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Recording drums. Where is my money best spent?

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Music and Performing Arts

Bachelor of Arts, Music

Concentration in Recording Technologies

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Abstract

I want to invest in recording equipment so I can record music at my house. I do not want to pay for studio time because I would rather pay for, and keep, the gear. What gear do I need to record myself playing drums? What elements of recording myself playing drums are most important? How much do these things cost? Considering these costs, where is my money best spent? I decided to do an experiment where I record myself playing the same sound file with different drum sets, with different microphones, in different spaces to find out.

To find out how much the instrument plays a role in the recording, I set up two different drum sets in the highest quality space I had available to me, with the highest quality mics I had available to me and played a drum part. To find out how much the recording space plays a role in the recording, I set up the highest quality drum set I had available to me, with the highest quality mics I had available to me in two different recording spaces and played the exact same drum part. To find out how much different microphones play a role in the recording, I set up multiple microphones on the highest quality drum set I had available to me, in the highest quality recording space I had available to me and played the exact same drum part.

This experiment has answered my questions about where to invest in my drum set, how valuable acquiring the best recording space as possible is, which types of microphones I should be shopping for, as well as where in the recording process I can save some money and where I should not cut corners.

Recording drums. Where is my money best spent?

I find it very exciting that these days we are able to make music and share it with the world more easily than ever before. I want to make music--cut records, play shows, and collaborate with other artists. I want to invest in recording equipment so I can record music at my house. First and foremost, I am a drummer and drums aren't the simplest instrument to record, but what I want to be able to do is to record myself playing drums. I do not want to pay for studio time because I would rather pay for, and keep, the gear. What gear do I need to record myself playing drums? What elements of recording myself playing drums are most important? How much do these things cost? Considering these costs, where is my money best spent? I decided to do an experiment where I record myself playing the same sound file with different drum sets, with different microphones, in different spaces to find out.

Context

This is not an all inclusive experiment to find out all of how different drums, mics, and spaces sound. This experiment is meant to show me the relationship to the difference in costs and how that translates to what I hear in recordings. With that said, I can only perform this experiment with the gear I have available to me, either at home or at school.

What do I need to record myself playing drums? What do I have to work with?

What do I need to record myself playing drums and what do I have to work with? I need three main elements; a drum set, a recording space, and microphones. I have my drum set. It is a Pacific by DW, CX series kit with a 6.5'' deep, Ludwig Rocker Elite snare. The entire kit has new heads. The kit also has Zildjian A series cymbals. My drum set is the highest quality drum set I have available to me. To find the impact the instrument has on the recording, I will compare my drum set with one of the school's drum sets, the lowest quality drum set I have available to me. The school's drum set I am using is a Pearl Export series kit with a 5 inch deep, Gretsch Catalina snare. The entire kit has old, old heads. The kit also has Zildjian ZBT series.

The recording spaces I will be using are room 100 in Music Hall at California State University Monterey Bay (CSUMB) and the old MIDI lab in Music Hall because they are the two rooms within reach of the MTA recording console. Room 100 is the highest quality space I have available to me, while the old MIDI lab is the lowest quality space I have available to me. I also have baffles available to help with sound treatment and see what effect that has on the recording.

When the campus used to be Fort Ord, the building that is now the music building used to be one of the church buildings on the fort. Room 100 was the congregation room in the building. Now the room is pretty much the same, but instead of sermons, it is a lecture room. The room has tall ceilings, almost in shape that feels like being inside of a cone. The floors are carpeted everywhere except where the lecturer podium would be. That portion of the floor is either hardwood floors, or a hardwood floor disguised laminate. The walls are acoustically treated with both wall fabric and acoustic panels behind where the lecture podium would be. The doors to the

room are big steel squares, which is one of the less than ideal aspects of the room. The old MIDI lab is a rectangular room with cinder block walls about ten feet high. It is very loud and very reflective in that room.

To record myself playing drums there are many different microphones and mic placement techniques to choose from. My preference is to use the spaced pair overheads with spot mics technique. To do this, I will need to spot mic the kick, snare, hi-tom, and floor tom. I will set up a spaced pair of overheads, a hi-hat mic, and a room mic, as well.

Methodology

To find out how much the instrument plays a role in the recording, I set up two different drum sets in the highest quality space I had available to me, with the highest quality mics I had available to me and played a drum part. To find out how much the recording space plays a role in the recording, I set up the highest quality drum set I had available to me, with the highest quality mics I had available to me in two different recording spaces and played the exact same drum part. In the lowest quality recording space available to me, I did two recordings; one without baffles and one with baffles. I did not do the without/with baffles comparison in the highest quality recording space available to me because this recording space is already of the highest quality available to me. I was only interested in seeing how baffles can improve a lesser quality recording space.

To find out how much different microphones play a role in the recording, I set up multiple microphones on the highest quality drum set I had available to me, in the highest quality recording space I had available to me and played the exact same drum part. The overhead mics

had two microphones taped to each other for comparison; Neumann KM184 MPs, the more expensive microphones, and Avantone CK1s, the lesser expensive microphones. The hi-tom and floor tom had two microphones occupying the same spot for comparison; Josephsons E22s, the more expensive microphones, and Shure SM-57s, the lesser expensive microphones. The snare top had two microphones taped to each other for comparison; an AKG C451EB MP, the more expensive microphone, and a Shure SM-57, the lesser expensive microphone. The snare bottom had only one microphone, the Shure SM-57. The snare bottom did not have another microphone to compare with. I was simply interested in the presence the snare bottom has. Depending on the number of preamps your interface has, you might not have the space to record everything. If I had to make a choice between including the snare bottom or not, how valuable is it?

The kick drum had a Shure Beta 52a on it. The kick drum did not have a comparison microphone for one simple reason—I love the Shure Beta 52a. I love the way it sounds and it is sold in a package with 3 SM57s for only $400. This experiment was meant to help me answer certain financial questions and what to put on the kick drum is not one of them. The Shure Beta 52 is a great mic in my opinion and a sound engineer can't have enough SM57s. The hi-hats had an AKG C451EB MP on them and the room mic was a Lauten Audio Atlantis FC. The hi-hats and the room did not have comparison microphones either. My interest in these microphones is similar to the snare bottom. When recording my drum set and if I am limited to a certain number of preamps—which is more valuable, a room mic or a hi-hat mic?

Results

After recording myself playing drums in the highest quality space I had available to me, with the highest quality mics I had available to me, the results show that one set of drums does not sound better than the other, they just sound different. On my drum set, the kick sounded great, it sounded big and punchy. The snare sounded tight and it cracked. It sounded big, bright and full. The toms sounded great. They sounded rich, full, and bright and they had a lot of attack. On the school's drums the kick sounded full and had a little boom. It also sounded a little punchy. The snare sounded great. It sounded fat with a nice natural reverb. The toms sounded bad. They had a lot of overtone and unwanted reverberation.

The heads on both kits made the biggest difference when comparing the drums. My drum's heads were new and easy to tune and sounded great. They sounded crisp with a nice attack and decay. The school's drum set's heads were very old and very beaten. I tried to tune them, no matter what I did they just sounded old. They sounded wobbly with a lot of overtones.

The cymbals made the biggest overall difference. My cymbals weren't the most expensive, but they sounded pure. They have a nice attack without being too washy. The school's cymbals sounded bad. They sounded harsh, even irritating. They were very washy and crowded the drum set's mix.

With the highest quality drum set I had available to me, with the highest quality mics I had available to me, the results show that, as expected, room 100 sounded the best. The room's resonance enhanced the drum sound. The reflections in the room were more so welcomed than a problem. The old MIDI lab without baffles sounded very harsh. The reflections were very present and unwelcomed. They were loud and lasted a long time. The old MIDI lab with baffles

sounded much better. The baffles really turned the reflections down. The room still had unwelcomed reflections, but it was way more tolerable with baffles.

With the highest quality drum set I had available to me, in the highest quality recording space I had available to me, the microphones comparison results showed that the overhead mics' difference was not that noticeable. The Neumann KM184 MPs sounded very detailed. I could pick everything out with absolute clarity. They were full and bright on the high end and warm on the low end. The Avantone CK1s were crisp and offered a clean recording. Most of their presence was in the mid range. They were a little harsh on the cymbals, but it wasn't offending. Results showed that the hi-tom and floor tom mics compared were significantly different. The Josephsons E22 were full sounding, bright, and had a lot of body. The Shure SM-57s featured mostly attack, but not a lot of body. Mostly what I was hearing from the Shure SM-57s were the midrange. The snare top mics were also significantly different. The AKG C451EB MP had most of the low end and most of the smack. It also had a lot more body. It's fat, but not too bright. The Shure SM-57 had most of the resonating sound. It had a nice body with a crisp fullness to it's sound.

The snare bottom mic, the Shure SM-57, sounded like a rattle. It picked up the snares almost exclusively. It sounded very bright and had a lot on the high end. The hi-hats mic, the AKG C451EB MP, had a lot of the attack. It sounded bright and detailed. The room mic, the Lauten Audio Atlantis FC-387, had a lot of boom and natural reverberation. It picked up the kick and snare most and made them stand out.

Cost

After hearing the results, I looked to see what the cost of this recording process was. For the drum sets, I saw them as three different areas of cost; the drums, the heads, and the cymbals. My drum set's drums cost around $700. The drum's new heads cost around $140. My cymbals cost around $500 bringing the total to around $1,340. The school's drum set's drums cost around $500. The heads cost $0 because I did not put new heads on them to see the value in buying new heads. The school's cymbals cost around $250 bringing the total to around $750.

The cost of the recording space for this experiment was specific to this context. My personal costs for the MIDI lab and Room 100 are my tuition. When recording myself playing drums, the cost of the recording space would be sound treating the space I am forced to make do with, like my bedroom or wherever. The microphone costs varied. The overhead mics had two sets of microphones. The Neumann KM184 MPs cost around $1,500 for a pair and the Avantone CK1s cost around $300 for the pair. The hi-tom and floor tom had two sets of microphones. The Josephsons E22s cost around $2,800 for the pair and the Shure SM-57s cost around $100 each. The snare top had two microphones. The AKG C451EB MP cost around $500 and the Shure SM-57, again cost around $100 each. The snare bottom microphone, the Shure SM-57, cost around $100 each. The kick drum microphone, a Shure Beta 52a, cost around $170. The hi-hat microphone, the AKG C451EB MP, cost around $500. Finally, the room mic, the Lauten Audio Atlantis FC, cost around $1,500.

Conclusions

After listening to the recordings, analysing the sound, and analyzing the costs of these recordings I am able to reach conclusions about where my money is best spent when trying to record myself playing drums. In the highest quality recording space I had available to me, with the highest quality mics I had available to me, when comparing two different drum sets the results suggest that my money is best spent on new drum heads, a good snare drum, and really good cymbals. Money spent on quality drums is important, but not as important as all new drum heads, a good snare, and good cymbals.

With the highest quality drum set I had available to me and with the highest quality mics I had available to me, when comparing recording spaces the results suggest that the room makes a huge difference. A big, sound-treated room is much much better than a square cinderblock room. If can, the right room is worth the effort to find, treat, and use.

With the highest quality drum set I had available to me, in the highest quality recording space I had available to me, when comparing different microphones the results suggest that I do not need to buy the most expensive mics. When looking at the overhead mics, between the Neumann KM184 MPs and the Avantone CK1s, I don't believe there is an extreme difference. There was a little more clarity and brightness to the more expensive Neumann KM184 MPs, but the Avantone CK1s were not bad at all. They provided an adequate overhead recording. I see the value in investing in good overhead mics. The biggest difference is in the cymbals. Expensive mics made them sound a little better, but it appears that $300 will do the trick compared to $1,500.

For the hi-tom and floor tom mics, between the Josephsons E22 and the Shure SM-57, the Josephsons E22 definitely sounded better. However, when analyzing the cost they didn't sound that much better. The less expensive Shure SM-57 didn't not sound as full, but they gave the attack needed, and the fullness of the toms were picked up by the overheads. However, the Shure SM57s sounded just fine at $200 when keeping in mind the Josephsons E22 are $2,800.

The AKG C451EB MP on the snare top did not show much value. The Shure SM-57 sounded better on a snare drum anyway. Together the AKG C451EB MP and the Shure SM-57 make a great pair, but it did not sound that much better for how much more expensive that makes micing the snare drum. However, I found the snare bottom mic, the Shure SM-57, to be valuable and to be quite worth the extra money spent. Micing the bottom snares really made a world of difference. With only a top snare mic, the snare sounded pingy, lots of unwelcome resonance and overtones.

The hi-hat mic, the AKG C451EB MP, was great if I was doing a lot of articulate work on the hi hat, but overall I found it unnecessary. If I was able to I would mic the hi-hat, but on a budget, putting a mic on the hi-hat would fall low on my priority list. A lot of the hi-hat was picked up on the overheads anyway. I would say a room mic is a must. The natural reverb that it adds to the kit sounded great. Which do I prefer, a room mic or a hi-hat mic? I prefer the room mic for sure.

Overall Conclusion

After analysing the experiment in its entirety, I was able to put together what I saw as different levels of depth with different microphone combinations when recording drums. The best mic setup I had available to me had a Shure Beta 52a on the kick, an AKG C451EB MP and a Shure SM57 on the snare top, a Shure SM57 on the snare bottom, Josephsons E22s on the toms, an AKG C451EB MP on the hi-hat, Neumann KM184 MPs on the overheads, and a Lauten Audio Atlantis FC-387 for the room mic. This set up is $7,170 in microphones. If my budget was endless, this setup does sound great! Sounds as good as I can get with these resources.

The next best mic setup, when trying to cut the cost would be a Shure Beta 52a on the kick, only a Shure SM57 on the snare top, a Shure SM57 on the snare bottom, Shure SM57s on the toms, nothing on the hi-hat, Avantone CK1s on the overheads, and a Lauten Audio Atlantis FC-387 for the room mic. This mic setup is $2,300 in microphones. The first thing I would do to save money compared to the best case scenario is use the less expensive overheads. The 451 on the snare top is unnecessary, in my opinion. The 451 on the hi-hat is unnecessary, overheads pick them up just fine in my opinion. The more expensive mics on the toms are not worth the high price at all, the 57s work just fine.

The next best mic setup, when trying to cut the cost would be a Shure Beta 52a on the kick, only a Shure SM57 on the snare top, a Shure SM57 on the snare bottom, Shure SM57s on the toms, nothing on the hi-hat, Avantone CK1s on the overheads, and I would cut the room mic. This mic setup is $870 in microphones. The next wave of saving/budgeting I would do is cut out

the room mic. The room mic is valuable, but it is very much on the expensive side. I would consider this mic setup to be the sweet spot in great sound and good budgeting.

The smallest mic setup, when trying to further cut down the cost would be a Shure Beta 52a on the kick, only a Shure SM57 on the snare top, I would cut the mic on the snare bottom and the toms. Nothing on the hi-hat, Avantone CK1s on the overheads, and no room mic. This mic setup is $570 in microphones. This is what I would conclude is the absolute minimum needed to do a critical recording. There is a noticeable difference in sound quality between the third set of conclusion mics and the best mics. However, the cost is the biggest noticeable difference. The most expensive mics sound great, but they don't sound $6-7K better.

I hope this experiment was helpful to anyone looking to record themselves playing drums, on a budget. This experiment has answered my questions about where to invest in my drum set, how valuable acquiring the best recording space as possible is, which types of microphones I should be shopping for, as well as where in the recording process I can save some money and where I should not cut corners. I learned that when trying to record myself playing drums, the ideal setup for me to get my desired sound with a reasonable investment, my money is best spent on new heads, a good snare, good cymbals, good overhead microphones, and a good Room mic. Also, workhorse kind of dynamic mics, like the Shure Beta 52a and SM-57 are great and work just fine. My biggest take away was to try and record in the best room possible. Stay away from rooms with a lot of reflection. On a scale between a dead room and a very reflective room, the side of the dead room would be preferred over the side of the very reflective room, although somewhere in the middle is most prefered.

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