JCMT Observing Tool Tips and Tricks

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JCMT OT tips and tricks

• Aims
  – Simplify science programs.
  – Avoid mistakes, e.g. copy & paste errors.

• Overview
  – Target information.
  – Inheritance.
  – Folders.
  – Survey containers.
  – Validation.
MSB life cycle

CADC

Hedwig Proposal Submission System

QT

ORAC-DR

OMP
Target information — tips

• Try to give the target’s usual name.
  – Use the name you would want to see in the archive.

• Make use of offset iterators.
  – Define locations relative to a fixed target.
Target information and MSB title

**Target Name**
Give the name you would wish to see used in the archive.

**MSB Title**
Use this for your own identification of the MSB.
Target information — FITS headers

FITS headers

```
MSBTITLE = 'Standard:CRL618'   / Title of minimum schedulable block
OBJECT = 'CRL618'              / Object of interest
```
Target information — CADC

This is how the observation will appear in the search interface at CADC.
Inheritance — tips

• Science programs are hierarchical:
  ◆ Top level
    ➔ Folder
    ➔ MSB
    ➔ Observation

• Observations inherit options from parents.
  – Instrument, target, site quality, DR recipe, notes.
Inheritance — example

Inherited Options
MSBs inherit options from parent containers.
Target information without inheritance

- Individual targets in each MSB.
- Define 3 positions along a source.
- Personal target names.
- Uninformative MSB titles.
Inheritance — target information

Better Example

- Standard target name.
- Shared target component.
- Same base position for each MSB:
  - ORAC-DR should automatically co-add maps.

- Personalized MSB titles.
- Offsets for position of each MSB.
- Avoid having to manually compute offset positions.
Inheritance — notes

Multiple “Show to the Observer” notes.
Inheritance — notes in QT

The OMP combines all of the notes when they are shown in the Query Tool.

- This is a note at the top of the science program.
- This is the 1st note in the MSB.
- This is the 2nd note in the MSB.
Inheritance — warnings

- Warnings:
  - Parent options *after* the MSB are included too.
  - Target information & heterodyne setup must be at the same level when using target’s radial velocity.
  - DR recipe must be at same or lower level than instrument.
Folders

- “AND” folders
  - Organize MSBs into groups.

- “OR” folders
  - Select alternative MSBs.
“AND” folders

Configuration at the top level used by all MSBs.

Configuration in the “AND” folder used by the MSBs inside.

“AND” folder does not affect when MSBs are observed.
“OR” folders

Original Program
- 5 different MSBs
- Want to do 2 of them ("Select" 2)
- 5 observations each (5X)
“Or” folders — during selection

- This MSB has been observed.
- MSB moved outside OR folder.
- Observe counter decreased to 4.
“Or” folders — after selection

- “Select” counter now at 0.
- No more MSBs will be chosen.

- 2 MSBs have now been observed.
- Selected MSBs outside folder.
- They will be completed (4X more each).
Survey containers

- Repeat an observation for multiple sources.
- Source list can be loaded from a file.
Survey container — example

MSB inside Survey Container.

**Means:** make a copy of this MSB for each target.
Survey container — in the OMP

Becomes multiple MSBs in the OMP.

Click here for more details on the science program.
Click here to download or plot the regions observed in this program.
Survey container — fetched MSB

MSB fetched from the OMP
System inserts a target from the survey container when MSB is observed.
Survey container in MSB

Survey Container inside MSB.

**Means:** a single MSB to observe all targets in one session.

Very long time estimate!
Survey container in MSB — OMP

Single large MSB in the OMP.

Normally not what you want!
Validation — overview

- Validation of a single MSB:
  - Internal check only.

- Validation of whole program:
  - Internal check of each MSB.
  - XML schema validation of program.
Validation — internal check

Select an MSB to do internal check only.

Errors and warnings generated by the OT.
Validation — XML schema validation

Select program to do internal check and schema validation.

Technical description of problems in XML file.

Cause of error: “country” field is empty.
Common pitfalls (1/2)

- Some MSBs can be hard to observe:
  - Long time.
  - Strict constraints (e.g. opacity, scheduling).
  - Widely-spaced targets.

- “Observe” counter vs. “Repeat” iterator.
  - MSB “observe” counter: do MSB multiple times.
  - “Repeat” iterator: extends duration of the MSB.
Common pitfalls (2/2)

- Program may have been updated by the OMP.
  - Message: “Science Program has changed on disk”.
  - Fetch program from OMP database before editing.

- Must use Oracle’s version of Java.
  - OpenJDK can appear to work at first but problems often occur.

- Sometimes updates only saved on key-press.
Tutorials

• Basics tutorial
  – Installation and basic usage of the OT.

• Tricks tutorial
  – Practice of techniques from this presentation.

• Tutorials & example files can be found here:
  http://www.eaobservatory.org
  /jcmt/science/reductionanalysis-tutorials/