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Nuclear Nonproliferation Division

Radiation Review User Manual

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NATIONAL LABORATORY

Author(s):

S. Klosterbuer

H. Nordquist

J. Longo

J. Montoya

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Authored by the Safeguards and Security Systems Group (N-4) of Los Alamos National Laboratory.

History of Revisions

REVISION NO.	EFFECTIVE DATE	PAGES REVISED	REASON FOR ACTION
003.000	January 8, 2004	All	First version that has revision tracking. Major upgrade of September 20, 1999 user manual.
003.001	February 13, 2004	All	Added detail not covered in Jan 8, 2004 version due to time constraints
003.002	November 19, 2004	All	Updated to reflect menu options for 3.1.0 0
003.002	December 1,2004	Fac Mgr Section	Update with latest dialog box
003.003	December 15, 2004		Updated Tools | Export Data section to handle exporting MiniGRAND data for FDMS. Updated files written in Appendix A.
003.004	December 9, 2005	All	Updated all sections to reflect changes for Radiation Review 3.2.0.0
003.005	January 25, 2006		Updated Determine Measurements section to include information about the new “minutes before” parameter (also Fig 2.4-25). Added new MG status bits to Fig. 2.6-5.
003.006	December 13, 2007		Changes for B2R1. DRAFT Page 2: New copyright information. Added EOSS information.
003.006	March 23, 2008		Changes to add EOSS instrument and document other changes for B2R1
003.006	March 26, 2008		Changed Data Integrity Check section to reflect removal of “Update Conditions” button.
003.007	Feb. 8, 2010		B2R1 issues for RAD 3.2.0.7 and the User Guide are summarized in Appendix § C.1
003.008	Aug. 2, 2010		The 3.2.0.8 release issues for RAD are summarized in Appendix § C.2

Table of Contents

Radiation Review

User Manual

1. Introduction

1.1. Purpose

This User Manual is intended to be a reference for users of the Radiation Review program. This manual provides instructions to use the Radiation Review program to display data collected from GRAND (either GRAND-3 or MiniGRAND), shift register (either JSR, AMSR or ISR), MiniADC, Binary Logger, VIFM, or EOSS instruments running in unattended mode with step-by-step instructions for each menu option. Descriptions of any files that are either input to or output from Radiation Review are part of this manual as well as instructions for setting parameter values for some analysis options.

1.2. Scope

This manual provides instructions for using the Radiation Review program. It details how to use each of the menu options in the program. These instructions are intended to be a reference for the general user.

In addition, the appendices contain information on the file formats, databases used, etc. that may be of interest to maintenance staff.

1.3. Background

In general, a collect program runs on a computer connected to either one or many instruments. The collect program runs in unattended mode during the inspection period. The collect program downloads data from its instrument(s) and stores them in data files, one file per day. In the case of the legacy DOS collect programs, SR Collect (Ref. 1) and GRAND Collect (Ref. 2), the collect program runs on a computer located in the same cabinet with the instruments. The current data collection program, Multi-Instrument Collect (MIC) Ref. 3, can run on a local computer or more typically, on a central computer running Windows connected to several instruments. Radiation Review is also capable of reading data files produced by the VIFM Collect application (Ref. 11).

The Radiation Review program is used to read data files from several instruments and import them into its database, search for events (peaks) in specified channels using various algorithms, determine the direction of motion if applicable, provide options for the user to display the data graphically or to display subsets of the data in the database and to select measurement runs for export to other analysis programs.

Radiation Review is one of the programs that make up the Integrated Review Software (IRS) suite. Other programs in the IRS are Operator Review (Ref. 6), IAEA Neutron Coincidence Counting code (INCC) Ref. 4, Digital Video Review (DVR) Ref. 5, Isotopic Review (ISO) which uses SFRAM Refs. 8-9, and Integrated Review (IR) Ref. 7. Radiation Review can be run standalone or as a member of an IRS installation.

1.4. Acronyms

AMSR	Advanced Multiplicity Shift Register
A/T	Accidentals/Totals test
COM	Component Object Model
DVR	Digital Video Review
EOSS	Dr. Neumann Electronic GmbH. Electro-Optical Sealing System
FDMS	Fork Detector Measurement System
GRAND-3	Gamma Ray And Neutron Detector electronics package
IAEA	International Atomic Energy Agency
ID	Identifier
ILON	Intelligent Local Node
INCC	IAEA Neutron Coincidence Counting software
INI	Initialization file
IR	Integrated Review
IRS	Integrated Review Software
ISO	Isotopic Review
ISR	Intelligent Shift Register
JSR	Jomar Shift Register
LANL	Los Alamos National Laboratory
LA-UR	Los Alamos Unclassified Report
MIC	Multi-Instrument Collect
MII	Measurement Interval of Interest
MiniADC	Miniature Analog to Digital Converter electronics package
MiniGRAND	Miniature Gamma Ray And Neutron Detector electronics package
N	Nuclear Nonproliferation Division
N-4	Safeguards & Security Systems Group
NCC	Neutron Coincidence Counter
PC	Personal Computer
RAD	Radiation Review
SFRAM	Standalone Fixed energy Response function Analysis with Multiple efficiencies
SR	Shift Register
UNARM	Unattended and Remote Monitoring
VIFM	VXI Integrated Fuel Monitoring System

1.5. References

1. W. J. Hansen, J. A. Painter, R. Auguston, “SR (Shift Register) Collect Users Manual Version 2.00l”, Ron, December 19, 1994, LA-UR-95-1393
2. W. C. Harker, “GRAND Collect Users Manual”, Bill, October 13, 1995, GCOL-UM-001.001S.
3. D. G. Pelowitz, P.J. Moore and T. R. Wenz, “Multi-Instrument Collect User’s Manual”, Feb. 8, 2010, LA-UR-02-2371 (Rev), MIC-UM-002.0.0.5
4. W. C. Harker, M. S. Krick, “INCC Software Users Manual, Mar. 29, 2009, LA-UR-01-6761
5. S. E. Buck, “Digital Video Review User Manual”, January 25, 2000, LA-UR-99-2206 (Rev 3), UM-DVR-016.004
6. S. E. Buck, C. M Schneider, “Operator Review User Manual”, August 2003, LA-UR-99-2205 (Rev)
7. S. E. Buck, M. E. Abhold, S. F. Klosterbuer, “Integrated Review User Manual, Version 1.32”, May 1999, LA-UR-99-1290
8. C. M Schneider, H. A. Nordquist, “Isotopic Review User Manual, Version 0.1”, February 2003, LA-UR-03-1517
9. T. E. Sampson, T. A. Kelley, “PC/FRAM, Version 4.2 User Manual”, March 2003, LA-UR-02-5268
10. S. F. Klosterbuer, “Radiation Review Release Notes”, January 8, 2004, LA-UR-99-1602 (Rev. 6), RAD-RN-003.001
11. Bot Engineering Ltd., “VIFM Collect Application Version 5.0.8 Functional Specification” June 21, 2004

1.6. Overview of Document

Section 2 of the document contains the step-by-step instructions for how to use the various menu options.

Section 3 contains information on installing the software.

Appendix A documents the files used by Radiation Review. It discusses the input files (raw data, configuration, databases, etc.) and output files (INCC exports, text files produced for user by IR, etc.).

Appendix B provides troubleshooting information.

Appendix C gives Technical Support contact information and a list of recently fixed issues.

Appendix D provides procedures for determining how to set parameters for some menu options.

Appendix E describes the analysis performed on shift register data.

2. Operations Reference

Step-by-step instructions to the menu options are provided. The application conforms to standard windows conventions. All clicks are assumed to be left-mouse clicks unless otherwise stated.

2.1. Main Menu Bar

The Radiation Review program is started by double-clicking on the Radiation Review icon.

When the program starts, the Main Menu shown in Figure 2.1-1 appears:

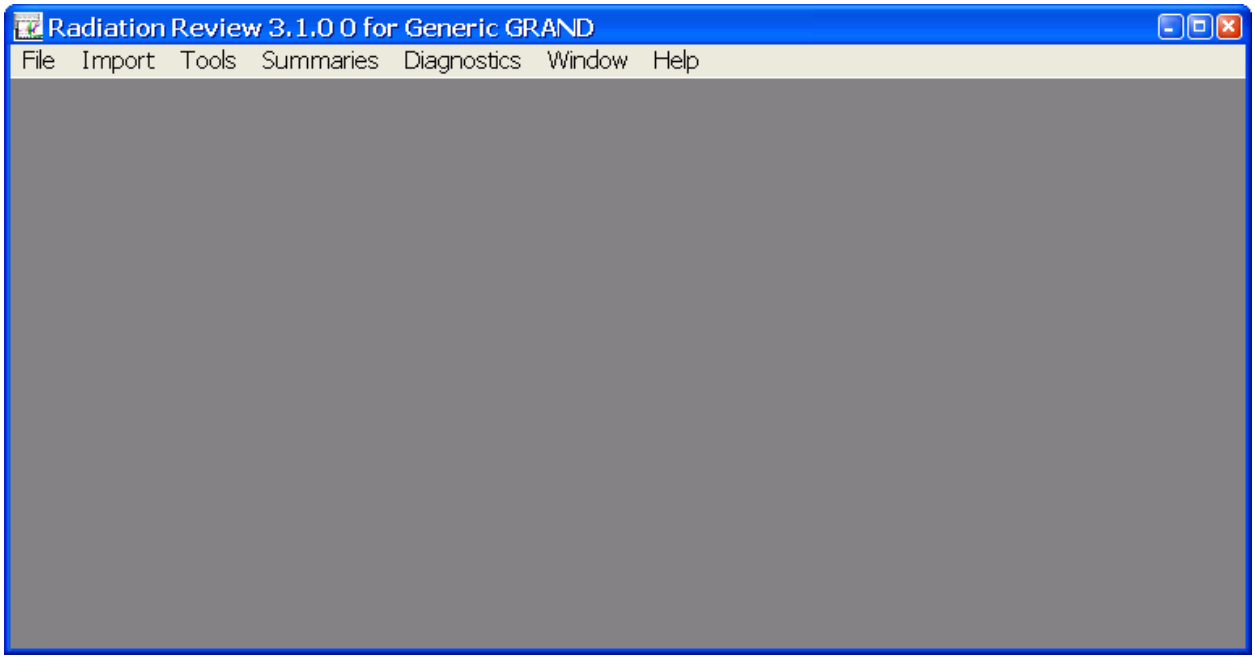


Figure 2.1-1 Main Menu

Select one of the column headings from the Main Menu Bar (File, Import, Tools, Summaries, Diagnostics, Window, or Help) by using the mouse to select the desired topic. Or you can press the Alt key plus the underlined letter indicated by the underlined character. For example, to display the File submenu you could either use the mouse to left-click on the File heading or use the keyboard to type Alt-F.

2.2. File Menu

If you select File from the Main Menu Bar, the menu in Figure 2.2-1 is displayed.

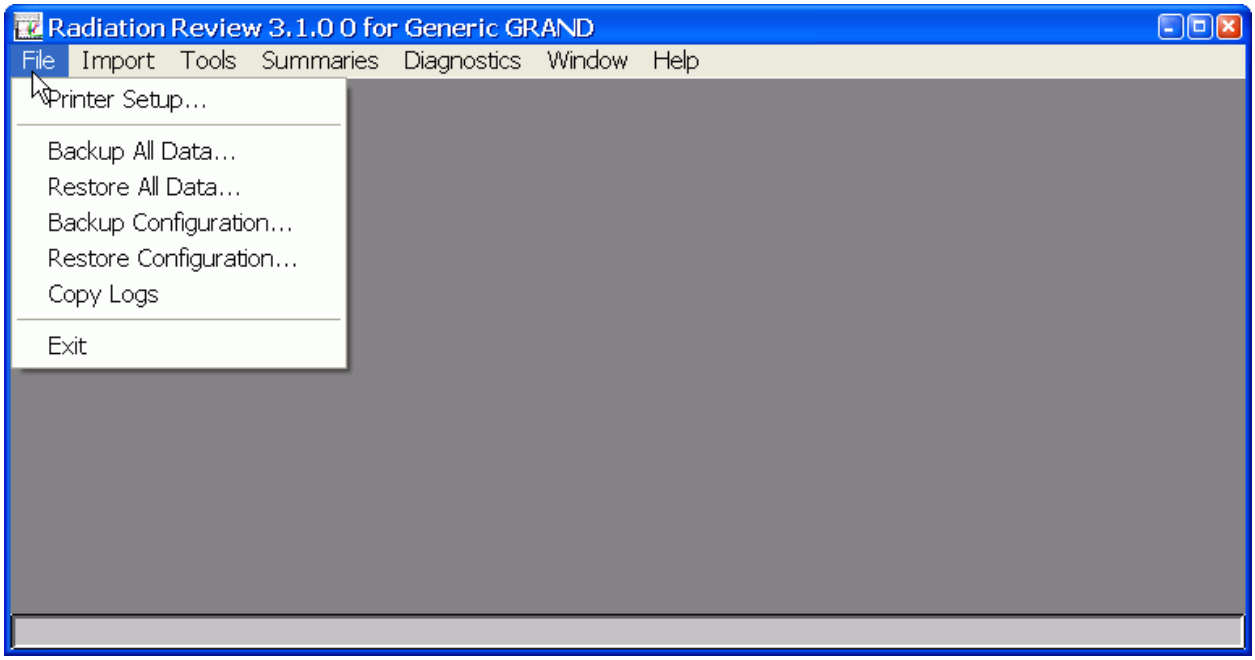


Figure 2.2-1 File Submenu

2.2.1. Printer Setup

The Printer Setup connects you to the standard Windows printer setup options for the default printer connected to the computer running Radiation Review.

2.2.2. Backup All Data

The **File | Backup All Data** option can be used to copy all Radiation Review data associated with the current facility. When this option is chosen, the Figure 2.2-2 dialog box is displayed.

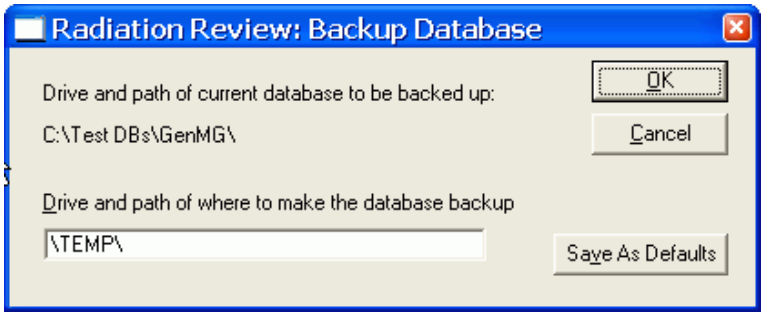


Figure 2.2-2 File | Backup All Data Dialog Box

The current facility's database is displayed at the top of the dialog box in the **Drive and path of current database to be backed up** field.

To copy all Radiation Review data associated with the current facility, fill in the drive and path in the **Drive and path of where to make the database backup** field.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **OK** button starts the backup process.

If a path does not exist at the specified backup directory, you are asked if you are sure you want to create the path with the question box shown in Figure 2.2-3.

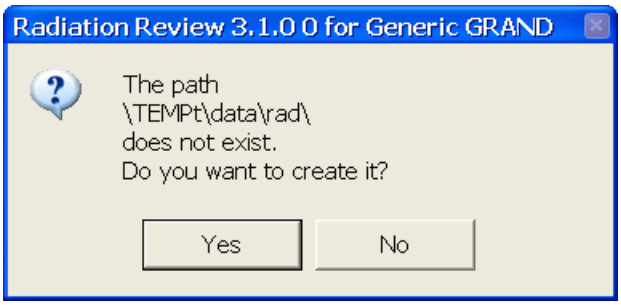


Figure 2.2-3 Create path question

If a database already exists at the specified backup directory, you are asked if you are sure you want to overwrite the database with the question box shown in Figure 2.2-4.

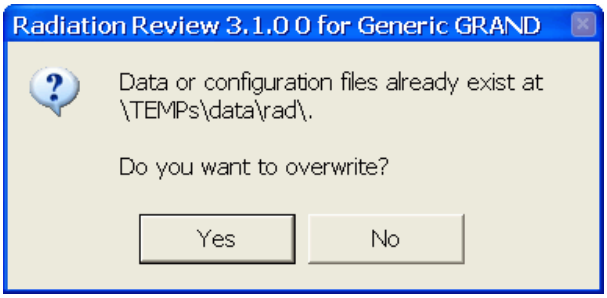


Figure 2.2-4 Overwrite database question

If you answer yes to the question, then all Radiation Review data associated with the current facility is copied to the specified directory. If the database is large this may take some time. You are updated of the progress of the copy with a dialog box. When the copy is finished, the message in Figure 2.2-5 is shown.

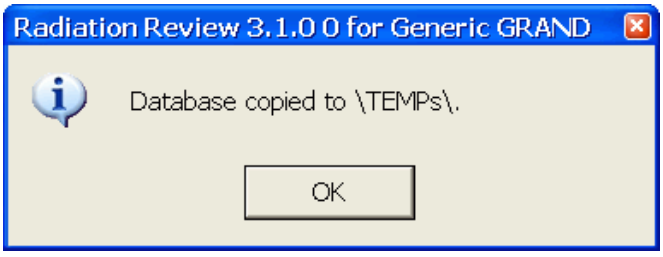


Figure 2.2-5 Database copy complete

2.2.3. Restore All Data

The **File | Restore All Data** option allows you to copy Radiation Review data from a backed-up database to the current facility database. When this option is chosen, the Figure 2.2-6 dialog box is displayed.

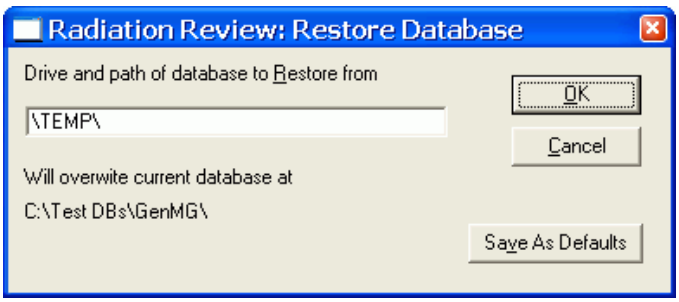


Figure 2.2-6 File | Restore All Data Dialog Box

The drive and path of the database to copy are in the **Drive and path of the database to Restore from** field.

The **Will overwrite current database at** field gives the location to which the database will be copied. This is always the database associated with the currently selected facility.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **OK** button starts the backup (copy) process.

If a path does not exist at the specified restore directory, you are asked if you are sure you want to create the path with the question box in question Figure 2.2-3 Create path question .

If a database already exists at the specified restore directory, you are asked if you are sure you want to overwrite the database with the question box in Figure 2.2-4 Overwrite database question.

If you answer yes to either question, then all the Radiation data at the backup database are copied to the current facility's database. If the database is large this may take some time. You are updated of the progress of the copy with a dialog box. When the copy is finished, the database specified as the restore database is opened. You are informed of this by the information in Figure 2.2-7

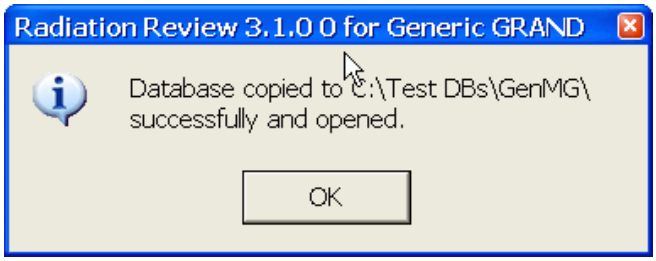


Figure 2.2-7 File | Restore All Data Complete Message

2.2.4. Backup Configuration

The **File | Backup Configuration** option can be used to copy all Radiation Review configuration information associated with the current facility. When this option is chosen, the Figure 2.2-8 dialog box is displayed.

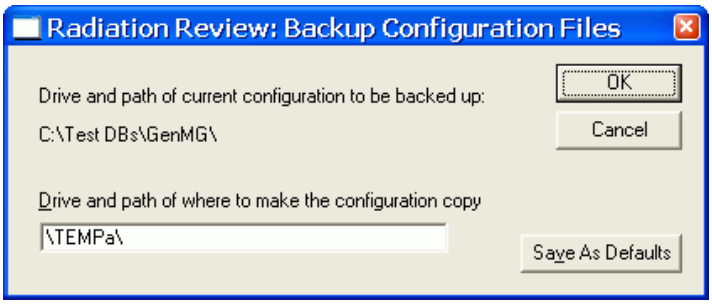


Figure 2.2-8 File | Backup Configuration Dialog Box

The location of the current facility's configuration information is displayed at the top of the dialog box in the **Drive and path of current configuration to be backed up** field.

To copy all Radiation Review configuration information associated with the current facility, fill in the drive and path in the **Drive and path of where to make the configuration copy** field.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **OK** button starts the backup process.

If a path does not exist at the specified backup directory, you are asked if you are sure you want to create the path with the question box shown in Figure 2.2-3.

If configuration information already exists at the specified backup directory, you are asked if you are sure you want to overwrite the database with the question box shown in Figure 2.2-4.

If you answer yes to the question, then all Radiation Review configuration information associated with the current facility is copied to the specified directory. You are updated of the progress of the copy with a dialog box. When the copy is finished, the message in Figure 2.2-9 is shown.

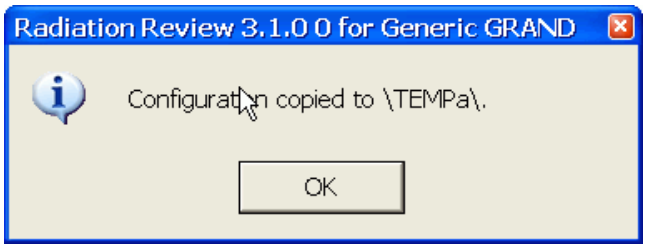


Figure 2.2-9 Configuration copy complete

2.2.5. Restore Configuration

The **File | Restore Configuration** option allows you to copy Radiation Review configuration data from a backed-up configuration. When this option is chosen, the Figure 2.2-10 dialog box is displayed.

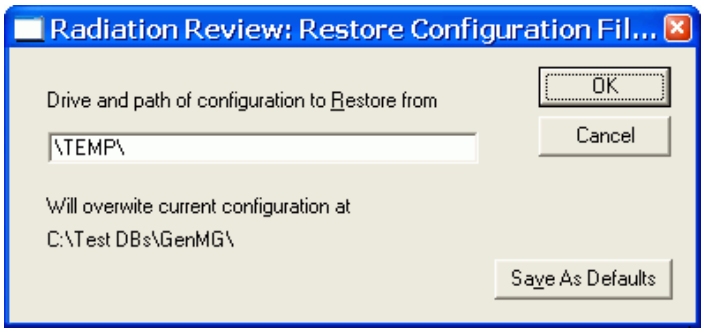


Figure 2.2-10 File | Restore Configuration Dialog Box

The drive and path of the database to copy are in the **Drive and path of the configuration to Restore from** field.

The **Will overwrite current configuration at** field gives the location to which the configuration will be copied. This is always the configuration associated with the currently selected facility.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **OK** button starts the backup process.

If a path does not exist at the specified configuration to be written directory, you are asked if you are sure you want to create the path with the question box in question Figure 2.2-3 Create path question .

If a configuration already exists at the specified restore directory, you are asked if you are sure you want to overwrite the configuration with the question box in Figure 2.2-4 Overwrite database question.

If you answer yes to either question, then all the Radiation Review configuration data at the backup are copied to the current facility's configuration. You are updated of the progress of the copy with a dialog box. You are informed when the configuration is copied by the message in Figure 2.2-11. It is required that you restart Radiation Review to make sure the new configuration is completely used.

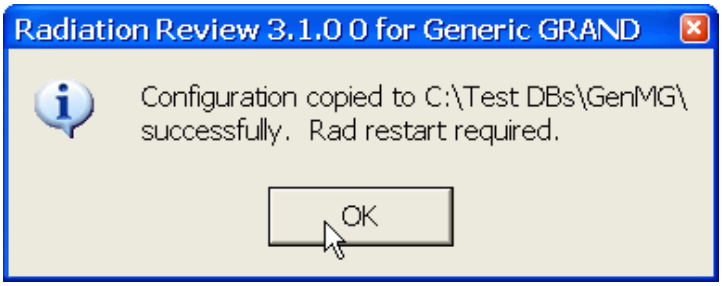


Figure 2.2-11 File | Restore All Data Complete Message

2.2.6. Copy Logs

The **File | Copy Logs** option can be used to copy all log files created by Radiation Review in the specified directory to another directory. When this option is chosen, the dialog box in Figure 2.2-12 is displayed.

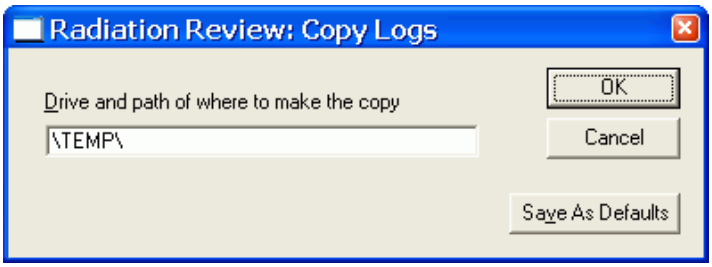


Figure 2.2-12 File | Copy Logs Dialog Box

The location of where to copy the current facility's logs is displayed in the dialog box in the **Drive and path of where to make the copy** field.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **OK** button starts the backup process.

If a path does not exist at the specified place to copy to, you are asked if you are sure you want to create the path with the question box shown in Figure 2.2-3.

All Radiation Review logs associated with the current facility are copied to the specified directory. You are updated of the progress of the copy with a dialog box. When the copy is finished, the message in Figure 2.2-13 is shown.

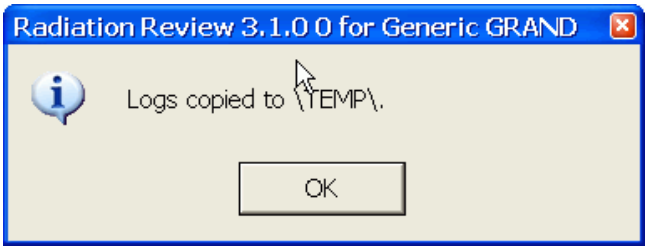


Figure 2.2-13 Logs copy complete

2.2.7. Exit

To exit the Radiation Review program, choose the Exit option under the File menu.

2.3. Import Menu

If you select Import from the Main Menu Bar, the menu in Figure 2.3-1 is displayed.

Figure 2.3-1 Import Pull-down Menu

2.3.1. Import All Dialog Box

The **Import | Import All** option allows you to import raw data from the instruments into the database. Typically, this option is used to import all data for an entire inspection period into the database. All files in the specified directory(ies) are imported. When the **Import | Import All** option is selected, Figure 2.3-2 appears:

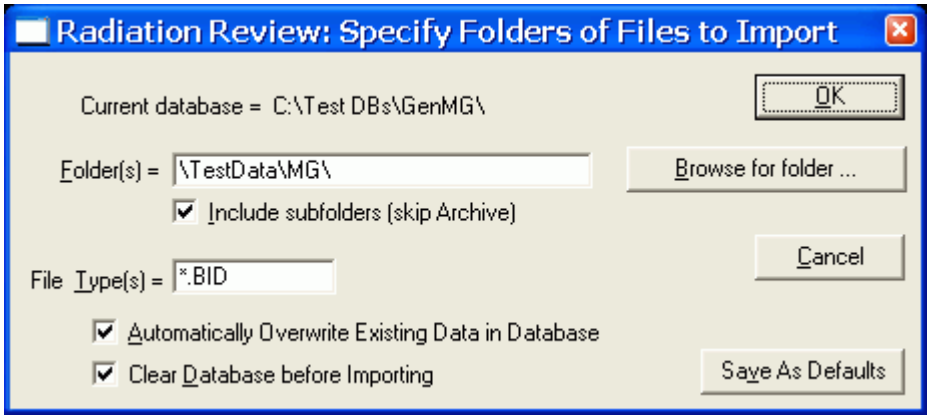


Figure 2.3-2 Import | Import All Dialog Box

The location of the database associated with the current facility is displayed in the **Current database** field. This is an information only parameter that cannot be changed by the user.

In the **Folder(s)** field, the user specifies the path or paths from which data will be imported. To specify multiple paths, separate the path names with a semicolon (;). An example would be “C:\DATA\GRAND1;C:\DATA\GRAND2”.

It is also possible to browse for the folder(s) to use for data import. If the **Browse for folder** button is clicked, a directory tree structure of all drives on your computer is displayed and you can select the path containing the raw data files.

If you check the **Include subfolders (skip Archive)** box, then the import process searches through all subfolders using the **Folder(s)** directory as the root. You may only have one folder as the root folder. If you have more than one path in the **Folder(s)** path and have the **Include subfolders** box checked, you are informed that only the **Folder(s)** paths specified will be searched (no subfolders). Any subfolders named Archive will be skipped and no data imported from those subdirectories.

In the **File Type(s)** field, the user specifies the extension of the files to be imported. The following types are supported:

File Extension	Instrument Data
.BID	GRAND-3 or MiniGRAND-3 data collected by DOS GRAND Collect or MIC
.BSR	JSR-11/12 data collected by DOS SR Collect
.ISR	AMSR/ISR data collected by MIC
.JSR	JSR-11/12 data collected by MIC
.MCA	MiniADC data collected by MIC
.BNY	Binary Logger data collected by MIC (Previously was *.EVT)
.ID	ID information produced by Operator Review (See Appendix A.1.3),
sl.* or *.vbf	VIFM data
*.ESS	EOSS binary data files produced by MIC

Note: Radiation Review 3.2.0.7 forward supports reading of signed Grand and VIFM files only. Signed, or 'sign and forward' .ISR data files are **not** processed by Radiation Review at the present time.

It is possible to specify multiple data types by separating the data types with a comma (,). For example, to import data from both GRANDs and ISRs, set the **File Type(s)** field to **.BID, *.ISR*.

The **Automatically Overwrite Existing Data in Database** checkbox indicates whether to automatically overwrite a day's information for an instrument in the database, if there is an overlap. If this box is checked, when a day's data exists in the database and another file for the same day is imported, one of the following actions occurs:
1) if existing database data occur only after the new data, then the new data are pre-pended (added before) to the data already in the database,
2) if existing database data occur only before the new data, then the new data are appended to the data already in the database,
3) if existing database data overlap with the new data, then the existing data are deleted and the new data written to the database.

The **Clear Database before Importing** checkbox indicates whether to clear all data (erase) in the database before starting the import process.

If the **Save As Defaults** button is clicked, you have the option to save the current parameters to be the default values the next time the program starts.

To cancel the Import, select **Cancel**.

When you have selected your parameters, select **OK** to start the import.

2.3.2. Common Data Import Process

If the **Clear Database before Importing** box is checked, Figure 2.3-3 appears:

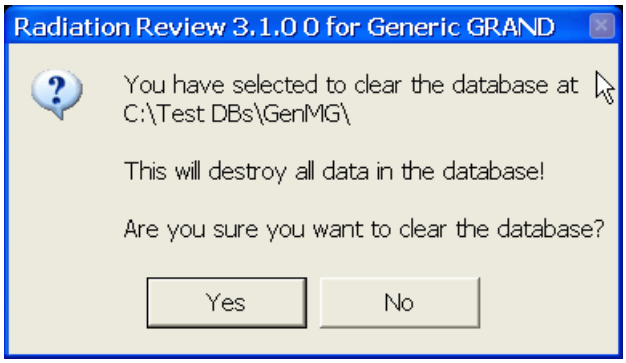


Figure 2.3-3 Clear Database Question

If you select OK to clear the database, all the data currently in the database are deleted (the parameters settings are part of the configuration information stored elsewhere and are unchanged if you clear the data). If you select to Cancel, the import process aborts.

While the data are being imported, a progress dialog box, Figure 2.3-4, showing the progress is displayed.

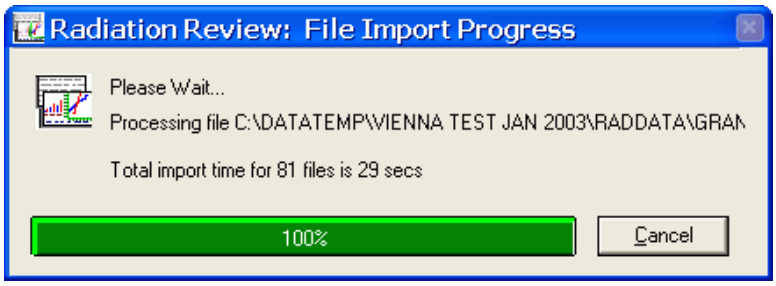


Figure 2.3-4 Import Progress Bar

A Cancel button is in the *File Import Progress* dialog box, Figure 2.3-4. If you select Cancel, another dialog box, Figure 2.3-5 appears asking whether you are sure you want to cancel. If you answer Yes, the import process terminates after the current file is in the database. If you answer No the import process continues.

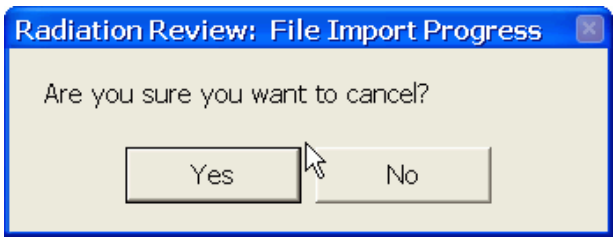


Figure 2.3-5 Cancel Import Question

When the import process is complete, a results summary is displayed in a text window similar to Figure 2.3-6, *Data Import Log for All Files*.

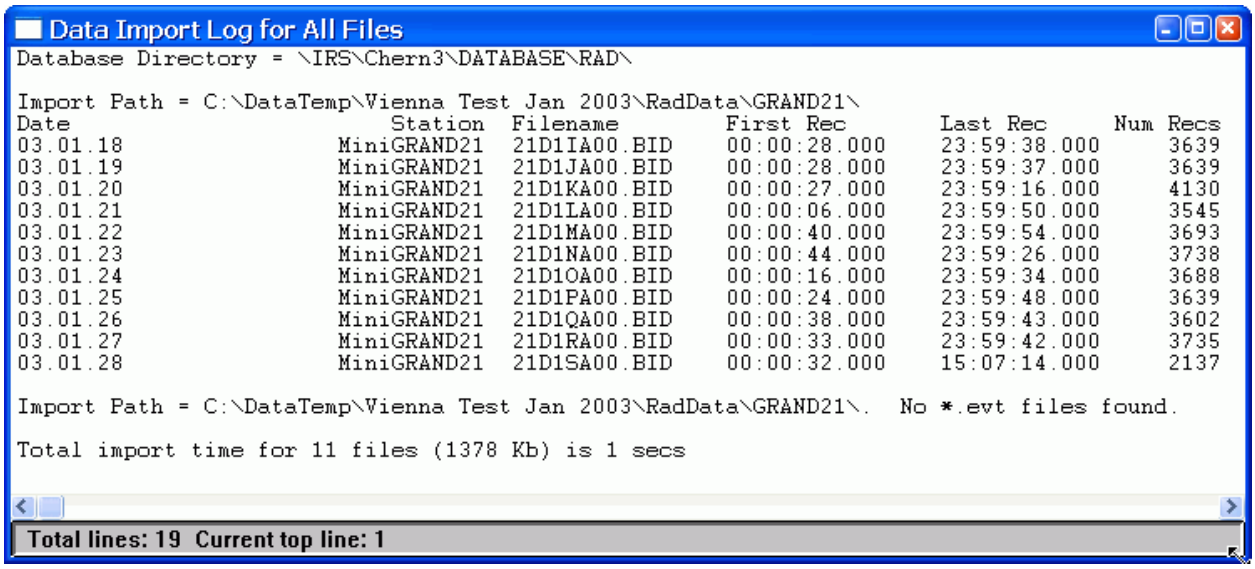


Figure 2.3-6 Import | Import All Log Results Window

The **Data Import Log for All Files** results window has the following sections:

Header Portion:
The first line displays the root directory path of the database(s) into which the data have been imported.
Main Results:
For each path searched a list of all the files found matching the file extension are listed. For each file the following columns of results are displayed:
Date – date for data contained in the file
Station – station associated with data in the file
Filename – name of the data file
First Rec/Last Rec – the timestamps of the first and last records in the data file (hour, minute seconds, milliseconds)
Num Recs – number of data records in the file
Optional information – any special conditions about the import such as overwriting existing data, data out of order, etc. are listed at the end of the line.

Note: The datestamps of the first and last records and number of records in the file are not displayed for the EOSS instrument type, but seal IDs found in the file are displayed instead. The EOSS data files are not day files.

Summary Portion:
In the summary at the bottom, the totals for import time, number of files and data amount in all the files imported is listed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

2.3.3. Text Window Results

Anytime results are displayed in a text window in Radiation Review, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard. To

access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window. Figure 2.3-7 shows the options possible for any text window.

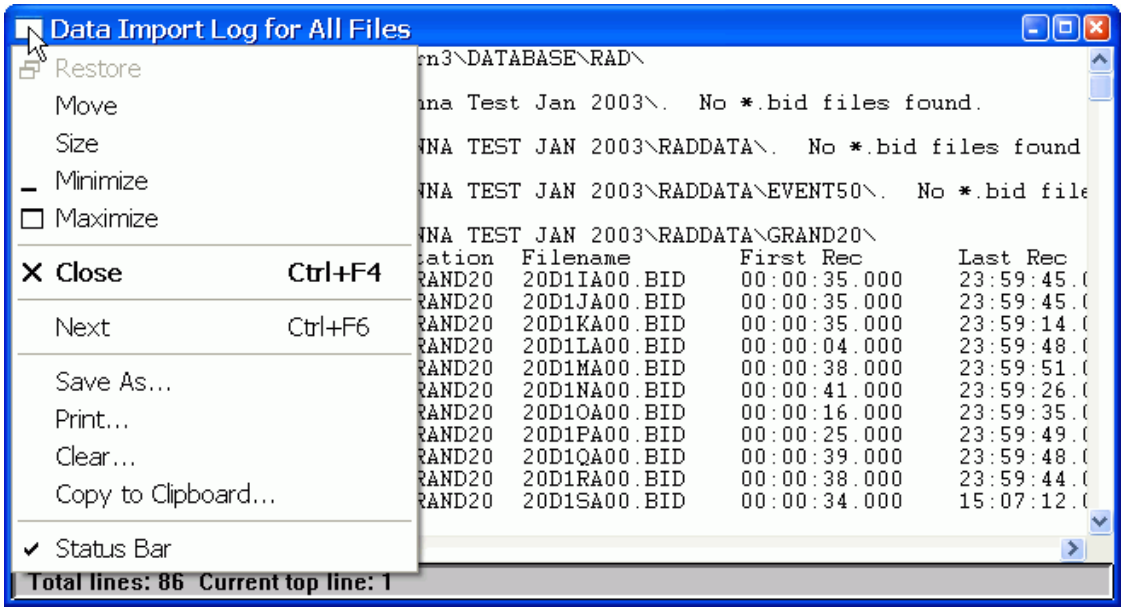


Figure 2.3-7 Text Window Actions Pull-down Menu

You can select to save or print the entire contents of the text window or only a portion (indicated by highlighting the desired portion). If you want to save only a portion of the window, just highlight the lines of interest. The following actions can be taken with either the entire text window or a portion of it:

Save As … The standard Windows File Save dialog box appears and you can select to name and save the file wherever you want to. These files can then be used to import the data into other applications, such as Microsoft Excel.

Print … You are prompted with how many lines will be printed. If you choose to print, the selected contents are printed to your default printer.

Clear … If you select this action, the contents of the text window are deleted.

Copy to Clipboard … The contents of the window are copied to the Windows Clipboard and you can paste them into any document you want.

2.3.4. Import Selected Files Dialog Box

The **Import | Import Selected Files** option allows you to import selected data files into the database. This option is used to import a subset of the possible files into the database. When the **Import | Import Selected Files** option is selected, the *Specify Selected Files to Import* dialog box, Figure 2.3-8, appears:

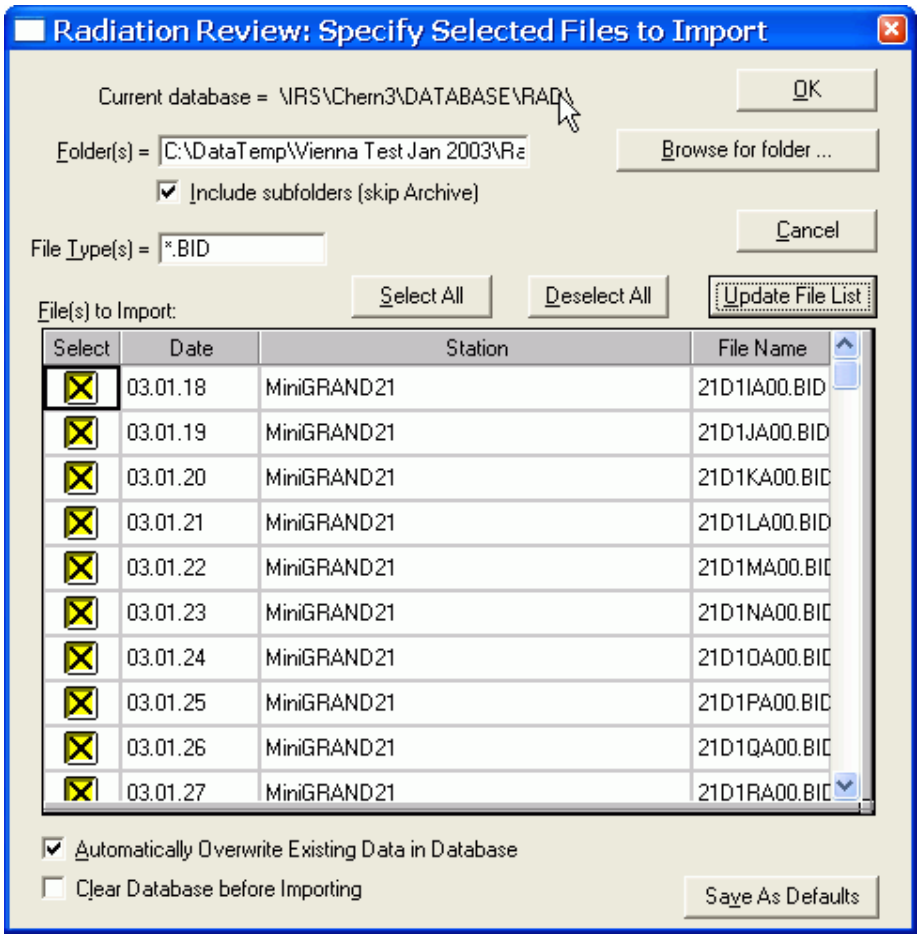


Figure 2.3-8 Import | Import Selected Files Dialog Box

The location of the database being used is displayed in the **Current database** field. This is an information only parameter that cannot be changed by the user.

In the **Folder(s)** field, the user specifies the path or paths from which data will be imported. To specify multiple paths, separate the path names with a semicolon (;). An example would be “C:\DATA\GRAND1;C:\DATA\GRAND2”.

It is also possible to browse for the folder(s) to use for data import. If the **Browse for folder** button is clicked, a directory tree structure of all drives on your computer is displayed and you can select the path containing the raw data files.

If you check the **Include subfolders (skip Archive)** box, then the import process searches through all subfolders using the **Folder(s)** directory as the root. You may only have one folder as the root folder. If you have more than one path in the **Folder(s)** path and have the **Include subfolders** box checked, you are informed that only the **Folder(s)** paths specified will be searched (no subfolders). Any subfolders named Archive will be skipped and no data imported from those subdirectories.

In the **File Type(s)** field, the user specifies the extension of the files to be imported. The following types are supported:

File Extension	Instrument Data
.BID	GRAND-3 or MiniGRAND-3 data collected by DOS GRAND Collect or MIC
.BSR	JSR-11/12 data collected by DOS SR Collect
.ISR	AMSR/ISR data collected by MIC
.JSR	JSR-11/12 data collected by MIC
.MCA	MiniADC data collected by MIC
.BNY	Binary Logger data collected by MIC (Previously was *.EVT)
.ID	ID information produced by Operator Review (See Appendix A.1.3),
sl.* or *.vbf	VIFM data
*.ESS	EOSS binary data files produced by MIC.

It is possible to specify multiple data types by separating the data types with a comma (,). For example, to import data from both GRANDs and ISRs, set the **File Type(s)** field to **.BID, *.ISR*.

The **File(s) to Import** table in the dialog box displays a list of files that meet the conditions in the **Folders(s)** and **File Type(s)** fields. For each file, the date of the data in the file, the name of the station at which the data were collected, and the filename are listed. In addition there is a column labeled **Select**. To select a file for import, click on the **Select** column entry for that file. If the file is already selected indicated by an X, clicking on the X de-selects it. If there are more files in the directories than can be displayed in the dialog box, a scroll bar appears on the right side of the dialog box so that you can scroll through the files.

The **Select All** button can be used to select all files. When this button is clicked, an X appears in the **Select** column for each file.

The **Deselect All** button can be used to deselect every file. When this button is clicked, all X's are removed from the **Select** column.

The **Update File List** button is used to create a new list of files based on the conditions in the **Folders(s)** and **File Type(s)** fields. It should be always clicked after you have changed the **Folders(s)** or **File Type(s)** fields.

The **Automatically Overwrite Existing Data in Database** checkbox indicates whether to automatically overwrite a day's information for an instrument in the database, if there is an overlap. If this box is checked, when a day's data exists in the database and another file for the same day is imported, one of the following actions occurs:
1) if existing database data occur only after the new data, then the new data are pre-pended (added before) to the data already in the database,
2) if existing database data occur only before the new data, then the new data are appended to the data already in the database,
3) if existing database data overlap with the new data, then the existing data are deleted and the new data written to the database.

The **Clear Database before Importing** checkbox indicates whether to clear all data (erase) in the database before starting the import process.

If the **Save As Defaults** button is clicked, you have the option to save the current parameters to be the default values the next time the program starts.

To cancel the Import, select **Cancel**.

When you have selected your parameters, select **OK** to start the import.

The same process as described in Section 2.3.2, Common Data Import Process is used to import the data.

2.3.5. Import Most Recent Files Dialog Box

The **Import | Import Most Recent File(s)** main menu option allows you to import only the most recent file in each of the specified directories. This option provides a way to quickly update the most recent data collected (typically used in real-time data review). When **Import | Import Most Recent File(s)** is selected, the *Specify Folders of Files to Import* dialog box, Figure 2.3-9, appears:

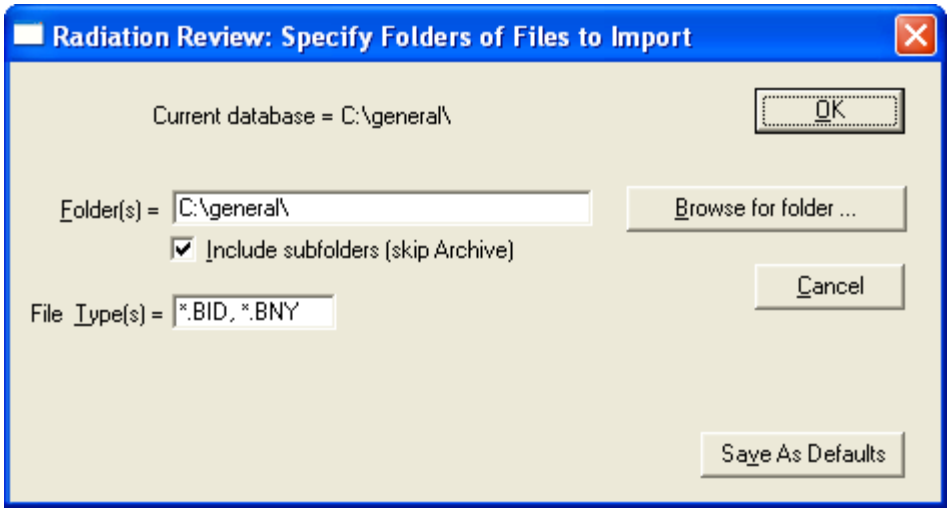


Figure 2.3-9 Import | Import Most Recent File(s) Dialog Box

The location of the database being used is displayed in the **Current database** field. This is an information only parameter that cannot be changed by the user.

In the **Folder(s)** field, the user specifies the path or paths from which data will be imported. To specify multiple paths, separate the path names with a semicolon (;). An example would be “C:\DATA\GRAND1;C:\DATA\GRAND2”.

It is also possible to browse for the folder(s) to use for data import. If the **Browse for folder** button is clicked, a directory tree structure of all drives on your computer is displayed and you can select the path containing the raw data files.

If you check the **Include subfolders (skip Archive)** box, then the import process searches through all subfolders using the **Folder(s)** directory as the root. You may only have one folder as the root folder. If you have more than one path in the **Folder(s)** path and have the **Include subfolders** box checked, you are informed that only the **Folder(s)** paths specified will be searched (no subfolders). Any subfolders named Archive will be skipped and no data imported from those subdirectories.

In the **File Type(s)** field, the user specifies the extension of the files to be imported. The following types are supported:

File Extension	Instrument Data
.BID	GRAND-3 or MiniGRAND-3 data collected by DOS GRAND Collect or MIC
.BSR	JSR-11/12 data collected by DOS SR Collect
.ISR	AMSR/ISR data collected by MIC
.JSR	JSR-11/12 data collected by MIC
.MCA	MiniADC data collected by MIC

.BNY	Binary Logger data collected by MIC (Previously was *.EVT)
.ID	ID information produced by Operator Review (See Appendix A.1.3),
sl.* or *.vbf	VIFM data
*.ESS	EOSS binary data files produced by MIC.

It is possible to specify multiple data types by separating the data types with a comma (,). For example, to import data from both GRANDs and ISRs, set the **File Type(s)** field to **.BID, *.ISR*.

The default behavior of Import Most Recent Files is the following:

1. The database is not cleared, but appended to.
2. Any data found that is after the last data point in the existing database is imported.
3. Data that exists in the database is not overwritten, but appended to .

If the **Save As Defaults** button is clicked, you have the option to save the current parameters to be the default values the next time the program starts.

To cancel the Import, select **Cancel**.

When you have selected your parameters, select **OK** to start the import.

The same process as described in Section 2.3.2, Common Data Import Process is used to import the data.

2.4. Tools Menu

If you select **Tools** from the Main Menu Bar, a menu similar to Figure 2.4-1 is displayed. Depending on which instruments are at the specified facility being reviewed, some of the menu options may be grayed out if they have no meaning for the specific facility.

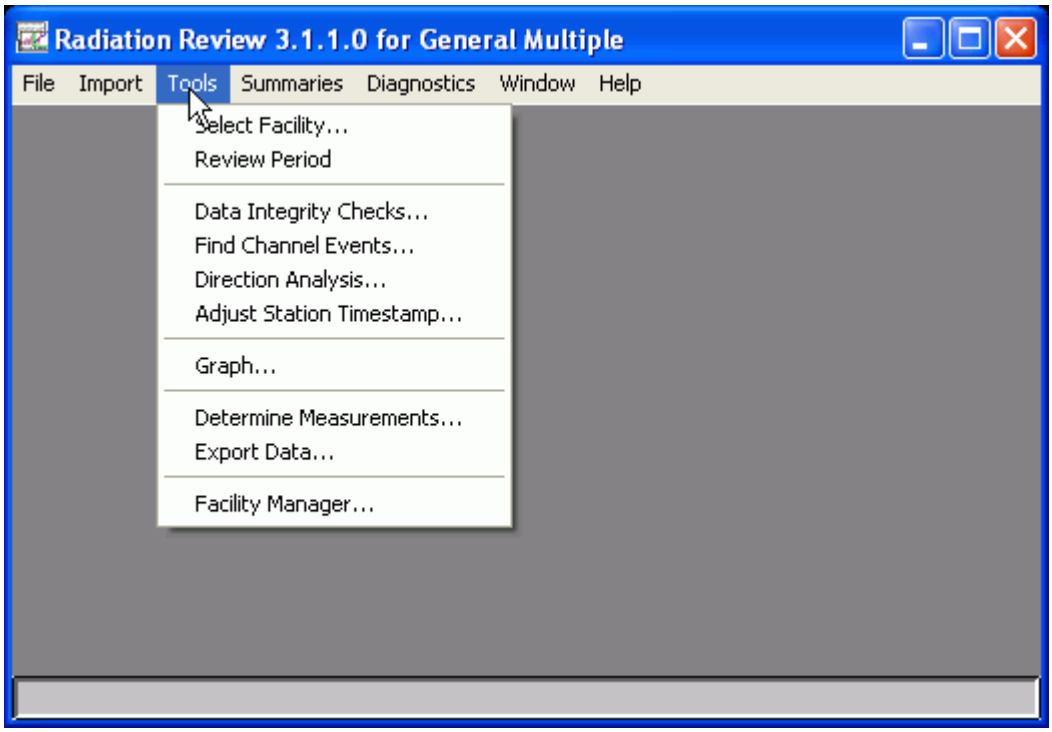


Figure 2.4-1 Tools Pull-down Menu

2.4.1. Select Facility

This option allows the user to select a specific facility if there is more than one facility contained in the Facility Manager database. When the Select Facility option is selected, the Figure 2.4-2 dialog box appears:

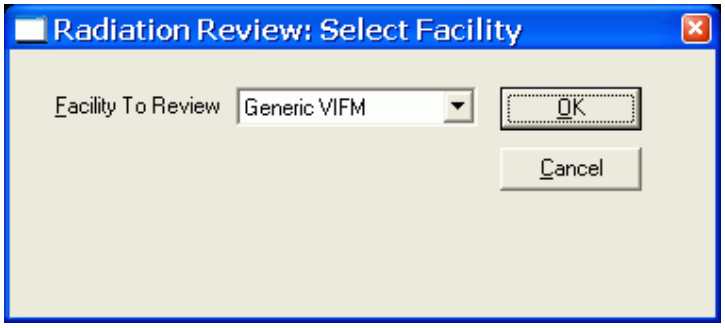


Figure 2.4-2 Tools | Select Facility Dialog Box

Clicking on the arrow in the **Facility to Review** field produces a list of all facilities in the current database. The user can select a different facility by clicking on the name of it in the list.

Click on **Cancel** to abort the option and not change the facility.

Click on the **OK** button to accept the current highlighted facility. Two different informational messages could appear based on whether you selected a different facility (Figure 2.4-3) or chose to keep the current facility (Figure 2.4-4).

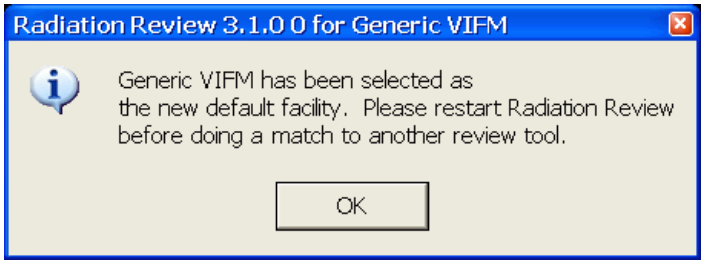


Figure 2.4-3 Different Facility Selected

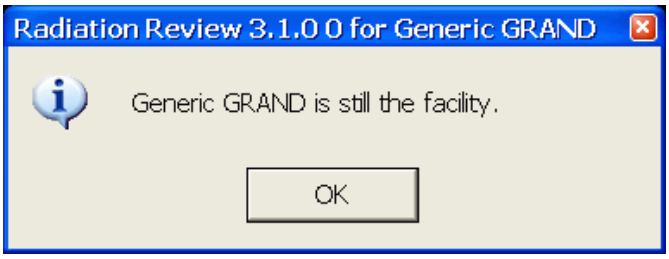


Figure 2.4-4 Same Facility Selected

2.4.2. Select Review Period

The **Tools | Review Period** main menu option allows you to specify a subset of the database as the data to be reviewed. Once a subset of the database to be reviewed is selected, then the default **Search Start Date/Time** and **Search Time Interval** values for the fields on all menu options contain this selection. When **Tools | Review Period** is selected Figure 2.4-5 appears:

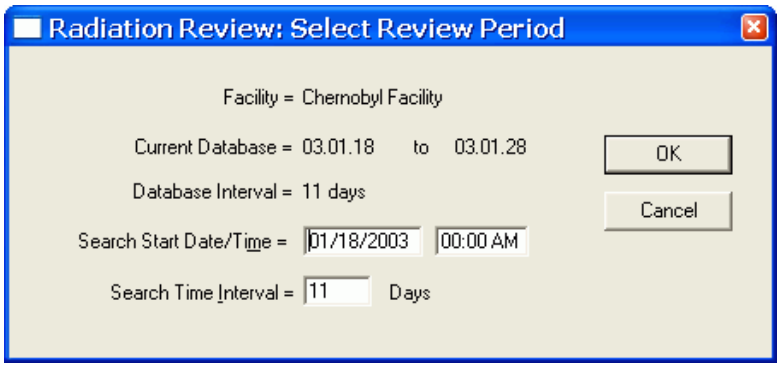


Figure 2.4-5 Tools | Review Period

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used by the other review options. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database unless this Review Period menu option is executed. If this Review Period menu option is executed more than once while the program is running, then the values selected the last time OK was clicked for Select Review Period are displayed. If Radiation Review is running as part of an IRS session, then these parameters default to the time interval specified on the Inspector Information Screen or stored in the INSPEC.INI file.

2.4.3. Data Integrity Checks

The **Tools | Data Integrity Checks** option will search the data for points corresponding to the conditions specified in the parameters. This allows the user to quickly check the completeness of the data set as well as look for unexpected conditions, such as no AC power present. When the **Tools | Data Integrity Checks** option is selected, Figure 2.4-6 appears (various check boxes may be grayed out if they do not apply to the instrument type(s) for the facility):

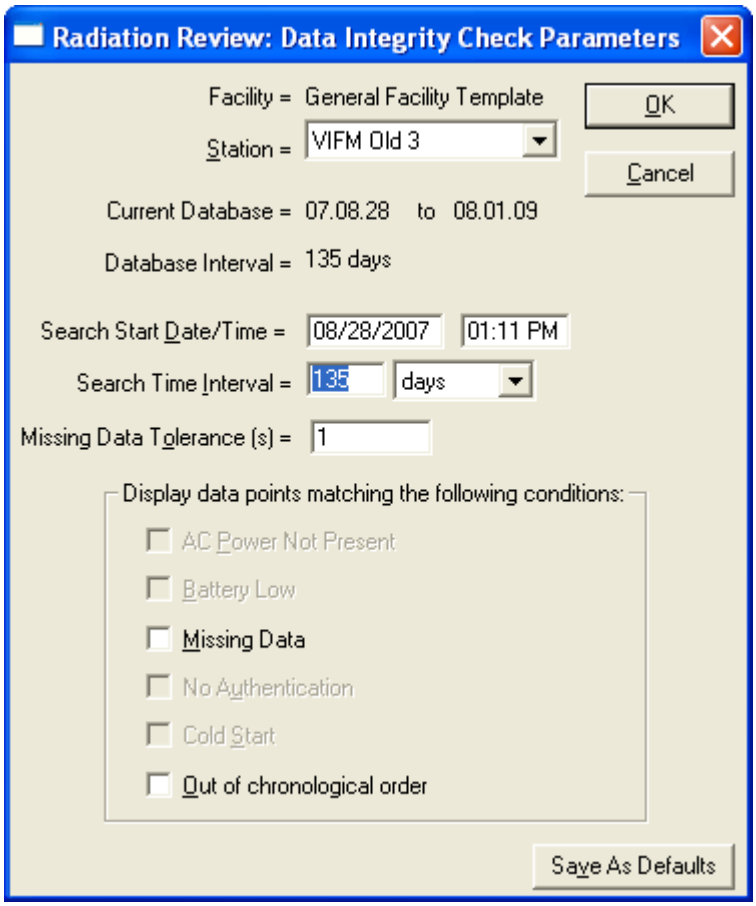


Figure 2.4-6 Tools | Data Integrity Checks Dialog Box

The **Facility** name is displayed on the top line. The **Station** field provides a dropdown list of all stations in the facility and allows the user to indicate whether to perform the search for a single station or all stations. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If

Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The six check boxes at the bottom of the dialog box specify the conditions for which the data can be searched. Depending on the data type of the station specified, some of the boxes may be grayed out indicating that this status does not apply to that type of data. The following data integrity checks are possible:
AC Power Not Present: the data record status is examined to see if the status indicates that AC power was not present when the record was acquired.

Battery Low: the data record status is examined to see if the status indicates that the battery was low when the record was acquired.

Missing Data: the data record is examined to see if all time is accounted for. For each data point in the interval, the expected timestamp of the next point is calculated as a function of its elapsed time and its timestamp. The next data point timestamp is expected to be a calculated number (elapsed time * 1.1 + x where x is the **Missing Data Tolerance**) of seconds beyond the current point's timestamp. If the timestamp of the next point is more than this expected difference, data is said to be missing in the data set.

No Authentication: the data record status is examined to see if the status indicates that the record could not be authenticated by the data collection program. When data are transmitted between the instrument Monitor firmware and MIC, each data record is authenticated. The first records transmitted after a Cold Start are not expected to be authenticated. All other records are expected to be authenticated.

Cold Start: the data record status is examined to see if the status indicates that the data record was acquired when the Monitor program was in the cold start state. When the Monitor program in the GRAND-3 is completely reset (by doing a switch 2 reset in the hardware), it is called a cold start. All data records will indicate a cold start status until a group of records has been successfully transmitted to MIC. Since cold start records require physically changing the GRAND-3 hardware switch state, cold start records are expected only after new software has been installed or maintenance has been done on a GRAND-3.

Out of Chronological Order: each data record in the interval is checked to see if its timestamp is greater than or equal to the timestamp of the previous data point. If it is not, the data are declared out of order. The data should only be out of order when the time in the instrument is changed to be an earlier time.

Note: Checks do not apply to all instruments data. Those that don't apply the check boxes will be grayed out for that instrument.

Since the conditions depend on the instrument type of the station, once you select a new station the station type's applicable conditions to be enabled/disabled in the list of checkboxes.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **OK** button starts the search.

The data in the specified station(s) is searched for the requested condition(s). Depending on the amount of data in the interval, this search may take several minutes. As each station is searched, the current status of the search is shown in a dialog box with a Cancel button at the bottom. If you select to Cancel the search process, another dialog box appears asking

whether you are sure you want to Cancel. If you answer Yes, the search process stops with the current data set. If you answer No, the integrity check continues.

During the search, a results window, *Data Matching Status Flag Conditions*, is updated. The first part of the results window documents the search conditions and lists the status definitions for the instrument. Any records that match one of the specified conditions are displayed with a 3-character code indicating the reasons. The possibilities are (these are listed in the order the conditions are searched):
AC – No AC power present,
Low – Battery low,
CS – Cold Start,
Ath – Authentication Error
MII – In Measurement Interval of Interest
Out – Out of Order and
Gap – missing data
If a data record matches 2 or more conditions, only the last matching reason is printed. The following three text windows show sample results from three different kinds of instruments supported by Radiation Review: MiniGRAND/GRANDs, AMSR/ISRs and MiniADCs. If an instrument operated with no problems during the inspection, you would expect to find 0 conditions matching.

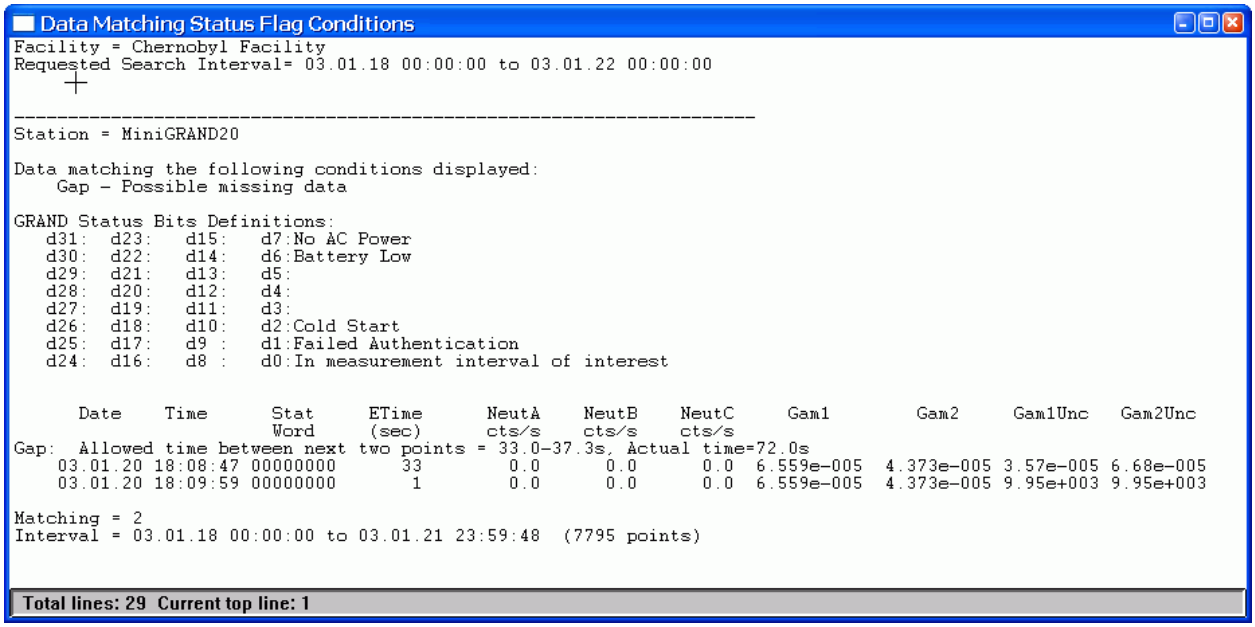


Figure 2.4-7 Tools | Data Integrity MiniGRAND/GRAND Text Window Results

The **Data Matching Status Flag Conditions** results window has the following sections for MiniGRAND/GRAND instruments:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the search parameters.

Main Results:
For each station searched a list of all the data points matching the specified conditions are listed. For each data point the following columns of results are displayed:
First Column: Which condition the data point matches
Date/Time – the date/time

Stat Word – the status word associated with the data record (hexadecimal format),
Etime – the elapsed time,
Neut A – the count rate in pulse channel A,
Neut B – the count rate in pulse channel B,
Neut C – the count rate in pulse channel C,
Gam1 – the relative gammas in the first current channel,
Gam2 – the relative gammas in the second current channel,
Gam1 Unc – for GRAND-3s, the uncertainty associated with the Gam1 relative gammas; for MiniGRANDs depending on the MiniGRAND configuration this is either the Gam 1 relative gammas uncertainty or the internal temperature,
Gam2 Unc – for GRAND-3s, the uncertainty associated with the Gam2 relative gammas; for MiniGRANDs depending on the MiniGRAND configuration this is either the Gam 2 relative gammas uncertainty or the external temperature.

Summary Portion:
In the summary at the bottom, the status of the search, the number of matching data points and the search interval are displayed.

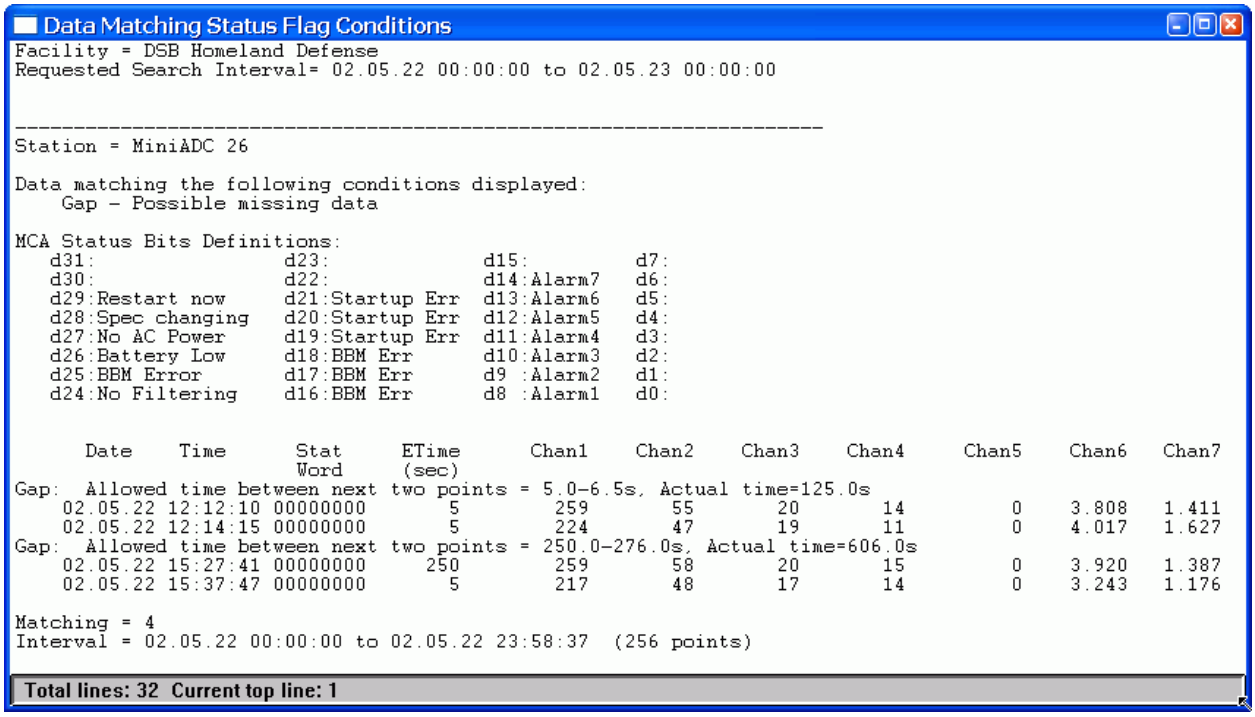


Figure 2.4-8 Tools | Data Integrity MiniADC Text Window Results

The **Data Matching Status Flag Conditions** results window has the following sections for MiniADC instruments:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the search parameters.

Main Results:
For each station searched a list of all the data points matching the specified conditions are listed. For each data point the following columns of results are displayed:
First Column: Which condition the data point matches

Date/Time – the date/time
Stat Word – the status word associated with the data record (hexadecimal format),
Etime – the elapsed time,
Chan 1, Chan2, Chan3, Chan4, Chan5, Chan6, Chan7 – the counts in the channels defined in the MiniADC.

Summary Portion:
In the summary at the bottom, the status of the search, the number of matching data points and the search interval are displayed.

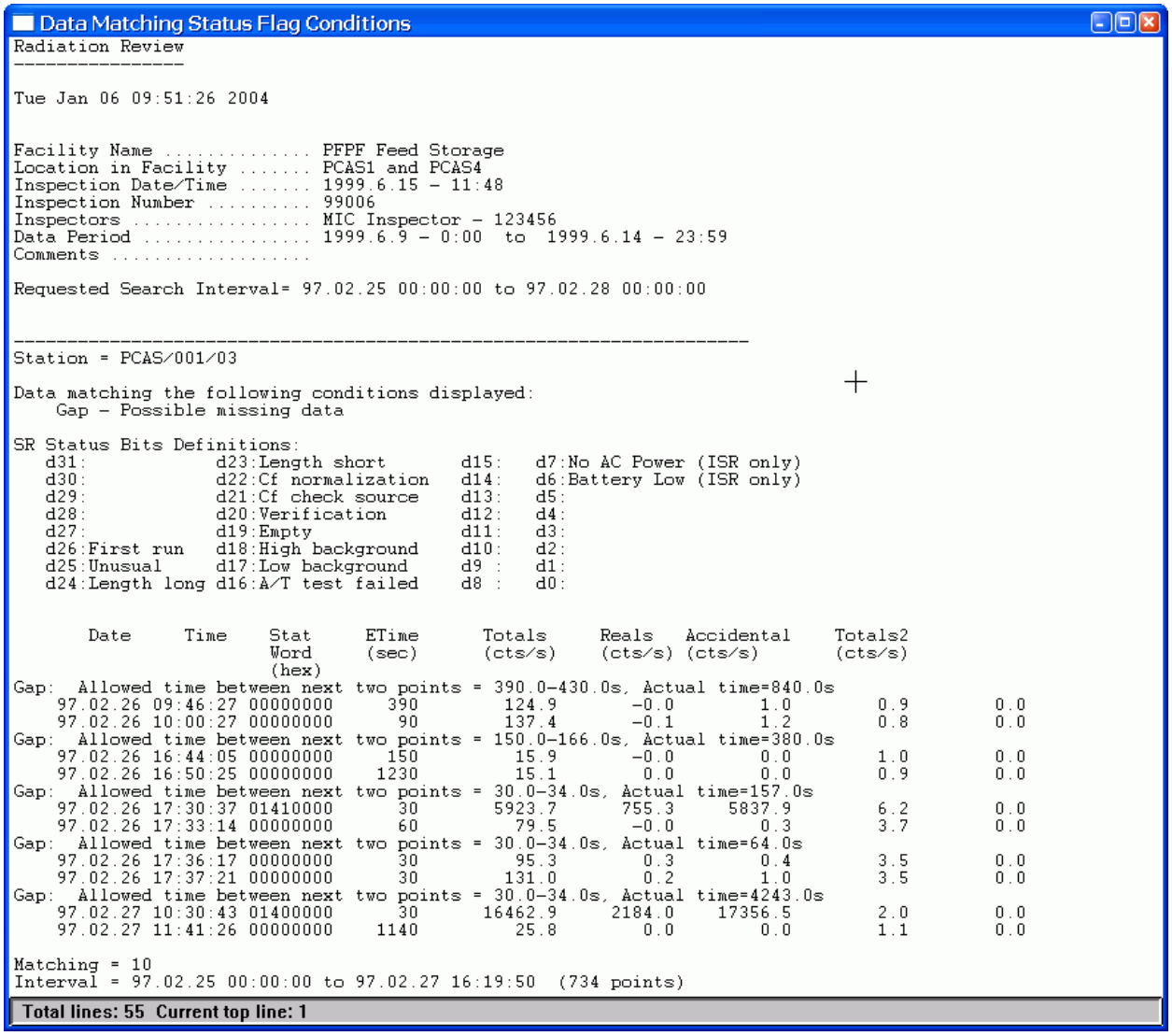


Figure 2.4-9 Tools | Data Integrity SR Text Window Results

The **Data Matching Status Flag Conditions** results window has the following sections for JSR/ISR/AMSR instruments:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the search parameters.

Main Results:
For each station searched a list of all the data points matching the specified conditions are listed. For each data point the following columns of results are displayed:
First Column: Which condition the data point matches
Date/Time – the date/time
Stat Word – the status word associated with the data record (hexadecimal format),
Etime – the elapsed time,
Totals – the totals (singles) count rate,
Reals – the reals (doubles) count rate,
Accidentals – the accidentals count rate,
Totals 2 – the second totals count rate.

Summary Portion:
In the summary at the bottom, the status of the search, the number of matching data points and the search interval are displayed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

2.4.4. Find Channel Events

The **Tools | Find Channel Events** option will search the database for peaks corresponding to the conditions specified in the parameters. The parameters must be carefully set for each facility. Typically experts such as facility officers set these parameters. See Appendix D for directions on how to determine the parameters for a given facility. When the **Tools | Find Channel Events** option is selected, Figure 2.4-10 appears:

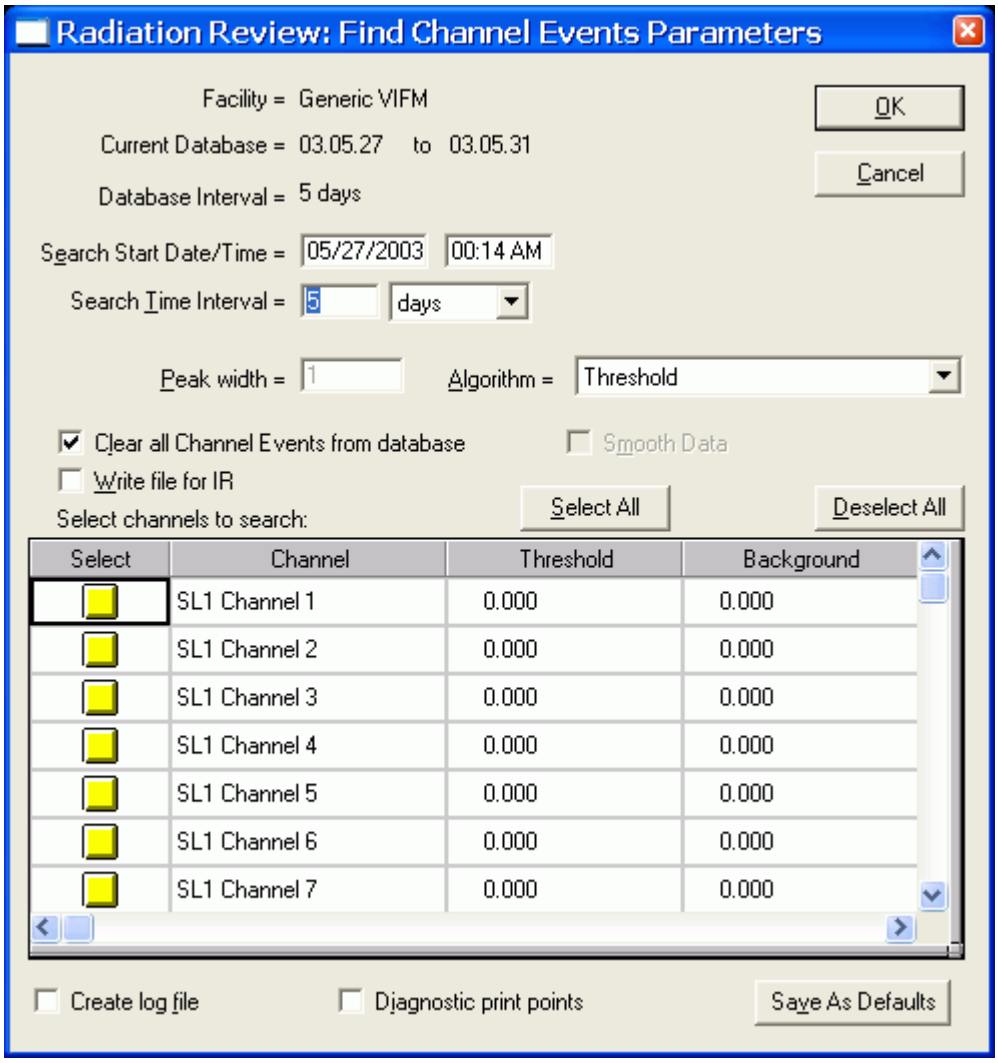


Figure 2.4-10 Tools | Find Channel Events Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and

Search Time Interval vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The **Peak Width**, **Algorithm** and **Smooth Data** parameters should be set to facility specific values (not all values apply to all algorithms).

The **Algorithm** allows you to specify which search algorithm to be used. Radiation Review currently supports 3 algorithms:
Threshold - The data in each selected channel are analyzed, channel events are defined as those data points which are above the threshold value entered for that channel in the table. Each channel event is defined as starting with the first data point that is above the threshold and ends with the last consecutive data point above the threshold. This search algorithm is well-suited for facilities with a constant background whose radiation movements are easily distinguished from the background. (The background value in the table, the peak width and the smooth data parameters are not used for this algorithm.)
Sliding Window with Background - The data in each selected channel are analyzed by applying a “comb-type filter” to the data and a second data array is formed. The peak containing a channel event is located by evaluating whether the data in the second array are above the threshold. If data are found to be above the threshold in the second array, then the start and end of the event are determined by searching backwards and forwards to find the first and last consecutive data points of the original data that are above the background specified. If smoothed data have been selected, then the original data is smoothed before the calculations. The peak width is used in the Sliding Window with Background algorithm. This search algorithm is well-suited for facilities that have a constant background and whose channel events can be distinguished from the current background value specified. The threshold and background values are determined as described in Appendix D, Section D.1.
Sliding Window with Local Background - this algorithm is similar to the Sliding Window with Background. The peak containing a channel event is found by checking if the data in the second data array are above the threshold just like before. The start and end points are determined by when the second data array crosses zero. If smoothed data are selected, then the original data is smoothed before the calculations. The peak width is used in the Sliding Window with Local Background algorithm. The search algorithm is well-suited for facilities that do not have a constant background but whose channel events can be distinguished from the current local background. The threshold and background values are determined as described in Appendix D, Section D.1.

The **Peak Width** parameter used in the Sliding Window analyses specifies the average number of points contained in the peak; a single number must represent all channels so if the peaks are different widths in different channels an estimate that represents all of them is entered. The number is obtained by examining typical data on the graph and counting the points in several typical peaks. (Since this does not apply to the Threshold Algorithm, the field cannot be edited when Threshold is selected as the Algorithm).

The **Smooth Data** checkbox used in the Sliding Window analyses specifies whether a three-point smooth should be done on the data before the search Algorithm is executed. (Since this does not apply to the Threshold Algorithm, the box is not enabled when Threshold is selected as the Algorithm).

Table Columns: The table at the bottom of the dialog box contains an entry for each channel at the facility. The table contains these columns:
Select - a checkbox for whether the channel is selected (should be analyzed),
Channel - the channel name (cannot edit this column)

Threshold – the value above which data are considered to be an event,
Background – for Sliding Window analyses, this is the typical background for the channel (cannot edit this column if Algorithm = Threshold).

If there are more channels in the facility than can be displayed, a scroll bar appears at the right side of the dialog box of the table. The threshold and background values are determined as described in Appendix D, Section D.1.

The **Select All** and **Deselect All** buttons allow you to select all or none of the channels for analysis. Individual channels can be selected/de-selected by clicking on the X in the Select column for that channel.

The **Clear All Channel Events from Database** checkbox can be used to delete all the channel events that are currently in the database before the new search is started.

The **Write File for IR** checkbox, if checked, indicates that the results of the search should be written to the file for use by Integrated Review. The format of the file is described in Appendix A. Section A 2.5.

The **Create log file** box can be checked if the user wants the results written to a file. If this box is checked, when the analysis begins, the user will be prompted for the filename in which to store the results. The format of the file is described in Appendix A. Section A 2.4.

The **Diagnostic Print Points** box is used only by an expert during the parameter determination. In order to correctly identify what the values for the threshold and background are for the different algorithms, this option gives the user a list of the raw data, smoothed data and calculated data for the specified time period. By examining the values around an event, the expert determines which parameter values should be used. In normal operation this is never checked! See Appendix D for more details.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **OK** button starts the search.

The channels are searched on a station by station basis. Depending on the amount of data in the interval, this search may take several minutes. As the stations are being searched, a progress bar, Figure 2.4-11, appears indicating the current status of the search. There is a progress bar for each station.

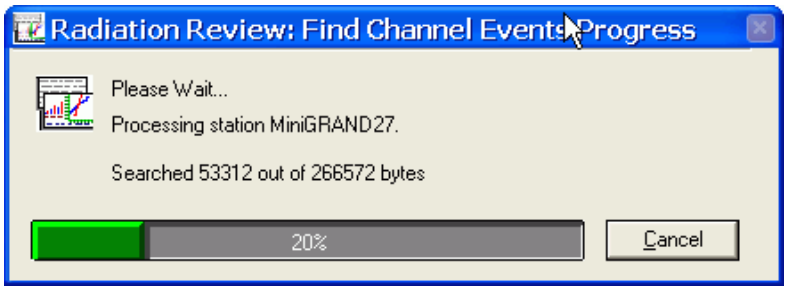


Figure 2.4-11 Event Search Progress Bar

The progress bar dialog box indicates which station is being processed, the amount of data to search and percentage of the search for the station finished so far. If you click on the Cancel button, a second dialog box appears asking if you are really sure you want to cancel the search. If you answer No, then the search is continued. If you answer Yes, the search stops when the current analysis is completed and the partial results are displayed.

While the search is being performed, the results are being written to the Channel Events Found text window, Figure 2.4-12. This window is constantly updated as the search proceeds. When the search is finished you may examine the results in this window.

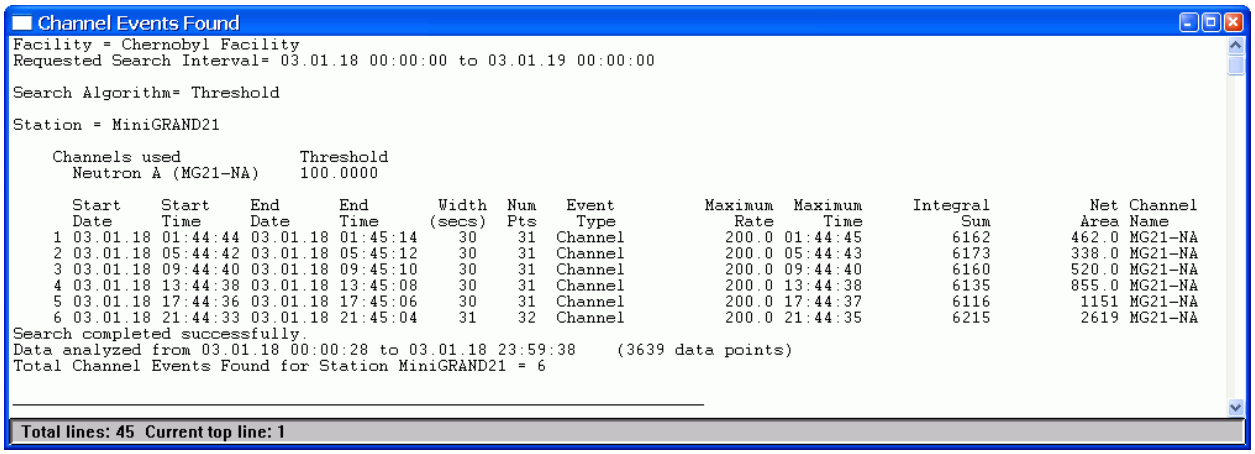


Figure 2.4-12 Tools | Find Channel Events Text Window Results

The **Channel Events Found** results window has the following sections:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the search parameters including the choice of algorithm and which channels were selected to be searched.

Main Results:
Then for each station searched a list of all the events found in the interval are listed. For each event the following columns of results are displayed:
Start Date/Start Time – for this event, the date/time when the event started
End Date/End Time – for this event, the end time
Width – the duration of this event in seconds calculated by subtracting the start time from the end time. The width includes both the start and end time in the interval, so events with an identical start/end time are given a length of 1.
Num Pts – the number of data points found in the event.
Event Type – This column indicates the type of event – at present the only choice that will appear is Channel indicating the event was found with the Find Events menu option.
Maximum Rate/Maximum Time – the rate displays the highest count rate in the channel within the event and the time indicates the timestamp associated with that rate.
Integral Sum – the integral sum is the sum of the total counts (not count rates) in the event (including the start/end time points)
Net Area – the net area (counts) represents the total counts (area) above a straight line going from the start time to the end time. This is intended as a general indication of net area – for a precise net area calculation, a more accurate method should be used to do the background subtraction.

Summary Portion:
In the summary at the bottom, the status of the search, the data interval and number of data points in the interval, and the number of channel events found for the station are listed.

Log File: If you had checked the Create Log File on the original Find Events dialog box, the results without the header and summary portions are written to the text file that you selected

when asked at the start of the search. That file and its format are described in Appendix A., Section A.2.4.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

IR File: In addition if Radiation Review is running as part of an IRS session, one of the options is to have a file containing some of these results produced for use by Integrated Review. That file and its format are described in Appendix A., Section A.2.5.

2.4.5. Direction Analysis

The **Tools | Direction Analysis** main menu option will search pairs of events in the database to determine the time sequence in which they occurred. If an event occurs in channel A and then 5 seconds later an event occurs in channel B, the direction of motion is said to be from A to B. Since the direction analysis is done on the events in the specified channels, events must have been found using the **Tools | Find Events** or **Tools | Determine Measurements** menu option before executing the **Tools | Direction Analysis** menu option. Because this option involves comparing times from events in different channels, you must carefully select to compare events on either a single station or time-synchronized stations. Typically all parameters are carefully set for each facility by an expert such as the facility officer. See Appendix D, Section D.2 for directions on how to determine the parameters for a given facility. When the **Tools | Direction Analysis** option is selected, Figure 2.4-13 appears:

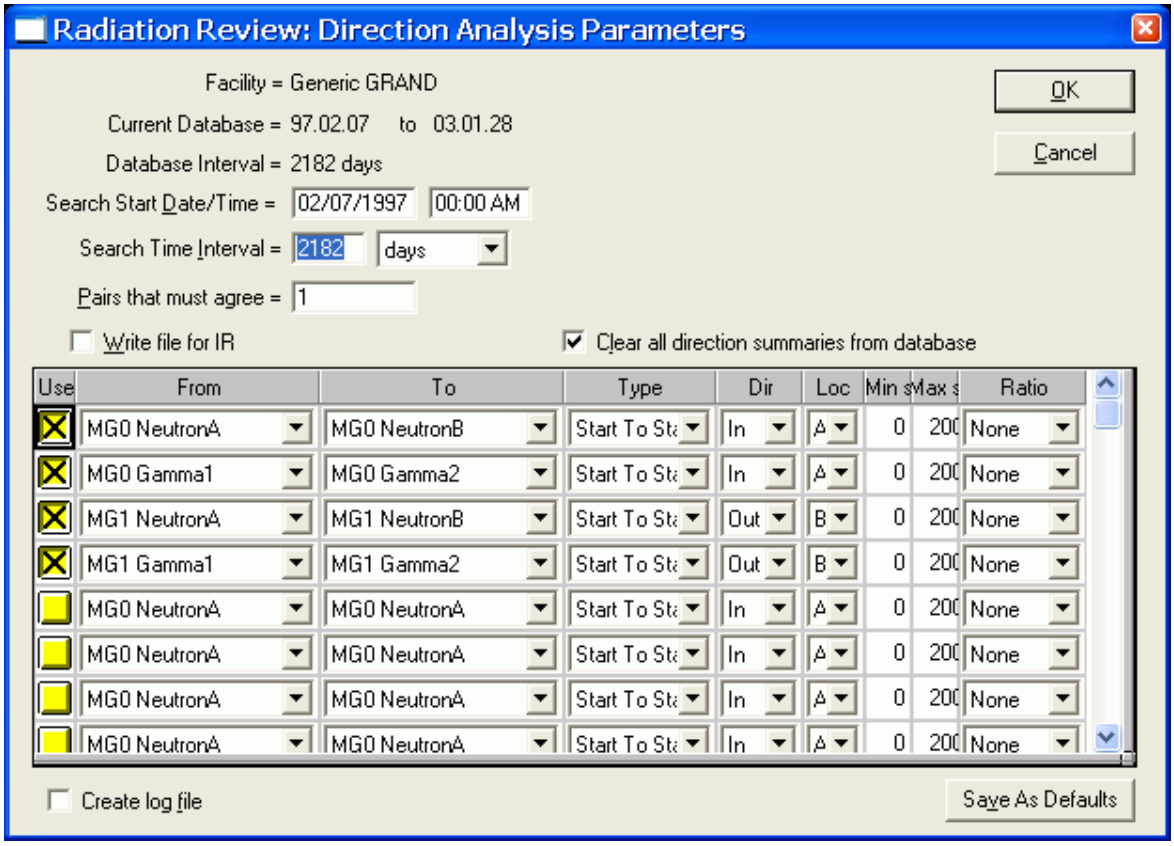


Figure 2.4-13 Tools | Direction Analysis Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire

database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The **Pairs that must agree** parameters allow you to specify how many of the specified From/To pairs must agree to establish a condition. (Currently only one pair is allowed.)

The **Clear all direction summaries from database** checkbox, if checked, causes all direction summaries that are currently in the database to be deleted before the new search is started.

The **Write File for IR** checkbox, if checked, indicates that the results of the search should be written to the file for use by Integrated Review. The format of the file is described in Appendix A. Section A 2.7.

Table Columns: The conditions for the direction search are set in the table. The table has as many entries as there are channels in the facility; if all the entries cannot be displayed a scroll bar on the right-hand side of the table appears. The following columns are in the table:
Use- check the box for each condition that you want to add to your search.
From - specifies the first channel in which the movement is detected. If you click on the arrow in the right-hand part of the column, a list of all channels in the facility appears and you can select the desired channel. If the movement is from Neutron A to Neutron B, for example, Neutron A would be in the From column.
To - specifies the second channel in which the movement is detected. If you click on the arrow in the right-hand part of the column, a list of all channels in the facility appears and you can select the needed channel. If the movement is from Neutron A to Neutron B, for example, Neutron B would be in the To column.
Type – sets the condition for which edges of the channel event to use when deciding whether the events are in the same group. The choices are Start to Start, Start to End, End to Start and End to End. These conditions have the following meaning:
Start to Start - Start time of the From event is compared to the Start time of the To event,
Start to End – Start time of the From event is compared to the End time of the To event,
End to Start – End time of the From event is compared to the Start time of the To event,
End to End – End time of the From event is compared to the End time of the To event.
Dir – sets the direction of motion that describes the movement. If moving from Neutron A to Neutron B is moving into the facility, then you would select In. The only choices for this column are In, Out, None or In/Out. There is no standard way to describe what is in or out – these are facility specific parameters that must be defined. These choices have the following meaning:
In - used to signal an inward movement,
Out – used to signal an outward movement,
None – used to describe a movement that cannot be classified as either in or out,
In/Out – used to describe a movement that was both in and out. For example if the From and To channels are the same channel then a directional movement would signal that the item moved both in and out.
Loc - defines the location where the movement has occurred; the only choices are the generic locations, A and B. These generic locations must be “mapped” to definitions that have meaning for the specific facility.
Min, Max - these two columns specify the time boundaries of the condition. The columns have this meaning:
Min - specifies the minimum number of seconds that must pass from the time that the From event edge starts until the To event edge starts. This number can be 0 or greater.
Max - specifies the maximum number of seconds that can pass from the time that the From event edge started until the To event edge begins.

For example if you set Min to 5 and Max to 60 and the Type as Start to Start then if the From event starts at 10:40:35 then the To event must begin in the range of 10:40:40 - 10:41:35.
Ratio - specifies a simple relationship between the rows of the table. Typically this column is used to calculate a rough neutron/gamma ratio that can tell something about the type of material that was moved. Your choices are Numerator, Denominator or None. If you select a row to be used in the numerator calculation, then the maximum values of both the From and To channel are included in a numerator sum and likewise for the denominator. If you select None, then this row is ignored in the ratio calculation.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **OK** button starts the search.

The channel events for the pairs of channels for each condition are searched. In order to qualify as matching the criteria, the following analysis is performed. First all events in the database are grouped using the Type and Min/Max criteria; based on the Type the following algorithms are executed:
Start to Start – check if the beginning time of the first event in the database is within the Min/Max criteria of the next event's beginning time. If yes, set the group time of both events to be the beginning time of the first event. If no, then use the second and third events in the database for the comparison. Continue until all database events have been compared.
Start to End – check if the beginning time of the first event in the database is within the Min/Max criteria of the next event's ending time. If yes, set the group time of both events to be the beginning time of the first event. If no, then use the second and third events in the database for the comparison. Continue until all database events have been compared.
End to Start – check if the ending time of the first event in the database is within the Min/Max criteria of the next event's beginning time. If yes, set the group time of both events to be the beginning time of the first event. If no, then use the second and third events in the database for the comparison. Continue until all database events have been compared.
End to End – check if the ending time of the first event in the database is within the Min/Max criteria of the next event's ending time. If yes, set the group time of both events to be the beginning time of the first event. If no, then use the second and third events in the database for the comparison. Continue until all database events have been compared.
Note – previous versions of Radiation Review used the maximum values rather than the start/end of the events for the calculations; this version does the calculation based on the actual start/end times.

The results are displayed in a text window similar to Figure 2.4-14.

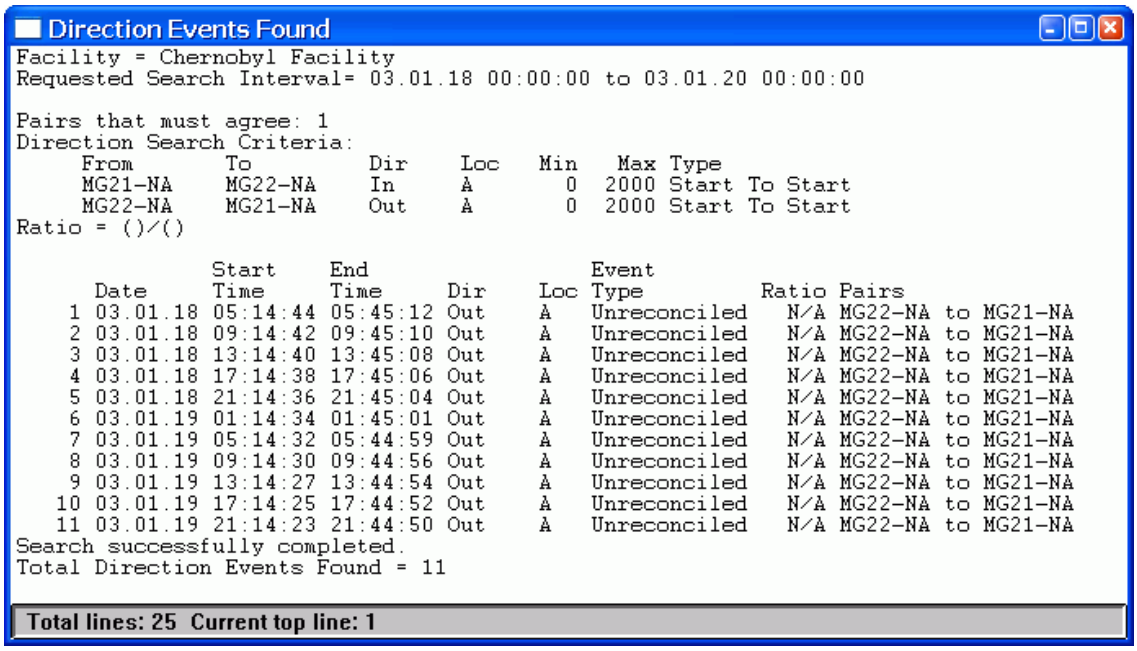


Figure 2.4-14 Tools | Direction Analysis Text Window Results

The **Direction Analysis** results window has the following sections:

Header Portion:
The top of the results text window shows the facility, search interval and the conditions selected for this particular search (the number of pairs, which pairs and their conditions, and the channels to use in the ratio calculation).

Main Results:
The direction events found are printed. For each event the following columns of results are displayed:
Date – for this event, the date when the event started
Start Time – for this event, the time when the event started
End Time – for this event, the end time (normally the date of the end time is the same as the start time)
Dir – the direction assigned to this movement,
Loc – where the direction occurred,
Event Type – always is Unreconciled,
Ratio – results of calculation specified in dialog box, if no calculation is specified, this entry is N/A for not applicable.
Pairs - pairs of channels containing channel events that met the specified conditions and indicate the direction of motion (x to y). The short names of the channels are used.

Summary Portion:
In the summary at the bottom, the status of the search and total direction events found is displayed.

Log File: If you had checked the Create Log File on the original Direction Analysis dialog box, the results without the header and summary portions would be written to the text file that you selected. See Appendix A, Section A.2.6.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described

in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

IR File: In addition if Radiation Review is running as part of an IRS session, one of the options is to have a file containing some of these results produced for use by Integrated Review. That file and its format are described in Appendix A, Section A.2.7.

2.4.6. Adjust Station Timestamp

The **Tools | Adjust Station Timestamp** main menu option is used to align the times of two or more stations whose data were collected when the station clocks were not synchronized. If this option is used, the data should be time-aligned immediately after the data have been imported before any analysis has been done. In order to use this option, the user must be able to identify precisely when common events occurred on two or more stations (typically done using the graph). The time of the first station checked in the list is considered to be the "correct" time and all data from selected stations below it are corrected to align with the "correct" time. When the **Tools | Adjust Station Timestamp** option is selected, the dialog box and graph shown in Figure 2.4-15 appears:

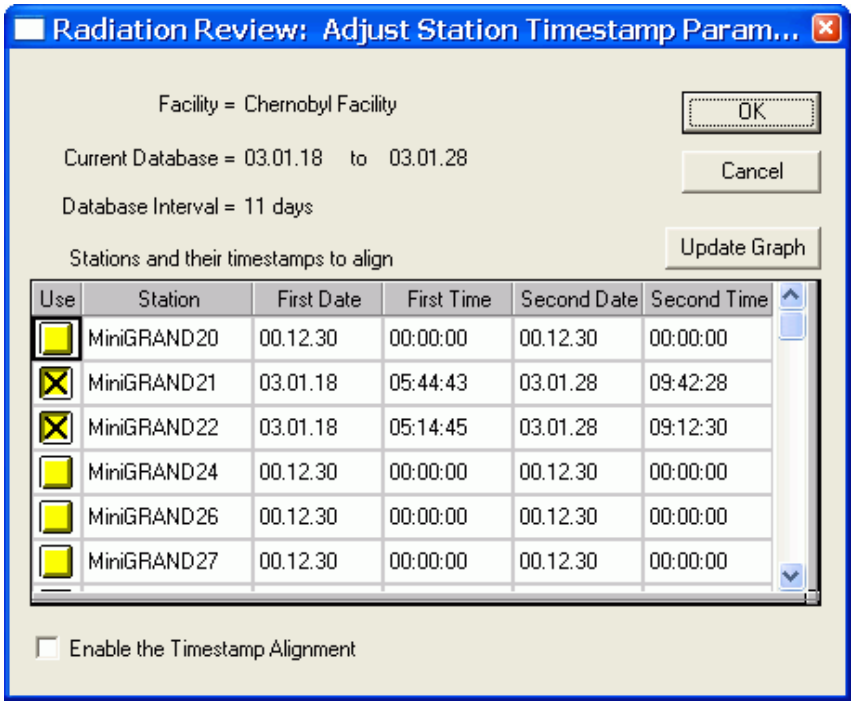


Figure 2.4-15 Tools | Adjust Station Timestamp Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The table in the lower half of the dialog box allows the user to enter the times of two events that are known to occur at precisely the same time on two or more stations. The columns of the table are defined as:
Use – check the box for each station that you know had an event at the same time
Station – names of the stations in the facility – this column cannot be changed
First Date – the day of the first common event
First Time – the time of the first common event
Second Date – the day of the second common event
Second Time – the time of the second common event.

The checkbox **Enable the Timestamp Alignment** is checked for the alignment to occur. This box allows the user to look at data in the both uncorrected and corrected formats.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

All parameters are automatically saved when the analysis is done. There is no **Save As Defaults** button.

Clicking on the **OK** button starts the calculation.

During the calculation the parameters are saved and the slope and intercept of a straight line going from time 1 to time 2 is calculated. If the timestamp alignment is active (Enable the Timestamp Alignment box is checked), then each time data are accessed either for raw data or to retrieve results the timestamp is adjusted. The database always maintains data with the original times read from the raw data files.

It is important that you conduct all analysis with a common time base – either everything is done with adjusted timestamps or all with unadjusted timestamps. If you would perform the following steps in this order: Import All, then Find Channel Events and then Adjust Station Timestamp, you will see that the “events” marked on the graph are not on the peaks. This is because you used unadjusted times for the Find Channel Events and then used adjusted timestamps for the Graph. The proper sequence would be: Import All, Adjust Station Timestamp, Find Channel Events and then Graph.

2.4.7. Graph

The **Tools | Graph** main menu option is used to graphically display the data in the database. This allows the user to quickly examine the data for trends and information of interest. Attempts have been made to optimize the most commonly used graph features. When the **Tools | Graph** option is selected, the dialog box and graph shown in Figure 2.4-16 appears:

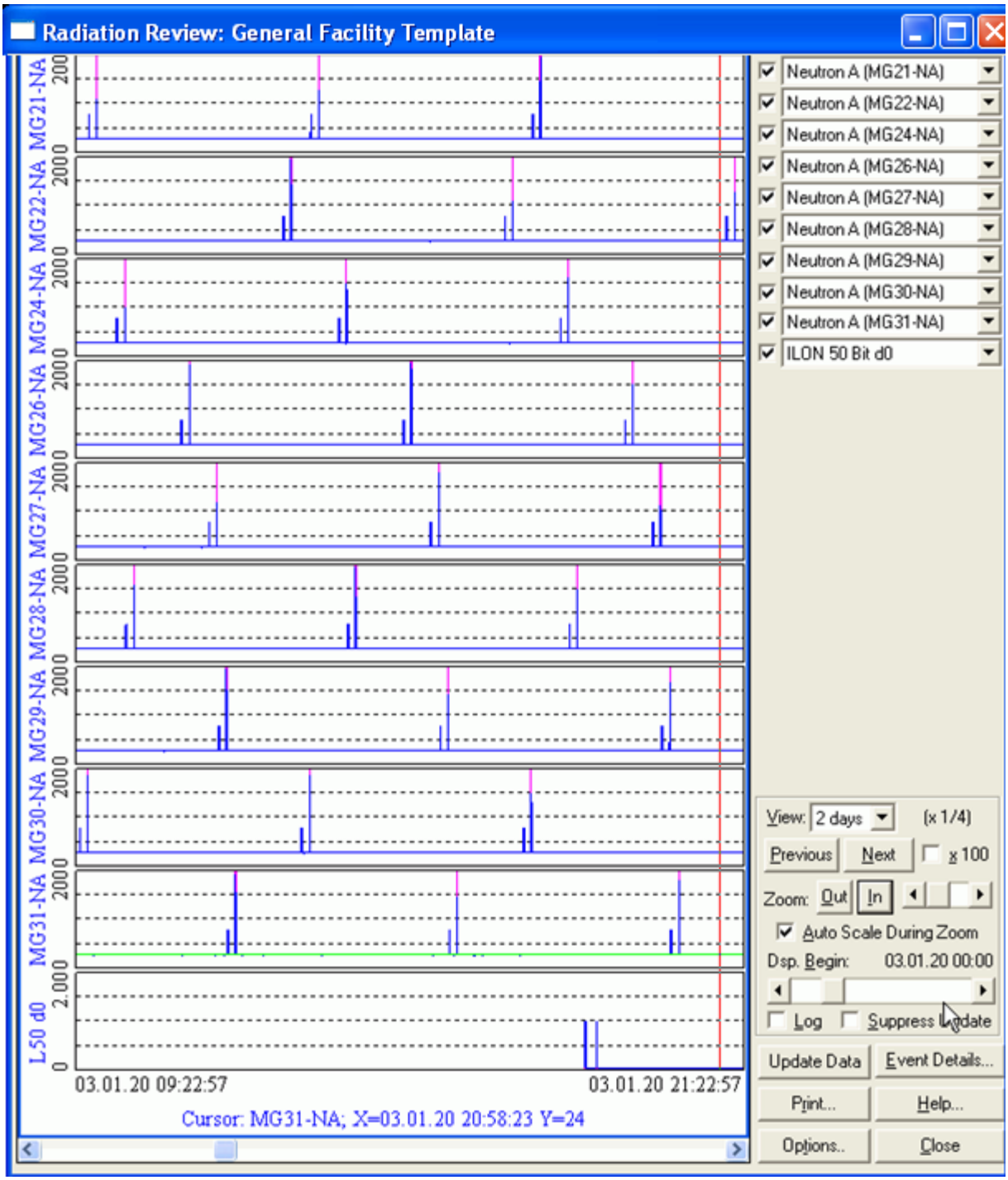


Figure 2.4-16 Tools | Graph Dialog Box and Display

The graph consists of several components:
Graph traces:
On the left side of the dialog boxes, there are from 1 to 10 traces. Each trace displays the time series data associated with one channel from a station (instrument). The channel name associated with each trace is listed on the left-hand axis of each trace – you can also determine the associated channels by looking at the boxes checked in the upper right portion of the dialog box.

The normal color for a trace is blue. A pink trace indicates channel events found using the Tools | Find Channel Event menu option. An orange trace indicates measurement events found using the Tools | Determine Measurements menu option. A gray trace indicates a manually marked background.

Graph cursor:
The timestamp and data associated with a data point can be displayed by using the cursor. The cursor is indicated by red crosshairs. The cursor extends vertically across all the traces so that timestamps on one trace can be correlated with timestamps on another trace.

The data at the cursor position are printed at the bottom of all the traces and include the trace (channel) name, the x value (date/time) and the y value. The color of the cursor readout information corresponds to the type of data point on which it resides. The following colors indicate the different kinds of information: pink - channel event, orange – measurement event, gray - background, red - mark.

Cursor movement left and right:
To move the cursor left or right on a trace, either:
click on a location to the left or right of the present cursor position or
use the left/right arrow keys on the keyboard to move one point left or right.

Cursor movement from trace to trace:
To move the cursor from one trace to the same time on another trace, click anywhere in the trace area of the new trace. The cursor will move to the new trace at the same time as on the previous trace (if the exact time is not present on the new data trace, you are informed on the bottom line of cursor information that this data is interpolated).

To move the cursor from one trace to a new time on another trace, click twice at the new trace and time desired. The first click moves to the new trace, the second click to the new timestamp.

Selecting how many channels to display:
The upper right corner of the display allows you to select up to 10 traces (channels) to be displayed. The channels containing a checked box by their label will be displayed. The top trace is associated with the first box checked. The number of traces available is decreased to 9 if you are using a low-resolution (800 X 600 or less) monitor. A minimum recommended monitor resolution is 1024x768; more is better.

Selecting which channels to display:
Once a trace (channel) in the upper right corner of the dialog box has a checked box, click on the right hand arrow to display a list of all channels possible. You can change which channel is displayed by selecting another channel from the list.

Selecting view period:
The **View** box allows you to select the interval to be displayed on the graph x-axis. You can select time intervals from 5 minutes up to 110 days.

Selecting next/previous view period:
The **Previous** and **Next** buttons allow you to select the Previous view period or the Next view period. For example, if the View box is set to 8 hours and you select Previous then the previous 8 hours are displayed in graph x-axis.

Zoom:
There are several methods for zooming in and out on the plots.
1) The checkbox **x100** zooms in by a factor of 100 around the current location of the cursor.
2) Each time you click on the **Out** or **In** box you zoom in/out by an additional factor of two.
3) Alternately you can use the scroll bar next to the In/Out buttons to zoom by a variable amount; the amount of the zoom is displayed on the line with the View amount.

The maximum zoom amount is 100x99 or 9900.

When the graph is zoomed in, a scroll bar appears along the x-axis of the bottom graph trace. You can use this to scroll through the expanded data by clicking on the endpoints of the scrollbar.

Auto scale during zoom:
If the checkbox **Auto Scale During Zoom** is checked then the graphical display will automatically scale vertically to the data being displayed. If the check box is not checked, then the graphical display will retain the same scale as was present before the zoom was performed.

Selecting time to display using scroll bar:
There is a scroll bar in the middle of the lower right corner area of the dialog box labeled **Dsp. Begin** (Display Begin). This scroll bar represents the entire time interval covered by the database. The thumb (scroll box) can be dragged along the scroll bar to select a different starting time. As the thumb is moved, the date/time above the scroll bar are updated; this date/time is where the graph will be started. When the thumb is released, the graph is updated using the scroll bar time as the beginning time.

Log/linear display:
To change between log and linear scale, simply check the **Log** checkbox. This will toggle between log and linear scale. In log scale, negative numbers and 0 are plotted as the lowest value in the data array although their actual value is displayed with the cursor readout. All traces is set to log or linear – it is not possible to have some log traces and some linear traces.

Suppress Update:
If the suppress update box is checked, then no data are present on the graph traces. This is helpful when configuring which graph traces to display. After the graph layout is complete, uncheck the suppress update box and the data are displayed.

Mark/Unmarking time on graph:
There are 6 buttons in the lower right of the dialog box. The upper left button can be labeled either Mark/Unmark or Update depending on a checkbox in the Graph Options button. If the button is labeled Mark, then the time associated with the cursor position can be labeled on the graph. To label a specific time on a graph trace, position the cursor at the position to be labeled. Select the **Mark** key and the time will be labeled on the graph trace. In addition to the time being labeled on the graph trace, the information is entered into the database. The next time the cursor is on this point the cursor readout information at the bottom of the screen will be red to indicate this is a marked point and the button label changes to **Unmark** when the cursor is residing on the marked point.

Update:
There are 6 buttons in the lower right of the dialog box. The upper left button can be labeled either Mark/Unmark or Update depending on a checkbox in the Graph Options button. If the button is Update, then the action normally taken with the Import|Import Most Recent File(s) is performed when the button is clicked. This is useful when you are viewing data in near-real-time.

Event Details
Capabilities exist for adding, editing or deleting events on a graph trace. To access these

capabilities, click the **Event Details** button. Either Figure 2.4-17 or Figure 2.4-18 dialog box appears depending on whether the cursor on the graph is located in an event or not.

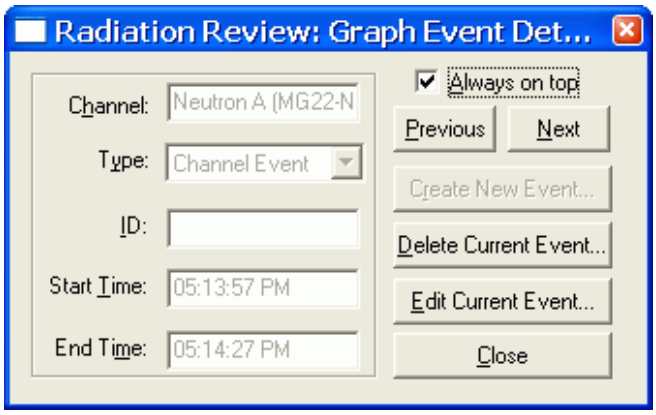


Figure 2.4-17 Graph Event Details Dialog Box of Existing Event

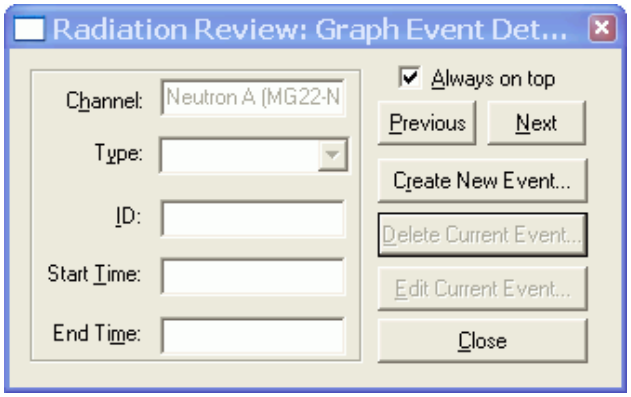


Figure 2.4-18 Graph Event Details Dialog Box of New Event

The left-hand column of the dialog box shows this information about the event (if any) in which the cursor currently resides: the channel name, the type of event, the associated ID if this event is a measurement, and the start/end time of the event. Which buttons are enabled in the right-hand column of the dialog box depends on whether the cursor is currently in an event or not. If the cursor is positioned in an event, the **Delete Current Event** and **Edit Current Event** are enabled.

If you are in an event and select **Delete Current Event**, another dialog box Figure 2.4-19 appears asking if you are sure you want to delete the event. If you answer yes, the event is deleted and the graph redrawn and the event will no longer be highlighted in a different color. If you answer No, no changes are made in the graph.

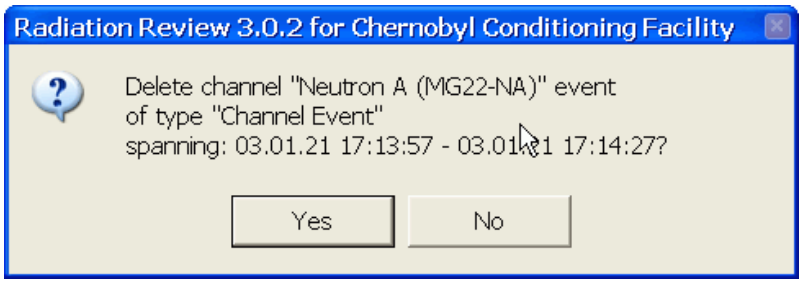


Figure 2.4-19 Graph Delete Event Question

If you select **Edit Current Event**, the same dialog box is displayed as before except this time the left-hand columns are available for editing as indicated by Figure 2.4-20.

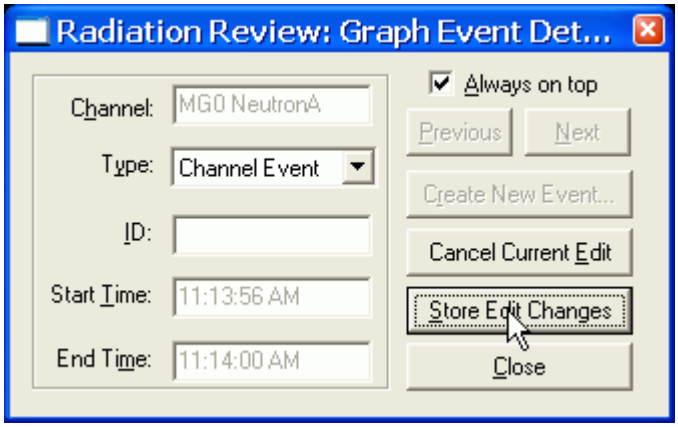


Figure 2.4-20 Graph Edit Event Dialog Box

In addition the selected event is marked on the graph trace with a heavy pink trace and a bounding box indicated by dotted lines appears around the event (see Figure 2.4-21). Several actions are possible at this point: in the left hand column of the dialog box you can select an event type and enter an ID, on the graph trace you can use the cursor to adjust the left/right sides of the bounding box to change the event start/end times

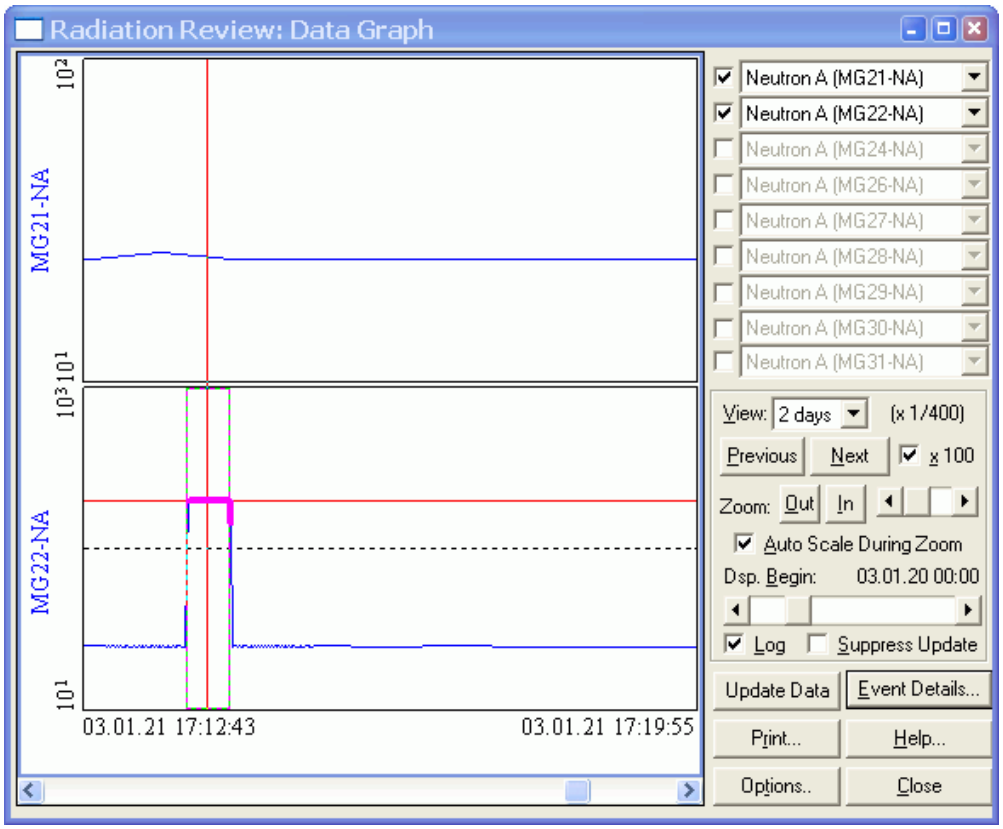


Figure 2.4-21 Graph Showing Event Being Edited

When you have completed the edit process for the event, select the **Store Edit Changes** button to delete the original event and store the new event in the database. The graph is then redrawn with the new event colored appropriate to its type.

Printing graph:
To print the graph, select the **Print** key. The normal Windows default printer selected will be used.

Help:
To display a simple graph help menu shown in Figure 2.4-22, select the **Help** button.

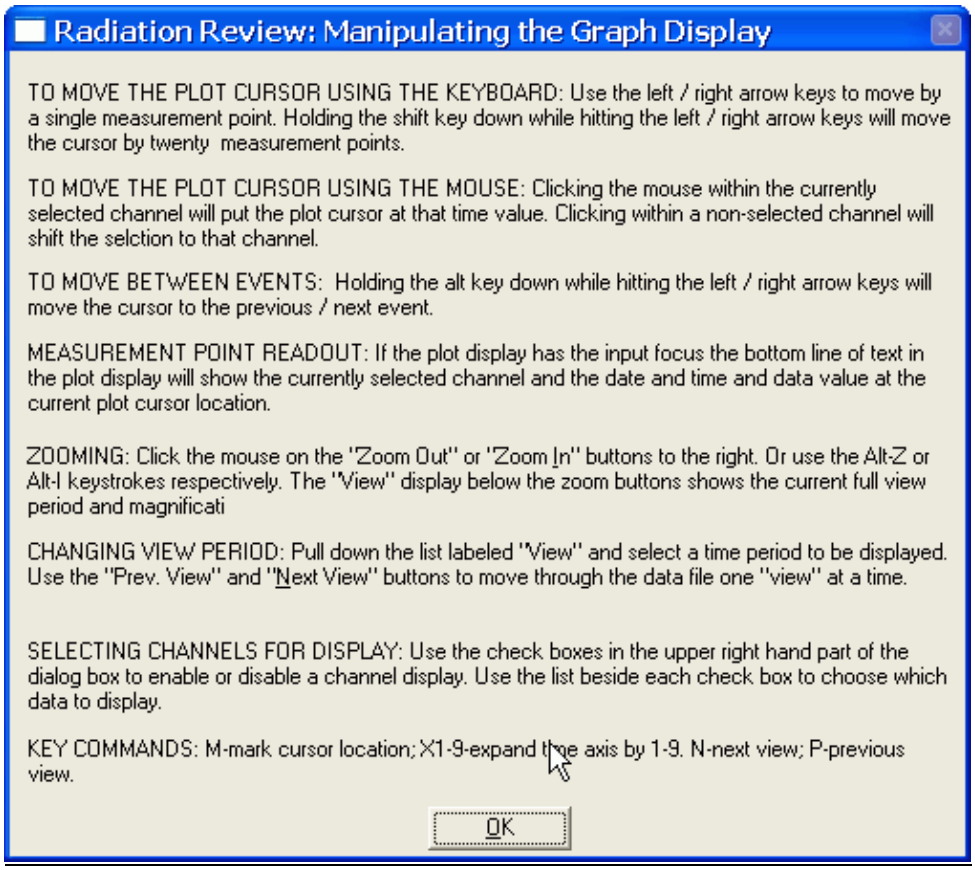


Figure 2.4-22 Graph Help Information

Options:
If the Options button is clicked, the dialog box in Figure 2.4-23 appears. There are three actions that can be taken – setting the time of the graph or reading/writing all the graph parameters from the database or changing the label of a button on the graph to be either Mark or Update.

The top half of the dialog box deals with setting the graph time span. At the top of the dialog box you can select either **Start Time** or **Center Time**. If Start Time is selected, then the graph beginning time will be the time set in the scroll boxes or the Date/Time fields in the dialog box. If Center Time is selected, then the graph center time will be the time set.

The middle part of the dialog box, **Graph Configurations**, provides the capability to manipulate graph trace configurations. There are four possible actions:
Read Configuration – the selected configuration is read from the database and all the graph parameters are set to those values (including the time in the upper half of the dialog box).
Write New Configuration – the current graph parameters are stored in the database identified by the name in the entry at the bottom. This is particularly helpful in facilities where there are so many instruments that not all the data can be displayed at one time.
Update Configuration – the current graph parameters are written over the existing graph parameters of the name specified
Delete Configuration – deletes the current set of graph parameters from the data base.
The configuration name “default” is reserved to save the graph parameters any time the graph exits. The next time the graph is plotted the same graph will be displayed with the exception that no zoom is shown.

The Update or Mark portion of the graph allows the user to change the label of the upper left button in the lower portion of the main graph dialog box. If the box is checked the label on that button is “Update”, if the box is not checked the label on the button is “Mark”.

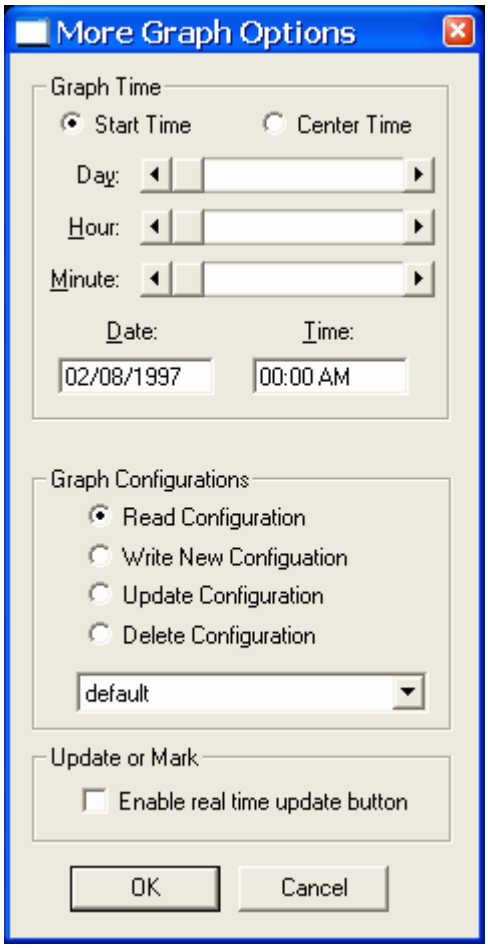


Figure 2.4-23 Graph Options Dialog Box

Close:
To exit the graph option, select the **Close** button or double click on the icon in the upper left corner of the graph. The parameters selected when you close the graph are the defaults for the next time the graph is displayed whether it is during this run of the program or another run of it.

2.4.8. Determine Measurements

The **Tools | Determine Measurements** option is typically used with shift register data to perform the same measurement analysis as was previously performed in the DOS SR Collect program. This menu option is enabled when shift register data are being used. Each data point is analyzed to determine the run type (normal, high or low background, moving, assay/verification, empty, and Cf normalization or check source). Consecutive runs of the same type are grouped into measurements. The data can be analyzed in one of two ways: (Reals-Doubles or Totals-Singles).

When the **Tools | Determine Measurements** option is accessed from the main menu, the Figure 2.4-24 dialog box appears:

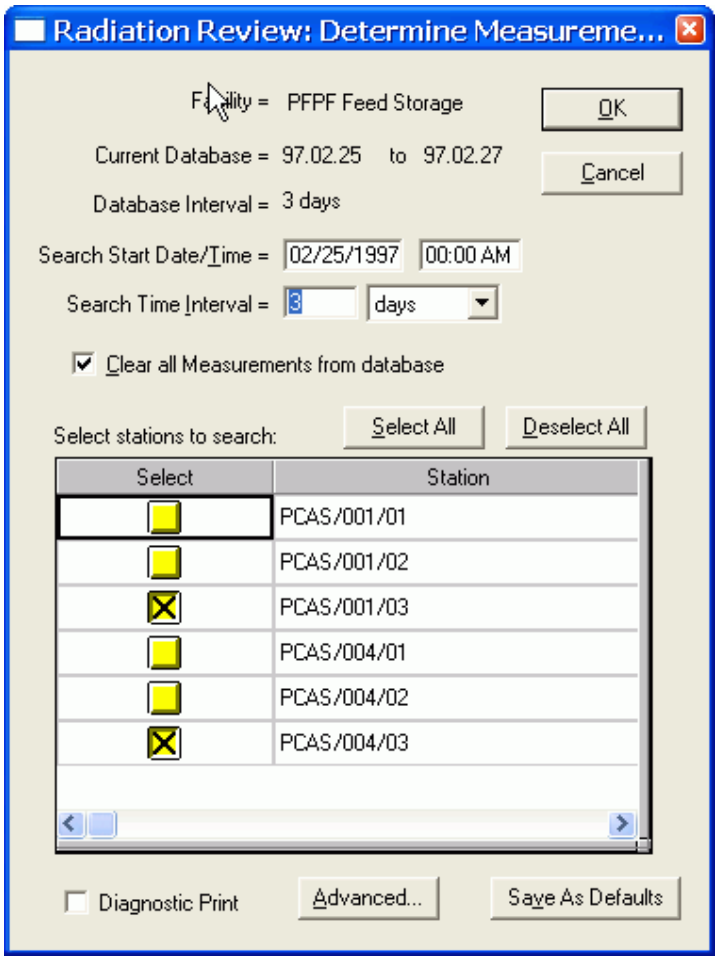


Figure 2.4-24 Tools | Determine Measurements Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval**

units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The **Clear all Measurements from database** button can be used to delete all measurements in the database before a new search is started.

Table Columns: The stations to be searched for measurements are set in the table. The following columns are in the table:
Select- check the box for each station to be analyzed.
Station - all the stations at the facility. You cannot edit this column.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **OK** button starts the search.

Clicking on the **Select All** button puts a checkmark in the Select column for each station in the table.

Clicking on the **Deselect All** button removes the checkmark from each Select column for each station in the table.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

The **Diagnostic Print** box is used only by an expert during the parameter determination. In order to verify the analysis is being performed as expected, this option gives the user a list of the raw data and its analysis state data for the specified time period. By examining the values around an event, the user determines which advanced parameter values should be used. In normal operation this is never checked!

Click on **Advanced** to display the parameters that are used during the analysis. When this button is clicked, the Figure 2.4-25 dialog box appears:

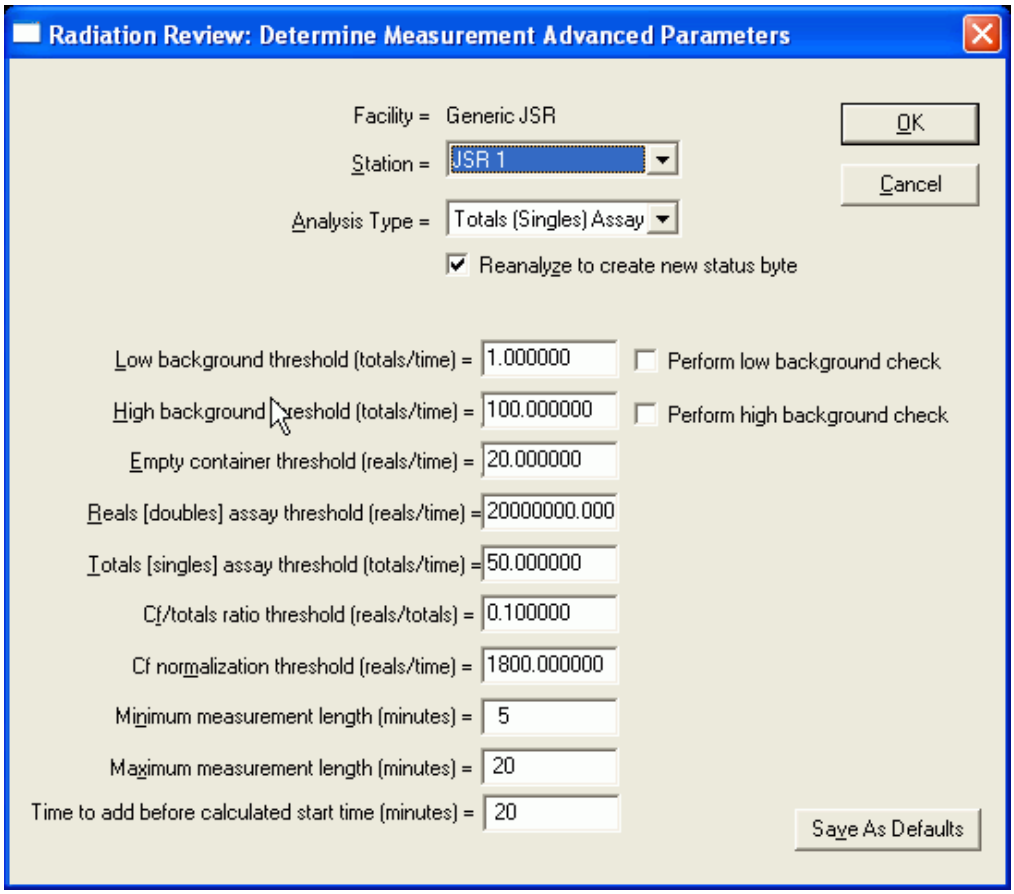


Figure 2.4-25 Advanced Measurement Parameters Dialog Box

The user can change any of the listed parameters. A separate set of parameters is maintained in the database for each station. The data are analyzed according to the flow charts contained in Appendix E.

The **Facility** name is displayed on the top line. This is an information only parameter; it cannot be changed by the user.

The **Station** field allows the user to select a specific station from a dropdown list of all stations at the facility.

The **Analysis** type can be either Reals (Doubles) Assay or Totals (Singles) Assay. See Appendix E for the algorithms that are executed for each analysis.

The **Reanalyze to create new status byte** checkbox allows you to selectively choose to use whether the data collected by DOS SR Collect will be reanalyzed. This box must always be checked for data collected by MIC from the AMSR/ISR as no on-line analysis is performed in the ISR.

Low background threshold: runs on which the totals rate falls below this value are said to be low background. The values for this field can range from 0 - 10,000.

Perform low background check: if this box is checked, the runs are checked for low background.

High background threshold: runs on which the totals rate falls below this value and above the low background threshold are said to be high background. The values for this field can range from 0 - 10,000.

Perform high background check: if this box is checked, the runs are checked for high background.

Empty container threshold: runs on which the reals rate falls below this value and above the reals/doubles assay threshold are of type empty. The values for this field can range from 0 - 10,000.

Reals/doubles assay threshold: runs on which the reals rate falls above this value are not background runs. Further analysis is done to determine the type of assay/verification type. The values for this field can range from 0 - 100,000.

Totals/singles assay threshold: runs on which the totals rate falls above this value are of type totals assay. The values for this field can range from 0 - 100,000. This parameter only has effect when the Analysis type is Totals (Singles) Assay.

Cf/totals ratio threshold: runs on which the reals value is above the reals/doubles assay threshold and the reals rate/totals rate falls above this value are of type Cf. A further test is done to decide whether it is a normalization or check Cf source. The values for this field can range from 0 - 10,000.

Cf normalization threshold (reals/time): for runs on which it has been determined the Cf is present, the runs that fall above this threshold are of type normalization; those below the threshold are of type check. The values for this field can range from 0 - 10,000.

Minimum Measurement Length: Measurements whose elapsed time is less than this value are classified as short. The values for this field can range from 0 - 100 minutes. Measurements marked as less than the minimum length are not filtered. The **short** classification is retained with the measurement. The **short** status is displayed by both the Diagnostics | Raw Data (§ 2.6.1) and the Tools | Data Integrity Checks features (§ 2.4.3).

Maximum Measurement Length: Measurements whose elapsed time is more than this value are classified as long. The values for this field can range from 0 – 100 minutes. Measurements marked as longer than the maximum length are not filtered. The **long** classification is retained with the measurement. The **long** status is displayed by both the Diagnostics | Raw Data (§ 2.6.1) and the Tools | Data Integrity Checks features (§ 2.4.3).

Time to add before calculated start time (minutes): Special parameter added primarily to support WCASA system. For measurements determine with Totals (Singles) Assay analysis, subtract the specified number of minutes from the start of the measurement. Note, to get the Totals analysis to run, set the Reals (doubles) assay threshold (reals/time) to be high enough so that the Totals analysis is performed. See Appendix E for a flowchart of the algorithm. The values for this field can range from 0 - 999.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **OK** button saves the parameters and closes this dialog box and returns you to the dialog box in Figure 2.4-24 Tools | Determine Measurements Dialog Box.

After all the parameters are correctly set, the user clicks on the OK button in the Figure 2.4-24 Tools | Determine Measurements Dialog Box. The data runs are sequentially analyzed according the algorithm described by the flow charts in Appendix E. Status bits are set as appropriate as the analysis proceeds.

During the analysis a progress box is displayed showing the amount of data analyzed for each station. There is a Cancel button as the bottom of the progress box. If you select to Cancel another dialog box appears asking if you are really sure you want to cancel the search. If you answer Yes, the search aborts when the current data are analyzed and the partial results are displayed. If you answer No, the search will resume and the total results are displayed.

The results of the measurement search are displayed in a text window similar to Figure 2.4-26.

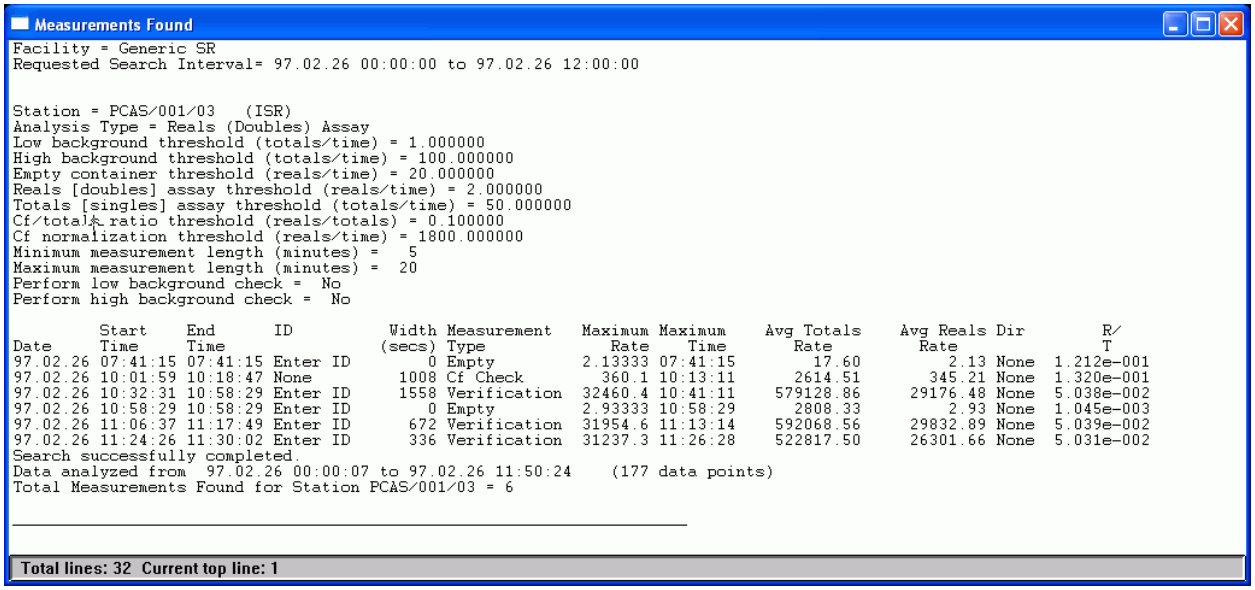


Figure 2.4-26 Determine Measurements Text Windows Results

The **Measurements Found** results window has the following sections:

Header Portion:
The top of the results text window shows the facility, search interval and the conditions selected for this particular analysis.

Main Results:
The measurement events found are printed. For each measurement event the following columns of results are displayed:
Date – for this event, the date,
Start Time – for this event, the time when the event started,
End Time – for this event, the end time (normally the date of the end time is the same as the start time),
ID – the ID associated with the sample,
Width – number of seconds between the Start Time and End Time, ,
Measurement Type – can be Low Bkg, High Bkg, Empty, Verif., Cf Check, Cf Norm, Totals, GRAND MII or Undefined,
Avg Totals Rate – average totals (singles) counting rate for the measurement event,
Avg Reals Rate – average reals (doubles) counting rate for the measurement event,
Dir – direction associated with this measurement event, if any,
Maximum Time – the time associated with the highest totals or reals rate in the event (totals are used if Totals (Singles) Assay is selected, reals used if Reals (Doubles) Assay is selected,
Maximum Rate – the highest rate of either reals or totals depending on the Analysis Type (Reals or Totals).

Summary Portion:
In the summary at the bottom, the status of the search, the interval analyzed and the number of measurement events found is displayed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

IR File: If Radiation Review is running as part of an IRS session, one of the options is to have a file containing some of these results produced for use by Integrated Review. That file and its format are described in Appendix A, Section A.2.7.

2.4.9. Export Data

The **Tools | Export Data** menu option is used with shift register and MiniGRAND/GRAND data to select data contained in measurement or channel events to export to other analysis tools such as INCC or FDMS for further analysis. Events for export must have been found prior to using this menu option. Events can be found either through the Tools | Find Channel Events or Tools | Determine Measurements menu options. They can also be created manually on the graph using the Create Event option. Selected subsets of these events can be sent to other review tools for further analysis.

When the **Tools | Export Data** option is accessed from the main menu, the Figure 2.4-27 dialog box appears:

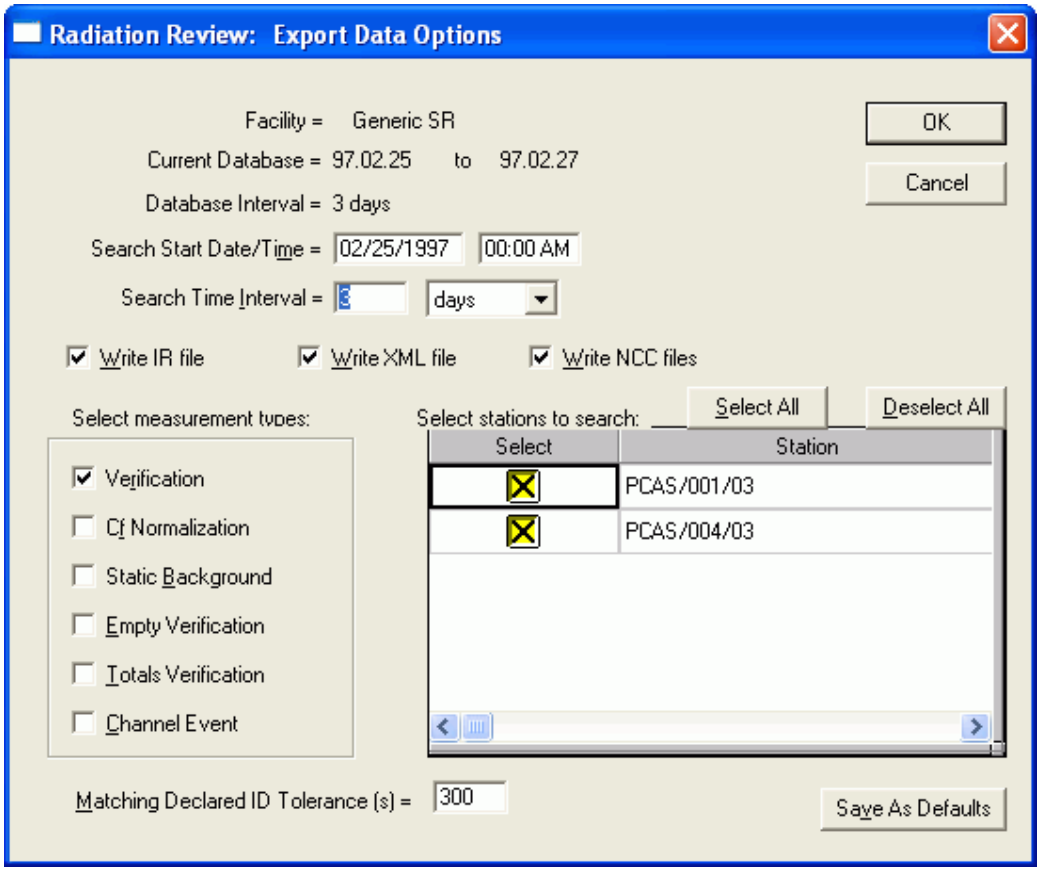


Figure 2.4-27 Tools | Export Data Dialog Box

The **Facility** name is displayed on the top line. This is an information only parameter; it cannot be changed by the user.

The **Current Database** and **Database Interval** display the first and last dates in the database and the total number of days covered by the database. The units for these parameters are whole days; even if a day only contains data for an hour in the day, it is counted as an entire day. These are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or

a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The **Write File for IR** checkbox, if checked, indicates that the information about the selected measurements should be written to the file for use by Integrated Review. The format of the file is described in Appendix A. Section A 2.7.

The **Write XML File IR** checkbox, if checked, indicates that the information about the selected measurements should be written to the file for use by FDMS. The format of the file is described in Appendix A. Section A 2.3.

The **Write NCC files** checkbox, if checked, indicates that the data from each selected measurement should be written to *.NCC files for use by INCC. The format of the file is described in Appendix A. Section A 2.2.

Table Columns: The conditions for the export are set in the table. The table has as many entries as there are channels in the facility; if all the entries cannot be displayed a scroll bar on the right-hand side of the table appears. The following columns are in the table:
Select - check the box for each station that you want to export data from.
Station - all the stations at the facility. You cannot edit this column.

In the **Select Measurement Types**, the following types of measurements can be selected for export by checking the appropriate checkboxes:
Verification - measurements that were determined to be verification/assay either by DOS SR Collect or during the Tools | Determine Measurements option of Radiation Review are presented for export to INCC.
Cf Normalization - measurements that were determined to be Cf normalization either by DOS SR Collect or during the Tools | Determine Measurements option of Radiation Review are presented for export to INCC.
Background - groups of runs that were marked to be Background from the Tools | Graph | Event Details button are presented for export.
Empty Verification - measurements that were determined to be empty verification/assay either by DOS SR Collect or during the Tools | Determine Measurements option of Radiation Review are presented for export to INCC.
Totals Verification - measurements that were determined to be totals verification/assay either by DOS SR Collect or during the Tools | Determine Measurements option of Radiation Review are presented for export to INCC. These types of measurements are only possible when Totals (Singles) Assay is selected in the Advanced Parameters for the Tools | Determine Measurements option.
Channel Event - measurements that were determined to be channel events either by using the Tools | Find Channel Events option of Radiation Review or manually marking events on the Tools | Graph | Event Details button are presented for export to another review tool.

In the **Matching Declared ID Tolerance** field, you can enter a tolerance (in seconds) for matching an ID to the measurement. If a file (produced by Operator Review) containing information about the IDs associated with certain stations and timestamps has been imported into the database, then those IDs will be searched to try to find the ID that is within the specified tolerance from the start of the measurement. If no ID file has been imported, then this field is ignored.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **Select All** button puts a checkmark in the Select column for each station in the table.

Clicking on the **Deselect All** button removes the checkmark from each Select column for each station in the table.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **OK** button starts the search for measurements/runs meeting the conditions specified.

The database is searched for measurement events which meet the qualifying conditions. When all measurement events have been searched, a table containing the matching measurement events is displayed as shown in Figure 2.4-28.

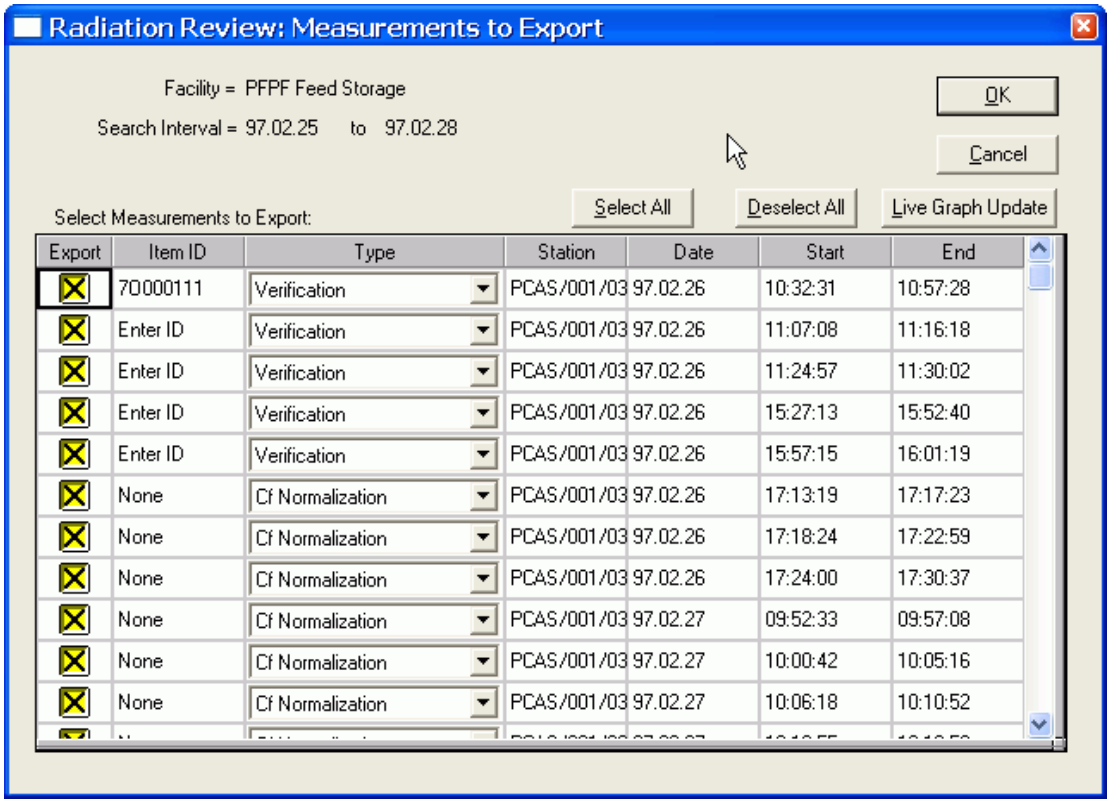


Figure 2.4-28 Tools | Export Data – Measurements to Export Dialog Box

The **Facility** name is displayed on the top line. This is an information only parameter that cannot be changed by the user.

The **Search Time Interval** displays the interval selected in the previous dialog box, Figure 2.4-27 Tools | Export Data Dialog Box.

The **Select All** button puts an X in every row in the Export column.

The **Deselect All** button removes the X's from every row in the Export column.

The **Live Graph Update** button opens the graph. You can then switch back and forth between the table and the graph to edit IDs, change start/end times, etc. When the events are stored to the database, the corresponding events on either the graph or the table are updated.

Table Columns: The table contains 7 columns of information of which the first 3 can be edited.
Export: an X in this column selects the measurement in the row for export to INCC.
Item ID: At any time the user can manually enter the ID for the item that is specified by the row. Normally only verification and empty verification measurements are associated with specific item IDs. This ID is used by INCC to identify the item and the associated parameters such as isotopics to use to calculate the mass, etc. The ID can be up to 12 characters long. If an ID file has been imported into the database, the IDs are searched to try to find an ID within the specified time tolerance of the measurement. If an ID is found that meets the conditions, then the ID field is filled in with this as a "best guess". IDs are typically found in the operator declarations and if possible, the inspector should independently verify the ID through another means, such as am image.
Type: The type of the measurement to be exported to another review tool, such as INCC or FDMS, can be selected here. Normally the user would accept the type determined by the automated analysis in Tools | Determine Measurements or Tools | Find Channel Events.
Station: The name of the station where the measurement occurred is listed. This field cannot be edited.
Date: The date of the measurement start. This field cannot be edited (measurement date can only be changed using Tools | Graph | Event Details.
Start: The time of the measurement start. This field cannot be edited (measurement start times can only be changed using Tools | Graph | Event Details.
End: The time of the measurement end. This field cannot be edited (measurement end times can only be changed using Tools | Graph | Event Details.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Clicking on the **OK** button initiates the export.

For each measurement event selected for export a file is written that can be imported into by other review tools. If SR data are being exported, it is assumed the data will be used by INCC and a separate file for each measurement event is written in the format described in Appendix A, Section A.2.2. If MiniGRAND/GRAND data are being exported, event summaries are written to an XML file described in Appendix A, Section A.2.3 – it is assumed that the review tool receiving the data will read the XML file and retrieve the needed raw data from the CoGrandImport COM. After all files have been written a text window of results is displayed similar to Figure 2.4-29.

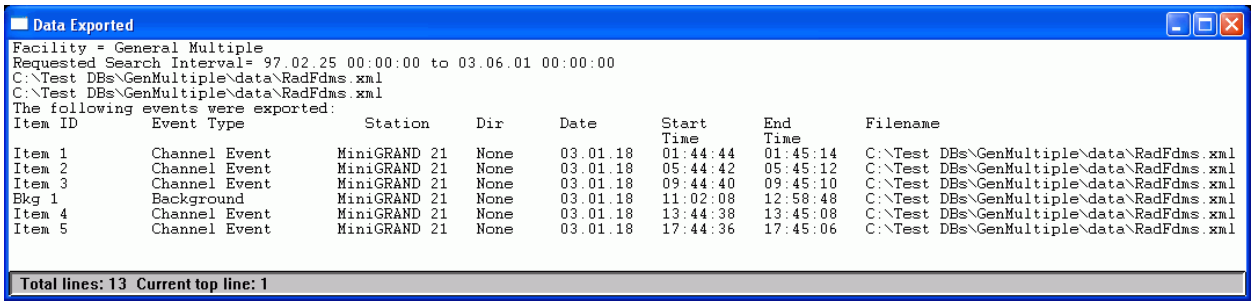


Figure 2.4-29 Tools | Export Data Text Window Results

The **Data Exported** results window has the following sections:

Header Portion:
The top of the results text window shows the facility and search interval.

Main Results:
The measurement files that were created are listed. For each file the following columns

of results are displayed:
Item ID – Item ID contained in the file,
Event Type – whether Verification, Cf Normalization, Background, Empty Verification, Totals Verification, or Channel
Station – Name of station associated with measurement event,
Dir – direction associated with this measurement event, if any,
Date – for this measurement event, the date,
Start Time – for this event, the time when the event started,
End Time – for this event, the end time (normally the date of the end time is the same as the start time),
Filename – file written for either INCC (contains drive, path and name) or the XML file

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

IR File: In addition if Radiation Review is running as part of an IRS session, one of the options is to have a file containing some of these results produced for use by Integrated Review. That file and its format are described in Appendix A Section A.2.7.

2.4.10. Facility Manager

The **Tools | Facility Manager** menu option uses the common Facility Manager Component present in all Integrated Review software tools. This option allows the user (with proper privileges) to add/delete/change the facility configuration. No detailed instructions are provided in this manual since the Facility Manager contains online help accessed via the Help button on the dialog box. When the **Tools | Facility Manager** option is selected, the following dialog box appears.

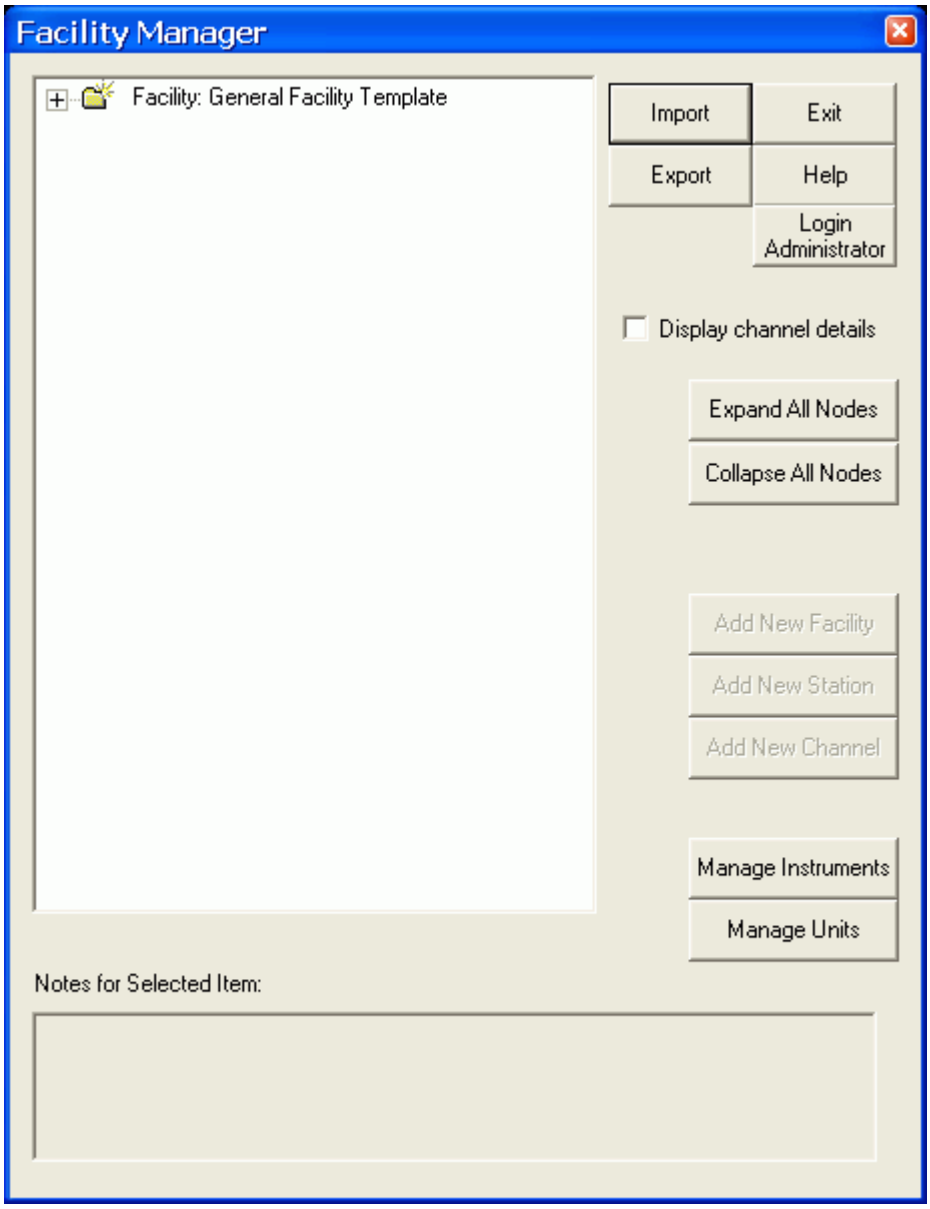


Figure 2.4-30 Tools | Facility Configuration Dialog Box

When you exit Facility Manager the following dialog box appears warning that you should re-import data if you have changed or added or deleted any stations for the facility you are currently using.

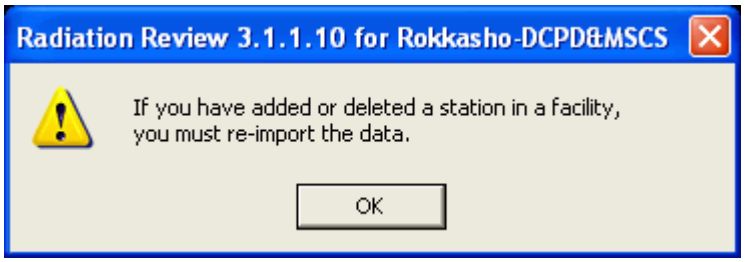


Figure 2.4-31 Tools | Facility Manager Exit Warning Message

If you click on the Manage Instruments button in Figure 2.4-30, the dialog in Figure 2.4-31 appears. This option allows the user (with proper privileges) to add/delete/change the instrument definitions configuration. No detailed instructions are provided in this manual since the Instrument Manager contains online help accessed via the Help button on the dialog box.

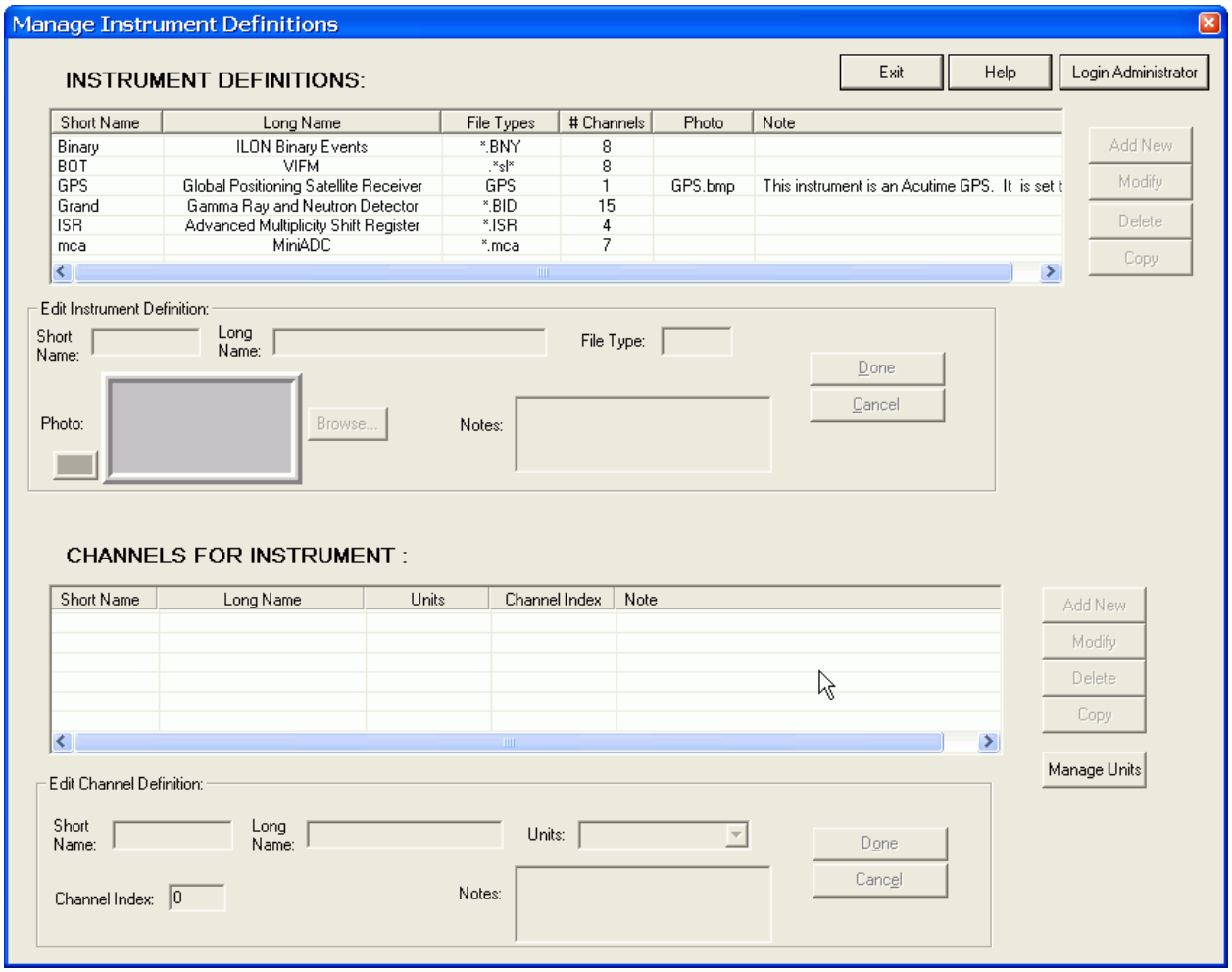


Figure 2.4-32 Tools | Instrument Manager Dialog Box

If you click on the Manage Units button in Figure 2.4-30, the dialog in Figure 2.4-32 appears. This option allows the user (with proper privileges) to add/delete/change the instrument units. No detailed instructions are provided in this manual since the Units Manager contains online help accessed via the Help button on the dialog box.

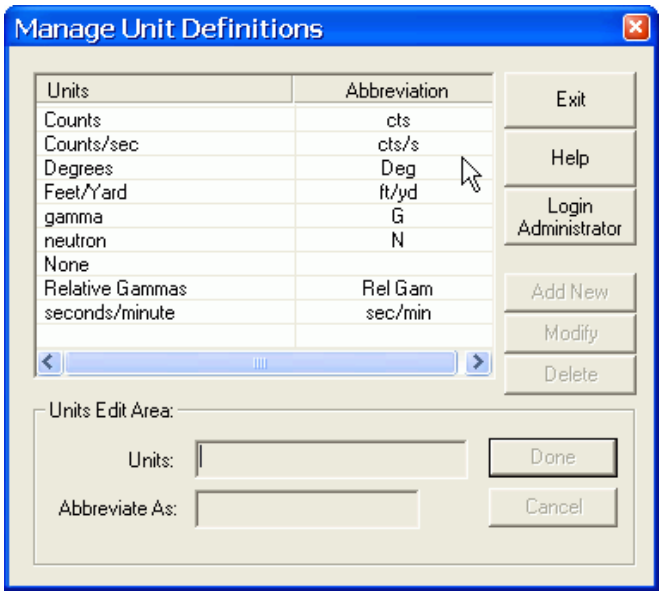


Figure 2.4-33 Tools | Units Manager Box

Caution: if the current Facility is deleted prior to changing to a new Facility by using Select Facility in the Radiation Review tools menu, Radiation Review will fail to open properly. Manually edit the irs.ini file in C:\irs folder to reflect the new Facility ID number. Restarting Radiation Review now should use the existing facility.

2.5. Summaries Menu

The Summaries options allow you to summarize the data in the database in various ways. If you are not using shift registers, then the option for Measurements has no meaning and could be grayed out to indicate it is not available. In a similar manner, Direction Events could be grayed out if you are not using Direction Analysis. If you select Summaries from the Main Menu Bar, the menu in Figure 2.5-1 is displayed.

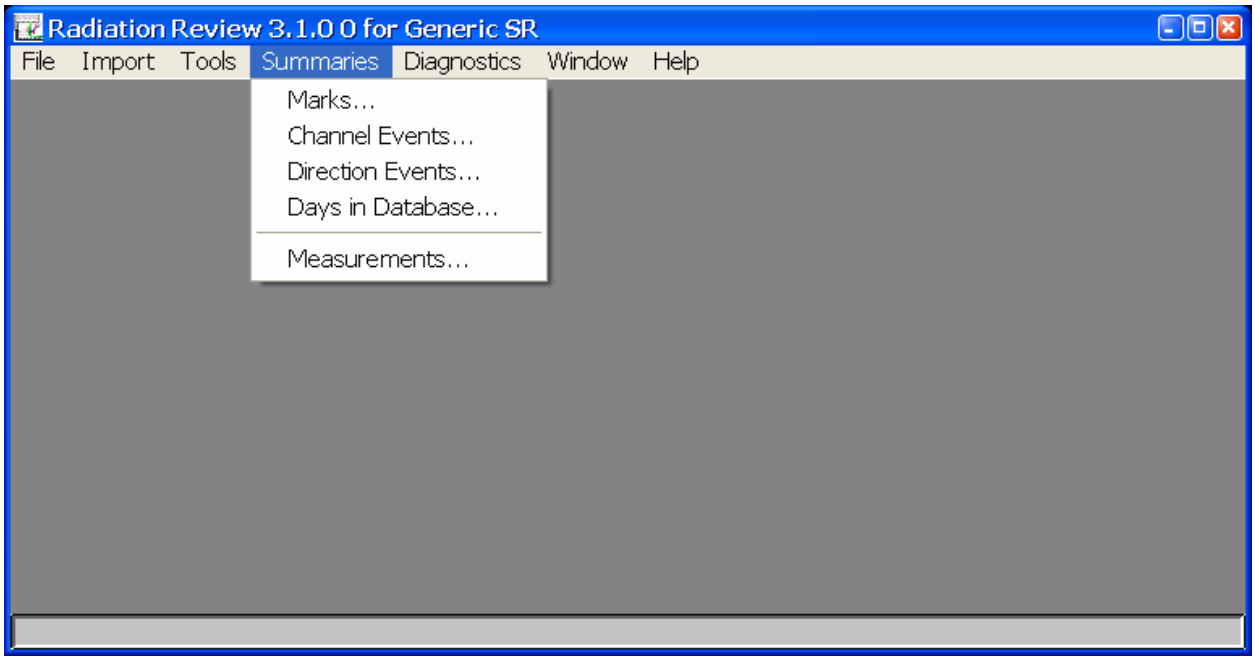


Figure 2.5-1 Summaries Pull-down Menu Examples

2.5.1. Marks

The **Summaries | Marks** option allows you to list the data points that were marked during the Tools | Graph option. When **Summaries | Marks** is selected the Figure 2.5-2 dialog box appears:

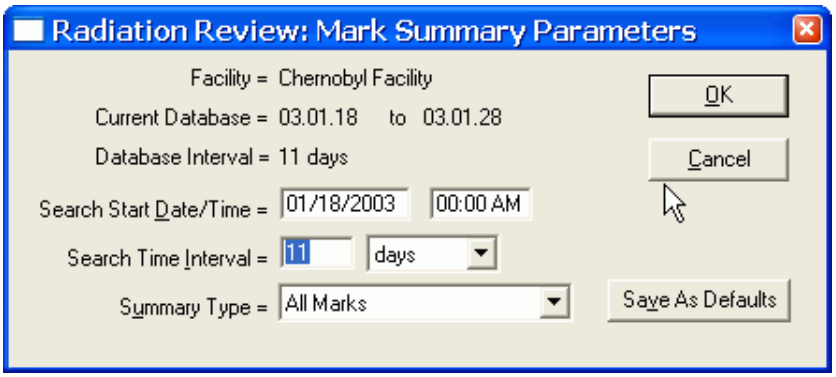


Figure 2.5-2 Summaries | Marks Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only

contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

You can select which type of summary you would like displayed. You have the choice to select All Marks or Daily Mark Summaries.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started. The Search Start Date/Time and Search Time Interval are not saved. Their defaults are set as described above.

Clicking on the **OK** button starts the search.

After the search is finished the results are shown in a text window like Figure 2.5-3 if you selected All Marks as your search condition or Figure 2.5-4 if you selected Daily Summaries.

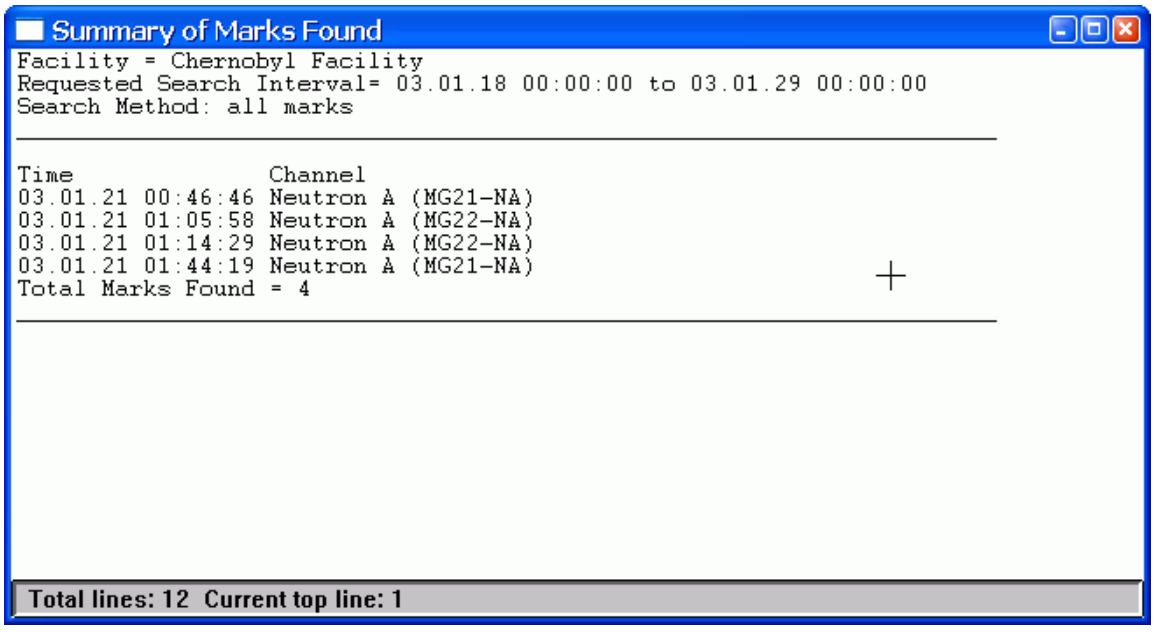


Figure 2.5-3 All Marks Summaries Text Window Results

The **Summary of Marks Found** for All Marks results window has the following sections:

Header Portion:
The top of the results text window shows the facility, search interval and the conditions selected for this particular search (all marks).

Main Results:
The marks information is displayed. For each mark the following columns of results are displayed:
Time – for this mark, the date/time of the mark
Channel – which channel this mark is associated with

Summary Portion:
In the summary at the bottom, the status of the search and total number of marks found is displayed.

If you selected Daily Mark Summaries as the search condition, results similar to those in Figure 2.5-4 are generated.

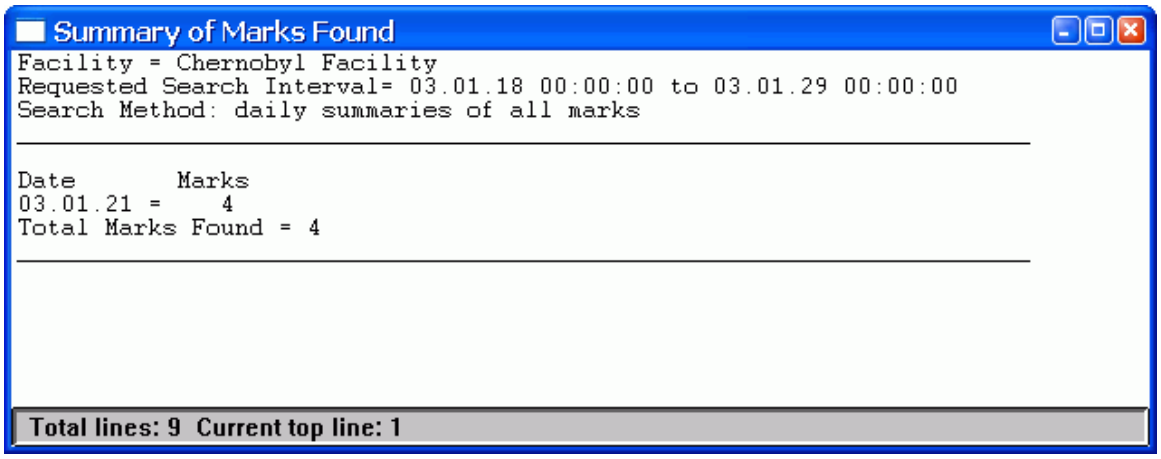


Figure 2.5-4 Daily Mark Summaries Text Window Results

The **Summary of Marks Found** for Daily Summaries results window has the following sections:

Header Portion:
The top of the results text window shows the facility, search interval and the conditions selected for this particular search (all marks).

Main Results:
The marks information is displayed. For each mark the following columns of results are displayed:
Date – which day the summary is for
Marks – how many marks (for all channels) for the day

Summary Portion:
In the summary at the bottom, the status of the search and total number of marks found for all days is displayed.

To get a copy of any results windows, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

2.5.2. Channel Events

The **Summaries | Channel Events** option allows you to list the channel events that were found using the Tools | Channel Events option. When **Summaries | Channel Events** is selected the Figure 2.5-5 dialog box appears:

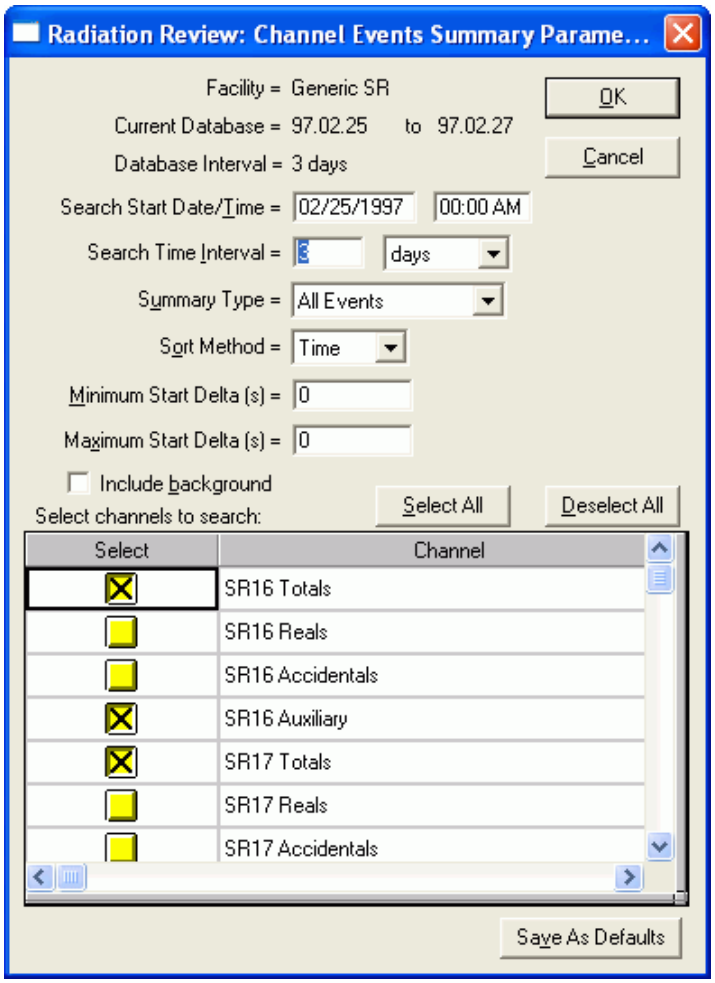


Figure 2.5-5 Summaries | Channel Events Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu

option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The **Summary Type** (All Events or Daily Summaries) allows you to choose whether you want to list the individual events (All Events) or to provide only a numerical total of the events for each day (Daily Summaries).

The **Sort Method** (Time or Channel) allows you to choose the grouping method. If you select Time all selected channels from an instrument are examined and the results are listed in order of the times the channels events occurred. Subsequent GRANDs at the facility are handled the same way. If you select Channel then all events for the first selected channel are listed, then all events for the second selected channel are listed, and the other selected channels are also listed separately.

The **Minimum Event Start Delta** and **Maximum Event Start Delta** allow you to format your output by grouping events together whose starting times fall within the Minimum to Maximum range (in seconds) of each other.

The **Include background** checkbox, if checked, indicates that the background events that were manually marked using the graph will be included in the results for the specified channels. If it is not checked, then only Channel events found using Tools | Find Channel Events or manually marked on the graph will be displayed.

Table Columns: The table at the bottom of the dialog box allows you to select on which channels you would like to perform the search.
Select: An X in this column selects the channel to be searched for channel events.
Channel : All channels in the facility are listed. If all channels cannot be displayed, a scroll bar appears at the right of the table and the user can scroll through all the channels. You cannot edit this column.

The **Select All** and **Deselect All** buttons allow you to select all or none of the channels for searching. Individual channels can be selected/de-selected by clicking on the X in the Select column for that channel.

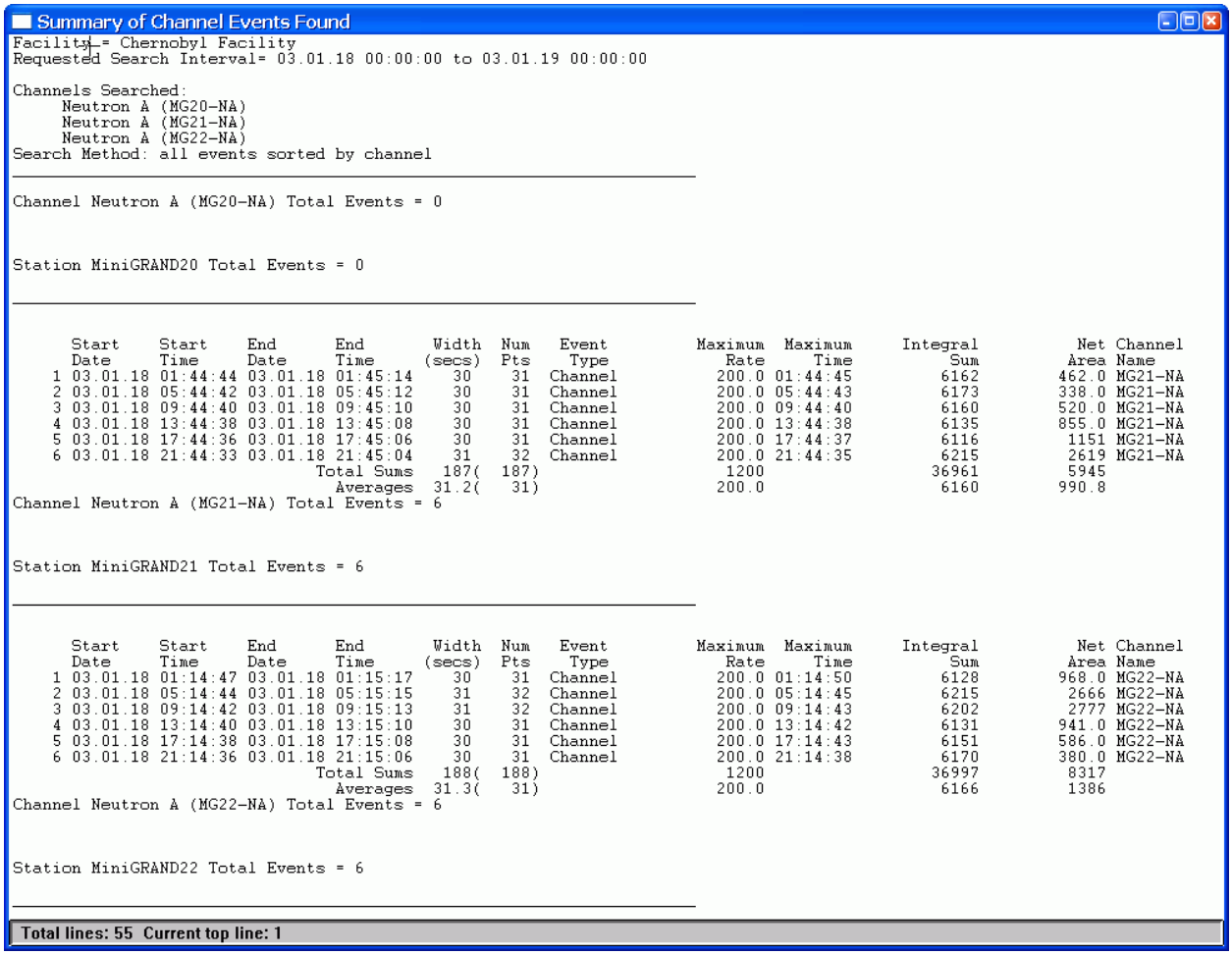
Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started. The Search Start Date/Time and Search Time Interval are not saved. Their defaults are set as described above.

Clicking on the **OK** button starts the search.

The specified interval is searched for channel events and the results are displayed.

If you selected **Summary Type** of All Events and **Sort Method** of Channel then Figure 2.5-6 is shown.



Summary of Channel Events Found

```
Facility = Chernobyl Facility
Requested Search Interval= 03.01.18 00:00:00 to 03.01.19 00:00:00

Channels Searched:
     Neutron A (MG20-NA)
     Neutron A (MG21-NA)
     Neutron A (MG22-NA)
Search Method: all events sorted by channel
```

Channel Neutron A (MG20-NA) Total Events = 0

Station MiniGRAND20 Total Events = 0

	Start Date	Start Time	End Date	End Time	Width (secs)	Num Pts	Event Type	Maximum Rate	Maximum Time	Integral Sum	Net Area	Channel Name
1	03.01.18	01:44:44	03.01.18	01:45:14	30	31	Channel	200.0	01:44:45	6162	462.0	MG21-NA
2	03.01.18	05:44:42	03.01.18	05:45:12	30	31	Channel	200.0	05:44:43	6173	338.0	MG21-NA
3	03.01.18	09:44:40	03.01.18	09:45:10	30	31	Channel	200.0	09:44:40	6160	520.0	MG21-NA
4	03.01.18	13:44:38	03.01.18	13:45:08	30	31	Channel	200.0	13:44:38	6135	855.0	MG21-NA
5	03.01.18	17:44:36	03.01.18	17:45:06	30	31	Channel	200.0	17:44:37	6116	1151	MG21-NA
6	03.01.18	21:44:33	03.01.18	21:45:04	31	32	Channel	200.0	21:44:35	6215	2619	MG21-NA
				Total Sums	187(	187)		1200		36961	5945	
				Averages	31.2(	31)		200.0		6160	990.8	

Channel Neutron A (MG21-NA) Total Events = 6

Station MiniGRAND21 Total Events = 6

	Start Date	Start Time	End Date	End Time	Width (secs)	Num Pts	Event Type	Maximum Rate	Maximum Time	Integral Sum	Net Area	Channel Name
1	03.01.18	01:14:47	03.01.18	01:15:17	30	31	Channel	200.0	01:14:50	6128	968.0	MG22-NA
2	03.01.18	05:14:44	03.01.18	05:15:15	31	32	Channel	200.0	05:14:45	6215	2666	MG22-NA
3	03.01.18	09:14:42	03.01.18	09:15:13	31	32	Channel	200.0	09:14:43	6202	2777	MG22-NA
4	03.01.18	13:14:40	03.01.18	13:15:10	30	31	Channel	200.0	13:14:42	6131	941.0	MG22-NA
5	03.01.18	17:14:38	03.01.18	17:15:08	30	31	Channel	200.0	17:14:43	6151	586.0	MG22-NA
6	03.01.18	21:14:36	03.01.18	21:15:06	30	31	Channel	200.0	21:14:38	6170	380.0	MG22-NA
				Total Sums	188(	188)		1200		36997	8317	
				Averages	31.3(	31)		200.0		6166	1386	

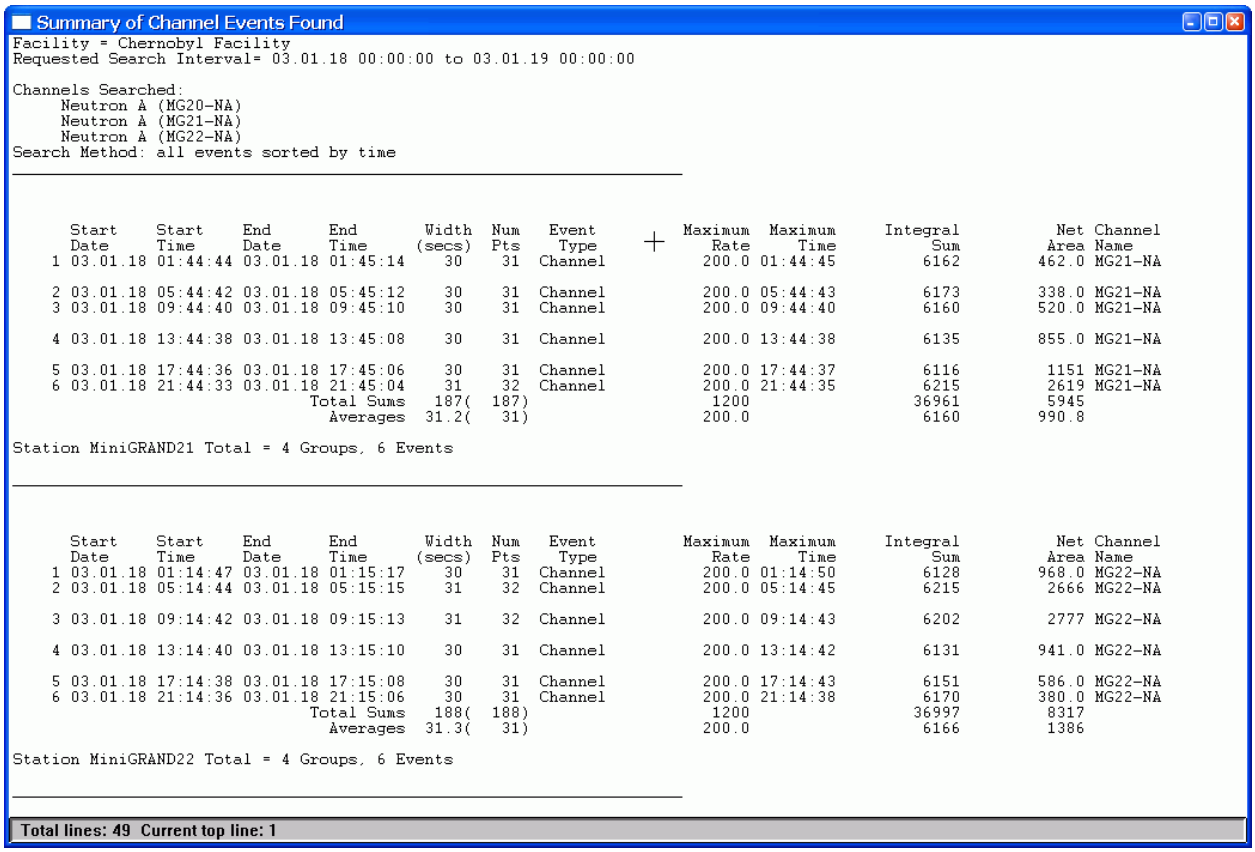
Channel Neutron A (MG22-NA) Total Events = 6

Station MiniGRAND22 Total Events = 6

Total lines: 55 Current top line: 1

Figure 2.5-6 Summaries | Channel Events - All Events Sorted by Channel

If you selected **Summary Type** of All Events and **Sort Method** of Time then the results similar to Figure 2.5-7 are shown.



Summary of Channel Events Found

```
Facility = Chernobyl Facility
Requested Search Interval= 03.01.18 00:00:00 to 03.01.19 00:00:00

Channels Searched:
     Neutron A (MG20-NA)
     Neutron A (MG21-NA)
     Neutron A (MG22-NA)
Search Method: all events sorted by time
_____________________________________________________________________


      Start    Start    End      End       Width  Num   Event        Maximum  Maximum      Integral          Net Channel
      Date     Time     Date     Time      (secs)  Pts    Type         Rate     Time           Sum         Area Name
    1 03.01.18 01:44:44 03.01.18 01:45:14    30    31   Channel       200.0 01:44:45         6162        462.0 MG21-NA

    2 03.01.18 05:44:42 03.01.18 05:45:12    30    31   Channel       200.0 05:44:43         6173        338.0 MG21-NA
    3 03.01.18 09:44:40 03.01.18 09:45:10    30    31   Channel       200.0 09:44:40         6160        520.0 MG21-NA

    4 03.01.18 13:44:38 03.01.18 13:45:08    30    31   Channel       200.0 13:44:38         6135        855.0 MG21-NA

    5 03.01.18 17:44:36 03.01.18 17:45:06    30    31   Channel       200.0 17:44:37         6116       1151 MG21-NA
    6 03.01.18 21:44:33 03.01.18 21:45:04    31    32   Channel       200.0 21:44:35         6215       2619 MG21-NA
                              Total Sums   187(  187)                  1200                36961       5945
                                 Averages  31.2(   31)                 200.0                6160        990.8

Station MiniGRAND21 Total = 4 Groups, 6 Events

_____________________________________________________________________


      Start    Start    End      End       Width  Num   Event        Maximum  Maximum      Integral          Net Channel
      Date     Time     Date     Time      (secs)  Pts    Type         Rate     Time           Sum         Area Name
    1 03.01.18 01:14:47 03.01.18 01:15:17    30    31   Channel       200.0 01:14:50         6128        968.0 MG22-NA
    2 03.01.18 05:14:44 03.01.18 05:15:15    31    32   Channel       200.0 05:14:45         6215       2666 MG22-NA

    3 03.01.18 09:14:42 03.01.18 09:15:13    31    32   Channel       200.0 09:14:43         6202       2777 MG22-NA

    4 03.01.18 13:14:40 03.01.18 13:15:10    30    31   Channel       200.0 13:14:42         6131        941.0 MG22-NA

    5 03.01.18 17:14:38 03.01.18 17:15:08    30    31   Channel       200.0 17:14:43         6151        586.0 MG22-NA
    6 03.01.18 21:14:36 03.01.18 21:15:06    30    31   Channel       200.0 21:14:38         6170        380.0 MG22-NA
                              Total Sums   188(  188)                  1200                36997       8317
                                 Averages  31.3(   31)                 200.0                6166        1386

Station MiniGRAND22 Total = 4 Groups, 6 Events

_____________________________________________________________________
```

Total lines: 49 Current top line: 1

Figure 2.5-7 Summaries | Channel Events - All Events Sorted by Time

The **Summary of Channel Events Found** for All Events (whether sorted by Channel or Time) has the following sections:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the search parameters including the choice of algorithm and which channels were selected to be searched.

Main Results:
Then for each station searched a list of all the events found in the interval are listed. For each event the following columns of results are displayed:
Start Date/Start Time – for this event, the date/time when the event started
End Date/End Time – for this event, the end time (normally the date of the end time is the same as the start time, you can use the parameter Width to verify this.)
Width – the duration of this event in seconds calculated by subtracting the start time from the end time. The width includes both the start and end time in the interval. Events with an identical start/end time are given a length of 1.
Num Pts – the number of data points found in the event.
Event Type – This column indicates the type of event – at present the only choice that will appear is Channel indicating the event was found with the Find Events menu option.
Maximum Rate/Maximum Time – the rate displays the highest count rate in the channel within the event and the time indicates the timestamp associated with that rate.
Integral Sum – the integral sum is the sum of all the count rates in the event (including

the start/end time points)
Net Area – the net area (counts) represents the total counts (area) above a straight line going from the start time to the end time. This is intended as a general indication of net area – for a precise net area calculation, a more accurate method should be used to do the background subtraction.

To give gross information about the data, two calculations are done on the columns of numbers.
Total Sums – The numbers in each column above are summed.
Averages –The average of the numbers in each column above are calculated.

Summary Portion:
In the summary at the bottom, the status of the search, the data interval and number of data points in the interval, and the number of channel events found for the station are listed.

If you selected **Summary Type** of Daily Summaries and **Sort Method** of Channel then results similar to Figure 2.5-8 are shown.

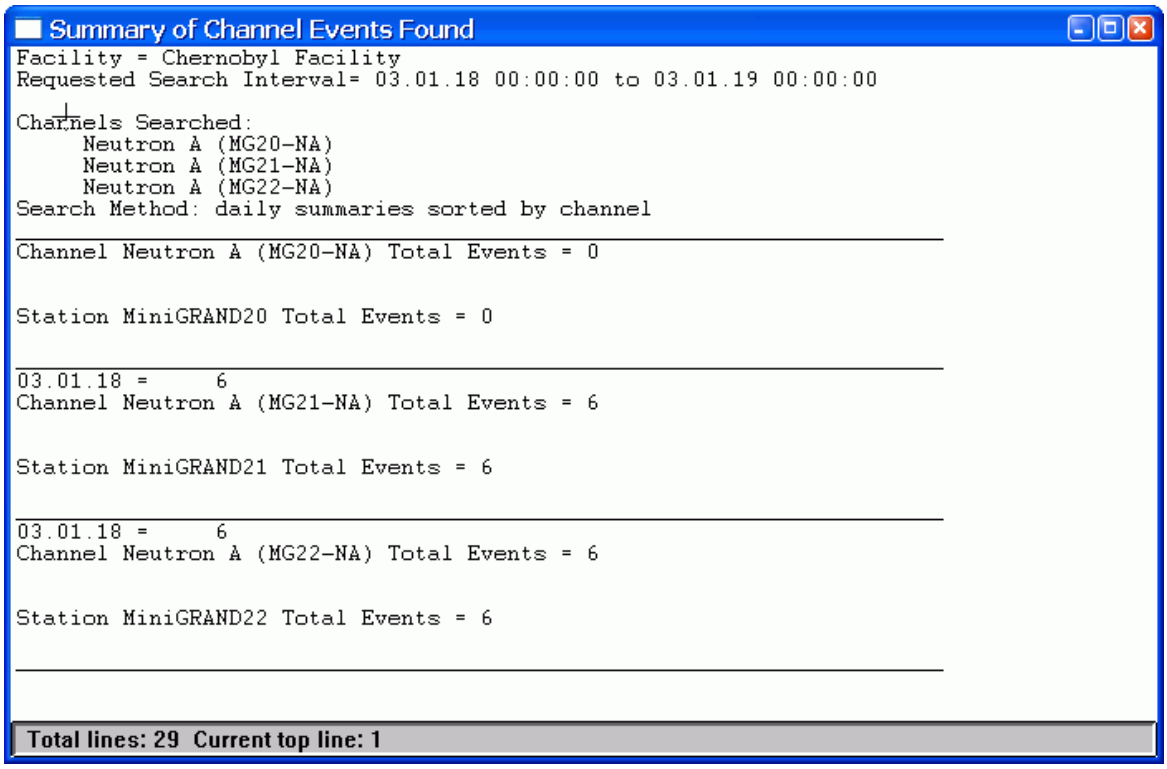


Figure 2.5-8 Summaries | Channel Events – Daily Summaries Sorted by Channel

The **Summary of Channel Events Found** for All Events sorted by Channel has the following sections:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the channels to be searched and the sort method.

Main Results:
For each channel searched, the total number of events for each day in the interval is displayed.

Summary Portion:
In the summary for each instrument, the total number of events found for all channels on the instrument is displayed.

If you selected **Summary Type** of Daily Summaries and Sort Method of Time then results similar to Figure 2.5-9 are shown.

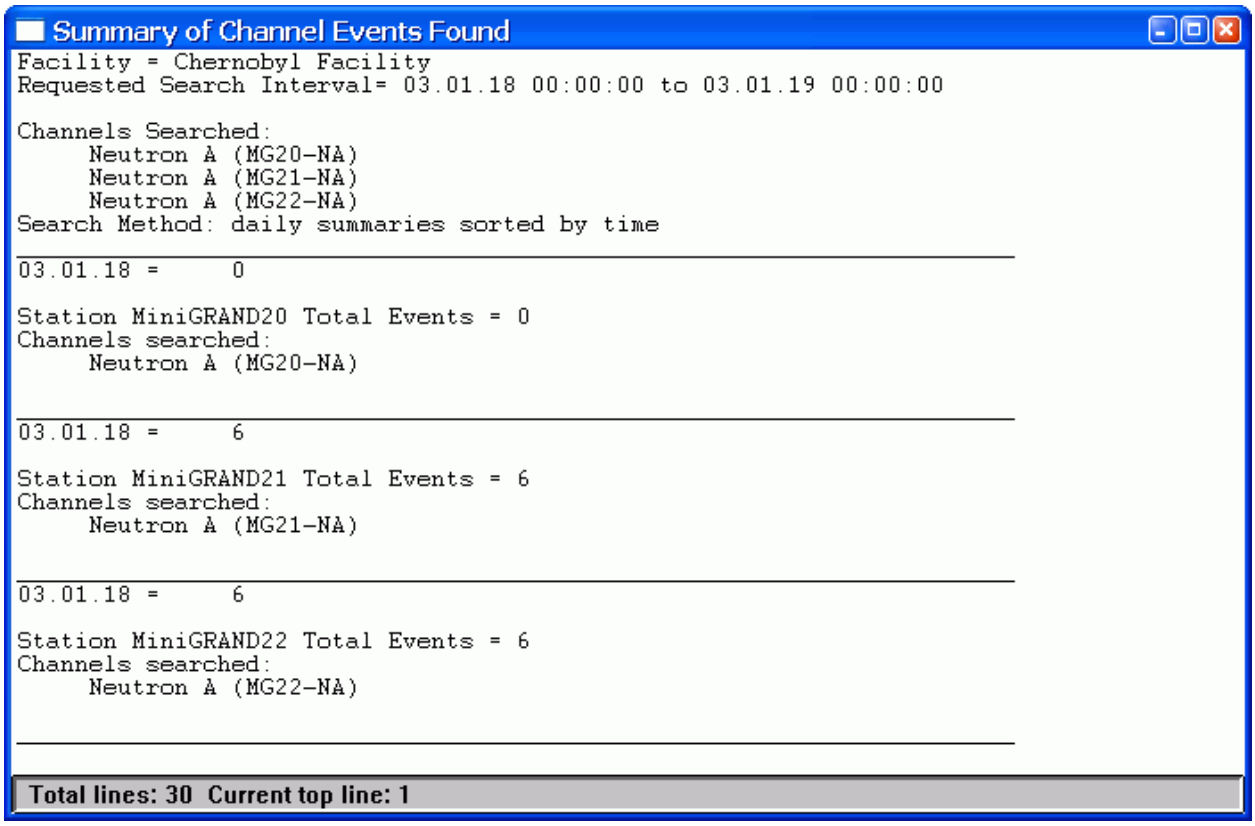


Figure 2.5-9 Summaries | Channel Events – Daily Summaries Sorted by Time

The **Summary of Channel Events Found** for Daily Summaries sorted by Time has the following sections:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the channels searched and the sort method.

Main Results:
For each day, the total number of events for each instrument is listed.

Summary Portion:
For each instrument, the total number of events for all the days is listed.

To get a copy of any results window, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

2.5.3. Direction Events

The **Summaries | Direction Events** option allows you to list the direction events that were determined in the Tools | Direction Analysis option. When **Summaries | Direction Events** is chosen the Figure 2.5-10 dialog box is displayed:

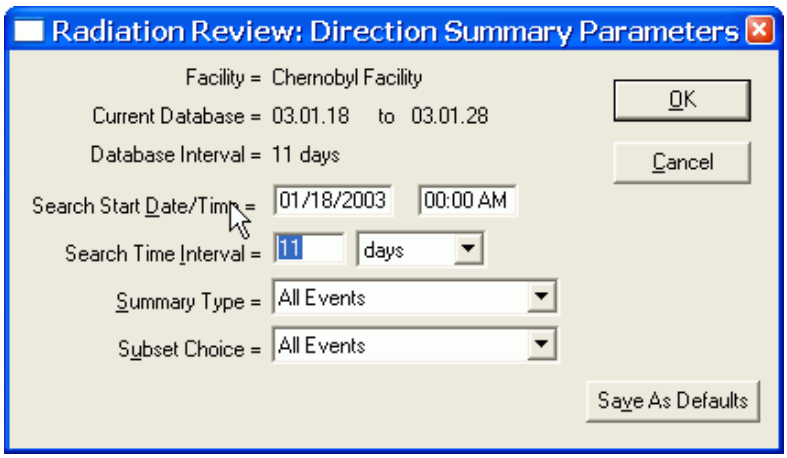


Figure 2.5-10 Summaries | Direction Events Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The **Summary Type** (All Direction Events or Daily Direction Summaries) allows you to choose whether you want to list the individual direction events (All Direction Events) or to provide only a numerical total of the direction movements for each day (Daily Direction Summaries).

The **Sort Method** (All Events; Direction In, Location A; Direction Out, Location A; Direction In, Location B; Direction Out, Location B; All Location A Events; All Location B Events; All Direction In Events or All Direction Out Events) allows you to choose which of the direction events to display.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started. The Search Start Date/Time and Search Time Interval are not saved. Their defaults are set as described above.

Clicking on the **OK** button starts the search.

The specified interval is searched for the specified kind of direction events and the results are displayed.

If you selected to search for all events in the interval, a text window of results similar to Figure 2.5-11 will appear:

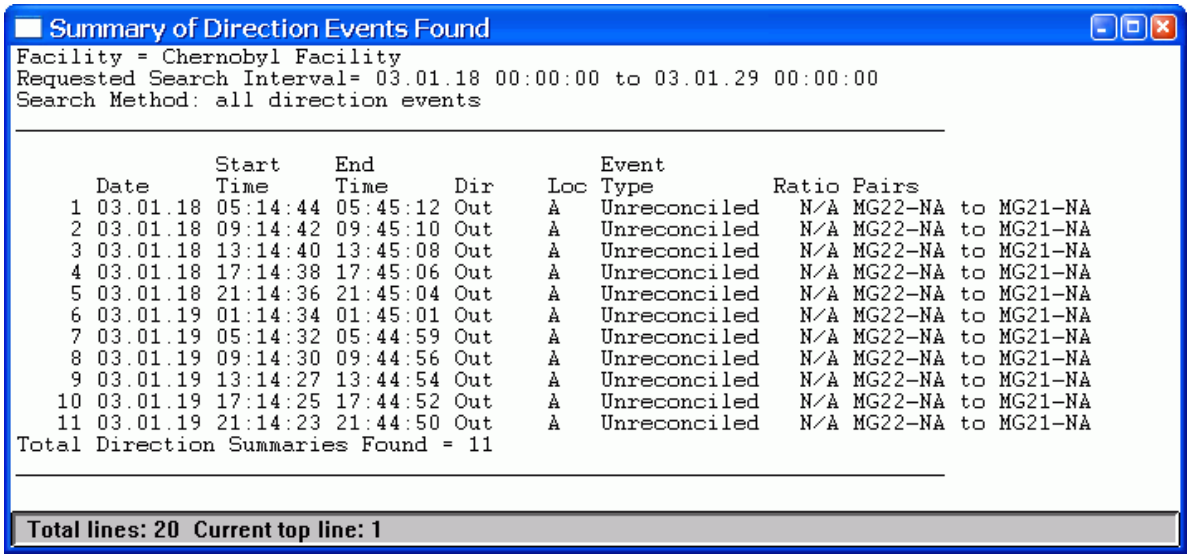


Figure 2.5-11 Summaries | Direction Events - All Events Text Window Results

The **Summary of Direction Events Found** results text window has the following sections:

Header Portion:
The top of the results text window shows the facility, search interval and the conditions selected for this particular search.

Main Results:
The direction events found are printed. For each event the following columns of results are displayed:
Date – for this event, the date when the event started
Start Time – for this event, the time when the event started
End Time – for this event, the end time (normally the date of the end time is the same as the start time)
Dir – the direction assigned to this movement,
Loc – where the direction occurred,
Event Type – always is unreconciled,
Ratio – results of calculation specified in Tools | Direction Analysis dialog box, if no calculation is specified, this entry is N/A for not applicable.
Pairs - pairs of channels containing channel events that met the specified conditions and indicate the direction of motion (x to y). The short names of the channels are used.

Summary Portion:
In the summary at the bottom, the total number of direction events found is displayed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

If you selected to list only daily summaries of all events in the interval, a text window of results similar to Figure 2.5-12 will appear:

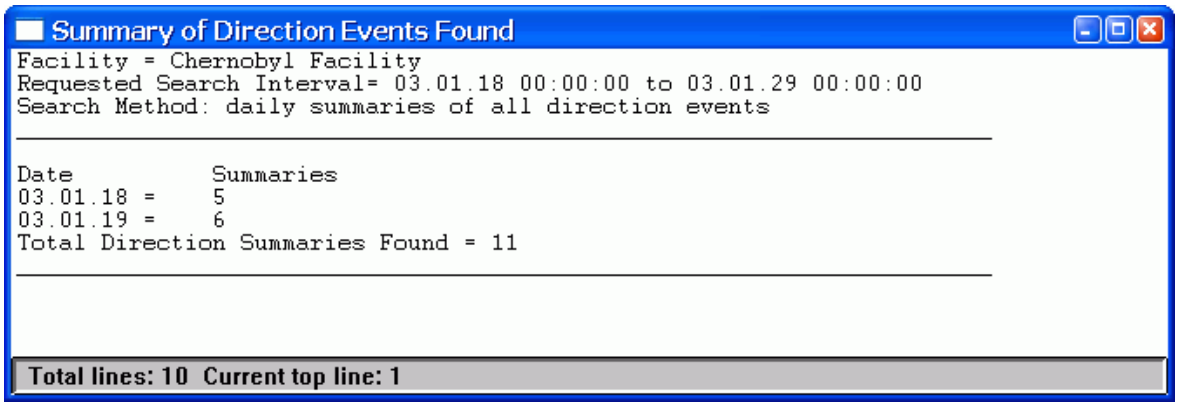


Figure 2.5-12 Summaries | Direction Events - Daily Summaries Text Window Results

The **Summary of Direction Events Found** for daily summaries has the following sections:

Header Portion:
The top of the results text window shows the facility header, search interval and the conditions selected for this particular search.

Main Results:
The direction events found are printed. For each event the following columns of results are displayed:
Date – day being summarized
Summaries – number of direction events for all instruments for the day.

Summary Portion:
In the summary at the bottom, the total direction events found is displayed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

2.5.4. Days in Database

The **Summaries | Days in Database** provides a list of which days for which instruments are in the database. When the **Summaries | Days in Database** option is selected the Figure 2.5-13 dialog box appears:

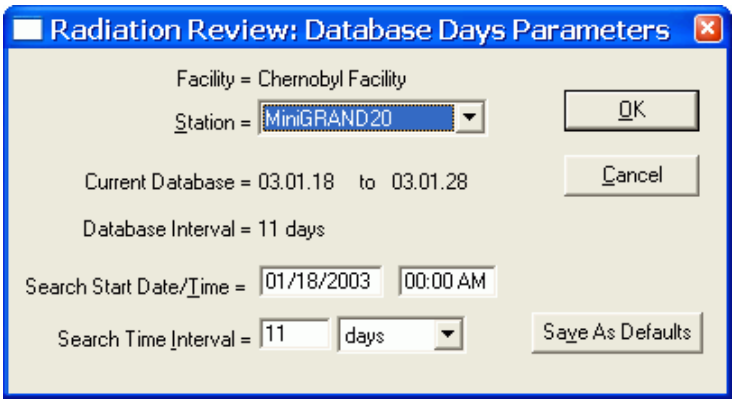


Figure 2.5-13 Summaries | Days in Database Dialog Box

The **Facility** name is displayed on the top line. The **Station** field provides a dropdown list of all stations in the facility and allows the user to indicate whether to perform the search for a single station or all stations. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started. The Search Start Date/Time and Search Time Interval are not saved. Their defaults are set as described above.

Clicking on the **OK** button starts the search. When the search completes, a text window similar to Figure 2.5-14 shows the results:

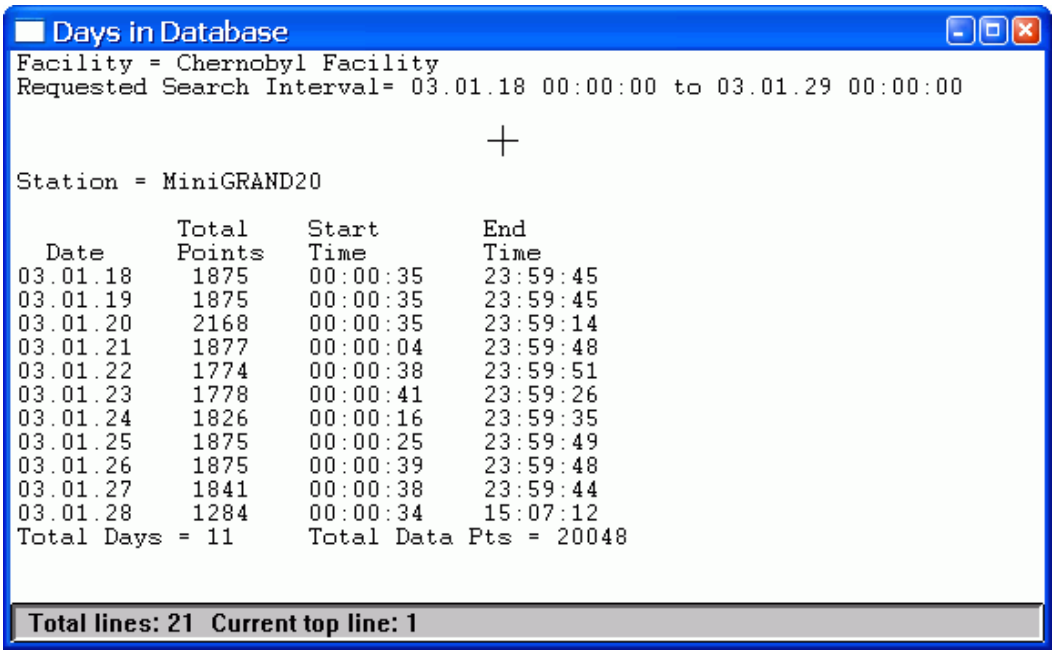


Figure 2.5-14 Summaries | Days in Database Text Window Results

The **Days in Database** results text window has the following sections:

Header Portion:
The top of the results text window shows the facility and search interval.

Main Results:
For each day in the database for the specified station, the total number of data points and the time for the first and last point in the day are listed.
Date – day being summarized
Total Points – number of data points for the specified station in the day
Start Time – time of first data point in the day for the station
End Time – time of last data point in the day for the station.

Summary Portion:
In the summary at the bottom, the total number of days and data points is calculated and displayed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

2.5.5. Measurements in Database

The **Summaries | Measurements** options allows you to list the measurement events that were determined in the Tools | Determine Measurements option. When the **Summaries | Measurements** option is selected the dialog box in Figure 2.5-15 appears:

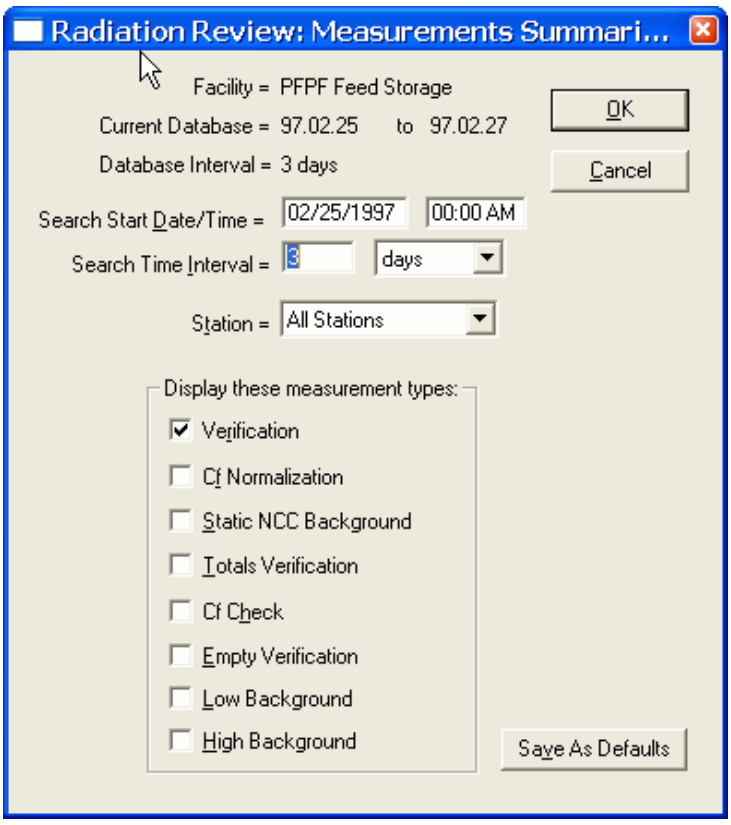


Figure 2.5-15 Summaries | Measurements Dialog Box

The **Facility** name is displayed on the top line. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

The **Station** field provides a dropdown list of all stations in the facility and allows the user to indicate whether to perform the search for a single station or all stations.

Select which measurement types to display by checking the appropriate boxes in the **Display these measurement types** check boxes.

Clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started. The Search Start Date/Time and Search Time Interval are not saved. Their defaults are set as described above.

Clicking on the **OK** button starts the search. When the search completes, a text window similar to Figure 2.5-16 shows the results:

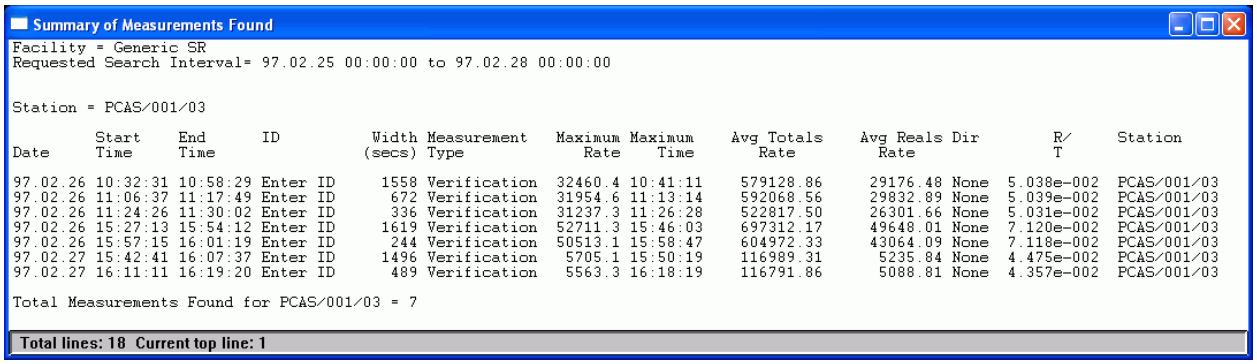


Figure 2.5-16 Summaries | Measurements Text Window Results

The **Summary of Measurements Found** text window has the following sections:

Header Portion:
The top of the results text window shows the facility, search interval and the conditions selected for this particular analysis.

Main Results:
The measurement events found are printed. For each measurement event the following columns of results are displayed:
Date – for this event, the date,
Start Time – for this event, the time when the event started,
End Time – for this event, the end time (normally the date of the end time is the same as the start time),
ID – the ID associated with the sample,
Width – number of seconds between the Start Time and End Time, ,
Measurement Type – can be Low Bkg, High Bkg, Empty, Verif., Cf Check, Cf Norm, Totals, GRAND MII or Undefined,
Avg Totals Rate – average totals (singles) counting rate for the measurement event,
Avg Reals Rate – average reals (doubles) counting rate for the measurement event,
Dir – direction associated with this measurement event, if any,
Maximum Time – the time associated with the highest totals or reals rate in the event (totals are used if Totals (Singles) Assay is selected, reals used if Reals (Doubles) Assay is selected,
Maximum Rate – the highest rate of either reals or totals depending on the Analysis Type (Reals or Totals).

Summary Portion:
In the summary at the bottom, the status of the search, the interval analyzed and the number of measurement events found is displayed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window.

2.6. Diagnostics Menu

The diagnostics are intended only for use by experienced users. If you select Diagnostics from the Main Menu Bar, the menu in Figure 2.6-1 is displayed.

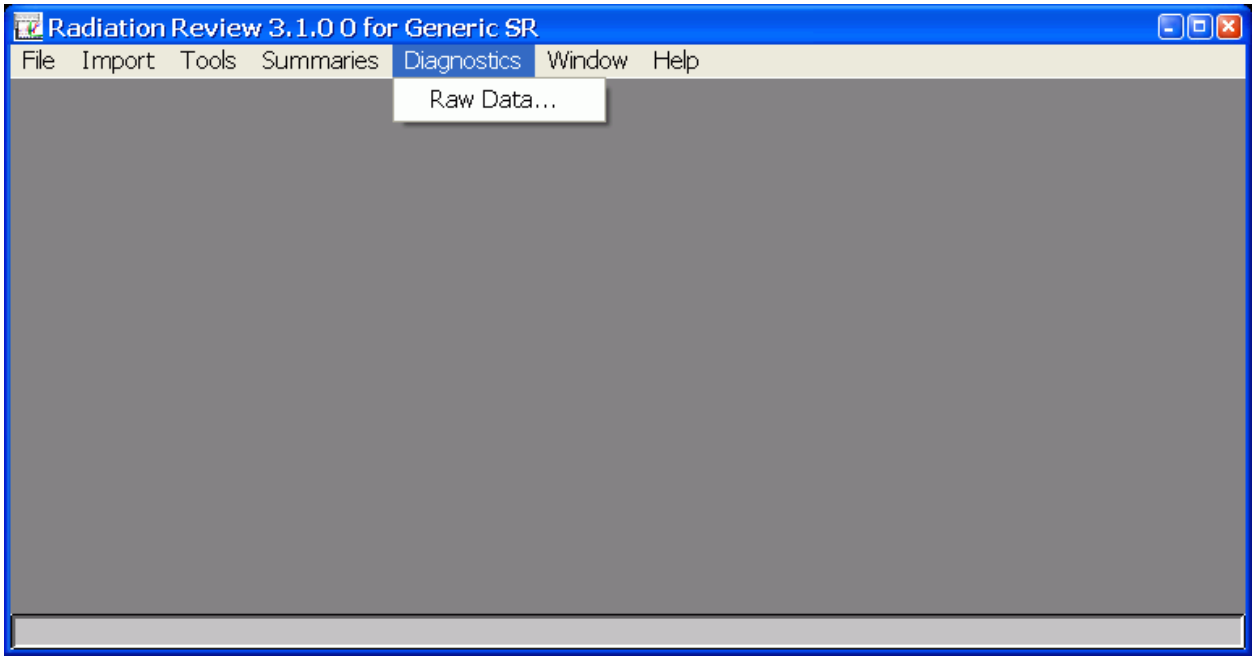


Figure 2.6-1 Diagnostics Pull-down Menu

2.6.1. Raw Data

The **Diagnostics | Raw Data** option allows you to select a portion of the data in the database for display. This option is more basic than Tools | Data Integrity because it searches based on any combination of status bits for the search criteria. The Figure 2.6-2 dialog box is displayed when this option is chosen.

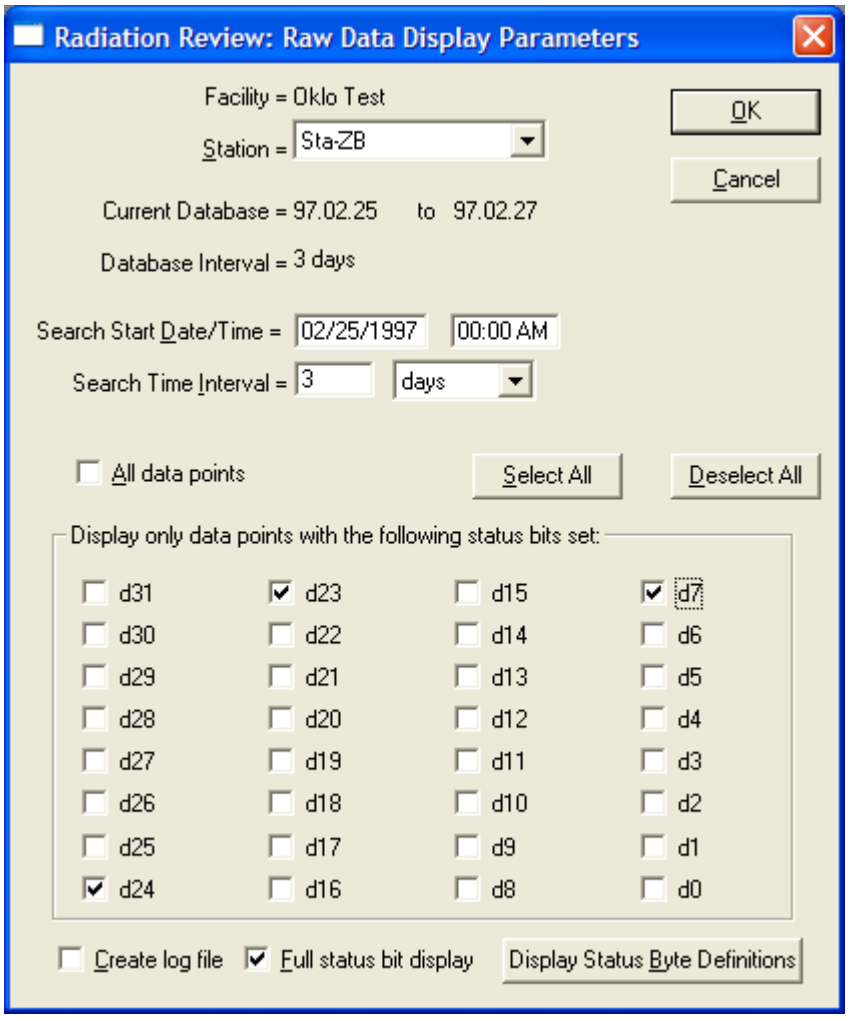


Figure 2.6-2 Diagnostics | Raw Data Dialog Box

The **Facility** name is displayed on the top line. The **Station** field provides a dropdown list of all stations in the facility and allows the user to indicate whether to perform the search for a single station or all stations. The **Current Database** and **Database Interval** display the first and last dates of data in the database and the total number of days covered by the database. The **Database Interval** is expressed as days; even if a day only contains data for an hour in the day, it is counted as an entire day. **Facility, Current Database** and **Database Interval** are information only parameters and cannot be changed by the user.

The next two lines of parameters, **Search Start Date/Time** and **Search Time Interval**, allow the user to select a subset of the entire database to be used. The **Search Time Interval** units can be days, hours or minutes. The default values for **Search Start Date/Time** and **Search Time Interval** vary depending on whether Radiation Review is running standalone or a part of an IRS session. In standalone mode, these parameters default to the entire database or the time interval last selected using the Tools | Review Period menu option. If Radiation Review is running as part of an IRS session, then these parameters correspond to the time interval specified on the Inspector Information Screen. If you execute this menu option more than once during a program run, then on re-entry to this menu option these interval values are set to those used the last time in this menu option.

You can select which data points you would like displayed by checking the appropriate check boxes. The following conditions can be checked for:
All Data Points: all data points in the interval are listed.
d31-d0: individual status bits can be specified for the search. Only data points having the indicated status bits set will match the search.

Clicking on the **Display Status Byte Definitions** button will cause a help box to be displayed that defines the status bits for the instrument type of the currently selected station in the Station field. Based on the instrument type of the station selected one of the following dialog boxes appears. Click OK to return back to the Raw Data Display Parameters dialog box.

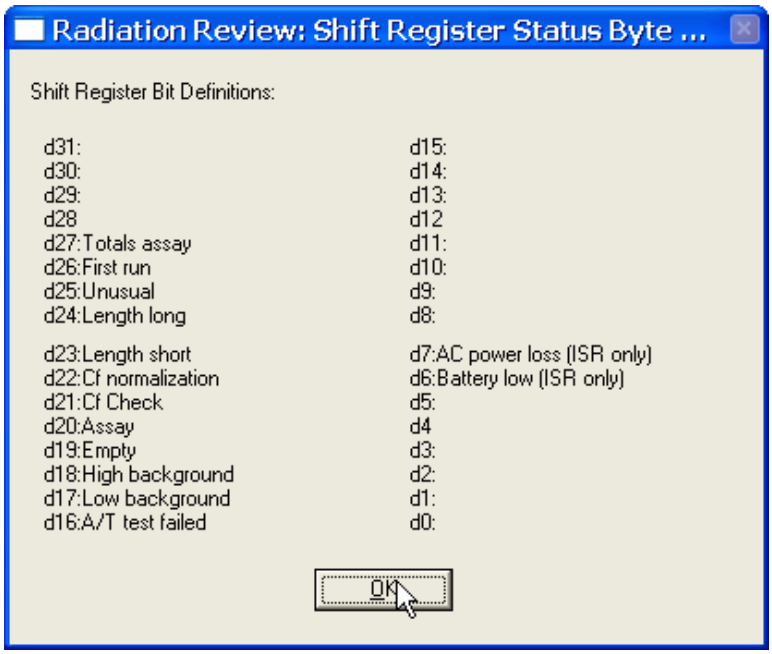


Figure 2.6-3 Shift Register Status Bit Definitions

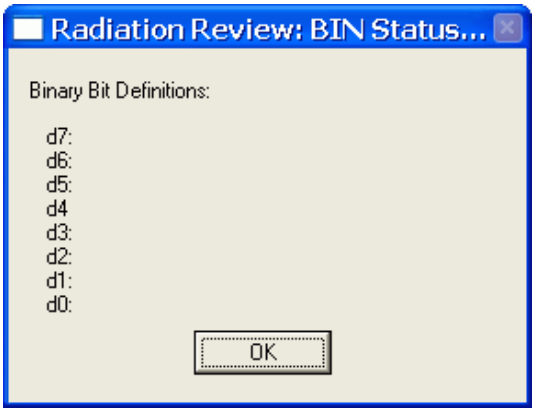


Figure 2.6-4 Binary Status Bit Definitions

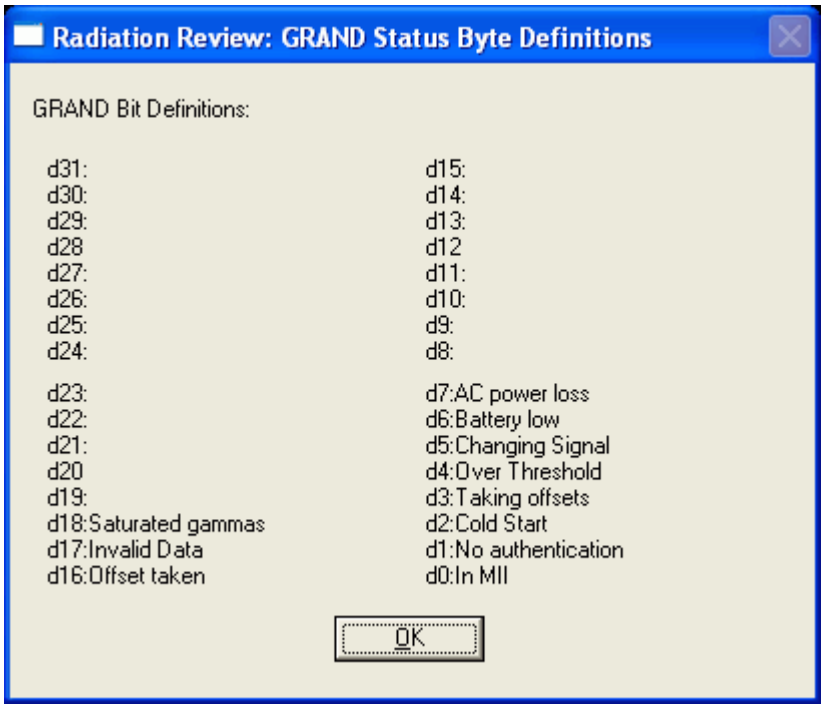


Figure 2.6-5 GRAND Status Bit Definitions

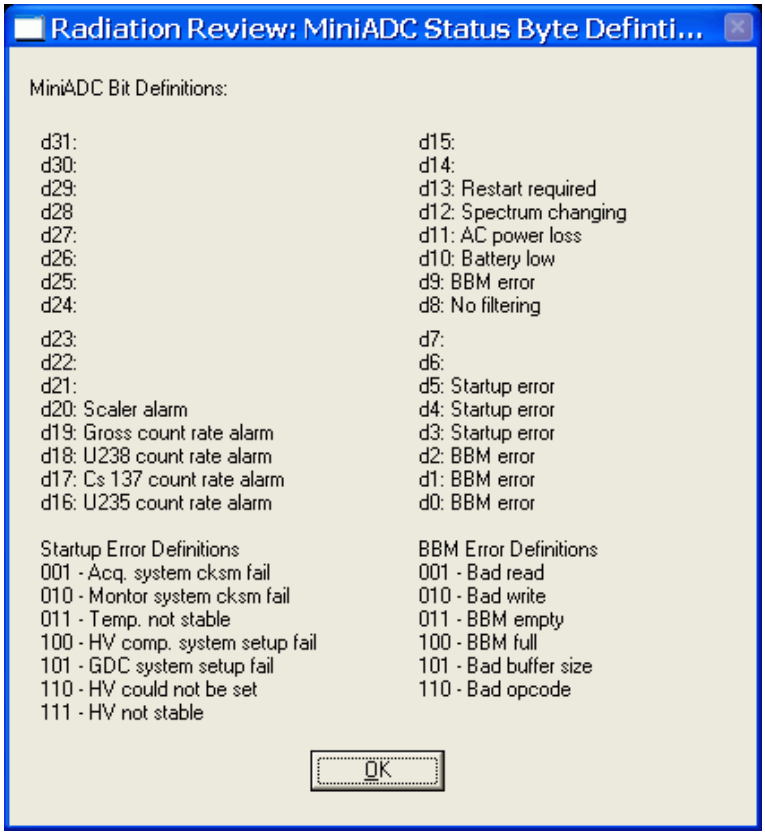


Figure 2.6-6 MiniADC Status Bit Definitions

Referring to the Raw Data Display Parameters dialog box, clicking on the **Cancel** button aborts the option and all changes you have made to the parameters are discarded.

The **Create log file** box can be checked if the user wants the results written to a file. If this box is checked, when the analysis begins, the user will be prompted for the filename in which to store the results.

The **Full status bit display** box is checked automatically. This checkbox enables a full description of each bit set in the "Stat Word" column to be displayed under each line. An example of this expanded display feature is shown in Figure 2.6-7 for SR data (below). Uncheck this box to obtain the standard single line display format.

Click on **Save As Defaults** to save these parameters to be the defaults the next time the program is started.

Clicking on the **OK** button starts the search.

The specified station is searched for data in the interval that match the criteria. Depending on the amount of data in the interval, this search may take several minutes. As the station is being searched, a progress bar appears indicating the current status of the search.

After the search is completed a text window displays the results similar to that shown below depending on the type of instrument. Any record that matched one of the specified conditions is displayed. If more than 16K records match the criteria, only the first 16K are printed in the results text window and you are informed that the results are truncated.

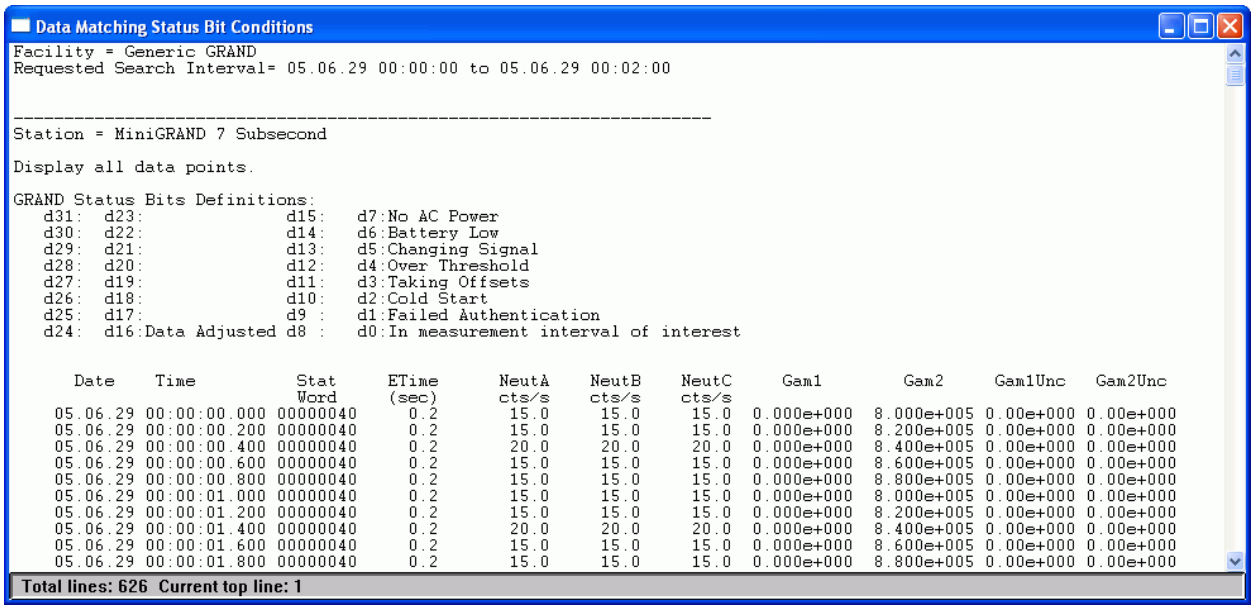


Figure 2.6-8 Diagnostics | Raw Data Results Text Window for GRAND data

The **Data Matching Status Bit Conditions** text window has the following sections for GRAND data:

Header Portion:
The header specifies the facility name and the time interval searched. For each station, a list of the conditions searched and a definition of the status bytes is displayed.

Main Results:
For each data point matching the condition the following information is given:
Date – date of matching data point
Time – time (with milliseconds) of matching data point
Stat Word – the status byte represented in hexadecimal – the status bit definitions are given in the header of the results text window.
ETime – the elapsed time that this data point represents
NeutA – the count rate in the GRAND/MiniGRAND A pulse channel
NeutB – the count rate in the GRAND/MiniGRAND B pulse channel
NeutC – the count rate in the GRAND/MiniGRAND C pulse channel
Gam1 – the relative gammas for the GRAND/MiniGRAND G1 ion chamber input
Gam2 – the relative gammas for the GRAND/MiniGRAND G2 ion chamber input
Gam1Unc – the G1 uncertainty as calculated by the GRAND/MiniGRAND or on-board temperature
Gam2Unc – the G2 uncertainty as calculated by the GRAND/MiniGRAND or off-board temperature

Summary Portion:
In the summary at the bottom, the status of the search, the number of matching data points and the search interval are displayed.

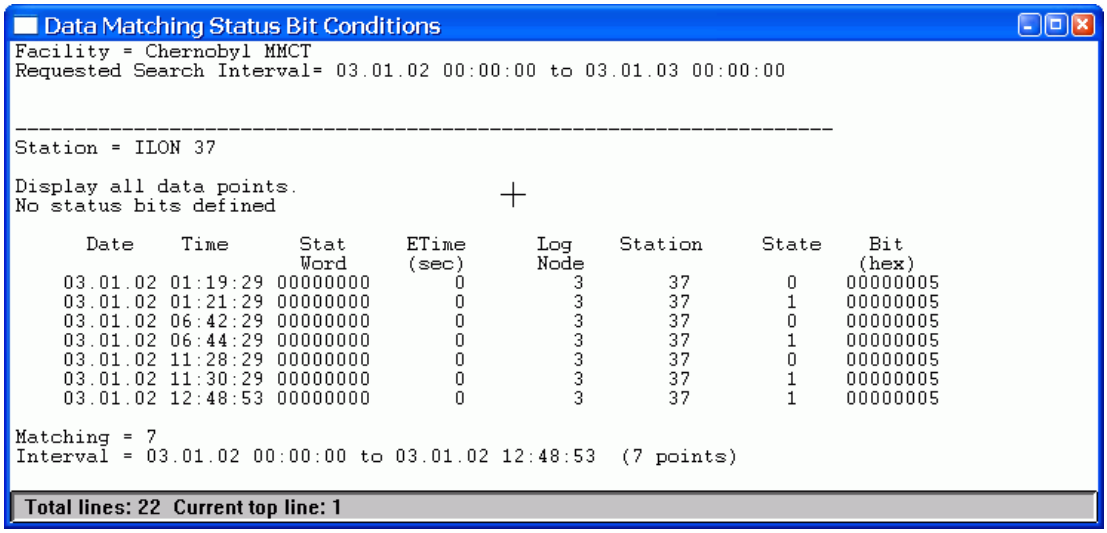


Figure 2.6-9 Diagnostics | Raw Data Results Text Window for Binary data

The **Data Matching Status Bit Conditions** text window has the following sections for Binary data:

Header Portion:
The header specifies the facility name and the time interval searched. For each station, a list of the conditions searched and a definition of the status bytes is displayed.

Main Results:
For each data point matching the condition the following information is given: **Date** – day being summarized
Date – date of matching data point
Time – time of matching data point

Stat Word – the status byte represented in hexadecimal – the status bit definitions are given in the header of the results text window.
ETime – the elapsed time that this data point represents
Log Node – the number of the ILON to which the information was logged
Station –the number of the ILON with which the data are associated
State – state that was logged (0 or 1)
Bit – which bit changed state

Summary Portion:
In the summary at the bottom, the status of the search, the number of matching data points and the search interval are displayed.

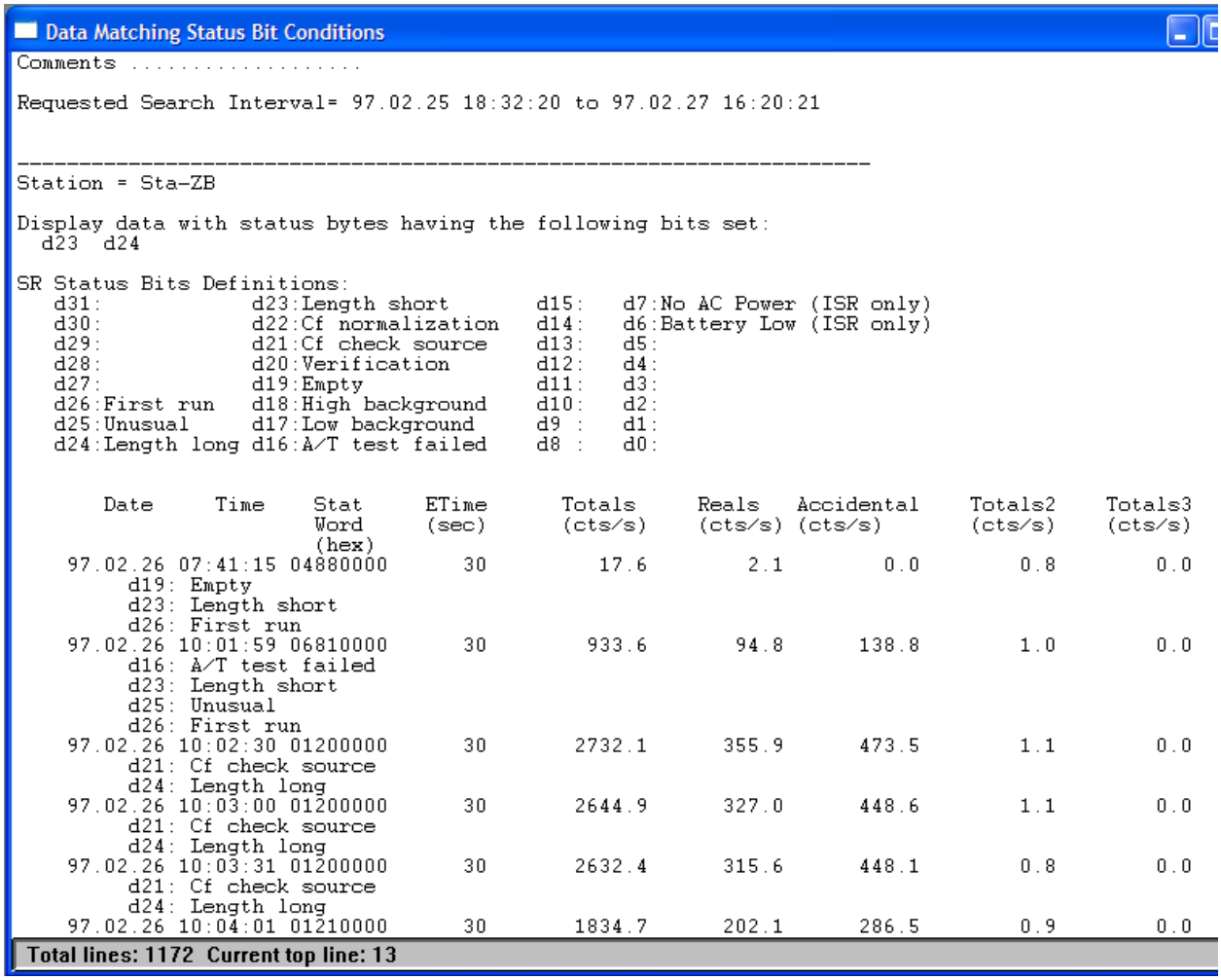


Figure 2.6-10 Diagnostics | Raw Data Results Text Window for SR data

The **Data Matching Status Bit Conditions** text window has the following sections for SR data:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the search parameters.

Main Results:
For each station searched a list of all the data points matching the specified conditions

are listed. For each data point the following columns of results are displayed:
First Column: Which condition the data point matches
Date/Time – the date/time,
Stat Word – the status byte represented in hexadecimal – the status bit definitions are given in the header of the results text window.
Etime – the elapsed time,
Totals – the count rate for the totals channel,
Reals – the count rate for the reals,
Accidentals – the count rate for the accidentals,
Totals 2 – the count rate in the auxiliary 1 channel.
Totals 3 – the count rate in the auxiliary 2 channel.

Summary Portion:
In the summary at the bottom, the status of the search, the number of matching data points and the search interval are displayed.

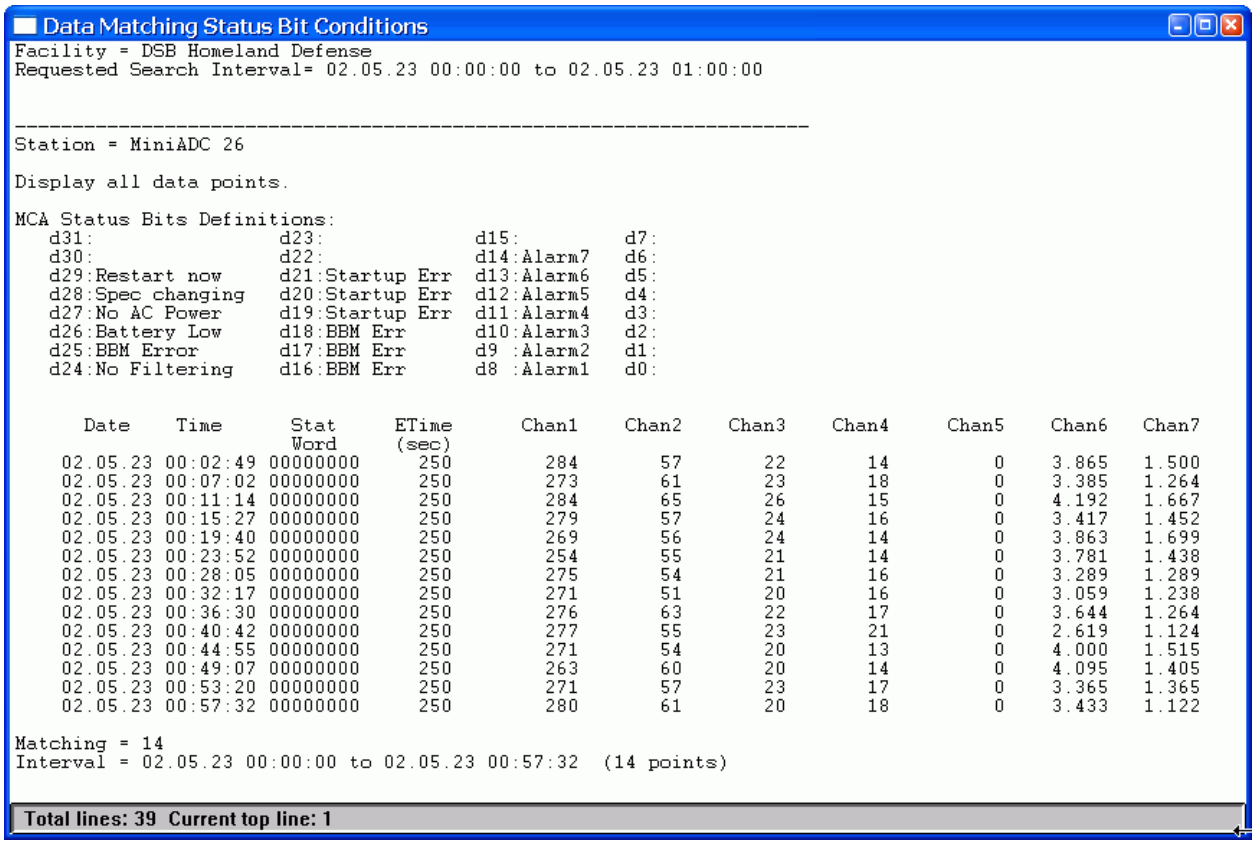


Figure 2.6-11 Diagnostics | Raw Data Results Text Window for MiniADC data

The **Data Matching Status Bit Conditions** text window has the following sections for MiniADC data:

Header Portion:
The first lines in the results text window display the facility specific header. The next section lists the search parameters.

Main Results:
For each station searched a list of all the data points matching the specified conditions are listed. For each data point the following columns of results are displayed:

First Column: Which condition the data point matches
Date/Time – the date/time,
Stat Word – the status byte represented in hexadecimal – the status bit definitions are given in the header of the results text window.
Etime – the elapsed time,
Chan 1, Chan2, Chan3, Chan4, Chan5, Chan6, Chan7 – the counts in the first channel defined in the MiniADC

Summary Portion:
In the summary at the bottom, the status of the search, the number of matching data points and the search interval are displayed.

To get a copy of the complete results windows as shown above, you can select to copy the text window results or a portion of it to the printer or to a file or to the clipboard as described in Section 2.3.3. To access the menu that allows you to save or print results, click on the icon in the upper left corner of the text window. Again, note that only 16,000 lines are printed to the results window – if you want to get all the data points check the Create Log File box on the initial dialog box and the results are written to a file.

2.7. Window Menu

If you select Window from the Main Menu Bar, the menu in Figure 2.7-1 is displayed.

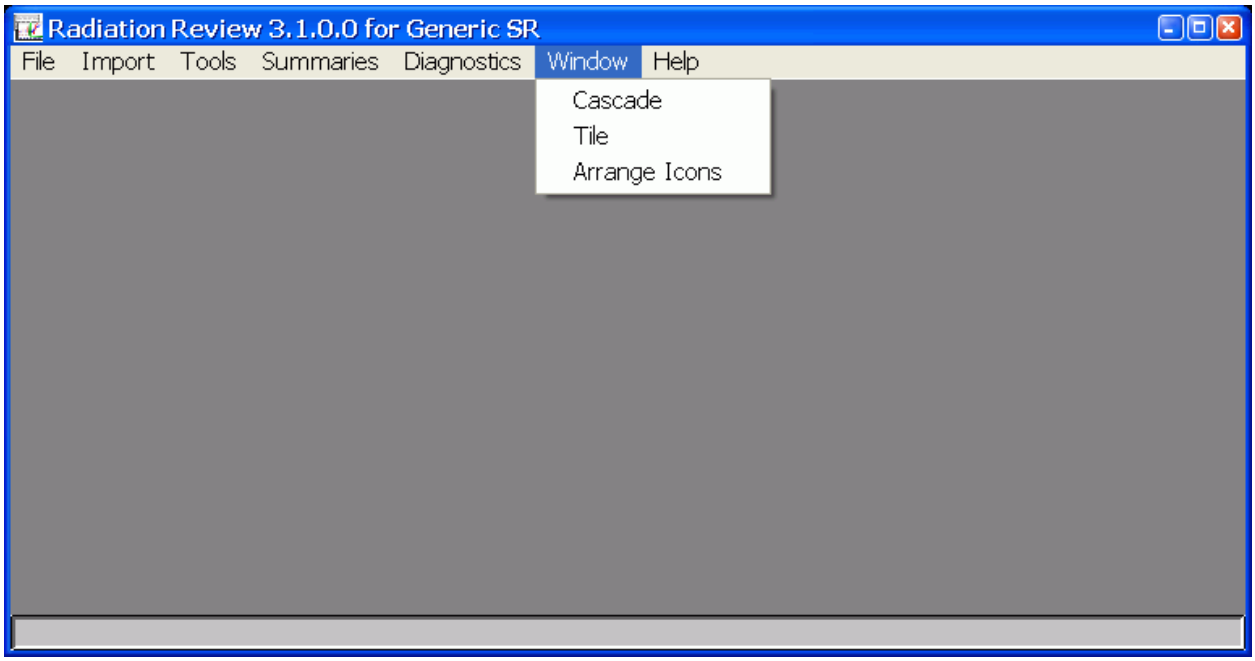


Figure 2.7-1 Windows Pull-down Menu

The typical Windows actions of Cascade, Tile, and Arrange Icons are available.

2.8. Help Menu

If you select Help from the Main Menu Bar, the menu in Figure 2.8-1 is displayed. A complete help is not implemented.

Figure 2.8-1 Help Pull-down Menu

2.8.1. Contents

This option is not yet implemented.

2.8.2. Search

This option is not yet implemented.

2.8.3. Product Support

Help | Product Support displays the Figure 2.8-2 information box.

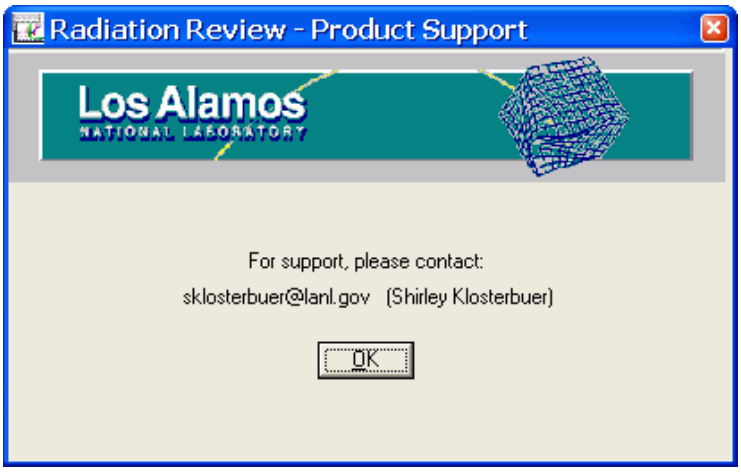


Figure 2.8-2 Help | Product Support Screen

2.8.4. About Radiation Review

Help | About Radiation Review displays the Figure 2.8-3 information box.

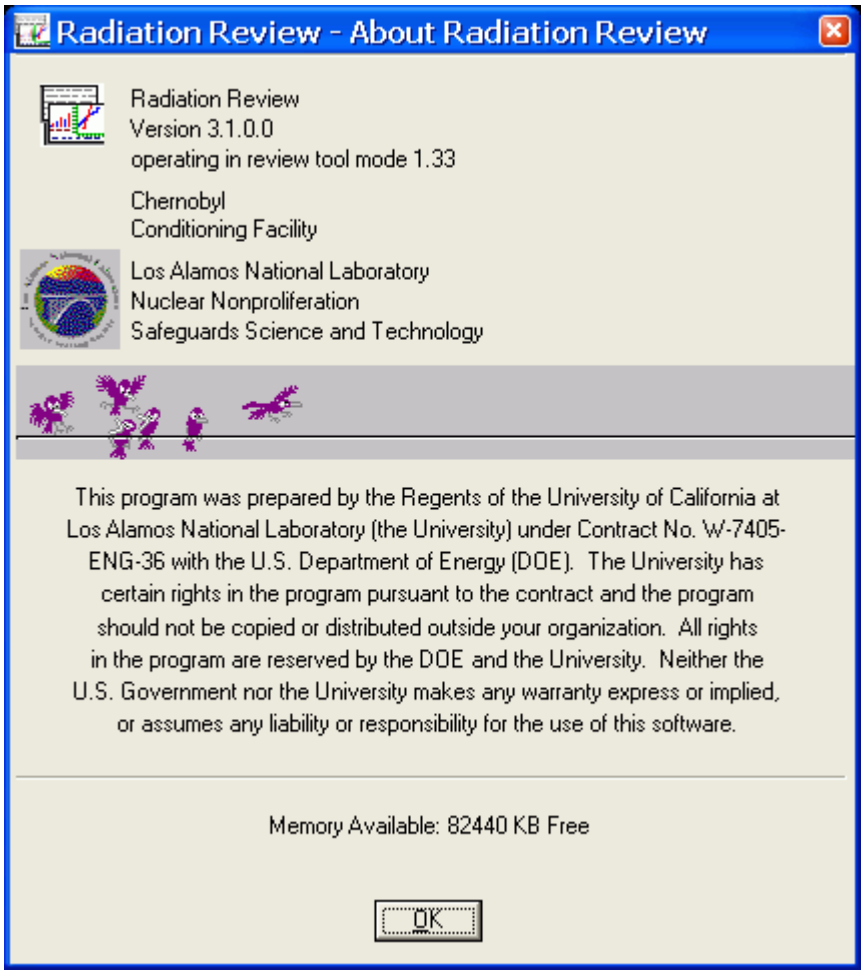


Figure 2.8-3 Help | About Screen

2.9. Alternate Startup

Radiation Review contains the IRS Upper Layer software consisting consists of a defined messaging protocol between Integrated Review Software (IRS) tools as well as each tool supporting various startup modes. The startup mode for any IRS tool is indicated as a command line parameter when an IRS tool is started (or if no command line parameter is present, then the IRS tool starts in the mode indicated by a configuration parameter in its IRS Upper Layer .INI file). Typically different startup modes are only used when Radiation Review is running as part of an IRS session. The user is never required to select a startup mode; the other IRS tools call Radiation Review in the different startup modes. The following startup modes are possible: REVIEW, IMPORT, REANALYZE, SETUP, TITLE, INSPECTION and SKIP_RUNNING_MSG. This section details the Radiation Review actions for each of these startup modes.

2.9.1. REVIEW Startup Mode

The REVIEW startup mode is the same as the standalone startup mode for the Radiation Review. Typically the main menu is displayed and the user can execute any of the menu options. Radiation Review is exited only by user request. When the IRS tools are running together, the REVIEW mode is the startup mode used when Radiation Review is started to do a time match of data. In addition to starting in REVIEW mode when a time match message is received, the graph is displayed and the cursor positioned at the timestamp contained in the time match message. The menu options that are enabled are indicated by parameters in the RAD.INI file (see Appendix A, Section 1.4).

2.9.2. IMPORT Startup Mode

Radiation Review performs actions to import/organize/analyze all data for the time range specified in the INSPEC.INI file. Radiation Review runs in automated mode as much as possible (with minimal, if any, interactions required from the user) stringing together several menu options. Radiation Review automatically exits when all import actions are completed. The actions that are performed are indicated by parameters in the RAD.INI file (see Appendix A, Section 1.4).

2.9.3. REANALYZE Startup Mode

REANALYZE is requested by an IRS tool when the user has taken an action that changes the data that are supplied to other IRS tools further down the line. Since Radiation Review has no IRS review tools that it depends on that can change their data, Radiation Review has no defined action for REANALYZE MODE.

2.9.4. SETUP Startup Mode

in this startup mode, Radiation Review displays dialog boxes that could be used to set the default parameters to be used with the menu options that are automatically executed during the IMPORT startup mode. Radiation Review exits automatically when all dialog boxes have been displayed and parameters set. The actions that are performed are indicated by parameters in the RAD.INI file (see Appendix A, Section 1.4).

2.9.5. TITLE, INSPECTION or SKIP_RUNNING_MSG Startup Mode

TITLE, INSPECTION or SKIP_RUNNING_MSG all have the same actions in Radiation Review. When you start Radiation Review in one of these modes, Figure 2.9-1 information screen is displayed.

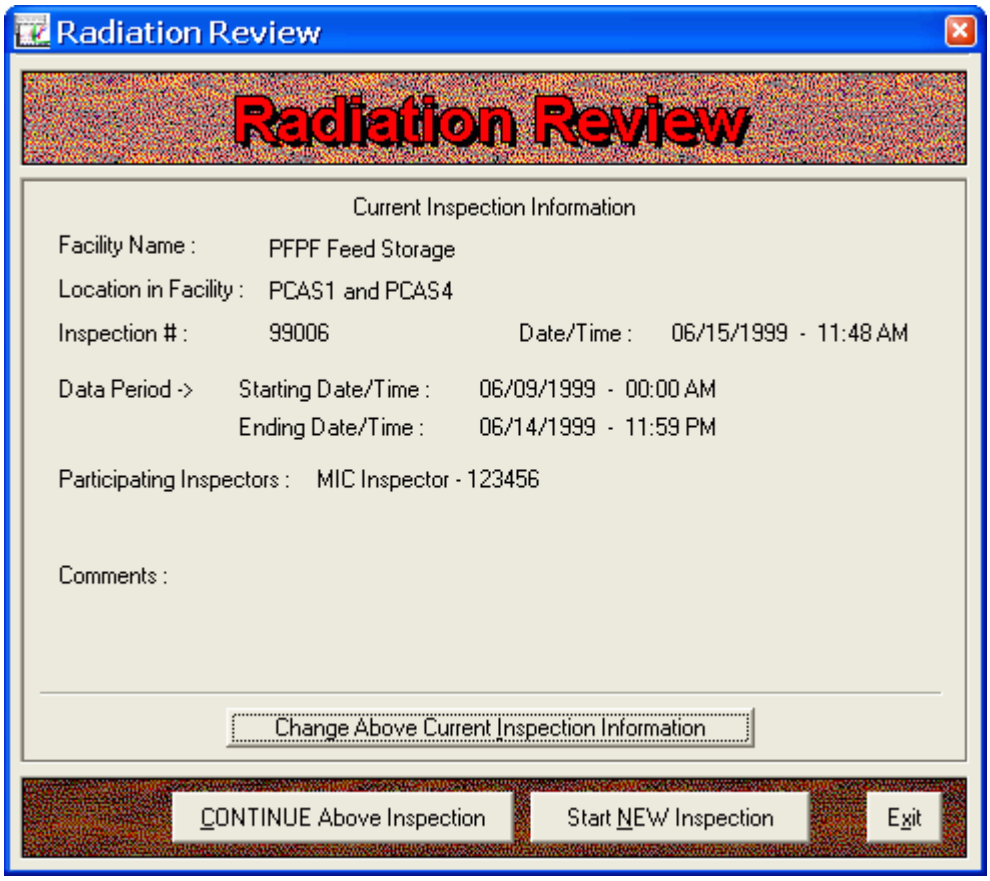


Figure 2.9-1 Inspection Startup Dialog Box

This screen shows the inspection specific information such as the facility name, the dates of the inspection, the inspectors and a comment. There are several actions that can be taken on this screen as indicated by the buttons on the bottom of the dialog box:

Continue Above Inspection: Clicking on Continue Above Inspection causes Radiation Review to be run in REVIEW mode and you can execute any of the program options as described in Section 2.1 Main Menu Bar.

Start NEW inspection: Clicking on the Start NEW Inspection Button causes these actions to be taken:
1) The Inspection Information Dialog box is displayed and the user updates fields as needed (described in Section 2.9.6)
2) Radiation Review is run in IMPORT mode and all actions that are specified in the RAD.INI file to be performed in IMPORT mode are executed (For IMPORT mode to work correctly, the facility specific default parameters for each menu option must have been established and saved – this would be done by the facility expert. See Appendix D for details on setting the facility specific default parameters), and
3) Radiation Review is started in REVIEW mode to allow the user to use all capabilities of Radiation Review as described in Section 2.1 Main Menu Bar.

Change Above Current Inspection Information: Clicking on the Change Above Current Inspection Information displays the Inspection Information Dialog box and the user updates fields as needed (described in Section 2.9.6). When you click OK on the Inspection Information Dialog box you return to the original screen displayed in Figure 2.9-1 and can take any of the actions.

Exit: Clicking on the Exit button exits the program.

2.9.6. Inspection Information Dialog Box

Figure 2.9-2 appears.

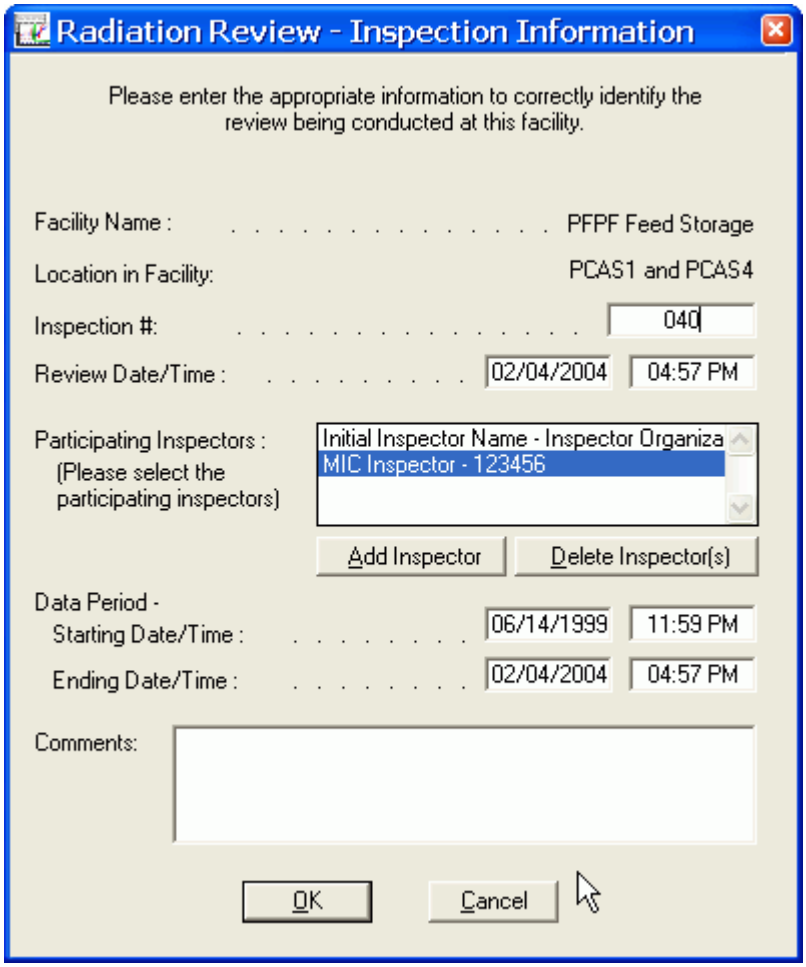


Figure 2.9-2 Inspector Information Dialog Box

The following actions can be taken to change the inspection information:

Facility Name: The current facility name is listed, you cannot edit this field.

Location in facility: The current location being reviewed in the facility is listed, you cannot edit this field.

Inspection #: You can set the Inspection Number; the format is YY0MM where YY is the last two digits of the year and MM is the current month.

Review Date/Time: The current date and time is displayed.

Participating Inspectors: The scroll box displays the names of the possible inspectors who are conducting this review. Select your name in the list.

Add Inspector: Clicking on the Add Inspector dialog box brings up a second dialog box where you are prompted to enter the name and organization of the inspector you wish to all

to the Participating Inspectors list. Click OK and the name is added to the Participating Inspectors list.

Delete inspector(s): Highlight the inspector(s) that you wish to delete from the Participating Inspectors list. Click on the Delete Inspector(s) button. You are asked if you want to delete the specified inspectors. Answering Yes removes the name(s) from the Participating Inspectors list.

Data Period - Starting Date/Time: this should be set to the date of the first data to be examined.

Data Period - Ending Date/Time: this should be set to the date of the last data to be examined.

Comments: A text string describing this inspection can be entered.

Cancel: Clicking on Cancel discards the changes and returns you to the first screen.

OK: Clicking on OK accepts the changes and returns you to the Information screen (Figure 2.9-1 Inspection Startup Dialog Box).

3. Installation Information

See the most recent version of Radiation Review Release Notes.

Appendix A. Files

Radiation Review 3.x and higher is composed of a general program and several supporting Component Object Module (COM) library modules. This Appendix describes the input/output files associated with the main Radiation Review program as well as all of its COM libraries.

A.1. Input Files

There are several inputs to Radiation Review. The raw data files contain the data produced by MIC or other IRS tools that can be imported into Radiation Review for analysis. For all databases, at a minimum, empty database files need to be present.

A.1.1. Binary Raw Data Files (*.BID, *.ISR, *.BSR, *.MCA, *.JSR,*.ESS)

The Radiation Review program can import data files from several instrument types. The following table summarizes data collection programs and file formats produced. For details on the file formats, see the references for the associated data collection program.

Instrument	Data Collection Program	Files produced
GRAND-3	DOS Grand Collect (Ref. 2) or MIC (Ref.3)	*.bid, *.cev, *.pfm
MiniGRAND	MIC (Ref. 3)	*.bid, *.cev, *.pfm
AMSR/ISR	MIC (Ref. 3)	*.isr, *.cev, *.pfm
JSR	DOS SR Collect (Ref. 1) or MIC (Ref. 3)	*.bsr or *.jsr, *.cev, *.pfm
Binary Logger ILON	MIC (Ref. 3)	*.bny, *.cev, *.pfm
MiniADC	MIC (Ref. 3)	*.mca, *.cev, *.pfm
VIFM Instruments	Standard Bot Collection software	*.*sl* or *.vbf
Neumann Electronic Seals	MIC (Ref. 3)	*.ess

Note: When reading *.bid files, Radiation Review does special interpretations of the gamma data. If the MiniGRAND has put in special numbers to indicate gammas out of range or taking offsets, then Radiation Review replaces those values with the last known valid value for a gamma reading and sets the Data Adjusted bit in the status word to warn the user that data has been replaced.

A.1.2. Database Files

There are three dbVista databases associated with Radiation Review as described in the table below.

Database	Description	Files	Location
Primary RAD database	Contains information imported from SR, MiniADCs, and all event information.	DB_MAIN.DBD, DB_MAIN_.DBF, DB_MAIN_.KEY, DB_MAIN_DATA.DBF, DB_MAIN_DATA.KEY, DB_MAIN_DATAD.DBF,	Located in the DATA\RAD subdirectory under the Facility Root Directory specified in Facility Manager

		DB_MAIN_DATAD.KEY, DB_MAIN_DAY.DBF, DB_MAIN_DAY.KEY, DB_MAIN_FAC.DBF, DB_MAIN_FAC.KEY, DB_MAIN_SUMM.DBF	
Operator Declaration database	Contains information imported from *.ID files produced by Operator Review	DB_OPER.DBD, DB_OPER.DBF, DB_OPER.KEY	Located in the DATA\RAD subdirectory under the Facility Root Directory specified in Facility Manager
Default Values database	Contains the default parameters for most Radiation Review menu options	DB_DFLT.DBD, DB_DEFS.KEY, DB_DEFS.DBF	Located in the CONFIG\RAD subdirectory under the Facility Root Directory specified in Facility Manager

Independent databases or *.INI files are used by the COM libraries:

COM Library	Description	Files	Location
EOSS Import Com	Access database containing binary events imported from *.ESS files	EOSSBINARYDATA.MDB	Located in the Data\Import\EOSS subdirectory under the Facility Root Directory specified in Facility Manager
Grand Import COM	Db_Vista database containing information imported from GRAND or MiniGRAND *.BID files.	DB_DATA.DBF, DB_DATA.KEY, DB_DAY.DBF, DB_DAY.KEY, DB_RMON.DBD	Located in the DATA\IMPORT\MG subdirectory under the Facility Root Directory specified in Facility Manager
VIFM Import COM	Db_Vista database containing information imported from *sl.* files.	DB_VIFM.DBD, DB_VIFMDATA.DBF, DB_VIFMDATA.KEY, DB_VIFMDAY.DBF, DB_VIFMDAY.KEY	Located in the DATA\IMPORT\VIFM subdirectory under the Facility Root Directory specified in Facility Manager
Binary Import COM	Access database containing information imported from *.BNY files.	BINARY.MDB	Located in the DATA\IMPORT\Binary subdirectory under the Facility Root Directory specified in Facility Manager
Time Align COM	INI file containing parameters for timestamp adjust	TIMEALIGN.INI	Located in the CONFIG\RAD subdirectory under

			the Facility Root Directory specified in Facility Manager
Facility Manager COM	Access database containing facility configuration information entered using Tools | Facility Configuration menu option	FACILITYCONFIG.MDB	Located in the \IRS\COMLIBS directory

A.1.3. Text Raw Data Files

*.ID Files

ID files are text data files containing information about the item ID associated with a particular sample being measured. Each item is defined in a single line in the file. The various entries are separated by a comma. The format is:

Each Record:
- up to 12 character item id
- up to 11 character detector id (AAAA/BBB/CC)
- timestamp for start of event in the timestamp format described below.
- timestamp for end of event in the timestamp format described below.

TimeStamp Format:
- 5 ASCII Chars – not used, set to 00000
- 8 ASCII Characters – YYYYMMDD (year, month day)
- 6 ASCII Characters – HHMMSS (hour, minute, seconds)
- 3 ASCII Characters – MMM (milliseconds)

Examples of two entries would be:

NO000111,PCAS/001/03,00000199906140959000000,00000199906141005000000

NO000112,PCAS/001/03,00000199906141058000000,00000199906141110000000

(Note: eventually this documentation should be moved to the Operator Review User Manual since the file is produced there.)

A.1.4. Configuration Files

In addition to the Default Values database described above, Radiation Review gets configuration information from these files. The configuration information for Radiation Review is kept in several different files. A brief description of each file follows.

Configuration File	Description	Lines:	Location
RAD.INI	Contains information for interacting with other review tools and some general default parameters.	This file should only be edited by LANL personnel.	Located in the CONFIG\RAD subdirectory under the Facility Root Directory specified in Facility Manager

INSPEC.INI	Contains inspection period information such as last inspection ID, date/time of the start/end of the inspection period, inspector ID, etc.	This file should never be edited.	Located in the DATA subdirectory under the Facility Root Directory specified in Facility Manager
RADRUNNING.INI	Used to determine whether Radiation Review is already running	This file is empty	Located in the CONFIG\RAD subdirectory under the Facility Root Directory specified in Facility Manager
IRS.INI	Contains the Facility ID number for the current selected facility in Radiation Review. The facility number is RAD's index into the Facility Manager. FDMS and INCC use irs.ini for the same purpose	Caution: if the default facility is deleted prior to changing facilities in Radiation Review, this file must be hand edited to reflect the current facility number.	Located in IRS Root Directory, normally C:\irs

Some RAD.INI parameters may need to be changed by technical experts to provide desired functioning of Radiation Review for a particular facility. The following sections detail parameters these experts may need to change to configure performance of Radiation Review.

RAD.INI Parameter Name	**Values**
RT_*****	All parameters named with the RT_ prefix deal with the LANL Upper Layer parameters. These parameters should be changed only by LANL personnel.
RAD_NCC_PATH	Indicates where RAD stores intermediate INCC files. This subdirectory is appended to the Facility Root Directory for the facility in Facility Manager.
RAD_INSPECTION_FILE_VALID	If TRUE, then RAD will use the inspection limits from INSPEC.INI as the default time interval rather than the start and end of the database for all options.
RAD_IMPORT_ALL	Applies only to IMPORT or SETUP startup modes. Set to TRUE if want the appropriate part of the *Import* | *Import All* menu option to be executed in either IMPORT or SETUP modes.
RAD_IMPORT_TODAY	Applies only to IMPORT or SETUP startup modes. Set to TRUE if want the

	appropriate part of the *Import* | *Import Most Recent Files* menu option to be executed in either IMPORT or SETUP modes
RAD_INTEGRITY	Applies only to IMPORT or SETUP startup modes. Set to TRUE if want the appropriate part of the *Tools* | *Data Integrity Checks* menu option to be executed in either IMPORT or SETUP modes
RAD_FIND_EVENTS	Applies only to IMPORT or SETUP startup modes. *Tools* | *Find Channel Events* menu option to be executed in either IMPORT or SETUP modes
RAD_DIRECTION	Applies only to IMPORT or SETUP startup modes. Set to TRUE if want the appropriate part of the *Tools* | *Direction Analysis* menu option to be executed in either IMPORT or SETUP modes
RAD_MEASUREMENT	Applies only to IMPORT or SETUP startup modes. Set to TRUE if want the appropriate part of the *Tools* | *Determine Measurements* menu option to be executed in either IMPORT or SETUP modes
RAD_EXPORT	Applies only to IMPORT or SETUP startup modes. Set to TRUE if want the appropriate part of the *Tools* | *Export to INCC* menu option to be executed in either IMPORT or SETUP modes
RAD_GRAPH	Applies only to IMPORT or SETUP startup modes. Set to TRUE if want the appropriate part of the*Tools* | *Graph* menu option to be executed in either IMPORT or SETUP modes.
RAD_MENU_IMPORT_TODAY	Applies only to REVIEW startup mode. Set to TRUE if you want the *Import* | *Import Most Recent Files* main menu option to be active for the user. (FALSE grays out the menu option)
RAD_MENU_IMPORT_SELECTED	Applies only to REVIEW startup mode. Set to TRUE if you want the *Import* | *Import Selected Files* main menu option to be active for the user. (FALSE grays out the menu option)
RAD_MENU_DETERMINE_MEASUREMENTS	Applies only to REVIEW startup mode. Set to TRUE if you want the *Tools* | *Determine Measurements* main menu option to be active for the user. (FALSE

	grays out the menu option)
RAD_MENU_DIRECTION_ANALYSIS	Applies only to REVIEW startup mode. Set to TRUE if you want the *Tools* | *Direction Analysis* main menu option to be active for the user. (FALSE grays out the menu option)
RAD_MENU_EXPORT_TO_INCC	Applies only to REVIEW startup mode. Set to TRUE if you want the *Tools* | *Export to INCC* main menu option to be active for the user. (FALSE grays out the menu option)
RAD_MENU_MEASUREMENTS_SUMMARY	Applies only to REVIEW startup mode. Set to TRUE if you want the *Summaries* | *Measurements* main menu option to be active for the user. (FALSE grays out the menu option)
RAD_MENU_DIRECTION_SUMMARY	Applies only to REVIEW startup mode. Set to TRUE if you want the *Summaries* | *Direction Events* main menu option to be active for the user. (FALSE grays out the menu option)
RAD_MENU_INTEGRITY_CHECK	Applies only to REVIEW startup mode. Set to TRUE if you want the *Tools* | *Data Integrity Checks* main menu option to be active for the user. (FALSE grays out the menu option)
RAD_WRITE_CHAN_EVENT_RESULTS_FILE	TRUE - Write RAD.DB file described in Section A.2 after executing the *Tools* | *Find Channel Events* FALSE – do not write the RAD.DB file. Also controlled by checkbox in Find Channel Events dialog box.
RAD_WRITE_DIR_EVENT_RESULTS_FILE	TRUE - Write RAD.DB file described in Section A.2 after executing the *Tools* | *Direction Analysis* FALSE – do not write the RAD.DB file. Also controlled by checkbox in Direction Analysis dialog box.
RAD_WRITE_MEASUREMENT_RESULTS_FILE	Redefined in RAD 3.2.0.0 to be a number with the following bit definitions: bit 0 = 1, write *.ncc file bit 1 = 1, write file for IR bit 2 = 1, write XML file. These parameters are set through the Tools | Export Data dialog box by checking the appropriate boxes.
RAD_REAL _TIME_UPDATE	TRUE (“Update” button on Graph dialog box) or FALSE (“Mark” button on Graph dialog box). Also controlled by a

	checkbox on the Options button of the graph.
RAD_REANALYZE_ENABLED	Used when running RAD as part of IRS. TRUE – RAD prompts as to whether to request a REANALYZE from IR after the *Tools* | *Export to INCC* menu option is executed. FALSE – REANALYZE not supported.
RAD_MEAS_AT_THRES	Used in Determine Measurement SR analysis. Accidentals/Totals test threshold level, default is 100.0
RAD_MEAS_AT_BIAS	Used in Determine Measurement SR analysis. Accidentals/Totals test bias limit, default is 0.1
RAD_MEAS_AT_SIGMA	Used in Determine Measurement SR analysis. Accidentals/Totals test sigma allowed, default is 3.0
RAD_MEAS_GATE_WIDTH	Used in Determine Measurement SR analysis. Gate width for Accidentals/Totals test, default is 64.0
RAD_MEAS_TERM_ON_MOVING	Used in Determine Measurement SR analysis. If TRUE, then a run that fails A/T will terminate a measurement, default is FALSE
RAD_MEAS_INCLUDE_AT_FAIL	Used in Determine Measurement SR analysis. If TRUE, then include runs that fail A/T in those sent to INCC, default is TRUE
RAD_LOCATION_MATCH_TYPE	Should always be 1
RAD_LOCATION_MATCH_ITEM	Should always be 1
RAD_LOCATION_NO_MATCH_MSG	Should always be TRUE
RAD_IMPORT_AUTOMATE_QUESTION	Normally is FALSE. If TRUE then when running in IMPORT mode, ask a question about whether they really want to delete the database before importing the new data
RAD_IMPORT_DISK_PROMPT	Normally is FALSE. If TRUE then when running in IMPORT mode, display a prompt telling user to put disk containing RAD data in the proper drive.
RAD_IMPORT_MULTIPLE_DISKS	Normally is FALSE. If TRUE then when running in IMPORT mode, display a prompt telling user to put multiple disks containing RAD data in the proper drive.
RAD_R_T_UPPER_LIMIT	In doing Tools | Determine Measurements, add a check on the

	upper limit for the R/T ratio if Cf. Default is 0.5.
RAD_ENABLE_RATIOS	When displaying results for Tools | Find Channel Events, either display Integral Sum and Net Area or 3 Rokkasho specific ratios. TRUE = use Rokkasho specific ratios.
Other RAD_ parameters	Values are settable through RAD dialog boxes and do not need to be hand edited.

A.2. Output Files

Several files can be produced by Radiation Review if the user specifies them. They fall into 2 general categories: ASCII files containing all or a portion of text window results and log files generated by checking the appropriate boxes. The names for the files can be specified by the user so they are not listed here.

A.2.1. Files from text window results

Anytime results are displayed in a text window the user has the option to save all or a portion of the text window in a filename specified by the user. The format of the file is an exact copy of what appears on the screen.

A.2.2. Files for import to INCC

During the Tools | Export Data option, if using shift register data, files can be generated for input to INCC at the location specified in the RAD.INI file with the RAD_NCC_PATH parameter. Each file includes all the cycles for one verification, background or normalization measurement event.

The Radiation Review measurement event data file is in binary format, and the file extension is always .NCC. The filename encodes the date and time of the first run in the event into the standard LANL 8-character naming convention described in Ref. 3. The format of the file is:

Header

"IREV", 4 characters specifying the file type

1 character, B = background, N = normalization, V = verification

11 character detector id (AAAA/BBB/CC)

where:

AAAA = detector type, e.g. PCAS

BBB = detector identifier, e.g. 004

CC = configuration id, usually 01

12 character item id (filled with trailing blanks if less than 12 characters)

yy.mm.dd, 8 characters, date of first cycle

hh:mm:ss, 8 characters, time of first cycle

unsigned short, number of cycles

Repeated for each cycle in the measurement

yy.mm.dd, 8 characters, date of cycle i

hh:mm:ss, 8 characters, time of cycle i

unsigned short, count time in seconds for cycle i

double, totals for cycle i

double, R+A for cycle i

double, accidentals for cycle i

double, scalar 1 for cycle i

double, scalar 2 for cycle i

unsigned short, number of multiplicity values for cycle i (n = 0 to 128)

n unsigned longs, non-zero R+A multiplicity distributions for cycle i

n unsigned longs, non-zero accidentals multiplicity distributions for cycle i

Note: All cycles in a verification or normalization measurement must have the same count time. Background measurements may have cycles with different count times because all the cycles will be summed into one cycle.

A.2.3. Events XML File for Reading by FDMS or other review tools

When Radiation Review exports MiniGRAND/GRAND data using the Tools | Export Data option an XML file is written. The XML file is always named RADFDMS.XML and is located in the Data subdirectory under the Facility Directory set by Facility Manager. It is assumed that the analysis program using the data reads the XML file and then makes calls to the CoGrandImport COM library to retrieve the raw data for events of interest. A sample XML file containing summaries of events is shown in the figure below.

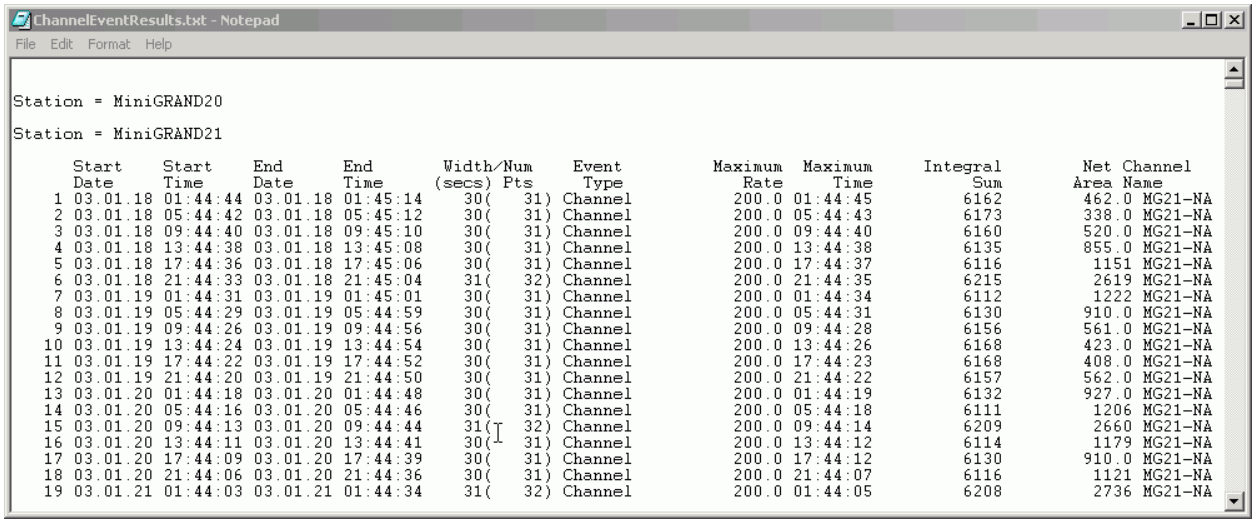
```
<?xml version="1.0"?>
<IR>
  <Events>
    <Columns>
      <Title>RAD-Sequence Num</Title>
      <Title>RAD-Start Timestamp</Title>
      <Title>RAD-End Timestamp</Title>
      <Title>RAD-Max Timestamp</Title>
      <Title>RAD-Integral Sum</Title>
      <Title>RAD-Max Value</Title>
      <Title>RAD-Max Reals Rate</Title>
      <Title>RAD-Max Totals Rate</Title>
      <Title>Station Name</Title>
      <Title>Station Type</Title>
      <Title>RAD-Event Channel</Title>
      <Title>RAD-Type</Title>
      <Title>RAD-SubType</Title>
      <Title>RAD-Data Point Num</Title>
      <Title>RAD-Event ID</Title>
    </Columns>
    <Event num="0000"
       starttime="0000019970226152713000" endtime="0000019970226155412000" maxtime="0000019970226154603000"
       sum="     1493138.0 " maxvalue="   2711.3 " mrrate="     9648.01 " mtrate="    97312.17 "
       sname="OKLO/101/404" stype="isr" echan="  2 " etype="Measurement " esubtype="Verification"
       edpcount="   54 " eid="Unknown    "/>
    <Event num="0001"
       starttime="0000019970226155715000" endtime="0000019970226160119000" maxtime="0000019970226155847000"
       sum="     9043459.0 " maxvalue="  50513.1 " mrrate="     3064.09 " mtrate="    54972.33 "
       sname="OKLO/101/404" stype="isr" echan="  2 " etype="Measurement " esubtype="Verification"
       edpcount="    9 " eid="ABCD0089   "/>
    <Event num="0002"
       starttime="0000019970226171824000" endtime="0000019970226172259000" maxtime="0000019970226172229000"
       sum="       20450.0 " maxvalue="    267.2 " mrrate="      168.54 " mtrate="     6489.80 "
       sname="    Jones.1" stype="isr" echan="  2 " etype="Measurement " esubtype="Cf Norm     "
       edpcount="   10 " eid="None        "/>
    <Event num="0003"
       starttime="0000019970226161219000" endtime="0000019970226164353000" maxtime="0000019970226163847000"
       sum="     7795841.0 " maxvalue="   2088.5 " mrrate="     7382.90 " mtrate="   109821.19 "
       sname="    Jones.1" stype="isr" echan="  2 " etype="Measurement " esubtype="Verification"
       edpcount="   63 " eid="WhatIsIt   "/>
  </Events>
```

The attributes in each Event map have constraints and map to the column names like so:

1 *RAD-Sequence Num (Event num):* must be 4 digits, indicates line number, example 0001
2 *RAD-Start Timestamp (starttime)*: IR format timestamp
3 *RAD-End Timestamp (endtime)*: IR format timestamp
4 *RAD-Max Timestamp (maxtime)*: IR format timestamp
5 *RAD-Integral Sum (sum)*: sum of counts for channel from start to end timestamp
6 *RAD-Max Value (maxvalue)*: highest count rate from start to end timestamp
7 *RAD-Max Reals Rate (mrrate)*: maximum reals rate if SR data, otherwise is 0.0
8 *RAD-Max Totals Rate (mtrate)*: maximum totals rate if SR data, otherwise is 0.0
9 *Station Name (sname)*: Name of the station the data is associated with (from Facility Manager).
10 *Station Type (stype)*: Type of the station the data is associated with (from Facility Manager).
11 *RAD-Event Channel (echan)*: Which channel at the station the data is associated with (from Facility Manager).
12 *RAD-Type (etype)*: Type of event (unknown, channel, measurement or background)
13 *RAD-Subtype (esubtype)*: If Event Type is Measurement, then subtype is Unknown, Empty, Assay, Cf Check, Cf Normalization or Totals. If Event Type is Background, then subtype is Normal Background, Low Background or High Background.
14 *RAD-Data Point Num (edpcount)*: Number of data points in the events
15 *RAD-Event ID (eid)*: ID associated with the event.

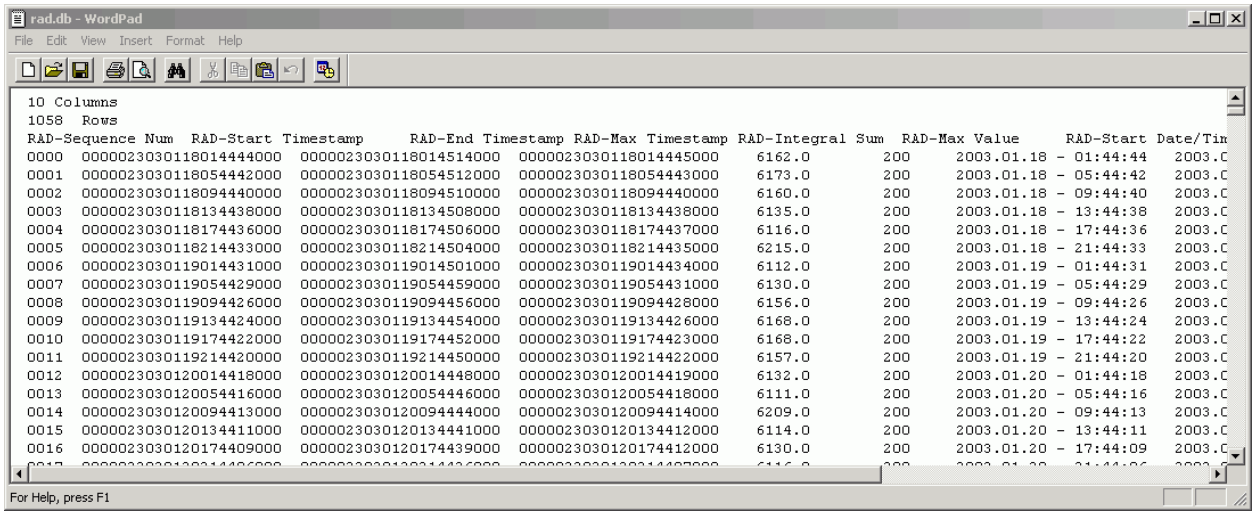
A.2.4. Find Events Log File

Typically if you want a file version of the Channel Events Found results text window, you would click on the icon in the upper left-hand corner and select “Save As” from the drop down menu. However, the results window has a limit of 16,000 lines that can be written to it. If your output exceeds 16,000 and you want get a file version of the results, check the Create Log File box on the Tools | Find Events dialog box. You are prompted for a name and location for the log file when the analysis starts. As the results are processed, most of what would normally be displayed in the Channel Events Found text window is also written to the specified log file. The figure below shows a portion of a log file:



A.2.5. Find Events Data File for Reading by Integrated Review

When Radiation Review runs as a member of the IRS, through configuration parameters in the RAD.INI file, you can select to have the results written to a file to be read by Integrated Review. The name (plus path) of the file is specified in the RAD.INI parameter RT_SUMMARY_DATA_FILENAME (typically rad.db or rad.txt). This file is written only if the checkbox in the Find Events dialog box is checked. The figure below shows a portion of this specially formatted file:



The file has this format:

Line 1 – number of columns in the “table”

Line 2 – number of rows in the “table”

Line 3 – Heading labels for “columns” in the “table”

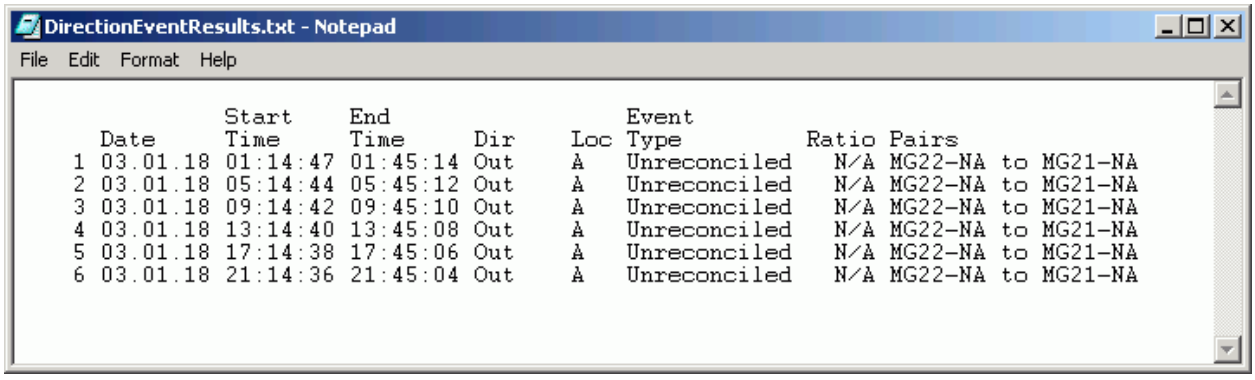
Line 4 – n Data values written into the columns in the “table”

The 10 columns in the table (referred to by Lines 3 and 4 are:

1 *RAD-Sequence Num*: must be 4 digits, indicates line number, example 0001
2 *RAD-Start Timestamp*: IR format timestamp, example 00002303011801444400O
3 *RAD-End Timestamp*: IR format timestamp
4 *RAD-Max Timestamp*:IR format timestamps
5 *RAD-Integral Sum*: sum of counts for channel from start to end timestamp
6 *RAD-Max Value*: highest count rate from start to end timestamp
7 *RAD-Start Date/Time*: timestamp format displayed to user
8 *RAD-End Date/Time*: timestamp format displayed to user
9 *RAD-Max Date/Time*: timestamp format displayed to use)
10 *RAD-Type*: always is Channel

A.2.6. Direction Analysis Log File

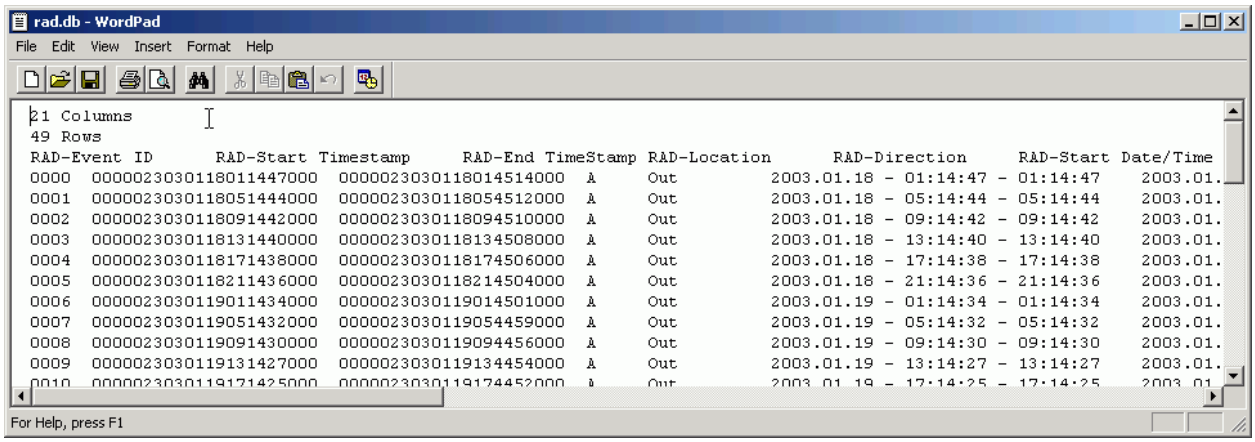
Typically if you want a file version of the Direction Analysis results text window, you would click on the icon in the upper left-hand corner and select “Save As” from the drop down menu. However, the results window has a limit of 16,000 lines that can be written to it. If your output exceeds 16,000 and you want get a file version of the results, check the Create Log File box on the Tools|Direction Analysis dialog box. You are prompted for a name and location for the log file when the analysis starts. As the results are processed, most of what would normally be displayed in the Direction Events Found text window is also written to the specified log file. The figure below shows a log file:



	Date	Start Time	End Time	Dir	Loc	Event Type	Ratio	Pairs
1	03.01.18	01:14:47	01:45:14	Out	A	Unreconciled	N/A	MG22-NA to MG21-NA
2	03.01.18	05:14:44	05:45:12	Out	A	Unreconciled	N/A	MG22-NA to MG21-NA
3	03.01.18	09:14:42	09:45:10	Out	A	Unreconciled	N/A	MG22-NA to MG21-NA
4	03.01.18	13:14:40	13:45:08	Out	A	Unreconciled	N/A	MG22-NA to MG21-NA
5	03.01.18	17:14:38	17:45:06	Out	A	Unreconciled	N/A	MG22-NA to MG21-NA
6	03.01.18	21:14:36	21:45:04	Out	A	Unreconciled	N/A	MG22-NA to MG21-NA

A.2.7. Direction Analysis Data File for Reading by Integrated Review

When Radiation Review runs as a member of the IRS, through configuration parameters in the RAD.INI file, you can select to have the results written to a file to be read by Integrated Review. The name (plus path) of the file is specified in the RAD.INI parameter RT_SUMMARY_DATA_FILENAME (typically rad.db or rad.txt). This file is written only if the checkbox in the Direction Analysis or Export to INCC dialog box is checked. The figure below shows a portion of this specially formatted file:



The file has this format:

Line 1 – number of columns in the “table”

Line 2 – number of rows in the “table”

Line 3 – Heading labels for “columns” in the “table”

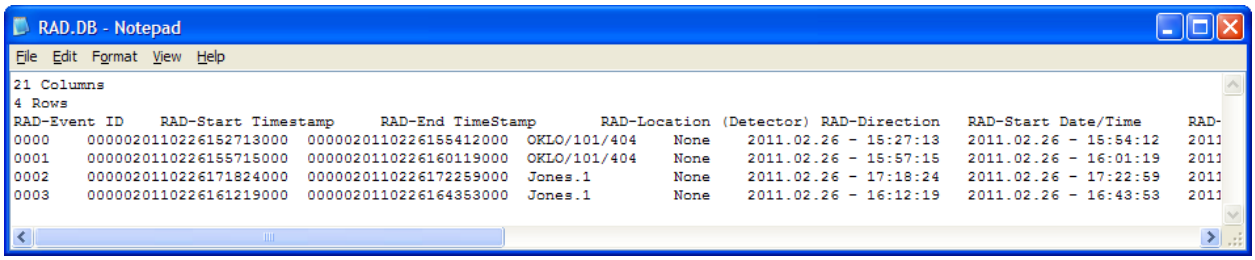
Line 4 – n Data values written into the columns in the “table”

The 21 columns in the table (referred to by Lines 3 and 4 are:

1 *RAD-Event ID*: must be 4 digits, indicates line number, example 0001
2 *RAD-Start Timestamp*: IR format timestamp, example 00002030118014444000
3 *RAD-End Timestamp*: IR format timestamp
4 *RAD-Location*: either A or B (or Station in case of MiniGRAND data)
5 *RAD-Direction*: either In, Out, None or In/Out
6 *RAD-Start Date/Time*: timestamp format displayed in table, i.e., 1998.06.05 - 17:33:37
7 *RAD-End Date/Time*: timestamp format display in table
8 *RAD-Start Date*: date only, i.e. 1998.06.05
9 *RAD-Start Time*: time only, i.e. 17:33:37
10 *RAD-End Date*: date only, i.e. 1998.06.05
11 *RAD-End Time*: time only, i.e. 17:33:37
12 *RAD-n/g ratio*: the neutron gamma ratio
13 *RAD-Status*: always is Unreconciled
14 *RAD-1a*: Name of From channel in first pair meeting the condition
15 *RAD-1b*: Name of To channel in first pair meeting the condition
16 *RAD-2a*: Name of From channel in second pair meeting the condition
17 *RAD-2b*: Name of To channel in second pair meeting the condition
18 *RAD-3a*: Name of From channel in third pair meeting the condition
19 *RAD-3b* : Name of To channel in third pair meeting the condition
20 *RAD-4a*: Name of From channel in fourth pair meeting the condition
21 *RAD-4b*: Name of To channel in fourth pair meeting the condition

A.2.8. Export Analysis Data File for Reading by Integrated Review

When Radiation Review runs as a member of the IRS, through configuration parameters in the RAD.INI file, you can select to have the results written to a file to be read by Integrated Review when the Tools | Export Data option is run. The name (plus path) of the file is specified in the RAD.INI parameter RT_SUMMARY_DATA_FILENAME (typically rad.db or rad.txt). This file is written only if the checkbox in the Export Data dialog box is checked. The figure below shows a portion of this specially formatted file:



The file has this format:

Line 1 – number of columns in the “table”

Line 2 – number of rows in the “table”

Line 3 – Heading labels for “columns” in the “table”

Line 4 – n Data values written into the columns in the “table”

The 21 columns in the table (referred to by Lines 3 and 4) are:

1 *RAD-Event ID*: must be 4 digits, indicates line number, example 0001
2 *RAD-Start Timestamp*: IR format timestamp, example 00002030118014444000
3 *RAD-End Timestamp*: IR format timestamp
4 *RAD-Location (Detector)*: Station name
5 *RAD-Direction*: either In, Out, None or In/Out
6 *RAD-Start Date/Time*: timestamp format displayed in table, i.e., 1998.06.05 - 17:33:37
7 *RAD-End Date/Time*: timestamp format display in table
8 *RAD-Start Date*: date only, i.e. 1998.06.05
9 *RAD-Start Time*: time only, i.e. 17:33:37
10 *RAD-End Date*: date only, i.e. 1998.06.05
11 *RAD-End Time*: time only, i.e. 17:33:37
12 *RAD-Inspector Entered Item ID*: the ID as entered in the previous dialog box
13 *RAD-Status*: type of event
14 *RAD-1a*: Name of From channel in first pair meeting a direction condition
15 *RAD-1b*: Name of To channel in first pair meeting a direction condition
16 *RAD-2a*: Name of From channel in second pair meeting a direction condition
17 *RAD-2b*: Name of To channel in second pair meeting a direction condition
18 *RAD-3a*: Name of From channel in third pair meeting a direction condition
19 *RAD-3b* : Name of To channel in third pair meeting a direction condition
20 *RAD-4a*: Name of From channel in fourth pair meeting a direction condition
21 *RAD-4b*: Name of To channel in fourth pair meeting a direction condition

Appendix B. Troubleshooting

B.1. Warning/Error Messages

Error Num	Warning Message	Recommended Action
1100	BLANK_STRING_ERR: A blank string is not a valid entry. Please further specify the xxx field.	Fill in the xxx field.
1101	BROWSE_INFO_WARN: Subfolder search is only valid for a single root path. The import will continue using only paths xxx.	No action needed. Only the first path defined is used for browse, all others are ignored.
1102	CANNOT_OPEN_ANY_DATABASE_ERR: No database at xxx could be opened. Program cannot proceed.	Reinstall Radiation Review.
1103	CHAN_NOT_DEFINED_ERR: Channel xx is not defined (Function yyy).	Add the channel using *Tools* | *Facility Configuration* menu option
1104	COPY_DB_ERR: An error occurred while trying to copy the database from xxx to yyy. The copy is aborted.	Verify the selected destination drive can be written to.
1105	DB_DOES_NOT_EXIST_ERR: A database does not exist at yyy	Reinstall Radiation Review.
1106	DATABASE_OPENED_INFO: Database at xxx is open.	No action needed.
1107	DB_BAD_ERR: Unexpected database error. Try clearing database and reimporting the data. Or Unexpected database error in function xxx. Try clearing database and reimporting the data. Or Unexpected database error number xxx in function yyy. Try clearing database and reimporting the data."	Use *Import* | *Import All* menu option to clear the database and import the data again.
1108	DB_EMPTY_STATUS: The database has no data. Please import data	Use *Import* | *Import All* menu option to import the data.
1109	DB_INIT_ERR: An error occurred during the initialization of xxx. Option will abort.	Reinstall Radiation Review.
1110	DEFAULT_CFG_PATH_TOO_LONG_ERR: Pathname of xxx specified in yyy is too long. Please fix and start Rad again. Maximum length is %d characters.	One of the paths in the DEFAULT.CFG file is greater than 256 characters. Change RAD data storage to make path length less than 256 characters.
1111	DEFAULT_CFG_FILE_ERR: Fatal error reading the default.cfg file. Please fix it.	Reinstall Radiation Review.
1112	DFLT_DB_READ_ERR: Requested an invalid field from the default database. The option will abort. Or Unexpected error while reading the default parameters for %s	Reinstall Radiation Review.
1113	DISPLAY_AT_LEAST_ONE_CHANNEL_ERR: At least	Select at least one channel in

Error Num	Warning Message	Recommended Action
	one channel must be enabled	the previous dialog box.
1114	DRIVE_DOES_NOT_EXIST_ERR: The specified path does not exist.	Select a drive that exists on your computer.
1115	EVENT_NOT_FOUND_WARN: Couldn't find event to update. Nothing will be changed in database.	Database is probably corrupt. Reimport data.
1116	FAC_NOT_IN_DB_ERR : Facility xxx is not defined (Function xxx)	Change the default facility with the Diagnostics | Select Facility menu option.
1117	FACILITY_NOT_DEFINED_ERR: Facility xxx is not defined. Please select a valid facility from Diagnostics | SelectFacility menu option.	Change the default facility with the Diagnostics | Select Facility menu option.
1118	FILE_OPEN_ERR: The specified file xxx could not be opened.	File may be corrupt.
1119	FILE_READ_ERR: Error reading file xxx.	File may be corrupt.
1120	FILE_WRITE_ERR: Unexpected error when writing to xxx	File may be corrupt or read protected.
1121	FILE_STA_NOT_IN_DB_WARN: File: xxx Station number yy is unknown to Radiation Review. Add with Facility Manager.	Add the station using *Tools* | *Facility Configuration* menu option
1122	INTERNAL_ERR: Internal Error:xxx This should not occur, please report it to LANL.	Report error and circumstances that produce the error to LANL.
1123	INVALID_DFLT_DB_FIELD_ERR: Requested an invalid field from the default database. The option will abort.	Reinstall Radiation Review.
1124	MAKE_DIR_ERR: The specified directory xxx could not be created.	Verify drive exists and can be written to.
1125	MEMORY_ALLOCATION_ERR: Memory allocation error: Option will abort. If possible, select a smaller interval. Or Memory allocation error for xxx: Option will abort.	Try restarting your computer to free up memory.
1126	NAME_TOO_LONG_ERR: The specified name xxx too long. Maximum length is 256 characters.	Use a filename shorter than 256 characters.
1127	NAMES_CFG_READ_ERR: Database cleared okay, but could not read .cfg file.	Not in V 3.0.x
1128	NO_ASSOCIATED_GRAPH_TRACE_ERR: No traces on the graph match the specified location: xxx. Please manually select appropriate traces now.	Select graph traces to go with the specified location.
1129	NO_CHANS_SELECTED_WARN: No channels were selected. The option will abort	In the previous dialog box, select at least one channel.
1130	NO_DATA_IN_INTERVAL_WARN: No data for xxx found in interval: yyy to zzz.	Information only.
1131	NO_DEFAULT_CFG_FILE_ERR: File xxx is not	No default.cfg file exists in the

Error Num	Warning Message	Recommended Action
	present, current working directory is yyy. Please fix this problem. The program will exit now.	specified directory.
1132	NO_DIR_SELECTED_WARN: No direction analysis conditions were selected. The option will abort.	In the previous dialog box, select at least one condition for the direction analysis.
1133	NO_FACILITIES_ERR: There are no facilities defined.	Add at least one facility using *Tools* | *Facility Configuration* menu option
1134	NO_FILES_EXIST_WARN: No xxx files exist at yyy.	Information only.
1135	NO_LOCATION_NUM_MATCH_SUPPORTED_ERR: Matching to a location number is not support. The option will abort	Information only.
1136	NO_MATCHING_CHAN_EVENTS_WARN: No channel events found for any station in specified time interval. The option will abort. Or No channel events found in interval: xxx to yyy.	Information only.
1137	NO_MATCHING_DATA_WARN: No data for xxx found in interval: yyy to zzz.	Information only.
1138	NO_MATCHING_RAW_DATA_WARN: No conditions selected for raw data display. The option will abort.	Select at least one condition in the previous dialog box.
1139	NO_MATCHING_DIR_EVENTS_WARN: No direction events found in interval xxx to yyy.	Information only.
1140		
1141	NO_MEAS_SELECTED_WARN: No measurements were selected. No measurements will be sent to INCC.	Information only.
1142	NO_MEAS_TYPE_IN_INTERVAL_WARN: No measurements of specified types\n found in interval: xxx to yyy.	Information only.
1143	NO_MEAS_TYPES_SELECTED_WARN: No measurement types were selected. The option will abort.	Select at least one measurement type in the previous dialog box.
1144	NO_MEMORY_FOR_APP_ERR: Not enough memory available to begin the application. Please try to free more memory and begin again.	Try restarting your computer to free up memory
1145	NO_NCC_FILE_REQUESTED_ERR: Requested not to write NCC file. To write files, change parameter RAD_WRITE_MEASUREMENT_RESULTS_FILE in RAD.INI file to TRUE.	Have expert set correct values in RAD.INI file.
1146	NO_STAS_SELECTED_WARN: No stations were selected. The option will abort.	Select at least one station in the previous dialog box.
1147	NO_STATIONS_FOR_FACILITY_ERR: There are no stations in the database for the default facility	Add at least one station for facility using *Tools* | *Facility Configuration* menu option

Error Num	Warning Message	Recommended Action
1148	NOT_ENOUGH_DATA_TO_ANALYZE_WARN: Not enough data in interval to analyze. Please select larger time interval. Event search will abort now.	Information only.
1149	ONLY_ONE_GRAPH_WARN: Only one graph may be displayed.	Information only.
1150	OPEN_COM_DB_WARN: Could not open xxx database at yyy, check path is correct.	Verify path or reinstall Radiation Review.
1151	PATH_DOES_NOT_EXIST_ERR: The specified path does not exist.	Information only.
1152	PATH_TOO_LONG_ERR: The specified paths xxx are too long. Maximum length is 256 characters.	Move data to a shorter path length name.
1153	PATHS_TOO_LONG_ERR: The specified paths xxx are too long. Maximum length is 256 characters.	Move data to a shorter path length name.
1154	PEAK_WIDTH_TOO_LARGE_WARN: Not enough data in interval to analyze. Please select larger time interval or reduce the peak width. Event search will abort now.	Information only.
1155	RAD_INVALID_DATABASE_PATH_ERR: There is not a Radiation Review database at xxx. Program will abort now.	Verify path or reinstall Radiation Review.
1156	RAD_START_FATAL_ERR: A fatal error was encountered when xxx during the Rad startup. Rad will abort now.	Try restarting your computer.
1157	RT_IMPORT_ERR: The Radiation Review Import process did not successfully complete. This could be due to an error during the import or the user selecting to cancel the process. Press okay to continue the Import process for the other tools.	Information only.
1158	SUMMARY_NOT_FOUND_STATUS: No summaries were found.	Information only.
1159	UNKNOWN_EVENT_TYPE_ERR The event type is unknown.	Database may be corrupt. Try reimporting data and repeating analysis.
1160	WILDCARDS_TOO_LONG_ERR: Too many wildcards are specified, reduce the length to < 40.	Shorten wildcards string.
1161	WILDCARD_DOES_NOT_EXIST: The specified wildcard xxx is not recognized.	Enter a valid wildcard.
1162	INVALID_FACILITY: The FacilityID xx in \\IRS\\IRS.INI is not known to Facility Manager. Please change IRS.INI	Change the facility number in the IRS.INI file.
1163	NO_CHANNEL_STRING_MATCH_SUPPORTED_ERR: Matching to a channel string xxx is not supported. Change RAD_LOCATION_MATCH_ITEM in RAD.INI.	Set the indicated parameter in RAD.INI to FALSE.

Error Num	Warning Message	Recommended Action
1164	REQUESTED_FACILTY_NOT_CURRENT_FACILTY: xxx is not the current default facility.	Use Tools | Select Facility to chose the indicated facility.
1165	INSPEC_INI_ERR: Hint: Check RT_INSPEC_INFO_COMMON_FILENAME in RAD.INI for valid path.	INSPEC.INI file could not be found. Change the path and name in RAD.INI to point to the INSPEC.INI file desired.
1166	No error defined	
1167	DEFAULT_CANNOT_BE_DELETED: Graph configuration “default" cannot be deleted.	No action needed – warning message if try to delete graph configuration named default..

B.2. Database becomes corrupt

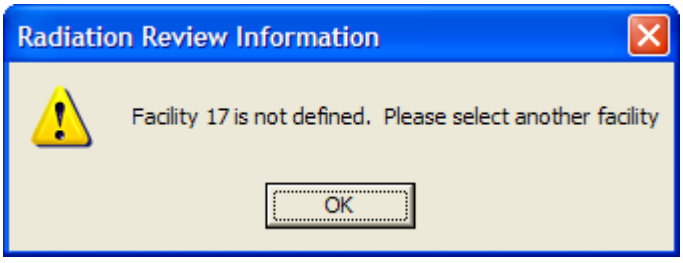
If the database becomes corrupt and clearing and reimporting the data do not solve the problem, reinstall the Radiation Review program.

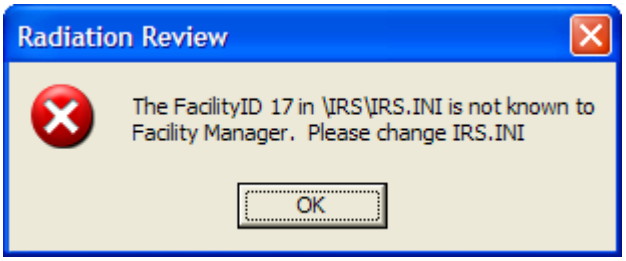
B.3. Program locks up

Unexpected problems may arise where the program locks up. If this happens, display the task list for the specific operating system and choose to End Task for Radiation Review.

B.4. Undefined facility on startup

Radiation Review uses the file irs.ini to select and access the current facility. The value in irs.ini is the Facility ID defined in the Facility Manager database. If the ID in irs.ini is not in the Facility Manager database, two dialogs are displayed (see below), and Radiation Review will not start. To repair this problem, manually edit irs.ini with a valid Facility ID and restart Radiation Review.





Appendix C. Technical Support, Change Summary

Questions, comments, and trouble reports for this program should be directed to Joe Longo, phone number (505) 667-2452, email longo@lanl.gov. You may also email general UNARM software and hardware questions to the UNARM software control board at uscb@lanl.gov.

C.1. Radiation Review 3.2.0.7 Resolved Issues and Change Summary

Issue #	Item	Summary
BMEND-1	RAD	RAD graph loses data on import under some conditions: Displaying data for two MGs, (MG21/MG20), importing MG20 data, the data display blanks, this is seen often in the 1 week view window.
BMEND-6	RAD	RAD graph left-button navigating to DVR connects eventually, but the long delay connecting to DVR (or some other unknown interaction) causes RAD to crash.
BMEND-7	RAD	RAD graph marking activities often create [“Internal error: create mark failed.”] pop-up errors, with of course no contextual information as to why it might fail.
BMEND-8	RAD	When doing database size stress-testing using MG data, internal errors are logged, but the user is not notified. Then RAD must be restarted to get import errors cleared; even when the database is cleared first. The graph is unusable at the DB full poin...
BMEND-9	RAD UG	'Determine Measurements' doesn't appear to function correctly, or else **the manual needs to be made clearer**, or the feature should be implemented to be a filter for short duration's measurements. Placed note in § 2.4.8 describing the use and limits of these flags
BMEND-10	RAD	RAD XML export crashes with IR/OP config. The config used was experimental and not functioning, so a proper arrangement (per #5) might already work fine.
BMEND-15	RAD	Blank screen on graph update needs an hourglass or some sort of visual indication to user that work is being performed.
BMEND-16	RAD UG	RAD and MIC manuals have no EOSS description in them. Also see #56. Added minor EOSS description improvements in UG
BMEND-19	RAD UG	Irs.ini not documented anywhere. This all-important file is the root definition of the 'current facility' for RAD, FDMS and INCC. The file's existence and use should be documented. Added content to §§ 2.4.10, A.1.4 and B.4
BMEND-23	RAD	The RAD ‘integrity check’ verbose text changes, requested in 2008, are not included in this weeks’ test, but the fix is ready in the latest internal RAD release.
BMEND-29	RAD UG	RAD created events for AMSR and JSR, but 'Find Events' does not find them, nor are they in the summary report. Added info about UNKNOWN events not being used by Find Events.
BMEND-30	RAD	EOSS events can be created only in some locations on the graph (where there are two points available, not at end points). Also see #BMEND-57.
BMEND-56	RAD UG	EOSS should be in the MIC UG and in the RAD manual too. Also see #BMEND-16. Added minor EOSS description improvements in UG
BMEND-57	RAD	EOSS graph marking hard to handle. See #30.

BMEND-66	RAD UG	Note in RAD UG: Shift Register data "sign and forward" is not implemented. Added note in § 2.3.1
BMEND-84	RAD	Verify all crashes in IRS (especially RAD) don't happen when the Install/Configuration is fixed
BMEND-85	RAD	Data Integrity Checks for VIFM data must be fixed
BMEND-114	RAD	RAD EOSS GetDataByStation can be inconsistent

C.2. Radiation Review 3.2.0.8 Resolved Issues and Change Summary

Issue #	Item	Summary
BMEND-124	RAD	Some EOSS and VIFM data files fail to import into RAD
BMEND-125	RAD	RAD graph missing MG data when multiple data sources displayed

Appendix D. Setting Facility Specific Parameters

D.1. Channel Event Parameters

The following steps should be taken to determine the facility parameters for the **Tools | Find Channel Events** menu option:

Use the Graph option to find a data segment containing typical data for all channels in your facility. Record the starting and ending time of this data segment. Try to choose a small segment, no more than approximately 100 data points if possible. From the graph evaluate the type of data you have to determine which channel search algorithm is most appropriate for your data - if the background is constant select either the threshold or sliding window with background algorithm; if the background varies greatly select the sliding window with local background.

If you selected **Threshold** follow these steps:

1. Select the **Tools|Find Channel Events** menu option.
2. Adjust the **Search Start Date/Time** and **Search Time Interval** to specify the data segment containing the typical peaks.
3. Select the **Algorithm** to be Threshold.
4. The Smooth Data and Peak Width have no effect on the threshold.
5. Select a single channel to be evaluated.
6. Check the **Diagnostic Print Points** box and the click on **OK**. Data in the specified interval are analyzed and results with the following columns are displayed:

Date	Time	Chan Num	Pt Num	Sub Num	Data	
97.01.06	00:45:00	0	2	0	16.000	
97.01.06	00:45:02	0	3	1	16.000	
97.01.06	00:45:04	0	4	2	16.000	
97.01.06	00:45:06	0	5	3	16.000	
97.01.06	00:45:08	0	6	4	16.000	
97.01.06	00:45:10	0	7	5	916.500	Peak Start
97.01.06	00:45:12	0	8	6	5635.500	Above V
97.01.06	00:45:14	0	9	7	10730.000	Above V
97.01.06	00:45:16	0	10	8	15767.000	Above V
97.01.06	00:45:18	0	11	9	18358.500	Above V
97.01.06	00:45:20	0	12	10	13304.500	Above V
97.01.06	00:45:22	0	13	11	8235.000	Above V
97.01.06	00:45:24	0	14	12	3152.000	Above V
97.01.06	00:45:26	0	15	13	16.000	Peak End + 1
97.01.06	00:45:28	0	16	14	16.000	
97.01.06	00:45:30	0	17	15	16.000	

7. Look at the Data column. Select a number for the threshold that represents when the event starts according to the graph. For the example above, 25 might be a good choice for threshold.
8. Repeat the preceding 2 steps for all channels that indicate the peak.
9. When you have determined the values for all channels that you need to use, put the values in the Threshold column in the Find Events dialog box. Set all the values in the Background column to 0.

10. Run the analysis and use the graphics option to determine if these parameters are good. If not adjust the Threshold values.
11. When you have determined that you have the correct numbers in the dialog box for the Tools | Find Channel Events, click on the **Save As Defaults** button. This writes the parameters to the default database and they will be the defaults the next time the program starts.

If you selected **Sliding Window with Background** follow these steps:

1. Select the **Tools | Find Channel Events** menu option.
2. Adjust the **Search Start Date/Time** and **Search Time Interval** to specify the data segment containing the typical peaks.
3. Select the **Algorithm** to be Sliding Window with Background.
4. If you want to use data smoothed with a 3 point smooth, check the **Smooth Data** box.
5. Select a single channel to be evaluated.
6. Check the diagnostic print points box and the click on OK. Data in the specified interval are scanned and results showing the following columns are printed:

Date	Time	Chan Num	Pt Num	Sub Num	Data	Smoothed Data	V Data	Event Status
97.01.06	00:45:00	0	1	40	16.000	16.000	-72867	
97.01.06	00:45:02	0	2	41	16.000	16.000	-76003	
|97.01.06	00:45:04	0	3	42	16.000	16.000	-73302	
97.01.06	00:45:06	0	4	43	16.000	16.000	-56443	
97.01.06	00:45:08	0	5	44	16.000	16.000	-24301	
97.01.06	00:45:10	0	6	45	916.500	916.500	22952	Peak Start+0
97.01.06	00:45:12	0	7	46	5635.500	5635.500	77980	Above V
97.01.06	00:45:14	0	8	47	10730.000	10730.000	117845	Above V
97.01.06	00:45:16	0	9	48	15767.000	15767.000	142502	Above V
97.01.06	00:45:18	0	10	49	18358.500	18358.500	149209	Above V
97.01.06	00:45:20	0	11	50	13304.500	13304.500	132350	Above V
97.01.06	00:45:22	0	12	51	8235.000	8235.000	100208	Above V
97.01.06	00:45:24	0	13	52	3152.000	3152.000	52955	Above V
97.01.06	00:45:26	0	14	53	16.000	16.000	-2073	End + 1
97.01.06	00:45:28	0	15	54	16.000	16.000	-41938	
97.01.06	00:45:30	0	16	55	16.000	16.000	-66595	
97.01.06	00:45:32	0	17	56	16.000	16.000	-76003	
97.01.06	00:45:34	0	18	57	16.000	16.000	-75103	
97.01.06	00:45:36	0	19	58	16.000	16.000	-69483	
97.01.06	00:45:38	0	20	59	16.000	16.000	-58769	
97.01.06	00:45:40	0	21	60	16.000	16.000	-43018	
97.01.06	00:45:42	0	22	61	16.000	16.000	-24676	
97.01.06	00:45:44	0	23	62	16.000	16.000	-11387	
97.01.06	00:45:46	0	24	63	16.000	16.000	-3168	
97.01.06	00:45:48	0	25	64	16.000	16.000	-32	
97.01.06	00:45:50	0	26	65	16.000	16.000	-32	
97.01.06	00:45:52	0	27	66	16.000	16.000	-32	
97.01.06	00:45:54	0	28	67	16.000	16.000	-32	
97.01.06	00:45:56	0	29	68	16.000	16.000	-32	

7. Look at the V Data column. Select a number for the threshold that represents when the event starts according to the graph. For the example above, any number 0-20000 might be a good choice for threshold.

8. Look at the Data column. Select a number that represents a good value for the constant background. For the example above, 20 would be a good choice for background.
9. Look at the Data column. Select a number that represents the number of points in the peak that will be used as the Peak Width. For the example above, 8 might be a good choice for the number of points in the peak.
10. Repeat the preceding 5 steps for all channels that indicate the peak.
11. When you have determined the values for all channels that you need to use, put the values in the **Threshold** and **Background** columns in the Find Events dialog box. Set the **Peak Width** to the most common number of points in the peak.
12. Run the analysis and use the graphics option to determine if these parameters are good and all peaks are properly detected. If not, adjust the Threshold and Background values.
13. When you have determined that you have the correct numbers in the dialog box for the Tools | Find Channel Events, click on the **Save As Defaults** button. This writes the parameters to the default database and they will be the defaults the next time the program starts.

If you selected **Sliding Window with Local Background** follow these steps:

1. Select the **Tools | Find Channel Events** menu option.
2. Adjust the **Search Start Date/Time** and **Search Time Interval** to specify the data segment containing the typical peaks.
3. Select the **Algorithm** to be Sliding Window with Local Background.
4. If you want to use data smoothed with a 3 point smooth, check the **Smooth Data** box.
5. Select a single channel to be evaluated.
6. Check the diagnostic print points box and the click on OK. The specified interval is scanned and results showing the following columns is printed:

Date	Time	Chan Num	Pt Num	Sub Num	Data	Smoothed Data	V Data	Event Status
97.01.06	00:45:00	0	1	40	16.000	16.000	-72867	
97.01.06	00:45:02	0	2	41	16.000	16.000	-76003	
|97.01.06	00:45:04	0	3	42	16.000	16.000	-73302	
97.01.06	00:45:06	0	4	43	16.000	16.000	-56443	
97.01.06	00:45:08	0	5	44	16.000	16.000	-24301	
97.01.06	00:45:10	0	6	45	916.500	916.500	22952	Peak Start+0
97.01.06	00:45:12	0	7	46	5635.500	5635.500	77980	Above V
97.01.06	00:45:14	0	8	47	10730.000	10730.000	117845	Above V
97.01.06	00:45:16	0	9	48	15767.000	15767.000	142502	Above V
97.01.06	00:45:18	0	10	49	18358.500	18358.500	149209	Above V
97.01.06	00:45:20	0	11	50	13304.500	13304.500	132350	Above V
97.01.06	00:45:22	0	12	51	8235.000	8235.000	100208	Above V
97.01.06	00:45:24	0	13	52	3152.000	3152.000	52955	Above V
97.01.06	00:45:26	0	14	53	16.000	16.000	-2073	End + 1
97.01.06	00:45:28	0	15	54	16.000	16.000	-41938	
97.01.06	00:45:30	0	16	55	16.000	16.000	-66595	
97.01.06	00:45:32	0	17	56	16.000	16.000	-76003	
97.01.06	00:45:34	0	18	57	16.000	16.000	-75103	
97.01.06	00:45:36	0	19	58	16.000	16.000	-69483	
97.01.06	00:45:38	0	20	59	16.000	16.000	-58769	
97.01.06	00:45:40	0	21	60	16.000	16.000	-43018	
97.01.06	00:45:42	0	22	61	16.000	16.000	-24676	
97.01.06	00:45:44	0	23	62	16.000	16.000	-11387	

97.01.06 00:45:46	0	24	63	16.000	16.000	-3168
97.01.06 00:45:48	0	25	64	16.000	16.000	-32
97.01.06 00:45:50	0	26	65	16.000	16.000	-32
97.01.06 00:45:52	0	27	66	16.000	16.000	-32
97.01.06 00:45:54	0	28	67	16.000	16.000	-32
97.01.06 00:45:56	0	29	68	16.000	16.000	-32

7. Look at the V Data column. Select a number for the threshold that represents when the event starts according to the graph. For the example above, any number 0-20000 might be a good choice for threshold.
8. Look at the Data column. Select a number that represents the number of points in the peak that will be used as the Peak Width. For the example above, 8 might be a good choice for the number of points in the peak.
9. Repeat the preceding 4 steps for all channels that indicate the peak.
10. When you have determined the values for all channels that you need to use, put the values in the **Threshold** columns in the Find Events dialog box. Set the **Background** column to 0s. Set the Peak Width to the most common number of points in the peak.
11. Run the analysis and use the graphics option to determine if these parameters are good and all peaks are properly detected. If not, adjust the Threshold values.
12. When you have determined that you have the correct numbers in the dialog box for the Tools | Find Channel Events, click on the **Save As Defaults** button. This writes the parameters to the default database and they will be the defaults the next time the program starts.

D.2. Direction Analysis Parameters

The following steps should be taken to determine the facility specific parameters for the **Tools | Direction Analysis** menu option: This option is used for facilities that have special combinations of detectors that can be used to determine direction of motion.

1. Use the **Tools | Find Events** or **Tools | Determine Measurements** to determine channel or measurement events for the facility.
2. Use the **Tools | Graph** option to find a data segment containing typical data for all channels in your facility. Expand around the peaks indicating a direction of motion. Use the cursor to manually determine the number of seconds between the start of the event on one channel to the start of the event on another channel. If the times differ on the various channels record the times for each pair of channels. Also record approximately how long the time is in-between channel events.
3. In the dialog box for **Tools | Direction Analysis**, setup the conditions for the various direction events as described in Section 2.4.5. For the **Min** column fill in the number of seconds that must pass after the first channel in your pair detects the event until the second channel in your pair detects the event; normally this is 0. For the **Max** column fill in the most seconds choose the largest number of seconds that must pass after the first channel in your pair detects the event until the second channel in your pair detects the event; normally this is 200-500s. It must be less than the number of seconds in-between two events on the same channel. If you want to calculate a ratio of the neutron/gammas for all the pairs for a given direction/location, fill in the appropriate choice for each channel pair.
4. Run the analysis and to determine if these parameters are good and all direction events are properly detected. If not, adjust the values.
5. When you have determined that you have the correct numbers in the dialog box for the Tools | Direction Analysis, click on the **Save As Defaults** button. This writes the parameters to the default database and they will be the defaults the next time the program starts.

Appendix E. Shift Register Specific Information

E.1. Shift Register Analysis

E.1.1 SR Measurement Analysis

Data from each run are analyzed to determine the run type. The eight run types include the following:

Run Type	Meaning
BACKGROUND	Normal background run
LOW BKG	Low-background run
HIGH BKG	High-background run
MOVING	Moving source (failed A/T test) run
ASSAY	Plutonium container run
EMPTY	*Empty* container (low-level Plutonium source) run
CF NORM	Cf normalization run
CF CHECK	Cf check source run
TOTALS	Totals (singles) assay run

Run-type determination is described in the flow chart in Appendix E.1.2 for facilities using Reals (Doubles) analysis and Appendix E.1.3 for facilities using Totals (Singles) analysis. The run type **MOVING** indicates that a source may be moving past the detector. A moving source causes an anomaly in the counting statistics and fails the A/T test. The A/T test procedure is described in Appendix E.1.4.

Consecutive runs are grouped into measurements. There are eight measurement types:

Measurement Type	Meaning
BACKGROUND	Normal background measurement
LOW BKG	Low-background measurement
HIGH BKG	High-background measurement
UNKNOWN	Unknown measurement
ASSAY	Plutonium container measurement
TOTALS	Singles assay measurement
EMPTY	*Empty* container (low-level Plutonium source) measurement
CF NORM	Cf normalization source measurement
CF CHECK	Cf check source measurement

Six of these measurement types (**ASSAY**, **EMPTY**, **TOTALS**, **CF NORM**, **CF CHECK, and UNKNOWN**) are known as *event* measurements. Three (**BACKGROUND**, **LOW BKG**, and **HIGH BKG**) are known as *background* measurements.

Consecutive measurement runs with the same run types are grouped into their corresponding measurement types:

Run Type	Measurement Type
BACKGROUND	**BACKGROUND**
LOW BKG	**LOW BKG**
HIGH BKG	**HIGH BKG**
ASSAY	**ASSAY**
TOTALS	**TOTALS**
EMPTY	**EMPTY**
CF NORM	**CF NORM**
CF CHECK	**CF CHECK**

A measurement type begins with the first run of the corresponding run type and ends with the last run of the same corresponding run type. The average of the totals and reals rates of the runs is maintained for the duration of a measurement type. The duration covers the time from the start of the first run to the end of the last run (i.e., start of last run plus the duration of last run). The average rates are calculated from the sums of the rates of runs included in the measurement type divided by the number of runs included in the measurement type.

The moving (**MOVING**) run type is special. A moving run following a background measurement cannot be characterized until a subsequent run. It is designated an unknown (**UNKNOWN**) measurement type. Subsequent moving runs are grouped into one unknown measurement type. The duration of the unknown measurement type is maintained, but the average rates are defined as zero. If a subsequent run starts an event measurement, then the preceding unknown measurement is reclassified as part of the new event measurement type (i.e., the start of the new event is the start of the previously classified unknown event).

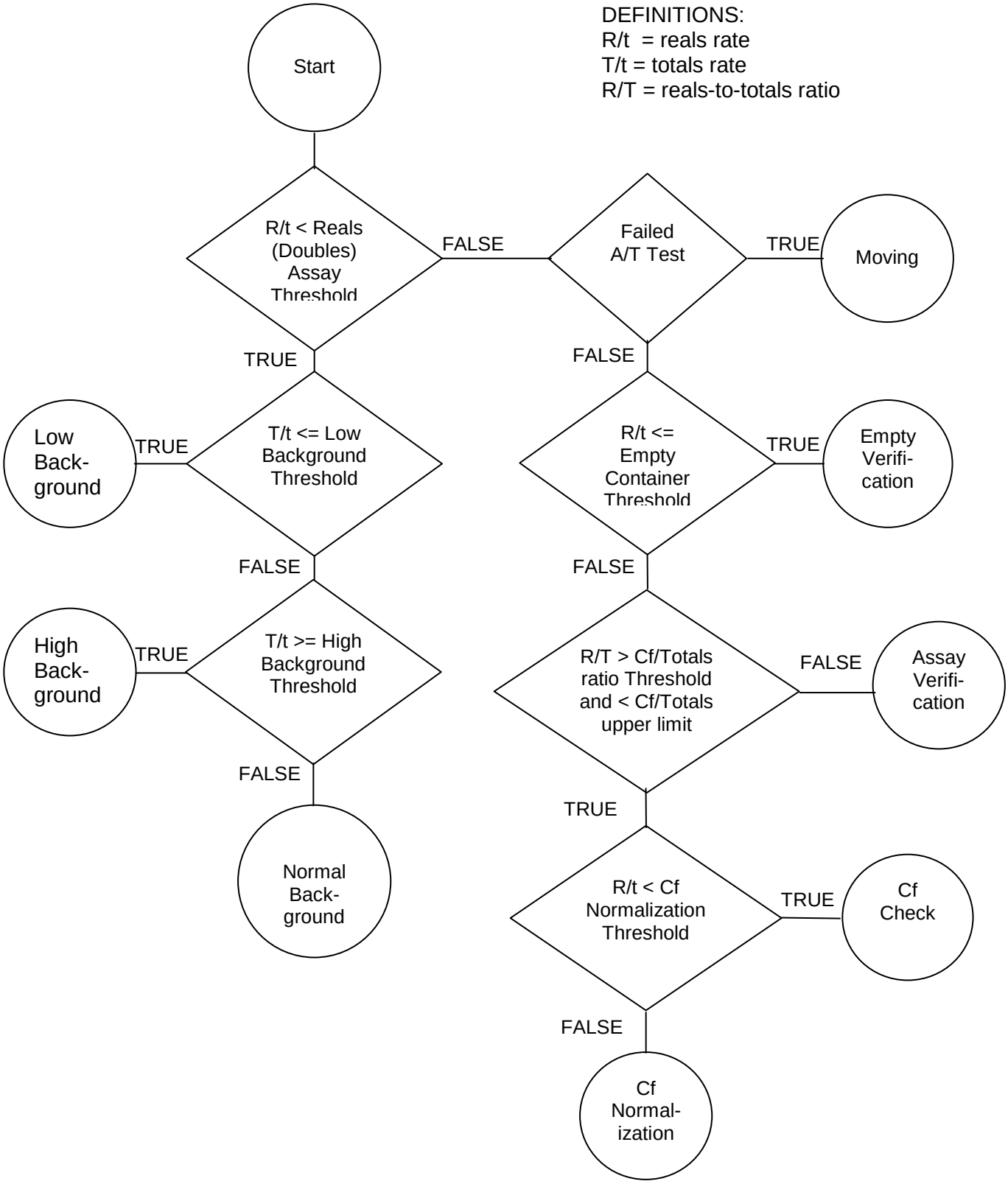
If a moving run follows an event measurement, it is included as part of the duration of the event measurement. If it is between two of the same measurement events, it is included as part of the duration of the event measurement as a whole. If it is at the end of one event measurement but before the beginning of a different event measurement, it is included as part of the duration of the first event measurement. In no case are the statistics of a moving run type included in the statistics of the event measurement.

If a subsequent run starts a background measurement, then the preceding unknown measurement is not reclassified. A moving run type is *never* included in a background measurement.

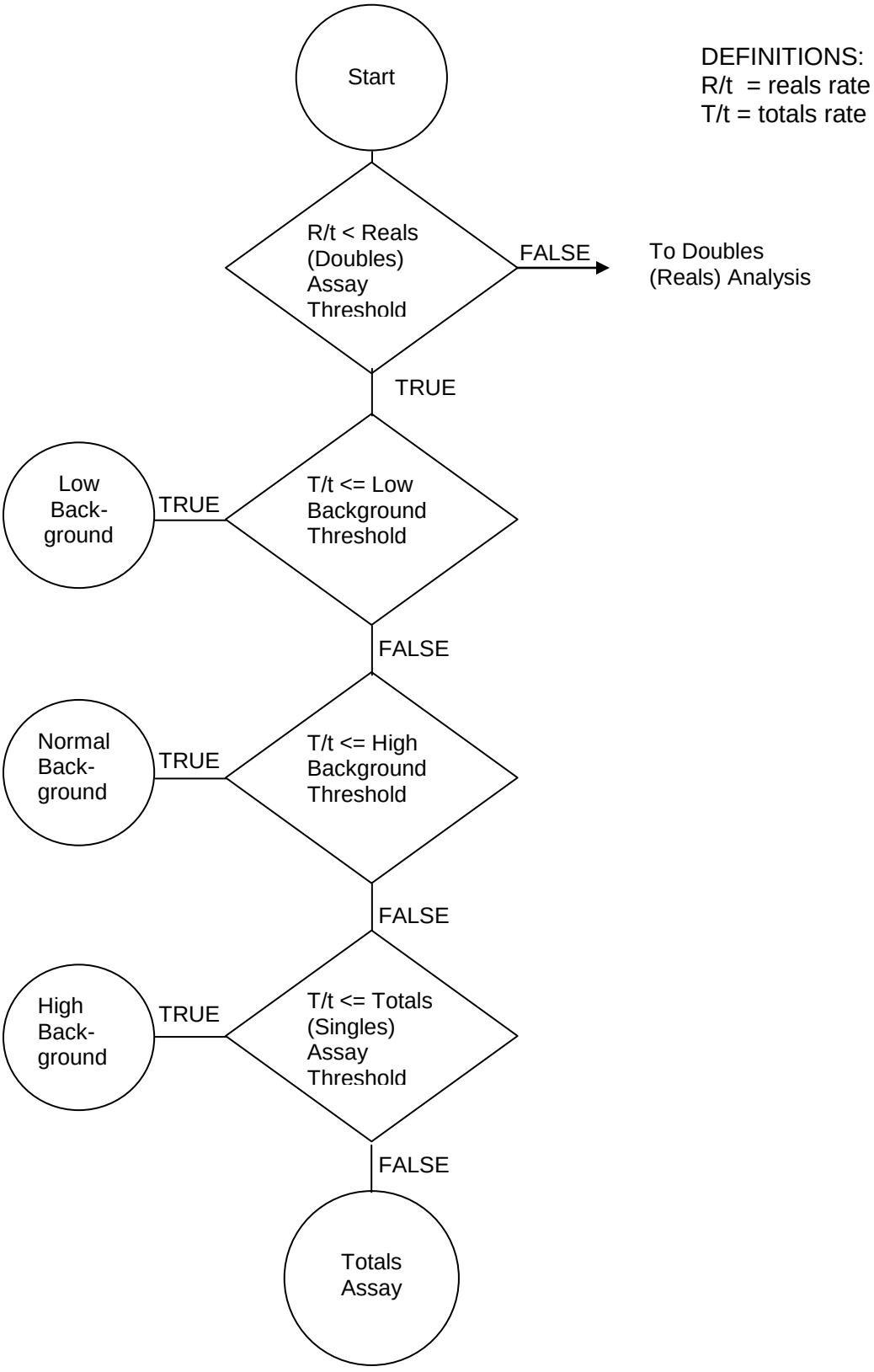
Analysis of each run results in flags being written to the status byte associated with the data. There are twelve flags:

Flag	Meaning
A/T Test Failed	Run is **MOVING** *run* type
Low Background	Run is part of a **LOW BKG** measurement
High Background	Run is part of a **HIGH BKG** measurement
Empty	Run is part of an **EMPTY** measurement
Assay	Run is part of an **ASSAY** measurement
Cf Check	Run is part of a **CF CHECK** measurement
Cf Norm	Run is part of a **CF NORM** measurement
Length short	Event measurement duration is less than minimum event limit
Length long	Event measurement duration is greater than maximum event limit
Unusual measurement	Run is part of **UNKNOWN** measurement
First run	First run of a measurement (does not apply to **BACKGROUND** measurements)
Totals	Run is part of a **TOTALS** measurement

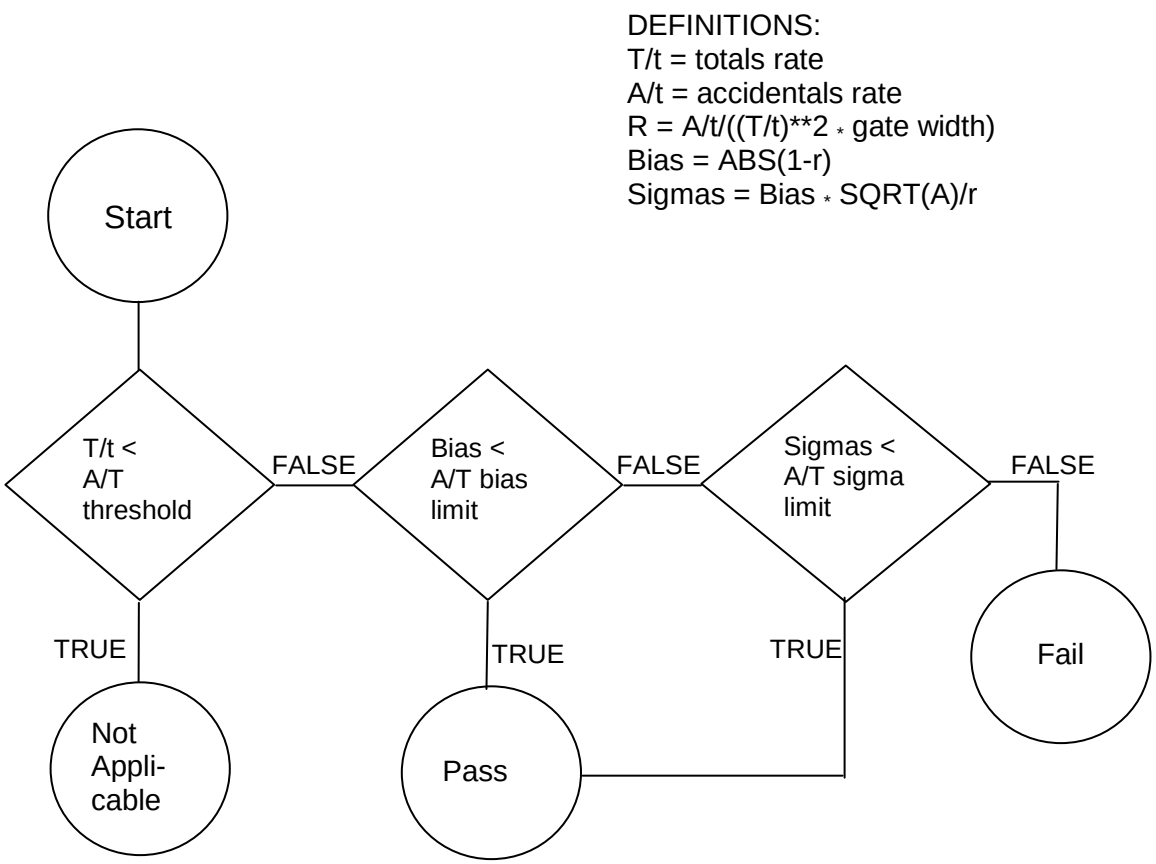
E.1.2 Run Type Determination (Doubles Assay)



E.1.3 Run Type Determination (Singles Assay)



E.1.4 A/T Test


DEFINITIONS:
T/t = totals rate
A/t = accidentals rate
R = A/t/((T/t)**2 * gate width)
Bias = ABS(1-r)
Sigmas = Bias * SQRT(A)/r
Start
T/t < A/T threshold
FALSE
Bias < A/T bias limit
FALSE
Sigmas < A/T sigma limit
FALSE
TRUE
TRUE
TRUE
Not Appli-cable
Pass
Fail