Bob Heil - YouTube

<https://www.youtube.com/watch?v=q6ga_BS9-Hk>

Transcript:

(00:00) down cooperation and uh Dr Heil is the expert when it comes to talking about speech and what we can do with uh improving qsos with better quality speech Dr Heil please take it away sir thanks for tomorrow there we go hi everybody I hope I hope you're hearing me okay everything all right we better hear you okay that's for sure yeah that's what we got to do all right thank you and boy do I agree with that transmission line is so important and um people just kind of fluff it off piece of coax is a piece

(00:50) coax but it's not really so congrats on uh warming up some of our uh our knowledge about that that's great well there's so many things that I get into on these I think this is number 336 of these and most of them are an hour some are two hours that I've done since 2020 February because once I get into it you guys will let me go but we'll keep this down to an hour a little bit after but uh you'll find out why because we're going to talk about things that you hear about but they're not explained

(01:28) very well and we're gonna try to make your signals better I'm going to take it just a couple of minutes to let you know where I came from I uh I started this great hobby uh in 56 but in 1952 my parents bought me a Hammond B3 organ that was a very expensive thing and they were not rich people but my mother thought I needed that I had been playing an accordion and two years later I become a professional making 50 bucks a weekend in 1954.

(02:01) uh playing in a restaurant locally and from there it got really crazy in 56 I became the assistant at the Fox Theater in St Louis now why I take time to tell you this that what you're looking at is how Bob Heil learned to listen listening is very important and I did that because that organ hadn't been played in 20 years and the uh the organists there needed help there are 3 500 pipes in that organ here's just a couple of hundred and these are one inch out to 32 foot that's where I learned to listen listening is so

(02:44) important because you you have to get into not just hearing everybody hears that's a physical process listening is a mental process hearing all of the harmonics and the many things that happen with audio and as a 15 year old kid I really dove into that also was uh traveling around the country playing theater organs all over the country the most prestigious was this that was the Paramount Theater in Times Square that's now the Hard Rock Hotel and that had exactly the same organ as the fox here in St Louis there were four of them that

(03:27) had the same instruments but you know what does this have to do with him radio learn to listen and we're going to really get into that and take a couple of my minutes more one day now I had uh had quit playing at the Fox I had got some other uh jobs that I was playing around the country but the fox called me and it was about 50 miles away from my hometown and said hey we're throwing out some of our speakers uh would you like to have them you seemed like a gadget guy and so I go up and what are they doing they're throwing out

(04:03) these Olsen bins on the right there's two of them there there were four of them that I got those were 16 foot folded horns built by a Western Electric and uh I just started playing with them I got some Altex there to the left those are a4s these are all monstrous speakers but I uh I built a PA from all of that we started a plant and building amplifiers not just an amplifier these were 400 watt amps but they were modular the only modular high-powered amplifier ever if a group went out and something got blown up in one of their amps they went

(04:46) home no it came with a parts kit pull that out take a four screws loose and the next thing you know you're back on the air that was a very significant move in in the late 60s into the 70s but we were doing all kinds of things my first major concert was in 1968 was Jimi Hendrix with Janice Joplin opening and I thought what did I get myself into well it really grew we became the predominant sound reinforcement company in the country The Who summoned me I lived with them for four years I was on the road with them for

(05:29) six and um just great things and we just lost one of our great artists here recently was Jeff Beck he wanted the very special system that they could get in and out of the Arenas quickly and we did that but Jeff was a great guy along with all that I met up with Joe Walsh and we with the James gang and we discovered we were hams but we needed to build a talk box thing I didn't even know exactly what he was talking about but he had a song that he recorded called Rocky Mountain Way he recorded that in a studio in Nashville

(06:12) Bill and Dottie West were good friends of his and they had this little speakers a little three inch speaker and a funnel and the Liberty hose and that's what he used to record that well that's fine in a studio where it's so quiet and everything's good what do you do in Arena and so we were putting his new band Barnstorm together in our plant we did that we built a lot of systems together and uh pie and numerous others and so uh hey what do you do I build a high-powered dock box 100 watt driver

(06:49) had my fiberglass shop build me a little case for it away we went and until Joe can do this live however Peter Frampton's little girlfriend Penny uh she uh she called me one day and she said look I need a Christmas present for Peter I don't send me a guitar he's got a lot of them so of course I sent her a talk box and if you know anything about Peter Frampton you know what made his career and he tells that in all of his interviews he gives me great credit because it was the talk box that really launched him into the number one Arena

(07:28) act for many years but one day I get a call I got a call from Paul Klipsch I'm going he said that you Heil and I said yes sir this is God on the other hand to this phone what can I do for you sir he said you the guys that got that kilowatt sound system yeah I am I want to come and see it see it but Paul Clips was an efficiency nut he could take one Watt and do 110 DB with the speakers it was totally amazing and here he was standing in front of me in my place in Marissa Illinois 50 miles south of St Louis I I just I couldn't believe that

(08:12) he came but he wanted to see this kilowatt system well it wasn't one it was six he freaked out and all day long even taller and I well why did you do that well where'd you learn to do that what what college I didn't go to college well where do you learn it what high school I barely made it out of high school I really did my grades were D's and F I guess they felt sorry for me but I was making more money than my teachers I did not have to have all this nonsense because out with that play in the theater organ making things

(08:49) happen on one of those and so the way we went got in this airplane flew to Hope Arkansas that night and he's still where did you learn it all I said I learned it from ham radio no like what really guided you ham radio because I was a building nut and uh my uh my first uh my first ham radio station was a pretty meager uh bought that in 1956 the same year I became the organist because Walter Ash was right across down the street from the fox and that Harvey Wells and all of that that was amazing but I was on six meters

(09:36) I was there for 17 years why because the bands were open all the time and when I tell people that and they weren't around in those days they look at me like I'm making this up no the largest Sunspot Cycle ever and so it was totally amazing I'd come home from playing the shows at the fox or the restrooms I was doing 11 12 o'clock and the bands were wide open it was so much fun and that Harvey Wells really worked well I still have it my Harvey Wells is a an amazing little box in the gut it uh it still is on one of

(10:15) the other consoles here but I just love building and doing things and that that was one of the things that turned me into doing things like this well Paul was very amazed at some of the things I had done so we're in here we go back to hope it's been a couple days that's an old telephone exchange building that he ended up with and that was his lab and in that lab he had all kinds of his experiments that's uh one of his K horns he made it out of Plexiglas he had to build a special saw to make one of the angles

(10:55) because some of the angles were pretty pretty crazy and so what'd he do he built in a Plexiglas to show everybody now a k horn if you never experienced notice I didn't say here I said experienced a k horn it was made like so and it fit in the corner of a room the last 16 foot was your wall this way and this way you had to have two eight Footers and your speaker became part of the room that's what I said if you ever experienced a k horn you won't believe it it would do 16 Cycles like nothing with just a couple of Watts so efficient

(11:45) but he taught me a lot of stuff said Heil you need to know some things and he started in first thing he did is he gave me this book the audio cyclopedia and it it it's with me every day it's amazing how much I turned to it at 1750 pages of whatever you want to know about audio and it's how Bob Heil really got my feet work in the very beginning of building the sound systems and later into making ham radio sound a little better but he said Heil we got to do something and we were several days he'd bring up

(12:31) all kinds of things and he said you need to know about the Bell System he said you know when the early telephone systems were put into use they were just building it it didn't work they were mushy they had no clear speech articulation what had happened was they they started New Jersey bill every 500 miles across America was a relay station to keep the voltage and the audio up when they got out to the West Coast and they picked up the phone for the first time this is what they heard okay what happened here hmm

(13:18) I don't know they couldn't figure it out because everything looked okay what's the problem what happened to the speech articulation it's gone it's not what come out of our mouth why so they had all these questions let me bring that back up here so they had all these questions that they had to figure it out and so they put 4 000 scientists yes there were four thousand of them at Bell They concluded everything they were doing and they all got onto this project this could not fail while it was failing

(14:03) two guys were the lead Dr Fletcher and Dr Munson I would only hope that many of you know about these two gentlemen because they really guided the audio in those days and woke us all up what they discovered was not the equipment exactly it was our ears here is a graph of your ears you go I don't hear like that yes you do notice I put 100 DB it's almost flat that's what kids like to listen to their music real loud it's almost flat they hear all the bass all the vocals in the middle all the symbols but you go down here where

(14:48) you're listening tonight maybe 20 or 30 DB without any kind of Tailoring you just heard what happened and what these two Geniuses figured out escaped so many but not to us audio freakos the telephone system is 3K wide kind of sounds like something you talk into every night isn't it they discovered that 2.

(15:27) 5 k in between 2 and 3K Magic human speech articulation I'm all I have a parametric equalizer in this mixer I'm going to do this again I'll pay attention what's going to happen here I'm only taking out 2.5 when I do what happened I didn't turn up the bass I didn't turn the treble I just took out that so important speech articulation and so I'm gonna bring it back up and when I do you'll know the minute the minute that I hit 2.

(16:10) 5 the F and the s so articulate I take it back out and he has it all kind of run together there's no articulation well that really woke me up as all Klipsch told me he said you need to figure this out in your systems okay so they discovered the problem where they're gonna fix that how they gonna fix it there was no equalizer there were no mentions the word hadn't existed in 1920 for audio so what they had to do had to do it with a high pass filter I also put a low pass in there just for the heck of it but they didn't use that

(16:59) one on the right by the right size of a capacitor straight through you could carry all the audio you needed but you wanted to get rid of the base and stuff you played with the resistors that was the main thrust of early Equalization and they finally got the telephone system to work because the telephone system was like that and the most incredible thing to me there was no Equalization during all those decades none and of course today everything's got EQ in it it was 1967.

(17:53) listen up 1967. I had heard that longevan they were a company that built Studio mixers and uh all kinds of audio equipment for that that they came up with the very first active equalizer I jumped on a TWA Air Freight out of St Louis and off I went to California I go into laundry and I told them what I wanted I had talked to him on the phone before he said yeah we're we're doing that we'll take care and let me show you so we stepped around the corner and look what we found wow the very first active equalizer to all

(18:38) of you say oh home oh home big deal no it was a major deal it was like whoa I can select a frequency I can cut I can boost all my gracious why have you been so long coming yeah there was some minor EQ back in the late 40s to 50s when the Hi-Fi came in but all it was with that high pass filter and you could it could vary the the uh the components and it wasn't very good but it was better than nothing I know I was there 18 years old yeah and one of the first Wi-Fi systems and that was all fun and uh they also were building

(19:23) mixers and stuff and um in those days leading up to that Jimi Hendrix and Joe Walsh you know this is the mixers that we had that green when you see that was it you see any EQ on that no there wasn't any we did Equalization by the type of speakers I would build the type of drivers I would use and how to display them where they would point we needed more highs over here so we had long throws that kind of thing it was all a mechanical thing and all we had was that one little line mixer which was it they took me around the corner

(20:09) and they showed me a new mixer they just they'd come up with again you're going to say oh big deal you can't you gotta imagine you got to put yourself in my place nobody had ever seen anything like this and so I said Okay I want to buy two of those and I want to buy a couple of your uh your equalizer they well now wait a minute we got some coming here we're working with All Tech and it'll be out in about a month they took me in another room and I thought I was going to die what was this and of course you're all laughing we

(20:47) know it not in 1967 you didn't this long wow and in 1968 it hit the market and of course I I bought all of that went back to Marissa had a really good Carpenter cabinet builder and he built that walnut cabinet we put the two mixes I had 16 channels the two meters on that panel that's a limiter and mature we didn't overdrive the amps way over on the back side you can see a light flash from the from the camera that's the equalizer can you imagine pile sound rolling into an arena with that instead of that little six Channel

(21:32) thing I showed you it was crazy but I had had many years playing and I said you know what I gotta get back to radio I've been off the air for 12 years what happened to my great art Collins audio what'd you guys do couldn't believe how terrible some of the audio was it was all basically and mushy and yeah like what did you do well what they did was using their new tin well that's a kin a Yazoo what is that I was like what is all of this stuff well it certainly wasn't made in America and it sounded terrible well it's gone

(22:24) matching microphone the only thing matching is the color they don't build their microphones and you've been through for years and it really aggravates me that people don't listen those things are terrible but Heil they they it came in the Box I don't give a darn where they came later in life I started working for I for ISU and and I know what we're talking about then it's like oh my God oh boy so 1880 I'm playing around us I got to do something something has to happen and this terrible audio

(23:09) and built very first equalizer for ham radio for me but oh boy well check in what are you doing oh my gosh that sounds great of course it did they have a filter at 2.5 k uh-huh punch up that articulation and I have another one at 160 and we can roll off some low end well I wrote an article about this and I sent it to the league called me they said this is a revelation this has not happened we've been trying to research and there is no indication any active equalizer in ham radio and so the article will become our lead

(24:03) article for July 1982 and it will receive the cover award which I was very very blessed I didn't expect all of this but it was a DIY article where you could build it and all the parts told you how to do it but I made one mistake put my phone number there there people started calling me they wanted me to build it well I had closed the plant in 1980 when punk rock came in all my other music groups they kind of took a dive along the 1978-90 right in 80 there I left the industry hunk rockers came in see ya because you're looking at a guy

(24:52) I live with the lived a Grateful Dead all of these great guys Jerry Garcia was a wonderful friend I've never in my 82 years tasted beer I've never smoked anything and for gosh next did their drugs here I am running around the biggest drug addicts in the world but that's okay they knew where I was and they never forced anything no problem they only wanted what I knew to help their audio and so I was very blessed and it was it was really quite fun in those days but um Pete Townsend always put it good

(25:39) he said leave the guy alone when you're passing out your stuff he doesn't want any he's got his soldering iron he makes us sound good and he can drive the truck and and I did so it was those are great days well here comes his equalizer I had an empty plant for about it was somewhere around five six years so I called back to my great solder gals and we started building the very first product for ham radio from Heil sound and this we built thousands of these things and it just got me really into what was

(26:21) needed and so away we went and things were really happening but there was a problem with that as to how to adjust it I'd hear a lot of guys they'd have it all backwards or not at all and wow you're wasting a tremendous piece here of information so we started doing um websites that would help you we got about 50 pages just on this subject in our ham radio uh website you have to decide what you're doing before you ever turn the radio on think about where am I going am I going to do just rag chew stuff

(27:06) am I going to get in and do DX and contest I'm going to do net control the very first thing you do is set the transmitter bandwidth that is so important hey usually you want to set it at 2.9 for rag chew but for DX work you're going to set that around 2.45 why is that important well first of all are going to go in to your transceiver and you are going to adjust what Equalization 2.

(27:49) 5 right you're going to open up 2.5 it's the first thing you do with the EQ roll off the base a little Bingo you're going to be articulate you heard what happens well let's talk about that bandwidth stuff you see there's a great demonstration if air in here was RF or out to 2.9 we got a little bump at 2 5. that is really nice okay but we're going to do contesting I want all the articulation I can get and you're going to narrow it up you're going to narrow 2.

(28:32) 4 on one end and about 500 on the other but you got that 2.5 open 2.4 it's wide open where is all of your RF going it's not going to be wasted out here it's going to be put right where your brain needs it that's why bandwidth is so important and if you're going to do rags you fine level it out a little bit you always no matter what you always will have 2.

(29:10) 5 elevated a little bit but that just is something that I never read it bugged me to death I said I got to do something about this so we started building websites to help you then I started going around the country traveling all over helping you doing clubs I love going but pandemic stopped that and I got this idea to zoom and this is really great because I got all my toys here and so you set that bandwidth 500 to 2500.

(29:45) you're not going to waste it we don't want any low end all the base low end does is muddle up what you're trying to say and I hear guys all the time they're so darn Bassy well it's really great isn't it no it's not great it's sick I can't understand what you're saying well you have a Bill said I'll sound good no you don't sound good you sound terrible we have to have articulation if you're going to do like net control widen it out a little bit 200 to 2700 with that 2.

(30:20) 5 up a little bit and there's what happens you look at that you see you don't need all that low end it does you no good in 1999 I got a letter from a doctor anyway in a way Communications and he had a picture of his station it was at the time his ic781 that was a great transceiver the first one had a scope it was a real CRT if you remember in that picture he had one of my Gold Line microphones on one of our booms we were the first company to bring Booms to ham radio tens of thousands later were still there I did it for me because whenever you

(31:06) hear me on the air I am not just sitting here I'm building doing stuff and I needed something to hold the microphone so we started building booms and we built a really cool one because the top comes off and you can hide the cable in it you don't need a bunch of wire wide time it don't work and during the way he had one of these you gotta understand a little kid from Marissa seeing the president founder of icon with this little box that says built by those who care in Marissa Illinois you got to think about that

(31:45) that was pretty special but then I needed to help because I'd hear people with the new icoms he um he started with the pro one because he said we're thinking about a new transceiver line and I want to put your EQ in so history remains from the Pro 1 to Pro 2.3 all the way through the Icom line the great Icom 58 7851 and a little 705 the really Dandy 7610 they all have my equalizer in them and so I'll hear people that are not using it during the default mode because they don't know how to say because the instructions are pretty bad

(32:38) all of these instructions I designed it I don't understand what they're trying to say it's really simple it's very simple what's the first thing you do set the bandwidth right we're going to do some rag tube while you do 100 to 2900 you go up there and then drop out some of that bass minus two minus one or two you play around listen to yourself and another receiver sometimes the monitors will work with headphones punch that treble up that's 2.5 plus three and you feather those out

(33:13) and away we go what you do for DX hmm you know what we do 500 to 2500 roll all the base down into there and all of the icoms have my equalizer in it it's really saddens me when I hear guys every eight Equalization my I've proven it to you everybody don't let anybody tell you you don't because you'll sound so much better and that's what it's all about he also asked me to build a proper microphone he said we just buy OEM things put her name on it do something right and so and so I did we build the microphone it only works on

(34:10) Icom and oh my gosh does it work there's nothing like it nothing I call it the ICM it almost spells icon it doesn't work on a Kenwood yasu nothing it works on icon and it's very inexpensive and I love it my I got in trouble with it because we don't make any money on it like I said you're crazy we got I make a few dollars that's about it but I want everybody to get rid of the darn microphones that were made by some who knows what it's matching the painted the same color are you trying to kid make it

(34:49) out of here a couple years later Dr hassagawa his family owns Jesu stepped into my booth at Dayton I want to talk about that stuff and what stuff the EQ well let's step out of the booth here I want to do it better I said well the only way to do it better would be with a parametric yeah that'd be good not so fast what be the problem education you see when my little two band I've set the frequencies oh you need to do is to feather it out with a parametric there are three different filters one of them have three adjustments that

(35:39) means you have to find out how to set nine buttons there is no anything and their manuals are terrible they're a whole bunch of graphs and do the fit and I don't understand what they're trying to tell you we did it and we did it right bottom you see that the top is a 528e that's a wonderful equalizer every broadcast station in the world has one including my all of my vintage gear this intersection it's got all kinds of compression and de-essing and so on and so on but the heart of the matter are those three

(36:28) filters at the bottom they have the level they have the bandwidth and plus or minus three of them but you don't know where they are and it was just it was just really crazy when it first came out but look at the filter you're going to set the frequency then you're going to set the level you're going to boost it or cut it and how wide is that audio is it gonna be a one octave or wider and this is what you come up with it's very simple I fuzzed out all the stuff on the left I just tells you that what the name of the

(37:12) filter forget it here we go frequency level width right 200 we're going to minus that 200 and two octaves of bandwidth that's how wide that filter is going to be is it going to reach into the next one or whatever just do it don't question it too octave is fine the next one's 900.

(37:34) why did I choose 900 all of my audio life there's something about 600 to a thousand it's kind of a weird weird thing that happens with the human hearing do this to your ears and when you talk you'll hear that real boxy sound and we have to get rid of that boxy sound and so we do it by setting at 900 minus three two octaves a bandwidth and what do you do with the last one my gosh if you don't know I really have failed 2.5 Plus 8.

(38:09) and that's how you how you said it and this is what they should put in their books it's on my site you go now there's one other thing down at the bottom in red is a whole nother set parametric EQ when you turn on the processor then you have to adjust that I got news for you listen up listen up and please do not use a compressor or a processor they only add Distortion we'll build that I'm louder no you're not you're distorted and for somebody that really understands good audio you are not

(38:48) in the ball game you don't need it you have the right microphone you know how to use the microphone and the right Equalization that is what makes your signal really good so you want to pay attention to that you can see here how we move them around those three filters you can move them wherever you need their frequency wise plus or minus and how wide do you want it all that but it's just really sad Kenwood came to me and said we're gonna do a big EQ so I I said okay my my idea would be six six Channel EQ

(39:34) that's all you need you don't need but they come out with 13 bands are you out of your stupid mind well they were because they did it and what's even worse look what they put in their manual raise up all the base don't worry about 2.5 and roll off the top end what kind of an engineer did this he was pretty damn stupid and I really regret that if you're going to do that here's what you needed to do you roll offs in low end keep the 2.

(40:09) 5 and roll off the top end and now we go now we're going somewhere if you have gear that doesn't have an EQ you go turn to w2ihy notice what I did here we don't just go from one to the other I see these smiley faces makes me sick you want to creep up on them we call it Feathering you start at 50. and then you do a little bit of 100 we're coming up to the zero Mark and then we stay out to zero and then we start Feathering up to 2.

(40:46) 5 that's how you adjust Equalization you don't just slam it on there it's just so so so so sad but it's all about listening everybody needs a scope you can buy them for next to nothing at ham Fest today okay how do you how you hook it up I only I don't see in our any kind of so239 we go to antique Electric Supply when you buy a little box you put two coax connectors and you take a piece of rg8 or just a straight piece of wire we're just passing through thank you very much but on the input you do a voltage divider of 51k

(41:31) 680 the ground that Junction of 0.04 goes out to the RCA there's your scope and you can see when you're flat topping it can see when you have things all upside down we talked about using a microphone I have sold so many times I hear guys they're sitting back in their chair and they're talking in their microphone that's two feet away well remember this guy mm-hmm I don't think we want to argue with that every time you double the distance you lose six decimal doesn't will you put that on your hand

(42:18) and not forget it doubling your powers three you're gonna throw six away every time you double the distance oh Ohio you're crazy but you got to do there just turn up the game well if you do that it sounds like you're in a roller rink but I hear so many guys they're like this with their microphone because no one has ever taken the time to tell them they lost all of their dynamic range they lost all of their transient response never never should be more than two inches it's one of those things that

(43:00) these things bug me and and it's why common science that's why I'm here as you need to know about but many don't care deal the other thing is a thing we call plosives the heck is a closing Thief well a plosive Nui exit air some of us exit a lot more than others and so we end up with epops and to get rid of them there's two ways to get rid of them number one all of our microphones come with a windscreen I've heard guys say oh Joe take that stupid wind and sock off it makes you sound bad if you're using a windscreen

(43:57) it changes the audio you don't have the right one they're not acoustically transparent we go to Great Strides to make sure that we have them made just right so they don't injure the audio we also have them inside the microphone and what I like to do if you ever watch a broadcaster a lot of them don't talk into because that's where the Pelosi really come into it talk across it but your mz50s and all your other junk you can't do that Joe Walsh and I did so many things together he said y'all want you to make a microphone

(44:46) that is like my antenna and has power Focus and of course these are things that are out there that you never hear about probably because none of the other microphones do it even the re-20s and the great whatever things are 75 years old and you think it's the greatest thing on the planet it's not just a lot of people use it for ego and habit look at that that's how I build most all of our microphones watch the screen watch because you know well start with this you know how it goes what in the world happened to my audio

(45:40) I don't change anything it's the microphone and why do you see people like this with these dumb things all the time because if they get off it's gone see you later Joe said I don't want to do that and so watch first listen what happened to the audio whoa didn't change anything it's the microphone but watch the screen power Focus I can be 180 degrees off and it's still there so that makes it really nice put it in a boom and you talk across it and you don't have that Pelosi problem

(46:26) the windscreen also helps one of my great reductions was the pr 781 this microphone I built actually for Jesu but it's become the podcaster's dream saw one on Fox News tonight all kinds of broadcasters have figured it out along with rpr40 and I'm very excited about this microphone I hear so many of them people have discovered that we really did this right and I'm proud of this because he needed something the pr40 came along I I really didn't know what was going to happen Joe wanted a microphone that would

(47:16) get rid of 40 DB or rear rejection well that's not possible really really well those guys wrong didn't we oh I gotta watch it this thing has a lot of though and the pr40 it's become the darling of so many broadcasters and we're talking all the major networks podcasters and ham radio I didn't realize it was going to end up here but it did again my power focus is in play watch the screen and listen it's the only microphone on the planet that has 40 DB a rear listen and watch we're still working

(48:17) on its 40 DB down so you can imagine how the broadcasters love it they don't have to do a bunch of whatever to get rid of all the rear rejection because I did it for him let me plug this back in how'd I do that along with audio I'm I'm a real freak of phasing and antennas and all that I did it with phasing really this might be the most important thing I don't know the equalization is pretty good isn't it listen to this one I have a y chord not playing games here so I can have two microphones these are

(49:18) pr22s Paul Rogers asked me to build this for him because he wanted to have good articulation and he didn't have to equalize it as you noticed great articulation I'm not doing anything over here they're in phase when you're talking them the diaphragm goes down as should be uh one little side note do you know what happens if you have two signals in base learned that from the audio encyclopedia hmm how many decibel three when you double your power see if you can hear 3db this could be thousand dollars from 600 watts to 1200. listen

(50:08) huh well now wait a minute you really want to know this close your eyes because I'm going to take away a thousand dollars you ready here we go one two three the human being cannot detect 3db oh if we were in an echo chamber or whatever we could but no I could be here all night with that subject plays an important part but nobody talks about it I do I have a whole hour just don't have I have this magic little plug it's backwards pin three is to two and two is the three it's out of phase the end phase it goes down

(50:52) the outer phase it comes up well now wait a minute this sounds just like the other one yes it does and it's out of phase what happens when you take two signals out of phase are you ready watch the screen and listen they cancel this is coming down this is coming up how many hours do we have oh it's my favorite there is so much that it touches with our ham radio and gosh darn it I don't read it what's wrong with these people writing their self-proclaimed genius articles tell us something that means

(51:42) something how does your antenna work do you know so much about that foreign 1948 brought single sideband to ham radio it wasn't art Collins he was six years late to the party how do you get rid of the carrier who's out of phase how'd he get rid of the other sideband that's out of face some idiot piles on top of your only nice Q so you hit the notch Fielder he's gone how's that work it took his signal out of phase he's gone how did Dr yagi how did he come up with the yagi antenna I mean we're talking in days they didn't

(52:28) have great equipment he had two things he had a bunch of aluminum but he had a resonant resonant driven element and a field strength meter and so then he started moving things around started in with the different links and spacings and got into the eighth wave quarter waves and at one point he could get gain no batteries needed then he goes behind longer quarter wave halfway he started playing there it was out of phase hello you just saw what happened that's how it works phased arrays how simple are they if you've never done one of these you

(53:15) should this is an amazing antenna this was a 75 meter one I also had a 40 meter on it what happened here was I went to the telephone uh the uh power exchange company and they gave me those telephone poles there was I wanted them 65 foot high I did aluminum on the top and some fiberglass in so they didn't cause any problems they were just fantastic and we were they were 64 foot high 64 foot apart we're working in wavelengths everybody and so we bring down the lead 126 foot but look what we did we put a delay line

(54:02) of 43 foot 75 meters now we had a remote relay this thing this system is 500 feet from the shack here and by switching it left or right I can guide that signal from east to west really really big time you can do it with verticals and so on I used a meritron I also had another one I used DX engineering switching but I don't like rotary switches I hate them so what I do I go to antique Electric Supply and bought some Les Paul guitar switch and that's how I switch everything there's 35 relays behind me

(54:42) none of these little things you buy and you'd twist it man no they're all done with really good relays all the different phasing the colored ones are all the different some different uh yeah transceivers and so on you know you could do it with that but come on oh gosh it's just so much fun but let's talk about the height is not always better I read an article pay attention here this is very important the publication from art Collins stated most transmitting antennas of resonant dimensions elevated at a quarter wave above the

(55:30) ground are as close to 100 efficiency as possible you see your antenna has you know about the one you see it there's a reflected ray and if you could get those two together aha well I took that to heart and in 1976 when I came back on the arrowhead six meters as a ghost land it's a contest man what's your grid Square on there's all they want they want you grid screen they don't want to talk to you they don't care about you so okay took all my six meters stuff down I've been loving six I had for years

(56:09) I got an extra class license and land around 40 meters I had a group of guys and and every night I'd come on the air with a reference antenna at 20 feet so we could all I got California New Orleans Florida and one of the guys at the Comm Center at Collins and they'd get see what the atmosphere was doing one night it came on and it was uh five feet next night it came out it was at 40 feet that's right 50.

(56:41) you know what none of those are really you would think that that 50 would have done it no it didn't then I did what art wanted us to do I went a quarter wave 33 feet boom then we did it another night and took it to 66 foot it really really plays because we're getting those two together there's a lot of conjecture about what is the best antenna well there is no argument there's nothing like a resonant dipole for a great simple antenna yeah you can put some traps in it and do 40 and 75 pretty good but there's nothing

(57:28) nothing like resonant dipole I like to use mit's design of a coaxial dipole there's no question this is it this thing that covers uh entire 75 meter phone band I don't have tuners I don't like tuners I don't think we need tuners they just chew up a lot of your RF if you have a tuner and you rely on it you better think about it this is an incredible antenna and uh that it's always I love it and I hear these guys with the double bazooka what is it who did that I want to know who put that nomenclature that's

(58:10) stupid kid stuff it's a coaxial dipole designed imit at the invitation of our government in 1938 they wanted an antenna that would be great for radar no tuners nothing and cover the whole band that is what mit's coaxial dipole is so if you want to build one you look up bat go on my website it's there there's just all kinds of stuff I have done when I was on ham Nation I was on ham Nation 10 years we did all kinds of great stuff to try to let people that were just getting into ham radio know 2.

(58:58) 45 worked great did the yo-yo antennas they work great then you get into the things what do you do never ever ever use a pulley oh I got Marine but I don't care what you have it can load up with ice and snow and you're dead you use carabiners locking stainless steel six-inch carabiners it will never lock up what you see in the top right that's what I do for my coaxial dipole stick a piece of fiberglass and do it and you I'm sure you all know about what we can do with slopers and things like that

(59:39) some of the best wire that I use comes from mfj it's seven starands of Steel coppers played it and it is so strong and it it's just wonderful I love it where I'm at in this studio I don't I don't have room but my neighbor across the street her husband whose deceased now was a ham and she loans me her 70 foot tree and the 70-foot tree behind me at my other neighbor who works for Ameren and you do you can't even see it but man does that thing play oh yeah uh okay you guys with the balance line a

(01:00:26) twin leader and a window line no no every time the weather comes you're off the air here's how you do it and it really works you use two pieces of coax you bring out the Sinners that's your antenna connection but you want to solder together the two Shields then down at the bottom in the shack you do it again and you run that into a four to one balance Wow Let It Snow Let It Rain who cares so there's just all kinds of things there's a thing in an army manual if you're out in the field and you don't

(01:01:05) have any way to hang an antenna drive a nail in a tree no you're not gonna work DX but to try to summon somebody you can do it we tried this and it works a guy 10 miles away could hear me no I wasn't 40 over nine and one of my favorites Jim Aces are okay in a great idea idea for an attic antenna this is what he did from two meters to 80 meters and of course I'll cut the frequency where he needed it and here it is up in the attic Isn't that cool and for all you doom and groomers always somebody that oh well it does work check

(01:01:53) this out I checked 40 I checked all of them but I just copied 40 meters and it's just very very flat the only ones that suffered was six and two meters but he only wanted it for two repeaters and we cut that just for that repeater everybody was happy that's how it works I mean it is so much I could spend an hour on SWR I hate it when you just oh my God my SWR oh my God it's two to one I got to get off the air are you out of your mind come on when I first got into this business in 56 we didn't have any kind of meters we

(01:02:31) just did it if you're so inclined that you gotta have it flat put your darn dummy load on a tower and you'll have land [Music] then we can get into balance we're not talking about a balum another thing that Bob Heil goes straight through the ground when I hear you my ballum is working fine no you don't have a balama balanced to unbalanced that's where the word ballon are we not reading do they not tell us anymore I don't know I I just I give up when I first started Larry Burrows k0 dge about two days into my six meter Expose

(01:03:24) and so on he was one of the very first single sideband stations on six meters in St Louis to engineer at CBS and I started working him he was really thrilled because nobody would come back to him because he couldn't understand him I just happened to hit the bfo button one night and there he was we became great friends he taught me so much and I took a piece of coax up to him because I was having a hard time soldering you know through the little holes like the AWB horror man he'll kill you and he said heila you can't do that

(01:04:00) because you can't guarantee me those are all soldered I said what that's what the handbooks I don't care what the handbook says this is how you do it the first thing you do as you get this all set up and do the center but then before you start any of this you put that in a vise and you roll about a half inch of solder around it it's going to get really hot you come back in a half hour it'll be cool then you cut off about 3 8 of an inch you roll that down and you can absolutely guarantee every little

(01:04:44) Shield is soldered well people always made fun of me because you didn't do great well I got news for you until 2016. I visited with Tim Duffy the great Million Dollar Plus contestation DX engineering and I got in and here's 11 stations he's built they're all identical beautiful station 's great big clump of coax I look closer they're all done like that I'm going oh no I go over and shake his hand visit thank you what did I do would I do and I told him this story he said oh no kid no that's how you do coax connectors if

(01:05:46) you're gonna solder them I don't know there's just so much more I have a lot of people ask me how do I I use one microphone on everything and that's how the big story but I I make a patch panel like the old telephone operators and they're all nylon Jacks we cannot tie anything together in their grounds or anything and that works great for all of my uh gear we went through the pine board there's another hour program of building things that was really fun and we just we just do these things

(01:06:29) because we need to do them turn I also despise the microphone wire it's all junk you look at your Kenwood yasu icon it's junk it's 24 26 gauge and it's all inside one Shield well now wait a minute you have AC for the microphone you have DC for the push to talk and you're going to put them together in a shield no darn wonder you got RFI and so I said I'm going to fix it and I did tens of thousands of feet later look at that number one it's a pair of 18 gauge Mike wire because most all of my mics I use it is

(01:07:21) balanced and all of your transceivers have a hidden balance but the manufacturers don't want you to know it we do all of our cables are balanced but look at that blue and red it's on the outside of a 100 Shield it really means a lot so much of that's in my handbook if you don't have this the Dealer's have it or call our Factory and uh autograph it for you yeah and I'm very blessed in that recently I was given a PhD from Missouri University and music and electronics you have to think about it this is a kid that barely made

(01:08:02) it through High School to you know what aisle it took you 50 years to get here and then the biggie I'll sound the only manufacturer in the Rock and Roll Hall of Fame they know all the artists are there but one day the curator said you know what none of these guys would be there if it wasn't for those that gave their right sound systems and they found out who the number one was and I'm very blessed so that's kind of a nutshell and there's so much more I'm coming back three and four times to clubs will pick

(01:08:43) out a subject and do that and you're sure welcome to do that I just love sharing so much of this with you because it made my life and it still goes on I bet you have some questions don't be shy you gotta have something foreign you gotta unmute yourselves and anybody else with a question feel free to unmute at this point I have a question Richie good head Richie so that's Ohio two things um first so you've sold your company but you were the creative genius behind your company and it still Bears your name how do you

(01:09:26) ensure that there's still the creation let me stop that rumor right now okay first of all I am not retired I don't know where you guys get that my wife retired oh no I'm very do I look like I'm retired no no and our son who is a PhD taught for about 10 years in New York University Obama pulled his grants he's a classically muse trained musician plays lots of guitars he knows all the new bands which some of them I don't know but he and Stephen that's been with me for 26 years uh they're the two that's guided it and I

(01:10:09) wanted to make sure that if anything happened to me or Sarah Ash would take care of it and he is he's a genius kid so no it's not going anywhere it's still in the family and it always will be all right that's interesting because if you do a quick blurb it says that it was bought out by a company but but that's that's good to hear because there's tremendous creativity there the other thing um when you do noise cancellation like in earphones what is it exactly the process because if you hit the button to do the

(01:10:45) noise cancellation uh to me the audio is exactly the same but obviously now it's clear whereas before there was all of this other extraneous noise so what exactly is the noise cancellation process those two speakers are out of phase cancels a lot of the top end stuff and that's what we're wanting to do with it and that works great it's all about cancellation two signals out of face you heard the demonstration with the microphones right right there you go that's your answer we do that to headphones and

(01:11:26) hmm pile sound is the only manufacturer on the planet that does this first of all this is an amazing headset it's become the the headset for the big dxers and contesters I did everything they wanted I spent two years working I was even out on some some system with them they wanted a balance control so if you're left to right they wanted very soft ear pads but the speakers are way down inside here so if you have hearing aids or so on it won't feed back every one of our headsets this always bugs me I see oh I'll hurt you it hurts

(01:12:10) my ears you didn't read the instructions every one of them has a steel band in here so you get a pinhead like me fine but don't worry you're not gonna break it bend it and you can make it whatever you want secondly it wanted to Boom it went left or right interchangeable we have broadcast elements DX elements and the hc7 is my favorite it's just really great and then I put a jack for the monitors so if you have a monitor or you're a field day and you want people to listen you don't need a

(01:12:51) bunch of Y chords you plug it in right here you ready for this the only headset manufacturer in the world that has phase reversal you're going to say what's that do okay you ask the DX petitions and the contesters you hear a little signaling a little weak and he's way back here you reverse that phase and he comes up here you can move signals around in your head by reversing the phase it is a phenomenon that if you don't have a pro 7 any of our headsets you're missing it I'm telling you do it

(01:13:38) get it you'll you'll wonder why it took you so long to get with the program and we're I'm just so thrilled that I listened to you I build things I've told you several things about some of the products we built because people suggested things to me and I'm still doing that far from retired so I hope that answers that for you yes it does thank you okay George you have a question go ahead George on the phone George on the phone you unmuted yourself yeah George kd2fyu thank you hi Bob and

(01:14:23) uh yes I do recall Frampton and uh uh 1969 1970 at the Fillmore East that's one of the questions I want to ask if you were there and another thing is I started out with long lines in 1971 and the 400 to 4K audio response was drilled in our head with the 2.5 maximum but uh question was were you ever at the Fillmore East several times in different bands yeah we did a lot of things through there now that was a that was a Mecca I wasn't it yeah so many so many things that we did in those days yeah yeah yes Bob they were the house band at

(01:15:18) the time Frampton and uh and there were so many groups and and everything and all of that and thank you for coming back with it yeah this is George okay George yeah Santana was there quite often the dead played there a little bit but uh yep that was a great venue and it all went away thank you thank you I appreciate you having me let's come back and do more oh sorry I was Raymond Raymond you're next and then Rich okay thank you uh thank you for the presentation tonight um got a question you kind of came down

(01:16:03) hard on audio compression and limiting and um don't want to change mind but there's the compression used in top 40 radio stations that I think another different deal we're dealing with 3K wide it's a whole different compression system for broadcast audio and television all different to you I'm talking about this little sometimes two five and two no you don't need it towards the bandwidth is different yes yes there's a classical radio station compression compression can be clean if it's set up

(01:16:42) correctly that's the problem the compressors in the transceivers are not good and you're better off not to use it but hey if you choose to use it it's America have fun with it well when I'm into two-way radio LMR UHF um I want to experiment with audio processing because it gives more punch per watt instead of like your voice during this whole presentation has been quite low another speaker comes in and blasts my ears out so there's a lot of dynamic range in the zoom call which is awesome I like Dynamic change yeah but

(01:17:21) but it it if this was being transmitted on FM it would have been very hard to hear you above the noise floor why didn't you tell me to raise the gain by the way well I asked in the beginning I don't know it sounded good on my end it sounded good yeah I mean it's good don't get me wrong your audio is excellent but the dynamic range when another speaker comes in and blows my ears out that's a sign that compression would have possibly helped if your Audi if your average Audio Level had been higher

(01:17:53) you would have been a better match to the other callers again I probably should have raised to that nobody told me it was low I have all kinds of things to do that no it was good uh George in the room I I keep messaging uh who's at the computer to unmute the room that's why I haven't recognized you you're still you're still muted in the room so I was going to call on Rich while you take care of that rich thank you thank you Bob I am thrilled to see you here I got my novice ticket in 1970 and like a lot of the amateurs let

(01:18:29) things drop for a whole bunch of time but you and ham Nation single-handedly got me back in here all right got my extra and it's all because of you so thank you very much George thank you very much Bob I I hear that a lot ham Nation had a great impact on on us I I didn't realize Leo LaPorte and I put that together and I didn't know where it was going but it ended up being a very major thoroughfare for a lot of people many that got their license Leo being one of them but I'm really thrilled that

(01:19:09) somebody can take all the information and make their lives better okay George in the room you're unmuted now go ahead terrific thank you Bob um involving am broadcasting and even single Skype yet couple of things come to mind one of which is our speech in waveforms is not necessarily symmetrical if we have a real form that has a lot of second harmonic in it it's an asymmetrical waveform if we do even clipping uh it becomes symmetrical of course it sounds Hollow and it sounds false but we've learned as in you know as an

(01:19:56) expert against engineer that we can increase our volume levels by allowing audio levels to exceed 100 modulation in the positive direction and never in the negative and there's a lot of am audio processing of equipment that does that have you used any of it is there anything that's appropriate for playing radio yeah well when I'm talking about compression I'm not talking about your 520s and your icons and all that those processors suck they're terrible but what I use uh we've got a couple of things uh I I use the

(01:20:38) 528e that's got a really I mean how many radio stations have 528 East and uh there's the optimod really works great and that's over on that that console that didn't turn that camera on I should have done that for you but uh all of my all my old stuff is over there and it and that's what I use for that but that's a different subject I'm talking about your DX engineering by a transceiver I'm talking about that stuff on single sideband yeah yeah I guess what my uh my experiences with the old CBS lab

(01:21:18) series of Audi max volume max and that series of compressors that worked with a photocell and then uh okay photocell and Aid a little light bulb that are driving and then they had a brighter compression algorithm in it and they would look for positive Peaks and accentuate them and never let the negative Peaks um cut their carrier off uh because when you're modulating the negative Direction at zero we can't go any lower there's just nothing left but if you're modulating 100 percent um in your cabinet Direction you can

(01:21:57) continue the sky's the limit there but uh 200 modulation not allowed by the FCC on a broadcast sure a whole different ballgame with am that's for sure any other questions in the room I have I have one hand raised remotely anybody here besides me okay let me call on uh iPhone user iPhone go ahead and who and please identify yourself this is John ny2jj Dr Isle thank you for all you've put into the various Industries I'm wondering where nowadays we might be likely to hear you on the air uh every morning 38.85

(01:22:52) a.m we're there for about an hour hour and a half a bunch of us from Kansas through sometimes Indiana depends on what's going on but um I spent most of my time on am and it it's rewarding to me I love it but at night I might be anywhere but I I use usually do a lot of am work at night there's all kinds of knits and stuff like that but I don't have a place I don't really a lot of guys that'll email me and tell me to meet them on the 40 meters or whatever we do that no problem but I don't have a one place

(01:23:32) that I'm hanging out I I've tried that in the past but it ends up 30 40 people all piling in and I don't think that's fair so you chews up a lot of the band so I don't do that it just one to one you want to work meatwise send me an email we'll meet up okay thank you I had one question um I was just wondering because you were you had reflected about your time in the music industry and did you ever work with my buddy uh Ron delsner I don't think the name's familiar but so many but he was a promoter uh he's the

(01:24:21) Creator really of what's now called Live Nation no I uh hervey's office is a really great friend he came from this area Gario Speedwagon Michael McDonald which were customers of mine when they were in high school they weren't even known what by the REO and then Danny Fogelberg they were all Midwest guys that he took out to the coast and you know what happened there good stuff yeah no Ron was mostly on like the Northeast and uh he later uh teamed up with uh Slater so it was double their Slater Enterprises and they

(01:25:01) they pretty much he wanted to play anywhere in the Northeast you had to uh know them yeah yeah well thank you for your presentation it's excellent uh David 82 BGN oftentimes I am supporting a an event here on Long Island like the MS Walk or the ACS Law and then shadowing a managed member of the the team and recycle to listen to Megan control which one of your headsets would you recommend for a big pedal one year open and the other one uh listening to that control it's you know it's a personal thing I

(01:26:02) I just love the pro 7 it just everything you want but then there are others we have a lighter if you're going to use it with a handy talk of your stuff why there's bm17 or the even the the original one that we did back in 84 85 the bm10 real lightweight stuff so just look on the website there's a lot of them there and that you find the right thing that would work for you thank you sure you can always email me and we'll get on Zoom or whatever and help you too thank you so much uh anybody else have any more questions

(01:26:48) and I don't see any more but thank you this is one of the best ham radio calls I've ever listen to I really think question yeah hey hey Bob uh George again George again from New Orleans did you have anything to do with Janice Joplin's take another little piece of my heart that was a goodie goodie I I'd done the James gang and kind of stuck my toes into the that market and the promoter called from Keel Auditorium in St Louis and said we need to get you up here because uh we got a group coming in I've been in tell

(01:27:51) me that group was Jimi Hendrix and Janice opened uh with them and uh in those days we mixed right in front of the stage and I didn't know what I was getting myself into when Jimmy was about maybe six or eight feet in front of me on the stage and he took lighter fluid on his guitar and lit it I'm looking for the exits because I didn't know you gotta understand that I spent most of my early days doing that I didn't listen I hardly knew the Beatles were in 1965 or so when they came out I wasn't

(01:28:40) listening I'm listening to George Wright Jesse Crawford Lynn Larson all these great theater organs that taught me so much and all of a sudden I'm thrust into seeing this in front of my eyes I woke up pretty fast and uh we're we really got with the program my the funnest years was when I did the dead if you know that story it's a piece of History I got a call from the fox again and he said hey you have those big speakers that we gave you I do do they work yeah why he said well we have this group

(01:29:25) that's come in here today it was three o'clock in the afternoon and their pa didn't make it here's the story owsley who was a sound man for the for the year dead invented LSD by the way he was on probation he wasn't to be out of the state of California but they had a Hells Angels Funeral they needed to do and do Jersey so they thought we'll um to New Orleans and St Louis and Ohio they'll never know we'll sneak in there and then we'll go out and do the funerals well they did

(01:30:03) the show at the warehives warehouse and um the DEA and the FBI I heard about it that he was out of he was out of the state of California so they went sit in the back row when that concert was over Garcia and the band no cell phones hey Ashley will see at the fox at three o'clock okay he loaded the gear and when he padlocked the truck the DEA and padlocked him off they went back to California so when the band got on the stage at three o'clock the next day where's a stuff where's owes me they call back to the office in San Rafael

(01:30:46) and it's like uh he's in jail and so the stage manager handed the phone to Jerry and I told him what I had I had these great Olsen bins a lot of JBL horns and and all that kind of good stuff and um I can be there in an hour and a half I'll get it up here okay and so we did and and I have to tell you that I didn't know what I was getting myself into I loved it and I'm glad I did because it was the beginning of a whole different career for me it was it was something that you couldn't write the book you couldn't

(01:31:34) say well this is what I'm going to do none of that it just happened and so much so much of my life is like that it just came like this but one of my great great friends out of that was Jerry and after though that little torn things we went on with the rest of the tour oh there's one other little thing my my store here's a slide of that see a picture of one of the ye old music shop that was on all of our equipment and uh that I was in a music retail that's how I got into all this and Jerry uh called back the next day they

(01:32:27) were in Ohio and he said hey Kyle what's all this ye old music we have dark tough time saying uh we're just going to call you hail sound can we write that on the check history is fact Jerry Garcia named Heil sound and now you what was your company no my company was a yellow music shop and so and he would come oh three or four times he would fly from California to Marissa that was quite a little chore I actually bought a limousine and I could cart people back and forth 50 some miles from the airport because everybody was coming

(01:33:08) they were coming from England they were coming from Canada they were coming from all over because they heard about this dude that could help him and I did but we were talking about the wall of sound and I gave him some of my ideas that I thought would work something I didn't and right after that I got this call and the guy says uh you the guy that's got that big PA right and I said yes sir he said well um we need you tomorrow night in Boston I said not possible well you may not possible well we were out with Chaka

(01:33:44) Khan in Chicago because she was using one of my talk boxes it was a premier piece of one of her hits and I said I can't do that he said we'll find somebody I need you and he just really was very forceful and I said who are you he said who I said what you're oh you're the who I'm going wake up Kyle I told you I didn't know some of these people and so I said well we can't get there because we were one of the first companies that used semi trucks and buses I bought a bus so we could sleep 11

(01:34:19) people in it and all that and a 40-foot semi I said we can't we can't drive from Chicago to Boston well he said you go out to the airport and you were in a tiger Air Freight right and so we drove all of this up into the we made Boston and saved their tour because they were in big trouble they'd come over here with all new music they did Saratoga race track and the uh the public or the media was just eating them up I wish I would have saved the paper and said the who is dead and they were ready to go back

(01:35:00) but uh one of the guys that I knew well was there he said I think I got something that could help you so in that tiger Air Freight we went off we went and we saved their tour I was with him six years and became really good friends with Pete because Pete was very technical and of course I was there in 73 called me said come over I want to talk to you that's when I took these pictures he said you know quad sound as big right now yes he said build me a mixer that we can move Roger's voice around the hall can

(01:35:36) you do that no it's not in my vocabulary we were just finishing building a console with our sister company in England and it was the first wide refining mixer built I think maybe the only one and uh they were Pink Floyd and several others used it but just absolutely wonderful times in my life with Pete and we're still great friends and we still do a lot of things yeah I look like him too I didn't have to do what they did but I had to look like them there's a little bit of piece of that history

(01:36:12) but um yeah there's so much going on in those days and I'm blessed for it well if we got all of it done I think maybe I'll go in and see what I can do about getting something to eat what about you guys thank you so much and um was an excellent presentation and I think I'm speaking for everyone and you say we all enjoy thank you so much I'm glad to be here let's do it again we'll pick out something and do it okay have a good one just remember I'm always there for you email me we'll get up and talk about it

(01:37:01) bye bye for now