

Input Instructions for Head Observations

Input for the Head-Observation Package is read from a file that is specified with "HOB" as the file type in the MODFLOW Name File.

0. [#Text]

Item 0 is optional and can include as many lines as desired. Each line needs to begin with the “#” character in the first column.

1. NH MOBS MAXM IUHOBSV HOBDRY **[NOPRINT]** (free format)

2. TOMULTH (free format)

Read sufficient repetitions of item 3 and, optionally, items 4 through 6 to obtain NH head or change-in-head observations.

3. OBSNAM LAYER ROW COLUMN IREFSP TOFFSET ROFF COFF HOBS (free format)

If LAYER is less than zero, hydraulic heads from multiple layers are combined to calculate a simulated value. The number of layers equals the absolute value of LAYER, or |LAYER|.

Sufficient repetitions of item 4 are read to define the contributions from each layer. The order of the layers needs to be specified according to the method presented in figure 3.

4. MLAY(1), PR(1), MLAY(2), PR(2), ..., MLAY(|LAYER|), PR(|LAYER|)
(free format)

If IREFSP in item 3 is less than zero, read item 5.

5. ITT (free format)

If IREFSP in item 3 is less than zero, read item 6 for each of |IREFSP| observation times

6. OBSNAM IREFSP TOFFSET HOBS (free format)

Explanation of Variables

Text—is a character string (maximum of 79 characters) that starts in column 2. Any characters can be included in Text. The “#” character needs to be in column 1. Text is printed when the file is read and provides an opportunity for the user to include information about the model both in the input file and the associated output file.

NH—is the number of head (or change in head) observations.

MOBS—is the number of the NH observations that are multilayer.

MAXM—is the maximum number of layers used for any of the MOBS observations.

IUHOBSV—File unit for saving observation data in a file. Specify 0 for no observation output file. The file for this unit must be included as type “DATA” in the Name File.

HOBDRY—is the value of the simulated equivalent that is written into the observation output file (file unit IUHOBSV) when the observation is omitted because a cell is dry.

NOPRINT—is an option keyword that turns off printing of input and output data in the Listing File.

TOMULTH—is the time-offset multiplier for head observations [-- or T/T]. The product of TOMULTH and TOFFSET must produce a time value in units consistent with other model input. TOMULTH can be dimensionless or can be used to convert the units of TOFFSET to the time unit used in the simulation.

OBSNAM—is a string of 1 to 12 nonblank characters used to identify the observation. The identifier need not be unique; however, identification of observations in the output files is facilitated if each observation is given a unique OBSNAM.

LAYER—is the layer index of the cell in which the head observation is located. If LAYER is less than zero, hydraulic heads from multiple layers are combined to calculate a simulated value. The number of layers equals the absolute value of LAYER, or |LAYER|.

ROW—is the row index of the cell in which the head observation is located.

COLUMN—is the column index of the cell in which the head observation is located.

IREFSP—is the stress period to which the observation time is referenced. The reference point is the beginning of the specified stress period. If the value of IREFSP read in item 3 is negative, there are observations at |IREFSP| times -- item 5 is read and |IREFSP| repetitions of item 6 are read. Also, if IREFSP is negative, values of OBSNAM and HOBS read in item 3 are ignored and values read in item 6 are used.

TOFFSET—is the time from the beginning of stress period IREFSP to the time of the observation [T]. TOFFSET must be in units such that the product of TOMULTH (in item 2 above) and TOFFSET is in time units consistent with other model input. TOFFSET and TOMULTH from the HOB file and values of PERLEN, NSTP, and TSMULT from the Discretization File are used to determine the stress period, time step, and time during the time step for the observation. To specify that an observation is for a steady-state model solution, specify IREFSP as the stress-period number of the steady-state stress period, and specify TOFFSET such that the product $\text{TOMULTH} \times \text{TOFFSET}$ is less than or equal to PERLEN for the stress period; if PERLEN is zero, set TOFFSET to zero. If the observation falls within a time step, the simulated equivalent is calculated by linearly interpolating between heads at the beginning and end of the time step. If the first stress period is transient and the observation falls within the first time step of the stress period, the head from the beginning of the time step is determined by using the initial head distribution specified in the Basic Package input file.

ROFF—is the row offset used to locate the observation within a finite-difference cell (fig. 1).

COFF—is the column offset used to locate the observation within a finite-difference cell (fig. 1).

HOBS—is the observed hydraulic head [L]. In item 6, this needs to be hydraulic head even when ITT=2 in item 5; the program will perform the required subtraction.

MLAY(I)—is the I^{th} layer number for a multilayer head observation.

PR(I)—is the proportion of the simulated hydraulic head in layer MLAY(I) that is used to calculate simulated multilayer head. The sum of all PR values for a given observation needs to equal 1.0.

ITT—is a flag that identifies whether head or changes in head are to be used as observations.

ITT = 1: The observed hydraulic heads are used as observations.

ITT = 2: The initial observed hydraulic head and subsequent changes in head (for example, drawdown) are used as observations. Changes in head are calculated internally from the hydraulic-head values listed in item 6, so the HOBS values specified in item 6 need to be hydraulic heads.