

## **3 USING ASEAM3.0**

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## 3 USING ASEAM3.0

### 3.0 Introduction

This chapter explains the basic requirements of running ASEAM3.0. You should read through the chapter with your computer on. Practice performing the various operations using the sample files included in the data subdirectory.

### 3.1 Starting ASEAM3.0

Follow these steps to start ASEAM3.0:

1. Change the default directory to the one you created and installed the ASEAM3.0 diskettes on in Chapter 2. (e.g. `CD C:\ASEAM3.0`, followed by CR)
2. Type `AS3MENU` and press CR. This command executes the Main Menu program (AS3MENU). Once the program is retrieved, you should see the ASEAM3.0 Main Menu.

### 3.2 Using ASEAM3.0 Menus

If you have followed the instructions above for starting ASEAM3.0, the ASEAM3.0 Main Menu will be displayed on the screen:

#### ASEAM3 Main Menu

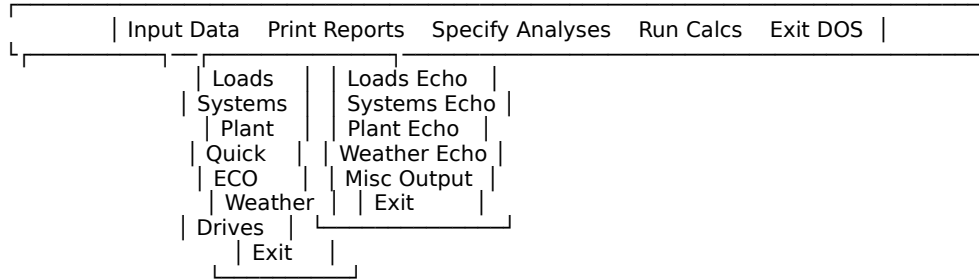
```
| Input Data  Print Reports  Specify Analyses  Run Calcs  Exit DOS |
```

#### 3.2.1 Menu Item Selection

The ASEAM3.0 menu for each program begins with a horizontal listing of choices displayed across the screen. One of the choices is highlighted by a reverse video box (the first selection when entering a program). To access different selections, use the right and left cursor control keys to move the highlighted area over the option you desire. To select an option, press CR, and the selected choice will either be executed or another menu will appear. Your computer will signal with a beep if you press any key other than the right or left cursor keys or CR.

Secondary menus may appear either as additional horizontal selections or as vertical "pull-down" menus under the item first selected. For example, by pressing CR when either "Input Data" or "Print Reports" is highlighted, the following pull-down menu will appear:

#### ASEAM3 Main Menu

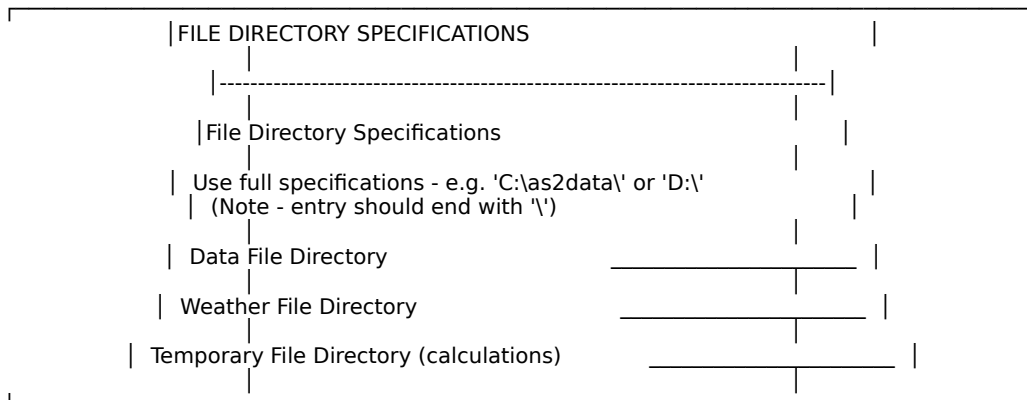


These vertical pull-down menus work exactly like the horizontal menus, except that the up and down cursor keys (instead of left and right) are used to move the highlighted selection. Press CR to select an option. Pressing any key other than these three will cause the computer to beep.

You often will see "Exit" as one of the choices on a menu. If you are in a program's horizontal menu at the top of the screen, "Exit" means to leave this program and go to another program. On a secondary menu (either horizontal or vertical), selecting "Exit" returns you to a higher level menu in ASEAM3.0.

### Data Subdirectory

In ASEAM3.0, data can be stored on hard disk subdirectories. To change the subdirectory where these files are stored, access the ASEAM3.0 Main Menu and press the 'enter' key when 'Input' is highlighted. A new choice ('Drives') appears in the vertical menu selection. Move the cursor down to the 'Drives' selection and press CR. A new screen will appear where the data and weather file subdirectories can be specified. Please note that the ASEAM3.0 Main Menu program (AS3MENU) is the only ASEAM3.0 program that can change these subdirectories. As in ASEAM2.1, all the input files required to perform an analysis must be on the data subdirectory. You are advised to create a new data subdirectory for each project. In ASEAM3.0, weather files can be stored in a separate subdirectory.



ASEAM3.0 will not create or delete any subdirectories for your data. All the data for the project will be stored in the same subdirectory by ASEAM3.0.

### 3.2.2 ASEAM3.0 Main Menu Options

From the ASEAM3.0 Main Menu you have the following choices:

Input Data - edit or create input data files

Loads

Systems

Plant

Quick

ECO

Weather

Drives

Exit - returns to horizontal bar menu

Print Reports - print reports to file, screen, or printer

Loads Echo - loads input data

Systems Echo - systems input data

Plant Echo - plant input data

Weather Echo - bin weather and solar data

Miscellaneous Output - calculation output reports

Exit - return to horizontal bar menu

specify

Specify Analyses - choose which segments and analyses are to be done; also,

weather data and output reports

Run Calcs - starts the calculations

Exit DOS - exit ASEAM3.0, return to the operating system

### 3.2.2.1 Input Data

The Input Data command from the Main Menu accesses the individual input programs for each segment. There are separate input routines for each calculation segment (Loads, Systems, Plant, and Economic), for Quick input, for ECO input, and for weather data input. To begin a particular input segment, use the up and down cursor keys to highlight the segment you want to input. Press CR.

As discussed in Section 1.5, ASEAM3.0 performs calculations in four segments. Each segment has its own input routine for entering new data and editing existing data. Note that Loads data must be entered first, followed by Systems data, and finally Plant data. Economic data can be entered either before or after the other input segments.

*Loads:* Enter data for building location, operating hours, thermostat setpoints, construction, infiltration, internal gains, and diversity factors. See Chapter 5 for further information.

*Systems:* Enter data for building HVAC systems, types, modes of operation; heating, cooling, and humidification requirements; economizer cycles, reheat, etc. See Chapter 6 for further information.

*Plant:* Enter data for building plant components, such as boilers, chillers, and cooling towers, energy costs and conversion factors, and miscellaneous energy consumption. See Chapter 7 for further information.

*Quick*: Generates Loads, Systems, and Plant input files from a minimum of user-specified information. A small subset of the data values from the complete Loads, Systems, and Plant input routines is entered here. See Chapter 9 for further information.

*Weather*: Creates temperature bin and solar data files to be used by ASEAM3.0. See Appendix A for further information.

*Drives*: Allows you to change the data subdirectory specification.

*ECO*: Used to create modifications to existing Loads, Systems, or Plant data files to model ECOs. See Chapter 8 for further information.

A complete ASEAM3.0 run requires only Loads, Systems, and Plant data files to have been input. The other inputs are optional.

### **3.2.2.2 Print Reports**

After you have completed the input segments, check the data to ensure that there are no mistakes. Reports, or "data echoes," which list the input data, are available for all data files. Choose which type of data file is to be printed from the pull-down menu.

**Note**: The last choice on the menu, "Misc Output," cannot be used until you have created output reports by running the calculations. The stand-alone reports, peak loads and energy consumption reports are covered in Chapter 12.

### **3.2.2.3 Specify Analyses**

Once you have a complete set of Loads, Systems, Plant, and, at your option, Economic data files, you are ready to specify the analyses. ASEAM3.0 has several calculation modes. In the Specify Analyses segment, you determine which data files and calculation modes are to be used in the calculations. See Chapter 11 for further information.

Specify Analyses should always be immediately followed by Run Calcs. Run Calcs saves the Specify Analyses run file describing the calculation mode and the files to be used.

### **3.2.2.4 Running the Calculations (Run Calcs)**

After the Specify Analyses segment has been completed, you are ready to begin running the calculations. Enter "Run Calcs" at this point. See Chapter 12 for further information concerning calculation reports during the execution of the calculations.

### **3.2.2.5 Exit DOS**

This command exits from ASEAM3.0 and returns control to DOS.

### 3.3 ASEAM3.0 Input Conventions

#### 3.3.1 General Information

The Loads, Systems, Plant, and Economic input segments allow you to enter data about the building, HVAC equipment, central plant equipment, and economic parameters to be simulated. It is not necessary to learn a complicated control language to enter your data. All of the input is done interactively: each screen contains a series of questions related to a particular component (e.g., walls or lighting in Loads, heating or cooling in Systems, boilers or chillers in Plant) with spaces for answers. Move the cursor to the appropriate question, and enter the data on the corresponding line.

Many of the questions are prompting; that is, you will choose your answer from a list of possible answers. If the answer is out of range or not allowed, the computer will beep, and an error message will appear briefly. Some of the questions have default answers, which you access by pressing a Function key (see section 3.3.4.2 below). If there is no default answer for a particular item, you will again hear a beep and see an error message briefly at the bottom of the screen.

#### 3.3.2 Input Menu

To demonstrate the input features of ASEAM3.0, access the Loads input segment by highlighting "Loads" on the pull-down menu under "Input Data"; press CR.

Note: In the discussion that follows, the designation L/S/P refers to Loads, Systems, or Plant. Wherever you read "L/S/P" in this manual, you will see "Loads," "Systems," or "Plant" on the screen. Data may be entered in only one segment at a time. For example, to switch between Loads and Systems data entry, you need to exit from the Loads input routine and enter the Systems input routine.

After you have marked L/S/P under "Input Data," the L/S/P Input menu will appear. Use the cursor control keys to select the operation to be performed.

##### ASEAM3 L/S/P INPUT

```
| Get L/S/P File  Save L/S/P File  Edit L/S/P Data  Enter New Data  Exit |
```

#### 3.3.2.1 Get L/S/P File

The Get command retrieves an existing L/S/P data file from the data subdirectory and loads it into memory. You must use this command before you can edit a file, since all editing works within memory and not directly from the subdirectory.

When you select "Get L/S/P File," the program responds with a list of all L/S/P input files stored on your data subdirectory. Using the cursor control keys (up, down, right, left), highlight the file you want and then press CR. If the file that you want to edit is not on the list, first highlight "Exit" and press CR (to get out of "Get L/S/P File"); then return to the ASEAM3.0 Main Menu and select "Drives" under the "Input Data" option.

Then return to the appropriate L/S/P input program and try "Get L/S/P file" again. Once you see the file you want, mark it with the reverse video box and press CR. (Remember that to perform calculations, the Loads, Systems, Plant, and Economic data input files for the run must all be on the same subdirectory.) The message "Retrieving Data From Disk" will appear on the screen briefly while the computer reads the file into memory. When the L/S/P Input Menu reappears, you are ready to "Edit L/S/P File."

If you use the "Get L/S/P File" command when data is currently in memory, a warning will be issued. Retrieving a file overwrites all data in memory with the data from the file.

### **3.3.2.2 Save L/S/P File**

The Save command saves a data file so that you can use it again. This command copies the complete input data file from memory (temporary storage), where you have been editing it, to the subdirectory (permanent storage). If you do not save a file, it will be lost once you exit from the L/S/P input program or get a different data file. The Save command should be used each time you finish editing a file, unless you have made no changes to the file, or you have made erroneous changes and would prefer to have the previous (last saved) version of the file.

When you use the Save command, a message will be displayed asking you for the name of the file to be saved. Press CR to save the file under the same name that you previously gave to the file (the same name that you used to retrieve it). Typing a new name causes the file to be saved under that name; typing `OOPS' aborts the Save command and returns you to the L/S/P Input Menu.

*Warning:* If you enter CR for the file name, the file in memory will overwrite the file on the data subdirectory. You may want to use a new file name and keep the old file as a backup.

File names may be up to eight alphanumeric characters. (Refer to your DOS manual for valid file-name characters.) Do not specify an extension or a subdirectory path in the file name. ASEAM3.0 automatically assigns the following extensions to your input file:

- .LID\_Loads Input Data
- .SID\_Systems Input Data
- .PID\_Plant Input Data

ASEAM3.0 uses these extensions to identify file types. Therefore, the same eight-character file name can be used for Loads, Systems, and Plant data files for a building. The program will keep track of each file type by its extension.

The subdirectory path for all ASEAM3.0 data storage can be changed only through the ASEAM3.0 Main Menu (see Section 3.2.1).

### **3.3.2.3 Edit L/S/P Data**

The Edit command allows you to review and change the contents of data files in memory. You must first "Get" a file before you can "Edit" it. When you use the Edit

command, another menu that lists particular screens to edit will be displayed. You can edit either the entire data file or only one particular screen. Refer to the "Loads Input," "Systems Input," "Plant Input," and "Economic Input" chapters of this manual for further information on input screens and input questions.

Once you have selected the screens to be edited, you need to specify which zones (in the Loads segment) or systems (in the Systems segment) to edit. A list will appear on the screen. An example using the Loads segment is shown below. The Systems list is the same, but it lists system names instead of zone names.

```
| Mark & Unmark Zones for Editing with CR (ESC to exit) |
|
| => 1 South Exposure
|     2 West Exposure
|     3 North Exposure
|     4 East Exposure
|     5 Core Area - No exposures except Roof
|     Edit All Zones
```

Use the up and down cursor control keys to move through the list of entries. The CR key is a toggle key; pressing CR marks (highlights) or unmarks the entry. When you have highlighted all the zones or systems to be edited, press the Escape (Esc) key. The first screen for editing will appear. The ASEAM3.0 editing function is explained in Section 3.3.4.

The information on each completed input screen is transferred into your computer's memory. After you have finished the screens that you indicated for editing, the Main L/S/P Menu will reappear. You can now choose to edit additional sections, save the file and begin editing another file, or exit to the Main Menu.

### 3.3.2.4 Enter New Data

The Enter New Data command clears the data in memory and allows you to begin entering a new set of data for the L/S/P file. All of the input screens will appear sequentially, with blank lines where you should enter values. Remember to store the file in memory before you Enter New Data. A warning message appears when data is presently in memory.

*Warning:* Do not use the Enter New Data command to continue entering additional data to an unfinished input file. If you do not complete the entire input data in one session, use the save command to store the unfinished data. Then, when you are ready to complete the input data file at a later session, use the `Get' and `Edit' commands to complete the data input. The Enter New Data command is used only when you are "starting from scratch".

### 3.3.2.5 Exit

The Exit command should be used when you want to leave the L/S/P input routine. The question "Did You Remember to Save Your Files?" will appear on the screen. If you answer `N' and then press CR, you will be returned to the L/S/P input menu for another opportunity to save the file. If you answer `Y' and press CR, a pull-down menu will appear.



## Exit to Other ASEAM3 Programs

```
| Main Menu - Specify Analyses - Run Calculations |
| Edit/Enter Loads Input Data                    |
| Edit/Enter Systems Input Data                 |
| Edit/Enter Plant Input Data                  |
| Edit/Enter ECO Input Data                    |
| Edit/Enter Quick Input Data                  |
| Enter Weather/Solar Data                     |
| Display/Print Loads Input Data                |
| Display/Print System Input Data              |
| Display/Print Plant Input Data               |
| Display/Print Weather Data                   |
| Display/Print Miscellaneous Output Reports    |
| Exit to DOS                                  |
| Exit to Previous Menu                        |
```

**Note:** The program you are in will not be displayed.

**Main Menu:** returns to the Main Menu, from which you can Specify Analyses and Run Calculations

**Edit/Enter Loads, Systems, Plant, Quick, ECO, or Weather Input:** accesses other input routines

**Display/Print Loads, Systems, Plant, or Weather Report:** accesses report (data echo) routines

**Display/Print Miscellaneous Output Reports:** accesses report routines for previous calculation output reports

**Exit to DOS:** exit from ASEAM3.0 and return you to DOS

**Exit to Previous Menu:** returns to the L/S/P Input menu without leaving the program presently in memory

### 3.3.3 Cautions about Memory

Memory is only temporary. The data stored in memory is destroyed when you exit any L/S/P input program, turn off the computer, lose power, or reboot. Only one file is held in memory at a time. Thus, if you replace the file in memory with a different file (either an existing file with "Get L/S/P File" or a blank file with "Enter New Data"), the file that was previously in memory will be lost. ASEAM3.0 issues a warning message whenever you use the "Get" or "Enter New Data" commands and there is existing data in memory.

To save the contents of the file in memory, you must use the "Save L/S/P File" command before editing other files or leaving any L/S/P input program. This command copies the file in memory to the data subdirectory, where it is stored permanently. Since the disk file is not changed until you Save, if you make mistakes or accidentally erase a lot of information while editing, you can always go back to the last-saved version of the file.

### 3.3.4 L/S/P Input Screens

This section explains how to move around, within and between input screens. The conventions are the same for editing all ASEAM3.0 screens.

Each input screen has a header stating the screen type (e.g., walls, heating, or boiler) and the file name for which the data is being entered.

The body of the screen shows a series of input questions with lines for the data input. There may be more than one column for data entry. The cursor will move only to those lines where you should input data. Cursor control is discussed in Section 3.3.4.1.

At the bottom of each input screen is a function key menu, describing the action resulting from pressing each function key. The function keys are explained in more detail in Section 3.3.4.2.

The cursor control and function key conventions are the same for all ASEAM3.0 input data screens. They apply for editing both existing and new data.

#### 3.3.4.1 Cursor Control

There are two types of cursors in ASEAM3.0. A "smiley-face" cursor comes up on the screen at the first entry. With this cursor you can move between entries. Once you begin typing an entry, the cursor changes to a blinking underline. The cursor control keys have different functions for the two types of cursors.

##### **Smiley-Face Cursor:**

When you first enter an input screen (through either the "Edit" or the "Enter New Data" command), the screen will display a list of input questions followed either by the current values (in the case of edit) or blank lines (in the case of new data). A smiley-face cursor is in front of the first question. This cursor is used to move around the screen from one input question to another.

The following keys are used to move the smiley-face cursor:

*Cursor up:* moves up to previous entry without error checking

*Cursor down:* moves down to next entry without error checking

*Cursor right:* moves right to next entry (down if no multiple columns) without error checking

*Cursor left:* moves left to previous entry (up if no multiple columns) without error checking

*PgUp:* completes error checking for entire screen. If no errors are found, moves to previous screen. If an error is found, prints an explanatory message at the bottom of the screen, beeps, and positions cursor at the incorrect entry. If current screen is the first in the editing sequence, returns to L/S/P Input Menu.

*PgDn*: completes error checking for entire screen. If no errors are found, moves to next screen. If an error is found, prints an explanatory message at the bottom of the screen, beeps, and positions cursor at the incorrect entry. If current screen is the last in the editing sequence, returns to L/S/P Input Menu.

*Return*: completes entry, performs error checking, moves to next entry if data is valid. If the entry is incorrect, an explanatory message is printed at the bottom of the screen, and the cursor remains at this entry.

*Esc*: refreshes the screen. The data will appear as they were when you first entered the screen. Any data that were changed will be replaced with the original data.

*Alt-x*: copies the data from zone or system x to the current zone or system, for this screen only.

The function keys, discussed in Section 3.3.4.2, may also be used. Any other keystroke will be interpreted as data entry and will be written on the entry line.

### **Underline Cursor:**

When you begin typing an entry, the cursor changes to a blinking underline. What you type is entered on the data entry line. With this cursor, you move *within* an entry, not between entries. The functions performed by the cursor control keys for the blinking underline cursor are different from those for the smiley-face cursor.

The following keys are used to move the underline cursor:

*Cursor up*: completes entry, performs error checking, moves up to previous entry if answer is valid; if this is the first entry on the screen, moves to previous screen.

*Cursor down*: completes entry, performs error checking, moves down to next entry if answer is valid; if this is the last entry on the screen, moves to next screen.

*Return*: same as cursor down

*Cursor Right*: moves cursor right to next character

*Cursor left*: moves cursor left to previous character

*Home*: moves to first character of entry

*End*: moves to last character of entry

*Delete*: deletes the character at the cursor; characters to the right of the cursor are moved to the left

*Insert*: inserts characters at the cursor. The insert key is a toggle - if the insert mode is presently "on" (as indicated by a large cursor), pressing the insert key will turn it "off" and vice versa. When the insert mode is "on",

characters are inserted at the cursor, and characters to the right of the cursor are moved to the right accordingly.

*Backspace:* deletes the character to the left of the cursor

*Ctrl-End:* deletes all characters to the right of the cursor

*Escape:* clears entry

Any alphanumeric character will be entered as data.

The function keys F9 (help) and F10 (exit) can be used.

Any other keystroke will cause the computer to beep.

### 3.3.4.2 Function Keys

The function keys can also be used during the input sessions. When you see the blinking underline cursor, only F9 and F10 may be used. All function keys are available with the smiley-face cursor.

The function keys have the following actions:

F3: delete entry at cursor

F4: delete column at cursor (only for screens with multiple columns); all other columns move to left

F5: insert column at cursor (only for screens with multiple columns); all other columns move to the right

**Warning:** Data in far righthand column move off-screen and is lost.

F6: copy column at cursor (only for screens with columns); copies to column at right; if pressed again, copies further right

**Warning:** Data in far righthand column move off-screen and is lost.

F8: use default value (if there is one; if not, message appears)

F9: help, supplies context-specific message (if there is one)

F10: exit to L/S/P Input Menu

*Warning:* F10 exits to the input menu *without* saving changes made during this screen. Every time you PgUp or PgDn out of a screen, or move to the next screen or menu automatically, the information you input is stored in memory. But when you use F10 to return to the menu, the information from that particular screen will not be stored. If you want to save the changes you have made on an input screen, press PgDn before using the F10 key.

### 3.3.4.3 Error Checking

Many of the input questions have upper and/or lower numeric limits or other restrictions such as number of digits, alphanumeric strings, etc. When you enter an unacceptable value (such as a letter when a number is required), the computer will beep, and an error message will appear briefly at the bottom of the screen; the cursor will remain at that line for you to enter a new value.

You cannot exit from a screen with incorrect or missing data. If you try to do so, the cursor will be returned to the erroneous data field. You can exit from a screen using

the F10 key at any time, but the data you just entered will not be saved, and the previously existing data for that screen will be kept.

The limits have been chosen with typical buildings and systems in mind, and your answers will probably fall within them. You can, however, change the limits without having to recompile the program (see Appendix C).

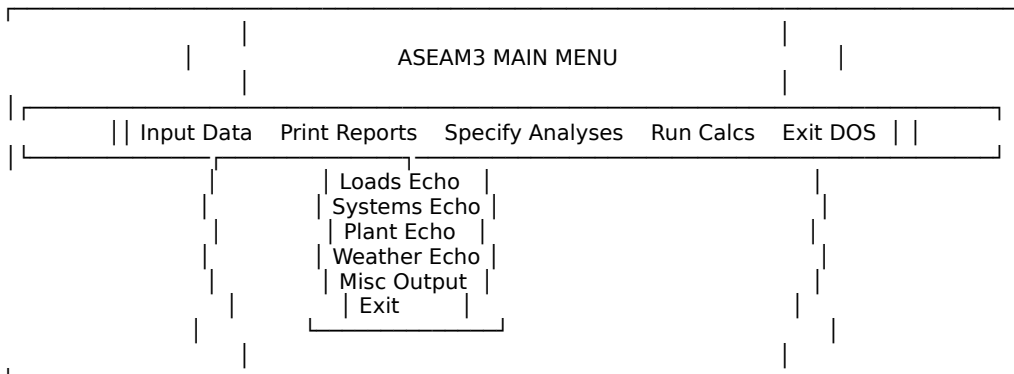
#### 3.3.4.4 Default Values

Default values have been assigned for many of the input questions. To enter a default value, press the F8 key. If there is no default value, the computer will beep, and a message will appear briefly at the bottom of the screen. The cursor will remain at the same entry if there is no default value.

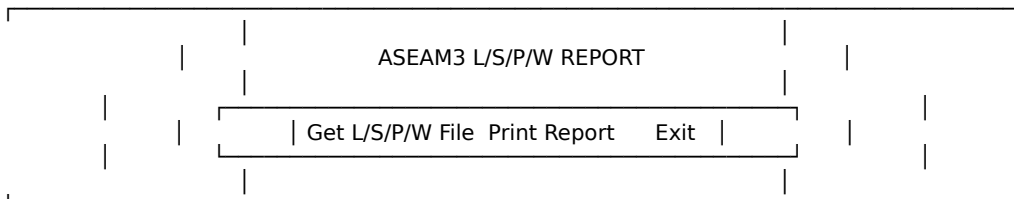
Default values have been chosen with typical buildings and systems in mind. You can, however, change the default values without having to recompile the program (see Appendix C for instructions on changing the input screen parameters).

### 3.4 Printing Data Echo Reports

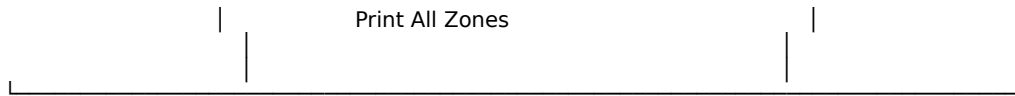
To display or print all of the data in an input file, use the Print Reports command from the ASEAM3.0 Main Menu or the Print/Display command from the Exit menu of any program. When you enter Print Reports from the Main Menu, a pull-down menu will appear on the screen (see below). Highlight the report you want to generate. The Miscellaneous Output reports can be used only after the calculations have been performed. All other reports are echoes of input data. (When you enter Print Reports from the Exit menu of any program, you will enter the Loads, Systems, Plant, Economic, or weather segment directly. See Section 3.3.2.5).



After you choose which report is to be generated, the ASEAM3.0 L/S/P or Weather Report menu will be displayed on the screen.







The data echo report will now be printed to the screen, the printer, or written to the output file. When the print or display is complete, the top part of the Loads Report menu will reappear. You may continue to select and print the reports or Exit to other programs.

### **3.5 Specifying Analyses**

When you have a complete set of input data in the data subdirectory, you are ready to specify the analyses. As discussed previously, there are several modes of performing the calculations. You specify which input files, modes of calculation, and output files are to be used with the Specify Analyses command.

Select the Specify Analyses command from the ASEAM3.0 Main Menu. A series of screens will follow, depending on the types of analyses you choose. The input for these screens is discussed in detail in Chapter 11. The editing procedure for these screens is the same as for all other screens.

### **3.6 Run Calculations**

After the analyses have been specified, you are ready to perform the calculations. Select Run Calcs from the ASEAM3.0 Main Menu. You can "stack up" several sets of calculations to be done and leave the program to run unattended. Requested output will automatically be sent to the printer (if available) and stored in files for later recall.

### **3.7 Output Reports**

Many different output reports are available. These are discussed in detail in Chapter 12.

The data subdirectory, besides storing all the input files, is used to store the requested output files from the calculations.

If you decide to use a diskette for data storage rather than the hard disk, it is advisable to check the diskette before specifying analysis and performing the calculations. Delete any unnecessary files. A "Disk Full" error (error #61) will result during the calculations if there is insufficient storage space on the diskette. ASEAM3.0 will abort, printing error #61 occurred if this happens.

### **3.8 The Data Subdirectory**

The data subdirectory should contain all the information needed for an analysis. The appropriate Loads, Systems, Plant, and Economic data files must be in the data subdirectory when you run the calculations. The weather files can be located on a different subdirectory (see section 3.2.1).

