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**HAWAII DEMAND-SIDE MANAGEMENT
RESOURCE ASSESSMENT**

**FINAL REPORT
REFERENCE VOLUME 5**

The DOETRAN User's Manual

**The DOE-2/DBEDT DSM
Forecasting Model Interface**

Prepared for:

**The Department of Business,
Economic Development, and Tourism
State of Hawaii**

April 1995

Prepared by:

**NEOS Corporation
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MEASURE IMPACTS DATABASE

- Single Family Residence
- Multi-Family Unit
- Large Office
- Small Office
- Large Retail
- Small Retail
- Fast Food Restaurant
- Sit Down Restaurant

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MEASURE IMPACTS DATABASE (Continued)

- Grocery
- Refrigerated Warehouse
- Non-Refrigerated Warehouse
- Hospital
- School
- College
- Oahu-Hotel
- Maui-Hotel

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1.0 INTRODUCTION

The DOETRAN model is a DSM database manager, developed to act as an intermediary between the whole building energy simulation model, DOE-2, and the DBEDT DSM Forecasting Model. DOETRAN accepts output data from DOE-2 and TRANslates that into the format required by the forecasting model. DOETRAN operates in the Windows environment and was developed using the relational database management software, Paradox 5.0 for Windows. It is not necessary to have any knowledge of Paradox to use DOETRAN. DOETRAN utilizes the powerful database manager capabilities of Paradox through a series of customized user-friendly windows displaying buttons and menus with simple and clear functions.

The DOETRAN model performs three basic functions, with an optional fourth. The first function is to configure the user's computer for DOETRAN. The second function is to import DOE-2 files with energy and loadshape data for each building type. The third main function is to then process the data into the forecasting model format. As DOETRAN processes the DOE-2 data, graphs of the total electric monthly impacts for each DSM measure appear, providing the user with a visual means of inspecting DOE-2 data, as well as following program execution. DOETRAN provides three tables for each building type for the forecasting model, one for electric measures, gas measures, and basecases. The optional fourth function provided by DOETRAN is to view graphs of total electric annual impacts by measure. This last option allows a comparative view of how one measure rates against another.

A section in this manual is devoted to each of the four functions mentioned above, as well as computer requirements and exiting DOETRAN.

2.0 SYSTEM REQUIREMENTS

System requirements are provided in Table 2.1. In summary, a 486 computer with at least 8 MB of RAM and 70 MB of free hard disk space (includes space required for Paradox installation) is required to use DOETRAN effectively.

Table 2.1
System Requirements

Component	Requirement
Microprocessor	80486 or higher
RAM	8 MB minimum
Hard Disk Space	70 MB
Video Monitor	VGA
Microsoft Windows	Version 3.1 or later
Mouse	A 2 or 3 function mouse

3.0 INSTALLATION

Since DOETRAN is a Paradox application, it is necessary to install Paradox 5.0 for Windows in order to run DOETRAN. Follow the instructions in the Paradox User's Guide to install Paradox. Paradox will prompt for a full, minimum, or custom installation. Any option will work for DOETRAN. If the minimum installation method is selected, 60 rather than 70 megabytes of computer space is required.

To install DOETRAN, it is necessary to first invoke Windows. Insert DISK 1 into a floppy drive. Choose File|Run from the Program Manager's main menu. In the command Line text box, type the letter of the floppy drive the DOETRAN disk is in, followed by `.\install`. Choose OK. Insert additional disks as prompted. When installation is complete, an icon with the title DOETRAN will appear.

4.0 START-UP

To start DOETRAN, you must be in the Windows Program Manager environment. Click on the DOETRAN icon. Figure 4.1 shows the screen that follows. This is the main menu for DOETRAN. Clicking any of the five buttons shown will perform the stated function. In most cases, additional menus will follow a mouse click.

Before DOETRAN is run for the first time, it is necessary to configure your computer for DOETRAN. This configuration does not alter your `autoexec.bat` or `config.sys` files. It only appends data to your existing `IDAPI.CFG` file. This data sets up the directory structure (aliases) required to run DOETRAN.

Click on the *Setup* button to configure your computer. The button will depress and the mouse arrow pointer will change to an hourglass shape while DOETRAN configures your computer. When the button and mouse shape return to their original state, the configuration is complete.

Figure 4.1
DOETRAN Main Menu

5.0 IMPORTING DOE-2 DATA

DOETRAN imports DOE-2 data in the form of one file containing energy and peak load information for each measure and basecase into a database file by building type. For example, for the building type, Oahu Hotel, if 80 measures and 6 basecases were evaluated, 86 files would be imported. These files are in ASCII format as produced by DOE-2. Each file is named by a convention described in the DOE-2 user's guide. Basically, each file name is its 8 digit measure/basecase ID. The file extension is PRN.

To import DOE-2 data, click on the *Import Data* button from the DOETRAN Main Menu (Figure 4.1) Figure 5.1 shows the Import Menu window that follows. The user first supplies a building type. A 4 digit code to select building types is used throughout the model. A list of these building codes with their descriptions is given in Table 5.1. The user may either type in the desired building type code in the highlighted field, or click on the scroll button to create a drop-down list of the available buildings, as shown in Figure 5.2. The buildings are listed in alphabetical order and by using the scroll bar, additional buildings may be accessed. Selection of a building using the drop-down list is made by clicking on the desired building type.

Data may be imported to either create a database file or to update or append the database. Two radio buttons are provided to perform these tasks. The *All* button will delete an existing database(if it exists) for the selected building type and create a new database with the new DOE-2 data. The *Single Measure* button will import only a single measure file. (Basecase files may not be imported using this button.) This button will perform either the update or append function, depending on whether the measure is new or existing. New imported measures are appended to the database, existing imported measures will update the database by deleting the existing database record and replacing it with the new record for the measure.

Selection of the *Import* button then executes the import function. If *All* was selected, the importation process begins. The lower left corner of the desktop displays the file names as they are imported as well as the status of the import(successful or not). The import button will remain depressed during the import process. When the button pops up, import is complete.

If the *Single Measure* button was selected, another window appears, prompting the user for the measure ID number, as shown in Figure 5.3 As with the building type field, this field may also be accessed through a drop-down list, or the user may simply type the measure ID number in the highlighted field. This ID number in DOETRAN is the same convention used by DOE-2. Therefore, if the user just received a new DOE-2 PRN file, then the name of that file is the measure ID number that the user should specify to import that file.

When all data to be imported has been done, click on *Done* to return to the main menu. Similarly, *Cancel* may be clicked to exit the Import Menu.

Figure 5.1
Import Menu

Table 5.1
Building Description Key

Building Code	Building Description
APTM	Apartment (Multi-Family Multi-Metered)
COLL	College
FFRE	Fast Food Restaurant
GROC	Grocery
HHOT	Hawaii Hotel
HOSP	Hospital
HRST	Hawaii Resrot
KHOT	Kauai Hotel
KRST	Kauai Resort
LOFF	Large Office
LRET	Large Retail
MFAM	Multi-Family (Single Meter)
MHOT	Maui Hotel
MRST	Maui Resort
NRWA	Non-Refrigerated Warehouse
OHOT	Oahu Hotel
ORST	Oahu Restaurant
RWAR	Refrigerated Warehouse
SCHL	School
SDRE	Sit Down Restaurant
SFAM	Single Family
SOFF	Small Office
SRET	Small Retail

Figure 5.2
Import Menu Building Type Selection

Figure 5.3
Import Menu Measure Selection

6.0 PROCESSING DOE-2 DATA FOR DBEDT DSM FORECASTING MODEL

The DBEDT DSM Forecasting Model requires three tables from DOETRAN: the electric measures, gas measures, and basecase database tables. These tables are generated by clicking on the *Process Data* button from the DOETRAN Main Menu. This action will bring up the Building Menu. As shown in Figure 6.1, the Building Menu is simply a group of buttons named with the 4 digit building codes. The user selects the desired building by clicking on the appropriate button. The next window to appear is the Process Type window as shown in Figure 6.2. The user selects whether all measures or a single measure is to be processed. When *All Measures* is selected, the three required database tables for the forecasting model are created using the full set of measures, for the selected building type. The single measure option is used to update or append existing database tables for the selected measure. If the single measure option is selected, a pop-up window will prompt the user for the measure ID number, as it did from the Import Menu.

A graph of the total electric monthly impacts appears for each measure as DOETRAN processes the data. Impacts represent the difference in building energy use with and without the measure. A positive impact represents energy savings due to the installed measure.

A sample graph of total electric monthly impacts is shown in Figure 6.3. The graph subtitle provides a description of the applied measure. Energy impact is given in Watt-hours per square foot of the building floorspace.

When processing for the selected building type is complete, the user is returned to the Building Menu. The user may then select another building to process or return to the Main Menu by clicking on that button.

Figure 6.1
Building Menu

Figure 6.2
Process Type Window

Figure 6.3
DOETRAN Sample Graph of Total Electric Monthly Impacts

7.0 GRAPHS

Graphs of the annual electric impacts for each building type may be viewed and printed by selecting the *Graphs* button from the DOETRAN Main Menu. Figure 7.1 shows the Graph Menu window that follows. After selecting the desired building type, the user then selects to view monthly or annual impacts. At this time, only annual impacts are available. Selection of monthly impacts will result in a pop-up window that informs the user that this feature is not currently available. Graphs of monthly impacts, however, may be viewed when processing data using the *Process Data* button from the Main Menu.

After clicking on the *Annual* button, the user may then select to simply view the graph or view and print by selecting the appropriate button. Printing the graph extends the procedure time, so viewing the graph should be selected when the print feature is not needed.

Figure 7.2 shows a typical graph screen for the building type Large Office. The comparative effect of the various measures is clearly seen. Due to space limitations, the measures are identified by their rank order only on the abscissa, with a list to the right identifying the top 25 energy saving measures by their measure ID number. Pressing the *View Measure List* button will open a table providing a description of the measure associated with each measure ID. Pressing the *OK* button will close the table, returning to the Graph Preview screen. The user may return to the Graph Menu by pressing the *OK* button.

Graphs may only be viewed for the buildings that have been previously processed by selecting the *Process Data* button.

Figure 7.1
Graph Menu

Figure 7.2
Example Annual Electric Impact Graph

8.0 WRAP-UP

To exit from the DOETRAN program, the user needs to return to the Main Menu. Clicking on *Exit* will return the user to the Windows Program Manager.

If the user has the forecasting model and DOETRAN on the same computer, then no further data manipulation is required for the forecasting model to access the DOETRAN output. If the two models are on separate computers, then the user will need to transfer the database tables to the forecasting model. A batch program is available to aid in performing this function upon request.