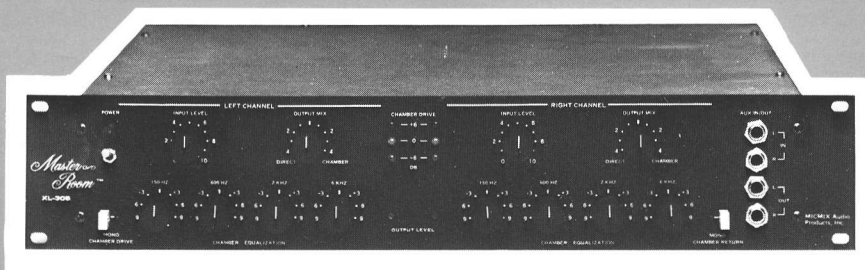


Master Room™

XL-305

The Acoustic Chamber Synthesizer™



- Totally new design approach
- The sound of a live acoustic chamber
- Natural sound, even on percussion
- Self-contained rack mount unit
- Full two-channel stereo

The Master-Room XL-305 is a unique design approach in self-contained reverberation systems. This "Acoustic Chamber Synthesizer" incorporates new technology that stems from years of research and analysis of "live" chambers currently in use in the recording industry. Properties such as room volume, echo density, and reverberation time versus frequency were studied. The most desirable characteristics of these live chambers are incorporated into the XL-305. The result: The sound of a live acoustic chamber in a rack-mount package.

A live chamber does not have the boing, twang, and flutter that are normally found in compact reverberation units. The XL-305 produces none of these unwanted sounds. A percussive attack, or any transient signal, is difficult for most compact reverbs to reproduce naturally. Under these conditions, a reverb is most likely to produce undesirable side-effects. The performance of the XL-305 under transient conditions is outstanding.

The XL-305 offers two-channel stereo capability, and is easily switched to stereo imaging of a monaural signal or full mono operation. Each channel features an INPUT LEVEL control, LED CHAMBER DRIVE indicators, and an OUTPUT MIX control to blend the direct and reverberated signals. Front panel OUTPUT LEVEL adjustments are provided for easy adaptation to various operating levels of other equipment. AUXILIARY INPUTS and OUTPUTS located on the front panel automatically defeat the rear panel connections, allowing

convenient patching. An input/output transformer option (model XL-305T) is available for those systems that require it.

A four-band equalizer allows each channel of the XL-305 to simulate the sound of reverberation plates, live chambers and large concert halls. This peak/dip EQ has a control range of plus or minus 12 dB with center frequencies at 150, 600, 2k and 6k Hz, thus providing the user with extreme flexibility and creative freedom.

Low acoustic susceptibility permits the unit to be

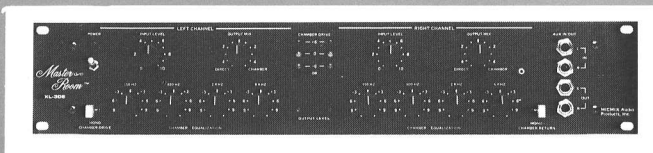
located in the same room with loudspeakers operating at high levels without acoustic feedback or mechanical interference. This, combined with the XL-305's rugged construction, lends itself to the rigors of road use without special handling. All of these features are packaged in a 3½ inch rack-mount unit that is easily installed and incorporated into any system.

Ruggedness, dependability, and ease of operation are part of every Master-Room.™

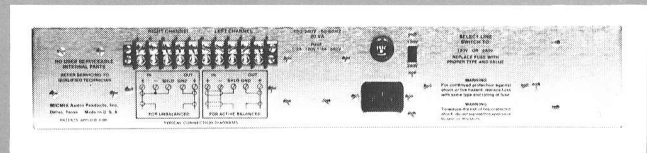
The XL-305 is the most significant advancement in

quality for self-contained reverb systems. The "Acoustic Chamber Synthesizer" is the result of a commitment by Master-Room to provide the finest in reverberation for a wide range of professional audio applications. This unit is a must for those who demand superior performance in their studio, broadcast, or sound reinforcement systems.

See your professional audio dealer for a demonstration of the totally unique "Acoustic Chamber Synthesizer". Hearing is believing.



Front view



Rear view

XL-305 Specifications

INPUT (Ref. 0 dBv = 0.775 volts)		DECAY TIME (at 1 kHz, octave noise, T ₆₀)	3.5 seconds
Minimum Level	-12 dBv	EQUALIZATION	
Maximum Level	+18 dBv	Type: Reciprocal Peak/Dip	
OUTPUT		Center Frequencies	150, 600, 2K and 6K Hz
Source Impedance	15 Ohms	Control Range	±12dB
Nominal Level	+4 dBm	LEVEL INDICATORS	
Gain Adjustment Range	20 dB	Type: Peak Responding	
Maximum Level (Into 600 Ohm Load)	+18 dBm rms	Circuit Location: At Chamber Drive	
FREQUENCY RESPONSE (Ref. 1 kHz)		Display and Levels Indicated	Green, -6, Yellow, 0; Red, +6 dB
Direct Channel 20-20k Hz	+0, -2 dB	POWER REQUIREMENTS	
OUTPUT NOISE (at unity gain)		Voltage (50/60 Hz)	100/120, 240v, +15, -10%
Direct Channel (20-20k Hz bandwidth)	-80 dBm	Power Consumption	20 VA
Reverberant Channel (A weighted)	-72 dBm	DIMENSIONS	3.5H x 19W x 12.5D inches
HARMONIC DISTORTION (direct channel)		SHIPPING WEIGHT	
At 0 dBm (20-20k Hz)	Less than 0.1%	Standard Model (XL-305)	13 lbs.
At +18 dBm (20-1k Hz)	Less than 0.4%	With Transformer Option (XL-305T)	15 lbs.
At +18 dBm (1k-20 k Hz)	Less than .05%		
REVERBERANT CHANNEL CROSSTALK	Better than -45 dB		

Specifications apply to the standard XL-305 and are subject to change or product improvement without notice.

MICMIX Audio Products, Inc.

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XL-305 INSTRUCTION MANUAL

(Preliminary)

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INTRODUCTION

Master-Room Reverberation, known throughout the world for its exceptional quality and reliability, is the result of years of research into the acoustical characteristics of live chambers.

In a live acoustic environment, reverberation begins with a group of first order echoes caused by initial reflections, from the room boundaries. These first order echoes are repeatedly reflected until they become randomly diffused and infinite in number. Natural sounding reverberation, therefore, requires simulating the desirable acoustic characteristics of live rooms.

The XL-305 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 versus frequency characteristics of the XL-305 chamber are optimized for applications in recording, sound reinforcement, and broadcast. In addition, timing differences between the Left and Right Chambers result in a reverberant "spaciousness" which is capable of producing enhanced stereo effects. The exceptional smoothness of the XL-305 is achieved by careful tuning and design principles to eliminate the annoying resonances and flutter echo common to most types of spring reverberators. This approach makes corrective equalization, limiting, or other signal processing devices unnecessary.

FEATURES

The XL-305 offers two independent stereo channels, and is easily switched for stereo imaging of monaural inputs, or full mono operation. Each channel features an INPUT LEVEL control, LED CHAMBER DRIVE indicators, and an OUTPUT MIX adjustment to blend the DIRECT and REVERBERATED signals. Recessed OUTPUT LEVEL trim pots are provided for ease of system interface. A four-band equalizer at the output of each chamber enables the XL-305 to simulate concert halls, live chambers, or plate echo units. As an added feature, Auxiliary Input and Output jacks defeat the rear panel connections permitting convenient front panel patching.

MODELS: XL-305, XL-305T

Two versions of the XL-305 are available. Both are identical with the exception that the rear panel connections of the XL-305T are transformer coupled.

FRONT PANEL CONTROLS, METERING, AND CONNECTIONS

POWER SWITCH

INPUT LEVEL adjusts the drive to the unit's internal circuitry. When the MONO CHAMBER DRIVE pushbutton is depressed, the composite input to the reverb chamber is mixed by using the Left and Right INPUT LEVEL controls.

OUTPUT MIX controls the blending between the DIRECT, or 'dry' input, and the CHAMBER return. When the XL-305 is used with a console echo system, set the OUTPUT MIX to CHAMBER.

CHAMBER DRIVE monitors the internal peak level driving the reverb chamber. To allow maximum headroom the +6 dB LED should only flash occasionally.

MONO CHAMBER DRIVE feeds both channels of the Reverb Chamber with the sum of the Left and Right inputs. The direct channels remain in stereo during this mode of operation. Applications of this feature may be found in the detailed operating instructions.

MONO CHAMBER RETURN combines the Left and Right outputs of the Reverb Chamber and applies the sum to both OUTPUT MIX controls. The direct Channels are not affected and remain in stereo. See the operating instructions for more information.

OUTPUT LEVEL trimmers adjust the level over a 20 dB range.

EQUALIZATION AT THE reverb chamber output is a four-band reciprocal peak/dip type with center frequencies of 150, 600, 2K and 6K Hz. Each section provides 12 dB of boost or cut.

AUXILIARY INPUTS and OUTPUTS defeat the rear panel connections when a plug is inserted allowing front panel patching. The AUXILIARY INPUTS are automatically balanced or unbalanced, depending upon the type of phone plug used. The unbalanced AUXILIARY OUTPUTS will drive a 600 ohm load.

INSTALLATION

POWERING THE UNIT

A voltage selector switch, located on the rear panel, may be set for either 120 or 240 volt power sources. If 100 volt operation is required, the unit may be factory ordered or easily modified by a skilled technician. Refer to the Service Manual for information concerning this procedure.

WARNING: Verify that the correct line voltage has been selected before applying power to the unit.

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

Black	-	Line (hot)
White	-	Neutral (low)
Green	-	Earth and chassis ground

PHYSICAL MOUNTING

The XL-305 requires 3-1/2 inches of rack panel space and may be mounted in virtually any horizontal location without danger of acoustic feedback or mechanical interference in typical studio environments. In live performance applications, some consideration in physical location may be required. In most instances, locating the unit at the 'house' mixing position will be adequate. It is not recommended, however, that the unit be placed on stage when extremely high sound pressure levels are encountered, or where RF interference produced by light dimming equipment is present.

The XL-305's reverb chamber transducers are triple shielded for protection from moderate magnetic hum fields. 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-305 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 on, another location should be considered for the XL-305.

ROUTINE SHIPPING

Although the XL-305 is ruggedly built, the rigors imposed by most common carriers during shipping requires some caution. For freight shipment, where it is possible that the unit could be physically abused, the securing screws retaining the reverb chamber should be reinstalled.

SIGNAL CONNECTIONS

- * The standard XL-305 features actively balanced inputs and unbalanced outputs at both the AUXILIARY and rear panel connections.
- * The XL-305T is transformer coupled which provides floating (isolated ground) inputs and outputs at the rear panel connections.
- * AUXILIARY INPUT and OUTPUT jacks are actively coupled on both models, and defeat the rear panel connections when a plug is inserted.

ACTIVE SIGNAL CONNECTIONS

Active input and output wiring is shown in Figure 2. For permanent installations the barrier strip connections should be used. If active balanced inputs are required, make certain that the 'high' and 'low' inputs are not reversed on either channel. This can cause input phase cancellation during mono chamber operation and should be avoided. Unbalanced inputs are also shown. The low, or (-) input, may be grounded using shorting links supplied with the unit. Auxiliary input connections switch automatically to unbalanced operation whenever a two conductor phone plug is inserted. For balanced inputs, use a three conductor plug wired:

Tip - high or (+) input
Ring - low or (-) input
Sleeve - Ground

Impedances at the (+) or (-) signal terminals are greater than 5k ohm and may be considered a 'bridging' load. The unbalanced outputs drive 600 ohm loads to greater than +18 dBm and should not be terminated in less than 150 ohms.

TRANSFORMER ISOLATED CONNECTIONS - XL-305

The XL-305T barrier strip connections are transformer isolated as shown in Figure 3. These balanced connections float from chassis ground for protection against ground loops (hum) in difficult studio environments. Because this feature is available only at the rear panel connections, operation of the transformers are defeated when AUXILIARY connections are made.

The transformer inputs are internally terminated with a 600 ohm resistor. If a 5K ohm bridging input is needed, then the resistor may be clipped from inside the barrier strip with some decrease in performance. The output transformers should be externally terminated with a 600 ohm load to preserve the frequency response of the unit. In most cases, a bridging input would follow the unit, requiring a 620 or 680 ohm resistor as external termination.

DETAILED OPERATING INSTRUCTIONS

INPUT LEVEL RANGE

The XL-305 may be driven properly with inputs as low as -12 dBv allowing connection to equipment operating at virtually any line level output. Audio signals, particularly those which have not been 'limited', often have peaks which are 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 +4 dBv, to avoid clipping signal peaks.

CHAMBER DRIVE LEVEL

A peak responding meter indicates the input-level to the reverb chamber. To allow approximately 15 dB of operating headroom, the +6 dB LED should only flash occasionally.

INPUT AND OUTPUT LEVEL ADJUSTMENTS

For maximum signal-to-noise ratio in any audio system, the studio reference level (the level for a '0' meter reading) of all equipment should be calibrated.

To calibrate the XL-305, feed a 1 kHz test signal at reference level to the LEFT and RIGHT channels. Release the MONO CHAMBER DRIVE pushbutton if it is depressed, and rotate the INPUT LEVEL control on each channel until the +6 dB LEDs are just extinguished. The XL-305 inputs are now calibrated, and should be adjusted at the source (console send control for example) using the CHAMBER DRIVE meter to monitor signal level. The output may be adjusted using the same test signal and INPUT LEVEL settings. Rotate each OUTPUT MIX control to the extreme DIRECT position and measure the output of the XL-305 with a VU meter or similar instrument.

The OUTPUT LEVEL adjustment permits operation at typical line levels of -10 or +4 dBv. Levels above +4 dBv reduce headroom, and should be used with care to prevent output overload (+18 dBm Max.) on signal peaks.

REVERB AND DIRECT MIXING

The XL-305 will ordinarily be connected to a recording console having an echo send and receive system. Certain applications, however, require that the XL-305 be used in-line, where reverberation must be added without external mixing.

OUTPUT MIX controls the blend between the DIRECT, or 'dry' input, and the reverb chamber signal. The extreme CHAMBER position should be used with console echo systems. For in-line applications, the desired amount of reverberation may be set at intermediate positions of the OUTPUT MIX control.

EQUALIZATION

The XL-305 incorporates a four-band reciprocal peak/dip equalizer with center frequencies at 150, 600, 2K and 6K Hz. Peaking response, as shown in Figure 4, provides a more precise degree of control than conventional 'shelving' types of equalization.

EQUALIZATION - continued

This response characteristic, combined with a 12 dB boost or cut range, permits the creation of many different effects. In order to realize its full potential, the user is suggested to experiment extensively with this tool. The following equalization suggestions demonstrate only a few of the many possible applications of the XL-305.

CONCERT HALL		ACOUSTIC CHAMBER		PLATE REVERBERATION	
150	+6 to +12	150	-3 to -9	150	0 to +6
600	0 to +3	600	0 to -6	600	-3 to -6
2K	0	2K	0 to +6	2K	+6 to +9
6K	0 to -6	6K	+3 to +6	6K	+9 to +12

Each concert hall, live chamber, or plate reverberation unit has its own unique sound. The XL-305's equalization section is extremely flexible, permitting most types of reverberation to be simulated realistically and with ease.

MONO - STEREO OPERATION

The XL-305's LEFT and RIGHT reverb chambers have different timing characteristics that simulate the reverberant spaciousness of live rooms. Because of this unique feature, monaural sources may be reverberated to produce a true stereo output. This process is called stereo imaging.

The MONO CHAMBER DRIVE is used for this purpose, and feeds both channels of the reverb chamber with either the Left, Right, or sum of both inputs. This eliminates the need for external patching for mono send to the unit, and allows independent operation of the Direct Channels when driving the chamber in Mono.

Stereo imaging of a monaural source during mixdown is extremely useful in adding dimension to a single instrument or vocal track. To demonstrate this effect, depress the MONO CHAMBER DRIVE pushbutton with the unit in operation. Monitor the XL-305 in stereo with the OUTPUT MIX control set at the maximum CHAMBER position. The MONO CHAMBER RETURN pushbutton defeats the stereo imaging effect, and may be used for comparison to full mono operation.

The echo density, or diffusion of reverberation, is effectively doubled when both the MONO CHAMBER DRIVE and RETURN pushbuttons are used. This results in a deeper, richer reverberation that is ideally suited for percussion, voice, or other applications which might not require full stereo capability.

When the MONO CHAMBER RETURN pushbutton is depressed, a slight reduction in reverb return level may be noticed. This effect is normal, and may be compensated by readjustment of the OUTPUT MIX control or console return level.

XL-305 SPECIFICATIONS

INPUT (Ref. 0 dBv = 0.775v)

Minimum Level	-12 dBv
Maximum Level	+18 dBv

OUTPUT

Source Impedance	15 Ohms
Nominal Level	+4 dBm
Gain Adjustment Range	20 dB
Maximum Level (Into 600 Ohm Load)	+18 dBm rms

FREQUENCY RESPONSE (Ref. 1 kHz)

Direct Channel, 20 - 20k Hz	+0, -2 dB
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OUTPUT NOISE (at unity gain)

Direct Channel (20 - 20k Hz bandwidth)	-80 dBm
Reverberant Channel (A weighted)	-72 dBm

HARMONIC DISTORTION (direct channel)

At 0 dBm (20 - 20 k Hz)	Less than 0.1%
At +18 dBm (20 - 1k Hz)	Less than 0.4%
At +18 dBm (1k - 20 k Hz)	Less than .05%

REVERBERANT CHANNEL CROSS TALK

Better than -45 dB.

DECAY TIME (at 1 kHz, octave noise, T₆₀)

3.5 seconds

EQUALIZATION

Type: Reciprocal Peak/Dip	
Center Frequencies	150, 600, 2K and 6K Hz
Control Range	±12 dB

LEVEL INDICATORS

Type: Peak Responding	
Circuit Location: At Chamber Drive	
Display and Levels Indicated	Green, -6; Yellow, 0; Red, +6 dB

POWER REQUIREMENTS

Voltage (50/60 Hz)	100/120, 240v, +15, -10%
Power Consumption	20 VA

DIMENSIONS

3.5H x 19W x 12.5D inches

SHIPPING WEIGHT

Standard Model (XL-305)	13 lbs.
With Transformer Option (XL-305T)	15 lbs.

Specifications apply to the standard XL-305 and are subject to change or product improvement without notice.

Patent Pending

FACTORY SERVICE

The MICMIX Customer Service Department is prepared to give additional assistance in the use of this product. All questions regarding system interface, service information, or special applications will be answered. You may call during normal business hours - Telephone 214/352-3811 or write to:

MICMIX Audio Products, Inc.
2995 Ladybird Lane
Dallas, Texas 75220

Most difficulties can be solved over the phone or by your dealer, but should it be necessary to have your equipment factory serviced:

1. Repack the unit in its original carton along with a note describing the problem, location and date of purchase. The lock down screws retaining the reverb chamber must be reinstalled before shipment. If the original carton is not available, one may be sent from the factory.
2. Send the unit freight prepaid to the above address.
3. We recommend that you insure the package and send it via United Parcel Service whenever possible.
4. Please direct all inquiries to the MICMIX Service Department.

Outside of the United States contact your nearest dealer for the name of an authorized repair center.

LIMITED WARRANTY

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

Any defective product will be repaired or replaced at our option, 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 any defect. 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, 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.

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