TABLE 4. SUMMARY OF HEAT LOSSES OF UNINSULATED RESIDENCE

Heat losses given in Btu per hour

Room or Space	Walls	Ceiling and Roof	Floor	Glass and Door	Infiltration	Totals
Bedroom A	5330	6660	....	1440	1010	14,440
Bedroom B	3490	4400	....	1440	1010	10,340
Bedroom C	2560	3300	....	970	500	7,330
Bedroom D	2650	3300	960	720	500	8,130
Bathroom 1	670	1510	....	500	500	3,180
Bathroom 2	1770	960	310	320	420	3,780
Living Room	7260	....	....	1800	1120	10,180
Dining Room	3720	....	....	3880	870	8,470
Kitchen	2850	....	....	950	760	4,560
Lavette	3000	....	....	1100	530	4,630
Entrance Hall	870	2490	....	640	560	4,560
Garage	−1030*	....	−2450†	3410	2700	2,630
Recreation	3850	....	4600	720	490	9,660
Totals	36,990	22,620	3,420	17,890	10,970	91,890
Percentages	40.2	24.6	3.7	19.5	12.0	100.0

*Wall heat loss of 2110 Btu minus wall heat gain of 3140 Btu.
†Heat gains; 960, 310 and 1180 Btu.

TABLE 5. SUMMARY OF HEAT LOSSES OF INSULATED RESIDENCE

Heat losses given in Btu per hour

Room or Space	Walls	Ceiling and Roof	Floor	Glass and Door	Infiltration	Totals
Bedroom A	2670	2370	....	1440	1010	7,490
Bedroom B	1750	1570	....	1440	1010	5,770
Bedroom C	1280	1170	....	970	500	3,920
Bedroom D	1320	1170	690	720	500	4,400
Bathroom 1	340	540	....	500	500	1,880
Bathroom 2	820	340	220	320	420	2,120
Living Room	3580	....	....	1800	1120	6,400
Dining Room	1860	....	....	3880	870	6,610
Kitchen	1400	....	....	950	760	3,110
Lavette	1460	....	....	1100	530	3,090
Entrance Hall	440	850	....	640	560	2,490
Garage	−400*	....	−2090†	3410	2700	3,620
Recreation	1430	....	1580	720	490	4,220
Totals	17,950	8,010	400	17,890	10,970	55,220
Percentages	32.5	14.5	0.7	32.4	19.9	100.0

*Wall heat loss of 1050 Btu minus wall heat gains of 590, 320 and 540 Btu.
†Heat gains; 690, 220 and 1180 Btu.

Chapter 7

COOLING LOAD

Design Outside Temperatures, Components of Heat Gain, Normal Heat Transmission, Solar Heat Transmission, Solar Radiation Through Glass, Heat Introduced by Outside Air, Heat Emission of Appliances

LOAD calculations for summer air conditioning are more complicated than heating load calculations because there are more factors to be considered. Due to the variable nature of some of the contributing load components and the fact that they do not necessarily impose their maximum effect simultaneously, considerable care must be used in determining their phase relationship so that equipment of proper capacity may be selected to maintain specified indoor conditions.

The conditions to be maintained in an enclosure are variable and depend upon several factors, especially the outside design conditions, duration of occupancy and relationship between air motion, dry-bulb and wet-bulb temperatures. Information concerning the proper indoor effective temperature to be maintained is given in Chapter 2, for different geographical locations and for various age groups of individuals.

Summer dry-bulb and wet-bulb temperatures of various cities are given in Table 1. The temperatures are not the maximums but the design temperatures which should be used in air conditioning calculations. The maximum outside wet-bulb temperatures as given in Weather Bureau reports usually occur only from 1 to 4 per cent of the time, and they are therefore of such short duration that it is not practical to design a cooling system for them. The temperatures shown in Table 1 are based on available design conditions known to be successfully applied.

COMPONENTS OF HEAT GAIN

A cooling load determination is composed of five components which are classified in the following manner:

1. Normal heat transfer through windows, walls, partitions, doors, floors, ceilings, etc.
2. Transfer of solar radiation through windows, walls, doors, skylights, or roof.
3. Heat emission of occupants within enclosures.
4. Heat introduced by infiltration of outside air or controlled ventilation.
5. Heat emission of mechanical, chemical, gas, steam, hot water and electrical appliances located within enclosures.