Mission Satellite Operations

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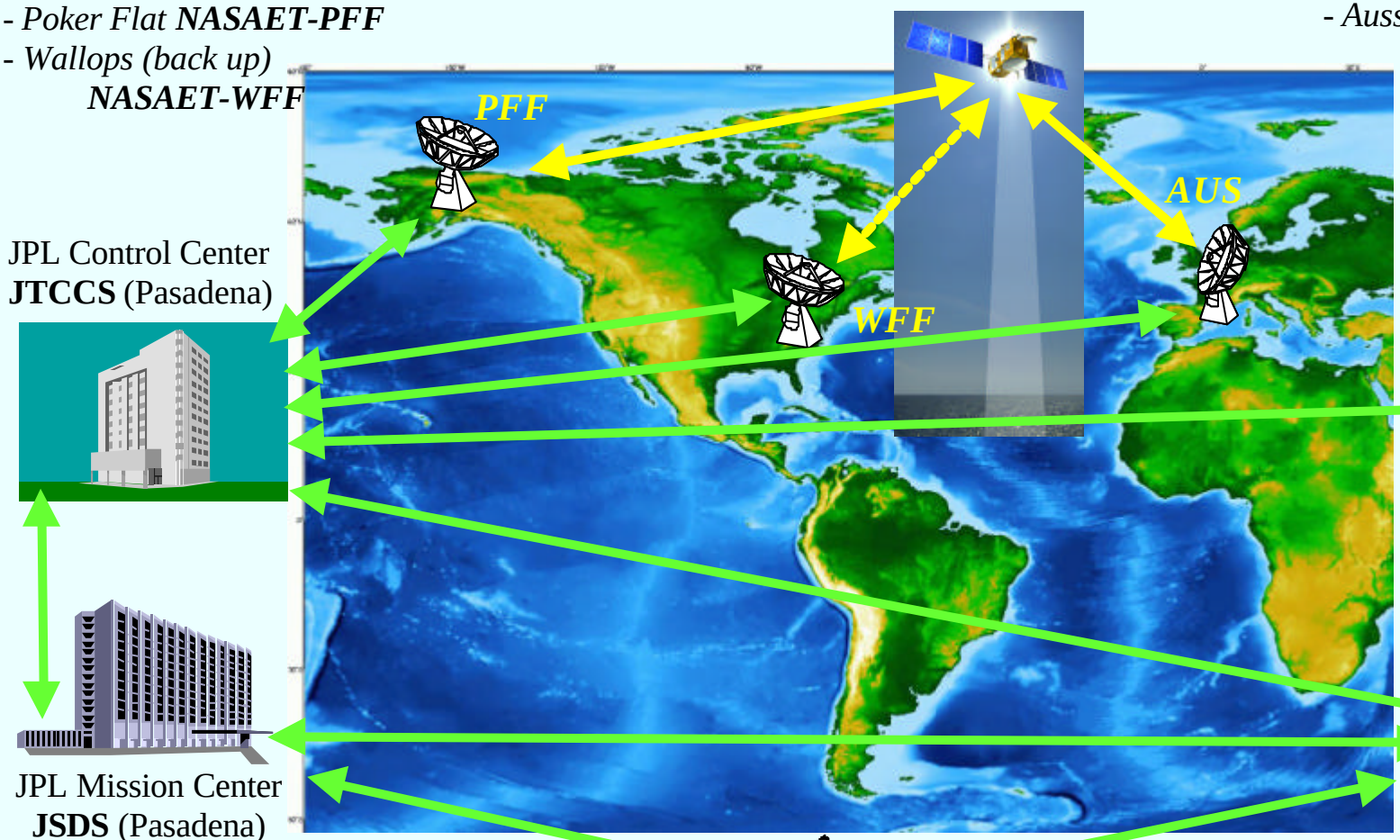
Jason Ground System (Routine)

NASA Earth Terminals :
*- Poker Flat **NASAET-PFF***
- Wallops (back up)
NASAET-WFF

CNES Earth Terminal :
*- Aussaguel **CNESET-AUS***



JPL Control Center
JTCCS (Pasadena)

CNES Control Center
JCCC (Toulouse)

JPL Mission Center
JSDS (Pasadena)

CNES Mission Center
SSALTO (Toulouse)

USERS

CNES/JPL Operations Organization 1/2

- Routine Fly-by activities
  - Connection to Earth Terminal to READ Satellite Mass Memory
  - Telemetry file transmission to Control Centers and Mission centers for archiving and processing
  - OSDR product generation and distribution (PODAAC/JSDS, SSALTO)
- Daily Routine activities
  - Navigation tasks : Orbit determination, maneuver determination, maneuver forecasts, Guidance TC generation and Upload to Satellite
  - Orbital products generation D-1 and distribution (MOE)
  - IGDR products generation for D-2
- Weekly Routine activities :
  - Joint Operational Coordination Group meeting every Thursday to plan the weekly activities
  - Instruments TC upload (Poseidon Calibration)

CNES/JPL Operations Organization 2/2

- Occasional Routine activities
  - Twice per month:
    - Thermal expertise, STR1 expertise : **no impact on science data availability**
  - Once per month:
    - GPS cyclic expertise, Power expertise for the monthly spacecraft report : **no impact on science data availability**
  - Every 3 months :
    - Cross maneuver for Poseidon pointing bias calibration, STR dark current monitoring, Second STR de-stocking to make sure it is running correctly **no impact on science data availability**
  - Every 6 months :
    - Gyro scale factors and gyro misalignments calibration through specific 3 axes maneuver **1 hour without altimeter measurements**
    - Third Gyro de-stocking to lubricate the spinning top axis **no impact on science data availability**

Platform Incident Summary
Since Last SWT (October 21, 2002)

Incident	Date	Cause	Mission impact
STRSTASURV Yellow alarm increasing	From end of October 2002	Suspected pollution	Depointing
POSSADMLERR	2003/09/05 22:10 2003/09/06 01:55	Crack on SADM sensor	None

STR Status

- STR1 patch in RAM on April 9th 2003:
  - This patch changed the “a” and black & white thresholds for star detection & rejection
  - → same behavior for both STR
- The dimming of the STR signal has stabilized since December 2002
  - monitored through STR1 expertise, twice per month
- MAG/GYRO/ALTI ground filter is in development
  - its integration at JCCC is in progress

SADM Status

- SADM zooms detected some errors on both sensors : the right and the left.
- To prevent a SHM due to an erroneous measurement on the right SADM sensor, it was decided to modify the right SADM filter value from 3 to 20 (a SHM will occur only if the error on right SADM position lasts longer than 10 minutes).
- Since the SADM commanding is linked to the right measurement, it is preferable not to disable completely the FDR.
- There is no risk concerning battery deficit linked to this operation.
- Analysis is in progress to change the gain of the filter of the SADM position estimation loop.

Payload incident synthesis since last SWT

Incident	Date	Cause	Mission impact
TRSR2 standby	2002/12/07 11h35 2003/02/28 19h45 2003/06/14 19h30 2003/09/02 07h40 2003/09/03 10h00		Loss of TRSR data, but no mission impact. (TRSR is not a mission critical instrument)
TRSR2 not sending PLTM packets	2003/05/16 03h32 2003/07/30 05h40	Software anomaly. To be modified with new s/w upload.	
TRSR1 incident	2003/09/25	Under investigation. Diagnostics are being planned.	
POSEIDON reinit	2003/03/01 18h23 2003/04/09 00h19		Loss of altimeter measurements: From 18h23 to 22h39 From 00h19 to 08h29

DORIS Specific Operations

- DORIS OBS 2.08 upload on November 25th, 2002.
- Major improvement: the ability to track shift frequency beacons. This permits several active beacons in the same area, without interference.
- Mission Impact:
  - Loss of Doris data from 2002/11/25 12h07 to 2002/11/26 about 21h00 UTC.
  - No OSDR product from 2002/11/25 12h07 to 2002/11/26 about 23h39 UTC.

Poseidon Specific Operations

- long calibration 2 sequence (low-pass filter precise measurement), over ocean (this is suitable for optimal results)
  - First command at 2003/10/06 00:15:00 UTC
  - duration of sequence = 34 minutes and 20 seconds

- particular CAL1 CNG calibration sequence mostly over land
  - First command at 2003/10/06 01:20:00 UTC
  - duration of sequence = 38 minutes and 2 seconds

Maneuver Summary

- Station keeping maneuvers:
  - 2002/10/29 with Δa = 15.28m
  - 2002/12/18 with Δa = 13.83m
  - 2003/02/15 with Δa = 15.33m
  - 2003/04/16 with Δa = 17.42m
  - 2003/04/26 with Δa = -8.69m
  - 2003/06/24 with Δa = 13.57m
  - 2003/10/01 with Δa = 11.58m
  - once every 2 months
- Cross maneuvers:
  - 1 every 3 months in routine
    - 2003/05/02
- Gyro calibrations:
  - 1 every 6 months in routine
    - 02/10/08 with STR1 in ACQ
    - 2003/02/04 with STR2
    - 2003/04/01 with STR2
    - 2003/04/03 with STR2
    - 2003/04/29 with STR1

Yaw Transitions (1/2)

Date and Time	Transition	ß
2002/11/04 23h28	Steering -> Fix –180°	~ 14.5°
2002/11/10 00h41	Fix –180° -> Fix 0°	~ 1.5°
2002/11/16 04h27	Fix 0° -> steering	~ -14°
2002/12/25 17h14	Steering -> Fix 0°	~ -14.5°
2002/12/31 17h52	Fix 0° -> Fix –180°	~ 0.5°
2003/01/06 13h11	Fix –180° -> Steering	~ 16°
2003/02/27 02h57	Steering -> Fix –180°	~ 14.5°
2003/03/04 04h15	Fix –180° -> Fix 0°	~ -0.15°
2003/03/09 00h03	Fix 0° -> Steering	~ -14°
2003/04/28 15h13	Steering -> Fix 0°	~ -15.5°
2003/05/04 13h59	Fix 0° -> Fix –180°	~ 0°
2003/05/10 10h05	Fix –180° -> Steering	~ 14.5°
2003/06/20 05h56	Steering -> Fix –180°	~ 14°
2003/06/26 05h39	Fix –180° -> Fix 0°	~ -0.9°
2003/07/01 05h16	Fix 0° -> Steering	~ -14.5°
2003/08/23 16h02	Steering -> Fix 0°	~ -15°
2003/08/28 14h32	Fix 0° -> Fix –180°	~ -0.8°
2003/09/03 13h29	Fix –180° -> Steering	~ 16.2°

Yaw Transitions (2/2)

Date and Time	Transition	ß
2003/10/23 02h23	Steering -> Fix –180°	~ 14°
2003/10/28 03h42	Fix –180° -> Fix 0°	~ 1°
2003/11/03 20h29	Fix 0° -> Steering	~ -16°

Jason Ground System Status

- Current Jason Ground System configuration and Earth Terminal performance is adequate to meet mission requirements. (Total recovery rate > 99.95%)
  - No system anomalies have led to the loss of any mission or science data
- Jason Telemetry, command and health/safety monitoring is very good
  - Operations Staff is fully trained and constantly recertified in routine operations and contingency procedures
  - Since handover to JPL, there have been 3 command related errors resulting in the loss of 10 minutes of science data.
- Sequencing
  - Hardware/software and the sequencing team are operating well
  - All products and services are meeting requirements
    - Earth terminal scheduling
    - Generation of routine flight time-tagged sequence
    - Generation of all routine flight operations support data products
- The use of task automation is increasing at both the JPL and CNES control centers

CNES/JPL Operations Status

- Mission operations at JPL entered routine phase on 16 April 2002, after a successful handover from CNES to JPL
- Very good performance for both CNES and JPL Control Centers:
  - 99.954% of HKTMR Telemetry archived since Jan 15
  - 99.953% of PLTM1 and 99.940% of PLTM2 Telemetry archived since Jan 15
  - since last SWT less than 0.002% of TM was lost (HKTM & PLTM)
  - Ground system : ROBUST
- Operations Status: GREEN
  - Since mid-January, all the JGS elements are performing well
  - All documentation and personnel training is complete and up to date
  - Doris OBS 2.08 successfully uploaded on November 25th, 2002
- CNES/JPL operational coordination is well defined and working smoothly

JPL Mission Operations
Foreseen Activities for 2003 & 2004

JPL Mission Operations activities during the remainder of 2003 and 2004 will include:

- Continued proficiency testing, retraining and recertification of the Jason-1 Mission Operations Teams at JPL
- Low bit rate testing at NASA & CNES Earth Terminals
- Support of exceptional STR, SADM and TRSR onboard software patches and upload activities
- Testing of increased automation-related activities at JPL