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Title: Electronic Logbook for DAQ Projects

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Intended for: Users of PC DAQ electronic logbook



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Electronic Logbook for DAQ Projects

Web based Electronic Logbook on Windows for DAQ Projects

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PURPOSE OF LOGBOOK PROJECT

OBJECTIVE

Every experiment should have a logbook where the status of the data and equipment is recorded. In ancient, bygone years (say 10 years ago); this would have been done with a bound, paper logbook. Such logbooks, while durable, can be cumbersome to use if multiple people are working on the same apparatus at the same time. Having to hunt down the current location of a paper logbook can be all the excuse a person needs not to make an entry. Adding pictures or charts is a chore. When it comes time to review an experiment, the book is often stored elsewhere. Finding a given piece of information can be difficult. Finally, making copies for distribution or safe keeping is tedious.

This web application provides an on-line logbook for use in experiments. It allows multiple people to view, add and edit individual entries in a time and author stamped database of text entries. As a web application, users (clients) only need a web browser of any flavor to use the program and can access the logbook from anywhere (subject to access requirements). As it is based on a relational database, it can be searched on a variety of different variables and content. As a computer file, it can be easily backed up. Because it is designed to be used in an experimental environment, log entries have additional fields to allow an entry to be associated with two different data streams (Run and pictures numbers), a two tiered activity labeling scheme, and any number of different data types (examples: Calibration, Background, etc.)

The database file can also be accessed in parallel by other programs. This allows various Data Acquisition (DAQ) applications to make automatic and/or standard entries into the logbook. For example, a DAQ program can automatically make an entry for each data run started for the experiment. Other programs can enter data tables on the status of different parts of the experiment at the click of a button by the user.

As this application has been developed for LANL projects, it also has additional parameters and controls for displaying LANL required notices, protection regime labels, etc.

HISTORY AND PERSONNEL

This web application is one component of the PC DAQ project. PC DAQ is a project for a general DAQ system running on a Windows system.ⁱ ⁱⁱ The Logbook was first developed by Larry Schultz and Gary Hogan in 2002. It was originally a Visual Basic 6 ASP application for Windows 2000. From the beginning, it was integrated into the DAQ system so that runs were automatically recorded in the database. In 2003 and 2004, Lisa Day and Gary Hogan expanded the functionality of the application. Since 2005, Gary Hogan has been maintaining the code, refactoring (cleaning up) code, documenting and moving the code to current versions of Visual Basic.Net in Visual Studio and the latest version of IIS. No major feature additions have occurred for a while.

This application is an addition to the basic PC DAQ project that started in 1995. The DAQ program was already using Access databases to keep track various data run parameters. The logbook application has been developed to use some of the existing database tables of PC DAQ as well as a new table/file for the logbook entries.

REQUIREMENTS

SYSTEM

The application is currently written in Visual Basic.Net for Visual Studio 2008. It is a ASP.Net 2.0 framework program. It uses a set of Access 2007 database files with numerous tables. It will run on any version of Windows IIS (XP through Server 2008 R2), 32 or 64 bit. Connection to the database uses the Jet 4.0 drivers which only come in a 32-bit version.

DISPLAY OVERVIEW

ENTRY DISPLAY FORMAT

USER ENTRY



● 27 | 1/20/2011 10:44:37 AM | **GEHogan** | [Edit](#) NIS0001 - Neutron Imaging - Setup
Today's first entry

Figure 1, Minimal Logbook Entry

Figure 1 is a typical minimal logbook entry. The various pieces are:

1. Upper Left Corner. The red dot followed by a number. The dot is just to decorate the start of the entry along with the horizontal line. The number is the primary key for the database entry. This key is assigned by the database engine and is not changeable. Duplicate keys are not allowed.
2. Display Time stamp. The display order for database entries is based on this time stamp. The default value for this is the time the entry is created. The user can change this, allowing the insertion after the fact of comments into the displayed order of entries. There are two other time stamps for each entry. A creation time stamp and the time of the last edit to an entry. The user does not have read or write access to these other times.
3. User. The display name for the user that created the entry.
4. Edit button. This button brings up an edit form for the entry.

5. Upper Right Corner. This displays the current activity for the experiment. It has three parts.
 - a. The activity number (or name). For this example, that is NIS0001
 - b. The Family name. This name that covers a range of related activities numbers. In this case it is "Neutron Imaging".
 - c. Activity Title. The Title for the activity. A specific text description of the activity. In this case it is "Setup"
6. Text Entry. This is the actual text for the logbook entry. It can be of any length. The display does **not** do text wrapping, so the client needs to insert their own carriage returns. The client is also not allowed to enter any text that looks like HTML or XML tags. This is a security feature of the Windows IIS/ASP.Net framework to prevent SQL injection attacks.
7. Background. The background pattern is defined by the file backgrnd.gif which is stored in the root directory of the site, not the application.

USER ENTRY WITH FILE

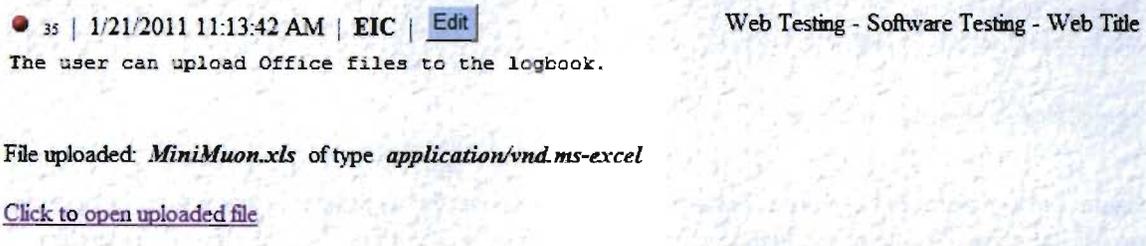


Figure 2, Office File Upload

The client can also "paste" files into the logbook. Figure 2 shows an Excel file that has been uploaded to the log book. One can click the link to get the file. There is a default size limit of 10 Megabytes for uploaded files. The actual files are stored outside the logbook database file in a known folder.

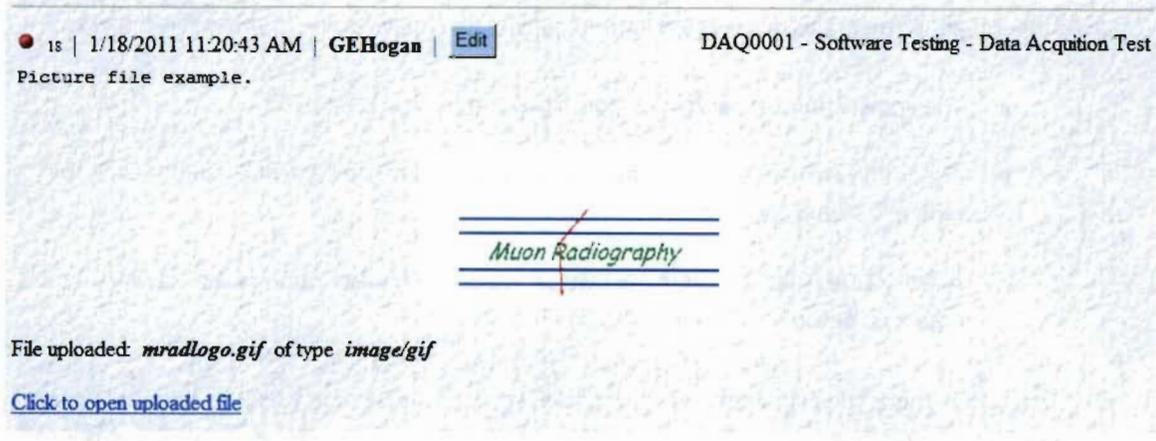


Figure 3, Entry with Picture

Figure 3 shows an entry with a picture file. For many common picture formats, the entry will display the picture.

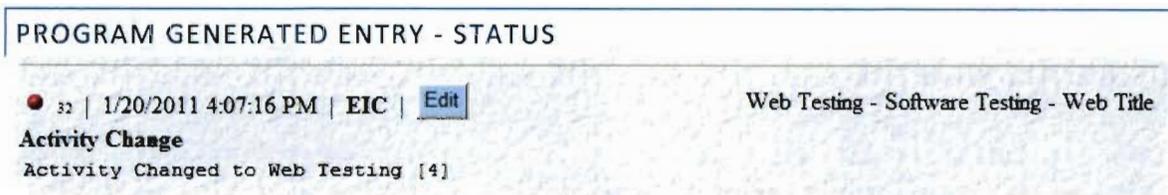


Figure 4, Program Generated Status Entry

Figure 4 shows a program generated log entry. These are generated by programs that directly access the Access database file holding the logbook. These entries have an additional field displayed, the Subject Field. The subject field is the bold face line "Activity Change" in this example. Users do not have access to this field. Thus, use of this field distinguishes user versus program generated entries. Another way of saying this is that users cannot manually impersonate program generated entries.

PROGRAM GENERATED ENTRY – SIMPLE RUN

5182 | 11/24/2010 4:15:32 PM | **DAQ On-line** | [Edit](#) | STAT0095 - Miscellaneous - STEPWEDGES

Run: 40931 Picture: 36461 Type: Beam

Start Run

11/24 16:15 *Start Run 40931* STAT 95, Stepwedges
11/24 16:15 *Arm*
11/24 16:15 *Trigger*
11/24 16:15 *Diffuser* 1039
11/24 16:15 *MP Width* 60
11/24 16:15 *Picture 36461* Beam, Cameras X, Y, Z, T, U, V, Q, R, S, N, O, P, K, L, M, H, I, J, 7, 8, 9, E, A, B, C, D
11/24 16:16 *End Run*

Figure 5, Simple Run Entry

Figure 5 is a simple run entry generated by the PC DAQ main DAQ program. A new line has appeared, the blue letters giving run information. "Run" is the run number, the main ID number for this set of data. "Picture" is the ID number for an additional data stream data set. As this application is written for the PRAD experiment, this additional data stream is referred to as "Pictures" (CCD camera pictures). The "Type" refers to the type of data being recorded. Examples might be "Calibration" or "Test", etc. This variable is called the "picture type" in the code and on the web forms.

These run parameters can be changed by the user. What can often not be changed is the text of the program generated entry. That is because programs often generate HTML tags for the text. But, for security reasons, users are not allowed to use HTML tags. Thus, the entry editor page does not allow changes to the text.

PROGRAM GENERATED ENTRY – COMPLEX

10901 | 1/28/2011 6:14:35 AM | **DAQ On-line** | [Edit](#) UCN0029 - Area B, 2011 - Winter 2011

Run: 23038 Picture: 0 Type: No picture

Start Run
01/28 06:14 *Start Run 23038 2011 Winter Run*
01/28 10:14 *End Run*

Lakeshore Summary, Run 23038, 01/28/2011 10:14:36

Device	Sensor	Kelvin	Celsius	Sensor	Linear	Min	Max
12	1	320	46.85001	57.3	0	4.1	325
12	2	2.311	-270.839	-7575.8	0	2.31	3.223
12	3	324.16	51.01001	62.1	0	5.976	325
12	4	308.21	35.06	59.2	0	4.308	325
12	5	314.88	41.73001	58.1	0	4.331	325
12	6	279.58	6.429993	64.5	0	5.225	306.27
12	7	300.22	27.07001	60.6	0	65.209	325
12	8	300.32	27.17001	60.5	0	74.569	324.71
13	1	289.66	16.51001	62.5	0	85.965	325
13	2	289.22	16.07001	62.6	0	133.85	308
13	3	318.71	45.56	57.5	0	37.482	325
13	4	325	51.85001	57.4	0	31.686	325
13	6	325	51.85001	50.5	0	2.31	325
13	8	307.12	33.97	59.4	0	30.85	325

Figure 6, Complex Entry

Because programs directly access the database and do not go through the web interface, they are allowed to use HTML for their text entry. Figure 6 is an example of such an entry.

HEADER DISPLAY



Figure 7, Page Header GIF File

Because you normally want to keep the web display focused on the entries, the web page tries to minimize the amount of header and footer clutter. For the header, the default is to display a simple gif logo file the host organization supplies.

If a logbook has Official Use Only material or other restricted information, you may need to add additional header and footer labels. How you do that is explained in the configuration controls section. Below is an example with many of the header options turned on.

Muon Tomography Logbook

~~Official Use Only~~
~~Trade Secrets~~
~~Protected CRADA Information~~

Muon Radiography

Figure 8, Full Header Example

The parts of the full header are:

1. Page Title.
2. Horizontal lines.
3. Protection regime labels. Only the unclassified regimes have labels.
4. Logo.

Each of these items is controllable with settings in the XML configuration files for the application, but not by the user.

FOOTER DISPLAY

[NIS Home](#) > [Logbook Home](#)

~~Official Use Only~~
~~Trade Secrets~~
~~Protected CRADA Information~~

[NIS On-Line](#) | [Logbook](#) | [Tables](#) | [LANL](#) | [NSTec](#) | [Phone](#)

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NATIONAL SECURITY TECHNOLOGIES

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Figure 9, Footer Example

Like the Header, the page Footer displays many items, some of which are required for LANL Web sites. Almost all of this content is controlled by configuration parameters defined in XML files the host organization can change as desired. See the section on Configuration Control.

1. Filter (Query) Section. Most of the filter section is normally hidden. See the next section for Filter section usage. In the hidden case, only three action buttons are shown:
 - a. Refresh. Update the displayed entries using the current state of the logbook and filter selection.
 - b. Show Filters. Show the filter section control.
 - c. New Entry. Bring up the log entry creation/edit form. Note, this button can be turned off if you do not want the user to make entries, i.e., only external programs can make status and run entries.
2. Logo. Not Shown. Same logo file as shown in the Header.
3. Site map. List of links to go back up the page tree to the root page for the site.
4. Protection regime labels.
5. Quick Links. List of project specific links.
6. Organization List. List of organizations on the experiment.
7. Contract Statement.
8. Web Master's name and e-mail link.
9. Copyright statement and link to details.
10. Link to disclaimer statement.

As noted earlier, the protection regime labels only include the unclassified regimes. For a classified web site, the host organization can make a logo file with the appropriate labeling and then turn on both top and bottom logos.

QUERIES (FILTERS)

If you click on the “Show Filters” button, a new control box appears.

Basic Filters	Content Filters
<input type="radio"/> By Date	Date Range Start <input type="text" value="1/27/2011"/> / <input type="text" value="1/28/2011"/> End
<input checked="" type="radio"/> Last 10	<input type="checkbox"/> Name <input type="text" value="EIC"/>
<input type="radio"/> Today	<input type="checkbox"/> Text Entry <input type="text" value="Ex: *camera*"/>
<input type="radio"/> This Week	<input type="checkbox"/> Activity No <input type="text" value="NIS0001 - Neutron Imaging - Setup"/>
<input type="radio"/> This Month	<input type="checkbox"/> Expt Family <input type="text" value="Neutron Imaging"/>
<input type="radio"/> This Year	<input type="checkbox"/> Pic Type <input type="text" value="No Data"/>
<input type="radio"/> All	<input type="checkbox"/> Run No <input type="text"/> <input type="checkbox"/> Pic No <input type="text"/>

Check checkboxes to select content filters ("" , "*" , "?" chars allowed).

Figure 10, Filter Definition

The purpose of this control box is to build a filter (or “query” in database speak) to pick which log entries the web application displays. What happens in the background is the application uses the user input to construct a “SQL query statement” that is then sent to the database engine. The selection process happens when the “Refresh” button is clicked. The constructed query is the logical “AND” of tests selected by the user.

BASIC (TIME) FILTERS

The first part of the selection process is chose the time span for the query. The user defined Display Time Stamp is used for this selection. The other criteria choices are combined with this basic choice to make the entry list that is displayed. One and only one of the choices provided are used:

1. By Date. Use the Date Range start and end times. The default for the start is yesterday, the default for the end is today.
2. Last 10. This is the default choice. When selected, the most recent 10 entries in time that meet all other selection criteria are shown. If no other criteria are selection, this would be the 10 most recent entries made to the log book. Again, recent is defined using the user definable Display Time Stamp.
3. Today. All entries since midnight this morning.
4. This Week. All entries since midnight last Sunday morning.

5. This Month. All entries since midnight morning for the first day of the month.
6. This Year. All entries since midnight morning for the first day of the year.
7. All. No time based selection.

CONTENT FILTERS

Once the time frame is selected, the filter can be further refined by setting criteria on various fields available in the log entry. Filters are applied on a field only if the field is selected using the check boxes.

1. Name: Select one and only one name from list of defined users.

The screenshot shows a web-based filter configuration interface. On the left, there is a vertical list of filter criteria, each with a checkbox. The 'Name' checkbox is checked, while others are unchecked. To the right of the 'Name' checkbox is a dropdown menu that is currently open, showing a list of user names. The name 'EIC' is highlighted in blue. Below the dropdown menu, there are two buttons: 'Check checkboxes' and 'Refresh'.

Figure 11, User Filter Selection

2. Text: Search pattern based on text and wildcards of the contents of both entry text and subject field.
3. Activity No. Activity number. Select one and only one activity from the activity list.
4. Expt Family. Experimental family. Select a group of activities that fall under a defined family of activities. Note, if Activity Number is also selected, it effectively overrides an experiment family filter, except you can then get an empty data set.
5. Pic Type. Select one and only one activity from the picture type list.

6. Run No. Run number. While the run number is an integer, the selection is base on using the run number as a string. Thus wildcard search control can be used. So a search for 50* would produce all runs which start with numbers 5 and 0.

7. Pic No. Picture number. While the picture number is an integer, the selection is base on using the picture number as a string. Thus wildcard search control can be used. So a search for 50* would produce all pictures which start with numbers 5 and 0.

MAKING AND EDITING ENTRIES

If the “New Entry” button is clicked, an edit form for a log entry is displayed.

The screenshot shows a web-based form for editing log entries. At the top, there is a checkbox labeled "Enable Date/Time Change" and a "Date/Time" field displaying "1/20/2011 7:53:10 PM". Below this is a "Select Name:" dropdown menu with "EIC" selected, followed by the text "or" and a blue "Add New User" button. The "Activity Number:" field contains "Web Testing - Software Testing - Web Title" and has a checkbox for "Disable activity number default". Further down, there is a checkbox for "Enable Run/Pic Entry", two empty "Run No:" and "Pic No:" input fields, and a "Pic Type:" dropdown menu with "Calibration" selected. A "Text Entry:" label is positioned above a large, empty text area. Below the text area, there is a label "Enter a filename to upload (optional):" and a field for "Enter a filename for upload:" with a "Browse..." button. At the bottom, there is a checkbox for "Scale-to-fit image:" and two buttons: "Submit" and "Cancel".

Figure 12, Entry Edit Form

TIME STAMPS

As stated elsewhere, each log entry has three time stamps; Creation, Last Edit, and Display. The user can see and edit only the last; Display. The Display Time determines the order of entry display and time based selections. The Display Time defaults to the creation time and is shown at the top of the edit control. The

text box for changing the time is normally disabled so that the user cannot accidentally change this critical item. Clicking the "Enable Data/Time Change" button will enable the text box.

USER SELECTION

User (author) selection is chosen from a drop down list. A defined list of users makes searching for a particular author better defined. If the user is not on the list, the user can click on "Add New User". See details later in this text.

If the logbook application does not use user authentication, the first time the new entry is picked, the default user selected by the configuration file is the default selection for the user. If user authentication is used, the application will try to find a match between the user's logon account and a Z number in the user table. On subsequent new entries, that default will be the last selection (new or edit) for this session.

ACTIVITY NUMBER

The activity for the entry is selected from a drop down list of defined activities. See "Activity Number Table" for how to add/edit activities. The default selection is the current activity selected using the "EIC Control" page. See "EIC Control" section later. If the user wants to make a series of entries under a different activity number, they should check the "Disable activity number default" checkbox. Then the default will be the last used activity.

RUN AND PICTURE NUMBERS

Run Numbers, Picture Numbers, and Picture Types can be added or changed by the user. To prevent accidental change, these text boxes are normally disabled, but can be enabled by clicking the "Enable Run/Pic Entry" button.

The Picture Type for the entry is selected from a drop down list of defined picture types. See "Picture Type Table" for how to add/edit types. The default selection is the current picture type selected using the "EIC Control" page. See "Changing Picture Type".

TEXT ENTRY

This is the actual text for the logbook entry. It can be of any length. The display does **not** do text wrapping, so the client needs to insert their own carriage returns. The client is also not allowed to enter any text that looks like HTML or XML tags. This is a security feature of the Windows IIS/ASP.Net framework to prevent SQL injection attacks. If the text already contains such tags, the text box will be disabled and the user will not be allowed to make changes. Other items in the entry like Picture Type or File Uploads can still be changed.

FILE UPLOADS

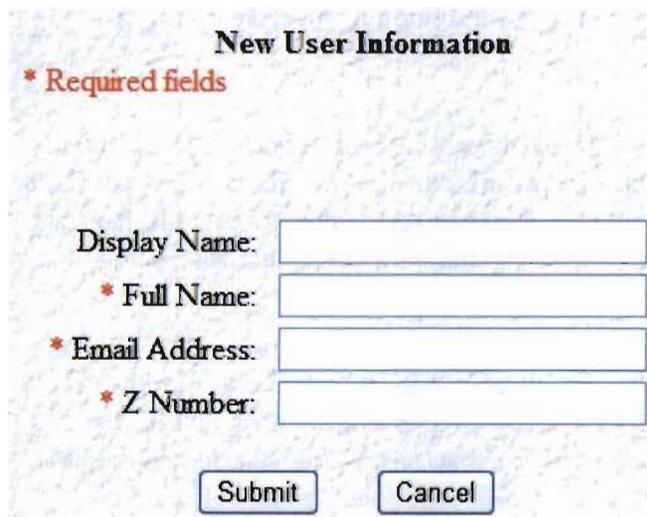
The client can also “paste” files into the logbook. There is a default size limit of 10 Megabytes for uploaded files. The actual files are stored outside the logbook database file in a known folder. If the file is a common picture format, the picture will be displayed by the web application. If the file name matches a file already stored, the new file name will be modified to make it unique. If you change files for an entry, the old file becomes an orphaned file in the Logbook upload directory and is *not* deleted.

SUBMIT AND CANCEL

If the Cancel button is chosen, all additions or changes are lost and no change is made to the database. Changes to the database occur only if the “Submit” button is clicked.

ADD NEW USER

If the “Add New User” button is clicked, a form for defining a new user appears.



New User Information

* Required fields

Display Name:

* Full Name:

* Email Address:

* Z Number:

Figure 13, New User Information

The Display Name is what is used for entry display and user drop down lists. If not filled in, it will default to the Full Name. No change is made to the database unless the “Submit” button is click. “Cancel” will lose all entered information. The Z number is used to correlate the user’s logon account to the user list if Windows authentication is used.

User information can also be changed using the “User Table” web page.

SETTING DEFAULTS

EXPERIMENTER IN CONTROL (EIC) CONTROL

The Logbook application allows the user to change two defaults; the activity number and the picture type. In an experimental environment, this might correspond to activity "Sample 134" and picture (data) type "Calibration." By setting and adhering to these defaults, the logbook can be searched later for certain well defined procedures or data. The logbook sets these defaults by inserting entries with predefined content representing certain types of changes. The current activity or picture type is then defined by the most recent entry with this format.

For experiments using the PC DAQ system, these changes are made using a program call the "EIC Control" which is under the control of the experiment's operator. This program provides access to the definition of the current defaults as well as the auxiliary tables such as the user list. Overlooking users do not have control of these defaults or tables. For other cases, there are web pages for changing the defaults and table contents. Description of the "EIC Control" program is outside the scope of this document.

Access to these defaults comes in 3 levels. These levels are setup using the configuration controls described later.

1. Locked down mode. Control and access is through the independent "EIC Control" program. The logbook web pages have links to the table control pages removed. The change web pages may be removed. If present, links are removed. If only the links are removed, only a user who has read this manual very carefully will find them. The change entries use the subject field, so users cannot manually create a change entry.
2. Table only mode. The table update pages are available, but the default change control is not available. The quick links at the bottom of page allow changes to the reference tables. The current activity and picture type are shown but not changeable. The top page for this is usually accessed with a quick link at the bottom of the logbook page titled "Tables". It looks like:

Logbook Reference Tables

[NIS Home](#) > [Logbook Home](#) > EIC Control

Current Activity: Web Testing - Software Testing - Web Title

Current Picture Type: Calibration

[Home](#) | [Logbook](#) | [EIC Control](#) | [Activities](#) | [Experiment Families](#) | [Picture Types](#) | [Users](#) | [Phone](#)

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Figure 14, Table Links Only

3. Complete user control. The logbook is being used in a standalone mode and web control is needed for the defaults. In this case, the top level “Tables” page looks like:

Logbook Reference Tables

[NIS Home](#) > [Logbook Home](#) > EIC Control

Current Activity:

Current Picture Type:

[Home](#) | [Logbook](#) | [EIC Control](#) | [Activities](#) | [Experiment Families](#) | [Picture Types](#) | [Users](#)

Figure 15, Default Control with Links

Using the “Complete User Control” mode with the “EIC Control” program can be complicated as it means setting up message queues and other things to keep the current information in sync.

CHANGING ACTIVITY

The current activity can be changed using either the web page described above or having an independent program such as the “EIC Control” sending a change entry to the log box. This entry is identified as a change entry by content of the subject line. Since the subject line is not available to the user, a user cannot manually generate this special type of entry.



Figure 16, Activity Change Entry

CHANGING PICTURE TYPE

The current picture can be changed using either the web page described above or having an independent program such as the “EIC Control” sending a change entry to the log box. . This entry is identified as a change entry by content of the subject line. Since the subject line is not available to the user, a user cannot manually generate this special type of entry.

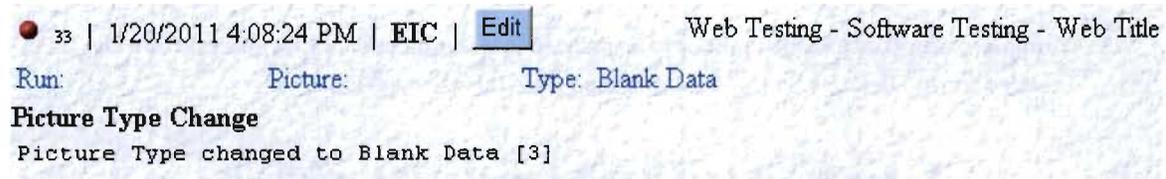


Figure 17, Picture Type Change Entry

ADDING TO REFERENCE TABLES

ACTIVITY NUMBER TABLE

Access to the Activity Number Table is found by clicking the “Activities” quick link at the bottom of the EIC Control web page. Clicking on the column heading will sort the table display by that column.

Activity Table

[NIS Home](#) > [Logbook Home](#) > [EIC Control](#) > Activities

	<u>Key</u>	<u>Activity</u>	<u>Title</u>	<u>Date</u>	<u>Description</u>	<u>Family</u>
Edit Delete	3	DAQ0001	Data Acquisition Test	9/12/2010	Test of Logbook	Software Testing
Edit Delete	1	NIS0001	Setup	9/12/2010	Setup of Detector	Neutron Imaging
Edit Delete	2	NIS0002	Data	9/12/2010	Data	Neutron Imaging
Edit Delete	4	Web Testing	Web Title	1/20/2011	Testing of the Web	Software Testing

[Add Activity](#)

Figure 18, Activity Table Change

EXPERIMENT FAMILY TABLE

Access to the Experiment Family Table is found by clicking the "Experiment Families" quick link at the bottom of the EIC Control web page. Clicking on the column heading will sort the table display by that column.

Experiment Family Table

[NIS Home](#) > [Logbook Home](#) > [EIC Control](#) > Families

	<u>Key</u>	<u>Family</u>
Edit Delete	1	Neutron Imaging
Edit Delete	2	Software Testing
Edit Delete	3	The Adams Family II

[Add Experiment Family](#)

Figure 19, Experiment Family Table

PICTURE TYPE TABLE

Access to the Picture Types Table is found by clicking the "Picture Types" quick link at the bottom of the EIC Control web page. Clicking on the column heading will sort the table display by that column.

Picture Types Table

[NIS Home](#) > [Logbook Home](#) > [EIC Control](#) > Picture Types

	<u>PictureTypeKey</u>	<u>PictureType</u>	<u>Comment</u>
Edit Delete	3	Blank Data	Ghost pictures
Edit Delete	2	Calibration	Calibration
Edit Delete	1	No Data	No Data being taken

[Add Picture Type](#)

Figure 20, Picture Types Table

USER TABLE

Access to the User Table is found by clicking the “Users” quick link at the bottom of the EIC Control web page. Clicking on the column heading will sort the table display by that column.

Logbook User Table

[NIS Home](#) > [Logbook Home](#) > [EIC Control](#) > [Users](#)

	<u>NameKey</u>	<u>Display Name</u>	<u>Full Name</u>	<u>E-mail</u>	<u>Z Number</u>
Edit Delete	1	Anonymous	Anonymous	anon@lanl.gov	0
Edit Delete	2	DAQ On-line	PCDAQ, On-line	hogan_gary@lanl.gov	1
Edit Delete	3	DAQ Replay	PCDAQ, Replay mode	hogan_gary@lanl.gov	2
Edit Delete	4	EIC	Experimenter in Charge (Generic)		0
Edit Delete	8	GEHogan	Gary Hogan	hogan_gary@lanl.gov	89987
Edit Delete	11	Me	Myself	mail@lanl.gov	123456
Edit Delete	12	your name	your name	y@l	654321
Edit Delete	13	Elmer	Fudd	fudd@lanl.gov	445633
Edit Delete	14	geh	geh	geh@lanl.gov	998877
Edit Delete	15	Jaberwocky	Jaberwocky the III		0

[Add User](#)

Figure 21, User Table

CONFIGURATION CONTROLS

The hostmaster can control many aspects of the logbook by changing various control parameters. These parameters are defined in several XML files that are in the logbook application folder. Web.Config has XML tags specifically for the logbook application. Webcontrol.xml has tags that control the underlying master page used by PC DAQ web sites. Web.Sitemap provides information to the ASP.Net SiteMap control. Because of the way IIS works, these changes can be made on live web sites and IIS will automatically make changes available.

WEB.CONFIG

A number of variables in the logbook application have default values defined in the application's web.config file.

****Warning**.** This file is used for lots of other IIS settings such as access security. Thus, this file might well be changed from the defaults first published to the folder during setup. So once the hostmaster has this file in place, only make manual changes to the application sections rather than blind copies of the Visual Studio version.

For the appSettings keys, the names are not case sensitive.

```
<connectionStrings>
  <add name="Logbook" connectionString="~\Databases\PRADLog.mdb"/>
</connectionStrings>
<appSettings>
  <add key="DBASE_PATH" value="Databases\"/>
  <add key="UPLOAD_PATH" value="uploads\"/>
  <add key="IMAGE_PATH" value="images\"/>
  <add key="LOGO_IMAGE" value="NIFLogo.gif"/>
  <add key="ShowTopLogo" value="true"/>
  <add key="ShowRefreshLogo" value="false"/>
  <add key="ShowBottomLogo" value="false"/>
  <add key="ShowNewButton" value="true"/>
  <add key="EventLog" value="NISLogbook"/>
  <add key="REDBALL_IMAGE" value="RedBall.gif"/>
  <add key="LOG_DBASE_NAME" value="PRADlog.mdb"/>
  <add key="DB_PROVIDER" value="Provider=Microsoft.Jet.OLEDB.4.0; "/>
  <add key="MAX_UPLOAD_FILE_SZ" value="10000000"/>
  <add key="MAX_UPLOAD_FILE_MB" value="10 MB"/>
  <add key="DEFAULT_ACTIVITY" value="NIS0001"/>
  <add key="DEFAULT_ACTIVITY_KEY" value="1"/>
  <add key="DEFAULT_USER" value="EIC"/>
  <add key="DEFAULT_USER_KEY" value="4"/>
  <add key="NULL_USER_KEY" value="0"/>
  <add key="DEFAULT_PICTURE_TYPE_KEY" value="1"/>
  <add key="DEFAULT_PICTURE_TYPE" value="No Data"/>
  <add key="DEFAULT_EXPERIMENT_FAMILY" value="Neutron Imaging"/>
  <add key="DEFAULT_EXPERIMENT_FAMILY_KEY" value="1"/>
</appSettings>
```

```

<add key="REMOTEEICCOMPUTER" value="pcprad134"/>
<add key="REMOTEEICQUENAME" value="commandque"/>
<add key="REMOTERUNCOMPUTER" value="Unknown"/>
<add key="REMOTERUNQUENAME" value="Unknown"/>
<add key="USEREMOTEQUES" value="false"/>
<add key="STANDALONE" value="true"/>
</appSettings>

```

1. **ConnectionString:** The connection string used by the ASP.Net GridView controls on the Table web pages. Because of the use of Link Tables in the database definition, the tables all look like they are in the one file.
2. **Relative Paths.** DBASE_PATH, UPLOAD_PATH, and IMAGE_PATH are the relative paths to the database files, the uploaded files, and the image folder.
3. **Logo Control.** LOGO_IMAGE, ShowTopLogo, ShowRefreshLogo, ShowBottomLogo control the logo image and whether it will be displayed at various places on the web page.
4. **ShowNewButton.** Controls whether the "New Entry" button is available to the user.
5. **EventLog.** The application can write diagnostics to a system event log. The setup procedure can create this special event log. This is the name of the log.
6. **RedBall_Image.** The gif file for the little red dot at the beginning of each entry display.
7. **Database Definition.** LOG_DBASE_NAME is the file name for the database. Because of the use of Link Tables in the database definition, the tables all look like they are in the one file. DB_PROVIDER is the name of the database engine to use with the ADO.Net commands. Because Jet 4.0 only comes in a 32-bit version, the application pools for 64-bit versions of IIS have to be told to allow 32-bit applications.
8. **Maximum File Size.** The maximum file size for uploaded files. MAX_UPLOAD_FILE_SZ defines the size in bytes. MAX_UPLOAD_FILE_MB is used in the related error message.
9. **Default Values.** The default values for picking items from various reference tables are given. Both the string and primary keys are given. This is poor database design, but so be it. It is up to the hostmaster to be sure these items match. The hostmaster has to use values that match the content of the relevant reference tables.
10. **EIC Control parameters.**

- a. If STANDALONE is TRUE, the full user accessible EIC control web page is used. No attempt is made to talk to an independent "EIC Control"
- b. If STANDALONE is false, and USEREMOTEQUES is false, the EIC Control web page shows the current activity and picture types, but does not allow them to be changed. That would be done by an independent "EIC Control". This is the setting for both the "Table Only" and "Lockdown" modes mentioned in the "Experimenter In Control (EIC) Control" section above.
- c. If STANDALONE is false, and USEREMOTEQUES is true, the application will attempt use the message queue REMOTE EIC QUEUE NAME on the computer REMOTE EIC COMPUTER to sync to an independent "EIC Control". The user EIC Control web page will be fully available. With changes in the IIS authorization model, it is not clear if this can be made to work.
- d. REMOTERUNCOMPUTER and REMOTERUNQUEUE NAME are reserved for future project development where the web site can control PC DAQ programs.

WEBCONTROL.XML

The logbook displayed web page uses the master page methods developed for PC DAQ web projects. This master page controls how the header and footer appear across all the pages in a web site. This control file appears in the root folder of an application. It can be overridden in child folders by another instance of this file. Control values for a typical logbook page are given below. Added comments are in *[purple]*.

```
<?xml version="1.0" encoding="utf-8" ?>
<files>
  <file filename="Default">
    <title>TARDIS Logbook</title> [title that appears in browser tab]
    <Header></Header> [title on the web page]
    <UseHeaderLine>0</UseHeaderLine>
    <UseFooterLine>0</UseFooterLine>

    <DisclaimerURL>http://int.lanl.gov/copyright.shtml#disclaimers
  </DisclaimerURL>
    <DisclaimerPrefixWording>For conditions of use, see
  </DisclaimerPrefixWording>
    <DisclaimerPostfixWording></DisclaimerPostfixWording>
    <DisclaimerLinkWording>Disclaimer</DisclaimerLinkWording>

    <WebMasterURL>mailto:TheDoctor@lanl.gov</WebMasterURL>
    <WebMasterName>Doctor Who</WebMasterName>

    <HomeURL>http://computer.lanl.gov</HomeURL> [The first Quick link]
    <HomeText>TARDIS</HomeText>

    <GroupURL></GroupURL> [Optional group ID and quick link]
  </file>
</files>
```

```

<GroupText></GroupText>

<CopyrightStart>2010</CopyrightStart>
<CopyrightURL>http://int.lanl.gov/copyright.shtml</CopyrightURL>
<CopyrightPostfixWording> Los Alamos National Security,
LLC</CopyrightPostfixWording>

<Contract>
  <i>Operated by the Los Alamos National Security, LLC for the
National Nuclear Security Administration of the U.S. Department of
Energy </i>
</Contract>

<URLList reset="true"> [list of quick links and organization titles]

  <URLItem>
    <URLTitle>Logbook</URLTitle>
    <LinkWording>Logbook</LinkWording>
    <URL>default.aspx</URL>
    <DisplayTitle>False</DisplayTitle>
    <DisplayLink>True</DisplayLink>
  </URLItem>

  <URLItem>
    <URLTitle>Tables</URLTitle>
    <LinkWording>Tables</LinkWording>
    <URL>Tables/Tables.aspx</URL>
    <DisplayTitle>False</DisplayTitle>
    <DisplayLink>True</DisplayLink>
  </URLItem>

  <URLItem>
    <URLTitle>L O S   A L A M O S   N A T I O N A L   L A B O R A T
O R Y</URLTitle>
    <LinkWording>LANL</LinkWording>
    <URL>http://int.lanl.gov</URL>
    <DisplayTitle>True</DisplayTitle>
    <DisplayLink>True</DisplayLink>
  </URLItem>

  <URLItem>
    <URLTitle>N A T I O N A L   S E C U R I T Y   T E C H N O L O G
I E S</URLTitle>
    <LinkWording>NSTec</LinkWording>
    <URL>http://www.nstec.com/ </URL>
    <DisplayTitle>True</DisplayTitle>
    <DisplayLink>True</DisplayLink>
  </URLItem>

</URLList>
</file>
</files>

```

If protections regimes are needed, the following tags and values can be added to this file. Multiple labels can be used applied to one regime by separating the list with “|” symbol. Either string or number can be use.

```

<isouo>0|1|True|False</isouo>
<Regime0></Regime0>
<Regime1></Regime1>
<Regime2>
  ECI | 1      [Export Control Information]
  PI  | 2      [Proprietary Information]
  TS  | 4      [Trade Secrets]
  CRADA | 8     [Protected CRADA Information]
  Med | 16     [Medical Records]
  PA  | 32     [Performance Appraisals]
  LR  | 64     [Laboratory Reporting]
</Regime2>
<Regime3>
  UCNi | 1      [Unclassified Controlled Nuclear Information (UCNI)]
  CFGI | 2      [Confidential Foreign Government Information - Modified (C/FGI-MOD)]
  AT   | 4      [Applied Technology (AT)]
  UNNPI | 8     [Unclassified Naval Nuclear Propulsion Information (NNPI)]
</Regime3>
<LabProtectionLevel>
  R0 | 0      [This page has no restrictions.]
  R1 | 1      [This page requires authentication.]
  R2 | 2      [This page requires authentication and authorization. Encryption recommended.]
  R3 | 3      [This page requires authentication, authorization, and encryption protections.]
</LabProtectionLevel>

```

Note that folder that has the reference table change pages as it own WebControl.xml file so that it can have a different set of quick links.

WEB.SITEMAP

The Web.Sitemap file is setup to work with the ASP.Net site map control. See documentation on this control for format.

BACKGROUND PATTERN

The background pattern is defined by the file “backgrnd.gif” in the root directory of the site.

PROGRAMMING NOTES

LOGBOOK DATABASE TABLE

Database File	d:\logbookcode\databases\PRADLog.mdb		
Database Table	Entries		
Key Field	Entry_no		
Description Field	TextEntry		
Name	Type	Default Value	Comment
Entry_no	Integer	0	Primary Key for Logbook Entries
DisplayTime	Date	now	Time to display for entry
Name	String		User Name
ActivityNumber	String		Activity
RunNumber	String		Run Number
PictureNumber	String		Picture Number
PictureType	String		Picture Type
Subject	String		Subject
TextEntry	String		Text entry for log book
Filename	String		Filename for attachment
FileMimeType	String		File Mime Type
FileSize	Integer	0	File Size
ScaleImage	Boolean	FALSE	Flag to scale image in HTML display
TimeStamp	Date	now	Time entry created
ChangeTime	Date	now	Time of last alteration
User	Integer	0	User making the entry
ActivityKey	Integer	115	Key to Activity Table
RunKey	Integer	0	Run Number
PictureSetKey	Integer	0	Picture Set
PictureTypeKey	Integer	8	Picture Type

USER DATABASE TABLE

Database File	d:\logbookcode\databases\RefTables.mdb		
Database Table	UserNames		
Key Field	NameKey		
Description Field	Name		
Name	Type	Default Value	Comment
NameKey	Integer	0	Name Key
Name	String	Unknown	Name
Full_Name	String	Unknown	Full_Name
Email	String	who@lanl.gov	Email
Znumber	Integer	0	Z number

ACTIVITY DATABASE TABLE

Database File	d:\logbookcode\databases\RefTables.mdb		
Database Table	ActivityNumbers		
Key Field	ActivityKey		
Description Field	ActivityNumber		
Name	Type	Default Value	Comment
ActivityKey	Integer	0	Activity Key
ActivityNumber	String	Misc0000	Activity or Shot Number
ActivityTitle	String	Undefined	Title
ActivityDate	Date	Now	Date of Activity
FamilyKey	Integer	19	Experimental Family Key
Description	String	unknown	Description of activity

FAMILY DATABASE TABLE

Database File	d:\logbookcode\databases\RefTables.mdb		
Database Table	ExperimentFamilies		
Key Field	FamilyKey		
Description Field	Family		
Name	Type	Default Value	Comment
FamilyKey	Integer	0	Family Key
Family	String	Undefined	Experimental Family

PICTURE TYPE TABLE

Database File	d:\logbookcode\databases\PCDAQDatabase.mdb		
Database Table	PictureTypes		
Key Field	PictureTypeKey		
Description Field	PictureType		
Name	Type	Default Value	Comment
PictureTypeKey	Integer	0	Picture Type Key
PictureType	String	Undefined Type	Picture Type
Comment	String	Undefined Comment	Comment

USE OF CLASS WIZARD

Code shells for the various classes were produced by the Class Wizard tool developed for the PC DAQ project.^{iii iv} Since most of the code was written before the Class Wizard was developed, the shells were used to comment the code so that SandCastle could be used to develop the code help files.

The classes are defined in the Excel files used to by the Class Wizard. These files are in the Documentation folder of the Logbook Visual Studio project file and are available upon request. The files are DbaseInterface.xls and LogWebApp.xls. These Excel file give a compact definition of the class objects.

SANDCASTLE HELP FILES

Code help files (.chm) are available detailing the classes, methods, etc for the application code. These help files have the standard Microsoft help file format for defining classes. This help file is ultimately derived from the Class Wizard input files mentioned above. So the Excel files are a more compact version of the same information.

EVENT LOG

The Logbook application has its own system event log to record errors. Its main use is for the instance when a user comes to the hostmaster saying "I am getting these funny error messages in red at the bottom of the page" and the hostmaster wants to see the exact wording. The application writes the same error messages to this special event log.

The name of the event log is defined in web.config using the appString key "EventLog". I have a console application that creates an event log. The application is called "CreateLog.exe". It must be run twice. In both cases, you give it the name of the new log you want to create. The first time it runs, it creates the log. The second time, it creates a test entry in the log. You need to explicitly run this program as an administrator.

You can view the event log by bringing up the event viewer and then looking for this log. For Win 2008, you do this by going to Server Manager → Diagnostics → Event Viewer → Application and Services Log → This event log. The Event IDs are:

Explanation	Event ID
Start Application	1
Start Session	2
End Session	3
End Application	4
Application Reset	5
Session Reset	6
Error Message	7

LOGBOOK APPLICATION

MAIN PAGE

The main web page is mostly a series of ASP.NET panels. The various functions for this page are staged by turning the panels on or off. The HTML sent to the client actually has a fairly detailed comment section on what the page contains. Those comments should probably be kept elsewhere.

The main page inherits from the PC DAQ master page to control the header and footer. It has:

Header

Main Panel (panMain) contains panDisplayEntries, panRefreshFilter, and panButtons
panDisplayEntries panel is a repeater to fill with entries
panRefreshFilter panel contains specs for querying records to display
panButtons panel contains buttons located under refresh panel

Add Entry [panAddEntry] panel contains entry fields for adding or editing an entry

Add New User [panCreateNewUser] panel contains controls for adding a new user

Invisible labels for keeping values persistent across page-loads

Site map control

Footer

Data is held between page loads in the Application and Session default collections and in invisible labels on the HTML form.

EIC CONTROL

The EIC Control page is a PC DAQ master page with a few drop-down lists and buttons.

DATABASE TABLE PAGE

The database table pages are actually very simple. They use ASP.Net controls directly bound to the database. These controls are on a web page inherited from the PC DAQ master page. The controls are:

1. A GridView control to display and edit the contents of a table.
2. An AccessDataSource control to define the interface to the table.
3. A FormView control to define the new record popup form.

PROGRAM GENERATED ENTRIES

This section applies only if the logbook is used with other PC DAQ programs.

As noted before, other programs can and do make entries to the logbook. For the PC DAQ ensemble of programs, they do this by sending entry requests to a common program. .Net programs access this program first through an in-process Visual Basic (VB) 6 COM (ActiveX) library program called "ConnectorToNet". This defines a number of "Connectors" for a number of DAQ objects, including the logbook. The "Connectors" then talk to a central "DBConnector" to get device specific information, such as the name and location of the database files. The DBConnector program is a VB6 ActiveX DCOM Server standalone program. Even when there are multiple computers being used in the DAQ system, DBConnector runs on one and only one computer. All logbook requests funnel through this program. This way, the actual Database filenames and logic exists in only one program. That makes it easier to debug and maintain. It also reduces the number of objects actually and actively attaching to the database files. This is also how information such as the current activity number key is communicated to other programs rather than having them make queries. Other information like the current run number and status is also centrally stored here.

Since Visual Basic 6 and ActiveX are rapidly becoming unsupported, this communication model will have to be replaced soon.

ERROR MESSAGES

Error messages appear in two places. First, they show up in red at the bottom of the web page displaying entries. And they are recorded in the special event log. Below are examples of some typical errors.

1. **No records found for specified search criteria, verify Basic & Content Filters selections.**
There are not records that match the current query defined by the Basis and Content Filters.
2. **Dates specified are invalid, format: mm/dd/yy.**
There is an error in the dates typed into the date range fields of the Content Filters.
3. **Start date > end date. Please try again.**
There is an error in the dates typed into the date range fields of the Content Filters.
4. **Bad user key for Entry 24.**
The user key in the entry record does not appear as a primary key in the user table. Someone is making serious changes to the user table and not cleaning up!

5. **ExecuteReader requires an open and available Connection.**
This can be caused on 64-bit servers where 32-bit applications have not been enabled in the application pool for the IIS manager.

6. **Inconsistent activity information for Entry 13302
PRAD0175 vs PRAD0174.**
This inconsistency is because the string stored in the field "ActivityNumber" in the entry record in the logbook table does not match the string stored in the field "ActivityNumber" for the activity record in the activity number table.

The fix for this is to open the edit form for the entry, correct the activity if needed (it will default to the activity given by the key stored in "ActivityKey"), and click submit. The submit process will automatically fix the inconsistency.

This is a symptom of a flaw in the database design, but it is way it was done. This string should not be duplicated in separate tables. This will probably be fixed if the database is ever moved to SQL or another database engine.

7. **Inconsistent user information for Entry 8429
KathyPrestridge vs Kathy**
Similar to above, but involving the user name string.

8. **Bad activity information for Entry 51497.**
It may be that there has been a big change in contents of the activity table and changes to the logbook were not made. See comment above on database design. Or the server is very busy or the logbook files are locked up.
Try refreshing the web page. Still no luck, try opening the entry in the edit form fix it there. If still no luck, try rebooting the server. If still bad, you may have to open the Access database in Access and manually fix the records.

9. **Bad user information for Entry 51497.**
It may be that there has been a big change in contents of the user table and changes to the logbook were not made. See comment above on database design. Or the server is very busy or the logbook files are locked up.
Try refreshing the web page. Still no luck, try opening the entry in the edit form fix it there. If still no luck, try rebooting the server. If still bad, you may have to open the Access database in Access and manually fix the records.

10. **Bad picture type information for Entry 51497.**
It may be that there has been a big change in contents of the picture type table and changes to the logbook were not made. See comment above on database design. Or the server is very busy or the logbook files are locked up.
Try refreshing the web page. Still no luck, try opening the entry in the edit form fix it there. If still

no luck, try rebooting the server. If still bad, you may have to open the Access database in Access and manually fix the records.

11. **Object reference not set to an instance of an object. ...**

The web server has lost contact with the access database file.
Either the server is very busy or the logbook files are locked up.
Try again, if still no luck, try rebooting the server.

12. **Error in GetEntryList call by RefreshPage.**

For this and other rare errors, just try again.

ⁱ Hogan, Gary E., "PC DAQ, A Personal Computer Based Data Acquisition System", Los Alamos National Laboratory, LAUR-98-4531, 10-Oct-1998. More recent versions are available from the author.

ⁱⁱ Hogan, Gary E., Mottershead, C. T., "PC DAQ, Version 4.0", Los Alamos National Laboratory, LA-CC-99-0078, 08-Dec-1999

ⁱⁱⁱ Hogan, Gary E., "Code Generator for Visual Basic .Net", Los Alamos National Laboratory, LA-UR-02-7758.

^{iv} Hogan, Gary E., "Code Generator for Visual Basic .Net", Los Alamos National Laboratory, LA-CC-99-79.