

Chapter 4

Creating an Input Data File

The HEC-2 program is a batch program, that means the necessary data for the program is provided as input at program execution and the program processes the entire job to completion. The program user does not interact with the program during execution. This section describes the sequence of an HEC-2 computation process, the input data format, and the basic steps for creating and storing an input data file.

4.1 Sequence of HEC-2 Computations

The HEC-2 program is designed to compute multiple water surface profiles with a given data set describing a river reach. The data set for the first profile defines the starting conditions and the physical river reach. If additional profiles are to be computed, the starting conditions for the subsequent profiles are provided at the bottom of the input data file that defines the first profile. Title plus job records (J1 & J2) are required for additional profiles. **NOTE: Since 1988, HEC-2 does not require three title records.**

As HEC-2 computes water surface elevations for each given cross section, the results are written to a file, TAPE95. There is also a sequential writing of results to the output file. When the program has completed one profile, the starting conditions are determined (if provided) for the next profile. The program repeats the process of computing the water surface profile with the new starting conditions and the original river reach data. The multiple profiles are computed for as many profiles as are defined in the input data set. The data set ends with an ER record. **NOTE: Since 1988, HEC-2 does not require three blank records.**

Once all the profiles are computed, the program reads TAPE95 and formats the summary tables requested by the input data. (See Section 6.1 for more information on HEC-2 operation and Section 6.2 for descriptions of program output files.)

4.2 Input Data File Format

The structure of the HEC-2 input data file can be seen by reviewing any of the test data sets provided with the program. The detailed input description is provided in Appendix VII of the User's Manual.

The format for the HEC-2 data is a "standard" HEC format. The concept is based on the eighty-column data card associated with batch input. The term card is used here even though the cards are more appropriately defined as records in a file. The first two columns are used for record identifier (ID); the program reads and sorts through the data based on the record ID. Each record is divided into ten (10) fields of eight columns each. However, a variable in field one may only occupy record columns 3 through 8 because the record ID is in columns 1 and 2. The HEC-2 User's Manual, and this text, refer to the individual records by their ID and the variable location of the record by the field number (1 through 10).

Data entry into fields requires careful counting of columns to ensure that the data are located in the correct fields. If a datum is entered across a boundary (column) between fields, the program will read part of the value as one variable and the remainder of the datum as the value for the variable in the next field.

There are several options available to assist the program user to enter data into fields without counting record columns to space data entries into the correct fields. The HEC-2 and EDIT2 programs will accept input data in "FREE" format and convert the data into fixed-format. However, the Corps' interactive edit program, COED, will automatically place input data into HEC standard (fields of eight) format. COED also provides on-screen help features that enhance the data entry function of the editor. The use of COED is assumed in the following sections.

4.3 COED Application

Creating or editing an input file from MENU2 calls COED. Calling COED from MENU2 also includes two parameters: **FS** and **HP HEC2**. If you run COED separately, these parameters can be entered while in COED. Entering **HP HEC2** will cause the HEC-2 input help file to be loaded, providing the tab settings for data entry and the input variables for HEC-2. Entering **FS** puts you into the Full Screen working environment. COED operates as a command editor (where you enter edit command codes and parameters) and also as a full screen editor (like a word processor). See the COED User's Manual for detailed documentation. Figure 6 shows an input data file in COED full screen edit mode, which is better for data entry.

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TOP . .
T1  WATER SURFACE PROFILES WORKSHOP SOLUTION
T2  COED INPUT PREPARATION FOR PC VERSION
T3  RED FOX RIVER Q = 1000 cfs
J1  0      2      0      0      0      0      0      0      0      3.0
QT  3      1000   6500   10000
NC  0      0      0      .1     .3
NH  5      .1     415    .05   650    .03    710    .05   1020   .10
NH  1635
X1  1      11     650    710
GR  25     20     10     110   17     415    14     650    1      675
GR  0      650    1      710   13     710    14     1020   14     1590
GR  25     1635
NH  4      .1     415    .05   575    .03    640    .1     1250
X1  2      10     575    640   500    500    500
GR  25     30     20     110   20     200    17     415    10     575
GR  4      500    4      615   10     640    10     1195   25     1250
NC  .1     .05    .03
X1  3      10     370    400   400    400
GR  25     40     22     260   10.7   370    15     420    7.1    500
GR  7.5    530    17.3   560   20     600    22     850    25     875
NH  5      .1     130    .05   330    .036   460    .05   610    .1

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T1 FIRST TITLE RECORD
 Help=F1 Caps-Lk Col=1 Line=1

Figure 6
 HEC-2 Input Data File in COED Full Screen Mode

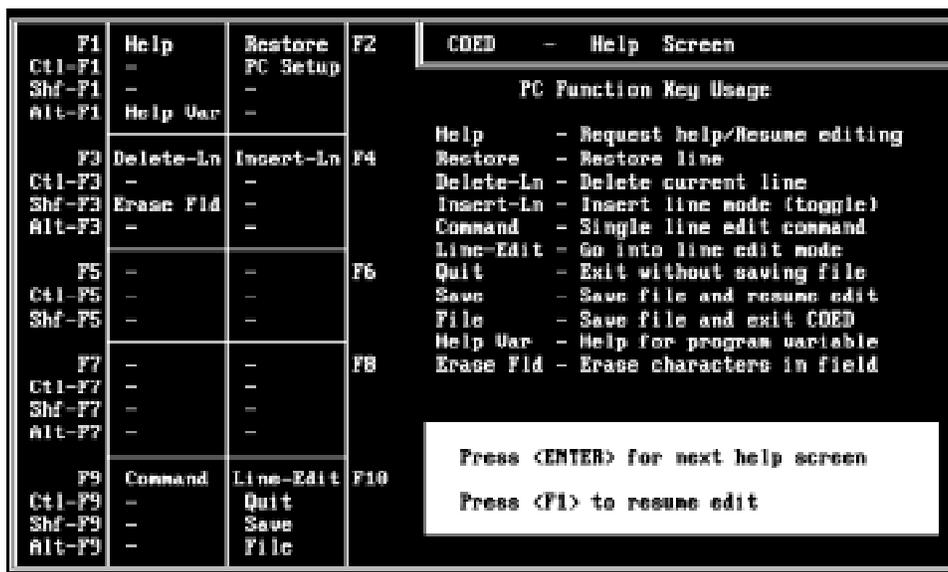
Once in COED, with HEC-2 help file and full screen edit mode, data entry will automatically use the first two columns for ID, the next six columns for Field 1, and the remaining nine sets of eight columns as Fields 2 through 10. With the cursor at the first column, enter any appropriate HEC-2 ID (e.g., T1). The bottom of the screen will display a line of input information for the entered ID (e.g., FIRST TITLE RECORD for T1). If the ID is not appropriate for HEC-2, you will get the message:

ID >> >>> Record ID not valid for HEC-2 input <<< <<<

For title record information the entire line is available to enter text; there are no fields. For data records, most fields represent variables, and the variables are shown on the line at the bottom of the screen. For example, enter J1, and the variables for the J1 record are shown on the bottom line. Use the **<TAB>** key (usually shown with two horizontal arrows) to move the cursor from field to field. The cursor automatically moves to the right of each field. Data entry will also fill the field from the right. Therefore, the data are always right justified.

Data entry only affects the field that the cursor is on. Therefore, inserting or deleting data in a field only works in the one field. If you continue to enter data in a field, the previously entered data is displaced to the left until it is moved completely out of the field. Use the **<TAB>** key, or a cursor key, to move to another field. Use the **<SHIFT><TAB>** to move the cursor to the left.

Help information for COED is provided by pressing **<F1>**. The function keys are defined, and a list of additional help information is provided, as shown in Figure 7. The COED User's Manual is essentially provided through the help file.



**Figure 7
COED Help Screen**

Help

information for HEC-2 variables is provided by pressing **<ALT><F1>**. The HEC-2 ID in columns one and two provides the line of variables, for that record type, listed at the bottom of the screen. Moving the cursor to any field on the data input line and pressing **<ALT><F1>** provides the input description for that field's variable. Therefore, while you are entering data, you can obtain the input description for any input variable in the HEC-2 program.

With the HEC-2 help file loaded, COED can recognize legal input types. That is, the program will not accept a letter <O> for an entry that requires a number. This feature should reduce illegal input data errors.

4.4 File Creation and Storing

Basically, the input file is made up of the title records, the job records that define starting conditions and program options, and a series of cross sections that define the river reach. Refer to the User's Manual, Appendix VII, for input descriptions. A Functional Use Index in Appendix VII shows the records to use for various program options.

The first profile data usually begins with the title records (1988 version allows any number of title records) and ends with the EJ record. For multiple profiles, three more title records and a J1 and J2 record are provided to define the starting conditions for each succeeding profile. After the EJ record, only title records, J1, J2, and JR are allowed to define each succeeding profile. An ER record ends the input data file; blank records are not required with the 1988 version. See Test 2 input for an example of a four-profile job.

To create an input file, the editor program COED is executed along with an input filename. If the file does not exist, the file is created and is then available for data entry. The data are entered, starting with the first record, and sequentially entered through the required data set for the reach. For subcritical water surface profiles, the cross section data starts with the most downstream section, and the cross sections are defined sequentially upstream to the end of the reach, which would represent the first profile.

The input data file is saved with the appropriate command. Usually, the **FILE** command is used. It saves the edited file and exits the COED program. The **FILE** command can be invoked by pressing the <ALT><F10> keys. While in full screen mode, a single COED command can be entered for the **E>** prompt, which can be obtained by pressing the <F9>. Pressing <F10> will change COED into the command mode of operation. Entering <FS> will take COED back to full screen mode.

When completed, exit the text editor; the input data file is now available to use with the various programs. Chapter 5 describes how to check the input data file. Before running HEC-2 with your data, it is strongly recommended that the input data file be checked with EDIT2.