Using a Lexicon MX200 to duplicate the room acoustics of most public spaces.

This program is designed to take a simple electronic reverb/digital delay devise and use it to recreate the acoustics of variable and specific room designs and sizes in a customized way. I have chosen the Lexicon MX200 because it has two processors and it is a very inexpensive devise. One processor can be used to set the reverberation times of that specific room with a general delay matching that of that general size room and the second processor can be utilized to duplicate more specifically the echoes that would be present in that type and size room depending more specifically on it's shape and over all diffusive qualities. The variations this system can duplicate is easily in the hundreds if not thousands, so the ability to accurately duplicate any given room is a very high percentage. In fact, I would estimate that only a very select few, educated and trained individuals could tell the difference between the actual room and the electronic simulation created by this program.

The first thing you will need to do is determine the rooms present reverberation time. This is a simple process and requires no more than an I-phone and a downloadable AP for RT-60 [the time it takes for sound to decay 60 decibels in the room.] There are several free RT-60 apps and some that are able to be calibrated for only $10 per year. After you have an app for determining the RT60 go ahead and get RT60 information at 2,00 hz, 1,000 hz, 500 hz, 250 hz, and the ever important to this generation 125 hz. You should take several of each until you get a certain amount of consistency. Not so much from frequency to frequency, but each frequency should settle into a few that seem consistent and "believable". Throw out the wild ones and take an average of the ones that seem close and predictable. Various interruptions and glitches are common in RT60 measurements, but again, you should see some consistency after several tries at each frequency.

There are three factors that will go into determining all the settings you will make on the Lexicon MX200. They are reverb [RT60} time, Volume [size] of the space being considered, and apparent diffusion of the space being considered. Even though this is going to seem over simplified to you, believe me there are hundreds, if not thousands, of possibilities and your room will be amazingly true to the final setting of the Lexicon MX200's electronic simulation of your room. I have allowed programming from a 40'X50' x10' room of 100 people to a 200'x200'x30' room of 2,500 people. Room volume can easily be calculated by simply multiplying the length X width X height = volume. Now you're ready to set processor one on the Lexicon MX200 according to volume of the room and tested reverberation times. The numbers after each equal sign on each line are simply the position of a hand on a clock for the three dials of Processor 1.

The first number is the 'pre Delay' knob, and we will use it as one dimension aspect of the room

The second number is the 'Decay' knob and we will use it to establish the reverb of the room.

The third number is the 'variation' knob and we will use it to establish the sidewall diffusive characteristic of the room.

Small Rooms from 100 to 200 seats or 20,000 to 40,000 Cubic Feet.

For rooms of 100 to 200 seats or 20,000 to 40,000 cubic feet select 'Small Hall' on Processor 1. Mix 1 should be at 3 o'clock. Make sure the bypass button is off.
We will use the 'Pre Delay' knob to set room volume.
20,000 cubic feet=9 o'clock
25,000 cubic feet=10 o'clock
30,000 cubic feet=11 o'clock
35,000 cubic feet=12 o'clock
40,000 cubic feet=1 o'clock

We will use the 'Decay' knob to set reverb time

2 seconds=5 o'clock	1. seconds=12 o'clock
1.8 seconds=4 o'clock	.8 seconds= 11 o'clock
1.6 seconds=3 o'clock	.6 seconds=10 o'clock
1.4seconds=2 o'clock	.4 seconds = 9 o'clock
1.2 seconds= 1 o'clock	

We will use the variation knob to set side wall echo/diffusion where 7 o'clock is taking the side walls out of the equation by either extensive absorption or extensive diffusion units, rolling up to 5 o'clock is where reflection is at a maximum due to hard flat sheet rock or concrete block walls. This is subjective, so look at your facility and make a value judgment as to how absorptive/diffusive or reflective the sidewalls are. [Hint…Flat, hard side walls with a little 'shape' or window housing every few feet might take it down to 3 o'clock, etc. Extensive sidewall ornamentation might take it down to 12 o'clock. Low ceilings in this size room, will not allow much wall echo. Only good extensive diffusion/absorption will take it down to 7 o'clock]

Now set Processor 2. We will use the Pre delay knob to establish the distance of the back wall.
50 ft.=9 o'clock, 75 ft.=10 o'clock, 100 ft.=11 o'clock, 125ft. =12 o'clock, 150ft.=1 o'clock, 175 ft.=2 o'clock, 200 ft.=3 o'clock
Set the 'Decay' knob at 9 o'clock
Set the Variation knob on 5 o'clock
We will use the Mix 2 knob to set the echo/diffusion where 7 o'clock is taking the back wall out of the equation by either extensive absorption or extensive diffusion units, rolling up to 12 o'clock where reflection is at a maximum due to hard flat sheet rock or concrete block walls. This is subjective, so look at your facility and make a value judgment as to how absorptive/diffusive or reflective the back wall is. [Hint…A flat, hard back wall with a little 'shape' or window housing every few feet might take it down to 10 o'clock, etc. Extensive back wall ornamentation might take it down to 9 o'clock. Only good extensive diffusion/absorption will take it down to 7 o'clock in this parameter most of the difference will be very sensitive between 9 and 7 o'clock] You just electronically set up the MX200 to duplicate either the before or after treatment of your room! You will find it to be a very accurate representation!!

Large sized Rooms From 60,000 to 320,000 Cubic Ft. and 300 to 1,000 Seats

For rooms of 300 to 1,000 seats or 60,000 to 320,000 cubic feet select 'Large Hall' on Processor 1. Mix 1 should be at 1 o'clock. Make sure the bypass button is off.
We will use the 'Pre Delay' knob to set room volume.
60,000 cubic feet-[300 seats]=9 o'clock
100,000 cubic feet-[450 seats]=10 o'clock
160,000 cubic feet-[600 seats]=11 o'clock
240,000 cubic feet-[800 seats]=12 o'clock
320,000 cubic feet-[1,000 seats]=1 o'clock

We will use the 'Decay' knob to set reverb time
6.5 seconds=5 o'clock 4 seconds=12 o'clock
6 seconds=4 o'clock 3.5 seconds= 11 o'clock
5.5 seconds=3 o'clock 3 seconds=10 o'clock
5 seconds=2 o'clock 2.5 seconds = 9 o'clock
4.5 seconds= 1 o'clock 2.0 seconds = 8 o'clock 1.5 seconds= 7 o'clock

We will use the variation knob to set side wall echo/diffusion where 7 o'clock is taking the side walls out of the equation by either extensive absorption or extensive diffusion units, rolling up to 5 o'clock is where reflection is at a maximum due to hard flat sheet rock or concrete block walls. This is subjective, so look at your facility and make a value judgment as to how absorptive/diffusive or reflective the sidewalls are. [Hint…Flat, hard side walls with a little 'shape' or window housing every few feet might take it down to 3 o'clock, etc. Extensive sidewall ornamentation might take it down to 12 o'clock. Only good extensive diffusion/absorption will take it down to 7 o'clock]

Now set Processor 2. We will use the Pre Delay knob to establish the distance of the back wall.
50 ft.=9 o'clock, 75 ft.=10 o'clock, 100 ft.=11 o'clock, 125ft. =12 o'clock, 150ft.=1 o'clock, 175 ft.=2 o'clock, 200 ft.=3 o'clock
Set the 'Decay' knob at 9 o'clock
Set the Variation knob on 5 o'clock
We will use the Mix 2 knob to set the echo/diffusion where 7 o'clock is taking the back wall out of the equation by either extensive absorption or extensive diffusion units, rolling up to 12 o'clock where reflection is at a maximum due to hard flat sheet rock or concrete block walls. This is subjective, so look at your facility and make a value judgment as to how absorptive/diffusive or reflective the back wall is. [Hint…A flat, hard back wall with a little 'shape' or window housing every few feet might take it down to 10 o'clock, etc. Extensive back wall ornamentation might take it down to 9 o'clock. Only good extensive diffusion/absorption will take it down to 7 o'clock in this parameter most of the difference will be very sensitive between 9 and 7 o'clock] You just electronically set up the MX200 to duplicate either the before or after treatment of your room! You will find it to be a very accurate representation!!

Arena sized Rooms From 400,000 to 1,200,000 Cubic Ft. and 1,000 to 2,500 Seats

For rooms of 1,000 to 2,500 seats or 400,000 to 1,200,000 cubic feet select 'Arena' on Processor 1. Mix 1 should be at 12 o'clock. Make sure the bypass button is off. We will use the 'Pre Delay' knob to set room volume.
400,000 cubic feet=7 o'clock
600,000 cubic feet=8 o'clock
800,000 cubic feet=9 o'clock
1,000,000 cubic feet=10 o'clock
1,200,000 cubic feet=11 o'clock

We will use the 'Decay' knob to set reverb time

9 seconds=3 o'clock	5 seconds=10 o'clock
8 seconds=2 o'clock	4 seconds= 9 o'clock
7 seconds=1 o'clock	3 seconds=8 o'clock
6 seconds=12 o'clock	2 second = 7 o'clock

We will use the variation knob to set side wall echo/diffusion where 7 o'clock is taking the side walls out of the equation by either extensive absorption or extensive diffusion units, rolling up to 5 o'clock is where reflection is at a maximum due to hard flat sheet rock or concrete block walls. This is subjective, so look at your facility and make a value judgment as to how absorptive/diffusive or reflective the sidewalls are. [Hint…Flat, hard side walls with a little 'shape' or window housing every few feet might take it down to 3 o'clock, etc. Extensive sidewall ornamentation, or sloped seating might take it down to 12 o'clock. Only good, extensive diffusion/absorption will take it down to 7 o'clock]

Now set Processor 2. We will use the Pre Delay knob to establish the distance of the back wall.
100 ft.=7 o'clock, 125ft. =8 o'clock, 150ft.=9 o'clock, 175 ft.=10 o'clock, 200 ft.=11 o'clock,225 ft,=12 o'clock,250 ft.=1 o'clock
Set the 'Decay' knob at 8 o'clock
Set the Variation knob on 5 o'clock
We will use the Mix 2 knob to set the echo/diffusion where 7 o'clock is taking the back wall out of the equation by either extensive absorption or extensive diffusion units, rolling up to 10 o'clock where reflection is at a maximum due to hard flat sheet rock or concrete block walls. This is subjective, so look at your facility and make a value judgment as to how absorptive/diffusive or reflective the back wall is. [Hint…A flat, hard back wall with a little 'shape' or window housing every few feet might take it down to 9 o'clock, etc. Extensive back wall ornamentation or sloped seating might take it down to 8 o'clock. Only good extensive diffusion/absorption will take it down to 7 o'clock. In this parameter most of the difference will be very sensitive between 9 and 7 o'clock] You just electronically set up the Lexicon MX200 to duplicate either the before or after treatment of your room! You will find it to be a very accurate representation!!