

TAPE OP MAGAZINE

Russell Frehling Expanded
by Steve Silverstein
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I contacted Russell Frehling for a sidebar to my interview with composer Pauline Oliveros. To accompany the Oliveros article, I wanted to include a profile of Deep Listening Space's house engineer. Frehling's diverse experiences and his love of the technology of recording contained far too much breadth for the space of a sidebar.

While *Tape Op* has covered countless recordists with low-budget, grass-roots backgrounds in rock recording, we've talked to few grass-roots engineers in the avant-garde music world. Russell Frehling, who now runs the house studio at Pauline Oliveros's Deep Listening Space, is one of the most experienced. He's done everything from recording punk bands (and the Jim Carroll Band) to developing underwater sound fences for dolphins with Greenpeace in Japan, and his own creative pursuits involve large-scale sound installations. He's best known for his avant-garde recordings, and it's this experience that's led to his role in Oliveros's not-for-profit foundation and its studio.

"I was in a rock n roll band that got a record deal when we were 12—right when the Beatles came out. They called us the Echoes of Carnaby Street. They just changed our name to try to fit the mood of the time. That experience was outrageous for me. People didn't really have much hi-fi in their homes at the time. You pretty much listened on your parents' car radio, or you had a little box at home that held a bunch of 45s and had a little speaker in the front. It was 4 track then, at Criteria in Miami, which is a big, famous studio. You cut your instrumental tracks live in stereo, and then you had a lead vocal track and a sweetening track. That was a huge experience. I went and did some, 'Hey man, can I hang around?—just go and watch. I don't know what I learned at that age, other than to see it happening and want to do it more. I started tinkering by myself, got a little Sony tape recorder with sound on sound as a Christmas present when I was probably 13 or 14, and did a lot of work from there. All through college, [he did] a lot of classical and new music recording."

"I graduated as an undergraduate from Brandeis, and then I did [a] summer in Buffalo program. In those days, Morton Feldman ran this summer thing. They'd take a handful of young composers from around the country. They had a really top-notch music ensemble there. They'd have Morton and then a couple of guest composers. Pauline was one, and Joel Chadabe was the other. We lived in the dorm together and just became really close over the summer. She encouraged me to go to Mills, and we'd see each other on the road over the years."

Frehling "began a public access, low price, subsidized studio, and spent about 3 years there working hard, and then built my first public recording studio, probably around '74 or 5. [He] ran that til about 1980, and then did freelance stuff. I lived in Miami at the time. I was in Japan for a few years doing stuff with Greenpeace for dolphins, developing an under water sound fence that worked with dolphins."

"When I lived in the Bay Area and had a commercial studio, I did a lot of freelance work. They have a big independent film [community], they did back in the 70s in San Francisco. It was great, because I got to use automation. Everything was on sprocketed tape. You have all these transports that are set up for SMPTE time code, you have 10 tracks and 10 actual transports, 10 reels of tape. Hit a button and all 10 machines whirr up at the same time. It's expensive, so it was all very business-like—it was very different from rock n roll in the '70s. You showed up on time, you were sober. You monitored very quietly because you were

there for 12 hours. You wanted to be as good at the end of the day as you were at the beginning of the day. I learned a lot from those guys."

"There was no studio after that. I would pick up and go wherever the project was going."

"People don't call me up to do a whole lot of rock n roll, especially as an independent, because there are a lot of people that are really good at it. I might be OK at it, but I wouldn't be the first guy you'd think of. If you were doing a new music project, or a classical music or jazz, anything acoustic—I got my rep in the West Coast doing jazz."

"Jim Carroll was kind of a poet kind of rocker. I did his first big hit, 'People Who Died'. He used a band that was from around Marin County. They came to us, and they didn't have a deal at the time. They came on the cheap and did these tracks, and they ended up using them."

"I worked with David Tudor during the years. I did Rainforest with him. I wasn't in it as long as some people, but I don't do good in groups. He's one of those people I just hit it off with, I had a lasting friendship with. He'd always do a long stretch at Berkeley with Merce Cunningham. They had a really small, tight-knit group that was usually Tudor, maybe David Behrman, [Takehisa] Kosugi, and occasionally somebody else."

"I play a lot of things but that's never been my strong suit, unless enthusiasm counts for something. I hold my own on stage, but I don't think of it that way. All through the '80s and even into the '90s, until there just stopped being that sort of thing in America, a lot of my commissions came from the art world. I did mostly installations, large-scale pieces that sounded all the time. I did a couple of large ones with visual artists, but for the most part the visual field was kept as neutral as possible. Sound is very tactile if you use it in the right way. It did a lot of the things that sculpture would do, except it doesn't have any mass. That was the delicate game. It became increasingly difficult to do those kinds of pieces," both in the US and abroad. Frehling's installations have run "sometimes in public buildings, the percent for the arts kind of programs that people have, [and] sometimes in museums and galleries. They were up and running in public buildings for years. There's nothing up and running now. I have a lot of interests, and it turned out that now I'm back doing a lot of engineering and I'm really busy, and it's been fun."

As a composer, "I work mostly these days, with very small [sounds], what people have come to call grains. They're just taking normal ambient noise, getting down into the waveform level, taking a few thousandths of a second of it, and looping it back on itself, so it becomes a repetitive waveform, like an oscillator with a much more complex waveform. I go through and I take all of these little parts and then rebuild the sound field with the broken down parts. These little photographs where you stop something in motion, it's much like that concept. That's my sound material, and then I perform with it live. There are several pieces I do with those kinds of materials. These days I'm exploring delicate upper harmonic series with these sounds. They'll tend to be very quiet, you'll almost feel it as much as hear it. It'll use a lot of complex panning, but very delicate sounds that are the high frequency portions of the waveforms. I'll use a MIDI keyboard sampler. I'll load a waveform per key, so it has nothing to do with pitch. The keyboard ends up just being a bunch of buttons. The playing is building much bigger complex things. Some of these things will be a whole keyboard, but it'll only be within a half step or a whole step tuning. As you develop really complex phasing and little shifts and beating, those pieces get hugely massive. [In contrast,] my installations are almost imperceptible, they're very quiet, not much happens in 'em, and they last for a long time. Sometimes I get the feeling that my performance pieces are like everything compressed down, just like 'Eeeah.' It's pretty intense. I think this new piece that I'm cooking up will be much more like the installations in the sense that they're these very delicate sounds that are moving in a space."

Oliveros "came to me several years ago and [the studio] was something we had talked about doing. I think the model was the studio at Mills College, at the Center for Contemporary Music."

Frehling's first task at Deep Listening was completing the design and construction of the space. "There were two shells that we started with. David Gamper, who is in the Deep Listening Band with Pauline, did the first part—took this old building and framed out a couple of the rooms. From there, I made a few modifications for dimensional things and non-parallelism, and treated 'em basically by ear, with diffusion and damping where required."

"It's one of my pet things to try and find ways to build good sounding rooms and get good absorption and diffusion with the world's cheapest materials. I got a bunch of surplus ceiling tiles. They're that compressed junk. Instead of using 'em as absorbers, I make little 2x2 blocks that have been cut off at angles. I will put them on some kind of a backing board and glue those little squares on. You get these patterns of oddly matched shapes. They work great, and they cost next to nothing. Then building out walls where you build boxes literally on the wall, so you have variable depth cavities. You can put a mixture of straight absorption or panel type absorption, bass traps. Pegboard becomes really handy there as a sort of resonator. There's a formula that will figure out depth."

"If you just think random, you'll do pretty well in general contouring of the room. If you can afford it, you can build a room that sounds good everywhere in the room. If you can't afford it, then the best you can do is work to have it sound good at the critical position. Since we were a non-profit and had to beg for every dollar we spent, you can guess which approach we used. It works fine. It's important what's the music you're doing. If you're doing acoustic music, it's silly to monitor loud, because the music isn't loud. It's important to match your listening levels to the music you're recording. Consequently, you're not loading the room as much by not listening really loud and having really artificially deep bass. The standing waves don't have much amplitude. You can do a lot in simple conditions in this sort of music. You just don't want things that are bizarre."

"The trouble we have, the biggest constant fight I have, and I think everybody would have this battle, is low ceilings. It's very difficult to get separation with low ceilings. A few feet makes a lot of difference, between 8 and 10 feet is huge. It's not enough energy loss by the time it hits the ceiling surface. Gobos and things like that become ineffective because the sound just bounces over the top."

"For equipment, we use hard disk. It's on a Mac, dual-processor, G4. One of the first pieces of equipment that was donated was the old, original MOTU Mark none, just a 24/08. I was using ProTools at home, a Digi001. My feeling was that it had no place in a studio where you never knew what was going to come in. There was just no flexibility to it whatsoever. It does a fine job where you control the environment. There's not enough I/O of various kinds, and you can't build on that system unless you go to full-blown ProTools, which we couldn't afford. MOTU is really great with having boxes of all shapes and sizes. We had a 308 in there that allowed us to interface with whatever came in. I think all [of these units] do about the same thing. It's just getting used to the logic, or lack thereof, of the systems. Our main converters are Metric Halo Mobile IO. We recently got the Focusrite 428, which is 4 Focusrite ISA preamps, and they have an 8-channel converter card, which is damn good, especially for the price. Over the years we moved up. I got the MOTU Mark III, which is just better all around than the other ones, but I basically don't use the converters in it. I use it as kind of the traffic cop of the system."

"We've got a big Mackie 32 input 8 bus. Pauline had gotten that when she was doing this big opera years ago. I don't like it. In 3 years, I don't think I've put anything through it. I use it like this giant monitor mixer."

"I feel that the weakest part of a digital system is the mix part. I lustily eye those boxes like the Dangerous Music that are just a mix bus. But frankly, I'm a big fan of digital. There are shortcomings to it, but I think a lot of the people that wax nostalgic about the good old days didn't go through [them]. It was an hour before every session just to clean and align and bias machines. If you were serious about it then you did that before every session. It's fun to splice tape, once, but by the 50th tape it's not fun anymore. The ability for a session to move quickly, to just quickly say 'Let's run another take,'" is a big plus of digital.

"Everybody's in a rush. Come the end of the session, people say 'Can I have something to take home,' and I can at least get them something. The downside is obviously that you have to sample and bit-depth convert before you can give 'em something on a CD. The process is pretty quick, and it's getting the music. People say I have really good ears, and I don't know, I just have the ears I have. I'm a good listener. The differences I hear [between analog and digital] are very subjective. There's a certain smoothness to analog which is really nice, but would I trade it for the ability to work quickly and work smoothly and be able to afford it? Analog costs a lot of money and it costs a lot of time. Since this is a volunteer effort, we couldn't possibly do tape. People come in and you're trying to charge a low rate. One roll of tape [costs \$200]. Sessions don't generally fit on one roll of tape. The tape becomes more expensive than the studio time, which is kind of silly. A lot of people come from different states and different parts of the country. They come in there for a couple of days and record, and I can get stuff back and forth to them in a hurry without incurring all kinds of charges."

"Digital as a working medium is really wonderful, and I probably wouldn't have been so keen to come out of retirement if the technology hadn't changed radically in the interim. It does make life very easy, and the sound quality is good enough, as far as I'm concerned. I don't want to be controversial about that. You still have to work to get it sounding right before it hits any recording medium, [but] then I've never felt disappointed by the recorded sound. If you AB things all day and you spend a lot of time worrying about that stuff, there's probably a difference, but in good hands, digital sounds good. In bad hands, digital sounds shit. If you push digital, it's like the chalk on the blackboard thing, it just really grates. You learn your tools, and you learn where you can push it and where you can't, and what you can be careful about. I've dug some stuff out of Pauline's archives, and some other people of her generation, and I've seen some beautifully recorded analog tapes, where the hiss is almost inaudible, and then other ones where, 'Do you really want to work on this thing?' We're going to spend a lot of time trying to de-hiss this, it wasn't that good to start with. I'm shocked at the range of stuff. Now, hiss isn't an issue, it's all kinds of other stuff. I think part of what people hear as the brittleness of digital is the lack of noise and distortion. It's a different kind of distortion. There's certainly distortion in digital. Obviously, the higher the sample rate, and 24 bit has never been a problem, but the [lower] sample rate does lose those delicate little corners in the upper frequencies. [88.2 or 96 KHz] is certainly more open sounding, I'm the first to admit that. But often, for quickness and ease, if the session calls for it, I just record in 44.1/24, especially if it's a lot of amplified instruments. I definitely don't hear a lot of difference at that point. For acoustic ensembles where it's delicate, I will run it at 88.2 [KHz]. In my mind the math [to convert to 44.1] is easier. If it's easier for me, it must be easier for the computer—just cut it in half, it's gotta be better than rounding off all those numbers. The difference is a small percentage at that point, and there's already a noticeable improvement, and that's been fine. The more rounding off the computer has to do, I think the more errors creep in. That's what I hear when I read the stuff that other people who spend a lot of time worrying about it tell me."

"I think the first good preamp we got was the old CLM, which is from Scotland, a really nice class A, very simple but very functional. We use the dbx 586, which I think is one of the most under-rated preamps in history. It's very clean, very nice, good headroom. The EQ on it is pretty vanilla. It's not a very tube-y tube amp, but it's a real tube amp, 250 Volts across the plate. It's definitely not a character amp. The music that we do, day in and day out, is acoustic, what you hear is what you get."

"We have Meyer's HD1s. They're very good nearfields. [It] took a little getting used to working that close. It's quiet music, not overly loud is probably a better word. It's like anything else—you sort of refine that a little bit over time. I think, later records are better than the first ones. That's the nature of the beast."

For microphones, "we started off in good shape. Pauline had a pair of B&K 4011s. I had a pair of vintage AKG 451s, [and] an old RE20 that I had totally rebuilt by Electro Voice. They were really shocked to see it. This was a low serial number, and I've had it since the early 70s. The new AEA R84, the big ribbon mic, is a real gorgeous piece of work. I picked up on the Internet a Beyer 260, with the [Stephen Sank] DX mod. We got a pair of [Audio Technica] 4033s and a 4050 and 4051. I got the 4051 off some studio that was closing down in Connecticut. When we first started this, it was [a lot of] running around. I even bought wire from the guy. There's not a lot of 3000 dollar mics, except for those B&Ks. I go for mics that I know the sound,

and that do a particular thing, and do it well, and are affordable."

"I just picked up, a couple of months ago, one of those Studio Project [LSD-2] stereo mics. For ease of use and versatility, that's been pretty good. They're the guys that make those Chinese made condenser mics. They came out with the stereo version, which is two of their multi pattern mics, one on top of the other, like an old AKG. What's nice about 'em is you can rotate the capsules, and they're both multi pattern. I like MS recording. For some things, if you're doing live performances in the gallery, even Blumlein. If you just want to stick up and get the murky stereo field, it gets a lot of space in it. For documenting a live performance, it's sometimes the way to go. You don't even have to think about it. You just get a hefty mic stand, because this is a big microphone, and you put it up there, and you just dial in the sound. It's really versatile that way. And it was probably, 7 or 8 hundred dollars for a decent quality. It's not a Neumann, but as I often tell people, neither is our room."

"I think it was a European thing to make the ORTF and the different things—this is 90 degrees but this is 120 degrees, and 8 millimeters instead of 11 millimeters. Eukh. Every time I go out into the tracking room, I forget my little millimeter ruler. Somehow I've left it home—it's not in my back pocket. It doesn't matter. You put the mics up there, and you can hear when they sort of click in, right. It just goes, 'Ah, that's it.' It doesn't matter what the measurements are."

Frehling likes the Earthworks SRO. "Although it's noisy and doesn't have much output, you can shove it as close as you dare to the source. I recorded a woman who plays this homemade instrument, a koto-looking thing that you bow or pluck, a big wooden resonator box with little holes, bridges on the surface. She had two sound-holes in there. I could not get a better, truer sound than shoving those SROs into the sound-holes with a piece of foam. It was remarkable. They're fantastic mics and they're so cheap. [Earthworks] came out with a DTD30, which is a kind of a smaller version of the DTD1s, for a couple of hundred less, which one day we might be able to afford. I'm a fan of those mics. I really like a good omni."

"We know somebody down the street who has a pair of [Earthworks] SR77s that I'll twist away once in awhile. I think the 77s are better [than the B&Ks] myself. The B&Ks are good mics—I've just found that I have to be really careful using them, because they don't flatter anything. Dull isn't a fair word, cause that sort of implies that they don't have top end. Is clinical the word people use? But in the right circumstances, there's nothing common that touches them. Somebody had got them for Pauline years ago."

"I know another killer mic, the GT40. It was part of that ill-fated Groove Tubes/Alesis combination. It's a medium-capsule tube mic [with] 3 capsules. It doesn't have a figure 8, but it has a hyper, cardioid, and an omni. Somebody was just dumping them—I think I got them for \$250 a microphone. I had to go back to Groove Tubes and special order the other 2 capsules. At one time they were dumping those mics—I think that's not the case anymore. People have figured out that that was far and away the best mic that came out of that combination. They still make it," as the GT-44. "Groove Tubes sells [them] under a different distributor."

"Somebody almost made me take [an] ADK, another Chinese mic. I said Nah. I had some leftover money, like a store credit. The guy goes, 'Try it, try it, try it.' I've listened to a bunch of these. He said, 'This one is different than the one everybody bought. This is the multi-pattern mic. It's really designed for classical music and that's my background. How about if I sell it to you for this much?' The owner of the company called me up. For that much money... It's just another mic in the cabinet, but, like the Studio Projects, it does a fine job. These are fine mics. It's a multi-pattern mic that's sort of tuned more for classical music than a rock n roll vocal mic. It's pretty good."

"I [almost] forgot to talk about one of the best mics I ever used, and I hope they're still making 'em. You know the place called the Sound Room? They used to be the distributor for all the Oktavas. He made his own line of mics called THE. The KR33A is on his regular preamp tube. You have all the capsules you can screw on top, 6 or 7 different capsules, from wide cardioids and omnis, free-field omnis, diffuse-field omnis."

He's got this one that's tuned to be a big solo sound, [with] a big 33 millimeter capsule. It's the most killer voice-over mic known to man, and it's also a great violin mic, especially for a big full sound. It looks a lot like that Audix mic, with the thin barrel and the lollipop on top. I know he got sick, so I'm not sure what's happening with that company, but man they built a gorgeous mic. Their regular 25 capsule, which is the standard 1 inch capsule, is clear as a bell and it's one of those all purpose wonders—very quiet, very rich, and there's no gross anomaly to it. I'm a big fan of those. They're not cheap. For what you get they're cheap—they're a bargain."

"There's a lot of mics that are popular that I've listened to and sent back. For example, I never cared at all for the BLUE mics. I haven't heard the high end ones, but I had the BLUE Bottle in there for a couple of days, and it sounded to me like a [Shure] SM57 on steroids. It didn't fill a slot in my stable. There have been some others. The [Neumann] U87, I would never spend the money on it. It would be nice to have a Neumann in there just to say we did. People ask for it all the time, especially in voice-overs."

"On the Metric Halo newsgroup, somebody asked about recording something in a tough hall. They were stuck in that the audiophile way of doing a stereo recording. They had read this in books. Throw all that stuff out, because your room is not gonna let you do that. That works when the room is as good as the instruments that you're recording. If you're in a room with some anomalies in it that are gross, then take the room out of there and deal with it later. I think it was something like a violin and piano sonata, and the guy couldn't figure how he was gonna get both evenly. I said, first off, time. To do a true, 2 mic setup, takes ten times as long to get it right then it is to use multiple mics. Why are you killing yourself? They're gonna give you a half an hour or an hour for a soundcheck. They say they're gonna give you that, and it ends up being 15 minutes. Don't kid yourself! Stick a mic here and get a good violin sound, stick a mic here, get a good piano sound. He had some mediocre stereo [mics], one of those Shure [VP] 88s. I said, back that off 10 feet for some ambience, and see if you need it. Put it on separate tracks, and just bring it underneath. Think of it as reinforcement, not as your stereo image. You're gonna get your stereo image just fine with mono mics on the two instruments. This is classical music, you back em off a ways. Don't get any more than a couple of feet away. 'Wow, I never thought of that.' If you think about what you're trying to record and think about the situation and forget about what you read in the book, usually common sense is a pretty good thing. If you walk around with your ears, the trick of one earplug, it really does work. The microphone is not very smart. It's very good at picking things up, but it's not very smart. The brain has the advantage of being able to act as a super-fast filter. It plucks things out of the din. Microphones can't do that. What you hear straight on is pretty much what goes into them. And then you adjust to tape. The microphone has its biases just like anything else."

"Altiverb, which is really wonderful, couldn't be done any other way. When it first came out, it was only MOTU, and so that's why we stayed with MOTU for all this time. Now it's probably available on a lot of things, but I would never have changed. I thought that plug-in was the coolest plug-in to ever come out. That's a company called Audio Ease in the Netherlands. It was the first convolution reverb that was available as a plug-in. Sony makes a 10 or 15 thousand dollar box that does it. The impulse response in each room is modeled. It's only presets, because it's literally pulling up a specific room. It is as if you were talking in that room. [To capture a room's response,] you do it by using some loud impulse sound like a starter pistol, but better than that are sine wave sweeps. You do the whole spectrum. You do that several times, and you lay them all on top of each other. Your signal-to-noise goes way up because it cancels out the noise and your signal keeps getting reinforced. [Altiverb] sucks up CPU energy in a hurry. It treats what you put into it as it would in that room. It's pretty damn remarkable—it's so different from regular reverb. It just sounds different—you use it differently. It's the best glue for a mix I've ever seen, and you don't even notice it's there half the time, unless you wanna take it into a big concert hall or something. There are some rooms that, I've never been there, but I love these rooms—I'd like to visit 'em one day. There's an organ practice room at some conservatory in the Netherlands that's wonderful. But there are odd rooms too. They did a bunch of odd things, like a garbage can. One of em was that they did the environment of a washing machine. Opened the washing machine up, put the mic in there, ran the sine waves through it. [When] I did a punk thing, there are all the normal tricks to the vocalist where you really wanna rough it up—you get the radio EQing where you chop off the top and bottom and you compress the crap out of it and you put a little distortion on it. That all sounded kind of trite. Then I stumbled upon this, and, 'Whoa! That's

the sound!' And everyone, 'Yeah, that's the sound.' It's just unique. You don't have to EQ it, because by plugging in that box, all those anomalies are naturally there, and so it does this really weird thing, and it was just a wonderful thing. Sometimes the obvious and the well used isn't the thing, or you get tired of it. It's gets too well used."

"Pauline and I are working on some solo pieces with Altiverb now where she literally plays against the rooms live. Instead of the reverb being a kind of sugar-coating on the thing, she's going to play against that room, and as the room changes, her playing will change accordingly. It's a little difficult to do because there's some latency, and it's not an instantaneous change [when] it has to load each one in. You don't have to do it continuously. You do 5 minute segments of each one and knit it all together later. We haven't figured that part out yet. We're trying different things and playing with the idea. When she's in town for any length of time, we usually get a segment in where we'll do something recording in Altiverb looking to make a project out of it."

For "Pauline's New Circle Five band, her East Coast, New York based band, we did everybody at once, live. I did gobo everybody off. You've got such a range of instruments: vocalist, violin, accordion, drums, trombone—a weird collection of instruments. The trombone can be penetratingly loud, probably the highest powered instrument except maybe a kick drum. The sound that's actually coming out of the bell of a trombone gets hyper-sonic for about 10 inches. It's very powerful, and so it's tough. After the session, I wondered whether I did the right thing, whether I traded maybe 40 percent better isolation for the claustrophobia, the discomfort of the performers, [and] also dynamics, blends of things. As an engineer, it's difficult. Sometimes you make a decision, do you go for the clearest possible sound, or do you want the performers to be comfortable and play their best. Everybody seems very happy with [*Dreaming Wide Awake*]. I know in the beginning of the session, it took awhile for them to warm up to [the isolation]. They're great players, and once they get to playing, they kind of close their eyes and they don't know where the hell they are. You lose some eye contact and things like that. I really had to massage those to get it to sound as fluid as it does when they play live. It's worth the effort. There again, can you imagine making all those changes in analog? It would be very difficult, you would have to have a lot of hands on the console. [In digital], you can do a lot, fairly quickly. It still takes a long time to do anything well, but there's one of those examples where digital is just wonderful. Listen to the record, and I think it sounds pretty good."

Frehling mixed jazz multi-instrumentalist Joe McPhee's recent collaboration with Oliveros's Deep Listening Band, *Unquenchable Fire*. "He had a nice commission to do a major piece, a full album length piece. It was done at the space before anybody had done anything, and it was just a bare sheetrock box. There was really no separation between the control room and the other [room]. There was a wall with a big hole in it, and they just draped the snake over. Bob Bielecki, a really first rate engineer, did the initial recordings. He was sitting 15 or 20 feet away, rather than truly being isolated. They had everything in one room. Deep Listening Band uses all that live electronics, so all of the monitors are in the [same] room, and they're just as loud as the instruments. You have this swarm of stuff. He did a very good job under the circumstances of getting a sound. The voiceover was done separately, and I just didn't like the sound of it. It's based on a book, and the author [Rachel Pollack] read. The [recording of the] voice bothered me, and I was playing with it. EQing it didn't work, and this and that. Somebody had put it onto DAT. And they had just, for safety, or whatever reasons, recorded the same [performance] on both tracks of the DAT. It wasn't the same signal twice. I think they just recorded it with two mics or a stereo mic. All I did to solve this problem was pull up both channels and manipulate the faders until I got a phase shift that made the thing click in. I flipped the polarity, and I'm not even sure how much EQ I ended up having to use. There was just a way of simply, and I've found this with guitars too, you take a phase shifter kind of thing, but you don't have it swirl. You just sort of set it on a pedal. You dial in a sound and leave it. It just sits there, and it's so much more complex than EQ would be. It doesn't take a particular frequency and work on it—there are so many different peaks. You've just gotta keep working the problem. If it's a problem, the obvious thing isn't always going to solve it. The elegant solution, you're gonna stumble on it by accident more often than not, but you just keep working it until you give yourself a chance to stumble on the nice accident. It really popped out there—it sounded rich and real and it didn't have that sort of odd sound that was a distraction. I thought it took away [when] you were listening to the odd voice rather than what the voice was saying."

It's a subtle thing but it was driving me nuts. I did it and everybody seemed happy with it, and it probably wasn't that big a deal, but it was enough to satisfy me. The guy that's mixing it, they have to listen to that, whatever it is, good, bad, or indifferent, they listen to it a thousand times. Things stick out, and it becomes a different relationship when you're over and over again listening to the same stuff."

Recording in-house projects, including Oliveros's work, is a central component of Frehling's role at Deep Listening Space. "We have artist in residence things, and part of that is to do something in the studio. We have recorded several duets with Pauline and one of her generational colleagues. We just did Anthony Braxton."

One artist in residency who stands out to Frehling is Houston trombonist David Dove, who played in the Houston punk band *Sprawl*, and whose Dave Dove Paul Duo once released a CD on Charalambides' Wholly Other label. "David Dove did a nice thing. They just sat in there and played a trombone and percussion. After awhile I said, 'We really have this down. We have the sounds dialed in. Start and stop the machine when you want to.' They had to catch a bus at some point, and they wanted to stay a few extra hours and do it. I left, and, 'Here's the key, just drop it off at the office when you go.' I came back and they had like an hour and a half more material on disk. They improvise these little things, and some of them work and some of them don't. That was fun. They did a trio thing, also, with Joe McPhee. If they don't get back to me, it'll never get finished. I'm on to the next thing and it's sort of sitting there. That was a great record. I sent 'em the trio that was mixed to my taste. I always send an approval mix out, and then they'll make some changes, do this, do that. I haven't heard back on that, so I don't know if they released that [trio session] or not. The duo stuff I know is still sitting there because it's got these 3 hours of little 6, 8 minute pieces, or 10 or 12 minute pieces. I sent em 6 CDs. Tell me which CD and where you want, and we'll cut those pieces out and use them. I haven't heard from them."

Many outside projects arrive "through that community of new music. People know we exist and have faith that I know what I'm doing. Occasionally by word of mouth, people know there's a studio. We've done some rock n roll things. We've done some nice jazz releases that have worked out well. We don't have a great piano, so that limits us [from] doing more jazz. We've done some mixes [of projects] people have done in the bigger studios around this part of the Hudson Valley. We're near Woodstock, there's a bunch of studios here, [especially] on the other side of the river. They're mostly rock n roll oriented places and jazz guys feel less comfortable. A nice Chicago based sax player came in and I solved some problems for 'em, and they said, 'Go ahead and mix it.' It's mostly word of mouth, because we really haven't advertised."

"I'm just trying to think of the oddest projects we've had in there." A woman who "was part of the Fluxus group did this thing with all these little objects that went around. She [had] laid out plastic, like Saran Wrap, on the ground. In the fall when the leaves fell on it, she'd cover it up—she put another layer that trapped everything in there. That became the score. She makes paper objects that she uses as instruments. It was all these little delicate sounds. We recorded it, we've never mixed it, because she hasn't gotten it back together. I sent her the stuff and I said, 'OK, you tell me what you want to use of it, because it's crazy to do a couple hours worth of stuff when you're only gonna end up doing a half hour piece. You've gotta edit it down for me. Put it on your machine and tell me that you want, 2 minutes to 6 minutes, this part and that part.' I've never heard back. We did that in sort of quad, pseudo-surround. We put the score, instead of a linear thing, I said, 'Why don't we put it in a circle?' We ended up doing a squarish thing, with 4 mic stands holding up the score in a circle, and then [at] the top of the mic stands, I had the pair of B&Ks and a pair of the Earthworks cardioid 77s. It was fun. That's the kind of thing we like to do. Something where either the music pushes some envelope or the whole process pushes an envelope in some way. We don't have the constraints that other studios might have. There should be more public knowledge that it's there."

"Part of the reason I did this [was] as a training facility for younger people that want to come in. I'm quite inviting of young people that want to come in and learn the system and do a kind of apprenticeship. You can learn a lot out of books, but recording you just sort of learn by doing it. There's too many things that are experiential. Here is a fully functioning multi-track recording studio. It doesn't look like something in

your bedroom. On a small scale it has all the things that you need: a good talkback system, good headphone system, good variety of equipment that you can route anywhere that you want. All those kinds of things that are built into a studio that you kind of take for granted, but just don't exist in bedroom studios. The chain is a good chain."

"It would be nice to do more sessions, especially if it would bring any income into the foundation, but it becomes difficult if I'm the one whose gonna have to do them all. I need to get people in there that come up through that I develop to be able to take over sessions and do em consistently. They're perfectly welcome to bring in projects and work on them in the studio."

"I just hang around on the fringes. I don't have a lot of ambition. I don't really want to be working all the time, so I go off and do other things, whether it's music or outside of music. I have this relationship with sound that it's the sound that interests me as much as the music. My composing is like that. I just have always been fascinated with the medium, not always what gets done with it. I look for the quirkiest projects. If I wanted to make a full time career out of it, I had the opportunity and didn't take it. My mind goes in lots of directions, so it's hard to do the same thing every day, over and over again."

