295K to ~305K

Optical Bench Temp incr. from ~282K to 290K

Other Temp B increased from ~275K to ~290K

on-board software problem caused anomaly (orbits 49651 - 49652);
~16:45 - ~20:00

Level 0:

18/10/2004

- 3*Nack flag set

- scan mirror position at 261.8 deg

- detector temperatures at ~267K (instead nominally 235K)

- scan mirror motor current low at 2750 BU (nominally at ~30000 BU)

on-board software problem caused anomaly (orbits 50035 - 50039);
~12:30 - ~21:00

Level 0:

14/11/2004

- 3*Nack flag set

- scan mirror position at 261.8 deg

- charge Amp temperatures. Scan Mirror temperatures, Scan Motor temperatures, scan Unit Electronics temp, Optical Bench temp., calibration unit Lamp temp., pre disperser prism temp. increase

- scan mirror motor current high at 64300 BU (nominally at ~30000 BU)

on-board software problem caused anomaly (orbits 50683-50684);
~19:21:39 - 22:19:42

Level 0:

29/12/2004

- parameter V315 out of limit;

cured with GOME power cycle

on-board software problem caused anomaly (orbits 50685-50692);
22:26:35 (29/12/04) - 11:44:29 (30/12/04)

Level 0:

- parameter V316 out of limit;

- 3xNack flag set

29-30/12/04

- instrument not in rotating mode

- scan mirror position set 16 at 261.8 deg, instead of alternating between +/- 30 deg

- scan mirror motor current at 65535 BU

(nominal would be ~37000 BU)

- pixel channel summation values 0 (no science data available)

patches of the on-board software: none

cooler switchings:

Date coolers off/on maximum detector warm up temperature [Kelvin]

		FPA 1: 244.8 FPA 2: 245.0
08/01/04	10:57:30 off 10:59:37 on	FPA 3: 244.5
		FPA 4: 244.9 FPA 1: 244.7 FPA 2: 244.9
16/02/04	12:09:17 off 12:11:09 on	FPA 3: 244.5
		FPA 4: 244.6 FPA 1: 274.4 FPA 2: 275.2
21/06/04	13:19:28 off 17:47:42 on	FPA 3: 274.8
		FPA 4: 275.3 FPA 1: 270.4 FPA 2: 271.3
18/07/04	01:25:37 off 10:19:00 on	FPA 3: 271.1
		FPA 4: 271.5 FPA 1: 268.8 FPA 2: 269.7
06/11/04	03:50:30 off 10:39:42 on	FPA 3: 269.6
		FPA 4: 269.8 FPA 1: 269.2 FPA 2: 270.0
24/11/04	03:49:30 off 09:34:57 on	FPA 3: 269.9
		FPA 4: 270.1

list of datagaps due to anomalies or special GOME instrument operations: (For detailed information see monthly/weekly performance)

Date	Orbit	duration (GOME off/start of nominal operations)	reason
07-08/01/04	45567 - 45581	~09:44 (07/01/04) - ~10:53 (08/01/04)	loss of data due to SEU
08/01/04	45581	10:57:30 - 10:57:18	gap at KS due to the execution of timeline GMN11 (switch-off/switch-on in time-tag) to cure the SEU
16/02/04	46141	12:09:17 - 12:10:55	gap at KS due to the execution of timeline GMN11 to cure the anomaly (switch-off/switch-on in time-tag) as planned
11/06/04	47803	14:43:24 - 14:51:02	data gap at KS due to an IDHT power cycling to cure an EGH header problem (see ER2-UNA-2004/013)
11/06/04	47803	14:51:10 - 15:03:36	data gap at GS due to an IDHT power cycling to cure an EGH header problem (see ER2-UNA-2004/013)
11/06/04	47804	16:17:09 - 16:27:32	data gap at KS due to an IDHT power cycling to cure an EGH header problem (see ER2-UNA-2004/013)
21/06/04	47946-47	13:19:28 - 16:09:40	data gap due to GOME switch-off (see ER2-UNA- 2004/014)
18/07/04	48324 - 48328	01:25:37 - 09:00:12	data gap due to GOME switch-off (see ER2-UNA- 2004/019)
06/08/04	48608	20:13:37 - 20:27:31	gap at KS due to dissemination problem
06/08/04	48609	21:54:54 - 22:07:08	gap at KS due to dissemination problem
06/08/04	48610	23:38:58 - 23:46:16	gap at KS due to dissemination problem
07/08/04	48614 - 48624	06:31:41 - 23:15:15	KS data missing due to dissemination problem

08/08/04	48628 - 48638	06:00:56 - 22:44:04	gap at KS due to dissemination problem
06/11/04	49915 - 49919	03:50:30 - 10:26:01	data gap due to instrument switch-off (see unavailability report ER2-UNA2004/027)
24/11/04	50173 - 50175	03:49:30 - 09:30:00	data gap due to instrument switch-off (see unavailability report ER2-UNA2004/027)
16/12/04	50496 - 50499	17:46:40 - 22:58:15	no data due to payload switch-off due to incorrect execution of AMI ICU memory test procedure (see ER2-UNA 2004/031)
26-29/12/04	50629 - 50677	00:27:29 (26/12/04) -09:31:00 (29/12/04)	no data due to IDHT in standby and Payload switch-off (ER2-UNA- 2004/034)

Timeline Interruption (operations in static nadir view):

Date	Orbit No.	duration	reason
11/06/04	47804	16:17:09 - 16:43:49	GOME in Nadir Static View
22/06/04	47959	12:30:42 - 12:41:19	GOME timeline was interrupted, instrument in Nadir Static View
07/11/04	49932	08:43:30	GOME Timeline stopped due to Payload synchronisation, instrument in Nadir Static View
07/11/04	49933	10:16:00	GOME Timeline stopped due to Payload synchronisation, instrument in Nadir Static View

Narrow Swath Timeline GMNNOT41

Date	Orbit No.	Duration
04-05/01/04	45526 - 45539	~13:00 (04/01/04) - ~11:00 (05/01/04)
14-15/01/04	45670 - 45683	~14:00 (14/01/04) - ~12:00 (15/01/04)
24-25/01/04	45812 - 45825	~12:00 (24/01/04) - ~10:00 (25/01/04)
04-05/02/04	45970 - 45984	~13:00 (04/02/04) - ~12:30 (05/02/04)
14-15/02/04	46114 - 46127	~14:30 (14/02/04) - ~12:00 (15/02/04)
24-25/02/04	46256 - 46269	~13:00 (24/02/04) - ~10:30 (25/02/04)
04-05/03/04	46388 - 46401	~18:00 (04/03/04) - ~16:00 (05/03/04)
14-15/03/04	46530 - 46443	~16:00 (14/03/04) - ~14:30 (15/03/04)
24-25/03/04	46674 - 46688	~17:30 (24/03/04) - ~17:30 (25/03/04)
14-15/04/04	46976 - 46989	~20:00 (14/04/04) - ~17:30 (15/04/04)
24-25/04/04	47120 - 47133	~21:00 (24/04/04) - ~19:00 (25/04/04)
04-05/05/04	47262 - 275	~19:00 (04/05/04) - ~17:00 (05/05/04)
14-15/05/04	47406 - 419	~21:00 (14/05/04) - ~19:00 (15/05/04)
24-26/05/04	47547 - 47573	~18:40 (24/05/04) - ~12:30 (26/05/04)
04-05/06/04	47706 - 47719	~20:00 (04/06/04) - ~17:30 (05/06/04)
14-15/06/04	47850 - 47863	~21:00 (14/06/04) - ~19:00 (15/06/04)
24-25/06/04	47992 - 48005	~19:30 (24/06/04) - ~17:00 (25/06/04)
04-05/07/04	48136 - 48149	~20:30 (04/07/04) - ~18:30 (05/07/04)
14-15/07/04	48278 - 48291	~19:00 (14/07/04) - ~16:30 (15/07/04)
24-25/07/04	48422 - 48435	~20:00 (24/07/04) - ~18:00 (25/07/04)
04-05/08/04	48580 - 48593	~21:00 (04/08/04) - ~19:00 (05/08/04)
14-15/08/04	48722 - 48735	~19:00 (14/08/04) - ~17:00 (15/08/04)
24-25/08/04	48866 - 48878	~20:30 (24/08/04) - ~18:00 (25/08/04)
04-05/09/04	49022 - 49036	~18:30 (04/09/04) - ~18:00 (05/09/04)
14-15/09/04	49166 - 49179	~20:30 (14/09/04) - ~17:30 (15/09/04)
24-25/09/04	49310 - 49323	~21:00 (24/09/04) - ~19:00 (25/09/04)
04-05/10/04	49450 - 49463	~16:00 (04/10/04) - ~13:30 (05/10/04)
14-15/10/04	49593 - 49606	~17:00 (14/10/04) - ~14:30 (15/10/04)
24-25/10/04	49734 - 49747	~12:00 (24/10/04) - ~09:30 (25/10/04)

04-05/11/04 49892 - 49905 ~13:00 (04/11/04) - ~10:30 (05/11/04)
 15/11/04 50042 - 50049 ~00:00 - ~12:00 (15/10/04)
 24-25/11/04 50178 - 50191 ~12:30 (24/11/04) - ~10:00 (25/11/04)
 04-05/12/04 50322 - 50335 ~14:00 (04/12/04) - ~12:00 (05/12/04)
 14-15/12/04 50464 - 50479 ~12:00 (14/12/04) - ~13:00 (15/12/04)
 24-25/12/04 50608 - 50620 ~13:30 (24/12/04) - ~10:00 (25/12/04)

Commanding Problems - Incorrect Timelines Executions: none

Moon Measurements: none

Lamp Failures:

Date	reason	remark
28 /01 /04	Lamp Failures (no. 88) Orbit 45871	Lamp Failure set, the calibration lamp voltage reached only a value of ~182 V instead of nominally ~197 V, the lamp calibr. interrupted (lamp failure flag set from 15:32:51)
28 /01 /04	Lamp Failure (no. 89) orbits 45872	Lamp Failure set, the calibration lamp voltage reached only a value of ~180 V instead of nominally ~197 V, the lamp calibr. interrupted (lamp failure flag set from 17:13:24)
28 /02 /04	Lamp Failures (no. 90) Orbit 46318	Lamp Failure set, the calibration lamp voltage decreased to a value of ~182 V instead of nominally ~197 V, stop time lamp failure 20:44:47 (start time cannot be analysed due to data are available only at visibility of groundstation)
28 /02 /04	Lamp Failure (no. 91) orbits 46318	Lamp Failure set, the calibration lamp voltage reached only a value of ~180 V instead of nominally ~197 V, Lamp Failure start 20:57:16 stop later than 21:05:41 (data are available only at visibility of groundstation)
11 /03 /04	Lamp Failure (no. 92) Orbit 46481	Lamp Failure set, stop time lamp failure 06:00:59 (start time cannot be analysed due to data are available only at visibility of groundstation)
11 /03 /04	Lamp Failure (no. 93) Orbit 46482	Lamp Failure set, 07:54:03 - 08:03:48, voltage decreased suddenly from ~200 - 180 V
11 /03 /04	Lamp Failure (no. 94) Orbit 46486	Lamp Failure set, 14:36:29 - 14:46:10, voltage decreased suddenly from ~200 - 180 V
11 /03 /04	Lamp Failure (no. 95) Orbit 46488	Lamp Failure set, 17:57:39 - 18:07:20, voltage decreased suddenly from ~200 - 180 V
11 /03 /04	Lamp Failure (no. 96) Orbit 46489	Lamp Failure set, stop time lamp failure 19:25:43 (start time cannot be analysed due to data are available only at visibility of groundstation)
11 /03 /04	Lamp Failure (no. 97) Orbit 46491	Lamp Failure set, stop time lamp failure 22:46:53 (start time cannot be analysed due to data are available only at visibility of groundstation)
12 /03 /04	Lamp Failure (no. 98) Orbit 46493	Lamp Failure set, stop time lamp failure 02:08:03 (start time cannot be analysed due to data are available only at visibility of groundstation)

12 /03 /04	Lamp Failure (no. 99) Orbit 46495	Lamp Failure set, stop time lamp failure 05:29:13 (start time cannot be analysed due to data are available only at visibility of groundstation)
12 /03 /04	Lamp Failure (no. 100) Orbit 46498	Lamp Failure set, 10:43:33 - 10:53:14, voltage decreased suddenly from ~200 - 180 V
12 /03 /04	Lamp Failure (no. 101) Orbit 46501	Lamp Failure set, 14:04:43 - 14:14:24, voltage decreased suddenly from ~200 - 180 V
28 /03 /04	Lamp Failures (no. 102-110) Orbit 46730-734	Lamp Failure set, the calibration lamp voltage reached only a value of ~182 V instead of nominally ~197 V, lamp failures between ~15:40- ~23:50
29 /03 /04	Lamp Failures (no. 111-113) Orbit 46737,46739, 46740	Lamp Failure set, the calibration lamp voltage reached only a value of ~182 V instead of nominally ~197 V, lamp failures between ~03:05 - ~08:36
28 /05 /04	Lamp Failure (no. 111) Orbit 47606	Lamp Failure set, 20:20:06 - 20:27:31, voltage decreased suddenly from ~200 - 181 V
21 /06 /04	Lamp Failure (no. 112) Orbit 47948	Lamp Failure set, 17:46:00 - 17:47:40, voltage reached only a value of 180 V
28 /06 /04	Lamp Failure (no. 113 - 117) Orbit 48046, 48050, 48051	Lamp Failures set during monthly calibration sequences, voltage reached only a value of 180 V
29 /06 /04	Lamp Failure (no. 118 - 122) Orbit 48052, 48053, 48054	Lamp Failures set during monthly calibration sequences, voltage reached only a value of 180 V
28 /07 /04	Lamp Failure (no. 123 - 127) Orbit 48476, 48480, 48481	Lamp Failures set during monthly calibration sequences, voltage reached only a value of 180 V
29 /07 /04	Lamp Failure (no. 128 - 131) Orbit 48482, 48483	Lamp Failures set during monthly calibration sequences, voltage reached only a value of 180 V
28 /10 /04	Lamp Failure (no. 132 - 137) Orbits 49792 - 49797	Lamp Failures set during monthly calibration sequences, voltage reached only a value of 180 V; sequence without Lamp Failure orbit 49794, 17:00:17 - 17:10:19 (but Lamp voltage only 181 V instead of nominal 198 V)

24 Lamp Failure
 /11 (no. 138 -
 /04 139)
 Orbits 50176

Lamp Failures set during monthly calibration sequences, voltage reached only a value of 178 V

Other Events

Date	Orbit	remark
10-12/03/04	46465 - 46499	Lamp Calibration Timeline performed (due to operational error) every two orbits
12/03/04 - 05/05/04	46501- 47279	GOME North Polar View operations
22-23/03/04	46645 - 46659	Due to mode-change to FPM the data is degraded or not available (unavailability fax ref. ER2-UNA-004/002 & 003)
28/11/04	50236	calibration lamp mode 14:07:28 - 14:17:28 after ignition with nominal lamp voltage value, sudden decrease of voltage to a value of ~182 V at 14:07:47 (nominal value ~198V) however no lamp failure occurred
29/12/04	50678	calibration lamp mode without Lamp Failure (TST44 with warm detectors) 11:04:47 - 11:06:41 11:14:23 - 11:16:20 calibration lamp mode without Lamp Failure (TST44 with warm detectors) 21:08:20 - 21:10:16 21:18:02 - ~21:20:22;
29/12/04	50684	first sequence however with calibration lamp instability: after ignition with nominal lamp voltage value, sudden decrease of voltage to a value of ~180 V at ~21:08:52 (nominal value ~198V) however no lamp failure occurred