

WEIL-McLAIN

EASY-LOOP BOOKLET FOR ESTIMATING RESIDENTIAL HYDRONIC SYSTEMS

FEATURES:

- HEAT LOSS CALCULATION
- BOILER & BASEBOARD SELECTION
- PIPE SIZING
- JOB QUOTATION

This Manual provides simplified procedures for designing an Easy-Loop Hydronic System using Weil-McLain Boilers, Convector Baseboard and Series-Loop piping.

In this system, $\frac{3}{4}$ " Convector Baseboard serves as a part of the system piping. This series loop design offers all the unequalled advantages of modern forced hot water heating and may be used in all types of residential construction.

By following the simplified design and estimating procedures in this Manual, the hydronic heating contractor will quickly be able to provide price estimates for more jobs with less effort. Once a job has been sold, a complete L-B-R calculation and piping layout should be made to accurately locate the necessary baseboard panels in each room; thus little time need be expended upon any job except those that are sold.

WEIL-McLAIN

A Marley Company

Michigan City, Indiana 46360



FEATURES OF AN EASY-LOOP SYSTEM

Installation time and material costs are substantially reduced with an Easy-Loop system since the convactor baseboard eliminates a major portion of the piping. Actual tests have proven that installation time can be reduced over 50% and piping material costs reduced a like amount by eliminating pipe, pipe fittings, radiator union elbows, radiator valves, etc. Listed below are other major features and advantages of a Well-McLain Easy-Loop System.

1. The appreciably lower installed cost assures the availability of a quality hydronic heating system for more home owners.
2. Adaptable to all types of residential construction

including ranch, two story, basementless, split level homes and multiple apartment units.

3. Zoning can be provided at low additional cost through the use of more than one loop, and with zone valves or circulators.

4. Comfort conditions in the home are equivalent to a system using a conventional one-pipe system.

5. Can be installed in basementless and slab type ranch homes at costs which are comparable to a warm air system.

The following simple steps provide an accurate "short-cut" method for designing an Easy-Loop System.

STEP 1. ESTIMATE TOTAL HEAT LOSS

Select from the Construction Design Table, those features that best identify the construction for the area which is to be heated. Choose the appropriate heat loss according to square feet of floor area, and record this heat loss in the proper line below. Repeat this procedure for other areas. Determine design temperature difference for the locale and the corresponding correction factor on Page 6. Then multiply

total heat loss calculated for each area by the correction factor to obtain the adjusted heat loss on which to base boiler selection.

NOTE: Do not add in heat losses for basements which are not to be heated. Ignore crawl spaces which are open to basement areas. Make deduction from first floor heat loss for two story structures.

LEVEL	CONSTRUCTION NO.	AREA SQ. FT.	HEAT LOSS AT 70°F. DESIGN TEMP. DIFF.	CORRECTION FACTOR AT ____°F.	ADJUSTED HEAT LOSS (TO NEAREST 100)
FIRST LEVEL				X	=
SECOND LEVEL				X	=
MID-LEVEL				X	=
BASEMENT				X	=
FLOOR				X	=
TOTAL ADJUSTED HEAT LOSS =					

EXAMPLE:

28' x 50' Ranch type house, single story (8 ft. ceiling) with basement, 1300 sq. ft. floor area.

Construction: Double glass, weatherstripped, 2" wall insulation, 3" ceiling insulation.

Design temperature difference: 30°F.

Owners wish to heat first floor and basement.

Owners wish to zone into living, sleeping, and basement areas.

By following the instructions in Step 1 and using this example, the total adjusted heat loss is calculated as shown below.

LEVEL	CONSTRUCTION NO.	AREA SQ. FT.	HEAT LOSS AT 70°F. DESIGN TEMP. DIFF.	CORRECTION FACTOR AT 30°F.	ADJUSTED HEAT LOSS (TO NEAREST 100)
FIRST LEVEL	5	1300	37,340	X 1.15	= 42,940
SECOND LEVEL				X	=
MID-LEVEL				X	=
BASEMENT	22	1300	13,340	X 1.15	= 15,340
FLOOR				X	=
TOTAL ADJUSTED HEAT LOSS =					58,280

CONSTRUCTION DESIGN TABLE

(8 FT. CEILING HEIGHT)

CONSTRUCTION NO. 1 Single glass, weatherstripped 1" Wall Insulation 2" Ceiling Insulation	CONSTRUCTION NO. 2 Double glass, weatherstripped 1" Wall Insulation 2" Ceiling Insulation	CONSTRUCTION NO. 3 Single glass, weatherstripped 1" Wall Insulation 2" Ceiling Insulation
CONSTRUCTION NO. 4 Double glass, weatherstripped 1" Wall Insulation 3" Ceiling Insulation	CONSTRUCTION NO. 5 Double glass, weatherstripped 2" Wall Insulation 3" Ceiling Insulation	CONSTRUCTION NO. 6 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation
CONSTRUCTION NO. 7 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation Full Basement or Crawl Space	CONSTRUCTION NO. 8 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation Full Basement or Crawl Space	CONSTRUCTION NO. 9 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation Full Basement or Crawl Space
CONSTRUCTION NO. 10 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation Full Basement or Crawl Space	CONSTRUCTION NO. 11 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation Full Basement or Crawl Space	CONSTRUCTION NO. 12 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation Full Basement or Crawl Space
CONSTRUCTION NO. 13 Double glass, weatherstripped 3" Wall Insulation 3" Ceiling Insulation Full Basement or Crawl Space	CONSTRUCTION NO. 14 4" Brick, 4" Light Weight Block Furred, Lath and Plaster 2" Ceiling Insulation Single Glass, Weatherstripped	CONSTRUCTION NO. 15 4" Brick, 4" Light Weight Block Furred, Lath and Plaster 2" Ceiling Insulation Double Glass, Weatherstripped
CONSTRUCTION NO. 16 4" Brick, 4" Light Weight Block Furred, Lath and Plaster 3" Ceiling Insulation Single Glass, Weatherstripped	CONSTRUCTION NO. 17 4" Brick, 4" Light Weight Block Furred, Lath and Plaster 3" Ceiling Insulation Double Glass, Weatherstripped	CONSTRUCTION NO. 18 5" Brick, Furred, Lath and Plaster 3" Ceiling Insulation Single Glass, Weatherstripped
CONSTRUCTION NO. 19 4" Brick, Furred, Lath and Plaster 3" Ceiling Insulation Double Glass, Weatherstripped	CONSTRUCTION NO. 20 5" Brick, Furred, Lath and Plaster 3" Ceiling Insulation Single Glass, Weatherstripped	CONSTRUCTION NO. 21 5" Brick, Furred, Lath and Plaster 3" Ceiling Insulation Double Glass, Weatherstripped
CONSTRUCTION NO. 22 Concrete or Brick Walls 6" High - 6" below grade. Slab at or below grade and piling included - Oil - vented crawl space.	CONSTRUCTION NO. 23 4" Concrete Slab with 1" Perimeter Foundation	

HEAT LOSS TABLE* (Continued on Page 4)
CALCULATED AT 70°F. DESIGN TEMPERATURE DIFFERENCE

Floor Area, Sq. Ft.	CONSTRUCTION DESIGN										
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11
500	28,750	23,900	37,550	22,510	18,075	15,860	17,910	16,160	15,460	13,110	15,360
600	32,300	27,030	39,620	25,350	20,520	19,200	20,460	18,360	17,520	17,100	17,490
700	35,860	30,150	43,900	28,190	22,970	21,540	23,010	20,560	19,580	19,090	19,610
800	39,440	33,590	47,600	31,300	25,640	24,080	25,760	22,960	21,640	21,230	21,920
900	43,040	36,680	51,320	34,160	28,050	26,380	28,270	25,120	23,860	23,230	24,010
1000	46,660	39,800	55,090	37,000	30,500	28,720	30,820	27,320	25,920	25,220	26,140
1100	50,300	42,920	58,870	39,840	32,940	31,060	33,370	29,520	27,980	27,210	28,270
1200	53,960	46,040	62,660	42,680	35,390	33,400	35,920	31,720	30,040	29,290	30,400
1300	57,640	49,170	66,460	45,530	37,840	35,830	38,020	33,480	31,660	30,750	32,120
1400	61,340	52,300	70,270	48,370	40,290	38,260	40,580	35,680	33,720	32,740	34,240
1500	65,060	55,430	74,090	51,220	42,740	40,700	42,690	37,440	35,340	34,290	35,970
1600	68,800	58,570	77,920	54,070	45,190	43,130	44,840	39,240	37,000	35,860	37,730
1700	72,560	61,720	81,760	56,920	47,640	45,570	47,140	41,190	38,810	37,620	39,530
1800	76,340	64,880	85,610	59,770	50,090	48,010	49,490	43,190	40,670	38,410	41,350
1900	80,140	68,050	89,470	62,620	52,540	50,440	51,400	45,140	42,690	40,760	43,200
2000	83,960	71,230	93,340	65,470	55,000	52,890	53,750	47,190	44,780	42,850	45,070
†	18%	21%	12%	14%	17%	18%	12%	14%	9%	6%	14%

* Based upon 1-8-5 dimensions where ceiling height is 8 ft. and where total window and door areas do not exceed 20 percent of the GROSS wall area. For 9 ft. ceiling height add 12 percent to heat loss for 10 ft. ceiling height, and 22 percent for lower levels ONE HALF or LESS below grade level, use FIRST FLOOR heat loss.

† Deduct these percentages from FIRST FLOOR heat loss for two-story structures.

HEAT LOSS TABLE*

CALCULATED AT 70°F. DESIGN TEMPERATURE DIFFERENCE

Floor Area Sq. Ft.	CONSTRUCTION DESIGN											
	No. 12	No. 13	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	No. 23
500	14,660	14,815	30,360	25,520	28,960	24,120	32,780	27,940	31,380	26,540	5,180	4,330
600	16,660	16,230	34,060	26,770	31,350	27,105	36,690	31,400	35,010	29,740	6,150	4,725
700	18,660	18,140	37,760	32,650	35,750	30,090	40,600	34,890	38,550	32,930	7,180	5,220
800	20,660	20,240	41,960	35,670	39,630	33,430	45,040	38,790	42,800	36,500	8,210	5,600
900	22,750	22,120	45,930	38,910	42,840	36,390	48,890	42,240	46,370	39,720	9,230	5,980
1000	24,740	24,040	49,260	42,170	46,460	39,070	52,810	45,720	50,010	42,920	10,250	6,370
1100	26,730	25,960	52,960	45,430	49,680	42,550	56,720	49,190	53,640	46,110	11,300	6,750
1200	28,720	27,880	56,660	48,690	52,890	45,830	60,630	52,670	57,270	49,310	12,310	7,150
1300	30,720	29,390	59,860	51,200	55,720	47,560	63,430	55,290	59,810	51,600	13,340	7,630
1400	32,720	31,300	63,060	54,460	59,140	50,340	67,360	58,750	63,440	54,570	14,370	7,720
1500	33,870	32,820	65,770	56,970	61,570	52,770	70,180	61,320	65,980	57,180	15,400	7,920
1600	35,490	34,370	68,440	59,500	64,060	55,020	73,050	64,020	68,570	59,340	16,420	8,110
1700	37,050	36,060	71,710	62,370	66,750	57,610	75,990	67,050	71,520	62,290	17,440	8,400
1800	39,060	37,800	74,960	65,270	69,910	60,230	79,780	70,110	74,740	65,070	18,480	8,690
1900	40,460	39,130	77,190	67,410	71,570	62,690	82,080	72,404	76,760	66,990	19,500	8,970
2000	42,270	40,870	80,420	70,310	74,320	64,710	85,470	75,360	79,870	69,760	20,600	9,560
†	9%	8%	17%	20%	12%	13%	15%	18%	11%	12%	-	-

*Based upon L&P calculated where ceiling height is 8 ft. and where total window and door areas do not exceed 20 percent of the GROSS wall area. For 8 ft. ceiling height add 1% percent to heat loss for 10 ft. ceiling height, and 2% percent for lower levels ONLY HALF of L&P below grade level, use FIRST FLOOR heat loss.
 **Use for basement heat losses WITHOUT fully exposed walls and for floor losses over raised unheated crawl spaces.
 ***For basements with fully exposed walls, use FIRST FLOOR heat loss.
 ****Use for grade level slab construction.
 †Deduct these percentages from first floor heat loss for two-story structures.

CORRECTION FACTORS

FOR OTHER THAN 70°F DESIGN TEMPERATURE DIFFERENCE

DESIGN TEMPERATURE DIFFERENCE	25°F	30°F	35°F	40°F	45°F	50°F	55°F	60°F	65°F
FACTOR	0.35	0.42	0.50	0.57	0.64	0.71	0.78	0.85	0.92

DESIGN TEMPERATURE DIFFERENCE	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F
FACTOR	1.07	1.15	1.20	1.29	1.36	1.43	1.50	1.57	1.64

NOTE: Conversion factor for "in between" temperatures can be determined by interpolation between the closest tabulated values.
 EXAMPLE: The outdoor design temperature in Cincinnati, Ohio is 17° F. Indoor minus outdoor temperature equals 56° F.
 Interpolated factor equals 0.82 (rounded).

STEP 2. SELECT BOILER AND BASEBOARD

The **BOILER AND BASEBOARD SELECTION TABLE** below will provide for the selection of a gas or oil boiler (based upon I-B-E-P Net Ratings). This same table also provides for the selection of Wall-Loc-Lineal convector baseboard and is based upon I-B-E-P Ratings using 200°F. average water temperatures (see note at bottom of page).

(a) Opposite **NEAREST** total heat loss, select gas or oil boiler.

Record Boiler Selection Here: _____

(b) Follow line opposite **NEAREST** total heat loss to select total lineal feet of convector baseboard.

Record Convector Baseboard Selection Here: _____

(c) Follow line opposite **NEAREST** total heat loss to select total number of end caps or end boxes.

Record Number Here: _____

EXAMPLE:

Continuing with previous example and following the above instructions for **STEP 2**, select a gas-fired boiler, baseboard and end caps for the total heating load of 55,280 BTUH from **BOILER AND BASEBOARD SELECTION TABLE**:

(a) Opposite **NEAREST** total heat loss of 55,280 BTUH, select **VIE-4** gas-fired boiler.

Record Boiler Selection Here: **VIE-4**

(b) Follow line opposite **NEAREST** total heating load of 55,280 BTUH and select total lineal feet of 3/4" Therma Trim Baseboard:

Record Baseboard Selection Here: **85 Ft.**

(c) Follow line opposite **NEAREST** total heating load of 55,280 BTUH and select total number of end caps:

Record Number Here: **16**

BOILER AND BASEBOARD SELECTION TABLE

Heat Loss Total BTUH	WATER BOILER NO.				BASEBOARD Lineal Ft. Based on 200°F. Avg. Water Temperature (120°F. Rise)		Estimated End Caps or End Boxes		Heat Loss Total BTUH	WATER BOILER NO.				BASEBOARD Lineal Ft. Based on 200°F. Avg. Water Temperature (120°F. Rise)		Estimated End Caps or End Boxes	
	Gas		Oil		Therma Trim	High Temp.	Therma Trim	High Temp.		Gas		Oil		Therma Trim	High Temp.	Therma Trim	High Temp.
	WBE	BE	OSM	OR						WBE	BE	OSM	OR				
30,000	3	3	25	255	44	32	42	14	70,000	4	4	4	4	103	74	26	14
31,000	3	3	25	265	45	32	42	14	71,000	4	4	4	4	107	76	26	14
32,000	3	3	25	265	47	34	42	14	72,000	4	4	4	4	108	77	26	14
33,000	3	3	25	265	48	35	42	14	73,000	4	4	4	4	108	78	26	14
34,000	3	3	25	265	49	35	42	14	74,000	4	4	4	4	109	79	26	14
35,000	3	3	25	265	50	37	42	14	75,000	4	4	4	4	109	80	26	14
36,000	3	3	25	265	50	38	42	14	76,000	4	4	4	4	111	81	26	14
37,000	3	3	25	265	51	39	42	14	77,000	4	4	4	4	112	82	26	14
38,000	3	3	25	265	52	40	42	14	78,000	4	4	4	4	114	83	26	14
39,000	3	3	25	265	53	41	42	14	79,000	4	4	4	4	115	84	26	14
40,000	3	3	25	265	53	42	42	14	80,000	4	4	4	4	116	85	26	14
41,000	3	3	25	265	54	44	42	14	81,000	4	4	4	4	118	86	26	14
42,000	3	3	25	265	55	45	42	14	82,000	4	4	4	4	118	87	26	14
43,000	3	3	25	265	56	46	42	14	83,000	4	4	4	4	121	88	26	14
44,000	3	3	25	265	57	47	42	14	84,000	4	4	4	4	122	89	26	14
45,000	3	3	25	265	58	48	42	14	85,000	4	4	4	4	124	90	26	14
46,000	3	3	25	265	59	49	42	14	86,000	4	4	4	4	125	91	26	14
47,000	3	3	25	265	60	50	42	14	87,000	4	4	4	4	127	92	26	14
48,000	3	3	25	265	61	51	42	14	88,000	4	4	4	4	128	93	26	14
49,000	3	3	25	265	62	52	42	14	89,000	4	4	4	4	129	94	26	14
50,000	3	3	25	265	63	53	42	14	90,000	4	4	4	4	130	95	26	14
51,000	3	3	25	265	64	54	42	14	91,000	4	4	4	4	131	96	26	14
52,000	3	3	25	265	65	55	42	14	92,000	4	4	4	4	132	97	26	14
53,000	3	3	25	265	66	56	42	14	93,000	4	4	4	4	134	98	26	14
54,000	3	3	25	265	67	57	42	14	94,000	4	4	4	4	135	99	26	14
55,000	3	3	25	265	68	58	42	14	95,000	4	4	4	4	136	100	26	14
56,000	3	3	25	265	69	59	42	14	96,000	4	4	4	4	137	101	26	14
57,000	3	3	25	265	70	60	42	14	97,000	4	4	4	4	138	102	26	14
58,000	3	3	25	265	71	61	42	14	98,000	4	4	4	4	139	103	26	14
59,000	3	3	25	265	72	62	42	14	99,000	4	4	4	4	140	104	26	14
60,000	3	3	25	265	73	63	42	14	100,000	4	4	4	4	141	105	26	14
61,000	3	3	25	265	74	64	42	14	101,000	4	4	4	4	142	106	26	14
62,000	3	3	25	265	75	65	42	14	102,000	4	4	4	4	143	107	26	14
63,000	3	3	25	265	76	66	42	14	103,000	4	4	4	4	144	108	26	14
64,000	3	3	25	265	77	67	42	14	104,000	4	4	4	4	145	109	26	14
65,000	3	3	25	265	78	68	42	14	105,000	4	4	4	4	146	110	26	14
66,000	3	3	25	265	79	69	42	14	106,000	4	4	4	4	147	111	26	14
67,000	3	3	25	265	80	70	42	14	107,000	4	4	4	4	148	112	26	14
68,000	3	3	25	265	81	71	42	14	108,000	4	4	4	4	149	113	26	14
69,000	3	3	25	265	82	72	42	14	109,000	4	4	4	4	150	114	26	14
70,000	3	3	25	265	83	73	42	14	110,000	4	4	4	4	151	115	26	14
71,000	3	3	25	265	84	74	42	14	111,000	4	4	4	4	152	116	26	14
72,000	3	3	25	265	85	75	42	14	112,000	4	4	4	4	153	117	26	14

For proper choice of baseboard required at other average water temperatures multiply listed heat required for 200°F. Average Water Temperature by factors shown at right.

Average Water Temperature
180°F. 1.52
190°F. 1.40
210°F. 1.02

Multiply
1.52
1.40
1.02

Note: When total heat loss exceeds 110,000 BTUH, consult rating tables in Wall-Loc-Lineal convectors literature.

STEP 3. DETERMINE CIRCUIT AND TRUNK PIPE SIZING

The Pipe Sizing Table on Page 7 is based upon "standard" type circulators with a maximum of a 20°F. temperature drop.

All circuits are designed for use with 1/2" or 3/4" piping in single or multiple series loop circuits. Where

total heat loss found in STEP 1 exceeds the capacity of one 3/4" loop circuit, two or more loop circuits must be used and supplied from a 3/4", 1" or 1-1/4" trunk main which has a capacity equal to or exceeding the total heat loss.

(a) Determine total measured length of entire SINGLE circuit or total measured length of circuit No. 1, including the convectors baseboard; determine the heating load of circuit No. 1; determine the pipe size of the circuit and record all data here. Repeat for additional circuits when required.

Length of circuit No. 1 = _____ feet
BTUH load of circuit No. 1 = _____ BTUH
Size of circuit piping = _____ "

Length of circuit No. 2 = _____ feet
BTUH load of circuit No. 2 = _____ BTUH
Size of circuit piping = _____ "

Length of circuit No. 3 = _____ feet
BTUH load of circuit No. 3 = _____ BTUH
Size of circuit piping = _____ "

Length of circuit No. 4 = _____ feet
BTUH load of circuit No. 4 = _____ BTUH
Size of circuit piping = _____ "

(b) Determine the total length of the longest Circuit noted above, determine the total heating load handled by the TRUNK main, determine the pipe size of the trunk main and record all data here:

*Do not exceed 3/4" pipe for individual circuits.

Length of LONGEST circuit = _____ feet
BTUH load of trunk main = _____ BTUH
Size of trunk main piping = _____ "

Example:

Using the previous example of a 26' x 50' house with a total heating load of 58,280 BTU, it can be assumed that a single loop circuit measured length will be at least 26' + 26' + 50' + 50' + 10' = 162' (See piping layout). Opposite 58,000 BTUH in the Pipe Sizing Table, it is shown that 1" pipe is needed. Since loops are limited to 3/4" piping because of the 3/4" baseboard tube size, the system must be laid out in at least two loops.

In this example there will be three loops, as you will recall from STEP 1 that the owner wanted three zones -- two on the first floor and one in the basement.

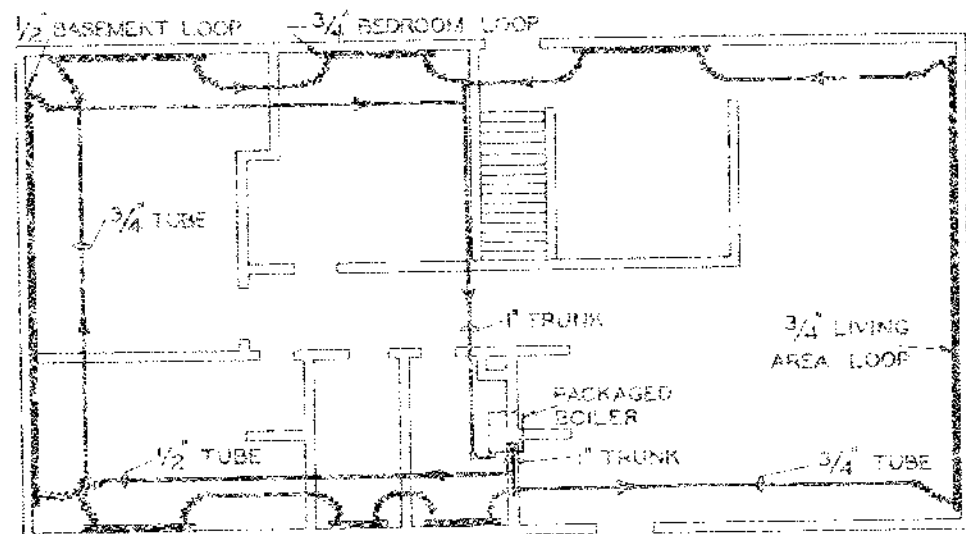
When estimating the pipe sizes for the first floor loops, it is necessary to determine the heating load carried by each loop. Since the living area usually carries the greater load because of larger glass areas, we will assume that the living area loop will carry a load of 24,000 BTUH and the sleeping area loop a load of 18,940 BTUH. Assume also that the measured length of each floor loop is 26' + 26' + 25' + 25' + 10' = 112'.

Opposite 24,000 BTUH in the Pipe Sizing Table it is shown that a 3/4" loop up to 268' will be adequate. Opposite 18,940 BTUH it is found that 1/2" pipe will be adequate for only up to 109' measured loop length and is therefore not large enough for this example. Hence, each first floor loop must be 3/4" piping.

The basement heating load is 15,340 BTUH. Assuming that the entire basement load is on a single circuit of 112' measured length (see piping layout) it is shown in the Pipe Sizing Table that 1/2" pipe will handle this load for up to 160'. The baseboard elements in the basement will still be 3/4", but all basement loop piping can be 1/2" copper tubing.

The pipe size of the supply and return trunk main is determined from the total heating load of 58,280 BTUH and from the longest loop length which is 112'. Entering the Pipe Sizing Table at 58,000 BTUH, it is shown that a 1" pipe will handle the load up to a measured loop length of 187'. The trunk main will therefore be a 1" pipe or tube.

LAYOUT OF
EXAMPLE HOUSE



PIPE SIZING TABLE

Maximum measured length of loop and trunk, including baseboard. Pump head 7.5 ft. — 20° temperature drop.

Total Circuit Load BTUH	Piping Dimensions								Total Circuit Load BTUH	Piping Dimensions			
	Size	Length	Size	Length	Size	Length	Size	Length		Size	Length	Size	Length
5,000	1/2"	1,120							67,000	1"	145	1 1/4"	535
6,000	1/2"	950							68,000	1"	145	1 1/4"	535
7,000	1/2"	770							69,000	1"	145	1 1/4"	535
8,000	1/2"	590							70,000	1"	137	1 1/4"	490
9,000	1/2"	440							71,000	1"	132	1 1/4"	450
10,000	1/2"	350							72,000	1"	129	1 1/4"	430
11,000	1/2"	300							73,000	1"	125	1 1/4"	401
12,000	1/2"	260							74,000	1"	121	1 1/4"	369
13,000	1/2"	215	3/4"	930					75,000	1"	119	1 1/4"	355
14,000	1/2"	182	3/4"	850					76,000	1"	115	1 1/4"	330
15,000	1/2"	150	3/4"	725					77,000	1"	112	1 1/4"	321
16,000	1/2"	120	3/4"	620					78,000	1"	109	1 1/4"	311
17,000	1/2"	100	3/4"	545					79,000	1"	107	1 1/4"	301
18,000	1/2"	82	3/4"	465					80,000	1"	105	1 1/4"	292
19,000	1/2"	69	3/4"	420					81,000	1"	102	1 1/4"	283
20,000	1/2"	58	3/4"	372					82,000	1"	100	1 1/4"	273
21,000	1/2"	48	3/4"	342					83,000	1"	98	1 1/4"	266
22,000	1/2"	40	3/4"	310					84,000	1"	95	1 1/4"	250
23,000			1"	290					85,000	1"	93	1 1/4"	251
24,000			1"	265					86,000	1"	92	1 1/4"	243
25,000			1"	250					87,000	1"	91	1 1/4"	236
26,000			1"	230					88,000	1"	89	1 1/4"	222
27,000			1"	220					89,000	1"	87	1 1/4"	221
28,000			1"	205					90,000	1"	86	1 1/4"	214
29,000			1"	187					91,000	1"	84	1 1/4"	207
30,000			1"	175	1"	620			92,000	1"	82	1 1/4"	200
31,000			1"	160	1"	605			93,000	1"	80	1 1/4"	195
32,000			1"	155	1"	580			94,000	1"	78	1 1/4"	187
33,000			1"	150	1"	565			95,000	1"	76	1 1/4"	180
34,000			1"	144	1"	550			96,000	1"	74	1 1/4"	173
35,000			1"	138	1"	535			97,000			1 1/4"	171
36,000			1"	133	1"	520			98,000			1 1/4"	167
37,000			1"	125	1"	510			99,000			1 1/4"	163
38,000			1"	117	1"	490			100,000			1 1/4"	158
39,000			1"	113	1"	480			101,000			1 1/4"	154
40,000			1"	110	1"	470			102,000			1 1/4"	149
41,000			1"	103	1"	460			103,000			1 1/4"	146
42,000			1"	98	1"	447			104,000			1 1/4"	142
43,000			1"	93	1"	434			105,000			1 1/4"	139
44,000			1"	88	1"	420			106,000			1 1/4"	135
45,000					1"	407			107,000			1 1/4"	131
46,000					1"	395			108,000			1 1/4"	128
47,000					1"	380			109,000			1 1/4"	124
48,000					1"	370			110,000			1 1/4"	119
49,000					1"	359			111,000			1 1/4"	114
50,000					1"	350			112,000			1 1/4"	109
51,000					1"	340			113,000			1 1/4"	104
52,000					1"	332			114,000			1 1/4"	101
53,000					1"	324			115,000			1 1/4"	97
54,000					1"	317			116,000			1 1/4"	93
55,000					1"	309			117,000			1 1/4"	89
56,000					1"	304			118,000			1 1/4"	87
57,000					1"	295			119,000			1 1/4"	85
58,000					1"	287			120,000			1 1/4"	83
59,000					1"	284			121,000			1 1/4"	81
60,000					1"	277	1 1/4"	453	122,000			1 1/4"	79
61,000					1"	270	1 1/4"	435	123,000			1 1/4"	77
62,000					1"	266	1 1/4"	418	124,000			1 1/4"	75
63,000					1"	260	1 1/4"	397	125,000			1 1/4"	73
64,000					1"	257	1 1/4"	379	126,000			1 1/4"	72
65,000					1"	255	1 1/4"	360	127,000			1 1/4"	70
66,000					1"	249	1 1/4"	347	128,000			1 1/4"	68

STEP 4. ESTIMATE THE PRICE

Page 8 of this booklet lists the material required for a residential heating system. Boiler, baseboard and trim pieces can be priced from our current price sheet. The price of pipe, fittings, etc., can be quickly estimated from past experience, using this page as a check list.

When an L + B + R heat loss has been calculated, the contractor can complete the page in order to determine the exact price of the job.

MATERIAL LIST

QTY	ITEM	AMOUNT	QTY	ITEM	AMOUNT
	Boiler Model No.			Sub-Total Brought Forward	
	BOE Efficiency Rating			Standard Splice Set	
	Thermostats			14" Splice Set	
	Zone Valves			Element Bracket	
	Balancing Valves			Element Gild.	
	Air Cushion Tank			Return Tube Hanger	
	Flow Control Valve			Supply Tube Hanger	
	Low Limit or Reverse Acting Control				
	Pressure Reducing Valve				
	Smoke Pipe				
	Extra Valves			Leaky Head Fitting	
	Gas Piping			Flour Grommet	
	Oil Tank, Pipe and Fittings			Flexible Elbow Connector	
	Pipe			(with) (without) coupling	
	Fuel Valves			Flexible Corner Connector	
	Circulators			Expansion Joint	
	Relay				
	Circuit Breaker (or fuse) Panel				
	240v. Disconnect Switch				
	240v. 3-Wire Service Cable				
	Copper Pipe 1/2"				
	3/4"				
	1"				
	Fittings				
	Linear Feet of Baseboard				
	Baseboard Accessories				
	End Cap R.H.			Electric Wiring	
	End Cap L.H.			Freight and Cartage	
	End Box R.H.			Incidentals	
	End Box L.H.				
	Valve Box R.H.			TOTAL COST OF MATERIAL	
	Valve Box L.H.			Labor	
	Inside Corner (With Filler)			Profit	
	Outside Corner			Overhead	
	Inside Bay Corner (With Filler)				
	SUB-TOTAL			Bid Price	

STEP 5. MAKE I=B=R CALCULATION

Once a job has been sold a complete I=B=R calculation should be made to accurately locate baseboard panels in each room. Refer to I=B=R heat loss calculation guide.

OTHER MATERIALS AVAILABLE TO AID IN HEAT LOSS CALCULATIONS

- Easy-Loop Worksheet—Form No. C-565—to be used in conjunction with your Easy-Loop Booklet.
- "Modern Method" Heat Loss Calculation Sheet—Form No. MC-1467.
- "Detailed Method" I=B=R Heat Loss Calculation Sheet—Form No. MC-1956.

Contact Your Local Weil-McLain Distributor or Field Representative or write to: Advertising Dept.,
Weil-McLain, Blaine St., Michigan City, IN 46360