BEOLINK

Master **C**ontrol **L**ink Handbook

Bang&Olufsen

PREFACE

This handbook deals with Bang & Olufsen's BeoLink System and AV system, paying special attention to the installation requirements applying to them. Consequently, this handbook is especially addressed to dealers and installers.

Any product, for example a stereo system, a PC, a natural gas system, etc., that has to be incorporated into a network needs to have certain requirements satisfied by the surroundings in connection with its installation. These requirements must ensure the optimal operation of the system after installation.

The same applies to Bang & Olufsen's BeoLink System and AV system. Although the requirements are not many, it is essential that they be known since compliance with the basic requirements often determines whether or not the system is able to operate once the installation has been completed.

This handbook gives a brief and precise introduction to the basic rules for the MCL product programme until 1994. The rules must be observed in connection with the installation of a BeoLink System and/or an AV system.

The handbook has been designed partially as a reference book but the **entire** handbook should be read in order to obtain the total overview. Only then will it serve its purpose as a reference book.

CONTENTS

READING INSTRUCTIONS

The hardware (plugs, cables, X-tra kits, etc.) used for connecting Bang & Olufsen's products into a system is always the same, no matter if it is a Beocenter 9500 and an MX 6000 that have to be connected or if it is a Beomaster 7000 and an MX 6000, for example.

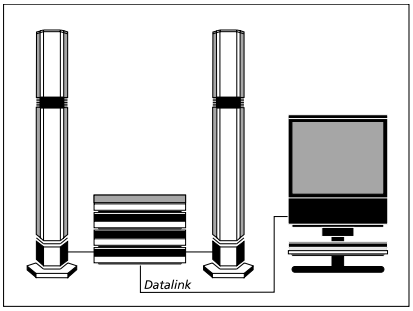
The handbook employs various symbols to illustrate audio products, video products and speakers. Unless otherwise stated in the text, these symbols merely have to be understood as covering one of these product areas and **not** as the specific product which the illustration may depict.

Since the handbook is focusing particularly on the basic rules in connection with the installation of the systems, variables which are specific to particular products have been omitted to the greatest possible extent. This means that the handbook will always be relevant in connection with installation of Master Control Link Systems and AV systems; both with regard to products launched prior to the publication of the handbook and products that will be launched later.
Because the basic rules applying to the AV and Master Control Link Systems will always be the same.

If information specific to a particular product is required, please see Bang & Olufsen's Product Configuration Guide.

GENERAL DESCRIPTION

What is an AV system?

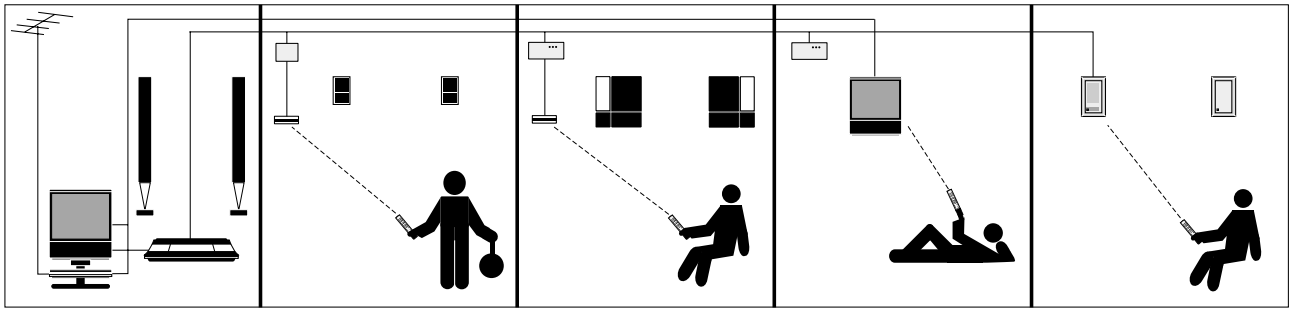


When a Bang & Olufsen audio system and video system are interconnected, they make up an AV system.

An AV system offers a number of possibilities which are not accessible if the products are placed as independent products. For example, in an AV system the sound can be moved from the TV to the audio system speakers; a function that proves its excellence when the sound and the picture have to merge into a higher synthesis. The sound from the audio system can similarly be moved to the TV speakers. This function comes in handy if you wish to record sound from the audio system on the video tape recorder, for example.

The interconnection of the audio and video systems is furthermore a condition for distributing and operating video sources (satellite, TV and video tape recorder) to and from other rooms in the house.

What is a BeoLink System?



BeoLink System is a common denominator for those elements which enable the distribution of sound and picture to different rooms in the house.
In other words, the BeoLink System enables operation and enjoyment of a centrally placed audio/video system from different rooms in the house.
Some of the basic elements included therein are:
The obligatory 7-conductor Master Control Link cable (MCL cable), X-tra kit, relay boxes, MCL 2 AV panel and IWS 2000.

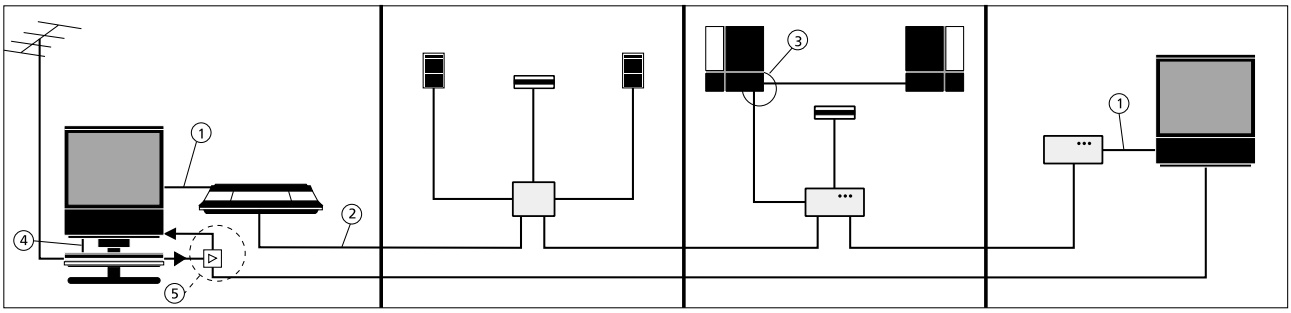
So, with a centrally placed audio system and a BeoLink System it is possible to listen to and operate e.g. a radio, CD player, tape recorder, etc. from other rooms.

If the centrally placed audio system is connected with a video system, thereby forming an AV system, a host of new possibilities are made available. This further allows the distribution of video sources to other rooms. In addition to listening to and operating the audio system from different rooms, it is also possible to watch, listen to and operate the video system from other rooms.
For example, you can listen to the TV news through the speakers in the kitchen; or you can watch and operate satellite TV and the video tape recorder via the TV in the bedroom. Encoded TV and satellite programmes can also be watched in the link room, provided that a decoder is connected in the main room. Another possibility is to listen to the radio via the TV in the bedroom, for example.

TECHNICAL DESCRIPTION

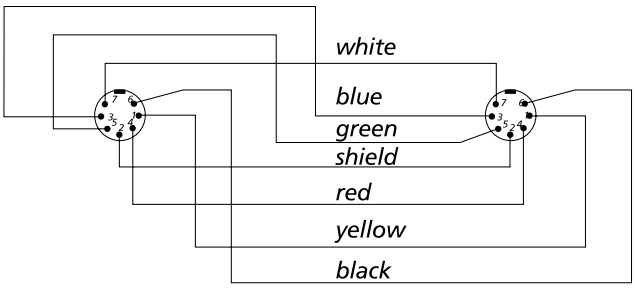
The following section contains a brief description of the cabling typically used in connection with an AV and Master Control Link System installation.

Pictures (satellite, video tape recorder and ordinary TV broadcasts) are distributed through a 75 ohm coaxial cable.



All plugs and sockets are illustrated from the solder side.

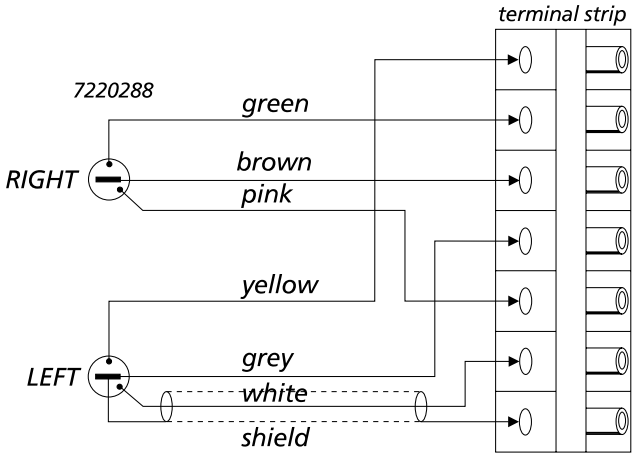
① Datalink cable



7-pin DIN cable for connection of audio and video systems:

pin 1 = yellow = output, left channel
pin 2 = shield = signal ground
pin 3 = blue = input, left channel
pin 4 = red = output, right channel
pin 5 = green = input, right channel
pin 6 = black = data ground
pin 7 = white = Datalink

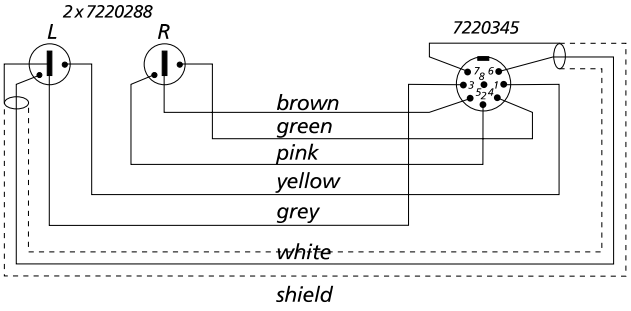
② Master Control Link cable



MCL cable between audio system and 7-pin terminal strip:

green = signal, right channel
brown= ground, right channel
pink = DC supply
yellow= signal, left channel
grey = ground, left channel
white = Datalink
shield = data shield

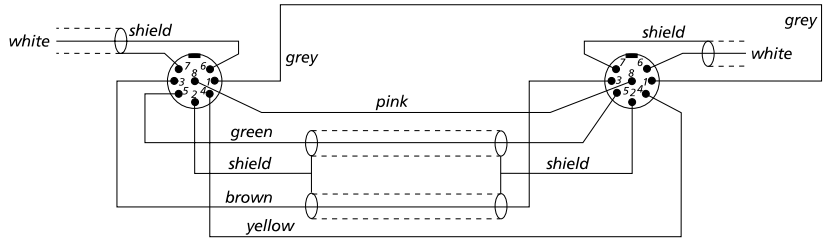
② Master Control Link cable



MCL cable between audio system and 8-pin wall socket:

pin 1 = yellow = signal, left channel
pin 2 = pink = DC supply
pin 3 = grey = ground, left channel
pin 4 = green = signal, right channel
pin 5 = brown = ground, right channel
pin 6 = white = Datalink
pin 7 = shield = data shield

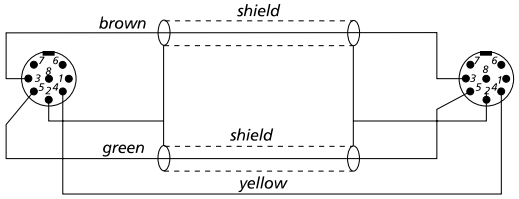
③ Power Link cable



8-pin DIN cable, Power Link cable, for connection of the Master and MCL 2P or Beolab amplifier:

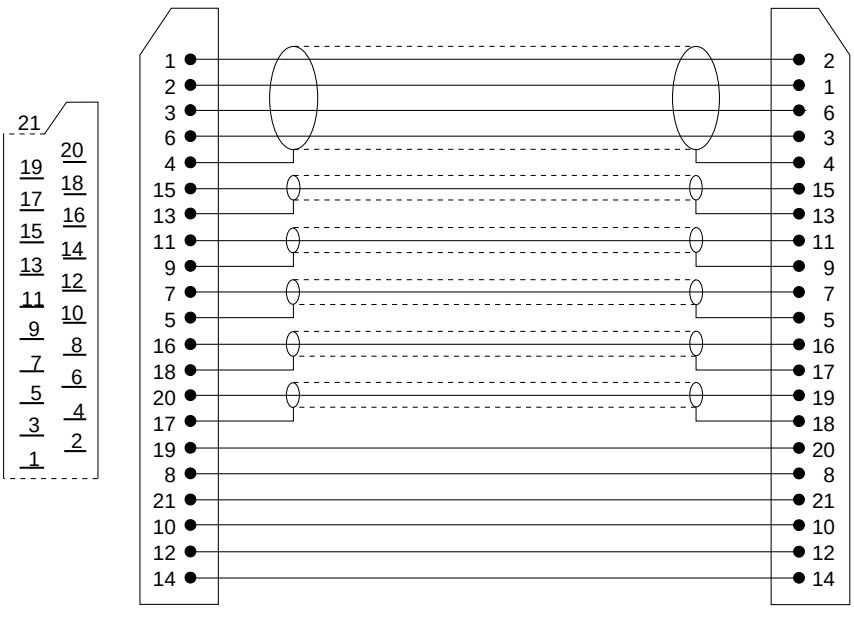
pin 1 = grey = power up/down
pin 2 = shield = ground
pin 3 = brown = signal, left channel
pin 4 = yellow = loudspeaker relay
pin 5 = green = signal, right channel
pin 6 = white = Datalink
pin 7 = shield = ground
pin 8 = pink = overload

③ Thin Power Link cable



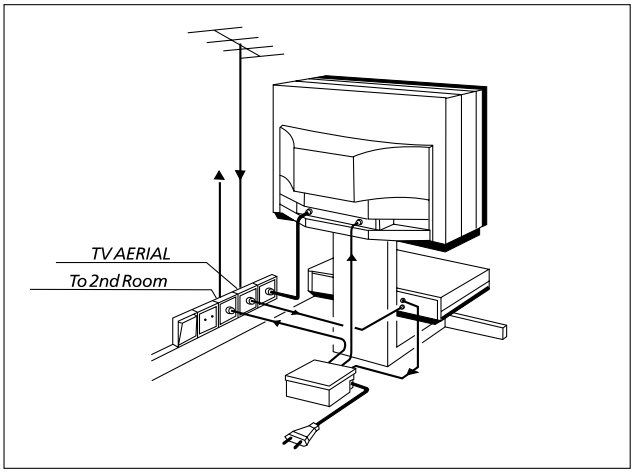
pin 2 = shield = ground
pin 3 = brown = signal, left channel
pin 4 = yellow = loudspeaker on
pin 5 = green = signal, right channel

④ 21-pin A/V cable with RGB connection



pin 1 = audio out, right channel
pin 2 = audio in, right channel
pin 3 = audio out, left channel
pin 4 = audio ground
pin 5 = blue ground
pin 6 = audio in, left channel
pin 7 = blue signal
pin 8 = 12V sense and Datalink
pin 9 = green ground
pin10 = data 2
pin11 = green signal
pin12 = data 1
pin13 = red ground
pin14 = fast blanking, ground
pin15 = red signal
pin16 = fast blanking
pin17 = video out, ground
pin18 = video in, ground
pin19 = video out, signal
pin20 = video in, signal
pin21 = shield, ground

⑤ Coaxial cable



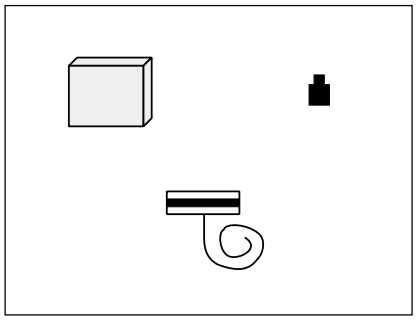
Run the coaxial cable direct to the TV-set in the local room via an aerial splitter or an aerial amplifier.

PRODUCT DESCRIPTION

Below you will find a description of the individual elements included in the BeoLink System as well as their scope of application.

Content

X-TRA SPEAKER KIT



The X-tra speaker kit contains an MCL 2A relay box, a transceiver, a Beolink 1000 wall fixture and fittings for installation.

Application

The X-tra speaker kit is used in those rooms where you wish to have sound via passive speakers. The Beolink 1000 wall fixture is intended as a storage place for the remote control terminal.

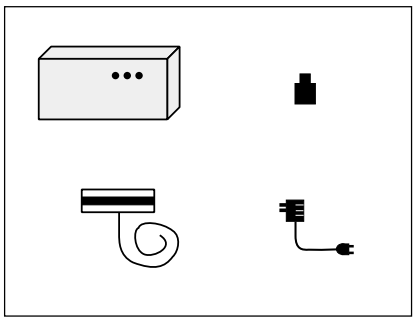
Miscellaneous

In addition to the content of the X-tra kit and the passive speakers, some MCL cable and perhaps some plugs and connection boxes are required. (See the section on installation types, page 27, for further information, if required.)

When using the X-tra speaker kit the volume adjustment is common with that in the Central room and any other X-tra speaker kits.

Content

X-TRA ACTIVE SPEAKER KIT



The X-tra active speaker kit contains an MCL 2AV panel, a transceiver, a mains adaptor, a Beolink 1000 wall fixture as well as fittings for installation.

Application

The X-tra active speaker kit is used in those rooms where you wish to have sound through active speakers. The mains adaptor supplies power to the MCL 2AV panel. The Beolink 1000 wall fixture is intended as a storage place for the remote control terminal.

In addition to using the centrally placed audio and video systems via the X-tra active speaker kit, it is possible to connect local sources (CD player and tape recorder) to the MCL 2AV panel. Connection of local sources allows you to listen to a CD player or a tape recorder independently of the centrally placed products.

The X-tra active speaker kit has built-in “volume control”. This volume control permits you to reduce the volume in the link room without affecting the volume in other rooms. The volume can be increased by 12 dB in the link room without affecting the volume in other rooms. If the volume is increased further, the volume in other rooms will be increased comparatively.

Miscellaneous

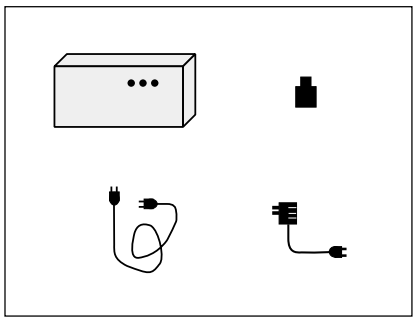
In addition to the content of the X-tra kit and the active speakers, some MCL cable and perhaps some plugs and connection boxes are required. (See the section on installation types, page 27, for further information, if required.)

REMEMBER

When planning an installation, remember that both the active speakers and the MCL 2AV panel have to be connected to the mains.

Content

X-TRA TV KIT



The X-tra TV kit contains an MCL 2AV panel, a mains adaptor, a 7-pin AV cable, a Beolink 1000 wall fixture as well as fittings for installation.

Application

The X-tra TV kit is used in those rooms where you wish to have sound and picture via a Bang & Olufsen TV set. The 7-pin AV cable forms the connection between the MCL 2AV panel and the TV set. The mains adaptor supplies power to the MCL 2AV panel. The Beolink 1000 wall fixture is intended as a storage place for the remote control terminal.

In addition to using the centrally placed audio and video system via the X-tra TV kit, it is possible to connect local sources (CD player and tape recorder) to the MCL 2AV panel. Connection of local sources allows you to listen to a CD player or a tape recorder independently of the centrally placed products. In the link room with the X-tra TV kit, the volume can be adjusted without affecting the volume in other rooms.

If the centrally placed audio system is set to a very low-volume starting level, volume adjustment of the X-tra TV in the link room will have a slight effect on the volume in other rooms.

Miscellaneous

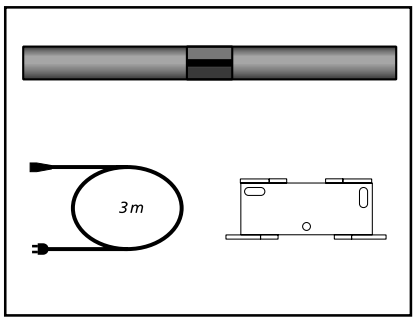
In addition to the content of the X-tra kit and the TV set, some MCL cable and perhaps some plugs and connection boxes are required.
(See the section on installation types, page 27, for further information, if required).

REMEMBER

When planning an installation, remember that both the TV set and the MCL 2AV panel have to be connected to the mains.

Content

BeoLab 3500 (LCS 9000)



The BeoLab 3500 is an integrated link room speaker consisting of an active speaker with Master Link (ML) connection, an IR receiver and a display. BeoLab 3500 also has Master Control Link (MCL) connection. Furthermore, the BeoLab 3500 has a built-in clock.

The BeoLab 3500 is supplied with a mains lead and a bracket for wall mounting.

Application

The BeoLab 3500 is used in link rooms where you wish to have an integrated active speaker. From the BeoLab 3500 it is possible to listen to all audio sources from the main room.

BeoLab 3500 has built-in sound control, meaning that tone and volume can be adjusted independently of the main room.

With the tone control it is possible to adjust balance, bass, treble and loudness individually.

BeoLab 3500 offers the following close-up operation features:

- Timer on/off
- PLAY / ST.BY

Part no.

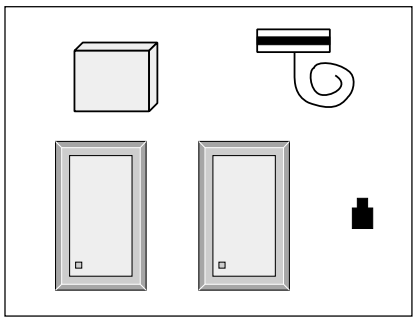
1160111 (EU)
1160211 (GB)
1160311 (USA/CDN)
1160411 (JAP)
1160511 (AUS)

Miscellaneous

Besides the parts included with the BeoLab 3500, the installation may require a Master Control Link cable as well as plugs, sockets,cable covers and connection boxes (see the section on installation types, page 27).

Content

IWS 2000



The IWS 2000 kit consist of 2 Beovox IWS 2000 and an x-tra speaker kit.

Application

The IWS 2000 kit is for building-in in light partition walls, e.g. plasterboard or wooden walls. The IWS 2000 kit is an integrated solution with loudspeakers and MCL, where the X-tra speaker kit is mounted in one of the IWS 2000 loudspeakers.

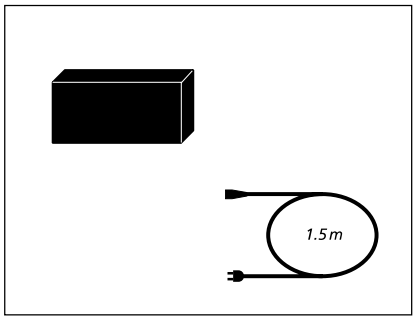
For further use, see X-tra speaker kit.

REMEMBER

As the wall dimensions and constructions vary considerably throughout Europe, it is recommended that you make sure that the IWS 2000 is suitable for mounting in your walls, before cutting the holes.
(See the IWS 2000 installation guide).

Content

BeoLink Converter



BeoLink Converter consists of a control box and a mains lead.

Application

BeoLink Converter is used when audio system and video products with Master Link and Audio Aux Link (datalink) have to be interconnected.

BeoLink Converter can be used in conjunction with both a video and an audiomaster. BeoLink Converter features autoconfiguration, meaning that it is able to detect automatically whether it is installed in a Master Link audio or in a Master Link video system. Configuration takes place when it is connected to the mains.

BeoLink Converter is used in compatibility setups (see the section on recommended compatibility setups, page 18).

Part no.

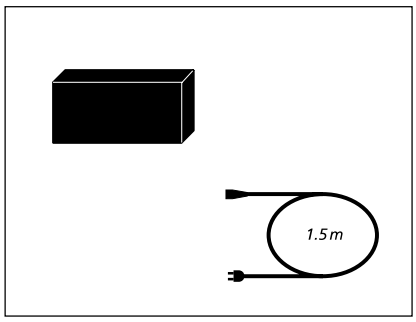
1161466 (EU)
1161366 (USA/CDN)

Miscellaneous

Besides the parts included with the BeoLink Converter, the installation requires a Master Link cable/Maste Control Link cable as well as plugs, sockets and junction boxes (see the section on installation types, page 27).

Content

AV 9000 Audio Kit



The AV 9000 Audio Kit consists of a control box and a mains lead.

Application

The AV 9000 Audio Kit is used to obtain compatibility between Beosystem AV 9000 and products without Master Link connection (see the section on recommended setups, Beosystem AV9000, page 17).

AV 9000 Audio Kit has been updated with a built-in power supply, and it features autoconfiguration. The AV 9000 Audio Kit can be used in conjunction with Beovision AV 9000 only.

Please note that the AV 9000 Audio Kit with switch cannot be used with the new 9-pin Master Link cable.

Part no.

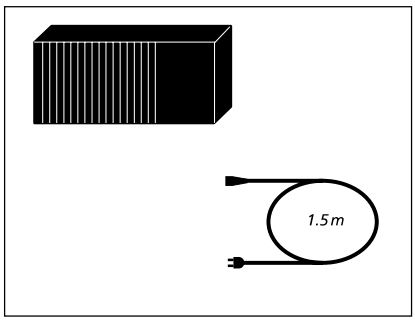
1161066

Miscellaneous

Besides the parts included with the AV 9000 Audio Kit, the installation requires a Master Link cable/Master Control Link cable as well as plugs, sockets and junction boxes (see the section on installation types, page 27).

Content

ML/MCL Converter



ML/MCL Converter consists of an amplifier including a control unit and a mains lead.

Application

ML/MCL Converter is used where a conversion from Master Link (ML) to Master Control Link (MCL) is wanted. Such a conversion is required if you want to maintain the existing Master Control Link system although the audio system in the main room is replaced with a Master Link driver, for example a BeoSound Ouverture.

At the same time the ML/MCL converter replaces MCL 2P.

See setups with ML/MCL Converter, page 20.

Part no.

Available from Nov. 1995.

1165166 (EU)
1165266 (GB)
1165366 (USA/CDN)
1165066 (AUS)

Miscellaneous

Besides the parts included with the ML/MCL Converter, the installation requires a Master Link cable, a Master Control Link cable as well as plugs, sockets and junction boxes (see the section on installation types, page 27).

SETUPS

Recommended setups

An object consisting of several parts can usually only be assembled in one way if the intended result is to be achieved. For example, a gearbox for a car will not perform optimally according to the specifications if you omit installing some of the gearwheels. If you manage to instal one gearwheel too many, that will be most likely to cause trouble as well.

The point of the above is that things must be put together in the way they were designed to be put together if they are to perform optimally.

The same applies to Bang & Olufsen's AV and BeoLink Systems. In theory, Bang & Olufsen's products may be connected in many thousands of different ways. Since it would be totally impossible to have an overview of just a fraction of this multitude of connection possibilities, Bang & Olufsen has selected the most attractive combinations. These selected combinations are called recommended setups. The recommended setups are the ones which are focused on in connection with product development and service.

When an AV system and/or a Master Control Link System is configured it is therefore very important that this is done in accordance with the recommended setups.

If the recommended setups are not followed, the result may easily be the same as with the gearbox with too many or too few gearwheels.

Bang & Olufsen services the recommended setups ONLY.

Option programming

One of the conditions for the recommended setups to perform optimally is that the products included in the setup "know" in what kind of environment they are placed.

Are they standing alone (stand-alone products) or are they standing together with other products. When option programming the products, you "tell" them whether they are stand-alone products or they are standing together with other products. After the option programming, the products will perform optimally in the given setup.

The actual option programming is executed by pressing a certain sequence of keys on the Beolink terminal.

For the Beolink 1000 terminal the key sequence is the following:

Beovision:	●	PICTURE	"digit"	STORE
Beomaster:	●	SOUND	"digit"	STORE
Link room products:	●	LINK	"digit"	STORE

Other products need not/cannot be option programmed.
The digit to be used depends on the setup.
See the illustrations on the following pages.

For the Beo4 terminal the key sequence is the following:

● Press and hold

then

LIST Press to access the setup function. The Beo4 display reads [OPTION?] - let go of both buttons

GO Press to access *Option*-programming

LIST Press to display [V.OPT] BeoVision, or
[A.OPT] Beomaster/BeoSound, or
[L.OPT] link room products

then

1 Key in the number of the appropriate *Option*, e.g. 1

The digit sequence to be used depends on the setup.

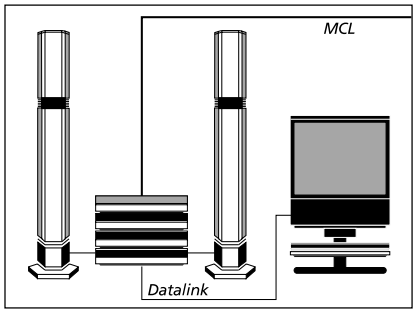
Option 0 = No IR reception
Option 1 = Two IR-eyes in the same room
Option 2 = One IR-eye in the same room
Option 4 = Link room product connected to one or two main room products

It applies to most setups that they are delivered with the correct option setting from the factory, and they are thus "ready for use".

However, since in some situations you may have to work with products that have been installed before, e.g. in connection with a house that has been rebuilt, the correct option is indicated at ALL illustrations, even those which are "ready for use" from the factory.

NOTE!
If the option programming is not executed correctly, a malfunction will occur.

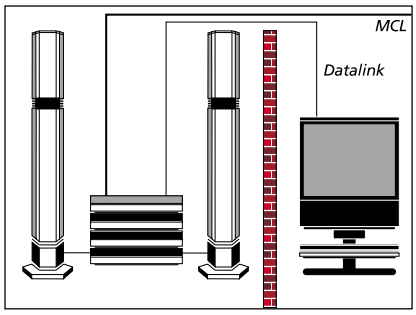
Recommended AV systems



AV system in one room

Option programming Beovision : Ready for use
Factory setting Beovision : Option 1

Option programming Beomaster : Ready for use
Factory setting Beomaster : Option 1



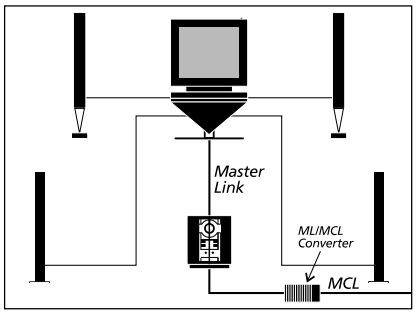
AV system in two rooms

Option programming Beovision : Option 2
Factory setting Beovision : Option 1

Option programming Beomaster : Option 2
Factory setting Beomaster : Option 1

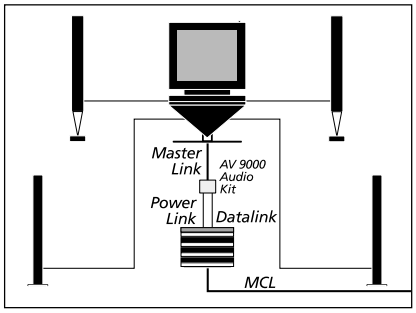
Recommended AV 9000 Systems

AV system in one room



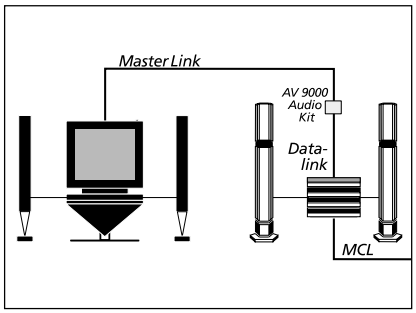
1.

Option programming AV 9000	:	Ready for use
Factory setting setting AV 9000	:	Option 2
Option programming Master Panel	:	Ready for use
Factory setting Master Panel	:	Option 2



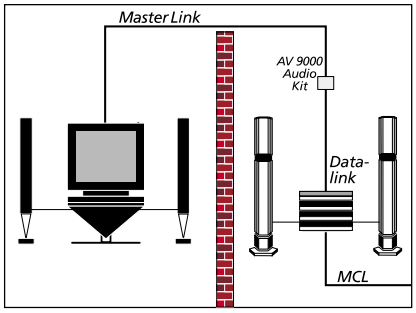
2.

Option programming AV 9000	:	Ready for use
Factory setting AV 9000	:	Option 2
Option programming Beomaster	:	Option 0
Factory setting Beomaster	:	Option 1
AV 9000 Audiokit with one ML-socket	:	Ready for use
AV 9000 Audiokit with two ML-sockets	:	Switch in position 3



3.

Option programming AV 9000	:	Option 1
Factory setting AV 9000	:	Option 2
Option programming Beomaster	:	Ready for use
Factory setting Beomaster	:	Option 1
AV 9000 Audiokit with one ML-socket	:	Ready for use
AV 9000 Audiokit with two ML-sockets	:	Switch in position 2



AV system in two rooms

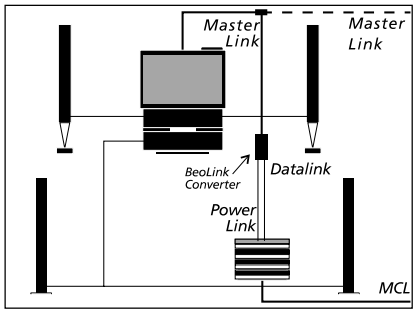
Option programming AV 9000	:	Ready for use
Factory setting AV 9000	:	Option 2
Option programming Beomaster	:	Option 2
Factory setting Beomaster	:	Option 1
AV 9000 Audiokit with one ML-socket	:	Ready for use
AV 9000 Audiokit with two ML-sockets	:	Switch in position 2

NOTE!
Information as to which Beomaster can be connected to AV 9000 audio kit, see Bang & Olufsen Product Configuration Guide.

Recommended compatibility setups

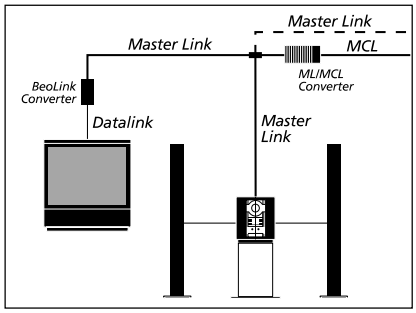
Compatibility between products with Master Link connection and Audio Aux Link (datalink) connection or Master Control Link connection.

One room setup



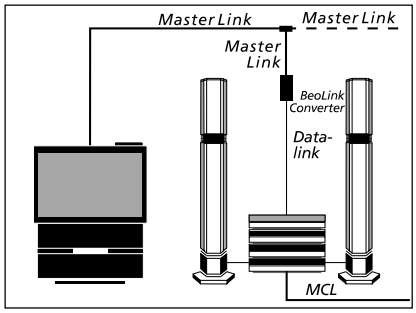
1.
Option programming BeoVision : Option 2
Factory setting BeoVision : Option 1

Option programming Beomaster : Option 0
Factory setting Beomaster : Option 1



2.
Option programming BeoVision : Ready for use
Factory setting BeoVision : Option 1

Option programming BeoSound : Ready for use
Factory setting BeoSound : Option 1

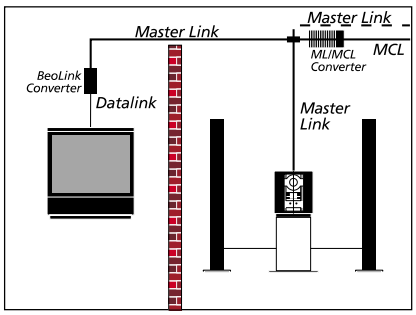


3.
Option programming BeoVision : Ready for use
Factory setting BeoVision : Option 1

Option programming Beomaster : Ready for use
Factory setting Beomaster : Option 1

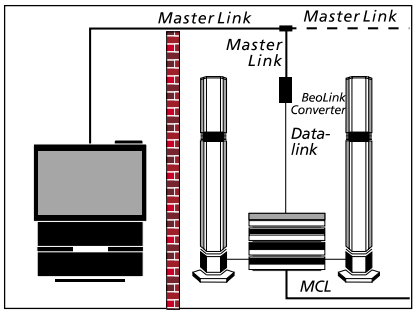
NOTE!
Information as to which Beomasters and BeoVisions can be connected to BeoLink Converter, see Bang & Olufsen's Product Configuration Guide.

Two room setup



1.
Option programming BeoVision : Option 2
Factory setting BeoVision : Option 1

Option programming BeoSound : Option 2
Factory setting BeoSound : Option 1



2.
Option programming BeoVision : Option 2
Factory setting BeoVision : Option 1

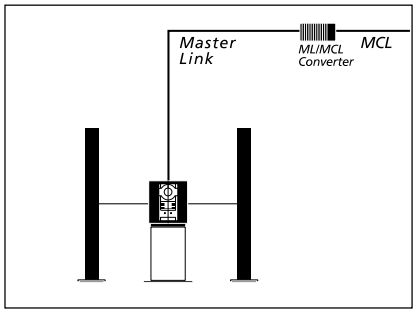
Option programming Beomaster : Option 2
Factory setting Beomaster : Option 1

NOTE!
Information as to which Beomasters and BeoVisions can be connected to BeoLink Converter, see Bang & Olufsen's Product Configuration Guide.

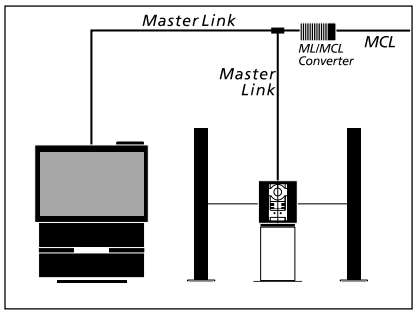
Setups with ML / MCL Converter

This product is used where the customer wishes to maintain his current MCL system and to replace the audio system in the main room with a Master Link driver.

The ML/MCL Converter can be connected to all recommended MCL link room setups.

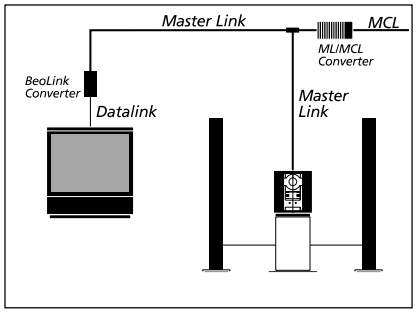


1.
Option programming BeoSound : Ready for use
Factory setting BeoSound : Option 1



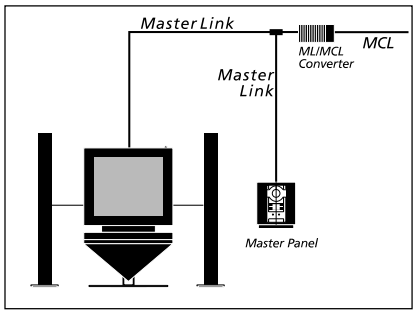
2.
Option programming BeoVision : Ready for use
Factory setting BeoVision : Option 1

Option programming BeoSound : Ready for use
Factory setting BeoSound : Option 1



3.
Option programming BeoVision : Ready for use
Factory setting BeoVision : Option 1

Option programming BeoSound : Ready for use
Factory setting BeoSound : Option 1

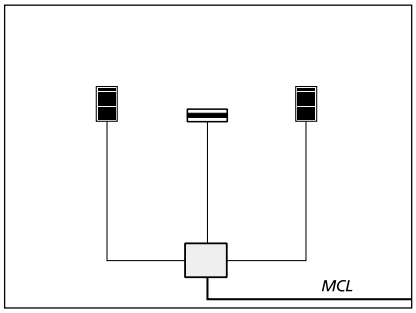


4.
Option programming AV 9000 : Ready for use
Factory setting AV 9000 : Option 2

Recommended Link Room setups

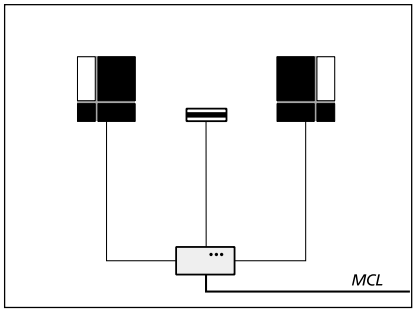
One or several recommended Link room setups may be connected to the above-mentioned Main room.

NOTE!
If the audio system in the Main room is a BS 2300 or a BS 2500, see the section on special setups.



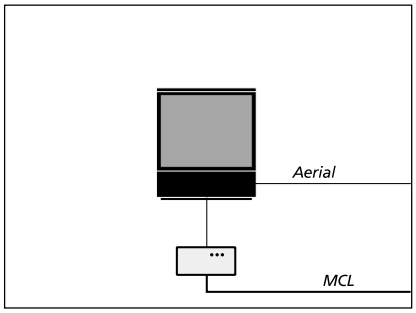
Passive speakers in Link room

Option programming : Ready for use
Factory setting : Option 2



Active speakers in Link room

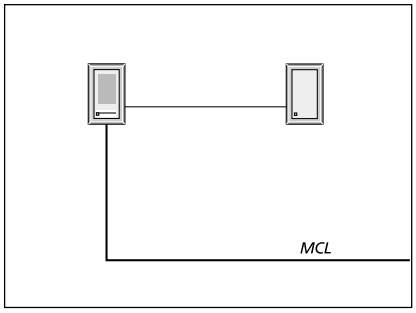
Option programming : Ready for use
Factory setting : Option 2



TV in Link room

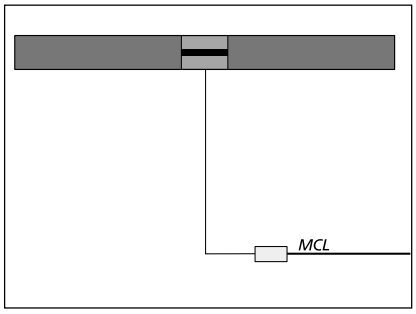
Option programming Beovision : Option 2
Factory setting Beovision : Option 1

To be able to receive video tape recorder and satellite from the Main room, the TV in the Link room has to be set (tuned in) to receiving the modulator frequency of the video tape recorder.



IWS 2000 in Link room

Option programming : Ready for use
Factory setting : Option 2



BeoLab 3500 in Link Room

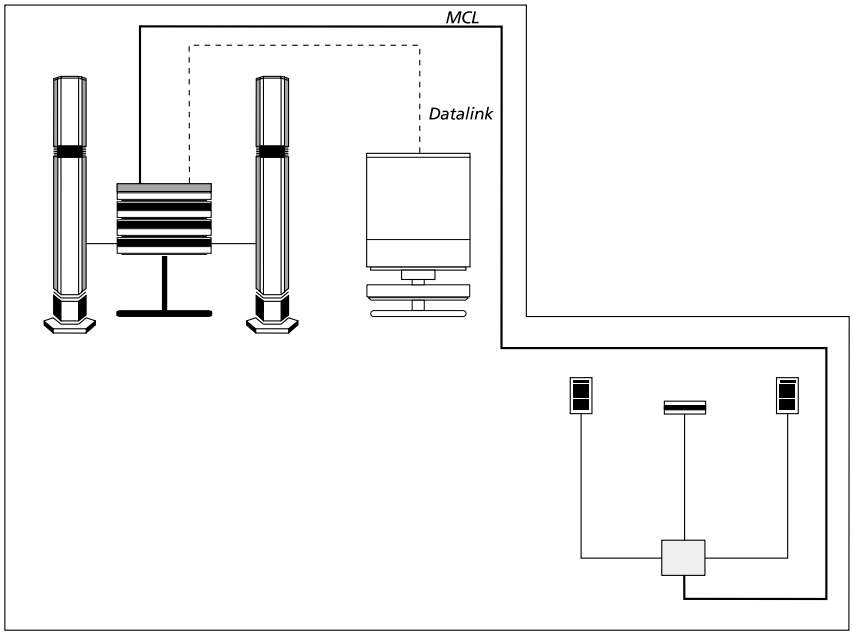
Option programming : Ready for use
Factory setting : Option 2

Special setups

Further to the recommended setups, there are two additional combinations. The reason why they are not mentioned under recommended setups is that they do not fully live up to Bang & Olufsen's own standards as regards operating simplicity. They have been included anyway, because in some situations they might be appropriate, and they will always permit operation of the basic functions such as source selection (radio, CD, a.tape, etc.), source control (fast forward and rewind, step, selection of a certain track, etc.) and volume control.

If an additional listening area is required in the main room, e.g. if it is an L-shaped room, it should be possible to operate it without activating the listening area by the AV system (the speakers connected to the centrally placed audio system), it is possible to mount an X-tra speaker kit, an X-tra active speaker kit or an IWS 2000 kit in the Central room.

X-tra speakers, X-tra active speaker, BeoLab 3500 or IWS 2000 kit in Main room



Option programming link room product : Option 4

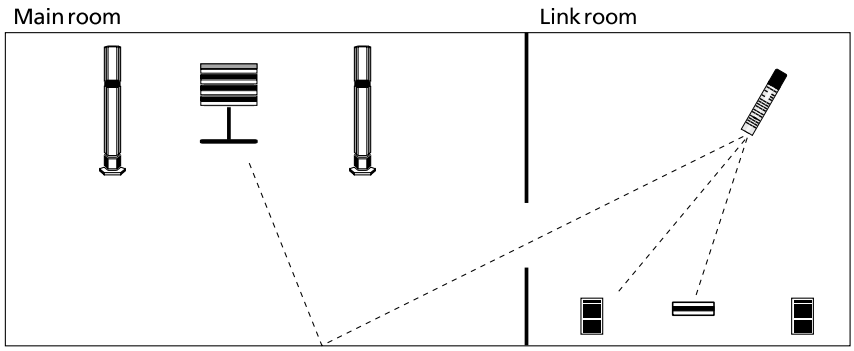
Audio/video system : See AV setups

Note
- The AV system is operated in the ordinary way.
- The extra listening area will only understand information from the terminal if the LINK key is actuated prior to a source selection (CD, radio, a.tape, etc.).

Example:
LINK RADIO = sound from radio in the extra listening area
LINK CD = sound from CD player in the extra listening area
LINK AV TV = sound from TV in the extra listening area

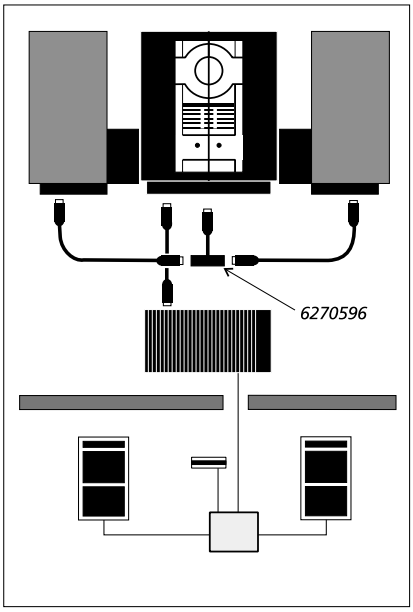
- The extra listening area CANNOT be operated with a Beolink 1000 mk.I.

Moreover, the above-mentioned Option 4 can be used if a Link room and the Main room are located in such a way that both rooms will be operated simultaneously. By setting the Link room to Option 4, the room can be operated independently of the Main room, because the Link room which is set to Option 4 will only accept information from the terminal if the LINK key has been actuated.



NOTE!!
The X-tra TV kit CANNOT be set to Option 4!
Option 4 CANNOT be used between two link rooms!

Beosystem 2300/2500 with MCL



Beosystem 2300/2500 do not have a built-in output amplifier, and consequently a BeoLink System cannot be immediately connected to a Beosystem 2300/2500.
If a BeoLink System is to be connected to a Beosystem 2300/2500, the solution shown below must be employed. (MCL 2P is used as output amplifier).

SETUPS WITH LIGHT CONTROL

The BeoLink System allows operation and enjoyment of a centrally placed audio and video system from different rooms in the house.

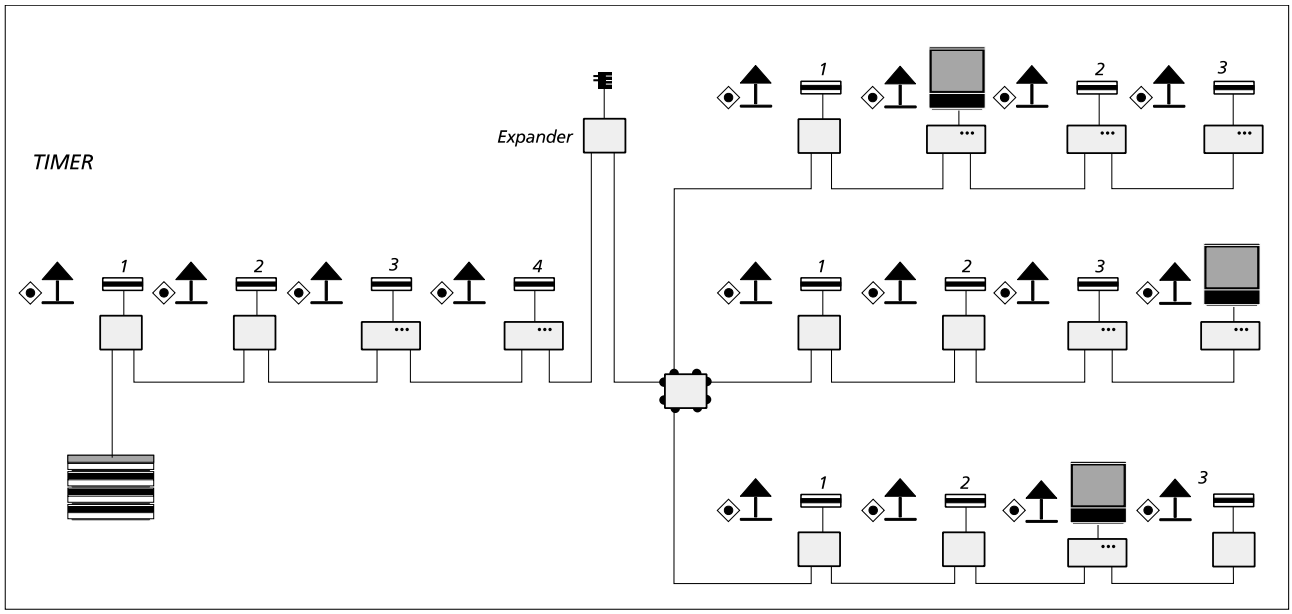
Furthermore, the light in the entire house may be controlled via the BeoLink System. You may sit in any room in the house and control the light in the rest of the house (link light control). This can be done either by means of the Beolink terminal or through timer programming.

Up to nine Light Controls can be connected in each room. A condition for achieving link light control is that the transceivers in the setups are set to transmitting link light commands. This setting is programmed in the following way:

First ensure that the entire system is in stand-by.

While pressing the "TIMER" key on the transceiver, enter a digit (1, 2, 3 or 4) into the Beolink terminal.

Each digit must not be repeated more than four times.

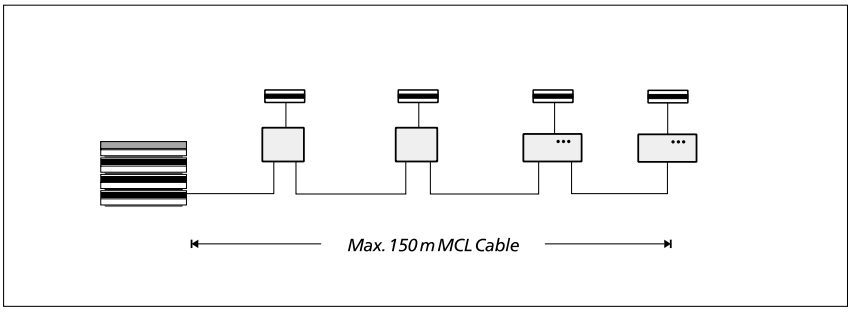


Link light control can also be transferred via Beovision. Beovision are set by the factory to transferring link light control, and no additional programming in connection with light control is therefore required.

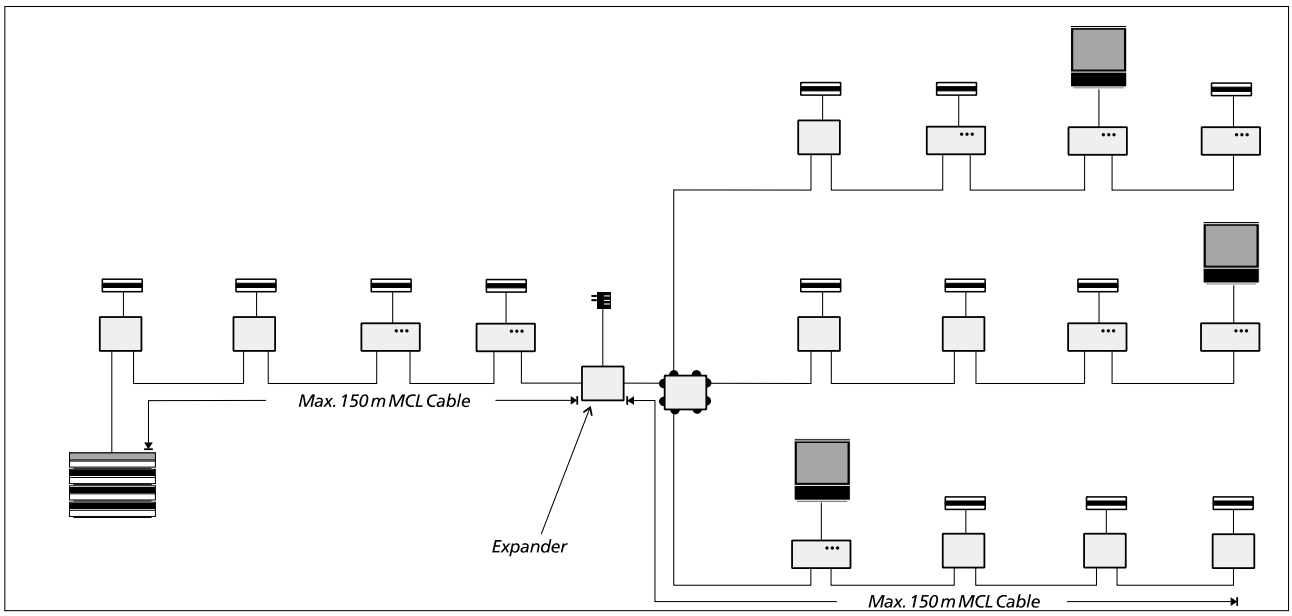
Link light control is not possible with all audio systems, please refer to Bang & Olufsen Product Configuration Guide for specific information of a particular product.

DIMENSIONING

It is possible to connect four MCL 2A's or 2AV's to a Beomaster or a Beocenter, and a maximum of 150 m of MCL cable may be used.

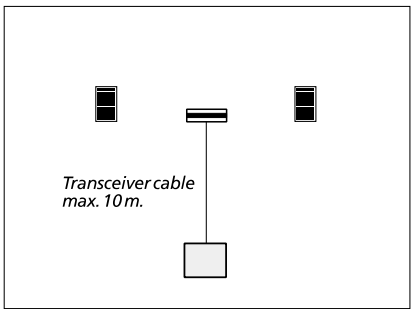


If the number of MCL 2 units is increased, or if more than 150 m of cable is used, it is necessary to insert an MCL 2 Expander.



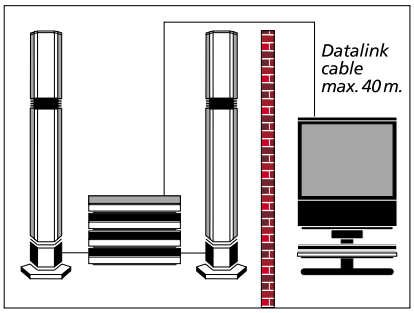
An additional 12 MCL 2 units can be connected to the MCL 2 Expander. These 12 units can be distributed in up to three strings with a maximum of four units in each string. The total cable length connected to the MCL 2 Expander must not exceed 450 m (3 x 150 m). The MCL 2 Expander should be placed as close to the audio master as possible.

Applicable to the MCL 2A only.
As the speakers in the link rooms are connected in parallel, there is a limit to the number of link rooms in which the speakers can be cut in simultaneously. If too many speakers are cut in at the same time, the protection circuit of the audio master will be activated and either lower the volume or switch the whole system into stand-by.



The cable between the transceiver and the relay box must not exceed 10 m. 5 m is mounted ex factory.

If more than 10 m is used, there is a risk of malfunction.



The 7-pin datalink cable which is used between the audio and video system or MCL 2AV and the TV should not exceed 25 m. A longer cable will result in a poorer sound quality (40 m. = -3dB at 20kHz).

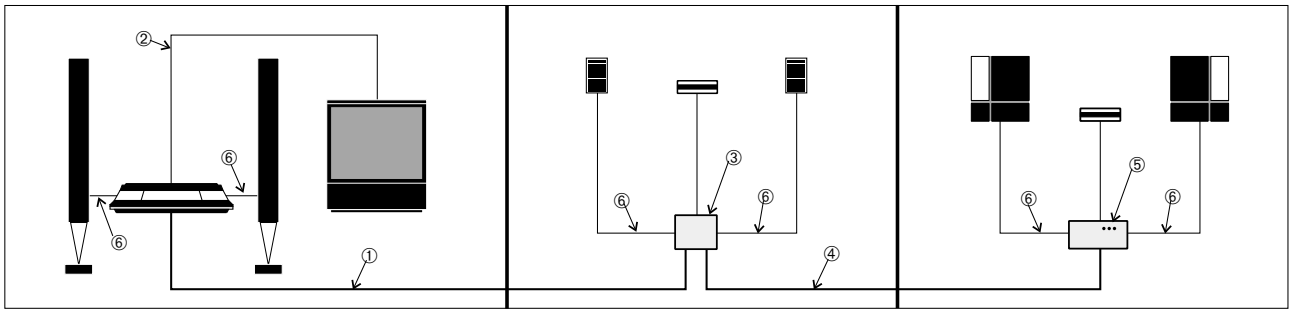
INSTALLATION TYPES

The following section gives a brief introduction to two typical installation types, namely the visible and the invisible installation. The examples will also include various applications of Bang & Olufsen's installation accessories, which are shown at the end of the handbook.

The illustrations give only a few installation examples. There are many alternatives, of course.

Visible installation.

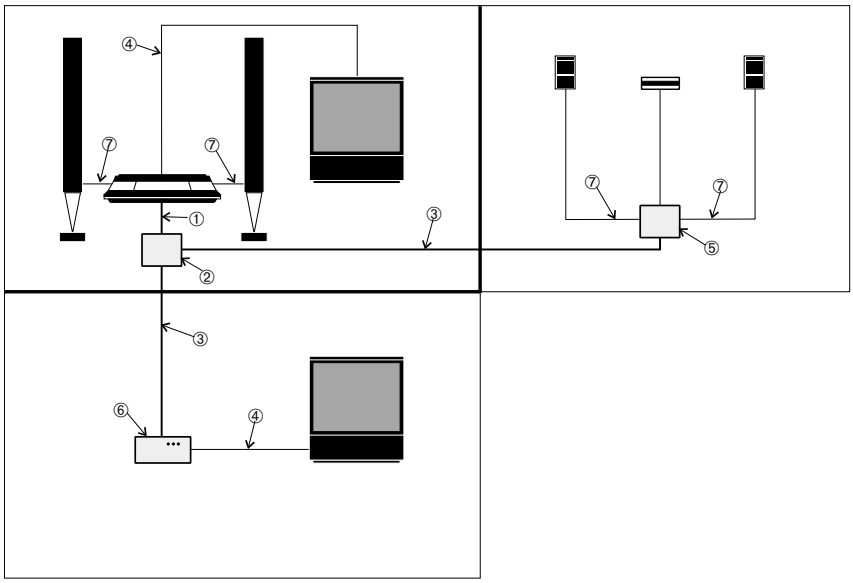
A visible installation is used where it is not possible to hide cable and installation materials in the attic and/or in conduits in the wall.



The illustration shows a visible installation, executed according to the loop-through principle.

In this example the following has been used:

1. 1 x MCL cable with two plugs
2. 1 x datalink cable
3. 1 x X-tra speaker kit
4. MCL cable by the metre
5. 1 x X-tra active speaker kit
6. Furthermore, various speaker cabling is required, depending on the type of speaker.



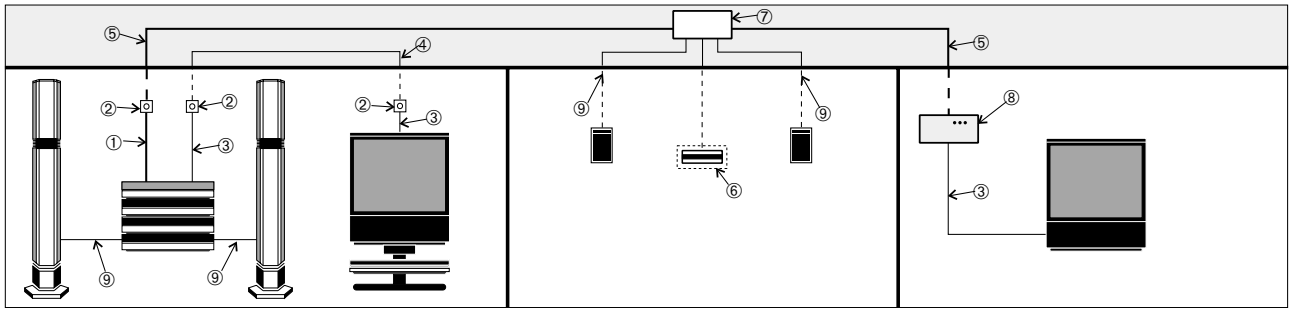
The illustration shows a visible installation, executed according to the star distribution principle.

In this example the following has been used:

1. 1 x MCL cable with two plugs
2. 1 x Connection box
3. MCL cable by the metre
4. 2 x datalink cable
5. 1 x X-tra speaker kit
6. 1 x X-tra TV kit
7. Furthermore, various speaker cabling is required, depending on the type of speaker.

Hidden installation

It applies to this type of installation that it is possible to hide the cables and installation materials in the walls and/or in the attic.



The illustration shows an invisible installation.
In this example the following has been used:

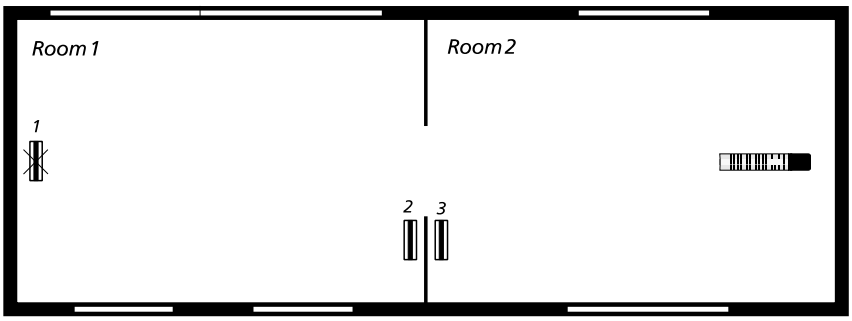
1. 1 x MCL cable with two plugs and 1 DIN plug
2. 3 x 8-pin wall sockets
3. 3 x datalink cable
4. Datalink cable by the metre
5. MCL cable by the metre
6. 1 x flush-mount box for transceiver
7. X-tra speaker kit
8. X-tra TV kit
9. Furthermore, various speaker cabling is required, depending on the type of speaker.

INSTALLATION TIP

Placing of transceiver

The transceiver must be placed so that nothing prevents it from receiving the signals from a Beolink terminal or an MCP.

When deciding on the position of the transceiver, remember that it should not be possible to activate more than one transceiver at a time using a remote control terminal.



The diagram shows that transceiver 3 is placed appropriately, whereas transceiver 1 can be activated from room 2. Transceiver 1 should be placed as transceiver 2 instead.

The transceiver should not be placed in direct sunlight or direct artificial light (e.g. spotlight) or near objects producing electric noise (e.g. dimmers) as this reduces the sensitivity of the transceiver (shorter range).

If the transceiver is placed outdoors, please note that it does not function at temperatures above 55°C or below 0°C. If higher or lower temperatures may occur, it should be possible to switch it off by means of a switch. Otherwise, it can block the operation of the whole system. The transceiver must be mounted in an outdoor mounting box.

It might be a good idea to place the transceiver next to a door so that it is easy for the person entering or leaving the room to operate it.

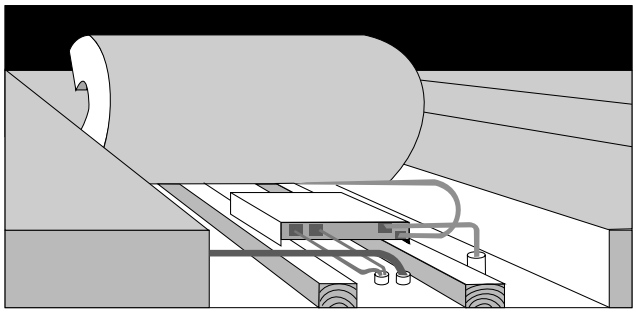
It might also be an advantage to place the transceiver close to the telephone so that the speakers can easily be switched off by the person talking on the phone.

The relay box need not be placed in the same room as the transceiver but may be placed in the attic, for example.

Placing of MCL 2A relay box

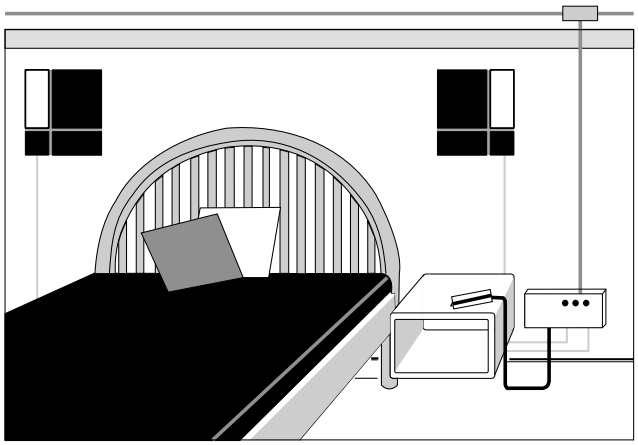
Examples of placing:

The relay box is not designed to function at temperatures above 65°C or below 0°C. If it is placed in the attic, it must be wrapped in insulating material.



If it is not possible to place the relay box concealed in the attic or under the floor, it can be flush-mounted in the wall, using a flush-mount box.

Placing of MCL 2AV panel



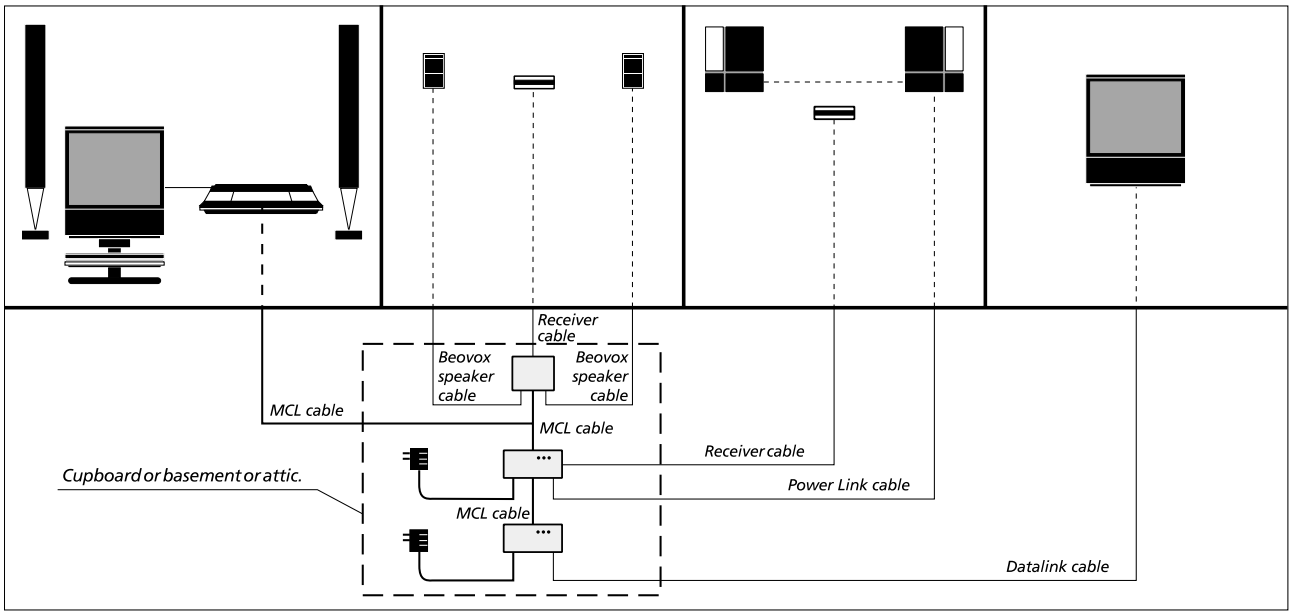
The socket panel may be placed inconspicuously, e.g. at the skirting of a wall.

The socket panel is not designed to function at temperatures above 40°C or below 10°C.

Due to the cable length, it must be placed within reach of an AC outlet and local sources, if any.*

* This applies to active speakers, too.

Central placing of relay boxes and MCL 2AV panel

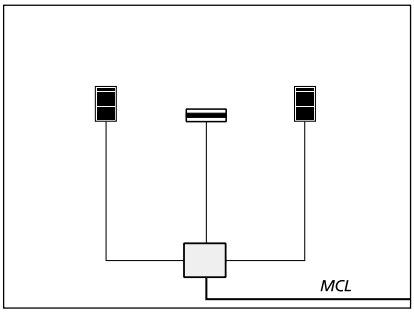


As appears from the illustration, relay boxes and panels can be placed in a central location. (However, maximum cable lengths must not be exceeded, and the same applies to maximum and minimum ambient temperatures. See the section on dimensioning for further information, if required).

Possible advantages of a central placing could be that the MCL units are easier to hide, MCL 2AV panels could use a joint current output, etc.

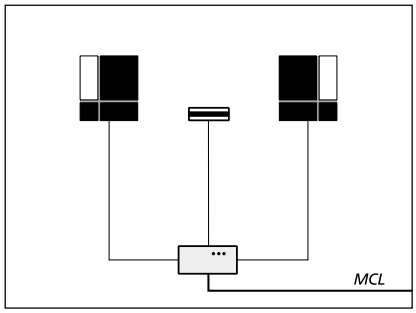
TROUBLE SHOOTING GUIDE

X-tra speaker kit



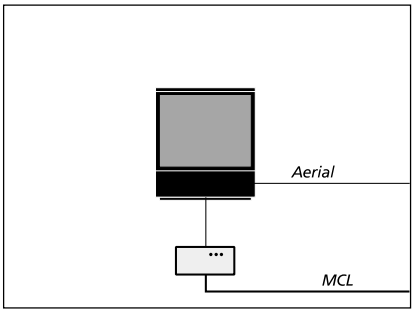
Trouble	Possible cause
The sound cannot be muted in the link room. Operation from link room is not possible.	Is supply voltage available at the terminal strip in the relay box? This can be checked by seeing if there is light in the timer button. Error in transceiver or relay box. *Voltage is absent* A) Pink cable in MCL cable is disconnected. (Check terminal strip.) B) Check that the L & R speaker plugs are properly mounted in the Beomaster. White lead = right (R) Black lead = left (L) *Voltage is too low* A) MCL cable too long. Too many Link units connected. B) Error in relay box or in transceiver (drawing too much current).
No sound in the link room. Operation from the link room not possible.	Does the speaker relay in the relay box click when the transceiver is used for operating? A) The data lead (white) in the MCL cable is disconnected or short circuited. (Check terminal strip.) B) The transceiver picks up noise from e.g. dimmer or light source. (See section on placing of transceiver.) C) Error in transceiver or relay box.
When operating the system in a link room, other link rooms and/or the main room are activated.	A) The information from the terminal can be “seen” from the other rooms, which are then activated. (See the section on placing of transceiver, or use “Option 4” as described in the section on special setups.)

X-tra active speaker kit



Trouble	Possible cause
Operation from the link room is possible, but no sound in the link room.	A) The active speakers are not connected to the mains. B) The switches on the active speakers are not set properly. C) MCL cable is mounted incorrectly in the terminal strip on the MCL 2AV panel. (Check that green, yellow, grey & brown leads are correctly mounted in the terminal strip.) D) Power Link cable between speakers and MCL 2AV panel is disconnected.
No sound in the link room. Operation from the link room not possible.	A) The MCL 2AV panel is not connected to the mains. B) MCL cable is not mounted or incorrectly mounted in the Beomaster. Check that the L & R speaker plugs are properly mounted in the Beomaster. White lead = right (R) Black lead = left (L) C) The data lead (white) in the MCL cable is disconnected or short circuited. (Check terminal strip.) D) The transceiver picks up noise from e.g. dimmer or light source. (See section on placing of transceiver.) E) Error in transceiver, MCL 2AV panel or mains adaptor.
When operating the system in a link room, other link rooms and/or the main room are activated.	A) The information from the terminal can be “seen” from the other rooms, which are then activated. (See the section on placing of transceiver, or use “Option 4” as described in the section on special setups.)

X-tra TV kit



Trouble	Possible cause
Use of the TV as an independent TV is OK but operation of the centrally placed system from the link room is not possible.	A) The MCL 2AV panel is not connected to the mains. B) The AV cable between the MCL 2AV panel and the TV is not mounted or it is disconnected. C) The MCL cable is not mounted or it is mounted incorrectly in the Beomaster. Check that the L & R speaker plugs are properly mounted in the Beomaster. White lead = right (R) Black lead = left (L) D) The data lead (white) in the MCL cable is disconnected or short circuited. (Check terminal strip.) E) Error in MCL 2AV panel or mains adaptor.
Poor TV picture, no v.tape and/or satellite picture. Operation of centrally placed system is OK.	A) The video tape recorder in the main room is not connected to the mains. (The modulator is therefore not in operation.) B) The video distribution has not been executed correctly. (Check that output and input have been connected correctly in the video distributer.)
When operating the system in a link room, other link rooms and/or the main room are activated.	A) The information from the terminal can be “seen” from the other rooms, which are then activated. (See the section on placing of transceiver, or use “Option 4” as described in the section on special setups.)

GLOSSARY

21-pin AV cable/SCART	Standard connection between a TV set and a video tape recorder. The cable is specified for transferring RGB signals.
Audio Aux link	Perhaps better known as AV connection. Connection between the audio and video systems. Established through a 7-pin DIN cable.
Audio master audio product/system	Designation of a Beolink-compatible Beomaster or Beocenter, e.g. Beomaster 7000, Beocenter 9500.
BeoLink	The brand name and a general term describing Bang & Olufsen's way of distributing sound and picture. BeoLink may be obtained in different ways depending on the products used: either the Audio Aux Link/Master Control Link (MCL) system or the Master Link system.
Beolink-compatible	Beolink-compatible products can be interconnected, thereby making them more functional.
BeoSound	Common designation of audio products, e.g. BeoSound Ouverture.
BeoVision	Common designation of TV sets, e.g. Beovision MX 6000 and BeoVision Avant.
Link room	Designation of the other room/rooms in the home in which sound and/or picture are installed.
Main room	Designation of the room in which the audio and/or video systems are placed. There are two kinds of main rooms ONE-room = audio and video systems placed in the same room TWO-room = audio and video systems placed in separate rooms.
Master Control Link (MCL)	Master Control Link is the name of the former connection between main room and link room.
Master Link (ML)	Bang & Olufsen's new systems interface. Master Link is the connection between the products in the main room and those in the link room but it is also the connection between the audio system and the video system.
Option programming	Option programming is executed via a Beolink terminal and with the products concerned in stand-by. Upon completed option programming, the products "know" what kind of environment they are placed in, and they can then be operated and function optimally.
Product Configuration Guide (PCG)	A PC-based tool in which it is possible to compose the setup you want and which provides answers to any questions concerning compatibility, setups, options, terminals, special conditions, and much more.

Power Link	8-pin DIN cable containing all necessary signals and data required for operating an active speaker (or an external output amplifier).
Speaker link	4-pin screened speaker cable.
Video master video product/system	Designation of a Beolink-compatible Beovision TV set, e.g. Beovision MX 4000, Beovision LX 6000.

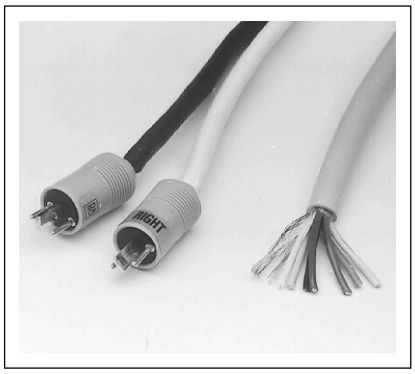
ACCESSORIES

For information about other spare parts, see the "Accessories" handbook.

Datalink cable (7/7 pin A/V cable)

Signal and control cable between audio and videosystems (7-pin).

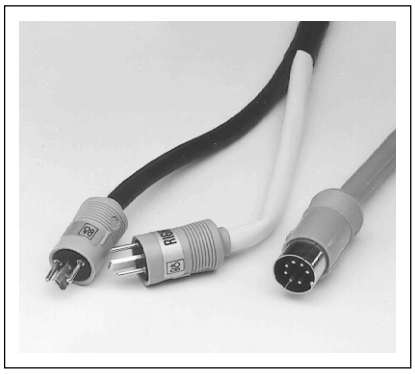
Black	Grey	Lenght
6270222	6270393	1.5 m
6270639	6270640	3.0 m
6270353	6270394	5.0 m
6270337	6270395	10.0 m
6270354	6270396	20.0 m
6250472	6250471	100 m, without plugs
6270338	1.5 m extension cord, black	



Master Control Link cable

Fitted with two 3-pin loudspeaker plugs. For connection between the first MCL unit or connection box to the audio system.

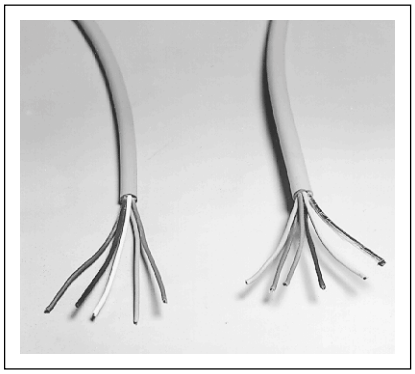
Grey	White	Lenght
6270266	6270566	1.5 m
6270267	6270567	5.0 m
6270268	6270568	10 m
6270269	6270569	15 m
6270270	6270570	20 m
6270271	6270571	30 m
6250431	6250433	100 m, without plugs
6250436	100 m, grey, flat, without plugs	
6270621	10 m, grey, special cable for BeoLab 3500 / LCS 9000	



Cable

Cable from audio system to wall socket, fitted with two 3-pin speaker plugs and one 8-pin DIN plug.

6270298	1 m, grey
6270295	3 m, grey



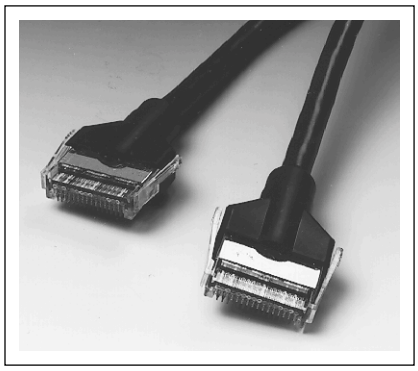
Transceiver cable

From transceiver to relay box.
Ø 5 mm.

6250481	50 m, grey
6250483	50 m, white

For MCL 30/82

6250491	50 m

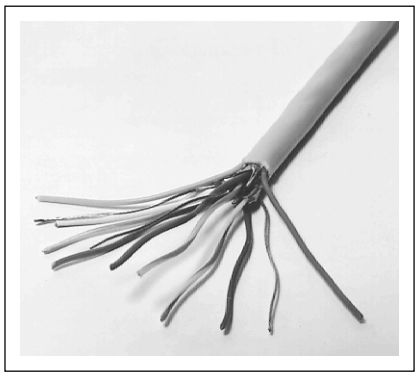


Master Link cable

Used for connection between two products or between a wall socket and a product.
Junction box included.
Ø 6.5 mm.

6270632 3.0 m with one plug, black

6270631 3.0 m with two plugs, black
6270633 10.0 m with two plugs, black
6270635 20.0 m with two plugs, black



Master Link cable without plugs

Used for connection between wall sockets.
Ø 6.5 mm.

6250441 100 m, grey
6250442 100 m, black
6250443 100 m, white

Power Link cable 8/8 pin

Signal and control cable between two Power Link sockets, e.g. between Master and MCL 2P or Beolab amplifier.
Ø 5.5 mm.

Black	Grey	White	Length
6270598	6270417	6270601	2.5 m
6270599	6270418	6270602	5.0 m
6270600	6270419	6270603	10 m
	6270637		20 m
6250452	6250451	6250453	100 m, without plugs

Power Link cable, thin

Signal and control cable between two Power Link sockets, without wire for display data.
Ø 2.5 mm.

6270644 2.5 m, black
6270645 5.0 m, black
6270646 10 m, black
6270647 20 m, black
6250462 100 m, black without plugs

Power Link adapter

Used for connection between MCL 2P and Beosystem 2300/2500 and serial connection of active speakers.

6270596 0.3 m, black
6270597 1.6 m, black

Speaker Link cable

Cable for Beolab Penta, with 4 pin socket.

6270336 4 m
6270352 10 m

Double screen cable without plugs
6250504 50 m, grey, 2 x 0.14 mm²
6250501 50 m, grey, 2 x 0.75 mm²

7220440 Plug, female
7229085 Extension, 4 pin SP female/ female

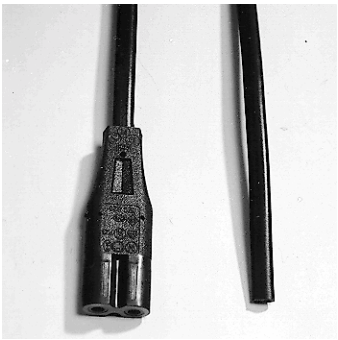
Speaker cable

6270464 5.0 m, black
6270476 5.0 m, white
6270479 5.0 m, grey

Speaker extension cable

2-pin speaker plug DIN male / DIN female.

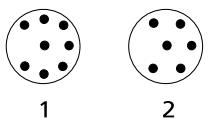
6270466 4.0 m, black
6270465 4.0 m, white
6270178 4.0 m, grey
6270181 10 m, grey



Mains cable

Mains cable with figure-of-eight connector.

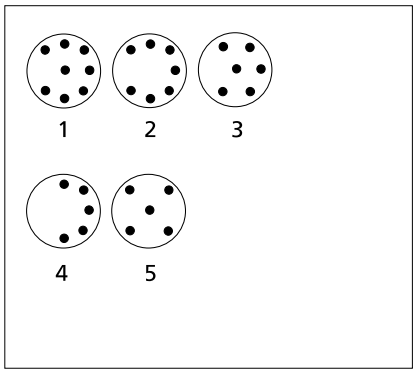
6100256 10 m, black



DIN plug, female

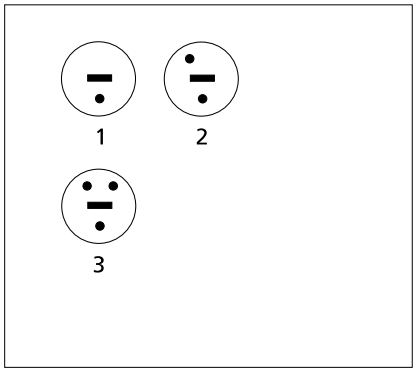
Used with Datalink and Power Link cables.

7220235 8-pin, plastic (1)
7210636 6-pin, plastic (2)



Used with Datalink and Power Link cables. **DIN plug, male**

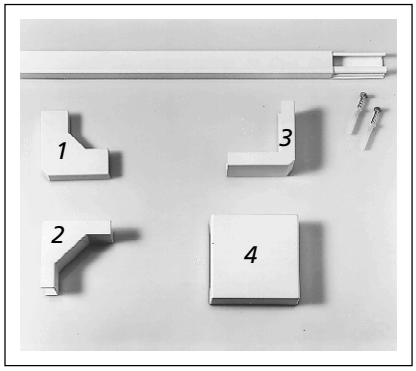
7220345 8-pin, grey (1)
7220573 8-pin, black (1)
7220163 7-pin, black (2)
7220688 7-pin, grey (2)
7220701 7-pin, grey, angle (2)
7220586 6-pin, grey (3)
7222017 5-pin, grey (4)
7220404 5-pin, black (4)
7210237 5-pin, black (5)
7500139 Threaded pin



Speaker plug, DIN

7220027 Male, with screw terminals (1)
7210502 Female, with screw terminals (1)

Special speaker plugs
7220288 MCL, 3-pin (2)
7220440 Beolab Penta, 4 pin (3)



Cable cover, narrow

2560257 2.5 m, white, internal dimensions: 8 x 18 mm. Available in cartons of 10 pieces each.
2548257 L-shaped piece (1)
2548256 Inside corner (2)
2548255 Outside corner (3)
7219071 Junction box incl. special terminal strip (4)
2369117 Nail plugs (100 pieces) for mounting of Cable covers.

Cable cover, round

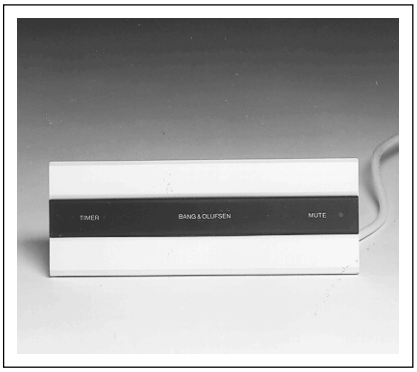
For concealing wiring from BeoLab 3500 and LCS 9000 on the wall.
Available in cartons of 10 pieces each.
Lenght: 2.5 m
Colour: white

2560276

Cable cover, flexible

Flexible plastic tube.
Internal diameter: 23 mm
Colour: white
Available in coils of 10 m.

2952033



Transceiver

For the MCL 2 AV.

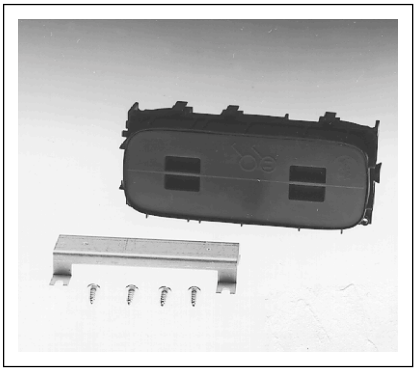
Note!
If a BeoLink compatible TV-set is connected to the MCL 2 AV, the transceiver may be dispensed with.

8920215

Table-top mount

Table-top mount for MCL transceiver.

7219060

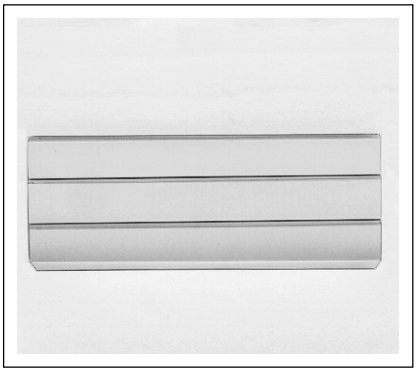


Flush-mount box

Box for flush-mounting MCL transceiver in solid walls.

Dimensions: 52 x 127 x 37 mm

7219061



Blanking plate

Plate for blanking flush-mount box, part no. 7219061.

3164683

Mounting box

Outdoor mounting box for MCL transceiver.

Dimensions: 170 x 80 x 67 mm

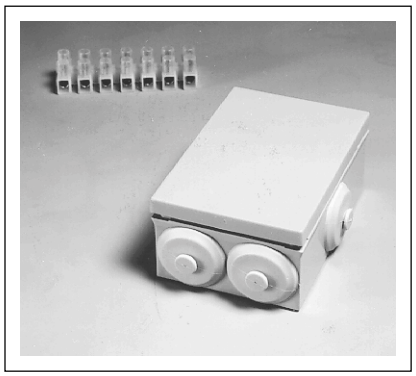
7210611

Flush-mount box

Flush-mount box for relay box (solid and light partition walls).

Dimensions: 180 x 180 x 50 mm

7219064

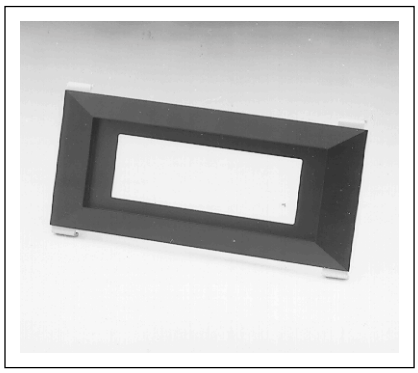


Connection box

Supplied with special terminal strip and seven cable entries.

Dimensions: 90 x 90 x 42 mm

3152431



Converting plate

Converting plate for adapting the MCL transceiver either to a hole originally made for the MCL 30/82 or to a hole in a hollow wall though which a relay box has been inserted and mounted.

7219067 Black
7219078 White

Infrared light dimming filter

Infrared light dimming filter for the MCL transceiver. The filter has three shaded fields, each with a different degree of dimming.

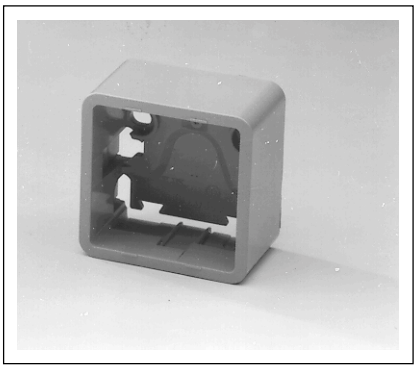
Sensitivity without filter: approx. 30 m.
Sensitivity with light filter: approx. 20 m.
Sensitivity with medium filter: approx. 15 m.
Sensitivity with dark filter: approx. 10 m.

3370162

Mounting base, EURO

Mounting base for wall socket. Used for mounting on the outside of e.g. a brick wall.

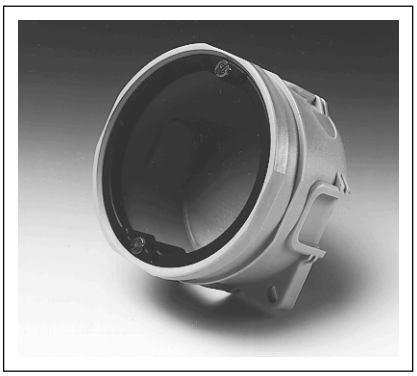
7219092 White, 80 x 80 x 33 mm



Mounting base, DK

Mounting base (patress) for wall socket.
Used for mounting on the outside of e.g. a brick wall.

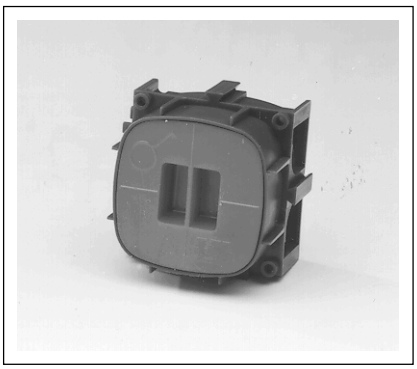
7210681	White, 49 x 49 x 24 mm
7210474	Grey, 49 x 49 x 24 mm
7210899	White, 75 x 49 x 24 mm
7210898	Grey, 75 x 49 x 24 mm



Fixture box, EURO

Fixture box for wall sockets.
Used for flush-mounting in brick walls or plaster-board walls.

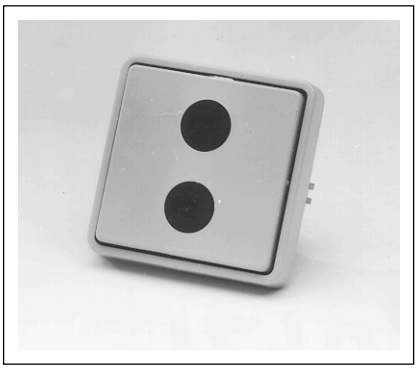
7219090	71 x 71 x 44 mm



Fixture box, DK

Fixture box for wall sockets.
Used for flush-mounting in brick walls or plaster-board walls.

7219048	49 x 49 mm
7219089	75 x 49 mm



Wall socket

Wall socket with 2 x 2-pin DIN speaker sockets. Used for speaker connection where relay box is not situated in the Link room.

7210676	49 x 49 x 24 mm, white, DK
7210472	49 x 49 x 24 mm, grey, DK
7210511	80 x 80 x 24 mm, white, EURO

Wall socket

Wall socket with 1 x 4-pin DIN speaker socket (Beolab Penta) with screw terminals. Used for speaker connection where relay box is not situated in the Link room.

7210674	49 x 49 x 24 mm, white, DK
7210604	49 x 49 x 24 mm, grey, DK
7210606	80 x 80 x 24 mm, white EURO

Wall socket

Wall socket with 8-pin DIN socket with solder terminals.
Used for plug connection between audio system and wall socket.

7210675 49 x 49 x 24 mm, white, DK
7210473 49 x 49 x 24 mm, grey, DK
7210512 80 x 80 x 24 mm, white, EURO

Blanking plate, DK

Plate for covering installations not in use.

3164593 49 x 49 x 24 mm, grey
3164707 49 x 49 x 24 mm, white

Wall socket, Master Link

Wall socket with Master Link socket. Solder free terminals. Used for Master Link connection, between rooms or between Master Link products and wall socket.

7210937 72 x 50 x 24 mm, grey (DK)
7210938 72 x 50 x 24mm, white (DK)
7210940 80 x 80 x 33 mm, white (EURO)

ML socket

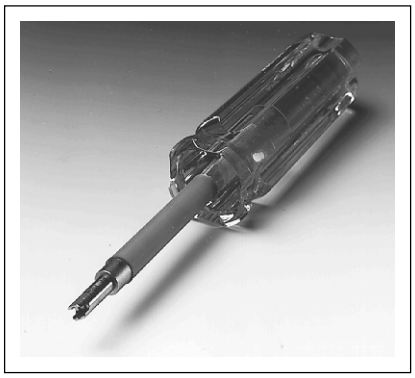
Master Link socket for mounting in optional wall plate (blanking cover).

8009653

ML junction box

Used for lenght-adjustment of ML cable, colour-change of cable and for connections between products.

3132170 Black
3132197 Grey
3132220 White



Professional tools for terminating.

Tools

3629127	For terminating in ML wall socket.
3629132	For terminating in ML junction box.

Notes :

BANG & OLUFSEN
DK - 7600 STRUER
DENMARK

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CABLE ADDRESS BANGOLUF
TELEFAX 97853911

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