9 QUICK INPUT

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9.1 Introduction

ASEAM3.0 includes a simplified input routine called Quick Input that allows you to generate complete Loads, Systems, and Plant input files in a minimum amount of time. In contrast to the normal ASEAM3.0 input programs, Quick Input has only nine separate input screens to complete for Loads, Systems, and Plant combined.

Quick Input provides values for many of the Loads, Systems and Plant input questions by using "dynamic defaults." That is, based on your answers to certain input questions, various default values are used. For example, with Quick Input, people density and lighting watts per square feet are defaulted based on the space type you select. Other input values (e.g., wall U-Factor) are defaulted based on climate conditions. This is quite different from the standard input routines, in which only one fixed default value is accessed (when you press the F8 key) _ regardless of climate location, building, zone, or space type.

Since many input values have been assumed, Quick Input files MUST be used with care. It is suggested that after you use Quick Input to create input files, you use the input data echo programs to review the default values which have been assigned and change those which you feel are inappropriate with the normal input programs. Alternatively, since the files created by Quick Input are standard Loads, Systems, and Plant input files, you can edit these files with the respective input program.

The advantage to using Quick Input is that you can have a complete set of standard input files in a very short amount of time. Quick Input should also be very useful in the contexts of design and education, when it is desired to observe the effects of changes in certain parameters, but the user does not wish to spend a great deal of time in defining the base case building.

Quick Input makes use of five sets of default files for the loads default values. The systems and plant default values are stored in separate standard systems and plant input files. The contents of these default files are described in Appendix G. You can modify or add to these default tables (each stored as a separate file) to customize them for your use or location. The Systems and Plant default files especially should be reviewed before using Quick Input. For example, preheat, baseboard, and humidification are assumed to be available in the systems. This is a reasonable assumption for the colder climates, but may not be appropriate for warmer locations.

Quick Input also simplifies the loads input data by automatically dividing a building into zones and calculating exterior surface and zone floor areas. All you need to do is to select the appropriate building shape from a list, enter some overall exterior dimensions and the zone depth and Quick Input will automatically calculate areas and divide the building into zones. With Quick Input, however, you have no choice of the zone divisions; the zones will automatically be defined by exposure and or core areas (see Section 9.2).

In Quick Input, commercial buildings can have either five or ten zones. A five-zone building has four perimeter zones (one to each orientation) and a core zone, the height of each zone being the height of the building. A ten-zone building has the same layout, but the zones one through five have heights equal to that of the entire building minus the top floor while zones six through ten have zone heights equal to the top floor. The ten zone configuration is useful in that it keeps solar gains from the

roof in the top zone. An orientation for the first zone must also be specified.

In each of the building shapes (see Figures in Section 9.2), there is an arrow pointing out of zone one; you are asked to choose the direction in which this arrow is pointing to determine the orientation of the building.

Obviously, Quick Input may not be appropriate for all buildings. You may want to model a building that is not one of the above shapes, or the number of floors are not equal for different parts of the building. Likewise, the systems in the building can be such that zoning the building by orientation is not correct. In these cases, you must use the standard Loads, Systems, and Plant input routines. Alternatively, you could use Quick Input for the default values for lighting, people, etc. and then edit the Loads, Systems, and Plant files created by Quick Input to correspond to your building (for example, correcting the wall, window, roof, and floor areas).

In addition to modeling only certain building geometries with given zone configurations, another Quick Input limitation is its use of extensive default files. It is imperative that you understand the assumptions behind both the zoning and area calculations and the use of the default values. Quick Input is NOT an alternative to modeling a building with data obtained from a building walk-through audit. The input files generated by Quick Input will NOT describe a particular building as it is operating. In general, the default values used by Quick Input (e.g., wall and roof construction; rate of heat gain from occupants, lights, and equipment; lighting levels; schedules and diversity factors; etc.) are those prescribed in standard references. The wall U-Factors coefficients, for example, were derived from the ASHRAE Standard 90.1 standard. That is, the default values are representative for newer construction, but may be entirely inappropriate for an older building. Again, you can modify or create new default files if necessary (see Appendix G).

Quick Input simplifies the loads portion of the input by using a three-tiered classification of building -> zone -> space. That is, once you specify the building type, Quick Input determines typical zone types and defaults for the building from the building default file. For example, laboratories are typical for medical clinics, but not appropriate for hotels or residences. Likewise, once the predominate zone type is entered for each zone, typical space types and default values are determined from the zone default file. As an example, locker rooms are typical spaces for gymnasium zones, but not for conference zones. Each zone may have up to four different space types. Most of loads default values are stored in the space default file - people density, lighting and equipment watts, etc. If you use multiple spaces in a zone, some of the zone default values (e.g., number of people) are weighted-area values for all the spaces.

Finally, remember that the output of the Quick Input program are complete Loads, Systems, and Plant input files. These files are exactly the same as if they had been created using the standard Loads, Systems, and Plant Input Routines. Thus, any input file can be edited in the usual manner, or printed with the Data Echo Report Programs. It may be helpful to use Quick Input to generate most of the input data quickly, and then to edit the files to change certain values.

9.2 Building Shapes Modeled by Quick Input

Quick Input models nine different building shapes - seven commercial (five or ten zones) and two residential (single zone). These building shapes include:

Commercial Building (5 or 10 zones)
- Rectangular
- L-Shaped
- T-Shaped
- I-Shaped
- U-Shaped

Courtyard (low building and/or large courtyard)
Courtyard (tall building and/or small courtyard)

Residential (single zone)
- Rectangular
- L-Shaped

Each of these shapes is presented in the following sections. These building sketches show which dimensions are required to define the building areas, how the building will be zoned, and any restrictions on the dimensions. Note that you cannot choose how the building is to be divided into zones; the Quick Input program assumes that all zoning is done based on orientation. You must additionally specify the zone depth (i.e., the depth of the perimeter zones, measured perpendicular from the exterior walls).

All of the buildings are assumed to have four orientations, with each wall perpendicular to the adjacent wall. Thus, the four wall exposures are North, East, South, and West or Northeast, Southeast, Southwest, and Northwest. For the commercial buildings, each of these exposures will be a perimeter zone. For the residential buildings, the one zone will have all four exposures. In both type buildings, you will be asked to identify the direction which the first zone faces. Refer to the sketches on the following pages and indicate the direction in which the arrow is pointing. If you specify the arrow is pointing North, the zones will have the following orientations:

Zones	Orientation
1 & 6	- North
2 & 7	- East
3 & 8	- South
4 & 9	- West
5 & 10	- Core

You will be required to enter the exterior dimensions for the buildings. Be careful to read the measurements in the proper order. Each dimension must be greater than 20 feet. Also, since a core zone is required in all commercial buildings, there are some limitations in the building dimensions. These limitations are listed for each building type.

9.2.1 Case 1: Rectangular Building

The rectangular building is the simplest shape to model. It requires only two exterior dimensions and a zone depth.

Limitations:

1) D(1) > 2 x Zone Depth
2) D(2) > 2 x Zone Depth

9.2.2 Case 2: L-Shaped Building

The L-shaped building requires the input of four exterior dimensions and a zone depth. By adjusting the orientation for zone 1, you can effectively change the alignment of the building. For example, by rotating the orientation for zone 1, you can effectively change the "L" into a "J" shaped building.

Limitations:

1) D(4) > 2 x Zone Depth
2) D(3) > 2 x Zone Depth
3) D(2) > D(4)
4) D(1) > D(3)

9.2.3 Case 3: T-Shaped Building

The T-shaped building requires the input of seven exterior dimensions and a zone depth.

Limitations:

1) D(2) > 2 x Zone Depth
2) D(4) > 2 x Zone Depth
3) D(6) > 2 x Zone Depth
4) D(7) > Zone Depth
5) D(5) > Zone Depth
6) D(3) > 3 x Zone Depth
7) D(2) < D(3)
8) D(4) < D(3)
9) D(1) = D(5) + D(6) + D(7)

9.2.4 Case 4: I-Shaped Building

The I-shaped building requires the input of twelve exterior dimensions and a zone depth.

Limitations:

1) D(2) > Zone Depth
2) D(3) > Zone Depth
3) D(8) > Zone Depth
4) D(9) > Zone Depth
5) D(4) > 2 x Zone Depth
6) D(6) > 2 x Zone Depth
7) D(10) > 2 x Zone Depth
8) D(12) > 2 x Zone Depth
9) D(1) > D(2) + D(3)
10) D(7) > D(8) + D(9)
11) D(4) + D(5) + D(6) = D(10) + D(11) + D(12)

9.2.5 Case 5: U-Shaped Building

The U-shaped building requires the input of seven exterior dimensions and a zone depth.

Limitations:

1) D(2) > 2 x Zone Depth
2) D(3) > 2 x Zone Depth
3) D(5) > 2 x Zone Depth
4) D(7) > 2 x Zone Depth
5) D(4) > Zone Depth
6) D(6) > Zone Depth
7) D(1) > D(2) + D(3)
8) D(5) > D(4)
9) D(7) > D(6)

9.2.6 Case 6: Courtyard Building (low building and/or large courtyard)

This building is rectangular with an interior courtyard. The courtyard need not be centered within the building, nor need it have exactly the same shape, although it must also be rectangular. This model is for a low building and/or a large courtyard. That is, the configuration of the building is such that the sun can enter the courtyard windows. This building has two sets of perimeter zones, one set (all four orientations) on the exterior and another set (again, all four orientations) facing the courtyard. Because the sun can shine into the courtyard perimeter zones, the zones of like orientation are modeled as one zone. Thus, the East zone consists of two non-contiguous spaces, both facing East. The same is true for all the other zones.

The courtyard building required the input of six exterior dimensions and a zone depth.

Limitations:

1) D(2) > 2 x Zone Depth
2) D(1) - D(2) - D(3) > 2 x Zone Depth
3) D(5) > 2 x Zone Depth
4) D(4) - D(5) - D(6) > 2 x Zone Depth
5) D(4) > D(5) + D(6)
6) D(1) > D(2) + D(3)

9.2.7 Case 7: Courtyard Building (tall building and/or small courtyard)

This building is rectangular with an interior courtyard. The courtyard need not be centered within the building, nor need it have exactly the same shape, although it must also be rectangular. This model is for a tall building and/or a small courtyard. That is, the configuration of the building is such that the sun cannot enter the courtyard windows - they are essentially shaded all the time. This building has two sets of perimeter zones, one set (all four orientations) on the exterior and another set (again, all four orientations) facing the courtyard. Since the courtyard exposures are assumed to be always shaded, however, the courtyard perimeter zones are all modeled as north-facing zones. The north zone thus consists of the north-facing exterior perimeter area and the entire perimeter area around the courtyard.

Limitations:

1) D(2) > 2 x Zone Depth
2) D(1) - D(2) - D(3) > 2 x Zone Depth
3) D(5) > 2 x Zone Depth
4) D(4) - D(5) - D(6) > 2 x Zone Depth
5) D(4) > D(5) + D(6)
6) D(1) > D(2) + D(3)

9.2.8 Case 8: Rectangular Residence (single zone)

The rectangular residence requires the input of only two exterior dimensions. No zone depth is required because the entire space is modeled as one zone.

Unlike the commercial buildings, the glass area is assumed to be the same on all four orientations.

Limitations: both dimensions must be greater than 20 feet.

9.2.9 Case 9: L-Shaped Residence (single zone)

The L-shaped residence requires the input of four exterior dimensions. No zone depth is required because the entire space is modeled as one zone. By adjusting the orientation for zone 1, you can effectively change the alignment of the building.

Limitations:

1) D(2) > D(4)
2) D(1) > D(3)

9.3 Entering Quick Input Data

The data entry for the Quick Input program is accomplished in the same manner as that for the other ASEAM3.0 input programs. With the Quick Input program, you actually create four files. The first of these is the Quick Input file itself, which contains only the data you entered in the Quick Input program. You must use the "Save Files" command to create this file. The Quick Input file can be edited to change the Quick Input entries. (If you choose "Get Quick Input Data" from the Quick Input menu, this is the file which will be retrieved.) The other three files created are Loads, Systems, and Plant Input files. The "Save Files" command saves these files at the same time as it saves the Quick Input file. To edit these files, you must enter the appropriate Loads, Systems or Plant input routine.

9.3.1 Creating a New Quick Input File

To create a new Quick Input file, you must first access the Quick Input program of ASEAM3.0 from the "Exit" menu of any program or from the Main Menu program. The procedure for doing this is discussed in detail in Chapter 3. Once within this program, you should choose the "Enter New Data" command from the main Quick Input bar menu.

All of the input screens will then appear sequentially in the order shown below. Fill in the blanks for each item, just as you would for the other input routines.

9.3.2 Editing an Existing Quick Input File

To modify an existing Quick Input file stored in the data subdirectory, you first need to access the Quick Input program and then retrieve the existing data with the "Get File" command. The procedure for doing this is discussed in detail in Chapter 3. Briefly, you should use the following steps:

1. Access the Quick Input program from the "Exit" menu of any program or from the Main Menu program.

2. Choose "Get File" from the Quick Input Menu.

3. Choose the file you wish to edit from the list. (This will copy the Quick Input data from the subdirectory into memory.)

4. Choose "Edit File."

All the screens will then appear for editing in the order presented below. If you want to edit only a certain portion of the file, you must use the "Page Down" key to move through the screens until the screen you want to edit appears.

9.3.3 Creating Loads, Systems, and Plant Input Files

The complete Loads, Systems, and Plant input files are automatically created when you use the "Save Files" command. The filenames for each of these files will have the same first 8 characters as the Quick Input file. As usual, ASEAM3.0 will distinguish among the files by their extensions:

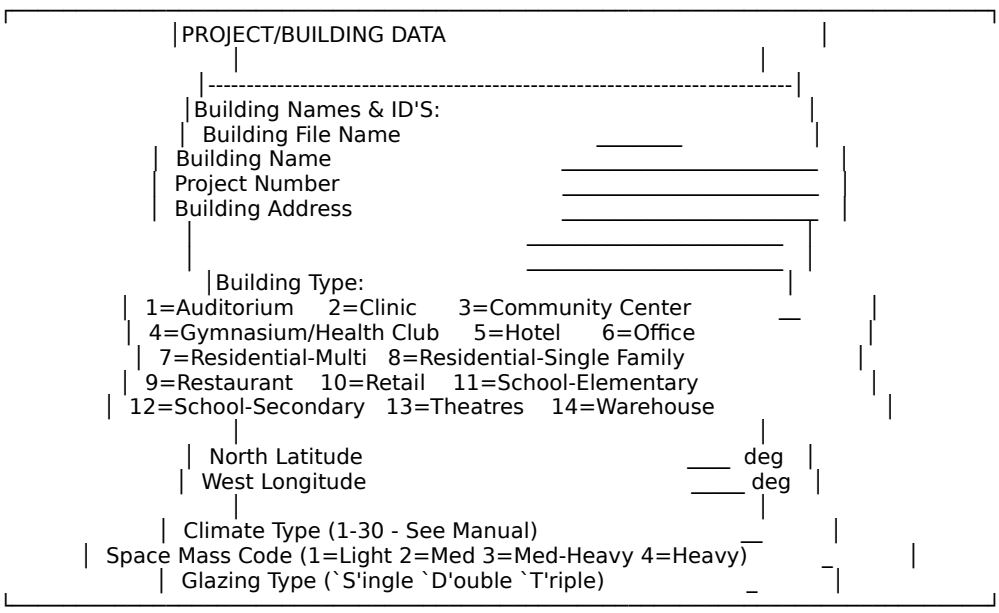
.QID - Quick Input Data
.LID - Loads Input Data
.SID - Systems Input Data
.PID - Plant Input Data

9.4 Quick Input Screens

The Quick Input screens are shown below in the order in which they appear. The editing features are the same as for the other input programs.

9.4.1 Project Data

This screen asks questions about the basic project data.



Building File Name
for your reference only.

Building Name
for your reference only.

Project Number
for your reference only.

Building Address
for your reference only.

Building Type
number 1 - 14. Enter the number for the type of building. Typical zone

types will be displayed on a subsequent screen based on the building type you select. Consult Appendix G for the typical zone types for each building type.

North Latitude
: decimal degrees. For example, 35 deg 30 minutes north latitude is entered as 35.5.

West Longitude
: decimal degrees.

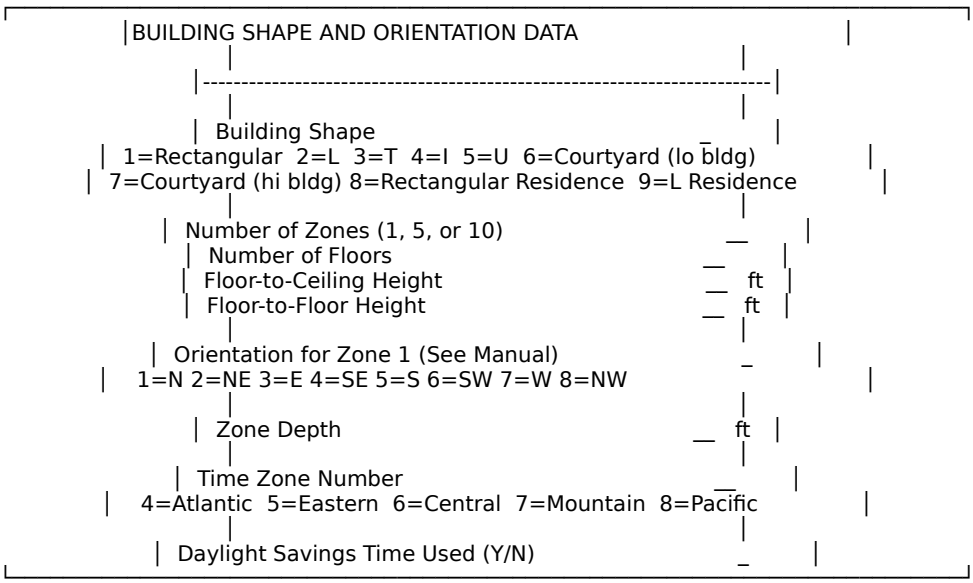
Climate Type
: number 1 - 30. Enter the number which corresponds to the climate type for the building location. The climate locations for over 200 U.S. stations can be found in Section 9.5 at the end of this chapter.

Space Mass Code
: number 1 - 4. Enter the number for the overall building mass:
  1 - light
  2 - medium
  3 - medium-heavy
  4 - heavy

Glazing Type
: Enter the letter for the type of glazing the building has:
  S - single
  D - double
  T - triple

  Warmer climate locations have choices between Single and Double glazing. Colder climates have choices of Double or Triple glazing.

9.4.2 Building Shape and Orientation Data



Building Shape

number 1 - 9. Enter the number for the building shape:

1 - rectangular multizone
2 - L-shaped multizone
3 - T-shaped multizone
4 - I-shaped multizone
5 - U-shaped multizone
6 - courtyard building (low building/large courtyard)
7 - courtyard building (tall building/small courtyard)
8 - rectangular single zone
9 - L-shape single zone

Building shapes 1 through 7 are for commercial buildings with either 5 or 10 zone capability. Building shapes 8 and 9 are to be used for single zone residences only. Refer to section 9.2 for sketches of these building shapes

Number of Zones

number 1, 5, or 10. Enter the number of zones in the building. Residential buildings can have only one zone. Commercial buildings can have either five or ten zones; the ten-zone configuration separates the roof zones from the other floors.

Number of Floors

number. Enter the total number of conditioned floors in the building.

Floor-to-Ceiling Height

feet. Enter the floor-to-ceiling height. The conditioned zone volume is calculated using this height, and the number of floors.

Floor-to-Floor Height

feet. Enter the floor-to-floor height. The exterior wall and window areas are calculated using this height and the number of floors.

Orientation for Zone 1

number corresponding to N,NE,E,SE,S,SW,W, or NW. Enter the direction which the first zone faces (the arrow in the building sketch). Refer to the appropriate building sketch in section 9.2 for the orientation of Zone 1.

Zone Depth

feet. Enter the depth of the perimeter zones, measured perpendicular to the exterior wall. Note that all the zones have the same depth. This question is not asked for single zone buildings.

Time Zone Number

number. Enter the number for the time zone in which the building is located:

4 - Atlantic
5 - Eastern
6 - Central
7 - Mountain

8 - Pacific

(Default values are generally available only for U.S. locations.)

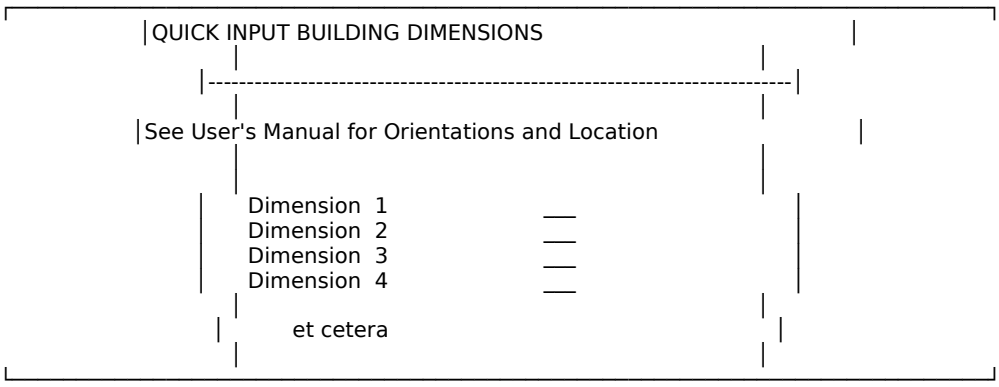
Daylight Savings Time Used

Enter a `Y' if daylight savings time is observed; otherwise, enter a `N.'

9.4.3 Building Dimensions

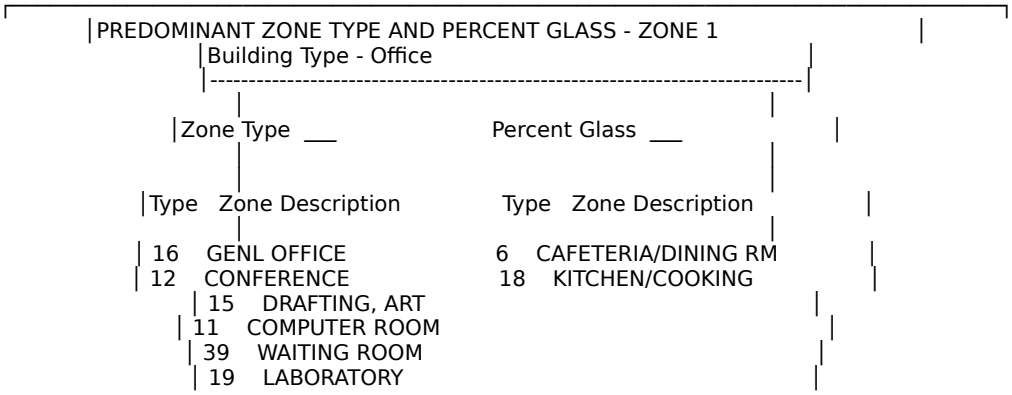
All of the exterior building dimensions are entered on this screen. Refer to the sketch for the building shape (Section 9.2) for the dimensions required. D(1) in the sketch corresponds to Dimension 1, etc. The appropriate number of dimensions will be asked for. All entries are in feet, and must be greater (or equal) to 20 feet.

Before entering the dimensions, be sure to check the limitations for the building shape selected (Section 9.2). An error message will be printed on the screen if any of the limitations are not observed. If this occurs, you must change either the zone depth or some of the dimensions to satisfy the limitations of the building shape selected.



9.4.4 Predominant Zone Type and Percent Glass

On this screen the predominant zone type and percent glass is input. This screen appears once for each zone.



Zone Type

number. Choose a number for the zone description which best fits the overall zone function. Typical zone types (chosen from a list based on the building type) are displayed below the input question. Note that you are not limited to only those zone types displayed on the screen - other zone types can be entered. Quick Input checks to insure that default values exist for the zone type entered.

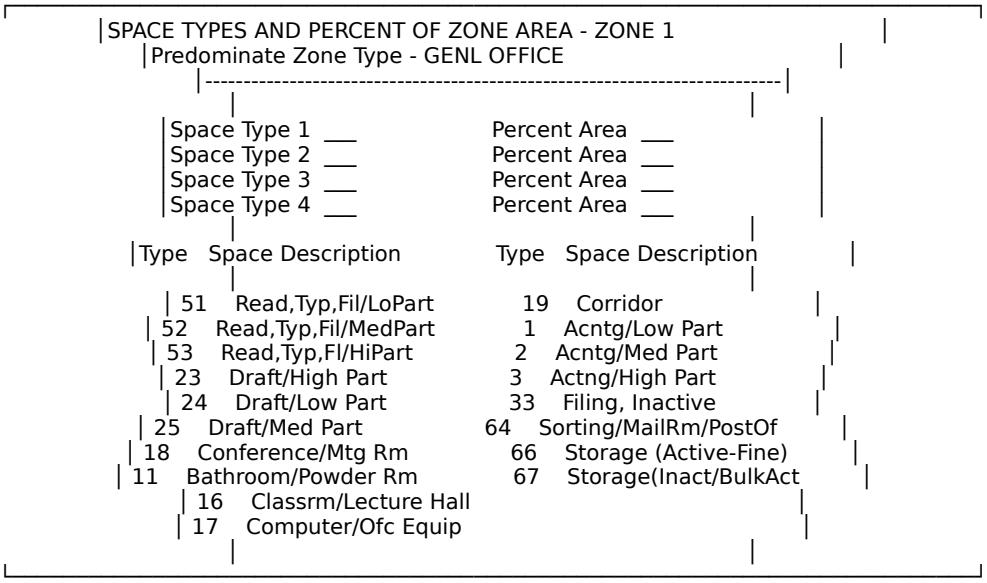
The zone type chosen determines the zone setpoint temperatures, whether or not the zone has a ceiling plenum, and the listing of typical space types for the zone on the next screen.

Percent Glass

number 0 - 100 (in percent). Enter the portion of the gross wall area which is glass. This value will be used for all exterior walls and windows in this zone. Note that this questions is not asked for the core zones (5 and 10).

9.4.5 Space Types and Percent Zone Area

On this screen, which also appears once for each zone, the space types within the zone are defined.



Space Type

number. Enter a number corresponding to the space type within the zone. Typical space types and their numbers are listed on the screen.

The predominant zone type, specified in the previous screen, determines which space types are listed. You are not limited to those space types displayed on the screen - you can enter other space types as long as default values exist for the space type entered.

Up to four different space types can be entered in each zone. The space type chosen will determine the lighting, people, equipment, and infiltration parameters.

Percent Area

percent (1-100). Enter the percent of the total zone area which each space type occupies. The total of all areas MUST equal 100 percent. (If you specify that the first space type occupies 100 percent of the zone area, then you will not be able to input any additional space types.)

The percent area is used to area-weight the zone default values based on the space type. For example, an office zone can have spaces for reading, conference rooms, bathrooms, and corridors. The lighting requirements are different for each of these spaces. The lighting requirement for the entire zone is calculated as:

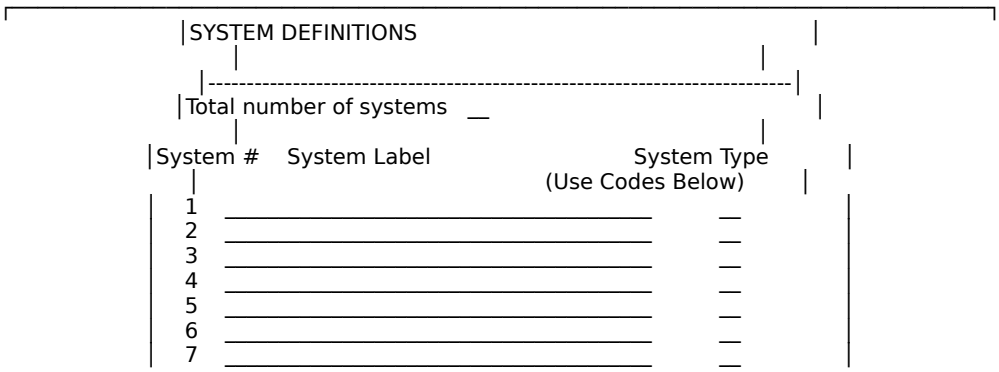
LZ = AZ * [(LS1*A1)+(LS1*A2)+(LS3*A3)+(LS4*A4)]

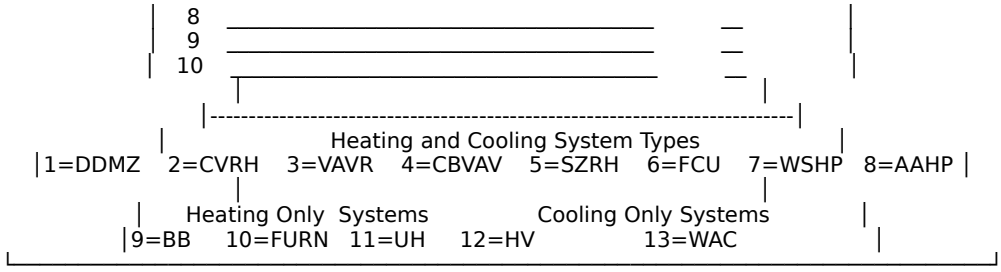
where LZ - lighting watts for the zone
AZ - total zone area, ft2
LSn - lighting watts/ft2 - space n
An - percent zone area, space n

The zone type and space type screens will appear once for each zone. After you have input data for all zones, the loads portion of the input is complete. The remaining input screens for systems and plant data will then appear.

9.4.6 System Types

The first two Quick Input screens for systems are exactly like those for the Systems Input program. You specify the number and types of systems found in the building on the first screen. On the second, the load zones are assigned to the systems.





Total Number of Systems

integer 1 - 10. This is the number of systems conditioning the entire building.

System #

The systems are numbered sequentially one through as many systems as you have specified above. This is done automatically.

System Label

for your reference only. This label, or user-defined name, will be used when you are asked which systems you want to edit, and will also be printed on some output reports.

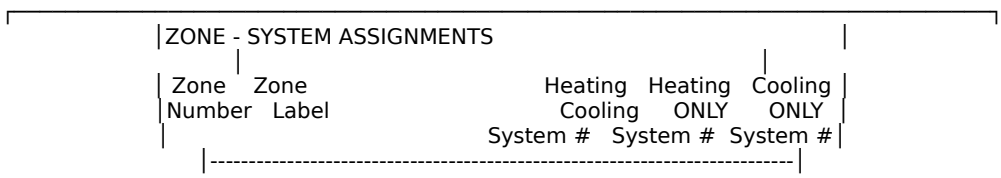
System Type

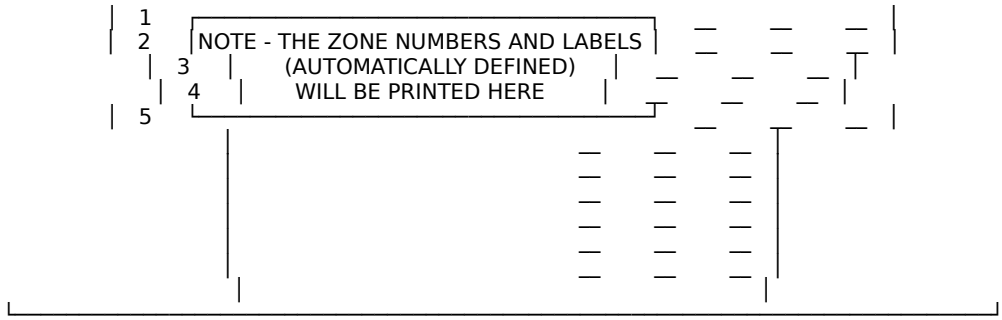
integer 1 - 13. This number, corresponding to the list at the bottom of the input screen, indicates the type of system. The available system types are:

1 - Dual Duct or Multizone
2 - Constant Volume Reheat
3 - Variable Air Volume Reheat
4 - Ceiling By-Pass Variable Air Vol
5 - Single Zone Reheat
6 - Fan Coil Unit
7 - Water Source Heat Pump
8 - Air to Air Heat Pump
9 - Baseboard
10 - Furnace
11 - Unitary Heater
12 - Heating and Ventilating Unit
13 - Window Air Conditioner

9.4.7 Zone-System Assignment

In this screen, the zone-system assignments are made.





Zone Number

The zones are numbered 1 through as many zones as you defined in the loads portion of Quick Input. There will be 1, 5, or 10 zones. These numbers are inserted in this column automatically by ASEAM3.0.

Zone Label

The zone labels are also printed by ASEAM3.0 automatically. Zone labels consist of predominant zone type and orientation of the zone.

Heating/Cooling System #

integer 1 - 10. This is the system number from the previous screen (NOT the system type number). Enter the system number in this column if the system type provides both heating and cooling. Otherwise, leave this column blank.

Heating ONLY System #

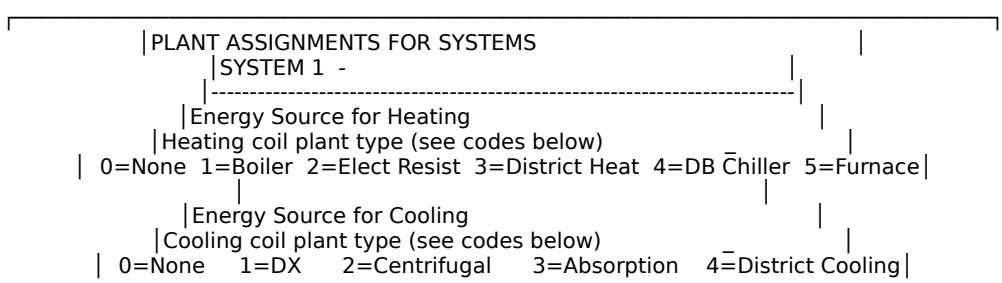
integer 1 - 10. This is the system number from the previous screen (NOT the system type number). Enter the system number in this column if the system type provides heating only. Otherwise, leave this column blank.

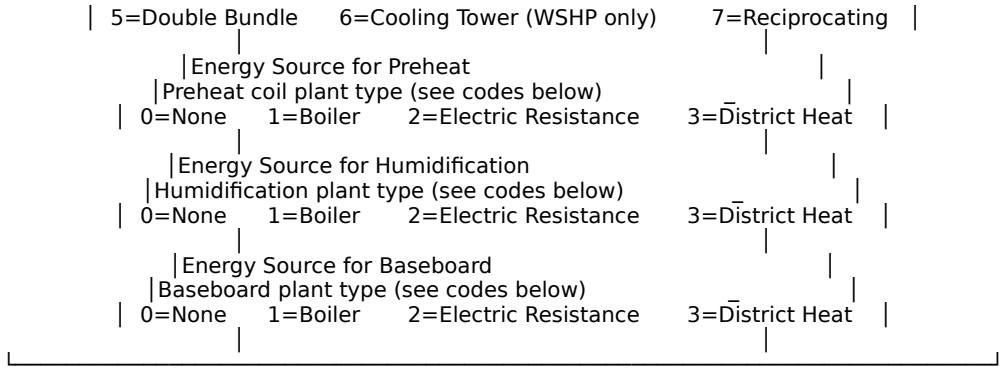
Cooling ONLY System #

integer 1 - 10. This is the system number from the previous screen (NOT the system type number). Enter the system number in this column if the system type provides cooling only. Otherwise, leave this column blank.

9.4.8 System-Plant Assignment

In this screen, the system-plant assignments are made. The plant equipment which is to meet the loads for each system is specified. This screen appears once for each system.





Energy Source for Heating

integer 0 - 5. Enter the energy source for heating or the heating coil plant type:

0 - None
1 - Boiler
2 - Electric Resistance
3 - District Heating
4 - Double Bundle Chiller
5 - Furnace

Energy Source for Cooling

integer 0 - 7. Enter the energy source for cooling or the cooling coil plant type:

0 - None
1 - DX
2 - Centrifugal
3 - Absorption
4 - District Cooling
5 - Double Bundle
6 - Cooling Tower (WSHP only)
7 - Reciprocating

Energy Source for Preheat

integer 0 - 3. Enter the energy source for preheat or the preheat coil plant type:

0 - None
1 - Boiler
2 - Electric Resistance
3 - District Heat

Energy Source for Humidification

integer 0 - 3. Enter the energy source for humidification or the humidification plant type:

0 - None
1 - Boiler
2 - Electric Resistance
3 - District Heat

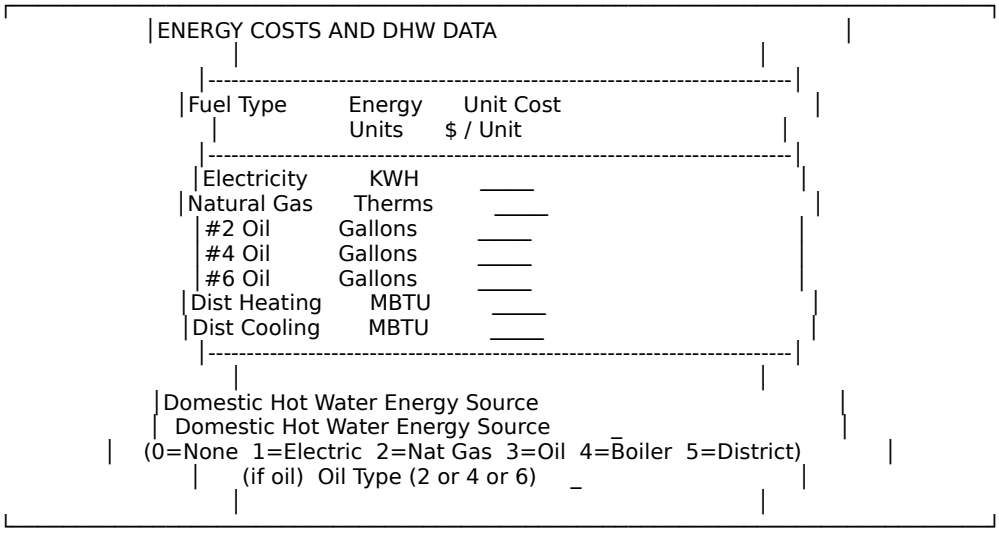
Energy Source for Baseboard

integer 0 - 3. Enter the energy source for baseboard heating or the baseboard plant type:

0 - None
1 - Boiler
2 - Electric Resistance
3 - District Heat

9.4.9 Energy Costs and Domestic Hot Water Data

In this screen the energy costs and the domestic hot water data are entered.



Fuel Type

All fuel types are listed here automatically by the Quick Input program.

Energy Units

All energy units are also listed here automatically by the Quick Input program.

Unit Cost

dollars per unit. This is the cost of the energy source in dollars per the unit specified in the column to the left. Average unit cost, including demand and fuel adjustments charges, should be entered for electricity. This value can be left blank for fuel types not used.

Domestic Hot Water Energy Source

integer 0 - 5. Enter the number for the energy source type of domestic hot water

0 - None
1 - Electric
2 - Natural Gas

3 - Oil
4 - Boiler
5 - District Heating

Oil Type

2, 4, or 6. Enter the fuel oil type if the domestic hot water energy source specified above is oil.

This concludes all the input required for the Quick Input program. Use the "Save Files" command to save the Quick Input file and to generate and save Loads, Systems, and Plant input files.

9.5 Climate Locations for Quick Input

On the following pages you will find an alphabetical listing of over 200 cities and their corresponding weather data. Of particular importance is the third column (CLM), which lists the climate type to be used with Quick Input (see Section 9.4.1).

The climate type is used for defining the default values for exterior wall, glass, and roof transmission (U-Factor). These values were derived from the ASHRAE 90.1P Envelope Criteria. To change the default values for these transmission coefficients, see Appendix G.

Please note that the weather values listed were calculated using the hourly TMY weather files for each station. They may not correspond to data published by other sources (i.e., ASHRAE, NOAA).

The following abbreviations were used for the column headings:

STATION	The weather station name
ST	The two character state abbreviation
CLM	The climate type to be used for this station (see Section 9.4.1)
VSN, VSEW, VSS	The daily solar radiation on vertical surfaces for each of the orientations. VSN - North orientation VSEW - East and West orientation VSS - South orientation
CDD50	Annual cooling degree days (base 50)
CDD65	Annual cooling degree days (base 65)
CDH80	Annual cooling degree hours above 80 deg.
HDD50	Annual heating degree days (base 50)
HDD65	Annual heating degree days (base 65)

STATION	ST	CLM	VSN	VSEW	VSS	CDD50	CDD65	CDH80	HDD50	HDD65
ADAK	AK	24	280	652	434	124	0	0	3,562	8,913
ANNETTE	AK	19	285	739	482	756	12	0	2,545	7,277
BETHEL	AK	30	252	789	453	312	0	0	8,285	13,449
BIG DELTA	AK	30	249	989	527	777	16	25	9,355	14,069
FAIRBANKS	AK	30	241	919	492	922	19	8	9,841	14,414
GULKANA	AK	30	257	943	522	498	4	6	8,865	13,846
HOMER	AK	29	272	926	538	236	0	0	5,301	10,540
JUNEAU	AK	25	254	642	410	348	0	0	4,223	9,350
KINGSALMON	AK	30	270	860	499	330	4	6	6,843	11,992
KODIAK	AK	26	276	852	509	360	6	0	3,775	8,896
McGRATH	AK	30	246	841	467	578	3	0	9,967	14,868
NOME	AK	30	242	871	478	119	0	0	9,061	14,418
SUMMIT	AK	30	247	893	488	155	0	0	9,210	14,530
YAKUTAT	AK	25	247	650	402	248	0	0	4,486	9,714
BIRMINGHAM	AL	7	464	908	789	5,182	1,825	6,272	765	2,882
MOBILE	AL	9	486	919	816	6,478	2,419	7,479	164	1,580
MONTGOMERY	AL	9	462	981	823	5,821	2,116	8,473	491	2,261
FORT SMITH	AR	18	462	1,005	842	5,307	2,077	10,413	1,149	3,394
LITTLEROCK	AR	9	465	981	831	5,351	2,055	8,450	912	3,091
PHOENIX	AZ	12	488	1,310	1,116	7,830	3,647	34,521	90	1,382
PRESCOTT	AZ	15	473	1,334	1,090	3,385	895	3,973	1,477	4,462
TUCSON	AZ	10	500	1,280	1,112	6,822	2,769	19,657	178	1,601
WINSLOW	AZ	15	471	1,338	1,092	3,708	1,141	7,347	1,695	4,603
YUMA	AZ	12	493	1,330	1,151	8,921	4,186	37,892	43	782
ARCATA	CA	4	407	926	724	1,038	1	0	582	5,020
BAKERSFIEL	CA	9	474	1,211	1,053	5,879	2,294	15,447	305	2,194
CHINA LAKE	CA	10	468	1,312	1,091	6,222	2,782	26,739	409	2,444
DAGGETT	CA	10	475	1,309	1,102	6,516	2,720	22,302	237	1,916
EL TORO	CA	5	486	1,163	977	4,764	834	2,391	32	1,577
FRESNO	CA	7	459	1,199	1,029	5,070	1,803	13,085	492	2,700
LONG BEACH	CA	5	482	1,144	956	4,947	900	1,616	54	1,483
LOSANGELES	CA	5	482	1,146	962	4,456	472	136	3	1,494
MT. SHASTA	CA	21	419	1,153	909	2,395	556	2,073	1,947	5,583
OAKLAND	CA	4	453	1,102	909	2,792	82	23	157	2,922
POINT MUGU	CA	4	477	1,131	936	3,435	145	70	8	2,193
RED BLUFF	CA	7	428	1,177	951	5,110	1,930	14,404	589	2,884
SACRAMENTO	CA	7	444	1,185	987	4,274	1,171	7,315	381	2,753
SAN DIEGO	CA	5	490	1,121	950	4,865	662	383	2	1,275
SAN FRANCI	CA	4	454	1,146	941	2,496	73	204	186	3,238
SANTA MARI	CA	4	476	1,128	950	2,663	92	513	138	3,041
SUNNYVILLE	CA	4	456	1,145	947	3,112	204	421	142	2,708

STATION	ST	CLM	VSN	VSEW	VSS	CDD50	CDD65	CDH80	HDD50	HDD65
COLO SPRGS	CO	21	435	1,321	976	2,557	491	2,075	2,587	5,996
DENVER	CO	21	428	1,321	971	2,611	567	2,934	2,652	6,083
EAGLE	CO	27	432	1,296	976	1,480	90	1,008	4,232	8,317
GRAND JUNC	CO	23	420	1,115	843	3,611	1,221	6,147	2,616	5,701
PUEBLO	CO	21	442	1,309	992	3,384	971	5,899	2,223	5,285
HARTFORD	CT	20	384	834	646	2,857	706	2,197	2,953	6,277
GUANTANAMO	CU	2	612	1,018	1,045	11,071	5,596	18,452	0	0
WASHINGTON	DC	21	419	905	724	3,734	1,083	3,592	2,004	4,828
WILMINGTON	DE	21	414	921	726	3,602	1,078	2,188	2,133	5,084
APALACHICO	FL	9	508	971	887	6,967	2,695	8,289	163	1,366
DAYTONA	FL	9	503	953	860	7,404	2,635	5,252	81	787
JACKSONVIL	FL	9	495	943	849	7,045	2,721	7,488	206	1,357
MIAMI	FL	11	527	936	874	9,338	4,045	9,166	3	185
ORLANDO	FL	11	511	974	881	8,288	3,312	9,757	33	532
TALLAHASSE	FL	9	495	944	845	6,462	2,401	7,323	307	1,721
TAMPA	FL	9	518	974	890	7,985	3,047	8,905	37	575
W. PALM BE	FL	11	519	906	846	9,203	3,904	10,324	8	177
ATLANTA	GA	7	467	930	807	4,837	1,566	3,799	866	3,070
AUGUSTA	GA	7	468	933	803	5,458	1,904	6,904	664	2,584
MACON	GA	9	476	939	822	5,769	2,111	8,097	514	2,330
SAVANNAH	GA	9	474	926	805	6,112	2,194	6,308	410	1,967
BARBERS PT	HI	1	592	965	978	9,314	3,842	3,617	0	3
HILO	HI	1	557	805	817	8,494	3,019	1,112	0	0
HONOLULU	HI	1	588	932	953	9,625	4,150	4,537	0	0
LIHUE	HI	1	567	893	895	9,219	3,746	1,912	0	0
BURLINGTON	IA	21	419	1,030	802	3,393	1,002	2,598	3,009	6,094
DES MOINES	IA	26	413	1,027	788	3,116	812	2,383	3,275	6,447
MASON CITY	IA	27	400	1,053	783	2,708	658	1,882	4,311	7,735
SIOUX CITY	IA	26	406	1,064	794	3,326	993	3,488	3,608	6,750
BOISE	ID	21	399	1,228	916	2,828	744	4,512	2,276	5,667
LEWISTON	ID	21	370	988	729	2,709	645	4,121	2,015	5,426
POCATELLO	ID	26	405	1,262	935	2,330	526	3,293	3,404	7,075
CHICAGO	IL	21	402	936	729	3,339	1,015	3,190	3,000	6,151
MOLINE	IL	21	405	959	736	3,204	894	2,808	3,085	6,250
SPRINGFIEL	IL	23	422	962	768	3,675	1,158	4,038	2,490	5,448
EVANSVILLE	IN	23	426	890	736	4,063	1,265	4,288	1,948	4,625
FORT WAYNE	IN	20	395	826	664	3,096	743	1,629	3,023	6,145

STATION	ST	CLM	VSN	VSEW	VSS	CDD50	CDD65	CDH80	HDD50	HDD65
INDIANAPOL	IN	21	407	851	692	3,430	951	2,263	2,624	5,620
SOUTH BEND	IN	21	396	857	690	2,917	684	1,840	3,038	6,280
DODGE CITY	KS	23	450	1,196	942	4,008	1,384	7,186	2,280	5,131
GOODLAND	KS	21	434	1,228	935	3,047	905	5,147	2,757	6,090
TOPEKA	KS	23	434	1,068	837	4,120	1,388	5,212	2,458	5,201
COVINGTON	KY	19	408	843	687	3,656	1,057	2,638	2,154	5,030
LEXINGTON	KY	23	425	872	729	3,904	1,157	2,853	1,921	4,649
LOUISVILLE	KY	23	424	883	727	4,144	1,357	4,716	1,851	4,539
BATONROUGE	LA	9	488	889	806	6,682	2,543	8,814	237	1,573
LK CHARLES	LA	9	489	864	795	6,849	2,615	7,883	214	1,455
NEW ORLEAN	LA	9	497	923	838	6,840	2,578	7,380	179	1,392
SHREVEPORT	LA	9	484	954	843	6,022	2,365	10,039	447	2,265
BOSTON	MA	21	387	849	659	2,810	695	1,601	2,416	5,775
BALTIMORE	MD	21	419	932	739	3,683	1,134	3,825	2,020	4,946
PATUXENT	MD	17	429	943	758	4,180	1,289	2,966	1,418	4,002
BANGOR	ME	27	378	950	693	1,853	243	454	4,132	7,998
CARIBOU	ME	28	357	922	649	1,410	121	203	5,297	9,483
PORTLAND	ME	26	376	856	643	1,946	245	399	3,531	7,305
ALPENA	MI	27	371	862	661	1,928	335	894	4,282	8,164
DETROIT	MI	21	390	858	676	3,199	922	2,238	2,799	5,997
FLINT	MI	24	379	811	641	2,502	473	921	3,471	6,917
GRAND RAPI	MI	26	438	1,303	1,003	2,680	590	1,461	3,392	6,777
SAULT SAIN	MI	28	359	858	640	1,399	119	246	5,087	9,282
TRAVERSE C	MI	24	369	818	642	2,193	438	1,124	3,934	7,654
DULUTH	MN	28	355	886	633	1,511	157	258	5,797	9,918
INTL FALLS	MN	28	351	962	669	1,473	119	167	6,414	10,535
MINNEAPOLI	MN	27	380	972	709	2,751	773	2,509	4,563	8,060
ROCHESTER	MN	27	383	927	691	2,360	442	590	4,544	8,100
COLUMBIA	MO	23	431	972	790	3,940	1,234	4,242	2,225	4,994
SPRINGFIEL	MO	23	446	982	812	4,115	1,311	4,170	1,839	4,509
ST. LOUIS	MO	23	432	983	797	4,193	1,467	5,379	2,111	4,860
JACKSON	MS	9	481	942	833	5,927	2,330	8,789	546	2,424
MERIDIAN	MS	9	480	905	811	5,723	2,148	9,508	546	2,446
BILLINGS	MT	26	380	1,160	814	2,544	598	2,695	3,627	7,156
CUTBANK	MT	27	357	1,150	768	1,368	117	702	4,718	8,941
DILLON	MT	27	386	1,187	838	1,564	159	784	4,140	8,210
GLASGOW	MT	28	361	1,115	752	2,272	543	2,642	5,082	8,828

STATION	ST	CLM	VSN	VSEW	VSS	CDD50	CDD65	CDH80	HDD50	HDD65
GREAT FALL	MT	26	366	1,133	776	2,199	450	1,886	3,728	7,454
HELENA	MT	26	372	1,098	771	1,911	328	1,771	3,926	7,817
LEWISTOWN	MT	27	368	1,084	753	1,629	216	1,270	4,027	8,089
MILES CITY	MT	27	374	1,156	800	2,694	773	4,364	4,435	7,989
MISSOULA	MT	26	363	957	704	1,629	221	1,513	3,492	7,560
ASHEVILLE	NC	15	449	946	782	3,442	763	1,298	1,407	4,203
CAPE HATTE	NC	7	460	972	819	4,978	1,613	2,039	635	2,745
CHARLESTON	NC	17	456	968	809	4,698	1,549	4,299	1,086	3,412
CHERRY PT.	NC	7	461	996	826	5,277	1,788	3,614	569	2,556
GREENSBORO	NC	17	449	994	810	4,274	1,298	3,642	1,261	3,760
RALEIGH	NC	17	445	935	774	4,485	1,389	3,697	1,131	3,509
BISMARK	ND	28	371	1,114	766	2,175	496	2,067	5,196	8,992
FARGO	ND	28	371	1,077	751	2,388	573	2,288	5,582	9,242
MINOT	ND	28	358	1,059	724	2,064	431	1,570	5,336	9,178
GRAND ISL.	NE	26	390	872	688	3,309	996	4,580	3,315	6,477
N. PLATTTE	NE	26	419	1,183	880	2,731	715	3,468	3,447	6,905
OMAHA	NE	21	414	1,066	806	3,618	1,130	3,883	2,981	5,968
SCOTTSBLUF	NE	26	413	1,168	861	2,603	693	3,745	3,335	6,900
CONCORD	NH	24	375	824	630	2,254	463	1,865	3,742	7,425
LAKEHURST	NJ	21	407	917	712	3,299	915	3,019	2,174	5,265
NEWARK	NJ	21	406	912	710	3,556	1,009	2,487	2,027	4,956
ALBUQUERQU	NM	17	469	1,361	1,105	3,942	1,257	5,705	1,633	4,423
CLAYTON	NM	21	457	1,310	1,019	3,122	685	2,093	2,138	5,176
ROSWELL	NM	17	490	1,280	1,081	4,536	1,539	11,135	1,008	3,486
TRUTH OR C	NM	17	488	1,326	1,113	4,457	1,500	6,882	1,074	3,592
TUCUMCARI	NM	17	470	1,300	1,046	4,451	1,554	8,424	1,344	3,922
ELKO	NV	26	420	1,332	1,000	1,997	355	4,065	3,345	7,178
ELY	NV	26	432	1,350	1,014	1,650	157	1,317	3,683	7,666
LAS VEGAS	NV	10	456	1,417	1,136	6,567	3,043	26,408	449	2,399
LOVELOCK	NV	21	418	1,452	1,094	2,813	745	6,659	2,438	5,845
RENO	NV	21	428	1,401	1,068	2,180	365	4,059	2,181	5,841
TONOPAH	NV	21	427	1,502	1,130	2,742	611	3,777	2,308	5,652
WINNEMUCCA	NV	21	418	1,350	1,014	2,264	486	6,366	2,774	6,471
YUCCA	NV	15	450	1,399	1,112	3,378	1,041	11,568	1,664	4,802
ALBANY	NY	26	395	942	719	2,812	619	1,308	3,488	6,770
BINGHAMTON	NY	24	370	733	592	2,373	410	672	3,885	7,397
BUFFALO	NY	24	371	746	609	2,476	509	779	3,213	6,721
MASSENA	NY	27	380	942	708	2,026	365	913	4,583	8,397
N.Y. (CP)	NY	19	392	817	650	3,273	834	911	1,986	5,022
N.Y. (LAG)	NY	19	392	817	650	3,273	834	911	1,986	5,022

STATION	ST	CLM	VSN	VSEW	VSS	CDD50	CDD65	CDH80	HDD50	HDD65
ROCHESTER	NY	24	374	771	622	2,557	595	1,642	3,482	6,995
SYRACUSE	NY	24	371	764	611	2,579	513	926	3,448	6,856
AKRON	OH	20	396	812	664	2,845	661	1,100	2,881	6,172
COLUMBUS	OH	19	401	819	671	3,195	789	2,268	2,424	5,493
DAYTON	OH	21	408	855	696	3,367	868	1,346	2,573	5,549
TOLEDO	OH	21	393	853	676	2,791	698	1,794	3,132	6,514
YOUNGSTOWN	OH	20	383	760	624	2,593	546	1,128	3,129	6,557
OKLHMA CTY	OK	17	465	1,053	875	4,901	1,834	8,878	1,417	3,825
TULSA	OK	18	453	991	820	5,244	2,072	10,065	1,429	3,732
ASTORIA	OR	13	350	782	588	1,357	29	145	1,080	5,226
MEDFORD	OR	15	405	1,005	814	2,681	568	4,081	1,531	4,893
NORTH BEND	OR	4	392	977	740	1,429	2	0	629	4,678
PORTLAND	OR	13	364	841	647	2,321	272	1,086	1,151	4,577
REDMOND	OR	21	395	1,127	835	1,573	228	2,390	2,535	6,665
SALEM	OR	15	373	874	680	1,849	172	1,224	1,128	4,926
ALLENTOWN	PA	21	401	864	682	3,105	698	1,146	2,692	5,760
AVOCA	PA	20	389	811	646	2,823	652	1,547	2,931	6,236
ERIE	PA	20	384	792	646	2,527	472	378	3,006	6,426
HARRISBURG	PA	21	404	864	687	3,518	992	2,860	2,302	5,251
PHILADELPH	PA	21	408	889	701	3,661	1,065	3,172	2,044	4,923
PITTSBURGH	PA	20	392	780	642	2,989	648	1,040	2,773	5,907
KOROR ISL.	PN	2	662	827	890	11,435	5,960	14,548	0	0
KWAJALEIN	PN	2	678	888	961	11,635	6,160	16,217	0	0
WAKE ISL.	PN	2	609	977	1,002	10,869	5,394	10,167	0	0
SAN JUAN	PR	2	608	931	963	10,648	5,173	11,563	0	0
PROVIDENCE	RI	21	393	874	677	2,756	693	1,284	2,610	6,022
CHARLESTON	SC	9	467	925	796	5,722	2,005	5,249	435	2,194
COLUMBIA	SC	9	467	953	816	5,613	2,110	8,541	694	2,666
GREENVILLE	SC	7	459	971	814	4,563	1,400	3,494	907	3,220
HURON	SD	27	390	1,044	769	2,718	774	3,739	4,820	8,351
PIERRE	SD	27	392	1,147	822	3,079	934	5,262	4,028	7,358
RAPID CITY	SD	26	394	1,142	819	2,581	663	3,477	3,672	7,229
SIOUX FALL	SD	27	394	1,078	778	2,811	779	3,029	4,240	7,683
CHATTANOOG	TN	17	444	869	738	4,652	1,541	5,079	1,232	3,595
KNOXVILLE	TN	17	446	898	762	4,455	1,514	3,840	1,283	3,818
MEMPHIS	TN	18	460	935	806	5,319	2,069	7,807	1,034	3,259
NASHVILLE	TN	17	443	863	749	4,583	1,552	5,078	1,165	3,609

STATION	ST	CLM	VSN	VSEW	VSS	CDD50	CDD65	CDH80	HDD50	HDD65
ABILENE	TX	9	494	1,066	924	5,968	2,416	13,206	792	2,714
AMARILLO	TX	17	471	1,253	1,013	4,113	1,377	6,763	1,592	4,331
AUSTIN	TX	9	503	972	877	6,873	2,862	14,093	271	1,735
BROWNSVILL	TX	11	547	908	908	8,531	3,664	12,218	35	642
CORPUS CHR	TX	11	529	946	906	8,200	3,508	13,109	106	889
DEL RIO	TX	9	511	1,008	903	7,376	3,112	14,870	186	1,397
EL PASO	TX	9	503	1,306	1,133	5,617	2,225	13,224	522	2,605
FORT WORTH	TX	9	485	994	875	6,174	2,448	13,682	605	2,354
HOUSTON	TX	9	490	883	805	7,215	2,891	10,569	195	1,346
KINGSVILLE	TX	11	527	922	881	8,302	3,652	15,512	49	874
LAREDO	TX	12	532	936	900	8,827	4,130	25,225	65	842
LUBBOCK	TX	17	488	1,267	1,070	4,754	1,749	9,827	1,173	3,643
LUFKIN	TX	9	492	942	848	6,667	2,668	11,737	370	1,846
MIDLAND	TX	9	504	1,247	1,079	5,695	2,159	11,177	634	2,573
PORTARTHUR	TX	9	497	900	824	6,888	2,662	8,837	167	1,416
SAN ANGELO	TX	9	503	1,076	944	6,522	2,619	14,621	538	2,110
SAN ANTONI	TX	9	510	955	878	7,170	3,013	13,841	261	1,579
SHERMAN	TX	9	476	996	862	5,844	2,378	12,065	699	2,708
WACO	TX	9	495	972	874	6,676	2,879	15,658	488	2,166
WICHITA FA	TX	9	480	1,077	911	5,708	2,299	14,487	984	3,049
BRYCE	UT	27	445	1,386	1,063	899	4	69	4,709	9,288
CEDAR CITY	UT	21	447	1,342	1,054	2,802	624	3,119	2,592	5,888
SALT LAKE	UT	21	422	1,266	975	3,011	941	7,030	2,570	5,975
NORFOLK	VA	17	443	964	792	4,636	1,586	4,554	1,185	3,609
RICHMOND	VA	17	430	923	745	4,225	1,323	4,021	1,322	3,895
ROANOKE	VA	17	433	946	763	3,986	1,183	3,306	1,520	4,192
BURLINGTON	VT	27	382	925	698	2,118	365	490	4,211	7,932
OLYMPIA	WA	13	351	819	619	1,550	79	466	1,546	5,550
SEATTLE	WA	13	350	828	621	1,683	106	256	1,382	5,281
SPOKANE	WA	21	363	1,064	758	2,094	363	1,595	2,983	6,727
WHIDBEY IS	WA	15	344	878	630	1,403	22	7	1,179	5,274
YAKIMA	WA	21	373	1,091	790	2,370	449	3,285	2,323	5,877
EAU CLAIRE	WI	27	376	923	683	2,545	603	1,898	4,751	8,285
GREENBAY	WI	27	380	947	696	2,172	426	957	4,310	8,039
LA CROSSE	WI	26	386	937	701	2,786	716	2,121	3,838	7,243
MADISON	WI	27	391	955	717	2,559	542	1,329	4,009	7,466
MILWAUKEE	WI	26	396	941	724	2,427	487	1,013	3,586	7,121
CHARLOTTE	WV	19	409	798	667	3,712	1,008	3,054	1,816	4,587
CASPER	WY	26	403	1,343	961	2,177	495	2,699	3,824	7,617
CHEYENNE	WY	26	416	1,267	906	1,963	271	1,040	3,435	7,218
ROCK SPRIN	WY	27	411	1,395	1,012	1,698	207	702	4,407	8,391
SHERIDAN	WY	26	387	1,133	806	2,074	360	2,105	3,605	7,366