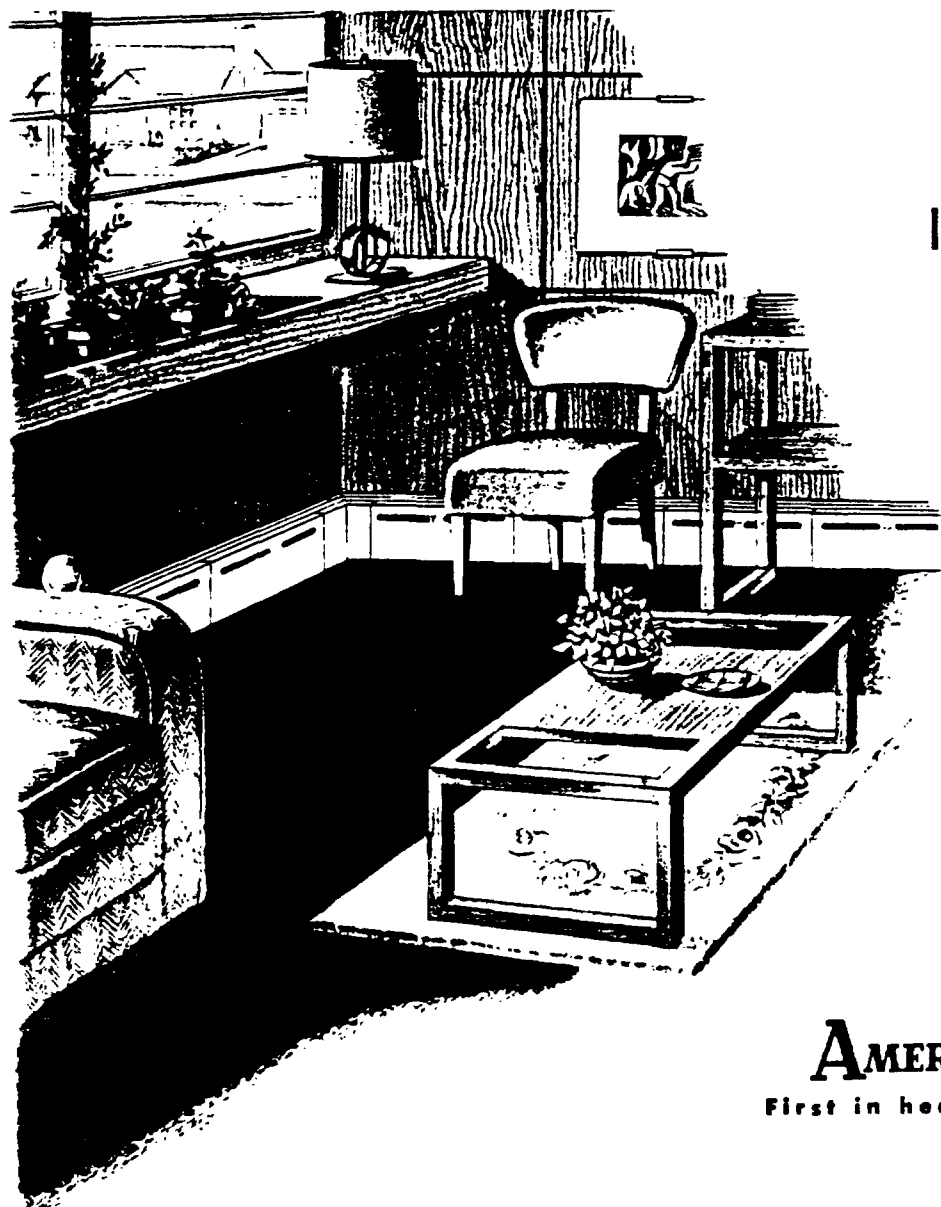


RADIANTRIM PANELS

FOR FORCED HOT WATER OR TWO-PIPE STEAM

PLAINTIFF'S EXHIBIT

ASL-1076



INSTALLATION PRACTICE

RATINGS

DATA

DIMENSIONS

AMERICAN-Standard

First in heating . . . first in plumbing

03985

RADIANTRIM PANELS

Quality Heating Equipment by **AMERICAN-Standard**

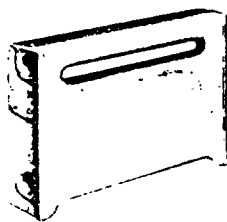
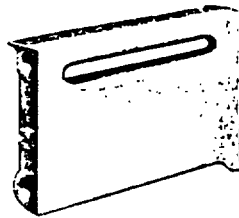
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Radiantrim Panel
Installation Practice

Pa.

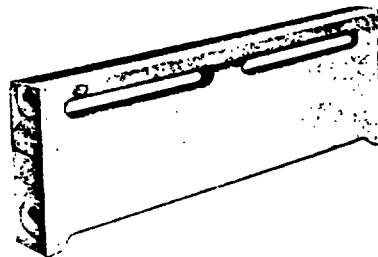
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FRONT VIEW,
RIGHT HAND END PANEL

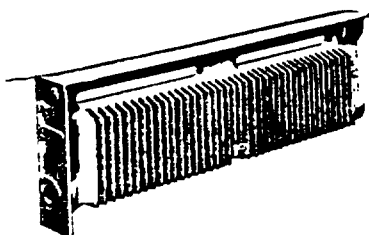


FRONT VIEW,
1 FOOT ASSEMBLY

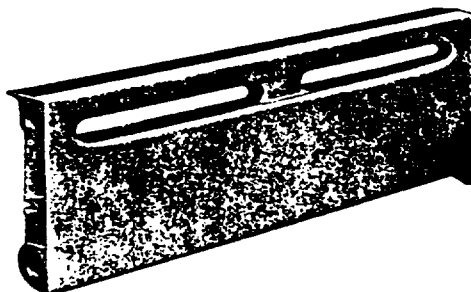
FRONT VIEW
2 FOOT ASSEMBLY



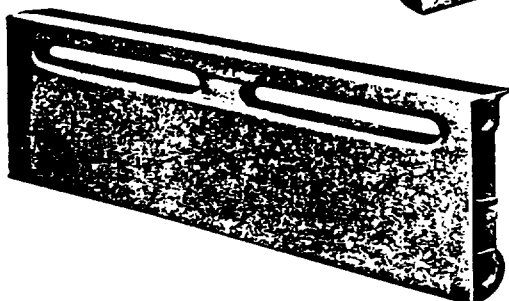
REAR VIEW,
RIGHT HAND END PANEL



FRONT VIEW,
RIGHT HAND END PANEL



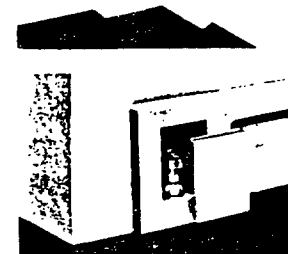
FRONT VIEW,
CENTER PANEL



Projecting
Corner Cover



Inverted
Corner Cover



Valve Enclosure



Extension Panels

RADIANTRIM PANELS

by

AMERICAN-Standard

Maximum Comfort from Modern Heating with Forced Hot Water or Two-Pipe Steam Installations

Radiantrim Panels, by American-Standard, represent the most advanced type of radiant heating. Here, with completely water-backed cast iron panels that provide all the benefits of sunlike radiant heat at its best, American-Standard adds new meaning to the term "radiant heating." Radiant heating installations have been thought of generally as limited to new buildings, as costly when introduced after the building had progressed out of the blueprint stage, as experimental projects, or as heating jobs that required uncommon engineering and installation skill. But this is not so. American-Standard now presents a product that provides the best in radiant heating with forced hot water or two-pipe steam installations in large, medium or small homes and buildings, and a great number of commercial installations as well. Radiantrim Panels are efficient and economical, well within the price range of the average home owner, and easy to install in both new construction and modernization jobs. The increasingly modern applications employed by so many outstanding archi-

tects, heating engineers and contractors have made this type of heating markedly popular in the comparatively short time since Radiantrim Panels have been introduced.

Radiantrim Panels form an 8-inch high, radiant belt of heat around the room, killing the infiltrating cold where it enters the room far more effectively than many other radiant heating systems. These new radiators provide a balanced combination of radiant and convected heat to meet the heating requirements of every new home or building.

The purpose of this Radiantrim Panels Installation Practice is to provide in condensed form the practical and technical information, drawings, illustrations and notes on application that prove the installation of Radiantrim Panels a comparatively simple matter. It is important, therefore, in the interest of securing maximum economy from jobs installed in the fastest and easiest way possible, that the instructions contained herein be followed closely and carefully. Necessary ratings, data and dimensions are also included.

RADIANTRIM PANELS in modern homes

Radiantrim Panels are modern. These smart new radiators take the place of regular wood baseboards and, when recessed, are almost invisible. Through advanced design and exacting engineering, they provide all the health and comfort and

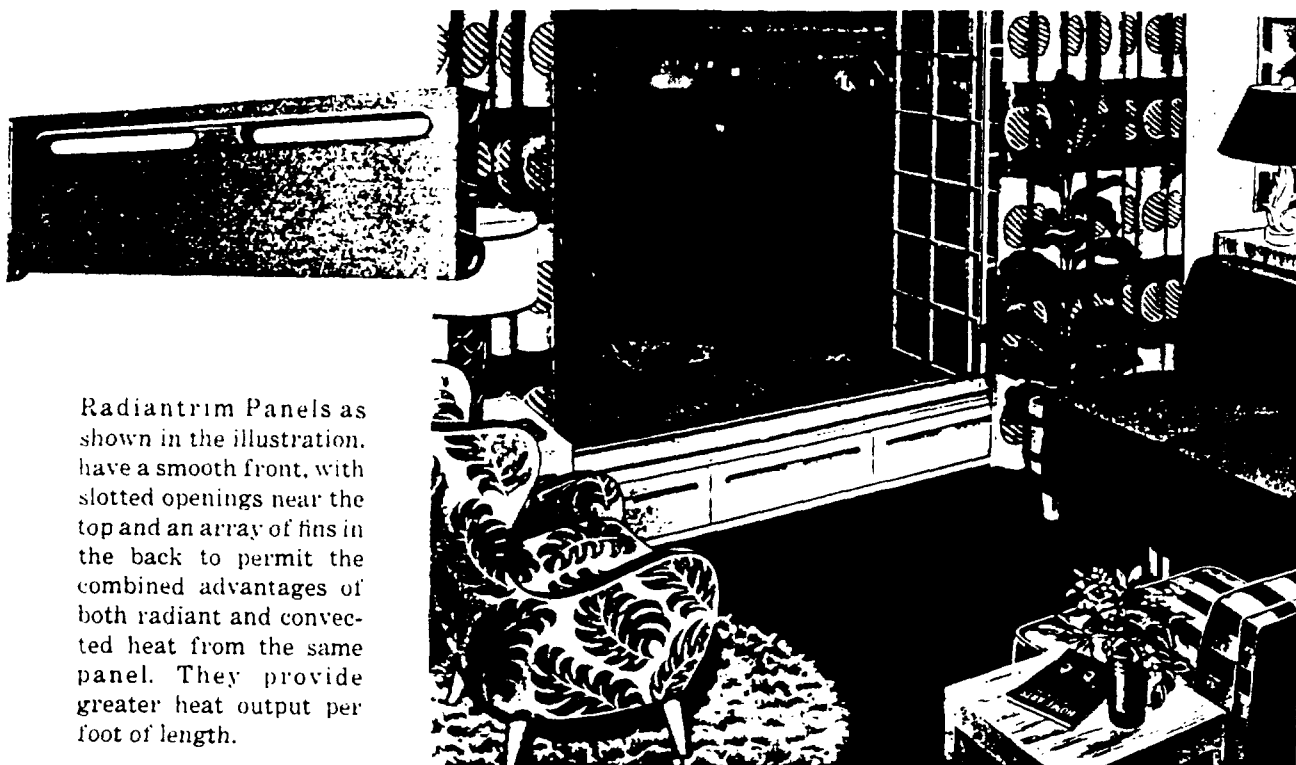


carefree convenience of automatic radiator heating—all that is best in radiator heating plus all that is best in panel heating without the lags of heavy

panel mass. They are truly space-saving, not only in that the heating element is out of the way, but also in the fact that all room area, including the normally cold rim along outside walls, is comfortably available even in extreme weather. Note how inconspicuously, yet how gracefully, these panels blend into the two room scenes reproduced here. Radiantrim Panels by American-Standard are being installed in more and more homes every day.



RADIANTRIM PANELS



Radiantrim Panels as shown in the illustration, have a smooth front, with slotted openings near the top and an array of fins in the back to permit the combined advantages of both radiant and convected heat from the same panel. They provide greater heat output per foot of length.

Design & Construction

Radiantrim Panels, by American-Standard, are designed to provide the best in radiant heating—a trim, smartly modern baseboard so fashioned that it will be, when installed, completely inconspicuous and harmonious with any wall or room decoration. Radiantrim Panels are made of cast iron, the proven ageless metal that has withstood the test of time for effective, efficient transmission of heat. Made

in one and two-foot sections, they are joined together easily in various assemblies to meet the needs of all room requirements. Radiantrim Panels are 8-inches high and 2-inches thick. With Radiantrim Panels at his command, the home owner, heating contractor, builder, engineer or architect can handle every heating requirement in the widest possible range of modern homes, apartments, buildings and commercial installations.

Ratings

The ratings as shown in the tables on page 3 are based on the actual heat emitted by Radiantrim Panels. Ratings show heat emission expressed in Btu per hour per lineal foot, and are listed in the table on the next page for various average water temperatures, and for steam at 215° F. Since heat loss calculations are first expressed in Btu per hour, selection of Radi-

antrim Panels can be made directly from the table without converting, unless desired, to the equivalent square feet of radiation.

Knowing the heat loss, it is an easy matter to select the right number of lineal feet of Radiantrim Panels by following the simple formula underneath the table. However, ratings in square feet of radiation based on the standard equivalent of 240 Btu heat emission per hour per square foot at average water or steam temperature of 215° F are also included. They can be used for added convenience in estimating, pricing and ordering.

RATINGS and DATA

Panel Length Number of Lineal Feet	Output in Sq Ft Water or Steam (215°)	CAPACITIES—MBH—Thousand Btu per hour								
		HOT WATER—Average Water Temperature—°F.								STEAM
		150	160	170	180	190	200	210	220	215°F.
		Heat Emission Btu per Sq Ft for Above Temperatures								
		108	127	147	166	188	206	228	252	240
1	2.56	.28	.33	.38	.43	.48	.53	.58	.65	.61
2	5.12	.55	.65	.76	.86	.96	1.06	1.17	1.27	1.23
3	7.7	.8	1	1.1	1.3	1.4	1.6	1.8	1.9	1.8
4	10.2	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.6	2.5
5	12.8	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.2	3.1
6	15.4	1.7	2.0	2.3	2.5	2.9	3.2	3.5	3.9	3.7
7	17.9	1.9	2.3	2.6	3.0	3.4	3.7	4.1	4.6	4.3
8	20.5	2.2	2.6	3.0	3.4	3.8	4.2	4.7	5.2	4.9
9	23.0	2.5	2.9	3.4	3.8	4.3	4.8	5.3	5.8	5.5
10	25.6	2.8	3.3	3.8	4.2	4.8	5.3	5.8	6.5	6.1
11	28.2	3.0	3.6	4.1	4.7	5.3	5.8	6.4	7.1	6.8
12	30.7	3.3	3.9	4.5	5.1	5.8	6.3	7.0	7.7	7.4
13	33.3	3.6	4.2	4.9	5.5	6.2	6.9	7.6	8.4	8.0
14	35.8	3.9	4.6	5.3	5.9	6.7	7.4	8.2	9.0	8.6
15	38.4	4.1	4.9	5.6	6.4	7.2	7.9	8.8	9.7	9.2
16	41.0	4.4	5.2	6.0	6.8	7.7	8.5	9.3	10.3	9.8
17	43.5	4.7	5.5	6.4	7.2	8.1	9.0	9.9	11.0	10.4
18	46.1	5.0	5.9	6.8	7.6	8.6	9.5	10.5	11.6	11.1
19	48.6	5.2	6.2	7.1	8.1	9.1	10.0	11.1	12.3	11.7
20	51.2	5.5	6.5	7.5	8.5	9.6	10.6	11.7	12.9	12.3
21	53.8	5.8	6.8	7.9	8.9	10.1	11.1	12.3	13.6	12.9
22	56.3	6.1	7.2	8.3	9.3	10.5	11.6	12.8	14.2	13.5
23	58.9	6.4	7.5	8.6	9.8	11.0	12.1	13.4	14.8	14.1
24	61.4	6.6	7.8	9.0	10.2	11.5	12.7	14.0	15.5	14.7
25	64.0	6.9	8.1	9.4	10.6	12.0	13.2	14.6	16.1	15.4
26	66.6	7.2	8.5	9.8	11.0	12.5	13.7	15.2	16.8	16.0
27	69.1	7.5	8.8	10.1	11.5	12.9	14.3	15.7	17.4	16.6
28	71.7	7.7	9.1	10.5	11.9	13.4	14.8	16.3	18.1	17.2
29	74.2	8.0	9.4	10.9	12.3	13.9	15.3	16.9	18.7	17.8
30	76.8	8.3	9.8	11.3	12.7	14.4	15.8	17.5	19.4	18.4

*Add 1/2-inch to length for each bushing. Also, add 5 1/2-inches to length for each valve enclosure, 4 1/4-inches for each inverted corner cover and 1 3/4-inches for each projecting corner cover. (Panel length is part of order number—see page 27.)

NOTE: Ratings are shown in Btu to permit easy selection of Radiantrim Panels. The following simple formula applies: First calculate the heat loss of the room in Btu's, using any recognized and approved method. Then locate the heat loss in vertical column under desired "Average Water Temperature" or "Steam" in rating table above. Following a line horizontally to left, find the number of lineal feet in first column.

Ratings are 2.56 sq ft per lineal ft, based on 240 Btu emission per square foot per hour for steam or average hot water temperature of 215°F.

For example, determine the number of panels for a job, assuming the heat loss of room to be 5300 Btu, with an average water temperature of 200° to be maintained. In the table locate 5.3 (5300 Btu expressed in MBH) in the column under 200°. On the same line, note the figure in first column (Panel length) at left. It is 10, indicating that 10 lineal feet of panels are required. At 170°, 14 lineal feet will be needed.

Selection for Every Installation

Heating systems using Radiantrim Panels by American-Standard can be set up and calculated in practically the same manner as any other radiator heating system. In selection of product and planning for these heating installations, an important factor to remember is the greatly improved distribution of heat that is possible with Radiantrim Panels. The band of baseboard panels encircling the room with the mass of radiating area at ankle height insures comfort starting where it should, at the floor line, effectively offsetting the cold rim of the room and saving room space that normally would be stolen by cold areas. And the temperature differential from floor to ceiling in any given room will be lower than with ordinary radiators in the same type of installation.

Radiantrim Panels are designed for installation in either forced hot water or two-pipe steam systems. In two-pipe forced hot water installations, reverse return piping arrangements are recommended.

Radiantrim Panels should be located, insofar as possible, around the outside walls of each room

to cover the cold outside wall area. The heat loss from each room should be calculated separately. Radiantrim Panels are especially adaptable to installation in basementless houses and similar construction. In addition to providing a radiant wall of warmth around each room, they produce warm floors and thus eliminate the greatest single discomfort factor normally found in homes without basements—the cold, clammy, uncomfortable, or seemingly damp floor. The panel assembly must be at least one foot shorter than the available wall length to allow for valve and fitting space at each end. If the outside wall assemblies alone will not provide the heat required, it will be necessary to include on the inside wall whatever additional panels are needed to complete the total heat requirement. To arrive at the number of panels needed, simply follow the example in the footnote under the table on the preceding page. The same design temperature can be used in all assemblies of any one installation, or, with automatic zone controls, different temperatures can be maintained efficiently and economically.

A Typical Installation

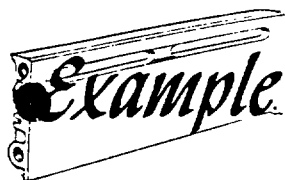
The typical small home floor plan shown on the next page and the pages that follow has been chosen as an example of a type of house very much in demand today. The typical installations shown scaled into this floor plan provide an easy-to-read, easy-to-understand guide that will enable the heating contractor and installer to figure jobs using Radiantrim Panels quickly, easily and profitably.

The heat loss shown for each room in the typical floor plan has been calculated as in preparation for any other radiator heating installation. The heat transfer coefficient in British thermal units per hour per square foot per degree Fahrenheit for all surfaces of the house, both with minimum insulation and with full insulation, is the same as that shown and explained in the I.B.R. installation guides. The outside air temperature, for the purpose of these examples, is arbitrarily chosen as

0° F., while the indoor temperature is set at 70° F. This gives a temperature difference of 70 degrees which, multiplied by the surface coefficient, provides the following heat transfer factors in Btu per hour per square foot for this differential:

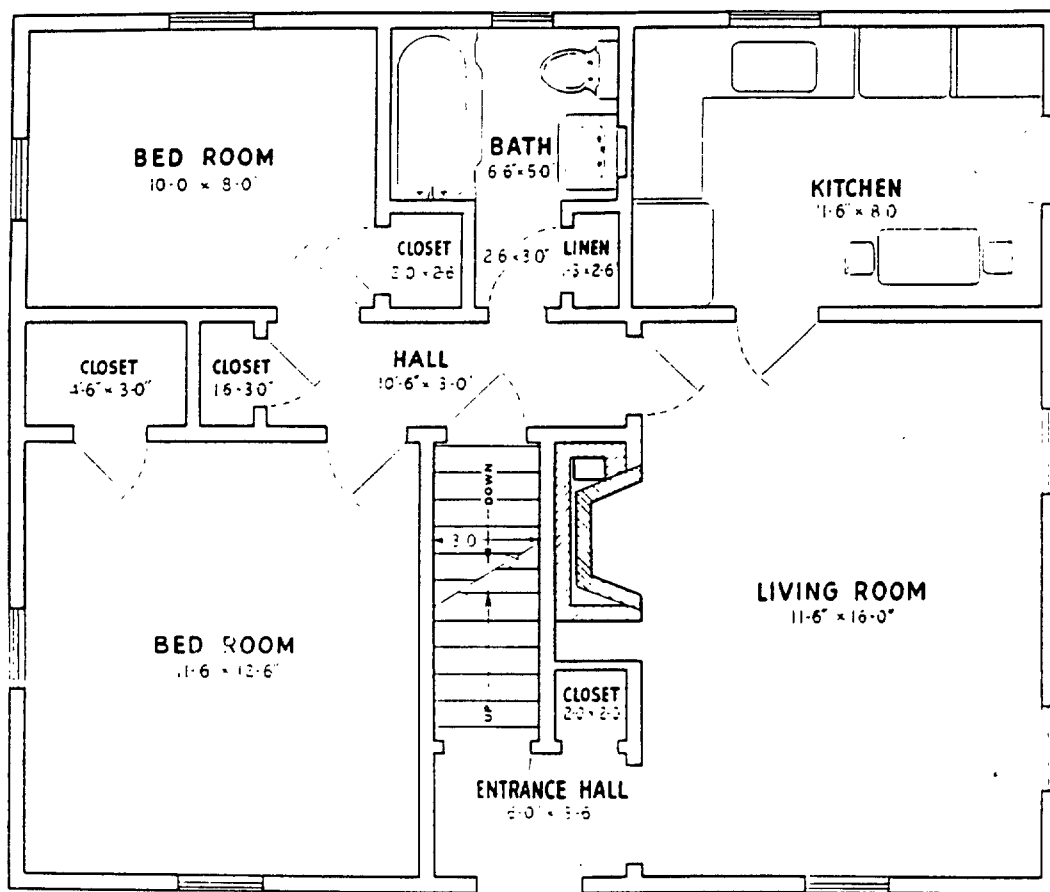
	<u>House</u>	<u>Wall</u>	<u>Ceiling</u>	<u>Window</u>	<u>Floor</u>
With Minimum Insulation—					
Coefficient:		0.25	0.13	1.13	0
Factor:		18.	9.	79.	0
With Full Insulation—					
Coefficient:		0.12	0.10	0.75	0
Factor:		8.	7.	53.	0

Details of construction are shown on pages 6 and 7. In these examples, no heat loss through the floor has been considered. As shown on the layout pages, a choice of radiation is available for each room, with each type of installation.



ESTIMATING HEATING REQUIREMENTS for RADIANTRIM PANELS

Designed to provide room temperature of 70° F inside with outside temperature at 0° F.



FIRST FLOOR PLAN

The plans and descriptions on this and the following pages are provided merely as a basic example for estimating heating requirements and to illustrate a few of the methods of installing Radiantrim Panels. They do not necessarily represent recommended construction. Use any standard approved formula, such as the method explained in the American-Standard Heating Practice, to calculate heat loss. Then, by referring to the table on page 3, the total number of lineal feet of Radiantrim Panels can easily be determined. For

the sake of simplicity, only the first floor plan has been illustrated in these examples.

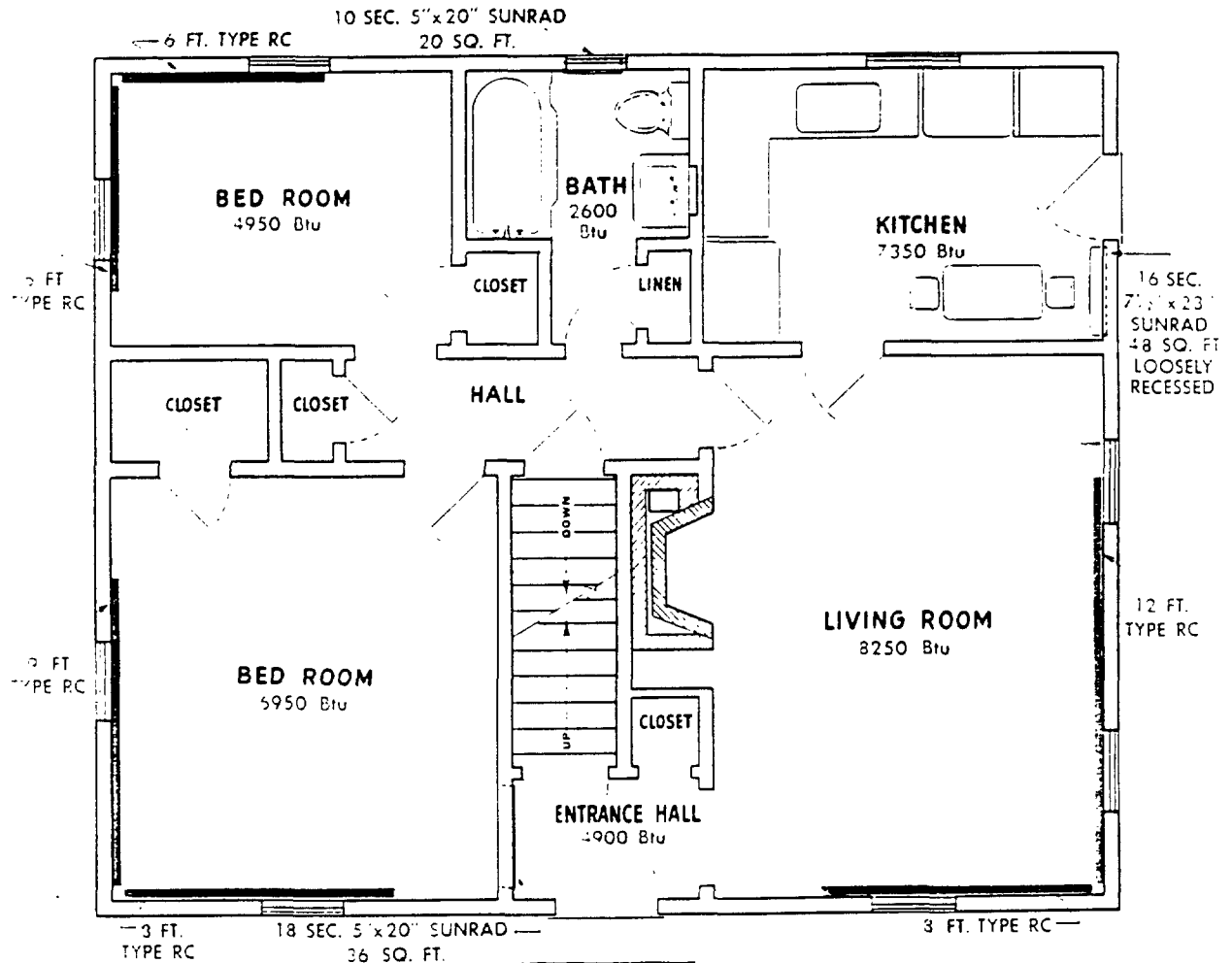
If the house is to be built as a single floor home originally with provisions for future expansion, it is easy and economical to run the risers to the second floor while the initial construction is under way. Correctly sized assemblies of Radiantrim Panels can be fitted very simply to any future room design. The second floor bathroom radiator, too, is similar to the installation on the first floor.

RADIANTRIM PANELS

Example

TYPICAL LAYOUT TO MEET HEATING REQUIREMENTS

And recommended supplementary radiators to supply heat in locations with insufficient wall length for Radiantrim Panels.



FIRST FLOOR PLAN—WITH MINIMUM INSULATION

The illustration above shows the same floor plan used on the preceding page with the heat loss for each room figured separately and expressed in Btu. Shown in red in the floor plan, Radiantrim Panels occupy the outside wall space in each room uniformly and comfortably.

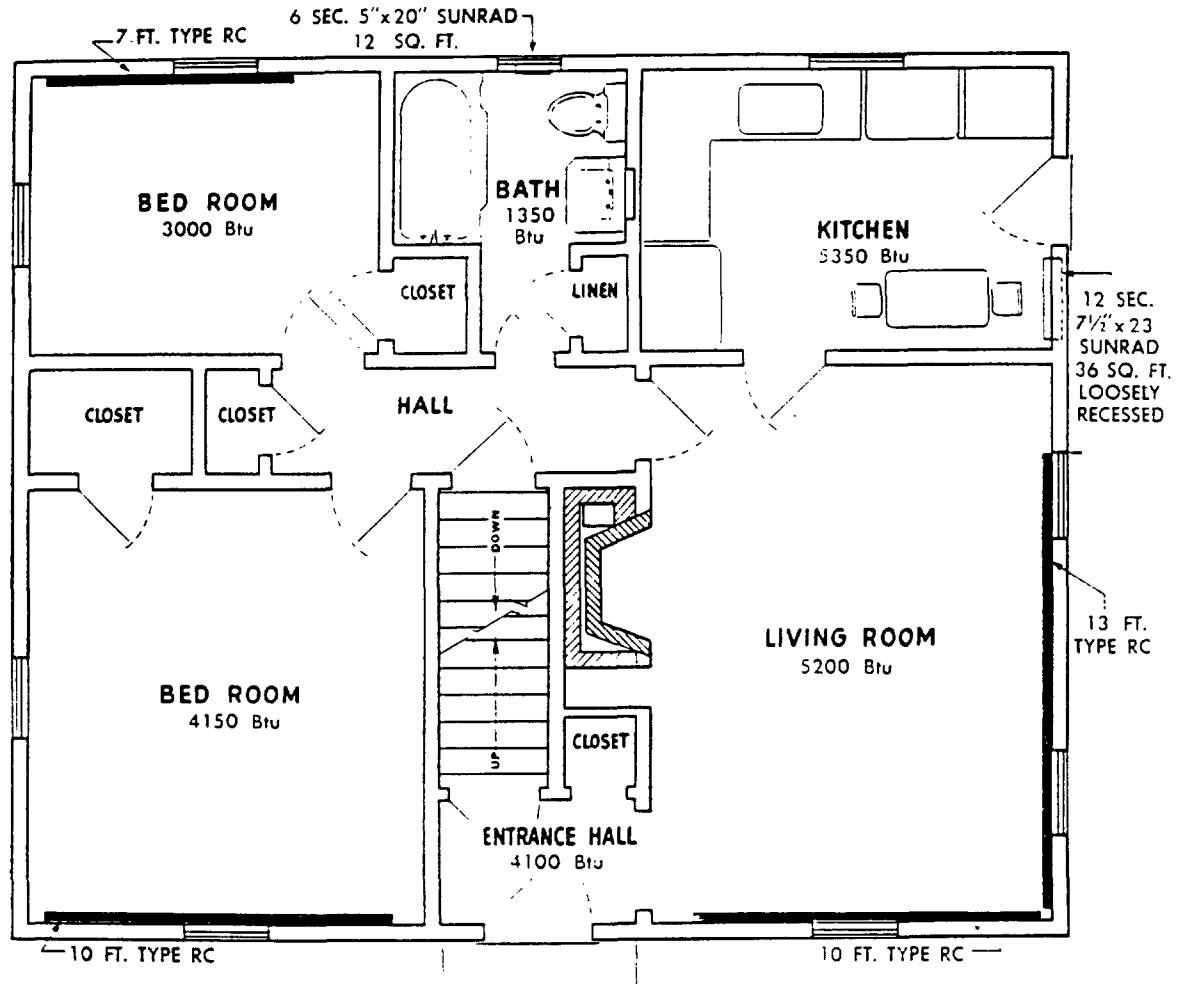
Plan above is considered to have an 8-foot, 6-inch ceiling height, average for homes to which this floor plan might apply. Construction details include: Windows—wood, double-hung, no storm sash; outside doors figured as windows. Walls—

wood siding, building paper, studs, lath, plaster and 3/4-inch rigid insulation for sheathing; otherwise no insulation. Ceiling—lath and plaster, no floor above, 2-inch mineral wool, fiber, quilt, loose fill, bat or reflective foil insulation between joists. Floor—over unheated space, double floor on joists, no ceiling below; if exposed to outside air, ceiling below. Infiltration—windows, average fit, no weather stripping; outside doors, average fit, no weather stripping.



TYPICAL LAYOUT TO MEET HEATING REQUIREMENTS

And recommended supplementary radiators to supply heat in locations with insufficient wall length for Radiantrim Panels.



FIRST FLOOR PLAN—WITH FULL INSULATION

Here, again, the same floor plan shown on page 5 is used for the purpose of illustrating the Radiant-rim Panel layout and installation. However, due to the insulation used in construction, the heat loss figures are lower. Radiantrim Panels are shown in red in the floor plan.

Rooms designated by floor plan above are considered to have same ceiling height as detailed on opposite page. Construction details include: Windows—wood, double-hung, storm sash of wood;

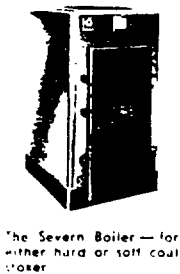
outside doors figured as windows. Walls—wood siding, building paper, studs, lath, plaster and 3/4-inch rigid insulation for sheathing; 2-inch mineral wool, fiber, quilt, loose fill, bat or reflective foil insulation. Ceiling—lath and plaster, no floor above; 3 3/4-inch insulation, material selected, between joists. Floor—over unheated space, double floor on joists, no ceiling below; if exposed to outside air, ceiling below. Infiltration—windows, average fit, with weather stripping; outside doors, average fit, with weather stripping.

RADIANTRIM PANELS

Mainless System

TYPICAL LAYOUT FOR FORCED HOT WATER

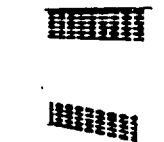
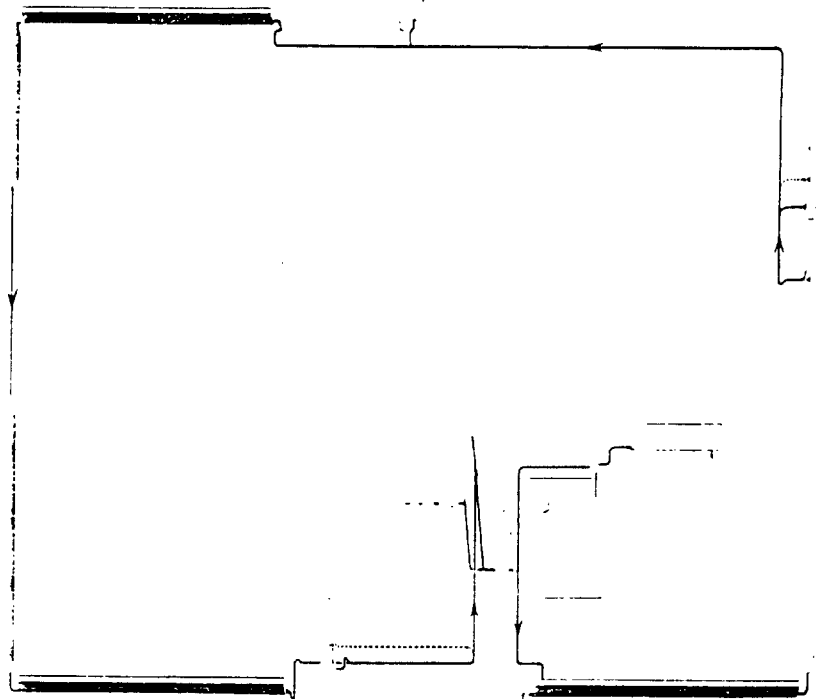
Installed in Home with Minimum Insulation



The Severn Boiler — for either hard or soft coal burner



Radiantrim Panels — complete the efficient, trouble-free installation



Sunrad Radiators — readily adaptable to installation with Radiantrim Panels



Arco Radiators — and equally efficient Arco Convectors — may also be used.

Radiantrim Panels provide a minimum total of 29,150 Btu output; Sunrad or other supplementary radiation provides an additional 14,850 Btu, or 194 square feet.

Installation Notes

Radiantrim Panels are used in this mainless system installation designed to provide temperatures, as noted on preceding pages, of 70° F. inside at 0° F. outside. System design has been calculated to use Radiantrim Panels with forced hot water at an average temperature of 180° F.

Normally, there will be ample wall area for installation of the required assemblies of Radiantrim Panels. However, in some rooms—in the bathroom, kitchen and front hall shown above, for example, or in powder rooms and utility rooms—the arrangement of appliances, fixtures,

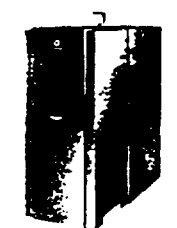
and openings around the rooms prohibit the installation of Radiantrim Panels. Conventional type radiation can be installed in these particular rooms, with Radiantrim Panels throughout the rest of the home. For recommended installation practice in such cases, see "Illustrations with Other Radiators" on page 12.

Materials for the installation illustrated above include the Severn Boiler for stoker fired coal, 18 lineal feet of Radiantrim Panels, 3 Sunrad Radiators—one 18-section, 5 by 20-inch, tightly recessed in the front hall; one, 10-section, 5 by 20-inch, tightly recessed in the bathroom; and one 16-section, 7½ by 23-inch, loosely recessed in the kitchen—6 valve enclosures for Radiantrim Panel assemblies, 3 inverted corner covers, 6 center panel screw legs, 3 compression corner connections, 7 = 132 union elbows, 3 = 902 Arco packless radiator valves, necessary pipe, and other fittings.

One-Pipe System

TYPICAL LAYOUT FOR FORCED HOT WATER

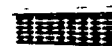
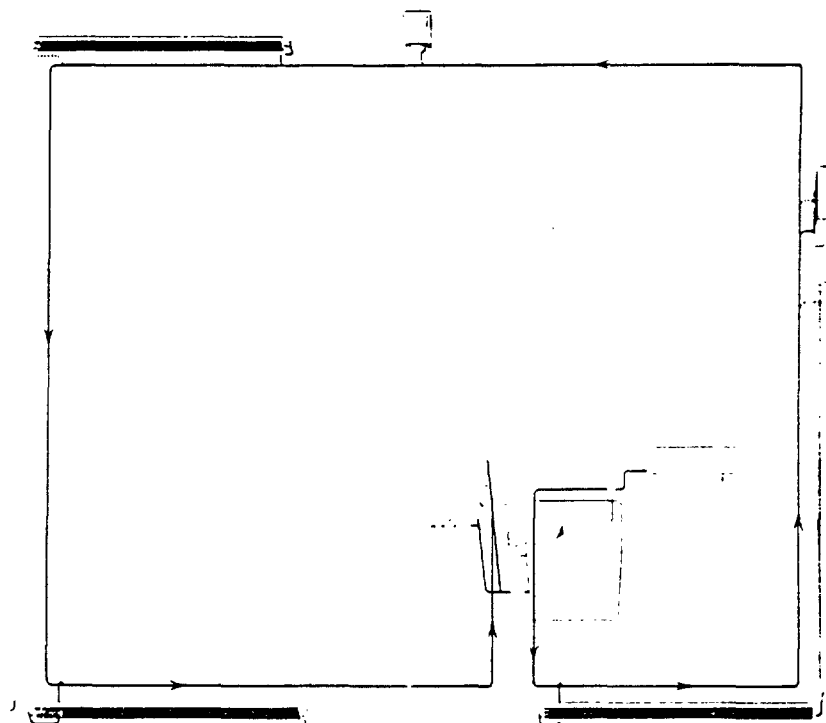
Installed in Home with Full Insulation



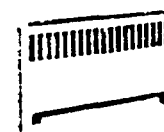
The Arcoliner Wet Base Boiler—for oil—can be installed in first floor locations.



Radiantrim Panels—complete the efficient, trouble-free installation.



Sunrad Radiators—readily adaptable to installation with Radiantrim Panels.



Arco Radiators—and equally efficient Arco Convectors—may also be used.

Radiantrim Panels provide a minimum total of 12,350 Btu output; Sunrad or other supplementary radiation provides an additional 10,850 Btu or 80 square feet.

Installation Notes

Radiantrim Panels are used in this one-pipe system installation, again designed to provide a uniform indoor temperature of 70° F. with the temperature at 0° F. outside. System design uses Radiantrim Panels with forced hot water at an average temperature of 180° F.

Boilers illustrated in these layouts accent the wide variety of sizes and models that make up the complete line of American-Standard Heating Equipment. Designed for all types of firing and all fuels, boilers by American-Standard fit every home heating requirement perfectly. For each actual installation, the proper size and type of boiler should be selected.

Structural arrangements—like doorways, french doors, arches, fireplaces, bookcases, special cabinets and the like—may occupy part of the wall area that would normally be used in installing the Radiantrim Panels. For installation practice pertaining to these jobs, suggestions for running piping under partitions, and other time-saving ideas, refer to "Unusual Applications" on pages 28 and 29.

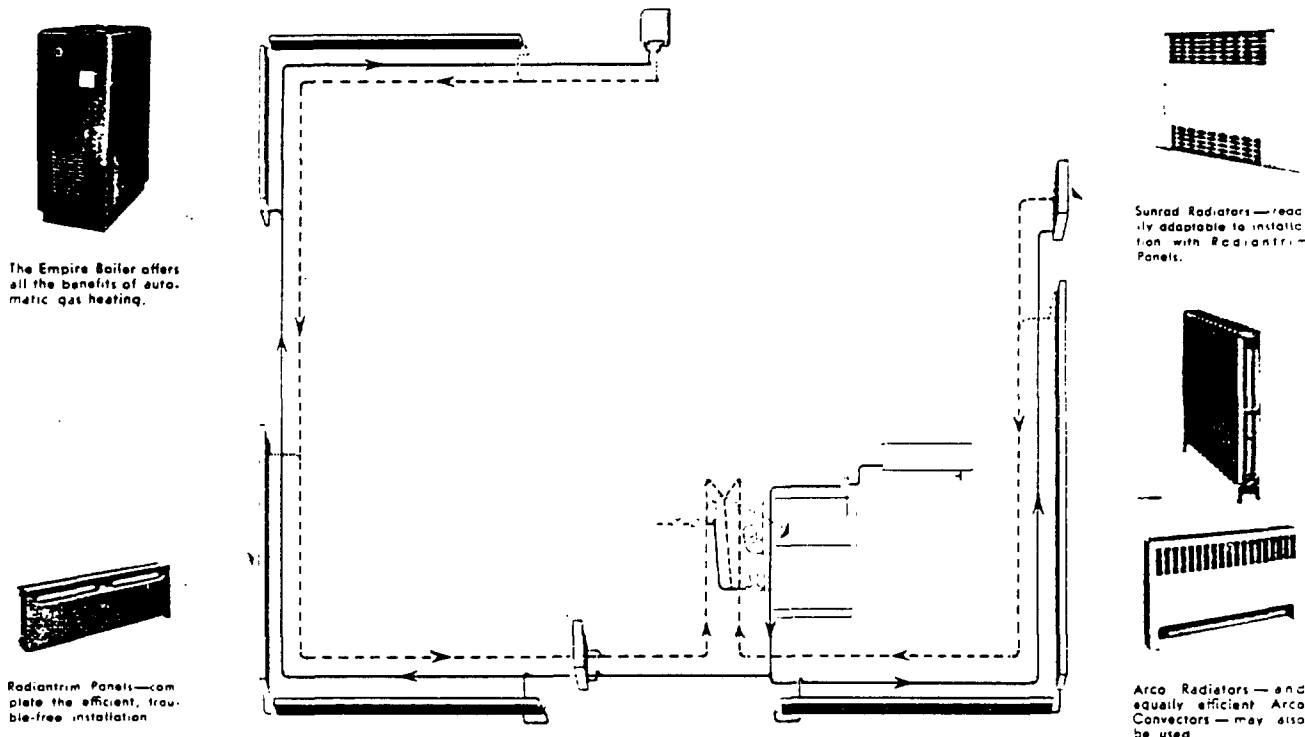
Materials for the installation illustrated above include the Arcoliner Wet Base Boiler for automatic oil firing, 30 feet of Radiantrim Panels, 3 Sunrad Radiators—one, 16-section, 5 by 20-inch, tightly recessed in front hall; one, 6-section, 5 by 20-inch, tightly recessed in the bathroom; and one, 12-section, 7½ by 23-inch, loosely recessed in the kitchen—6 valve enclosures for Radiantrim Panel assemblies, 3 inverted corner covers, 6 center panel screw legs, 6 #232 union elbows, 6 #901 Arco packless radiator valves, necessary pipe, and other fittings.

RADIANTRIM PANELS

Two-Pipe System

TYPICAL LAYOUT FOR FORCED HOT WATER

Installed in Home with Minimum Insulation



Radiantrim Panels provide a minimum total of 20,150 Btu output; Sunrad or other supplementary radiation provides an additional 14,850 Btu, or 164 square feet.

Installation Notes

Radiantrim Panels are used in this two-pipe system installation, designed to provide the comfort of 70° F. indoor temperature while the outdoor temperature is 0° F. System design has been calculated to use Radiantrim Panels with forced hot water at an average of 180° F.

The Empire, used to illustrate this layout, is only one of the boilers by American-Standard that can be selected for actual installation. For example, the popular Arcoliner "Wet Base" can be selected if oil firing is chosen.

Any of the quality boilers by American-Standard may be used in place of the boilers shown on these pages, and, if preferred, either the Arco Radiator or Arco Convector, both made of du-

table cast iron, may be used instead of the cast iron Sunrad shown in these illustrations.

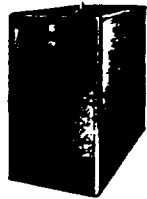
The installation of Radiantrim Panels does not require special construction. No expensive engineering or make ready is needed, nor must walls or floors be altered at any time. Radiantrim jobs are installed in practically the same way as ordinary radiator heating jobs.

Materials for the installation illustrated above include the Empire Boiler for automatic firing with gas, 48 feet of Radiantrim Panels, 3 Sunrad Radiators—one, 18-section, 5 by 20-inch, tightly recessed in front hall; one, 10-section, 5 by 20-inch, tightly recessed in the bathroom; and one, 16-section, 7½ by 23-inch, loosely recessed in the kitchen—6 valve enclosures for Radiantrim Panel assemblies, 3 inverted corner covers, 6 center panel screw legs, either sweat or compression fittings for connections between assemblies, and the necessary pipe and additional fittings required.

Two-Pipe System

TYPICAL LAYOUT FOR STEAM

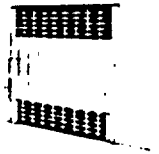
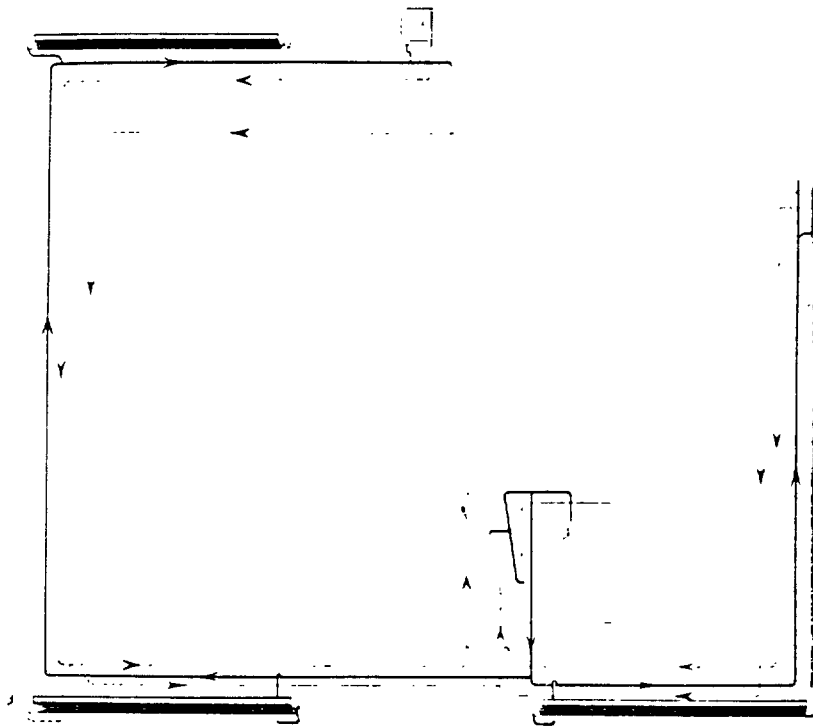
Installed in Home with Full Insulation



The Oakmont Boiler is designed exclusively for economical, automatic oil firing.



Radiantrim Panels—complete the efficient, trouble-free installation.



Sunrad Radiators—readily adaptable to installation with Radiantrim Panels.



Arco Radiators—and equally efficient Arco Convectors—may also be used.

Radiantrim Panels provide a minimum total of 12,350 Btu output; Sunrad or other supplementary radiation provides an additional 10,850 Btu. or 80 square feet.

Installation Notes

Radiantrim Panels are used in this two-pipe system installation, designed to maintain even 70° F. warmth indoors with the outdoor temperature at 0° F. System has been calculated to use Radiantrim Panels with steam at 215° F.

In this layout, too, the Oakmont illustrated is only one of the boilers by American-Standard that can be chosen for an actual installation. If gas firing is desired, the compact Empire O-GS-E performs well.

In the typical layout illustrated above, as in the examples on other pages, Radiantrim Panels are indicated for installation along the outside, or exposed, walls. It is recommended, and especially applicable to steam installations, that Radiantrim

Panels be installed level, without any pitch in either direction. Corner connections, inlet and outlet connections all at the same level means that drainage of condensate in steam installations must be allowed for by installation of a steam trap of suitable quality and size to fit behind the valve enclosure cover. A trap of maximum body diameter or width of 2 inches is recommended, although traps slightly wider may be used.

Materials for the installation illustrated above include the Oakmont Boiler for automatic oil firing, 30 feet of Radiantrim Panels, 3 Sunrad Radiators—one, 16-section, 5 by 20-inch, tightly recessed in the front hall; one, 6-section, 5 by 20-inch, tightly recessed in the bathroom; and one, 12-section 7½ by 23-inch, loosely recessed in the kitchen—6 valve enclosures for Radiantrim Panel assemblies, 3 inverted corner covers, 6 center panel screw legs, either sweat or compression fittings for connections between assemblies, and the necessary pipe and additional fittings required.

Assemblages

Radiantrim Panels are made in 12 and 24-inch lengths, as shown on the opposite page. Therefore, beginning with the minimum of 1 foot they can be assembled in increments of 1 foot up to a maximum of 30 feet. Lengths greater than 30 feet are not recommended. They are assembled from the following sections: 12-inch panel with legs and tappings at each end, 24-inch panel with legs and tappings at each end, 24-inch left hand end panel, 24-inch center panel, 24-inch right hand end panel, and 12-inch right hand end panel.

Radiantrim Panels will be shipped assembled in lengths up to and including 6 lineal feet. Panels of greater lengths will be shipped in two or more sub-assemblies for assembling on the job by the installer.

In selecting or planning Radiantrim Panel assemblies, it is very important to allow for the valve enclosures and corner connections. In single assemblies with valve enclosures at each end add 11 inches to assembly length, $5\frac{1}{2}$ inches for each valve enclosure. For example, a 12-foot long assembly requires a total length of 12 feet and 11 inches.

In the case of inverted corner connections, a nominal space of $4\frac{1}{4}$ inches should be allowed at the corner, plus the $5\frac{1}{2}$ -inch valve space at the end, so that each leg of the angle will equal the assembly length plus $9\frac{3}{4}$ inches. For projecting corner connections, a nominal space of $13\frac{1}{4}$ inches should be allowed at corner plus the $5\frac{1}{2}$ -inch valve space at the end, so that each leg of the angle will equal the assembly length plus $7\frac{1}{4}$ inches.

Where three assemblies are connected on 3 walls, the center one should be the panel assembly length plus $4\frac{1}{2}$ inches for each inverted corner and $13\frac{1}{4}$ inches for each projecting corner, to allow for the corner connection at each end.

Temperature Limitations

It is recommended that Radiantrim Panels in hot water installations be sized for an average water temperature not exceeding 220° F in the panels. Lower average water temperatures are recommended, however, for the most satisfactory designs. In steam installations, best efficiency is obtained at minimum steam temperature of 215° F. Installation may be designed for a higher temperature in every job that requires it, but better efficiency, reduced operating costs and greater satisfaction on the part of the owner will result if the lower average temperature rule is followed. If

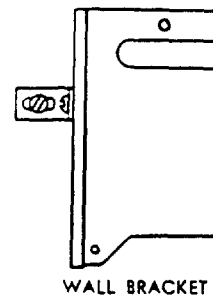
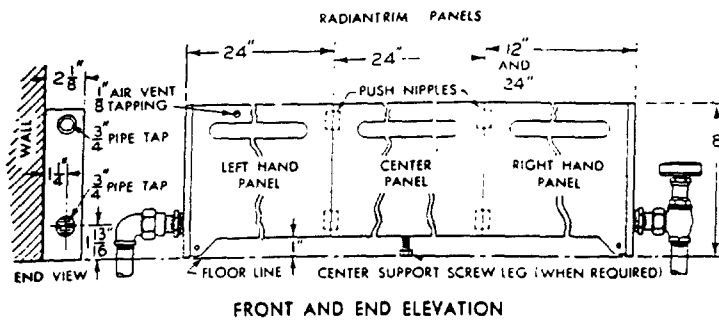
there is not room enough along the walls for the required length of panels to transmit enough heat at a given temperature, naturally a shorter length of panels may be used, designed for a higher temperature from the boiler. The same holds true in the reverse sense, too. If the job has excessive wall and floor line, it may make a neater and more presentable appearance if a few added panels are included in the assemblies involved and the whole installation run at a lower temperature. Radiantrim Panels lend themselves so readily to forced hot water heating especially, that they will meet virtually every radiator heating requirement.

Installations with Other Radiators

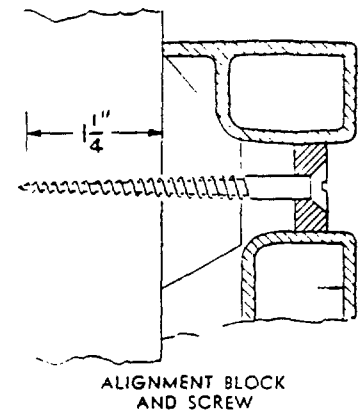
Radiantrim Panels, made to standard and uniform dimensions, are readily adaptable to installation in the same heating system with other quality radiators by American-Standard. For example, a length of Radiantrim Panels may be installed from both sides of a window to the corners of the room with a fully recessed Sunrad Radiator occupying the space underneath the window itself. In this manner, a desirable increased amount of heat is available to blanket window drafts and cold area.

Since the Radiantrim Panel installation is made in practically the same manner as any other ordi-

nary radiator heating installation, there are no problems involved in connecting the conventional radiator to the same system. Installation can be a direct loop, with the water or steam passing from the boiler to Radiantrim Panels, then through the conventional radiator and continuing on through the panels. Or the Radiantrim Panels can be connected in one loop directly to the boiler, with the conventional radiators in a separate loop. This latter method often proves best where only one conventional radiator is needed for a separate room such as a kitchen. As a general rule, greater efficiency will be obtained from Radiantrim Panels as the assemblies and loops are held to a minimum practical length.

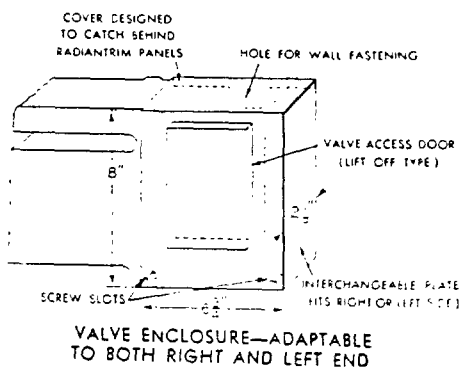
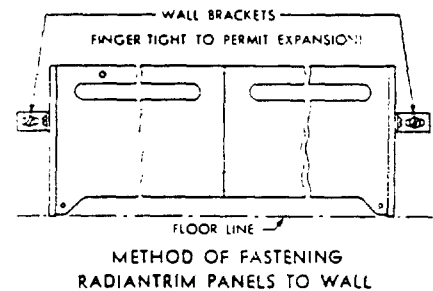
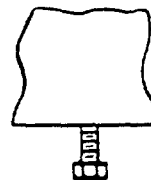


The diagram at the right illustrates the application of the alignment block and screw to the Radiantrim Panel. The cast iron block is placed in the slot of the panel in line with the wall studding. The screw is inserted in the block and driven into the studding. One alignment block and screw is used for each assembly up to 30 feet.



Radiantrim Panels will include center support as follows:

7 to 12 lineal feet	1
13 to 18 lineal feet	2
19 to 24 lineal feet	3
25 to 30 lineal feet	4

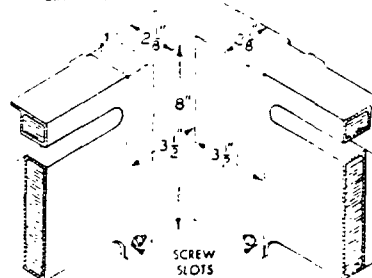


Radiantrim Panels are installed with correctly designed wall brackets and supports to permit necessary movement of panels during expansion and contraction that goes with heating and cooling. Diagram at left shows valve enclosure, with dotted lines indicating the amount of overlap on the end of the panel and characteristics of interchangeable enclosure end plate. Additional diagrams are shown on the following pages.

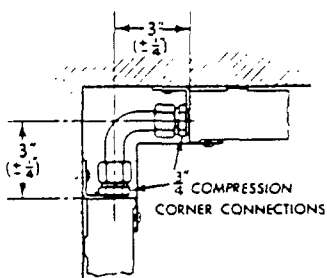
RADIANTRIM PANELS

Radiantrim Panels present no installation problems at corners, either. They are readily adaptable to either inverted corner or projecting corner installations, with compression or sweat fittings, as desired. The diagrams on this page are self-explanatory—show prescribed practice for various phases of inverted corner installations, and the assembly clamp provided for these modern radiators.

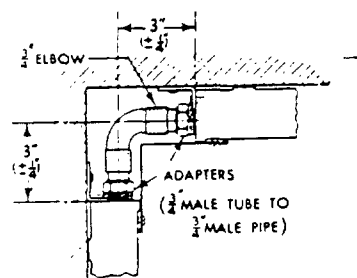
COVER DESIGNED TO CATCH BEHIND RADIANTRIM PANELS



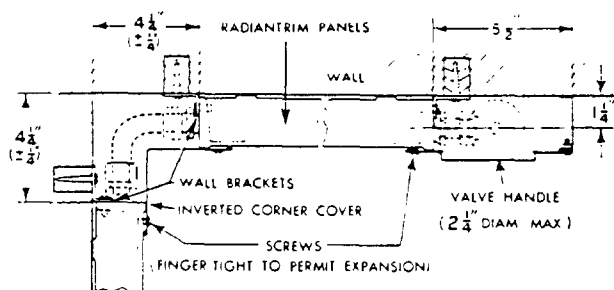
STURDY METAL COVER FOR INVERTED CORNER INSTALLATIONS



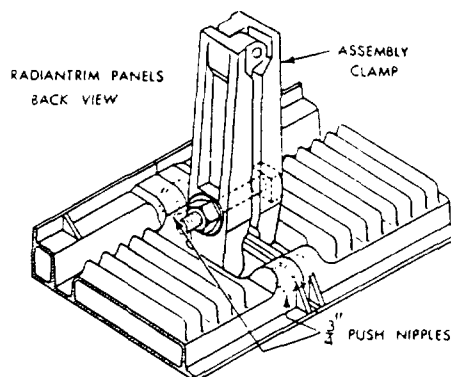
INVERTED CORNER CONNECTION WITH STANDARD COMPRESSION FITTINGS



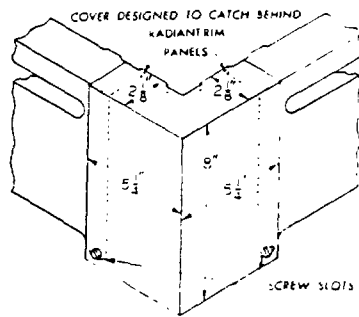
INVERTED CORNER CONNECTION USING SWEAT FITTINGS



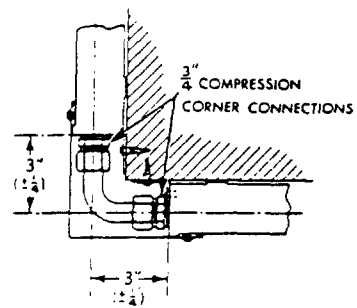
ASSEMBLED INVERTED CORNER INSTALLATION SHOWING WALL BRACKETS AND VALVE



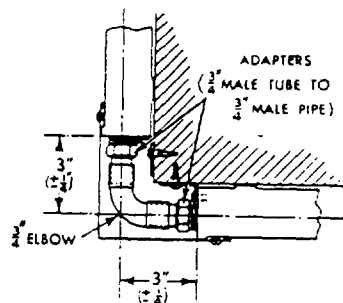
METHOD OF ASSEMBLING PANELS SHOWING USE OF ASSEMBLY CLAMP



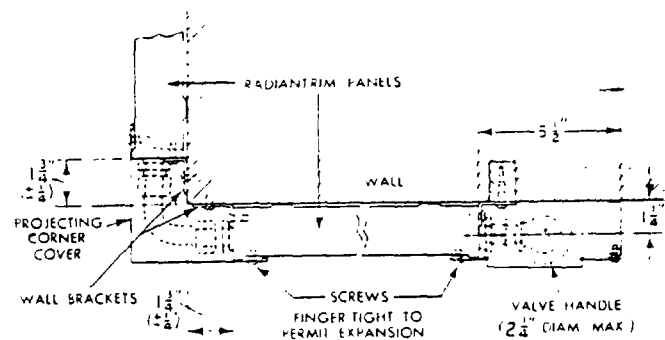
DURABLE METAL COVER FOR PROJECTING CORNER INSTALLATIONS



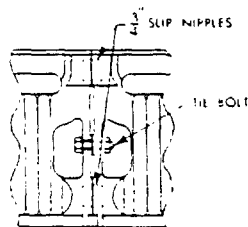
PROJECTING CORNER CONNECTION WITH STANDARD COMPRESSION FITTINGS



PROJECTING CORNER CONNECTION USING SWEAT FITTINGS



ASSEMBLED PROJECTING CORNER INSTALLATION SHOWING WALL BRACKETS AND VALVE



METHOD OF HOLDING PANELS SHOWING USE OF TIE BOLT

Diagrams above show installation practice for projecting corners. Radiantrim Panels can be installed in any type of construction and lend themselves readily to unique architectural use. They are used widely in modern homes with different level arrangement for rooms. The diagram at left shows the tie bolt that is provided to keep the assembled panels in place, assuring a tight positive joint that means maximum economy and efficiency.

RADIANTRIM PANELS

System Design

Radiantrim Panels for use in forced circulation hot water or steam installations are designed and laid out the same as any other similar steam or hot water installation using conventional radiators. As shown on the preceding pages, Radiantrim Panels are made with $\frac{3}{4}$ -inch IPS tappings at each end. Radiator valves, such as the No. 999 for steam, or radiator valves and

union elbows such as the No. 902 and No. 132 for hot water as shown in the American-Standard General Catalogue, are also made in $\frac{3}{4}$ -inch IPS sizes. Steam traps and other steam specialty items of a quality comparable to the American-Standard Heating Accessories used assure an outstanding steam installation.

Resistance to water flow, as it applies to the Radiantrim Panel installation, is expressed in terms of pressure drop in inches of water. The following table shows the resistance to water flow for Radiantrim Panels with $\frac{1}{2}$ -inch and $\frac{3}{4}$ -inch pipe connections.

RESISTANCE TO WATER FLOW

Expressed in Inches of Water

Assembly Length in feet	WATER FLOW — POUNDS PER HOUR*							Equivalent Length in feet of pipe For Any Flow
	200	300	400	500	1000	1200	1500	
	APPROXIMATE WATER FLOW — GALLONS PER MINUTE							
	4	6	8	10	12	14	16	
1 or 4	.06	.18	.39	.67	1.00	1.44	2.16	1.0
5 or 6	.07	.21	.45	.78	1.19	1.68	2.56	1.9
7 or 8	.08	.23	.49	.84	1.28	1.80	2.74	2.0
9 or 10	.09	.25	.52	.90	1.37	1.92	2.92	2.1
11 or 12	.10	.27	.57	.96	1.46	2.04	3.10	2.3
13 or 14	.11	.29	.61	1.02	1.55	2.16	3.28	2.5
15 or 16	.12	.31	.65	1.08	1.64	2.28	3.46	2.6
17 or 18	.13	.33	.69	1.14	1.73	2.40	3.64	2.8
19 or 20	.14	.35	.73	1.20	1.82	2.52	3.82	2.9
21 or 22	.15	.37	.77	1.26	1.91	2.64	4.00	3.1
23 or 24	.16	.39	.81	1.32	2.00	2.76	4.18	3.2
25 or 26	.17	.41	.85	1.38	2.09	2.88	4.36	3.3
27 or 28	.18	.43	.89	1.44	2.18	3.00	4.54	3.5
29 or 30	.19	.45	.93	1.50	2.27	3.12	4.72	3.6
1/2" Pipe								
1 or 4	.03	.08	.16	.25	.42	.60	.90	3.0
5 or 6	.04	.10	.20	.35	.54	.75	1.14	3.8
7 or 8	.05	.12	.24	.41	.62	.87	1.32	4.5
9 or 10	.06	.14	.28	.47	.71	.99	1.50	5.2
11 or 12	.07	.16	.32	.53	.80	1.12	1.68	5.8
13 or 14	.08	.18	.36	.59	.89	1.23	1.86	6.5
15 or 16	.09	.20	.40	.65	.98	1.35	2.04	7.2
17 or 18	.10	.22	.44	.71	1.07	1.47	2.22	7.8
19 or 20	.11	.24	.48	.77	1.16	1.59	2.40	8.5
21 or 22	.12	.26	.52	.83	1.25	1.71	2.58	9.2
23 or 24	.13	.28	.56	.89	1.34	1.83	2.76	9.9
25 or 26	.14	.30	.60	.95	1.43	1.95	2.94	10.5
27 or 28	.15	.32	.64	1.01	1.52	2.07	3.12	11.2
29 or 30	.16	.34	.68	1.07	1.61	2.19	3.30	11.9
3/4" Pipe								

*Flow in Pounds Per Hour can be converted to GPM by dividing by 500.

Temperature Drop in Loop

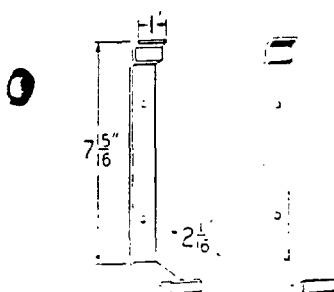
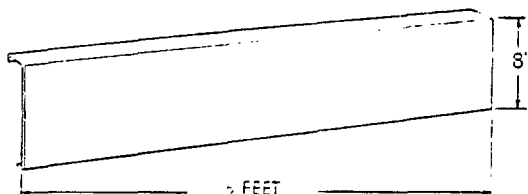
With Radiantrim Panels in a mainless installation, the temperature distribution through the panels will be different from that in an installation where a distributing main is used. Due to the fact that all the water for the entire series passes through every panel in turn, the water will, naturally, be cooler at the end of the series, when it passes through the final assembly, than it was for the first assembly of panels. The temperature drop for each individual Radiantrim Panel assemblage can be calculated

easily by dividing its total heat emission by the total quantity of water flowing through the panel expressed in pounds per hour, which is gallons per minute multiplied by 500. Proceeding around the entire series in this manner, the entrance and exit temperature, and the average temperature can be calculated. If the heat production is not sufficient, longer assemblies must be selected, using the rating tables on page 3. Adequate heat output for the room at the end of the series can usually be obtained by using a longer assembly of panels here to compensate for this temperature drop.

Extension Panels

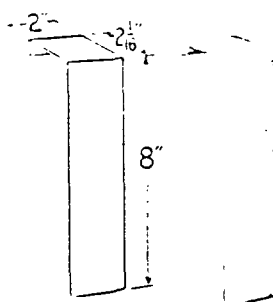
Designed to complete the appearance of the Radiantrim Panel installation and serve as an added convenience and utility accessory for the installer as well, these smartly fashioned Extension Panels permit the home owner to

enjoy the beauty of an uninterrupted baseboard line from wall to wall. Made of sheet steel, prime painted, Extension Panels are shipped in 6-foot lengths which can be cut easily on the job, when necessary, to fit extension requirements. Special support brackets and connecting pieces are provided to hold the necessary lengths of Extension Panels rigidly to the wall and offer a smoothly joined, finished assembly of two or more panels.



SUPPORT BRACKET, left, holds Extension Panel firmly in position. Made of heavy sheet metal, secured to wall by two wood screws, they make installation of Extension panels a simple, speedy job.

CONNECTING PIECE, right, provides an easy, smartly finished means of joining two lengths of Extension Panels, covers joint where Extension Panels meet. Easy-to-keep clean; attractive in appearance.



Extension Panels are designed to fit snugly, without overlap or bulky projections, joining at either end of a Radiantrim Panel assembly. The connecting piece holds two Extension Panels, (or an Extension Panel and either side of valve enclosure of regular Radiantrim Panel assembly.) Moulding strips are normally used both along the top of Extension Panel assemblies and along the floor line, just as they are used with Radiantrim Panels. See chart at right for information pertaining to use of brackets.

Extension Panels are made by American-Standard for installation with Radiantrim Panels. They lock into place quickly and easily and provide the installer with an economical means of covering pipes, filling in short gaps between Radiantrim Panels and corners, and otherwise finishing the normal Radiantrim Panel installation. Offering maximum flexibility, Extension Panels are readily adaptable to virtually any architectural arrangement, and may be installed in free-standing or recessed jobs, exactly the same as the Radiantrim Panels they supplement.

BRACKET CHART

Use Extension Panel Support Brackets
As Follows:

- Up to 3 lineal feet.....(2)
- Over 3 and up to 5 lineal feet.....(3)
- For Multiple Panel Assemblies, over 6 lineal feet, use combinations of 2 and 3 brackets shown above depending on total lineal feet in the installation.

Every Length of Extension Panel Should Be
Supported By At Least 2 Brackets.

RADIATRIM PANELS

Method of Installation

Radiantrim Panels are installed against the plaster or other wall surface, or may, if necessary, be partly recessed. When recessed, the Radiantrim Panel assembly should fit loosely against the studs or furring strips and under the plaster edge or plaster stop, to allow for expansion and ease of installation.

The panel assembly should be set directly on the finished floor. If the finished flooring does not extend far enough under the panel, additional flooring must be installed so that the panel assembly rests level on the floor surface. This will usually apply to modernization jobs where recessed panels are desired. Refer to pages 19 to 24 inclusive for detailed information and illustration showing progressive steps in the installation of Radiantrim Panel assemblies.

Insulation

To assure the utmost economy and comfort, it is always advisable to use insulation behind the Radiantrim Panel installation. In new buildings, or where the plaster line does not extend to the floor, it is essential that

the stud space be insulated with rock wool or other approved insulating material to a height of at least one foot above the floor, to prevent excessive heat loss through walls. Where masonry walls occur, the space between the furring strips should be insulated with asbestos or wood fibre board insulation.

Seal Behind Baseboard

When Radiantrim Panels are installed it is necessary to provide some kind of paper seal in back of each assemblage, not for its insulation value but as a guard against dirt streaking on walls. The material used must be strong, must withstand the effect of heat, and must be durable enough to last indefinitely. A sturdy paper with a tough fibrous content, or aluminum foil coating, will answer the purpose. But, in any event, do not use sheet asbestos or a paper with an asphalt base: they are apt to crack or deteriorate.

The seal is held in place at the floor line by a

moulding strip. This moulding strip is back against the wall, out of sight, and remains in place after the Radiantrim Panels are permanently set. The seal must extend high enough so that it can be bent over the top of the panels and securely held by another moulding which is later attached along the top of the completed assemblage. It is often possible to attach the seal to the rough floor and hold it in place with the finished floor. This eliminates the necessity of using a moulding strip at the bottom.

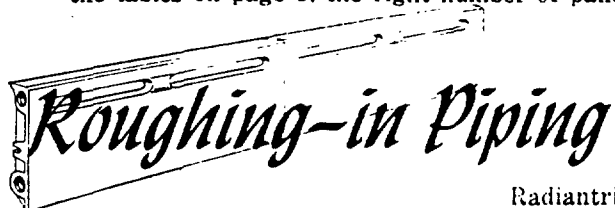
Dimensions & Specifications

Radiantrim Panels are made in one-foot and two-foot lengths with legs and tappings at both ends, 2-foot left hand end panels, 2-foot center sections, 2-foot right hand end sections, and 1-foot right hand end sections. This size range makes it easy to match wall lengths. They are easily assembled in any required length by means of the push nipples and tie bolts provided on the ends and back of each panel. All panels are provided with $\frac{3}{4}$ -inch top and bottom tappings at

each end, and each assembly is furnished with one $\frac{3}{4}$ -inch solid plug and one $\frac{3}{4}$ x $\frac{1}{8}$ -inch bushing. Valve enclosures and corner covers, designed specifically to fit Radiantrim Panels, complete a finished, workmanlike job. See pages 13, 14, and 15 for measurements and roughing-in dimensions of panels, valve enclosures, corner covers, and the added piping connections, valves, vents and fittings that are necessary to make up a completed assembly.



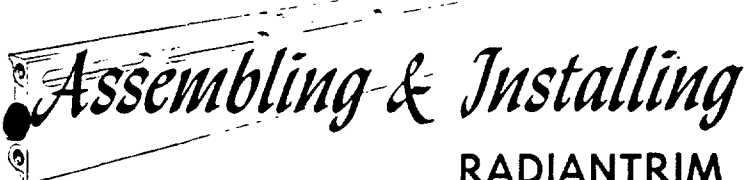
Heat loss calculations for Radiantrim Panel installations are exactly the same as for the conventional radiator installation. Use any standard approved practice in selecting pipe sizes for mains, risers, branches and special fitting adaptations. With the help of the tables on page 3, the right number of panels



Radiantrim Panel installations can be roughed in easily and quickly using the dimensions provided on pages 13, 14 and 15. Rough in supply and return risers as accurately as possible, but diameter of drilled holes should be at least $\frac{1}{4}$ -inch larger than the diameter of the pipe to permit

can be fitted to the job. And the boiler, in a modern model for coal, gas or oil, can be selected with confidence from the complete line of American-Standard Heating Equipment. Heating Accessories by American-Standard, too, will assure complete satisfaction in the job. A general catalogue, allied manuals and special pieces of literature are available to help make selection and sizing quick and accurate.

movement brought about by alternate expansion and contraction of panels and piping. This movement varies with the temperature for which the installation is designed, and of course, is carried through in the same direction as the horizontal line of the panels themselves. This movement is slight, approximately $\frac{1}{8}$ -inch for each 10 lineal feet, but its importance, however, cannot be overlooked or underestimated. Swing connections should be used between main and risers.



RADIANTRIM PANELS

Radiantrim Panels are shipped in sub-assemblies that provide greatest convenience for the installer. Insofar as possible, panels are factory assembled in assemblages up to 6 lineal feet.

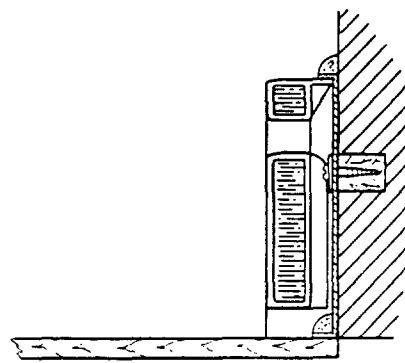
When assemblies of Radiantrim Panels longer than 6 lineal feet must be used in any given installation, some assembling must be done on the job. These assemblies, as well as assemblies employing less than 6 lineal feet, should be checked carefully before installation. Therefore, it is extremely important that the same installation practice be followed for each Radiantrim Panel installation.

This installation practice for Radiantrim Panels provides the necessary A, B, C's of installing these modern radiators. After the simplicity of this progressive installation routine becomes habit, every job can be installed right the first time—and in less time—resulting in real time and money savings for the installer.

Two or more panels can be assembled quickly and easily by one man when approved methods are followed. Variations, of course, are only natural, and one installer may be able to cut time and expense locally by completing some separate operation one way while another will have an equally

successful method. This installation practice, therefore, should be used as a guide to correct installation procedure for this specific quality product—Radiantrim Panels by American-Standard. As such, it can be most helpful if it is used as a primer by the installer, who with his years of experience and practical ability, goes on from this practice to use Radiantrim Panels in the wide range of modern home and building adaptations for which they have been designed.

Diagram shows cross-section of an installation with moulding strips, paper seal, wall and floor line.



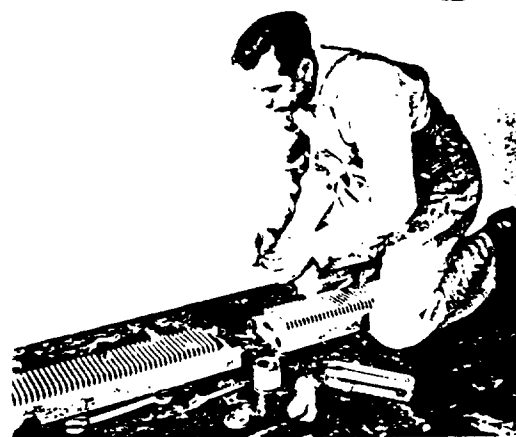
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Assembling & Installing

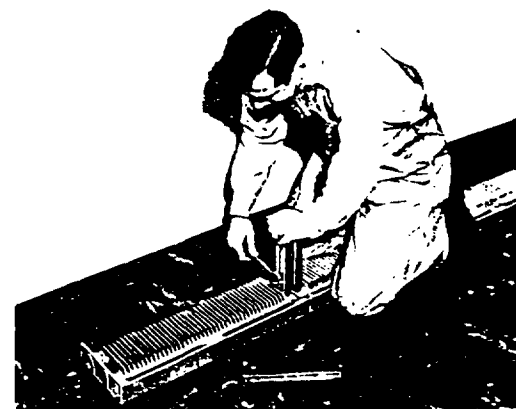
In assembling two or more Radiantrim Panels, it is most important to assemble the panels with the front face down, flat on the floor or on a smooth clean surface as close as practical to the wall against which they are to be installed. They should be kept in this position and handled only after they have been raised to an upright position *after* being assembled. Note, in the top illustration, how the installer is very carefully cleaning out the nipple ports.



The next step in assembling Radiantrim Panels is that of cleaning the nipples. In the middle illustration, the installer is shown wiping off the nipple, which should be inspected carefully and cleaned thoroughly, using a good grade of kerosene or light lubricating oil. After being dried off, the nipples should be "doped" and inserted squarely in the opening, or nipple ports, in the end of one of the panels. The other panel should be placed in position so that the nipple ports in the end of it are squarely in line with the inserted nipples already projecting from the first panel. The second panel should then be brought up to engage the nipples and the two panels pushed together and tightened as far as possible by hand.

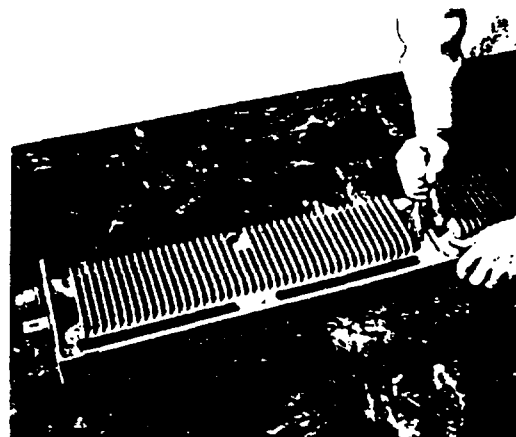


The special assembly clamp is then placed in position. Shown in operation in the lower illustration, this clamp fits over the cast flanges between the nipple hubs provided on the back of each Radiantrim Panel. Reasonable care must be exercised in using the clamp to prevent any possible cracking of the flanges or castings due to over-tightening or poor positioning. After the bolt is turned as far as possible with the fingers, further tightening of the clamp with a open-end wrench starts to bring the panels together. To prevent the possibility of panels bowing, the installer should place one foot on the top of panels during final tightening of the assembly. As the clamp is tightened, it is possible that the two nipples may not draw up evenly. The wooden mallet should be used freely, striking the end of the panels to aid in bringing the two assemblies together and to keep the panels in line.



Assembling & Installing

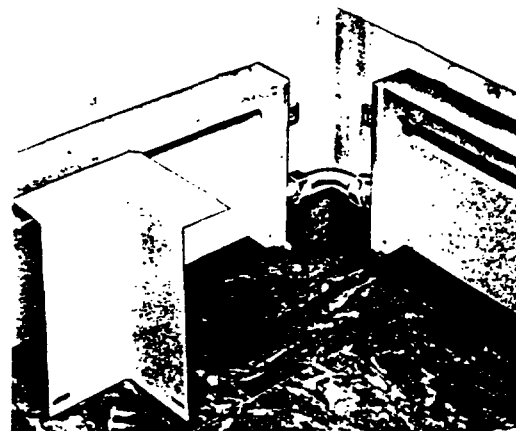
After the two panels are drawn together satisfactorily, the clamp is removed and the tie bolt is put in place in the flanges provided on the back of the panels. The illustration at the top of the page shows the installer tightening the tie bolt. Here the wall bracket and bushing have already been placed in position on the end panel. The panel assembly should be checked to ascertain that all the fittings are in place at each end to eliminate, insofar as possible, working on the panels while in the upright position. Center panel screw legs, as shown on page 13, should be inserted. Air vent fittings should also be placed at this time. After the tie bolt is tightened between this and all other panels in the assembly, the completed assembly is ready to raise into position against the wall. Handle Radiantrim Panel assemblies carefully until they are finally in upright position against wall.



Prior to raising the panel assembly, the paper seal must be applied. The paper selected for the seal (see page 18) should be cut roughly to cover the entire wall area behind the installation, allowing enough height to double paper over on top of panels and back up corner covers, valve space and piping. The seal is placed in position before the panels, and top edge of the seal can be fastened temporarily by means of masking tape or tacks. A piece of quarter round or moulding strip is then placed in position permanently along the bottom of the seal. This moulding holds the bottom of the seal tightly in place at the floor line, and is used to hold down the paper seal behind the panels. The illustration in the middle of the page shows the installer raising the assembly into position. Note how close the assembly is to the wall before it is raised.



In the illustration at bottom of the page the two adjacent wall assemblies have been raised into position, the paper seal and bottom moulding strip are in place, and the wall bracket is fastened on each end. The screws holding brackets to the wall should be drawn up snug, then backed off a fraction of a turn so that sliding room for the movement caused by expansion and contraction is assured. Just as soon as all connections can be tightened, the system should be water tested for leaks.



RADIANTRIM PANELS

Assembling & Installing

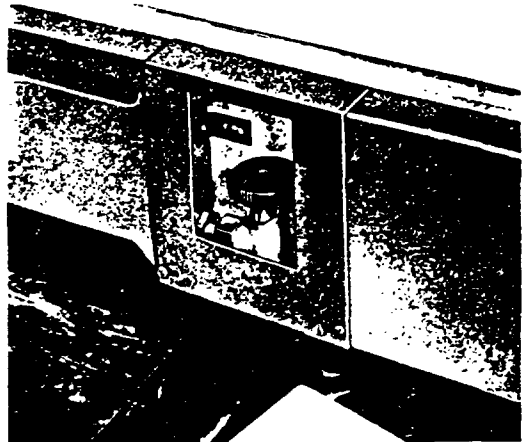
The illustration at the top of this page shows the installer working on the right hand end of the assembly. The corner cover has been installed, and the piping and No. 902 Arco Packless Valve connected. He is tightening the valve enclosure cover screws, the final step in installing the valve enclosure. The valve access door laying close at hand on the floor can be snapped into place and removed easily and quickly without the use of tools, permitting instant access to the valve at any time. Note the use of the wall bracket on the end of the panel inside the valve enclosure.



Next, the tapes, temporary brads or fastenings are removed and the paper seal folded smoothly over the top of the panels all the way around. Now another moulding strip is cut to fit the top lengths of the assemblages, and placed on top of the panels over the paper seal that has been folded down. Excess paper is removed by cutting with a sharp knife. The illustration at the middle of page shows the assembly nearing completion, with the top moulding strip already loosely in position as a guide for the paper cutting. The end cover is shown with the valve access door snapped into position.



A close-up view of the end of the same assembly is shown in the bottom illustration. Here the paper seal has been completed, the moulding strip is permanently attached, the valve enclosure is installed and a length of Extension Panel carries on the trim finished look to the end of the wall. Extension Panels lend themselves beautifully to installation in any kind of construction, and can be cut and fitted easily on the job by the installer. They are secured by special support brackets and joined by connecting pieces, all of which are shipped with the order for Radiantrim Panels when so specified.



Assembling & Installing

The illustration at the top of the page is a close-up of the left hand end of the assembly making up the other leg of this room installation. Notice the neat, workmanlike job that has been done in removing the excess paper and applying the moulding. This illustration shows the No. 132 Union Elbow and wall bracket at the return end of this assembly. The covers at both the corner and the ends of the assemblies extend over the baseboard for greater protection and security as well as finished appearance, and a little care expended in installing these covers not only makes a better looking job, but also protects the piping and valves, as well.



* * *

The installer is shown placing the top moulding strip in position in the illustration at the middle of the page. Only a comparatively small number of panels were used in this assembly. Home owners often designate that panels occupy only a certain portion of the wall in any one room.



* * *

The complete installation, as it appears after the last operation has been finished, is shown in the illustration at the bottom of the page. In the longer assembly, two center screw legs have been used under the two center panels to help hold up the weight of the panels. Actually, the installation would have stood up with only one, but here is an example of the installer bettering the job by using his own experience and good judgment of symmetry and balance. Extension Panels, the smartly modern units designed specifically for these installations, have been extended from each side of the Radiantrim Panel assembly shown here. However, regular wood baseboard extensions are also popular. Or it would have been equally possible to extend wood baseboard sections made to simulate the panels themselves, thus making a wood and metal assembly the same height and shape to run all the way around the room.



RADIANTRIM PANELS

Assembling & Installing

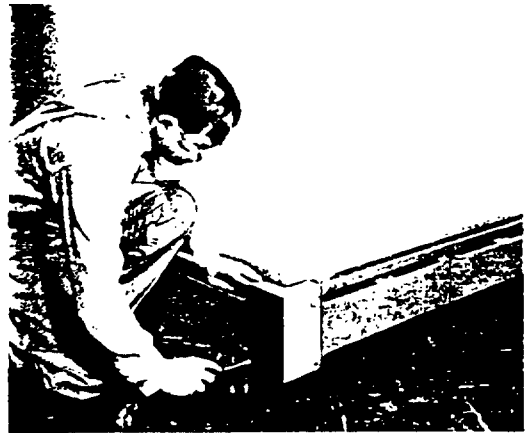
Radiantrim Panels are equally well adapted to installation conditions found in virtually every type of modern architecture and construction. Here, in the illustration shown at the top of the page, the installer is connecting a projecting corner assembly. The Radiantrim Panels are joined together and made up into the two assembly legs for this installation in exactly the same manner as they were assembled for the inverted corner job. In fact, the only different equipment needed is the projecting corner cover rather than an inverted corner cover. Roughing-in measurements for this corner are, of course, practically the reverse of the inverted corner. The installer is shown tightening the union on one side of the compression corner connection used. This job is a free-standing installation. However, projecting corners are easily completed in recessed installations, as well.

* * *

In the illustration in the middle of this page, the projecting corner cover has just been placed in position and the two screws installed to hold the cover. The screw holes through the covers, as can be seen in the view presented here, are slots rather than round holes. This is a precaution to protect the cover from warping when the panels expand. The screws themselves should be only finger tight, or screwed tight with a screwdriver then backed off enough to allow the panels to move inside the cover.

* * *

The illustration at the bottom of the page shows a complete projecting corner installation. Note that the moulding strip is finished, mitered at the corner and permanently attached, adding greatly to the appearance of the job. The moulding strip applied at the bottom of the paper seal, at the floor line, is not exposed to view except at a very low angle, yet there is room under the panels for cleaning when necessary. The same installation practice stated for inverted corners holds true for these jobs.





Mainless Installation

In small homes, homes without basements and similar installations, one of a number of jobs where convenience is the major factor, Radiantrim Panels can be installed without the use of distributing mains. Connected in series in a single loop, Radiantrim Panels will provide rated performance. It is recommended, however, that total pressure drop be considered before the installation is put in, and if the total loss will be too great, the loop should be split up into two or more legs or separate loops to reduce the total pressure drop as far as possible. Here, $\frac{3}{4}$ -inch IPS connections should be used everywhere in the loop. Total pressure drop should be figured out very accurately, and, with the help of the table on page 16, a suitable circulating pump to offset the total pressure can be selected. This will assure the desired

heat output in every part of the series loop. The quantity of water that will be circulated, in gallons per minute, can easily be computed by dividing the "pounds per hour" figure shown in the table on page 16 by 500. This constant is exactly correct for a temperature of 70°, and, for practical purposes, can be used with reasonable accuracy for all water temperatures found in Radiantrim Panel design. The total pressure drop can then be obtained easily from standard tables for the pipe size used, and the rating tables published by the circulating pump manufacturer will indicate whether or not the pressure drop is too large. To determine the flow rate in pounds per hour with various temperature drops, it is necessary only to divide the heat loss in Btu per hour by the proposed temperature drop in degrees Fahrenheit.

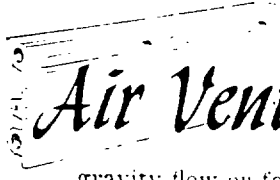


Distribution

Radiantrim Panels should be used, wherever possible, in longer assemblies rather than in short assemblies offering the same total heat output. And it is equally preferable to use the maximum outside wall length, where possible, and set up the system for a lower temperature rather than use the minimum wall length and depend on the highest temperature available. Radiantrim Panels have an outstanding heat distribution factor, an advantage that cannot be overlooked.

Inside walls can be used for the installation of Radiantrim Panels, but it is recommended that not more than 50 per cent of the total length of the assemblies used in any one room be on the in-

side wall. Where a too-small assembly of Radiantrim Panels must be used, the heating surface can be increased as desired by installing a Sunrad Radiator, Arco or other conventional type radiator or cast iron convector. Conventional radiation can be used in the same loop with Radiantrim Panels, or the panels and separate radiators can be connected to the boiler by separate piping loops. The most common method of attaining the heat desired for the home is to install panels wherever possible and a conventional radiator or cast iron convector in suitable locations, such as in the kitchen, bathroom, and occasionally, the lower hall area. Radiantrim Panels alone will provide all the heat necessary in the majority of installations. And they provide a flexibility of installation that assures the utmost in satisfaction.



Air Vents

When Radiantrim Panels are installed in hot water jobs, either gravity flow or forced circulation, air vents must be inserted in the line on each assembly. Any standard high quality automatic or manual type air vent may be used. The air vent can be installed in either or both ends of the panel assemblies in the $\frac{1}{8}$ -inch IPS tappings provided on the right and left-hand end panels. Or it can be located in the tapping provided at the upper left hand corner on the face of each left hand end panel. However, it is

recommended that air vents be installed on the same end of each assembly as the return fittings rather than in the ends at corners, for the reason that it is easier to gain access to them. If necessary, venting can be completed easily by removing the access door from the valve enclosure cover and discharging the air and water into a sponge, cotton waste, rag or suitable small receptacle. Compact, space-saving automatic air vents are available, as well as the small coin-operated type shown at the top of page 23 and other illustrations.

RADIANTRIM PANELS

Piping & Connections

Radiantrim Panels are easy to install. For best performance, piping connections to Radiantrim Panel assemblies should be run individually to each loop from the distributing mains. If this is not possible, it is recommended that runs be held to as short a length of panel assemblies as is practical, with as many individual loops as it is practical to run. In general, a separate loop for each room to be heated in the home is the best hook-up.

Location & Fit

Radiantrim Panels should be installed along outside walls where possible. In addition they may, of course, also extend around the room, on inside walls, where necessary to provide adequate heating surface.

Decorating

Radiantrim Panels can be finished to match or harmonize with surrounding walls, woodwork or furnishings. It is important only to use a non-metallic heat-resisting paint or finish for the purpose. They can be painted any color. A decorator's dream.

Between assemblies, Radiantrim Panels in every installation should be connected with $\frac{3}{4}$ -inch IPS pipe where standard compression fittings are used. If standard sweat fittings and tubing are used, the tubing between assemblies should not be less than $\frac{7}{8}$ -inch in outside diameter. Piping around corners or connecting assemblies to risers and returns is neatly and effectively concealed by the valve enclosures and corner covers specially designed and shipped with these outstanding radiators.

The ideal installation is, of course, along walls of such length that the correct assemblage of panels and fittings will comfortably occupy the available space. Extension panels, as shown on page 17, efficiently and decoratively solve the problem of filling in wall line area not occupied by Radiantrim Panels.

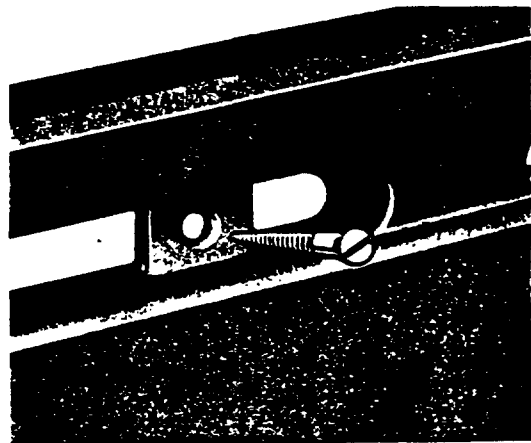
these new radiators hug the wall, out of the way—there's nothing to interfere with drapes or decorations. In pleasing color, or practically invisible when wall tones are chosen. Radiantrim Panels give full use of every foot of wall and floor space, permitting complete freedom in furniture arrangement.

Alignment Block and Screw

An alignment block and screw is available for use on long assemblies of Radiantrim Panels. This unit consists of a tapered cast iron block which is countersunk to hold a #14 flat head wood screw three inches long. It is designed to keep the panels in alignment with and flush against the wall and to provide additional support.

The application of the alignment block and screw is simple. The block is inserted into the outlet slot of the panels near the middle of the assembly and in line with a stud. As the wood screw is driven into the stud, it draws the block into the slot where the tapered edges of the block are wedged into the slot.

One alignment block and screw is necessary for each assembly up to 30 feet. The alignment block and screw is available on special order. See next page for ordering instructions.

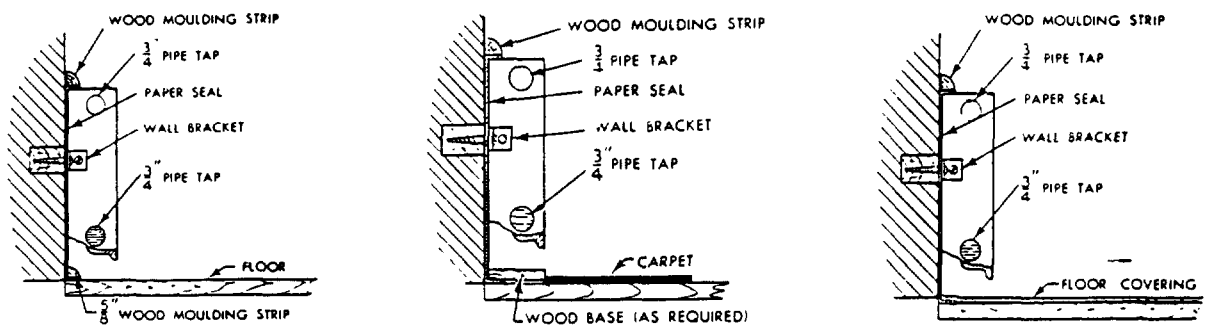


Finishing Variations

In cases where a home owner intends to use wall-to-wall carpeting in the same room with Radiantrim panels, it is advisable to set each panel assembly up on a strip of wood, or base, $2\frac{1}{8}$ -inches wide and $\frac{1}{2}$ -inch thick. This

method is shown in the diagram below, and assures full efficiency from the radiators as well as a neater, more attractive job. The diagram at right below illustrates how cove or ornamental mouldings may be used if the installation dictates.

METHOD FOR APPLICATION OF MOULDING STRIPS



How to Order

The required number of Radiantrim Panel corner covers, valve enclosures, tie bolts, special clamp, operating instruction for clamp, wall brackets and all necessary screws, and bolts, when so ordered are shipped together with the Radiantrim Panels. All other quality heating equipment, such as the boiler, supplemental radiators, radiator valves, air vents and controls can be selected from the American-Standard General Catalogue and allied manuals. Tubing, piping, unions, elbows, miscellaneous fittings and other materials necessary to complete the job, as in all radiator installations, will be furnished at the job site, normally by the installer.

In ordering Radiantrim Panels, it is only necessary to indicate the quantity and panel assembly number desired for each size panel, the number of valve enclosures, corner covers, compression corner connections, additional center support screw legs, and assembly clamp if required.

The panel assembly number designates the total number of lineal feet of Radiantrim Panels in the assembly ordered. For example, a number 23 type RC panel assembly (1—23 type RC) is the order designation for an RC Radiantrim Panel assembly totaling 23 lineal feet.

A sample order specification should be as follows:

- 2—14 type RC
- 1—22 type RC
- 3—Alignment Blocks and Screws
- 1—Compression Corner Connection
- 10—Valve Enclosures
- 1—Inverted Corner Cover
- 8—Center Screw Legs
- 1—Assembly Clamp
- 1—Extension Panel
- 1—Connecting Piece
- 3—Support Brackets

NOTE:

Approximate shipping weights may be determined by referring to the square foot rating column in the tables shown on page 3. Multiply square foot rating by five pounds.

RADIANTRIM PANELS

In New Homes

Radiantrim Panel installations, like these illustrated, and hundreds more in all parts of the country, indicate the sweeping popularity these modern radiators are gaining in new buildings . . . in residences, hotels, apartments, hospitals and wide range of commercial structures, as well. Note in the illustration at top of page how attractively yet unobtrusively Radiantrim Panels fit under the smart picture window. They lend themselves equally well to outstanding design and construction practice in the widest possible range of homes and buildings. The striking effect of a long assembly is shown at left, below, in a job where these new



radiators are being used to heat a large room. And in the illustration directly opposite, note how the wood baseboard, fitted between the end of the Radiantrim Panel assembly and the fireplace, has been scored to match the openings in the panels. The illustration at the bottom of the page shows a pleasing room arrangement with Radiantrim Panels smartly installed under a bookcase and cabinet combination. The maximum, all-around economies, extreme flexibility and other advantages of Radiantrim Panels are appreciated by architects, heating engineers and installers alike. These modern radiators are readily adaptable to virtually every type of new home and similar construction.



Modernization Jobs

The use of Radiantrim Panels need not be limited to installations in new homes for they lend themselves perfectly to modernizing and remodeling jobs in existing homes and buildings. These modern radiators greatly increase the value of the property, and here, as in all Radiantrim Panel installations, they go far toward perfection in creating comfort, preserving health, effecting economy and increasing flexibility. Radiantrim Panels can be installed in older homes simply by removing the wood baseboards and replacing them with panels, following the same installation procedure outlined in this manual. The space for installing these new radiators is prepared exactly in the same manner



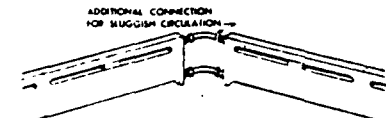
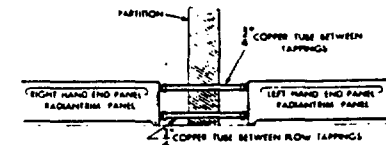
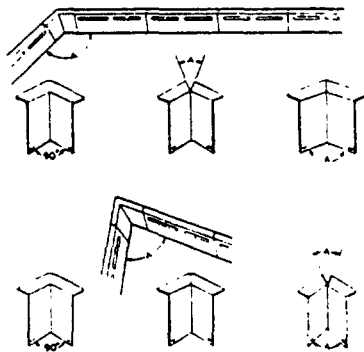
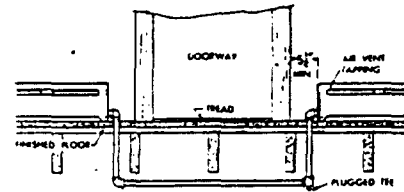
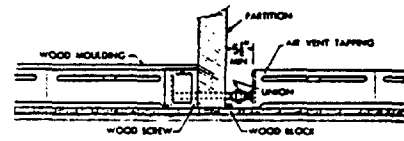
as would apply to new homes, and Radiantrim Panels can be installed either against the plaster in a free-standing or recessed installation. In the illustration at top of page, Radiantrim Panels are shown in an attractive installation against wood paneled walls, while the illustration at the bottom of the page shows an equally smart installation against natural wood siding. The two illustrations in the middle of the page show, left and right, plastered and papered walls respectively in rooms that have gained more living space, greater comfort and a striking new beauty through the use of Radiantrim Panels.



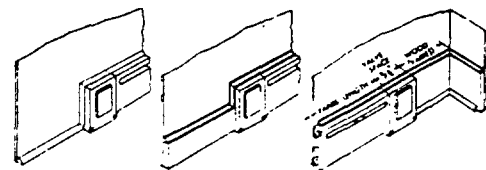
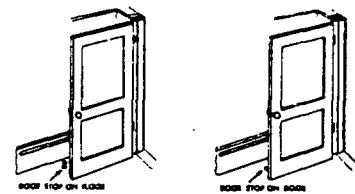
RADIANTRIM PANELS

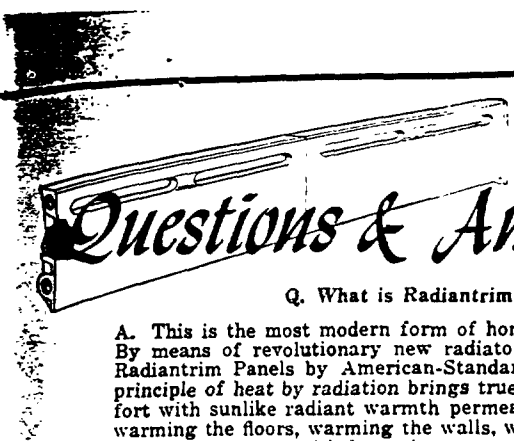
Unusual Applications

A number of applications not encountered in ordinary radiator jobs have been worked out especially for Radiantrim Panels. A few of these are shown here. At the top of page, diagrams show, first, a method of completing adjoining room pipe connections between Radiantrim Panel assemblies where it is possible to go straight through the wall, and, second, a similar connection where there might be an obstruction to a straight piping layout, such as in construction like doorways, fireplaces, closets, and the like. The latter would, of course, be applicable only to first floor installations. The diagrams at left, below, show how corner covers may be altered to permit installations around corner angles greater than, and less than, 90 degrees. Although the inverted corner cover is used for



the illustration, projecting corner covers may be handled in the same manner if necessary. Directly opposite, a method for improving possible sluggish circulation is shown in connections straight through the wall and around a typical corner. This "bleeder" line not only improves circulation, but also permits gravity flow on many installations when flow valves are open and panel assemblies are connected in a single loop. The diagrams at the bottom of the page show simple methods of handling finishing variations like door stops and wood baseboard extensions. Although seemingly minor, close attention to these details results in real satisfaction with every Radiantrim Panel installation. And this means increased business and greater profits.





Questions & Answers

Q. What is Radiantrim Panel heating?

A. This is the most modern form of home heating today. By means of revolutionary new radiators—trim, efficient Radiantrim Panels by American-Standard—the age-old principle of heat by radiation brings true health and comfort with sunlike radiant warmth permeating every room, warming the floors, warming the walls, warming furniture and warming you with heat that starts at the floor line, where true comfort begins.

Q. Will Radiantrim Panels heat every type of home?

A. Emphatically, yes. If the home is under construction or still in the blueprint stage, these modern radiators can easily be fitted into the design as an integral part of each room. In existing houses, where any radiator heating system for forced hot water or two-pipe steam is already installed, Radiantrim Panels can be substituted for ordinary radiators.

Q. How are Radiantrim Panels installed?

A. These amazingly compact radiators replace or take the place of regular wood baseboards, blend in beautifully with modern construction and decoration design and are practically invisible when finished to match walls or woodwork. Only 8 inches high, they fit snugly against the wall, and when recessed take up less than an inch of floor space. They permit complete freedom in furniture arrangement.

Q. Do Radiantrim Panels require special boilers or heating equipment?

A. No. Any of the boilers by American-Standard or boilers of similar quality can be used with equal success. The boiler selected can burn coal, gas or oil, but it is recommended that the boiler be automatically fired in order that full advantage can be derived from the benefits of Radiantrim Panels.

Q. Does it cost more to heat a home with Radiantrim Panels?

A. No. It has been proven in our own Institute of Heating Research, in independent laboratories, and in hundreds of homes in all parts of the country that fuel consumption for these scientifically designed new radiators can be considered generally the same as fuel consumed for conventional tube radiators. As a plus factor, Radiantrim Panels offer greater comfort in the room from the same amount of fuel.

Q. Do Radiantrim Panels take up much space?

A. No. These smartly designed radiators give full use of every foot of wall and floor area. When recessed, they take up less than an inch of floor space, becoming practically unnoticeable. There is no specially-built, space-consuming woodwork, duct or metalwork necessary; absolutely nothing to interfere with drapes or decorations. Radiantrim Panels are the answer to every modern home owner's need for a better radiator—and they're a decorator's dream.

Q. Will Radiantrim Panels streak walls?

A. With Radiantrim Panel systems designed for normal operating temperatures, and correctly installed with prescribed paper seals, there is little danger of streaking or dirt patterns. Due to the absence of concentrated air currents, walls, draperies, curtains and blinds remain remarkably clean.

Q. What other advantages can be gained from Radiantrim Panels?

A. These modern radiators offer maximum operating economy, better health, greater comfort—all of the advantages of radiant heating plus the added beauty and convenience of radiators engineered and built to such outstanding specifications. Radiantrim Panels kill cold where it creeps into the home—at the floor line of outside walls. Children can play on the floor without danger from cold. Grown-ups can sit in comfort anywhere in the room. And drafts are blanketed to protect young and old alike. Radiantrim Panels also offer extreme flexibility without need for adjustment—in design, installation and temperature selection.

Q. How does heating with Radiantrim Panels differ from other heating?

A. Heat is transmitted by three means—radiation, convection and conduction. Radiantrim Panels make use of all three to a certain extent but supply a large percentage of heat by radiation, just as the sun warms the earth. By this radiation, as in ordinary radiators, the heat is emitted directly from the radiator in straight rays, passing through the room air without warming the air, but warming the furniture, room occupants and everything in their path. Convection, commonly associated with convectors, transmits heat by heating the air itself, and a certain amount of convected heat is obtained from the surface of Radiantrim Panels by room air currents to add to the comforting warmth in the room. And a small amount of conduction takes place as the wall and floor are heated adjacent to the Radiantrim Panels.

Q. Will Radiantrim Panel systems create "too dry" or stagnant air?

A. No. In fact, just the opposite holds true. The sunlike radiant warmth from these modern radiators does not dry out room air or affect furniture, fabrics and the like as much as other heating systems. The gentle, continuous movement of air heated by radiation keeps stale air, odors and tobacco smoke moving. And there is sufficient permissible air infiltration in most houses, new and old, to prevent stagnant air conditions.

Q. What floor coverings are necessary for Radiantrim Panel installations?

A. The home owner or builder can use any floor covering. Owners, especially, have a complete choice of flooring or carpeting, ranging from deep pile carpets to linoleums, rubber or asphalt tiles, ceramics, wood parquets, paints or bare floors of any material. When Radiantrim Panels are installed under recommended practice, the floor covering selected has no effect whatsoever on operating economies and heat transfer from these quality radiators.

Q. Can Radiantrim Panels be used in rooms with picture windows and large glass areas?

A. Yes, they are ideal for these modern installations. The fact that Radiantrim Panels require only a maximum 8-inch height, right at the floor line, means that they fit perfectly into a wide variety of outstanding room designs. And they provide the flow of heat necessary to blanket the added air movement and conducted cold that may be present with larger expanses of glass.

Q. Will Radiantrim Panels cause plaster walls to crack?

A. Radiantrim Panels, installed in accordance with recommended practice, can be recessed without causing any cracking or buckling of plaster. And of course, when free standing, there is no danger from this trouble. Specially designed wall brackets and cover plates permit the panels themselves to take care of the movement caused by expansion and contraction due to heating and cooling, independently of the wall or floor materials.

RADIANTRIM PANELS

Questions & Answers

Q. Are Radiantrim Panels adaptable to installation in homes without basements?

A. Yes, Radiantrim Panels are especially well suited to basementless houses, slab flooring and similar types of construction. Cold floors are a major discomfort factor in these buildings, usually, even when the rest of the room is well heated. But Radiantrim Panels produce warm floors and a concentration of heat around the outside of the walls and along the floor, resulting in greater comfort in the room and better health for all occupants.

Q. Do Radiantrim Panels require special construction or engineering methods?

A. No. These modern radiators can be installed easily and quickly by following the recommended installation practice set forth in this manual. The skilled installer will have no trouble with even the first installation, for Radiantrim Panel jobs are installed practically the same as ordinary radiator heating jobs. And the installer will find that these new radiators present fewer installation problems than ordinary conventional radiators. No expensive pre-construction engineering or make-ready is necessary, nor must walls or floors be altered at any time. For modernization jobs, the application is as easy as removing ordinary wood baseboards and replacing them with the new Radiantrim Panels.

Q. Do Radiantrim Panels require special insulation?

A. No. The installation is usually more efficient if the wall space immediately behind the panels, up to a height of approximately 12 to 15 inches, is insulated to prevent heat loss through the outside walls. Radiantrim Panels actually form part of the wall itself, and the warming effect to the room interior will be greater if conventional insulation practice is carried out. The majority of new houses where Radiantrim Panels are being installed are insulated on outside wall surfaces behind the panels. Radiantrim Panels require only normal construction and insulation practice, the same as buildings for conventional heating systems.

Q. What tests or precautions need be applied in Radiantrim Panel installations?

A. Only the normal water test for leaks. This should be made just as soon as the loop or loops are connected, and can be done just as easily as it is carried out in the installation of any radiator heating job. Completing the water test early in the installation allows the installer to check that all points are tight, especially between separate panels in each assembly, and saves both time and money if there should happen to be a slight leak, since nipples and tie bolts can be checked without removing moulding strips, covers and the like.

Q. Do walls and floor ever get too warm with Radiantrim Panels?

A. No. The majority of the heat from Radiantrim Panels is radiated directly into the room and there is never any danger from hot spots or uncomfortable floor areas. Regardless of the type of construction used in the building, Radiantrim Panels offer better heating with more of the heat flowing immediately to the living areas of the room. Design temperatures never need be high enough to create dangerous or uncomfortably warm spots on either walls or floors.

Q. How are sizes of mains and risers selected for Radiantrim Panels?

A. Mains, risers and all other parts of the Radiantrim Panel installation are selected and hooked up exactly as in any other radiator heating installation for ordinary radiators. The American-Standard Heating Practice, or any other recognized practice, provides the information needed.

Q. Can separate rooms be controlled at different temperatures with Radiantrim Panels?

A. Yes, in a number of ways. Balancing valves may be installed in the system, zoning may be employed with separate loops to the boiler, or shut-off valves may be used at the supply end of each room hook-up, to mention the most popular. Balancing valves permit different room air temperatures by regulation of water flow. Many manual and automatic controls, and the wide variety of heating accessories by American-Standard permit day and night temperature selection, night-time shutdown or other regulation as desired.

Q. Can Radiantrim Panels be used with other radiators in the same system?

A. Yes, it is recommended that a Sunrad or conventional radiator of similar quality be installed in those rooms or building areas where there is not enough free floor or wall area to use Radiantrim Panels to best advantage. Usually a conventional radiator is placed in the bathroom, kitchen or hallway, and conventional radiation is used quite often to heat garages and little used rooms. In office and commercial installations, too, Radiantrim Panels can be installed in conjunction with other heating, air conditioning or ventilating equipment.

Q. How is room heat regulated in a Radiantrim Panel system?

A. Radiantrim Panel systems can be regulated in exactly the same manner employed with any other radiator heating system. It is recommended that automatic control be installed, using any of the control combinations listed with the quality boilers in the American-Standard line, but manual control is perfectly feasible. Automatic control, with a good room thermostat installed on a centrally located inside wall, permits the home owner to derive full satisfaction and all of the advantages of carefree comfort possible with Radiantrim Panels.

Q. Can Radiantrim Panels be installed in existing buildings?

A. Yes, they are highly adaptable for modernization installations in existing or older buildings. In fact, in those buildings already heated by radiator heating system of any kind there is only a minimum amount of work involved in the conversion. Radiantrim Panels replace the present wood baseboards and eliminate the necessity for bulky, space-stealing, ordinary radiators. Radiantrim Panels can be purchased on an attractive time payment plan that makes modernization easy.

AMERICAN-Standard

Quality Products that make Radiant Heating Better



ARCOTINE WET
BASE BOILER—for
carefree, completely
automatic oil firing.

SEVERN BOILER—uni-
versal boiler for all
fuels—shown for
hand fired coal.



04019



EMPIRE BOILER—for
trouble-free automatic
heating with every
type of gas.

WATER TUBE BOILER
—for oil or coal—
shown for stoker fired
coal.



No. 902 CIRCULATOR
VALVE—designed for
forced hot water heat-
ing systems only.

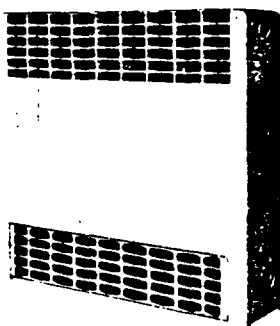


No. 102 CIRCULATOR
VALVE—another
round handle, angle
pattern for forced hot
water.



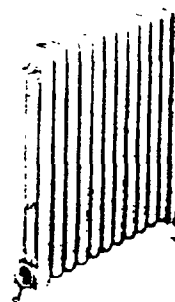
No. 116 CIRCULATOR
VALVE—opens easily
with 1/4-turn. Order
No. 216 for sweat con-
nection.

The Complete Line Makes Your Radiant Panel Installation Complete

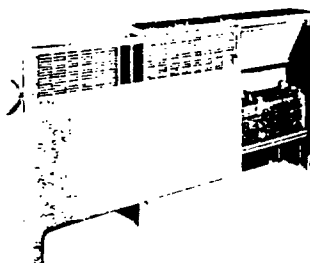


SUNRAD RADIATORS
—modern, all cast iron
—for recessed or free
standing installations.

ARCO RADIATORS—
slim-tubed, made of
cast iron in four nar-
row widths.



ARCO CAST IRON
CONVECTORS—for
recessed, free stand-
ing or wall hung in-
stallation with enclo-
sures.



PEERLESS WALL RADI-
ATORS—space-sav-
ing, cast iron wall
hung type for any
structural condition.



No. 133 ARCO BAL-
ANCING ELBOW—for
balanced heating. Or-
der No. 233 for sweat
connection.



No. 132 UNION EL-
BOW—designed for
water systems. Order
No. 232 for sweat con-
nection.