Science Documentarians
Tutorial
for the August 2002
FIDO Field Test

What are Documentarians?

- Documentarians are responsible for taking notes about science analysis and the tactical sequence build while they fully participate in both
  - A Documentarian is not passive team member!
- There is a Documentarian for each Science Theme Group (STG) and for the SOWG
  - STG Documentarians focus on respective groups; assigned by STL of each group
  - SOWG Documentarian integrates reports from all STG Documentarians for daily tactical build; assigned by SOWG Chair
  - LTP Documentarian has unique duties related to the strategic process and the End of Sol Science Debrief; assigned by SOWG Chair
- This tutorial focuses on STG Documentarians since any Science Team member may be called on to fill this role
Tactical Build Process for August 2002 FIDO Field Test

- Compress 24 hour MER tactical build process to 5 hour FIDO process...
- ...and do it twice a day

August 9, 2002  Science Documentarians Tutorial
If I’m a STG Documentarian, what do I do?

- Take notes about discussions going on within your STG during science assessment and observation planning. You are trying to capture the science behind the command sequences we create.
- Use personal judgment about what should be captured – Hit the high points and avoid a transcript of “He said… She said…”
- Channel the discussion by asking leading questions to gather needed information
- Some of the information you capture will be needed by the SOWG to plan the day’s command sequence
  - This information is passed to the SOWG for discussion at the Science Assessment Meeting and the SOWG Meeting via verbal reports by the STL and by electronic transfer of selected STG notes to SOWG notes
- Good documentation prevents the SOWG (or the ST) from changing your STG’s full color stereo 60 degree wide Pancam panorama of a layered cliff face to a single color Navcam wedge of a rock at the base of the cliff in order to fit an IPS calibration measurement with 10000 coadds into the command sequence

If I’m not a STG Documentarian, what do I do?

- Provide your STG’s Documentarian with any information they need
- As you join the test, review the daily reports created from the Documentarian Database to familiarize yourself with what has been going on
- Capture new science results and hypotheses whenever you like
- Fill out Intent Frames for observation requests
How do I do all this?

• Documentarian notes are captured in an online MySQL database
• GUI web forms guide STG Documentarians through the process. The forms follow the timeline of the Tactical Build Process.
• Standard daily reports will be created to summarize STG and SOWG notes.
• The database will be accessible and searchable to science team

Documentarian Database

• Located online at Washington University
• Examples to follow show screenshots to walk you through the database and explain data inputs
  – Example uses the Geology Documentarian with example notes in database fields
  – Help notes are in blue boxes
• General Tips:
  – Avoid using Back and Forward buttons on web browser
  – Use the Submit button frequently to avoid inadvertently losing your work
• The database is undergoing continuing improvement and may look somewhat different at the FIDO test
If you are your STG’s Documentarian, this is where you start...

Step 1: Login as STG Documentarian

- Login to database as STG Documentarian using userid from table
- Throughout tutorial, we'll will use the Geology STG notes
Step 2: Select Science Assessment Page

- To enter notes from STG Science Data Assessment, select Science Assessment, the proper STG, and the sol from the pulldown menus and hit the “Go/Refresh” button.
- When selected, the “Go/Refresh” button refreshes the current page from the database. If another page has been selected in the fields to the left, that page is displayed.

Step 3: Enter STG Science Data Assessment Notes

- Fill in the fields as needed. They are arranged roughly chronologically from top to bottom of the form.
- Use the Submit button at the top or bottom of the page to enter the information into the database.
- You can submit as often as you like.
- **IF YOU FAIL TO SUBMIT THE INFORMATION, EVERYTHING YOU TYPE WILL BE LOST WHEN YOU LEAVE THE PAGE!!**

- The STL Report section holds any information relevant to today’s operations passed by STL to STG.
- The STL Assignments section holds any assignments from the STL to the STG.
- These sections are not frequently used since STG’s are very informal.
Step 3: Enter STG Science Data Assessment Notes (con’t)

- The Tactical Downlink Assessment section holds any information needed to make tactical decisions for this sol. For example, results of reviewing a hazcam image to determine if an in-situ target is within reach.

- Preliminary, brief science results from downlinked data are entered here. Each result should be referenced to a science hypothesis. New hypotheses can be entered as needed.

- Further science analysis results of a more detailed nature can be presented at the End of Day Science Debrief.

- Check items that should be “published” to SOWG Notes & presented to entire SOWG at Science Data Assessment Mtg.

- Not all information in STG notes needs to be presented to the SOWG. For example, some science results may need further analysis before “publishing” them to the entire SOWG for discussion.

- The Other Issues section holds miscellaneous items not covered in other sections. This section is not frequently used.

- The “Remove” button deletes the adjacent field.

- To add another item in any section, use the “Add <NAME>” button to insert another field in that section.
Step 3: Enter STG Science Data Assessment Notes (con’t)

- Don’t forget to SUBMIT information before leaving the page!

Step 4: Select Observation Planning Page

- To enter notes from STG Science Observation Planning, select Observation Planning, the proper STG, and the sol from the pulldown menus and hit the “Go/Refresh” button.
- Since FIDO tests are time compressed, observation planning and science assessment are often simultaneous. It will be easiest if you have two browsers open and logged in, one to this form and one to the Science Assessment form described in the previous slides, and quickly switch between the two.
Step 5: Enter STG Observation Planning Notes

- Observation requests are entered in this section.
- It is initially blank, and requests need to be added.

Step 5: Enter STG Observation Planning Notes (con’t)

- After adding a request, fill in the fields as needed. The only mandatory fields are Priority, Name, and Hypothesis. Use the other fields as you feel necessary to characterize the observation.
- Enter a number signifying the priority the STG places on this observation relative to other observations requested by the STG.
- Not all fields are shown in this screen capture.
Step 5: Enter STG Observation Planning Notes (con’t)

• To remove the observation request, hit the “Remove” button

Step 5: Enter STG Observation Planning Notes (con’t)

• Don’t forget to SUBMIT information before leaving the page!
If you are not your STG’s Documentarian, this is where you start...

Science Team Members

- Even though you aren’t a Documentarian, there are still things you can do:
  - Fill out Intent Frames for observation requests
  - Capture new science results or hypotheses
  - Review SOWG Documentarian reports summarizing tactical operations
Intent Frames

- Intent Frames provide “background material” for observation requests: special constraints, related observations, downlink rationale, etc.
  - This information needs to be passed along to the ST who create the command sequence
- Entered by any Science Team member or Documentarian as part of an observation request
- During MER operations, Intent Frames will be embedded in SAP. For the FIDO test, Intent Frames will be captured in a database as a proof of concept for MER operations

Selected Intent Frame Fields

- **Science Rationale** – One or two sentences describing the purpose or specific information the observation will generate
- **Constraints & Rationale** – Any constraints on the observation and the reason (e.g., time of day constraint on IPS observations to ensure good illumination)
- **Downlink Rational** – Why the observation should be placed in the DTE or UHF downlink
- **Related Observations** – references to other observations related to this one (e.g., science campaigns)
Select Observation Request
Soil MI Target of Opportunity
Entering and Editing Intent Frames

Step 1: Login as an SOWG member and select "Intent Frames" from the Page Selector and the sol number.

Step 2: In dropdown list, select name of observation request whose intent frame you wish to edit.

Step 3: Enter information in fields

- Science Rationale:
  - Rover is in an old streambed
  - Ruth is a layered sedimentary feature that has undergone solution weathering

- Not all intent frame fields are shown in this screen capture.

- You can enter new hypotheses as needed by clicking here.

Step 4: Submit when done

Capturing Science Results and Hypotheses

- Science results and hypotheses are typically discussed at the SOWG Science Assessment Meeting or the End of Day Science Debrief
  - Documentarians capture the information and resulting discussion at those times

- However, any Science Team member can enter new science results or hypotheses into the database whenever they like
  - Realize that entering information in the database without presenting it at a meeting does not guarantee that other team members will notice your entry!
Entering & Editing Hypotheses

Step 1: Login as an SOWG member and select “Hypothesis Entry” from the Page Selector.

Step 2: In dropdown list, select name of hypothesis to edit or select “New Hypothesis” to create a new entry.

Step 3: Enter information in fields.

Step 4: Submit when done.

The process is similar when entering a science result – Just select “Result Entry” rather than “Hypothesis Entry.”

SOWG Reports

• Each sol, the SOWG Documentarian will create a report summarizing today’s tactical operations.

• The report will cover:
  – Information discussed and presented at the Science Data Assessment Meeting and the SOWG Meeting
  – The final SOWG prioritized observation requests list
  – Summaries of radiated and executed command sequences

• The report will be available to all Science Team members in the Documentarian Database.

• To access the reports, just login as SOWG member and select the sol, STG, and report you would like.

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**SOWG Documentarian**

- For the FIDO test, the SOWG Chair will select SOWG Documentarians from a small group. This group will be trained separately since they use unique tools.
- The SOWG Documentarian integrates information from all STG Documentarians. Primary role is to document the tactical process leading to the final SOWG observation request list and the science and tradeoffs behind it.

**Long Term Planning Documentarian**

- For the FIDO test, the SOWG Chair will select LTP Documentarians from a small group. This group will be trained separately since they use unique tools.
- The LTP Documentarian captures information discussed at the End of Day Science Debrief:
  - This requires the LTP Documentarian merge hypotheses from all other STGs and continuously tracks hypothesis status, approaches to hypothesis testing, key scientific findings, and generation of new hypotheses.
- Primary role is to document the strategic process and maintain a science log.
Glossary

Observation A high-level group of rover commands that provides a desired data product. This is the level of detail at which the SOWG usually plans. At times, the SOWG will plan at the more detailed command level to speed the tactical build or fit within resource constraints. An example of an observation is an IPS measurement of a specified target. This high level observation typically consists of low level commands for a calibration spectrum, a Navcam wedge, several IPS spectra, another calibration spectrum, and a series of mast movements to aim the instrument; the SOWG may alter the observation by removing the command for the Navcam wedge to reduce data volume.

Downlink Transmission of acquired data from rover to Earth. DTE downlink of Sol N data occurs at the start of planning for Sol N+1. UHF downlink of Sol N data occurs after the SOWG Meeting for Sol N+1 while the ST (including the SOWG Chair) is creating the Sol N+1 sequence. UHF data for Sol N is not available to plan the Sol N+1 sequence.

Sequence The command list created by the ST using SOWG observation requests and radiated to FIDO. Also called the command sequence.

Uplink Build The daily tactical activity cycle including downlink assessment, SOWG meetings, and the ST meeting. The result of the build is the command sequence radiated to the rover.
## Acronym List

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>STG</td>
<td>Science Theme Group</td>
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<tr>
<td>STL</td>
<td>Science Theme Lead (chairs STGs)</td>
</tr>
<tr>
<td>LTP</td>
<td>Long Term Planning STG</td>
</tr>
<tr>
<td>ICWG</td>
<td>Information Communication Working Group</td>
</tr>
<tr>
<td>SOWG</td>
<td>Science Operations Working Group</td>
</tr>
<tr>
<td>SAP</td>
<td>Science Activity Planner</td>
</tr>
<tr>
<td>FIDO</td>
<td>Field Integrated Design and Operations rover</td>
</tr>
<tr>
<td>MER</td>
<td>Mars Exploration Rover</td>
</tr>
<tr>
<td>ST</td>
<td>Sequence Team (builds command sequence for uplink to FIDO)</td>
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<tr>
<td>DTE</td>
<td>Direct to Earth</td>
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<tr>
<td>UHF</td>
<td>Ultrahigh Frequency</td>
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