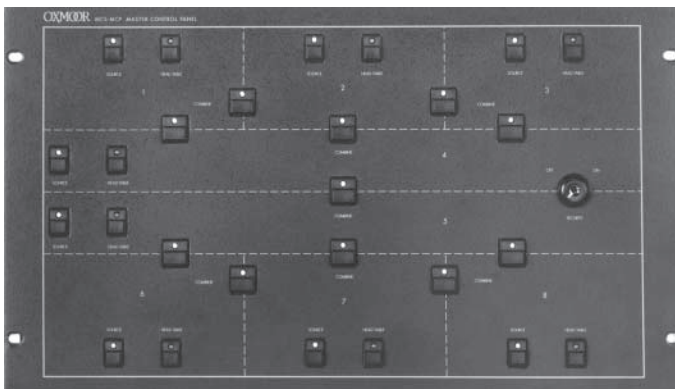


OXMOOR®

MCS ROOM COMBINING SYSTEM



Installation
&
Operation
Manual

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MCS ROOM COMBINING SYSTEM INTRODUCTION

The MCS™ Room Combining System combines up to eight rooms in any combination. A non-volatile memory feature preserves system settings in the event of a power failure.

Using one of Oxmoor's intuitive-designed, custom Master Control Panels, an operator may easily combine the audio of up to eight rooms and synchronize their remote volume controls, select sources from the combined rooms and mute speakers at head-table locations. A volume control on the rack-mounted Master Volume Panel is switch-assignable to provide audio level adjustment for any room.

A typical MCS system would also include a wall-mount Room Panel in each zone. The Room Panel offers a rotary audio level control and switch selection of background music or a local sound source. As on the Master Volume Panel, the volume control is Oxmoor's well-established RC-16 that features a unique "Virtual Pointer™" LED to show system level.

At the heart of the MCS Room Combining System is a self-powered, 5.25" rack-mount Mainframe. The

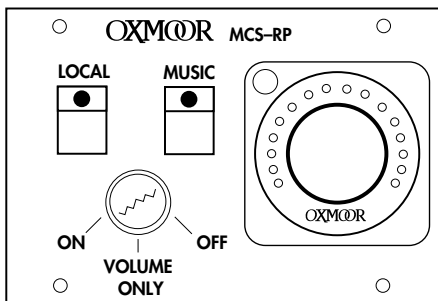
Mainframe contains Logic, Audio and Control cards. The MCS-LC Logic Card has a balanced input and a volume control for a Music/Page source. "Logic" contacts permit paging to be heard in rooms where background music has been selected without interfering with sound system usage in other areas. Upon activation, the PAGE function temporarily overrides room volume controls, its level defaulting to that established by the COMBINE LEVEL "MUSIC" control located on the card.

An Audio, or "Line Input" Card (MCS-LI), is used for each zone or room to be controlled. Each card provides a balanced audio input and output, a trim pot for adjusting the audio input level, remote volume connections, and LOCAL or MUSIC SELECT with TALLY status.

Communication between the Master Control Panel and the Control card in the system Mainframe follows PA-422 protocol. As an alternative to the Oxmoor Master Control Panel, system control may come from a PA-422 control device or contact closures working in concert with Oxmoor's MCS-IB Interface Box.

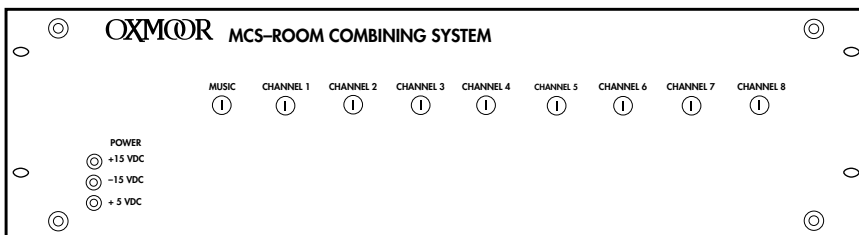
The logo for Oxmoor, featuring the word "OXMOOR" in a stylized, bold, serif font. The letters are closely spaced, and there is a registered trademark symbol (®) at the end of the word.

MCS ROOM COMBINING SYSTEM COMPONENTS



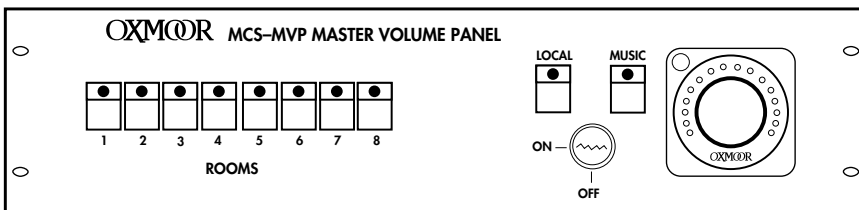
ROOM PANEL

- Room volume control, local source and background music select switches
- Synchronizes with other Room Panels when rooms are combined



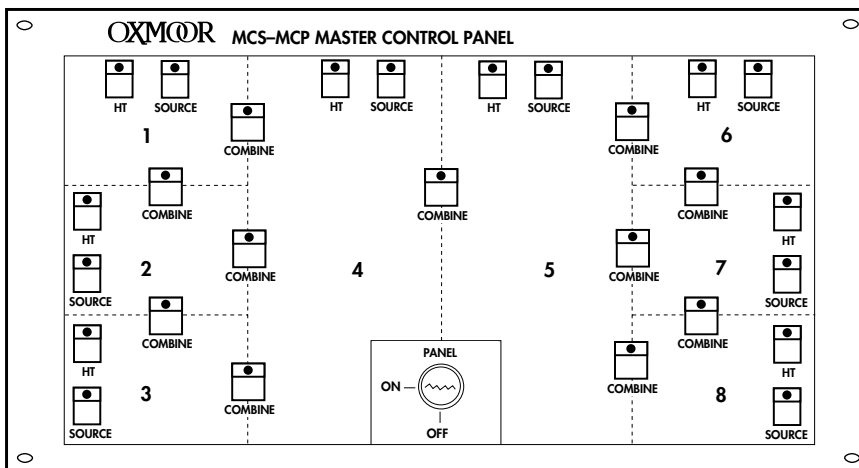
MAINFRAME

- PA-422 communication interface
- Non-volatile memory
- Combine any combination of eight rooms



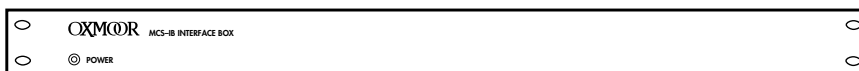
MASTER VOLUME PANEL

- Volume control and source selection for each room at a remote location



TYPICAL MASTER CONTROL PANEL

- Custom screened for your specific room configuration
- Combine, source and head-table switches for each zone
- Field-programmable
- PA-422 communication interface



INTERFACE BOX

- Converts combine, source and head-table switch closures to PA-422 signals that can communicate with the Mainframe

MCS SYSTEM DESCRIPTIONS

MCS SYSTEM DESCRIPTION

(Callouts refer to Figures 1.0 and 1.1)

- **MCS-Mainframe:**

A 19" rack-mount by 3 rack-unit (5.25") chassis that houses the MCS-PS Power Supply, MCS-CC Control Card, MCS-LC Logic Card and MCS-LI Line Input Cards.

- **MCS-MCP Master Control Panel:**

A 19" rack-mounted panel finished in a black textured paint. The front will be silkscreened for your specific room configuration. The panel provides momentary push-button switches for room combining, SOURCE selection, and HEAD-TABLE speaker muting.

- **MCS-MVP Master Volume Panel:**

A 19" rack-mounted panel finished in a black textured paint. Switch-assignable to any room, the Master Volume Panel synchronizes with the selected room's MCP-RP Room Panel. Designed to provide remote audio level adjustment and LOCAL or MUSIC selection for any room within the system.

- **MCS-RP Room Panel:**

Wall-mounted panel used in each room to be combined. It provides an RC-16 volume control and push-button switches for selection of background MUSIC, LOCAL sound source or off. Also included is a lockable key switch for user-selected security.

- **MCS-IB Interface Box:**

The Interface Box serves as an interpreter to convert contact closures to PA-422 signals that can communicate with the MCS Mainframe. It also provides a means to program the MCS system. The 1 rack-unit chassis provides terminals for LINKS ("COMBINE"), SOURCE, and HEAD-TABLE lines. Also provided are TALLY indicator terminals for COMBINE, SOURCE and HEAD-TABLE status. All control functions are by momentary contact closures to common.

MCS SYSTEM BLOCK DIAGRAMS

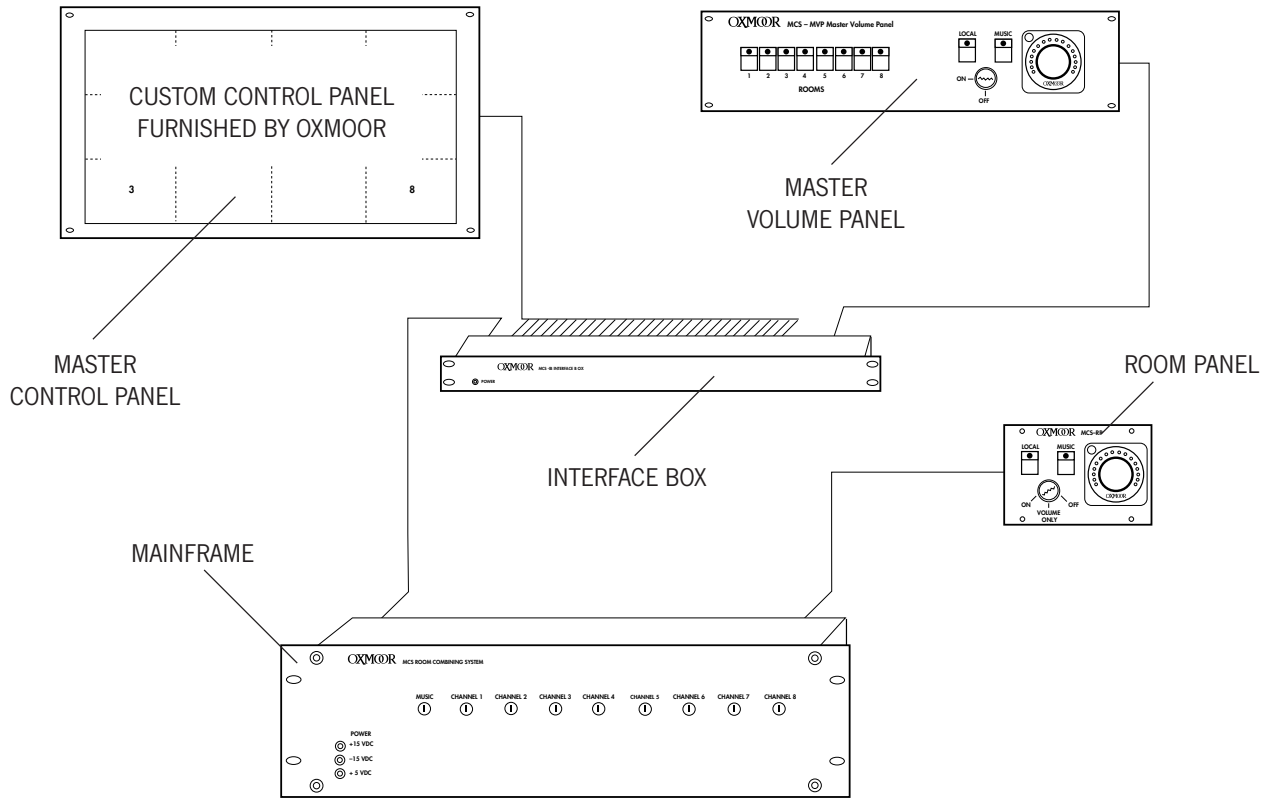


Figure 1.0: MCS Block Diagram with Master Control Panel Furnished by Oxmoor

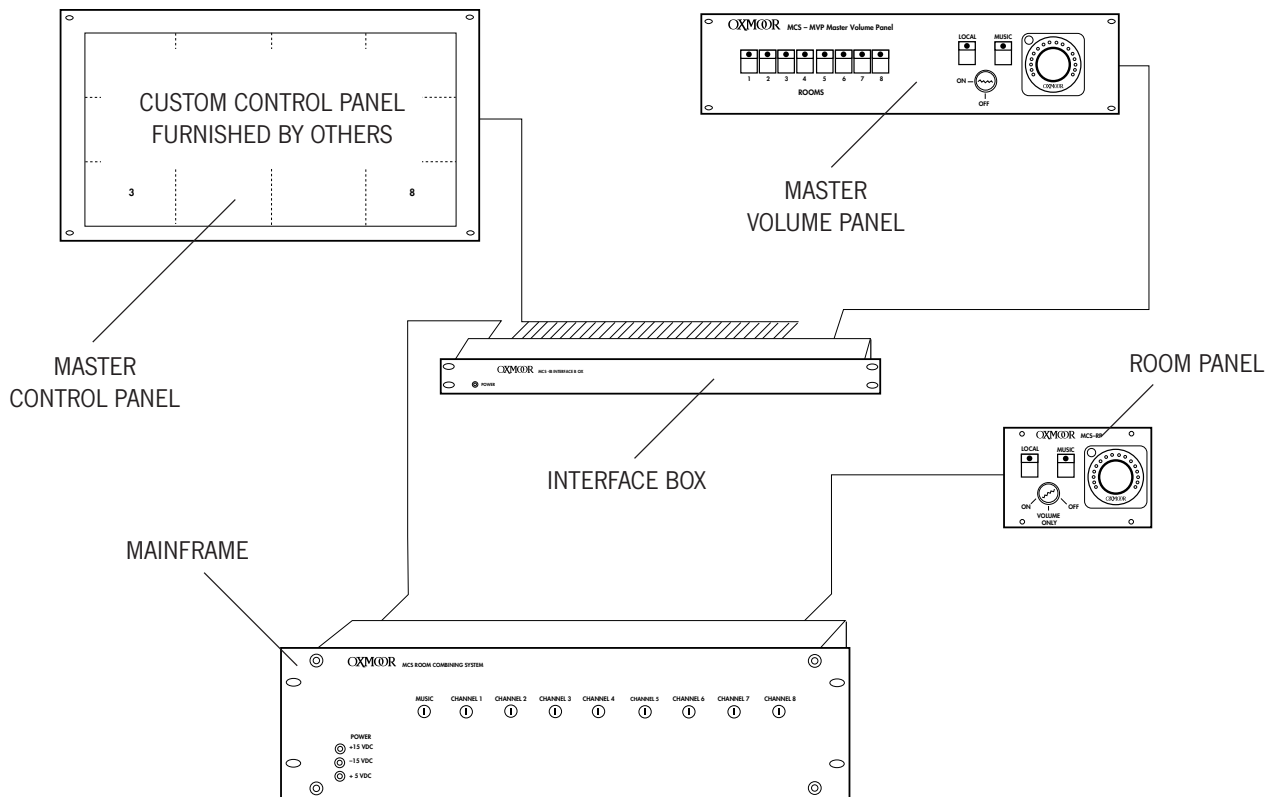


Figure 1.1: MCS Block Diagram with Master Control Panel Furnished by Others

MCS-MAINFRAME

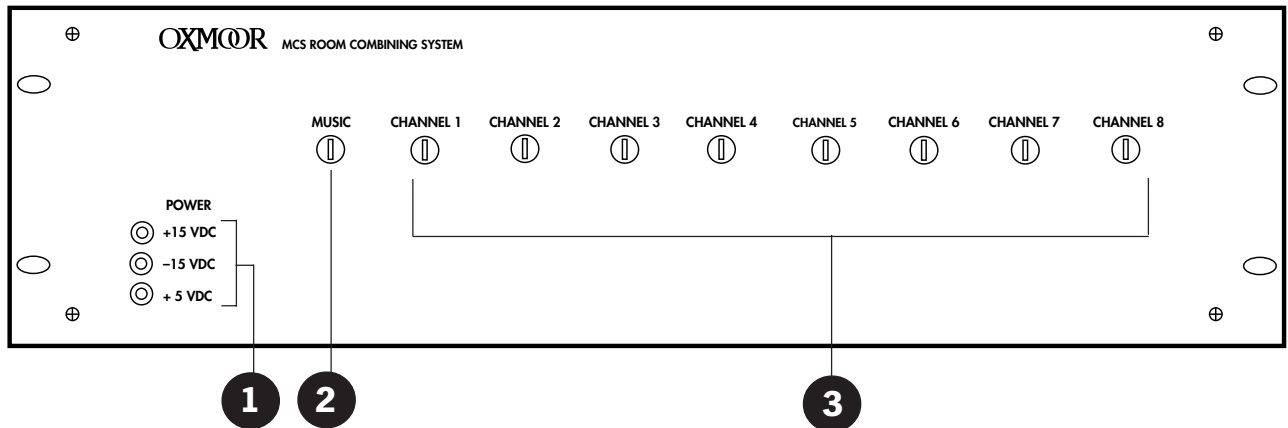


Figure 1.2: MCS-MAINFRAME Front View

MCS - MAINFRAME DESCRIPTION

(Callouts refer to Figures 1.2 and 1.3)

- 1. POWER STATUS LED's** - Indicators for +15 VDC, -15 VDC and +5 VDC Power On.
- 2. MUSIC** - Input gain pot, accessed through the front panel with a small flat-blade screwdriver, adjusts the input stage from 0 to -60 dB, to compensate for varying input signal levels.
- 3. INPUT GAIN TRIM POTS** - (Labeled "CHANNEL 1", "CHANNEL 2", etc.) Accessed through the front panel with a small flat-blade screw driver, these trim pots adjust the input stage gain +/-15 dB, to compensate for varying input signal levels.
- 4. MCS-LI LINE INPUT CARDS** - One used for each zone to be combined. Each provides terminal strips for balanced audio inputs and outputs, remote volume controls, and LOCAL and MUSIC SELECT with TALLY in-

dications. A trim pot is provided (see Front Panel View) for audio input level adjustments, and a MUTE contact allows the audio output of the MCS-LI Line Input Card to be muted by momentary contact closure to common.

5. MCS-LC LOGIC CARD - Provides controls for setting LOCAL and MUSIC default levels, terminal block connections for balanced MUSIC input, PAGE logic connection, and HEAD-TABLE speaker muting. Terminals are also provided (POWER and COM) for connection to the power supply for the HEAD-TABLE relays.

6. MCS-CC CONTROL CARD - Provides loop-through connections and address selection for PA-422 devices. The Control Card handles communication between the MCS-Mainframe and a controller (Control Panel, Oxmoor's Interface Box, PA-422 control device).

7. MCS-PS POWER SUPPLY - Provides power to the MCS Mainframe and all remote logic functions. Requires 100 to 130 VAC at 50 to 60 Hz for normal operation.

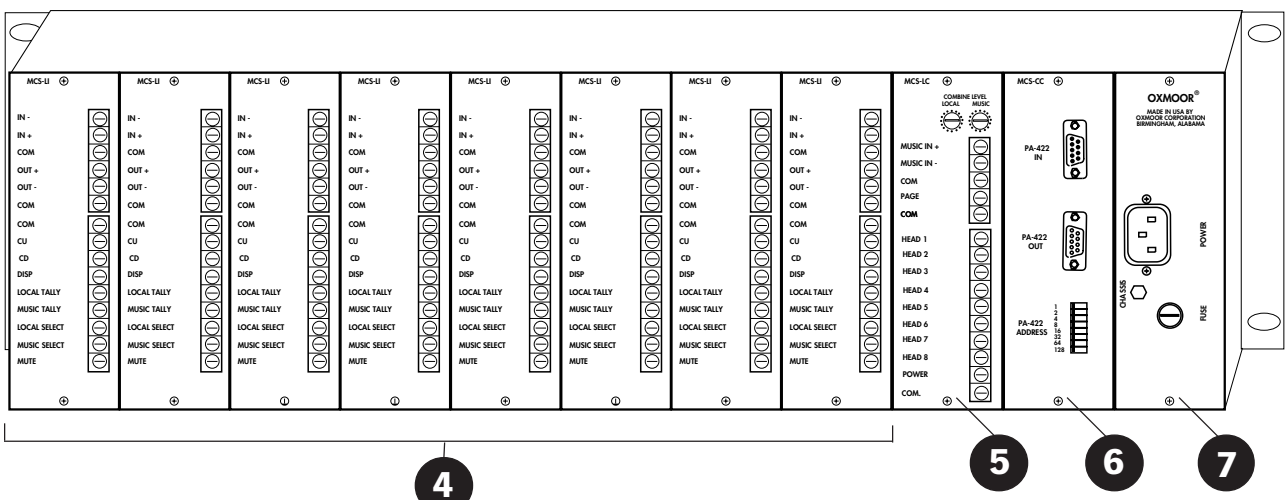


Figure 1.3: MCS-MAINFRAME Rear View

MCS-LI LINE INPUT CARD

MCS-LI LINE INPUT CARD

(Callouts refer to Figure 1.4)

One MCS-LI Line Input card is required for each room to be combined. A total of eight Line Input cards can be used with each MCS-MAINFRAME.

1. **AUDIO INPUT** - Electronically balanced input, accepts balanced or unbalanced signals from line-level devices. Normal input level is 0 dBu with a maximum input level of +24 dBu.

NOT SHOWN: A trim pot, accessible from the front panel, may be used for audio input level adjustment.

A typical system has an audio source located in each room. Each room's audio source connects to the IN on the appropriate MCS-LI Line Input Card.

2. **AUDIO OUTPUT** - Electronically balanced output, accommodates balanced or unbalanced lines. Recommended Load Impedance is 600 ohms or greater. Maximum output level is +24 dBu.

The Audio OUT connects to an amplifier driving speakers located in the room where the source (Audio IN of the MCS-LI) is located.

3. **REMOTE VOLUME** - Provides for connection of Oxmoor's RC-16 and/or RC-2 Remote Volume Controls.

The volume control(s) would normally be located in the room where the audio source is located.

4. **TALLY** - LOCAL SELECT and MUSIC SELECT TALLY connections. A typical room panel would have LEDs on or next to the LOCAL and MUSIC select switches. The TALLY connections provide a path to common through open-collector transistors to turn the appropriate LED on when either LOCAL or MUSIC is selected.

5. **LOCAL SELECT and MUSIC SELECT** - Provide connections for the LOCAL and

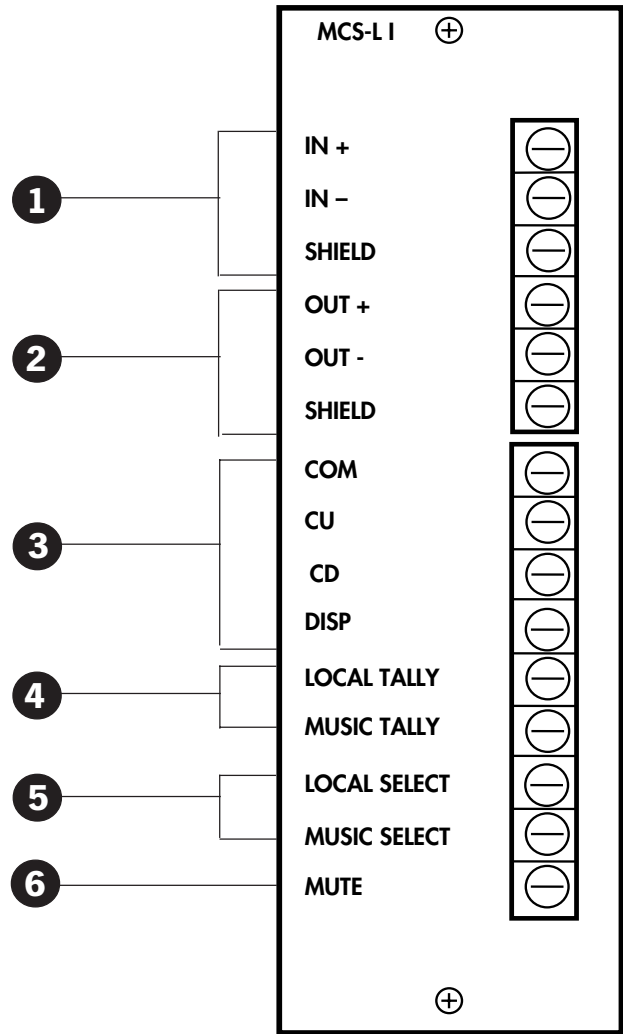


Figure 1.4: MCS-LI Line Input Card

MUSIC buttons. These momentary push-buttons are normally located in the zone associated with the MCS-LI's audio source. The user may select between LOCAL (source connected to the audio "IN" of the MCS-LI Line Input card) and MUSIC (source connected to the "MUSIC IN" on the MCS-LC Logic Card).

NOTE: The MCS-RP Room Panel incorporates the functions described in 3, 4 and 5 above.

6. **MUTE** - Each momentary contact closure between the MUTE terminal and COM "toggles" the audio output on and off.

MCS-LC LOGIC CARD

MCS-LC LOGIC CARD

(Callouts refer to Figure 1.5)

One MCS-LC Logic Card is required for each MCS Mainframe used.

1. **LOCAL** - Used to set the COMBINE LEVEL "LOCAL" default volume setting. When rooms are combined, or a room is added to a combined group, all volume controls in the combined group default to this "LOCAL" volume level.
2. **MUSIC** - Used to set the COMBINE LEVEL "MUSIC" setting. The first time MUSIC SELECT is activated on one of the MCS-LI cards within a combined group, all volume controls in the group default to this "MUSIC" volume level.
3. **MUSIC IN** - Designed to be used for background music and/or paging. Electronically balanced input, accepts balanced or unbalanced signals from line-level devices. Normal input level is 0 dBu with a maximum input level of +24 dBu.

NOT SHOWN: A screwdriver-adjust level control of this input is accessible from the front panel.

Every Line Input Card has access to this MUSIC IN by activating MUSIC SELECT on the desired MCS-LI Line Input Card.

4. **PAGE** - When MUSIC IN is being used as the page input to the system, the page logic connections may be used to activate paging overrides.

All MCS-LI Line Input Cards that have MUSIC SELECT active will default to the COMBINE LEVEL "MUSIC" volume setting when the PAGE logic is pulled low. When the page logic is released all MCS-LIs return to their previous volume setting.

5. **HEAD 1 through HEAD 8** - The HEAD-TABLE logic provides closures to common for controlling relays to turn HEAD-TABLE speaker(s) on and off.

The open-collector outputs (HEAD 1 through HEAD 8) are capable of sinking 0.5 amps to common. The maximum supply voltage (POWER) is 50 VDC.

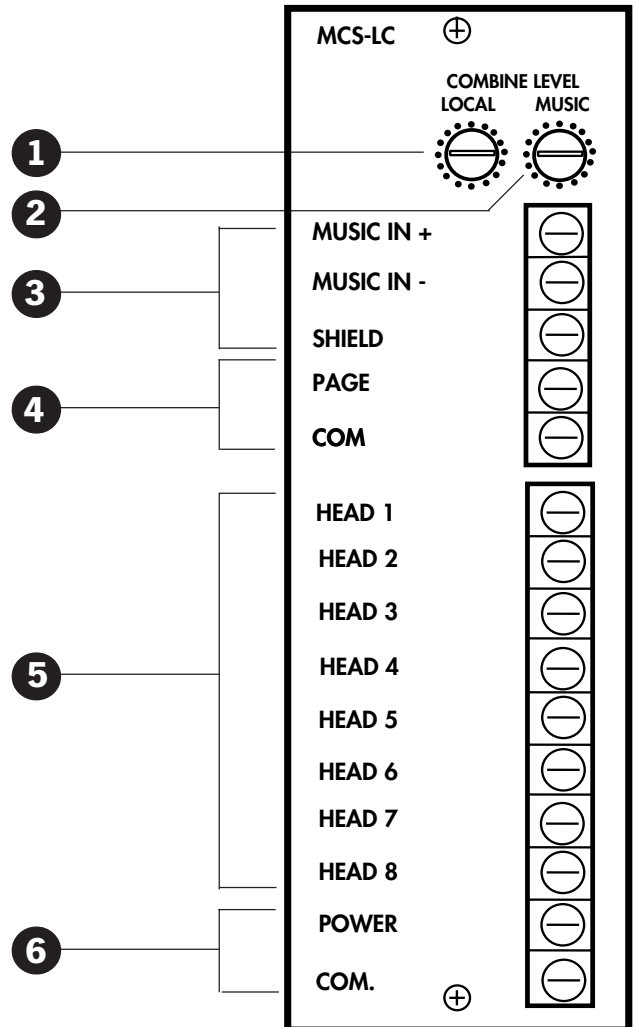


Figure 1.5: MCS-LC Logic Card

6. **POWER and COM** - These should be connected to the plus and ground of the power supply driving the HEAD-TABLE relays. This is to protect HEAD 1 through HEAD 8 outputs from any back-EMF of the relay coil.

NOTE: Do not connect HEAD 1 through HEAD 8 directly to the plus terminal of the power supply driving the relays; this will cause damage to the Head-Table outputs.

MCS-CC CONTROL CARD

MCS-CC CONTROL CARD

(Callouts refer to Figure 1.6)

One MCS-CC Control Card is required for each MCS Mainframe used. Communication between a controller and the MCS-CC Control Card follows PA-422 protocol. The Control Card provides loop-through connections for PA-422 devices and PA-422 address selection for the MCS system.

1. **PA-422 IN** - Male, 9-pin D-sub connector. This port is connected to the PA-422 OUT of the MCS-MCP Master Control Panel, an MCS-IB Interface Box or other control devices.
2. **PA-422 OUT** - Female, 9-pin D-sub connector. It is used to carry the PA-422 data to the next PA-422 device.
3. **PA-422 ADDRESS** - A selector switch that is used to assign an address to the MCS system. The MCS Mainframe and the control device have to be assigned the same address in order for them to communicate with each other.

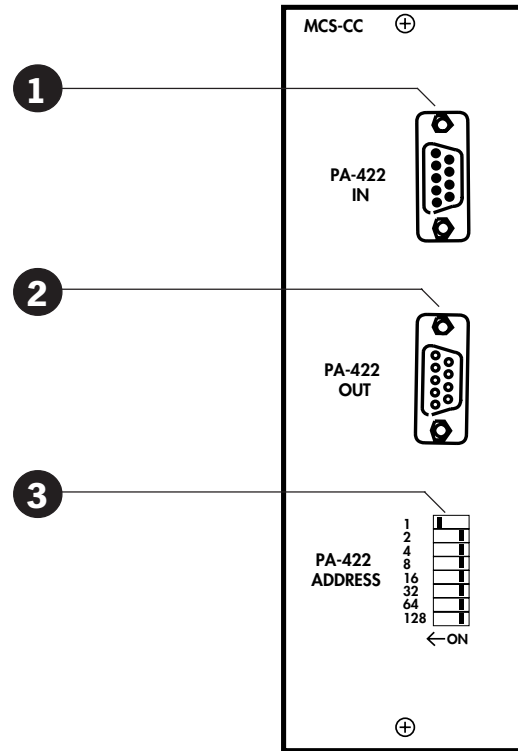


Figure 1.6: MCS-CC Control Card

MCS-PS POWER SUPPLY

MCS-PS POWER SUPPLY

(Callouts refer to Figure 1.7)

One MCS-PS Power Supply card is required for each MCS Mainframe used. The MCS-PS Power Supply module provides power for the Mainframe.

1. **POWER CONNECTOR** - Standard IEC 3-pin connector for AC power cord. Use only with grounded (3-wire) outlets. Cord sets are available for all world connection standards.
2. **CHASSIS GROUND POST** - A screw with a star washer enables the installer to secure a ground wire to the chassis.
3. **FUSE HOLDER** - Replace only with approved type of fuse in a rating appropriate to the mains voltage, as indicated on back panel. (See SPECIFICATIONS.)

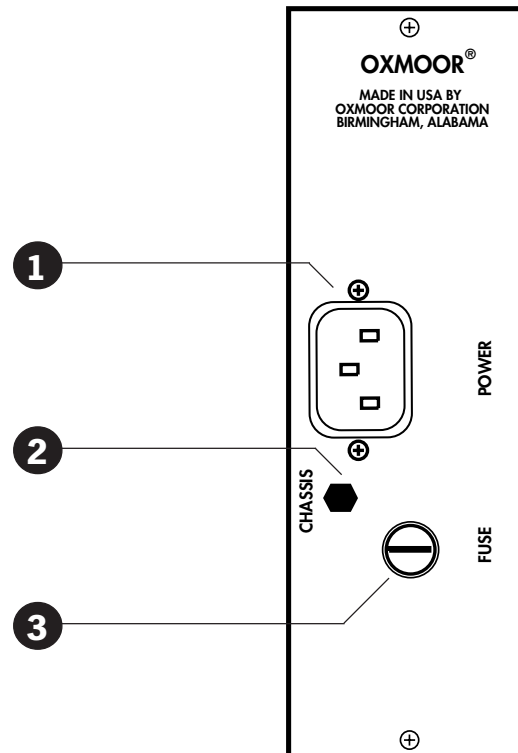


Figure 1.7: MCS-PS Power Supply Card

MCS-RP ROOM PANEL

MCS-RP ROOM PANEL

(Callouts refer to Figure 1.8)

A typical MCS system includes a (standard 3-gang) wall-mounted MCS-RP Room Panel in each room or zone to be combined. The Room Panel provides:

1. **LOCAL** - Push-button switch with tally LED for selection/indication of LOCAL sound source.
2. **MUSIC** - Push-button switch with tally LED for selection/indication of background MUSIC.
3. **KEY-SWITCH** - Lockable Key Switch for panel security.
4. **VOLUME** - Master volume control for LOCAL or MUSIC source.

When rooms are combined through the MCS system, all functions of the MCS-RP Room Panels in the combined group synchronize. Making a source selection (LOCAL or MUSIC) at a Room Panel will determine the source for any other rooms with which it is combined. Likewise, adjusting the RC-16 Remote Volume Control on the MCS-RP Room Panel in one room will adjust the volume in all rooms with which it is combined.

OPERATION:

1. Insert key in 3-position Key Switch.
2. Turn key to ON position.
3. Select source. Options include LOCAL sound source, background MUSIC, or no source.
 - a. Select LOCAL sound source (usually a mixer). Push LOCAL switch; the LED on the switch will indicate that the LOCAL source has been selected (audio IN on the MCS-LI Line Input Card). If background MUSIC has previously been selected, it will be replaced by the LOCAL source and the LED on the MUSIC switch will no longer be illuminated. Only one of the two sources (LOCAL or MUSIC) may be active at a time.
 - b. Select MUSIC. Push the MUSIC switch; the LED on the MUSIC switch will illuminate, indicating that the current audio source is the background music system (MUSIC IN on the MCS-LC Logic Card). If the LOCAL source has previously been selected, it will be replaced by background MUSIC and the LED on the LOCAL switch will no longer be illuminated. Only one of the two sources (LOCAL or MUSIC) may be active at a time.
 - c. LOCAL and MUSIC off — no source. Push whichever switch is active (LED illuminated)

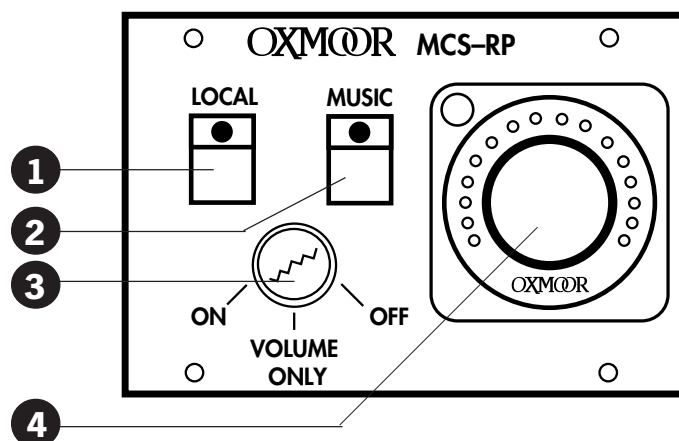


Figure 1.8: MCS-RP Room Panel

and both sources are effectively disconnected or turned off. Neither the MUSIC nor the LOCAL LED tally light will be illuminated until a source is once again selected.

4. Adjust volume. The Oxmoor RC-16 serves as the master volume control for the room/zone. When rooms are combined through the MCS system, any of the volume controls in the combined group may be used to adjust the volume in all the combined rooms. The LED volume control position indicators on the RC-16s in all combined rooms will track in synch.
5. Turn Key Switch to the position that presents the level of security desired for the particular Room Panel. The three switch position options are:
 - a. **ON** - With the switch left in the ON position all controls operate. No security is provided against unwanted tampering. An authorized operator may select this position to deliberately leave control of volume and source selection in the hands of the room occupants.
 - b. **VOLUME ONLY** - With the switch set to VOLUME ONLY, the RC-16 Volume Control is operable. The LOCAL & MUSIC buttons are secured or locked out, preventing tampering or unauthorized operation. All LEDs continue to provide status indication.
 - c. **OFF** - In the OFF position, the Key Switch secures all functions. No LED indicators are illuminated. This highest level of security renders the Room Panel tamper proof.
6. Remove the key. The key may be removed from the panel in any of the three switch positions.

MCS-MCP MASTER CONTROL PANEL

MCS-MCP MASTER CONTROL PANEL

(Callouts refer to Figure 1.9)

The MCS-MCP Master Control Panel is typically a custom control panel that is arranged to depict the physical layout of the rooms to be combined. The panel provides a means to combine rooms, select sources, and activate the Head-Table locations.

1. **HEAD-TABLE** - Momentary push-button switch. The HEAD-TABLE switch/indicator controls open collector outputs for driving relays. The relays would be used to mute the loudspeaker(s) directly over the location of the Head-Table microphone(s).
2. **SOURCE** - Momentary push-button switch. The SOURCE switch/indicator mutes/un-mutes the input of the audio channel dedicated to this room. This allows the user to determine which rooms will have active inputs.
3. **COMBINE** - Momentary push-button switch. The COMBINE switch/indicator combines the audio of the appropriate rooms and causes the MCS-RP Room Panels in the combined rooms to synchronize.
4. **KEY-SWITCH** - The Key Switch allows the user to secure all functions of the MCS-MCP Master Control Panel.

The switches and tally LEDs shown in Figure 1.9 are typical of what would be incorporated into a custom MCS-MCP Master Control Panel from Oxmoor. The functions of these switches and LEDs may also be performed by means of another PA-422 control device. An alternate custom controller, utilizing contact closures, tally indicators and a locking Key Switch, may be employed if used with an MCS-IB Interface Box to translate contact closures to PA-422 signals for communication with the Mainframe.

OPERATION:

1. Turn the Key Switch to the ON position. This enables all Master Control Panel functions until the switch is returned to the OFF position.
2. Depress the COMBINE switch which lies on the intersection of two rooms you wish to combine. The tally LED on the COMBINE switch will illuminate, indicating that the two rooms have been combined. Add any adjacent rooms to the combination as desired simply by pushing the COMBINE button on the intersection of another room and any of the combined rooms.

Note that all of the push-button switches operate in a "toggling" push on/push off manner.

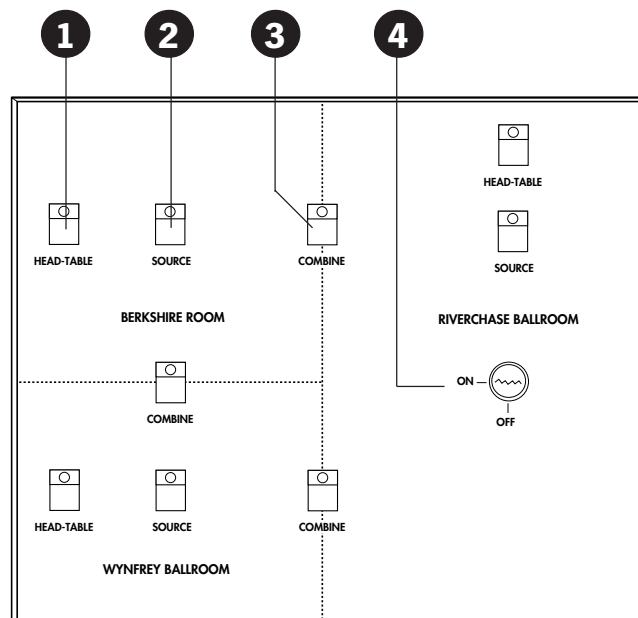


Figure 1.9: Section View of Typical MCS-MCP

3. Select desired SOURCE or combination of SOURCES. Note: Combining rooms will automatically cause the audio SOURCE in each to default to LOCAL (typically the local mixer for that room) and to become "active". That is, the SOURCES will mix to serve the needs of the combined space. The tally LED will illuminate on each switch to indicate the SOURCE is active.

To delete a SOURCE from the mix, push the appropriate SOURCE button. The LED will go off and the SOURCE will no longer be active. This should be done with any unused SOURCE, even if its mixer is off, disconnected or unattended, in order to eliminate any possibility of undesired additions to the audio in the combined rooms.

4. Mute the loudspeaker over the Head-Table microphone location to reduce the risk of feedback. Determine the Head-Table location and depress the HEAD-TABLE switch that corresponds to it. The tally LED on the HEAD-TABLE switch will illuminate indicating that speaker muting has occurred.
5. Secure system. Once the desired configuration has been selected, eliminate unauthorized tampering by turning the key-switch to the OFF position and removing the key.

MCS-MVP MASTER VOLUME PANEL

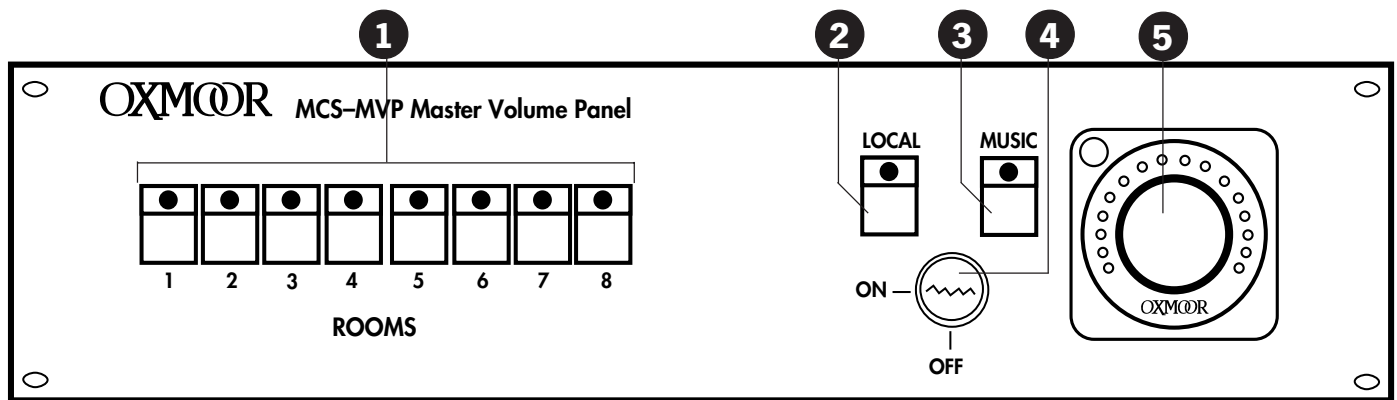


Figure 1.10: MCS-MVP Master Volume Panel

MCS-MVP MASTER VOLUME PANEL

(Callouts refer to Figure 1.10)

A typical MCS system includes an MCS-MVP Master Volume Panel. Designed to be located next to the Master Control Panel, the MVP provides remote control of any MCS-RP Room Panel. The Master Volume Panel provides:

1. **ROOMS** - Momentary push-button switch for selection of room to control.
2. **LOCAL** - Momentary push-button switch for selection of LOCAL sound source for the selected room.
3. **MUSIC** - Momentary push-button switch for selection of background music for the selected room.
4. **KEY SWITCH** - ON/OFF Key Switch for panel security.
5. **VOLUME** - Master volume control for LOCAL or MUSIC source.

The Master Volume Panel provides remote volume control and LOCAL/MUSIC source selection for any room or combined group of rooms. A simple interlock operating logic scheme provides a measure of security and reduces the chance of unintentional changes being made. The volume control and the LOCAL and MUSIC switches will not function unless a room button is simultaneously depressed.

OPERATION:

1. Push the room button that corresponds to the room over which you wish to exercise control. As long as the button is depressed, LEDs will designate three kinds of status:

- a. **ROOM(S)**. LEDs will be illuminated on the depressed button and on those buttons which represent rooms with which the selected room is currently combined.
 - b. **LOCAL** or **MUSIC** source. If either a LOCAL or MUSIC source has been selected in the room or zone, an LED will also light on the LOCAL or MUSIC button to show which is active.
 - c. **VOLUME**. An LED on the array around the volume control will be illuminated, indicating by its position what the volume level setting is for the room or group of rooms.
2. With the appropriate room button depressed, rotate the volume control to achieve the desired level, then release button.
 3. As long as the room button remains depressed, the LOCAL or MUSIC buttons may be used to select the desired source for the room. Push LOCAL to assign the LOCAL source (usually a mixer) to the room or group of rooms. Push MUSIC to replace the LOCAL source with background music and page. Depressing either button while it is active (LED illuminated) will remove the source, leaving no source connected.

KEY SWITCH SECURITY:

The Key Switch, with its removable key, may be locked in either the ON or OFF position. Switched ON, all controls operate; no security is provided against unwanted tampering. With the Key Switch in the OFF position, all functions are secured, rendering the Master Volume Panel tamper proof.

MCS-IB INTERFACE BOX

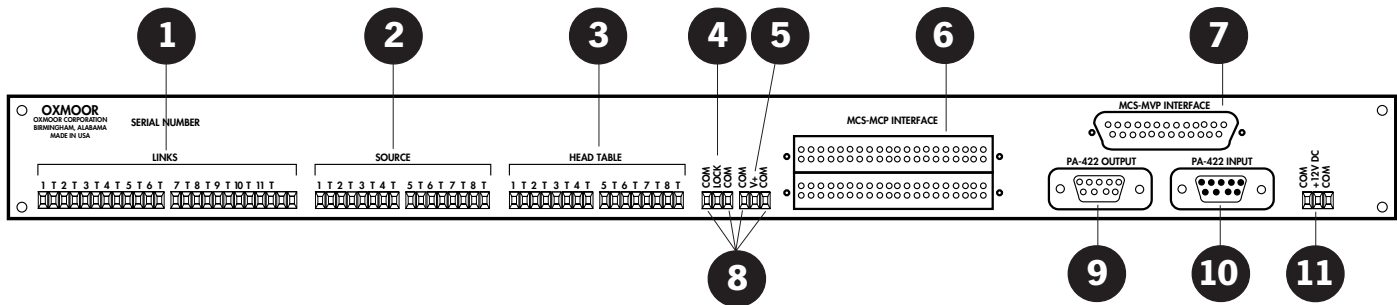


Figure 1.11: MCS-IB Interface Box Rear View

MCS-IB INTERFACE BOX

(Callouts refer to Figure 1.11)

The MCS-IB serves as an interface for:

- Contact closures (LINK, SOURCE and HEAD-TABLE) to PA-422 signals that communicate with the MCS Mainframe.
- MCS-MVP Master Volume Panel communication with the MCS Mainframe.
- Programming of the LINKS lines.

- LINKS** - Terminal block connections for 11 momentary LINK (COMBINE) switches. Each LINK line can be programmed to LINK/COMBINE any combination of the MCS-LI Line Input modules.
- SOURCE** - Terminal block connections for 8 momentary SOURCE switches. The eight SOURCE terminals correspond to the eight MCS-LI Line Input modules located in the MCS Mainframe. Each momentary contact closure between the SOURCE terminal and COM “toggles” the associated audio channel’s source (LOCAL or MUSIC) on or off.
- HEAD-TABLE** - Terminal block connections for 8 momentary HEAD-TABLE switches. The eight HEAD-TABLE terminals correspond to the eight MCS-LI Line Input modules located in the MCS mainframe. Each momentary contact closure between the HEAD-TABLE terminal and COM “toggles” the associated open-collector output, HEAD 1 through HEAD 8, (located on the MCS-LC Logic Card) on or off.

TALLY - The terminals marked “T”, located to the right of each LINK, SOURCE and HEAD-TABLE terminal provide an open-collector closure to common for a TALLY indicator. The TALLY

indicator, which may be an LED or an incandescent (see SPECIFICATIONS), provides status indication when its associated control line is active.

- LOCK** - Provides security for the LINKS, SOURCE and HEAD TABLE functions. Designed for use with a key switch, a maintained contact closure between LOCK and COM terminals provides security from unauthorized operation.
- V+** - The V+ terminal provides the positive powering voltage for TALLY indicators.
- MCP I/F** - 2 40-pin, male header connectors. Used to connect the Master Control Panel to the IB box.
- MVP I/F** - Standard, 25-pin, female D-sub connector. Used to connect the MCS-MVP Master Volume Panel to the MCS system.
- COM** - The common terminal for use with LINKS, SOURCE, HEAD-TABLE, TALLY and LOCK functions.
- PA-422 OUTPUT** - Female, 9-pin D-sub connector. It is used to handle the exchange of PA-422 data between the MCS-IB Interface Box and the Mainframe and/or another PA-422 device.
- PA-422 INPUT** - Male, 9-pin D-sub connector. It is used to handle the exchange of PA-422 data between the MCS-IB Interface Box and the Mainframe and/or another PA-422 device.
- 12 VDC** - Provides COM (common) and + connections for the MCS-IB external powering module.

MCS-LI LINE INPUT CARD CONNECTIONS

MCS-LI LINE INPUT CARD CONNECTIONS

(Refer to Figure 2.0)

The MCS-LI Line Input Card provides connections for audio IN and OUT, Room Panel (Remote Volume, LOCAL/MUSIC SELECT, LOCAL/MUSIC TALLY) and MUTE.

NOTE: When wiring each MCS-LI card it is very important to keep track of which card corresponds to which room so as to maintain consistency between MCS-LI wiring and that of the Master Control Panel or MCS-IB Interface Box. As you face the rear panel of the Mainframe, the MCS-LI cards will be numbered from right to left.

1. Audio IN. Electronically balanced input, accepts balanced or unbalanced signals from line-level devices. Normal input level is 0 dBu with maximum input level of + 24 dBu.

The line-level signal from the audio source (typically a mixer) for the room which corresponds to the MCS-LI is routed into the IN terminals. The drawing illustrates a proper balanced connection using 2-conductor, shielded cable. Be sure polarity is consistent with the source connections.

2. Audio OUT. Electronically balanced output accommodates balanced or unbalanced lines. Recommended load impedance is 600 ohms or greater. Maximum output level is +26 dBu.

From the OUT terminals, the signal is routed to the appropriate power amplifier for the room. The drawing illustrates a proper balanced connection using 2-conductor, shielded cable. Be sure polarity is consistent with the load connections.

3. Room Panel Connections. Figure 2.0 shows the correct interconnection of the MCS-LI Line Input Card and the MCS-RP Room Panel. Each of the eight terminals on the rear of the Room Panel connects directly to the terminal of the same name on the MCS-LI. Using a number 22 AWG cable, the maximum cable length to each MCS-RP is 600 m (2000 ft).

4. MUTE Connections. A momentary contact closure between MUTE and COM will mute the audio output of the MCS-LI Line Input Card. The next momentary contact closure between MUTE and COM will unmute the audio output of the MCS-LI Line Input Card.

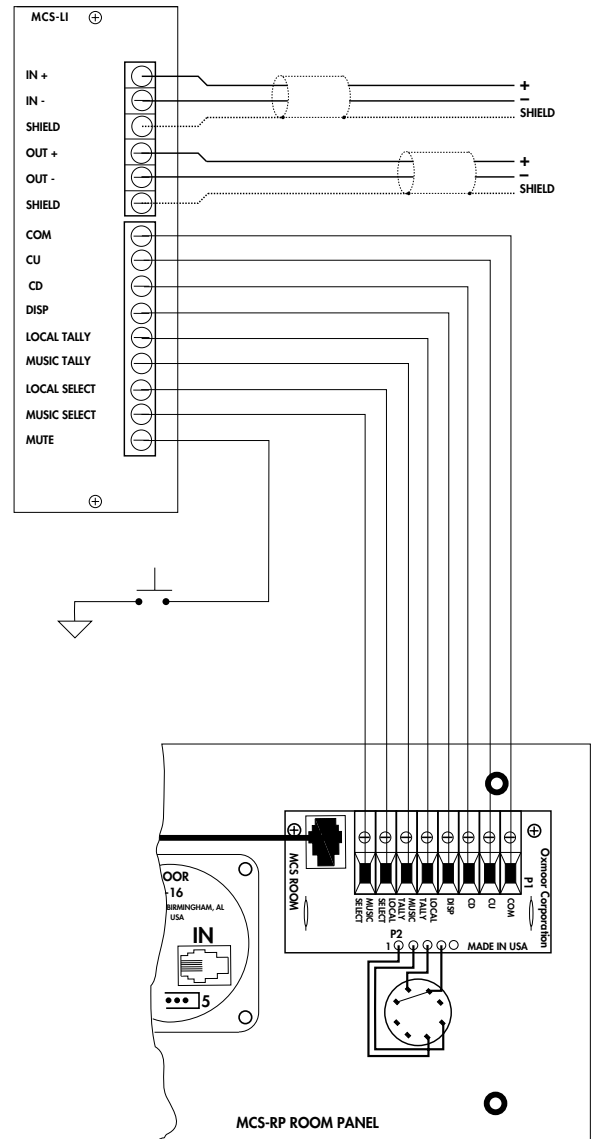


Figure 2.0: MCS-LI Line Input Card Connections

AUDIO OUTPUT CONVERSION: BALANCED TO UNBALANCED

While the MCS-LI is configured from the factory for balanced audio output, a jumper on its circuit board allows easy conversion to an unbalanced configuration.

The Procedure:

- Disconnect the AC cord from the MCS-PS Power Supply.
- Remove the two screws holding the MCS-LI in place and slide the MCS-LI out of the Mainframe.

(continued next page)

MCS-LI LINE INPUT CARD CONNECTIONS

MCS-LI LINE INPUT CARD CONNECTIONS

(Continued from previous page)

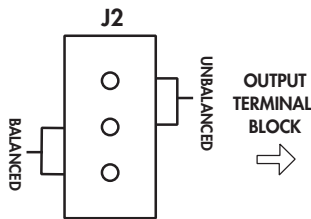


Figure 2.1: Balanced/Unbalanced Jumper

- c. Locate the Balanced/Unbalanced Jumper Block, J2, immediately behind the audio OUT terminals.
- d. Observing the positions shown in Figure 2.1, remove the jumper and re-install it in the unbalanced position.
- e. Slide the MCS-LI card back into the Mainframe and replace the two mounting screws.

The connector is now configured for unbalanced output and should be connected to an unbalanced input as shown in Figure 2.2.

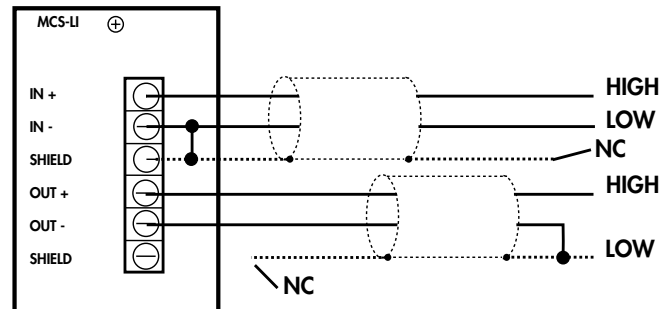


Figure 2.2: MCS-LI Unbalanced Audio

IMPORTANT NOTE: The output wiring configuration shown above is correct ONLY if the Balanced/Unbalanced Jumper Block has been moved to the unbalanced position.

CONTRACTOR - FABRICATED ROOM PANEL CONNECTIONS

CONNECTIONS TO A CUSTOM ROOM PANEL

(Refer to Figure 2.3)

Figure 2.3 provides the wiring information required to custom-fabricate a room panel using Oxmoor's RC-16 Remote Volume Control.

1. **LEDs (D) and Resistors (R).** High-efficiency LEDs are recommended for the TALLY indicators. For an LED that draws 1 mA, an 8 K Ohm current-limiting resistor should provide suitable brightness. The value of the resistor will vary with the current demand of the LED and the brightness desired. Be certain that the LED/resistor combination does not exceed the 20 mA, 15 V maximum power provided by the MCS-LI card.
2. **Security Switch (K1).** Switch K1 demonstrates how a 2-pole, 3-throw switch can be wired to provide the security functions performed by the key switch on the Oxmoor MCS-RP Room Panel. If no switchable security functions are desired,

wire as indicated by the ON position of K1.

3. **LOCAL SELECT and MUSIC SELECT (S).** The LOCAL and MUSIC SELECT switches are SPST, Normally Open, Momentary Contact.
4. **WIRE.** Using 22 AWG cable, maximum cable length between the MCS-LI and each room panel is 600 m (2000 ft).

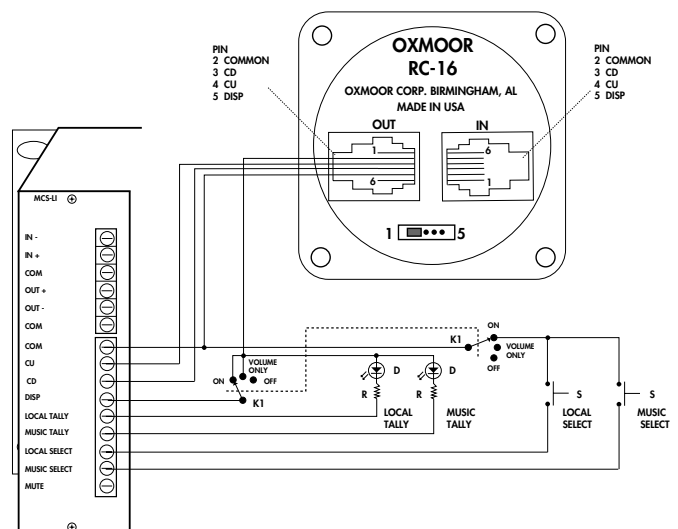


Figure 2.3: MCS-LI Connection for Contractor-Fabricated Room Panel

MCS-LC LOGIC CARD CONNECTIONS

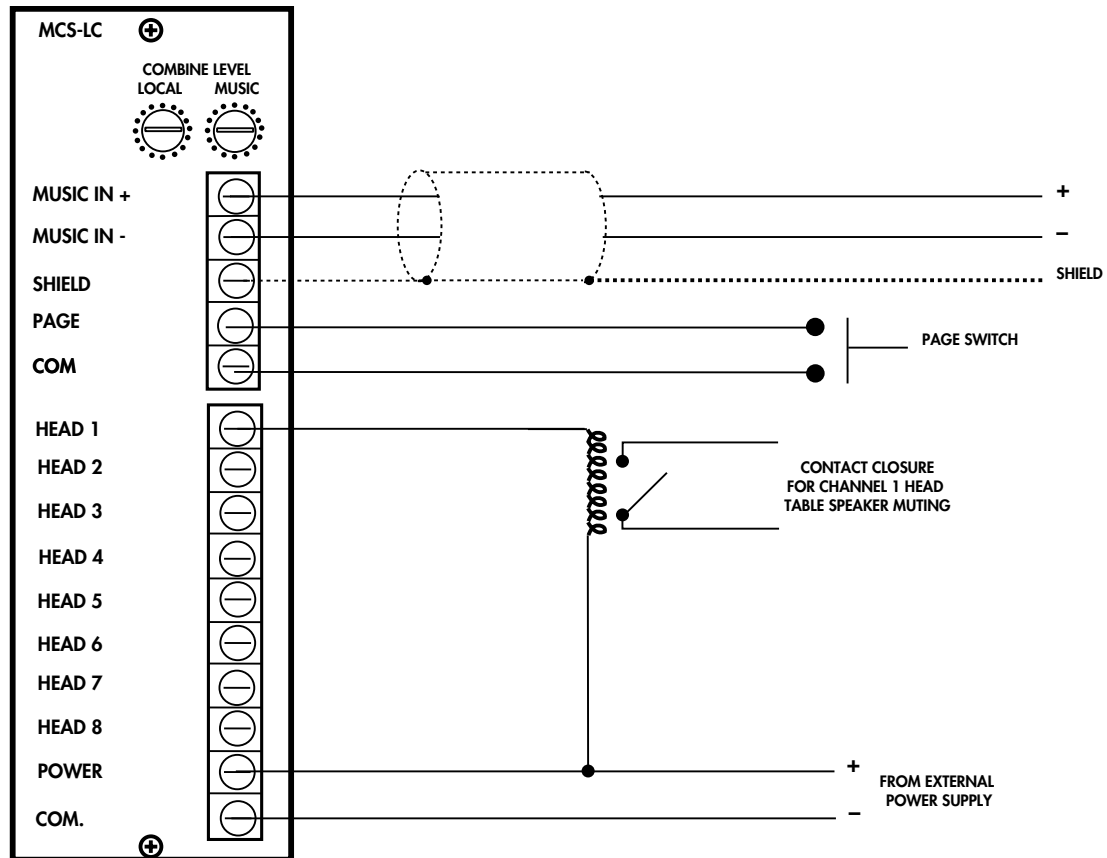


Figure 2.4: MCS-LC Logic Card Connections

MCS-LC LOGIC CARD CONNECTIONS

(Refer to Figure 2.4)

1. **MUSIC.** The three MUSIC terminals (MUSIC IN +, MUSIC IN -, and SHIELD) provide an electronically balanced input for a background music source and/or paging. Normal input level is 0 dBu with maximum input level of + 24 dBu. The two signal leads connect to MUSIC IN + and MUSIC IN -; it is good practice to maintain consistent polarity throughout system wiring. If the source is unbalanced (single-conductor, shielded) connect the shield to both the MUSIC IN - and the SHIELD terminals.
2. **PAGE and COM.** The drawing shows a SPST, Normally-Open, Momentary-Contact switch wired between the PAGE and COM terminals. This may be used to provide paging override. As long as the circuit is closed, the PAGE logic is pulled low, causing all MCS-LI Line Input Cards that have MUSIC SELECT active to default to the COMBINE LEVEL "MUSIC" volume setting.
3. **HEAD 1 through HEAD 8.** Figure 2.4 illustrates the proper wiring of a HEAD-Table speaker muting relay and its power supply. HEAD 1 through HEAD 8 provide open-collector outputs to activate the relays. An output is toggled on or off by each closure of the corresponding momentary switch across the HEAD-TABLE terminals of the MCS-IB Interface Box.
4. **POWER and COM.** POWER and COM connect to the plus and ground of the relay power supply to protect the eight open-collector outputs from the back EMF of the relay coil. Note: It is important that the POWER and COM terminals be wired correctly. Do not connect any of the outputs directly to the plus terminal of the power supply driving the relays, this may cause damage to the outputs.

MCS-MCP MASTER CONTROL PANEL CONNECTIONS

MCS-MCP MASTER CONTROL PANEL CONNECTIONS

(Refer to Figure 2.5)

The MCS-MCP Master Control Panel and the MCS-IB communicate with each other by two 40-pin header connectors. The required data cable will have a female, 40-pin connector at both ends.

1. **40 Pin Header Connectors** - Interconnect the MCS-MCP and the MCS-IB.
2. **POWER** - Connect the 12 VDC External Power Supply (supplied by Oxmoor) to the 12 VDC connection on the MCS-IB rear panel as illustrated.

3. After ALL system interconnections have been made, plug the MCS-IB External Power Supply into the equipment rack's mains supply.
4. If the Master Control Panel is communicating with the Mainframe, all tally LEDs will blink momentarily and then stay on or off depending upon their control line status.

If the Master Control Panel is *NOT* communicating with the Mainframe, all tally LED's will continue to flash until communication is established.

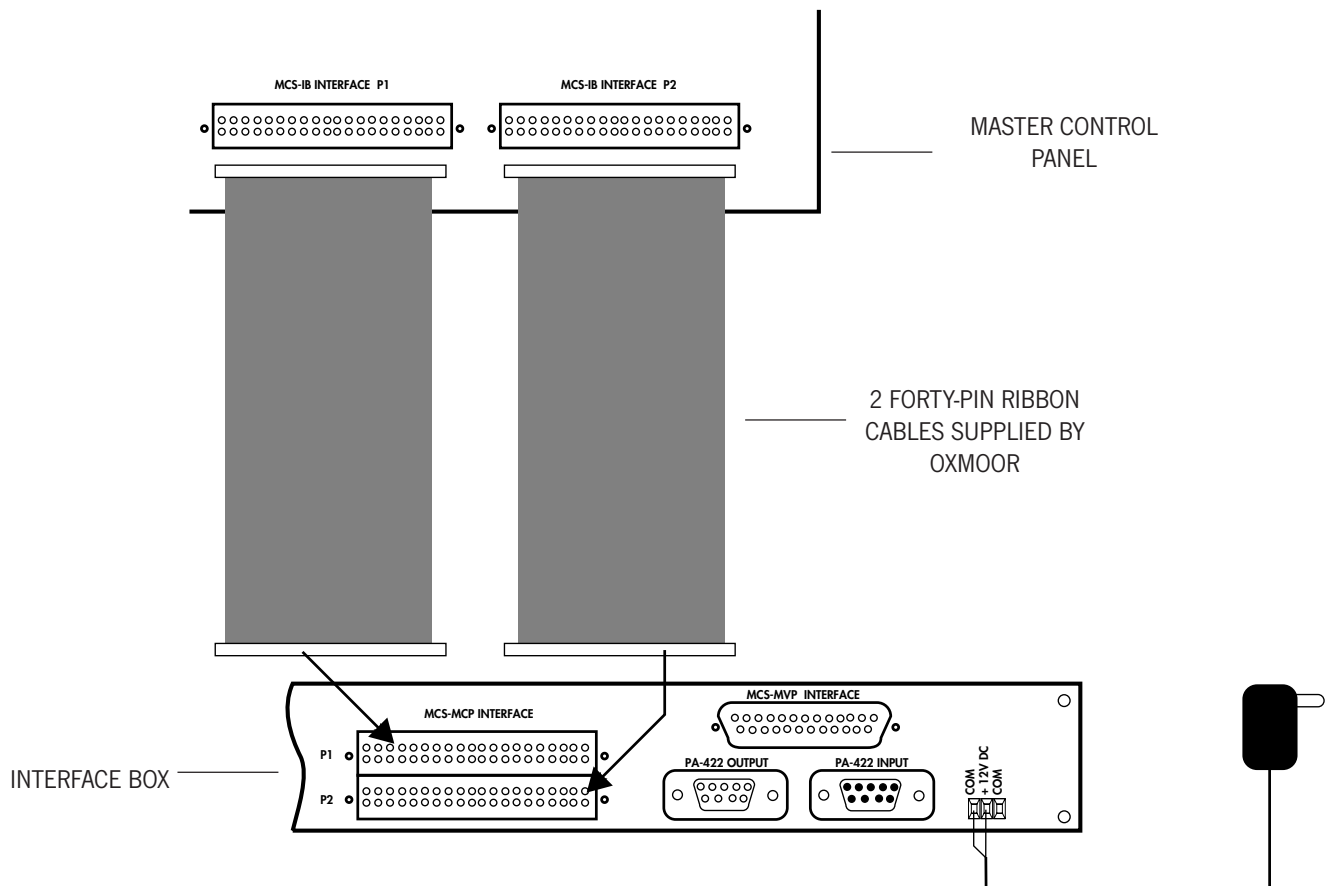


Figure 2.5: MCS-MCP Master Control Panel Connections

MCS-IB INTERFACE BOX CONNECTIONS

MCS-IB INTERFACE BOX CONNECTIONS

(Refer to Figure 2.6)

The MCS-IB Interface Box and the MCS-Mainframe communicate with each other by a PA-422 serial interface. The required data transfer cable will have a male, 9-pin D-sub connector at one end and a female, 9-pin D-sub connector at the other.

1. **PA-422 INPUT and OUTPUT** - Interconnect the MCS-IB and the MCS Mainframe. This may be accomplished by either of two methods:

Either -

- a. Plug the data cable into the PA-422 INPUT on the MCS-IB and the PA-422 OUTPUT on the MCS-CC Control Card.

Or -

- b. Connect the data cable to the PA-422 OUTPUT on the MCS-IB and the PA-422 INPUT on the MCS-CC Control Card.

NOTE: Do not connect both the PA-422 INPUT and the PA-422 OUTPUT of the MCS-IB to the MCS-CC.

2. **PA-422 ADDRESS** - Connect any other PA-422 devices used in the system to one of the remaining PA-422 ports on the MCS-IB or the MCS-CC. If additional PA-422 devices are connected, be sure to establish different PA-422 addresses on each.
3. **POWER** - Connect the two DC output conductors of the MCS-IB External Power Supply to the 12 VDC terminals on the MCS-IB rear panel as illustrated. Connect the positive lead to the + terminal and the minus lead to the COM terminal.
4. After all system interconnections have been made, plug the MCS-IB External Power Supply and the MCS-Mainframe into the equipment rack's 100-130 VAC mains supply.
5. If the Interface Box is communicating with the Mainframe, all tally LEDs will blink momentarily and then stay on or off depending upon their control line status.

If the Interface Box is NOT communicating with the Mainframe, all tally LED's will continue to flash until communication is established.

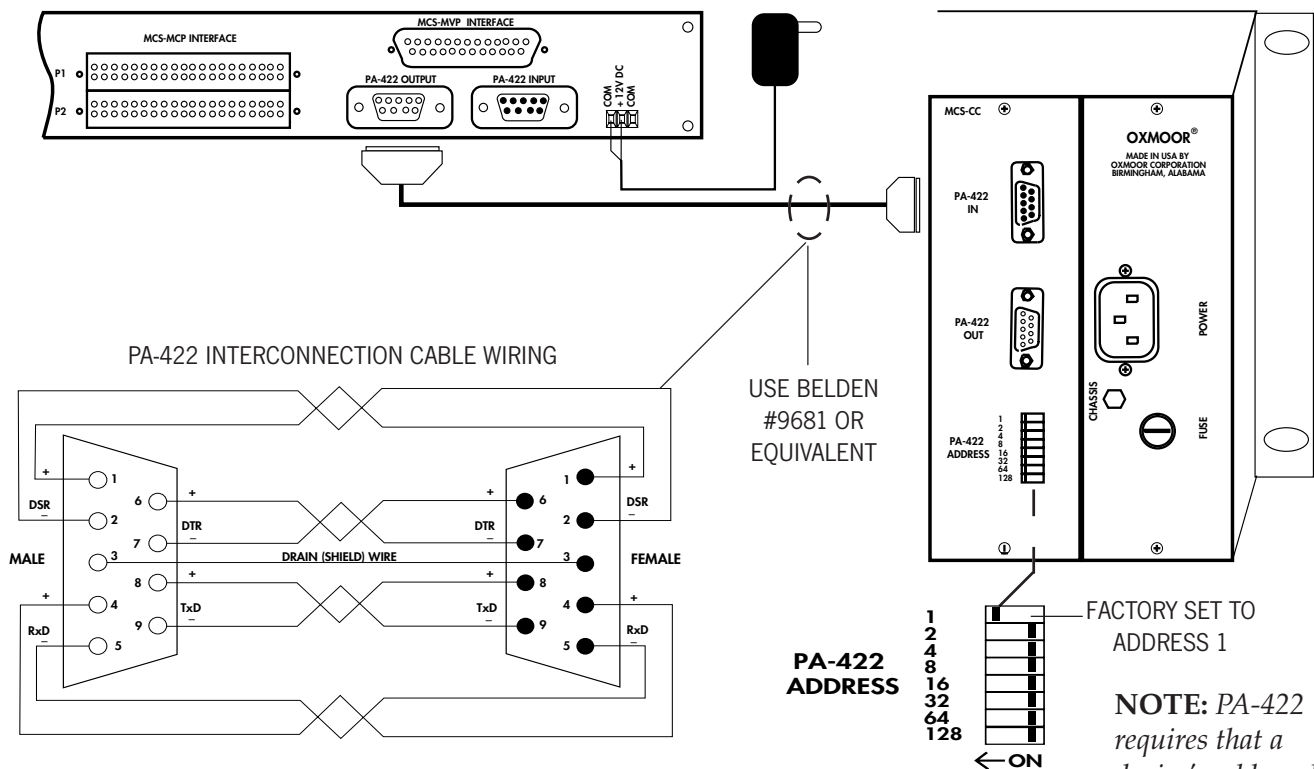


Figure 2.6: MCS-IB Interface Box Connections

MCS-IB INTERFACE BOX SCREW TERMINAL CONNECTIONS

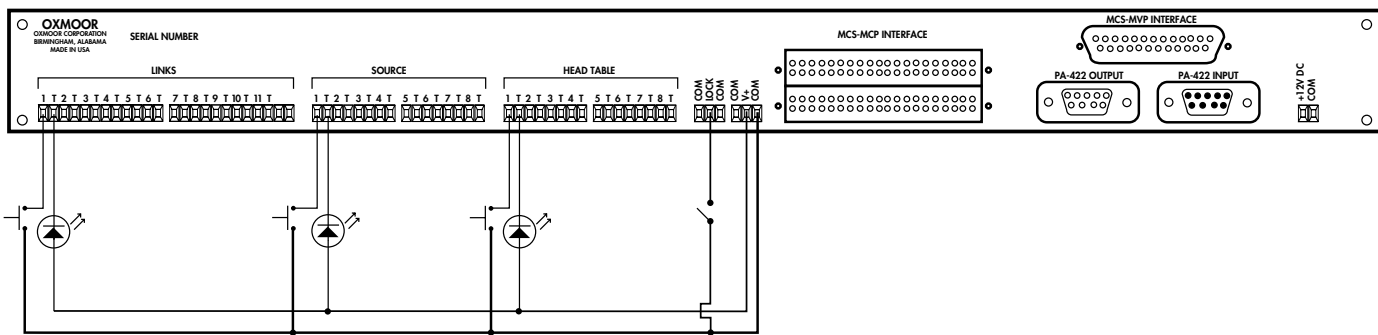


Figure 2.7: MCS-IB Interface Box Screw Terminal Connections

MCS-IB SCREW TERMINAL CONNECTIONS

(Refer to Figure 2.7)

NOTE: The MCS-IB Interface Box LINK lines must be programmed (assigned channels to combine) before any of the audio channels in the MCS system will perform a combine function. (See page 20 for programming the MCS-IB LINKS [COMBINE] lines.)

1. **LINKS.** As illustrated in Figure 2.7 above, wire a momentary contact switch between a numbered LINK terminal (1 through 11) and the COM terminal for each LINK line to be programmed.
2. **SOURCE.** Each MCS-LI Line Input Card in the system has a LOCAL and MUSIC source. These sources can be turned on and off using the SOURCE terminals on the Interface Box. Each SOURCE number corresponds to a Line Input Card channel in the Mainframe. That is, SOURCE 1 controls the LOCAL and MUSIC sources on channel 1 of the Mainframe, etc.

As illustrated in Figure 2.7 above, wire a momentary contact switch between a numbered SOURCE terminal (1 through 8) and the COM terminal for each Line Input Card in the system.

NOTE: It is not necessary to wire the SOURCE terminals if your system does not require muting the LOCAL and MUSIC sources on the Line Input Cards. The Interface Box is shipped from the factory with all SOURCES un-muted.

3. **HEAD-TABLE.** Each MCS-LI Line Input Card in the system has a Head-Table logic function

associated with it. The Head-Table logic can be turned on and off using HEAD-TABLE terminals 1 through 8. Each HEAD-TABLE terminal number corresponds to a Line Input Card channel in the Mainframe. That is, HEAD-TABLE terminal labeled 1 corresponds to MCS-LI card 1 of the Mainframe.

As illustrated in Figure 2.7 above, wire a momentary contact switch between a numbered HEAD-TABLE terminal and the COM terminal for each Line Input Card in the system.

NOTE: MUSIC SELECT on the associated Line Input Card overrides the Head-Table function. The Head-Table function will be active only when the corresponding Line Input Card is in the LOCAL source position. When the MUSIC source is selected, the Head-Table function will be turned off by the MCS system.

4. **TALLY.** A TALLY connection is provided for each LINKS, SOURCE and HEAD-TABLE terminal. The TALLY terminal is labeled "T" and is located to the right of its controlling terminal.

Connect an LED between the "T" terminal and V+ for each control line used. A current-limiting resistor for each LED TALLY is provided in the Interface Box; an additional resistor is NOT required. All power required by the TALLY LEDs is supplied by the Interface Box.

5. **KEY-SWITCH.** Connect a latching key switch between the LOCK and COM terminals to provide security against unauthorized system operation. Maintained contact closure secures LINKS (COMBINE), SOURCE and HEAD-TABLE switching functions.

MCS-MVP MASTER VOLUME PANEL CONNECTIONS

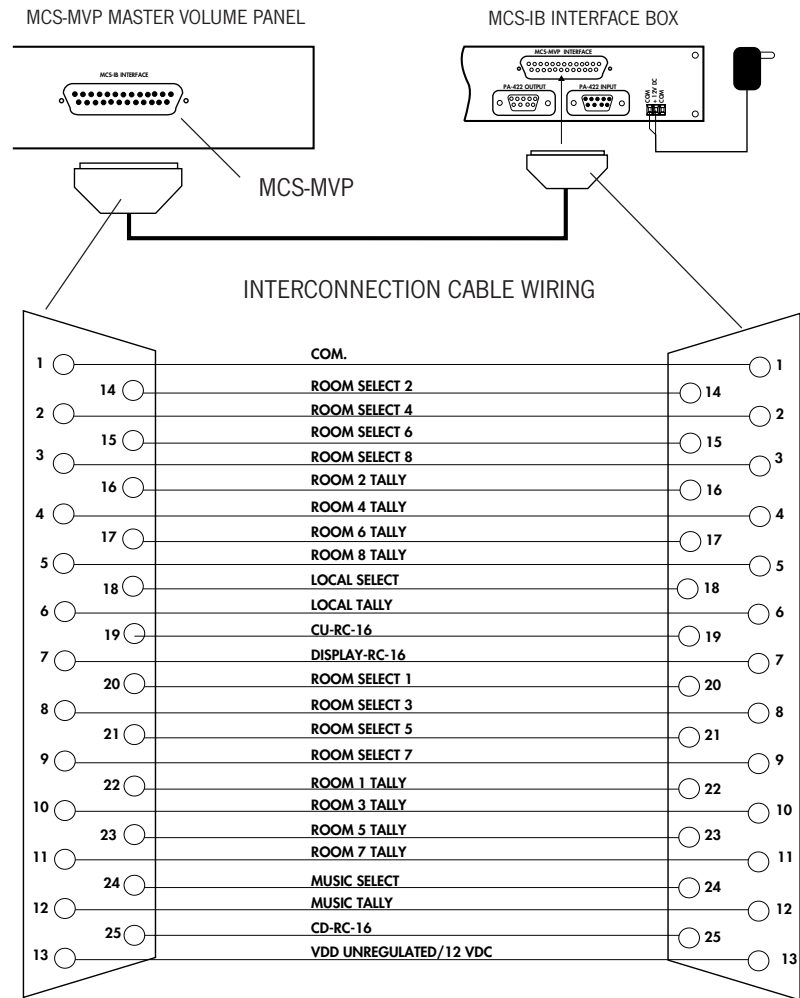


Figure 2.8: MCS-MVP Master Volume Panel Connections

MCS-MVP MASTER VOLUME PANEL CONNECTIONS

(Refer to Figure 2.8)

The MCS-MVP Master Volume Panel communicates with the system through the MCS-MCP Master Control Panel or the MCS-IB Interface Box.

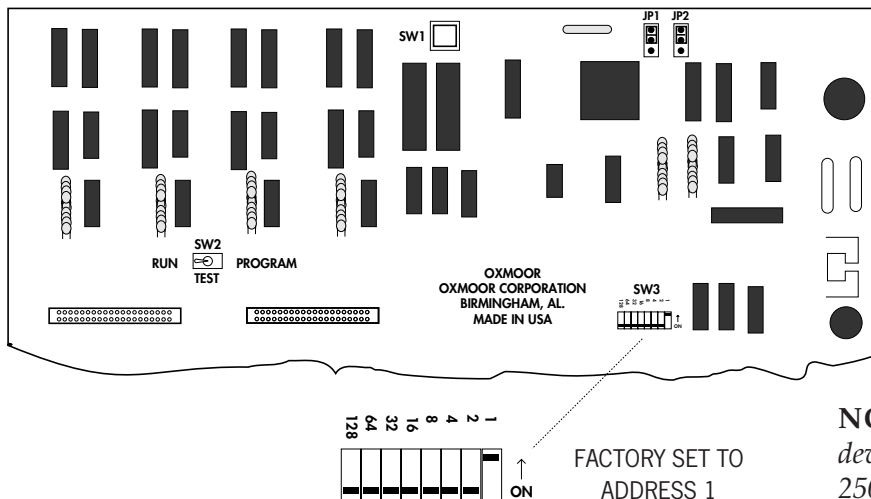
Connect the 3 ft. cable (supplied by Oxmoor) to the 25-pin D-sub connector on the rear panel of the MVP and the female, 25-pin D-sub connector labeled “MVP I/F” on either the MCS-MCP or the MCS-IB as shown.

CABLE CONSIDERATIONS

Using 22 AWG cable, the Master Volume Panel can be located up to 60 feet from the MCS-MCP or the MCS-IB.

If a cable length of more than 3 feet is required, a 25-conductor ribbon cable may be quickly and easily press fit into 25-pin, D-sub connectors, female at one end and male at the other.

MCS PROGRAMMING



NOTE: PA-422 requires that a device's address be between 1 and 250. Address 0, 251, 252, 253, 254, and 256 are illegal.

Figure 3.0: MCS-IB or MCS-MCP Micro-Processor Board

PROGRAMMING THE COMBINE BUTTONS

(Refer to Figure 3.0)

Programming instructs the MCS system as to which channels are to be combined when a COMBINE button is pushed.

NOTE: Your system may have been programmed at the factory as indicated by a programming sheet attached to your Master Control Panel or Interface Box.

All programming functions are handled by pressing and releasing the momentary-contact COMBINE and SOURCE buttons. In the PROGRAM mode each SOURCE button becomes a channel-designator button, used for adding or deleting that channel from the combination.

Programming requires the following steps:

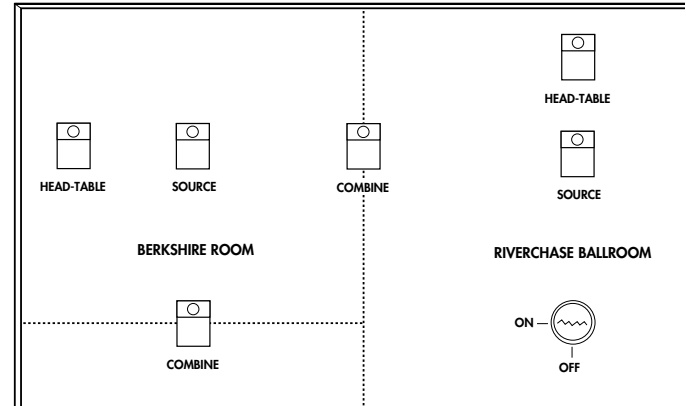
1. Remove power from the MCS-IB. Remove the top panel of the MCS-IB.
2. If you need to clear all programming to an ALL uncombined condition follow steps 3 through 5, otherwise go to step 6.
3. Move the jumper on JP1 to the two pins away from the front panel.
4. Apply power the MCS-IB. One LED on the Master Control Panel will start blinking.
5. Remove power from the MCS-IB. Move the jumper on JP1 to the two pins closes to the front panel.

6. Apply power the MCS-IB.
7. Locate SW2 on the microprocessor board. (See Figure 3.0).
8. Switch SW2 to the PROGRAM position. The PROGRAM position is used for programming only; SW2 must be returned to the RUN position when programming is completed. (Note: the TEST position is for factory use only.)
9. Push the COMBINE button to be programmed. The corresponding TALLY will illuminate. If this COMBINE button has been programmed, SOURCE TALLY indicators will also illuminate to show which channels are linked by this COMBINE button.
10. At this point you may simply add or delete rooms by push-on/push off operation of the SOURCE buttons. "On", TALLY illuminated, indicates the channel will be added to the combination.
11. Once you have selected the channels you wish linked with this COMBINE button, push the COMBINE button a second time to accept the program. The LEDs will flash 3 times and then go out, indicating that programming of this COMBINE button has been successful.
12. Repeat steps 9 - 11 above for each of the COMBINE buttons to be programmed.
13. Switch SW2 to the RUN position. The system will not operate with SW2 in the PROGRAM position.
14. Replace the chassis cover.

Programming is completed.

MCS-MCP MASTER CONTROL PANEL OPERATION

Figure 4.0: Section View of a Typical MCS-MCP Master Control Panel



MCS-MCP MASTER CONTROL PANEL OPERATION (Refer Figure 4.0)

NOTE: Each MCS-MCP is custom configured for the system it is to control. Not all functions described below are present on all MCS-MCP panels and actual control locations will vary with each panel.

ROOM COMBINING:

Action	Result
1. Turn Key Switch ON.	All Master Control Panel functions operable.
2. Press the COMBINE switch located at the intersection of the rooms you wish to COMBINE. (Note that each of the push buttons on the panel functions in a "push-on/push-off" manner.)	TALLY LED on COMBINE switch illuminates, indicating the two rooms have been combined. Audio SOURCE in each room defaults to LOCAL (typically the local mixer). LOCAL SOURCE becomes "active." LED illuminates on each switch to indicate SOURCE is active.
3. Push the COMBINE button on the intersection of one of the combined rooms and an adjacent room you wish to add.	Selected adjacent room is added to the combination. Other results same as #2 above.

SOURCE ADDITION/DELETION:

NOTE: To eliminate any possibility of undesired additions to the audio in combined rooms, delete each unused SOURCE, even if its mixer is off, disconnected or unattended.

Action	Result
1. Push SOURCE button representing an active SOURCE (LED illuminated).	LED goes off; SOURCE is no longer active.
2. Push button representing a SOURCE that is deleted (LED not illuminated).	LED is illuminated; SOURCE becomes active.

HEAD-TABLE SPEAKER MUTING:

Action	Result
Determine HEAD-TABLE location and push the corresponding HEAD-TABLE button.	TALLY LED on the HEAD-TABLE switch illuminates indicating speaker muting has occurred. Feedback potential is reduced.

RESTORING SYSTEM SECURITY:

Action	Result
Turn Key Switch to OFF and remove key.	Control Panel is secured against unauthorized tampering.

MCS-MVP MASTER VOLUME PANEL OPERATION

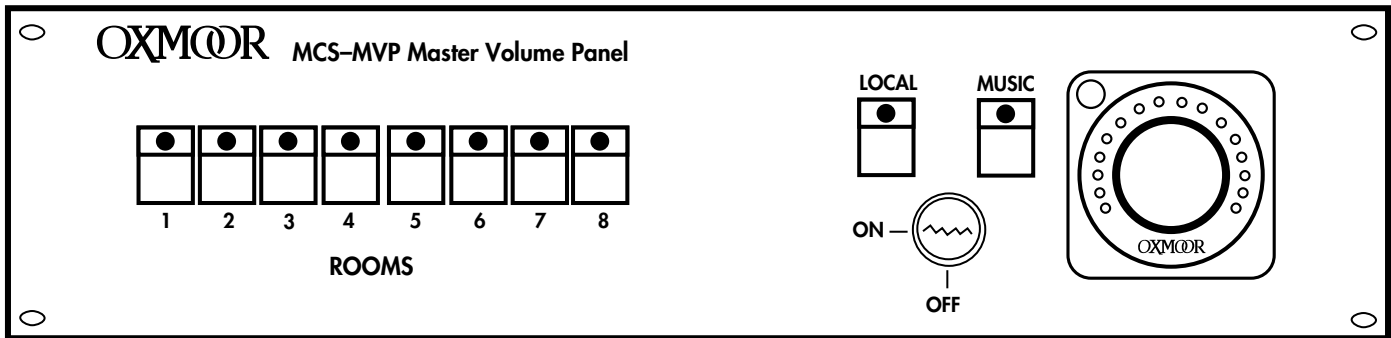


Figure 4.1: MCS-MVP Master Volume Panel

MCS-MVP MASTER VOLUME PANEL OPERATION

(Refer to Figure 4.1)

The Master Volume Panel provides remote volume control and LOCAL/MUSIC source selection for any room or combined group of rooms. The volume control and the LOCAL and MUSIC switches will function only when a room button is simultaneously depressed.

Action	Result
1. Turn Key Switch ON.	All MVP functions operable; no security provided against unwanted tampering.
2. Push button (ROOMS 1-8) representing room you wish to effect, and HOLD BUTTON DOWN.	As long as button is depressed: <ul style="list-style-type: none"> LEDs will be illuminated on the depressed button and on those of any room to which it is linked. If LOCAL or MUSIC has been selected in the room, LED will light on the LOCAL or MUSIC button to show which is active. LED on the volume control will light, indicating volume setting for the room or combined rooms.
3. With room button depressed, select the desired source (LOCAL, MUSIC or none) for the room. <ul style="list-style-type: none"> Push a LOCAL or MUSIC button that does not have LED illuminated. 	The source selected becomes active in room and all linked rooms. LED on selected button and corresponding ones on MCS-RP Room Panels are illuminated. If other source was active (LED illuminated) the new selection will replace the previous one. Only one source may be active at a time.
<ul style="list-style-type: none"> Push the button of an active LOCAL or MUSIC source (LED illuminated). 	Both sources are inactive; both LEDs are off until a source is again selected.
4. With room button depressed, rotate the volume control to achieve desired level.	Volume will be adjusted in the selected room and any linked rooms. LED indicator on all linked volume controls will track to show level setting.
5. Turn Key Switch OFF and remove key.	All functions are secured, rendering the Master Volume Panel tamper proof.

MCS-RP ROOM PANEL OPERATION

MCS-RP ROOM PANEL

(Refer to Figure 4.2)

The Room Panel provides a “master” volume control for the room. The panel operator may select either the LOCAL sound source (usually a mixer) or background MUSIC to be “active, that is to be heard in the room. Both sources may also be deleted. Panel security is provided by a locking Key Switch. The key may be removed in any of the three switch positions.

When rooms are combined, or “linked,” at the Master Control, all functions of their Room Panels synchronize or act as one. This means you may control the combined-room system at any Room Panel in the linked rooms.

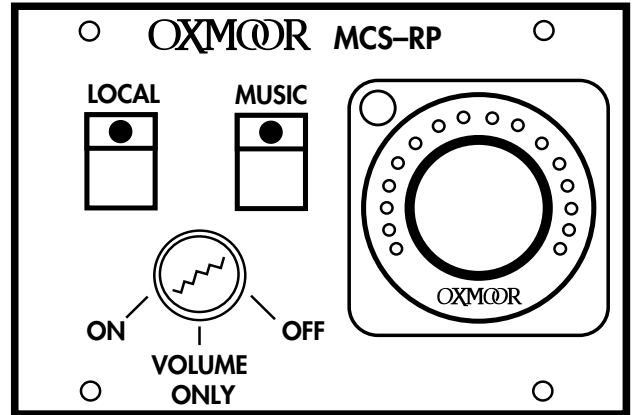


Figure 4.2: MCS-RP Room Panel

Action

Result

1. Turn Key Switch ON.
2. Select desired audio source (LOCAL, background MUSIC, or none) as follows:
 - a. Push a LOCAL or MUSIC button that does not have an LED illuminated.
 - b. Push the button of an active LOCAL or MUSIC source (LED illuminated).
3. With a sound source active, adjust volume control to desired level.
4. Turn Key Switch to VOLUME ONLY and remove key.
5. Turn Key Switch OFF and remove key.

All RP functions operable; no security provided against unwanted tampering.

The source selected becomes active in the room and in all rooms to which it is linked. (This assumes that the SOURCE is active at the Master Control.)

LED on selected button is illuminated.

If other source was active (LED illuminated) the new selection replaces the previous one. Only one source may be active at a time.

Volume returns to the last setting for the source (LOCAL or MUSIC) that has just been selected. For example, you may adjust the background MUSIC level as desired then switch to LOCAL and change the level as required. When you return to MUSIC, the volume control will return to the setting at which you left it.

Both sources inactive; both LEDs are off until a source is again selected.

Volume is adjusted in the room.

LED indicator shows volume control setting.

Volume control remains functional; LOCAL and MUSIC switches are locked out, protected from tampering.

All LEDs function, providing status indication.

All functions are secured, rendering the Room Panel controls tamper proof.

No LEDs are illuminated.

MCS BLOCK DIAGRAM

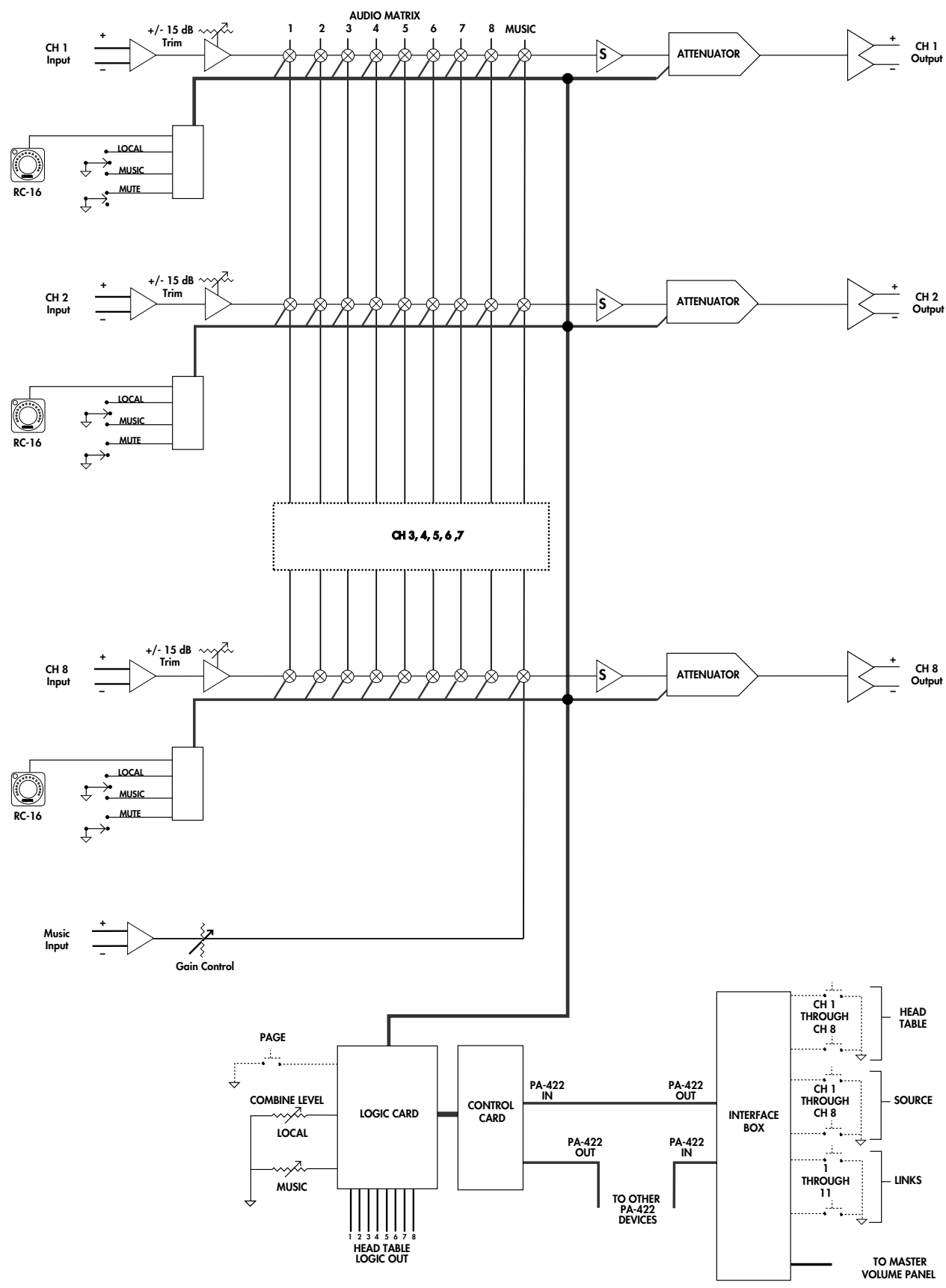


Figure 5.0: MCS Block Diagram

MCS-LI LINE INPUT SPECIFICATIONS

AUDIO IN	Type Electronically Balanced (RF Suppressed) Connectors Screw Terminal Blocks Input Impedance 80 k Ohms Maximum Input Level +24 dBu CMRR 50 dB @ 1 kHz
AUDIO OUT	Type Electronically Balanced Connectors Screw Terminal Blocks Source Impedance 20 Ohms (10 Ohms Each Side) Recommended Load Impedance 600 Ohms or Greater Maximum Output Level (Ref. 1 kHz @ rated THD) Terminated w/600 Ohms +18 dBm Unterminated +26 dBu
FREQUENCY RESPONSE	20 Hz to 20 kHz +0, -0.3 dB -3 dB Points, Ref. 1 kHz 4 Hz to 70 kHz (+4 dBm Output)
HUM AND NOISE	Ref. +4 dBm Output @ Unity Gain -85 dB (20 Hz to 20 kHz, Unweighted)
DISTORTION	Total Harmonic (THD + NOISE) Ref. +4 dBm Output @ Unity Gain -80 dB/0.01% (20 Hz to 20 kHz) Ref. +4 dBm Output @ Unity Gain SMPTE IMD* -80 dB/0.01% Transient IMD -80 dB/0.01%
CROSSTALK & OFF ISOLATION	Channel to Channel** -85 dB (@ 1 kHz) Driven Input to Off Output -85 dB (@ 1 kHz)
TRIM POT GAIN RANGE	Ref. 0 dBu Output ±15 dB
VOLUME CONTROL	Type Oxmoor's RC-16 Connector Screw Terminal Blocks
LOCAL and MUSIC SELECT	Connector Screw Terminal Blocks Input Type Active Low, Internally Pulled Up Input Protection 1/2 Max. Line Voltage, 12 kV Static Logic Action Momentary Closure to Common Logic Levels (at Terminal Block) Low < .8 Volts, High > 2.4 Volts Maximum Sink Current 1 mA Maximum Cable Length 600m (2000 ft), #22 AWG Switching Time 50 ms
LOCAL and MUSIC TALLY	Connector Screw Terminal Blocks Output Type Open-Collector Darlington to Common Max. Sink Current 500 mA Max. Voltage 50 VDC
MUTE	Connector Screw Terminal Blocks Input Type Active Low, Internally Pulled Up Input Protection 1/2 Max. Line Voltage, 12 kV Static Logic Action Momentary Closure to Common Logic Levels (at Terminal Block) Low < .8 V, High > 2.4 V Relative to Com. Maximum Sink Current 1 mA Maximum Cable Length 600m (2000 ft), #22 AWG Switching Time 50 ms

**SMPTE Method; 60 Hz + 7 kHz mixed 4:1.*

*** Input terminated w/600 ohms, unity gain, adjacent channel driven to +4 dBm output.*

Specifications subject to change without notice.

MCS-LC LOGIC CARD SPECIFICATIONS

AUDIO IN	Type Electronically Balanced (RF Suppressed) Connectors Screw Terminal Blocks Input Impedance 80 k Ohms Maximum Input Level +24 dBu CMRR 50dB @ 1kHz
FREQUENCY RESPONSE	20 Hz to 20 kHz +0, -0.3 dB -3 dB Points, Ref. 1 kHz 4 Hz to 70 kHz (+4 dBm Output)
HUM AND NOISE	Ref. +4 dBm Output @ Unity Gain -85 dB (20 Hz to 20 kHz, Unweighted)
DISTORTION	Total Harmonic (THD + NOISE) Ref. +4 dBm Output @ Unity Gain -80 dB/0.01% (20 Hz to 20 kHz) Ref. +4 dBm Output @ Unity Gain SMPTE IMD* -80 dB/0.01% Transient IMD -80 dB/0.01%
CROSSTALK & OFF ISOLATION	Channel to Channel** -85 dB (20 Hz to 20 kHz) Driven Input to Off Output -85 dB (20 Hz to 20 kHz)
GAIN CONTROL RANGE	Ref. 0 dBu Output + 15 dB TO - 45 dB
PAGE	Connector Screw Terminal Blocks Input Type Active Low, Internally Pulled Up Input Protection 1/2 Max. Line Voltage, 12 kV Static Logic Action Maintained Closure to Common Logic Levels (at Terminal Block) Low < .8 Volts, High > 2.4 Volts Maximum Sink Current 1 mA Maximum Cable Length 600m (2000 ft), #22 AWG Switching Time 50 ms
HEAD 1 THROUGH HEAD 8	Connector Screw Terminal Blocks Output Type Open-Collector Darlington to Common Max. Sink Current 500 mA Max. Voltage 50 VDC
POWER	Connector Screw Terminal Blocks Maximum Voltage 50 VDC

MCS-CC CONTROL CARD SPECIFICATIONS

PA-422 IN	Type Serial Interface, PA-422 Connector Male, 9-pin D-sub
PA-422 OUT	Type Serial Interface, PA-422 Connector Female, 9-pin D-sub
PA-422 ADDRESS	Type 8 position selector switch Address Select 1 through 250

**SMPTE Method; 60 Hz + 7 kHz mixed 4:1.*

*** Input terminated w/600 ohms, unity gain, adjacent channel driven to +4 dBm output.*

Specifications subject to change without notice.

MCS-PS POWER SUPPLY SPECIFICATIONS

MAINS POWER	Internal Supply	± 15 VDC, + 5 VDC: Regulated ± .5 V
	Power Requirements	100 to 130 VAC
		50 to 60 Hz
	Power Cord	Detachable power cord w/IEC connector
	Fuse	Main, 500 mA, NB
ENVIRONMENTAL		± 15 VDC, 500 mA, NB
		+ 5 VDC, 500 mA, NB
	Storage Temperature	- 25° C to 70° C (13° F to 158° F)
	Operating Temperature	0° C to 50° C (32° F to 122° F)
	Humidity	Less than 80% RH, non-condensing

MCS MECHANICAL SPECIFICATIONS

MAINFRAME	Packaging	133mm H x 483mm W x 305mm D
		5 1/4 in. H x 19 in. W x 12 in. D
	Finish	Textured Black Paint
	Weight	Shipping: 12.7 Kg (28 lb.) Net: 9.5 Kg (21 lb.)
MCS-RP ROOM PANEL	Packaging	114mm H x 162mm W x 38mm D
		4 1/2 in. H x 6 3/8 in. W x 1 1/2 in. D
	Finish	Textured Black Paint
	Weight	Shipping: .7 Kg (1.5 lb.) Net: .5 Kg (1 lb.)
MCS-MVP MASTER VOLUME PANEL	Packaging	89mm H x 483mm W x 130mm D
		3.5 in. H x 19 in. W x 5 1/8 in. D
	Finish	Textured Black Paint
	Weight	Shipping: 3.6 Kg (8 lb.) Net: 2.3 Kg (5 lb.)
MCS-IB INTERFACE BOX	Packaging	44mm H x 483mm W x 171mm D
		1.75 in. H x 19 in. W x 6.75 in. D
	Finish	Textured Black Paint
	Weight	Shipping: 3.6 Kg (8 lb.) Net: 2.7 Kg (6 lb.)
MCS-MCP MASTER CONTROL PANEL	Packaging	267mm H x 483mm W x 106mm D
		10 1/5 in. H x 19 in. W x 4 3/16 in. D
	Finish	Textured Black Paint
	Weight	Shipping: 4.5 Kg (10 lb.) Net: 3.6 Kg (8 lb.)

Specifications subject to change without notice.

MCS-IB INTERFACE BOX SPECIFICATIONS

LOGIC (LINKS, SOURCE AND HEAD TABLE)	Connector	Screw Terminal Blocks
	Input Type	Active Low, Internally Pulled Up
	Input Protection	1/2 Max. Line Voltage, 12 kV Static
	Logic Action	Momentary Closure to Common
	Logic Levels (at Terminal Block)	Low < .8 Volts, High > 2.4 Volts
	Maximum Sink Current	1 mA
	Maximum Cable Length	600m (2000 ft), #22 AWG
	Switching Time	50 ms
TALLY (LINKS, SOURCE AND HEAD TABLE)	Connector	Screw Terminal Blocks
	Output Type	Open-Collector Darlington to Common
	Max. Sink Current	500 mA
	Max. Voltage	50 VDC
LOCK	Connector	Screw Terminal Blocks
	Input Type	Active Low, Internally Pulled Up
	Input Protection	1/2 Max. Line Voltage, 12 kV Static
	Logic Action	Momentary Closure to Common
	Logic Levels (at Terminal Block)	Low < .8 Volts, High > 2.4 Volts
	Maximum Sink Current	1 mA
	Maximum Cable Length	600m (2000 ft), #22 AWG
	Switching Time	50 ms
V+	Connector	Screw Terminal Blocks
	Maximum Sink Current	500 mA
	Maximum Cable Length	600m (2000 ft), #22 AWG
POWER	Connector	Screw Terminal Blocks
	Voltage	Max: 24 VDC, Min: 12 VDC
	Current	1 A
	Input Protection	Short to common
PA-422	Input	Male, 9-pin D-sub connector
	Output	Female, 9-pin D-sub connector
	Input Type	Serial Communication, PA-422
MVP I/F	Connector	Female, 25-pin D-sub connector
	Room Selects 1 through 8	Pins 20, 14, 8, 2, 21, 15, 9, 3
	Local and Music Selects	Pins 18, 24
	Input Type	Active Low, Internally Pulled Up
	Input Protection	1/2 Max. Line Voltage, 12 kV Static 5
	Logic Action	Momentary Closure to Common
	Logic Levels (at Terminal Block)	Low < .8 Volts, High > 2.4 Volts
	Maximum Sink Current	1 mA
	Maximum Cable Length	600m (2000 ft), #22 AWG
	Switching Time	50 ms
	Room Tallies 1 through 8	Pins 22, 16, 10, 4, 23, 17, 11, 5
	Local and Music Tallies	Pins 6, 12
	Output Type	Open-Collector Darlington to Common
	Max. Sink Current	500 mA
	Max. Voltage	50 VDC
	Remote Volume Control	Pins 7 (DISPLAY), 25 (CD), 19 (CU)
	Type	Oxmoor's RC-16
	VDD	Pin 13
	Type	Unregulated, 12 VDC
	Common	Pin 1

Specifications subject to change without notice.

OXMOOR FACTORY SERVICE

For service information contact:

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Toll Free: 1 (800) 262-6898
Fax: (205) 982-8250
Internet: www.oxmoor.com

Additional Installation & Operation Manuals are available from Oxmoor. Contact the Oxmoor Sales Department for pricing and other ordering information. Consult warranty statement for cautions concerning unauthorized service.

OXMOOR TWO YEAR LIMITED WARRANTY

Oxmoor warrants that each Oxmoor electronic product shall be free from defects in workmanship and materials and will, at its option, repair or replace any part of the product without charge provided the product is delivered to Oxmoor within two years of date of original purchase from or delivery by an authorized Oxmoor dealer. Excluded from this warranty are finish and appearance items and malfunction resulting from abuse, from use that is not in accordance with instructions, or operation under other than specified conditions. Also excluded are incidental or consequential damages except where precluded by applicable law. This warranty provides the customer with specific legal rights; there may also be other rights which vary from state to state.

Repair by other than Oxmoor Factory Service Department or its authorized service agency, unauthorized modification, or the removal or defacing of the serial number will void this warranty.

Products returned for factory warranty service must be prepaid and packaged in such a way as to insure safe transit and must be accompanied by a sales slip or other valid proof of purchase date.

PRIOR AUTHORIZATION FROM OXMOOR IS REQUIRED FOR RETURN. Contact Oxmoor for a Return Authorization (R.A.) Number and shipping information before returning product for service.



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For 24-hour access to product specs and information visit Oxmoor's complete product line on the internet at www.oxmoor.com.

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Specifications and design are subject to change without notice.