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GeneTox Manager System

User's Guide- VAX Component

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GeneTox Manager System (GENETOX)

USER'S GUIDE VAX Component

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PREFACE

This User's Guide is the reference manual describing use of the GeneTox application under the VAX/VMS operating system.

GeneTox Manager is a data capture, data management, and statistical analysis program used for microbial mutagenicity data. Its main purpose is to provide a homogeneous environment for the collection, organization, and analysis of data generated in the laboratory while also supporting a quality assurance program. The complete system consists of both a personal computer (PC) system and a minicomputer (VAX) system, although the PC system can be used as a stand-alone system. The system controls the data collection and management through a user-friendly menu driven system that requests specific information and provides uniform methods for data and information entry. GeneTox Manager is capable of performing specialized statistical analysis of the data and creating tabular and graphical summaries. Two versions of the PC system exist: a stand alone PC only version, and a VAX version. The VAX version of the system is designed to function with VAX FOCUS databases so that the VAX can be used for long-term storage, archiving of files, and the analysis of large groups of data.

We only make a few REQUESTS OF THE USERS. First, we request that you provide to the creators of this software proper acknowledgement. [See the title page to the software and to the User's Guide. Also in the near future, we hope to have references that you may cite.] Secondly, realizing that the software is provided free of charge, please understand that we cannot service this software. [Because the source code is available, many consultants and companies that use FOCUS® could provide additional help and programming options for you.]

We sincerely hope that this software will be useful to you and will aid you in your scientific endeavors.

Acknowledgements

We would like to acknowledge those individuals who used prototype versions of this software and gave us useful, productive comments. Without their suggestions, this product could have not been done. In this regard, we give our thanks to Sarah Warren, Erica Perry, Virginia Houk, and Maria Taylor.

We also want to thank those who gave us permission to use the statistical analysis programs that they developed. These include Dr. L. Bernstein, Dr. D. Krewski, and Dr. A. Stead. If you use information from these statistical programs, we hope that you will give proper acknowledgement to the authors of the statistical manuscripts.

We also want to thank Mr. Ken Laws for providing administrative support that made this project possible, and Drs. Lawrence W. Reiter and Michael D. Waters for creating the scientific support that made our endeavors a joy.

Notice

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This document has been reviewed in accordance with U.S. Environmental Protection Agency policy and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

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1.0 INTRODUCTION

The GeneTox Manager System has been developed for the Health Effects Research Laboratory (HERL) of EPA in Research Triangle Park, North Carolina for the purpose of systematizing the collection of experimental results of In-Vitro tests run by the EPA Genetic Bioassay Branch and their contractors.

A series of computer programs has been written to allow for verification of experimental results, statistical analysis of data, and reports of raw data collected. The GeneTox Manager system is comprised of several different programs on two different computer systems. The data acquisition program uses dedicated PCs connected to laboratory equipment to collect the In-Vitro data. The FOCUS data base and report generation programs are located on the VAX Cluster. Programs for statistical analysis and graphic output of the In-Vitro data are also located on the Cluster and can be accessed from the FOCUS program.

This User's Guide covers the use of the FOCUS GeneTox system and the statistical programs that reside on the VAX Cluster system called VAXTM1. The PC programs for GeneTox Manager are discussed in a User's Guide for GeneTox Manager on the PC; Appendix G of this document provides a description of file formats used in transferring data between the PC and the VAX.

1.1 Intended Audience

This manual is intended for all users of the application. The user community consists of laboratory technicians responsible for the collection of experimental results of In-Vitro tests run by the EPA Genetic Bioassay Branch and their contractors.

Access to the application is restricted. The GeneTox Application Manager is responsible for the operation and maintenance of the GeneTox application. System identifiers and Access Control Lists (ACLs) have been established to grant the GeneTox Application Manager administrative authority.

1.2 Document Organization

Section 1 provides an overall introduction to facilities offered by the application.

Section 2 describes how to access the application and how the user interacts with the application.

Section 3 is arranged in sections organized by the commands available to the user: LOAD, UPDATE, REPORT, STATISTICS, HELP, and EXIT.

Appendix A provides an example of a data base extract file generated for input to statistical model runs.

Appendix B provides an example of the report generated by the Stead Statistical Model.

Appendix C provides an example of the report generated by the Bernstein Statistical Model.

Appendix D provides an example of an Inventory Report.

Appendix E provides an example of a Raw Data Report.

Appendix F provides an example of a Summary Data Report.

Appendix G provides the detailed file specification for transfer files used to migrate experiment data between the VAX and PCs.

1.3 Documentation Conventions

The following conventions are used in this manual.

1.3.1 Command Syntax Conventions

Typically, the user will enter a value on the command line to indicate the action to be performed. This manual uses special conventions and symbols to describe correct usage of the command components.

UPPER CASE letters indicate characters that must be entered as they are shown. Where abbreviation of command components is allowed, the shortest form will be indicated in uppercase with the remainder in lowercase.

Lower case letters indicate general terms to be replaced by specific names or values.

Braces ({ }) denote one or more required components. If more than one component is enclosed in braces, one (but no more than one) must be chosen.

Brackets ([ ]) enclose one or more components that are optional. If more than one component is shown, one or none of the components may be selected.

Angle brackets (< >) enclosing a word indicate the component is common to several commands.

Ellipsis (...) indicate that the preceding component may be repeated.

1.3.2 Keyboard Notations

The following special terminal keys are referenced:

<keyname> refers to special keys indicated by inclusion within angle brackets. Examples: <PFI>, <RET>.

<RET> refers to the carriage return, or RETURN, key. <RET> concludes all operator responses.

<CTRL> is the control, or CTRL, key. This key is often used in conjunction with other keys. The symbol <CTRL/key> indicates that CONTROL and another key should be entered simultaneously.

<TAB> indicates the TAB key, or <CTRL/I> on terminals without a TAB key.

1.3.3 Representation of Terminal Displays

In this manual, the terminal displays produced are indicated in exactly the form as seen by the operator and are indented from the surrounding text. The underscore ("__") indicates a position at which the operator is expected to enter information.

1.4 Associated Documents

GeneTox software on the VAX is a component of the total GeneTox Manager application. This manual deals only with the components that reside on the Cluster VAX computer system. These components consist of the data base storage of test results data and the reporting and processing of this data. The data input portion, which resides on the PC, is referenced in Appendix G and in other documents as detailed therein.

The system that supports GeneTox is Digital Equipment Corporation's (DEC) VAX computer. 'Introduction to VAX/VMS' is a DEC manual that describes the VAX/VMS operating system and the use of the command language. This manual is recommended for users who lack experience with interactive computer systems or users new to the VAX/VMS environment.

2.0 OPERATIONAL OVERVIEW

The GeneTox application is installed in a production directory on the VAX Cluster. This section provides detailed information on the procedures for accessing the GeneTox application.

2.1 Accessing the GeneTox Application

This section describes the procedures for logging on to the VAX, establishing a set of commands that define the GeneTox environment (a one-time effort), and invoking GeneTox on an ongoing basis.

2.1.1 Logging on the VAX

The user may log on to the host computer in one of two ways. One method is for the user to log on independent of the GeneTox Manager system (standard logon process from a DEC terminal or a PC to the VAX). For detailed information on this method of access to the computer, refer to the VAX User's Guide. The second method is for the user to log on to the VAX via a menu option from the GeneTox PC application. Details for this method can be found in the GeneTox Manager User's Guide for the PC.

2.1.2 Defining the GeneTox Environment for a Specific VAX ID

In order to access GeneTox, there are two items related to the user's VAX ID that must be completed. The first of these is the allocation of an appropriate GeneTox Access Control List (ACL) entry for the user's ID. See the GeneTox Application Manager for issuance of a GeneTox ACL for your VAX ID.

The second item is the definition of VAX 'Symbols' and 'Logicals' on the user's ID that are specific to GeneTox. (An understanding of 'Symbols' and 'Logicals' is not required, but the user may reference VAX documentation for further information on these constructs if desired.) Upon logon to the VAX, the system will check a file called LOGIN.COM for initialization of the user environment. The following two commands must be added to the user's LOGIN.COM file (or a .COM file called by LOGIN.COM) in order to initialize the GeneTox environment for the user.

(1) The following command invokes a .COM file that will establish required GeneTox logicals:

```
@$2$DUA90:[INVITRO]GTMSET
```

(2) The following command establishes a symbol for invocation of GeneTox:

GENETOX :== "@GTM$SYS:GENETOX"

To define a printer to accept GeneTox output, include the following command as well:

DEFINE GTMSYSPRINTER pppppp

where:
pppppp is the name of a printer defined on the VAX network

From this point forward, this manual assumes that the user has logged on to the VAX.

2.1.3 Invoking the GeneTox Application

After logging on to the VAX computer, enter "GeneTox" at the DCL prompt ($) to start the application. (Moving into a separate subdirectory (SET DEFAULT) before initiating this application will isolate print listings and various work files that the application will produce from outputs from other programs or tasks.)

$ GeneTox<RET>

The GeneTox Main Menu is then displayed on the screen. The main menu presents a list of options and corresponding functions; a function is selected by entering the appropriate letter at the command prompt.

```
*** Welcome to the ***
HERL GENETOX MANAGER DATA MANAGEMENT SYSTEM

Enter          To Perform -

D              Download GeneTox data to flat file for PC.
R              Report Data Base functions.
H              Help screen for system.
E              Exit system and return to command line.

Enter code to perform ==>
```

Figure 2-1. Main Menu Screen

The user invokes the desired option by entering the first initial of the particular function. Each function has an associated menu (see Section 3).

2.2 User Interface

Input screens allow the user to enter GeneTox options and data. The screens have been implemented with the following design:

- The <TAB> key allows the user to move from one input field to another.
- The <RET> key submits an entire input screen, at which time validation procedures are performed.
- The <PF3> key cancels a transaction and returns the user to the next highest level menu screen.

2.2.1 Menu-Driven Operation

GeneTox provides menus that guide the user in operation of the application. Menu items are identified by the first letter of the particular function. Each function provides its own menu, with options to perform subsequent functions.

2.2.2 Termination

There are several ways to terminate a GeneTox session. The recommended method is to select the main menu EXIT option. After pressing <RET>, the user is returned to the VMS prompt.

A built-in feature of FOCUS enables the user to enter a <PF3> to cancel an operation and return to the FOCUS single prompt ">". The user then enters "FIN" at the FOCUS prompt to terminate the session.

2.3 Function Options

Download - Module that extracts data for an experiment specified by the user from the VAX GeneTox data bases and stores the data in a flat ASCII file on the user's VAX directory.

Report - Module that produces output reports of current GeneTox data. Four different report formats exist: Statistical output, Inventory output, Raw Data output, and Summary Data output.

Help - Module that displays further information on all functions and commands described in this User's Guide.

Exit - Exit GeneTox system and return to command line prompt ($).

3.0 FUNCTION DESCRIPTIONS

This section provides a description of each function offered by GeneTox. The following conventions are common to all functions.

1. User input must be in upper case.

2. <CR> or null entry in response to any command line prompt will cause the prompt to be issued again with no action taken.

3. For screens where the cursor has been left on a line below tabular displayed information, the user is required to enter selection values in one or more of the tabular fields.

   - When all data for the screen has been entered, <CR> must be pressed to process the entire screen. A <TAB> may be entered in any given field to indicate no data or no action for that item (field); however, at least one value must be entered per line of valid data entry.

   - A <CR> on a line by itself will skip the command action for the current line of data and either continue to the next item (or line of items) within the current group or return to the command line prompt (if there are no more items for this command).

   - The word "END" entered on a line by itself will terminate the command action for the current group or level within the current group.

   Terminal display output may be temporarily suspended at any particular point by touching the "Hold Screen" or "Scroll" key. Resume terminal display by touching the key again. On older terminals, typing <CTRL/S> and <CTRL/Q> provides this XON/XOFF screen control.

3.1 LOAD Option

Note: This option is not currently available for use. Currently, the LOAD function is initiated from the PC containing the required experiment data and control is returned to the PC-based GeneTox application once the Load has been completed.

3.2 DOWNLOAD Option

This function allows the user to define a set of experiment data to be extracted from the VAX data bases in a format in which it can be transferred to the PC. Upon selection of the Download option, the following screen is displayed to the user:

```
HERL GENETOX MANAGER DOWNLOADING SYSTEM          10/23/92
Selection Screen Menu

Experiment Name        ===>              (10 Characters)

Must enter a value, press [RETURN] to continue, PF4 to exit
```

Figure 3-1. Download Selection Screen

3.2.1 User Input

The following field is input for the Download option:

Experiment Name - The 10-character name of the experiment which the user wishes to download to the PC. An Experiment name does not have to be 10 characters in length; however, the entire Experiment name must be provided.

The PF4 key may be pressed to abort execution of the Download option before leaving this screen.

3.2.2 Processing

The system will search the GeneTox master data base for the requested experiment. If it is not found, a message is displayed and the user is returned to the input screen to specify another experiment name or exit the Download option.

If the requested experiment name is found, the system will proceed to extract all data pertaining to that experiment and generate an ASCII file.

3.2.3 Outputs

The extract ASCII file generated by this option has a default name of PCDOWN.VAX. The status field in applicable records of this file has a value of 'V' to indicate that this type of extract file was a download from the VAX and will provide 'read-only' access to users who load the file in their PC-based, GeneTox data bases.

When returning to the $ prompt in VMS, the user may make use of communication software on the VAX and on the PC to transfer the file to the PC. If the user wishes to save the extract file, PCDOWN.VAX, that was generated, it is recommended that the file be renamed since it will be over-written the next time the user executes the Download option. It should be noted that a VAX Download option may be initiated from the PC component of GeneTox, which will automatically access the VAX, extract experiment data and retrieve the extract file to the PC.

3.2.4 Quality Control

The system checks for the existence of the requested Experiment name in the VAX data bases before performing an extraction, and notifies the user with an error message if it cannot be found.

3.3 UPDATE Option

Note: This option is not currently available for use. Currently, the Update function is initiated from the PC containing the required experiment data and control is returned to the PC-based GeneTox application once the update has been completed.

3.4 REPORT Option

This function allows the user to report the In-Vitro experiment data in several different formats. The formats are: Statistical Report, Inventory Report, Raw Data Report, and Summary Data Report. Each of the formats is discussed in detail in the following sections.

The Report option is selected from the main menu by entering an 'R' at the command prompt and pressing <RET>. The following screen will be displayed.

```
HERL GENETOX MANAGER REPORTING SYSTEM        10/20/92
                Selection Screen Menu

Experiment Name          ===>
Sample Identification    ===>                TO =>
Experiment Date          ===>                TO =>
Research Lab ID          ===>
Test Type Code           ===>        2=>
                         3=>         4=>
                         5=>
Bacteria Strain          ===>                    2=>
                         3=>                     4=>
                         5=>                     6=>
                                                 7=>

Enter values for the search selection(s) you require.  All ranges are
optional input areas and are not required.  Leave all others blank.  Press
TAB to move between fields.  Press ENTER when complete.

Press NEXT_SCREEN key to obtain help on the content of above fields.
```

Figure 3-2. Report Screen #1

3.4.1 User Input

The following fields are input for the REPORT Selection screen:

Experiment Name - The 10-character name of the experiment performed to obtain the data. All 10 characters do not need to be filled in to select data to be reported. Any samples containing the input characters will be retrieved for the report.

Sample Identification - The 10-character sample identification number that identifies the agent being tested. A range of samples may be selected by entering both a beginning and ending sample ID.

Experiment Date - The date the experiment was started. Use the standard Year-Month-Day format to enter this date, for example: 890215. A range of dates may be used to select samples for reporting by entering a beginning and ending sample date.

Research Lab ID - The 4-letter code from the table of valid research lab IDs that identifies the organization to report. This identifies the group that conducted the experiment.

Test Type Code - The 2-digit code from the table of valid test types available. Up to five different test type codes can be entered to select sample data for reporting.

Bacteria Strain - The 6-character strain abbreviation from the table of valid bacteria strains. A total of seven different bacteria strains can be entered to select the sample data for reporting.

At least one of the selection fields must be selected or the following error message will be displayed:

******* PLEASE ENTER AT LEAST ONE VALUE TO TEST *******

Any number of selection fields may be entered; experiment data that meets all selection criteria are reported.

Help may be obtained while completing this screen by pressing the NEXT_SCREEN keypad key (PAGE DOWN on PC keypad.) The following screen will be displayed.

```
Report Select Help Screen

Length and format of screening fields:

Session Identification     => 10 Characters
Sample Identification      => 10 Characters
Experiment Date (YYMMDD)   =>  6 Characters
Research Lab ID            =>  4 Characters
Test Type Code             =>  2 Characters
Bacteria Strain            => 15 Characters

Press PREV_SCREEN key to return to selection screen.
```

Figure 3-3. Report Screen #2

To return to the REPORT Selection menu, press the PREV_SCREEN keypad key (PAGE UP on PC keypad).

3.4.2 Processing

After the selection criteria are correctly entered, a menu of the available report formats will be displayed. The following screen will be displayed.

```
*** REPORT SELECTION MENU ***

Enter      To run -

S          Statistics Report Format
I          Inventory Report Format
R          Raw Data Report Format
U          Summary Report Format
M          Main Data Selection Menu
E          Exit Report Menu

      Enter code to run ==>
```

Figure 3-4. Report Screen #3

The user may select one of the four report formats, return to the data selection screen, or return to the main GeneTox menu.

3.4.2.1 Statistics Report Format

This option allows the user to produce an extract of experiment data from the VAX data bases in an output form that the statistical analysis programs can use as input for processing. The user may direct output to any one of three output media (ASCII file, the terminal screen, or a printer), or request the extract of experiment data and associated execution of the statistical models. The following screen, which lists these statistical reporting alternatives, will be displayed.

```
                                        10/22/92

*** STATISTICAL MODEL SELECTION MENU ***

Enter      To run -

F          Model input data written to File
S          Model input data written to Screen
P          Model input data printed to Laser
R          Statistical Models Executed
E          Terminate Report Request

      Enter code to run ==>
```

Figure 3-5. Statistics Screen #1

3.4.2.1.1 Model Input Data to a File

Upon selection of this option, the user will be prompted for a file name which will contain extracted data. The following screen is displayed to the user:

```
Enter Filename for output report =>
```

Figure 3-6. Statistics Screen #2

The file name (and an optional file extension) must be specified to produce the file.

3.4.2.1.2 Model Input Data to the Screen

Upon selection of this option, extracted data is displayed to the screen in model input form.

3.4.2.1.3 Model Input Data to a Printer

Upon selection of this option, extracted data is routed to the system printer defined by the VAX logical GTMSYSPRINTER. This logical definition is discussed above in Section 2.1.2.

3.4.2.1.4 Statistical Models Executed

This function allows the user to execute statistical models that analyze experiment data extracted from the VAX-based master data bases for GeneTox. The two statistical analysis programs currently supported on the VAX are the STEAD Model and the BERNSTEIN Model. When selecting this option, both programs are executed - the STEAD Model first, followed by the BERNSTEIN Model. Statistical and graphical analysis of experiment data are performed by the statistical models; output for this option is described below in the Outputs section.

3.4.2.1.4.1 User Input

Upon selection of this option, the user will be prompted with the following screen to select one or both of the available statistical models to run.

```
*** STATISTICAL MODEL SELECTION SUBMENU ***

Enter      To Run

  S        Run STEAD Model Only
  B        Run BERSTEIN Model Only
  A        Run Both Models
  E        Terminate Report Request

                Enter code to run ==>
```

Figure 3-7. Statistical Model Selection Menu

No user input is required to initiate processing of the statistical models. Data will be extracted from the GeneTox data bases on the VAX according to selection criteria specified in the screen described in Section 3.4 above.

3.4.2.1.4.2 Processing

In the first execution step for this option, data is extracted from the GeneTox data bases and output to an intermediate ASCII file, MODEL.DAT. The second execution step invokes one or both of the statistical models (according to the user selection), using the MODEL.DAT file as input. Invalid data found in MODEL.DAT may result in abnormal termination of the statistical models.

3.4.2.1.4.3 Outputs

Under the first execution step of this option, a data extract file named MODEL.DAT, which contains requested experiment data, is generated. An example of this extract file may be found in Appendix A. This file serves as an input file to both statistical models, under the second execution step of this option.

Output reports for the Stead and Bernstein Models are stored in default files STEADMODEL.RPT and BERNSTEIN.RPT, respectively. After successful execution of each statistical model, the user is prompted for an output destination for the report file to either the screen or a printer, as shown below.

```
***** Run Stead Model. *****

FORTRAN STOP

***** Stead Model output complete.  *****

Select screen or laser printer output for the Model results.
Enter "S" for screen and "P" for printer:
```

Figure 3-8. Stead Model Output Media Prompt

```
***** Run Bernstein Model. *****

FORTRAN STOP

***** Bernstein Model output complete. *****

Select screen or laser printer output for the Model results.
Enter "S" for screen and "P" for printer:
```

Figure 3-9. Bernstein Model Output Media Prompt

Appendix B provides an example of a Stead Model report. Appendix C provides an example of a Bernstein Model report.

3.4.2.1.4.4 Quality Control

Data is extracted from GeneTox master data bases on the VAX according to the selection criteria specified on the screen listed in Section 3.4.

3.4.2.2 Inventory Report

The Inventory Report produces a report of high-level information for each experiment, including: specific test types, identification of analyzed samples, relevant experiment strains, and associated batch dates.

3.4.2.2.1 User Input

Before the report is generated, the user is prompted for the desired output device, as listed on the screen below:

```
                                                    10/20/92

          ***  REPORT OUTPUT SELECTION MENU  ***

          Enter     To run -

            F       Report written to File
            S       Report written to Screen
            P       Print report on Laser Printer

                 Enter code to run ==>
```

Figure 3-10. Report Screen #4

Output reports may be displayed on the terminal screen, sent to a named file, or sent directly to the default laser printer. If the screen or printer options are selected, no further input is necessary to process the report (the output will also be saved in a default file name of REPORT.LIS). If the user explicitly selects the option of sending the output to a file, the following screen is displayed.

```
Enter Filename for output report =>
```

Figure 3-11. Report Screen #5

The file name (and an optional file extension) must be specified to produce the file.

3.4.2.2.2 Processing

Data is extracted according to the selection criteria entered on the selection screen, as described in Section 3.4 above.

3.4.2.2.3 Outputs

An example of the Inventory Report is found in Appendix D.

3.4.2.3 Raw Data Report

The Raw Data Report produces a report with full descriptive information for each selected experiment.

3.4.2.3.1 User Input

The only user input for this report is the same as that for the Inventory Report above, i.e., the user need only specify the intended output device as described in Section 3.4 above.

3.4.2.3.2 Processing

Data is extracted according to the selection criteria entered on the selection screen, as described in Section 3.4 above. One important note is that the text for sample description is only provided with the first set of sample analysis information for the experiment. Any additional references to the same sample for a given experiment do not include the sample description, as it would be redundant.

3.4.2.3.3 Outputs

An example of the Raw Data Report is found in Appendix E.

3.4.2.4 Summary Data Report

The Summary Data Report provides high-level information on Experiment Strains and Experiment Controls, ordered by Test Type.

3.4.2.4.1 User Input

The user input for this report is the same as that for the Inventory Report above, i.e., the user need only specify the intended output device as described in Section 3.4.2.2.1 above.

3.4.2.4.2 Processing

Data is extracted according to the selection criteria entered on the selection screen, as described in Section 3.4 above.

3.4.2.4.3 Outputs

An example of the Summary Report is found in Appendix F.

3.4.3 Outputs

Sample output for each of the available reports is provided in Appendices D through F of this User's Guide.

3.4.4 Quality Control

Only experiment data that meets all of the input selection criteria is reported to the user.

3.5 HELP Option

This function displays Help text on the GeneTox system to the terminal screen. The Help text is the same information contained in this User's Guide.

3.5.1 User Input

The Help screen is invoked by selecting 'H' on the main menu.

<RET> - The return key is the only response to the Help screens displayed.

3.5.2 Processing

The selected Help text is retrieved and displayed to the user. No other processing takes place for this option.

3.5.3 Outputs

No output files are produced for this option. The Help text is displayed to the user on the terminal screen only.

3.5.4 Quality Control

No quality control constraints are relevant for this option.

3.6 EXIT Option

This function allows the user to exit from the GeneTox system and return to the command line prompt ($). This option is selected from the main menu by entering an 'E' at the command prompt and pressing <RET>.

APPENDIX A

Extract File via the Statistics Report

```
SAMPLE_ID: PARC-91-0010  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1024      BATCH: 91/08/07  ACTIVATION: - RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL    24   29   31
150.000*ng  1358 1146 1231
  .500 ng   130  113
 1.000 ng   253
 5.000 ng   691  978
10.000 ng  1616 1598
50.000 ng  2296 2916
100.000 ng 3113 2376
@EOF
SAMPLE_ID: PARC-91-0010  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1024      BATCH: 91/08/07  ACTIVATION: + RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL    24   39   29
125.000*NG  2178 2168 2117
  .500 ng    31   25
 1.000 ng    33   41
 5.000 ng    39   36
10.000 ng    41   56
50.000 ng   177  210
100.000 ng  474  612
@EOF
SAMPLE_ID: PARC-91-0010  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1029      BATCH: 91/08/07  ACTIVATION: - RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL   225  207  198
500.000*ng  419  397  409
 1.000 ng   243  280
 5.000 ng   237  261
10.000 ng   487  291
50.000 ng  1526  312
100.000 ng 2310 2283
500.000 ng 1969 2376
@EOF
SAMPLE_ID: PARC-91-0010  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1029      BATCH: 91/08/07  ACTIVATION: + RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL   135  147  175
125.000*NG  1214 1098 1302
 1.000 ng   188  174
 5.000 ng   179  191
10.000 ng   225  211
50.000 ng   738  654
100.000 ng 1113 1186
500.000 ng 1952 1930
@EOF
SAMPLE_ID: PARC-91-0011  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 7-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1024      BATCH: 91/08/07  ACTIVATION: - RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL    24   29   31
150.000*ng  1358 1146 1231
  .500 ng    68   29
 1.000 ng    98   38
 5.000 ng   115   98
10.000 ng   416  486
50.000 ng  1155  638
100.000 ng 1101 2825
@EOF
SAMPLE_ID: PARC-91-0011  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 7-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1024      BATCH: 91/08/07  ACTIVATION: + RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL    24   39   29
125.000*NG  2178 2168 2117
  .500 ng    18   29
 1.000 ng    27   25
 5.000 ng    56   55
10.000 ng    76   43
50.000 ng   146  179
100.000 ng  745  845
@EOF
SAMPLE_ID: PARC-91-0011  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 7-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1029      BATCH: 91/08/07  ACTIVATION: - RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL   225  207  198
500.000*ng  419  397  409
 5.000 ng   179  181
10.000 ng   187  207
50.000 ng   280  260
100.000 ng  519  212
500.000 ng 1500 1485
1000.000 ng 1543 1686
@EOF
SAMPLE_ID: PARC-91-0011  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 7-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041              TECHNICIAN: MST
STRAIN: YG1029      BATCH: 91/08/07  ACTIVATION: + RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:  1.5 (In Hours)      TEMP:  37.0 (Centigrade)
  .000 UL   135  147  175
125.000*NG  1214 1098 1302
 5.000 ng   198  200
10.000 ng   144  183
50.000 ng   200  163
100.000 ng  187  177
500.000 ng  596  450
1000.000 ng 771  788
@EOF
```

APPENDIX B

Sample Output from Stead Model

```
*******************************************
* S T E A D   M O D E L   A N A L Y S I S *
*******************************************

SAMPLE_ID: PARC-91-0010  LAB: EHRT   DATE: 91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041                TECHNICIAN: MST
STRAIN: YG1024      BATCH: 91/08/07  ACTIVATION: - RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME:   1.5 (In Hours)      TEMP:  37.0 (Centigrade)
```

MEAN	S.D.	DOSE	UNITS	PLATE COUNTS		
28.00	3.61	0.00	UL	24	29	31
1245.00	106.69	150.00*	ng	1358	1146	1231
121.50	12.02	0.50	ng	130	113	
253.00	0.00	1.00	ng	253		
834.50	202.94	5.00	ng	691	978	
1607.00	12.73	10.00	ng	1616	1598	
2606.00	438.41	50.00	ng	2296	2916	
2744.50	521.14	100.00	ng	3113	2376	

	B(0)	B(1)	B(2)	B(3)
ESTS.	24.0623	5.5421	0.7776	0.01250

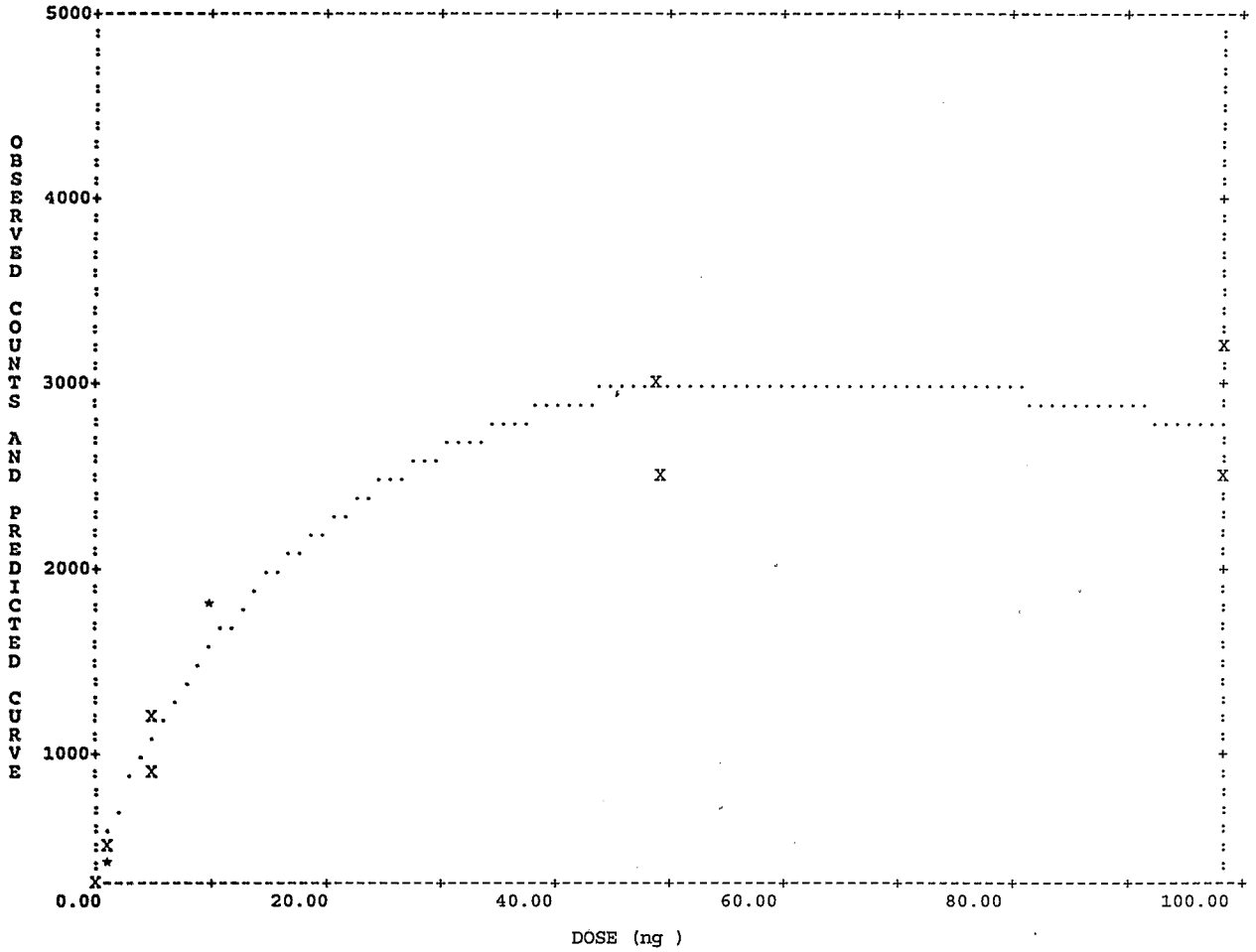
TEST	CHI-SQUARE	DF	P	DLOGL
POISSON	224.28	7	0.0000	-167.8005
ADEQUACY	176.47	3	0.0000	-256.0340
TOXICITY	785.05	1	0.0000	-648.5595
MUTAGENICITY	28104.82	2	0.0000	-14308.4430

AVERAGE SLOPE (NONLIN. MODEL) = 106.896

AVERAGE SLOPE (LINEAR REGR.) = 48.437
95% CONF. LIMITS = (32.033, 64.840)

WARNING: 4 PARAMETER MODEL DID NOT CONVERGE
WARNING: 3 PARAMETER MODEL DID NOT CONVERGE

SAMPLE_ID: PARC-91-0010 LAB:EHRT DATE: 91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041 TECHNICIAN: MST
STRAIN: YG1024 BATCH: 91/08/07 ACTIVATION: - RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME: 1.5 (In Hours) TEMP: 37.0 (Centigrade)



APPENDIX C

Sample Output from Bernstein Model

```
*****************************************************
* B E R N S T E I N   M O D E L   A N A L Y S I S *
*****************************************************
```

SAMPLE_ID: PARC-91-0010 LAB: EHRT DATE: 91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041 TECHNICIAN: MST
STRAIN: YG1024 BATCH: 91/08/07 ACTIVATION: - RLA058
TEST TYPE: 17 - Reduced Kado Assay, 100 ul rxn vol.
TIME: 1.5 (In Hours) TEMP: 37.0 (Centigrade)

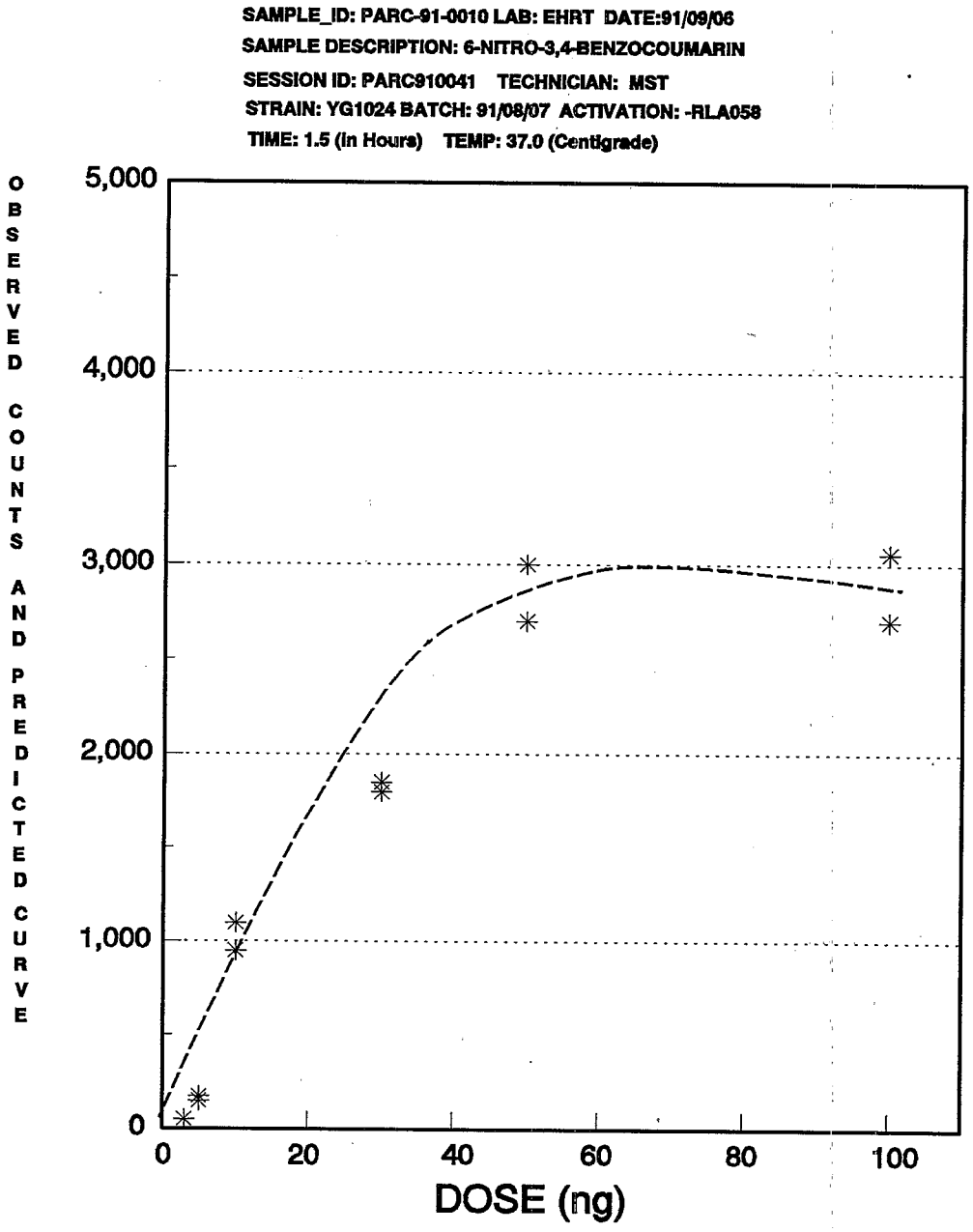
DOSE UNITS	PLATE COUNTS
0.00 UL	24. 29. 31.
150.00* UL	1358. 1146. 1231.
0.50 ng	130. 113.
1.00 ng	253.
5.00 ng	691. 978.
10.00 ng	1616. 1598.
50.00 ng	2296. 2916.
100.00 ng	3113. 2376.

5 Dose Levels Used.

NOTE: B(0) is the estimated Intercept
B(1) is the estimated Slope
C is the estimated Variance/Mean Ratio

	B(0)	B(1)	C
ESTS.	29.0300007	161.6000061	7.6160002
S. D.	7.6236472	6.4799695	3.4842503

TEST	CHI-SQUARE	DF	P
Adequacy	3.7800	3	0.2863
Regr	1.8650	2	0.3936
Cntrls	1.9150	1	0.1664
Mutagenicity	790.8000	1	0.0000


SAMPLE_ID: PARC-91-0010 LAB: EHRT DATE:91/09/06
SAMPLE DESCRIPTION: 6-NITRO-3,4-BENZOCOUMARIN
SESSION ID: PARC910041 TECHNICIAN: MST
STRAIN: YG1024 BATCH: 91/08/07 ACTIVATION: -RLA058
TIME: 1.5 (In Hours) TEMP: 37.0 (Centigrade)
OBSERVED COUNTS AND PREDICTED CURVE
5,000
4,000
3,000
2,000
1,000
0
0
20
40
60
80
100
DOSE (ng)

APPENDIX D

Inventory Report Example

Sample ID No.	Sample Description	TEST TYPE	STRAIN	ACTIVATION	LVL	LAB	DATE
PARC-91-0010	6-NITRO-3,4-BENZOCOUMARIN	Reduced Kado Assay, 100 u	YG1024		0	EHRT	91/09/06
		Reduced Kado Assay, 100 u	YG1024	RLA058	1	EHRT	91/09/06
		Reduced Kado Assay, 100 u	YG1029		0	EHRT	91/09/06
		Reduced Kado Assay, 100 u	YG1029	RLA058	1	EHRT	91/09/06
PARC-91-0011	7-NITRO-3,4-BENZOCOUMARIN	Reduced Kado Assay, 100 u	YG1024		0	EHRT	91/09/06
		Reduced Kado Assay, 100 u	YG1024	RLA058	1	EHRT	91/09/06
		Reduced Kado Assay, 100 u	YG1029		0	EHRT	91/09/06
		Reduced Kado Assay, 100 u	YG1029	RLA058	1	EHRT	91/09/06

APPENDIX E

Raw Data Report Example

```
**************************
* Raw Data Output Report *
**************************
                                    Report Date: 10/20/92
                                    Page Num.:  1
Sample ID: PARC-91-0010      ResLab..: EHRT          Exp Date.: 09/06/91
Samp Desc: 6-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041        Lab Tech: MST           P Invest.: JL
Strain...: YG1024            Str Date: 08/07/91      Act Type.:
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol.   Act Level: 0
Time (Hr):  1.5              Temp C..:  37.0         Input By.: MST
-----------------------------------------------------------------------
 Dose    Dose   Plate  Plate  Plate  Plate  Plate
Amount   Units  Count  Count  Count  Count  Count   Mean       SD
-------  -----  -----  -----  -----  -----  -----  ---------- ----------
  0.000  UL      24     29     31                   28.0000    3.6056
   .500  ng     130    113                         121.5000   12.0208
  1.000  ng     253                               253.0000     .0000
  5.000  ng     691    978                         834.5000  202.9396
 10.000  ng    1616   1598                        1607.0000   12.7279
 50.000  ng    2296   2916                        2606.0000  438.4062
100.000  ng    3113   2376                        2744.5000  521.1377

            POSITIVE CONTROL NAME..:  Nitrofluorene,2-
150.000 *ng    1358   1146   1231                1245.0000  106.6911

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91              Culture Density...: 5X
Pheno Copy Check.....: 1                     Incubation Hours....:  72.00
Samp Sterility Before: 1                     Samp Sterility After: 1
S9 Sterility Before..: 1                     S9 Sterility After..: 1
Solvent..............: DMSO                 Solv Amt:   2  Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture
-----------------------------------------------------------------------
```

```
**************************
* Raw Data Output Report *
*   Sample Description   *
**************************
                                  Page Num.:  2
Sample ID: PARC-91-0010  P Invest: JL    Cas Number:
Source Batch and Lot No.:
-----------------------------------------------------------
Sample Description: 6-NITRO-3,4-BENZOCOUMARIN
```

```
***************************
* Raw Data Output Report *
*     S9 Description     *
***************************
                                Page Num.:  3
Activation Type: RLA058
S9 Level 1.....: 50        S9 Units 1.....: UL
S9 Level 2.....:           S9 Units 2.....:
-----------------------------------------------------------------------
```

****
* Raw Data Output Report *
****

Report Date: 10/20/92
Page Num.: 4

Sample ID: PARC-91-0011 ResLab..: EHRT Exp Date.: 09/06/91
Samp Desc: 7-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041 Lab Tech: MST P Invest.: JL
Strain...: YG1024 Str Date: 08/07/91 Act Type.:
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol. Act Level: 0
Time (Hr): 1.5 Temp C..: 37.0 Input By.: MST

Dose Amount	Dose Units	Plate Count	Plate Count	Plate Count	Plate Count	Plate Count	Mean	SD
0.000	UL	24	29	31			28.0000	3.6056
.500	ng	68	29				48.5000	27.5772
1.000	ng	98	38				68.0000	42.4264
5.000	ng	115	98				106.5000	12.0208
10.000	ng	416	486				451.0000	49.4975
50.000	ng	1155	638				896.5000	365.5742
100.000	ng	1101	2825				1963.0000	1219.0521
POSITIVE CONTROL NAME..: Nitrofluorene,2-								
150.000	*ng	1358	1146	1231			1245.0000	106.6911

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91 Culture Density...: 5X
Pheno Copy Check.....: 1 Incubation Hours....: 72.00
Samp Sterility Before: 1 Samp Sterility After: 1
S9 Sterility Before..: 1 S9 Sterility After..: 1
Solvent.....: DMSO Solv Amt: 2 Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture

```
**************************
* Raw Data Output Report *
*   Sample Description   *
**************************
                                  Page Num.:  5
Sample ID: PARC-91-0011  P Invest: JL    Cas Number:
Source Batch and Lot No.:
-----------------------------------------------------------------------
Sample Description: 7-NITRO-3,4-BENZOCOUMARIN
```

****
* Raw Data Output Report *
****

Report Date: 10/20/92
Page Num.: 6

Sample ID: PARC-91-0010 ResLab..: EHRT Exp Date.: 09/06/91
Samp Desc: 6-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041 Lab Tech: MST P Invest.: JL
Strain...: YG1024 Str Date: 08/07/91 Act Type.: RLA058
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol. Act Level: 1
Time (Hr): 1.5 Temp C..: 37.0 Input By.: MST

Dose Amount	Dose Units	Plate Count	Plate Count	Plate Count	Plate Count	Plate Count	Mean	SD
0.000	UL	24	39	29			30.6667	7.6376
.500	ng	31	25				28.0000	4.3426
1.000	ng	33	41				37.0000	5.6569
5.000	ng	39	36				37.5000	2.1213
10.000	ng	41	56				48.5000	10.6066
50.000	ng	177	210				193.5000	23.3345
100.000	ng	474	612				543.0000	97.5807
POSITIVE CONTROL NAME..: Aminoanthracene,2-								
125.000	*NG	2178	2168	2117			2154.3333	32.7159

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91 Culture Density...: 5X
Pheno Copy Check.....: 1 Incubation Hours....: 72.00
Samp Sterility Before: 1 Samp Sterility After: 1
S9 Sterility Before..: 1 S9 Sterility After..: 1
Solvent.....: DMSO Solv Amt: 2 Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture

```
**************************
* Raw Data Output Report *
*   Sample Description   *
**************************
                                Page Num.:  7
Sample ID: PARC-91-0010  P Invest: JL    Cas Number:
Source Batch and Lot No.:
-----------------------------------------------------------------------
Sample Description: 6-NITRO-3,4-BENZOCOUMARIN
```

****
* Raw Data Output Report *
****

Report Date: 10/20/92
Page Num.: 8

Sample ID: PARC-91-0011 ResLab..: EHRT Exp Date.: 09/06/91
Samp Desc: 7-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041 Lab Tech: MST P Invest.: JL
Strain...: YG1024 Str Date: 08/07/91 Act Type.: RLA058
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol. Act Level: 1
Time (Hr): 1.5 Temp C..: 37.0 Input By.: MST

Dose Amount	Dose Units	Plate Count	Plate Count	Plate Count	Plate Count	Plate Count	Mean	SD
0.000	UL	24	39	29			30.6667	7.6376
.500	ng	18	29				23.5000	7.7782
1.000	ng	27	25				26.0000	1.4142
5.000	ng	56	55				55.5000	.7071
10.000	ng	76	43				59.5000	23.3345
50.000	ng	146	179				162.5000	23.3345
100.000	ng	745	845				795.0000	70.7107

POSITIVE CONTROL NAME..: Aminoanthracene,2-

125.000	*NG	2178	2168	2117		2154.3333	32.7159

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91 Culture Density...: 5X
Pheno Copy Check.....: 1 Incubation Hours....: 72.00
Samp Sterility Before: 1 Samp Sterility After: 1
S9 Sterility Before..: 1 S9 Sterility After..: 1
Solvent.....: DMSO Solv Amt: 2 Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture

```
**************************
* Raw Data Output Report *
*   Sample Description   *
**************************
                                Page Num.:  9
Sample ID: PARC-91-0011  P Invest: JL    Cas Number:
Source Batch and Lot No.:
-----------------------------------------------------------------------------
Sample Description: 7-NITRO-3,4-BENZOCOUMARIN
```

****
* Raw Data Output Report *
****

Report Date: 10/20/92
Page Num.: 10

Sample ID: PARC-91-0010 ResLab..: EHRT Exp Date.: 09/06/91
Samp Desc: 6-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041 Lab Tech: MST P Invest.: JL
Strain...: YG1029 Str Date: 08/07/91 Act Type.:
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol. Act Level: 0
Time (Hr): 1.5 Temp C..: 37.0 Input By.: MST

Dose Amount	Dose Units	Plate Count	Plate Count	Plate Count	Plate Count	Plate Count	Mean	SD
0.000	UL	225	207	198			210.0000	13.7477
1.000	ng	243	280				261.5000	26.1630
5.000	ng	237	261				249.0000	16.9706
10.000	ng	487	291				389.0000	138.5929
50.000	ng	1526	312				919.0000	858.4276
100.000	ng	2310	2283				2296.5000	19.0919
500.000	ng	1969	2376				2172.5000	287.7925

POSITIVE CONTROL NAME..: Sodium Azide

500.000	*ng	419	397	409			408.3333	11.0151

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91 Culture Density...: 5X
Pheno Copy Check.....: 1 Incubation Hours....: 72.00
Samp Sterility Before: 1 Samp Sterility After: 1
S9 Sterility Before..: 1 S9 Sterility After..: 1
Solvent.....: DMSO Solv Amt: 2 Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture

****
* Raw Data Output Report *
* Sample Description *
****

Sample ID: PARC-91-0010 P Invest: JL Cas Number:
Source Batch and Lot No.:

Sample Description: 6-NITRO-3,4-BENZOCOUMARIN

****
* Raw Data Output Report *
****

Report Date: 10/20/92
Page Num.: 12

Sample ID: PARC-91-0011 ResLab..: EHRT Exp Date.: 09/06/91
Samp Desc: 7-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041 Lab Tech: MST P Invest.: JL
Strain...: YG1029 Str Date: 08/07/91 Act Type.:
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol. Act Level: 0
Time (Hr): 1.5 Temp C..: 37.0 Input By.: MST

Dose Amount	Dose Units	Plate Count	Plate Count	Plate Count	Plate Count	Plate Count	Mean	SD
0.000	UL	225	207	198			210.0000	13.7477
5.000	ng	179	181				180.0000	1.4142
10.000	ng	187	207				197.0000	14.1421
50.000	ng	280	260				270.0000	14.1421
100.000	ng	519	212				365.5000	217.0818
500.000	ng	1500	1485				1492.5000	10.6066
1000.000	ng	1543	1686				1614.5000	101.1163

POSITIVE CONTROL NAME..: Sodium Azide

500.000	*ng	419	397	409			408.3333	11.0151

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91 Culture Density...: 5X
Pheno Copy Check.....: 1 Incubation Hours....: 72.00
Samp Sterility Before: 1 Samp Sterility After: 1
S9 Sterility Before..: 1 S9 Sterility After..: 1
Solvent.....: DMSO Solv Amt: 2 Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture

```
***************************
* Raw Data Output Report *
*   Sample Description   *
***************************
                                  Page Num.: 13
Sample ID: PARC-91-0011  P Invest: JL    Cas Number:
Source Batch and Lot No.:
-----------------------------------------------------------------
Sample Description: 7-NITRO-3,4-BENZOCOUMARIN
```

****
* Raw Data Output Report *
****

Report Date: 10/20/92
Page Num.: 14

Sample ID: PARC-91-0010 ResLab..: EHRT Exp Date.: 09/06/91
Samp Desc: 6-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041 Lab Tech: MST P Invest.: JL
Strain...: YG1029 Str Date: 08/07/91 Act Type.: RLA058
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol. Act Level: 1
Time (Hr): 1.5 Temp C..: 37.0 Input By.: MST

Dose Amount	Dose Units	Plate Count	Plate Count	Plate Count	Plate Count	Plate Count	Mean	SD
0.000	UL	135	147	175			152.3333	20.5264
1.000	ng	188	174				181.0000	9.8995
5.000	ng	179	191				185.0000	8.4853
10.000	ng	225	211				218.0000	9.8995
50.000	ng	738	654				696.0000	59.3970
100.000	ng	1113	1186				1149.5000	51.6188
500.000	ng	1952	1930				1941.0000	15.5563

POSITIVE CONTROL NAME..: Aminoanthracene,2-

125.000	*NG	1214	1098	1302			1204.6667	102.3198

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91 Culture Density...: 5X
Pheno Copy Check.....: 1 Incubation Hours....: 72.00
Samp Sterility Before: 1 Samp Sterility After: 1
S9 Sterility Before..: 1 S9 Sterility After..: 1
Solvent.....: DMSO Solv Amt: 2 Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture

```
**************************
* Raw Data Output Report *
*   Sample Description   *
**************************
                                    Page Num.: 15
Sample ID: PARC-91-0010  P Invest: JL    Cas Number:
Source Batch and Lot No.:
-----------------------------------------------------------------------
Sample Description: 6-NITRO-3,4-BENZOCOUMARIN
```

****
* Raw Data Output Report *
****

Report Date: 10/20/92
Page Num.: 16

Sample ID: PARC-91-0011 ResLab..: EHRT Exp Date.: 09/06/91
Samp Desc: 7-NITRO-3,4-BENZOCOUMARIN
Exp Name.: PARC910041 Lab Tech: MST P Invest.: JL
Strain...: YG1029 Str Date: 08/07/91 Act Type.: RLA058
Test Type: 17 - Reduced Kado Assay, 100 ul rxn vol. Act Level: 1
Time (Hr): 1.5 Temp C..: 37.0 Input By.: MST

Dose Amount	Dose Units	Plate Count	Plate Count	Plate Count	Plate Count	Plate Count	Mean	SD
0.000	UL	135	147	175			152.3333	20.5264
5.000	ng	198	200				199.0000	1.4142
10.000	ng	144	183				163.5000	27.5772
50.000	ng	200	163				181.5000	26.1630
100.000	ng	187	177				182.0000	7.0711
500.000	ng	596	450				523.0000	103.2376
1000.000	ng	771	788				779.5000	12.0208
POSITIVE CONTROL NAME..: Aminoanthracene,2-								
125.000	*NG	1214	1098	1302			1204.6667	102.3198

Negative Control Name: DMSO
Laboratory Book Num..: MT-6
Computer Entry Date..: 09/25/91 Culture Density...: 5X
Pheno Copy Check.....: 1 Incubation Hours....: 72.00
Samp Sterility Before: 1 Samp Sterility After: 1
S9 Sterility Before..: 1 S9 Sterility After..: 1
Solvent.....: DMSO Solv Amt: 2 Solv Unt: UL
Assay Modification...: 5X cells, 2 ul sample, 50ul culture

```
**************************
* Raw Data Output Report *
*   Sample Description   *
**************************
                                Page Num.: 17
Sample ID: PARC-91-0011  P Invest: JL    Cas Number:
Source Batch and Lot No.:
-----------------------------------------------------------------------
Sample Description: 7-NITRO-3,4-BENZOCOUMARIN
```

APPENDIX F

Summary Report Example

Test Type: 17

Strain Name	Strain Date	Activation L Typ Lot	ResL	Exper.	Lab Date	Negative Control Tech	Cd	Name	Counts			Mean,	STD
YG1024	91/08/07	0 RLA 058	EHRT	91/09/06	MST	54		DMSO	24	29	31	28.00	3.61
YG1024	91/08/07	1 RLA 058	EHRT	91/09/06	MST	54		DMSO	24	39	29	30.67	7.64
YG1029	91/08/07	0 RLA 058	EHRT	91/09/06	MST	54		DMSO	225	207	198	210.00	13.75
YG1029	91/08/07	1 RLA 058	EHRT	91/09/06	MST	54		DMSO	135	147	175	152.33	20.53

APPENDIX G

GENETOX MANAGER SYSTEM
TRANSFER FILE RECORD DESCRIPTIONS

Record Type ST01 - Required with all associated records below for EACH experiment/strain combination.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	ST01 - Master record for an experiment strain
5-13	ExpKeys	Integer	9	Experiment strain key
14	RecStat	Character	1	Data record status in PC databases: (A)ctive, (I)nactive, (M)odified, (R)ead Only,(V)ax Download, (X)Archived
15-24	ExpNam	Character	10	Experiment Name
25-30	StrnAbr	Character	6	Strain Abbreviation
31-36	StrnDate	Date	6	Strain Date (YYMMDD)
37	ActLevel	Character	1	Activation Level
38	GenRec	Character	1	General Experiment Info included (Y/N)
39-41	NumSmp	Integer	2	Number of Samples included for this experiment strain analysis
42-43	NumNeg	Integer	2	Number of negative controls for this experiment strain analysis
44-45	NumPos	Integer	2	Number of positive controls for this experiment strain analysis
46-55	CultDnsy	Character	10	Culture Density
56	TFFormat	Character	1	Transfer file format (N = new)

End-of-record

Record Type GE01 - Required if GenRec field in STO1 record = Y.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	GE01 - General experiment information
5-13	ExpKeys	Integer	9	Experiment strain key
14	RecStat	Character	1	Data record status in PC databases: (A)ctive, (I)nactive, (M)odified, (R)ead Only, (V)ax Download, (X)Archived
15-20	ExpDate	Date	6	Experiment Date (YYMMDD)
21-22	TesTypCod	Integer	2	Test type code
23-28	S9TypLot	Character	6	S9 Type and Lot
29-32	LabTech	Character	4	Lab Technician initials
33-67	TesTypDes	Character	35	Test type description

End-of-record

Record Type GE02 - Required if GenRec field in STO1 record = Y.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	GE02 - General experiment information
5-13	ExpKeys	Integer	9	Experiment strain key
14-16	TimeMi	Integer	3	Experiment time in minutes
17-22	TimeHr	Floating	6.1	Experiment time in hours
23-28	TempF	Floating	6.1	Temperature in Farenheit
29-34	TempC	Floating	6.1	Temperature in Centigrade
35-59	LabBook	Character	25	LabBook Number
60-63	ResLabID	Character	4	Research Lab ID

End-of-record

Record Type GE03 - Required if GenRec field in STO1 record = Y.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	GE03 - General experiment information
5-13	ExpKeys	Integer	9	Experiment strain key
14-48	AsyModf	Character	35	Assay Modification
49-54	EnDate	Date	6	Data entry date (YYMMDD)
55-58	P_Invest	Character	4	Principal investigator initials
59-62	EntryTech	Character	4	Data entry technician initials

End-of-record

Record Type GE04 - Required if GenRec field in STO1 record = Y.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	GE04 - General experiment information
5-13	ExpKeys	Integer	9	Experiment strain key
14	S9StrB	Integer	1	S9 sterility before
15	S9StrA	Integer	1	S9 sterility after
16-21	S9Level1	Character	1	S9 level 1
22-27	S9Level2	Character	1	S9 level 2
28-31	S9Units1	Character	4	S9 units 1
32-35	S9Units2	Character	4	S9 units 2
36	S9Used	Character	1	S9 used (+/-)
37-40	NmS9Desc	Integer	4	Number of S9 description records to follow (i.e., number of GE05s)

End-of-record

Record Type GE05 - Number of GE05 records must correspond to value in NmS9Desc field in GE04 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	GE05 - General experiment information
5-13	ExpKeys	Integer	9	Experiment strain key
14-78	S9Desc	Character	65	S9 description line

End-of-record

Record Type NP01 - Number of NP01/NP02 record sets must correspond to value in NumNeg field in ST01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	NP01 - Negative control general information
5-13	NegKey	Integer	9	Negative control key
14	RecStat	Character	1	Data record status in PC databases: (A)ctive, (I)nactive, (M)odified, (R)ead Only, (V)ax Download, (X)Archived
15-16	NegCode	Integer	2	Negative control code
17-36	NegName	Character	20	Negative control name
37-45	NegAmt	Floating	9.3	Negative control amount
46-48	NegUnit	Character	3	Negative control units
49-58	NegMean	Floating	10.4	Negative control mean
59-68	NegStDev	Floating	10.4	Negative control standard deviation
69	NmNegCnt	Integer	1	Number of negative control plate counts to follow in NP02 record

End-of-record

Record Type NP02 - Number of NP01/NP02 record sets must correspond to value in NumNeg field in ST01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	NP02 - Negative control plate counts
5-13	NegKey	Integer	9	Negative control key
14-18	NegPlCnt1	Integer	5	Plate count 1
19	NegBkgnd1	Character	1	Background code 1
20-24	NegPlCnt2	Integer	5	Plate count 2
25	NegBkgnd2	Character	1	Background code 2
26-30	NegPlCnt3	Integer	5	Plate count 3
31	NegBkgnd3	Character	1	Background code 3
32-36	NegPlCnt4	Integer	5	Plate count 4
37	NegBkgnd4	Character	1	Background code 4
38-42	NegPlCnt5	Integer	5	Plate count 5
43	NegBkgnd5	Character	1	Background code 5

End-of-record

Record Type PP01 - Number of PP01/PP02 record sets must correspond to value in NumPos field in ST01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	PP01 - Positive control general information
5-13	PosKey	Integer	9	Positive control key
14	RecStat	Character	1	Data record status in PC databases: (A)ctive, (I)nactive, (M)odified, (R)ead Only, (V)ax Download, (X)Archived
15-16	PosCode	Integer	2	Positive control code
17-36	PosName	Character	20	Positive control name
37-45	PosAmt	Floating	9.3	Positive control amount
46-48	PosUnit	Character	3	Positive control units
49-58	PosMean	Floating	10.4	Positive control mean
59-68	PosStDev	Floating	10.4	Positive control standard deviation
69	NmPosCnt	Integer	1	Number of positive control plate counts to follow in PP02 record

End-of-record

Record Type PP02 - Number of PP01/PP02 record sets must correspond to value in NumPos field in ST01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	PP02 - Positive control plate counts
5-13	PosKey	Integer	9	Positive control key
14-18	PosPlCnt1	Integer	5	Plate count 1
19	PosBkgnd1	Character	1	Background code 1
20-24	PosPlCnt2	Integer	5	Plate count 2
25	PosBkgnd2	Character	1	Background code 2
26-30	PosPlCnt3	Integer	5	Plate count 3
31	PosBkgnd3	Character	1	Background code 3
32-36	PosPlCnt4	Integer	5	Plate count 4
37	PosBkgnd4	Character	1	Background code 4
38-42	PosPlCnt5	Integer	5	Plate count 5
43	PosBkgnd5	Character	1	Background code 5

End-of-record

Record Type SM01 - Number of SM01 record sets must correspond to value in NumSmp field in ST01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	SM01 - Sample analysis header information
5-13	SampKey	Integer	9	Sample key
14	RecStat	Character	1	Data record status in PC databases: (A)ctive, (I)nactive, (M)odified, (R)ead Only, (V)ax Download, (X)Archived
15-18	Filler			Not currently used
19-22	SmpLabID	Character	4	Sample lab ID
23-24	SmpYr	Integer	2	Sample year
25-28	SmpNo	Integer	4	Sample number
29	PhenoCod	Integer	1	Phenocopy code check
30	SmplStrB	Integer	1	Sample sterility before
31	SmplStrA	Integer	1	Sample sterility after
32-55	DosUnits	Character	24	Dose units
56-57	NumDose	Integer	2	Number of doses
58	GenSm	Character	1	General sample information included (Y/N) (i.e., do SM02-SM04 records follow?)
59-62	RemCt	Integer	4	Number of remarks records that follow (SM05s)
63-66	NumSDc	Integer	4	Number of sample description records that follow (SM02s)
67-75	OldKey	Integer	9	Old sample key if the SampKey field is a replacement

End-of-record

Record Type SM02 - Required for each SM01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	SM02 - Sample description records
5-13	SampKey	Integer	9	Sample key
14-38	SolvDesc	Character	25	Solvent description
39-42	SolvAmtPt	Integer	4	Solvent amount per plate
43-45	SolvUnits	Character	3	Solvent units
46-51	IncubatHr	Floating	6.2	Incubation hours

End-of-record

Record Type SM03 - Number of SM03 records must correspond to value in NumSDc field in SM01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	SM03 - General sample information
5-13	SampKey	Integer	9	Sample key
14-64	SampDesc	Character	51	Sample description line

End-of-record

Record Type SM04 - Required if GenSm field = Y in SM01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	SM04 - General sample information
5-13	SampKey	Integer	9	Sample key
14-64	Sc_Bat_Lot	Character	51	Source/Batch/Lot
46-60	CasNum	Character	15	CAS number

End-of-record

Record Type SM05 - Number of SM05 records must correspond to value in RemCt field in SM01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	SM05 - Sample remarks records
5-13	SampKey	Integer	9	Sample key
14-73	SampDesc	Character	60	Sample remark line

End-of-record

Record Type TD01 - Number of TD01/TD02 record sets must correspond to value in NumDose field in SM01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	TD01 - Dose analysis information
5-13	ExpKeys	Integer	9	Experiment strain key
14-22	SampKey	Integer	9	Sample key
23	RecStat	Character	1	Data record status in PC databases: (A)ctive, (I)nactive, (M)odified, (R)ead Only, (V)ax Download, (X)Archived
24-32	Dose	Floating	9.3	Dose amount
33-42	TestMean	Floating	10.4	Test dose mean
43-52	TestDev	Floating	10.4	Test dose standard deviation
53	TestCnt	Integer	1	Number of test plate counts to follow in TD02 record

End-of-record

Record Type TD02 - Number of TD01/TD02 record sets must correspond to value in NumDose field in ST01 record.

Col	Field	Data Type	Len	Description
1-4	RecType	Character	4	TD02 - Test plate counts
5-13	SampKey	Integer	9	Sample key
14-18	TstPlCnt1	Integer	5	Plate count 1
19	TstBkgnd1	Character	1	Background code 1
20-24	TstPlCnt2	Integer	5	Plate count 2
25	TstBkgnd2	Character	1	Background code 2
26-30	TstPlCnt3	Integer	5	Plate count 3
31	TstBkgnd3	Character	1	Background code 3
32-36	TstPlCnt4	Integer	5	Plate count 4
37	TstBkgnd4	Character	1	Background code 4
38-42	TstPlCnt5	Integer	5	Plate count 5
43	TstBkgnd5	Character	1	Background code 5

End-of-record

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