
HGRS DATA ACQUISITION SYSTEM

SOFTWARE USERS MANUAL



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MANUAL NUMBER 21-11-1129

REVISION C ISSUED: 8/98

**HGRS Data Acquisition System
Software Users Manual**

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Attachments:

 Sample HGRS Recipe Report

**HGRS Data Acquisition System
Software Users Manual**

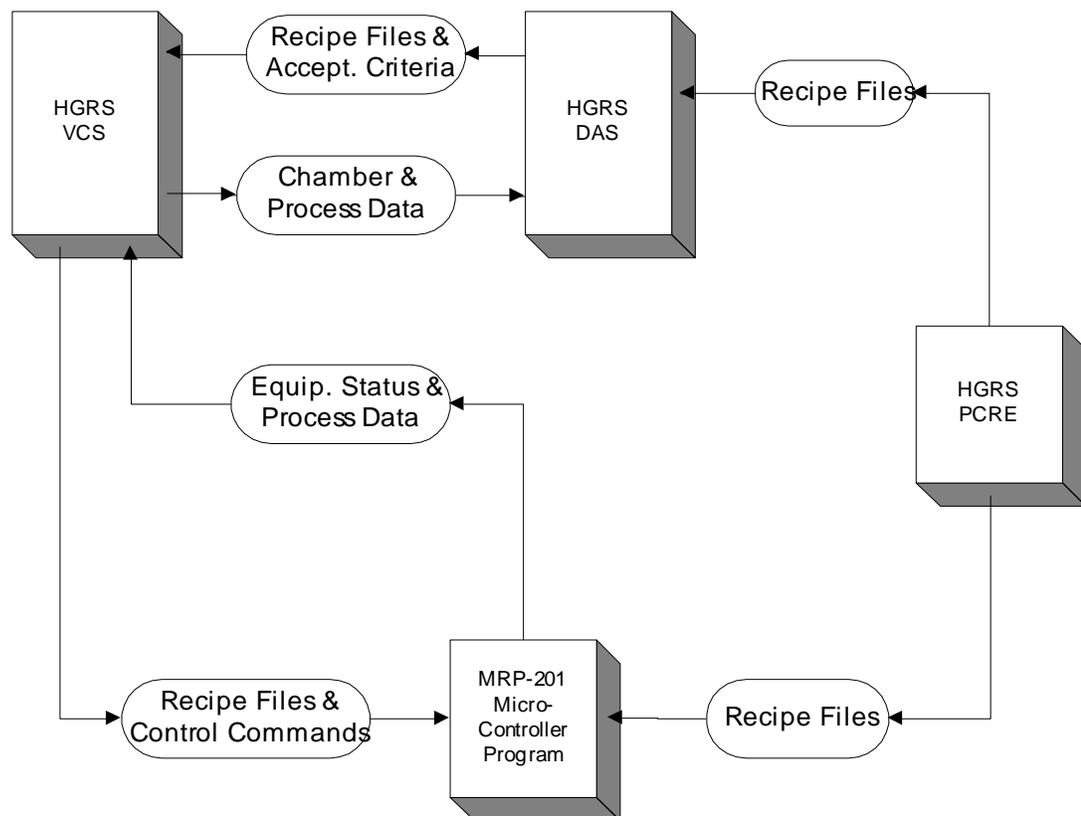
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1.0 Introduction

Galiso Incorporated/Nuvac Innovations would like to thank you for your investment and participation in this exciting new technology. The Hot Gas Recirculation and Sweep process, HGRS, is the state of the art in chamber vacuum acquisition and contamination removal. The patented and patent pending HGRS systems utilize a viscous flow approach to eliminating both moisture and particulate chamber contaminants rather than the less efficient, more costly, high vacuum, molecular flow technology. Figure 1-1 below, depicts the HGRS system control and monitoring software programs.



HGRS System Control And Monitoring Software Programs

Figure 1- 1

The Data Acquisition System (DAS) software operates on an Access database and is designed to interface with the Visual Control System and Process Control Recipe Editor software programs. The DAS is used to develop acceptance criteria for chamber processing and for reporting process test results. The DAS database accepts data from the Visual Control System and processes the information to determine if the chamber meets the specified acceptance criteria. The DAS also provides custom reports summarizing the results of each process control recipe used on each chamber.

1.1 Scope of Manual

This manual was written for an operator/technician familiar with Microsoft Windows 95 and who is properly trained in the use and operation of the MRP. This manual covers the installation and use of the DAS software only. The installation, operation and use of the MRP, Process Control Recipe Editor and the Visual Control System programs are the subject of separate manuals.

Figure 1-1 depicts the four software programs comprising the System Control And Monitoring Software, and their relationship to each other. The four basic programs shown are:

- HGRS PCRE; this is the Process Control Recipe Editor which is used to develop process control recipes for execution by a MRP unit .
- HGRS VCS; This is the Visual Control System which provides primary control over the MRP for chamber processing.
- HGRS DAS; This is the Data Acquisition System which configures an Access database used for defining acceptance criteria and reporting chamber processing results and is the subject of this manual.
- The MRP-201 micro-controller program interprets and executes VCS commands and process control recipes.

This manual includes descriptions of the DAS features and functions as well as instructions for program installation and creating chamber processing acceptance criteria. The manual is organized as follows:

- Program Installation - Section 2.0
- Description of Program Features - Section 3.0
- Maintenance and Troubleshooting - Section 4.0

2.0 Installation

The following instructions describe installation of the HGRS Data Acquisition System (DAS) software used to develop acceptance criteria and report HGRS processing results.

2.1 Prerequisites

In order to complete installation of the software, the following operating platform will be required:

- A. **Processor:** 100 MHz 486 with 32 MB RAM and 5 MB disk space.
- B. **Software:** Windows 95 with HGRS suite only, installation and/or use of other programs/applications is not recommended.
- C. **Network:** Windows Network Protocols, including NetBui and TCPIP

2.2 Installing the Software

The program will be provided on 3-1/2 inch floppy disks or CD-ROM.

2.2.1 Installation from Floppy Disk

The following steps describe installation of the program from floppy disk:

- A. Insert disk 1 in the computers' A: drive. Access the A: drive file listing, and double click on the Setup.exe file from the list of disk 1 files.
- B. The Welcome window will appear, click on OK, then select/type in the directory location you wish the program to be installed. The default directory is C:\Data\DAS. Note that if the default directory is not used, the VCS and PCRE .ini files will need to be edited to identify the new directory location.
- C. Click OK and an icon will appear, click this icon to begin installing the program files. The system will prompt the user when to install the remaining disks.
- D. When complete the system will indicate that the program has been successfully setup, click OK

Program installation automatically adds a new icon to the Start menu on your system. To run the program click the icon in the Start menu.

2.2 Installing the Software, continued

2.2.2 Installation from CD ROM

The DAS program may be supplied on CD ROM along with the other HGRS software programs. To install from CD, proceed as follows:

- A. Close all applications in preparation for program installation.
- B. Insert the CD into the computer's CD drive. The CD will automatically begin it's installation routine. Click on the desired operation from the installation menu selections shown in figure 2-1.



Figure 2 - 1

- B. Click on the Install VCS/DAS bar to begin DAS installation. The system will prompt the user through the installation process.
- C. When the installation is complete, the DAS program may be accessed from the Windows 95 programs menu. The user may want to make a shortcut for the Windows 95 desktop.

2.3 Installation Notes

The following installation notes are provided to help the user with specific installation issues.

- A. The DAS install program uses various standard system files, including Mfc40.dll Msvcrt40.dll, stdole.tlb and vaen21.olb. The use of these files may cause a “Unable to register file” error depending on the version of Microsoft Windows/Office installed. See Microsoft Technical Support, Knowledge Base articles Q163556 and Q153733 for instructions regarding resolution of this potential problem.
- B. The DAS comes with a runtime version 2.0 of MS Access. If later versions of the Access program are installed, they may not run due to conflicts with the runtime database included in the DAS program. See MS technical support articles Q183413, Q159333 and Q163998 for additional information.
- C. The DAS program comes with the following Employee/Password setup:
 - Employee Number = 100
 - Password = Password

Note that the factory Employee Number and Passwords may only be changed (and/or new ones added) via the DAS program. See Section 3.0 for instructions regarding program user access.

2.4 Network Database Installation

It may be desirable to install the database on a server so that multiple users can use the DAS application to develop acceptance criteria and so the VCS can datalog chamber processing results to a common server. Figure 2-1 depicts a multi-user database server installation. Network installation will require the following actions:

- A. Install the DASHGRS.mdb database on the desired server and delete this database file from the local user PC's.
- B. The network drive that the DASHGRS.mdb is installed on must be mapped to the local user's PC's. A logical DOS drive letter (such as K) must be assigned to the server to be used.

2.4 Network Database Installation, continued

- C. Insure that the local users PC's, the Hotgas.ini, and Editor.ini files have the correct (mapped network server drive) drive and path for the DASHGRS.mdb database.

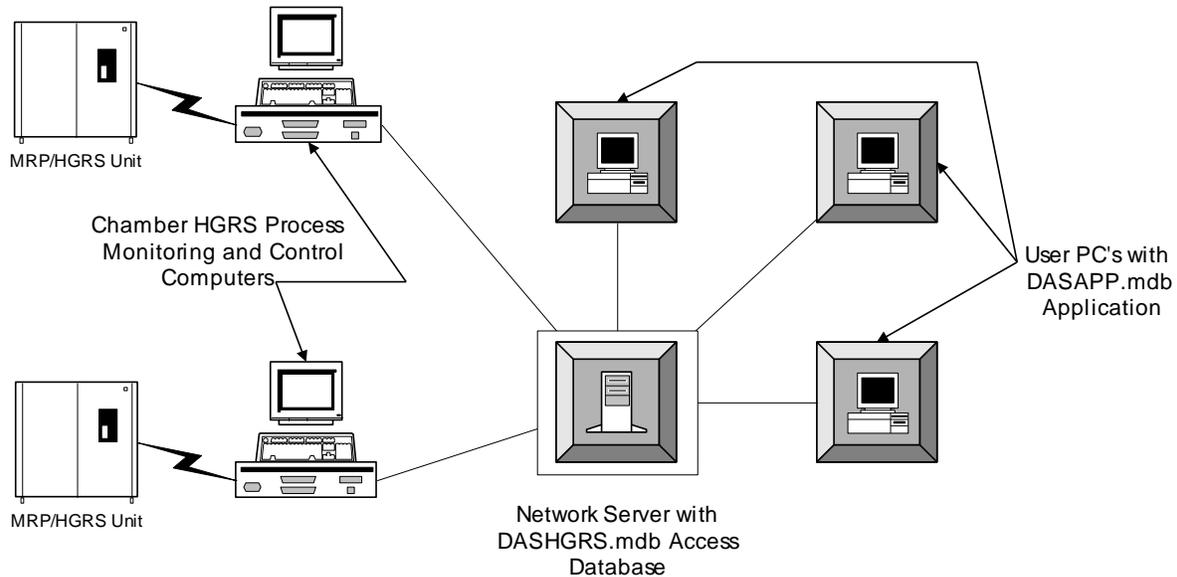


Figure 2 - 2

Galiso recommends coordinating with your network administrator prior to attempting to network the HGRS software system. If you require additional assistance with a network installation, contact your Galiso/Nuvac representative.

3.0 User Interface

This section describes the HGRS Data Acquisition System (DAS) functions and features. As previously mentioned, the DAS software operates on an Access database with a Windows based graphical user interface. In order to enhance the user interface, the standard menu bar has been removed from all program windows to allow maximum use of screen space. Descriptions of the window screens, their available features and associated functions are provided below.

3.1 System Access

In order to access the system, click the icon in the Start menu. The system will display a 'Splash' screen followed by the Wait message before going to the Operator Interface screen shown in figure 3-2. If the system cannot find the necessary database file, the 'Paths' window shown in figure 3-1 will appear for the user to specify the location of the database file. As indicated in Section 2.0, if the default directory is not used during program installation or the system has been installed on a network, the new database location must be specified in the DAS software as well as the Hotgas and Editor.ini files. If the file location is not properly specified, a series of error messages will appear until the Macro Error window terminates program operation.

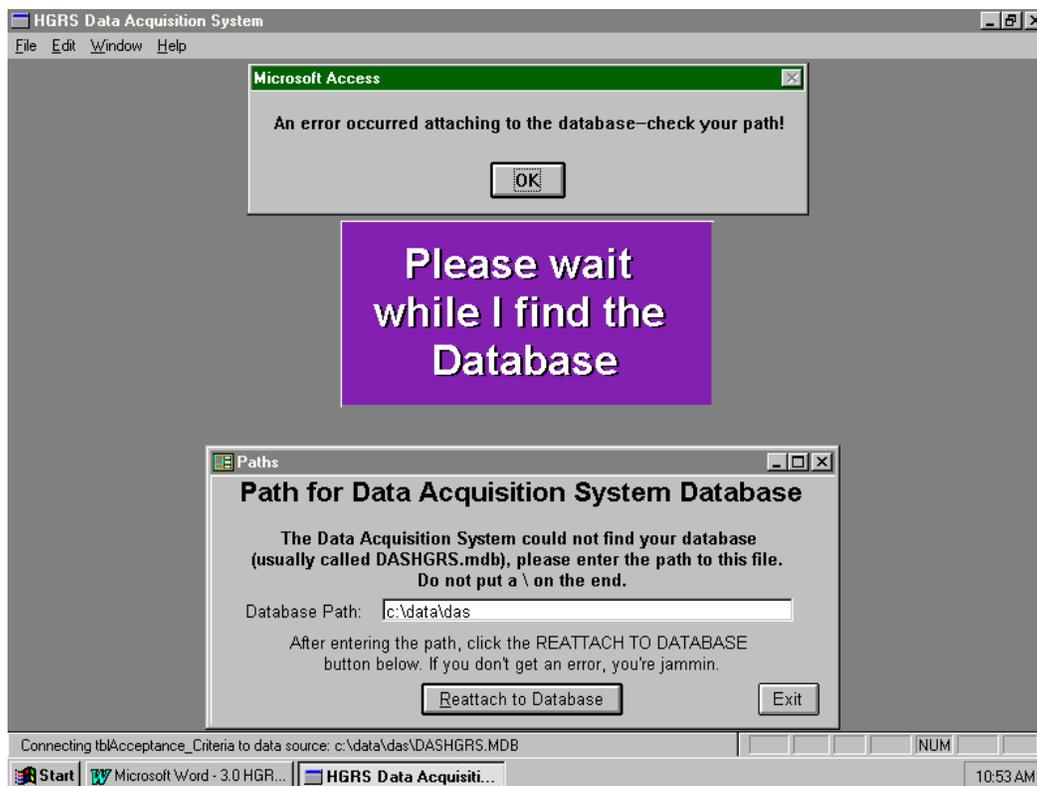


Figure 3 - 1 DAS Entry Screen

3.2 DAS Operator Interface

Immediately following the entry screen, the system will display the operator interface screen shown in figure 3-2.

Level 1 Interface

Hot Gas Recirculation System

Operator Interface Screen, Level 1

Chamber Number: ◀ ◀ Find Test Record ▶ ▶

| | | | | |
|------------|----------------|-----------------------|----------------------|----------------|
| Employee # | Employee Name. | Date: | Chamber Test Series: | Particle Spec: |
| 1 | Numb | Friday, July 31, 1998 | 146 | 5.00E+01 |
| Label1 | Label3 | Allowable Leak Rate: | Recipe: | He Leak Spec: |
| NONE | NONE | < 10.0 mTorr / min | TEST | 5.00E-04 |
| Label4 | Label2 | Gauge Max. Range: | Start Time: | End Time: |
| 1 | NONE | 200 mTorr | 16:25:44 | 16:32:45 |

| | Time: | Pressure [Torr]: | StepIndex: | LoopIndex: |
|---|------------|------------------|------------|------------|
| ▶ | 4:30:41 PM | 3.52E-03 | 6 | 0 |
| | 4:31:21 PM | 1.04E-02 | 6 | 0 |
| | 4:32:01 PM | 1.45E-02 | 6 | 0 |
| | 4:32:41 PM | 1.77E-02 | 6 | 0 |

Refresh Data

ROR Results

Particle Results

HE Leak Rate Results

Preview Traveler

Preview Series

Current Time

8:18 AM

Current Date

Tuesday, August 04, 1998

Exit Application

Edit Acceptance Criteria

System Administrator

Form View

Figure 3 - 2 Operator Interface Screen

The operator interface screen is not password protected (access level 1, all users) , see Section 3.6 for access level details. This screen is used to review previously completed HGRS process test results. The window area in figure 3-2 shows Rate of Rise results. Helium Leak Rate or Particle test results can be displayed depending on which button the operator selects. In addition, once a test record is selected, all the header text/data fields will automatically be filled in. All text/data fields shown in figure 3-2 are 'read-only'.

3.2 DAS Operator Interface, continued

The user can either scroll to the desired record, or press the Find record button. The window shown in figure 3-3 will appear when the Find Record button is pushed. The system will automatically display the last test record input to the database. Therefore, unless you have scrolled up to the first record in the database, you should choose the Up direction after typing the chamber number/record designator in the Find What field. If upper or lower case letters are used to differentiate chamber numbers you should check the Match Case box. The pull down box on the Where field allows the user to specify the search location, either start, part or whole field. When the system finds the requested record, it will return the user to the updated Operator Interface screen.

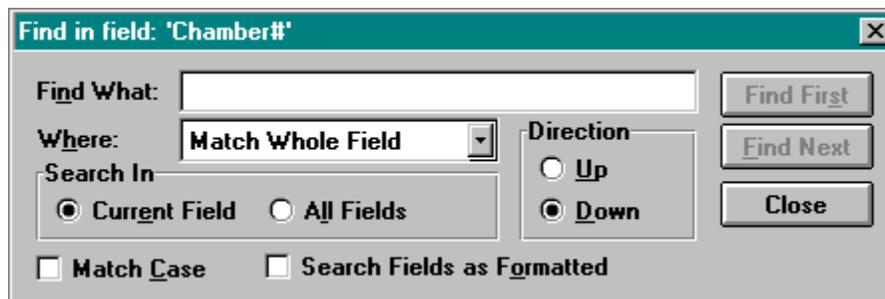


Figure 3 - 3

If the user is looking for relatively recent chamber test data, the Refresh Data may be used to ensure that the system contains the most current information.

Other than viewing chamber test data, there are three options for the user from the Operator Interface screen; Edit Acceptance Criteria (Section 3.3), System Administrator (Section 3.6) and Preview/Print Traveler/Series Report (Section 3.5). Note that with the exception of the traveler reports all other program features/functions require higher access level(s). See Section 3.6 for additional access level information.

3.3 Edit Acceptance Criteria

When the Edit Acceptance Criteria button is pressed, the access control box shown in figure 3-4 will appear. Access level 2 or higher is required for entry to the Edit Acceptance Criteria window. See Section 3.6 for additional information regarding access levels.

The dialog box is titled "Tuesday, August 04, 1998". It contains an "Employee Number" field with a pull-down menu showing "101" and a "Password" field with masked characters. At the bottom are "Ok" and "Cancel" buttons.

Figure 3 - 4

To access the acceptance criteria input window, type or select your employee number from the pull-down box and enter your password in the indicated fields. The system will check to verify that the user has been granted the appropriate access level, level 2 in this case. If the user has the necessary access level, the Acceptance Criteria Input window shown in figure 3-5 will appear.

The window is titled "Acceptance Criteria Input (Level 2 Access)". It features a "Record Locator, or Key Fields" section on the left with four input fields labeled "Label1" through "Label4". The main area displays three "Recipe Pass/Fail Criteria" sections, each with a recipe name and a table of specifications. A control panel at the bottom left includes buttons for "Save Criteria", "Add New Criteria", "Cancel", "Edit Current Criteria", and "Delete Current Criteria". A bottom navigation bar contains buttons for "Return to User Interface", "View / Print Recipe 1", "View / Print Recipe 2", "View / Print Recipe 3", and "Edit Lookup Tables". A status bar at the very bottom shows "Record: 2 of 2".

| Recipe | Allowable RDR: (mTorr) | Allowable Particles | Allowable He Leak |
|--------------------|------------------------|---------------------|-------------------|
| Recipe 1: test | 1.0 | 100 | 2.00E+00 |
| Recipe 2: test2 | 2.0 | 200 | 3.00E+00 |
| Recipe 3: Standard | 3.0 | 300 | 4.00E+00 |

Figure 3 - 5

3.3 Edit Acceptance Criteria, continued

An Acceptance Criteria is defined as a set of four chamber attributes identifying chamber characteristics, and up to three process control recipes and their associated chamber test Pass/Fail Criteria. The four chamber attributes are user definable access database key fields that are used by the system as a record locator. As stated above, up to three process control recipes can be assigned to each unique chamber attribute specification or record locator. In addition, up to three Recipe Pass/Fail Criteria may be specified for each recipe assigned. Recipe Pass/Fail are used to determine if a particular HGRS process control recipe has adequately decontaminated and/or evacuated the specified chamber. To summarize then, an Acceptance Criteria consists of:

1. Four chamber attributes that identify unique chamber characteristics.
2. Up to three process control recipes for each unique chamber record locator (see 1. Above).
3. Up to three Recipe Pass/Fail Criteria specifications for each process control recipe assigned to an Acceptance Criteria.

The Acceptance Criteria Input window (figure 3-5) is used to specify new or change existing criteria. This window will initially appear with the acceptance criteria information for the chamber test identified in the Operator Interface screen (figure 3-2). The record locator arrow buttons on the bottom of the screen may be used to scroll through acceptance criteria records to select a record to edit. Once the desired Acceptance Criteria record is located, the user simply clicks on the Edit current Criteria, selects/types in the desired changes and clicks on the Save Criteria button.

To prepare a new Acceptance Criteria, the four chamber attributes that constitute an Acceptance Criteria record locator must be selected from their pull-down lists. Next, the process control recipes must be assigned. Note that the process control recipes must be developed using the PCREditor program and saved to the DAS database to be available for selection during the Acceptance Criteria configuration process. Finally the allowable ROR (rate of rise), particle and He Leak pass/fail specifications must also be entered by the user. Note that if no Recipe Pass/Fail Criteria specifications are entered for a recipe with Test States included, the recipe will fail. Conversely, if Pass/Fail Criteria are specified for a recipe with no Test States included, the recipe will also fail. A detailed discussion of specifying/preparing Acceptance Criteria as well as overall DAS system operations is included in Section 3.7.

3.3 Edit Acceptance Criteria, continued

Another feature available from the Acceptance Criteria Input window is the View/Print Recipe function. The View/Print Recipe button accesses the window shown in figure 3-6 and allows the user to review and/or print the process control recipe selected. The recipe information shown is 'read only'. To create or change a process control recipe the Process Control Recipe Editor program must be used.

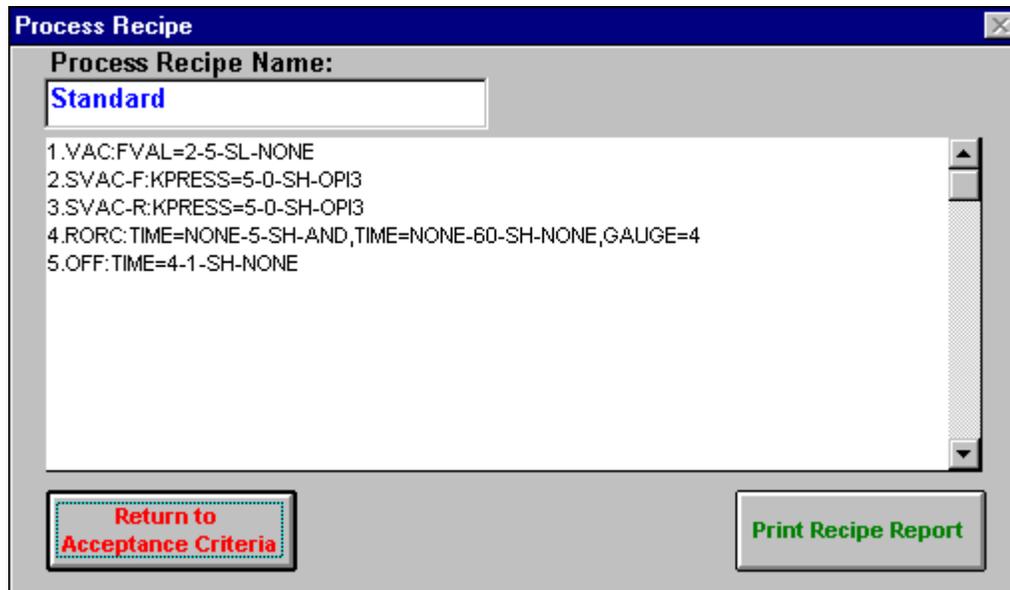


Figure 3 - 6

From the Acceptance Criteria Input window, the user may return to the User Interface screen, or click the Edit Lookup Tables button. The Edit Lookup Tables button provides access to the chamber attribute dropdown boxes to add, edit or delete chamber attribute selections that will be available for developing Acceptance Criteria. A detailed discussion of Look-up Table editing features and functions is provided in Section 3.4.

3.4 Chamber Look-up Table Editing

The Edit Lookup Tables button provides user access to the lookup table switchboard where chamber data records may be added or changed. To edit chamber data tables, click on the Edit Lookup Tables button to obtain the window shown in figure 3-7.

From the lookup table switchboard, the user can select which chamber attribute or Criteria table (1,2,3 or4) to add, edit or delete entries to/from. Figure 3-7 shows Criteria or attribute 1 selected, which is titled Chamber Type in this case.

To change (or delete) an existing data record click on the arrow buttons to find the desired record, type in the changes and click on the Save button (or the Delete button to delete the entry). To add a new record, click on the Add button, type in the required information and click on the Save button.

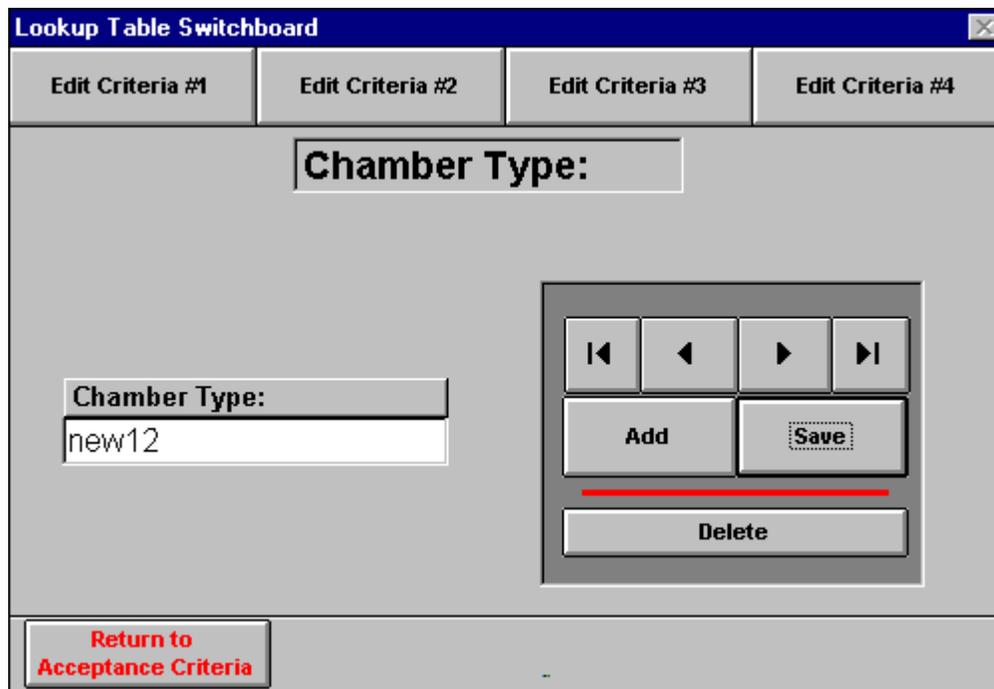


Figure 3 - 7 Look-up Table Editing

3.4 Chamber Data Table Editing, continued

When the user makes a change to an existing data record without saving it, and presses the arrow buttons to find a new record, the system will display the warning shown in figure 3-8. Note that if the user changes a data record without saving, and switches to a different chamber data table, the change will be saved without any user warning or notification.

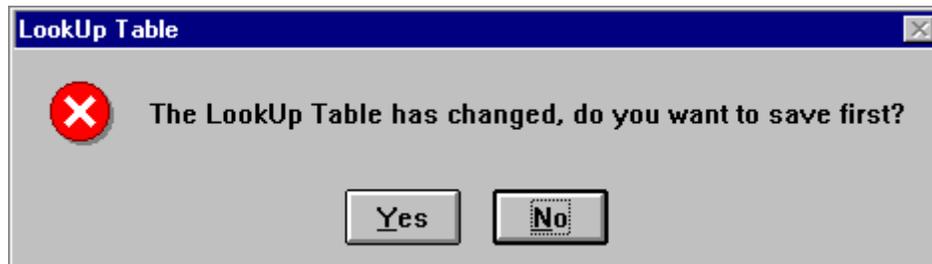


Figure 3 - 8 Look-up Table Warning

The chamber attribute or Criteria table labels/titles may also be changed. See Section 3.6 for a detailed discussion of how to access and change the system chamber attribute or Criteria labels/titles.

3.5 Test Traveler Report

From the Operator Interface screen, press the Preview Traveler Report button to view the traveler report as shown in figure 3-9. The top portion of the test traveler

contains the specified chamber and acceptance criteria information. The rest of the form contains the pertinent HGRS process test data and a Pass/fail indication based on the specified acceptance criteria. To print the traveler select File, Print, and to return to the operator interface screen select File, Close to return to the Operator Interface Screen.

| Pump Down Test Traveler | | | |
|---|---------------------|------------------------|---|
| Chamber Label | Employee ID: 1 | | |
| Date: 7/21/91 | Employee Name: Hank | | |
| Start Time: 15:25:44 | End Time: 15:32:45 | | |
| Label | None | Label | None |
| Label | None | Label | None |
| Particle Speed | 51.11 | Allowable Rate of Rise | 10 mTorr/min |
| Helium Leak Speed | 5.11E-14 | Chamber Position | Label |
| Max Pressure for | 211 mTorr | Initial | Label |
| Rate | | Expiry Guard | TEST |
| Rate of Rise Test Results | | | |
| A | 1 sec. sample | 3.52 mTorr | |
| A | 40 sec. sample | 10.36 mTorr | |
| A | 80 sec. sample | 14.51 mTorr | |
| A | 120 sec. sample | 17.68 mTorr | |
| Average rate of rise from 4 steps of sampling: 7.00 mTorr/min | | | |
| Particle Count from last 1 minute of test: 3 per min | | | |
| Helium Leak Peak: 0.00E+00 ATMs/cc per sec | | | |
| NOTE | | | |
| IF PARTICLE COUNT OR HELIUM LEAK PEAK EXCEEDS "MA", NO DATA WAS AVAILABLE FOR DISPLAY | | | |
| | | | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL |

Figure 3 - 9 Test Traveler Report

3.5 Test Traveler Report, continued

The View Series button on the Operator Interface screen (see figure 3-2) will pull up a Traveler Report shown in figure 3-10. Note that the results of all three recipes for a particular acceptance criteria/chamber process run are displayed.

| Pump Down Test Traveler | | | | | | | | | | | | | | |
|--|-----|------|-------|-----------------|-----------------------|---------------------------------|------|-------|-----------------|-----------------------|-----|------|-------|-----------------|
| Chamber: InLoad | | | | | | Employee: 1 | | | | | | | | |
| Picked Up Date: 08-04-1998 | | | | | | Employee Name: Hank | | | | | | | | |
| Start Date: Friday, July 31, 1998 | | | | | | End Date: Friday, July 31, 1998 | | | | | | | | |
| Start Time: 16:14:23 | | | | | | End Time: 16:52:45 | | | | | | | | |
| Lubr: NONE | | | | | | Chamber Position: Internal | | | | | | | | |
| Lubr: NONE | | | | | | Tool Line Name: DELBERT | | | | | | | | |
| Lubr: NONE | | | | | | | | | | | | | | |
| Lubr: 1 | | | | | | | | | | | | | | |
| ROR Test Results | | | | | | | | | | | | | | |
| TEST | | | | TEST | | | | TEST | | | | | | |
| Al | 1 | Ser. | 3.76 | in Torr | Al | 1 | Ser. | 3.52 | in Torr | Al | 1 | Ser. | 3.52 | in Torr |
| Al | 40 | Ser. | 18.36 | in Torr | Al | 40 | Ser. | 18.36 | in Torr | Al | 40 | Ser. | 18.36 | in Torr |
| Al | 80 | Ser. | 14.26 | in Torr | Al | 80 | Ser. | 14.51 | in Torr | Al | 80 | Ser. | 14.51 | in Torr |
| Al | 120 | Ser. | 17.44 | in Torr | Al | 120 | Ser. | 17.32 | in Torr | Al | 120 | Ser. | 17.58 | in Torr |
| ROR Speed | | | | 18 | ROR Speed | | | | 18 | ROR Speed | | | | 11 |
| Avg. ROR | | | | 6.81 | Avg. ROR | | | | 7.28 | Avg. ROR | | | | 7.81 |
| Particle Speed | | | | 18.11 | Particle Speed | | | | 18.11 | Particle Speed | | | | 5.88 |
| Particle Count | | | | 18.8 | Particle Count | | | | 7.88 | Particle Count | | | | 9.81 |
| W-Brush Speed | | | | 5.88E-4 | W-Brush Speed | | | | 5.88E-4 | W-Brush Speed | | | | 5.88E-4 |
| W-Brush Rate | | | | 3.39E-5 | W-Brush Rate | | | | 3.39E-5 | W-Brush Rate | | | | NONE |
| Recipe End: | | | | 16:18:32 | Recipe End: | | | | 16:25:34 | Recipe End: | | | | 16:52:45 |
| <p>NOTE IF THE PARTICLE COUNT OR THE W-BRUSH RATE SAYS "NONE", THERE WAS NO DATA COLLECTED DURING THAT RECIPE</p> | | | | | | | | | | | | | | |
| | | | | | | | | | | Series FAILED | | | | |

Figure 3 - 10 Series Traveler

3.6 System Administrator

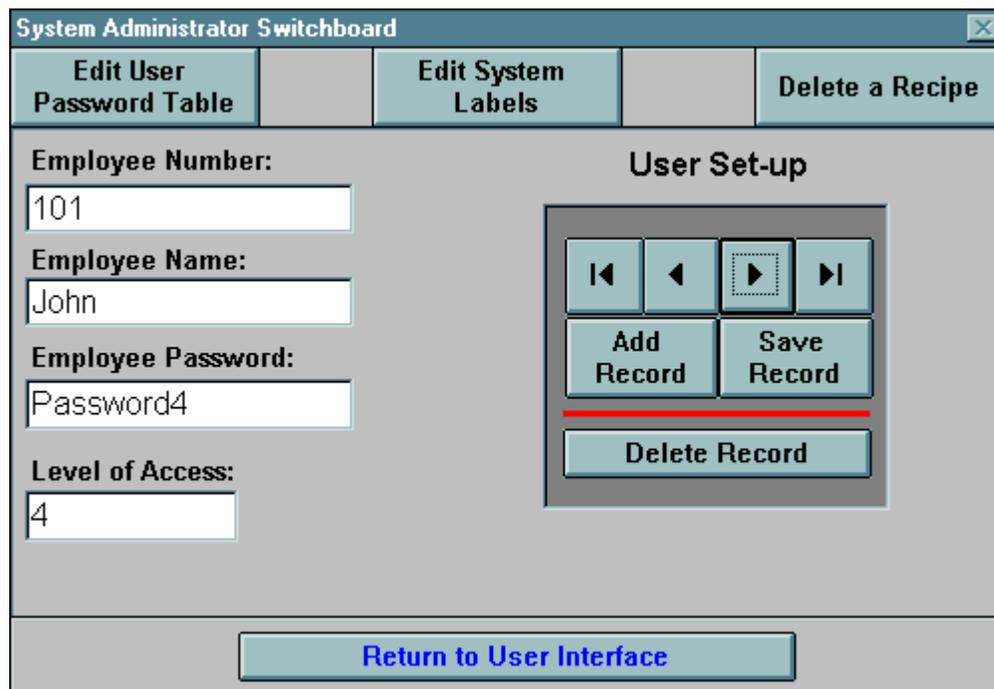
System administration functions are classified as access level 4 activities. From the Operator Interface screen press the system administrator button to obtain the access control box shown in figure 3-11.



The dialog box features a prominent red header with the text "STOP! You are entering a secured area. AUTHORIZED PERSONNEL ONLY!". Below this, there are two input fields: "Employee Number:" with a pull-down arrow on the right, and "Password:". At the bottom, there are two buttons: "OK" and "Close".

Figure 3 - 11 System Administrator Access

Either type or select your employee number from the pull-down list and enter your password to obtain the System Administrator Switchboard form shown in figure 3-11. The form will initially appear blank. Select the User password table, the User password set-up form is shown in figure 3-12.



The "System Administrator Switchboard" window has a menu bar with "Edit User Password Table", "Edit System Labels", and "Delete a Recipe". The main area is titled "User Set-up" and contains several input fields: "Employee Number:" (101), "Employee Name:" (John), "Employee Password:" (Password4), and "Level of Access:" (4). To the right of these fields is a "User Set-up" control panel with navigation arrows (left, right, home, end), "Add Record", "Save Record", and "Delete Record" buttons. A red horizontal line is positioned above the "Delete Record" button. At the bottom of the window is a "Return to User Interface" button.

Figure 3 - 12 User Password Setup

3.6 System Administrator, continued

The form shown in figure 3-12 is used to add or change user and/or administrative passwords and access level(s). Each employee may be assigned an alpha character password up to 16 characters long. There are four access levels which may be assigned:

- Access Level 1 - This is the lowest access level and allows the user to access the Operator Interface screen and the Pump Down Test Traveler Report only.
- Access Level 2 - Level 2 allows the user to input and edit Acceptance Criteria in addition to the access level 1 functions.
- Access Level 3 - Access level 3 is the same as access level 2 with respect to the DAS. Access level 3 is used to allow a user/employee to develop and edit process control recipes using the Process Control Recipe Editor (PCRE) software.
- Access Level 4 - This is the highest access level, and designates the employee as a System Administrator with full access to all program features and functions. Only system administrators (access level 4 employees) can access the system administrator control form.

The access levels described above also apply to the Visual Control System (VCS) and PCREditor programs. Table 3-1 summarizes the access requirements for each HGRS software program.

Table 3 - 1 Access Level Summary

| Access Level | PCRE | VCS | DAS |
|---------------------|-----------------------------|---|--|
| 1 | Not Accessible | Can Initiate Recipes, No Manual Mode Access | View/Print Chamber Results Only |
| 2 | Not Accessible | All Functions Accessible | View/Print Chamber Results Only |
| 3 | All Functions Accessible | All Functions Accessible | View/Print Chamber Results, Develop Acc. Criteria and Edit Look- up Tables Only |
| 4 | All Functions Accessible | All Functions Accessible | All Functions Accessible |

3.6.1 Assigning Passwords and Access Levels

To assign an employee password and access level, press the Add Record button, type in the appropriate information, and push the Save Record button. To

change a password or access level, select the desired employee using the arrow buttons, type the necessary changes and push the Save Record button. The Delete Record button will delete the record in the current display. In addition to the Tab and Enter keys, the keyboard arrow keys will move the cursor around the screen keypad when entering a new record.

Note that the DAS system administrator must assign a user access level and password to all employees who will need to use the Data Acquisition System (DAS), Visual control System (VCS) and/or Process Control Recipe Editor (PCRE) programs.

3.6.2 Editing Look-up Table Labels

In addition to passwords and access levels, the system administrator switchboard provides the capability to change system label names and delete process control recipes. The system label names are shown on the Acceptance Criteria Input and Look-up Table Switchboard screens (figures 3-5 and 3-7 respectively). Click on the Edit System Labels button to access the screen shown in Figure 3-13. To change a Look-up Table title/System Label, highlight the desired label, type in the desired changes and click on the Save Record button.

Figure 3 - 13 System Label Setup

3.6.3 Deleting Recipes

Figure 3-14 shows the recipe delete screen for deleting recipes from the database. Click on the Recipe Name drop down box arrow and select (highlight)

the desired recipe. The selected recipe will appear in the switch board window for review/confirmation. Click on the delete recipe button to delete the recipe selected.

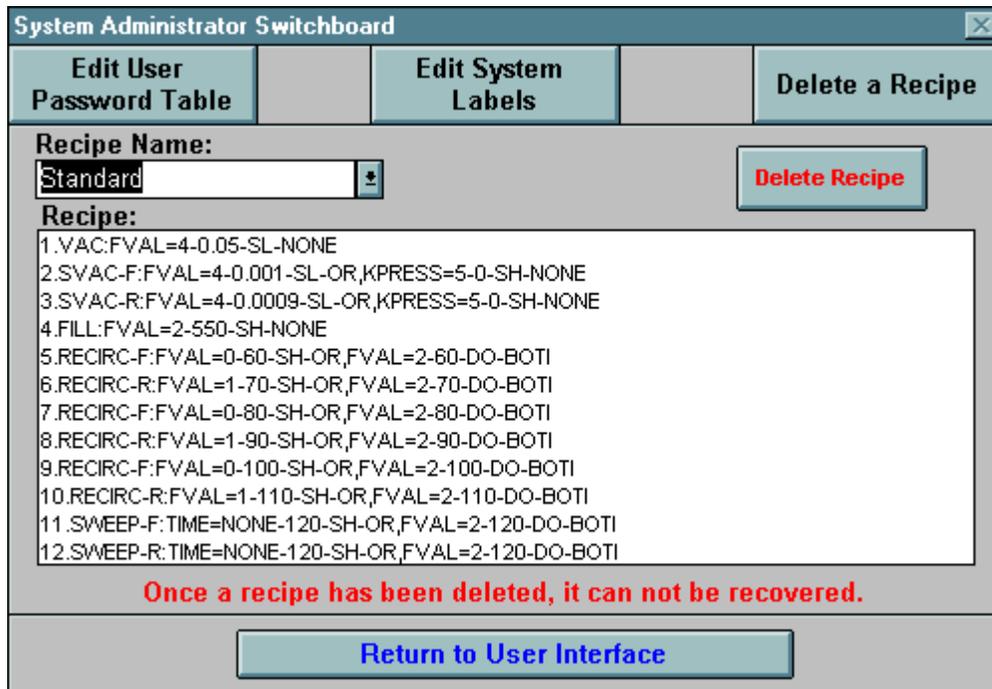


Figure 3 - 14 Recipe Delete Screen

3.7 Data Acquisition System Operations

The DAS database must be properly configured in order to use the Visual Control System (VCS) to initiate and monitor automated chamber processing operations. The primary purpose of the DAS is to configure Acceptance Criteria that will support automated chamber processing operations. This section

discusses the process and requirements for configuring the DAS to support efficient Acceptance Criteria development.

3.7.1 System Configuration

The prerequisites for DAS database configuration and subsequent Acceptance Criteria development are:

- DAS and PCREditor installation
- Process control recipe development

With both the DAS and PCREditor installed, the first step in the process is to prepare a set of process control recipes to be used for automated chamber processing. Recipe development is discussed in detail in the HGRS Process Control Recipe Editor Software Users Manual. Once recipes are prepared and saved to the DAS database, the DAS is ready for configuration. The following sequence of operations is recommended to provide for efficient Acceptance Criteria development.

A. As previously stated, the DAS comes from the factory with the following Access Level 4 Employee Number and Password assigned:

- Employee Number = **100**
- Password = **Password**

Launch the program and click on the System Administrator button. When the access control box appears, (figure3-11) select/type-in the Employee Number and enter the Password shown above. From the System Administrator Switchboard, perform the following database set-up tasks:

- 1) Click on the Edit User Password Table button and enter the required employee data, assigning the appropriate access levels for each employee. (ref. Section 3.6.1).

3.7.1 System Configuration, continued

- 2) Click on the Edit Admin Password Table button and enter the necessary data for each employee who is to be granted System Administrator access (level 4). (ref. Section 3.6.1).

- 3) Click on the Edit System Labels button and enter the look-up table titles/labels for each of the four chamber attributes which constitute a Acceptance Criteria data record locator. (ref. Section 3.3). Note that the system labels entered will appear on the VCS Operator Entry screen.

When the above steps have been completed, click on the Return to User Interface button at the bottom of the switchboard.

- B. From the User Interface screen (figure 3-2), click on the Edit Acceptance Criteria button to access the Acceptance Criteria Input screen (figure 3-5). From the Acceptance Criteria Input screen, click on the Edit Look-up Tables button to access the Look-up Table Switchboard (figure 3-7). From the Look-up Table Switchboard, enter the chamber attribute selections you wish to be available for describing/identifying the necessary chambers. Remember that each unique combination of the four chamber attributes selected will define an Acceptance Criteria data record locator. With the completion of the above items the system will be ready for Acceptance Criteria development.

3.7.2 Acceptance Criteria Development

The following steps illustrate the Acceptance Criteria Development Process.

- A. From the Acceptance Criteria Input screen, click on the Add New Criteria button. Select a chamber attribute from the drop-down box for each of the four chamber attribute boxes on the upper left of the Acceptance Criteria Input Screen.
- B. Select a process control recipe from the drop-down box next to the Recipe 1 heading. This will be the first of up to three recipes that the VCS will automatically sequence through. Note that recipes must be saved into the database using the PCREditor program to be available for drop-down box selection.

3.7.2 Acceptance Criteria Development, continued

- C. Enter the desired Recipe Pass Fail Criteria for Allowable ROR (rate of Rise), Allowable Particles, and Allowable He Leak. Note that if a Recipe Pass/Fail Criteria is specified for a recipe which does not contain the required test step or operating mode, the recipe will fail by default regardless of the actual condition of the chamber. The MRP operating modes required to support the three available Pass fail criteria are shown below.

Table 3 - 2 Pass/Fail Operating Modes

| PASS/FAIL CRITERIA | OPERATING MODE | UNITS |
|------------------------|-------------------|-------------|
| Allowable Leak-up Rate | ROR and RORI | MilliTorr |
| Particle Count | CFP-R | Each |
| Helium Leak Rate | HLD-Hi and HLD-Lo | Atm*cc/sec. |

- D. Enter the remaining two recipes and their associated pass/fail criteria as described above as necessary, and click on the Save Criteria button. The DAS database now has an Acceptance Criteria loaded which can be accessed from the VCS by selection of the exact unique combination of chamber attributes input in step A. above.
- E. Enter additional Acceptance Criteria as described in the above steps, return to the Operator Interface to exit the DAS program.

3.7.3 System Operations

As mentioned above, the VCS program will automatically sequence through up to three recipes specified for any Acceptance Criteria. However, the VCS will abort the sequence if any of the recipes fail their specified pass/fail criteria. The flow chart shown in figure 3-15 illustrates VCS recipe sequencing.

When an MRP unit is in one of the 'test' operating modes (see Table 3-2), and the acceptance criteria being used contains an appropriate Pass/Fail specification, the DAS database will accept process data from the VCS. The datalogged information is then processed by the DAS report routine(s) to prepare the Traveler Report discussed in Section 3.5.

3.7.3 System Operations, continued

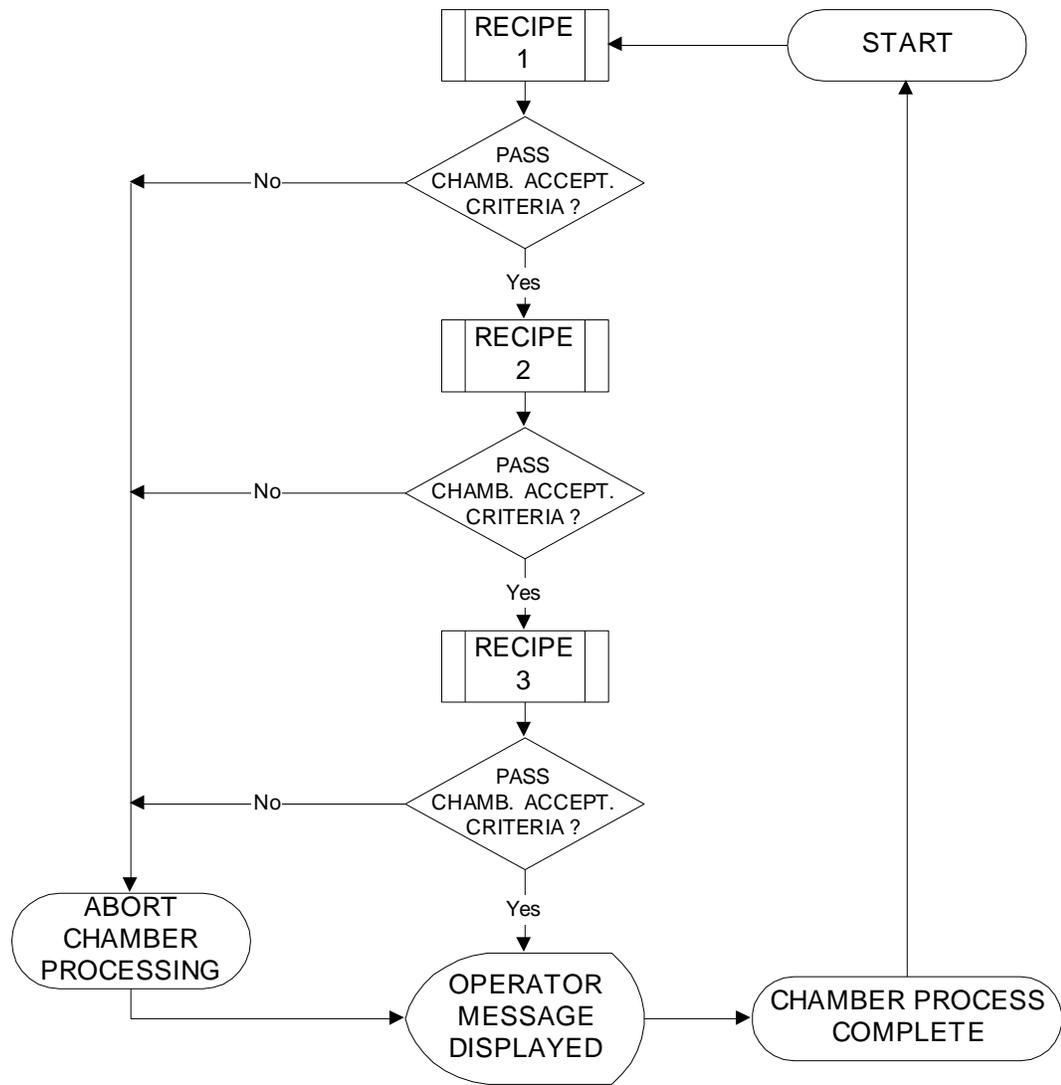


Figure 3 - 15

4.0 Maintenance and Troubleshooting

This Section includes instructions for repair and compacting of the DAS database as well as a discussion of potential problem areas associated with DAS operations.

4.1 Maintenance of Database File

The DASAPP.mdb database application file is referred to as the front end of the system. It includes the forms, queries, modules, reports, and a few temporary tables. The DASHGRS.mdb database file is referred to as the back end of the system, and includes only the tables that house the data.

If the database (back end) ever becomes corrupted or excessively large, repair and compacting the database should be performed. In addition, to prevent database problems, weekly database repair and compacting is recommended. Also, regular database backups are recommended so that the database can be restored in the event of a system 'crash'.

4.1.1 Database Repair and Compacting

In most cases the database should be both repaired and compacted. Note that the Repair function must be completed prior to compacting the database.

From the Start\Programs\HGRS selection, click on the Repair DAS Data File. The repair program will automatically run, and if successful, display the message shown in figure 4-1.



Figure 4 - 1

If the "Repair Database" program cannot resolve the corruption, it will be necessary to restore the database from the previous backup.

4.2 Troubleshooting

This section discusses commonly reported problems which may occur from time to time.

4.2.1 Database Not Available

The DASAPP, PCRE and VCS programs are designed to interface with the DASHGRS database. The DAS Setup program is factory set to install the database file in the C:\Data\DAS subdirectory. If the file path is changed from this default setting, the other HGRS software applications will not be able to locate the database, and an error message will result. If a 'database not found' error is received in the DAS, the user will be prompted to type in the new file path/location. If the 'database not found' error appears in the PCRE or VCS system, the operator must insure that the file paths shown in the .ini files match the actual location of the file. Contact your Nuvac representative for .ini file modification instructions.

4.2.2 Database Record Locking

Record locking errors may occasionally occur when multiple simultaneous database access commands have been issued. For example, if the VCS is currently datalogging test data to the database and a user attempts to save a new recipe (from the PCRE program) or other information to the database, the error message shown in figure 4-2 may appear.



Database Record Locking Error Message

Figure 4 - 2

These record locking errors are caused by the database engine which locks-out a 2K block of records when an application is writing or retrieving data from the DAS database. If this error occurs, the user must wait until the application currently accessing the database completes its' transaction in order to access the database.

4.2.3 Pumpdown Test Traveler Errors

The VCS datalogs pressure, particle count and/or helium concentration information to the Access database, depending on the acceptance criteria specifications input to the DAS for a particular chamber test. The most common problems associated with datalogging are failure to enter the necessary or correct specification in the chamber acceptance criteria, and process control recipe configuration errors.

1. Acceptance Criteria Specifications - In order to datalog HGRS process data, one or more of the following specifications must be entered in the DAS Acceptance Criteria Input screen:

| SPECIFICATION | DATA LOGGED | UNITS |
|------------------------|----------------------|-------------|
| Allowable Leak-up Rate | Pressure | MilliTorr |
| Particle Count | Number of Particles | Each |
| Helium Leak Rate | Helium Concentration | Atm*cc/sec. |

Note that if no entries are made for these specifications, the VCS will not datalog the information, and the Pump Down Test Traveler will state that no data was available. Also, if the specification value entered is beyond the range of the HGRS (MRP) system instrumentation, the test will 'fail'.

2. Process Control Recipe Requirements - The VCS is designed to datalog information only in the following operating modes:

| SPECIFICATION | OPERATING MODE | UNITS |
|------------------------|-------------------|-------------|
| Allowable Leak-up Rate | ROR and RORI | MilliTorr |
| Particle Count | CFP-R | Each |
| Helium Leak Rate | HLD-Hi and HLD-Lo | Atm*cc/sec. |

As indicated above, specific operating modes must be included as steps in the process control recipe or the VCS will not datalog the necessary information. For example, if a particle specification is entered in the acceptance criteria for a particular test and the associated process control recipe does not include the CFP-R operating mode, the test will automatically fail. Note that the Pump Down Test Traveler report will also indicate that the test has failed and that the necessary data was not available.

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