



Transcript – QSO Today Episode 72 – Bob Heil – K9EID

Transcript commissioned by Brent Putnam, W1NCH

Eric 4Z1UG: QSO Today Episode 72, Bob Heli K9EID.

Welcome to the QSO Today podcast, I'm Eric Guth 4Z1UG your host. Bob Heil K9EID is no stranger to Hams and Ham Radio as the cohost of TWiT Networks weekly podcast Ham Nation. Bob is the founder of Heil Sound, manufacturer of high-quality microphones, headsets and other audio accessories, not only for Ham Radio, but for the pro audio world as well. Bob is an audio pioneer and owes his education and expertise to his amateur radio background and his association with many of the pioneers of Ham Radio history.

This episode of QSO Today runs about 30 minutes longer than most of my interviews. It does contain, however, some pearls of Ham Radio wisdom that come from over 50 years in the hobby.

K9EID, this is Eric 4Z1UG, are you there Bob?

Bob Heil K9EID: I am

Eric 4Z1UG: 4Z1UG.

Bob Heil K9EID: This is K9EID. Greetings.

Eric 4Z1UG: It's a mouthful. Bob thanks for joining me on QSO Today. Can we start at the very beginning of your Ham Radio story, when and how did it start for you?

Bob Heil K9EID: It started with a friend, actually a high school chum; I had been playing the accordion. When I was 10 years old, I started playing. A long couple years later, the band director of the grade school, he was an organist at the Baptist Church he got a new Hammond organ and I started going down to his house to play that organ. It's very rare to

have a large C-model like the B3, a same thing with a different cabinet. I would go down there and play and have so much fun on this Hammond organ, but his son, my high school chum, was in the back room learning CW so I started spending my time, half-and-half, when I'd go down to Mister Crowder's house.

George Crowder got his license, K9DTQ, and I thought, "This ought to be cool," so I did the same. George helped me and we had a couple of guys there in Marissa, our little town of 2000 people, that were very involved in not just amateur radio, but more shortwave. They helped us also learn all of the things we had to learn because in those days it was tough. We had to do the questions, but we had to draw what's a Colpitts oscillator, what to push-pull, final, that kind of stuff. You had to draw the diagrams so it's a little tougher in those days, but I got it.

1956 September, I was licensed as K9EID and I had advanced . . . There's really so many sides to my story, Eric. The other side is in 1956 early, I had started taking organ lessons from Stan Kann who was the organist at the Fox theater. How I got there is in 1954 I started playing the Hammond organ at a restaurant, I was 14 years old. My parents bought me a B3 Hammond organ in 1952, it was a B2 then. My parents, I was so blessed, because they did so many of these incredible things. They were not wealthy people, but I don't know how they got the money, but they did. Bingo, I got infatuated with the Hammond organ and I'm starting to play in a restaurant at the age of 14.

At the age of 16, started playing the substitute shows at the Fox theater in St. Louis. We'd go by Walter Ash radio in between the shows that I had to play and that's where I bought my first Harvey Wells. That's what George also had, we had like stations, SX699 and RE152 and I got a technician's license and I never looked beyond VHF because in those days VHF was a monster. The bands were open 24x7 and 6 and 2-meters were just enormous and I got really involved in the VHF and in the building.

How I did that, I got on the air in September of 1956, a couple nights I'm listening on 6-meters with this 152 converted into a Hallicrafters, there's SX699. Hallicrafters receiver was really something in those days and then the Harvey Wells TBS-50D worked well on 6-meters, it also work on 2-meters, but I didn't do too much with that. I heard this weird signal every night about the same time. A couple of nights in, "What is that?" I turned the BFO on. Now we're on 6-meters in 1950,

this would've been 56 about October, November. It was a single sideband station on 6-meters that wasn't happening, that was not happening. Single sideband had barely made its way into HF, but here was a guy and I called him and he came back to me. Now I'm on AM, I did this with my Harvey Wells, the Harvey Wells works on 6; it even works on 2-meters too. I called the guy, came back and we set up a schedule every night, seven o'clock.

For about a week, I'm talking to Larry K0DGE and I got to telling him that I come into town into St. Louis. I was 50 miles south. That's what made it so intriguing for him because it was a pretty good path for ground wave and he was testing this rig. He was building a single sideband rig on 6-meters. He said, "We play the shows at the Fox." You'd play for 8 to 10 minutes and then they'd show a movie. Sometimes that movie, they'd do couple of them, and you'd have two or three hours and you had to be back. We had a schedule as to when we had to be there. I had two or three hours to kill so he gave me this address and the first time I wasn't even driving. I didn't have a driver's license yet. Well, no. My mom drove me up in front of this building and it was KMOX CBS radio. Larry Burrell was the chief engineer at KMOX and he took me under his wing.

Shortly after that, I got my license because I'm working. I'm playing the Fox and I was also doing some other little shows and things around the city and playing for parties and things like that. He took me under his wing. I said, "Would you build me one of those?" "No, I can't do that, but I'm going to teach you how," and he did. On the back benches of CBS KMOX radio, I learned how to solder. I knew how to read the color code; I knew how to design some of the things for it because he taught me. We did it, right there. The Greenlee punches and punched holes and bud chassis and made this transverter. Then I built a Central Electronics 10B. That was the first single side headband transmitter from Wes Schum, the father of single sideband. He's a guy that brought sideband to amateur radio in 1948 with his company called Central Electronics. I just got this totally immersed in building in 6-meter single sideband. Then I went to 2-meter sideband, I built a transverter.

In fact, it would've been in October maybe of 62, I became the single sideband . . . Check this out, it's pretty cool. I was the single sideband editor for a column in CQ magazine. That's how focused and how special the single sideband VHF was. We had our own column and I wrote that and I did the whole article on this transverter that we had

built because nobody was doing it commercially yet. Then finally a PNH picked up and they had one, but very few of them came along after that.

There again, all this stuff I learned was done from Ham Radio and I never looked below 50 megacycles. I just got totally immersed in the VHF. I put up a 110-foot room. Again, I told you my beloved parents let me do this. I was only 19 when I did that. I built a 6 and 2 Thunderbolt amplifier so I had a kilowatt of single sideband on 6 and 2-meters. I bought a 51J3 Collins receiver with a part's converter in front of it with Nuvistors and that was a big deal, the Nuvistor, it was quite a converter, the front end for a converter. Lauren Parks made those converters out in Oregon. They were terrific.

I was playing, I hardly went to school. I went to school the minimum days I had to be there. Stan Kann, who was quite a celebrity in St. Louis and he was on the Johnny Carson show more than any guest, he was on 77 times, but nothing to do with organ. He collected vacuum cleaners and Johnny loved him because he was a real character. He'd get on there and half of it wouldn't work and the hoses would blow out and they'd have some other stuff all over. It was hilarious, Stan Kann. He was a great concert theater, not church organ, theater organist and he took me under his wing. He didn't teach, I was his only student, but I'd become his protégé, but he needed somebody to do is substitute work because he traveled a lot to doing concerts and stuff.

Another important part of that was this organ, the Wurlitzer and the Fox was an original organ is still there, installed in 1929. That all shut down, the talkies came in and so on. Stan, he was intrigued, he was an organ student at Washington University in St. Louis. He went down to get that thing running, which he did. He needed help to voice and tune that thing, there's about 6000 pipes in it from 1 inch to 32 foot and so I was the guy. I didn't know that. When I first started taking lessons from him, I didn't know, it was a big question, "Why me?" I knew how to play a little bit. I've been playing for a couple years making some pretty good money as a 14, 15-year-old kid. I knew how to play, but it needs filing and stuff and he helped me there.

What was so important, Eric, was he needed somebody to help him voice and tune that big monster. Tuning is not a big deal a lot of people could get things in tune. Voicing was a tremendous art that I learned from Stan Kann and voicing those many pipes.

Eric 4Z1UG: Can you explain what the difference is? What voicing is?

Bob Heil K9EID: We're talking about the harmonic values of the pipes. Say we had an octave of a clarinet . . . Theater organs, they have actual brass trumpets, different links, they have their clarinets, flutes, all this kind . . . They're real instruments blowing some air. They have real viber harps, and snare drums, and a real piano, a real marimba with little hammers over each one.

For the pipes, let's take the clarinet for instance, we run up and down it, CDEG, da, da, da, da, da. When you run up and down, of course you're going to get in tune first, but now when you go from C to D to E, do they sound the same? We're not talking about tune, we're talking about monic value. Does one of them have a little more richer mids? Does this one have richer highs? This one lacks the lows. You had to do a physical change of the lead on the pipe to cause those harmonics to all come together and be the same. Learning to listen. I learned it from voicing theater organs.

Little did I know that much later in my life, those two things, amateur radio and, playing and voicing those big Wurlitzers, would be the basis of several of my careers. I had no idea. My family, they completely supported what I did. Oh my gosh, I mean I think back upon that and here's another example of that. In 1959, I had this 110-foot room a 35-foot-long Telex 6-meter 11 elements wide space, a 15 element 35-foot-long wide space 2-meter-telerX at 110 foot in the air. The Johnson Thunderbolt, I mean it was a serious VHF single sideband station.

I get call and it was Bob Drake from the Drake company, "You're the guy that's got that kilowatt on the VHF sideband?" I said, "Yes Sir, who's this?" "This is Bob Drake of the Drake Company. " I'm going, "Oh my goodness," because here I was a kid. You read about all the great equipment, you never realize there's a real person was behind it. He said, "We have a little meeting here at our club and I would love for you to come here and spend a day with us. It's actually a couple of days. We do it once a year in the Biltmore Hotel downtown. We cleared out all the furniture on one of the floors and we'll have Art Collins and the guys in one room. You have Carl Mosley and his antennas in another. We'll have Wes Schum from Central Electronics. We'll have Bill Halligan of Halligan," and on and on. He names his list; I'm going, "Whoa. What do you want me to do Sir?" "We want you to come and tell us how you built this station."

That was the Dayton Hamvention; there were 600 people there in the downtown Biltmore Hotel. It had been going for several years and it was a very small little technical session that the Dayton Amateur Radio Club put together, never dreamed what was going to happen later for them, but they had all these incredible people there to teach us, Hams, how to do these things. You get to really talk to a Bill Halligan or a Wes Schum or a Carl Mosley and so I did my little presentation and it was well received because these guys are all experimenters in those days.

I get this guy who's a Brit came to me, this great British accent. I'm a little kid from Marissa, Illinois, man, 2000 people in the coalfields of southern Illinois. I was not really impressed with this guy yet, this great accent. He says, "We're looking for somebody like you to do an experiment with our antenna." "Okay, what do you got?" He says, "We have a special antenna on 2-meters for the J. Beam Company and would you like to do this? You'll have to put the antenna up and all this. "Of course, I said, "Yes."

It was 128 element 2-meter array. It was 50-foot-wide. We had put up another . . . Thank goodness we had a spare lot behind our house actually beside it, that was never used and I asked the lady that owned . . . It's still vacant today by the way, she would never sell it, she's passed on, but anyway. I was able to go get all the tower and equipment. Again, I told you my loving parents, we had to hire a crane to put this monster up. We had a couple of really great Hams around the southern Illinois area, one of them was a contractor, and another one was a Motorola dealer so these guys could help. They were a great benefit to me and we put this thing up. It was just enormous and we did the test for them.

That also came back a little later in my life. In 1959, I got a wonderful job at a four-star restaurant that was in the largest Holiday Inn in the chain. This was not your usual little Holiday Inn coffee shop. In St. Louis Night Horse, there was a German restaurant. They had four other restaurants in St. Louis and I got a job there playing the organ every night. It was a great job. It was a great job. I even built a pipe organ, a theater organ, and put it in the restaurant and it was a tremendous drawing card for the entire Midwest and a lot of people from both coasts because it was extremely rare to hear a pipe organ in a restaurant.

Eric 4Z1UG: Bob, can I stop you for a second? How did you build that? Was that a kit or did you actually cut all the pipes?

Bob Heil K9EID: No, one of my great mentors was Martin Wick of the Wick Pipe Organ Company. I had met him through Stan Kann at one of the times I was taking a lesson. I hadn't even started playing at the Fox yet. This would've been late 55, 56 in there. He said, "I got to take you somewhere. We've got go downtown. ""Okay," so we jump in this Volkswagen and go downtown at one of the big hotels there and they had a pipe organ in it. Martin Wick had put this pipe organ, it was a home pipe organ that he had built for a home, a little theater organ. It was a display in one of the large rooms there, the banquet rooms. I just went nuts over that because it was just gorgeous. It wasn't your normal Wurlitzer, it's a little smaller and the console you could put it in your house.

I got to be really good friends with Martin Wick. That plant was in Highland, Illinois about 30, 40 miles north of Marissa. I would go up there on my way to the Holiday Inn to play that night; I'd go up early and spend time in the afternoon. That's how we got to doing this. I got the job at the Holiday Inn and I said, "Hey, why can't we do one of those organs?" We had to make it so that it would fit through a standard door. Think about this, we had five ranks of pipes, a blower, reservoirs, and relays and then the big console, but it took about a year-and-a-half to build it.

Each day, I'd go up to Highland and work on it and we finally installed it and it was incredible. It was really something, but there again, I had to voice in and tune it and they let me do it. They have people, of course, to do that at Wick's, but I wanted to do it on my own just to see if I could do it. Of course, I had some help with them. Once in a while, I'd get a couple of corners with it and they were right there, but that's how we did that.

Holiday Inn, the Schneider's restaurant, when I looked over the music rack every night when I'd play, I played six nights a week four hours a night, and I saw the Mosley sign. It was the Mosley Antenna Plant and beyond that was the airport. We were right on the edge of the St. Louis airport on the west side of it.

St. Louis was the home of McDonald Aircraft, who was in 1959 building the capsule, the Mercury capsule for NASA. About once a month, we would have seven guys come and stay at the inn for a few

days. They were taking their training at McDonald's just across Lindbergh Avenue. They were the seven original astronauts. They would listen to me play and I'd take my breaks and we became friends so to speak. We all knew each other, but Alan Shepard was a little special. He'd come sit on the bench with me because his father had a pipe organ in their home. He said, "I grew up with my dad playing the organ in there every morning," and he said, "So I'm very familiar with what's going on." He was intrigued by the fact that we built this thing in a restaurant.

I started telling him about my Ham Radio, "I put up a new antenna," and I showed him some pictures of one of them. He said, "Wait a minute, you have this thing working?" I said, "Yes." "Can we borrow it?" I said, "Well, of course." "Ah," he said, "This would be great." I said, "Well, you need to take it down?" "No, no, no," he said, "You have a phone patch?" I said, "Yes Sir." He said, "Here's what we're going to do. We're going to send you a signal from Houston in the telephone line. You patch it into your transmitter, into this 128 element. You point that sucker up to the moon and what we want to know is what kind of delay time." He said, "We know. We've figured it out. "

Of course, they didn't have computers, but the mathematics figured out what the delay was going to be, but he said, "This way we would really know," and I did. You've got to understand this is a 20, 21-year-old kid playing with NASA.

Eric 4Z1UG: You're doing 6-meter moon bounce with your 1 kw in this antenna?

Bob Heil K9EID: Yeah.

Eric 4Z1UG: Amazing.

Bob Heil K9EID: No, this is 2-meters, 128 elements, kilowatt 2-meters. They would send little signals, just little shots, and they would listen for it. They had, of course, fantastic . . . I didn't know exactly what but probably 50 foot dishes, who knows, but it was NASA. That was just such a big deal for me. I think about it again and I'm going, "What a stupid fool I was for not maybe paying more attention or whatever." I was so fascinated with that, but I just got very involved in building the gear. Every day, I'd do something different. It was again a blessing to me. I only had to play the organ for four hours a night. The rest of the day and the after morning and daytime, I was building stuff. I was doing things so the timing went perfectly.

My career was moving on because I'm playing the Holiday Inn and then I would play some of the shows at the Fox, not all because I had my regular job then. I'd played a lot different parties and things on the weekends and I was teaching in the daytime. My life was, as now, just crazy, but I loved it. I couldn't get enough of it and it makes me so sad that every day that I listen on the amateur radio airwaves, I don't hear people building. They don't build. I don't know. Where did we lose it? What happened? What happened was our Elmers went away and the clubs and all this are just interested in getting your license and helping you get your license, but what happened after that? What happened to all these wonderful people that I had, K9EBA, K0DEG, and W9ZVT? Where were all these guys?

I got a sad sad email last night that K9BQV died Saturday, had a stroke. He had a great store out in Nevada called Radio World, right on the edge of the dam out there. Maybe a lot of people know that, Dave Floyd. He was from Collinsville, Illinois. I sent a picture last night to the fellow, the AWRL fellow in Las Vegas that contacted me because he knew Dave and I were friends. I sent him a picture of Dave's QSL, I don't know why I kept that, but I did because I always kidded Dave when I'd see him and work him on the air after he moved out to Las Vegas or Nevada close by and started to his store out there.

His call was, "The Missouri Police Department, MPD. W9 MPD. ""No, you're not. You're K9BQV," and I always kidded him it, even though he knew. He had a Harvey Wells just like me. He and I would get on the air, he was 50 miles away, and we talked a lot on 6-meters because that was quite a deal to work somebody on ground wave. The band was open with so much, 6-meters, so exciting.

I liked working the ground wave because I had this huge station and I could work easily 800,000 miles ground wave every day because I had some incredible equipment. It wasn't me. This isn't about me, it's about the equipment that I learned to build from K0DGE and all these great mentors that would take me under their wing and so that parts missing for me. My education stopped. When I got out of high school finally, I just barely made it because I didn't go there very often, I was not interested in anything. By then, I was making out a very good living as a 14, 15, 16-year-old kid, had lots of big cars and stuff like that. I knew what I wanted to do.

My father, God bless him, he came through the depression like so

many and he wanted his son to be . . . He wasn't into electronics at all, but boy he and my mother supported me and he said, "You're going to go to the University of Illinois," and that's when I'm playing. They'd come to the restaurant and they'd come to the theater and of course they were proud of me. My mother played piano, that's probably where I got the talent to play because it's a God-given talent, especially this theater organ stuff. "What am I going to do dad? I mean I've got this great job." He said, "Well, let's go to University of Illinois and let's try it," so I did to please my parents. I hardly last the first semester, I was going crazy.

Stan Kann's calling me, "You've got to get back here. Get the jobs, man. What are doing up there?" I told him, "Well, my dad wants me to go to college. I hate it because I don't want to be an engineer." He said, "Come on back here. I'll put you in the music school at Washington-U, where I'd learned," and so dad accepted that. I moved back home to my parents' home in Marissa, Illinois and went on with my education a little bit at the School of Music at Washington-U. I continued on with my working career and the Ham Radio thing was at that time was a hobby, but then it's like, "Wait a minute." I got tired of playing and I had all this incredible equipment. Everything that came out, I practically had. When it came out new, I would buy it and see if it worked.

Now you've got to understand I'm only on 6-meters so I'm driving transfers with it, but I love [inaudible 00:31:24] HD37. I still have it. I was on the air yesterday with it. The 20A, I advanced by the way, I built that 10B, but then built 20A. Didn't really need too because we just used 20-meters to drive the transfer, but I did because I built that too. I kept a lot of that old gear. You watch on Ham Nation, you see it behind me, most of that gear with me from day one. I kid about it, but it's pretty serious that 20A was part of my education because that 20A was a phasing rig.

Like so many people, when you say the word phasing, it's like, "Oh yeah, okay. It's phased. Okay, cool, co . . .," and then you hear them say, "Co-phased." I come unglued. There is neither such word nor thing of co-phased so that came from another part of radio. It's not co-phased. It's either in phase or out of phase. I learned about that because how did Wes Schum get rid of the carrier? It was out of phase. He took us out of phase. How did he get rid of the other sideband? Phasing. How does a noise blanker on your receiver work? On and on and on, phasing is so important.

Have you ever read that on your test that you had to take? Heck no. Why? Why do we not learn the things we really need to make amateur radio more enjoyable and more of a success? It's all a bunch of nonsense and political crap. It's awful. Those are not the questions-

Eric 4Z1UG: Bob, I'm sorry, but don't you think that getting the license now is a license to learn? That maybe just getting past the . . . I mean this the argument I'm hearing in the Ham Radio circles is that once you're in, once you have the membership to the club, that now is the time to learn. Do you think that works?

Bob Heil K9EID: It does if you're in the right club. However, most of the clubs are repeater clubs. They don't build. They don't have those things. They don't hang around where things are being built anymore because they aren't. They're buying gear and it all matches so we'll put it on the air. Hot dog. I have a matching speaker and a matching microphone and a matching this and matching that and they've been fooled for decades. None of those companies build their own speaker. None of those companies build their own microphones. They go to some Chinese company, there's two of them, I can take you there and they build the microphone and put their name on it and fool the Ham Radio fraternity forever. It's not matching the quality of the microphone, what it does the quality to the speaker.

It incenses me because yes they should carry on, Eric, but they don't because they don't have the driving forces of a KODGE. They don't have the driving forces of these mentors. That's the problem. It needs to be addressed, but nobody wants to talk about it. They just want to talk about, "Whoa, what gear you got?" I hear it all the time and it's sad. Back in our day, we had met a lot of gentlemen on the air. I remember I was in the middle of it, but I wasn't actively because I was up on 6-meters.

Boy, down on 20-meters, at 75-meters, the wars, there were actual wars between the AM and the sideband guys. When the sideband stations came in, they just took over and the AMs are like, "Wait a minute." Finally, it came to a conclusion that we would have a gentleman's agreement . . . I don't know why the AWRL never stepped into this, but they never played a part and they don't play a part and they should play a part of helping to signify this. The AM contingency said, "On 75-meters, 3870 to 3890, that's going to be the AM window. 40-meters got a little short, 72 to 90 to 95. "There's really only two

basic frequencies, but what happened to that?

I heard a thing last night. A bunch of guys on 3890 maliciously causing interference because the AM guys were down at 3880. They were maliciously turning on big amplifiers, detuning them, cranking up their compressors to cause trouble. Wait a minute, what happened to the gentleman's agreement? I can name you another bunch of frequencies up and down 75-meters and 40-meters; I wouldn't want my children to listen to some of that. That's not amateur radio anymore and it's really sad, really sad, but that's the way it is.

That's what happened is that we forgot how to build and all of that, but I didn't. I carried it on. I got tired of playing the organ after all those many years every night. I started a little music shop in Marissa, Illinois. Now this is a place out in the middle of no place. Southern Illinois, it was the home of Peabody Coal. They had seven coal mines they had put in there. My father had a shoe store and a men's clothing store. My grandma had a ladies clothing store. I guess that's why I have the love of clothes because I grew up in the clothing industry, but anyway.

Eric 4Z1UG: Hey Bob, how far is that, Marissa, from like Centralia or Mount Vernon?

Bob Heil K9EID: It's about 60, 70 miles from Mount Vernon. Its 50 miles southeast of St. Louis if you know where Carbondale is?

Eric 4Z1UG: Sure.

Bob Heil K9EID: The home of SIU. You draw a line from St. Louis to Carbondale, bisect it right on that line, Marissa. That air again, Marissa is very very cool. It's a little mining town, but of course it didn't get very far, I have to tell you, after the mines left, but that's only here recently.

I opened a store and I got a Hammond organ franchise because I knew the guys at Hammond organ. I used to play demo stuff for them at the Namm shows and music shows and so on. I knew the people and I got a Hammond organ franchise. I became a Hammond organ dealer in Marissa and I started selling Hammond organs. It was a big deal in 1966, 67. I started the day after Thanksgiving in 1966. We're going to go into our 50th year. I started selling a lot of them to home people, but I started renting them to the promoters in St. Louis, the concerts. I wasn't into all that music, but hey and we'd rent organs.

We're talking about Janis Joplin. We're talking Jimi Hendrix. We're talking Ted Nugent. All these bands would come in, in their early career to Keil Auditorium and I'd rent them a Hammond organ and it's like, "What's the PA in this joint?" I wasn't into PAs much; I was into the sound systems for my organs. The stuff was terrible. There were little bitty columns.

One day I go by the Fox theater, this would've been about 68. I want to go see my old friend, George Bales, who was a stage manager back in the days when I was playing there. I pulled up to the stage door and here's all these great big boxes outside. I go, "What are you doing George?" "We're putting in some new speakers." I said, "Well, what are you doing with all those out there?" He said, "They're just for the trash guys." I said, "Wait a minute. You're throwing those away." "Sure." I said, "Can I have them?" "Sure." The Ham Radio in me kicked in, went and rented a truck.

These are Altec A4s, these things are huge. There are huge, big base bends, a pair of 15s in them. They're probably; I don't know what they were exactly, but about 10-foot-wide and about 8-foot-deep and about 8-foot-tall, four of them. I started playing; experimenting with these things in a vacant building we had there in Marissa. Put some radio horns with it. I heard JBL was good stuff, but then we needed amplifiers. I heard McIntosh was good so I bought some McIntosh amplifiers. Then we had to do some mixer thing and I had some little Altec mixers, the little single eight-input-and-one-out and I built this really cool PA. I didn't know nobody wasn't doing this.

One of them managers said, "Hey, could you help us our PA in this place when we bring acts in?" I said, "Sure." I took it up there; everybody went zonko's, and its like, "What is this?" Because it was a big hi-fi system to me. To me, it was just a big hi-fi system and we did a couple of shows with some They were acts from Nashville. They would come into St. Louis once a month called the Calgary to Stars, Dolly Parton, just all kinds of Nashville. They'd bring three or four of them up there, Jim Ed Brown. It was just really something for me because I'd heard of these people.

First thing you know, everybody's starting to talk about it around town and this one manager came to me at one of the shows, he said, "Hey, would you take some of this on tour? I don't need all of it. I got a little group we're starting to do in Ohio. Would you help me with it and bring it out?" I go, "Oh, I've never been on tour, but I got a couple of

guys that work for me and they go to SIU and they enjoy rock 'n roll and we'll do it." We took the system and went out on tour a couple weeks. Two days into the gig, two days, the second day, I found out the guy that was playing lead guitar was a Ham. It was WB6ACU, Joe Walsh. The group was the James Gang.

Joe talks about it a lot; we kid about it a lot. When I first showed up on the scene, I was just guy with a PA, but they were pretty, "Hey, this thing's pretty good." A couple of days in, we got to talking, Joe and I, and found out that we were Hams, it changed our whole life, both of us. We were just thrilled because I could fix things. He tells that story, "We'd played until things broke, and that was our show. This guy would come in and he'd fix it that night and we could play again the next day. "We started a tremendous relationship between two Ham Radio operators. Oh yeah, the focus was the music and it went on and on. We did a lot of little regional shows around the Midwest. One day, I get this call in 1970. It was 70, 71. I could look that up exactly the date. I get a call from George Bales, remember him?

Eric 4Z1UG: Sure.

Bob Heil K9EID: The guy that gave me the speakers. The guy that used the button to bring the organ up out of the pit when I was 15 years old. George Bales, third time I hear from George. "Hey George, what's up?" "Uh, you still got those speakers I gave you?" I said, "Yeah, why?" He said, "Well, I talked to this guy." He said, "They came in here tonight and they didn't have any PA and they're in trouble." The story is a piece of history of the whole thing, a piece of history of rock 'n roll.

The group went to New Orleans. They were going to do a short little Midwest, East Coast tour and their sound man was on probation out of the state of California. He wasn't supposed to be out of the state, but the drug agents and the FBI they found out that he was going to be on tour so they went to the first job. The first job and they sat and waited till they were finished playing. The group came on to St. Louis the second date. Now there were no cell phones. There were no communication in those days. The group shows up at the Fox at 4 o'clock in the afternoon. There's no PA. There's no Owsley. The group was the Grateful Dead. Well, they call back to their office found out that Owsley was in jail. The PA was confiscated; their group was not going to continue.

George Bales handed the phone to Jerry Garcia and I told Jerry what I

had. He said, "Man, you have A4s?" "Yep, four of them." "What kind of amp?" "McIntosh." "You have McIntosh amps?" I remember it was really cool because nobody was using that stuff. I just wanted the best thing I could possibly get at the time. We went up there and we did the show and it was marvelous and they took us right out of there that night on the rest of the tour. Jerry and I became very good friends. We could be here a long time talking about the things that we did together, the equipment, the technology, that's where I'm at with this. It wasn't so much of the group as it was Jerry and his love for gear and what we could do with different things and help them.

Eric 4Z1UG: Can I ask you one about one of your technologies though that may have come from this? What is the Heil Phase Reversal System and what was the process that led to its development?

Bob Heil K9EID: Well, it's exactly what I was about to talk about.

Eric 4Z1UG: Okay.

Bob Heil K9EID: We had figured out how to make monitors work back in the late 60s [crosstalk 00:47:10]. It was great to work with Joe because a lot of groups, oh my gosh, you couldn't move a mic cord once you got set up. With Joe, we could do anything. In fact, he'd have an idea in the middle of a song, "Hey, do that, do this, hook this, do this." It was cool because we're two Ham Radio operators playing. Monitors were not happening then. The better the PA-

Eric 4Z1UG: Speakers on stages before this?

Bob Heil K9EID: Yes, the better the PA system the least you hear it on stage. You don't hear it or if you do . . . The awful thing is you hear a slap off the back wall. Sound travels 1120-feet a second. If you're in a big arena and it's going out there and coming back, guess what?

Bob Heil K9EID: A big big bunch of delay and it messes you up. I figured we could do some type of a monitor, but how do you kill a feedback? Holy smokes, you've got a speaker about 3-feet down underneath your microphone. What I did, I started in the beginning and you can see some early pictures with the Dead, I used two microphones taped together. One was for the PA and the other one was for the monitor. How do you make that not feedback? Do you remember building the 10B? Do you remember what I learned from Wes Schum and all the things with the

20As? Phasing. If you take two signals out of phase, you get nothing. I have a great demonstration. I do it all the time. I do it on Skype with a lot of the clubs that I do these presentations for. It works great. You talk into two microphones, its three DVI. But I changed the cable to one of the cable out of the phase, you put them together, what do you get? Nothing.

Eric 4Z1UG: Nothing. Yes.

Bob Heil K9EID: It worked great. Where did I learn that, Eric? I learned it from Ham Radio. I learned it from those antennas. You understand that 128 elements, that was a serious project. Some of those elements had to be in phase. Some of those elements had to be out of phase. Along with that, along with the pipe organ, we had a lot of phasing problems with pipe organs where the pipes, some of the sound would hit you later than others, and we had to build complete walls to cause that phase cancellation to stop. Phasing is incredible. I loved playing with it.

Ask an average Ham today if he could tell you about it and he can't. That should be question three in the question pool. It's so important to everything we do. How does your antenna work? Yeah yagi. You have some elements in phase, you have some out. That's how you get rejection, when you turn it around. You don't hear somebody from the East Coast, when you're pointed to the West.

Phase dipoles, I have a pair of phase dipoles out here in my metal and I'm in love with them. I get to sit here in the Ozarks and talk to California just about every night on 75-meters. How do I do that? I'm not running 10,000 watts. I can do it with 400 or 500 watts. On AM, I run about 150 watts. I do it every night. How do you do that? I have a pair of phased coaxial dipoles. Coaxial dipoles because I hate non-resonant antennas that you need antenna tuners for so you do a resonant antenna and coaxial dipoles are resonant across that whole band. I have two of them. They're 64-foot a part and they're 64-foot high. 43-foot of phasing line that I switch in. It's all on my QRZ page. It's so simple. Don't understand why everybody doesn't do this? You can sometimes get 20dB front to back. Think about that!

On 75-meters, on 40-meters, are you kidding? No, it's science, the science of phasing. Why isn't everybody doing it? Because they say, "I have it phased right." You think, "Oh my God, this cost a million dollars." The guy's got a big amplifier and he's just bragging about his

stuff. No, it takes a 43-foot piece of coax. What's that cost you? A \$1.50, do it, you won't believe. There again how come we don't hear about this stuff? That's what we try to do is to show people on our Ham Nation broadcast . . . I do at least two or three club meetings a month on Skype. I love doing club meetings. They put up a nice screen. I have a good strong signal to Skype. Hey, it's like me being there. They put up a camera. I can see them. We have a question and answer. It's great. What's wrong with our hobby? Where did our mentors go? Why do we not have people teaching us the basic science of this hobby? Then it went on from there. I really jump into it when you ask about phasing.

Six, seven years ago, I got out of the rock 'n roll business, I was fast-forwarded that really quickly because I got out of it. I've got to tell you one other story. After that Grateful Dead show, we hit the front page of Billboard magazine, "It's this little place in Marissa Illinois, Ye Olde Music Shop has the contract for the Grateful Dead tour after Owsley was jailed." Everybody was calling me, everybody. I mean it went nuts. All these people were like, "Wow, this guy's got a big PA. He can do the Dead; he can do us, da, da, da." There was an article written by a guy, he would've had to been there that night, you can go look it up, it's called "The Night Rock 'n Roll Sound was Born". Look it up. It's about that night at the fabulous Fox.

I get a call from a guy one day, long about it would have been somewhere in the 1st of 71 right after the show, "Hey, we need that big PA up here in Boston." I said, "Wait a minute. Wait a minute. Who are you?" I'm Peter Rog. "Who are we talking about here?" "You've got that big PA. We've got to have it. You've got to save this band." I said, "What band is this?" He said, "It's the Who." I said, "The Who, you need my PA." "Yeah, need it tomorrow." "Not possible." "Why?" I said, "Because it's out on tour right now. A good part of it is on tour with Chaka Khan. She's using our talk box." That was another thing that I did with Walsh. We developed a talk box for Rocky Mountain Way and then I gave one to Frampton for a Christmas present because we were doing all the Humble Pie things and he was a member of Frampton and you can write the rest of that history.

I said, "I can't do that." Chaka Khan, they were using our talk box in one of their leading hit songs. I said, "I can't just leave them stranded." He said, "Yep, you can. You've got to have it." I said, "No." He said, "Get somebody to cover it," so I did. I called a friend of mine in Chicago that had a decent size PA. I said, "I can't drive there. It isn't

possible. ""Rent an airplane." I said, "This is a 40-foot semi." We were the first guys to do that. We were the guys that put touring together. You've got to understand, you're talking to a very straight dude here. We didn't carry things around in the back of Volkswagens and pickup trucks. I figured we can't have all this, "One guy bring this, one guy," so we would put everything in the 40-foot semi. That's all we had then were 40-footers. I took an old bus, we bought an old Greyhound, and we could sleep 10 guys in it and that was our first entrance to the touring type stuff. Here's the deal.

Eric 4Z1UG: Did you build more than one touring system? I mean did you have a fleet of tour buses at a certain point.

Bob Heil K9EID: Oh yeah, absolutely, we had three of them at one time and they were major tours. At any one time, we would be doing the Who, Humble Pie, J. Geils. We be doing J. Geils, Jeff Beck, ZZ Top, major, major, major acts. We had three systems. I had 35 people working and doing this.

I said, "Well now, wait a minute, how am I going to get this to Boston?" He said, "Rent a plane." I said, "I've got a 40-foot semi." He said, "Rent a Tiger airplane." Tiger was an airfreight company and we rented a 707 jet and flew the whole works to Boston in the next day. The Who had come over here with little columns, they weren't even four-foot high. They had about four or five of them to cover big arenas. In the time, they hadn't been here since the late 60s. That couple years, that little company called Heil Sound took the sound system world and put it in orbit. I said, "Okay, we're going to do that."

By the way, a little another one thing you should know is that was Ye Olde Music Shop painted all over our cabinets when we went out with the Dead from the Fox. "A couple days later I get a call from Garcia, he said, "Hey Bob, what's all this Ye Olde Music stuff? What is that?" I said, "That's my store. That's my company. ""No," he said, "We can't pronounce all that. We're just going to call you Heil Sound. Is that okay?" So it was Jerry Garcia that named my company. True story.

Eric 4Z1UG: Nice one.

Bob Heil K9EID: Anyway, did the Who. It went on for years. Townsend invited me to help him; he'd been working on this opera with four guys in each corner. He said, "Quad sound is big right now." This would've been 73. "Could you build a sound system that we can move Roger's voice

around the hall?" We had a sister company in England that at the time we were all sharing equipment because when one would come over here, if they came over here, they could use our stuff or if we came over there. Anyway, they were working on building a console and so I got with them, the timing was perfect. Timing was everything in my life I do believe.

They had a really great engineer, Bill Hoff. Bill Hoff and I worked and we formulated this new console called Mavis that was the guy that owned IES over there, his wife's name. It was the first of the quad consoles. We built the two consoles for the Quadrophenia tour. That's all history. Many of these pieces that we're talking about, one of the first monitors, the first touring mixer, the quad mixer, all these firsts. Talk box that I had Joe and Peter sign, all these things are in the Rock 'n Roll Hall of Fame. We're incredibly blessed. Just totally honored and humbled by the fact that we're the only manufacturer in the Rock 'n Roll Hall of Fame Museum in Cleveland. They have a whole floor of technical things. We're right beside Les Paul's room. One of the things I told them, "When you write all the history and you put up the signs about what you're seeing here, you have to make sure that it all came about because of Bob Heil's knowledge of Ham Radio." I guess, Eric, we can say Ham Radio is in the Rock 'n Roll Hall of Fame.

Eric 4Z1UG: Where it should be, of course.

Bob Heil K9EID: Of course, yeah. Then I got tired of the touring. Punk rock came in and they were very demanding. They weren't the nice, gentle people that the acts we had been . . . I became friends with these people. I did ZZ Top, I have pictures of this. I did ZZ Top's first tour. They didn't have beards. I wanted to be their friend. If I can't be their friend, I can't help them. You've got to communicate with me and we did with so many of the leading acts in the 70s, but I got tired of it. When the punkers came in and started demanding and getting real rural and violent. Good bye.

I came back home and I hadn't been on the air for about 12 years. I turned on my columns KWM2. Man, what did I hear? I heard something that sounded like [inaudible 01:00:10]. You see, the imports came in. Those people don't listen. They didn't know how to listen, obviously, because the audio is terrible compared to what I was listening to. I want to-

Eric 4Z1UG: You're talking about the Yaesu's and the Kenwoods?

Bob Heil K9EID: Absolutely, the imports.

Eric 4Z1UG: Right.

Bob Heil K9EID: The imports, all of them. Their matching microphones and they sounded awful. They weren't the clean, crisp articulate sound that I had been used to hearing. Especially in my touring days, my gosh, our PAs were gorgeous sounding. I thought, "I've got to do something about this," so I built a little box that changed the history and direction of amateur radio, just as we did in the Rock 'n Roll market. In 1982, I built the EQ200. It was the first equalizer that hit amateur radio. It became the cover story and won the cover award for that, for 1982 for QST, July 1982.

I don't know where this was going. I built it for me. I laid it all out; this is how you do this. Oh my gracious, we got bombarded with phone calls and letters. We didn't have email in those days. They wanted us to build one for them and so I opened the plant back up because I had closed the plant. You see, we had built thousands of speakers and mixers and all kinds of talk boxes and things for the music industry, but I got tired of that and just said, "Good bye," and closed it.

I opened it back up with a few the people who work with me. We started building these little boxes. Then I got in the situation, the problem is the microphones. They're bassy, they're tubby, they have no rear rejection and all of this. I'm going, "Okay," so we came up with the HC4s and 5s, tailored response elements for radios that didn't have equalization. You had to it in the microphone and the HC4s and 5s were very predominant for several decades. Until along, it must have been-

Eric 4Z1UG: Bob, these were microphone cartridges that you would put inside the standard microphones?

Bob Heil K9EID: Yep. We had-

Eric 4Z1UG: Or these were stand-alone mics?

Bob Heil K9EID: Nope, they were instructions of how to take your MC50s and your D-104s apart and put a decent sounding tailored response element in them. Thousands, over 100,000, have been built since 1982. Along about late 80s, I get a call from ICOM Doctor [Inouye 01:03:33].

Actually, he sent me first the picture of his station and it had an EQ200 and one of my Gold Line microphones we had just started building. Like, "Wait a minute. This is ICOM. He's got my stuff on a 751. "We got to talking because he was planning a new series of radios. To fast-forward, the Pro series 123,76, 77, 78 all those late-model ICOMs has our two-band equalizer in it.

Doctor Hasegawa called me from Yaesu shortly after the Pro One came out, "Oh, we have to do it better," so I did a parametric for them. Everything from the 9000 all the way down. I even got my way and I've screamed and bitched about this for decades, decades and decades, and nobody would listened, except Doctor Hasegawa. It has an XLR in the frontend. I say every Ham Radio transmitter should have an XLR, just like the broadcast transmitter. What are we? Some little sluffer on it? No, we're trying to do great audio and you've got all this RF and stuff around here because you're using unbalanced microphones. That started and the only problem is he took it out real quick. Coming out with the 5000, he took that off. I don't know why. It was money. You're kidding me, for a \$1? But, it's still there. The balance line that I developed for them in the preamp is still there.

Eric 4Z1UG: They're using A-pin Japanese connector or something like that.

Bob Heil K9EID: Yes, it's there. You have to know how to wire it and you have to have a balanced microphone. We build the cables for our balance line microphones, PR 781, the PR 40 to PR 30 that I'm speaking into the 20s. All of those microphones that are in our Pro division are now in the Ham Radio division and we have a cable that you can plug into almost all these radios to get their little hidden balance line inputs.

The other thing is I was so happy to be able to get Ham Radio to sounding better, to get guys to listen to their audio again. "Oh, I didn't hear you." Listening is a mental process. I teach a lot of classes in colleges and through Skype and I've written six books and I teach a lot about this thing. Finally, people are listening I guess. Hearing is a physical process. Everybody hears, but not a lot of people listen. Listening is a mental process. Close your eyes. Listen right now. If you close your eyes and start mentally dissecting what you hear, you're going to hear some things you didn't hear a minute ago. They're in your room and they're happening, but you were too busy listening here and you didn't focus. You didn't mentally dissect what you hear. Where did I learn that? I learned that from voicing theater, pipe organs, and I carried it through all my careers.

About, would it have been, eight years ago, Joe calls me one day and he says, "Hey, come here, I want to talk to you." At that time, we had a house in California. Joe and I were hanging out together a lot, doing a lot of stuff in rehearsal halls and studios because we had started doing some work in there. Joe says, "You've got to do something for me." I said, "What?" He said, "You've got to fix this," and he had a Gold Line microphone. I said, "Is it broke?" "No, take that 4-pin, take that push-to-talk out of there and make that a balance line, put an XLR on the bottom. I want to use it." I said, "For what?" "I want to use it on stage." I said, "Joe, a Ham Radio Gold Line, right?" "Yes, it's better than my SM58." I said, "You're out of your mind." "No, it's not. Come on, I'll show you." He took me downstairs in his studio.

I had never done that. Why you'd be crazy to take a Ham Radio microphone to the great standard of the world. The great standard of the world is now built in China and it's nothing like Mister Shure built back when I entered the sound business in the 60s. Nothing. Only the name and the ego to, "I have a Shure. I have an Electra Voice." All of those things are built in China because the founders were gone and they're owned by some other company or their grandchildren and they don't care. It's all about money. It's not about performance anymore. It used to be. That is-

Eric 4Z1UG: Bob, what you're saying is, is that these companies, these old companies, that are 67 years old even older, don't do the quality control on the product anymore the way [crosstalk 01:08:49]?

Bob Heil K9EID: No, the product is not built as well. It's built in China. They never see the product. They never see the product. They sit over in their little Golden Tower in Chicago, they never see it. It comes into their warehouse in Mexico and gets shipped to a dealer. Is it tested? You know where it's tested and that's sad. It's sickening. Joe says, "You've got to do something for me." I wasn't watching this stuff, Eric. I was busy playing with all my other Ham Radio stuff here as we were building, and we still do, tons of headsets and tailored response stuff for Ham Radio. I wasn't looking at the Pro and-

Eric 4Z1UG: Your professional microphone line came after the Ham Radio microphone line?

Bob Heil K9EID: Oh absolutely. It came in 2006 and Joe saying, "You've got to help me." "Do what?" "You've got to build this microphone," and I did. I

built one microphone for Joe. I'm not looking beyond. Eric, was I crazy? I mean you think you could build a microphone that would outperform these big stars. You've got to be kidding. I'm a little kid from Marissa. What's going on here?

I was wrong. The Gold Line wide element does outperform the 58. Oh my gosh. He said, "Build me one of these," so I did. He said, "But, there's a couple of things I want you to do. I want you to make it go down a little lower in response. "I rolled it off at around 100 cycles because I'm Ham Radio. We never needed that in the Gold Line.

Eric 4Z1UG: Right.

Bob Heil K9EID: "Make it down a little lower, at least an octave," so we took it down to 50 and actually that's where it really starts. He said, "Do you remember those HC elements? They were tailored and they had this incredible articulation. You got some in this Gold Line wide cartridge," but he said, "put a little bit more at about 3000 cycles." Now this is Joe Walsh calling out these frequencies. Yes, that Joe and so I built this microphone for him and I took it to him and it was really good. He used it on a solo tour he did. We went out and did . . . There were five or six little dates around the LA.

I'm going, "Whoa, we've got something here," because I had never listened to this stuff before. When I left the music industry in 1980, I slammed the door. I sold all of my Shure and I went to voice and AKG and all that stuff. He starts passing it around to his engineer friends and the first thing you know I got people calling me. We started building this microphone and I called it the Gold Line Pro. I'm like, "I'm not going to build very many of these. You're not going to do anything against big boys that's been here. You've got to be kidding, Heil. "I was wrong.

All of a sudden, serious engineers are calling me, serious engineers, and they said, "Now wait a minute, can you build us some of those, a number of them?" I said, "I can," so we did, but they said, "Now this Gold Line, that's just your Ham Radio?" I'm like, "No, no, no," then I had to tell them the story that No . . . I figured if we're going to do this, we're going to start a whole new division. We're going to have all new product lines, we've got to separate them, different people to build them and all that stuff, but that's what we did. The PR 20 was what the Gold Line Pro became. It was a fascinating time. There's so many other little things about it.

Then a new thing that was so big was Joe said, "Now listen, you remember that big antenna you had up? Man, when I'd come to St. Louis, you'd turn that thing around I couldn't hear anything. "Yeah. I said, "It had a lot to do with the phasing of those rear elements." He said, "Do that to my microphone. Let's get more, more, more rear rejection," and so I did.

Every other dynamic microphone has four little holes around the dock, right at the rim. That's not enough entrance of the rear sound so we put this element on a pedestal, a little rubber shock mount, it's about 2 inches high. We have panels in the side and so the whole bottom of the element is open so we just don't have four little holes and we'd get all of this serious rear rejection. All this rear information we don't want comes up into the bottom out of phase, we're getting 35 to 40dB of rear rejection. No other microphone, annoyance to Kmart. Yes I said, "Annoyment to Kmart." Shure Electro-Voice 80, all of that, no, they do not even come close to that.

It was all Joe Walsh guiding me through. Fun to have Joe as my beta tester, but that's really what it ends up being because every time I'd do something I'd let him have it and, "Tell me what do you think?" "No, do this, do that, do that," and we do. I'm very-

Eric 4Z1UG: Bob, did the PR 20 resuscitate Heil sound? I mean you're a much larger company now then you were before you were doing the PR 20?

Bob Heil K9EID: No. I have a lot of people say that our Ham Radio business is huge. We're the only manufacturer of serious headsets and microphones worldwide. We have 100s and 100s of dealers all over the world. I forget how many Sarah has in Russia alone for Ham Radio and this is just a-

Eric 4Z1UG: That sounds like a good thing for Ham Radio then. I mean you're saying there are people that are saying . . . At least I see it here, that the Ham Radio numbers are dwindling here in Israel and I don't know what it's doing it across Europe. I see it's going crazy in North America, but I think that's great news. I mean if the largest side of your business is the Ham Radio side.

Bob Heil K9EID: The other side of that is that I was the guy that brought quality audio in 1982. I got on and started listening, mentally dissecting, "Hey, I don't like Bob Heil. He's a whatever, what or I don't like him, but damn

he's right. "He's right because he only travels in the world of science. I do not do anything that's not scientifically possible. It's all about science. The phase reversal on our headphones, that's another thing, we have two speakers and a headphone. God, we could be here for hours and hours and hours talking about so I was very blessed.

I was in the home theater world from about 1978 through around 1999 or 2000. We were a huge leader in that. I did a lot of stuff. We're talking about \$200,000 and \$300,000 and \$400,000 rooms. I was one of the satellite television delivery services in 1878. One of the first along with Bob Cooper, who started it all. Interestingly enough, Bob Cooper was one of the stations I used to talk to on 2-meter moon bounce with 120A element antenna, but anyway there's so much history. There's so much going on.

Satellite television was a big deal. I was one of the first 10 on the test team for DirecTV in 1991. I had a 2-foot dish in my backyard and they'd send me test shots. We were the first store to sell DirecTV and on and on and on, but I got out of that too because that dwindled to nothing as far as that went, but I was there. I brought the technology around. I help bring it around.

The phasing was all part of the stuff and especially the home theater. How you get four channels out of two wires? Would you like to tell me that? You probably never thought about it before. You have a home theater system. You have a left and right. You come out of your DVD player or your satellite receiver. You plug it in and there's a little red and a little white RCA. You plug it into your receiver with the Dolby Pro Logic. How do you get left, right, center and rears? There's only two wires. How the hell do you do that? You did it with phasing. Nobody thinks.

I was very very blessed again because . . . How many hours do we have to do? When I built a console for the Grateful Dead touring, I had a [inaudible 01:18:22] and I had paid \$10,000 for this thing and in 1970 . . . I bought it actually around 69. That was a lot of money for this little kid. I had to do something with it because it was too hot, man, it was made for a serious recording studios. It was very high gain. You put that on a stage with a 110dB it was just overloading.

Remember I told you at Southern Illinois University, one of my little roadie guys said, "Hey, I had a guy that I went to high school with," and Pete Campbell he said, "Let me call him. He's just coming out of

the University of Illinois here in December and he doesn't have a job just yet and get him to . . . "I said, "Really? Let's do that. "I said, "Call him." That guy was Tomlinson Holman, the guy that went on to develop THX. I was his first boss I guess. He worked for Heil Sound for a while as we rebuilt that console. Back when THX was starting, he got hired in 1980; he did some wonderful, fascinating things in the audio business, the hi-fi audio business in the 70s.

He got a job in 82 with George Lucas to develop THX Tomlinson Holman Experiment. George wanted every one of his theaters that showed THX to be the same. That didn't happen because these theaters, they were just all over the map, so he, Tom, developed THX. In 1980, it would have been what six I think it was, they had me come out to the ranch and they would do classes about how to do a full-blown THX-certified dealership. I taught some classes with them there. I learned so much about all that.

Come back to this again, how do you get four channels out of two wires? It's all about phasing. They'll record the orchestra, and I've been there where they have this huge studio, you've probably seen pictures, got a big orchestra and they're recording the music left and right. Then they'll take Harrison Ford into a studio, stand him in front of a microphone and he records the voice track out of phase. When they put it all together, the Dolby Pro Logic pulls out those out of phase signals and puts them in the center channel and in the rear. Nobody thinks about that. It's really sad, but I did.

As I'm going, "Why don't I do this in my headsets?" Because it would change the acoustic platform in your head and it does. It's the only headset in the world, Heil Sound; we're the only people doing this. I'm telling you the serious D-Xers, the serious contesters; it's one of their main tools. It's our main tool of being able to move that audio around in your head and it's really quite something.

Eric 4Z1UG: You have a single volume control on your headset to adjust only one ear? So you-

Bob Heil K9EID: The Pro 7, yes. What we do there, it's just a balance for the left side so that you can raise or lower one side or the other. It's reversible so you put around on the right side if you want and move the boom around the other side. We just do the left side and you can lower the volume on the left side. I had there; again, I listened to my clients. A lot of guys are hard of hearing on one side or the other and this allows you

to do that. That's only in the Pro 7, but all of them have the phase reversal.

Even our headphone, which is a pair of great headphones. Everybody talks about, "Oh, I've got a pair of Sony's." If you haven't heard the Pro 3, you haven't heard headsets. I did that for the serious recording engineers that requested me to do that. We do it on and on and on and it's a great piece of science.

Eric 4Z1UG: With all the evolution of this Ham Radio station technology, is there some audio accessory that's still missing?

Bob Heil K9EID: I missed that. What did you say?

Eric 4Z1UG: I said with your contributions to improving the quality of audio in the Ham station, in addition to all of the commercial work that you've done, is there still some technology missing in today's Ham station that could be working better? Is there an audio accessory that's missing?

Bob Heil K9EID: Uh-huh, we're starting to bring people around to that. Nothing has been done, nothing, in the receiving part of amateur radio. It really is a sad commentary. You can go out and spend \$15,000 for a transceiver; you can spend \$400 for a transceiver. They all have a 1-watt at 10% distortion amplifier. You have never seen a spec sheet . . . I hate spec sheets, marketing people can write them. You have never seen a spec sheet on the audio output of these big transceivers because it's 1-watt at 10% distortion. It's junk. "Oh, that's okay. I've got my matching speaker. "The matching speaker is a \$. 50 speaker they put in the box, charge you \$125 because it's painted the same color. You don't believe me? "Oh Heil, you're full of crap." I work for these companies. I know what's on the other side of the fence. I get irritated when I see what they're doing to us because I'm one of them and I'm doing something about it. I certainly did in the microphone and the headset world, but there's nothing-

Eric 4Z1UG: What's the next thing?

Bob Heil K9EID: We're doing it. We've been doing it for years. We don't sell it, but boy I can't tell you every day I open up my inbox, there's a question about it. You go out and you spent \$50 and buy you a little Behringer or any

of those little mixers. Then you go buy a pair of JBL Control 2P for power. Control 2Ps are made for near field monitors, for serious recording studios. They have the \$40,000, \$50,000 monitor speakers up top, but they need something close to them. Near field and that's what they're using them for. They're very high quality. You go and buy them on the Internet for \$150 a pair. They have 35-watt amplifiers for each one of them. It's a 2-way speaker, got a tweeter in it. Gorgeous gorgeous audio and now you will have equalization. Can't believe what wonderful thing you can do with equalization on a received signal. You come out of the audio output of your receiver into this little mixer. Take that mixer out, drive those power amps in the back of that JBL. Oh my gracious, I can't tell you.

Eric 4Z1UG: What do you think about using a DSP, these DSP speakers? Do you think that's needed?

Bob Heil K9EID: I told them for a while, we were contracted by Clear Speech to do a project. I canceled it very quickly because they wouldn't give us a schematic and they wouldn't give us any parts. I said, "What happens if it breaks? We want to fix our stuff." "Ham Radio operators, we fix our stuff. "You just have to send it back." I said, "No, I want parts," and they wouldn't do it. I said, "See you later." They rented my production line actually to build their speaker and I thought it was going to be a good thing, but not with that attitude. See you later.

No, I don't like DSP because he does weird things. I want natural sound, natural. Let E do the equalization on my little console. I have a 12-channel Yamaha in my station. You can see it on my QRZ page. I have in it I have six of my receivers. I have a recording out; I can record any of that. I have full equalization, a 3-band with a parametric in the mids. Gorgeous stuff. What does that Yamaha drive? It drives a pair of JBL's. Fabulous stuff. Fabulous stuff. Gorgeous.

Eric 4Z1UG: If it doesn't drive the JBL's, it drives your headset.

Bob Heil K9EID: That's exactly right.

Eric 4Z1UG: If you've got to do it quietly.

Bob Heil K9EID: Yep.

Eric 4Z1UG: Somehow in all of our Ham Radio education, we are told that we have to bond all of our Ham shack equipment to a copper bus bar tied to

ground rides outside the ham shack. Yet, I've heard you speak against this practice and you've even pointed out a white paper from someone on the East Coast. What problems does this bonding process create and how do you handle it at K9EID?

Bob Heil K9EID: I don't have any grounds. I have 15 coaxes going out of here. It's all on my QRZ page. See, I work with these companies so this really isn't a Ham Radio shack. It's a station lab where I have to do for these different guys so I've got all the stuff and I've got all my old stuff. Got absolutely no RF. I have no hums, no buzzes, because I don't have any grounds. I have one ground, one, and that one ground is out there at the tower. Its damn well grounded, but none of the antennas are grounded to it so the coaxial shield that goes out there doesn't touch the tower. They're all using transformers. Balance, balanced to unbalanced. Not baluns, where you want to drive me nuts, or the balun. The balun came from the same guys that . . . It's-

Eric 4Z1UG: What about lightning protection, things like that? Do you use polyphasers or things like that?

Bob Heil K9EID: No. The tower is well grounded and all of the antennas are insulated from the coaxial shield. You don't need to ground all this stuff. That's the first thing. Now when you come in here, you ground one thing. Where you get in trouble, you get these bars and you da, da, da, da, da, all this copper stuff [inaudible 01:29:45], all that stuff.

Eric 4Z1UG: Right.

Bob Heil K9EID: No, when you plug that third pin ground to your power supply in, now what happens? It goes out and finds another ground from your house ground, greatest ground loop ever. It's just sad. WB2WIK, look him up. I think if you just put that in Google, you can find it. He has the best treatise and he and I get blasted so much by people that don't understand what we're trying to tell. They're not going to get electrocuted. You're not going to burn down their house, but where you get into trouble is when you have ground loops. You just put WB2WIK into Google and the first thing that comes up is station grounding. There it is. Cool.

Eric 4Z1UG: I'll put that on his Show Notes page.

Bob Heil K9EID: I just hate it, people don't understand then they're going to flame us because, "I don't what you're talking about. I'm going on 75 and they

said that, "You're a jerk and you don't know. "" Wait a minute, timeout, we're only applying science. Where did I learn it? K0DGE, the engineer at CBS that I met as a young kid in 1956 and guided me through a lot of my early career. They certainly don't ground every damn thing in the world in a radio station. They ground the things that you need to ground, but not all of it so that's where we are.

Eric 4Z1UG: What do you say to some- ?

Bob Heil K9EID: I wish we-

Eric 4Z1UG: I'm sorry.

Bob Heil K9EID: I wish we had hours and hours and hours, there's so much more to go through on some of this stuff, but covered a lot and we'll have to come back and do more.

Eric 4Z1UG: Can I ask you one last thing then?

Bob Heil K9EID: Mm-hmm (affirmative).

Eric 4Z1UG: Can I ask you what advice you would give to a new or returning Hams to the hobby?

Bob Heil K9EID: The first thing you want to do is get involved in HF, high-frequency. Go out and buy yourself a used transceiver. I've done this on Ham Nation a couple times. I bought a ICOM 730, paid \$150 for it. Had a guy go out on this parking lot in Dayton and buy it for me because I don't get on the parking lot, I had to be stuck behind my booth. He took that radio, brought it home here. I did this live on Ham Nation one night. I put up a little antenna. Gosh, I think it was 10 or 15 feet high, something like that, on the 20-meters. Turned it on at the first station I worked was a station in London. Well now, wait a minute, I thought you had to have all this other tower stuff and all that and you don't need that. They're given the wrong information. You don't need all that stuff.

To start out, start out with just a simple basic radio. I always like to get on 40-meters because 40-meters is open all the time 24x7. It has some decent people and you can work all around the globe at some times. It's just really cool. Learn to do things, build things. Build little oscillators and build little buzzers and build this and build that. Work up to building an amplifier, whatever, but what about building

Greenlee punches, how you punch a hole in the chassis and all that. There's all kinds of stuff out there that'll show you how to do that. That's what you want to do.

I say that because I have so many write me and I'm glad to answer them, especially returning Hams. Hams that just came back into the hobby because of Ham Nation. We brought lots of people back into this. It's really fun to be able to guide people along to things that they might have not heard before or they might have heard, "That's not true," and then they find out, wait a minute, its science and it is true. That's where I'm at with all of this. I follow the science.

My first love, of course, is my wonderful wife, Sarah, who owns Heil Sound. She owns it. I just invent stuff for them these days. She's an incredible business lady business. We've got an incredible team. Stephen's been with us for 16, 17 years. Ike came to me when he was 16 years old. He's an amazing kid. Jerry's been with us about 15 years. Donna's been with us 22 years. These People know and they build this stuff, they service this stuff, they ship this stuff. It's really wonderful to have people that really do things and understand what the problems are, but we're so thrilled to be able to give people things that work and it doesn't cost a lot of money.

Eric 4Z1UG: It sounds great and I am absolutely grateful that you agreed to come on QSO Today and tell us your story. With that, Bob, I'm going to wish you 73. I hope I work with you on 40-meters.

Bob Heil K9EID: I'm around, usually on AM, but I'm there.

Eric 4Z1UG: Okay.

Bob Heil K9EID: We're come back for about what's a going on. Thanks very much, Eric, and greetings to everybody.

Eric 4Z1UG: 73.

That concludes this episode of QSO Today. Please check out the Show Notes page for K9EID. I was careful to put many of the references that Bob made into the Show Motes.

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Until next time, this is Eric 4Z1UG, 73.