LOCAL CONTROL SYSTEM

Master Control Link Handbook

THIS MANUAL IS DESIGNED AS
AN AID FOR AUTHORIZED CUSTOM
INSTALLERS

NOTE: BUILDING AND ELECTRICAL CODES VARY
FROM LOCALITY TO LOCALITY, MAKE SURE
THAT THE INSTALLATION IS IN COMPLIANCE W [TH
APPLICABLE CODES, BANG & OLUFSEN SHALL NOT BE
BE LEGALLY RESPONSIBLE FOR INJURY OR DAMAG
CAUSED BY IMPROPER INSTALLATION,

PREFACE

This handbook deals with Bang & Olufsen's Local Control 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 surrroundings in connection with its installation, These requirements must ensure the optimal operation of the system after installation.

The same apllies to Bang & Olufsen's Local Control 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 roles for the product programme in 92/93 and for-future programmes. The rules must be observed in connection with the installation of a Local Control 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 5500 that have to be connected or if it is a Beomaster 7000 and an MX 5500, 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 local Control Systems and AV systems; both with regard to products launched prior to the publication of the handbook and products that will be launched later.

The basic rules applying to the AV and Local Control Systems will always he the same.

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

GENERAL DESCRIPTION

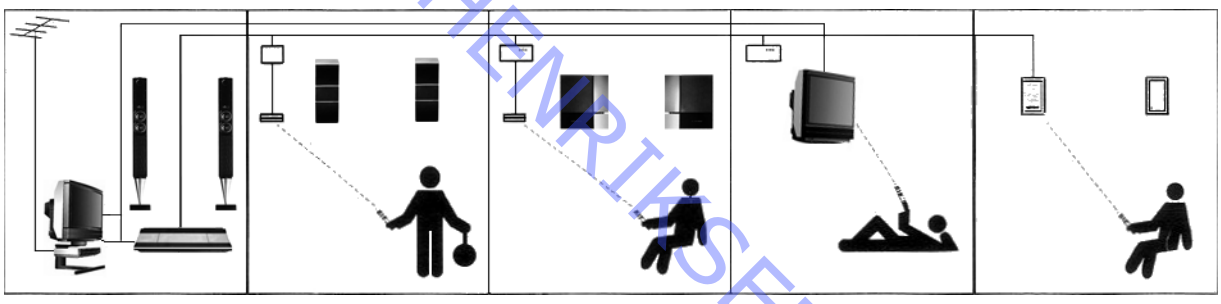
What is an AV system?

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 (antenna, cable, decoders and video tape) to and from other rooms in the house.

What is a Local Control System?



Local Control 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 Local Control 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 MCL cable and X-tra kits (transceivers, MCL 2A relay boxes and MCL 2AV panels).

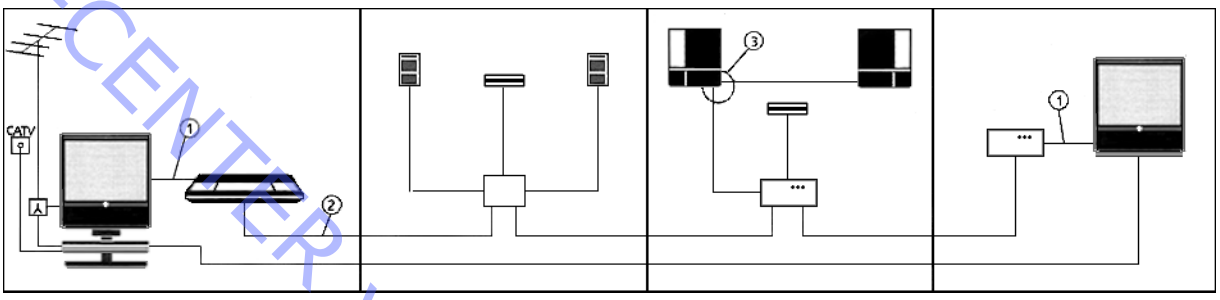
So, with a centrally placed audio system and a Local Control System it is possible to listen to and operate e.g. a radio, CD player, tape recorder, etc. from other rooms.

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 cable TV and the video tape recorder via the TV in the bedroom. Encoded cable TV programmes can also be watched in the local room, provided that a decoder is connected in the central room. Another possibility is to listen to the radio via the TV in the bedroom, for example.

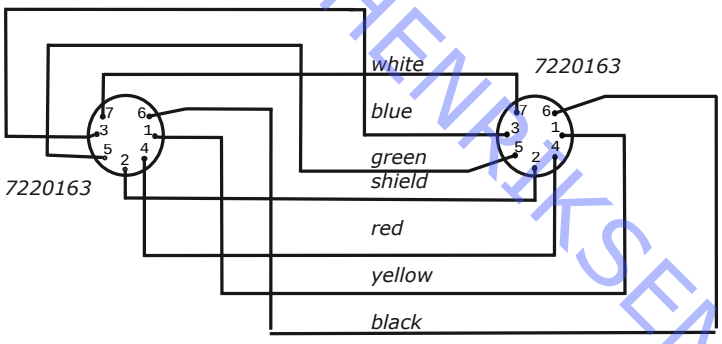
TECHNICAL DESCRIPTION

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

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

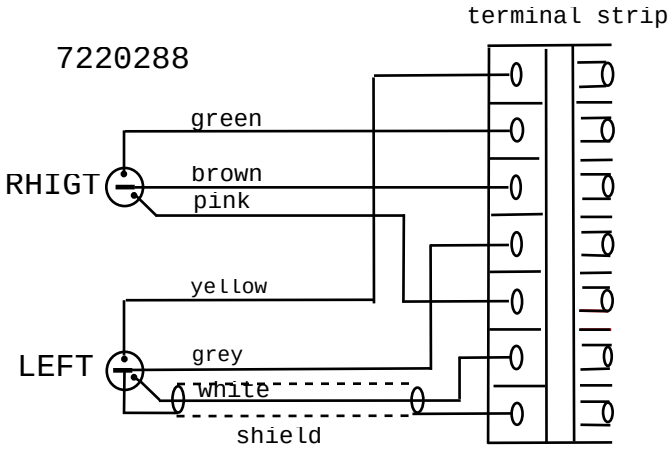


All plugs and sockets are illustrated from the solder side.



①

white = Datalink
blue = input, left channel
green = input, right channel
shield = signal ground
red = output, right channel
yellow= output, left channel
black = data ground



②

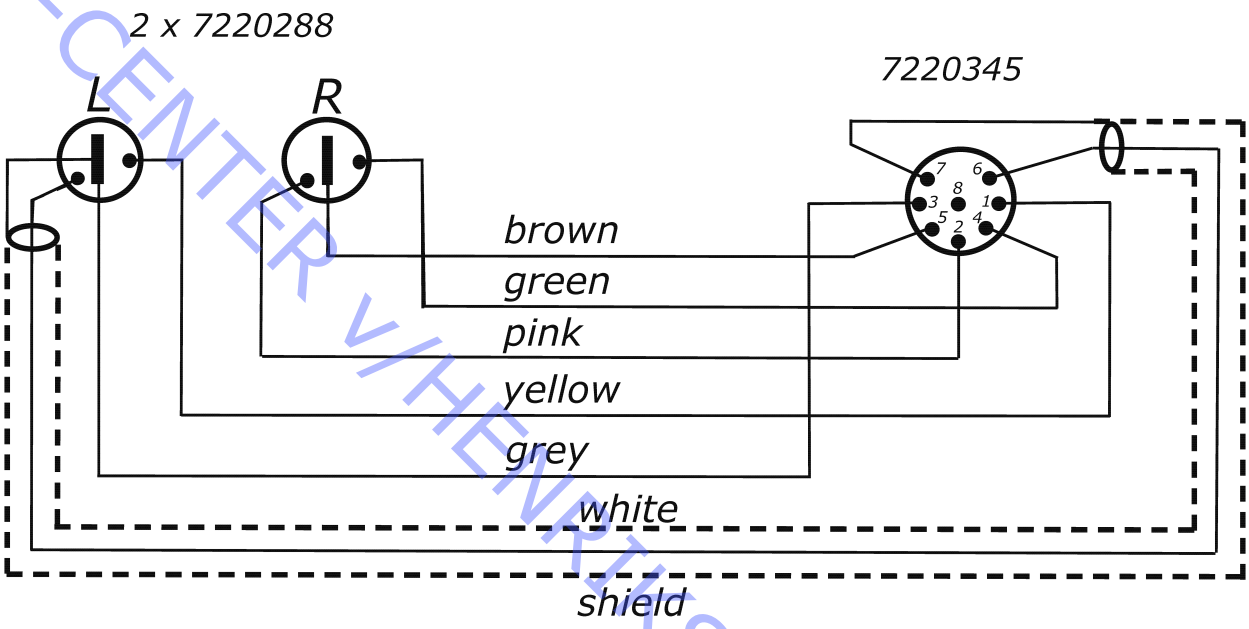
MCL cable between audio system and 7-pin terminal strip:

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

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

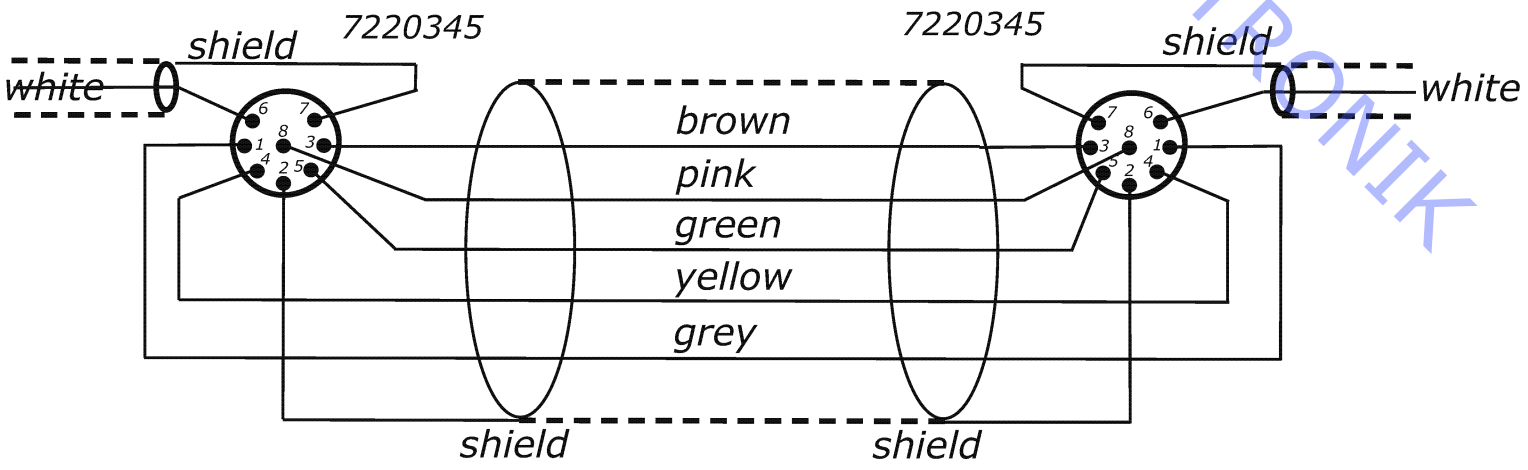
brown = ground, right channel
green = signal, right channel
pink = DC supply
yellow= signal, left channel
grey = ground, left channel
white = Datalink



③

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

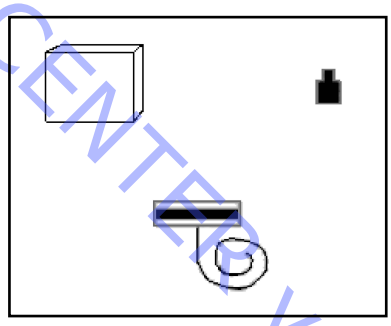
green = signal, right channel
brown = signal, left channel
grey = power up/down pink
= overload
yellow= loudspeaker relay
shield = ground
white = Datalink



PRODUCT DESCRIPTION

Below you will find a description of the individual elements included in the Local Control 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

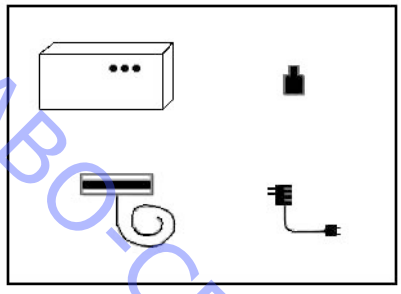
The X-tra speaker kit is used in those rooms where you wish to have sound via passive speakers. The Beolink 1000 wall fixture is intended as a storage place for the remote control terminal.

Miscellaneous

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

When using the X-tra speaker kit the^{y} 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 arrive speakers. The mains adaptor supplies power to the MCL 2AV panel. The Beoiink 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 i he 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.

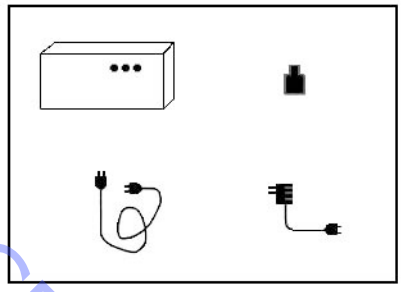
The X•tra active speaker kit has built-in "volumen control" . This volumen control permits you to reduce the volume in the Local room without affecting the volume in other rooms. The volume can be increased by 1 df3 in the Local morn v rthout affeerirtig the volume in other rooms, if the volume is increased 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 for further Inforrnation, if requrired.)

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 Auxlink 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 Auxlink 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 local 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 local room will have a slight effect on the volume in other rooms.

* The X-tra TV kit is designed for use only with an MX5500 or an MX5000 equipped with TwoWay software (SW 2.2, part number 8341369).

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 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.

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 Local Control 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 Local Control 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.

The entire B&O AV system MUST be in standby before option programming can be performed.

The key sequence is the following:

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

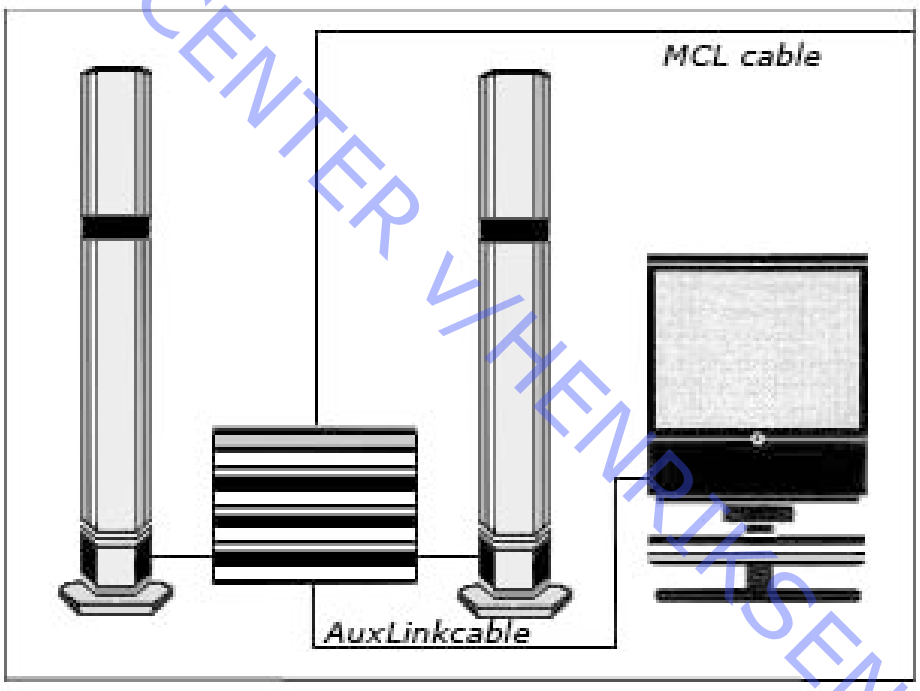
Other products need not/cannot be option programmed.
The digit to be used depends on the setup.
See the illustrations below.

It applies to most setups that they are delivered in the correct option 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, error functions will occur.

Recommended AV systems



AV system in one room

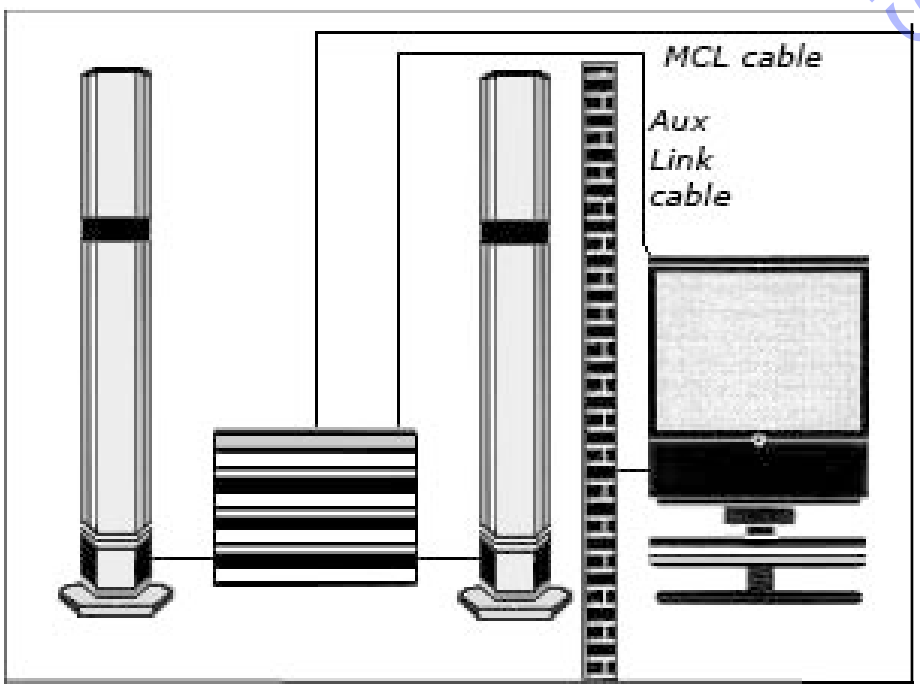
Option programming : Option 1 (Factory setting)

Beovision :

● PICTURE 1 STORE

Beomaster :

● SOUND 1 STORE



AV system in two rooms

Option programming : Option 2

Beovision :

● PICTURE 2 STORE

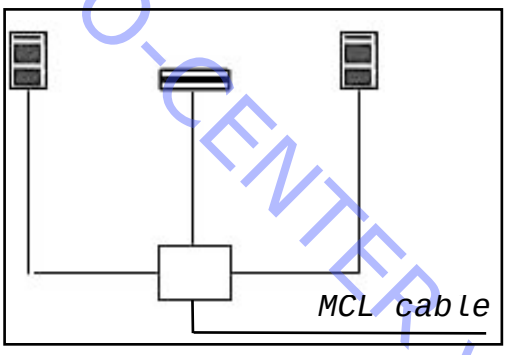
Beomaster :

● SOUND 2 STORE

Recommended Local Room setups

One or several recommended Local room setups may be connected to the above-mentioned Central room.

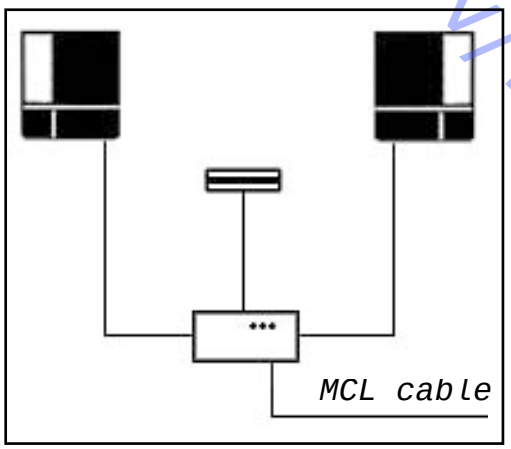
NOTE!
If the audio system in the Central room is a BS 2500, see the section on special setups.



Passive speakers in Local room

Option programming : Option 2 (Factory setting)

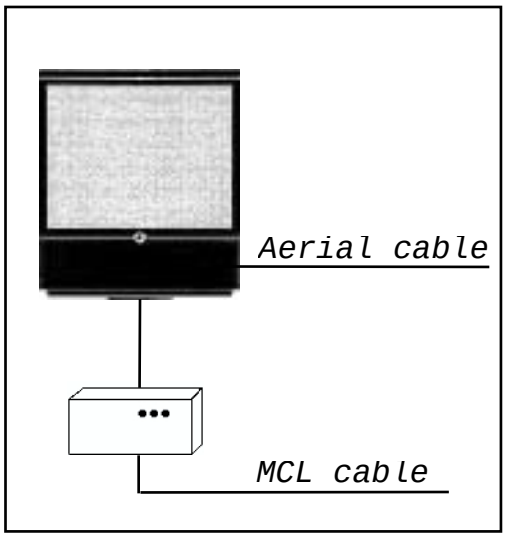
MCL 2A : ● LINK 2 STORE



Active speakers in Local room

Option programming : Option 2 (Factory setting)

MCL 2AV : ● LINK 2 STORE

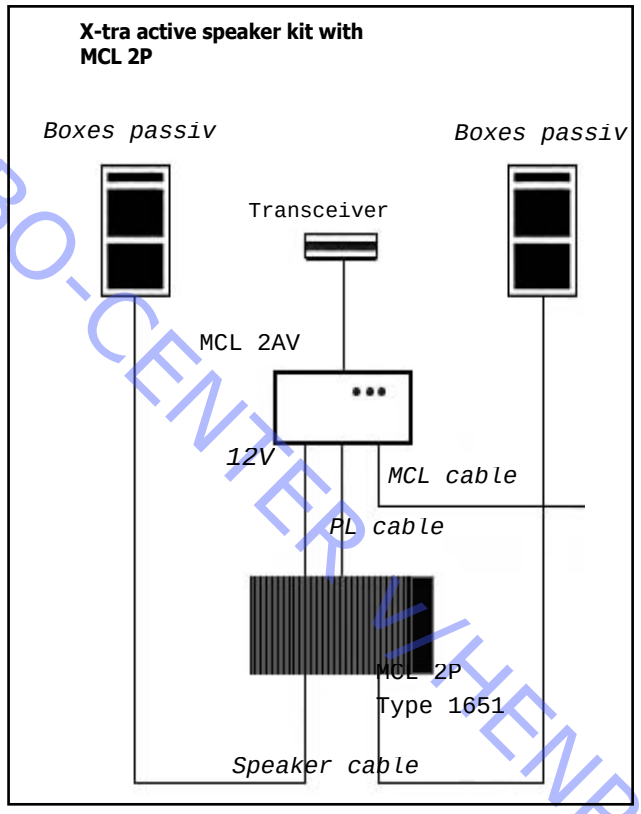


TV in Local room

Option programming : Option 2

Beovision ● PICTURE 2 STORE

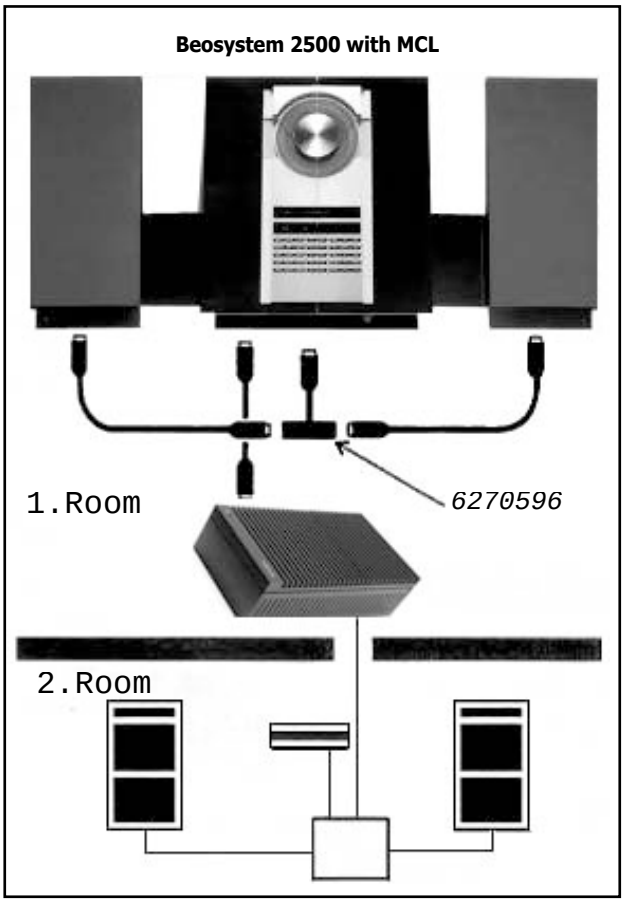
To be able to receive video tape recorder from the Central room, the TV in the Local room has to be set (tuned in) to receiving the modulator frequency of the video tape recorder.



Option programming : Option 2 (Factory setting)

MCL 2AV : ● LINK 2 STORE

Note:
Passive speakers ane connected to MCL 2AV via
MCL 2P which is an output arnplifier.



Beosystern 2500 do not have a built-in output amplifier, and consequently a
Local Control System cannot be immediately connected to a

Beosystem 2500.

If a Local Control System is to be connected to a Beosystem 2500, the solution
shown below must be employed. (MCL 2P is used as output amplifier).

SETUPS WITH LIGHT CONTROL

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

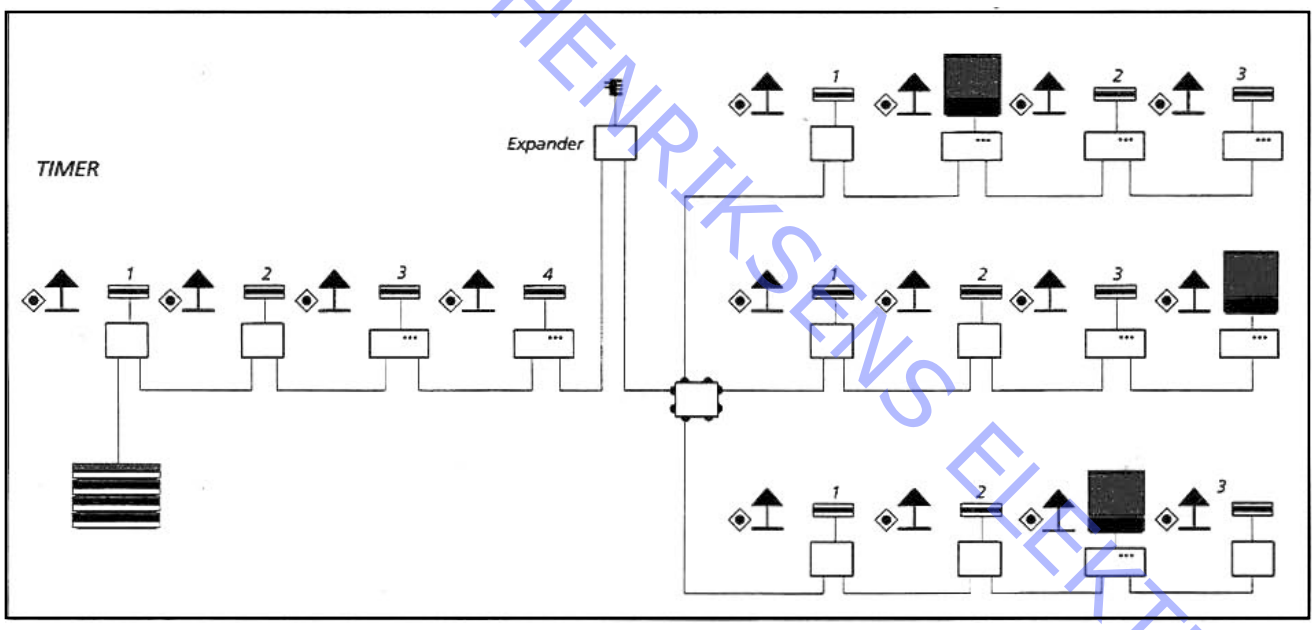
Furthermore, the light in the entire house may be controlled via the Local Control System. You may sit in any room in the house and control the light in the rest of the house (link light control). This can be done either by means of the Beolink terminal or through timer programming.

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.

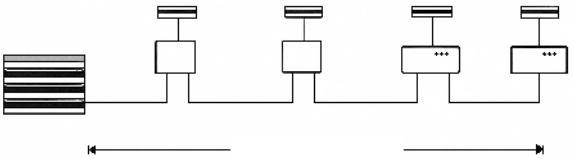


Link light control can also be transferred via Beovision. Beovision are set by the factory to transferring link light control, and no additional programming in connection with light control is therefore required.

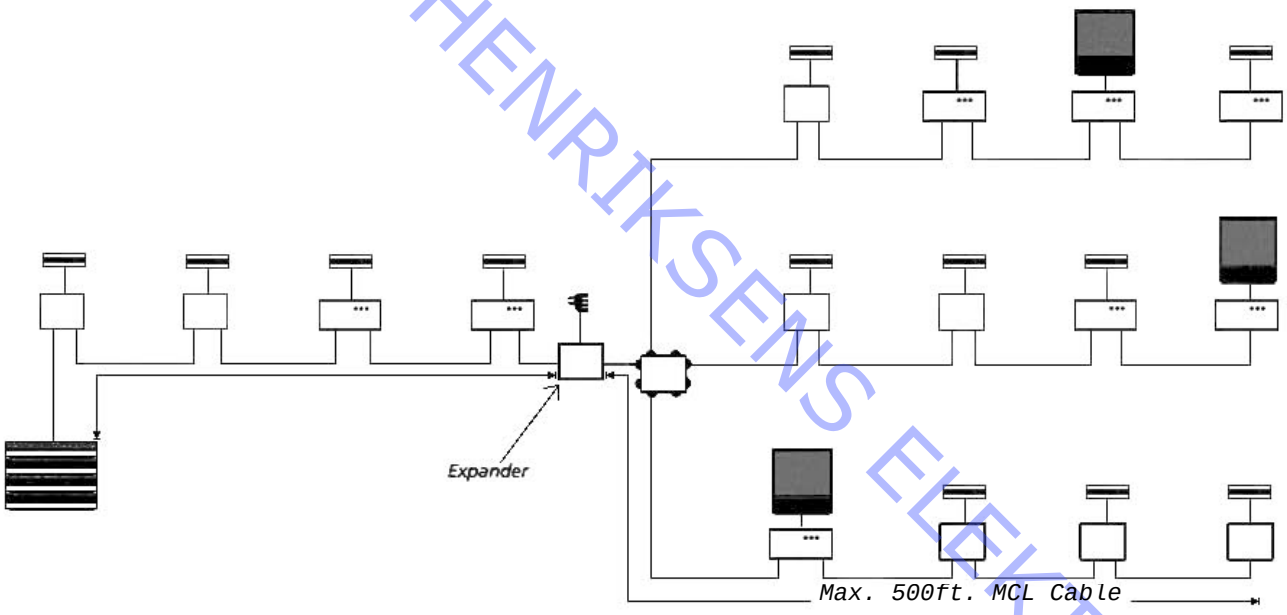
Link light control is not possible with all audio systems (Beosystem 2500, Beocenter 8000/8500, Beosystem 3500, Beocenter 9000, Beosystem 5500)

DIMENSIONING

It is possible to connect four MCL 2A's or 2AV's to a Beomaster or a Beocenter, and a maximum of 500 ft. of MCL cable may be used.

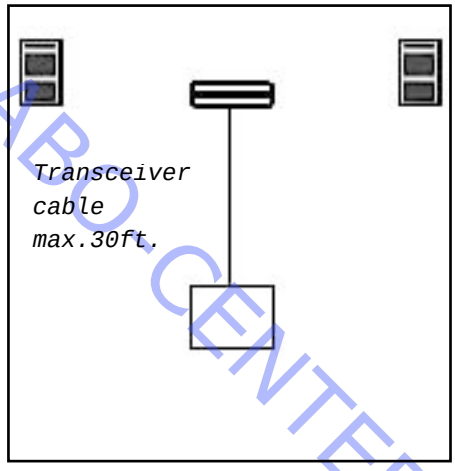


If the number of MCL 2 units is increased, or if more than 500 ft. of cable is used, it is necessary to insert an MCL 2 Expander.



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 1500 ft. (3 x 500 ft.). The MCL 2 Expander should be placed as close to the audio master as possible.

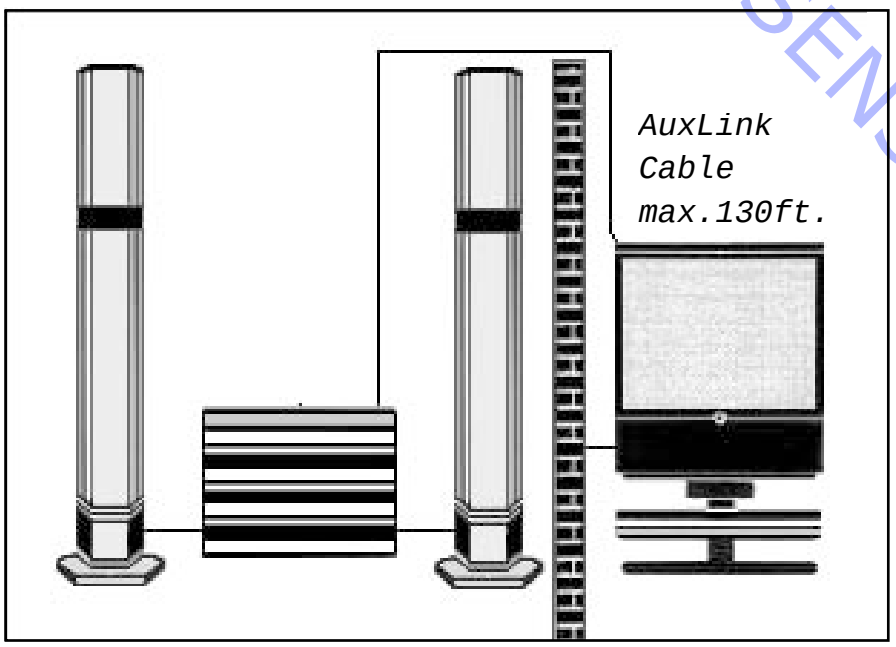
Applicable to the MCL 2A only.
As the speakers in the local rooms are connected in parallel, there is a limit to the number of local rooms in which the speakers can be cut in simultaneously. If too many speakers are cut in at the same time, the protection circuit of the audio master will be activated 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 32 ft. 16 ft. is mounted ex factory.

If more than 32 ft. is used, there is a risk of malfunction.

The 7-pin Auxlink cable which is used between the audio and video system or MCL 2AV and the TV should not exceed 80 ft. A longer cable will result in a poorer sound quality (example: 130 ft. = -3dB at 20kHz).



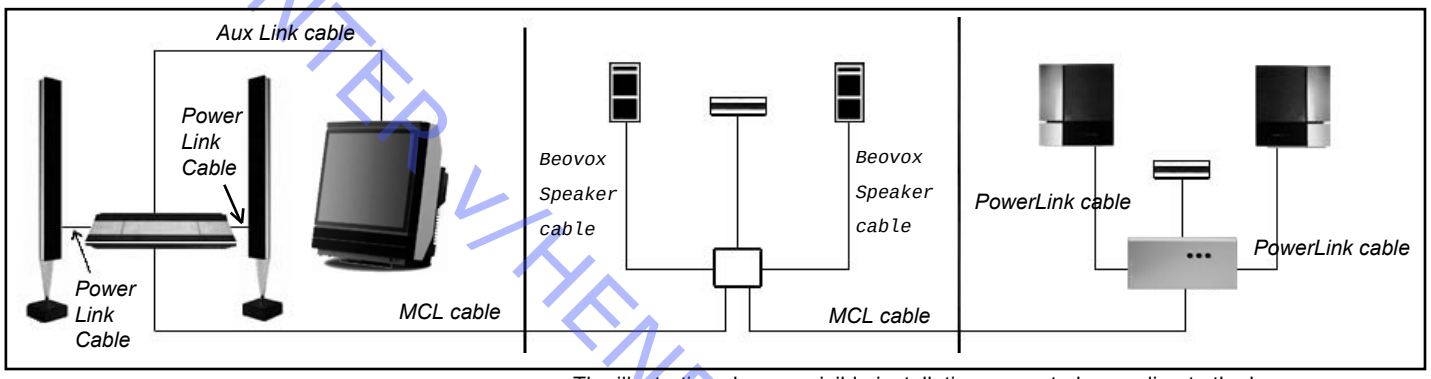
INSTALLATION TYPES

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.

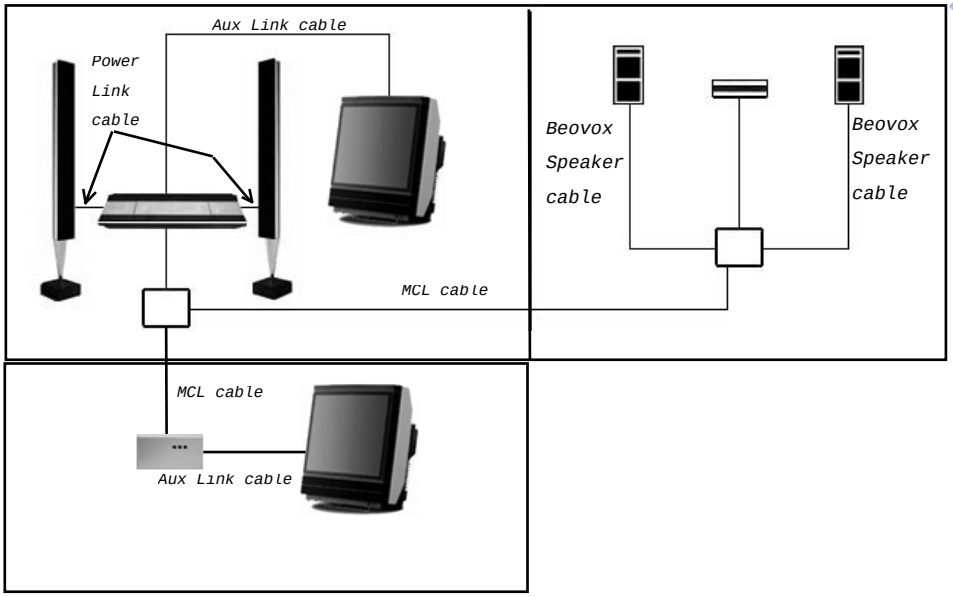
A visible installation is used where it is not possible to hide cable and installation materials in the attic and/or in conduits in the wall.



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

In this example the following has been used:

- 1 x MCL cable with two plugs
- 1 x 7-pin Auxlink cable
- 1 x X-tra speaker kit
- MCL cable by the metre
- 1 x X-tra active speaker kit
- Furthermore, various speaker cabling is required, depending on the type of speaker.



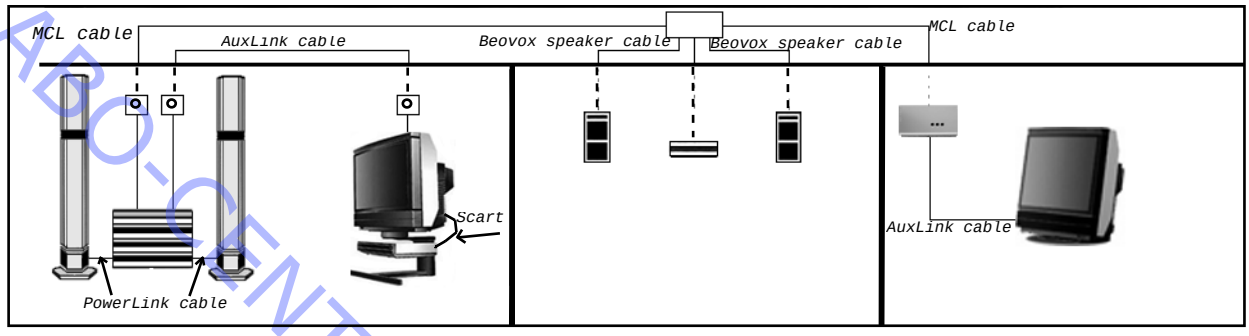
The illustration shows a visible installation, executed according to the star distribution principle.

In this example the following has been used:

- 1 x MCL cable with two plugs
- 1 x Connection box
- MCL cable by the metre
- 1 x 7-pin Auxlink cable
- 1 x X-tra speaker kit
- 1 xX-tra TVkit
- Furthermore, various speaker cabling is required, depending on the type of speaker.

Hidden installation

In this type of installation 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:

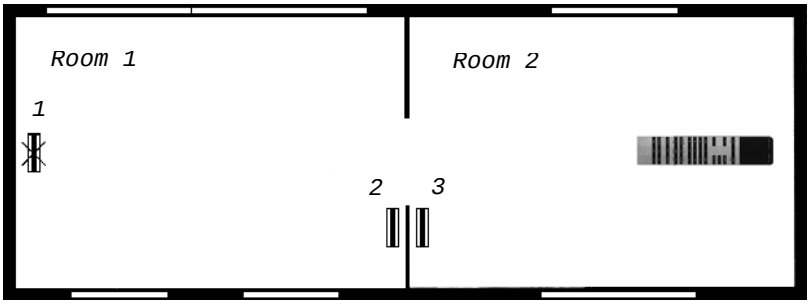
1 x MCL cable with two plugs and 1 DIN plug
3 x 8-pin wall plates
3 x 7-pin Auxlink cable
Auxlink (bulk)
MCL cable (bulk)
1 x fixture box for transceiver
X-tra speaker kit
X-tra TV kit
Furthermore, various speaker cabling is required, depending on the type of speaker.

INSTALLATION TIP

Placing of transceiver

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

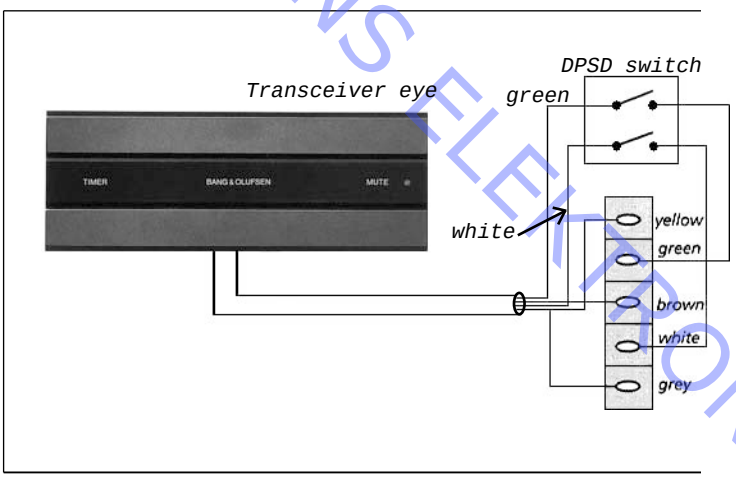
When deciding on the position of the transceiver, remember that it should not be possible to activate more than one transceiver at a time using a remote control terminal.



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 131°F or below 32°F. 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 (see diagram).



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.

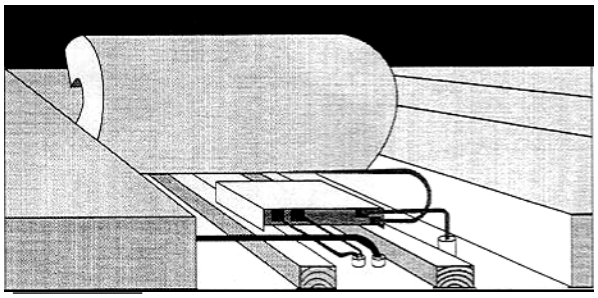
It might also be an advantage to place the transceiver close to the telephone so that the speakers can easily be switched off by the person talking on the phone.

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:

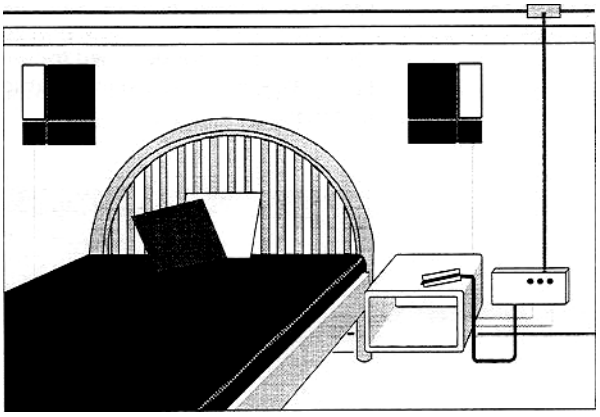
The relay box is not designed to function at temperatures above 149`F or below 32°F. If it is placed in the attic, it must be wrapped in insulating material.



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.

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

Placing of MCL, 2AV panel



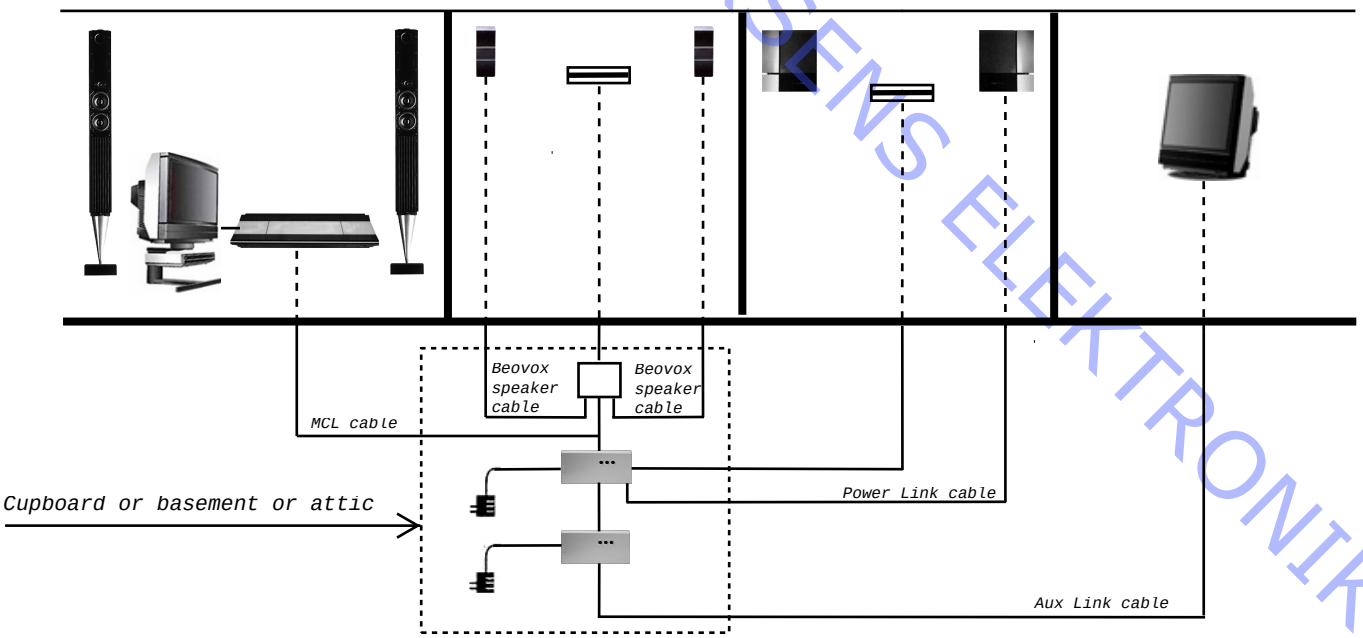
The socket panel may be placed inconspicuously, e.g. at the skirting of a wall.

The socket panel is not designed to function at temperatures above 104°F or below 50°F.

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).

TROUBLE SHOOTING GUIDE

IMPORTANT!
Before troubleshooting the MCL system, verify that the following set-up guidelines have not been exceeded.

1. Up to four links and 500 ft. of MCL cable may be used without additional accessories.

2. If more than 4 links or more than 500 ft. of cable are used, an MCL 2E expander must be installed. (See section on Dimensioning).

3. Make sure the transceivers are installed in such a way that the remote terminal can only "see" one transceiver at a time.

4. Verify on transceivers with additional cable that the length of the cable does not exceed a total of 32 ft.

5. Transceivers should not be placed near the sources of strong radio frequency or infrared interference (light dimmers, infrared alarms, direct sunlight, etc.).

6. Transceivers installed outdoors must be mounted in a moisture resistant box (7210611 or equivalent). If outdoor temparature falls below 32 degrees, a transceiver cutout switch should be installed. (See section on Installation Tip).

7. MCL relay boxes should not be installed in areas where the ambient temperature goes below 32 degrees or above 150 degrees Fahrenheit.

NOTE:
All references to MCL 2A also apply to X-tra speaker kits, and all references to MCL 2AV also apply to X-tra active sneaker kits.

Precautions to observe during trouble shooting.

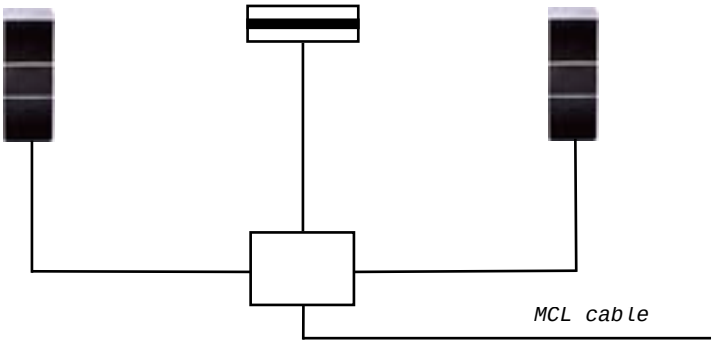
1. During the troubleshooting, it may be necessary to temporarily disconnect wires to take voltage measurements while the power to the main room system is still connected. Remember that simply reconnecting the wires afterwards may result in a data "lockup" rendering the system inoperable in the local rooms. Before going on, try resetting the system by disconnecting the AC mains from the main room components and all AC powered MCL components (MCL 2AV, MCL 2P, MCL 2E). Then reconnect the AC, first to the MCL components, and finally to the main room system.

2. The display on the Beolab® Penta/Panel speakers may not function after troubleshooting the system. Before proceeding further; disconnect the Beolab speakers from the AC mains, while the main room audio system is in STANDBY mode. Then reconnect the Beolab speaker.

3. Never cut MCL or tranceiver cables unless the entire MCL system is powered down. This includes all AC powered MCL components and the main room audio system. Remember that power is supplied to the MCL system even when the main room system is in STANDBY mode.

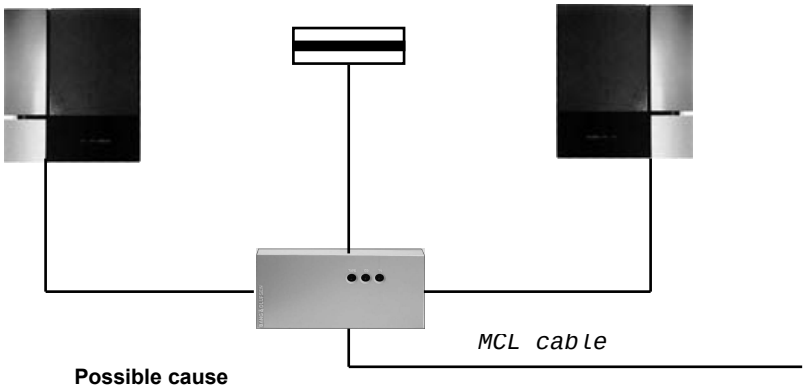
Possible advantages of a central placing could **be** that the LCS units are easier to hide, MCL 2AV panels could use a joint current output, etc.

X-tra speaker kit



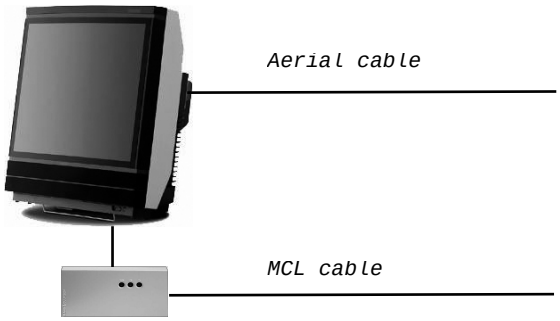
Trouble	Possible cause
The sound cannot be muted in the Local room. Operation from Local room is not possible.	Is supply voltage available at the terminal strip in the relay box? This can be checked by seeing if there is light in the timer button. Error in transceiver or relay box. *Voltage is absent* 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 *(pink cable below approx 7.5 Volt* or *white cable below approx 4. 5 Volt).* 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 Local room. Operation from the Local 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 Local room, other Local rooms and/ or the Central room are activated.	A) The information from the terminal can be "seen" from the other rooms, which are then activated.

X-tra active speaker kit



Trouble	Possible cause
Operation from the local room is possible, but no sound in the local 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. E) Check that the MCL 2AV is programmed in the proper option. (See the section on Option programming of AV systems). F) The MCL 2AV pre-programming has been changed. Pre-program the MCL 2AV to "active" mode. The main system and all MCL 2AV units is put in STANDBY mode, then hold down the TIMER button on the transceiver, press the AV button on a Beolink 1000 terminal.
No sound in the Local room. Operation from the Local 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.
Is the correct transceiver being used with the MCL 2AV?	Transceiver type 2045 cannot be used with MCL 2AV or X-tra active speaker kit.
When operating the system in a Local room, other Local rooms and/ or the Central room are activated.	A) The information from the terminal can be "seen" from the other rooms, which are then activated.

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 Local 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 cable picture. Operation of centrally placed system is OK.	A) The video tape recorder in the Central 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 Local room, other Local rooms and/or the Central room are activated.	A) The information from the terminal can be "seen" from the other rooms, which are then activated.

GLOSSARY

MCL
Master Control Link is the name/ designation of the connection/interface between the Central roam and the Local room.

Central room
Designation of the room in which the audio and/or video systems are placed. There are two kinds of Central room.
ONE-room Central roam = Audio and video systems placed in the same room.
TWO-room Central room = Audio and video systems placed in separate rooms.

Local roam
Designation of the other room/rooms in the house in which sound and/or picture are installed.

Speaker link
4-pin screened speaker cable.

Audio Aux link
Perhaps better known as AV connection. Connection between the audio and video systems. Established through a 7-pin DIN cable.

Power Link
8-pin DIN cable containing all necessary signals and data required for operating an active speaker (or an external output amplifier).

Audio master
audio productlsystem
Designation of a Beolink-compatible Beomaster or Beocenter, e.g. Beomaster 7000, Beocenter 9500.

Video master
video product/system
Designation of a Beolink-compatible Beovision TV set, e.g. Beovision MX5000, MX 5500.

Beolink-compatible
Beolink-compatible products can be interconnected, thereby making them more functional.

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.

21-pin AV cable/SCART
Standard connection between a TV set and a video tape recorder. The cable is specified for transferring RGB signals.