

## Elite Software CHVAC

The Elite Software CHVAC program quickly and accurately calculates the maximum heating and cooling loads for commercial buildings. CHVAC allows an unlimited number of zones which can be grouped into as many as 100 air handling systems. CHVAC automatically looks up all cooling load and correction factors necessary for computing loads.

In addition, the programs can look up outdoor design weather data for over 300 cities located around the world. There is also provision for editing the weather data as well as adding data for other cities. Comprehensive reports list the general project data, detailed zone loads, air handler summary loads, outside air loads, total building loads, building envelope analysis, tonnage requirements, CFM air quantities, chilled water flow rates (if applicable), and complete psychrometric data with entering and leaving coil conditions. Other outstanding features include ASHRAE Standard 62 analysis, automatic building rotation, 360 degree wall orientations, tilted glass, exterior shading, internal operating load profiles, variable indoor design temperatures, people diversity, pretreated outside air, seasonal infiltration and ventilation rates, reheat loads, duct gains and losses, and return air plenums. CHVAC project data files can also be used by Elite Software's EZDOE energy analysis program. A Dos version of CHVAC exists, but it is slightly less capable.

### Program Output

The CHVAC program provides eleven types of reports which can be selectively previewed on screen or printed as desired. CHVAC supports all printers that work with Windows and numerous full color reports are available. The reports are: General Project Data, Air Handler Input Data, Zone Input Data, Detailed Project Zone Loads, Air System Zone Summary, Total Building, Air System, and Zone Load Profiles, Air System Total Load Summary, Air System Psychrometric Analysis, Overall Building Envelope Report, Pie Charts, Bar Graphs, and the Total Building Load Summary. Air system summary data can be exported to your favorite spread sheet. See the sample reports below.

### Program Input

CHVAC is a true Windows program that uses all the latest data entry techniques such as toolbars, hyper linked help, and form tabs. All input data is checked at the time of entry so that no improper data can be entered. Five types of data are requested: general project data, outdoor design data, building material data, air handler data, and specific zone data. The general project data includes the project and client name, designer, building opening and closing hours, internal operating load schedules, and any desired safety factors. The outdoor



design data includes the summer and winter outdoor design conditions (automatically looked up for you if a city reference is given) and the desired ventilation and infiltration rates. The building material data includes the definition of master building material types for roofs, walls, partitions, glass sections, and exterior shading. A user defined material library is available for saving the data on common material types. The air handler data includes the fan and terminal type, the desired heating and cooling supply air temperatures and data for duct heat gains and losses. The zone data includes the zone name, floor length and width, number of people, equipment watts, lighting watts, external shading data, and specific roof, wall, partition, floor, and glass data.

### **CHVAC/QHVAC Differences**

Although CHVAC is easy to use, it is primarily intended for consulting engineers and large contractors who perform very sophisticated and detailed HVAC load calculations. On the other hand, QHVAC is a low cost commercial loads program primarily intended for architects and contractors who design small to medium sized commercial buildings. Both CHVAC and QHVAC follow the ASHRAE calculation procedures, but QHVAC does not have all the many options that CHVAC has, and thus it is somewhat faster and simpler to use. Some of the main differences are: 1) QHVAC only allows 50 zones grouped under ten air handling systems, 2) QHVAC does not allow for exterior shading and tilted glass, 3) QHVAC only accepts wall orientations on the eight compass directions, 4) QHVAC does not allow variable indoor design temperatures, 5) QHVAC does not allow pretreated outside air, and 6) QHVAC has no provision for internal load profiles on lights, people, and equipment. To decide whether QHVAC or CHVAC is more appropriate for your needs, carefully consider the features of each. If QHVAC is missing just one of the features you need or soon will need, you should use CHVAC as it is almost as easy to use as QHVAC.

### **CHVAC Features**

- Calculates Peak Heating & Cooling Loads
- Computes CFM Air Quantities With Psychrometrics
- ***Calculates Runout and Main Trunk Duct Sizes***
- ***Automates Compliance with ASHRAE Standard 62***
- ***CHVAC Calculates in both Metric and English Units***
- Allows Simultaneous Infiltration and Ventilation
- Selects Equipment from AR/GAMA Databases
- CHVAC Allows Unlimited No. of Zones per Project
- ***Zones May be Optionally Grouped Under VAV Boxes***
- Allows 12 Walls, 12 Windows, and 5 Roofs per Zone
- Prints Numerous Color Pie Charts and Bar Graphs
- Spreadsheet Output File Compatibility
- ***Links with both AUDIT and EZDOE Energy Programs***

## System Requirements

CHVAC requires a computer system with at least 16 meg of memory and Windows 95 or Windows NT.

## Calculation Method

Both CHVAC and QHVAC perform calculations using the CLTD procedures described in the ASHRAE Handbook of Fundamentals. The programs use exact CLTD and MSHGF table values where possible, otherwise direct calculations are made. This calculation technique allows the programs to calculate for any building orientation and still produce output results that can be easily verified by hand.

## ADVANCED FEATURES

**CHVAC contains many, many advanced features.** Listed below are just some of the capabilities of CHVAC.

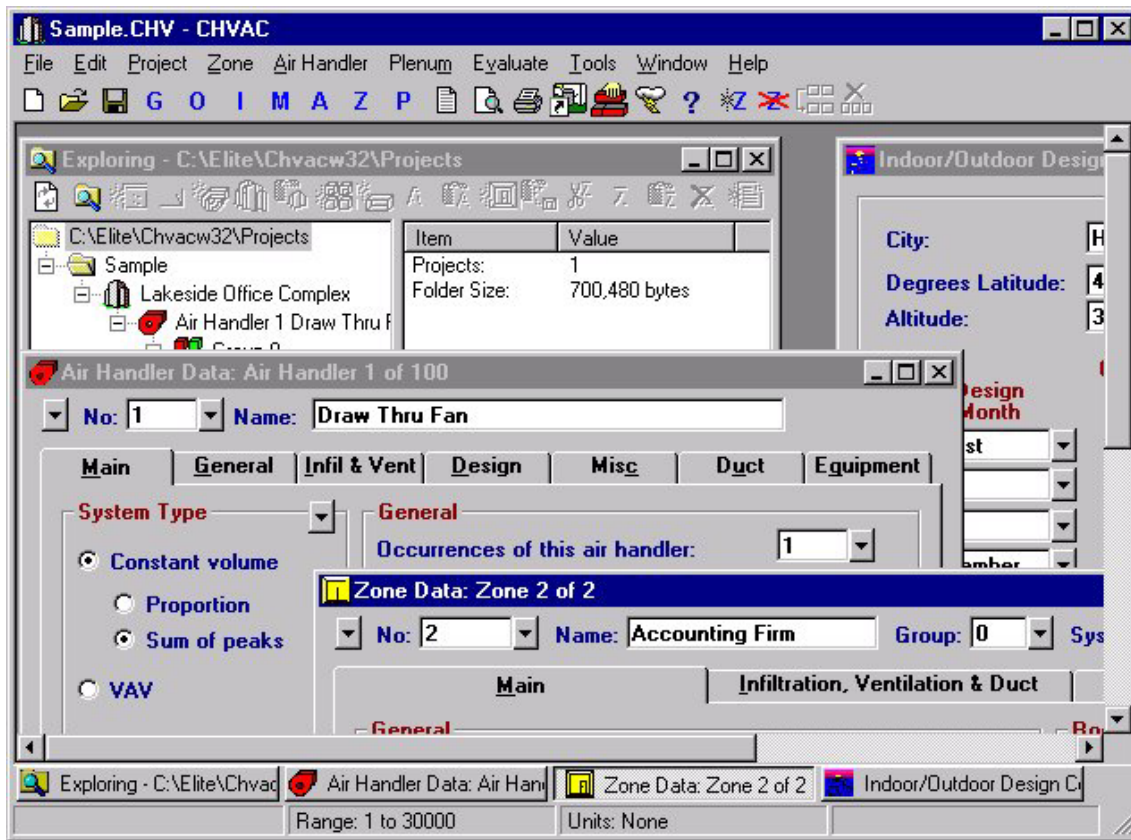
- Calculates Peak Heating and Cooling Loads
- Calculates Both Heating & Cooling Cfm Requirements
- Calculates Runout and Main Trunk Duct Sizes
- ***Automates Compliance with ASHRAE Standard 62***
- Provides Overall Building Envelope Report
- ***Spreadsheet File Compatibility***
- Performs Complete Psychrometric Analysis
- ***Prints Bar Graphs and Exploded Pie Charts***
- Exterior Shading Handles Overhangs, Fins, & Glass Tilt
- ***Uses Exact ASHRAE CLTD Procedures***
- Built-in Design Weather Data for Hundreds of Cities
- Analyzes Up to 12 Months Per Calculation
- Calculates 24 Hours per Design Day
- ***Allows Unlimited Number of Zones per Project***
- Zones May Be Grouped Under 100 Air Handlers
- ***Zones May Be Optionally Grouped Under VAV Boxes***
- Allows 12 Walls, 12 Windows, and 5 Roofs per Zone
- Allows Simultaneous Infiltration and Ventilation
- Allows Different Summer and Winter Air Rates
- Allows Varying Indoor Conditions Within a Project
- Allows 6 Master Roof Types, 8 Master Wall Types, 8 Master Partition Types, and 20 Master Glass Types
- Provides a User Defined Master Material Library
- Allows Up to 10 Internal Operating Load Profiles
- ***Allows Full 360 Degree Wall and Glass Orientations***
- Allows Glass to be titled from 0 to 180 degrees
- Allows for Roof and Wall Color Effects

- Provision for Both VAV and Constant Volume Systems
- Proper Handling of Return Air Plenum Loads
- Accounts for People Diversity in Total Building Load
- Computes Supply Fan Horsepower and Heat Gains
- Accounts for Both Draw-thru and Blow-thru Fans
- Calculates Reheat Requirements if Necessary
- Computes Supply and Return Duct Gains and Losses
- Allows Direct Specification of Supply CFM Quantities
- Allows Specification of Minimum Supply Air Quantities
- Allows Heating Only, Cooling Only, or Both
- Excess Supply Air Can be Handled as Reheat, Reserve Capacity, or by Adjusting the Leaving Coil Conditions
- Leaving Coil Conditions Can be Specified with a Desired Dry Bulb Temperature or a Relative Humidity
- Calculates Chilled and Hot Water Coil Flow Rates
- Allows for Pretreated Outside Air
- Allows Heating and Cooling Safety Factors
- Lighting & Equipment Watts along with No. of People can be Entered Directly or on a Per Square Foot Basis
- Selects Equipment from the ARI/GAMA Databases
- Creates Custom Sales Proposals

### **Links to Other Programs**

CHVAC not only calculates peak heating and cooling loads, it also aids in selecting hvac equipment and analyzing building operating costs. Project data from CHVAC can be exported to both Elite Software's AUDIT and EZDOE programs. Export to AUDIT when you want to analyze residential and light commercial projects, essentially any application which uses unitary hvac equipment. Export to EZDOE when you want to analyze large commercial projects that require precise modeling of variable loads, equipment, operating schedules, and control schemes. For just selecting unitary hvac equipment, use the built-in feature of reading equipment performance databases published by the American Refrigeration Institute (ARI) and the Gas Appliance Manufacturers Association (GAMA). If you want to create a custom sales proposal, use the special export feature to Microsoft Office 97/Word. This allows you to take the built-in sales proposal and further customize it.

## Sample Report 1



## Sample Report 2

Sample.CHV - CHVAC - [Print Preview (1)]

File Edit Project Zone Air Handler Plenum Evaluate Tools Window Help

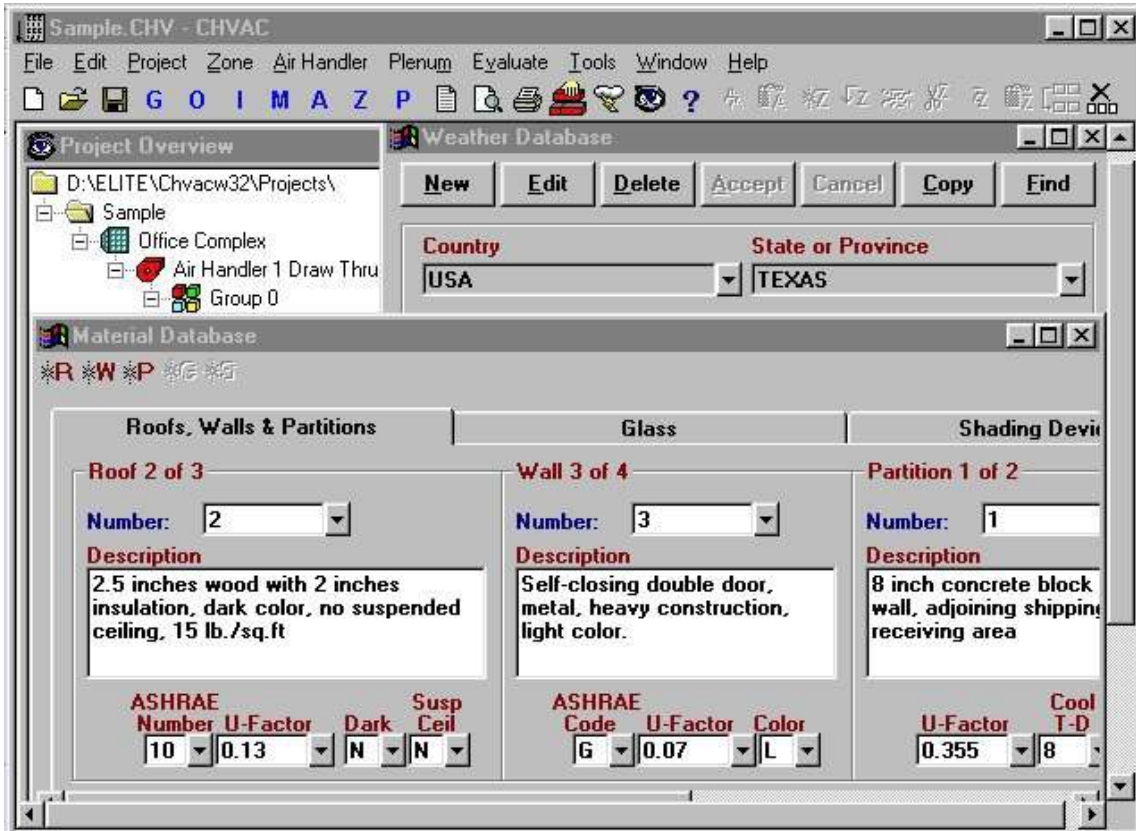
GOIMAZP

5 90%

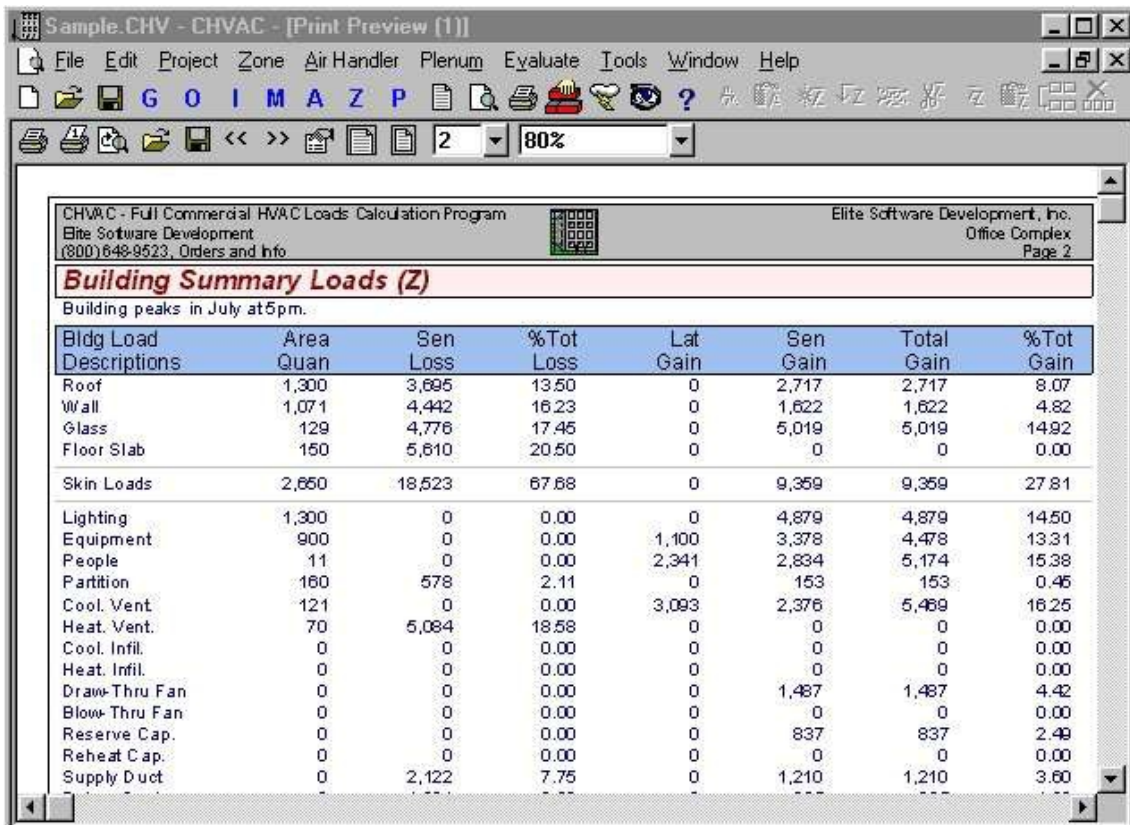
Zone Detailed Loads (At Zone Peak Times)

Load Description	Unit Quan	-SC- CFAC	CLTD SHGF	U.Fac -CLF-	Sen. Gain	Lat. Gain	Htg. Mult.
<b>Zone 1-Dentist's Office peaks (sensible) in June at 6pm, Air Handler 1, Group 0</b>							
Roof-1-6-Susp.C-D	700	1.00	54.0	0.038	1,436		2.584
Wall-1-NW-E-D	235	1	33.0	0.046	357		3.128
Wall-2-135-G-L	262	0.65	15.6	0.062	253		4.216
Partition-3-1	160		14/53	0.062	139		3.286
Gls-315*-1-90-Tran	12.0	1.000	12	0.380	55		31.960
0%S-1-L-NS-Solar	12.0	0.400	172	0.600	495		
Gls-315*-1-90-Tran	12.0	1.000	12	0.380	55		31.960
0%S-1-L-NS-Solar	12.0	0.400	172	0.600	495		
Gls-135*-1-90-Tran	18.0	1.000	12	0.380	82		31.960
0%S-1-L-NS-Solar	18.0	0.400	161	0.240	278		
Gls-315*-2-90-Tran	21.0	1.000	12	0.790	199		51.000
0%S-0-L-NS-Solar	21.0	0.300	172	0.600	650		
Lights-Prof=0	700	1.000			2,388		
Equipment-Prof=0	600	1.000			2,047	1,000	
People-Prof=1	6	1.000			1,380	1,140	
Floor slab	70						34.000
Sub-total					10,310	2,140	
Safety factors:					X1.10	X1.10	

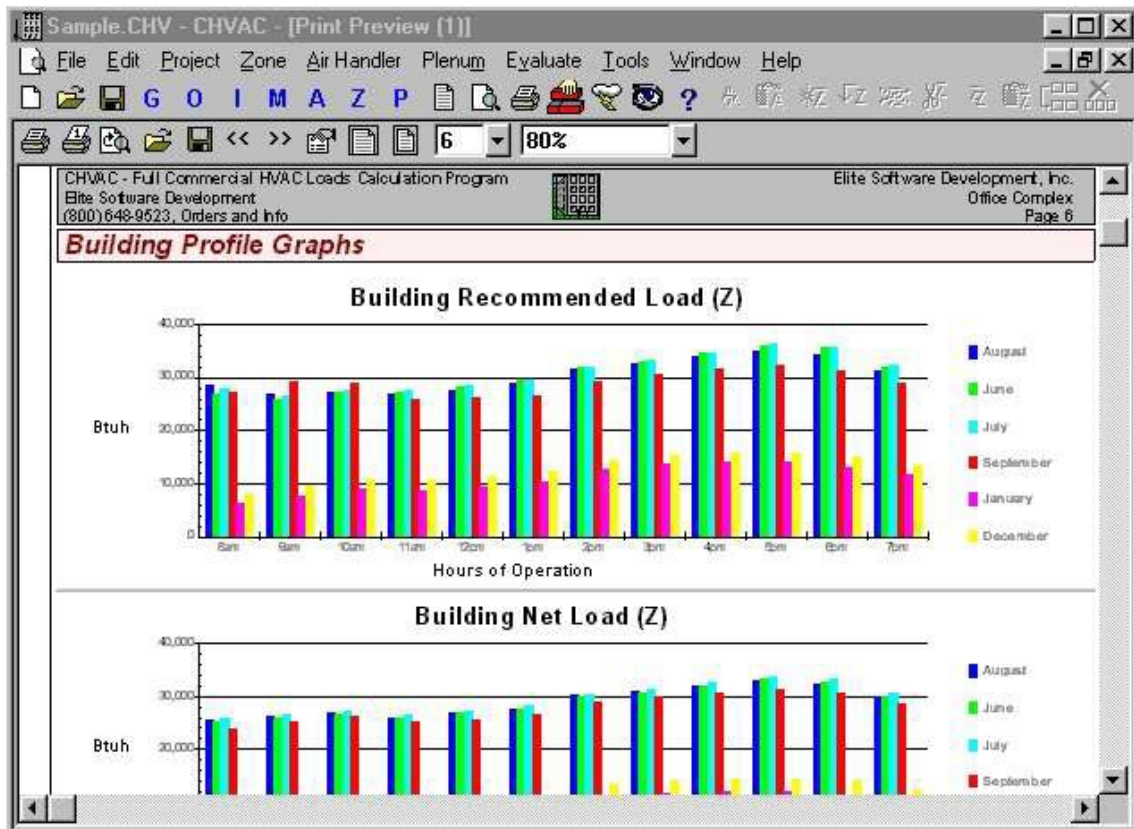
### Sample Report 3



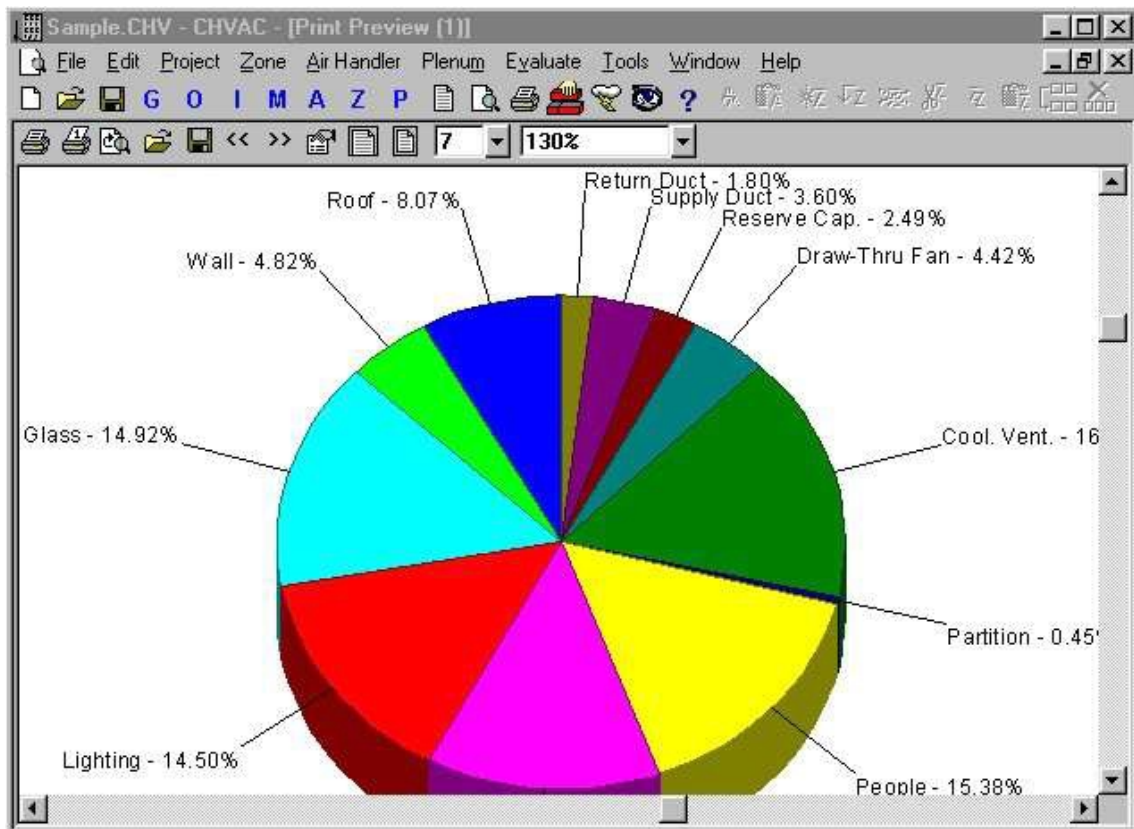
### Sample Report 4



## Sample Report 5



## Sample Report 6



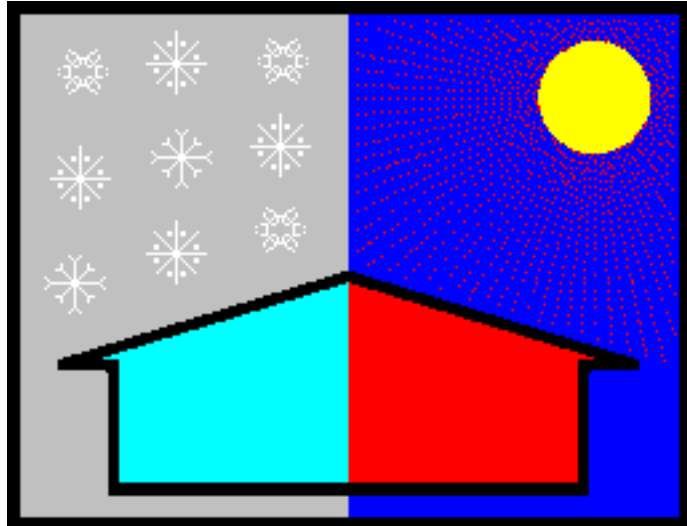
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# Elite Software RHVAC

The Elite Software RHVAC Program quickly and accurately calculates peak heating and cooling loads for residential and small commercial buildings in accordance with the seventh edition of the ACCA Manual J. This Windows based program is visually intuitive and exceptionally easy to use. The Heat Transfer Multipliers (HTM values) for all the walls, windows, doors, and roofs listed in Manual J are stored on disk and automatically looked up by the program as needed. Although HTM values are taken from Manual J directly, the user does have the option of entering his own U-Value for each wall, roof, or glass section so that a modified HTM value is used. Design weather data for over 300 cities is built-in to the program. In addition, the user can revise the existing weather data and add additional weather data as desired. Zoning cfm adjustments are automatically handled by the program as needed.



RHVAC also calculates the size of the runout ducts and the main trunk duct. Equipment can be selected from the ARI and GAMA databases and printed in the reports. Comprehensive reports list the general project data, equipment information, total building load summary, detailed room load calculations, and a room load summary for each zone and system complete with heating and cooling cfm values. Color graphic bar graphs and pie charts can be printed as well. Other outstanding features include exterior glass shading, ventilation air, miscellaneous latent loads, default room data, automatic rotation of the entire building, and the ability to share data with Elite Software's AUDIT operating cost analysis program. The Dos version of RHVAC provides similar features as the Windows version, but it is less capable so please call for details on the differences.

## Full Windows Capability

RHVAC is a true Windows program and offers exceptional productivity gains as it is visually intuitive, permits simultaneous operation of multiple programs and allows the easy exchange of data between programs. The program lets you take full advantage of Windows capabilities like cut and paste editing, high resolution graphics display and exceptionally complete help resources. The program's help features greatly facilitate learning program operation. RHVAC's Windows features allow it to produce a full array of easy to understand graphic reports in vivid color. The program supports most black and white and color printers.

## Program Output

The RHVAC program provides numerous presentation quality reports including a title page, general project data, total building and system load summaries, room summary data grouped

by zone, detailed room load reports, and numerous color pie charts and bar graphs. Shown below are just some of the many reports that can be printed or viewed on screen.

## **RHVAC Features**

- Quickly Calculates Peak Heating and Cooling Loads
- ***True Windows Program! (Dos Version Available)***
- Determines Optimal Room CFM Requirements
- Computes Room by Room, Zone, and Whole Building
- ***Calculates Runout and Main Trunk Duct Sizes***
- Follows ACCA Manual J Seventh Edition
- Allows 1000 Rooms Grouped in up to 10 Zones per System
- Rooms and Zones Can Be Assigned to 15 Systems
- Allows 10 Walls, 10 Windows, and 4 Roofs per Room
- ***Allows Custom Construction Material Descriptions***
- Looks up HTM & U-Values or Lets You Specify Them
- ***Equipment Selection From ARI and GAMA Databases***
- Shares Project Data with the AUDIT Energy Program
- ***Prints Exploded Color Pie Charts and Bar Graphs***

## **Calculation Method**

The RHVAC Program follows the exact methodology described in the Air Conditioning Contractors of America (ACCA) Manual J, Seventh Edition entitled “Load Calculation for Residential Winter and Summer Air Conditioning”. Although intended primarily for residential applications, the Manual J calculation procedures are also appropriate for some light commercial applications with additional data. All results computed by the RHVAC program can be easily verified by hand to be in accordance with ACCA Manual J.

## **Program Input**

The RHVAC program is a true Windows program complete with toolbars and hyperlinked help. All input data is checked at the time of entry so that no improper data can be entered. Two types of data are requested: general project data and specific room data.


The general project data includes the summer and winter design conditions, the outside air requirements, exterior shading and overhang data, the project name, the client name, and the designer name. The room input data includes specific information on the roof, walls, doors, and windows as well as general information on the room name, the number of occupants, and the number of appliances. Help is provided on all inputs. Data sheets are also provided for the easy organization of your information.

## **System Requirements**

RHVAC requires an IBM PC compatible computer equipped with at least 8 megabytes of memory and Microsoft Windows 3.1 or higher.

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# Sample Report 1

R HVAC - Residential & Light Commercial HVAC Loads Program Elite Software Development Bryan, TX 77802		 April 20, 1996		Elite Software Development, Inc. Jones Residence Page 2	
<b>Total Building Summary Loads</b>					
Component Description	Area Quan	Sen. Loss	Lat. Gain	Sen. Gain	Total Gain
1G Window Low Emit Glass e=.4 Wood Frame	4	236	0	152	152
2C Window Single Pane & Storm Clear Glass Metal	24	1,124	0	657	657
4C Window Double Pane & Storm Clear Glass Metal Frame	21	741	0	483	483
7G Skylight Double Plastic Dome/Clear Glass Wood Frame	12	575	0	1,920	1,920
8K Glass Door Single & Storm Low e TIM Frame	42	1,397	0	1,178	1,178
10F Door Wood Solid Core & Metal Storm	21	484	0	159	159
12D Wall R-11 + 1/2" Asphlt Board(R-1.3)	720	4,147	0	1,359	1,359
16E Ceiling R-22 Insulation	180	622	0	380	380
17K Roof Exp Bms 1 1/2" Wood Dk+R-13	390	1,684	0	1,029	1,029
20C Floor Over Open Crawl Hardwood + R-13	120	657	0	137	137
20I Floor Over Open Crawl Carpet + R-19	285	985	0	205	205
22C Slab on Grade 1 1/2" Edge Insulation(R-8)	35	680	0	0	0
Subtotals for structure:	1,854	13,332	0	7,659	7,659
Active People:	5	0	1,150	1,500	2,650
Inactive People:	0	0	0	0	0
Appliances:	0	0	800	1,500	2,300
Lighting:	0	0		0	
Ductwork:	0	1,107	0	527	527
Infiltration: Winter CFM: 66.6, Summer CFM: 29.6	124	5,275	725	651	1,376
Ventilation: Winter CFM: 0.0, Summer CFM: 0.0	0	0	0	0	0
Sensible Gain Total:				11,837	
Temperature Swing Multiplier:				X1.00	
<b>Building Load Totals:</b>		<b>19,714</b>	<b>2,675</b>	<b>11,837</b>	<b>14,512</b>
<b>Check Figures</b>					
Total Building Supply CFM:	538	CFM per square foot:	0.969		
Square feet of room area:	555	Square feet per ton:	433.235		
<b>Building Loads</b>					
Total heating required with outside air:	19,714 Btuh	19.714 MBH			
Total sensible gain:	11,837 Btuh	82 %			
Total latent gain:	2,675 Btuh	18 %			
Total cooling required with outside air:	14,512 Btuh	1.209 Tons (based on sensible + latent)			
		1.281 Tons (based on 77% sensible capacity)			
<b>Notes</b>					
Calculations are based on 7th edition of ACCA Manual J.					
All computed results are estimates as building use and weather may vary.					
Be sure to select a unit that meets both sensible and latent loads.					
Wednesday, August 28, 1996					

## Sample Report 2

RHVAC - Residential & Light Commercial HVAC Loads Program						Elite Software Development, Inc.					
Elite Software Development Bryan, TX 77802						Jones Residence Page 6					
April 23, 1995											
<b>Room Load Summary Reports</b>											
<b>System #1 Room Load Summary</b>											
Room No	Description	Area SF	Htg Sens Btuh	Htg Nom CFM	Run Duct Size	Clg Sens Btuh	Clg Lat Btuh	Clg Nom CFM	Zone Adj Fact	Clg Adj CFM	Air Sys CFM
---Zone 1---											
1	Living Room	210	10,181	132	1-10	6,123	992	278	1.05	292	278
2	Kitchen	120	2,890	38	1-6	2,554	583	116	1.00	116	116
3	Bedroom	225	6,643	86	1-7	3,160	1,100	144	1.00	144	144
System 1 Totals		555	19,714	256		11,837	2,675	538		552	538
Main Trunk Size: 12x10 in.											
<b>System #1 Cooling System Summary</b>											
	Cooling Tons	Sensible/Latent Split		Sensible Btuh	Latent Btuh	Total Btuh					
Net Required:	1.209	82%/18%		11,837	2,675	14,512					
Recommended:	1.281	77%/23%		11,837	3,536	15,373					
Actual:	1.000	75%/25%		9,000	3,000	12,000					
<b>System #1 Equipment Data</b>											
Type:	<u>Heating System</u> Natural Gas Furnace					<u>Cooling System</u> Standard A/C					
Model:	QC-F20-S81-G					QC-C12-S12					
Brand:	Quikcool FS Series					Quikcool AS Series					
Efficiency:	81.00 AFUE					12.40 SEER					
Sound:						8.1 bels					
Capacity:	20,000 BTUH					12,000 Btuh					
Sensible Capacity:	n/a					9,000 Btuh					
Latent Capacity:	n/a					3,000 Btuh					
Wednesday, August 29, 1996											

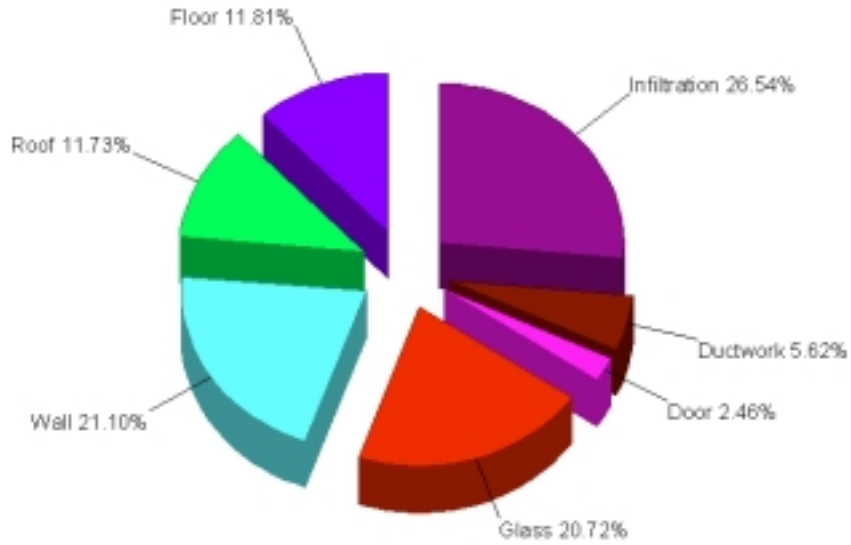
## Sample Report 3

R HVAC - Residential & Light Commercial HVAC Loads Program Elite Software Development Bryan, TX 77802		 April 23, 1995	Elite Software Development, Inc. Jones Residence Page 1		
<b>Project Summary</b>					
Client:	Mr. and Mrs. Jeffrey Jones	Company:	Jake's Heating and Air		
Address:	1234 First Street NW	Representative:	Jake Massetti		
City:	Harrisburg, PA 17177	Address:	8724 West Halver St.		
Phone:	(717) 555-5294	City:	Allentown, PA 18105		
Fax:	None	Phone:	(717) 555-HEAT		
		Fax:	(717) 555-COOL		
		Comment:	Bid prepared by Rodney.		
<b>Design Data</b>					
Project Name:	Jones Residence				
Comment:	Don't forget the picture window which will be installed later.				
Reference City:	Harrisburg, Pennsylvania				
Daily Temperature Range:	Medium				
Latitude:	40	Degrees			
Elevation:	308	Feet			
	Outdoor	Outdoor	Indoor	Indoor	Grains
	Dry Bulb	Wet Bulb	Rel.Hum.	Dry Bulb	Difference
Winter:	0	N/A	N/A	72	N/A
Summer:	95	75.22	50%	75	36
<b>Check Figures</b>					
Total Building Supply CFM:	538	CFM per square foot:	0.969		
Square feet of room area:	555	Square feet per ton:	433.235		
<b>Building Loads</b>					
Total heating required with outside air:	19,714 Btuh	19.714	MBH		
Total sensible gain:	11,837 Btuh	82	%		
Total latent gain:	2,675 Btuh	18	%		
Total cooling required with outside air:	14,512 Btuh	1.209	Tons (based on sensible + latent)		
		1.281	Tons (based on 77% sensible capacity)		
<b>Notes</b>					
Calculations are based on 7th edition of ACCA Manual J. All computed results are estimates as building use and weather may vary. Be sure to select a unit that meets both sensible and latent loads.					
Wednesday, August 28, 1996					

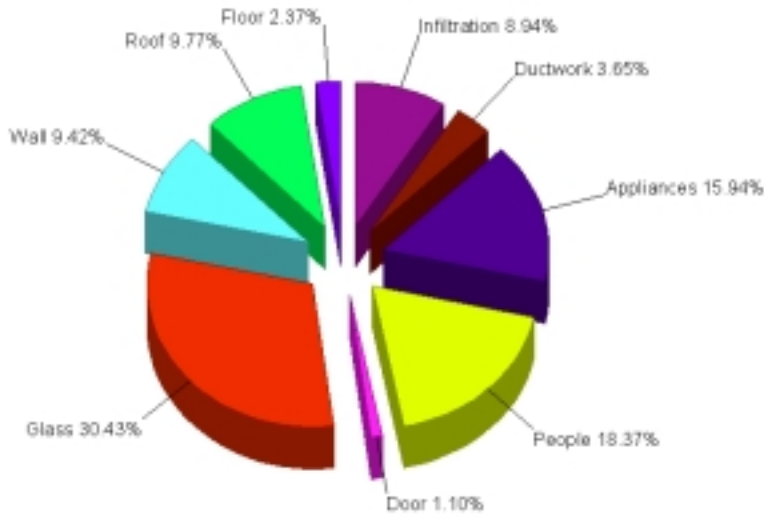
# Sample Report 4

## Building Load Pie Charts

### Total Building Loss 19,714 BTUH



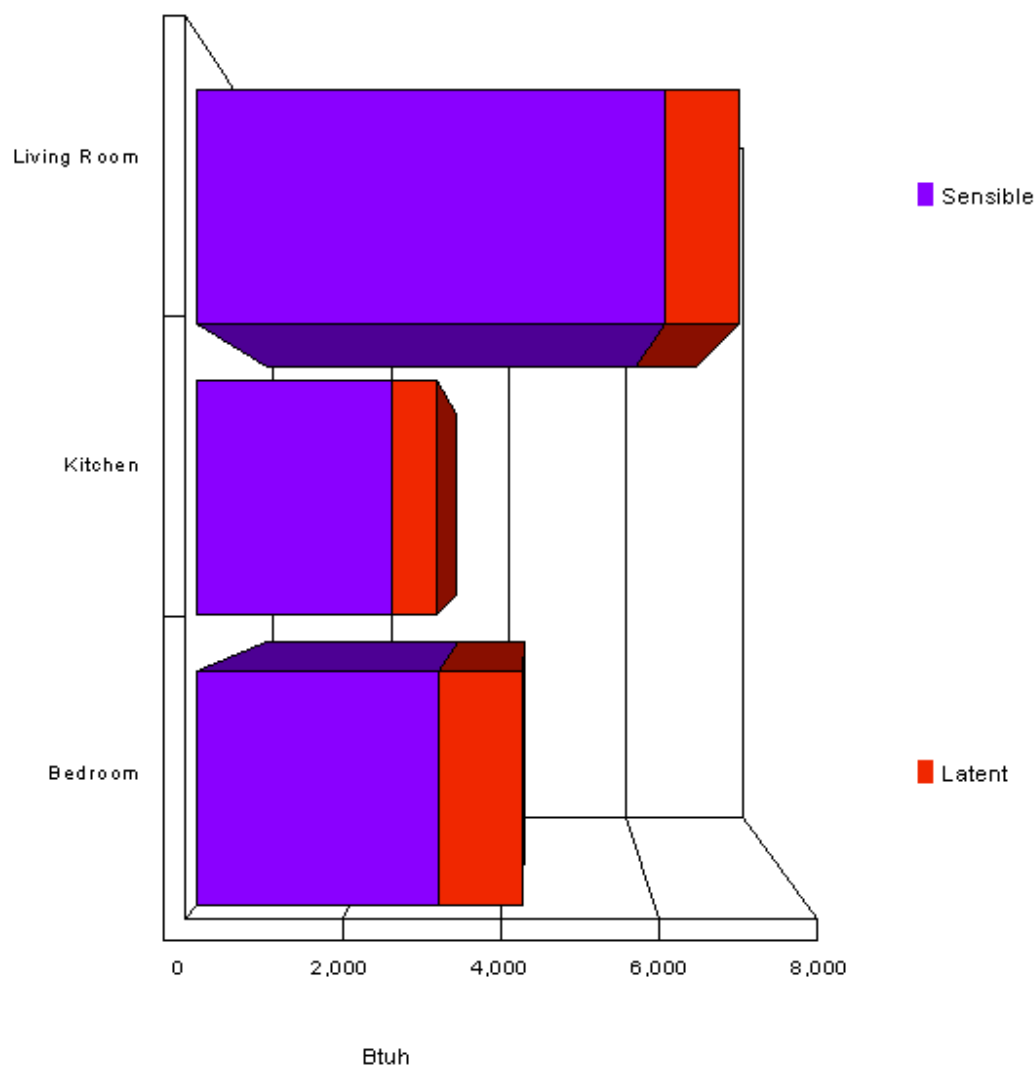
### Total Building Gain 14,512 BTUH



Wednesday, August 28, 1996

# Sample Report 5

## Room Cooling Loads Bar Graphs



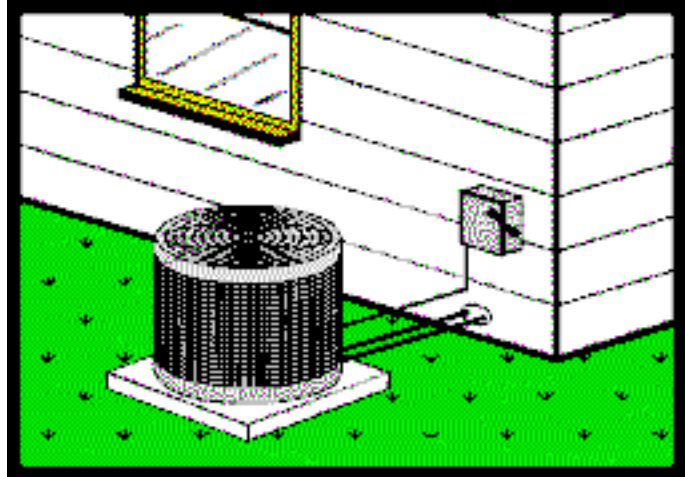
Wednesday, August 29, 1996

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# Elite Software AUDIT

The Elite Software AUDIT Program calculates monthly and annual heating and cooling costs for residential and light commercial buildings. Virtually any type of cooling and heating system can be simulated by AUDIT including standard DX, evaporative, air source heat pumps, water source heat pumps, York Triathlon, and all types of fossil fueled furnaces and boilers. An optional version of AUDIT with appliance capabilities can calculate appliance and hot water energy use as well.



AUDIT uses heating degree days, weather bin data, and full load cooling hours in its calculations. Weather data for over 300 cities throughout the world is built-in to AUDIT and additional weather data can be easily added.

Along with calculating energy costs, AUDIT also performs an economic analysis that allows you to compare system types and costs over any given study period. There is even a loan and lease analysis report designed to demonstrate affordability of better systems by showing that the effective net monthly cost is often very low when monthly energy savings are considered.

To make system comparisons easy, AUDIT allows you to manually enter equipment data or automatically look it up for you from ARI and GAMA equipment data files. AUDIT provides a wide selection of nicely formatted color charts, graphs, and reports. The DOS version of AUDIT provides the same basic features as the Windows version, but it is less capable and you should call Elite Software for details on the differences.

## System Requirements

AUDIT requires an IBM PC compatible computer equipped with at least 8 megabytes of memory and Microsoft Windows 3.1 or higher.

## Program Output

The AUDIT program provides numerous color presentation quality reports including a title page, project summary, system comparisons, appliance analysis, hot water heating, investment, loan, and lease analysis, line graphs, pie charts, and bar graphs. The reports can be previewed on screen or printed on any model printer supported by Windows. Any combination of detailed and summary reports can be selected for printing by the user. All reports reflect the input data that caused the calculated results. Shown below are just a few of the many reports and graphs that can be printed.

## AUDIT Features

- *Calculates Monthly & Annual Heating & Cooling Costs*
- *True Windows Program! (Dos Version also Available)*
- Simulates Nearly all Types of HVAC Systems
- *Optionally Analyzes Appliances and Hot Water Costs*
- Handles Both Simple and Complex Utility Rate Structures
- *References ARI and GAMA Equipment Files*
- Provides Comprehensive and Concise Graphical Reports
- *Prints Color Pie Charts, Bar and Line Graphs*
- Performs Economic Comparison of HVAC Systems
- Provides Loan and Lease Analysis for Purchasing Systems
- *Great Sales Tool for Selling HVAC Systems*

## Equipment Selection

Although you can manually enter system information on equipment from any manufacturer, AUDIT also allows you to quickly select model numbers from both the ARI and GAMA equipment databases. By selecting a model number, all the information for the model is looked up and read into the program. AUDIT can look up equipment data for all the manufacturers (over 70) whose products are listed in the Air Conditioning and Refrigeration Institute (ARI) directory and the Gas Appliance Manufacturers Association (GAMA) directory. The ARI and GAMA database disks are \$50 each and may be obtained from Elite Software.

## Full Windows Capability

AUDIT is a true Windows program and offers exceptional productivity gains as it is visually intuitive, permits simultaneous operation of multiple programs and allows the easy exchange of data between programs. The program lets you take full advantage of Windows capabilities like cut and paste editing, high resolution graphics display and exceptionally complete help resources. The program's help features greatly facilitate learning program operation. AUDIT's Windows features allow it to produce a full array of easy to understand graphic reports in vivid color. The program supports most black and white and color printers.

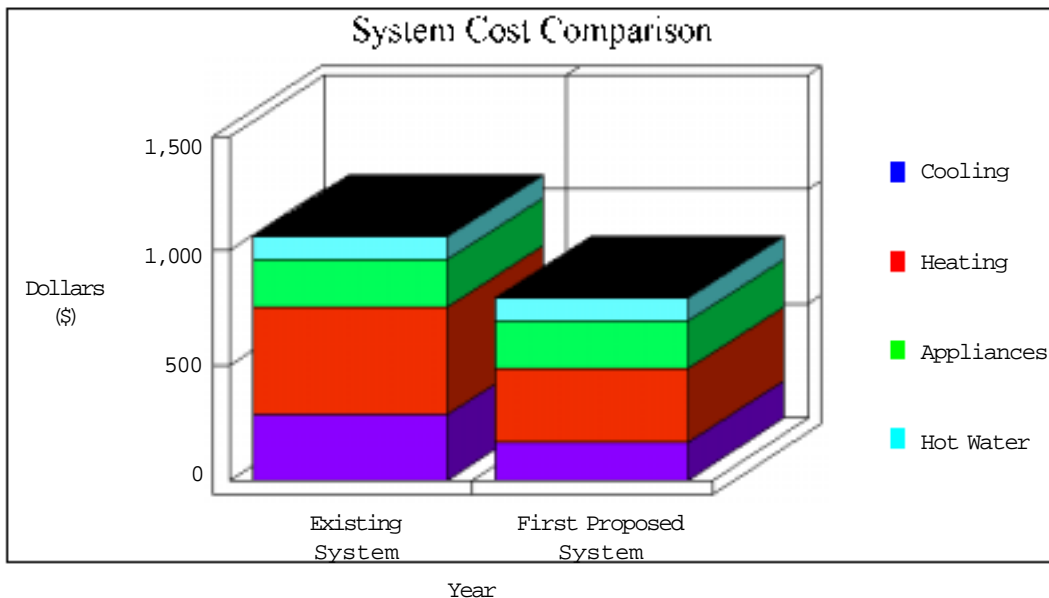
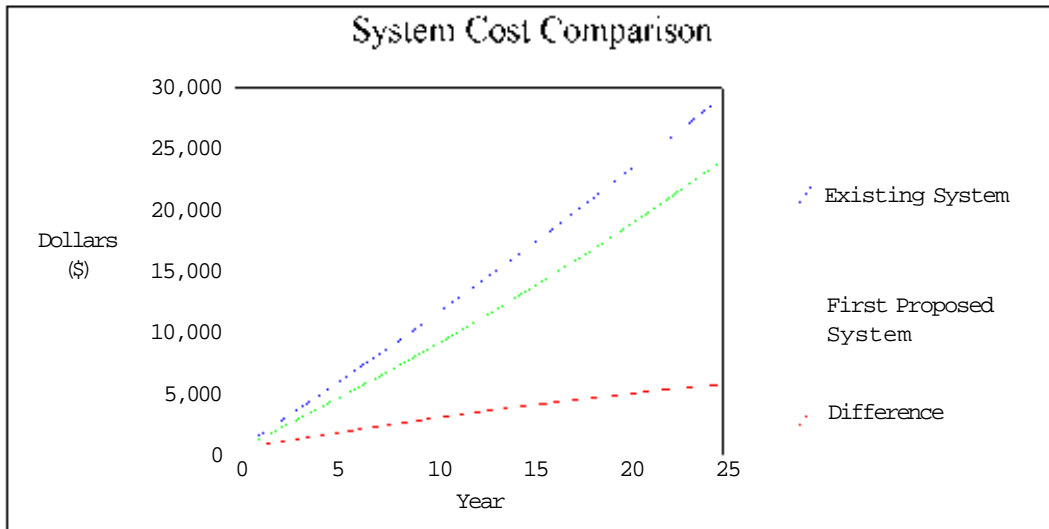
## Program Input

The AUDIT Program is a true Windows program and as such it operates in standard Windows fashion complete with toolbars and hyper linked help. All input data is checked at the time of entry so that no improper data can be entered. Two types of data are requested: general project data and specific HVAC system data. The general project data includes the summer and winter design conditions, total cooling hours, the project name and location, client information, fuel cost data, optional appliance data, and the design heating and cooling loads. The HVAC system data includes specific information on the system type, model number, efficiency, cost, capacity, and fuel used. Up to six HVAC systems may be defined per project and each system can have a backup heating system specified as well. Economic data concerning initial system cost, interest and inflation rates, and loan amounts can also be entered. In order to minimize redundant input, AUDIT can also import data from project data files created by the Elite Software RHVAC program that performs Manual J HVAC load calculations.

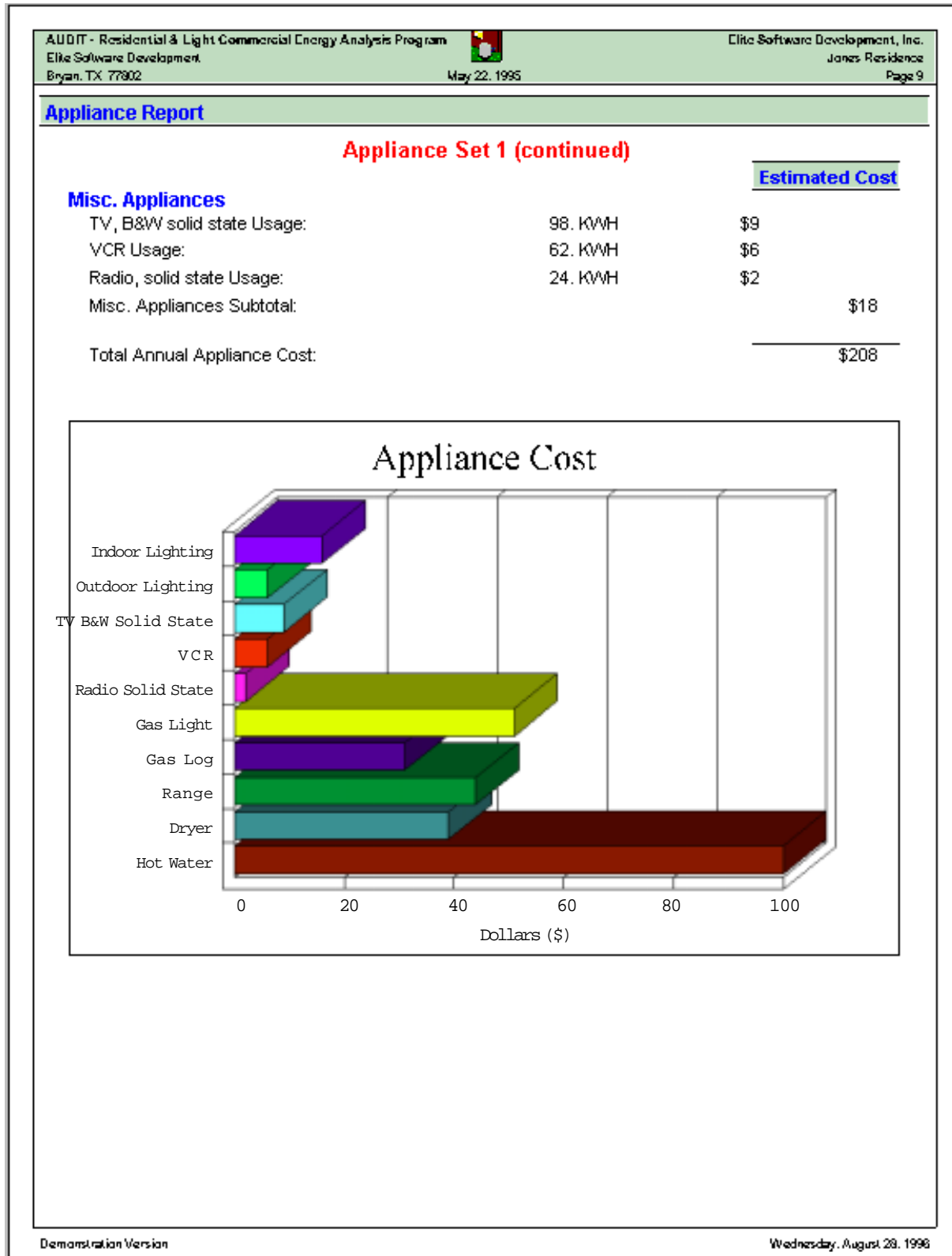
# Sample Report 1

## Comparison Report


### System #1 - Existing System VS System #2 - First Proposed System



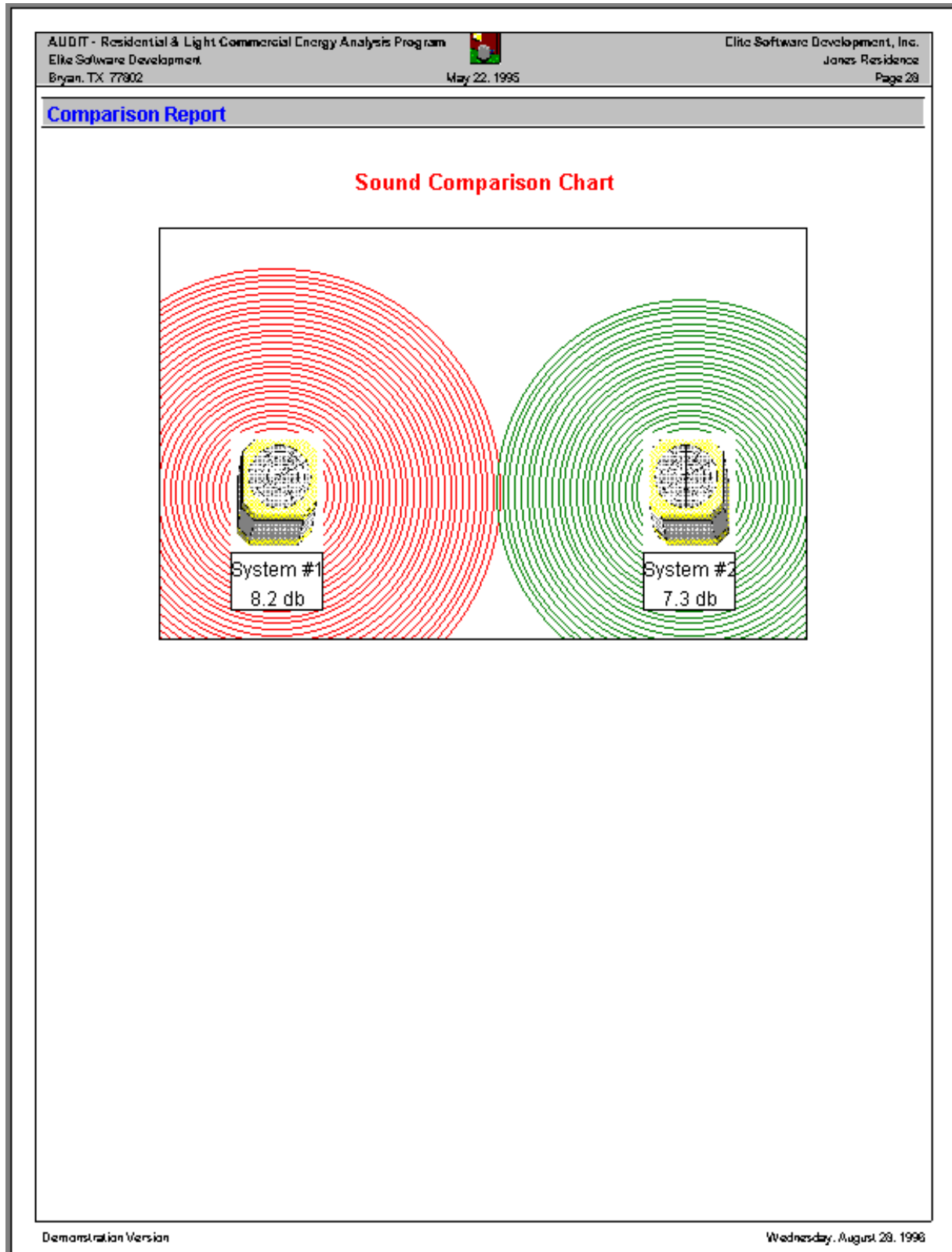
## Sample Report 2



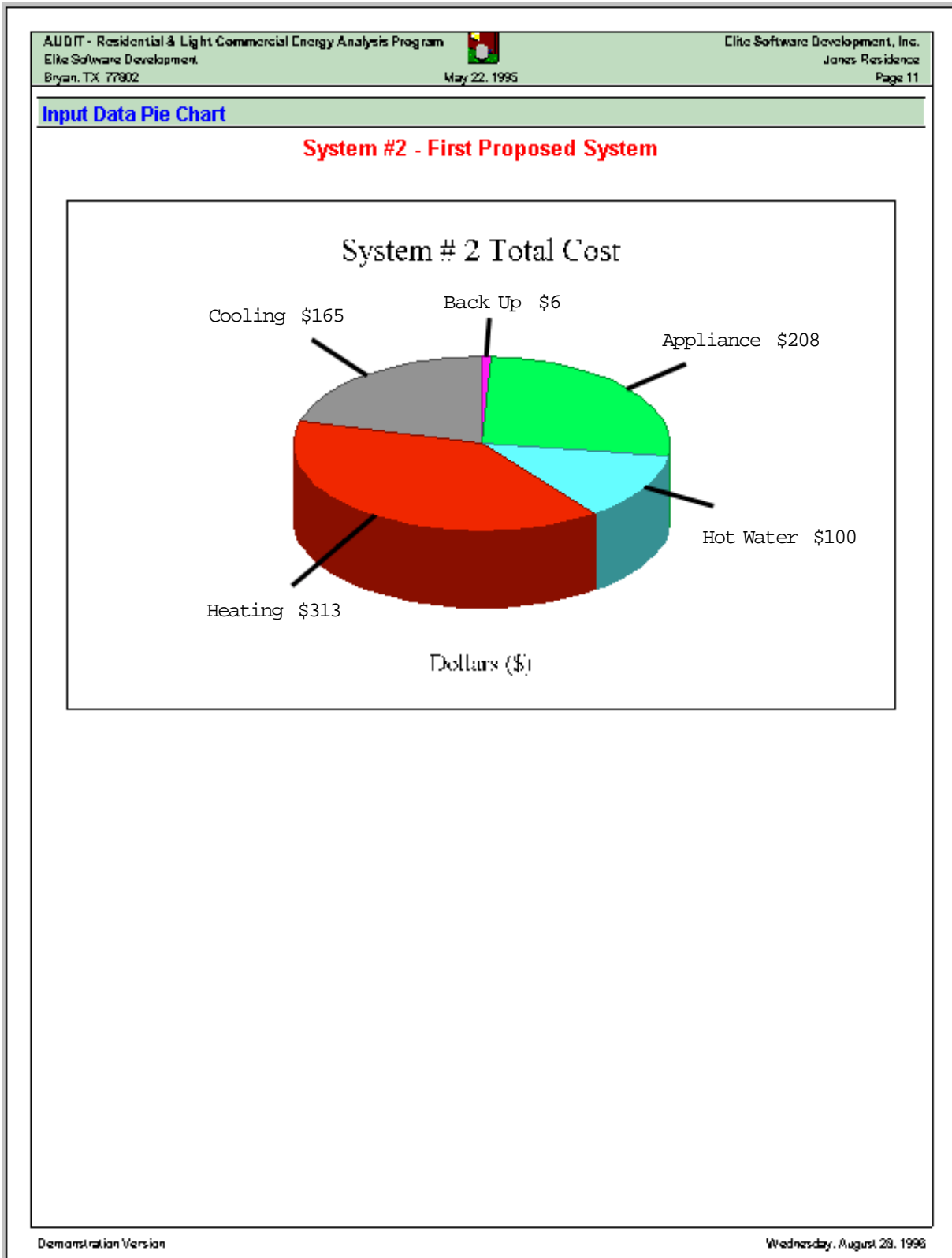
### Sample Report 3

AUBIT - Residential & Light Commercial Energy Analysis Program Elite Software Development Bryan, TX 77802				 May 22, 1995	Elite Software Development, Inc. Jones Residence Page 2			
<b>Project Summary</b>								
Client:	Mr. and Mrs. Jeffrey Jones	Company:	Jake's Heating and Air					
Address:	1234 First Street NW	Representative:	Jake Massetti					
City:	Harrisburg, PA 17103	Address:	8724 West Halver St.					
Phone:	(717) 555-5294	City:	Allentown, PA 18100					
FAX:	None	Phone:	(215) 555-HEAT					
Comment:	Mrs. Jones prefers no calls before noon.	FAX:	(215) 555-COOL					
		Comment:	Bid prepared by Rodney.					
<b>Design Data</b>								
Project Title:	Jones Residence	Cooling Load:	14,485 BTUH					
Building Area:	555	Heating Load:	19,714 BTUH					
People:	5	Loads Adjust. Factor:	0.77					
Occupancy:	12 HRS	A/C On Temp:	50 F					
Comment:	Proposal for change out, as existing unit needs repairs, and is 12+ years old.							
City Reference:	HARRISBURG, PENNSYLVANIA							
Summer Outdoor:	92 °F	Winter Outdoor:	10 °F					
Summer Indoor:	75 °F	Winter Indoor:	72 °F					
Cooling Hours:	1,000	Degree Days:	5,410					
<b>Annual Operating Cost Estimate</b>								
Description	Fuel Rates Set	Total Heating Cost	Total Cooling Cost	Water Heating Cost	Domestic Energy Cost	Total Operating Cost	Average Monthly Cost	
Existing System	1	\$467	\$286	\$100	\$208	\$1,061	\$88	
First Proposed System	1	\$320	\$165	\$100	\$208	\$793	\$66	
Second Proposed System	1	\$206	\$140	\$100	\$208	\$654	\$55	
Demonstration Version				Wednesday, August 23, 1995				

## Sample Report 4



# Sample Report 5

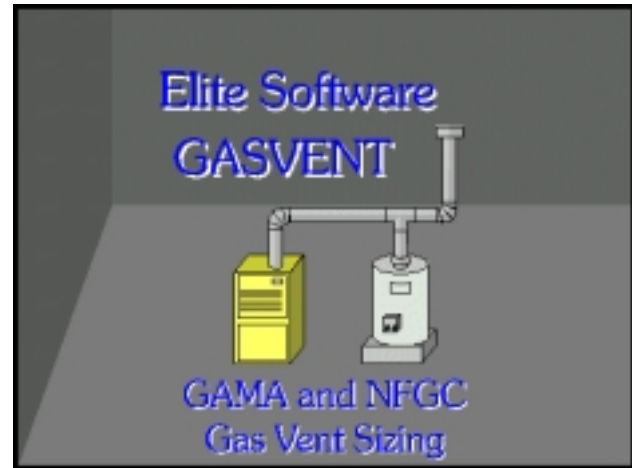


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## Elite Software GASVENT

The Elite Software GASVENT 2.0 program quickly calculates the correct vent sizes for Category 1 Gas Fired Appliances. GASVENT is a true Windows program designed to be simple and easy to use by both contractors and designers. The program is very graphical and especially easy to use.



Recent advances in technology have improved the average furnace efficiency to over 80%. These new mid and high efficiency furnaces can cause significant condensation in the vent. If a flue gas vent is either oversized, undersized, or of the wrong material, there is a high probability that corrosive condensate will cause pitting which will ultimately result in the failure of the vent pipe. The failure of a vent pipe can be deadly because the building occupants could be subjected to carbon monoxide poisoning. Besides gas poisoning, there are many other hazards from improperly designed vents. Masonry chimneys can collapse from the acid in the condensate dissolving the mortar between bricks and possibly causing a fire. Condensate can accumulate back at the furnace and cause severe rusting. There are so many potential problems with incorrect venting, that all contractors should make every effort to do the job right. GASVENT is a great help in vent design.

### Full Windows Capabilities

GASVENT is a true Windows program and offers exceptional productivity gains as it is visually intuitive, permits simultaneous operation of multiple programs and allows the easy exchange of data between programs. The program lets you take full advantage of Windows capabilities like cut and paste editing, high resolution graphics display and exceptionally complete help resources. The program's help features greatly facilitate learning program operation. GASVENT's Windows features allow it to produce a full array of easy to understand reports.

### GASVENT Update

Current users of Windows GASVENT 1.50 may update to GASVENT 2.0 for only \$49. The primary differences between GASVENT versions 1.5 and 2.0 concern new calculation routines, better handled multi-floor and multi-appliance applications, easier entry of manifolds, updated graphics, and new visually appealing reports. Updated graphics, a new manual, and a new help file make GASVENT 2.0 for Windows the easiest to use gas venting program on the market. Stay in compliance with the National Fuel Gas Code the easy way, with GASVENT for Windows!

## **GASVENT Features**

- Calculates Vent Sizes for Category 1 Gas Fired Appliances
- ***True Windows Program!***
- Follows National Fuel Gas Code and GAMA Procedures
- Sizes Single and Double Wall Metal Vents
- ***Computes Combustion Air Requirements***
- Calculates Acceptable Tile Lined Masonry Chimney Sizes
- Sizes Type B and Single Wall Metal Vent Connectors
- Calculates for Single and Multiple Appliances
- Works for Both Single and Multi Story Buildings
- Allows for Drafhood and Fan Equipped Appliances
- Accommodates any Height and Lateral Dimensions
- ***Graphical, Context Sensitive Help***
- Hypertext Feature Provides Link Between All Help Items

## **Calculation Method**

GASVENT calculates vent sizes based on the vent tables developed by the Gas Research Institute and subsequently published in the 1996 National Fuel Gas Code *by NFPA and the 1991 manual entitled, Venting Tables - Category 1 Central Furnaces*, published by the Gas Appliance Manufacturers Association. All output results produced by GASVENT can be easily verified by hand to conform with results from the vent tables.

## **Program Input**

The GASVENT program uses standard Windows data entry techniques that provide a full screen, simple "fill in the blank" input procedure. All input data is checked at the time of entry so that no improper data can be entered. If you have a question about what the program is requesting, you can press the F1 key for context sensitive help.

Additionally, there is a Hypertext feature that links all help information together. Three major types of data are requested: Customer Information, Single Appliance, and Multiple Appliances. The customer information includes the customer name, address, city, state, and phone number. A single appliance requires the appliance description (furnace, water heater, etc.), input MBH rating, vent lateral and height dimensions, outlet diameter, vent connector type, specification of natural or fan assisted draft, vent type (masonry, flexible liner, or Type B), and the number of elbows.

The same data is requested for each appliance in multiple appliance situations. Multiple appliance scenarios also allow the entry of a "floor" number for multi story buildings. All data is saved to disk and can be reviewed and edited whenever desired. Input sheets are provided for the easy organization of your data.


## **Program Output**

Output results from GASVENT are shown on each input data screen and can be printed whenever desired. Reports can be both previewed on screen or printed. Both Draft and Proof quality reports can be printed. Shown below are sample reports and screens from GASVENT program.

## **System Requirements**


GASVENT requires an IBM PC compatible computer equipped with at least 8 megabytes of memory and Microsoft Windows 3.1 or higher.

# General Project Data Report


GASVENT - Gas Venting Calculation Program, Version 2.05 Elite Software Development Bryan, TX 77802		 January 28, 1997		Elite Software Development, Inc. Jones Residence Page 2	
<b>General Project Data</b>					
<b>Client and Company Data</b>					
Client:	Mr. and Mrs. Jeffrey Jones	Company:	Jake's Heating and Air	Representative:	Jake Massetti
Address:	1234 First Street NW	Address:	8724 West Halver St.	City:	Allentown, PA 18105
City:	Harrisburg, PA 17177	Phone:	(717) 555-HEAT	Fax:	(717) 555-COOL
Phone:	(717) 555-5294	Comment:	Bid prepared by Rodney		
Fax:	None				
<b>Project Data</b>					
Project Name:	Jones Residence				
Comment:	Don't forget the water heater which will be installed later.				
Designed By:	Benito Flores-Meath				
Altitude:	308 Feet above sea-level				

Wednesday, August 13, 1997

# Single Story / Single Appliance Report

GASVENT - Gas Venting Calculation Program, Version 2.05 Elite Software Development Bryan, TX 77802		 January 28, 1997		Elite Software Development, Inc. Jones Residence Page 3			
<b>Single Story / Single Appliance</b>							
<b>Appliance and Connector Vent Data</b>							
<u>Appliance Description</u>	<u>Input (MBH)</u>	<u>App Type</u>	<u>Outlet (in)</u>	<u>Height (ft)</u>	<u>Lateral (ft)</u>	<u>Number Elbows</u>	<u>Conn Type</u>
Single Appliance	40.0	Natural	4	12.0	4.0	2	TB
<b>Vent Data</b>							
<u>Vent Height (ft)</u>				<u>Vent Type</u>			
12.0				Type B Double-Wall			
<b>Connector Vent Size</b>							
<u>Minimum Diameter (in)</u>				<u>Maximum Diameter (in)</u>			
4				6			
<b>Vent Size</b>							
<u>Minimum Vent Diameter (in)</u>				<u>Maximum Vent Diameter (in)</u>			
4				10			
<b>Notes</b>							
Calculations based on the 1991 GAMA gas venting tables developed by GRI.							
The vent diameters/chimney sizes and manifolds shown are based on the minimum connector diameter and minimum vent diameter. GAMA and NFPA both recommend using the smallest diameter permissible to minimize heat loss.							
Wednesday, August 13, 1997							

**Single Story / Multiple Appliance  
(Multiple Story / Multiple Appliance is Similar)**

GASVENT - Gas Venting Calculation Program, Version 2.05 Elite Software Development Bryan, TX 77802		 January 28, 1997		Elite Software Development, Inc. Jones Residence Page 4				
<b>Single Story / Multiple Appliance</b>								
<b>Appliance and Connector Vent Data</b>								
<u>Appliance Description</u>	<u>App Number</u>	<u>Input (MBH)</u>	<u>App Type</u>	<u>Outlet (in)</u>	<u>Rise (ft)</u>	<u>Lateral (ft)</u>	<u>Number Elbows</u>	<u>Conn Type</u>
First Appliance	1	25.0	Fan	3	2	4.0	2	TB
Second Appliance	2	15.0	Natural	3	3	3.0	2	TB
<b>Common Vent Data</b>								
<u>Common Vent Height (ft)</u>	<u>Common Vent Type</u>	<u>Common Vent Offset (ft)</u>	<u>Common Vent has Manifold Attached</u>					
14.0	Type B Double-Wall	2.0	Yes					
<b>Manifold Data</b>								
<u>Appliance Description</u>	<u>Appliance Number</u>	<u>Manifold Number</u>	<u>Manifold Length (ft)</u>	<u>Manifold Diameter (in)</u>				
First Appliance	1	1	3.0	4				
Second Appliance	2	1	3.0	4				
<b>Connector Vent Sizes</b>								
<u>Appliance Description</u>	<u>Appliance Number</u>	<u>Minimum Diameter (in)</u>	<u>Maximum Diameter (in)</u>					
First Appliance	1	3	3					
Second Appliance	2	3	5					
<b>Common Vent Size</b>								
<u>Minimum Vent Diameter (in)</u>			<u>Maximum Vent Diameter (in)</u>					
4			7					
<b>Notes</b>								
Calculations based on the 1996 National Fuel Gas Code gas venting tables developed by GRI.								
The vent diameters/chimney sizes and manifolds shown are based on the minimum connector diameter and minimum vent diameter. GAMA and NFPA both recommend using the smallest diameter permissible to minimize heat loss.								
Wednesday, August 13, 1997								

## Sample Appliance Data Input Screens

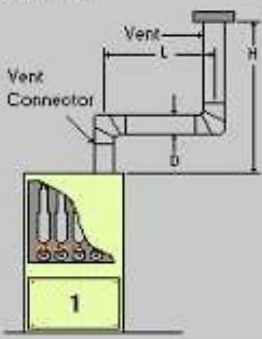
GASVENT - SAMPLE.GSV

File Edit Project Tools Window Help

Elite

Appliance Data

**System Type**



Connector Diameters

Min	Max
4 in.	6 in.

Vent Diameters\*

Min	Max
4 in.	10 in.

\*Sizes based on minimum

Single Appliance    Single Story / Multiple Appliance    Multiple Story / Multiple Appliance

Calculation Mode & Vent Data

Height H: 12 Ft.    Calculate

Vent

Type B  
 Masonry  
 Flex. Liner

Mode

NFGC  
 GAMA

Appliance & Connector Data

Input Rating: 40 MBH    Vent Connector

Lateral L: 4 Ft.     Type B  
 Single Wall

90° Elbows: 2    Type

Outlet Dia.: 4 In.     Natural  
 Fan-Assist

Description: Single Appliance

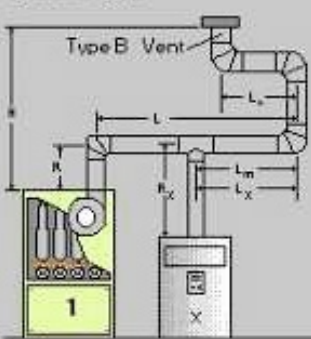
GASVENT - SAMPLE.GSV

File Edit Project Tools Window Help

Elite

Appliance Data

**System Type**



Connector Diameters

App	Min	Max
1	3 in.	3 in.
2	3 in.	5 in.

Vent Diameters\*

Min	Max
4 in.	7 in.

\*Sizes based on minimum

Single Appliance    Single Story / Multiple Appliance    Multiple Story / Multiple Appliance

Calculation Mode & Common Vent Data

Height H: 14 Ft.    Calculate

Offset Lo: 2 Ft.    Vent

Define Manifold(s)     Type B  
 Masonry  
 Flex. Liner

Mode

NFGC  
 GAMA

Appliance & Connector Vent Data

Appliance No: 1     Active

Input Rating: 25 MBH     Manifold #: 1

Rise R: 2 Ft.    Man. Length Lm: 3 Ft.

Lateral L: 4 Ft.    Vent Connector

90° Elbows: 2     Type B  
 Single Wall

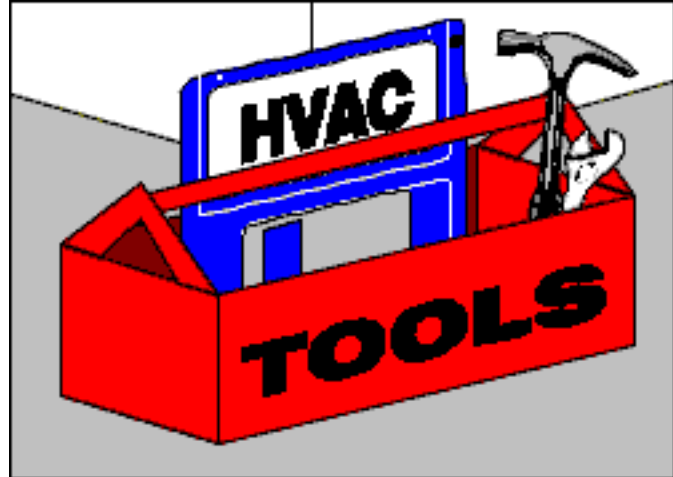
Outlet Dia.: 3 In.    Type

Natural  
 Fan-Assist

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# Elite Software HVAC Tools



The Elite Software HVAC Tools program allows the quick calculation of **13 common HVAC design tasks**. These tasks include duct sizing, wire sizing, three way coil interpolation, mixed air and state point psychrometrics, fan curve and cost analysis, U-Factor calculations, natural gas pipe sizing, refrigeration line sizing, general pipe sizing, hot/chilled water pipe analysis and the quick look-up of common HVAC formulas and conversion factors. HVAC Tools is designed to be used as a quick utility for calculating these common tasks. Minimal input is required for each function and results are instantly displayed on the same screen as the input data. Some of the functions in HVAC Tools are also covered by other Elite programs. For example, duct sizing is done on a system wide basis for multiple duct sections at a time in DUCTSIZE. The Tools program just sizes one duct at a time in order to minimize the data entry required. The same situation exists with psychrometrics, pipe sizing, and wire sizing. Elite has other programs you may want to consider that address those applications on a complete system basis. HVAC Tools is a simple and easy to use Windows programs designed for both engineers and contractors. A lower priced DOS version of Tools is also still available.

## System Requirements

HVAC Tools requires a computer equipped with at least 8 meg of memory and Microsoft Windows 3.1 or higher.

## Calculation Method

All HVAC related items in the HVAC Tools program follow the methodology described in the 1997 ASHRAE Handbook of Fundamentals. The wire sizing procedures are based on the 1997 National Electric Code. All results computed by the HVAC Tools program can be easily verified by hand.

## Program Output

Output information from HVAC Tools can be seen on each input data screen and printed whenever desired. There is also provision for printing a cover sheet for the output report of any function of HVAC Tools. Shown below are sample input screens with output data for several functions.

## HVAC Tools Features

- Automates 13 Common HVAC Design Tasks
- ***True Windows Program! (Dos Version Available)***
- Follows ASHRAE and NEC Procedures
- Sizes Round and Rectangular Duct Sections
- Sizes Wire Based on Ampacity and % Voltage Drop
- Sizes Pipes and Refrigerant Lines
- Performs Fan Curve and Cost Analysis
- Performs Mixed Air and State Point Psychrometrics
- Performs Three Way Interpolation of HVAC Units
- Automatic U-Factor Calculations for Roofs, Walls, etc.
- Hot and Chilled Water Pipe Sizing and Analysis
- High and Low Pressure Natural Gas Pipe Sizing
- Quick Look-Up of Common HVAC Formulas
- ***Provides Comprehensive and Concise Reports***

## Program Input

The HVAC Tools program is a true Windows program and as such it operates in standard Windows fashion complete with toolbars and hyperlinked help. All input data is checked at the time of entry so that no improper data can be entered. Each function of Tools requires only one screen of input data. Most functions require only a few items of input data. Others, like the HVAC Formula look-up, require almost no input data.

The Duct Size function, for example, requires the length of the duct, the cfm of air carried by the duct, the desired pressure loss per 100 feet of duct, and the material of the duct. There is also provision for entering height and width constraints along with minimum and maximum velocity constraints. The Refrigeration Line Sizing function requires refrigerant type, tonnage, temperatures, pipe lengths and type.

The Psychrometric function requires only two conditions to determine all other properties of air for a given state. The Fan Curve Analysis only requires any two of the following inputs: fan rpm, cfm, static pressure, or brake horsepower. The Wire Sizing function requires the load in either amps, horsepower, or kva. Given the voltage, wire length, material (aluminum or copper) and conduit type, Tools sizes the smallest wire that does not exceed NEC ampacity ratings or the user specified allowable % voltage drop.

## Ductsizing

**Duct Sizing**

File Edit Project Tools Help

Description: **Sample Duct Size Calculation**

Input		Constraints	
Design Air CFM:	100	Minimum Velocity: (Feet/Min)	450
Design Pres. Drop: (In. Wg/100 Ft)	.1	Maximum Velocity: (Feet/Min)	600
Roughness Factor: (Feet)	0.0005	Minimum Diameter: (Inches)	
Elevation (Feet):	0	Maximum Diameter: (Inches)	
Air Temp (*F):	55		
Shape:	<input checked="" type="radio"/> Round <input type="radio"/> Rect		

**Schedules**

Schedule Number: 1

Schedule Sizes: Diameter (Inches)  
2, 3, 4, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20

Calculated Results	
Pressure Drop:	0.100 In. Wg/100 Ft
Velocity:	536.52 Ft/Min
Diameter:	5.846 Inches
Height x Width:	x (Inches x Inches)

Actual Results	
Pressure Drop:	0.088 In. Wg/100 Ft
Velocity:	509.31 Ft/Min
Diameter:	6.000 Inches
Height x Width:	x (Inches x Inches)

## Fan Curve Analysis

**Fan Curve**

File Edit Project Tools Help

Description: **Fan Curve Sample Project**

Performance Variables			Calculations	
	Rated	Specified		
Fan Speed:	1025	900 <input checked="" type="radio"/> (RPM)	900	(RPM)
Volume Flow Rate:	1000	<input type="radio"/> (CFM)	878	(CFM)
Static Pressure:	.6	<input type="radio"/> (In. Wg)	.463	(In. Wg)
Brake Horsepower:	.32	<input type="radio"/> (BHP)	.217	(BHP)

## Mixed Air Psychrometrics

**Psychrometrics - Mixed Air**

File Edit Project Tools Help

Description: **Mixed Air Psychrometrics Sample Project**

Elevation (Feet):  Barometric Pressure (In.Hg):

Psychrometric Properties	Source 1	Source 2	Mixed Air
Air Flow Rate (CFM):	<input type="text" value="5000"/>	<input type="text" value="15000"/>	<input type="text" value="20000"/>
Dry Bulb Temperature (*F):	<input checked="" type="checkbox"/> <input type="text" value="40"/>	<input checked="" type="checkbox"/> <input type="text" value="75"/>	<input type="text" value="65.815"/>
Wet Bulb Temperature (*F):	<input checked="" type="checkbox"/> <input type="text" value="35"/>	<input type="checkbox"/> <input type="text" value="58.6"/>	<input type="text" value="54.867"/>
Relative Humidity (%):	<input type="checkbox"/> <input type="text" value="70.023"/>	<input checked="" type="checkbox"/> <input type="text" value="50"/>	<input type="text" value="57.515"/>
Vapor Pressure (Psia):	<input type="checkbox"/> <input type="text" value=".085233"/>	<input type="checkbox"/> <input type="text" value=".21502"/>	<input type="text" value=".1809"/>
Dew Point Temperature (*F):	<input type="checkbox"/> <input type="text" value="31.294"/>	<input type="checkbox"/> <input type="text" value="55.08"/>	<input type="text" value="50.393"/>
Moisture Content: <input type="radio"/> (Lb/Lb) <input checked="" type="radio"/> (Grains/Lb)	<input type="checkbox"/> <input type="text" value="45.206"/>	<input type="checkbox"/> <input type="text" value="115.88"/>	<input type="text" value="97.078"/>
Specific Volume (F <sup>3</sup> /Lb):	<input type="checkbox"/> <input type="text" value="22.541"/>	<input type="checkbox"/> <input type="text" value="24.507"/>	<input type="text" value="23.985"/>
Enthalpy (Btu/Lb):	<input type="checkbox"/> <input type="text" value="16.568"/>	<input type="checkbox"/> <input type="text" value="36.118"/>	<input type="text" value="30.918"/>

## Pipe Sizing

**General Pipe Sizing**

File Edit Project Tools Help

Pipe Type:  Description:

Input	Calculated Results
Roughness Factor: <input type="text" value=".0005"/> (Feet)	Head Loss: <input type="text" value="1"/> (Ft/100 Ft)
Fluid Type: <input type="text" value="Water"/>	Fluid Velocity: <input type="text" value="1.1338"/> (Ft/Sec)
Fluid Density: <input type="text" value="62.34"/> (Lbs/Ft <sup>3</sup> )	Inside Diameter: <input type="text" value=".8489"/> (Inches)
Fluid Viscosity: <input type="text" value="2.753"/> <input checked="" type="radio"/> Lbs/Hr Ft <input type="radio"/> C.Poise	
Design Flow Rate: <input type="text" value="2"/> (GPM)	
Design Head Loss: <input type="text" value="1"/> (Feet/100 Ft)	
	<b>Actual Results</b>
	Head Loss: <input type="text" value=".3661"/> (Ft/100 Ft)
	Fluid Velocity: <input type="text" value=".7425"/> (Ft/Sec)
	Inside Diameter: <input type="text" value="1.049"/> (Inches)
	Nominal Diameter: <input type="text" value="1"/> (Inches)

**Constraints**

Minimum Diameter:  (Inches)

Maximum Diameter:  (Inches)

Minimum Velocity:  (Feet/Sec)

Maximum Velocity:  (Feet/Sec)

## Refrigeration Line Sizing

**Refrigerant Type:** R-22  
**Pipe Material:** Copper

**At System Capacity**  
 System Capacity (Tons): 5  
 Saturated Suction Temp (°F): 40  
 Condensing Temp (°F): 120

**At Minimum Capacity**  
 Minimum Capacity (Tons): 2  
 Saturation Suction Temp (°F): 20  
 Suction Superheat (°F): 10  
 Saturat. Condensing Temp (°F): 90  
 Discharge Gas Temp (°F): 120  
 Liquid Temp (°F): 90

**Input Data**

	Suction	Discharge	Liquid
Total Line Length (Feet):	26	32	12
Design Pressure Drop (°F):	2	2	2
Additional PSI Loss (Psi):			
Addl. Feet of Loss (Feet):			
Riser Length (Feet):	3	13	
Double Riser:	<input type="checkbox"/>	<input type="checkbox"/>	

**Sizing Results**

	Suction	Discharge	Liquid
Horizontal Line (In):			
Override	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vertical Riser-A (In):			
Override	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vertical Riser-B (In):			N/A
Override	<input type="checkbox"/>	<input type="checkbox"/>	
Actual Hor. Drop (°F)			
Actual Ver. Drop (°F)			
Total Drop (°F):			
Total Drop (Psi):			

Buttons: Add Fitting, Calculate, Close

## Wiresizing

**Load**  
 Amperes: 18 HP: 12.472@75  
 KVA: 14.947 PF: .85  
 Voltage Drop Limit (%): 3  
 Line Frequency: DC, 50 Hz, 60 Hz, 400 Hz  
 Voltage: 480  
 Phase: 1Ø, 3Ø

**Conductor**  
 Cable Length (Ft): 390  
 Cables Per Phase: 1  
 Ambient Temp (°F): 86  
 Conductor Temp (°C): 60  
 Wire Size Constraints: Min.: 18 AWG, Max.: 1 AWG  
 Material: Copper, Aluminum  
 Type: Magnetic, Non-Magnetic  
 Shielding: Shielded, Non-Shielded

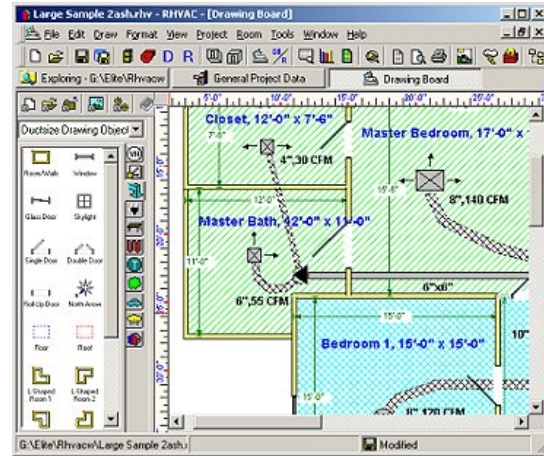
**Calculations**

Minimum Wire Size:		Rated Current:		Allowed % Voltage Drop:		Nominal Voltage:	
Displayed Wire Size:		Actual Current:		Actual % Voltage Drop:		Actual Voltage:	
KVA Losses:		KW Losses:		KVAR Losses:		Voltage Drop:	

Buttons: Calculate, Close

# Elite Software Drawing Board

DRAWING BOARD is a fast and simple program for drawing floor plans and ductwork. Drawings can be quickly created by dragging and dropping drawing objects from the built-in object catalogs onto the drawing window. The drawing objects in Drawing Board are pre-programmed shapes such as entire room shapes, walls, doors, windows, and ductwork. These are intelligent objects that contain data useful



for the CHVAC, RHVAC, and Ductsize programs. Soon, several other Elite Software programs will also include a Drawing Board window, each one having its own new, custom catalog of intelligent objects.

Drawing Board costs only \$495 and it can run as either a stand-alone program or as an integrated component within other Elite Software programs such as RHVAC, CHVAC, and DUCTSIZE. If you buy Drawing Board, it automatically becomes enabled inside of all programs you have from Elite that relate to Drawing Board. For example, if you own both RHVAC and Drawing Board, you can sketch the floor plan of a project on the drawing window of RHVAC and calculations will automatically be performed right from the floor plan you create. You can also draw the ductwork for the project on the Drawing Board window in RHVAC, which you can either size manually from within RHVAC, or you can open the same drawing in DUCTSIZE and let that program calculate all the duct sizes for you automatically.

**A demonstration version** of Drawing Board is included with each program that includes the Drawing Board window. As an example of the demonstration limits of the Drawing Board window, in RHVAC you can draw as large a floor plan as you like, but the load calculations will only be done for the first three rooms you draw, and the rooms will be limited to certain dimension restrictions. Once you purchase a license for Drawing Board, the drawing window will be 'unlocked' and load calculations can be done for all the rooms you draw on a drawing, no matter how large the rooms are.

## DRAWING BOARD ADVANCED FEATURES

**Professional Appearance:** Drawing Board uses full color, detailed, double line shapes for walls, windows, doors, and ductwork. This gives the drawing a much more professional appearance than simplistic single line representations.

**Realistic Ductwork:** Drawing Board shows ductwork completely realistic with bends, curves, and fittings just like you have to install it. Duct board and sheet metal shows as solid grey or any color

you like. Flex duct even looks like flex duct. Each duct section is shown on the drawing with its size and cfm, perfect for giving to the installer. Return duct sections appear just as nice and can be given a different color from the supply duct. Far superior to simplistic right angle stick drawings used for ductwork in other drawing systems.

**Realistic Duct Fittings:** Drawing Board can show realistic double line duct fittings that can be given any color. These fittings accurately depict what will actually be installed and make for specification quality drawings.

**Register/Diffuser Options:** Drawing Board offers both round, oval, and rectangular registers that can be specified to any size, shape, and color you like. Flow arrows can also be specified to indicate one way, two way, three way, and four way operation.

**Full Precision:** Drawing Board allows very precise control of line lengths and areas. No need to worry about rounding errors and unwanted shifting of objects due to lack of precision. You can set the grid and “snap to” setting to any precision desired.

**Undo:** If you make a mistake while drawing, click Undo to backtrack your changes. The Undo dialog shows you a preview that helps you to choose precisely how many of your changes to undo. You can undo a single change or go as far back in the current drawing session as you like.

**Dimensions:** Drawing Board provides accurate, easy-to-place dimension lines for all aspects of the drawing. All types of English and metric units are provided.

**Room Shapes:** Drawing Board allows rooms with any number of walls and odd angles desired. The basic rectangular room shape can be modified as desired or select from eleven standard room shapes to save even more time.

**Individual Walls:** All walls drawn with Drawing Board are individually selectable. Each wall can have its own material type, R value, orientation, and other properties related to HVAC load calculations. This also makes it very easy to define a partition wall separate from an exterior wall.

**Door Options:** Doors can be drawn with any degree of opening and swing arc desired. Hinge side and swing direction are easily selectable and changeable.

**Floors and Layers:** Drawing Board allows multiple story floor plans by using the concept of a sheet to represent each floor and layers to contain different types of objects per floor.

**Rooms, Zones, and Systems Colors:** Rooms can be assigned to zones and zones can be assigned to air handler systems that make up the building. Drawing Board allows room and zone areas to

have different background colors so that it is easy to distinguish them.

**Zoom and Pan:** Drawing Board provides numerous dynamic zooming and panning tools.

**Scaling:** Drawing Board allows setting the size of the drawing page and includes all the standard architectural sheet sizes and scales, thus providing an accurate “WYSIWYG” picture of what the drawing will look like while you are still working in the editing mode.

**Printer Options:** Drawing Board can print a floor plan on regular 8.5 x 11 paper or any size paper your printer or plotter will allow.

**Large Drawings:** Drawing Board can also print a large drawing over multiple sheets of paper when the drawing is larger than the printer’s standard paper size.

**Appearance Control:** Drawing Board gives custom control over the appearance of all drawing objects and layers. You can change settings like the line type, color, and shadow if desired. All text can be specified with any font style and point size desired.

**North Arrow:** Drawing Board provides an intelligent “north arrow” object that can be set to any direction desired and which controls the orientation assigned to all walls and windows.

**Borders, Title Blocks and Notes:** Drawing Board makes it easy to create custom borders, title blocks, revision clouds, and callout notes.

**Standard Shapes:** Drawing Board offers lots of standard drawing shapes including polygons, polylines, lines, rectangles, ellipses, arcs, text, rounded rectangles, and pie and chord objects. Use these to outline patios, flowerbeds, sidewalks and even create objects for custom object catalogs.

**Customizable Toolbars:** Drawing Board uses five toolbars which can be fully customized and located wherever desired.

**Calculation Links:** Drawing Board works with Elite’s CHVAC, RHVAC, and DUCTSIZE programs and soon it will link with FIRE and other Elite programs as well.

**Object Catalogs:** Drawing Board has a collection of drawing objects to supplement projects.

Objects include heating equipment (boilers, radiators, hydronic floor tubing, panels, etc.), appliances (washers, dryers, refrigerators, etc.), furniture (sofas, chairs, tables, etc.), plumbing fixtures (sinks, bathtubs, showers, etc.), electrical (outlets, switches, lights, etc.), landscaping (trees, shrubs, flowers, etc.) and many more objects.

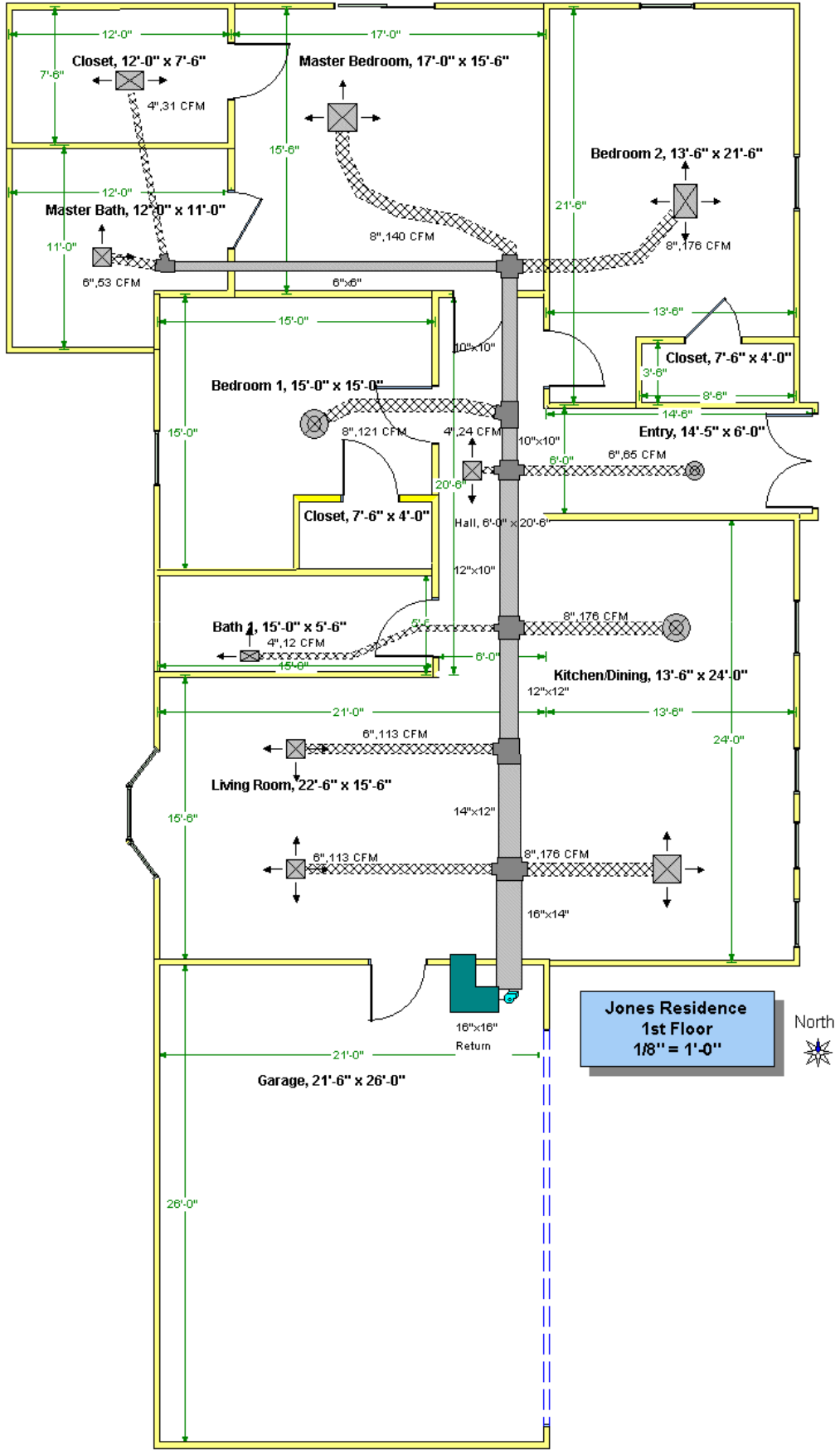


A basic use of Drawing Board is to create floor plans so that hvac load calculations can be performed from the plans with RHVAC and CHVAC. Duct work can be drawn and manually sized using RHVAC and Drawing Board, or automatically sized by using DUCTSIZE.

## **SYSTEM REQUIREMENTS**

Our Windows software applications are compatible with all Windows Operating Systems (Windows 95, 98, ME, NT 4.0, 2000, and XP). The minimum hardware requirements to run our application are the same as the minimum hardware requirements to run the operating system which the application is installed on. Additionally, 32MB of RAM and 10 MB of hard disk space is recommended to run DRAWING BOARD.

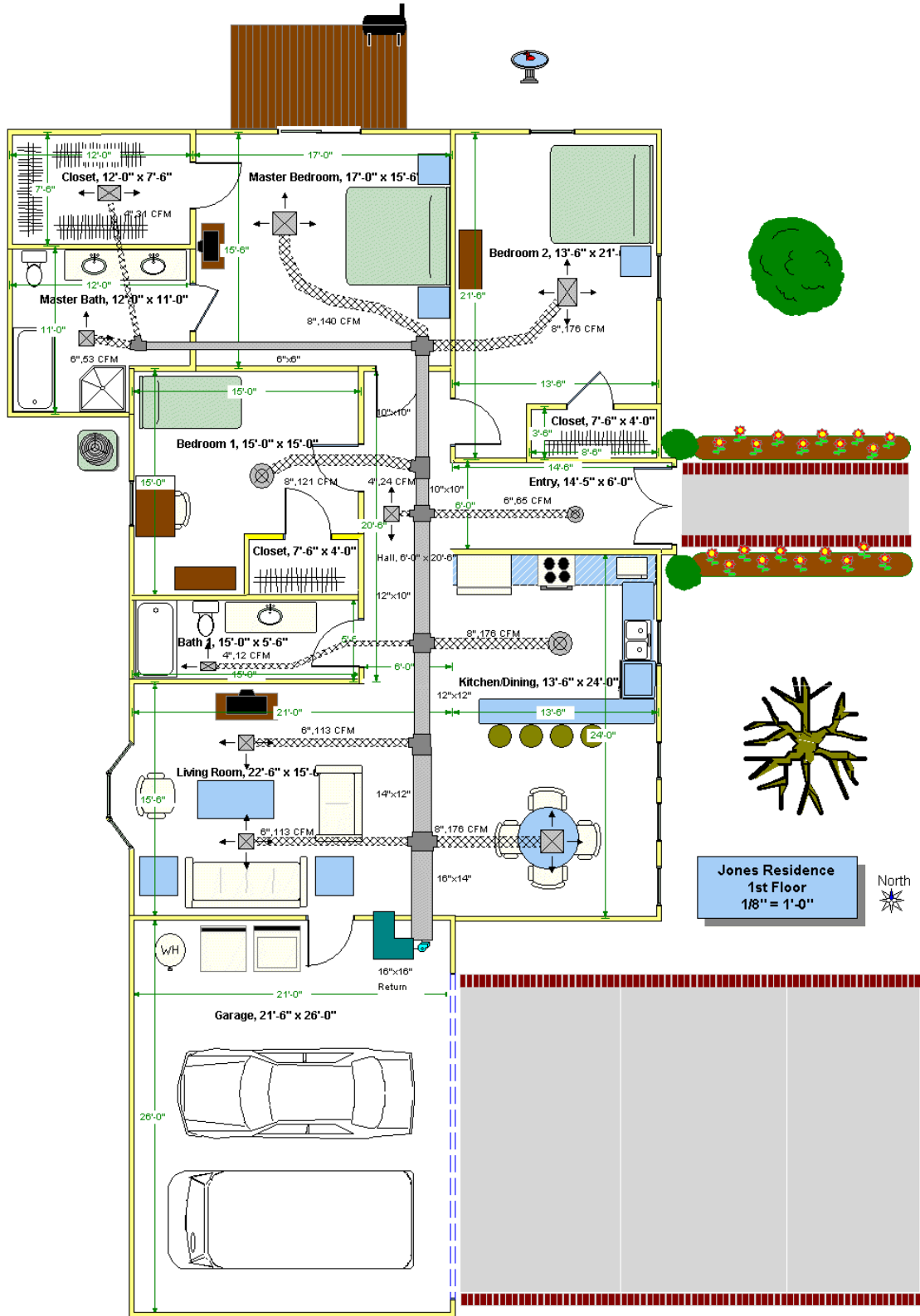
The latest updates for RHVAC, CHVAC, and Ductsize each include a built-in Drawing Board window that works at the demonstration level. It lets you create floor plans or duct layouts of unlimited size, but calculations will only be done on the first few rooms, zones, or ducts you draw (3 rooms in RHVAC, 2 zones in CHVAC and 6 trunks, 6 runouts in Ductsize). Once you purchase a Drawing Board license, these limitations on the drawing are removed.



**Jones Residence  
1st Floor  
1/8" = 1'-0"**



Drawing Board can be used for more than just drawing basic floor plans and duct systems. The drawing below illustrates using Drawing Board to embellish a drawing complete with furniture, appliances, landscape items, and even cars in the garage. All the objects in the drawing below were just dragged and dropped into place. It is very easy to win more clients by offering full architecturally correct drawings.



# Elite Software

## Proposal Maker

Proposal maker documents show your customers that you've done your homework. And that builds confidence and trust in you, which generates sales. They want to know that you've calculated the heating and cooling loads for their house, carefully selected equipment that will make them comfortable as well as save them money, and that you'll stand behind your work. Start using Proposal Maker today, and give your customers - and prospective customers - powerful literature that makes an impact.

### Features

- Works as a component within Energy Audit and Rhvac programs.
- Creates professional sales proposals linked to calculation results.
- Works for both commercial and residential applications (Proposal Maker in Chvac coming soon).
- Creates custom packets with multiple documents including credit applications, referral letters, and equipment pictures and descriptions.
- Completely customizable with many pre-built styles.
- Includes a large library of pictures from numerous HVAC equipment manufacturers (with energy audit program).
- Easily add, scale, and place your own pictures.
- Mix graphics and text in any way desired.
- Automatically places live charts and graphics from the Energy Audit or Rhvac programs wherever you like in the proposal.
- Will soon link with the Chvac program.
- Advanced word processor features like Microsoft Word.
- Creates PDF files of proposals and e-mails them for you!
- Imports and exports Word DOC files.
- No copy protection hassles!

### Overview

Proposal Maker is a fast and simple program for creating professional sales proposals and other sales related documents. Proposal Maker contains numerous word processing features such as found in Microsoft Word. But more than just a word processor, the main advantage of Proposal Maker is that it creates proposals automatically from equipment selection and cost comparison results obtained from Elite's Energy Audit and Rhvac programs and soon from Elite's Chvac program. As equipment is selected and compared, key results such as savings and payback

amounts are automatically pasted in both text and graphic form into the proposal. Additionally, pictures of the equipment being proposed can be shown as well. There is also provision for inserting your own pictures into a proposal such as a picture of the old unit that will be replaced or a picture of who will install the unit.

Proposal Maker is very flexible in that multiple proposal formats can be maintained. Use a long form format with lots of detail for that college professor customer or a short form for a single working parent with little time for details. Proposal Maker comes with numerous ready to use proposal formats, but you can create any number of new custom formats. Besides proposal letters, Proposal Maker can also print numerous support documents such as copies of customer referral letters, rebate forms, and credit applications, even factory literature can be printed for the proposed products! In this way, a very persuasive packet of information can be delivered to the customer. The proposal documents can be printed and delivered in full color or they can be created as PDF files and e-mailed directly to the customer right from Proposal Maker. Dramatically increase your sales with Proposal Maker!

## **Document Editing**

If you know how to edit a document with a word processing program such as Microsoft Word, you already know most of what you need to know to use Proposal Maker. Changing font and paragraph settings is done with dialogs that are similar to what you are already used to with your own word processor program.

## **Inserting Live Fields**

Adding fields from the host program is a snap. Just find the field you want in the Field Catalog, such as the cooling capacity of the unit you selected for system 1, then drag and drop the field onto the document where you want it to go. The field will automatically update itself to show the data from the current project.

## **Buyer's Guide**

Here are a few things to look for when shopping for a program like Proposal Maker:

- **Familiar Word Processor Features** - The processor itself should be very similar to the word processor program that you already learned how to use, such as Microsoft Word. You don't want to have to learn a whole new way of doing things. Shortcut keys, dialogs, menus, and buttons for changing fonts, paragraphs, tables, etc. should be similar to the ones you are already familiar with.

- **Fields for Main Calculation Results** - The program should provide insertable fields that automatically link to all the main calculation results of the host program. For example, you should be able to easily insert fields for the sensible and latent gains, the sensible loss, the CFM requirements, the operating costs, amount of infiltration, etc...
- **Fields for Each Input** - As far as is practical, the program should provide insertable fields that link to each of the host program's inputs, such as the client name and address, the outdoor design conditions, and the air conditioner and furnace model numbers that were selected for each system.
- **Drag and Drop Fields** - The program should let you insert fields on the document with drag and drop, in addition to inserting at the cursor location. Drag and drop is much faster when you want to insert several fields. You don't want to have to keep clicking back on the document to position the cursor each time you insert a new field.
- **Multiple Documents** - You should have the ability to create multiple documents in a single project. You should be able to have things like a proposal, an envelope addressed to the client, a thank you letter, a follow up letter, all within the same project for a particular customer.
- **Easy Template Selection** - When you start a new document, the program should prompt you with a list of available templates to choose from, and should show you a WYSIWYG preview of each template so you will know how it really looks on the page before you start your new document.
- **Dynamic Picture Fields** - The proposal program should provide dynamic picture fields, not just the ability to insert static pictures. Picture fields are intelligent pictures that automatically change based on the selections you made for the project. For example, the program should give you a picture field that will show the outdoor condensing unit for the air conditioner you selected for the current project, and if you later select a different unit the picture on the document should change automatically.
- **Live Graphs** - The program should let you insert live graphs onto the document that show the calculation results of the host program. A live graph is not just a static picture, but is an intelligent chart that automatically updates itself on the document to reflect the new results whenever you change anything in the project.
- **Customizable Toolbars and Menus** - If you have done much work in a word processor program you know that one of the most important things is to be able to customize the

toolbar and menus so you can make the tools you use most often easier to get to, and so you can set the shortcut keys however you want. The program should adjust to suit your preferences, not the other way around.

- **Accessible Menus** - The menus for the document window should be easily accessible without having to go through several sub-menus to get to the item you want.
- **Extensive Field Properties** - The program should give you the ability to change the properties of fields that are already on the document, and should give you a full array of choices for each field. For example, a field on the document that show fuel cost for a system should let you change which system is referenced, which type of fuel (electricity, natural gas, etc...), and how the number is formatted.
- **Custom Formulas** - The proposal program should give you the ability to put fields on the document that use your own custom formulas that the program evaluates and shows the results for. For example, you should be able to create your own field that takes the system list price and automatically adds 4% sales tax. Another example would be to define a field that automatically calculates the difference between the projected operating costs of two of your proposed systems.