

United States Department of Agriculture
Natural Resources Conservation Service

DATA_ED

The Data File Editor

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written by:
Clinton W. Liezert PE
Civil Engineer
(retired)

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Introduction:

One of the greatest advantages of the computer, other than computation speed, is the ability to readily access vast amounts of data. This advantage is utilized in many instances in the "Ohio" package of engineering programs. There are several files included in the package that contain strictly data that is used by one or several program applications. These data files include information such as rainfall, evaporation, hydrologic soil groups, waste production, crop needs, default values, etc.

Many technical computer applications utilize some sort of data base scenario in order to store great amounts of data in a manner that can be easily retrieved. It is not desirable to have to look at every bit of information in a data file in order to locate the small amount that is actually needed. For example, one should not have to look at the rainfall data for all 88 counties in Ohio when all that is needed is the data related to Medina County. This package of programs uses what are referred to as "random access" files to accomplish a relatively quick retrieval of data.

Like most things in life, there are pros and cons related to this procedure. As mentioned, the pros relate to the ease with which the data can be retrieved. The con or main disadvantage of this approach is that it is more difficult to manage or modify the data. (some consider this aspect a pro as the data is more secure.) Because of the nature of the data, this is not normally a problem after the initial data set is developed.

Some data sets can be developed or modified using any one of several simple text editors that are available as well as most word processors. That is not the case with "random access" data files and that is the whole purpose of this program (data_ed). It was developed to generate and maintain the data sets that are associated with the "Ohio Engineering" package.

Supporting Files:

This utility program is contained in a file named "*DATA_ED.EXE*". In order to run, it must be supported by the following additional files on the default drive:

BRT71EFR.EXE

This is a *runtime* module that is copyrighted to Microsoft QuickBASIC™

OH_ENG.CFG

The file containing all of the specifics about your computing system such as type of printer. This file is generated and managed by the program named "*eng_cfg.exe*"

***.DAT**

There are several data files that are managed using this program. Later we will discuss the specifics of these files and the data that they contain.

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Loading DATA_ED:

The most common method of loading this program is to load the main menu by entering "**engmenu**" at a DOS prompt (C>). (The engineering menu program is the main driver for all of the "Ohio Engineering Programs") When the menu appears on the screen move the cursor to the "Utility" selection and press return (↵). A second menu will appear. Move the cursor to "**Data File Editor**" and press return (↵)

An optional method of loading the program is to enter "**data_ed**" with a DOS prompt (C>).

Selecting a Data Set :

This program has been designed to interact with several files or types of data. The first screen that appears will include a list of all the files that are associated with this program. Should an asterisk (*) appear next to any selection in the list, it is meant to indicate that that particular data set could not be located on your particular system. This is not cause for alarm as you might not have (or want) the program that uses that particular data. If this is not the case, perhaps the data is in a different subdirectory, on a diskette or simply lost.

Once you have located the type of data that you would like to work with, move the highlighted bar over it and press the enter (↵) key and you should be on your way.

Moving about the Work Sheet:

It has already been mentioned that this program deals with a variety of data sets. For this reason, each work sheet or data entry screen will be somewhat different but the basic function of each of them is the same. Each screen will be divided into a series of windows. On each screen, one window will always be "active". This means that edits and selection can be made in that particular window. The "active" window will always have a double line border. The "active" window can be changed by pressing the tab or shift - tab keys. This will be discussed more later.

Each screen will have a "key" window. This term corresponds to the "key" value or element that is associated with most data base tables. It is the element in the table that ties all of the other information together. For example, if climate data is being edited, the name of the county (or area identification) appears in the "key" window. This means that all of the data that appears on the screen relates to the county that is highlighted in the "key" window. Other examples of "key" windows might include animal types, soil names, crop types, etc. In this application, the "key" window is in the top left corner of the screen.

The data in the "key" window is most often sorted. This is important so that the data can be quickly retrieved but the program will take care of those details if they are important. Typical activity in this window would include moving up or down the list until the desired choice is reached. This movement can be done with the mouse or the cursor keys. Addition methods of moving through the data in the "key" window include:

Home - instantly moves to the first item in the list.

PgUp - moves up several lines in the list.

PgDn - moves down several lines in the list.

End - moves to the last line in the list.

Entering the **first letter(s)** moves to the first item in the list that begins with that letter(s).

Entering / Editing Data:

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Entering and editing data in any of the windows other than the “key” window is rather straight forward. The cursor can be moved around within the active window using the cursor control keys or the mouse. New data will be accepted (subject to testing in some cases) once the enter (↵) key has been pressed. Once the data in the active window is deemed satisfactory, the tab or shift-tab key will change to the next (previous) window. With the exception of Esc to Quit, the “key” window must be active in order to move to a new set of data. (The F1 - Help key is not always active and will not be until the help information can be assembled.)

The Key Window:

As described before, the “key” window contains the key to the data, but it is also the location from which many of the functions of this program are launched. Most of these functions appear at the bottom of the screen when the “key” window is active. The available functions are described below:

Esc-Quit - this action will provide a means of exiting from the data file that is involved. If changes have been made to the data, the program will ask for permission to save the changes. In most cases, a “yes” response will cause the data file to be updated. Currently there is one file (crop.dat) that can not be modified because changes would compromise the validity of the program that uses the data. A message will appear on the screen explaining why the data can not be changed and you will receive instructions related to getting the data changed if there is really a problem.

*** **Note** *** - while we are talking about saving changes to data, this might be a good place to point out that this program is NOT intended to make mass changes in data by every user. Most of the files contain proven data and there should be very little need for change. Poor judgment in making changes to the data files can cause the program that eventually uses the data some severe heartburn.

F1-Hlp - the F1 key will provide a short description of either the file being worked on or the entry where the cursor is positioned. Currently there is limited help available but this function will be expanded in the future.

F5-Prn - this action provides a means of printing a copy of the data set involved. Initially you will be asked to select the output device for your report. The choices are the screen, the printer, or a file. Printed reports are a good way to review the data and compare it to other sources.

A second question that you might be asked when printing a data set is whether you would like to use the short headers or the long headers. The headers are the descriptors that appear at the top of each column of data. Short headers are abbreviations of the long headers and in some cases might only give a clue to type of data in the column. While the long headers are more descriptive of the data they can really mess up some reports because they take up so much space. The long headers are nice when the data will eventually be used in a spreadsheet application Excel™ or Lotus™ where the headers can be formatted to be more readable. Your choice should be based on your particular needs.

When a data set is printed to a file, it basically generates a delimited ASCII file using the file name that you provide.

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F6-Ed - provides a means of editing the entry in the “key” window. A small window will appear containing the “key” value and edits can be made or the entry can be completely changed.

F7-Add - provides a means of entering a completely new record of information. Initially you will be asked to identify the “key” information related to the record and then you will be provided with a blank worksheet where the data for the record can be entered. In a few instances, this function is inactive as adding a record would create a need to change the program that uses the data file and that is beyond the capability of this program. For example, one could not add a record to the “HYDR Default Values” because the “HYDR” program would not recognize the record that was entered. (If you find this difficult to understand, just trust me !!)

F8-Delete - pressing this key will cause the selected item to be “tagged”, When an item is tagged for deletion, it will be marked with a tilda (~). Pressing the F8 key when a tagged record is selected will afford the option to **Undelete** the record. Records are not actually removed until you have told the system to save any changes. When deleted, the entire record displayed on the screen will be removed from the data file. Care should also be exercised. If the program that uses this data file cannot find a record because you have removed it, the results can be somewhat unpredictable. In a few cases, this function has also been disarmed.

F9 - when working with the rainfall data (climate.dat) the F9 function will allow the seven frequencies to be changed. This should not be necessary and should be done with extreme caution because several of the programs that use this information rely on the data to be presented in a certain order. If this information is changed, the other programs should be monitored for strange results.

Alt I - this key stroke combination does not show up on the bottom of the screen but it adds great functionality to the program. Pressing this combination of keys allows data to be imported from an ASCII file. Initially a window will appear that will solicit the name of the file containing the ASCII information. Next you will be asked how many lines in the file contain header information. Header information is normally text information that identifies the data contained in each of the columns. There may be several lines of this type of information. The program will actually discard the lines containing header information. Next you will be asked whether the data should be added to an existing file or if a totally new data file should be created using the ASCII information. In most cases you will likely be creating a new file but the option to append your data to an existing file also is available.

***** Warning ***** - it is absolutely imperative that the structure of the ASCII file be consistent with the structure that the program is expecting. If it is not, the resulting generated data file will be really messed up and unusable. It is also extremely important that the ASCII file be delimited. This means that all of the text information is contained within double quotes (“”) and that all of the fields are separated by a comma (.). The data structure definitions at the end of this document will be of assistance in identifying the required structure.

This function is most useful when there is a need to make mass changes in a data set. While this program is designed to change data files, there are certainly software packages that are better suited to make mass changes. The preferred

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method for making these changes is to print an existing data set to a file using the F5 function. This will establish the format of the data that the program is accustomed to. Load this file into your favorite editor or spreadsheet and make all of the changes that are necessary. Make certain that the format and delimiter are respected. Save the changes to an ASCII file and import the file back into the data editing program. This sounds rather complicated but it really works pretty well.

F10 - causes the active window to change. Successive uses of the tab key moves the active window in a counter-clockwise direction around the screen. Shift-F10 changes the active window in the opposite direction.

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Data Structures: - the following information identifies the structure of the data that is saved for the various files. Also included is some definition of the various data elements. While this information is somewhat technical in nature, it might be beneficial in understanding the data and could be valuable when involved in making mass changes to the data files.

Note - the first item in all of the following tables is the “key” element.

animal.dat – this file contains values that are used in the design of animal waste management system. Data includes quantities of waste produced as well as possible nutrient values of this waste.

Variable	Type	Length	Description
KindOfAnimal	STRING	21	The name or description of the animal involved.
Waste	SINGLE		Waste produced in ft ³ / 1000 lb. / day
TS	SINGLE		Total Solids produced in lb. / 1000 lb. / day.
Nitrogen	SINGLE		Nitrogen excreted in lb. / 1000 lb. / day.
P2O5	SINGLE		P ² O ⁵ excreted in lb. / 1000 lb. / day.
K2O	SINGLE		K ² O excreted in lb. / 1000 lb. / day.
VS	SINGLE		Volatile Solids produced in lb. / 1000 lb. / day.
BOD5	SINGLE		BOD ⁵ produced in lb. / 1000 lb. / day.
LRV	SINGLE		Anaerobic Lagoon (Rational Method) design loading rate in lb. of VS / ft ³ storage / day.
LRVodor	SINGLE		Anaerobic Lagoon (Rational Method) design loading rate for odor control in lb. of VS / ft ³ storage / day.
SAR	SINGLE		Lagoon sludge accumulation ratio.
VSsu	SINGLE		Volatile solids in supernatant of anaerobic lagoon (rational design)
VSsa	SINGLE		Volatile solids in active sludge of anaerobic lagoon (rational design)
TKNsu	SINGLE		Total nitrogen in supernatant of anaerobic lagoon (rational design)
TKNsa	SINGLE		Total nitrogen in active sludge of anaerobic lagoon (rational design)
Nsu	SINGLE		Ammonia nitrogen in supernatant of anaerobic lagoon (rational design)
Nsa	SINGLE		Ammonia nitrogen in active sludge of anaerobic lagoon (rational design)
Psu	SINGLE		Phosphorus in supernatant of anaerobic lagoon (rational design)
Psa	SINGLE		Phosphorus in active sludge of anaerobic lagoon (rational design)
Ksu	SINGLE		Potassium in supernatant of anaerobic lagoon (rational design)
Ksa	SINGLE		Potassium in active sludge of anaerobic lagoon (rational design)

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climate.dat: this data set includes basically rainfall and evaporation data. The information is used by several of the programs including animal waste system design, hydrology tools, pond design and water and sediment control basins.

Variable	Type	Length	Description
County	STRING	20	Name of County or Area that is represented by the rainfall / evaporation amounts.
FreqRf (1 TO 7)	SINGLE		Seven rainfall amounts (in inches) that correspond to the seven frequencies in the data table. Typically 24 hr. events with 1,2,5,10,25,50,and 100 yr. return periods.
MonthRf (1 TO 12)	SINGLE		Monthly rainfall amounts (in inches) for each month of the year.
MonthEvap (1 TO 12)	SINGLE		Monthly class A pan evaporation amounts (in inches) for each month of the year.
Kval	SINGLE		Temperature related adjustment value used to adjust the loading rates when using the rational method of designing a anaerobic lagoon.
Pmp	SINGLE		Probable maximum precipitation for a 6 hr period.
AnLoad	SINGLE		Recommended anaerobic loading rate for the area as defined in the National Animal Waste Field Handbook.
AerLoad	SINGLE		Recommended aerobic loading rate for the area as defined in the National Animal Waste Field Handbook
HRT	SINGLE		Hydraulic Retention Time for designing biogas collection (methane collection) lagoon systems.

cnvershn.dat: a conversion module is included in the hydraulic formula application. The parameters necessary in making the conversion computations is included in this data file.

Variable	Type	Length	Description
FromUnit	STRING	20	Units of the current value.
ToUnit	STRING	15	Desired Units.
Factor	DOUBLE		Factor that value is multiplied by to make the desired conversion.
AddFactor	SINGLE		Factor that added to the value to make the desired conversion.
WhenFactor	INTEGER		0 - entered value is multiplied by Factor 1 - entered value is multiplied by Factor and AddFactor is added. 2 - AddFactor is added to value and the sum is then multiplied by the Factor.
Precision2Right	INTEGER		Display precision of the decimal portion of the result.
Precision2Left	INTEGER		Number of positions to display left of the result.

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hydr_def.dat: the default values, as well as the minimum and maximum acceptable entries, used by the hydraulic formula program are stored in this table.

Variable	Type	Length	Description
Description	STRING	40	Description of the variable involved.
DefValue	SINGLE		The default value that will be presented as a first choice if the initial value of the variable is zero.
MinValue	DOUBLE		Minimum entry that will be accepted for this variable.
MaxValue	DOUBLE		Maximum entry that will be accepted for this variable.

soils.dat: values related to soils properties are included in this table listed by soil mapping unit name. This information is used by hydrology tools and water and sediment control basins.

Variable	Type	Length	Description
SoilName	STRING	20	Common name of the soil mapping unit.
Texture	STRING	6	Texture of the soil.
HydGrp	STRING	3	Hydrologic soil group assigned to this soil.
usleK	SINGLE		“K” coefficient assigned to this soil for use in the universal soil loss equation.
Tallow	SINGLE		Allowable soil loss in Tons / Ac. / Yr. that will maintain a productive top soil.
Tsevere	SINGLE		Allowable soil loss in Tons / Ac. / Yr. when the soil has a history of severe erosion.