

# Table Of Contents

<b>TABLE OF CONTENTS</b> .....	<b>1</b>
<b>WELCOME TO OPSLOG</b> .....	<b>3</b>
<b>WHAT'S NEW IN THIS RELEASE</b> .....	<b>4</b>
<u>Version 1.1.1 02/26/2002</u> .....	4
<u>Version 1.1.0 2/24/2002</u> .....	4
<u>Version 1.0.0 2/16/2002</u> This is the first release of the program. ....	4
<b>GETTING STARTED</b> .....	<b>5</b>
System requirements .....	5
Hardware .....	5
Software.....	5
Installing OPSLOG .....	6
Starting OPSLOG .....	7
To start OPSLOG on Windows.....	7
Moving around in OPSLOG .....	11
Basic features of OPSLOG .....	14
Basic steps to use OPSLOG .....	15
Customizing OPSLOG .....	16
Getting Help .....	17
Getting Help .....	17
<b>USING OPSLOG</b> .....	<b>18</b>
Log into OPSLOG .....	18
Re Logging into a Shift .....	19
Log Entries.....	21
Introduction to Log Entries.....	21
Type of Log Entries .....	21
Types of Observing .....	21
Fields common to log entries.....	22
Program Mode or State .....	23
Failure Entry Type.....	24
Synopsis for Creating/Closing a Failure Entry .....	24
Creating a Failure Entry.....	24
Editing a Failure Entry .....	25
Restore to Operation.....	26
Closing the Failure Log Type.....	26

Project Change .....	27
Receiver Changes.....	28
Scan Information .....	29
Observers Arrival / Departure.....	30
Weather and Information.....	31
Comments .....	32
Miscellaneous Log Entries .....	33
Lost Time .....	34
Synopsis for Creating lost time information.....	34
Filling in the Amount of Lost Time .....	34
Closing a lost time tracking log entry.....	35
Single Lost time Failure for current shift only .....	35
Viewing the Log History.....	37
Viewing the Log History.....	38
Logging out of OPSLOG .....	39
Logging Out .....	39
Backing up.....	41
Printing .....	42
To print from OPSLOG .....	42
<b>ADVANCED TIPS AND TRICKS.....</b>	<b>43</b>
Advanced tips and trick .....	43
Keyboard Shortcuts .....	44
Adding new log entries .....	44
Navigating Log Entries .....	44
Editing and Saving (mode change).....	44
<b>TROUBLESHOOTING.....</b>	<b>45</b>
Troubleshooting .....	45

## Welcome to OPSLOG

### Yet another Logging program

Welcome to the Telescope **O**perations **L**ogging System or **OPSLOG** for short. Operations of an NRAO telescope (or systems of telescopes, arrays) typically require the on-duty operator to record different kinds of information during their shift at the console. The constraints on the kind of information that must be recorded is dictated by both NRAO management in connection with the type of reports required, internal operations requirements and the available (or lack of) software tools.

- **What does OPSLOG do?** This simple program is used to record various types of information related to the progress during an operator's shift. This includes such information as major hardware/software failures, observing projects, overall progress of astronomical observations and other details.
- **Features and Benefits.** OPSLOG was originally designed to replace all three paper logs the current GBT operators use. The type of information to be entered by the operator allows the program to automatically calculate the amount of telescope time spent doing various activities (such as maintenance, tests, astronomical observations, ...) and provide a running summary of activities during specific shifts. The program also calculates lost observing time. In principle the benefits include reduction of the information recorded and entered into the system (for example the Operators Supervisor at presents hand enters the current paper log information into spread sheets); more consistent entry of required information, and more speedy availability of observing statistics.
- Although OPSLOG was designed as the GBT operators logging program, this in principal could be utilized for any NRAO telescope.

**Note:**

The program requires certain types of information to be entered with different constraints. Although the [Getting started chapter](#) will give a very brief overview of using the program the [chapter Using OPSLOG](#) covers more of the details, options and constraints.

## What's new in this release

Version designation for this program is of the form n.m.o where m, n and o are integers. The least significant changes (mostly minor bugs) will be reflected by a change in the least significant number (o) while major program changes (mainly significant enhancements or critical bug fixes) will be reflected by a change in the most significant number (m). Intermediate bug fixes or minor enhancements will be indicated by a change in the intermediate number (n). This section will contain a history of bug fixes and enhancements.

### Version 1.1.1 02/26/2002

- Any operator can now re log into a shift previously owned by someone else (see Logging into OPSLOG).
- Only one operator can be logged into a specific shift at one time.
- Some minor bug fixes.
- A new report is now available to list the equipment status for any given date.

### Version 1.1.0 2/24/2002

- Fixed the 'not always calculating lost time records' when Lost Time tab selected
- Operator Log in details have been changed. It is now **always** important to specify Observing type, proposal code, observer, receiver, etc when applicable. Re logging into a shift now defaults these parameters to the values set when last logged out. See Logging into OPSLOG for more details.
- Logging out of a shift no longer brings up the log in screen. The program is exited immediately. See Logging out of OPSLOG for more details.
- **Failure** log entries when first created can be closed at the same time. See Failure Entry Type.
- Lost time (behind the scenes) handling has been made slightly more robust. Also entering lost time for a one time event during the shift has been made somewhat smarter and slightly simplified for the operator. See Lost Time for details.
- A few more details added to shift summary: the log key and observing code for each log entry. Some minor cosmetic changes as well.
- A few other minor bugs fixed.

### Version 1.0.0 2/16/2002 This is the first release of the program.

The basic features include:

#### ☐ Security

All users of the system must log in using their windows user name and a unique password.

#### ☐ Logging events

Type of events: maintenance activity, weather info, Project/proposal change, Receiver changes, scan info, general info, failure

Types of failures: power related, weather, comp hardware, computer software, front ends, back ends, ...

Text describing Feature 2

#### ☐ Lost Time

Lost time is tracked by failures that have been marked as 'lost time tracking'. Although the system determines which failures are still open the operator enters the actual hours lost against projects.

#### ☐ Equipment status

A basic equipment list is maintained to gain a quick summary of the current hardware status (for front ends, back ends, ...)

- ☐ **Note:** See [Using OPSLOG](#) for a more detailed description of the features and options.

## Getting started

### System requirements

This program is designed to run under windows on an IBM compatible PC. It is a 32-bit Windows application which can be run from a Citrix server for access from Unix/Linux machines as well as windows. It is a multi-user application whose data is stored in dBASE tables (could easily be stored in one of several different Client/Server dbms systems [would require some program changes]).

#### Hardware

The minimum hardware requirements are:

CPU:	Pentium III or later
Memory:	128MB or greater
Disk required for program installation:	About 5 MB
Disk space required after installation:	> =10 MB

#### Software

The minimum software requirements are:

Operating System:	Windows 95, Windows NT 4.0 or Windows 2000 or later
Other software:	None

## Installing OPSLOG

There is currently no installation program for installing the program on any PC. This could easily be setup. It has been installed on one of Green Banks Citrix servers, specifically Rome. OPSLOG may be moved to another (more general purpose) Citrix Server during the next year or so.

## Starting OPSLOG

The following instructions apply to starting the program on either a Windows operating system or a Unix / Linux operating system. The

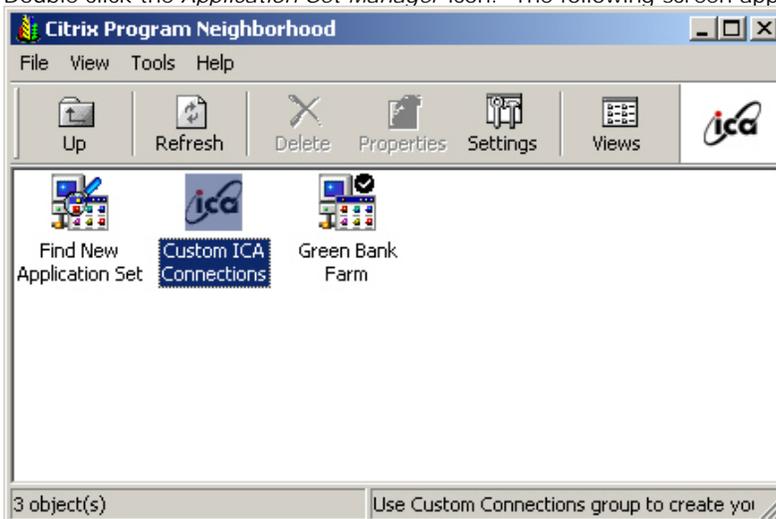
### To start OPSLOG on Windows

There are several possibilities. The choices available depend upon how the Citrix System Administrator has setup your PC.

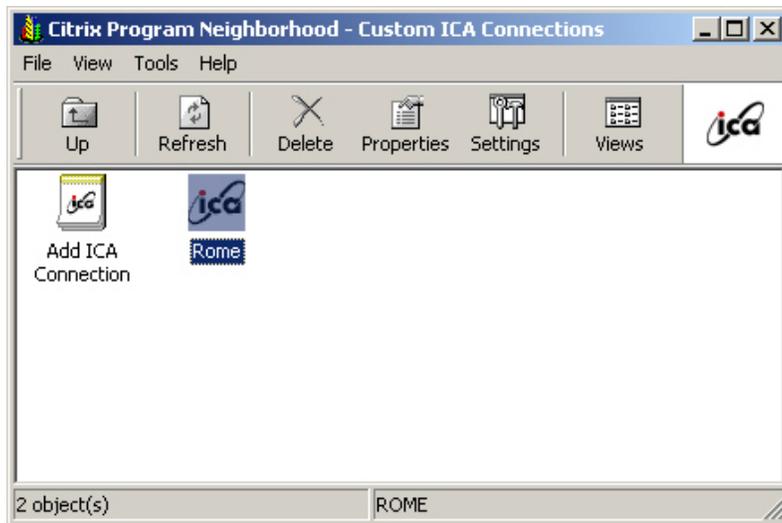
1. If the **OPSLOG** icon appears on your desktop simply double click it. You will be presented with the standard NRAO GREY SCREEN (see step 6 below); click OK. You will see the standard NRAO windows log in screen (see step 7 below). Use your windows user name and password. Your will be presented with a second Windows NRAO log in screen (don't ask me why). Upon completing this log in OPSLOG will load and you will have the OPSLOG log in screen (see Getting started).  
**OR**
2. Double Click the **Citrix Neighborhood** icon on the Windows desktop. The following screen is displayed. If the screen in step 4 is displayed skip to 5.



3. If the **OPSLOG** icon appears in the window double click the icon. You will then be presented with the OPSLOG log in screen. **Or**
4. Double click the *Application Set Manager* icon. The following screen appears.



5. Double click the *Custom ICA Connections* icon and the following screen appears.



6. Double click the Server icon (in this case it is Rome). The following Citrix log in screen appears.
7. Click the OK button and the following screen presents itself





8. Now enter your standard Windows user name and password. You will be presented with the



following.

9. Double click the **OPSLOG** icon and you will be presented with the OPSLOG log in screen.

#### To start OPSLOG on a Unix or Linux System

The basic instructions for running a program on the Citri Server from a Unix or Linux terminal are outlined in detail on a GB NRAO Computing web page. You access the Citrix Metaframe instructions from the GB Computer divisions home. Select the *How do I use the ICA Client?* and the Unix/Linux option. The basic instructions are summarized here (without screen shots):

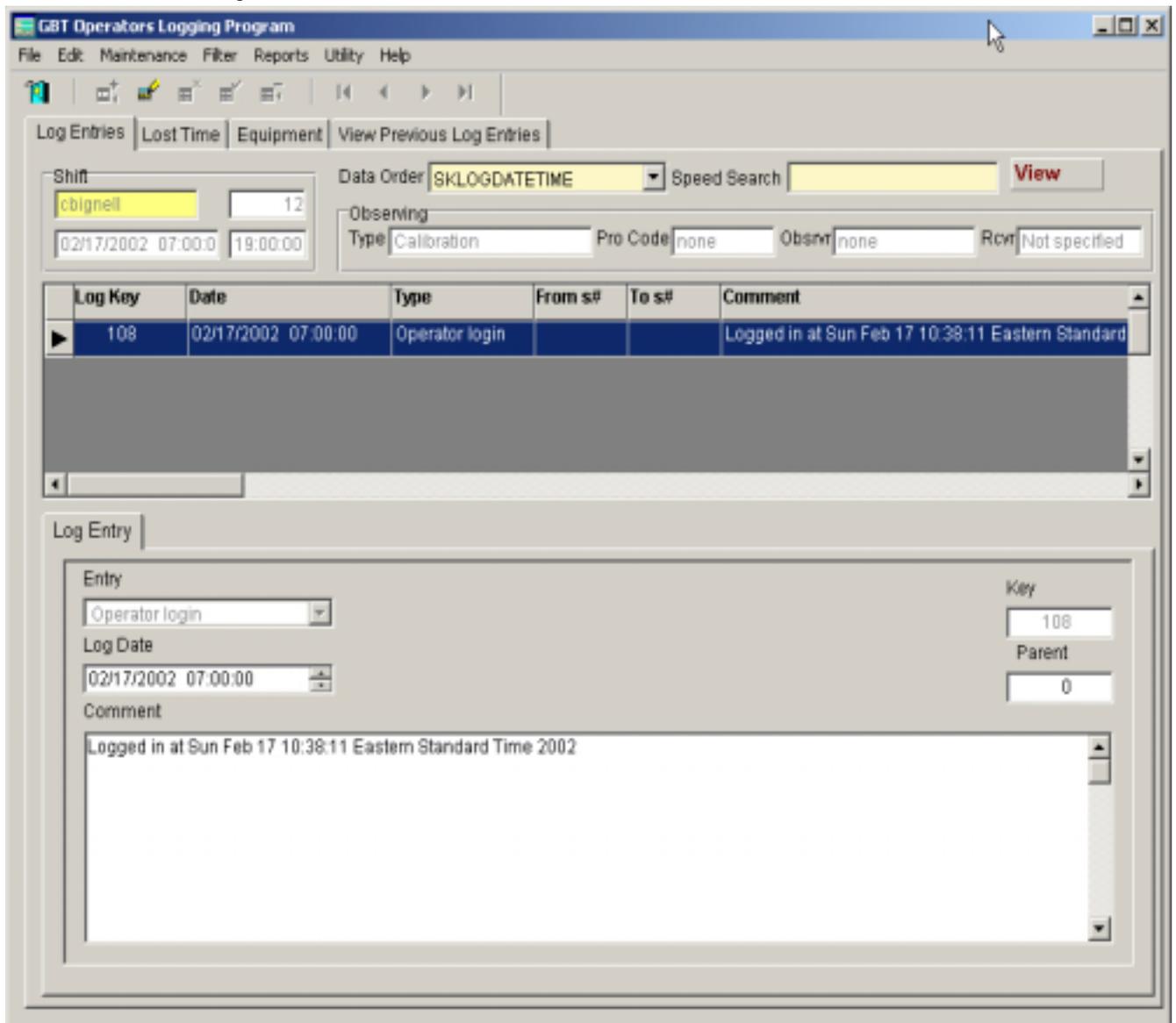
1. Open a new X terminal on the host workstation.
2. At the x-terminal type, **wfcmgr&** and press the enter key.
3. If this is the first time starting an ICA client, you must specify the server you want to connect to. If you want to do this select the Entry/New from the menu. Enter **Rome** in the description and the server name and then click OK.
4. Double click the "Rome" entry in the Citrix ICA Client window.
5. You will then be presented with the Windows "GREY SCREEN" (see step 6 in previous section) and the Windows Log in screen (see step 7 in previous section).
6. Once logged onto the server you will see a windows desktop with the OPSLOG icon. Double click this icon and proceed to Using OPSLOG/Logging into OPSLOG.

## Moving around in OPSLOG

As an introduction, the screen provides a visual overview of the main areas the program. The opening screen of OPSLOG consists of these main areas:

- Menu and tool bar.
- Tab access to the basic operators data.
- Current shift information.
- Data order and speed search.
- Current observing type and proposal code, receiver.
- Log entry Browse window.
- Current log entry information.

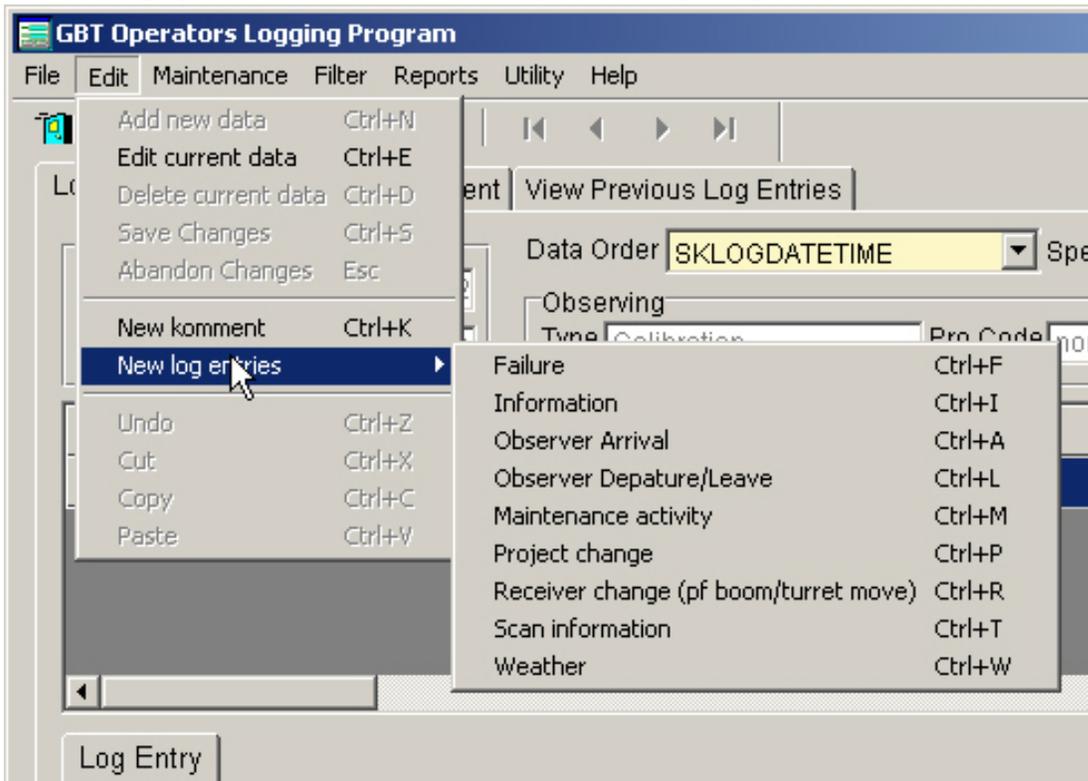
Click an area on the image below for more information.



A pop up menu is activated by right clicking anywhere on the OPSLOG screen. With this menu you can navigate the log entries , edit existing log entries, add new log entries, save changes or cancel changes.



The **Edit** option from the menu bar will bring up similar options to the pop up menu for adding new log entries, changing existing entries as well as saving or cancelling changes.



The **Maintenance** from the Menu bar allows navigating the log entries.



The tool bar also has the usual fair of options. The first option (open door) will close the program resulting in the log out screen being presented. In addition there are navigation buttons as well as a "change the mode to edit" to allow editing and save and cancelling any changes buttons.

## Basic features of OPSLOG

Operations of an NRAO telescope (or systems of telescopes, arrays) typically require the on-duty operator to record different kinds of information during their shift at the console. This program is used to record various types of information related to the progress during an operator's shift. This includes such information as major hardware/software failures, observing projects, overall progress of astronomical observations and other details.

Key features of OPSLOG include the following:

- Easy to enter shift information**
- Determines which lost time needs to be tracked** when the correct failure information is entered
- Provides** print outs of shift summaries and equipment status.

## Basic steps to use OPSLOG

A brief list of the steps to follow when using OPSLOG are:

- Startup OPSLOG and log into the program on the relevant shift.
- Make log entries relevant to your shift and add any appropriate comments to previous log entries.
- Update equipment status for event taking place during your shift.
- Check and update lost time for your shift.
- Log out at the end of the shift and print a summary of the shifts activities

☐ **Tip:** There are many details left out. Please and become familiar with the details in the chapter **Using OPSLOGS**.

## Customizing OPSLOG

There are currently no features that allow customizing the user interface. In some future release the ability to change OPSLOG passwords will be implemented.

## Getting Help

### Getting Help

The basic source of information for help is this help file. It is available in printed form as well.

There are various ways to get Help on OPSLOG:

- **Online application Help**  
From the OPSLOG **Help** menu, select **Contents**.
- Help on the Web
- User Communities
- Technical Support

☐ **Tip:**

## Using OPSLOG

### Log into OPSLOG

The log in screen for OPSLOGS is shown below. There are three boxes for information.

The screenshot shows the 'Operator Console Log In' dialog box. It contains three main sections:

- User name and password:** Fields for 'Operator:' and 'Password:'.
- Formal Shift:** A calendar for February 2002, 'Start' and 'End' time pickers (Hours and Minutes), and '< Prev Shift' and 'Next Shift >' buttons.
- Basic Observing Information at this login time:** Fields for 'Obs Type:' (dropdown: Calibration), 'Observer:', 'Proposal:', 'Receiver:' (dropdown: Not specified), and 'GO Project id:'.

Buttons for 'Ok' and 'Cancel' are located at the bottom.

Each of these boxes represent different information all of which are important.

1. **User Name and Password** The **Operator** identification is defaulted to their windows username, following the standard NRAO definition for determining employees usernames. The password is unique within the OPSLOG program and is NOT the same as the windows or unix passwords. In some future version each operator to change their OPSLOG password. The **Operator** identification/username can be either lower or upper case or a mixture. The **Password IS** case sensitive.
2. **Formal Shift** The formal shift is defined by the operator shift schedule. It is NOT the actual time the operator arrived on shift or left from shift. The default shift (date and time) upon log in is set by the time of day the log in screen was displayed. It is very important to get the shift boundaries exact (to the nearest 5 minutes). Any specific shift can be logged into more than

once by the same operator who first logged into the specific shift.

3.  **Basic Observing Information at this Login Time** These parameters are **ALWAYS** important whether first logging into the shift or logging back in. It is always important to get them correct. The fields are what was in effect at the formal time of the shift start.

The different observing information required include:

- **Obs Type** This is the type of observing that is in progress. The different possibilities are listed from the drop down list.
- **Observer** The observer(s) on duty in the control room.
- **Proposal** This is the formal proposal code assigned to the project when it is Astronomical observing.
- **Receiver** This is the particular receiver in use at the formal log in time. The receiver can be selected from the drop down list.
- **GO Project id** This is the project id assigned with the GO program and it specifically represents the sub directory in which the observing data is stored.

### Re Logging into a Shift

It is possible to log into and out of a particular shift many times (limited only by disk space). There are some restrictions.

- The first operator to log into a particular shift 'owns' that shift.  Any other operator may log into this shift - if the operator logging in does not own the shift a warning is given. The new operator will be allowed to log in or to cancel out. If the operator wishes to log in the ownership of that shift is changed to the new operator. A note about this change is recorded in the **Login** Log entry.
- Only one operator is allowed to log into any specific shift at one time. If you try to log into a shift which someone else is already logged into you will be warned and not allowed to log in.
- Any operator may log out of any shift (even those 'owned' by other operators).
- Re logging into a particular shift is accomplished by specifying the exact formal shift start and end for that shift.
- The Basic Observing Information should ALWAYS be set correctly for the time of log in. On the first log in this information must be correct for the time of the beginning of the **formal shift**. On successive log ins to a shift this information must be correct for the actual time of the log in, for reasons specified next.
- On successive log ins OPSLOG will default the Basic observing information to the values when last logged out. These values can (and should if appropriate) be changed so that they are accurate for the time of this log in. If some of this Basic Observing information is changed from the default, OPSLOG will automatically generate some additional log entries depending on the details of the change. In particular if the Observing Type or Proposal code is changed the program will add a **Project change** log entry or if the Receiver is different from the time of the last log out a **Receiver change** log entry will be generated. In either case you will be presented with the following screen to confirm the change, set the appropriate time for this change and to proceed with generating these log entries. If the cancel option is selected no entries are made to the log and furthermore the Basic Observing information reverts to the values at the time of the last log out.



NOTE Important points to remember:

- 1) The formal shift times MUST be specified correctly.
- 2) The Observing information MUST be correct at each log in.
- 3) A particular shift can be logged into repeatedly (see above restrictions) by any operator but not simultaneously.

## Log Entries

### Introduction to Log Entries

It is important to establish some definitions before proceeding into the different Log Entries. OPSLOG uses a mode or state to allow and disallow editing or adding new data. This is discussed in this section as well. The topics discussed are:

- Types of Log Entries
- Types of Observing
- Fields common to all Entries
- Program Mode or State

### Type of Log Entries

There are formally 12 different types of Log Entries. Their definition reflects when these entries should be made. All log types are entered directly by the operator with the exception of **Operator Login** and **Operator Logout**.

1. **Failure** This entry is used to indicate whenever there has been hardware, software or other failure that results in either lost observing time or may have an impact on the quality of data collected. ALL lost time is tracked using a **Failure** entry in the system, even when lost time is associated directly with weather (eg stow due to high winds, too much snow/rain/sleet, ...).
2. **Information** This is basically the catch all in that if events happen during the shift which do NOT fall under one of the other **Log Entry Types** this type should be used.
3. **Maintenance Activity** During maintenance day there are some maintenance activities that need to be tracked in the log. For example, inspecting brakes, greasing bearings, installed a ladder, repairing HVAC, ... These activities are essentially the major tasks being accomplished by the groups signing the access log for the antenna during maintenance days. Although these entries would reflect the major maintenance tasks on the GBT during maintenance days when NRAO gets into the situation of performing some inspections while observing those activities would be entered into the log under this log type.
4. **Observer arrival** is used to indicate which observers are present for their observations and when they arrived. This is usually used in conjunction with the **Observer departure** type to keep track of observers.
5. **Observer departure** is used to indicate which observer have left the control room and when.
6. **Operator Login / Operator Logout** These log entries are made automatically by the program when the operator logs in and out respectively.
7. **Project change** This type of log entry is used whenever the type of observing changes OR the formal proposal code changes for Astronomical and Test observing types. It is NOT used to indicate receiver changes (see the next type). This is an important entry since these entries along with **Failure**, **Receiver change**, **Restore to Operation**, **Operator login** and **Operator logout** types are used to determined lost time requirements.
8. **Receiver change** would be created whenever a receiver is changed. It is also used to indicate if either the prime focus boom, sub reflector or turret is moved. This is an important entry since these entries along with **Failure**, **Receiver change**, **Restore to Operation**, **Operator login** and **Operator logout** types are used to determined lost time requirements.
9. **Restore to Operation** is used to indicate that a **Failure** entry type is no longer in effect. It is effectively used to close **Failure** entry. This is an important entry since these entries along with **Failure**, **Receiver change**, **Restore to Operation**, **Operator login** and **Operator logout** types are used to determined lost time requirements.
10. **Scan information** is used to record information on observing scans.
11. **Weather** is used to record weather information.

#### Note

The log entry type is selected at the time the log entry is created by the operator. It cannot be changed later.

### Types of Observing

There are formally 8 types of 'observing' states. These are important because they determine some of the observing statistics required by NRAO management. The **Observing type** is set at initial shift log in and by **Project change** log entries

1. **Astronomical observations** As the name suggests these are the formally scheduled and approved astronomical observations (the GBT observing schedule indicates these by a proposal code). These do NOT include activities covered by the other observing types. Lost time is tracked ONLY for this type of observing.
2. **Maintenance** This type indicates scheduled maintenance days or periods.
3. **Test Observations or systems tests** These are the scheduled test (this includes tests as indicated on the graphical schedule or tests scheduled during commissioning). See Note below.
4. **Calibration** This type indicates observations used to calibrate the telescope (see Note below).
5. **Commissioning** These are all the activities that fall under Commissioning on the graphics schedule (see Note below).
6. **Shutdown** This indicates that the telescope is scheduled for shutdown. It does NOT include periods when observing is stopped due to high winds or snow. Formal shutdowns will occur three times a year (Thanksgiving, Christmas and New Years).
7. **Not scheduled** These are periods when there is no observing or scheduled maintenance. It does NOT include periods when observing is stopped due to high winds or snow.
8. **Observation setup** There is now a practice to schedule some extra time prior to the startup of scheduled Astronomical observing to check out the system in readiness for the observing. This is usually an hour in advance of the formal astronomy observing.

**Note**

The distinction between **Tests**, **Calibration**, and **Commissioning** types has not been clearly defined in the past. I propose that we attempt to make this distinction more meaningful beginning with the use of **OPSLOG**. It is not critical to be exact amongst these three types.

### Fields common to log entries

There are some fields which are common to ALL log entries. These include:

- **Log Date** This is the date and time (always Eastern Time Zone) of the action or state to which the log entry refers to. Some examples: the date and time the receiver failed, the date and time when observations XXXXX began, date and time when the weather was sampled and so on. It does NOT necessarily refer to the date and time the log entry was created (in most cases it will not). **Exception:** The date and time used for Operator login and logout are the formal shift change times.
- **Comment** The comment field is used to enter any information pertinent to log entry that is not covered in other fields. This is in principal a field whose size is not limited (other than by disk space).
- **Log Key** There is a unique number assigned to each log entry. It is used by OPSLOG to 'tie' information together between different tables. It is sometimes useful to the user of OPSLOG.
- **Parent** This is the log key of any log entry that the current one is related to. For example a **Restore to Operation** log entry will have the parent key referencing the original failure entry. Comment log entry types will also have the log key of the entry to which it refers to stored in the parent key.

There are some other common fields that are important which are not common to ALL log entry types. These include:

- **Proposal** This is the formal proposal code for approved Astronomical observations. These codes can be constructed from the GBT graphics schedule and are listed in the Astronomical Summary for each graphics schedule. Is **IMPORTANT** to get these codes correct since they are used for many of the statistics calculated for NRAO management. The form of the proposal code is
  - **GBT01A-011** for GBT proposals: 01A is the trimester and it refers to the first trimester of 2001; -011 is running number for the trimester
  - **AB123** for VLA proposals: A is VLA; B is the first letter of last name of PI; 123 is running number
  - **BU345** for VLBA proposals: B is VLBA; U is the first letter of last name of PI; 345 is running number
  - **GL026** for global proposals: G is Global L is the first letter of last name of PI; 026 is running number
  - **EVN113** for EVN proposals: 113 is running number

- **(GO) Project id** is the project id established in GO. Among other things it refers to the sub directory (within home/gbtdata) that contains the data for the current observations.

### Program Mode or State

OPSLOG uses a mode or state to indicate if the user is allowed to change or add data. The current state or mode (mode indicator) of OPSLOG is displayed in the upper right of the screen. The user changes mode by:

- Adding a new log entry from the Menu **Edit / New Log Entries** and selecting the type of Log entry from the list **OR** from the popup menu (right mouse click) **Add new log Entry** and choosing the type from the list (**Append** shows in the mode indicator)
- Selecting from the Menu **Edit / Edit current data** **OR** the popup (right mouse click) menu (**Edit** shows in the mode indicator)
- selecting the Menu **Edit / Save Changes** **OR** the **Save Changes** from the popup menu **OR** the edit toolbar icon (**View** shows in the mode indicator)
- selecting the Menu **Edit / Abandon Changes** **OR** the **Abandon Changes** from the popup menu **OR** the cancel toolbar icon (**View** shows in the mode indicator)

## Failure Entry Type

Any event or "happening" which results in either lost observing time or which can affect the quality of observing data **MUST** be entered as a **Failure** Log Entry. This includes downtime due to high winds, snow accumulation, rain/ice, etc.

### Synopsis for Creating/Closing a Failure Entry

The process of managing a Failure log entry is basically a two step procedure.

- Creating and or editing a **Failure** log entry.
- Closing a **Failure** log entry.

### Creating a Failure Entry

A new data screen for the failure log entry is initiated from the pop up menu (right click) **Add New Log Entry / Failure** or from the Menu Edit / **New Log Entry / Failure** or by using the short cut Ctrl-F.

The screenshot shows a 'Log Entry' dialog box with the following fields and values:

- Entry:** Failure (dropdown)
- Log Date:** 02/25/2002 11:48:03
- Type:** Not applicable (dropdown)
- Comment:** (empty text area)
- Failure Item:** (empty text field)
- Track lost time?:** (unchecked checkbox)
- WO#:** (empty text field)
- Closed Information:** Closed/Restored date and time (empty field)
- Total lost time:** 0:00
- Key:** 240
- Parent:** 0

The different fields that need to be filled in.

- **Log Date** This is the effective start date and time of the failure.
- **Type** or Failure Type refers to the type of failure. You select one from the drop down list. This is a mandatory field. The 11 different Failure types include:
  - **Back ends** refer to failures in the DCR, Spectral processor, Spectrometer, BCPM, etc (should be indicated in **Failure Item**)
  - **Receivers** refer to failures in a specific receiver (should be indicated in **Failure Item**)
  - **Computer Hardware** refers to failures in computer hardware (should be indicated in **Failure Item**)
  - **Computer Software** refers to failures in computer software which result in lost time
  - **Interference** refers to time lost due to interference
  - **Telescope** refers to telescope mechanical failures
  - **Weather** refers to bad weather conditions resulting in lost time
  - **Power related** refers to mechanical failures in the power system
  - **Human Error** indicates time was lost due to human error
  - **Other** indicates other causes
- **Failure Item** Indicates what particular piece of hardware was involved or the cause of the failure (if applicable)
- **Track Lost Time?** Did this particular failure cause a loss of observing time? This **MUST** be checked in order to track lost observing time.
- **WO#** This is the Mainsaver work order number if appropriate

- **Comment** spells out more details of the failure and its impact

☐ Once the new entry is saved the **Restore to operation** screen appears allowing you to specify a close date for this failure entry (see ). The failure can be left open by canceling out of the screen. If it is to be closed fill in the restore date and time appropriate for the problem being fixed, disappeared, whatever.

### Editing a Failure Entry

- The parameters for a **Failure** log entry can be modified at any time when the operator is logged into the shift that the failure was first created. Highlight the Failure entry in the browse window and selecting the pop up Menu **Edit current entry** or the Menu **Edit / Edit current entry** or the pressing the keyboard shortcut Ctrl-E.
- A Failure log entry **CANNOT** be closed by directly editing the **Failure** record (see Restore to operation).
- The close option for a **Failure** (which is presented when the Failure entry was first created) is not available during the edit procedure.

Once a failure entry is added to the log it will remain open until it is closed.

### ☐ Note

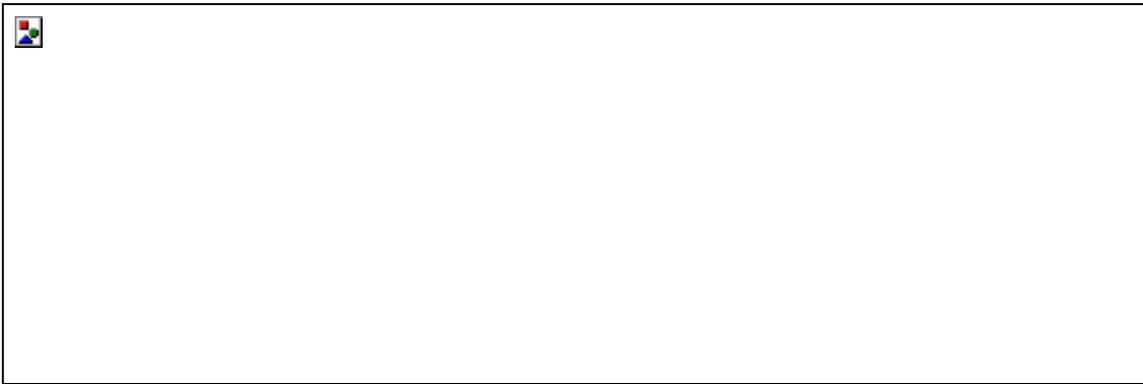
- a) Lost time is tracked only for the **Astronomical** Observing Type
- b) Telescope stowing for high winds, snow or icy conditions is tracked as a **Weather** cause
- c) Not all Failures have a lost time impact
- d) Some Failures are not "fixed" during the current shift and should be left open if it can result in further lost time.

## Restore to Operation

This log entry is specifically generated when a **Failure** log entry is closed. It is very important to close a Failure entry when it is a lost time tracking one; all Failure log entries should be closed. You **CANNOT** close a Failure log entry by editing the Failure. There are several mechanisms for closing a Failure:

- When the Failure log entry is first created the operator is presented with the **Restore to Operation** screen and is given the option of closing the Failure when it is first created.
- Whenever a **Failure** log entry is high lighted then selecting the **Close current Failure** from the pop up Menu or from the Menu **Edit / Close current failure** or using the Ctrl-Q keyboard short cut.
- Whenever in the Lost Time entry screen (see Lost Time) and a lost time record is high lighted the relevant Failure log entry can be closed by pressing the Restore/Close button.

## Closing the Failure Log Type



Fields are:

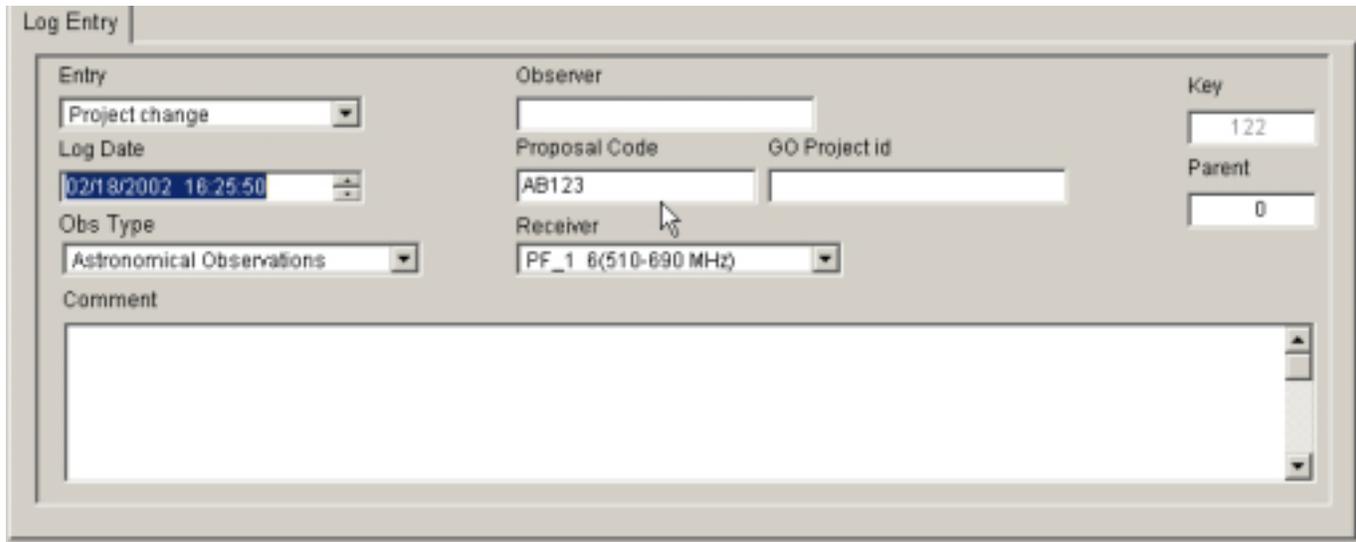
- **Repair/Close** date time refers to the time after the Failure is no longer to be tracked because the problem was repair, went away or it is no longer necessary to track lost time for this event.
- **Comment** Any comment as to the resolution of the failure.

## Project Change

A **Project change** log entry is created whenever the Observing Type or the proposal code changes.

A new data entry screen for the Project change log entry is initiated from the pop up menu (right click)

**Add New Log Entry / Project change** or from the Menu Edit / **New Log Entry / Project change** or by using the short cut Ctrl-P.



The screenshot shows a 'Log Entry' window with the following fields and values:

Field	Value
Entry	Project change
Observer	
Log Date	02/18/2002 18:25:50
Proposal Code	AB123
GO Project id	
Receiver	PF_1 8(510-690 MHz)
Key	122
Parent	0
Obs Type	Astronomical Observations
Comment	

The different fields that need to be filled in.

- **Log Date** This is the effective start date and time of the change in observing type or proposal code.
- **Obs Type** is the type of observing. It is important to get this parameter correct.
- **Observer** is the observer(s) who is(are) present in at the time of the change in proposal.
- **Proposal code** is the formal proposal code assigned to approved Astronomical Observing. It is mandatory to fill this in for an observing type of **Astronomical Observations** and desirable for observing types of **Tests** and **Observation setup** when applicable.
- **GO Project id** is the project id that has been assigned in the GO program for these observations.
- **Receiver** is the receiver in use when the observing type or proposal code changed. It is mandatory to fill this in for an observing type of **Astronomical Observations** and desirable for observing types of **Tests** and **Observation setup** when applicable.
- **Comment** spells out more details if necessary

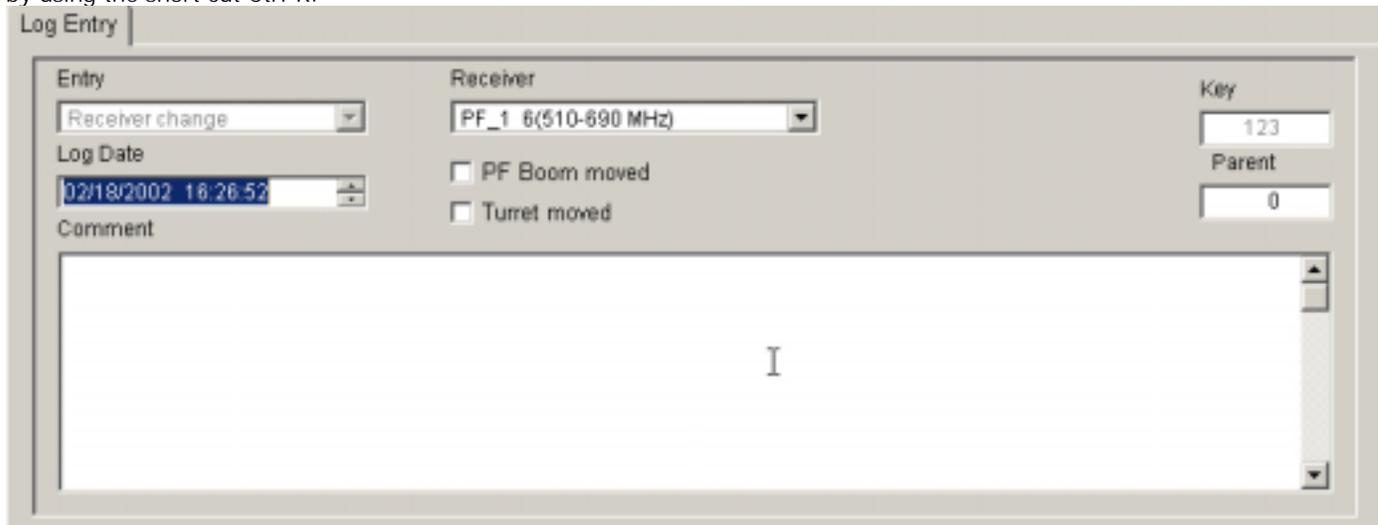
☐ **Note**

Project change is important for keeping track of the amount of time for different types of observing (required for NRAO management statistics).

## Receiver Changes

This type of log entry is issued whenever the receiver being used is changed or when either the prime focus boom or the sub reflector or turret are moved.

A new data entry screen for the receiver change log entry is initiated from the pop up menu (right click) **Add New Log Entry / Receiver change** or from the Menu Edit / **New Log Entry / Receiver change** or by using the short cut Ctrl-R.



The screenshot shows a software window titled "Log Entry". It contains several input fields and checkboxes. The "Entry" dropdown is set to "Receiver change". The "Receiver" dropdown is set to "PF\_1 6(510-690 MHz)". The "Log Date" field shows "02/18/2002 18:28:52". The "Key" field contains "123" and the "Parent" field contains "0". There are two checkboxes: "PF Boom moved" and "Turret moved", both of which are currently unchecked. A large text area for "Comment" is at the bottom, containing a cursor.

The different fields that need to be filled in.

- **Log Date** This is the effective start date and time of the change in receiver.
- **Receiver** is the receiver in use when the observing type or proposal code changed. It is mandatory to fill this in. Select the receiver from the drop down list.
- **PF Boom moved** When checked this indicates that the PF boom was moved.
- **Turret Boom moved** When checked this indicates that the turret was moved.
- **Comment** spells out more details if necessary. If the sub reflector was moved as part of the selection of a receiver then this should be indicated in the comments.

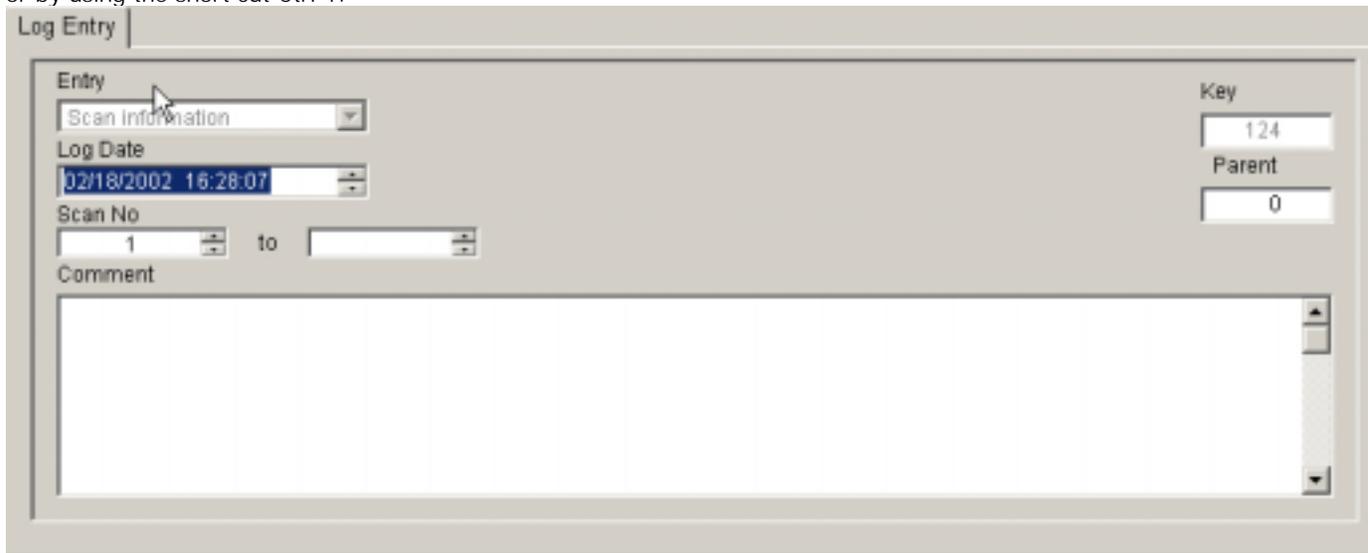
### **Note**

If the sub reflector only was moved for test purposes and did not involve selection of a receiver then this information should be entered into a **Maintenance activity** or **Information** Log Entry.

## Scan Information

Whenever information of a scan or group of scans needs to be entered into the log this entry type should be used.

A new data entry screen for the scan information log entry is initiated from the pop up menu (right click) **Add New Log Entry / Scan information** or from the Menu Edit / **New Log Entry / Scan information** or by using the short cut Ctrl-T.



The screenshot shows a software window titled "Log Entry". Inside the window, there are several input fields and a text area. The "Entry" field is a dropdown menu with "Scan Information" selected. The "Log Date" field contains the text "02/18/2002 16:28:07". The "Scan No" field has a spinner control with the number "1" and a "to" label followed by another spinner control. Below these is a large empty text area labeled "Comment". On the right side of the window, there are three input fields: "Key" with the value "124", "Parent" with the value "0", and an empty field below it.

The different fields that need to be filled in.

- **Log Date** This is the effective start date and time for the first scan of any sequence.
- **Scan No** This is the M&C system assigned scan number. If the information on only one scan is being logged only the first entry is filled in. If a sequence is logged the to scan number is also filled in.
- **Comment** The other information to be recorded is entered into the comments. This may include the source and/or any other details.

## Observers Arrival / Departure

When the Log Entry Type of Observers Arrival or Observers departure is added to the log the following screen is presented (the entry type is displayed in the entry box).

A new data entry screen for the Observers arrival or departure log entry is initiated from the pop up menu (right click) **Add New Log Entry / Observers arrival, departure** or from the Menu Edit / **New Log Entry / Observers arrival, departure** or by using the short cut Ctrl-A and Ctrl-L respectively.

The screenshot shows a 'Log Entry' window with the following fields:

Entry	Observer	Key
Observer arrival	<input type="text"/>	126
Log Date	Room	Phone
02/18/2002 16:29:35	<input type="text"/>	<input type="text"/>
Parent	<input type="text"/>	
0		
Comment		
<input type="text"/>		

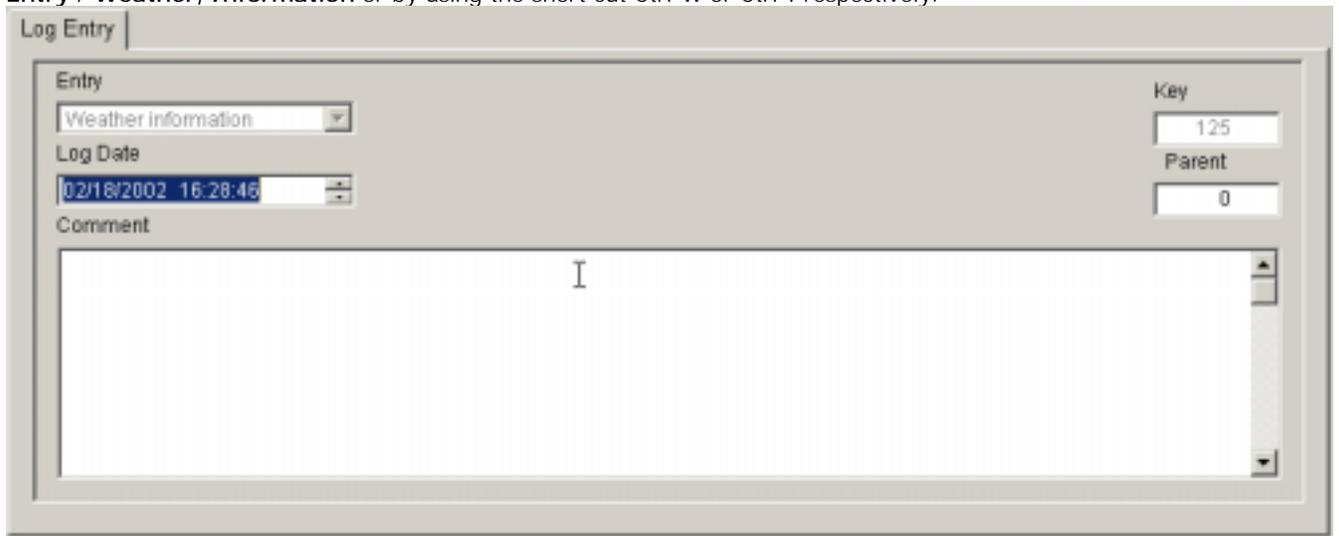
The different fields that need to be filled in.

- **Log Date** This is the effective start date and time for the observers arrival or departure which every is appropriate.
- **Observer** is the name of the observer.
- **Room** is the room he may be staying (as an aid to the operator)
- **Phone** is the observer's room phone number
- **Comment** Any other relevant information may be entered into the comments.

## Weather and Information

Whenever weather or general Information is entered the screen is identical except the Entry type is marked differently.

A new data entry screen for the Weather or general Information log entry is initiated from the pop up menu (right click) **Add New Log Entry / Weather, Information** or from the Menu **Edit / New Log Entry / Weather, Information** or by using the short cut Ctrl-W or Ctrl-I respectively.



The screenshot shows a 'Log Entry' window with the following fields:

- Entry:** A dropdown menu currently showing 'Weather Information'.
- Log Date:** A date and time field showing '02/18/2002 16:28:46'.
- Comment:** A large text area with a vertical scrollbar and a cursor 'I' in the center.
- Key:** A text box containing the value '125'.
- Parent:** A text box containing the value '0'.

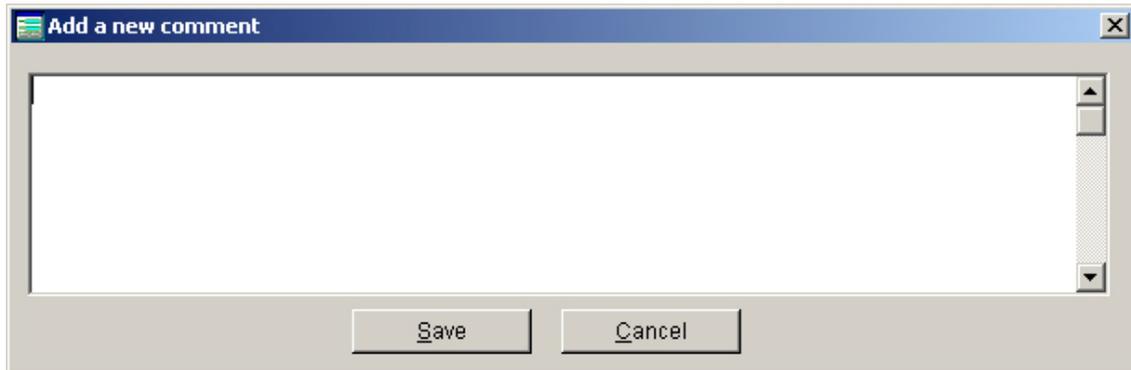
The different fields that need to be filled in.

- **Log Date** This is the effective start date and time that is applicable to the weather was sampled or to the information content.
- **Comment** The weather data is to be recorded or the information for other types of information.

## Comments

Adding comments to any log entry record is possible either from the main Log Entry screen (log Entry tab) or from the View Log History tab. These additional comments are stored in a separate table from the log entry to which they refer. They are linked using the log key of the parent.

To add a new comment highlight the original log entry or a Comment log entry which refers to the original log entry in the browse window and then select from the pop up menu (right click) **Add New Comment** or from the Menu **Edit / New Comment** or by using the short cut Ctrl-K.



Simply enter the comment you wish and press Save.

## Miscellaneous Log Entries

As discussed in the Introduction to Log Entries there are three types of log entries that the operator does not entry directly into the system. Rather OPSLOG enters these automatically depending upon certain actions he takes. These Log Entry types are:

- **Operator Log in** is created when the operator successfully logs into OPSLOG. The Log Date is always the formal date and time of the shift start. See Logging into OPSLOG for more details. The comments of the log in entry will list the different times that the operator logged in for the particular shift.
- **Operator Log out** is created when the operator successfully logs out. The Log Date is always the formal date and time of the shift end. See Logging out of OPSLOG for more details. The comments of the log out entry will list the different times that the operator logged out for the particular shift.
- **Restore to operation** the **Failure** log entry is created in the Lost Time process or from the pop up Menu (See ) or during the creation of the appropriate **Failure** log entry.

## Lost Time

Lost observing time is tracked only for Astronomical observations that are formally approved and scheduled. It does not track time lost during tests, calibration or commissioning.

### Synopsis for Creating lost time information.

This is basically a three step process.

- Create a **Failure** log entry which is marked as Lost Time tracking and the **Failure Type** set appropriately. Details for accomplishing this task are outline under Failure Entry Type.
- Filling in the amount of lost time (see Filling the Amount of Lost Time)
- Close the Failure log entry which describes the cause of the lost time (see Closing a Lost Time tracking log entry).

The reason for such a complication is to allow for tracking lost time against a single 'cause' that may remain open for days, weeks or longer. Most of our requirements fall into the category of single 'causes' which last during part of one shift. In such a case there is a slightly simplified procedure as described below under Single lost time failure for current shift only.

### Filling in the Amount of Lost Time

Clicking the Lost Time tab with the mouse brings up the screen.

The screenshot shows the 'GBT Operators Logging Program' window. The 'Lost Time' tab is selected. The interface includes a menu bar (File, Edit, Maintenance, Filter, Reports, Utility, Help), a toolbar, and a main content area. The 'Shift' section shows 'zbigneil' and '12'. The 'Observing' section shows 'Type: Calibration', 'Pro Code: none', 'Obsrv: none', and 'Not specified'. A table with columns 'Proposal', 'Receiver', 'Start', 'End', 'Scale', and 'Lost Time (hr)' is visible but empty. The 'Lost Time' section at the bottom has a note: 'Set the Start, End and Scale factor OR the total hours NOT both'. It includes input fields for 'Start', 'End', 'Scale', and 'Total Hours', along with a 'Repair/Close' button.

If there any lost time requirements for the current shift they will be listed in the browse window. Each line represents a record for each proposal - receiver combination for each **Failure** Log Entry marked as Lost Time tracking and still open.

The text window below the browse displays the comment from the original lost time tracking Failure log entry that is still open.

The operator is required to fill in the total number of hours lost during their shift for each of the records in the browse window. To set the total hours point to the appropriate record in the browse window and select Edit current data from the Menu or pop up menu (right mouse click) or from the tool bar.

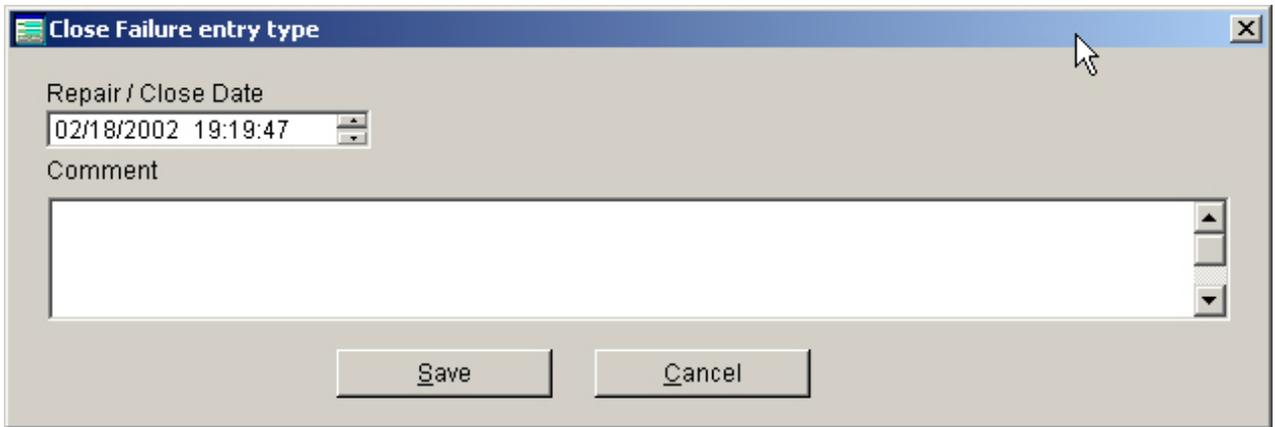
Lost time entry appropriate for the current shift may be entered in one of two ways:

- Specifying both the **start date** and **time** for the period during the shift along with a fraction (**Scale**) of the time during this time period **OR**
- by entering the total lost hours during the shift applicable to the lost time record.

The simplest and most straight forward is the use the latter method.

### Closing a lost time tracking log entry

If there will be no more lost time charged to the original lost time tracking failure select one of the lost time records from the browse and click the **Repair/Close** button.



Fill in the fields:

- **Repair/Close date** this is the date and time after which this log entry can no longer accumulate lost time.
- **Comment** Any appropriate comments to putting the piece of hardware back into service or the reason for returning to operations should be entered.

More information on closing a Failure entry is outlined under Restore to operation.

### Single Lost time Failure for current shift only

Many times the only need for tracking lost time will be an isolated incident (stow due to high winds or snow) during a shift. In this particular case the basic steps are outlined as follows:

1. **When the log entry is being initiated after the 'event' is over (for example after returning to operation).**
  1. Create the **Failure** entry as outlined above entering the time for the failure when the event started (ie stowing due to high winds)
  2. Fill in the **Close Entry** screen at the end of the process of creating the **Failure** entry, setting the **Close date** to the time that the antenna was returned to service **OR**
2. **When the log entry is being initiated before the 'event' is over**
  1. Create the **Failure** entry as outlined above entering the time for the failure when the event started (ie stowing due to high winds)
  2. Cancel the **Close Entry** screen that pops up at the end of the creating process
  3. When the 'event' is over (for example returning to operations after being stowed) then **Close the Failure** by following the procedure outlined under Restore to operation. Make sure that

the Repair/Close time is set to the time that operations was restored.

Whenever one of the above two procedures is followed correctly and the Failure is closed with the proper date/times (without logging out and back in during the process) any lost time records that are created will have the correct lost time entered automatically and there should not be any need to edit the lost time record under the **Lost Time** tab.

## Viewing the Log History

Any log entry that has ever been entered into the system can be viewed. Further you can enter additional comments to any log entry ever created.

Select the **View Previous Log Entries** tab.

The screenshot shows the 'GBT Operators Logging Program' window. The 'View Previous Log Entries' tab is selected. The interface includes a menu bar (File, Edit, Maintenance, Filter, Reports, Utility, Help) and a toolbar with navigation icons. Below the toolbar are tabs for 'Log Entries', 'Lost Time', 'Equipment', and 'View Previous Log Entries'. The 'View Previous Log Entries' tab contains a 'Shift' section with 'cbignell' and '12', and an 'Observing' section with 'Type: Calibration', 'Pro Code: none', 'Obsnr: none', and 'Not specified'. A table of log entries is displayed below, with the following data:

Key	Log Date	Type	Comment	Failure	Failed Item	Obs Type
103	02/13/2002 08:47:54	Weather informa	Cloudy with occasional g	Not applicable		Astronomica
104	02/13/2002 19:00:00	Operator logout	Logged out at: 02/13/200	Not applicable		Astronomica
105	02/07/2002 07:00:00	Operator login	Logged in at Sat Feb 16	Not applicable		Calibration
107	02/07/2002 19:00:00	Operator logout	Logged out at: 02/16/200	Not applicable		Calibration
108	02/17/2002 07:00:00	Operator login	Logged in at Sun Feb 17	Not applicable		Calibration

Below the table are three tabs: 'Log Entry', 'Additional Notes', and 'Log Details'. The 'Log Details' tab is active, showing a detailed view of the selected log entry (Key 108). The details include:

- Entry: Operator login
- Log Date: 02/17/2002 07:00:00
- Failure Type: Not applicable
- Failure item: [empty]
- Comment: Logged in at Sun Feb 17 10:38:11 Eastern Standard Time 2002
- Created: 02/17/2002 10:38:4 [empty]
- Updated: 02/17/2002 10:38:4 [empty]
- Obs Type: Calibration
- Observer: [empty]
- Room: [empty]
- Phone: [empty]
- Proposal: [empty]
- GO Project id: [empty]
- Operator: cbignell
- Receiver: Not specified
- L Key: 108
- S Key: 12
- Parent: 0
- N key: [empty]
- Track lost time? [checkbox]
- WO#: [empty]
- Failure Repair: [empty]
- By: [empty]
- Move PF boom [checkbox]
- Move Turret Lost Time [checkbox]

The three basic tabs show the following information:

- **Log Entry** - The log entry record with minimal fields for the entry type.
- **Additional Notes** - All notes added to this log entry.
- **Log Details** - shows all fields in the log entry record.

## Viewing the Log History

Any log entry that has ever been entered into the system can be viewed. Further you can enter additional comments to any log entry ever created.

Select the **View Previous Log Entries** tab.

The screenshot shows the 'GBT Operators Logging Program' window. The 'View Previous Log Entries' tab is selected, displaying a table of log entries. Below the table, the 'Log Entry' sub-tab is active, showing a form for editing or viewing a specific log entry.

Key	Log Date	Type	Comment	Failure	Failed Item	Obs Type
103	02/13/2002 08:47:54	Weather informa	Cloudy with occasional g	Not applicable		Astronomica
104	02/13/2002 19:00:00	Operator logout	Logged out at: 02/13/200	Not applicable		Astronomica
105	02/07/2002 07:00:00	Operator login	Logged in at Sat Feb 16	Not applicable		Calibration
107	02/07/2002 19:00:00	Operator logout	Logged out at: 02/16/200	Not applicable		Calibration
108	02/17/2002 07:00:00	Operator login	Logged in at Sun Feb 17	Not applicable		Calibration

The 'Log Entry' sub-tab shows the following information:

- Entry: Operator login
- Log Date: 02/17/2002 07:00:00
- Failure Type: Not applicable
- Failure Item:
- Comment: Logged in at Sun Feb 17 10:38:11 Eastern Standard Time 2002
- Created: 02/17/2002 10:38:4
- Updated: 02/17/2002 10:38:4

The three basic tabs show the following information:

- **Log Entry** - The log entry record with minimal fields for the entry type.
- **Additional Notes** - All notes added to this log entry.
- **Log Details** - shows all fields in the log entry record.

## Logging out of OPSLOG

The user may log out of the program at point in time. Log out is initiated whenever the window is closed by the operator using one of

- clicking the windows x in the upper right hand corner
- clicking the door on the tool bar
- accessing the Menu **File / Exit** sequences
- accessing the Menu **File / Log out** sequence

The screenshot shows a dialog box titled "Operator Console Log Out". It is divided into several sections. The first section, "User name and password", contains two text boxes: "Operator:" with the value "cbignell" and "Password:". The second section, "Formal Shift start and end", contains two time pickers: "Begin:" with the value "02/17/2002 07:00:00" and "End:" with the value "02/17/2002 19:00:00". The third section, "Actual Shift start and end", contains two time pickers: "Begin:" with the value "02/17/2002 10:38:11" and "End:" with the value "02/17/2002 10:45:53". The fourth section, "Print Shift summary", contains two checked checkboxes: "Print" and "Select printer". At the bottom of the dialog are two buttons: "Ok" and "Cancel".

The required fields to fill in are:

- **User Name and Password** The **Operator** identification is defaulted to their windows username, following the standard NRAO definition for determining employees usernames. The password is unique within the OPSLOG program and is NOT the same as the windows or unix passwords. In some future version each operator to change their OPSLOG password. The **Operator** identification/username can be either lower or upper case or a mixture. The **Password** IS case sensitive.
- **Formal Shift** The formal shift is defined by the operator shift schedule. It is NOT the actual time the operator arrived on shift or left from shift. The default shift (date and time) upon logout in is set by the time of day the operator logged in. It is very important to get the shift boundaries exact (to the nearest 5 minutes). Any specific shift can be logged out of more than once by the ANY operator.
- **Print Shift Summary** When this box is checked a summary of the shift being logged out of will be printed.
- **Select Printer** If it is important to select the printer this box should be checked.  The default is not to select the printer.

## Logging Out

- Any operator with a valid password may log off of a shift (unlike on logging in).
- If it is necessary to change the formal shift times (as such might be the case when an operator falls ill and has to be relieved before the normal end of his shift), this can be done at log out. This must be done **CAREFULLY** because the system is keyed on formal shifts.
- Prior to successful log out the program attempts to determine if any additional lost time information is needed. If it thinks more information is needed it will complain, disallow the log out and point to the Lost Time entry screen.
- Successful log out will trigger behind the scenes calculation of log summary information.
- Successful log out will close the program immediately after all house keeping chores are complete.

□ **Note**

- a) Any authorized operator can log out of a shift - their password and name must be specified
- b) The formal shift times can be changed on log out (important when unexpected illness requires another operator to take over)
- c) Shift summaries should always be printed to help data backup

## Backing up

The backup procedure has not been implement in the first release.

## Printing

Currently the only information which can be printed from OPSLOG is restricted to reports listed under the Reports menu item.

The present reports are limited to an shift summary (equipment list status will follow soon).

### To print from OPSLOG

Select the Menu **Reports** to display shift summary options.



The two options are printing the current shift or selecting a shift and printing it.

## Advanced tips and tricks

### Advanced tips and trick

1. **What do I do when someone else has logged into my shift?** At the moment there is no 'clean' way to deal with this. The correct operator must be logged into the shift so there are two possible approaches.
  1. Send cbignell a message to do a quick fix in the shift table **OR**
  2. Have the original operator log into his shift. The log out of his shift changing the end date of the shift (could try making the end date time exactly the same as the start date time - haven't tried this). The correct operator logs in to his shift.
2.  **How do I enter lost time during my shift?** This does depend somewhat upon the details for the lost time. These are covered under Lost Time and the appropriate topics mentioned therein. If the requirement is an isolated event that occurs during the shift entry can be simplified as discussed under Single Lost time Failure .

## Keyboard Shortcuts

### Adding new log entries

Failure	Ctrl-F
Scan Information	Ctrl-T
Weather	Ctrl-W
Project change	Ctrl-P
Receiver change	Ctrl-R
Observer arrival	Ctrl-A
Observer departure	Ctrl-L
Restore to operation	Ctrl-Q
Comments	Ctrl-K

### Navigating Log Entries

First log entry	Ctrl-PgUp
Previous log entry	PgUp
Next log entry	PgDn
Last log entry	Ctrl-PgDn

### Editing and Saving (mode change)

Change to edit mode	Ctrl-E
Save changes	Ctrl-S
Cancel changes	Esc

## Troubleshooting

## Troubleshooting

If there are any problems, errors or enhancements please email [cbignell](mailto:cbignell). It is important to give as many specific as possible.

Each line in this browse is a one line summary of the log entries made during the current shift.

The current shift information refers to the presently logged in shift. Displayed information is: (a) operator user name, (b) shift key - unique number assigned to identify the shift, (c) the start date and time of the formal shift and (d) the end of the formal shift.

The data for the current log entry is displayed in this window. The fields displayed will depend upon the **type** of log entry.

The data order combo box allows selecting between log entries order by **log date** or by **log key**. The **Search** box allows searching for a log entry by typing in the **log date** (in the form YYYYMMDD) when the **Data Order** is set to SKLOGDATETIME or by **log key** (format is just the number) when the data order is set to SKLOGKEY. These settings apply only to the **Log Entry** data under the Log Entries tab.

These tab options select the main data within OPSLOG: (b) **Log Entries** - log entries pertaining to the current shift only, (b) **Lost Time** entries for the current shift, (c) **Equipment** - lists the status of basic front ends, back ends and servo system and (d) **View Previous Log Entries** lists all log entries (and all of their comments) in the system by log key.

Almost all the program actions are activated through the menu bar. The tool bar is used to (a) navigate data entries in the visible browse window, (b) edit, save or cancel changes made to data entry and (c) close OPSLOGS.

The current settings for the **Observer**, **Receiver** in use, **Proposal** being observed and **Type of observations** are displayed on all pages.

The program uses a mode or state to allow or disallow adding or changing data. Changes between modes are activated through program actions.

# Index

<b>A</b>	
adding comments .....	38
antenna stow .....	24
<b>B</b>	
Basic steps .....	15
<b>C</b>	
comment .....	32
current shift .....	46, 47
Customizing.....	16
<b>D</b>	
data	
mode.....	53
Data entry	
mode.....	53
data order.....	49
Downtime.....	34
<b>E</b>	
equipment access .....	50
equipment status .....	37
<b>F</b>	
failure .....	24
Features .....	14
<b>H</b>	
Help .....	17
<b>I</b>	
information .....	31
Installing .....	6
<b>K</b>	
Key features.....	14
keyboard .....	44
keyboard shortcuts.....	44
<b>L</b>	
Log entries	
introduction.....	21
Log Entries .....	21
log entry .....	48
log history.....	38
Log in .....	18
log type comment .....	32
logentries access .....	50
Logging into OPSLOGS .....	18

<b>Logging out</b> .....	39
<b>Logging out of OPSLOG</b> .....	39
<b>login</b> .....	18, 33
<b>logout</b> .....	33
lost time	
access .....	50
<b>Lost time</b> .....	34
<b>losttime</b> .....	34
<b>M</b>	
menu .....	51
mode .....	53
<b>N</b>	
<b>number</b> .....	30
<b>O</b>	
observer .....	52
<b>observers</b> .....	30
Observing information .....	52
<b>Online application Help</b> .....	17
<b>Operating system requirements</b> .....	5
<b>P</b>	
<b>Printing</b> .....	42
<b>Product features</b> .....	14
<b>project</b> .....	27
<b>project change</b> .....	27
proposal code .....	52
<b>R</b>	
receiver .....	28, 52
receiver change .....	28
restore .....	33
room .....	30
<b>S</b>	
scan .....	29
scan information .....	29
search .....	49
shift .....	47
one line summary .....	46
<b>shortcuts</b> .....	44
<b>Starting</b> .....	7
<b>System requirements</b> .....	5
<b>T</b>	
tabs .....	50
<b>Technical Support</b> .....	17
<b>Tips and Tricks</b> .....	43
tool bar .....	51
<b>U</b>	
<b>User Communities</b> .....	17

**W**

**weather**..... 31  
**Welcome** ..... 3