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GBT Software Group

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GBT SOFTWARE PROJECT NOTE 2.0

GBT Use Cases

HTML version Available[1]

Contents

[1] http://www.gb.nrao.edu/GBT/MC/doc/use_cases/GBT_use_cases/index.html

Abstract

This document summarises Use Cases for the GBT

1 Introduction

This document summarises Use Cases for the GBT as a whole. The intent is to provide the background framework within which to discuss use cases for specific projects. For more background on Use Cases, see "Writing Effective Use Cases" by Alistair Cockburn

2 Name, System Scope and Boundaries

To be written.

3 In/Out List

The In/Out list consists of a step of topics which have come up in discussion, and whether they are "in scope" or "out of scope". The In/Out List for the GBT system as a whole is given in Table 1.

Title	In	Out
Get telescope time	In	
Analyze data		Out
Reduce data	In	
Data monitoring	In	
Publish results		Out
Collect data	In	
Metrology system	In	
Pointing	In	
GO	In	
CLEO	In	
Operators' log	In	
Observing statistics	In	
Maintenance tools	In	
Collage data	In	
Configure telescope	In	
Select configuration	In	
NSF		Out
Servo system		Out
Preventative Maintenance		Out
Archival	In	
Active Surface	In	

Table 1: GBT In/Out List

4 Actor Profile Table

The Actor-Profile table provides a description (background, skills) of the Users who will interact with the system. The Actor-Profile table for the GBT system is given in 2

5 Actor Goal List

The actor-goal list names all the user goals that the system supports, showing the system's functional content. The Actor-Goal list for the GBT system is given in table 2

6 Design Scope Diagram

A diagram outlining the main parts of the system is shown in figure 1.

Actor	Profile
observer	trained astronomer, may or may not be familiar with SuD, may have trouble using GUis, impatient, most important primary actor, knowledge of telescopes may be from novice to expert, responsible for all stages from initial proposal to final data reduction,seeks innovative uses of the telescope
configurer	understands thoroughly at least some significant proportion of the telescope's capabilities and the actual effect various devices' settings will have on the system and the resulting data; regular user of the SuD, generates useful setups of the telescope
operator	has good practical knowledge of telescope and is heaviest user of the SuD, has informal knowledge of astronomy and observing, will request changes to the GUIs, responsible for protecting personnel and equipment
scheduler	selects when and who observes, rarely uses the SuD, observer'srepresentative prior to actual observing, tracks telescope use,arranges peer reviews
engineer	has built part of the telescope either hardware or software, is responsible for maintenance and enhancements, occasional user of SuD, responds on short notice to irrecoverable failures, monitors key telescope values
support scientist	trained astronomer, second heaviest ueser of the SuD, responds or short notice to failures, monitors key telescope, helps observer, monitors and enhances scientific use of the telescope, reduces data
archiver	stores telescope data in a retrievable form

Table 2: GBT Actor Profile Table

[hbp]

Actor	Task-Level Goal	Priority
observer	selects telescope configuration collects astronomy data ensures data quality seeks innovative configurations	
operator	monitors data quality (?) ensures quality system performance verifies the selected configuration handles initial failure recovery mediates access keeps observing history performs privileged operations validates configurations are personnel safe validates configurations are equipement safe	
configurer	generates optimal telescope configurations	
scheduler	handles data archival monitor telescope usage schedules observations	
engineer	performs defect repair performs system enhancements ensures quality system performance handles final failure recovery	
support scientist	enhances scientific use of telescope handles secondary failure recovery	

Table 3: GBT Actor-Goal List

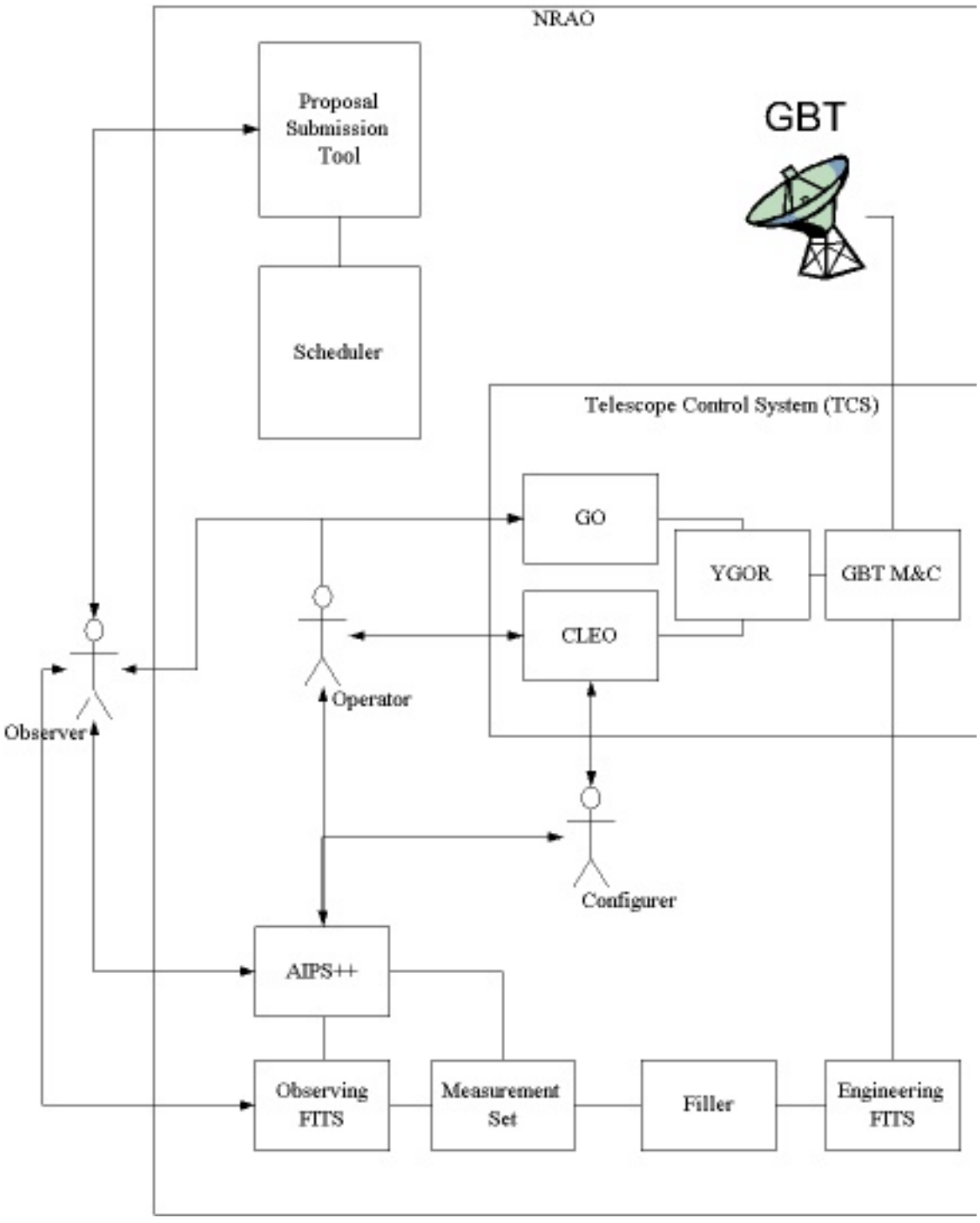

Figure 1: GBT Design Scope Diagram

7 The Use Cases

7.1 Observer Uses GBT

Context of Use

Using the GBT the observer gathers and processes all the data which is expected to provide at least a partial answer to an empirical question.

Scope

Observing with the GBT (Organization, black box)

Level

Summary

Primary Actor

Observer

Stakeholders and Interests

scheduler: efficiency, happy observer , approved-only observing
engineer: failures are handled by operator or reported fully

Precondition

observer has a well-formed empirical question

Minimal Guarantees

observer has an answer; or understands why an answer was not achieved

Success Guarantees

Trigger

Main Success Scenario

1. observer obtains telescope time on the GBT.
2. observer collects data using GO.
3. observer reduces data using a data program

Extensions

Technology and Data Variations List

Related Information

7.2 Collects Data

Context of Use

The observer runs a scheduled set of observations which are expected to successfully produce relevant data

Scope

GBT M & C (System, black box)

Level

User-goal

Primary Actor

Observer

Stakeholders and Interests

Precondition

good weather, operational system

Minimal Guarantees

clean data or rescheduled observing (?)

Success Guarantees

Trigger

telescope time

Main Success Scenario

1. observer selects telescope configuration using GO.
2. observer runs scans using GO.

Extensions

Technology and Data Variations List

Related Information

7.3 Reduces Data

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.4 Selects Telescope Configuration

Context of Use

The observer through various menu options, pre-defined templates, and value settings in GO sets up the telescope for observing.

Scope

GO (System, black box)

Level

User-goal

Primary Actor

Observer

Stakeholders and Interests

Precondition

GO is running

Minimal Guarantees

A valid configuration is selected or the appropriate error messages are generated.

Success Guarantees

Trigger

Main Success Scenario

1. observer selects receiver
2. observer selects system observing type
3. observer selects backend
4. observer selects switching mode
5. observer selects power levels
6. observer selects observing procedure
7. observer selects coordinate system
8. observer selects antenna movement

Extensions

Technology and Data Variations List

Related Information

7.5 Selects Receiver

Context of Use

Scope

Go (system, black box)

Level

Use-goal

Primary Actor

Observer

Stakeholders and Interests

Precondition

1. Receiver is operational
2. Cabling file is current

Minimal Guarantees

Useful message/error code is generated.

Success Guarantees

Selected receiver is properly configured.

Trigger

Main Success Scenario

1. Operator verifies receiver is in correct position.
2. Observer selects receiver settings.
3. System selects connectivity.
4. System selects appropriate devices.

Extensions

1. Error conditions for Main Success Scenario step 1.
    (a) Receiver is not in position - Sees tandard operating procedures

Technology and Data Variations List

Related Information

7.6 Selects System Observing Type

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.7 Selects Backend

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.8 Selects Switching Mode

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.9 Selects Power Levels

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.10 Selects Observing Procedure

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.11 Selects Coordinate System

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.12 Selects Antenna Movement

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.13 Obtains Telescope Time

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information

7.14 Run Scans

Context of Use

Scope

Level

Primary Actor

Stakeholders and Interests

Precondition

Minimal Guarantees

Success Guarantees

Trigger

Main Success Scenario

Extensions

Technology and Data Variations List

Related Information