Infra-Red Language Distribution System

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Using this data brochure

The section numbers listed on this page cover the main systems and individual categories within these groups for convenient reference.

It is possible to locate any section quickly by thumbing to the corresponding tab number on the outer margin of each page. The index section at the back of this data brochure includes an alphanumeric listing according to part number.

Infra-Red Language Distribution System

Infra-Red Language Distribution System

Introduction

A simultaneous interpretation system is almost indispensable for successful international conferences where multiple languages are used. In order to enable all participants to understand the proceedings, interpreters simultaneously translate the speaker's language as required. These interpretations are then distributed throughout the conference venue and delegates can select the language of their choice and listen to it through headphones. This data brochure deals with infra-red language distribution, and the products required to achieve this.

The infra-red (IR) distribution system described in this data brochure can be used with both the Philips Digital Congress Network (DCN) as well as with analogue systems such as the Philips CCS 400 and CCS 800 (in combination with up to 12 interpreter desks).

Infra-red distribution

In simple terms, an infra-red distribution system consists of a transmitter, one or more radiators and a number of receivers. Various accessories are also available, such as headphones, cables and battery chargers.

The heart of the system is the transmitter, which generates a carrier wave for each channel. Each interpretation language supplied by the audio source (DCN or analogue) is frequency-modulated on one of these carriers. All the modulated carrier waves are summed, then fed via a coaxial cable from the transmitter to a series of infra-red radiators.

The output of the infra-red radiators is intensity-modulated infra-red radiation. Each delegate is supplied with a pocket receiver, which has a lens to collect the infra-red signal and direct it to a sensor. These signals are then decoded back into interpretation languages, which are chosen by delegates using a channel selector and passed to the delegate's headphones.

Infra-Red Language Distribution System

Introduction

Characteristics of infra-red distribution systems

Infra-red radiation is an ideal medium for audio distribution. It is invisible to the human eye and can carry multiple channels each with a separate language, over relatively large distances. And, above all, it is a wireless distribution system, so conference participants can receive interpretations without being physically connected to the system.

Conference hall privacy

Conferences can often involve discussion of sensitive information, where it is important that any audio distribution does not compromise security. As infra-red radiation is unable to pass through opaque structures such as walls, the congress venue itself acts as a barrier to infra-red radiation escaping and being overheard.

Language distribution in adjacent halls

Infra-red systems are well-suited for conference centres with a number of separate halls. Since walls are opaque to infra-red radiation, there is no interference between separate conferences.

Maximum number of channels

The infra-red distribution system has a maximum of 16 channels and can therefore be used to distribute up to 16 languages.

Frequency range

The system can generate headphone frequencies ranging from 125 Hz to 12.5 kHz. Systems with such a high maximum frequency generally provide better intelligibility, making the system less tiring to use over extended periods. Delegates can therefore maintain their concentration more easily throughout a long conference session.

Freedom of movement for delegates

With an infra-red system, delegates have great flexibility in moving around within the hall, since the receivers are lightweight, portable and self-contained. As there is no physical connection to the system, delegates are free to move throughout the whole conference hall.

Installation and maintenance of the system

The system is easy to install. The installation time is largely determined by the time required to position and align the radiators. Connection of the transmitters is straightforward and quick. Once installed, the system can easily be extended to accommodate more conference delegates, simply by providing the required number of extra receivers. The basic structure of the system will remain the same.

The infra-red system is easy to maintain. The transmitter has a modular construction and modules can be easily added or removed as necessary. The infra-red distribution system is equipped with a radiator monitoring function. Circuitry in the transmitter and matching circuitry in the radiators allow effective monitoring of the infra-red radiator function. The status of the radiators is indicated by two LEDs on the transmitter and two on each radiator. Maintenance of the receivers generally involves recharging or replacing the batteries which they use.

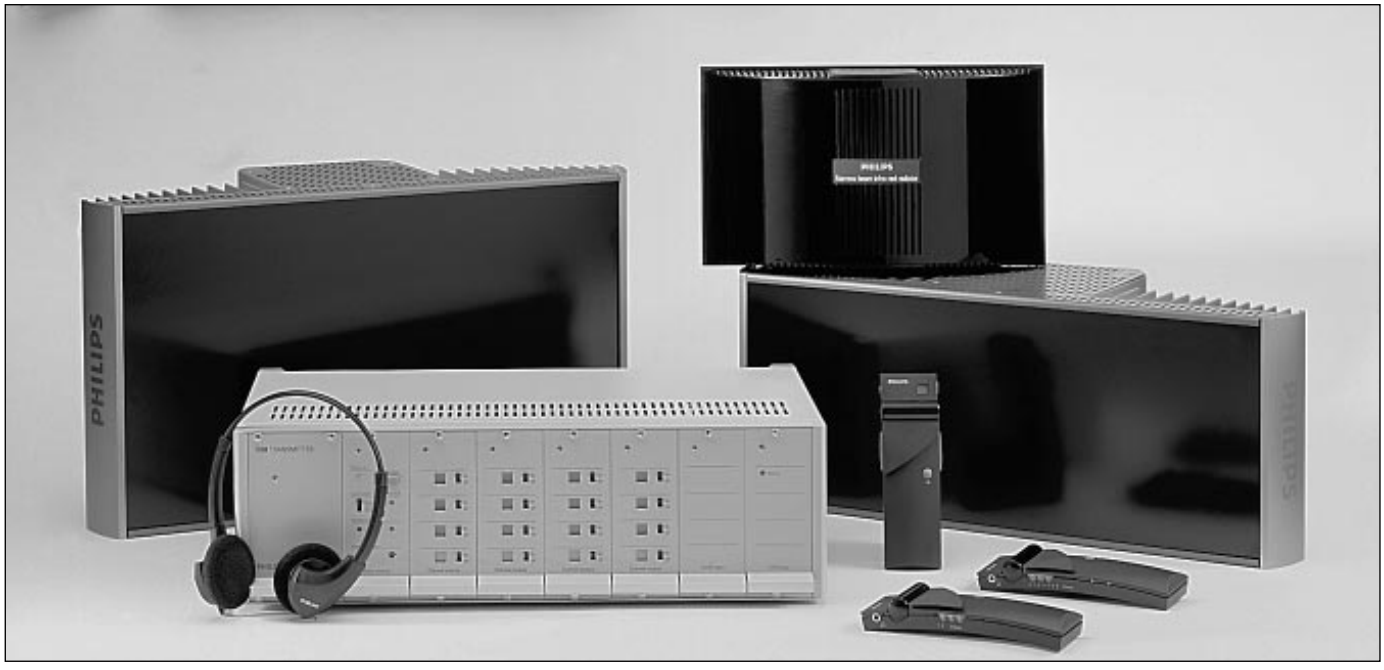
Emergency or auxiliary input

To satisfy demands for safety and security, the infra-red transmitter unit includes an additional auxiliary input which overrides all active audio channels. This auxiliary input allows the immediate distribution of emergency messages to all active channels. The emergency input may, of course, equally well be used for the distribution of music or other information.

To correctly install the radiators, the following factors should be considered:

- the effect of objects, surfaces and textures
- the effect of ambient lighting and radiation
- how to position and angle the radiators
- how to calculate the number of radiators

These subjects are discussed in the next chapter.



Infra-Red Language Distribution System

Information - what you need to know before installing an infra-red distribution system

Infra-red radiation spectrum

The nature of infra-red radiation has a number of consequences for its use in language distribution systems. Infra-red radiation forms part of the electro-magnetic spectrum, which is composed of visible light, radio waves and other types of radiation. It has a wavelength just above that of visible light, and like visible light, is reflected from hard surfaces yet passes through translucent materials such as glass. The infra-red radiation spectrum is shown in relation to other relevant spectra in figure 2.1.

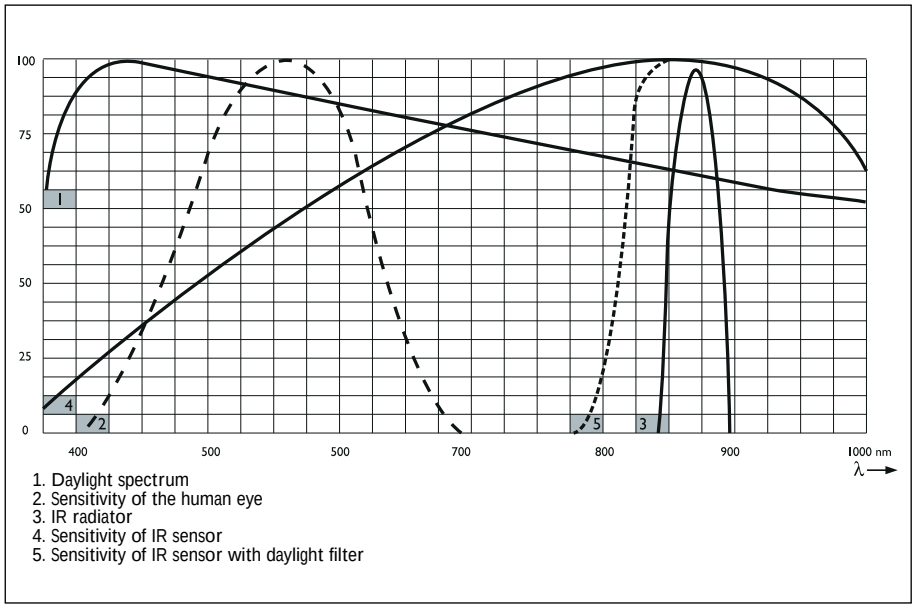


Fig 2.1 Infra-red radiation spectrum in relation to other spectra

The effect of objects, surfaces and textures

The presence of objects in a conference venue can affect the distribution of infra-red; and the texture and colour of the objects, and of walls and ceilings, can also play an important role.

Infra-red radiation is reflected from almost all surfaces. As is the case with visible light; smooth, bright or shiny surfaces reflect well, while dark or rough surfaces absorb large proportions of the infra-red signal (see figure 2.2). Infra-red radiation is absorbed even by thin obstacles such as paper. With few exceptions it cannot pass through materials opaque to light.

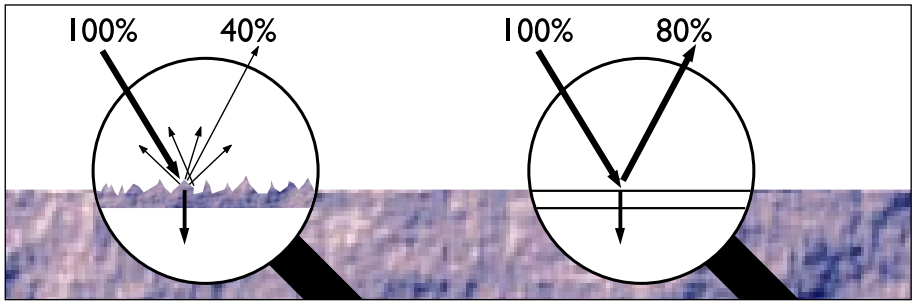


Fig 2.2 The texture of the material determines how much light is reflected and how much is absorbed

Problems caused by shadows from walls or furniture can be solved by ensuring that there are sufficient radiators and that they are well positioned, so that a strong enough infra-red field is produced over the whole conference area. Care should be taken not to direct radiators towards windows, as most of this radiation will subsequently be lost.

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Positioning the infra-red source

Since infra-red radiation can reach a receiver directly and/or via diffused reflections, it is important to take this into account when considering the positioning of the radiators. Though it is best if receivers pick up direct path infra-red radiation, reflections improve the signal-to-noise ratio and should therefore not be minimized. Radiators should be positioned high enough not to be blocked by people in the hall.

In practice, reflection from the ceiling is important. Reflection paths from the walls and the floor are usually obstructed by obstacles which are opaque to infra-red radiation.

The figures on the right illustrate how infra-red radiation can be directed to conference participants. In figure 2.3, the participant is situated clear from obstacles and walls, so a combination of direct and diffused radiation can be received. Figure 2.4 shows the signal being reflected from a number of surfaces to the participant.

For concentrically-arranged conference rooms, centrally-placed, angled radiators located high-up can cover the area very efficiently. In rooms with few or no reflecting surfaces, such as a darkened film-projection room, the audience should be covered by direct path infra-red radiation from a radiator positioned in front.

Examples of positioning radiators in various types of venue

Some examples of radiator positioning are given on the right. In figure 2.5, the radiators are positioned at each corner and adequately cover the diagonally-arranged seats. Figure 2.6 shows typical radiator positioning for venues with steep seating, and figure 2.7 shows another positioning option to cater for a hall with auditorium-style seating.

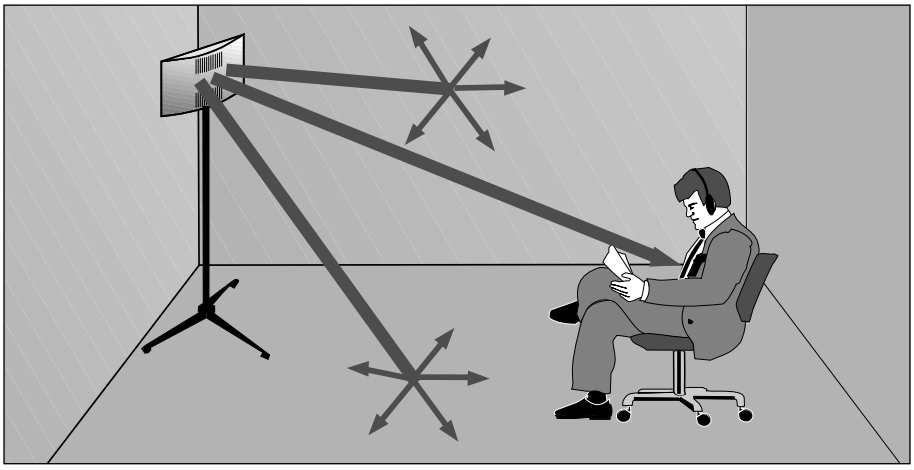

Fig 2.3 Combination of direct and reflected radiation

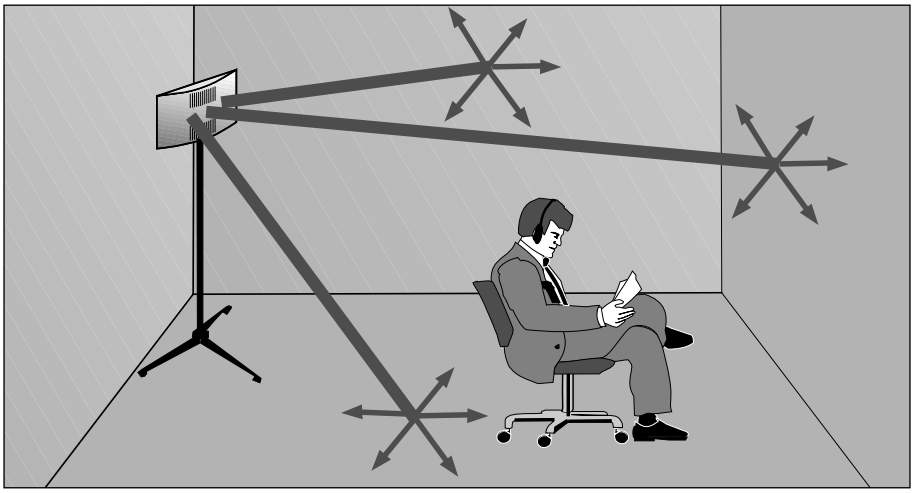

Fig 2.4 Combination of several reflected signals

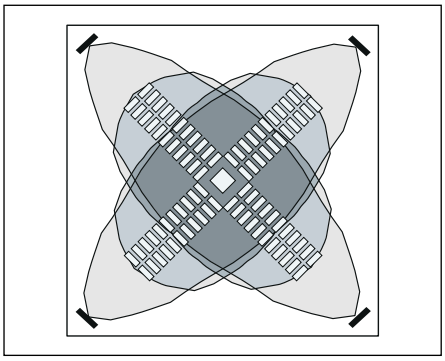

Fig 2.5 Radiator positioning in conference hall.

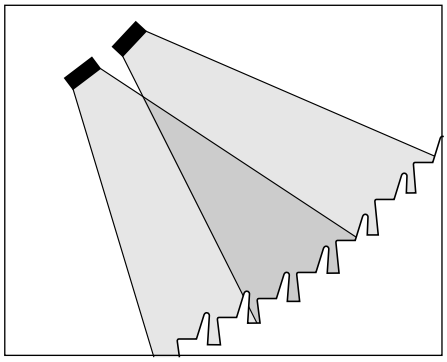

Fig 2.6 Radiator position (in cross-section) in a conference hall with very steep seating.

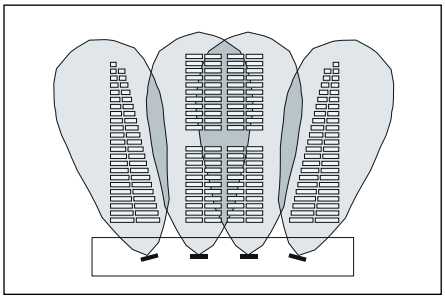

Fig 2.7 Radiator positioning in conference hall with auditorium seating.

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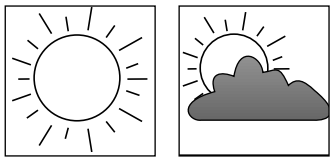
Information - what you need to know before installing an infra-red distribution system

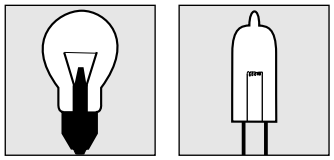
Effect of ambient lighting

There are a number of situations where ambient lighting affects the audio quality of an infra-red audio distribution system. There are five main lighting sources to consider:

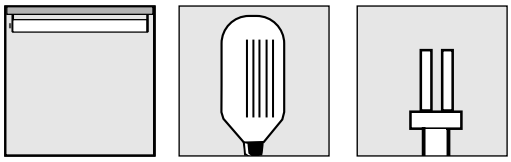
1. Sunlight
2. Halogen lamps and incandescent lamps
3. Fluorescent lamps with conventional ballasts
4. Fluorescent lamps working at frequencies of up to 28 kHz
5. Fluorescent lamps working at frequencies of 28 kHz or higher



Sunlight - if sunlight falls directly on a receiver, considerable amounts of noise are generated and this should therefore be avoided. For venues containing large, unscreened windows, you must plan on using several additional radiators. Alternatively, screening can be used to prevent daylight falling directly on receivers.



Halogen lamps and incandescent lamps - halogen and incandescent lamps (such as normal light bulbs), with or without a dimming facility, emit a high level of infra-red radiation, and will add considerable amounts of noise. It may be necessary to install additional radiators to compensate.



Fluorescent lamps with conventional ballasts - this type of lighting does not increase the noise level at the receiver side, and therefore presents no problems in congress venues.

Fluorescent lamps working at frequencies of up to 28 kHz - energy-saving fluorescent lamps (without a dimming facility) which oscillate at 28 kHz, such as PL electronic lamps, may cause interference at up to 200 kHz (this interferes with channels 0 to 3). This interference can be overcome by using the upshift facility, which eliminates interference on these channels.

Fluorescent lamps working at frequencies of 28 kHz or higher - these lamps can be used in combination with IR distribution systems only with special precautions.

Note: In general, it is advisable to carry out a site test when there is not enough information about the lighting system.

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The effects of ambient lighting on the signal-to-noise ratio

The signal-to-noise (S/N) ratio is defined as the strength of the audio signal in relation to the amount of background noise present. A signal-to-noise ratio of at least 40 dB(A) should ensure that the infra-red signal is strong enough to offer comfortable listening to conference delegates.

As described on the previous page, there are several types of ambient lighting that generate background noise and therefore affect the performance of an infra-red language distribution system.

The effect of ambient lighting on the signal-to-noise ratio of an infra-red receiver can be seen in figure 2.8. For fluorescent lighting, the decrease is negligible and fairly constant. For halogen lighting, there is a significant initial decrease, but this levels out then remains relatively constant up to 2000 lux.

The exact amount of interference is related to the illuminance at the receiver side, especially with incandescent and halogen lamps. Typical intensity figures for a variety of artificial light sources in conference venues are given below

Video or slide projectors	200 lux
Normal lighting	500 lux
Light for video recording	800 lux
Intense lighting	1000-2000 lux

(e.g. to enable clear visibility of exhibits)

Infra-red radiation pattern

The first thing to consider is how infra-red radiation is distributed by the radiators. Figure 2.9 shows an example of a footprint for the radiator LBB 3412/00, transmitting two channels in a venue with fluorescent lighting. The pattern shown represents an area within which the S/N ratio is at least 40 dB(A). An S/N ratio of this level ensures high speech intelligibility.

The shaded area shown in figure 2.9 takes tolerances into consideration, and it is this area which should be used to determine the required number of radiators and their locations. Figure 2.10 shows a 3-dimensional representation of the same radiation pattern. Figure 2.11 shows that when the radiator is angled down, a 'footprint' is created where the beam intersects a horizontal plane.

The cross section of this radiation pattern with an intersect plane, usually the floor, is known as the footprint.

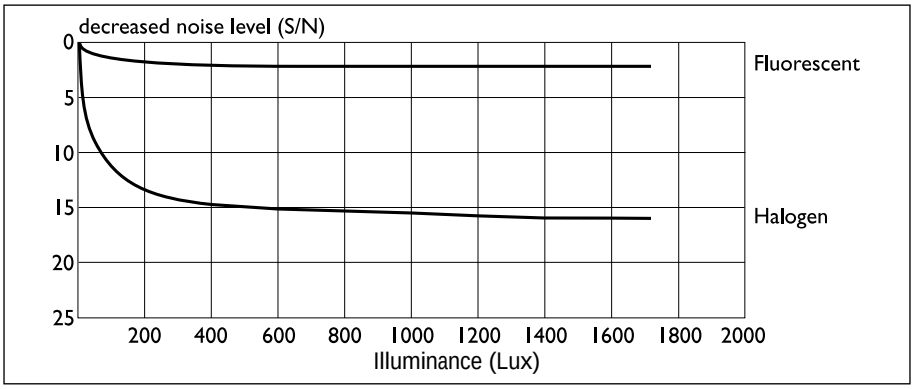

Fig 2.8 S/N ratio decrease when using fluorescent and halogen lighting

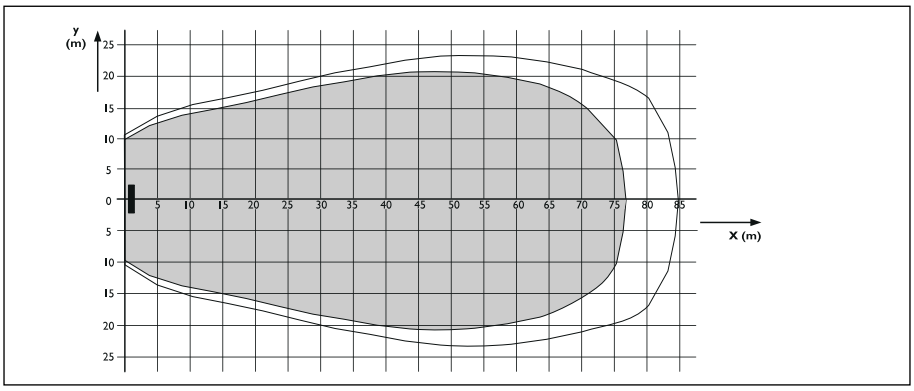

Fig 2.9 Example of an infra-red radiator footprint

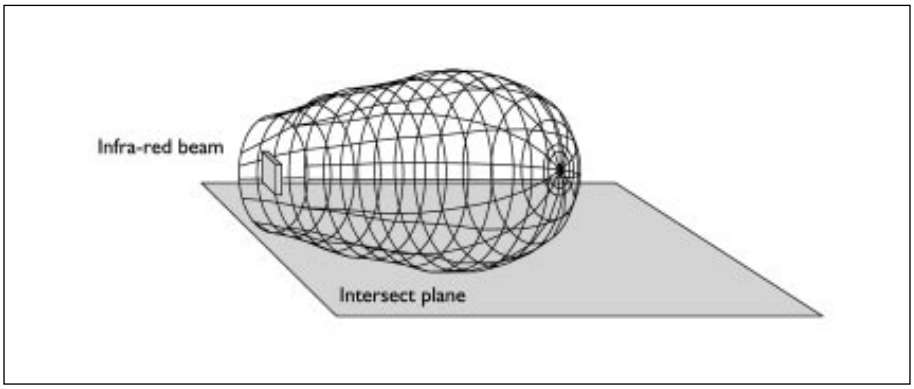

Fig 2.10 A 3-dimensional representation of Fig. 2.9

Information - what you need to know before installing an infra-red distribution system

Mounting angle of the radiators

The footprint of a radiator is defined as the area in which the signal is strong enough to ensure an S/N ratio of at least 40 dB(A). The footprint will vary depending on the angle at which the radiator is mounted. If the infra-red beam is directed at 15° with respect to the ceiling, the horizontal cross-section of the footprint will be as shown in figure 2.11.

However, if the radiator is at a greater angle (with respect to the ceiling), this cross-section (and hence the footprint) becomes smaller. In figure 2.12, the radiator is mounted higher above the floor and its beam makes an angle of 45° to the ceiling.

If the radiator is mounted so it points directly at the floor, the size of the footprint is dependant on the height of the ceiling. Figure 2.13 shows the radiator at almost its maximum height.

Because of the shape of the radiation pattern, the footprint will be larger if the ceiling is lower. For figures on maximum mounting distances and footprint areas, please refer to 'Calculating the number of radiators' on page 2.6.

Note: The size of the footprint is also dependant on the number of channels being used. The more channels there are, the smaller the footprint.

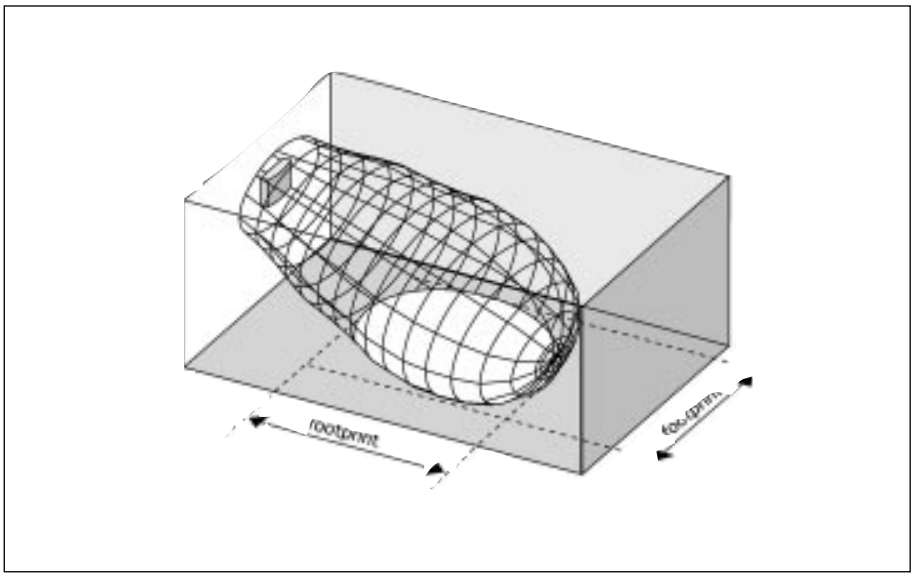

Fig 2.11 The radiator mounted at 15° to the ceiling

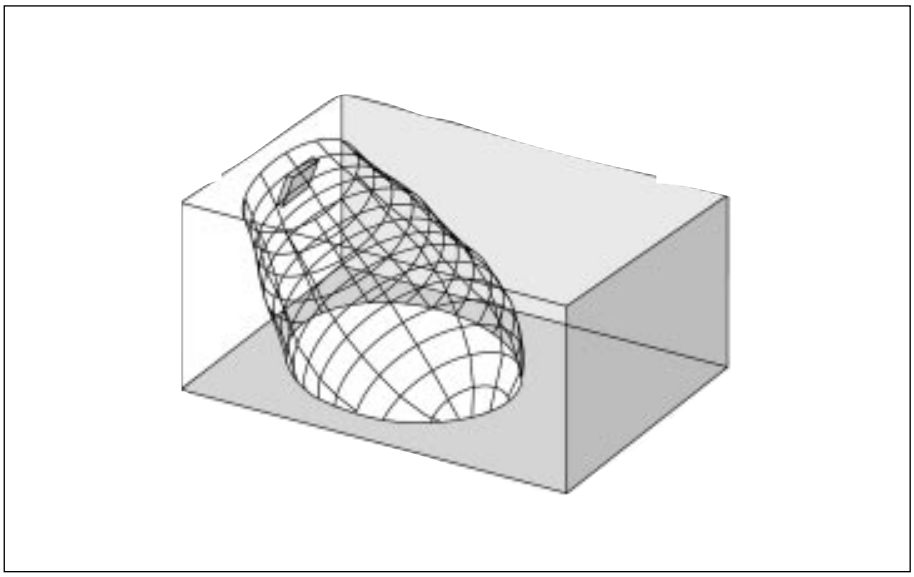

Fig 2.12 The radiator mounted at 45° to the ceiling

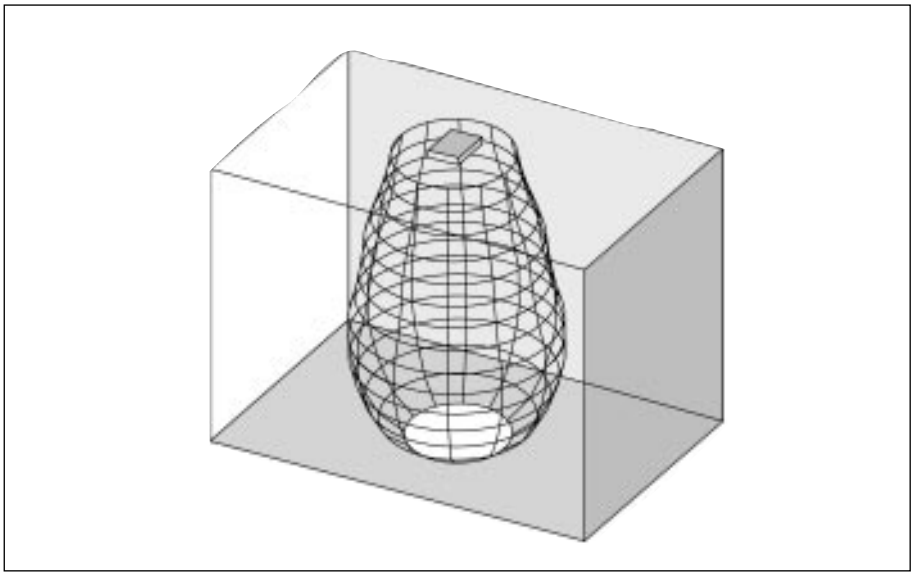

Fig 2.13 The radiator mounted perpendicular to the ceiling (i.e at 90° to the ceiling)

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Calculating the number of radiators

Determining the exact number of infra-red radiators required to give 100% coverage of a hall can normally only be done by performing a site test. The tables below and on the following pages give an indication of the guaranteed rectangular footprint under various lighting conditions, mounting heights, mounting angles and number of channels used. The figures given are for one radiator only, and therefore do not take into consideration the beneficial effects of overlapping footprints. The beneficial effects of reflections are also not included in the calculations.

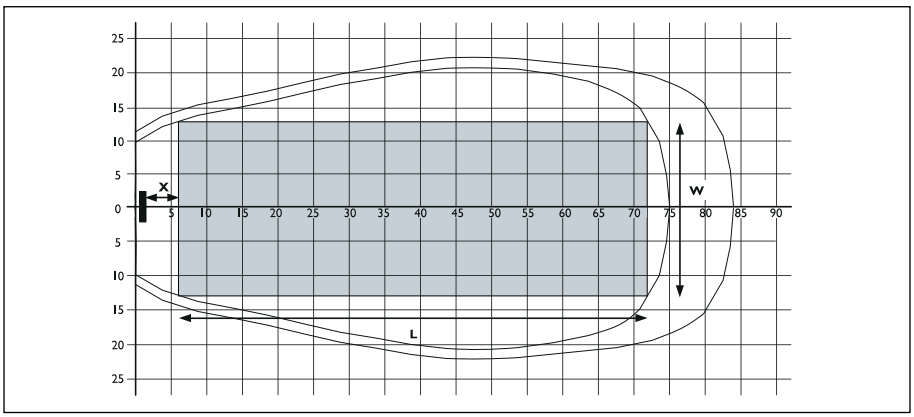

Fig 2.14 A typical radiator footprint for a mounting angle of 0°. The shaded rectangle shows the largest rectangular area where the signal-to-noise ratio is at least 40 dB(A). It si this area which is represented in the tables. The length (L), width (W) and horizontal point at which the rectangular footprint starts (X) are shown.

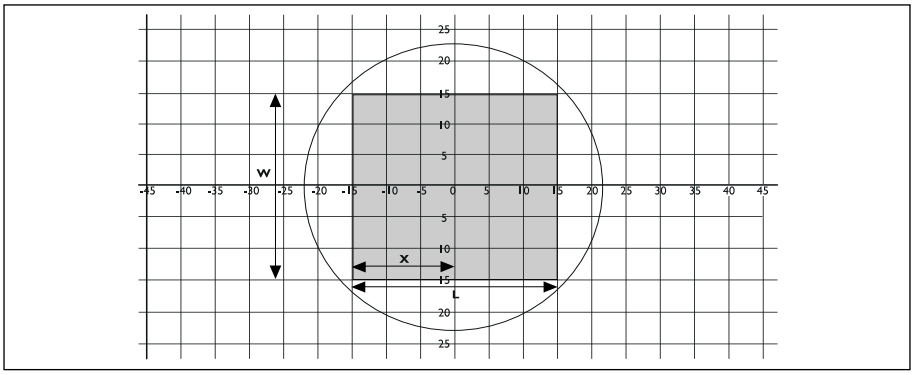

Fig 2.15 A typical radiator footprint for a mounting angle of 90°. X is negative because the radiator is actually mounted beyond the horizontal point at which the rectangular footprint starts.

Figures 2.14 and 2.15 show what is meant by a rectangular footprint. As can be seen, the rectangular footprint is smaller than the total footprint. The tables below and on page 2.7 indicate the guaranteed rectangular footprints in the presence of flourescent lighting. The tables on pages 2.8 and 2.9 indicate the guaranteed rectangular footprints in the presence of halogen and incandescent lighting. It should be noted that for fluorescent lamps operating at up to 28 kHz these figures are only valid when the upshift facility is used. For fluorescent lamps operating at frequencies of 28 kHz or higher, these figures can only be used when special precautions are taken. Under such circumstances, a site test is required. For flourescent lighting with conventional ballast, the figures can be used as given.

Fluorescent lighting (800 lux)

High output power LBB 3412/00 (25 W)

Radiator footprints in m^2 (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		2	4	8	12	16
Height	Mounting Angle	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X
2.5	0	1728 (64 x 27), 6.5	1078 (49 x 22), 5.3	738 (41 x 18), 4.4	646 (38 x 17), 2.4	576 (36 x 16), 2.4
7.5	15	1593 (59 x 27), 6.2	980 (49 x 20), 5.3	624 (39 x 16), 4.7	490 (35 x 14), 5.3	434 (31 x 14), 6.5
	30	1056 (44 x 24), 2.1	798 (38 x 21), 2.1	595 (35 x 17), 1.8	434 (31 x 14), 1.8	406 (29 x 14), 1.8
	45	580 (29 x 20), -2.9	504 (28 x 18), -1.8	336 (24 x 14), -1.5	308 (22 x 14), -0.6	294 (21 x 14), 0
	60	420 (21 x 20), -4.1	306 (18 x 17), -3.6	238 (17 x 14), -3.2	208 (16 x 13), -2.8	192 (16 x 12), -2.5
	90	400 (20 x 20), -10.0	289 (17 x 17), -8.5	196 (14 x 14), -7.0	169 (13 x 13), -6.5	144 (12 x 12), -6.0
15	30	1200 (48 x 25), 9.0	782 (34 x 23), 11.5	550 (25 x 22), 13.1	460 (23 x 20), 12.5	360 (20 x 18), 13.1
	45	918 (34 x 27), 4.8	588 (28 x 21), 6.0	462 (22 x 21), 7.1	399 (21 x 19), 7.1	357 (21 x 17), 6.5
	60	600 (30 x 20), -4.1	460 (28 x 20), -0.7	357 (21 x 17), 0.7	300 (20 x 15), 1.0	285 (19 x 15),1.0
	90	400 (20 x 20), -10.0	324 (18 x 18), -9.0	256 (16 x 16), -8.0	256 (16 x 16), -8.0	225 (15 x 15), -7.5
30	45	1050 (35 x 30), 13.1	644 (28 x 23), 13.1	342 (18 x 19), 14.8	195 (13 x 15), 15.9	70 (7 x 10), 16.6
	60	896 (32 x 28), 3.5	572 (26 x 22), 4.0	418 (22 x 19), 5.9	306 (18 x 17), 6.5	240 (16 x 15), 7.2
	90	729 (27 x 27), -13.5	576 (24 x 24), -12.0	400 (20 x 20), -10.0	324 (18 x 18), -9.0	256 (16 x 16), -8.0

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High output power LBB 3411/00 (12.5 W)

Radiator footprints in m² (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		2	4	8	12	16
Height	Mounting Angle	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X
2.5	0	966 (42 x 23), 4.7	630 (35 x 18), 3.5	420 (30 x 14), 0.6	351 (27 x 13), 0.8	325 (25 x 13), 1.7
7.5	15	836 (38 x 22), 8.5	510 (30 x 17), 7.6	322 (23 x 14), 7.5	240 (20 x 12), 7.9	198 (18 x 11), 8.2
	30	680 (34 x 20), 2.1	459 (27 x 17), 2.5	345 (23 x 15), 3.2	285 (19 x 15), 4.4	228 (19 x 12), 3.8
	45	456 (24 x 19), -0.6	320 (20 x 16), 0.0	266 (19 x 14), 0.0	216 (18 x 12), 0.0	204 (17 x 12), 0.6
	60	323 (19 x 17), -4.1	238 (17 x 14), -3.1	210 (15 x 14), -2.4	168 (14 x 12), -1.5	168 (14 x 12), -1.2
	90	289 (17 x 17), -8.5	196 (14 x 14), -7.0	144 (12 x 12), -6.0	144 (12 x 12), -6.0	121 (11 x 11), -5.5
15	30	660 (30 x 22), 5.6	396 (22 x 18), 11.6	210 (15 x 14), 12.7	121 (11 x 11), 13.1	64 (8 x 8), 13.7
	45	550 (25 x 22), 5.6	414 (23 x 18), 5.9	255 (17 x 15), 6.8	182 (14 x 13), 7.4	144 (12 x 12), 7.6
	60	414 (23 x 18), -1.2	315 (21 x 15), 0	216 (18 x 12), 0.6	198 (18 x 11), 0.6	150 (15 x 10), 1.2
	90	324 (18 x 18), -9.0	225 (15 x 15), -7.5	196 (14 x 14), -7.0	169 (13 x 13), -6.5	144 (12 x 12), -6.0
30	45	494 (26 x 19), 14.1	42 (6 x 7), 18.2	-	-	-
	60	475 (25 x 19), 4.7	210 (15 x 14), 7.1	-	-	-
	90	441 (21 x 21), -10.5	256 (16 x 16), -8.0	81 (9 x 9), -4.5	-	-

High output wide beam radiator LBB 3410/05 (2 W)

Radiator footprints in m² (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		2	4	8	12	16
Height	Mounting Angle	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X
2.5	45	70(7 x 10), -1.5	54 (6 x 9), -0.5	35 (5 x 7), 0.0	35 (5 x 7), 0.0	30 (5 x 6), 0.0
	90	56 (7 x 8), -3.5	42 (6 x 7), -3.0	30 (5 x 6), -2.5	25 (5 x 5), -2.5	20 (4 x 5), -2.0
5.0	45	108 (9 x 12), 0.0	60 (6 x 10), 2.0	45 (5 x 9), 2.5	35 (5 x 7), 2.5	30 (5 x 6), 2.5
	90	72 (8 x 9), -4.0	48 (6 x 8), -3.0	35 (5 x 7), -2.5	24 (4 x 6), -2.0	24 (4 x 6), -2.0
10	90	77 (7 x 11), -3.5	54 (6 x 9), -3.0	35 (5 x 7), -2.5	20 (4 x 5), -2.0	12 (3 x 4), -1.5

High output narrow beam radiator LBB 3410/15 (2 W)

Radiator footprints in m² (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		2	4	8	12	16
Height	Mounting Angle	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X
2.5	15	180 (18 x 10), 0.3	104 (13 x 8), 1.0	70 (10 x 7), 2.0	54 (9 x 6), 2.1	35 (7 x 5), 2.7
	45	96 (12 x 8), -1.9	77 (11 x 7), -2.1	63 (9 x 7), -1.3	54 (9 x 6), -0.8	48 (8 x 6), -0.4
	90	81 (9 x 9), -4.5	64 (8 x 8), -4.0	49 (7 x 7), -3.5	49 (7 x 7), -3.5	36 (6 x 6), -3.0
5.0	15	117 (13 x 9), 5.9	48 (8 x 6), 6.6	-	-	-
	45	110 (11 x 10), 0.8	72 (9 x 8), 1.4	49 (7 x 7), 1.6	36 (6 x 6), 1.9	36 (6 x 6), 2.3
	90	64 (8 x 8), -4.1	49 (7 x 7), -3.4	49 (7 x 7), -3.2	36 (6 x 6), -3	36 (6 x 6), -2.9
10	45	90 (10 x 9), 5.0	36 (6 x 6), 5.5	-	-	-
	90	81 (9 x 9), -4.5	64 (8 x 8), -4.0	25 (5 x 5), -2.5	-	-

Infra-Red Language Distribution System

Information - what you need to know before installing an infra-red distribution system

Halogen and incandescent lighting (800 lux)

High output power LBB 3412/00 (25 W)

Radiator footprints in m^2 (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		2	4	8	12	16
Height	Mounting Angle	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X
2.5	0	496 (31 x 16), 5.0	325 (25 x 13), 4.0	231 (21 x 11), 3.0	200 (20 x 10), 3.0	171 (19 x 9), 2.9
7.5	15	416 (26 x 16), 10.3	216 (18 x 12), 9.5	135 (15 x 9), 8.5	108 (12 x 9), 9.5	90 (10 x 9), 9.5
	30	364 (26 x 14), 3.5	216 (18 x 12), 4.0	176 (16 x 11), 4.5	150 (15 x 10), 5.1	126 (14 x 9), 5.4
	45	266 (19 x 14), 0.9	176 (16 x 11), 1.9	140 (14 x 10), 2.0	117 (13 x 9), 2.3	108 (12 x 9), 2.5
	60	180 (15 x 12), -2.5	132 (12 x 11), 0.0	100 (10 x 10), 0.3	90 (10 x 9), 0.4	80 (10 x 8), 0.3
	90	144 (12 x 12), -6.0	100 (10 x 10), -5.0	81 (9 x 9), -4.5	81 (9 x 9), -4.5	64 (8 x 8), -4.0
15	30	285 (19 x 15), 12.4	120 (12 x 10), 12.8	42 (7 x 6), 13.5	-	-
	45	340 (20 x 17), 6.3	208 (16 x 13), 6.9	120 (12 x 10), 6.9	80 (10 x 8), 6.9	56 (8 x 7), 6.9
	60	272 (17 x 16), 1.5	156 (13 x 12), 2	120 (12 x 10), 2.3	110 (11 x 10), 2.3	90 (10 x 9), 2.6
	90	196 (14 x 14), -7.0	169 (13 x 13), -6.5	121 (11 x 11), -5.5	100 (10 x 10), -5.0	100 (10 x 10), -5.0
30	45	42 (6 x 7), 16.6	-	-	-	-
	60	195 (15 x 13), 6.3	-	-	-	-
	90	225 (15 x 15), -7.5	-	-	-	-

High output power LBB 3411/00 (12.5 W)

Radiator footprints in m^2 (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		2	4	8	12	16
Height	Mounting Angle	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X
2.5	0	286 (22 x 13), 2.3	176 (16 x 11), 3.5	46 (12 x 8), 4.3	70 (10 x 7), 5.1	63 (9 x 7), 5.6
7.5	15	176 (16 x 11), 9.5	54 (9 x 6), 11.0	-	-	-
	30	252 (18 x 14), 4.3	130 (13 x 10), 5.5	63 (9 x 7), 6.9	42 (7 x 6), 8.0	-
	45	204 (17 x 12), 1.7	117 (13 x 9), 1.7	84 (12 x 7), 2.6	60 (10 x 6), 2.9	45 (9 x 5), 3.5
	60	156 (13 x 12), -1.4	108 (12 x 9), -0.9	90 (10 x 9), 0.0	72 (9 x 8), 0.4	64 (8 x 8), 0.9
	90	121 (11 x 11), -5.5	100 (10 x 10), -5.0	81 (9 x 9), -4.5	64 (8 x 8), -4.0	49 (7 x 7), -3.5
15	30	42 (7 x 6), 14.0	-	-	-	-
	45	132 (12 x 11), 7.5	-	-	-	-
	60	96 (12 x 8), 2.9	54 (9 x 6), 3.5	-	-	-
	90	144 (12 x 12), -6.0	64 (8 x 8), -4.0	25 (5 x 5), -2.5	-	-

High output wide beam radiator LBB 3410/05 (2 W)

Radiator footprints in m^2 (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		2	4	8	12	16
Height	Mounting Angle	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X	A, (L xW), X
2.5	45	30 (5 x 6), 0.0	20 (4 x 5), 0.5	15 (3 x 5), 1.0	12 (3 x 4), 1.0	12 (3 x 4), 1.0
	90	20 (4 x 5), -2.0	12 (3 x 4), -1.5	12 (3 x 4), -1.5	-	-
5.0	45	30 (5 x 6), 2.5	-	-	-	-
	90	24 (4 x 6), -2.0	15 (3 x 5), -1.5	12 (3 x 4), -1.5	-	-

Infra-Red Language Distribution System

Information - what you need to know before installing an infra-red distribution system

High output narrow beam radiator LBB 3410/15 (2 W)

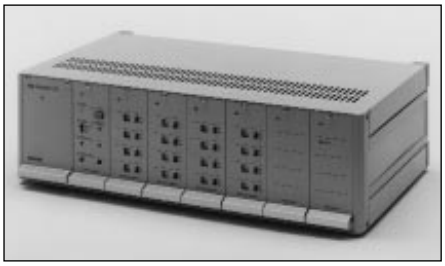
Radiator footprints in m^2 (LxW), plus minimum distance between footprint and radiator, X in m						
Number of Channels		**2**	**4**	**8**	**12**	**16**
Height	**Mounting Angle**	**A, (L xW), X**	**A, (L xW), X**	**A, (L xW), X**	**A, (L xW), X**	**A, (L xW), X**
2.5	15	35 (7 x 5), 0.4	24 (6 x 4), 0.4	12 (4 x 3), 1.3	-	-
	45	36 (6 x 6), -3.0	25 (5 x 5), -2.4	16 (4 x 4), -2.1	-	-
	90	25 (5 x 5), -2.5	-	-	-	-
5.0	45	25 (5 x 5), 2.5	-	-	-	-
	90	25 (5 x 5), -2.5	16 (4 x 4), -2.0	-	-	-

Infra-Red Language Distribution System

Infra-Red Language Distribution System

Transmitter Housing and Application Modules

The transmitter is the central element in an infra-red distribution system. It accepts analogue or digital input (DCN) for the floor language plus each of the interpretations, modulates these signals onto a carrier wave, and transmits these carrier waves to radiators located in the conference venue.



The Philips transmitter is a completely modular system that allows the ideal configuration to be realised for different conference requirements. The housing for this system is the LBB 3420/00, a 19" frame with slots for accommodating up to seven modules.

The LBB 3424/00 Basic Module must always be fitted. This enables standard functions such as power on/off, input selection, radiator status monitoring and connecting the radiators. There are separate modules available for increasing the number of channels (and thus the number of interpretations that can be distributed), for input from the Philips DCN, from analogue systems like the CCS 400 and CCS 800, and from auxiliary audio sources such as a public address system.

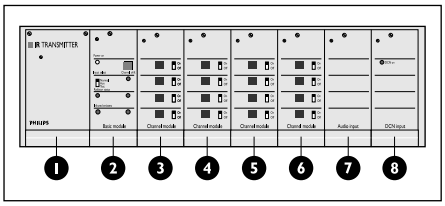


Fig. 3.1 Front view of the Transmitter Housing with all slots filled by modules.

Figure. 3.1 show a front view of the Transmitter Housing with the position of the transmitter modules. Position 1 is the Power Supply Unit which is part of the Transmitter Housing (LBB 3420/00). Position 2 houses the Basic Module and position 3 to 6 are used for Channel Modules. Positions 3 to 8 can also be used for the Symmetrical Audio Input and Interpreters Module (LBB 3422/10) and the DCN Interface Module (LBB 3423/00). The channel allocation for each position of the Channel Modules is predetermined, and is as follows:

- Position 3: channels 0-3
- Position 4: channels 4-7
- Position 5: channels 8-11
- Position 6: channels 12-15

Overview of infra-red transmitter housing and modules

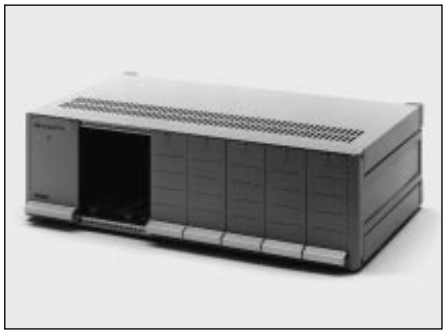
	Description	Comments
LBB 3420/00	Transmitter housing for up to seven modules and Power Supply Unit.	19-inch rack or table-top mounting.
LBB 3421/00	Channel module allows up to four interpretation channels.	Up to four channel modules possible.
LBB 3422/10	Interfaces with Philips CCS 800 and up to 12 interpreter desks.	Can accept other symmetrical audio sources.
LBB 3423/00	Interfaces with Philips DCN interpretation system.	Accepts digital (DCN) source.
LBB 3424/00	Basic module which provides four outputs to the infra-red radiators.	Facilities for monitoring, controlling and testing.

Infra-Red Language Distribution System

Transmitter Housing and Application Modules

LBB 3420/00

Infra-red Transmitter Housing and Power Supply Unit



- Can be used with DCN or analogue systems
- Up to four channel modules (16 channels) can be housed
- Auxiliary input for emergency messages
- Includes power supply module
- 19-inch rack table-top version
- Built-in audio and data bus can accomodate up to 7 application modules

The LBB 3420 is a housing that can accommodate the various application modules used to create a transmitter. It can be used in 19" rack mounting or table-top configuration, and has its own built-in power supply. It accepts up to seven modules, which are fitted into dedicated slots in the housing (see above). The module controls can be accessed via the front panel of the modules. The unit comes supplied with 19-inch mounting brackets/handles and five blanking plates for any positions not in use. An auxiliary input can be connected via a cinch plug at the back of the unit. This input is distributed to every channel and can be used for emergency messages for example.

Controls and Indicators

- Rear panel mains switch. After switching on the power the transmitter starts up in standby mode, if the Basic Module is installed.

Note: LEDs indicating the status of the system are located on the modules themselves and are described in the appropriate sections.

Interconnection

- Audio and data bus connectors.
- H15 female connector module for supply interconnection.
- Seven slots for accepting application modules.
- Cinch socket for auxiliary audio input.

Technical Data	
Dimensions (H x W x D)	140 x 450 x 266 mm (5.51 x 17.72 x 10.47 in)
Weight	5 kg (11.0 lb)
Finish	PH 10709 (grey)
Mounting	19-inch rack or table-top

LBB 3421/00

Channel Module

- Individually selectable channels
- Four channels per module
- LCD channel number indicator
- Designed for use in transmitter housing LBB 3420

The LBB 3421 generates a separate frequency-modulated carrier for each channel. The output from the Channel Module is the input to the Basic Module. One channel module allows the allocation of up to four channels for interpretations. A total of four Channel Modules can be inserted in the transmitter housing, giving a maximum of 15 channels for interpretations and one channel for floor distribution. The channels that these modules control are determined by the position of the modules in the transmitter housing, as shown on page 3.1.

Controls and Indicators

- Four front-panel slide switches to switch the four channels on or off.
- Four front-panel LCDs to show the channel numbers (0 to15). If a channel is switched off, the corresponding LCD is blank.

Transmitter Housing and Application Modules

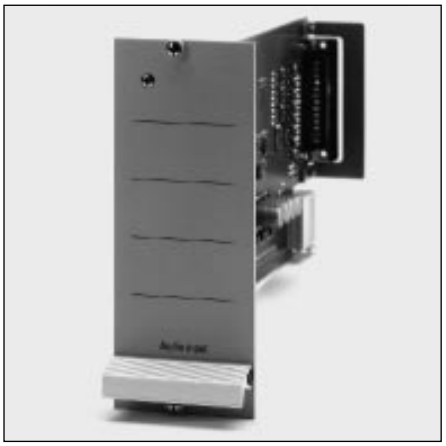
Interconnection

- Four asymmetric cinch audio input plugs.
- Audio and data bus connector.

Technical data	
Dimensions (H x W x D)	130 x 50.5 x 270 mm (5.12 x 1.99 x 10.63 in)
Weight	275 g (0.61 lb)
Finish	PH 10709 (grey)

LBB 3422/10

Symmetrical Audio Input and Interpreters Module



- For use with analogue conference systems
- Eight symmetrical inputs per module
- Up to 12 interpreter desks (LBB 3222/04) for six languages can be directly connected
- Facility for mounting input transformers
- Automatic floor selection for unused interpretation channels
- Designed for use in transmitter housing LBB 3420

The Symmetrical Audio Input and Interpreters Module is used for interfacing the infra-red transmitter with the Philips CCS 400 and CCS 800 analogue conference systems. With CCS 800, up to 12 interpreter desks (LBB 3222/04) for six languages can be directly connected to the module in a daisy-chain configuration. Eight symmetrical audio inputs at the back of the module are converted to the audio bus. This module can also accept inputs from auxiliary audio sources such as public address systems.

Different connections and switch settings are possible to also allow the module to be used with non-Philips systems. For all channels (8), an audio input transformer (Beyer TR/BV 3) can be mounted for galvanic isolation between audio source and IR transmitter.

Controls and Indicators

- On-board switches can be set for directly connecting interpreter desks (LBB 3222/04) or connecting other audio sources.
- An on-board switch can be set at position On or Off for routing the audio input to channels 0-7 or 8-15 respectively.
- An on-board switch can be used to match the amplification of floor signals from CCS 800 or from other analogue conference systems.
- An on-board switch can be used to replace the interpretation signal with the floor signal for distribution to the listeners, when an interpreter channel is not in use.

Interconnection

- Symmetrical analogue audio input - 25-pole female sub-D connector.
- Audio and data bus connector.

Technical data	
Dimensions (H x W x D)	130 x 50.5 x 270 mm (5.12 x 1.99 x 10.63 in)
Weight	200 g (0.44 lb)
Finish	PH 10709 (grey)

Transmitter Housing and Application Modules

LBB 3423/00
DCN Interface Module

- For interfacing with the DCN conference and interpretation system
- Automatically switches on the infra-red transmitter
- Designed for use in Transmitter Housing LBB 3420

The LBB 3423 DCN Interface Module allows simultaneous interpretations generated using the Philips DCN system to be distributed to conference participants via the infra-red language distribution system. The DCN Interface Module has a fixed 2 m (6 ft 6 in) cable. Interpretations plus the floor language are modulated and distributed to conference delegates.

The only signals available to the module are from DCN channels assigned to the floor language and interpretations. (This assignment can be carried out using the System Installation DCN software module). Intercom and other DCN communication channels are not available. Unused interpretations channels are automatically assigned for the distribution of the floor language.

When the DCN supply voltage is present at the module input, the infra-red transmitter is automatically switched from standby to operation mode. When the supply is not present, the transmitter is switched back to standby mode.

Controls and Indicators

- DCN supply voltage presence indicator (green LED).

Interconnection

- DCN trunk input cable (2 m (78.74 in)) with 6-pole DIN male connector.
- DCN trunk output, 6-pole female DIN female connector for loop-through connection.
- Audio and data bus connector.

Technical data	
Dimensions (H x W x D)	130 x 50.5 x 270 mm (5.12 x 1.99 x 10.63 in)
Weight	385 g (0.85 lb)
Finish	PH 10709 (grey)

LBB 3424/00
Basic Module

- Built-in mini infra-red radiator for audio monitoring
- Facilities for selecting normal, auxiliary or test signals
- LEDs to indicate system status
- Channel shift function to minimise HF interference
- Can provide output for up to 120 infra-red radiators with LBB 3411/00 or LBB 3412/00 (80 with LBB 3410/xx)
- Designed for use in Transmitter Housing LBB 3420

The LBB 3424 Basic Module is an essential component of the infra-red system and is present in every configuration. It is inserted in the transmitter housing. It provides the following functions:

- Power on/off
- Input selection
- Channel shift
- Radiator status

The Basic Module has four high-frequency inputs, each of which accepts the HF signal from an LBB 3421 Channel Module. These signals are filtered, summed and supplied as an asymmetric output to the infra-red radiators. The Basic Module has a built-in mini radiator for monitoring the system, and can generate a 1 kHz audio signal for system testing. Special connectors are supplied for terminating the coax cable for use with the LBB 3410/xx. This cable is used for connecting infra-red radiators in a loop-through chain.

Transmitter Housing and Application Modules

Controls and Indicators

- Power ON - toggles between standby and operation modes.
- 3-position front-panel slide switch for selecting one of three modes:
  - NORMAL - for normal use of the infra-red system.
  - AUX - audio signal at the rear-panel auxiliary input is distributed to all channels.
  - TEST - A 1 kHz test frequency is sent to all channels.
- 'Transmitter on' (green)/'Transmitter standby' (red) indicator (LED).
- 'Radiator disconnected/malfunctioning' indicator (red LED).*
- 'Radiator connected/functioning correctly' indicator (green LED).*
- Channel shift indicator (yellow LED).

* Indicator is active if Philips IR radiators are used.

The following controls are found on the printed circuit board inside the unit:

- Automatic Gain Control (AGC) on/off switch for symmetrical and asymmetrical audio sources.
- Channel shift switch - this increases each carrier frequency by 160/200 kHz.
- Four switches can be altered according to the type of infra-red radiator being used - whether that is Philips IR radiators with DC for remote switching or other types without remote switching facilities.

Interconnection

- 4 HF-output BNC connectors.
- Audio data bus connector.

Accessories

- Four terminating plugs for terminating each coaxial cable after the last radiator has been connected (only applies to LBB 3410/xx).

Technical data	
Dimensions (H x W x D)	130 x 50.5 x 270 mm (5.12 x 1.99 x 10.63 in)
Weight	280 g (0.61 lb)
Finish	PH 10709 (grey)

Infra-Red Language Distribution System

Transmitter Housing and Application Modules

Quick reference table

The table below allows you to see at a glance which modules are required for a specific application. You can easily identify the situation that applies to your congress venue (digital or analogue language distribution system, number of language channels, auxiliary audio input). Then simply read in the column relating to your situation which modules and how many of each are required.

Type of language distribution system	Digital (DCN)				Symmetrical Audio Input				Asymmetrical Input only				Digital and Analogue Symmetrical *1			
No. of channels	1-4	5-8	9-12	13-16	1-4	5-8	9-12	13-16	1-4	5-8	9-12	13-16	1-4	5-8	9-12	13-16
LBB 3420/00 Transmitter Housing and Power Supply Unit	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LBB 3424/00 Basic Module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LBB 3421/00 Channel Module	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LBB 3423/00 DCN Interface Module	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1
LBB 3422/10 Symmetrical Audio Input and Interpreters Module	0	0	0	0	1	1	2	2	0	0	0	0	1	1	1*2	1*2

*1 When a digital and/or an analogue symmetrical input is used, the Auto Gain Control is switched off.
*2 The maximum number of modules that can be installed in the Transmitter Housing is seven.

Radiators

Overview of infra-red radiators

Infra-red radiators are used to distribute the infra-red signals throughout the conference venue, enabling delegates to listen to the proceedings by means of personal infra-red receivers. The LBB 3411/00 and LBB 3412/00 are attractive and stylish high-power units which are ideal for large conference venues, LBB 3410/05 and LBB 3410/15 are designed for smaller venues, and as an addition to the LBB 3411/00 and LBB 3412/00. All the radiators can be mounted unobtrusively on walls, ceilings or floor stands.

	Description	Comments
LBB 3410/05	Wide beam radiator. 2 W built-in power supply	For small and medium-sized conference venues.
LBB 3410/15	Narrow beam radiator. 2 W built-in power supply	For small and medium-sized conference venues.
LBB 3411/00	High-power radiator with 12.5 W output. Built-in power supply	Ideal for medium and large conference venues.
LBB 3412/00	High-power radiator with 25 W output. Built-in power supply	Ideal for even the largest conference venues.

LBB 3410/05 and LBB 3410/15

Infra-red Radiators

- Wide- or narrow-beam transmission
- Excellent footprint coverage
- Mains and signal loop-through facility
- Unobtrusive, stylish design
- Built-in power supply
- Output power 2 W

These radiator units are used to distribute infra-red signals throughout small and medium-sized conference venues. They are designed to operate over short distances. The LBB 3410/05 is a wide-beam radiator, and the LBB 3410/15 is a narrow-beam model. These radiators have a built-in power supply and radiate when a connected transmitter is switched on.

Each radiator is equipped with 88 IREDs and has an infra-red output of 1.8 W. These radiators can be mounted unobtrusively on walls or ceilings, or on floor stands for portable installations. A mounting bracket is included.

Controls and Indicators

- Built-in green LED to indicate the radiator is switched on and is receiving carrier waves from the transmitter.
- Built-in red LED which illuminates when the infra-red output of the radiator is reduced to 70% or less of normal output level.
- 'Reduced Power' switch on the rear of the unit.

Interconnection

- Male mains socket for mains connection (3 m (9 ft 9 in) mains cable included).
- Female mains socket for mains loop-through connection.
- HF input and output connectors for connection to transmitter and loop-through to other radiators (2 x BNC connectors).

Technical data	
Dimensions (H x W x D)	300 x 176 x 125 mm (11.81 x 6.93 x 4.92 in)
Weight	1.5 kg (3.3 lb)
Finish	black
Mounting	ceiling, wall or floor

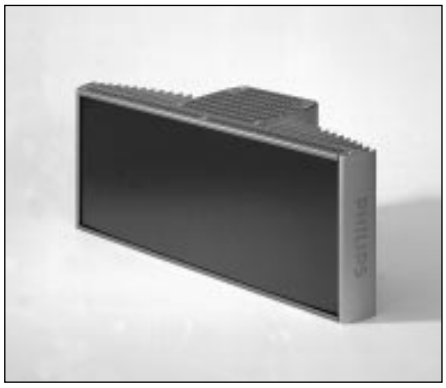
Infra-Red Language Distribution System

Radiators

LBB 3411/00 and LBB 3412/00

High-Power infra-red Radiators

- Universal mains power facility (90 to 264 Va.c.)
- Power output selection for efficiency and economy
- LED status indicators for radiator status checking
- Automatic cable termination simplifies installation
- Output power 25 W (LBB 3412/00) or 12.5 W (LBB 3411/00)



The LBB 3411/00 and LBB 3412/00 are high-power infra-red radiators which are ideal for use in even the largest conference venues. The LBB 3411/00 is equipped with 252 IREDs giving an output power of 12.5 W, while the LBB 3412/00 has 480 IREDs which deliver 25 W. This high output, coupled with effective directionality, gives very good coverage of larger venues or halls with large ceilings in an economical and easy manner. The radiators are stylishly designed and finished, and have a modern appearance which can complement any conference venue. They have convection cooling which means no cooling fan is required, so the radiators function quietly and unobtrusively.

The LBB 3411/00 and LBB 3412/00 can be connected to virtually any infra-red transmitter which uses the same analogue FM protocol in a simple loop-through configuration. Their universal mains power supply means they can be directly connected to the mains power supply almost anywhere. They are switched on automatically when the transmitter is switched on. If a radiator is not receiving carrier waves from the transmitter, it will automatically revert to standby mode to save power. It is possible to select either full- or half-power output, as required, using the power reduction switch. An automatic gain control inside each unit ensures the IREDs function with maximum efficiency.

To ensure easy monitoring, the radiators have LED status indicators which give visual confirmation that they are working properly. The radiators also communicate with the infra-red transmitter, which has a radiator status indicator to allow a centrally-located operator to easily check the radiators are connected and functioning properly. Should the radiators malfunction, or not be correctly connected, a warning LED on the transmitter will light. There is also built-in temperature protection circuitry, which automatically switches a radiator from full- to half-power if the temperature of the IREDs becomes too high. In this situation, a red warning LED will flash on the radiator. The IREDs are also protected by an attractive covering plate, making the units easy to maintain and clean.

The radiators can be mounted on walls, ceilings or stands - whichever is most suitable for the conference venue. A mounting bracket is provided for stand-mounting. A separate bracket (LBB 3414/00) is available for wall- or ceiling mounting. Once in place, the radiators can be adjusted through 0, 15 and 30° for floor-stand mounting, and through 0, 15, 30, 45, 60, 75 and 90° for wall/ceiling mounting, therefore ensuring maximum coverage.

Controls and Indicators

- Yellow LED only to indicate radiator is switched on and receiving transmitter signals.
- Red LED only to indicate the radiator is switched to standby mode.
- Red and yellow LEDs simultaneously illuminated indicate the radiator is malfunctioning.
- Yellow LED and flashing red LED to indicate that the radiator is in temperature protection mode.
- Power reduction switch to reduce the output of the radiator to half-power.

Interconnection

- Male Euro mains socket for mains connection (mains cable included).
- HF input and output connectors for connection to transmitter and loop-through to other radiators (2 x BNC connectors). Automatic cable termination by built-in switch.

Technical Data	LBB 3411/00	LBB 3412/00
Dimensions (H x W x D) (without bracket)	200 x 500 x 175 mm (7.9 x 19.7 x 7.0 in.)	280 x 500 x 175 mm (11.0 x 19.7 x 6.9 in.)
Weight: with bracket without bracket	8 kg (17.6 lb) 7 kg (15.4 lb)	11 (24.2 lb) 10 kg (22.0 lb)
Finish	Bronze coloured	Bronze coloured
Mounting	Ceiling, wall or floor stand	Ceiling, wall or floor stand

Radiators

LBB 3414/00
Wall Mounting Bracket

Bracket for wall mounting the LBB 3411/00 and LBB 3412/00 high-power infra-red radiators.

Technical data	
Dimensions (H x W x D)	200 x 280 x 160 mm (7.9 x 11.0 x 6.3 in)
Weight	1.8 kg (4.0 lb)
Finish	quartz grey
Mounting	wall

Infra-Red Language Distribution System

Infra-Red Language Distribution System

Receivers

Philips infra-red receivers incorporate the latest electronics technology - including a specially designed IC - to produce maximum performance, ergonomic design and a long battery lifetime. They offer improved sound quality and enhanced speech intelligibility. An added feature is circuitry that automatically switches off the receiver if the user has left the infra-red reception zone for a preset period of time.

Overview of infra-red receiver units

	LBB 3432/00	LBB 3432/10	LBB 3433/00	LBB 3433/05	LBB 3433/10	LBB 3433/15	LBB 3434/00	LBB 3434/10
No. of channels	2	2	7	7	7	7	16	16
Manual on/Auto off	•	•	•	•	•	•	•	•
Slider controls	•	•	•	•	•	•		
Push button controls							•	•
LCD display							•	•
Upshift Channel selection facility							•	•
Permanent upshift				•		•		
Programmable for 8/12/16 channels							•	•
Rechargeable batteries		•			•	•		•
Low battery indication							•	•
Speech boost							•	•
Operating time, hours	350	90	350	350	90	90	350	90
Charging time, hours*		2.3/14			2.3/14			2.3/14

**Note: 2.3 hours is the max. charging time using Quick Charging units*
14 hours is the max. charging time using Trickle Charging units

Infra-Red Language Distribution System

Receivers

LBB 3432/00 and LBB 3432/10

2-Channel Infra-red Receiver

- For use with headphones
- Enhanced audio intelligibility
- Automatic switch-off facility

Series LBB 3432 receivers can demodulate 2 audio channels. The LBB 3432/10 uses rechargeable batteries and has a mean operating time of 90 hours. The batteries typically take 1.5 hours to recharge, using a specially designed quick charging unit. The LBB 3432/00 uses disposable batteries (not included) - such as Philips LR6 mercury- and cadmium-free alkaline cells - which give a mean operating time of 350 hours.

Controls and Indicators

- On switch.
- Slide switch for channel selection.
- Slide adjuster for volume control.

Interconnection

- 3.5 mm (0.14 in) jack output socket for headphones.

Mechanical data	
Dimensions (H x W x D)	155 x 45 x 30 mm (6.10 x 1.77 x 1.18 in)
Weight (/00, /10)	75/120 g (0.16/0.26 lb)
Finish	charcoal

LBB 3433/00, LBB 3433/05, LBB 3433/10 and LBB 3433/15

7-Channel Infra-red Receiver

- For use with headphones
- Enhanced audio intelligibility
- Up to 7 audio channels
- Automatic switch-off facility

Series LBB 3433 receivers can demodulate up to 7 audio channels. The LBB 3433/10 and LBB 3433/15 uses rechargeable batteries and has a mean operating time of 90 hours. The batteries typically take 1.5 hours to recharge, using a specially designed quick charging unit. The LBB 3433/00 uses disposable batteries (not included) - such as Philips LR6 mercury- and cadmium-free alkaline cells - which give a mean operating time of 350 hours. The LBB 3433/05 and LBB 3433/15 have a permanent upshift facility. This significantly reduces interference caused by fluorescent lamps operating at 28 kHz.

Controls and Indicators

- On switch.
- Slide switch for channel selection.
- Slide adjuster for volume control.

Interconnection

- 3.5 mm (0.14 in) jack output socket for headphones.

Mechanical data	
Dimensions (H x W x D)	155 x 45 x 30 mm (6.10 x 1.77 x 1.18 in)
Weight (/00, /10)	75/120 g (0.16/0.26 lb)
Finish	charcoal

Receivers

LBB 3434/00 and LBB 3434/10

16-Channel Infra-red Receiver

- Programmable for up to 16 channels
- LCD display
- Upshift function for reduced interference
- Speech boost selection
- Automatic switch-off facility

Series LBB 3434 receivers, designed for more extensive interpretation systems, can demodulate up to 16 audio channels. A switch inside the battery compartment allows preselection of the maximum number or channels (8, 12, or 16) and selection of the channel shift function. The channel shift function can be easily used in combination with the Infra-red Transmitter, LBB 3420. The LBB 3434/10 uses rechargeable batteries and has a mean operating time of 90 hours. The batteries typically take 1.5 hours to recharge, using a specially designed quick charging unit. The LBB 3434/00 uses disposable batteries (not included) - such as Philips LR6 mercury- and cadmium-free alkaline cells - which give a mean operating time of 350 hours.

An LCD display is provided to give at-a-glance information which includes channel number and low battery power indication. It has push button controls for maximum ease of use and a speech boost facility to ensure superior speech intelligibility. An upshift channel selection function enables channels to be used which are not affected by interference from fluorescent lamps operating at 28 kHz.

Controls and Indicators

- On switch.
- Speech boost switch.
- Channel selection up/down push buttons.
- Volume control up/down push buttons.
- LCD display for channel number indication and low battery power indication.

The following controls are found inside the battery compartment:

- Channel shift function switch.
- Channel number selection switch (8, 12 or 16).

Interconnection

- 3.5 mm (0.14 in) jack output socket for headphones.

Mechanical data	
Dimensions (H x W x D)	155 x 45 x 30 mm (6.10 x 1.77 x 1.18 in)
Weight (/00, /10)	75/120 g (0.16/0.26 lb)
Finish	charcoal

Infra-Red Language Distribution System

Suitcases and Cabinets

Charging units are available in suitcase-style (LBB 3406/00, LBB 3407/00) and cabinet-style (LBB 3408/00, LBB 3409/00). Both types can accommodate up to 56 receiver units. Charging is microprocessor-controlled for quick charging units, and typically takes only 1.5 hours. Trickle charging of receivers takes a maximum of 14 hours. Green and red LEDs at the charging positions indicate the charge status of each receiver (LBB 3406 and LBB 3408). An LBB 3404/00 Storage Case is used to store receiver units not currently in use. It can accommodate up to 100 receiver units and its compact design makes it easy to store.

Overview of suitcases and cabinets

	Description	Comments
LBB 3404/00	Storage case for up to 100 receivers	Compact stylish design.
LBB 3406/00	Quick charging suitcase	Can hold up to 56 receivers.
LBB 3407/00	Trickle charging suitcase	Automatic mains selection facility. Can hold up to 56 receivers.
LBB 3408/00	Quick charging cabinet	Can hold up to 56 receivers.
LBB 3409/00	Trickle charging cabinet	Automatic mains selection facility. Can hold up to 56 receivers.

LBB 3404/00

Storage Case

This storage case is used to store receiver units. It includes a cover and can accommodate up to 100 receiver units, and its compact design makes it easy to store. This unit looks identical to the LBB 3406/00 and LBB 3407/00.

Technical Data	
Dimensions (H x W x D)	207 x 690 x 530 mm (8.15 x 27.16 x 20.87 in)
Weight (excluding receivers)	7.5 kg (16.5 lb)
Finish	grey

LBB 3406/00

Quick Charging Suitcase

- Quick-charge with auto-trickle charge
- Can accommodate up to 56 receivers
- Maximum charging time of 2.3 hours
- Microprocessor monitored and regulated charging
- LED status indicators

This suitcase is used to recharge receiver units type LBB 3432/10, LBB 3433/10, LBB 3433/15 and LBB 3434/10. The suitcase design is ideal for convenient storage and transportation of infra-red receivers. Each charging position is linked to a microprocessor for controlling the charging rate according to the pulse charge principle, ensuring optimum charging performance and maximum battery lifetime.

This suitcase can be set for quick with auto-trickle charge. Quick-charge is normally used. Auto-trickle charge ensures the batteries are always fully charged. Trickle-charge is only used when the receivers have been used for a very short period of time. Charging (quick-charge) takes a maximum of 2.3 hours. Green and red LEDs at the charging positions indicate the charge status of each receiver.

Infra-Red Language Distribution System

Suitcases and Cabinets

Controls and Indicators

- On/off switch.
- Mains input with loop-through facility.
- Red and green LEDs indicate status at each charging position.

Technical data	
Dimensions (H x W x D)	230x 690 x 530 mm (9.06 x 27.17 x 20.87 in)
Weight (excluding receivers)	22 kg (48.4 lb)
Finish	grey

LBB 3407/00

Trickle Charging Suitcase

- Universal mains power facility (90 to 264 Va.c.)
- Can accommodate up to 56 receiver units
- LED status indicators

This suitcase is used to recharge receiver units type LBB 3432/10, LBB 3433/10, LBB 3433/15 and LBB 3434/10. Up to 56 infra-red receivers can be recharged, and the suitcase is also ideal for convenient storage and transportation of infra-red receivers. It has a universal mains input which adapts the unit to mains voltages between 90 to 264 Va.c. (47 to 63 Hz), and a mains loop-through facility which allows up to six suitcases to be connected to a single mains socket in a loop-through configuration.

Red and yellow status LEDs are present at each charging position. The red LED indicates that charging is proceeding normally, while red and yellow LEDs illuminated simultaneously indicate a receiver-battery fault. The receivers can be stored for as long as required in charging positions, so ensuring that the batteries are always fully-charged.

Controls and Indicators

- On/off switch
- Mains input with loop-through facility
- Red and yellow LEDs indicate status at each charging position

Technical data	
Dimensions (H x W x D)	230 x 690 x 530 mm (9.06 x 27.17 x 20.87 in)
Weight (excluding receivers)	14 kg (30.8 lb)
Finish	grey

Suitcases and Cabinets

LBB 3408/00
Quick Charging Cabinet

This unit is functionally identical to the LBB 3406/00 Quick Charging Suitcase but is in cabinet form. The cabinet is stylishly designed and can be used on a table-top or conveniently wall-mounted for fixed installations. Mounting facilities are present at the rear of the cabinet.

Technical Data	
Dimensions (H x W x D)	130 x 680 x 520 mm (5.12 x 26.77 x 20.47 in)
Weight (excluding receivers)	12 kg (26.4 lb)
Mounting	wall
Finish	grey

LBB 3409/00
Trickle Charging Cabinet

This unit is functionally identical to the LBB 3407/00 Trickle Charging Suitcase but is in cabinet form. The cabinet is stylishly designed and can be used on a table-top or conveniently wall-mounted for fixed installations. Mounting facilities are present at the rear of the cabinet.

Technical Data	
Dimensions (H x W x D)	130 x 680 x 520 mm (5.12 x 26.77 x 20.47 in)
Weight (excluding receivers)	10 kg (22 lb)
Mounting	wall
Finish	grey

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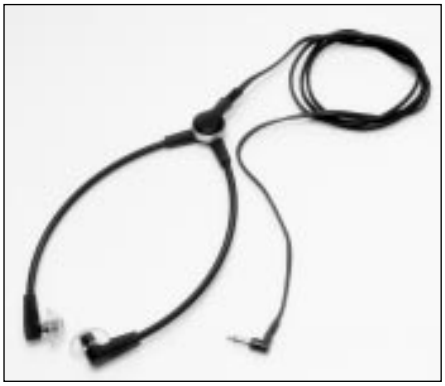
Headphones and Accessories

A range of headphones is available including stethoscopic headphones (LBB 3011/04), high-quality dynamic headphones (LBB 3015/04) and lightweight headphones (LBB 3440/00). Replacement ear pads are also available for the LBB 3015/04 and LBB 3440/00 units. There is also a lightweight single earphone (LBB 3442/00).

Overview of headphones and accessories

	Description	Comments
LBB 3011/04	Stethoscopic headphones	Lightweight.
LBB 3015/04	Dynamic headphones	High-quality sound reproduction.
LBB 3440/00	Headphones	Lightweight
LBB 3440/50	Replacement ear pads	For LBB 3440/00
LBB 3442/00	Single earphone	Lightweight
LBB 3306/00	100 m installation cable	For 6-channel interpreters' system.
LBB 3306/05	Extension cable assembly	For 6-channel interpreters' system (5 m grey).
LBB 3306/20	Extension cable assembly	For 6-channel interpreters' system (20 m grey).
LBB 3185/70	25-pole D-type plug	With sliding lock and backshell.
LBB 3185/75	25-pole D-type socket	With pin-lock and backshell.

LBB 3011/04
Stethoscopic Headphones



Lightweight headphones with stethoscopic earpieces. Fitted with a 1.2 m (47.2 in) cable terminated with a 3.5 mm (0.14 in) jack plug.

Technical data	
Weight	27 g (0.06 lb)
Colour	black

LBB 3015/04
High-Quality Dynamic Headphones

Durable dynamic headphones offering high-quality sound reproduction. Fitted with a 1.2 m (47.2 in) cable terminated with a 3.5 mm (0.14 in) jack plug.

Technical data	
Weight	90 g (0.20 lb)
Colour	black/grey

8222 321 16451
Replacement Ear Pads for LBB 3015/04 Headphones

Single pair of replacement ear pads for headphones LBB 3015/04.

Infra-Red Language Distribution System

Headphones and Accessories

LBB 3440/00
Lightweight Headphones

Durable dynamic headphones offering high-quality sound reproduction. Fitted with a 1.2 m cable terminated with a 3.5 mm jack plug.

Technical data	
Weight	84 g (0.19 lb)
Colour	black

LBB 3440/50
Replacement Ear Pads for LBB 3440/00 Headphones

Set of 50 pairs of replacement ear pads for headphones LBB 3440/00, allowing optimal hygiene in the use of these headphones. Each pair is individually packed.

LBB 3442/00
Single Earphone

Lightweight single earphone, fitted with a 1.2 m (47.2 in) cable terminated with a 3.5 mm (0.14 in) jack plug.

Technical data	
Weight	25 g (0.06 lb)
Colour	dark grey

LBB 3306/05
Extension cable assembly for 6-channel interpreter's system (5 m)

To interconnect 6-channel interpreter's desk when the standard cabling is too short.
- 12-pair cable terminated with a 25-pole D-type plug with a sliding lock mechanism and a 25-pole D-type socket with pin-lock mechanism
- Standard 5 m long, other lengths available on request
- Grey sheath

LBB 3306/20
Extension cable assembly for 6-channel interpreter's system (20 m)

As LBB 3306/05 but with a length of 20 m.

LBB 3306/00
100 m installation cable for 6-channel interpreters' system

As LBB 3306/05 but with a length of 100 m and without a 25-pole D-type plug and socket.

LBB 3185/70
25-pole D-type plug with sliding lock and backshell

Matches the 25-pole sockets on the 6-channel interpreter's desk (LBB 3222).

LBB 3185/75
25-pole D-type socket with pin-lock and backshell

Matches the 25-pole plugs on the 6-channel interpreter's desk (LBB 3222).

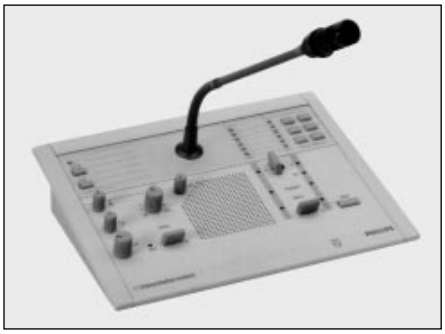
Infra-Red Language Distribution System

Interpreter desk

LBB 3222/04

6-Channel Interpreter Desk with Loudspeaker

- Built-in loudspeaker
- Six different language channels
- Channel protection facility
- Desktop or flush mounting



The LBB 3222/04 is a single-user microprocessor-controlled interpreter desk, which is suitable for use either as a free-standing, desktop unit, or as a flush-mounted unit. It can accommodate up to six different language channels plus the original floor language. Up to twelve 6-channel Interpreter Desks can be loop-through connected within and between interpreter booths. Up to three desks can be present per booth.

An incoming channel pre-selector key eliminates the need to manually search through all available language channels. Interpreters can quickly switch between the original floor language and the channel set on the channel selector. This leads to quick switching between languages and reduces the chance of operator errors. An electronic channel interlock function prevents interpreters in different booths from using the same output channel. There is also an auto-relay enable function which allows the interpreter to provide the auto-relay language (OR2) for relay interpretation.

A Channel B disable function allows the interpreter to disable channel B while ensuring that the desk remains connected to channel A.

Controls and indicators

- Microphone mounted on a flexible stem, complete with a light ring which illuminates when the microphone is on
- Headphone volume, treble and bass controls
- A-B channel selector key with channel select indicators
- 6 outgoing B-channel select keys with channel select indicators
- Outgoing 'OR2' (auto-relay) indicator
- 'Channel engaged' indicators to show which channels are in use by other interpreters
- Microphone 'Mute' key
- Microphone activating key with LED status indicator
- Select key with LED indicators for fast switching between the original floor language and the channel set on the channel selector
- Incoming channel 'OR2' (auto-relay) indicator to show that the original floor language has been replaced by a transfer interpretation channel, when the auto-relay facility is in operation
- Incoming language channel selector for headphone monitoring
- Call key (voice) to provide two-way communication between interpreter and chairman/operator
- Outgoing message key
- Incoming message indicator
- Rotary switch to preset the outgoing channel via the A output

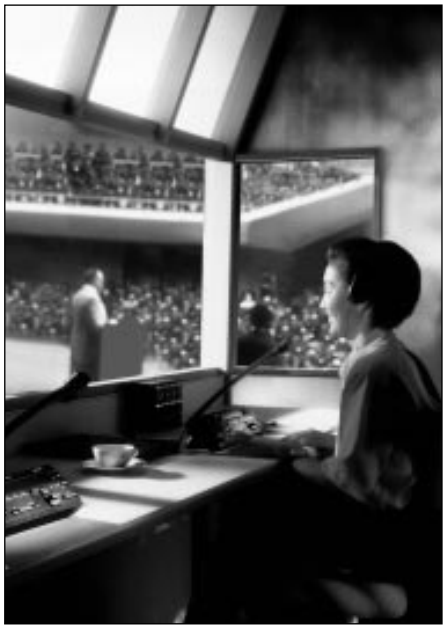
Interconnection

- 3 m cable terminated with a 25-pin D-type connector
- 25-pin D-type socket for loop-through connections
- 6.3 mm (0.25 in) stereo jack headphone connectors
- I 5-pole 180° DIN-type socket for connection of interpreter's headset with microphone, plus switch to mute the built-in microphone
- Auxiliary socket (message) for the desk's message function

Technical data	
Mounting	table-top or flush-mounting
Dimensions (H [front] - H [rear] x W x D)	20 - 58 x 250 x 189 mm (0.79 - 2.28 x 9.84 x 7.44 in)
Weight	1.75 kg (3.85 lb)
Finish	light grey

Infra-Red Language Distribution System

Digital Congress Network Equipment



Digital Congress Network equipment

The infra-red language distribution system can be used with the Philips Digital Congress Network (DCN). The range of DCN equipment uses advanced digital technology to meet the demands of modern discussion, conference and congress venues. The system comprises an extensive range of compact modular DCN units which can be assembled to produce the configuration most suited to the conference requirements. Every requirement of modern conference management is catered for, including simultaneous interpretation of languages, information display and electronic voting.

DCN technology offers high-quality audio, free from distortion and with excellent speech intelligibility, for all conference delegates, with no loss in signal quality during transmission. Because DCN uses only a single cable to carry all the system's digital signals, installation is easy and economical. By simply daisy-chaining the modular DCN units, any configuration can be put together quickly and easily. DCN technology also allows modules to be easily inserted at any point in the system cabling, so systems can be easily expanded to meet changing requirements. Software control and PC control is also possible. Small configurations do not require an operator, and even complex configurations can be monitored by a single operator.

Interpreter desks

The convenient DCN interpreter desk eases the task of the interpreter. The most relevant incoming languages can be preselected, thus reducing the chance of operating errors while the conference is in progress. The alphanumeric display gives an at-a-glance indication of the selected language, plus the 'quality level' of the incoming language, i.e. whether it is a primary or secondary interpretation. Relay interpretation caters for less well-known languages. The DCN can handle up to 15 simultaneous interpretation language channels, plus the floor language. Unused channels are automatically filled in with the floor language.

Technical Data

9.1 System specifications

Conforming to the international standards:
- IEC 914: conference systems - electrical and audio requirements
- IEC 61603: transmission of audio signals for conference and similar applications using infra-red radiation.

9.2 Transmission Links

Transmission link to delegate headphones	
Audio frequency response	100 Hz to 12.5 kHz (-3dB)
Total harmonic distortion	<4%
Crosstalk attenuation	>50 dB
Weighted signal to noise ratio	>40 dBA (within the footprint, refer to page 2-6)

9.3 Transmitters

Infra-red transmitter LBB 3420-24		
HF output: HF channel frequencies:	normal	shifted
Channel 0	55 kHz	215 kHz
Channel 1	95 kHz	255 kHz
Channel 2	135 kHz	295 kHz
Channel 3	175 kHz	335 kHz
Channel 4	215 kHz	375 kHz
Channel 5	255 kHz	415 kHz
Channel 6	295 kHz	495 kHz
Channel 7	335 kHz	535 kHz
Channel 8	375 kHz	575 kHz
Channel 9	415 kHz	615 kHz
Channel 10	495 kHz	655 kHz
Channel 11	535 kHz	695 kHz
Channel 12	575 kHz	735 kHz
Channel 13	615 kHz	775 kHz
Channel 14	655 kHz	815 kHz
Channel 15	695 kHz	855 kHz
Modulation	FM, deviation max. ±7 kHz	
LF frequency response	100 Hz to 12.5 kHz	
Distortion audio circuitry	<1%	
Crosstalk attenuation	>50 dB	
Signal-to-noise ratio	>50 dBA	
Mains voltage	115/230 Va.c. 48 to 62 Hz	
AC power consumption	75 VA	
Mains inlet	Euromains socket	
Housing	19-inch table top	
Auxiliary plug	1 x cinch straight	

Technical Data

Channel Module LBB 3421/00	
Audio input level with AGC	-16.5 dBV (150 mV_{eff}) to +3.5 dBV (1500 mV_{eff})
Audio input level without AGC	-4.4 dBV (600 mV_{eff})
Asymmetric input impedance	≥10 kΩ
Audio input plug	4 x cinch straight

Symmetrical Audio Input and Interpreters Module LBB 3422/10	
Audio input level with AGC	-16.5 dBV (150 mV_{eff}) to +3.5 dBV (1500 mV_{eff})
Audio input level without AGC	-4.4 dBV (600 mV_{eff})
Asymmetric input impedance	≥10 kΩ
DC input impedance	≥200 kΩ
Audio input plug	1 x 25 female sub D-type

DCN Interface Module LBB 3423/00	
Input plug and cable	DCN 6 pole male DIN with 1.6 m (63.0 in) cable length
Output plug (loop-through)	DCN 6 pole female DIN

Basic Module LBB 3424/00	
LF auxiliary audio input level with AGC	16.5 dBV (150 mV_{eff}) to +3.5 dBV (1500 mV_{eff})
Asymmetric input impedance	≥10 kΩ
HF output voltage, r.m.s.	1 V ± 6 dB (3 Vpp, when terminated)
HF output impedance	47 Ω
Maximum number of radiators	4 x 20 (with LBB 3410/xx), 4 x 30 (with LBB 3411/00 or LBB 3412/00)
Maximum cable length (RG59)	500 m (1640 ft) (with LBB 3410/xx), 750 m (2460 ft) (with LBB 3411/00 or LBB 3412/00)
HF output plugs	4 x BNC

9.4 Radiators

Infrared radiator LBB 3410/00 and /10	
HF input	1 to 5 V_{pp}
HF bandwidth electrical (-3 dB)	10 kHz to 1.5 MHz
Radiated frequencies	40 to 900 kHz
IR output	2 W (0.75 W at reduced power)
Total optical peak intensity	4 W/sr
IR peak wavelength	approx. 870 nm
Power consumption	25 VA
Coverage	see table on pages 2.6, 2.7 and 2.8
Mains voltage	selectable 115 or 230 Va.c. ±15%, 50 to 60 Hz

Technical Data

Infra-red radiators LBB 3411/00 and LBB 3412/00	
HF input	0.85 to 8 V_{pp}
HF bandwidth electrical (-3 dB)	10 kHz to 9 MHz
Radiated frequencies	40 to 1400 kHz
IR output	12.5 W (LBB 3411/00), 25 W (LBB 3412/00)
Total optical peak intensity	28 W/sr (LBB 3411/00), 60 W/sr (LBB 3412/00)
Peak wavelength	870 nm
Power consumption	105 VA (LBB 3411/00), 245 VA (LBB 3412/00)
Power supply frequency range	47 to 63 Hz
Coverage	see table on pages 2.6, 2.7 and 2.8
Mains voltage	90 to 264 Va.c.

9.5 Infra-red Receivers

Infra-red receivers LBB 3432/00 and /10, LBB 3433/00 and /10, LBB 3433/05 and /15, LBB 3434/00 and /10.	
Required IR irradiance level (S/N ratio >40 dBA)	4 mW/m^2 (1 channel/fluorescent lighting)
Squelch level	20 dBA ± 5 dB
LF output, load 32 Ω to 2 kΩ	100 Hz to 12.5 kHz
Output level	1 V rms
Max. signal-to-noise ratio	>56 dBA (for 1 channel distributed)
Operating time	see page 5.1
HF carrier frequencies	
LBB 3432/00 and /10	255 to 295 kHz
LBB 3433/00 and /10	55 to 295 kHz
LBB 3433/05 and /15	215 to 535 kHz
LBB 3434/00 and /10	55 to 855 kHz

9.6 Charging Storage Units

Quick charging units LBB 3406 and LBB 3408	
Number of compartments with charging and test facility	56
Mains voltage, 50/60 Hz	115/230 Va.c. ± 15% (user selectable)
Charging capability	typically 1.5 h for 56 receivers
Mains loop-through facility	Yes
Power consumption	240 VA

Storage unit LBB 3404	
Number of compartments	100

Trickle charging units LBB 3407 and LBB 3409	
Number of compartments with charging and test facility	56
Mains voltage, 47 to 63 Hz	90 to 260 V ± 15% (automatic selection)
Charging capability	14 h for 56 receivers
Mains loop-through facility	Yes
Power consumption	60 VA

Technical Data

9.7 Headphones

Stethoscopic Headphone LBB 3011/04	
Type	Stethoscope
Impedance	720 Ω
Frequency response	20 Hz to 2.4 kHz (-10 dB)
Max. power	50 mW
Sensitivity (1 kHz)	120 dB SPL/earpiece at 0 dBV/system (119 dB at 1 mW/system)

High Quality Dynamic Headphones LBB 3015/04	
Type	Dynamic
Impedance	360 Ω
Frequency response	250 Hz to 13 kHz (-10 dB)
Max. power	200 mW
Sensitivity (1 kHz)	97 dB SPL/earpiece at 0 dBV/system (96 dB at 1 mW/system)
Replacement earpads	8222 321 16451

Lightweight Headphones LBB 3440/00	
Type	Dynamic
Impedance	300 Ω
Frequency response	80 Hz to 15 kHz (-10 dB)
Max. power	100 mW
Sensitivity (1 kHz)	87 dB SPL/earpiece at 0 dBV/system (85 dB at 1 mW/system)
Replacement earpads	LBB 3440/50

Single Earphone LBB 3442/00	
Type	Dynamic
Impedance	32 Ω
Frequency response	100 Hz to 5 kHz (-10 dB)
Max. power	5 mW
Sensitivity (1 kHz)	114 dB SPL at 1 mW

9.8 Interpreter Desk

Interpreter Desk LBB 3222/04	
Frequency response	125 Hz (-10 dB) - 12.5 kHz (-2 dB)
Rated equivalent sound pressure due to inherent noise	<32 dB
Total harmonic distortion at overload	<5%
Crosstalk attenuation	>66 dB

Technical Data

9.9 System environmental conditions

General	
Temperature range	
Storage: IR receiver with batteries LBB 343x/1x	-20 °C
Operating: quick-charging suitcase LBB 3406 and LBB 3408	+35 °C
Storage: quick-charging suitcase LBB 3406 and LBB 3408	-40 °C (without receivers)
Storage: all other type numbers	-40 to +70 °C
Operating: all other type numbers	0 to 45 °C
Relative humidity	<93%
Safety	according to EN60065

Characteristics of the coax cables for connecting infra-red radiators	
75 Ω cable RG 059	Attenuation to 1 MHz: max. 1.5 dB/100 m

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Infra-Red Language Distribution System

Alphanumeric Index

Index of infra-red language distribution system according to product categories

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