



EasyLoads™

Version 3.0.3 (Revised 10/10/03)

A Residential Whole House Loads Program



With New
Practical
Exercises!

Inside This Manual

- **How to set up design conditions and re-occurring data**
- **How to use EasyLoads™**
- **Viewing & printing the summary**
- **How to calculate up to three systems in one home**

EasyLoads™ Handbook \$5.95

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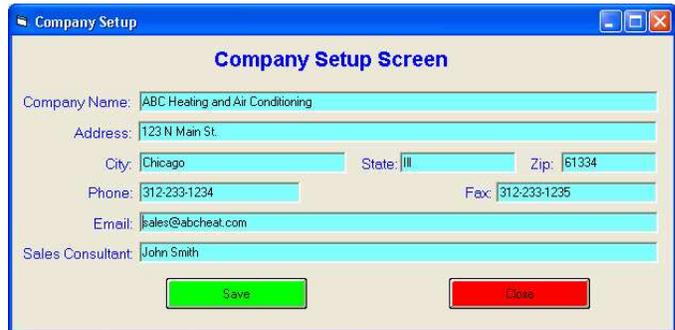
Welcome to *EasyLoads*

The quick and easy way to do residential whole house loads.

Setup

From the Menu Bar select “File” then “Company Setup”. The Company Setup Screen will pop up. Fill in your Company Information. This will print on the top of your Input Form.

The next step is to set the default settings. If you are using the *Electronic Consultant™*, it is best to set your default settings when you are doing your company setup.



Design Conditions

Set the design conditions for your area. If you are unsure of the conditions for your area, look in Manual “J” or the ASHRAE Handbook.

Capacity Multiplier

The Capacity Multiplier adjusts automatically for design temperatures other than the standard ARI rating of 95° outdoor ambient. The Capacity Multiplier may be overwritten, but is not recommended.

Moisture Removal % of Sensible Gain

The percentage you enter for your area will be multiplied by the Sensible BTUH Gain, to reflect the percentage of work needed to dehumidify the air, and obtain the Total BTUH cooling load for the house.

Note: *EasyLoads™* was designed for typical, whole house applications and is not intended for zoning, atypical applications or room by room.

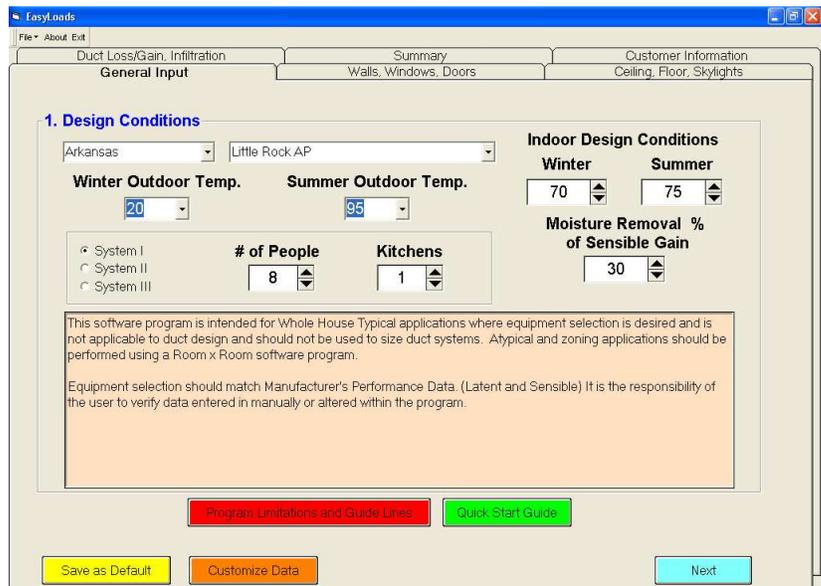
Save As Default Button

When setting up your system, it is best to review each page of the loads section and type in the values you want to be displayed each time you start the system.

Then click the “Save As Default” button.

The settings on the screen will come up each time you open the program.

You may change the default settings at any time.



Software for the HVAC Professional

Whole House
Loads Only



Customer Information Screen

Entering Customer Information

You may enter customer information in different ways.

First, You may click on the “Open” button and select from the -down list if you previously saved the customer information.

Second, if you have entered the customer information in the Electronic Consultant, then you may click on the “Import” button and the fields will be populated automatically.

You may also manually type the information in by hand.

General Input Screen

Entering Design Conditions

You should enter the specific design conditions for each job.

1. Select the State and the City
2. Enter the Indoor Design conditions
3. Select the system you're working on
4. Enter the number of people who live in this house.
5. Enter the number of Kitchens.
6. Enter the Moisture Removal % of Sensible Gain for your area.
7. Click “Next”.

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General Input Screen

How to add Customized Data

You may add additional building components and their specifications.

Review Manual “J” or ASHRAE manuals for proper specifications.

You will start by clicking on the “Customize Data” button located at the bottom of the General Input Screen.

The Customize Data Screen will popup.

Customize Data Screen

Adding Customized Data

1. Click on the tab of the building component that you want to modify.

2. Enter the data as outlined in your reference manuals (descriptions, U-Values, and HTM Values).

3. Click the Add/Update button to save your changes.

To proof the entries, you may wish to print the changes or new entries.

Click here to print/preview the active page.

Click here to print all the pages.

Click “Exit” to return to the General Input Screen.

Note:

It is the sole responsibility of the user to verify any and all new or altered data entered into this system.

Software for the HVAC Professional

How to add data; Walls, Windows, Doors

Selecting the System

One of the new features in this program allows you to calculate up to three different systems in the same residence. To start, select system I, II, or III.

Walls

1. Select the Wall Direction, click the down arrow and select from the drop-down menu, do not type in the "Direction" box or in any of the walls, windows, or doors description fields.

2. Enter the Wall ID (optional).

3. Enter the Wall Type (if a basement wall, then below grade and above grade may apply).

4. Enter the Wall Construction

5. Enter the Wall Length

6. Enter the Wall Height (Manual "J" considers the East wall and the West wall the same when calculating loads, so you may combine those walls if you prefer).

Dir.	Wall ID	Type	Const.	L	H	Area	Htg	Clg	Window	Frame	Area
N	1N	12 - Walls- ^A	C - R-11 C	65	8	520	0.09	2.1	3 - Double	A - Clear G	56

Windows

1. Enter the Window Type

2. Enter the type of Window Frame

3. Enter the window Area (Area is expressed in square feet).

Doors

1. Enter the Door Type

2. Enter the Door Construction

3. Enter the Door Area

Click the green **Add** button after completing each direction. The information will be added to the box at the bottom of the screen.

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Button Descriptions

Add Button

Click this button to add the selected information to the summary for each wall direction. It will be listed on the bottom of the screen.

The **Add/Clear** button will add the information on the screen to the summary and then clear the settings back to zero.

The **Delete** button will remove any line that is highlighted.

If you wish to change an entry, click on the desired wall direction from the list at the bottom, make the desired changes and click the **Update** button. You will be asked if this line is correct.

The **Clear** button will return the settings to zero. Click the **Next** button to go to the next screen.

Walls, Windows, Doors Screen

Dir.	Wall ID	Type	Const.	L	H	Area	Htg	Clg	Window	Frame	Area
N	1N	12 - Walls-Wood frame w/sheeting & Siding, veneer or other finish	C - R-11 Cavity insulation + 1/2in Gypsum Board	65	8	520	0.09	2.1	3 - Double	A - Clear G	56

Ceiling

Select the Ceiling Type and then the Ceiling Construction

Enter the Length and Width. (the area will be calculated automatically).

Click on Copy Dimensions

This will copy the length and width to the Floor Section and the Infiltration section.

Floor

Select the Floor Type and then the Floor Construction.

Skylight

To add a skylight, Select the Type and Frame, then Area.

Click the green **Add** button after completing each section. The information will be added to the box at the bottom of the screen.

Ceilings, Floors, Skylights Screen

Ceiling	Const.	L	W	Area	Htg	Clg	Floor	Const.	L	W	Area
16 - Ceiling	E - 6in-7in i	65	30	1950	0.048	1.84	20 - Floors	D - Hardwc	65	30	1950

Software for the HVAC Professional

How to add data; *Duct Loss/Gain & Infiltration*

Infiltration

Click the tab for whichever system you are working on.

If you clicked the “Copy Dimension” button on the previous screen, the length and the width was filled in for the 1st floor.

This software allows you to add up to four floors, plus a basement.

You must add each floor of the building when figuring infiltration, even though you may have combined the walls.

If there is a basement, then enter the wall height that is above grade.

Duct Loss/Gain, Infiltration Screen

	System 1	System 2	System 3
Length	65	0	0
Width	30	0	0
Sq. Ft.	1950	0	0
Height	0	0	0
Volume	0	0	0

Structural Air Tightness: Average
Fireplace: Average
of Fireplaces: 1
Air Changes per Hour: Winter 1, Summer 0.4

9. Ductwork
Location(1): Exposed to Outdoor Ambient
Insulation: Attic, Garage, Exterior Wall, Open Crawl Space - R4
Supply Air Temp: Above 120 deg F. / Below 120 deg F.
% of Area in Above Duct Location(1): Winter% 100, Summer% 100
Duct Loss/Gain Multipliers: Winter 0.15, Summer 0.15
Next

Structural Air Tightness

Click the down arrow and select from Poor, Average, or Best structural air tightness. See the [Building Component Envelope Evaluation](#) page in this manual for additional explanation.

Fireplace

Click the down arrow and select from Poor, Average, or Best.

of Fireplaces

Enter the number of fireplaces.

Air changes per hour will automatically be filled in.

Ductwork Location and Ductwork Insulation

Click the down arrow and select the duct location, then select the correct R-Value.

You will note two choices, Supply Air Temp Above 120 deg F. and Supply Air Temp Below 120 deg F. Your selection should be based on furnace type and/or heat pump.

Also, if you have ductwork located in more than one location that is in unconditioned space, then select the type that is the highest percentage being used.

Click Next to go to the Summary Screen.

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Summary

Summary Screen

Review the Sensible and Latent calculations.

In the Heat Loss / Heat Gain columns, look for zeros or any unusually large or small amounts.

The box in the lower right hand corner displays the suggested size for the air conditioner and the gas or electric furnace.

Printing

You may print a summary from this screen, or wait until you print the Proposal to do it.

	Heat Loss	Heat Gain			
Walls	4576	2221	Total BTUH Gain	27729	
Windows	4711	4926	Capacity Multiplier	1.00	
Doors	966	458	A/C Unit BTUH Rating	27729	
Ceilings	4680	4095	Please refer to our Room by Room Loads Program for Duct Design values.		
Skylights	0	0	Print Input Form		
Floors	5070	1560	Print System #1 Summary		
People/Kitchen	0	3000			
Infiltration	14300	2288			
Duct Loss/Gain	5145	2782			
Total Sensible		39448	21330	A/C Unit Nom. Selection*	2.5
Total Latent		0	6399	Furnace Output BTUH	39448
Total Loss/Gain		39448	27729	Electric Furnace KW	11.6

*Equipment Selection should match Manufacturer's Performance Data. (Latent and Sensible)

You are also able to print a blank input form for collecting the information needed to do a loads calculation.

Note:

Calculations are estimated values only. Please refer to our recommended room by room Loads Program for exact values.

Equipment selection should match Manufacturer's Performance Data for Latent and Sensible.

To calculate two or three systems in the same building

Assumption: Two story single family home over a crawl space. One kitchen on the first level. Two independent systems, one on each floor.

For the first level you must calculate the floor, and all walls exposed to outdoor ambient temperature. You do not need to add the ceiling, the second level is conditioned space. You must enter the first floor dimensions (W+L+H) on the Infiltration screen.

For the second level you must calculate the ceiling, and all walls exposed to outdoor ambient temperature. You do not need to add the floor, the first level is conditioned space. You must enter the second floor dimensions (W+L+H) on the Infiltration screen. Do not combine the wall height of the first and second floors.

If there are three systems on three different floors, one above the other, then the middle level would not have a ceiling or a floor due to both areas are conditioned space.

Usually the number of people occupying the house is estimated to be 2 per bedroom. When calculating two or more systems, only include the number of people in the area being occupied during peak load conditions, family dining room, etc.

Note: This software is not intended for Zoning. Room by room software is required.

Software for the HVAC Professional

Designed for
Residential Use!



Building Component Envelope Evaluation

Best:

Walls: Continuous infiltration barrier installed on outside of the walls which covers the entire wall area. All cracks and penetrations are sealed.

Windows & Doors: That are certified to have less than .25 CFM per running foot of crack.

Fireplaces: Combustion air from outdoors, air intake and flue equipped with tight damper and glass doors.

Ductwork: No duct leakage.



Average:

Walls: No infiltration barrier, some cuts and penetrations in plastic film vapor barrier.

Windows & Doors: That are certified to have between .25 and .5 CFM per running foot of crack.

Fireplaces: Combustion air from the conditioned space, flue equipped with tight damper and/or glass doors.

Ductwork: Some duct leakage to unconditioned space.

Poor:

Walls: No infiltration barrier or plastic vapor barrier.

Windows & Doors: That are not weather stripped and are not certified to have less than .5 CFM per running foot of crack.

Fireplaces: Combustion air from the conditioned space, no flue damper or glass doors, or poorly fitted damper.

Ductwork: Considerable duct leakage to unconditioned space.

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EasyLoads Practice Exercise 1 Ranch Over Crawl Space

General Input Screen

General Information		Winter	Summer
Outdoor Temperature		20	95
Indoor Design Temperature		70	75
Number of People	6		
Number of Kitchens	1		
Moisture Removal % of Sensible Gain	30		

Walls, Windows, and Doors Screen

Ignore Wall ID

Direction	Length	Windows	Doors
North	65'	56'	21'
South	65'	60'	21'
East	30'	15'	
West	30'	40'	
Wall Height	8'		

Wall Type

Wood frame w/ sheathing & siding
R-13 wall cavity w/ 3/4" beadboard

Window Type

Double Pane
Clear glass w/Wood frame & drapes

Door Type

Solid Core Wood

Ceiling, Floor, Skylights

Ceiling:

under ventilated attic (dark roof)
6" - 7" insulation R-22

Floor:

Over open crawl space
Hardwood + R=19

Skylights:

None

Duct Loss/Gain, Infiltration

Structural Air Tightness:

Average

Fireplace:

Average

of Fireplaces:

1

Ductwork Location

= Exposed to outdoor ambient
= Attic, Garage, Open Crawl Space R-4
= Percent of area in duct work location 100%
= Supply air temp above 120 deg F.
(fossil fuel)

Notes:



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EasyLoads Practice Exercise 2 Ranch Over Basement

General Input Screen

General Information		Winter	Summer
Outdoor Temperature		20	95
Indoor Design Temperature		70	75
Number of People	6		
Number of Kitchens	1		
Moisture Removal % of Sensible Gain	30		

Walls, Windows, and Doors Screen

Ignore Wall ID

Direction	Length	Windows	Doors
North	65'	56'	21'
South	65'	60'	21'
East	30'	15'	
West	30'	40'	
Wall Below Grade	4 1/2'		
Wall Above Grade	3 1/2'		
Wall Standard	8'		

Wall Type

Basement: Masonry w/1" foam (R-5) all

Standard: Wood frame w/ sheathing & siding
R-13 wall cavity w/ 3/4" beadboard

Window Type

Double Pane, Clear glass w/Wood frame & drapes

Door Type

Solid Core Wood

Ceiling, Floor, Skylights

Ceiling:

Under ventilated attic (dark roof) 6" - 7" insulation R-22

Floor:

Basement only, Slab

Skylights:

None

Duct Loss/Gain, Infiltration

Structural Air Tightness:

Average

Fireplace:

Average

of Fireplaces:

1

Ductwork Location

= Basement

= Located in conditioned area

= No insulation

= Percent of area in duct work location 100%

= Supply air temp above 120 deg F.
(fossil fuel)

Notes:



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EasyLoads Practice Exercise 3 Two-Story Colonial w/basement, crawl space, & two systems

General Input Screen

General Information		Winter	Summer
Outdoor Temperature		20	95
Indoor Design Temperature		70	75
Number of People	8		
Number of Kitchens	1		
Moisture Removal % of Sensible Gain	30		
Square Footage		1st Floor 1230	2nd Floor 918

Walls, Windows, and Doors Screen

Direction	Length	Windows	Doors
North			
Basement	34'	0	
Crawl Space	24'	0	
1st Floor	58'	48'	42'
2nd Floor	34'	40'	
South			
Basement	34'	7.5'	
Crawl Space	24'	0	
1st Floor	58'	24'	
2nd Floor	34'	30'	
East			
Basement	27'	7.5'	
Crawl Space	8'	0	
1st Floor	35'	48'	21'
2nd Floor	27'	24'	
West			
Basement	27'	0	
Crawl Space	13'	0	
1st Floor	35'	12'	
2nd Floor	27'	12'	
<u>Masonry Wall</u>	Height		
Below Grade	5.5'		
Above Grade	2.5'		
<u>Wall Standard</u>			
1st Floor	8'		
2nd Floor	8'		

Wall Type

Basement: Masonry w/R-11 all

Standard: Wood frame w/ sheathing & siding
R-13 wall cavity w/ 3/4" beadboard

Window Type

Double Pane, Clear glass w/Wood frame & drapes

Door Type

Solid Core Wood

Ceiling, Floor, Skylights

Ceiling under a vented attic (dark roof)

Ceiling: 1st Floor = 24' x 13' R-19

2nd Floor = 34' x 27' R-19

Floor:

1st Floor = Basement only, Slab

1st Floor = Crawl Space 24' x 13'

Hardwood R-11

(floor over open crawl space or garage)

2nd Floor = None

Skylights: None

Duct Loss/Gain, Infiltration

Structural Air Tightness: Average

Fireplace: Average (1)

Ductwork Location

= Crawl Space, Exposed in Unheated Space

= Vented or Unvented Crawl Space = R-4

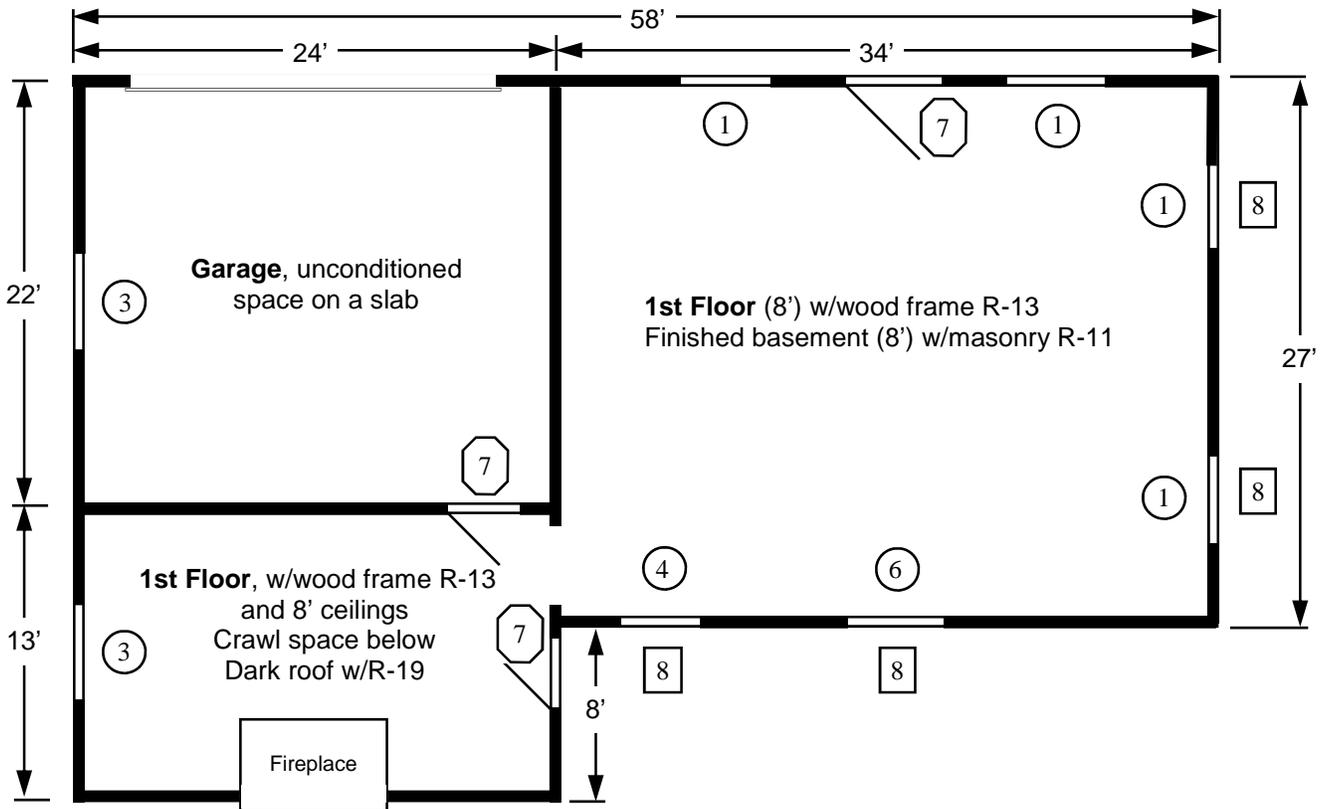
= Percent of area in duct work location 25%

= Supply air temp above 120 deg F.

(fossil fuel)

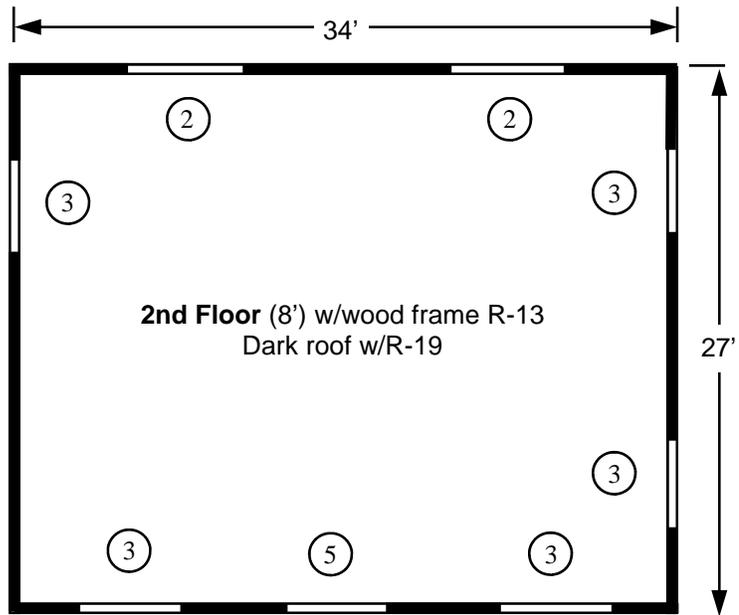
= 2nd Floor system = attic location, R-4

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Window & Doors

- 1 = 48" x 72"
 - 2 = 48" x 60"
 - 3 = 36" x 48"
 - 4 = 36" x 66"
 - 5 = 24" x 36"
 - 6 = 30" x 36"
 - 7 = 36" x 84"
 - 8 = 30" x 18"
- Basement



**Two-Story Colonial
With Two Systems**

Software for the HVAC Professional

Summary: Ranch Style

Answers:

Total Loss/Gain:

Total Heat Loss = 39,448

Total Heat Gain = 27,729

Capacity Multiplier 1.00

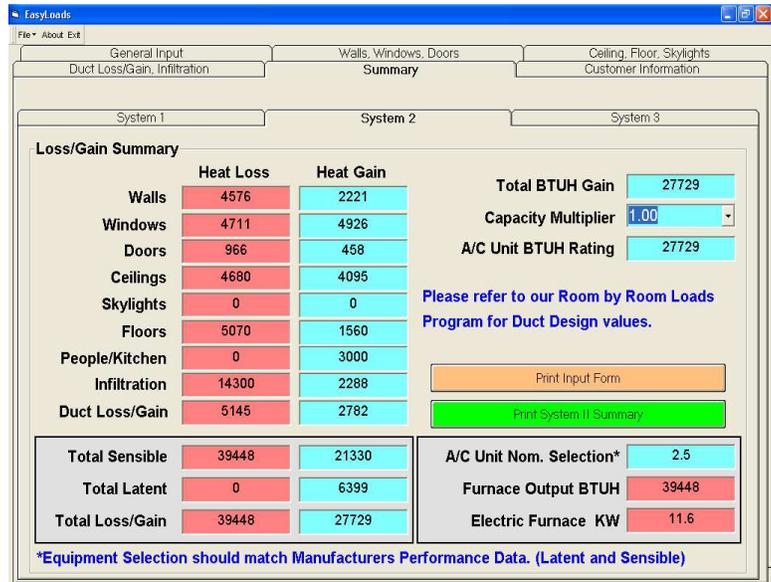
A/C Unit BTUH Rating = 27,729

AC = 2.5 Ton

Furnace Output BTUH = 39,448

Electric Furnace KW = 11.6

Summary Screen: Ranch Over A Crawl Space



Answers:

Total Loss/Gain:

Total Heat Loss = 43,723

Total Heat Gain = 25,372

Capacity Multiplier 1.00

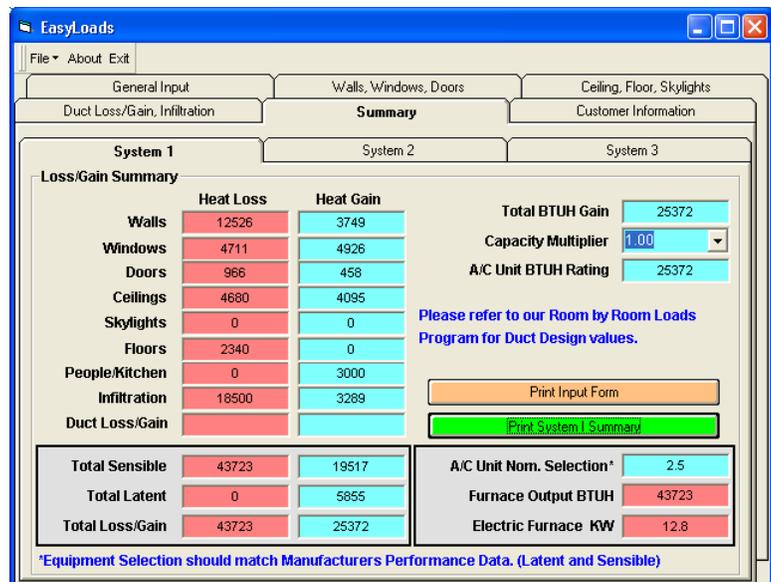
A/C Unit BTUH Rating = 25,372

AC = 2.5 Ton

Furnace Output BTUH = 43,723

Electric Furnace KW = 12.8

Summary Screen: Ranch Over A Basement



Software for the HVAC Professional

Summary: Two-Story Colonial w/Basement and Two Systems

System I Answers:

Total Loss/Gain:

Total Heat Loss = 27,224

Total Heat Gain = 19,223

Capacity Multiplier 1.00

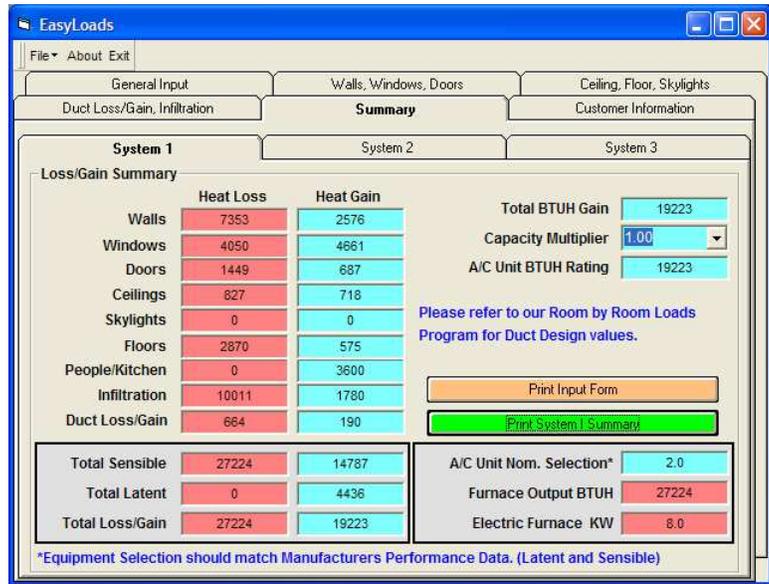
A/C Unit BTUH Rating = 19,223

AC = 2.0 Ton

Furnace Output BTUH = 27,224

Electric Furnace KW = 8.0

Summary Screen System I



System II Answers:

Total Loss/Gain:

Total Heat Loss = 17,465

Total Heat Gain = 11,973

Capacity Multiplier 1.00

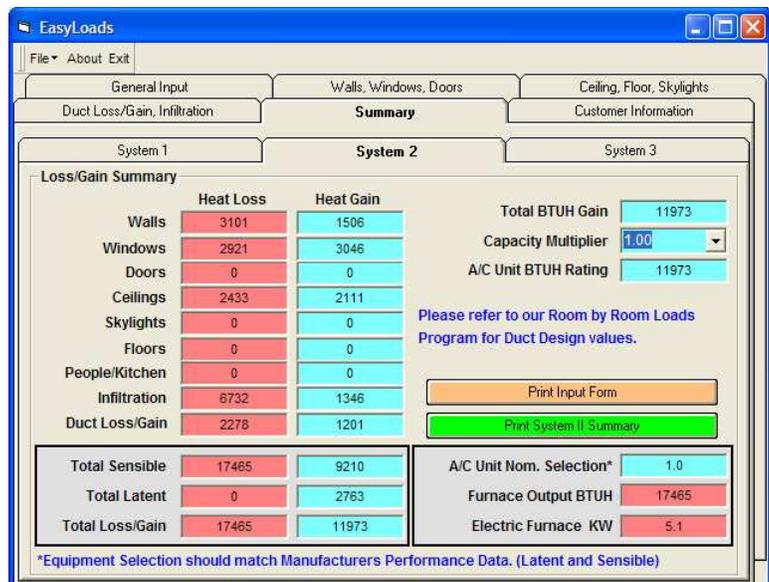
A/C Unit BTUH Rating = 11,973

AC = 1.0 Ton

Furnace Output BTUH = 17,465

Electric Furnace KW = 5.1

Summary Screen System II





"A high quality and professional sales approach is a powerful way to add value and differentiate yourself from your competition."

Graham Roberts-Phelps

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