

### 31 My Recording Career, Part 2: 1973 to 2020

I'm Doug Fearn and This is My Take On Music Recording.

In part one of this story of my early days of recording, I ended the episode when my studio had upgraded to 8-track, in 1972.

One thing that I really needed at that point was a good reverb unit. Sigma had an acoustic echo chamber that sounded great, plus EMT plate reverbs.

Neither of those was practical for me. I didn't have room for an acoustic chamber (although in retrospect, I might have been able to use some of the basement to build that), and an EMT was beyond my budget.

So I got an AKG BX20 spring reverb. I was skeptical of this unit from the start, because I always thought of Fender amp spring reverbs when I thought of springs. Or an interesting reverb in the production studio at WPEN, which used long springs in oil-filled tubes. None of them sounded anything like real reverb to me.

But the BX20 was within my budget, and it was small. I installed it in the basement, underneath the control room. It was better than nothing, but it really only sounded acceptable on strings.

Not long after, I heard about an EMT 140 for sale by a major studio in New York, and soon a friend with a pickup truck and I were on our way to get it.

The EMT went in the basement, too. I was thrilled to have it and it sounded great.

I was curious about how it worked, so I took off one of the side panels to take a look. For those who aren't familiar with the EMT, it has a large steel plate, suspended under tension in a framework, with transducers to make the plate vibrate with the sound, and pickups to extract the reverberation. A panel of sound-absorbing material can be moved with a control wheel so that it is closer or farther from the plate, to control the reverberation time. All this is in a massive wooden box. It weighs over 300 pounds and is about four by eight by two feet. It will pick up nearby sounds, so it must be isolated from any noise.

When I opened it up, I saw that one of the tiles of sound-absorbing material had broken loose from the framework and a corner of the material was touching the plate. I was never sure if this occurred before I bought it, or it was damaged on the 90-mile ride down the New Jersey Turnpike in the back of the pickup truck. Maybe this was why the studio sold it.

Whatever the cause, I decided to repair it, even though I was very happy with the sound. I glued the tile back in place and headed back to the control room to listen to my new, even-better plate reverb.

Only I didn't like it as well. It's hard to explain, but I liked the density of the short reverb with the broken tile.

So, I went back down and undid my repair. The plate stayed that way as long as I owned it.

Noise from tape was always a problem. The best you could expect from the machines of that era was about 65dB of useable dynamic range.

But Ray Dolby came up with an ingenious solution in the 1960s, the first product of Dolby Labs. It was a noise-reduction system that improved the signal-to-noise ratio by at least 10dB, and it was actually better than that subjectively because it was very effective at reducing tape hiss.

But the Dolby units were expensive. Each channel needed its own 1-rack unit device. But I could afford a pair of them for the two-track master machine. There was still the noise from the 8-track, but that noise could be minimized during the mix by pulling down the fader of any track that did not have audio on it at any given time. With 8 tracks, it was usually possible for one person to manage the faders, and that kept the noise at an acceptable level.

Incidentally, many years later I got to know Ray Dolby. We would talk about business for a few minutes and then our conversation turned to our mutual love of flying airplanes. Ray had some pretty impressive aircraft.

By 1975, I upgraded to 16-track on two-inch tape with another Scully machine. Now the console didn't have enough inputs, so I built some more. And the monitor section required expansion, too, and I wanted to make the monitor section more useful, with multiple effects sends for headphone feeds and reverb.

I designed the new monitor section and built it in the basement workshop. It was a big project that took a couple of weeks, but by that time, I had a couple of good engineers working for me and they could handle the sessions. My bench was right below the drum booth, and I enjoyed the sound of a great R&B drummer playing right over my head. All I could hear was drums.

And that brings up an important point about the way I recorded at the time. My first mixer, and the console that followed it, did not have solo buttons. With a separate monitor section, it was possible to pull down all the faders except the one you wanted to solo, but this was cumbersome with 8 tracks and impractical with 16 tracks. So, I never got used to using the solo function, even a few years later when I had a console that had solo buttons.

I always preferred to hear the sounds in context, so I didn't really miss the solo ability. It is also good ear training to pick out the part you need to focus on and mentally tune out everything else. Even today, with a DAW that has solo buttons, I rarely use them.

At this point, the studio was well-equipped and the sound was good, given the limitations of the space. It took a lot of experimentation with sound-absorbing materials to get the acoustics right. The studio was too small to have any useable room sound.

HVAC was a problem. We used a window air conditioner in the control room, which was turned off when critical listening was required. But the studio was difficult to cool. Eventually I rigged up an air-conditioning unit in the basement, with blowers and sound-isolating ducts to move the cool air into the

room as silently as possible. That was fine most of the time, but sometimes the system had to be turned off temporarily for a quiet overdub.

Heating was by hot water and radiators, so it was quiet.

By this time, we were getting some record company work and they wanted to book large blocks of time for artists and producers. The studio didn't have a lounge or other amenities that clients expected. Even though we got the work, it was obvious that I needed to up the game.

I began searching for a bigger building, but all the places I looked at were either too expensive or had noise problems.

Whenever we needed to rent an instrument, we would go to Medley Music, a prosperous and popular music store in our area. We got to know the staff and the owner pretty well. The music store was looking for a bigger building, too, and in discussion with the owner, it turned out that he wanted to move a few miles up the road and that would be a bit inconvenient for them to access the warehouse they had used for years. The owner offered to rent the building to me, and looking at it, it was obvious that this would be a major step up.

It took almost a year to build out that new studio, while still keeping the old room operating. The new space was much better for us. The studio I designed was about 35 by 25 feet, with a 12-foot ceiling. Not as high as I would have liked, but certainly better than the 9-foot ceiling I had in the original studio.

I could also have a much bigger control room, plus isolated space for the EMT reverb and other gear that didn't need to be in the control room.

The building was constructed in the mid-1800s out of stone. The walls were massive, and at some point, the stone was covered by brick. It was very soundproof and solid.

Prior to our use, the building was a warehouse, a printing plant, and a propeller factory. We never could find out its history prior to WW I.

The second floor was a spacious apartment, which we converted to office space, a large lounge, a room for tape storage, and a small studio with the disc lathe and tape machines for making copies and creating tape cassettes for the clients. And there was still room for a one-bedroom apartment, which was occupied by various employees at different times. It was good to have someone on-site around the clock most of the time.

The stone walls on the inside had been covered in a thick coat of plaster, but I designed a room-within-a-room like the old studio, using truckloads of old spruce barn siding we found. The original ceiling was made of embossed tin, which was popular 50 to 100 years prior. The old studio had that type of ceiling as well, although it was covered over.

But in the new building I decided to remove all the tin and do something different. With the tin removed, you could see the floor joists and floor above, along with all the knob-and-tube wiring from the early 20<sup>th</sup> century. All that had to go, and I rewired the entire building myself. I doubt that you could get away with that today, with strict building regulations. But I went to the township with my proposal for wiring and remarkably, the township engineer and electrical inspector agreed to let me do it. That saved a lot of money, even if it took a huge amount of my time.

In order to seal up the ceiling and the floor boards of the second floor, we found an old paint sprayer used to paint lines on roads. And I bought many 5-gallon buckets of surplus Navy ship paint from the Philadelphia Naval Yard. Painting the “ceiling” was the first order of business and we made a mess spraying that paint, which was more like pancake batter than what we think of as paint. But it did seal the floor above, which is important in reducing sound transmission.

The ceiling was then made of two layers of 5/8<sup>th</sup> inch drywall. I was never stronger, or more physically worn out at the end of the day, then when we were installing all the drywall. The sheets were four by twelve feet and bundled in pairs. Just getting them off the delivery truck and into the building was enough to wear me out.

I discovered that the floor was not very level, and to fix that, we needed to put many floor jacks in the basement to lift the floor back into its proper place. That took a couple of weeks, since it had to be done slowly to avoid breaking anything.

The studio space was wide open. I didn't want any booths, and I rarely felt the need for a booth. There was a small area in the back of the room, that led to a bathroom and mic closet, and I occasionally used that space if isolation was a problem. But mostly we just recorded in one big room.

For the new studio, a new console was required, and I found a used Auditronics 26-input board that the Power Station in New York was selling.

The new studio opened in 1977 as a 16-track facility and we immediately started getting some excellent clients doing record label work. But by this time, the competition was 24-track and I needed to upgrade. The console was capable, so that wasn't a problem. I bought a new 3M M79 24-track and all the Dolby units needed to make every track in the building quiet.

Digital devices were just starting to become available, and I bought an Eventide Harmonizer and a Lexicon Prime Time digital delay, and some other digital delay units made by companies long gone.

I had a couple of UREI 1176 limiters, and the old CBS Audimax from WPEN, which they gave me when they upgraded to something more modern. From the old studio, I brought over the Allison Research gain Brain and Keyplex rack, which was occasionally useful. And I had a pair of Federal Radio tube limiters that I presume were World War II surplus. Those were designed to communications circuits and were bandwidth limited, noisy, and had a lot of distortion. But they could be used sometimes to provide the most in-your-face compression you could imagine.

I expanded the mic collection, too, with AKG 451s, which were useful on string sections, Neumann U89, which was like a U87 only smaller, and a Neumann KM88, which had a nickel-coated diaphragm instead of the typical gold. The KM88 was very bright and excellent on snare. It had a medium-sized capsule that was side addressed.

I also added E-V RE20s, Beyer Dynamic M160s, some Calrec mics suggested by a producer client from a major label. And I got a Neumann SM69 stereo mic, which I still have.

A studio going out of business had Studer A80 and B67 two-track tape machines for sale, and I put them in as mixdown machines. To me, the B67 always sounded better, and even though it was a cheaper recorder, I preferred the sound of it over the A80.

From the beginning, I used 3M tape, mainly because it was the only thing available and it was reliable and sounded good.

Later, Ampex came out with their own line of tapes, which I didn't really like the sound of, but it was a good alternative to 3M if there was a problem with their tape.

And all the tape manufacturers had problems from time to time. It was insidious, because the tape worked fine for the first 50 or so passes. And then the oxide started shedding, and you had only a limited number of passes until the tape lost the highs and the level dropped. When that happened, I would take the 2-inch reels down to Sigma Sound Studios and make a copy. They were the only studio in town that had two 24-track machines in the same room.

Around 1978, I went to a Philadelphia AES Chapter meeting at a studio in town, where representatives from the German company Agfa were giving a talk and demonstration of their tape. They did an excellent comparison of all the major tape brands currently available, and I was astounded at how much better the Agfa tape sounded.

I repeated their comparison in my studio and heard the same improvement. So did everyone I played that samples for. I made the switch to Agfa tape and used that through the end of the tape era.

Around the same time, a sales engineer from Lexicon brought over a 224 digital reverb for me to listen to. Instead of the one excellent-sounding EMT reverb, here was a box capable of emulating many different reverberant spaces. It was expensive, but I knew I had to have it.

This early generation device was only 16 bit, and the processor section was a huge rack-mount box with noisy fans. But it offered lots of interesting alternatives and it quickly became our go-to reverb. At least for a while. After a few months, I went back to using the EMT most of the time. The 224 was good for strings, but for most things, I preferred the EMT. So did most of my engineers. We still used the 224, but the EMT was the right reverb for a lot of things.

As the 224 was refined, it sounded better, of course. But I think that was when I started to realize that 16-bit digital, at low sample rates, didn't really sound all that good. Maybe it was OK at first, but with continued listening it started to get on my nerves.

In the new facility, we had separate HVAC systems for the studio and control room. The studio system was conventional, except that I specified huge ductwork, with bends to act as sound traps, and no grilles on the outlets or returns. It was nearly impossible to tell it was running.

For the control room, I decided to use a water-cooled system. It operated the same as any air conditioner, but instead of an outdoor compressor with roaring fans, it used a slow trickle of water to remove the heat from the condenser coil. With large, slow velocity ducts, it, too was nearly silent.

At this point in the history of the studio, most of our income was from record company work. We would get a booking from a label and then they would book in other projects. Many were R&B albums, but we did all sorts of music, from traditional folk to what was called New Wave. That genre later morphed into Punk.

I got to work with many great producers and excellent musicians. It was a joy to work with people at that level.

I recorded that same way as I had in the past, but now I had more mics, plus a great Steinway B piano.

Typical mic'ing in this era had an RE-20 on the kick drum, a KM88 or KM84 on the snare, AKG 451s as overheads, a Beyer-Dynamic M160 on the high-hat, and Sennheiser 421s on the tom-toms. I added bottom mics to the drums, and often used a large-diaphragm condenser as a second kick drum mic, placed farther out.

I used the Neumann SM69 stereo mic on the piano, and often for string sections, plus accent mics.

For vocals, I was trending away from the U87 and often used the Calrec condenser. Sorry, I do not remember the model number. A well-known producer who did a lot of work with British artists suggested that mic, and it was great for many vocalists.

I also started using room mics, which was feasible with the bigger, more reverberant room. Often, I would have a vocalist do a double from about 20 feet away from the mic, which added a nice quality when blended in low. I would also do that with background vocal ensembles, with each overdub from a different distance, which gave the vocals a choir-like sound.

I had access to some really great studio musicians, plus strings from the Philadelphia Orchestra when the budget allowed. Many of the studio players that worked at Sigma also did sessions with us, and it was a joy to work with pros who could knock out amazing parts in no time at all.

But we still filled in the hours with some less-than-wonderful music, and that was not very satisfying to me. In fact, it became downright depressing to me to work with people who were not as good at what they did as I was in what I did.

I decided that it was time to head in a different direction, which ended up being the equipment manufacturing business. But I never stopped recording. Some sessions I did at other wonderful studios in New York and elsewhere around the country, and some were location recordings, mostly of classical and choral live performances. I liked the idea that there was one take, no overdubs, and minimal mixing.

Today, I have a studio again, which is about the same size as my first room. But I know so much more about acoustics and room design now that it sounds better than that original studio. I have mic lines running to other spaces in the building, so I can put the drums in my shop when needed, or use the large garage space for a different sound. But mostly I record everything in the same room, all at once, if possible, including vocals. The isolation isn't perfect, but with good players, the balance is correct in the room and the bleed is not an issue.

And the equipment today is much better, too. Not in the mics, however, which are still based on the classic designs that have proven themselves over the years.

Other things have improved. I do not miss tape, even though it has some wonderful qualities. On balance, high-resolution digital is better, especially DSD, when that is practical to use. I don't miss vinyl records, and all the limitations they put on the recording process, although I think good vinyl has a sound that no other consumer format can match.

I don't miss mixing analog, where it could take several people to do a complex mix and every mix was a performance in itself. Although that approach sometimes led to surprising discoveries, I prefer the automation and repeatability of digital.

In the analog days, it was highly unusual to do a re-mix. It was just too complicated and no one really had the budget for that unless it was a monster act. Now it is easy to revisit a mix and start right where you left off. Whether that is a good thing or a bad thing I leave up to you.

If I decide that a re-mix is necessary, I usually start over from scratch, as if I had never mixed the song before.

I don't miss doing edits on tape. Back in the 70s, I had a reputation as a good tape editor and would get calls from New York studios to come up and do the edits they wanted. Sure, tape editing is an art, but I don't think I was exceptionally good at it. But I would take the train to New York, wait until 1 or 2 AM for the mix to be complete, and then make the edits they wanted. It was kind of fun, and paid well, but I don't want to use a razor blade on tape ever again. And cutting a 2-inch master was nerve-racking.

Digital editing is a different world. Don't like it? Hit the undo button. It encourages experimentation and there is nothing to lose. Still, I rarely do any editing on the recording projects I work on. I am much more orientated towards getting the right performance from the start.

Punching-in on tape is a destructive process. Again, no un-do. Make a mistake and you could wipe out priceless parts. Not only is punching in digital totally foolproof, it is also cleaner, for technical reasons.

I am very fortunate that I do not depend on the studio for income, and I can just record the music and the performers I like to work with. I only do a few sessions a month, which keeps it exciting.

My equipment collection today is far different from the old days. I do not have a console, although I have a small Neve mixer from the 1980s that I bought for location work. I rarely mix through it, but I do on occasion. These days it is mostly used for headphone feeds and talkback.

For software, I use Merging Technologies' Pyramix most of the time. It has a lot of problems, but on balance it is very good for the type of projects I do. It cannot accept MIDI tracks, however, and although I don't do much recording that requires sampled sounds, I sometimes add parts, or play a part to show a player what I have in mind. For that, I use either Pro Tools or Reaper.

My converters are Merging Technologies, which I think are the best-sounding converters I have experienced. I also have my Radar system, which is now about 20 years old, but with hardware and software updates, it is still quite useful. Since it emulates a tape machine in operation, I like it for punching in. And the variable speed is great when it is necessary. The converters are excellent-sounding, if a bit limited in bit depth and sample rates compared to more modern converters.

All of my mic preamps are D.W. Fearn VT-1, VT-2, VT-12, or VT-24. I have 14 channels available, although I don't think I have ever used them all at once. I do not have any other mic preamps and have never felt a need for anything other than the preamps I designed.

Almost all my outboard gear is D.W. Fearn as well. I have a pair of VT-4 single-channel equalizers, two VT-5 Equalizers, and two VT-7 Compressors. I rarely need anything else, but I do have a couple of 1950s-vintage passive equalizers that are sometimes useful.

I would like to have an EMT 240 Gold Foil reverb, the successor to the EMT 140 plate, but they are difficult to find and very tricky to ship. Even the 240 takes up a bit of space, although it is much smaller than the 140, and should be placed away from any noise.

Instead, I have a Quantec 2496 digital reverb, which has dozens of useful emulations, including a lot of programs that were designed for film use. I find some of the ambience programs useful at times. Their plate emulation is excellent.

I also have a Bricasti M7, which is similar to the Quantec in many ways, but offers a different and expanded pallet of spaces, including some wonderful-sounding acoustic chambers and concert halls.

My mic collection is quite a bit different from what it was in my previous studio days. I tend to use ribbon mics for most things, which fit the music and style that I do. I have a pair of AEA R44 mics, plus two R88 stereo ribbons, a KU4, and a R92, plus three Coles 4038s, and a Beyer-Dynamic M160, very small. And an Ocean Way RM1 mic, which was designed by my long-time friend Cliff Henricksen.

I only have one dynamic mic, a Shure SM57.

There are also many condenser mics. My favorites are my vintage Neumann SM69 stereo, and U47fet, plus current production versions of the Neumann M49 and U48 and a pair of AKG C12s, made by Flea Microphones. Also in my favorites is a Bock 251, and a Horch RM2J.

I have other condenser mics from AKG, ADK, and B&K.

A typical session set up for me these days would have everyone in the studio. I would only use other rooms for isolation if necessary.

For drums, I use an AEA R88 stereo ribbon mic in front of the kit and out about 4 feet. I would adjust the mic vertically to achieve the proper balance between the upper drums and cymbals and the kick drum.

This is for a drummer that plays with balance between the all the drums and cymbals, and can control the dynamics to fit the music. But not all drummers have that kind of approach, so for them, I will probably use a separate kick drum mic, usually a Neumann 47fet. If I feel the need for a separate snare mic, I would use a Shure SM57 most of the time.

There can be some types of music, and some drummers, where I might need to use a Beyer-Dynamic M160 on the high-hat.

That's usually it. Using one mic eliminates any phase differences between the mics and makes the drum kit sound more solid and cohesive.

I would take the bass guitar direct, using a D.W. Fearn VT-I/F tube DI. We no longer make that model, but the same circuit us used in the Hazelrigg Industries VDI.

If there is a bass amp, I would mic it with an AEA R92 to start, and perhaps change to something else if I didn't like the sound.

For upright bass, the AEA R44 is my favorite choice almost always. Sometimes I will place a condenser mic next to the 44, which gives me a different sound. I might use them together, often panned hard left and right, or a blend, or whichever mic sounds best in context.

Acoustic guitar mic'ing would depend on the player, the part, and the situation. If the guitar player is also singing, isolation can be a problem. Ribbon mics, or condenser mics in the bi-directional position are usually my choice for this. It won't be 100% isolation no matter what you do, but it may not matter.

Since I do a lot of recording with singer playing guitar, I often record both with no particular effort to isolate the two from each other. Then, usually after any overdubs are finished, I will replace the guitar part on a track of its own, and then do the same for the vocal. The original tracks are not used, but I keep them anyway, since I might blend in a bit of them in the mix if it helps.

For the acoustic guitar part, I like the Neumann SM69 stereo condenser as my first choice. That gives me a nice stereo recording of the guitar. If that is not the right sound, I might use a KM84. It really depends on the instrument, the player, and the song.

My go-to mic for vocals is the AEA R44. It is a wonderful-sounding mic on almost any voice, but it does take a singer who has good mic technique. I usually have 12 to 24 inches away, and slightly off-axis. That is what you are listening to right now.

The 44 can be a bit too heavy-sounding for some vocalists. Or I might want something that cuts through better. The 44 accepts equalization very well, so it can be made to sound much more like a condenser if you like. I almost always roll off the bottom, to compensate for proximity effect. I use a D.W. Fearn VT-4 with 2 to 4dB of roll-off at 40Hz, which is what I have on my voice right now.

If that still does not sound right, I might change to a Flea M49, which is a very flat condenser. If I still need more high-end, I would go to a Flea U48, or a Horch RM92J, or a Flea C12, or a Bock 251. Each of those steps up the high frequency boost in that order.

For electric guitar, I often take it direct with the VT-I/F, which may be all it needs. Or the VT-I/F plus a mic on the guitar amp. I have an Vox AC30 in the studio, or we might use another amp the player brings.

For the guitar amp I would use an AEA R92, a Coles 4038, a Neumann U47fet, or a Shire SM57 depending on the sound I needed.

My grand piano mic'ing is always an AEA R88 over the top, with the lid removed.

For other instruments, it all depends on the context. In general, I prefer the sound of ribbon mics, which sound the most natural to me. But sometimes you need a different sound, so I will experiment with condenser mics if there is time. Since most of the recording I do is with people who have a full schedule, there often isn't time for much experimenting. It is rare for one of my sessions to go more than 3 hours.

These players have a lot of experience in the studio and come prepared and the recording goes quickly.

If I look back on the music I have recorded over the past 50 years and classify by genre, I find quite a variety. Here, in no particular order, are the ones that come to mind:

R&B, folk, rock, pop, gospel, country, reggae, classical, disco, string band, Appalachian, funk, jazz, blues, Zydeco, spoken word, jingles, commercials, audio books, punk, new age, Broadway, new wave, religious, big band, film scores, electronic, and lots that fit in between or bridge those categories.

I've learned something from all of those sessions, and continue to learn more all the time.

You'll notice that I don't have experience with some of the newer genres, like rap, grunge, or hip-hop, which came along after my commercial studio days.

I've learned obsolete skills like editing tape and cutting lacquer discs.

The music I enjoy recording today is almost entirely acoustic in foundation, even it has some electric instruments.

People often ask if I play an instrument. Well, I've worked with a lot of great musicians, and that changes the way I perceive musicianship. I cannot put myself in that category. Up until an accident when I was 30 broke me arm and reduced its range of motion – from a drunk driver hitting me head-on – I can't find any instrument I can play except a one-handed keyboard. But I did learn the basics of the guitar, and I was a reasonably good bass player. I could hit things in time, which came in handy on a session now and then.

I was always fascinated with all the instruments I recorded, and I tried to get a working knowledge of how they worked. I could never play acceptably on any of them, but I did learn the rudiments of the brass instruments, violin-family, saxophone, and double-reed instruments like the bassoon. I could pick out a melody on the piano, and play drums acceptably if I recorded each part of the kit separately! But I would only rarely play on anything. It was just too embarrassing. I don't like doing things I can't do well.

This is My Take On Music Recording. I'm Doug Fearn. See you next time.