

# Master Room™

## XL-210

### Reverberation System



- Advanced design technology
- Clean, natural reverberation
- Studio performance quality
- Rugged roadability
- Full two channel stereo

A recent technological breakthrough pioneered and developed by Master-Room now provides high quality reverberation at an affordable price. This new technology was first applied in the Master-Room XL-305 which has gained wide acceptance by professional users throughout the world in recording, broadcast, and sound reinforcement applications. The XL-210 is based on the same technology and offers the most natural sounding reverberation in its class.

Percussive signals have always been the most difficult sounds for a reverberation unit to reproduce naturally. Internal limiting and other signal manipulation tricks are often employed in many compact systems in an attempt to overcome or conceal chamber deficiencies. The usual result is a severe loss of the natural reverberation quality without eliminating the typical boing, twang, and flutter generally associated with such systems. The unique chamber design of the XL-210, however, provides smooth, natural sounding reverberation without employing internal limiting or any other signal processing to compensate for chamber deficiencies.

The XL-210 is a self-contained, 3½ inch rack-mount unit featuring two completely independent channels for true stereo operation. A front panel switch permits monaural operation, further increasing its already high echo density. Input and output connectors are typically used for permanent installation, while the front panel jacks allow convenient patching and automatically defeat the rear panel connectors. The active balanced input circuits automatically adapt to either balanced or unbalanced operation, and the unbalanced outputs will readily drive a 600 ohm load.

Each channel of the XL-210 features an equalization section that provides flexibility and creative freedom. The EQ allows the user to effectively simulate the reverberant sound characteristics of a live chamber, plate or concert hall. Included in this section is a LOW shelf, a HIGH shelf, and a MID peak/dip control, each with 12 dB of boost or cut.

The XL-210 can be used with the echo or effects send/return function of most mixers. The front panel MIX controls permit this unit to also be used in the main signal path by internally mixing the desired amount of dry and reverberated signals. The XL-210 can be located near loudspeakers operating at high levels without acoustic feedback, and front panel LED's indicate any overload condition in the chamber.

The Master-Room XL-210 is a high quality reverberation system designed for professional use in the recording studio or sound reinforcement system. Its advanced technical design, rugged construction, and overall versatility make it the ideal system for professional applications.

The XL-210 provides smooth, natural sounding reverberation that is unmatched in its price range. While others have made this claim, the XL-210 will back it up with an obvious and demonstrable performance difference. Visit your Master-Room dealer soon for a revealing demonstration of reverberation at its finest. Listen and compare....You'll hear the difference.

available from:



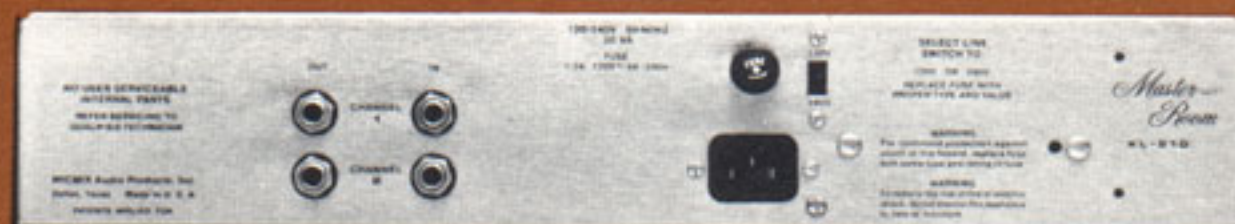
Front view

### A WORD ABOUT REVERBERATION DEMONSTRATIONS

It is important when auditioning a reverberation system to listen to just the reverberant sound, as only this will reveal its true performance characteristics. A professional quality system should produce smooth, natural sounding reverberation completely free of unwanted side effects.

Reverberation systems are often demonstrated by adding a small amount of reverb to smooth dry signals or by using it on a mixdown. Such methods mask the reverb's true performance and may provide an initially acceptable evaluation, but may result in later unhappiness when the unit is put to a real test after purchase.

One good evaluation technique is the use of a drum track or any other sharp percussive signal. This will reveal a great deal about the true performance capability of a system. Master-Room dealers can provide an even more stringent and practical demonstration utilizing electronic pulse testing. With this test, pure reverberant sound is heard and unwanted sounds or undesirable colorations become readily apparent.



Rear view

### XL-210 Specifications

INPUT (Ref. 0 dBv=0.775 volts)	
Minimum Level	-15 dBv
Maximum Level	+18 dBv
Impedance (Active balanced)	20k Ohms
(Unbalanced)	10k Ohms
OUTPUT	
Source Impedance (Unbalanced)	15 Ohms
Nominal Level (Internally adjustable)	0 dBm
Range (Ref. 0 dBv input level)	-14 to +6 dBm
Maximum Level (Into 600 Ohm load)	+18 dBm
FREQUENCY RESPONSE (Ref. 1 kHz)	
Direct Channel 20-20k Hz	+0, -2 dB
REVERBERANT CHANNEL	
CROSSTALK	Better than -45 dBm
HARMONIC DISTORTION (Direct channel)	
At 0 dBm (20-20k Hz)	Less than 0.1%
At +18 dBm (20-1k Hz)	Less than 0.4%
At +18 dBm (1k-20k Hz)	Less than .05%

OUTPUT NOISE (At unity gain)	
Direct Channel (20-20k Hz bandwidth)	-78 dBm
Reverberant Channel (A weighted)	-70 dBm
DECAY TIME (At 1 kHz, Octave noise, T60)	
	3 seconds
EQUALIZATION	
Low Frequency (Shelving type)	±12 dB at 100 Hz
Mid Frequency (Peak/dip type)	±12 dB at 1 kHz
High Frequency (Shelving type)	±12 dB at 10 kHz
OVERLOAD INDICATOR	
Type: Peak holding	
Circuit location: At chamber drive	
Threshold: +4 above nominal level at 1 kHz	
POWER REQUIREMENTS	
Voltage (50/60 Hz)	100/120/240 +15, -10%
Power Consumption	20VA
DIMENSIONS	
	3.5H x 19W x 12.5D inches
SHIPPING WEIGHT	
	13 lbs.

Specifications are subject to change or product improvement without notice.

**MICMIX Audio Products, Inc.**  
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Master-Room™

**MODEL XL-210**

**MASTER-ROOM  
REVERBERATION SYSTEM**

**OWNER'S MANUAL**

**PLEASE READ THIS MANUAL BEFORE OPERATING THE UNIT**

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**Dallas, Texas**

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## INTRODUCTION

Master-Room Reverberation, known throughout the world for its exceptional performance qualities and reliability, is the result of years of research into the acoustical characteristics of rooms, auditoria and concert halls.

In a live acoustic environment, reverberation begins with a single echo, followed quickly by several more to form a group of first-order echoes caused by initial reflections from the room boundaries. These first-order echoes are re-reflected repeatedly until they become randomly diffused and infinite in number. Natural sounding reverberation therefore requires simulation of the desirable characteristics of actual rooms.

The Master-Room XL-210 is identical to a live room in that it creates a reverberant field consisting of natural sounding first-order echoes followed by a randomly patterned increase in diffusion as the signal decays. Reverberation time vs. frequency has been optimized for applications in recording, sound reinforcement, and broadcasting.

Unique design, involving a high degree of craftsmanship, eliminates the annoying resonances and flutter echo common to most types of reverberators and produces an exceptional smoothness on even the most demanding of transient material. This design approach makes corrective equalization, limiting, or other signal processing devices unnecessary. Each of the two completely independent stereo channels provides smooth, transparently clean reverberant sound.

## INSTALLATION

### POWERING THE UNIT

The XL-210 when shipped from the factory is designed for 115 Volt, 50/60 Hz. operation. Export models are available for 230 Volts.

An IEC-type power connector is furnished with the line cord and is wired in the following manner:

- Black - Line
- White - Neutral
- Green - Earth & Chassis Ground

CAUTION - Replace Fuse only with same type and rating.

## PHYSICAL MOUNTING

The XL-210 requires 3.5 inches of rack space and may be mounted in virtually any horizontal location without danger of acoustical feedback or mechanical interference in typical studio environments. In live performance applications, some consideration of physical location may be required. In most instances, locating the unit at the "house" mixing position will be adequate. It is not recommended that the unit be placed on-stage where high sound pressure levels are encountered or where RF interference produced by light dimming equipment is present.

Although the reverberation chamber transducers are triple-shielded, the unit should not be located in close proximity to large power transformers such as those used in power amplifiers and similar equipment. Before final mounting, it is recommended that the desired location for the unit be evaluated for such magnetic fields. Temporarily connect the output of the XL-210 to a monitor system and compare its performance with adjacent equipment both on and off. If any substantial increase in hum is heard with nearby equipment turned on, another location for the XL-210 (or the other equipment) should be considered.

## CONTROLS AND INDICATORS

INPUT LEVEL adjusts the signal drive to the XL-210. When the unit is in the MONO mode of operation, the composite drive signal to the reverberation chamber is mixed by using the Input Level control of each channel.

MIX determines the blending between the Direct or "dry" input signal and the reverberated or "wet" signal. When the XL-210 is used with a console having echo send and receive capability, the Mix control should be set in the full REVERB position.

MONO (switch "in") operation feeds both channels of the reverberation elements with the sum of the input signals. In addition, the sum of the reverberated signals feeds both Mix controls.

POWER/OVERLOAD (PWR/DL) INDICATORS are dual-colored LEDs that monitor the internal peak signal levels driving the reverberation elements. They also indicate a "power-on" condition by remaining

The Input Level controls should be set such that the PWR/OL indicators flash Red occasionally (less than 50% of the time). At the point where the dual-colored LEDs change to Red, there is approximately 6 dB of headroom available.

EQUALIZATION at each of the reverberation chamber outputs (and prior to the Mix controls) is a 3-band, reciprocal peak/dip type providing +/- 12 dB of boost and cut at 150 Hz, 1.2KHz, and 6 KHz. These controls feature a center-detented flat EQ position for added versatility. Because of the reverb's exceptional performance, the Equalization controls allow the XL-210 to readily and effectively simulate the reverberant sound of concert halls, live chambers, and plate-type reverberators.

## SIGNAL CONNECTIONS

INPUT CONNECTIONS (REAR) are active balanced in design (3-conductor connection) and automatically switch to unbalanced if a 2-conductor plug is inserted. If active balanced inputs are utilized, connections must be identically phased to avoid phase cancellations during mono operation. For balanced operation, use a 3-conductor plug wired in the following manner

Tip	-	High or (+) input
Ring	-	Low or (-) input
Sleeve	-	Ground (shield)

Impedances at the (+) or (-) input signal terminals are greater than 10K ohms and can be considered as a 'bridging' load.

OUTPUT CONNECTIONS (REAR) are unbalanced and will drive a 600 ohm load to greater than +18 dBm but should not be terminated in less than 600 ohms.

AUX INPUT/OUTPUT connections on the front panel are identical to the rear connections except that they defeat the rear panel connections automatically whenever a plug is inserted at the front. This feature permits convenient break-in patching without disturbing the rear chassis connectors.

## OPERATING INSTRUCTIONS

### INPUT LEVEL RANGE

The XL-210 can be driven properly with input levels as low as -15 dBv (ref. 0 dBv = .775 volts rms), allowing connection to equipment operating at virtually any line level output. Audio signals, particularly those which have not been 'limited', often have peaks 20 dB or more above VU meter indications (VU meters read average levels). For maximum headroom, use an average VU indication such as -10 to 0 to avoid clipping on signal peaks.

## INPUT LEVEL ADJUSTMENTS

To calibrate the XL-210, feed a 1 KHz test signal at reference level (typically 0 to +4 dBv) to channel 1. Release the Mono push-button if it is depressed and rotate the Mix control to the direct position. Increase the Input Level control while monitoring the output of the XL-210 with the console return meter or an AC Voltmeter until the output level is the same as the input reference level. Repeat this procedure for Channel 2.

If you do not have a reference test signal available, an Input Level setting of midpoint (12 O'clock) or slightly greater will be satisfactory for most applications.

Input levels above +4 dBv reduce available headroom and should be used with care to avoid overload on signal peaks. Proper observance of the PWR/OL indicators will allow maximum headroom and best signal-to-noise ratio. Under program conditions, the PWR/OL indicators should flash occasionally as high peak signals are processed through the XL-210.

## REVERB AND DIRECT MIXING

The XL-210 will ordinarily be connected to a recording console or sound reinforcement mixing console having an echo send/return system. For this application, the Mix control should be placed in the full REVERB position.

In those applications where the XL-210 is used in-line (where reverberation is added without external mixing), set the Mix control to an appropriate position between the two extremes of rotation.

## EQUALIZATION

The response characteristics of the 3-band equalizer section permit the creation of many different effects. To realize the full potential available, the user is urged to experiment using the guideline settings shown below as a starting point for three different types of reverberant sounds. When experimenting, listen only to the reverberated signal.

CONCERT HALL		ACOUSTIC CHAMBER		PLATE	
LOW	+3 to +6	LOW	0 to -3	LOW	0 to -6
MID	0 to +3	MID	0 to +3	MID	+3 to +6
HIGH	0	HIGH	+3 to +6	HIGH	+6 to +12

Each concert hall, live chamber, and plate-type reverberation unit has its own unique sound characteristics. The equalization section of the XL-210 is very flexible permitting most types of

reverberation to be synthesized realistically and with great ease. The suggestions listed here demonstrate only a few of the many possible applications of the XL-210.

### **MONO-STEREO OPERATION**

The two reverberation channels of the XL-210 incorporates slightly different characteristics which improves the 'spaciousness' effect when operated in stereo.

Monaural operation (MONO switch 'in') effectively doubles the echo density and diffusion by combining the two reverberant channels. This results in a deeper, richer reverberation that is ideally suited for percussion, voice, or other applications which may not require full stereo operation.

When the MONO switch is depressed, a slight reduction in reverberation return level may be noticed. This effect is normal and may be compensated for by a slight readjustment of the console return fader.



## SPECIFICATIONS

INPUT (Ref. 0 dBv = 0.775 volts rms)	
Minimum Level	-15 dBv
Maximum Level	+18 dBv
Impedance (Active balanced)	20k Ohms
(Unbalanced)	10k Ohms
OUTPUT	
Source Impedance (Unbalanced)	15 Ohms
Nominal Level	0 dBm
Maximum Level (Into 600 Ohm load)	+18 dBm
FREQUENCY RESPONSE (Ref. 1 kHz)	
Direct Channel 20-20k Hz	+0, -2 dB
REVERBERANT CHANNEL CROSSTALK	< -45 dBm
HARMONIC DISTORTION (Direct channel)	
30 dBm (20-20k Hz)	< 0.1%
OUTPUT NOISE (At unity gain)	
Direct Channel (20k Hz bandwidth)	-76 dBm
Reverberant Channel (A weighted)	-66 dBm
DECAY TIME (1k Hz, Octive noise, T60)	3 seconds
EQUALIZATION (Peak/dip type)	
Low	+/- 12 dB at 150 Hz
Mid	+/- 12 dB at 1.2k Hz
High	+/- 12 dB at 6k Hz
POWER/OVERLOAD INDICATOR	
Power-on Condition:	Green
Overload Condition:	Red
OL Type:	Peak holding
OL Threshold:	6 dB below clipping
OL Location:	Reverb drive
POWER REQUIREMENTS	
Voltage (50/60 Hz)	115, +/- 10% Volts
Power Consumption	9 VA
Dimensions	3.5H X 19 W X 12.5 D inches
SHIPPING WEIGHT	13 lbs.
Specifications subject to change or product improvement without notice.	

## FACTORY SERVICE

The Customer Service Department is prepared to provide additional assistance in the event of difficulty in using this product. Call during normal business hours (214) 352-3811 or write to the address below.

Most difficulties can be solved over the phone or by your dealer. Should factory service be required on the unit, however:

1. Contact the Factory for authorization to return the unit.
2. Repack the unit in its original carton, together with a note describing the problem, your return address, and the date of purchase. If original carton is unavailable, contact the Factory.
3. Ship the unit, freight prepaid, to the address below. It is recommended that you insure the package and send it via United Parcel Service "Blue Label" whenever possible.

Outside the U.S., contact your nearest Master-Room dealer.

## LIMITED WARRANTY

MICMIX Audio Products, Inc. warrants this product against defects in workmanship and materials under normal usage and service for a period of one year from date of delivery to the original purchaser.

Any defective product will, at our option, be repaired or replaced without charge if the product is returned transportation prepaid to the Factory Service Department at the address listed below. A packing slip should accompany all shipments and include the sender's name and address, date of purchase, and information describing the problem.

This warranty does not cover damages resulting from transportation, accident, alteration, misuse or abuse, incorrect wiring by others, or failure to follow operating instructions, nor does the warranty cover the cost of any inconvenience or any direct or indirect or consequential damage by reason of the fact that such product was non-conforming or defective.

The foregoing warranty is in lieu of all other warranties, expressed, written or implied, including any warranty of merchantability or fitness for purpose, and MICMIX Audio Products, Inc. neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sale of its products.

REPAIRS OR ALTERATIONS PERFORMED BY UNAUTHORIZED PERSONNEL VOIDS THE GUARANTEE.

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