

# Identification of Issues that Need Resolution Before Webapps Can Be Used for Ka Observing

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## **Abstract**

This document lists a number of issues that should be addressed before the SSS group releases its webapps to the general community for Ka band observations on the VLA.

## **A. Work Flow**

The SSS programming team is working under the assumption that the end product of the Observation Preparation Tool (OPT) is a Jython script that can be fed to the executor and that the OPT need produce no other artifacts. There may be a serious impact to our schedule if these assumptions are incorrect. We are suspicious about these assumptions and have the concerns listed below.

1. How should the user indicate that observation preparation is complete? We anticipate some kind of "submit" button that triggers the generation of a script and sends it somewhere.
2. What actions should the OPT take upon script submission? Does it send the script somewhere? Does it notify someone or something that a script is ready?
3. If the observer has submitted a script, and if the script has not yet been executed, should the observer be able to "unsubmit" the script? This would seem necessary for situation where the observer has discovered an error in the observation setup. To whom or what would the OPT make the request to ignore the prior submission?
4. How is this observation scheduled? Is there enough information in the script alone for the current scheduler to do its job? If not, where does this other information come from, or, alternatively, how is this lack of information handled?

The programming team's lack of understanding in this area could be the biggest impediment to being able to use the webapps successfully.

## **Actions**

- a. SSS will either raise these issues at its next staff meeting or ask Bryan Butler for answers.

## **B. User Authentication and Authorization**

The SSS programming team no longer maintains the NRAO user database, and it has not yet begun interacting with the new user database (UDB) that is maintained by the E2E group. This is probably our second biggest hurdle to a successful introduction of our web applications. Issues that need to be addressed are shown below.

1. User authentication – is this person who they say they are. Presumably, once we hook into the E2E UDB this will be resolved.
2. User authorization – this particular user is permitted to take a particular action. At a bare minimum we need to be able to allow a project's owner access to their own projects and to no other projects. Beyond this we probably want to allow multiple people to have access to a given project, perhaps some who have permission to make changes and others who do not. We need to learn what support the UDB can give us in this regard, what the requirements are regarding permissions, and what we need to do to our applications in order to support user authorization.

## Actions

- a. SSS will talk to E2E in the very near future to learn what it needs to do in order to hook into their UDB.
- b. SSS will review the original requirements documentation to learn more about what must be supported.

## **C. Technical Issues**

There are a number of technical issues that may have an impact on the user experience. Some of these are listed below.

1. Will we be able to handle many people using the web applications at the same time?

### Actions

- a. Part of our testing must simulate this situation.

2. Will the response time for some of the more intensive operations, such as loading the whole GBT source catalog, be unacceptable?

### Actions

- a. We will solicit feedback from testers, especially off site testers.

3. The SSS staff tends to use web browsers from the Mozilla family. We will need to test the compatibility of our applications with other common browsers.

### Actions

- a. We have other browsers installed locally and will do some testing ourselves. We will also ask our testers to help us here.

4. We have experienced problems during the course of development with users starting some new action before the application has finished its current action (see JIRA issue EVL-444). Sometimes a problem caused by one user can affect all users.

### Actions

- a. We will test to see if this issue is still a problem.

5. Assuming that we will be allowing multiple users to access a single project simultaneously (see B.2., above), we need to understand what would happen right now in this situation. It is likely that the behavior we will see is not the one we want.

### Actions

- a. If the original requirements documents do not discuss simultaneous use thoroughly, we will ask our scientists what the requirements are. For example, do we need to give more than one user write-access to a project at the same time? If one or more people are updating a project and others are viewing, how soon after an update do the viewers need to see that update? Do they need to take some kind of refresh action?

- b. Assuming that simultaneous use is required and that we need to communicate updates quickly, SSS will start thinking about how to do this.

- c. SSS will talk to E2E to see how this may have been solved for the Proposal Submission Tool (PST).

6. The OPT communicates with the Source Catalog Tool (SCT) and Resource Catalog Tool (RCT) via XML. The object / XML translation is handled by JAXB. Beginning with version 2.1.x of JAXB, which is included in the latest JDK updates, many of our XML unit tests fail. The latest JAXB does not handle certain kinds of lists properly. There is a bug report in JAXB-land for this, but we do not know when this will be fixed.

### Actions

- a. Continue to monitor the JAXB project for updates. If no fix has been made by ???, begin making alternative plans for inter-application communication.

## **D. Clarification of Requirements**

Below is a list of questions that we need to ask in the context of Ka band observing. The answers we get in that context may be different than those we would receive were we to ask them in the context of the “final” system.

1. Do we keep the bracketed scan loop concept that we just implemented? There has been some back and forth here and we need a final decision.
2. For Ka observing we plan to support the Standard Observing and Interferrometric Pointing scan modes. Do we need to support Tipping? Amplitude Delay Calibrating?
3. Do we need to model and capture scheduling constraints for Ka observing?
4. Do we need to make improvements to calibrator searching?
5. Do we need to eliminate the RA / Dec groupings in the calibrator catalogs?
6. Should we add new groups to the calibrator catalogs? Who will specify these?
7. Should there be a catalog of instrument configurations populated with common Ka setups? Who will create these?

### **Actions**

- a. SSS will pose the questions above at one of the weekly meetings.

## **E. Known Model Issues**

Below is a list of issues for the model software.

1. The V1aConfiguration class is in charge of calculating SSLO.

### **Actions**

- a. SSS will confirm its understanding of how to calculate this. The issue is when to use subtraction and when to use addition.
2. There may be some combinations of data values within V1aConfiguration that are not valid. For example it has been mentioned that the two central frequencies must be within 2GHz of each other.

### **Actions**

- a. SSS will ask the scientists whether this is so.
3. It would be helpful to downstream clients if the V1aConfiguration had any irrelevant fields in a default state that would keep those clients from needing extra logic. For example, if the configuration is set up to use only one IF pair, and if in such cases downstream processes would like the same bandwidth codes for the used and unused pairs, then it would be convenient if the V1aConfiguration class ensured that both bw codes were the same.

### **Actions**

- a. SSS will determine what is convenient for the script producing code and make sure this class meets those needs.
4. Dave had an email exchange with Barry regarding the ProjectType and SchedulingType enumerations.

### **Actions**

- a. SSS will clean up these enumerations.
5. The idea of constraining the list of scan modifiers that we present to users based on the chosen scan mode has been discussed more than once.

### **Actions**

- a. SSS will ask the scientists for this information.

6. When constructing pointing scans from a well known pattern, such as a five-point, we currently have the offsets constructed with multipliers such as +1.0 or -0.5. The intention was to use these multipliers and some property of the chosen resource to derive actual RA / Dec offsets.

**Actions**

- a. SSS will ask Bryan Butler for the specifications.

## **F. Known Application Issues**

These are some of the issues for the RCT, SCT, and OPT.

1. There is currently little or no user help for our applications. Brian has shown Lorant where to go and what to do in order to add help messages.

**Actions**

- a. Lorant will begin creating help messages.
2. There are many data items that are currently part of the user interface, but that will not be ready for use for Ka band observing. For example, we plan on making the new automated scheduler privy to the project data model and have it, and the executor, update the execution status of SBs. We plan to hide such fields from the user for now in order to minimize confusion.

**Actions**

- a. SSS will identify many of these fields on its own, but will also seek guidance from the scientists.
- b. SSS will hide the identified data fields.
3. When a user of the OPT selects a source (or resource), they do so by being redirected to the catalog. When a selection is made, a copy of the source is imported into the project data model. If a user wants to edit a project's source, the means of doing so may not be apparent.

**Actions**

- a. SSS will come up with a way to make this more intuitive for users.
4. In the SCT the copy / paste mechanism is used to add a source that is already in the catalog to other groups. The copy / paste mechanism, however, will not lead to a second copy of a source in the catalog. This may not be what the user expects.

**Actions**

- a. SSS will come up with a different way to add catalog items to groups. The copy / paste mechanism will add a (renamed) copy of the item to the catalog.
- b. On a somewhat note, SSS will ask in one of its upcoming meetings whether or not all items in a catalog should belong to at least one group.
5. For the OPT we have two sets of HTML pages: one that allows read / write access and one that allows read-only access.

**Actions**

- a. SSS will ensure that these sets are in sync and stay that way.
6. The OPT has a status widget that shows when the system is busy, the RCT and SCT do not.

**Actions**

- a. SSS will put this widget on all three applications.
7. We will eventually be supporting the concept of reference antennas.

**Actions**

- a. SSS will ask the scientists if this is needed for Ka observing.

8. Users are able to drag scans in the tree view of a scheduling block to different locations, influencing a scan's order within the SB. Right now it is difficult to move a scan to the end of an SB if there is currently a loop at the end. This is JIRA issue EVL-504.

**Actions**

- a. SSS will first find out from users how important an issue this is.
9. Our current users felt that the "New" menu in the main menu bar (which also contains "File" and "Edit") was not intuitive and would be better placed within the File menu. This is JIRA issue EVL-499.

**Actions**

- a. SSS will make this change.
  10. The OPT has a first cut at a user interface for pointing scans.
- Actions**
- a. SSS will reexamine the interface and make changes if necessary.

## **G. Testing**

In a recent meeting regarding Ka observing we sketched a rough plan for testing. In the immediate term this testing is done mainly by the developers. After SSS gives the signal, Lorant and other NRAO scientists will become more involved in the testing. Awhile after that NRAO will enlist the help of off site (non-NRAO, or at least non-AOC) testers.

**Actions**

- a. SSS should try to get the NRAO testers involved around May 1.
- b. NRAO should make a go / no-go decision around June 1.
- c. NRAO should get outside testers involved some time in June.

The following are just a few items that we know need to be tested. A much, much, more thorough test plan is needed, but these are important enough to list here.

1. PST-style text import / export of sources in SCT. SSS is pretty sure this is done, but resting is warranted.
2. Comparison of scripts produced by OPT to those produced by JObserve / obs2script. SSS expects one or more of the scientists to do this.
3. Data in the NRAO calibrator catalogs. The calibrator catalogs shown in the SCT were produced programmatically by parsing plain text files or HTML pages. As such there could be systematic problems with the data. A scientist will need to review the data in these catalogs for accuracy.

## **H. Production Software**

Because we are not yet in production we have been able to play fast and loose in a few areas. This will have to stop soon, and we will need other ways of dealing with these things.

1. It is inevitable that we will need to update the database schema in the future, even after we have real user data stored. We must be able to update the schema without altering saved data. Certain simple actions, such as adding a column to an existing table, can be accomplished easily, but we occasionally have need to more complex manipulations.

**Actions**

- a. SSS will make sure it has a backup strategy in place for all user data. It will test this strategy to ensure it will work when needed.
- b. SSS will develop a strategy for updating the database schema without altering already stored data.

2. New information is incorporated into our standard calibrator catalogs by reparsing the original sources of information. Since NRAO staff will be able to use the SCT to change information in the catalogs directly, wiping out the catalogs and reparsing the original text files will no longer be acceptable.

**Actions**

- a. Ed Fomalont and Dave Harland worked on a means of doing mass updates via text files. This is currently done by a series of ad hoc and undocumented steps. SSS will rationalize and document this process.