

# **OCEAN DRILLING PROGRAM**

## **COLOR REFLECTANCE**

### **USER'S MANUAL**

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## Introduction

*Color Reflectance* is a program designed to upload reflectance spectroscopy data files to the central database. It also contains a browser/edit window. Selected data is displayed on this window for browsing or editing, or to correct for common data oversights/errors. For brevity, the program is referred to as **RSC** for *Reflectance Spectroscopy and Colorimetry*.

## Document Layout

This document is broken into several sections. The first two describe starting the program and the login. The next two describe each window and their functions. The fifth section describes the editing functions of **RSC**. Finally, the appendix includes technical details on the program installation and architectural notes. The appendix is designed for use by programmers and Marine Computer Specialists (MCS).

## Starting RSC

*RSC* can be started in one of two ways:

1. From the **Program Manager**, open the *Color Reflectance* group. Double click on the *Color Reflectance* icon.

**OR**

2. From the **File Manager**, open the program from the directory `c:\odp\rsc_upld`. Double click on the executable program **RSC\_UPLD**.

**Note:** This program has a built-in “**Help**” window. To access this window click `<Ctrl+H>`. Place the cursor where you need help. A “**Help**” window will open that displays information for the troubled area. Remove the help window by clicking `<Ctrl+H>` again.

## Login Procedure

Figure 1 displays the “Login” window.



Figure 1. The *RSC* “Login” window.

1. **Navigate** through the “Login” window with the mouse or the **Tab** key. `<Tab>` moves the cursor forward to the next entry box and `<Shift + Tab>` moves the cursor back to the previous entry box.
2. Enter a **USER**, **PASSWORD**, and **HOST** into the appropriate boxes. These restrict access to the central database and help to preserve data consistency and integrity.
3. When *RSC* is started for the first time, the **USER** and **PASSWORD** fields will be empty. Consult the appendix, on-duty lab technician or MCS for valid logins.

4. Multiple databases are setup for production, testing, and development efforts. Select the **Test** or **Production** database via the **HOST** selection box.

**Note: Be sure that HOST is in production mode during a “live” run.**

5. For subsequent logins, **RSC** recalls the **USER** and **HOST** settings. Check the “Remember Password” box if you also want the password recalled.
6. If you enter an invalid **USER** or **PASSWORD**, the program displays the following message:



Figure 2. Warning for an incorrect login.

7. Click **OK** to return to the “Login” window. Verify the **USER** and **PASSWORD**. If the login continues to fail, contact an MCS or the helpdesk. They will ensure that the program is installed and configured properly, and that the central database is available.
8. Click **OK** or the <**Enter**> key to complete the login process. Click **Quit** or the <**Esc**> button to exit the login procedure.

## RSC “Color Reflectance” Window

### Purpose

This window displays color reflectance data, which is stored in the central database, for the currently selected **leg**, **site**, **hole**, **core**, **section**, and **run**. *It is intended for data browsing and selection, and for minimal editing functions.*

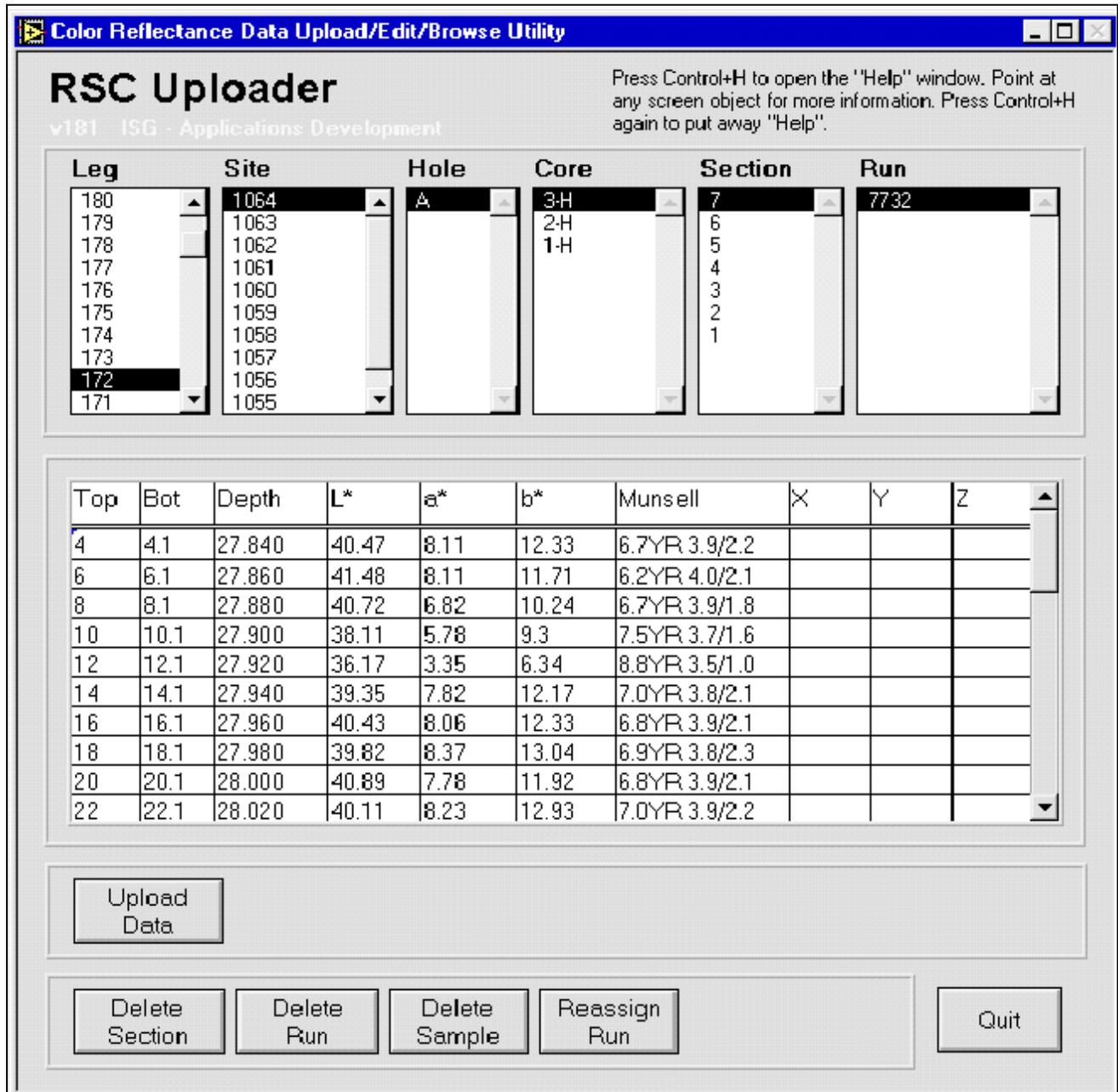


Figure 3. The “Color Reflectance” window of the RSC program.

## Window Layout and Navigation Info

1. Notice that the top half has columns for **leg**, **site**, **hole**, **core**, **section**, and **run**. *These columns display information that is already stored in the Janus database.* Each column displays information based on the highlighted choice from the previous column. For example, in Figure 3 “Site” displays all the sites available for leg 172 (etc.,).
  - To select specific data, use the mouse key to highlight your choice in each column. Use the scrollbar or the arrow keys to move up or down a column.
  - **Leg** – In addition to the other highlighting methods, you can also type in the leg # digits. The program displays the first item in the list that starts with those digits.
  - **Section** – Only sections with color reflectance data are shown. If the column displays no section numbers, make sure the previous column selections are correct.
  - **Run** – If this column is empty, either no data has been uploaded to the central database for that section or no data was collected.
2. The lower half of the window is a spreadsheet displaying samples that correspond to the selected column information (See Figure 4).

Top	Bot	Depth	L*	a*	b*	Munsell	X	Y	Z
4	4.1	27.840	40.47	8.11	12.33	6.7YR 3.9/2.2			
6	6.1	27.860	41.48	8.11	11.71	6.2YR 4.0/2.1			
8	8.1	27.880	40.72	6.82	10.24	6.7YR 3.9/1.8			
10	10.1	27.900	38.11	5.78	9.3	7.5YR 3.7/1.6			
12	12.1	27.920	36.17	3.35	6.34	8.8YR 3.5/1.0			
14	14.1	27.940	39.35	7.82	12.17	7.0YR 3.8/2.1			
16	16.1	27.960	40.43	8.06	12.33	6.8YR 3.9/2.1			
18	18.1	27.980	39.82	8.37	13.04	6.9YR 3.8/2.3			

Figure 4. Samples that correspond to selected column information.

**Note: These samples are for browsing, selection, and minor editing functions only (See "Editing Uploaded Data" p. 13).**

3. There are several buttons at the bottom of the window (See Figure 5).

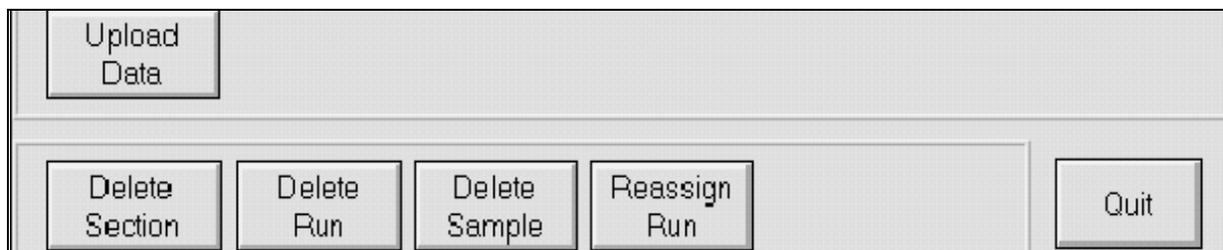


Figure 5. Buttons of the “Color Reflectance” window.

- **Upload Data** – Opens the *RSC* “Uploader” window. Data is uploaded to the central database from this window (See "Uploading" p. 11).
- **Delete Section** – Deletes all runs linked to the currently selected section (See "Editing Uploaded Data" p. 13).
- **Delete Run** – Deletes the color reflectance data associated with the selected run (See "Editing Uploaded Data" p. 13).
- **Delete Sample** – Deletes the color reflectance samples selected in the table (See "Editing Uploaded Data" p. 13).
- **Reassign Run** – Re-assigns a selected color reflectance run to a different section (See "Editing Uploaded Data" p. 13).
- **Quit** – Exits the *RSC* program completely.

## RSC “Uploader” Window

### Purpose

This window uploads selected files to the database. **Open this window from the main window by clicking on the *Upload Data* button.** You can upload all files listed or select only specific ones. Once files are uploaded to the central database, the data becomes available for selection on the “Color Reflectance” window (Section 3).

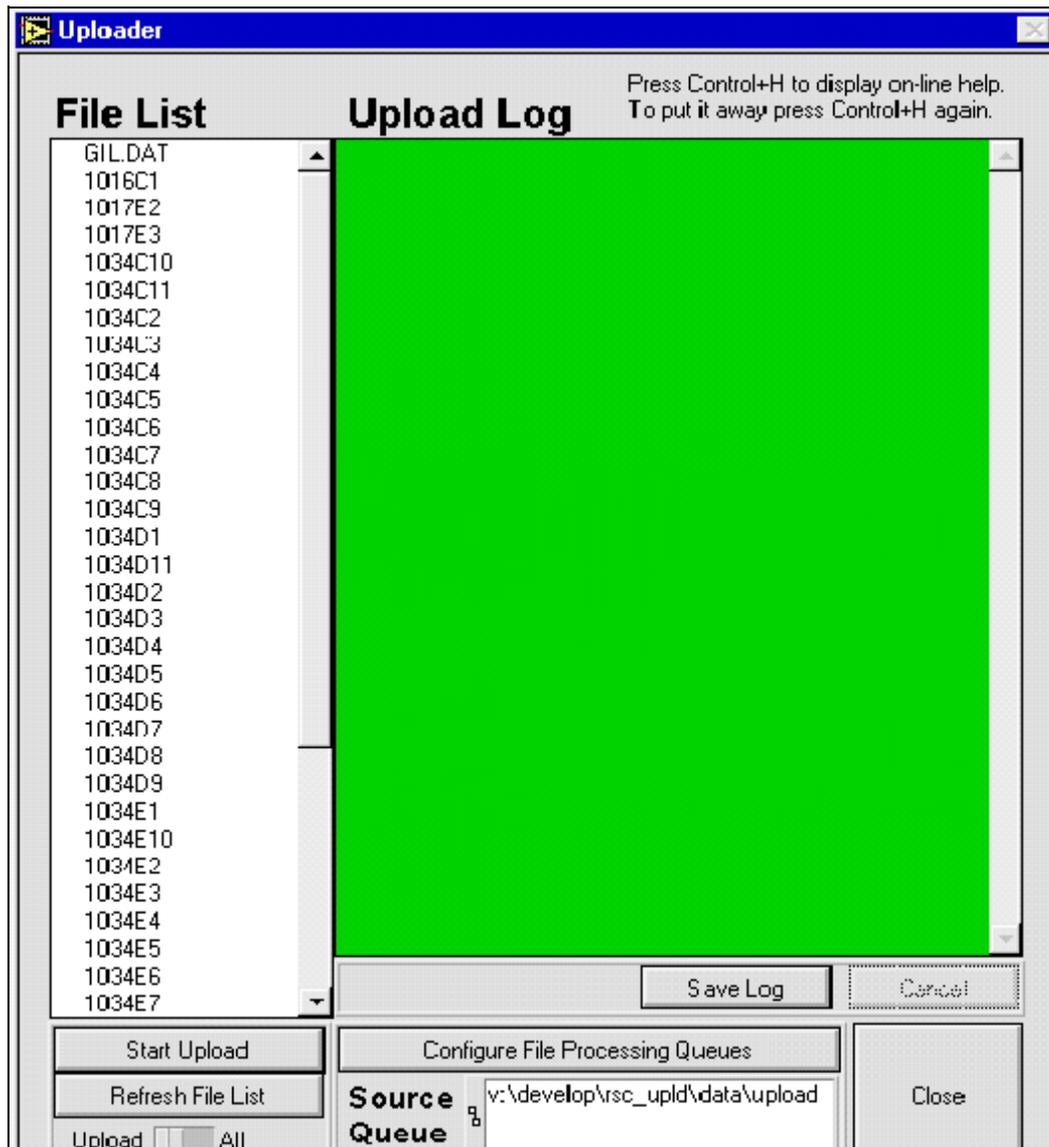


Figure 6. The “Uploader” window of the RSC program.

## Configuring Files

Before uploading files, set the directories that are used to sort and track processed files. Click on **Configure File Processing Queues** to open the set directories windows (See Figure 7). The very first time this window opens, all directories default to the location of the *RSC* program install. Use the **Change** buttons to pick alternate folder defaults (these are then recalled).

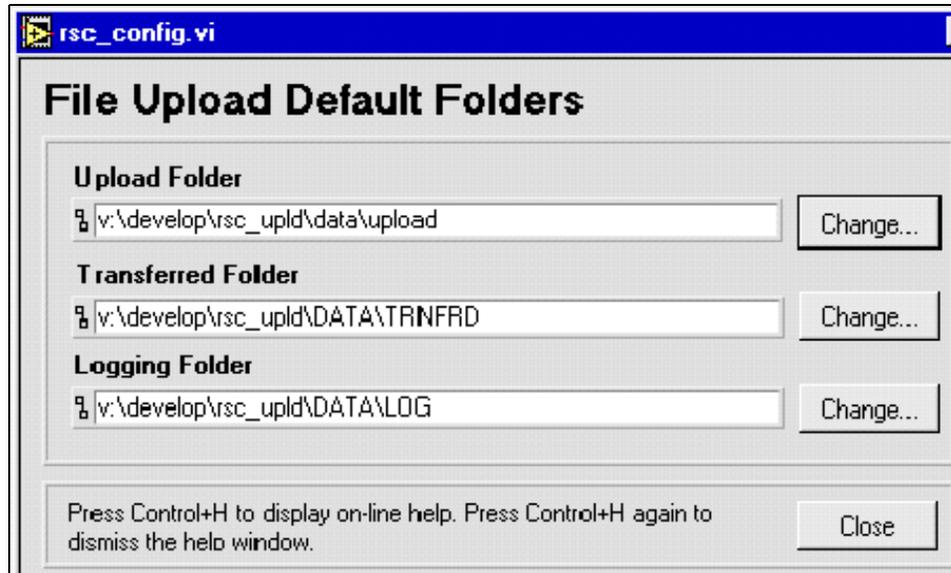


Figure 7. Configure directories used by uploader at this window.

The *RSC* program has three directories used to sort and track processed files. After setting the configurations, press the **Refresh File List** button on the “Uploader” window.

**Note: Changes in configuration are not automatically made in the list. Use the Refresh File List button to do this.**

1. The **Upload Folder** – is also known as the **Source Directory (or Source Queue)**. This directory stores files that are ready for upload to the database. For shipboard use, it is recommended that a color reflectance folder be setup on the primary data collection volume along with other upload files (e.g. \\data1\leg###\janus\_q\rsc).
2. The **Transferred Folder** – is the directory for files that have been successfully uploaded. Any log messages that are generated will also move to this location. For shipboard use it is recommended that a transferred folder be setup on the primary data collection volume (e.g. \\data1\leg###\trnfrd\rsc).
3. The **Logging Folder** – stores files that were not successfully uploaded. All files are stored unchanged. To save the error messages shown on the screen, click **Save Log**. The messages are saved to the “Log” folder with the current system time stamp. For shipboard use it is recommended that a log folder be created on the local hard drive of the upload station (e.g. c:\odp\rsc\logs).

## Source “Upload Folder”

There are two methods for changing the configuration of the **Source Upload Folder**. If you already know the directory, you can type it directly into the entry box (See Figure 7). Otherwise, use the following procedure:

1. Click the **Change** button next to the **Upload Folder** entry box. This opens the following dialog box:

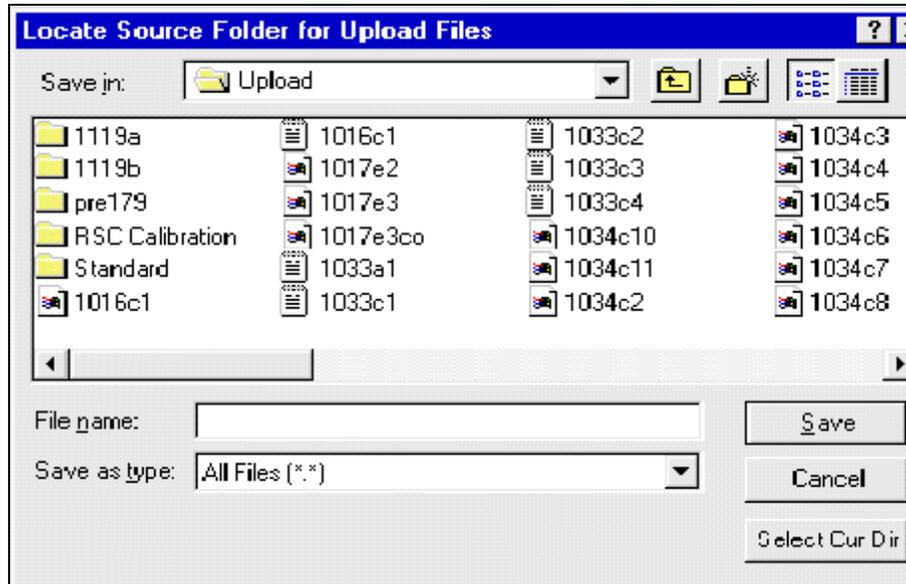


Figure 8. Locate the Upload Folder from this window.

2. Select the folder that contains the color reflectance upload data. **It does not allow you to select individual files.**
3. Click the **Select Cur Dir** button. This re-opens the “Uploader” window, with the **Source Upload** path filled out and a list of files displayed.

**Note:** Set the transferred and logging folder configurations in a similar fashion (e.g. use the *Change* button, select a folder from the dialog box, press the *Select Cur Dir* button, etc).

## Source Queue



Figure 9. The “Source Queue” in the “Uploader” window.

The source queue is displayed under the **Configure File Processing Queues** button. This win-

dow displays the **Upload Folder**, or **Source Directory**. Check this window to make sure you are uploading files from the correct directory.

## File List

Notice that the left side of the window is a list of files (See Figure 10). **These are all the files in the Source Queue (upload folder) that have not been saved to the database yet.**

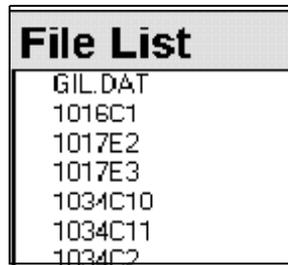


Figure 10. Files ready to upload.

If the list is empty, or if you have made any changes in configuration, click on the **Refresh File List** button. Changes made in the configurations are not automatically reflected in the list. The refresh function is the only method to update this list.

## Upload Log

The upload log displays information regarding the progress and success/failure during the upload process (See "Appendix B. Troubleshooting" p. 22).

When the upload is complete, you have the option to save the information by clicking on the **Save Log** button. **It is important to save when the program has had problems uploading files.** Successfully uploaded files are moved to the **Transferred Folder**, while problem files transfer to the **Logging Folder**.

**Note: The upload log is cleared for each new batch of files submitted for processing.**

## Uploading

1. Select the files you want to upload from the “File List” on the “Uploader” window.
2. You can select all files displayed by clicking on the **Start Upload** button and making sure the **upload** is set to **all** (See Figure 11).



Figure 11. Select “Upload All”

3. You can select individual files in several ways:

- Select only **one** file by clicking on it. This will highlight the file. Make sure the **upload** is set to **selected** (See Figure 12).



Figure 12. Select “Upload Selected”

- Select more than one **individual** file (See Figure 13) by holding down the **Shift** key while clicking on the individual files. Make sure the **upload** is set to **selected** (See Figure 12).

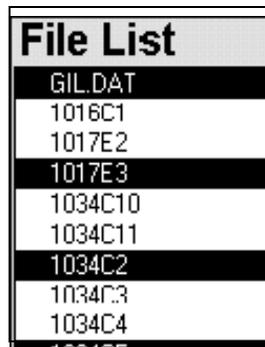


Figure 13. Multiple individual files.

- Select a block of files by holding down the **Shift** key while dragging the mouse over the group of files. Make sure **upload** is set to **selected** (See Figure 12).

4. Once you have selected the files and set the upload to the proper setting, click the **Start Upload** button.
5. As the program uploads the files, information regarding the files is displayed in the **Upload Log**. You can save this information by clicking on the **Save Log** button (See "Appendix B. Troubleshooting" p. 22).
6. All successful uploads should now be in the central database. You can inspect the successfully uploaded data from the color reflectance web browser reports at this address: **[http://janusaxp.tamu.edu/predef\\_queries/physprops/colordat.htm](http://janusaxp.tamu.edu/predef_queries/physprops/colordat.htm)**.

## Editing Uploaded Data

### Purpose

The **RSC** program contains several editing functions. These are used to edit samples so as to correct for common data oversights/errors. The editing functions are displayed as buttons on the main **RSC** window (See Figure 14).



Figure 14. Access editing functions with these buttons.

### Section and Run Identification

Before editing, you must first identify and select the proper section and run. A list of corresponding samples is then displayed.

1. Select the **leg**, **site**, **hole**, **core**, **section**, and **run** from the columns on the “Color Reflectance” window (See Figure 15). Each run consists of a series of color reflectance measurements taken on a section at selected intervals.

Leg	Site	Hole	Core	Section	Run
181	1064	A	3-H	7	7732
180	1063		2-H	6	
179	1062		1-H	5	
178	1061			4	
177	1060			3	
176	1059			2	
175	1058			1	
174	1057				
173	1056				
172	1055				

Top	Bot	Depth	L*	a*	b*	Munsell	X	Y	Z
4	4.1	27.840	40.47	8.11	12.33	6.7YR 3.9/2.2			
6	6.1	27.860	41.48	8.11	11.71	6.2YR 4.0/2.1			
8	8.1	27.880	40.72	6.82	10.24	6.7YR 3.9/1.8			
10	10.1	27.900	38.11	5.78	9.3	7.5YR 3.7/1.6			
12	12.1	27.920	36.17	3.35	6.34	8.8YR 3.5/1.0			
14	14.1	27.940	39.35	7.82	12.17	7.0YR 3.8/2.1			
16	16.1	27.960	40.43	8.06	12.33	6.8YR 3.9/2.1			
18	18.1	27.980	39.82	8.37	13.04	6.9YR 3.8/2.3			
20	20.1	28.000	40.89	7.78	11.92	6.8YR 3.9/2.1			
22	22.1	28.020	40.11	8.23	12.93	7.0YR 3.9/2.2			

Figure 15. Displayed samples that correspond to the selected information.

2. **The spreadsheet does not display the raw spectral data.** It only displays key *RSC* data to provide visual verification that the data has uploaded (See Figure 15).
3. If the data you need is not in the displayed list, check with the Lab Technician, Curator, or Database Administrator to ensure that the data has been entered into the database.

## Detailed Sample View

The spreadsheet shown in **Figure 16** is a detailed display of samples for a single run. The table provides a view of the L\*a\*b\* color coordinates and the Munsell (Hue/Value Chroma) color coordinates.

Top	Bot	Ception	L*	a*	b*	Munsell	X	Y	Z
4	4.1	27.840	40.47	8.11	12.33	6.7YR 3.9/2.2			
6	6.1	27.860	41.48	8.11	11.71	6.2YR 4.0/2.1			
8	8.1	27.880	40.72	6.82	10.24	6.7YR 3.9/1.8			
10	10.1	27.900	38.11	5.78	9.3	7.5YR 3.7/1.6			
12	12.1	27.920	36.17	3.35	6.34	8.8YR 3.5/1.0			
14	14.1	27.940	39.35	7.82	12.17	7.0YR 3.8/2.1			
16	16.1	27.960	40.43	0.06	12.33	6.0YR 3.9/2.1			
18	18.1	27.980	39.82	8.37	13.04	6.9YR 3.8/2.3			
20	20.1	23.000	40.89	7.78	11.92	6.8YR 3.9/2.1			
22	22.1	23.020	40.11	8.23	12.93	7.0YR 3.9/2.2			

Figure 16. Detailed view of samples for a single run.

The X, Y, and Z color coordinates are not collected as of this writing. When X, Y, and Z data is collected, it will appear in the columns shown.

**The individual cells of a row are NOT editable.** However, single rows or blocks of rows can be selected by either clicking the row, or clicking and dragging, respectively.

## Delete Section

This button allows you to delete **ALL** data runs associated with the currently selected section. For example, in Figure 17, Run #7732 would be deleted from Section #7.

Section	Run
7	7732
6	
5	
4	
3	
2	
1	

Figure 17. A section and its associated run.

The following message is displayed before the function will continue. Click **OK** to proceed, or **Cancel** to stop the deletion.

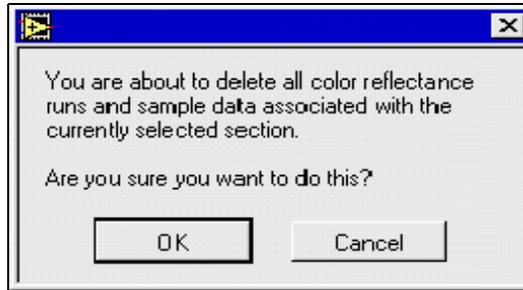


Figure 18. Warning for deleting sections.

## Delete Run

This button allows you to remove undesirable data runs from the database. For example, sometimes a second data run will be made on a core to verify spectrophotometer function. If subsequent measurements indicate some kind of equipment or operator failure, it is generally desirable to eliminate the one or more bad data runs identified.

1. Highlight the run you want to eliminate.
2. Click the **Delete Run** button. The following message will be displayed:

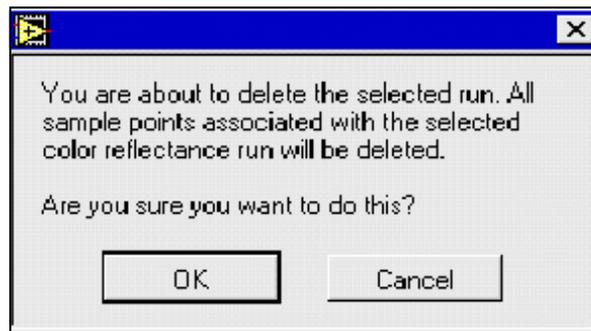


Figure 19. Warning for deleting runs.

3. Click **OK** to proceed with the deletion, or **Cancel** to stop the deletion.

## Delete Sample

It is possible that an interval may be missed or incorrectly specified during sampling. By noting the bad sample point and using the **Delete Sample** option, the operator can still upload the data and then delete the bad sample point or points.

1. Select a sample row or block of rows from the spreadsheet. Highlight one by clicking on it. *It is not necessary to highlight the whole row; highlighting one cell in the sample row is sufficient.* Highlight more than one sample by clicking and dragging with the mouse (See Figure 20).

Top	Bot	Depth	L*	a*	b*	Munsell	X	Y	Z
4	4.1	163.790	48.5	-1.56	5.44	1.5GY 4.7/0.9			
6	6.1	163.810	50.36	-1.39	4.51	1.8GY 4.9/0.7			
8	8.1	163.830	49	-1.81	5.26	2.3GY 4.7/0.9			
10	10.1	163.850	48.24	-1.51	5.56	1.3GY 4.7/0.9			
12	12.1	163.870	47.64	-1.61	5.68	1.4GY 4.6/0.9			
14	14.1	163.890	49.3	-0.58	5.77	8.4Y 4.8/0.8			
16	16.1	163.910	46.4	-0.59	4.14	9.2Y 4.5/0.6			
18	18.1	163.930	48.44	-1.12	5.49	0.3GY 4.7/0.8			
20	20.1	163.950	49.61	-1.59	6	1.2GY 4.8/0.9			
22	22.1	163.970	49.6	-1.24	5.2	0.8GY 4.8/0.8			

Figure 20. Selected samples to be deleted.

2. Click the **Delete Sample** button. The following message will be displayed:

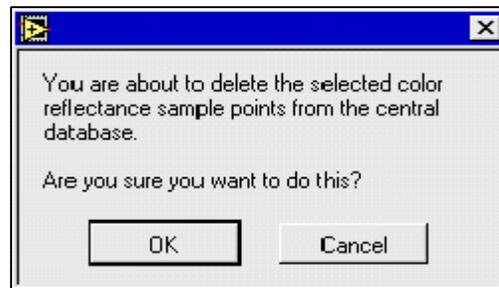


Figure 21. Warning for deleting samples.

3. Click **OK** to proceed with the deletion or **Cancel** to stop.

## Reassign Run

This button allows you to re-assign a run to a different section. For example, at the end of a run, you might notice that the section on the track doesn't match up with the section indicated on the data acquisition screen. Thus, the run is assigned to the wrong section. This can be fixed after the upload by using the **Reassign Run** function.

1. Select the problem run from the "**Run**" column by clicking on it.
2. Click the **Reassign Run** button. The following window is displayed:

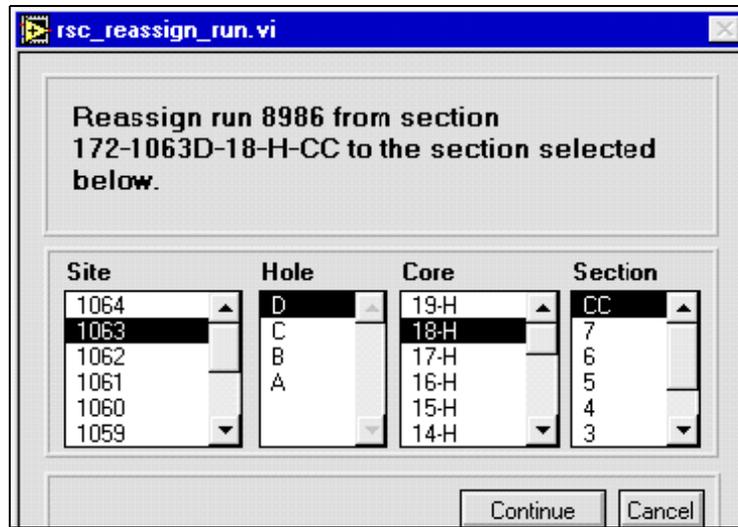


Figure 22. The “Reassign Run” window.

3. Select the correct section for the run by clicking on it.
4. Click the **Continue** button to proceed, or **Cancel** to stop.

**This function only allows you to select a section within the same leg. Runs cannot be re-assigned across legs.**

## Appendix A. Installing RSC

This appendix describes how to install, configure, and troubleshoot possible problems with the *RSC* program.

### Executable and Program Files

#### *New Installs*

*RSC* program files should be installed in the directory `\odp\rsc`, off the root of the deployment system's hard-drive.

1. Open the file Window's File Manager. Drag the **RSC** folder from the original distribution media into the `\odp` folder on the deployment system.
2. *RSC* distribution consists of the following files:
  - **RSC\_UPLD** The main executable
  - **RSC.ICO** An icon that can be used for the Windows desktop
  - **SETUP.DAT** This file is created at run-time and is not part of the distribution. It holds program default/configuration information (See "Appendix B. Troubleshooting" p. 22).
3. **When a new installation is complete, be sure to run the program and configure the upload, transfer, and logging directories.** Recommended settings are provided in the User's Guide.

#### *Updates*

Delete the existing *RSC* folder and follow the instructions above.

### Program Manager Setup

Set up the following property settings so the *RSC* program can be accessed from the Windows Program Manager.

1. Right click the mouse on the desktop. This opens a selection list.
2. Select **New>Shortcut**. This brings up the "Create Shortcut" dialog box (See Figure 23).

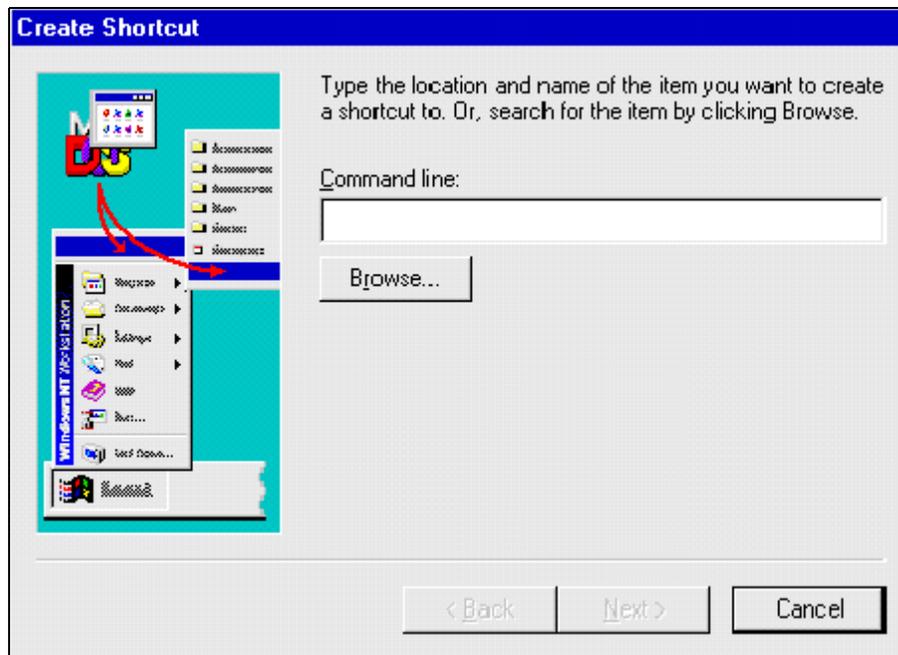


Figure 23. The “Create Shortcut” dialog box.

3. Type `c:\odp\rsc_upld\rsc_upld.exe` into the “Command line”, or click on **Browse** to retrieve this file. Click **Next** to continue.
4. Select a title for the program. Type in **RSC** for the title name (See Figure 24). Click the **Finish** button.

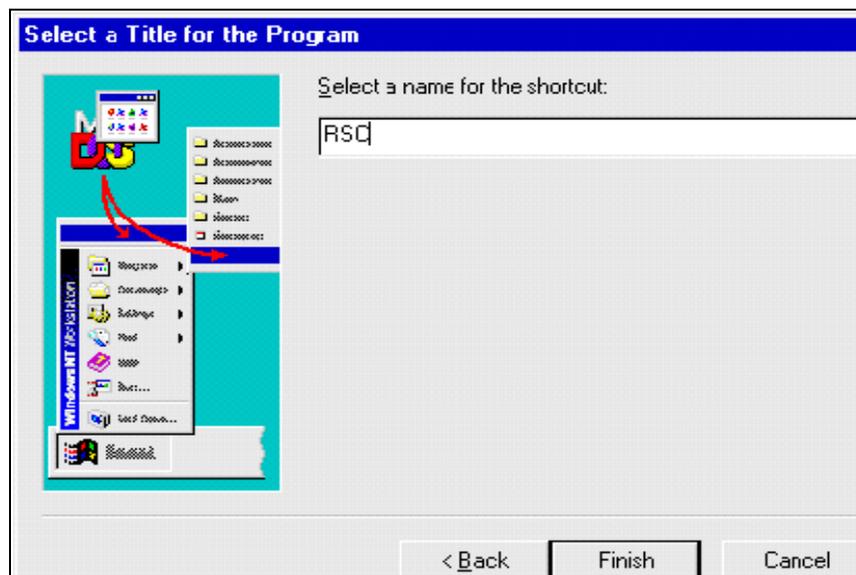


Figure 24. Enter the Shortcut name here.

5. An RSC icon will appear on the desktop. This icon should be changed to match the pro-

gram. Click on the icon once, then press <Alt+Enter>; or press <Alt> while double clicking on the icon.

6. The “RSC Properties” dialog box will appear. Select the **Shortcut** pane (See Figure 25).

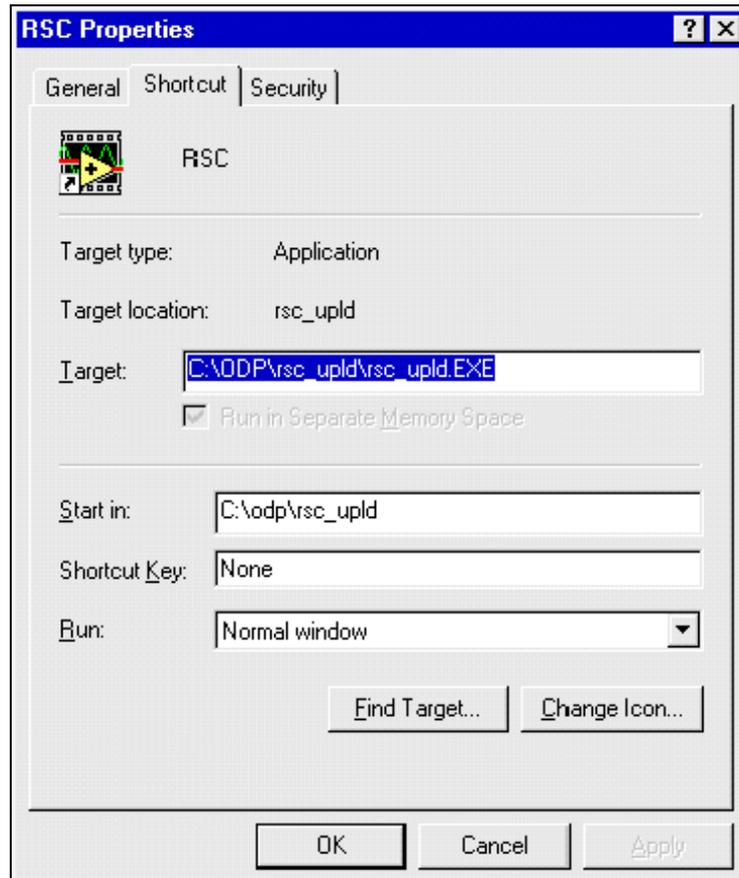


Figure 25. The “RSC Properties” dialog box.

7. Click on the **Change Icon...** button. This opens the “Change Icon” dialog box (See Figure 26).

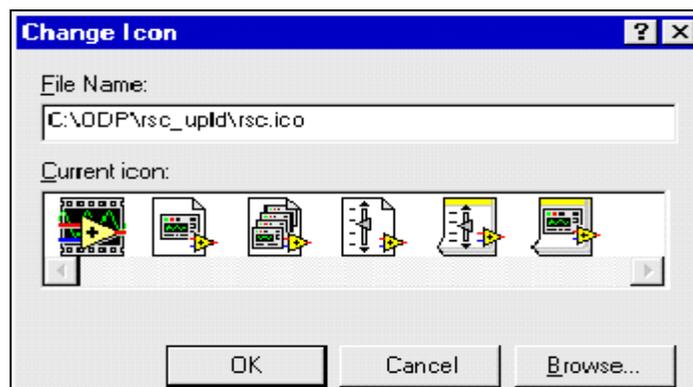


Figure 26. The “Change Icon” dialog box.

8. Change the "File Name" to **c:\odp\rsc\_upld\rsc.ico**. Click **OK**. The dialog box displays the current icon. Click **OK** again. Then click **OK** on the "RSC Properties" dialog box.
9. The current icon should now be visible on the desktop.

## System Requirements

The minimum recommended system requirements are:

1. Pentium 90 or better Wintel machine.
2. 32 megabytes of RAM.
3. Windows NT 4.0, Windows 95 or Windows 98.

**Note: For simplicity, it is assumed that the Windows operating system and Oracle's SQL \*Net are already properly installed and configured.**

## **Appendix B. Troubleshooting**

### **Login**

1. For shipboard and shore use, the proper **RSC** login is the Physical Properties account, username **phys111** and password **phys111**.
2. If **RSC** will not continue past login, verify the following:
  - Check that the **Host** name is correct. Contact an MCS if you are not sure what the Host name should be.
  - Verify that the web server on the database server is running and accessible.
  - Check that the **SETUP.DAT** configuration file is read-writeable.

### **Data Editing**

The **RSC** “data editing” functions should be used with caution. A sample, or run of samples, can be erroneously deleted. They can only be recovered by re-uploading the file containing those data points.

**Note: The current RSC version does not provide any means to view or edit calibration data.**

### **Upload File Format**

The source data files should be in the format specified in Appendix D for the **Upload Data Files** option. Sample files of the expected format are included with the original distribution of this program.

### **Configuration File Notes**

The **SETUP.DAT** file records the following configuration information:

- Upload, log, and transfer file defaults.
- Username, password, and host for database login.
- Next available run number for the upload processing.

**Note: This file is not human readable. Don't bother trying to edit it.**

### **Error/Validation Log Specifications**

## Appendix C. File Format Specification: Leg ???-178

This appendix contains a cumulative record of the *RSC* upload formats required by various versions of the program. **The program versions and format specifications are labeled by the leg in which they were used.** Also, any additional notes about specification development are included.

### **Format Specification: Leg ???-178**

The first release of *RSC* sailed on Leg 174B. It was a prototype of the color reflectance acquisition, upload, and editing under the LabVIEW instrument interface. The same upload format was used for several legs prior. How far back has not been determined.

#### *File Naming Conventions*

Each upload file contains reflectance samples for a specific site, hole, and core. The upload files are named accordingly, with no type extension (e.g. 1033a1, 1017e3).

For the Leg 175 *RSC* version, a log file is recorded for each uploaded file. The log records the success or failure of sample uploading in the associated upload file. The log files are named the same as upload files, but with a '**.log**' extension (e.g. 1033a1.log, 1017e3.log).

#### *Data Acquisition Format Specification*

The upload files were originally written from the Macintosh platform. The files are human readable ASCII text. Each column of information is a fixed width with runs of spaces delimiting the columns. The end-of-line indicator for the Macintosh is the carriage return character (CR).

Each line contains the following information:

1. Natural sample identifier – leg, site, hole, core, core type, section number or core catcher (CC), top interval, and bottom interval.
2. A blank column for inserting depth information.
3. Color coordinates based on the CIE L\*a\*b\* color description standard.
4. Color coordinates based on the Munsell Hue Value Chroma (HVC) color description system.
5. Spectral reflectance values for each wavelength from 400-700 nanometers (nm) at intervals of 10nm (31 values).

**Natural Sample Identifier**

The “Natural Sample Identifier” consists of a leg, site, hole, core type, section number (or core catcher), top interval, and bottom interval. The layout is as follows:

- Columns not specified are filled with blanks.
- Values shorter than a column are padded to the column width with spaces.
- Format specifiers **N** and **A** are used below to represent decimal digits (0 to 9, or sign, decimal point shown explicitly) and alphabetical characters (A to Z).

Field	Start	Length	Notes/Examples
Leg	2	3	Only 3-digit legs are used currently. The upload parser will handle 1 and 2 digit legs also. Value is right justified in the field width. Format 'NNN'.
Site	6	4	Format 'NNNN'.
Hole	11	1	Format 'A' (uppercase)—the parser can handle lower or upper case data.
Core	13	3	Value right justified and leading blanks used if value shorter than 3 digits. Format 'NN'.
Core Type	17	1	Format 'A' (uppercase)—the parser can handle lower or upper case data.
Section	19	2	2-digit section numbers are supported by this format. Shorter values are right justified and padded with spaces. Format 'NN'.
Top Interval	24	5	Values are expressed in centimeters precise to the millimeter, right justified, and padded with leading blanks if needed. Format 'NNN.N'
Bottom Interval	30	5	Values are expressed in centimeters precise to the millimeter, right justified, and padded with leading blanks as needed.

Figure 27: “Natural Sample Identifier” table.

**Other Columns**

Field	Start	Length	Notes/Examples
Depth	36	7	This column is left blank by the data acquisition program. For the parser to properly upload a file this column should be left blank.
L*	44	6	Value right justified and blank padded. Format 'NNN.NN'.
a*	51	6	Value right justified and blank padded. Format 'NNN.NN'.
b*	58	6	Value right justified and blank padded. Format 'NNN.NN'.
Munsell (Hue)	65	6	Format 'NN.NAA' or the text 'NEUTRA'. For example, 23.2YG or 1.6B. The exception records neutral hue values allowed by the Munsell system.
(Value/ Chroma)	72	9	Format 'NN.N/NN.N'.
Spectral Reflectance at 400nm	82	5	Format 'NN.NN'. There should be 31 columns of spectral reflectance values total. This first column is the percentage reflectance at 400 nanometers (nm). Subsequent columns record reflectances at wavelengths up to 700 nm at 10 nm intervals.
410nm	88	5	Value right justified and blank padded. Format 'NN.NN'.
420nm	94	5	Value right justified and blank padded. Format 'NN.NN'.
430nm	100	5	Value right justified and blank padded. Format 'NN.NN'.
440nm	106	5	Value right justified and blank padded. Format 'NN.NN'.
450nm	112	5	Value right justified and blank padded. Format 'NN.NN'.
460nm	118	5	Value right justified and blank padded. Format 'NN.NN'.
470nm	124	5	Value right justified and blank padded. Format 'NN.NN'.
480nm	130	5	Value right justified and blank padded. Format 'NN.NN'.
490nm	136	5	Value right justified and blank padded. Format 'NN.NN'.
500nm	142	5	Value right justified and blank padded. Format 'NN.NN'.
510nm	148	5	Value right justified and blank padded. Format 'NN.NN'.
520nm	154	5	Value right justified and blank padded. Format 'NN.NN'.
530nm	160	5	Value right justified and blank padded. Format 'NN.NN'.

540nm	166	5	Value right justified and blank padded. Format 'NN.NN'.
550nm	172	5	Value right justified and blank padded. Format 'NN.NN'.
560nm	178	5	Value right justified and blank padded. Format 'NN.NN'.
570nm	184	5	Value right justified and blank padded. Format 'NN.NN'.
580nm	190	5	Value right justified and blank padded. Format 'NN.NN'.
590nm	196	5	Value right justified and blank padded. Format 'NN.NN'.
600nm	202	5	Value right justified and blank padded. Format 'NN.NN'.
610nm	208	5	Value right justified and blank padded. Format 'NN.NN'.
620nm	214	5	Value right justified and blank padded. Format 'NN.NN'.
630nm	220	5	Value right justified and blank padded. Format 'NN.NN'.
640nm	226	5	Value right justified and blank padded. Format 'NN.NN'.
650nm	232	5	Value right justified and blank padded. Format 'NN.NN'.
660nm	238	5	Value right justified and blank padded. Format 'NN.NN'.
670nm	244	5	Value right justified and blank padded. Format 'NN.NN'.
680nm	250	5	Value right justified and blank padded. Format 'NN.NN'.
690nm	256	5	Value right justified and blank padded. Format 'NN.NN'.
700nm	262	5	Value right justified and blank padded. Format 'NN.NN'.

Figure 28. "Other Columns" table.

Some data files will have additional columns of information. At one point, ODP Lab Officers planned to extend the above format specifications to capture additional data about color reflectance runs. In other files, these values may be artifacts of researchers editing files during a leg.

The specification upload parser treats the values as reflectance values, uploading them into the database as such. Future programs will truncate these values.

**Example Sample Data**

Below are sample data lines from several color reflectance files – the lines are wrapped due to margin settings on this document.

```
169 1033 A 1 H 1 2.0 2.1 86.31 1.61 -5.18 0.6P 8.5/ 2.2 17.06 38.02 64.04
79.70 82.97 79.79 75.64 73.48 71.91 70.50 69.87 69.13 68.30 67.89 67.62 67.56 67.46 67.57 67.75
67.81 68.00 68.33 68.45 68.65 68.77 68.94 69.11 69.20 69.33 69.57 69.74
```

```
169 1033 A 1 H 1 11.0 11.1 32.04 -1.22 12.78 8.3Y 3.2/ 2.0 2.67 2.76 2.93
3.25 3.68 4.21 4.70 5.12 5.46 5.81 6.15 6.42 6.75 7.03 7.19 7.44 7.59 7.67 7.75
7.81 7.77 7.75 7.78 7.88 7.94 7.74 7.37 7.23 7.55 8.00 8.34
```

```
167 1017 E 2 H 6 149.0 149.1 32.31 -0.42 5.02 8.3Y 3.1/ 0.8 10.12 6.53 5.52
5.42 5.57 5.79 5.95 6.19 6.41 6.61 6.76 6.86 6.94 7.08 7.18 7.29 7.39 7.43 7.43
7.46 7.43 7.43 7.45 7.42 7.39 7.25 7.13 7.24 7.36 7.45 7.55 0.00 6.92 7.22 4.95
```

```
167 1017 E 2 H 7 2.0 2.1 34.92 -0.57 5.41 8.6Y 3.4/ 0.9 11.81 7.64 6.46
6.34 6.51 6.73 6.91 7.21 7.49 7.70 7.87 8.03 8.17 8.31 8.42 8.55 8.67 8.71 8.69
8.70 8.71 8.68 8.67 8.66 8.61 8.45 8.36 8.44 8.53 8.72 8.84 0.00 8.09 8.46 5.77
```

```
172 1062 D 8 H CC 6.0 6.1 50.01 0.21 5.18 7.9Y 4.8/ 0.8 13.99 14.32
14.59 14.94 15.30 15.63 16.00 16.35 16.66 16.99 17.24 17.46 17.68 17.85 18.06 18.35 18.65 18.89
18.97 19.00 18.94 18.78 18.58 18.41 18.24 17.99 17.76 17.56 17.34 17.16 16.97 0.00 20.28 18.43
5.70 0.00 18.43 0.46 0.41
```

```
172 1062 D 8 H CC 8.0 8.1 49.43 0.25 5.65 7.9Y 4.8/ 0.8 13.19 13.55
13.89 14.25 14.61 14.96 15.34 15.73 16.06 16.40 16.68 16.93 17.15 17.31 17.57 17.84 18.18 18.44
18.52 18.55 18.54 18.31 18.10 17.94 17.73 17.50 17.27 17.05 16.82 16.64 16.43 0.00 19.76 17.94
5.47 0.00 17.94 0.46 0.42
```

## **App D. File Format Specifications: Leg 179-Present**

## Appendix E. RSC Database Schema

This appendix describes, on a table-by-table basis, the structure of the color reflectance data model. Detailed comments and usage notes are provided for the various schema fields. Summary discussions provide review of table inter-relationships.

**Unless specifically noted otherwise, all fields discussed below are required fields** – in database terminology, non-nullable. Abbreviations used in the tables include:

PK = Primary Key

FK = Foreign Key

### Run Numbers

A color reflectance data *run* consists of point measurements made on a single core section or against a physical standard. Each run is assigned a natural counting number, starting with one for the first section/standard processed.

Multiple data runs can be collected for the same section. This may occur if previous data collection integrity is in question and being corrected.

Multiple runs against a physical standard (i.e. a calibration run) are made to ensure the measurement equipment is operating as expected.

Every run number is unique within a given leg. A laboratory journal is maintained at the color reflectance station for researcher's comments (if any) on the current calibration or data run.

### RSC Run Table

This table records current run information, some of which relates to current equipment settings. A new record is added for each data or calibration run.

Table Field	Format	Notes/Comments
leg	number(5), PK	Number identifying the cruise for which data was entered into the database.
rsc_run_num	number(4), PK	Run number under review.
rsc_num_meas	number(2)	The spectrophotometer allows multiple readings to be taken at each sample point. Data collected in this mode represents the average of this many readings taken at one sample point.

Rsc_run_date_time	date	Contains the date and time at which run data was uploaded to the central database.
Rsc_calib_date_time	date, FK	This field links the current run to the last available calibration run. Equipment settings associated with this calibration record apply to the data collected. Foreign key reference to the calibration table.

Figure 29.RSC "Run Table".

## RSC Section Table

This table identifies color reflectance data runs. **A sample record is tied to a particular leg/site/hole/core/section through a link to the Janus section table.** Select a "compound natural key" to distinguish run data from calibration data. The compound key also allows the recording of multiple data runs for the same section.

*Section Table* records are children of the **RSC Run Table**. Section information must already be logged into the database for data to be logged. Every section with color reflectance data has one or more entries in this table. If this table contains an entry with no child records, review the entry and either remove it or add appropriate child data.

Table Field	Format	Notes/Comments
section_id	number(7), PK	Unique number generated by system to identify section. This is done because of the physical subsection/0 section problems. In adding new sections deleting sections or changing sections don't want to have to ripple updates throughout the database
leg	number(5), PK	Number identifying the cruise for which data was entered into the database. Derives from the database Leg and Defaults tables.
Rsc_run_num	number(4), PK	Number assigned to the run under review.

Figure 30.RSC "Section Table".

## RSC Control Table

This table identifies color reflectance calibration runs. The calibrations are run against one of the physical standards. The standards are documented in the Janus physical properties standard table. *Control Table* records are children of the **RSC Run Table**.

Table Field	Format	Notes/Comments
standard_id	number(7), PK	Unique number used to link associated calibration data back to the physical standard against which the data was recorded.
leg	number(5), PK	Number identifying the cruise for which data was entered into the database.
rsc_run_num	number(4), PK	Number assigned to the run under review.

Figure 31.RSC "Control Table".

## RSC Run Data Table

This table records the sample point data values for a section run. Theoretically, color reflectance measurements are recorded for a given point. In practice, sample point top and bottom intervals are recorded as a 1mm distance. This is the minimum sample resolution allowed by the current database definition. It is presently used to ensure the uniqueness of a sampling point. Millimeter precision, although used here, is not indicative of depth measurement precision.

The tristimulus x,y, and z color coordinate fields are not required. Present data collection efforts do not include these data.

Table Field	Format	Notes/Comments
leg	number(5), PK	Number identifying the cruise for which data was entered into the database.
rsc_run_num	number(4), PK	Number assigned to the current run
top_interval	number(6,3), PK	Value expressed in meters! Upload files express this in centimeters. Distance from the top of the section to the top of the sample. Although 150 cm is generally the length of the sections, an additional 50 cm is allowed to account for core expansion or dividers used with hard rock samples.
bottom_interval	number(6,3)	Value expressed in meters! Distance from the top of the section to the bottom of the sample.  This field is not required. Neither top or bottom interval are meaningful for calibration runs or control runs

rsc_cielab_l_star	number(6,2)	CIELAB system color notation. Method based on <i>CIE COLORIMETERY</i> , Second edition, Publication 15.2 (1986). L* is the lightness variable.
rsc_cielab_a_star	number(6,2)	a* is a chromaticity coordinate.
rsc_cielab_b_star	number(6,2)	b* is a chromaticity coordinate.
rsc_height	number(4,2)	Distance in millimeters from the surface of the material to the spectrophotometer lens.
rsc_height_assumed_flag	number(1)	For legacy data, the height is assumed to be 1mm. This field is set to 1 if the height is assumed; otherwise, this field is set to 0.
rsc_munsell_hvc	varchar2(15)	Munsell HVC (hue, value, chroma) Color notation. ASTM D 1525-1980, <i>Standard Method of Specifying Color By The Munsell System</i>
rsc_tristimulus_x	number(6,2)	The value measured by the camera in the x direction of the color sphere coordinates.
rsc_tristimulus_y	number(6,2)	The value measured by the camera in the y direction of the color sphere coordinate.
rsc_tristimulus_z	number(6,2)	The value measured by the camera in the z direction of the color sphere coordinate.
rsc_first_channel	number(4)	The first channel or wavelength measured for a color reflectance measurement, in nanometers.
rsc_last_channel	number(4)	The last channel, or wavelength, measured for a color reflectance measurement, in nanometers.
rsc_channel_increment	number(4)	The increment between measured wavelengths for a color reflectance measurement, in nanometers.
rsc_spectra	varchar2(2000)	Space/comma delimited list of reflectance values for each channel in the range specified. Present upload programs expect space delimited values.

Figure 32.RSC "Run Data Table".

## RSC Calibration Table

This table records spectrophotometer setting information at the time of a calibration run.

Current uploads assume that the calibration settings apply to all subsequent data runs until a new calibration is made.

**Each calibration record is associated with only ONE standard against which measure-**

**ments are taken.**

The system ID field is presently not used, nor is it required by the database. At some future point, the ODP number will possibly be placed. This will occur when multiple pieces of measuring equipment come on line at the various sampling locations. The comment field is not required either.

Table Field	Format	Notes/Comments
rsc_calib_date_time	date, PK	The date and time this calibration was recorded.
rsc_comment	varchar2(80)	Any general notes recorded by the observer. This field is not required.
rsc_illumination_condition	varchar2(3)	CIE standard illuminants: e.g. A, C, D50, D65. For further detail on how these illumination standards apply to the resulting measurements, refer to the CM-2002 spectrophotometer manuals
rsc_num_meas	number(2)	Sometimes multiple measurements are taken at each sample point and averaged to obtain the recorded values. This field records how many values were averaged to obtain the values recorded for this calibration.
rsc_observer_angle	number(2)	Current equipment supports measurements taken at 2° or 10° (based on CIE standard observer specifications).
rsc_reflectance_corr	number(2,1)	Correction factor used to calculate SCI data from SCE measurements. The current equipment supports programmable settings in the range 0.0 -9.9%. Usually this factor is set to 0.0%. See the spectrophotometer manuals for more detail.
rsc_specular_status	varcha2(3)	SCI (specular component included) or SCE (specular component excluded). These are camera settings for the CM-2002 camera.
rsc_zero_calib_flag	number(1)	0 = not done, 1= zero calibrated. Refer to the spectrophotometer manuals for further details relating to zero calibration of the equipment against a standard.
system_id	number(7)	Non-natural ID number for a particular laboratory system. Identifies the camera and/or track system used to take reflectance readings. This field is not required.

Figure 33. RSC "Calibration Table".

## Physical Properties Standard Table

This table provides a central repository for information about the physical standards in use by ODP (at present, only for the shipboard laboratories). **The color reflectance database should reference only color reflectance standards.**

The following fields are not required for entry by the database system: standard name, standard set name, date/time decommissioned, lot serial number, and comments.

Table Field	Format	Notes/Comments
standard_id	number(7), PK	Non-natural database ID used to uniquely identify a particular standard within the database.
standard_name	varchar2(20)	The name of a specific physical properties standard.
standard_set_name	varchar2(20)	The name for a group or set of related physical properties standards.
date_time_commissioned	date	The date on which a physical properties standard went into use.
date_time_decommissioned	date	The date on which usage of a physical properties standard was discontinued.
lot_serial_number	varchar2(20)	Information concerning the lot and/or serial number associated with a physical properties standard.
comments	varchar2(80)	General notes/comments regarding the specific standard described by this record.

Figure 34. Physical Properties Standard Table.

## Section Table

This table records the leg, site, hole, core, core type, and section number for each piece of core against which laboratory measurements are taken. The table is included here as a reference.

**Any live runs of data entered into the system must tie back to this table.**

Following are non-required fields, but must be filled to ensure the usefulness of the data: section type, curated length, liner length, core catcher stored in, and section comments.

Table Field	Format	Notes/Comments
section_id	number(7), PK	Unique number generated by system to identify a section.
section_number	number(2), PK	Section number. If n regular sections then core catcher is section n+1
section_type	varchar2(2)	Used to differentiate sections of core (S) from core catchers (C). Previously core catchers were stored as section number CC, but in Janus core catchers are given the next sequential number from the last section recovered.
curated_length	number(6,2)	The length of the nth core section in cm sent to the repository. This may be different than the liner length for the same section. Hard rock cores will often have spacers added to prevent rock pieces from damaging each other.
liner_length	number(6,2)	The length in cm to which the liner of the nth core section is cut.
core_catcher_stored_in	varchar2(2)	Sometimes the core catcher is stored in a D-tube with a section. This field contains the section number of the D-tube that holds the core catcher for the current core.
section_comments	varchar2(45)	Observer or technician comments regarding the current section.
leg	number(5), FK	Number identifying the cruise for which data was entered into the database.
site	number(6), FK	Number identifying the site from which the core was retrieved. A site is the position of a beacon around which holes are drilled.
hole	varchar2(1), FK	Letter identifying the hole at a site from which a core was retrieved or data was collected.
core	number(5), FK	Sequential numbers identifying the cores retrieved from a particular hole. Cores are generally 9.5 meters in length, and are numbered serially from the top of the hole downward.
core_type	varchar2(1), FK	A letter code identifying the drill bit/coring method used to retrieve the core. The core type is only reported in data subsequent to leg 113.

Figure 35. Section Table.