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Gravity Probe B Relativity Mission

MISSION OPERATIONS CENTER

MOC Passlog Procedure

P0999 Rev –

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REVISION RECORD

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1.0 Equipment Required:

TQSM Logbook.

2.0 Scope:

This procedure defines the requirements for what should be entered in to the GP-B electronic logbook (Telemetry Quality and Status Monitoring system, or TQSM).

3.0 Applicability:

This procedure applies to all personnel involved MOC operations. The requirements outlined in this document are mandatory.

4.0 Quality Assurance:

N/A

5.0 Background:

The TQSM logbook is the record from the flight team to others as to what has occurred in the mission operations area. This document tells the flight team what must be logged in the logbook and how to ensure data is recorded for the electronic logbook in the event that it is not operational. The TQSM User's Guide (S0641) describes the process of running the logbook.

The TQSM logbook has four types of data entries. Two of these data types are used in nominal operations, two in off-nominal operations. One is filled in automatically by other software packages for alarm conditions. The last is filled out if there is a SV anomaly.

5.1 Passlogs
The primary data entry by the Cmd and Tlm Controllers is with the Passlog. A Passlog form collects a summary of inputs for each real-time support.

5.2 Notes
Notes are provided for other miscellaneous inputs from the flight team. They can be updates or corrections to Passlogs or inputs that are not specifically related to a support. All flight team members can and should provide note entries to the logbook.

5.3 Alarms

Alarms are summary reports of telemetry data that is out of limits. These inputs are collected by software that reads reports from the real-time and offline data processing software. These cannot be entered manually although notes may be appended to them for clarification or explanation.

5.4 Anomalies
If anyone in the MOC suspects that a SV anomaly has occurred, this is reported to the Flight Director as defined in the Anomaly Resolution Plan (S0897). At the Flight Director's direction, the RE may fill out an Anomaly in the logbook to support the Anomaly Team by capturing the details of the problem as quickly as possible.

6.0 Responsibilities:

6.1 Flight Director

The FD is responsible that all data be captured for the logbook. He is to monitor the logbook throughout operations and verify that passlogs are completed or updated with notes as necessary. The FD also ensures that all the information listed in this procedure is entered in the logbook, either as passlogs or notes.

6.2 Command Controller
The CMD Controller may work the logbook or may oversee inputs by the other controllers. He is responsible that the passlog information is complete and correct and should review it before it is submitted.

6.3 Telemetry Controller
The TLM Controller is generally the prime user of the logbook at the flight console. Passlog inputs should be reviewed by the CMD Controller before submitting them.

7.0 Required Logbook Entries

7.1 Passlog
The header information to each passlog is a summary of the pass - what Pod was used, who the support was with, what the telemetry confirmation was, etc. All fields should be entered correctly for other team members to interpret the activities on the support correctly.

7.1.1 Command Pod (D or E)

7.1.2 Operator (Logbook User Name)

7.1.3 Orbit Number (from the contact schedule)

7.1.4 GN/SN (select satellite or ground station providing the support)

7.1.5 Start time (this is the scheduled support start time)

7.1.6 Stop time (this is the scheduled end of support time)

7.1.7 AOS (the time that the data was actually acquired)

7.1.8 LOS (the time the data was lost)

7.1.9 32k Tlm Fmt. Even on SN passes, the format that is being recorded to the SSR should be entered here.

7.1.10 SSR Status

7.1.11 Cmd Rate

7.1.12 Tlm Rate

7.1.13 Num Cmds
The number of commands is not captured exactly for GP-B due to the command structure. For purposes of review by the rest of the team, count each CSTOL as one command and each load as one command and input the total. If no commands were sent, enter a 0.

7.1.14 Procedure File: Any CSTOLs that are non-standard (handwritten in to the PassPlan checklist)

7.1.15 Notes:
The Notes section is the heart of the passlog for passing on any information to the rest of the team that occurred during the pass. It should include:

a. The quality of the telemetry received.
b. Any issues with commanding.
c. Discuss commanding activity: loading an SPC (give the name of the load file); executing any CSTOLs other than sn_dl_on, sn_dl_off, or send_logevents; sending any commands in a Pass Plan Change Request (PPCR) (copy the command into the logbook or if more than one, at least describe the function of the commanding).
d. Note of any significant verification. This should always include verification of a new ping/pong load execution. If able, other significant timeline verifications should be noted here as well.
e. Any ground system problems encountered and what action has been or was taken to resolve them.
f. Describe any non-nominal activities relating to the support.

7.1.16 Out of Limit(s) or Anomaly(s):

a. A note that something was out of limits and the response taken. This should include snapping an RTWorks file and ensuring the out of limits are captured in an Alarm Entry. If a limit was then disabled or changed, this should be noted as well (and ensure the paperwork of the change has been completed).

b. Safemode occurrences (be sure just to list tests or macros that have ACTIVATED).
c. Error messages in the Eventlog or Messages log.

7.2 Notes
Other notes should be entered into the logbook to let the team know of any status updates or changes. In general, the Flight Director is responsible for making these entries or ensuring that they are entered. This includes:

7.2.1 Updates to any procedures

7.2.2 Changes to the timeline

7.2.3 Anomaly status information as passed on from the ARB

7.2.4 Data processing status (update if not entered by DP team)

7.2.5 Mission planning status (update if not entered by MP team)

7.2.6 Hardware or software problems (with any MOC equipment)

7.2.7 SV issues - these are not well understood issues that the flight team has identified that does not directly affect the operations (higher noise than expected, for instance)

7.2.8 Other - when in doubt, log it.

8.0 In the event TQSM is not operational

If TQSM is not operational, the data is to be captured for later entry in to the logbook. The primary path for this is a README file in the run_dir on the commanding Pod. The README file shall include all information listed above that was captured in the passlogs. Below is a README template for each support. The CMD or TLM controller shall own this file until the TQSM logbook is operational again. The README file shall be formatted as shown below

```
README file started at 2003/189/20:13 when TQSM went down.

Operator:  Fred Jones
Primary Pod:  D

189/20:50 Start of TDE support (2k/2k)  Orbit 532
  SSR Recording Slot 4 (IOCformat)
20:51 Telemetry in lock Fwd Antenna
  Verified timeline executing as scheduled
  Verified GSS3 to primary mode
20:58 Sent pong31900700.load file and enabled it
21:14 Loss of telemetry
21:15 End of support
  All health and safety checks performed.  Only issue was:
```

```
  ** Two parameters were out of limit on the ECU.  RTWorks file was
snapped for later capture into TQSM.  RE was notified and reported
that alarms are temporary due to non-standard ECU configuration for
gyro spin up.  Limit checking was disabled but a sticky note was
left reminding the team to reenable them them at 191/14:00.

189/23:01:14 Start of SGS playback support (2k/2.56M) Orbit 534
  SSR Playback
23:01:53 Telemetry in lock Fwd Antenna
  Verified timeline executing as scheduled
23:03 Sent and confirmed logevent 44
23:05:55 Loss of lock (antenna switch)
23:06:30 Telemtry in lock Aft Antenna
23:08 Sent and confirmed logevent 45
23:12:15 Loss of lock (end of support)
  All health and saftey checks performed.  No issues.
```

These pass entries shall continue with changes to the Pod or the operator noted as required.

The FD may make a separate logbook, the FD_README file to capture all activities and notes unrelated to supports or to capture details of any non-nominal operations.

When the TQSM system is unavailable, the FD will notify the TQSM software engineer. As soon as it is up again, the FD is responsible that the README files are submitted to the logbook as notes.

Summary:

The logbook is the primary communications path from real-time operations to incoming controllers and team members outside the MOC. Please ensure that they get the information that they need in a clear manner.