BY RON OCHU,* KOØZ

Making "Cans" Better!

CQ Reviews: Heil Sound Pro 7 Headset Mic

I wish a Happy New Year to my wonderful readers and hearty thanks for reading *CQ* and this column in particular. I enjoy sharing my ham radio experiences with you and I enjoy, even more, hearing from readers. Being a columnist is somewhat like being a musical artist. How so? Often times, performers report that they had no idea which of their songs would ultimately become hits. The same experience is true for me. Some topics generate more reader comments than others. For instance, I've received a lot of positive feedback over my Skywarn and proper grounding articles. Again, I thank you for the comments.

Speaking of which, my September article generated a lot of interest. Grounding is a very important subject and every year I continue to learn more about it. In that article, I point out that rods and pipes may be used for grounds. As a point of clarification, ground rods are solid and are driven into the ground. Many older homes have copper water pipes and the electrical breaker box uses the cold water pipe as a ground. That's fine, as long as the cold water pipe is connected to a copper, cold water pipe that is buried outside of your home and extends back to a well or a city water supply. The important thing is to know, for certain, if the copper water pipe leaving your home's foundation is still copper and it hasn't been replaced with a piece of PVC pipe. Otherwise, when it comes to driving a ground into the Earth, a grounding rod and not a section of water pipe is the only way to go to be compliant with electrical codes. Just to be safe and sure, I always use grounding rods. It's a little more work and expense, but it's well worth the effort.

Hopefully, I've clarified the difference between rods and pipes for grounding purposes, so, in the timeless words of the actor Jim Carrey, "Alrighty then!" Let's move on to this month's topic of making better "cans!"

Over the past months, we've looked at grounding, rigs, coax, antenna patterns, propagation, and a CW oscillator for the beginning ham operator. It occurred to me that an often-overlooked station accessory that goes a long way towards making our hobby more enjoyable is cans. "Cans," you exclaim? In radio parlance, the term "cans" refers to a set of headphones. Headphones with an attached microphone are called a headset, and just when I thought that a better headset couldn't made, the good folks at Heil Sound just proved me wrong.

Introducing the Heil Pro 7

My friend Bob Heil, K9EID, recently sent me an email in which he enthusiastically told me about a headset prototype that Heil Sound had been working on for the past two years. I just couldn't imagine Bob making any significant improvements to his already outstanding ham radio audio line. I have two of his headsets; namely, the Heil Pro

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Photo A. Roman Durand, KD9COA, gives the Heil Pro 7 a "thumbs-up!" (All photos courtesy of KOØZ)

Photo B. The Pro 7's adjustable headband with very comfortable padding.

Plus and its predecessor. Both have and continue to serve me well. I've used both for casual QSOs (conversations) and for breaking through DX pileups (huge numbers of hams calling at once for the attention of one, distant station). So to be really honest, I was wondering if any real improvements outside of cosmetic ones were in the offing. I'm here to tell you that, "a better mouse trap *can*, and has been invented." These headphones are awesome, *Photo A*.

Define Awesome

The Heil Pro 7 Headset is robust. When the package from Heil Sound arrived, I pulled out the headset and my initial impression was that these look very similar in appearance to aviation headphones, but much more colorful. I asked myself, "will these be comfortable to wear for hours on end while I am on my quest to find and work DX stations and ATNOs (All Time New Ones)?" Will this headset help me dig out those hard to hear, weak stations? I know that looks can be deceiving. The headset has an adjustable stainless steel headband enclosed within an extremely comfortable segmented padded headband, *Photo B*. Adjustments to the headband can be easily made with two thumbscrews. The ear pads are gel padded and the pressure from the ear pads is easily adjusted with the adjustable headband. The gel padded ear pads, *Photo C*, also come equipped with removable cotton coverings for periodic cleaning.

Okay, Great Appearance, But Do They Feel Good?

When I first donned the headset, I expected it to feel heavy and somewhat uncomfortable. To my very pleasant surprise, it was not the case. The headset felt comfortable and not bulky at all. The Pro 7 felt balanced and sat well over my head and on my ears. What I didn't expect to notice, and it took me aback, was how quiet my shack became when

Photo C. The Pro 7's headset pads excel in comfort and outside noise reduction. ←

Photo D. Pictured is the Pro 7's HC 7 dynamic microphone with wind screen and a versatile boom.

Photo E. The balance control helps ease fatigue during contests.

Photo F. The phase control makes a big difference in digging out the weak ones.

Photo G. Pictured is the Pro 7's PTT (push-to-talk) switch that can either rest on a desk or be clipped to a belt.

I put on the headset. Heil Sound specs indicate that the gel filled foam ear seals provide 26 dB PNR of outside noise reduction. So what do those figures mean? In other words, put these headphones on and your outside world becomes a whole lot quieter. It's just you and the headphones. While I was using the Pro 7, my wife Debbie, KC9ULA, had to tap my shoulder to get my attention. I was able to see her lips move, but I had to take off the headset to hear her. I wasn't able to hear her at all, and I did not have my radio's volume turned up high. Now please don't read into this that not being able to hear my wife while wearing the Pro 7 is an added benefit. All I am saying is that this headset is quiet.

Another example is when my stepson, Roman, KD9COA, had some of his fifth-grade buddies over. They are generally well-behaved lads, but after a few sodas and some cookies, they get loud. My ambient household noise floor level just became a whole lot louder, but nothing that the Pro 7 wasn't able to handle. I put them on and I was chasing DX like before, in the peaceful, quiet, solitude of my shack. I've worn this headset for a few hours at a time and I forget that I am even wearing it for it is that comfortable to wear. I thought my Pro Plus was great, but the Pro 7 just set the standard a whole lot higher.

Nice, But How Do the Headphones Sound?

To be "awesome," a headset not only needs to feel comfortable, but the audio (both received and transmitted) needs to excel as well. The Pro 7 accomplishes both hands down. Let's look at received audio first. In *Diagram A*, we see an audio frequency response chart. The Y-axis (vertical) is an indication of power and the X-axis (horizontal) is the range of frequencies from 20 to 20,000 Hz. This range is known as the audio range because most of us can hear this range of frequencies. Notice that the Heil Pro 7 headphone speakers respond from 100 Hz through 12,000 Hz before attenuating at the lower and higher ends of the audio spectrum. This is a good range for human hearing.

Music audiophiles would want speakers that would go a bit lower and higher in order to hear those really low and higher notes, but for ham radio, these speakers are just what we want and need. Higher response means static is also emphasized and who wants that? Please note, in *Diagram A* that the audio response line is for the most part a straight line. This is what engineers' call "flat response," which means that all frequencies are equally reproduced, resulting in natural-sounding speech.

Photo H. The Heil foot switch for hands-free PTT operation.

Photo I: Newly licensed amateur radio operator Tommy Reznicek, KD9COD, checking out the Pro 7's balance and phase features.

However, please note that the flat response does peak in two areas. The curve rises at 2,000 and at 5,000 Hz. This characteristic allows SSB (Single Sideband) signals to sound more natural. This rise also gives a SSB signal a little extra punch to make it stand out from the noise and render the signal more intelligible. Very helpful when differentiating between signals in a pile-up or for picking out weak signals.

How About Transmitted Audio?

Bob Heil is releasing the HC 7 dynamic microphone element. The HC 7 is an improvement over the Heil 4, 5, and 6 elements. This microphone element is intended to make SSB speech sound more natural while at the same time placing emphasis where it needs to be to help bust through DX pile-ups. Let's look at the frequency response chart for the HC 7. In *Diagram B*, we see that the dynamic microphone audio response curve is mostly flat from 300 Hz to 1,500 Hz before it dramatically rises from 2,000 Hz to 4,000 Hz, which is the traditional Heil speech articulation rise. This rise is exactly what allows his 600-ohm impedance dynamic microphone elements to punch through the pileup by putting the audio power exactly in the audio spectrum where the human ear detects it best.

Nice Specs, But How Does the Microphone Element Sound?

If you've been reading the ham publications as long as I have, it always seems that whenever someone reviews a new piece of ham radio gear the first contact on the air is with some distant part of the globe such as Australia. A standing joke I have with my ham buddies is that no matter what piece of new equipment I try out, whether it's a new antenna, a new rig, or a power amplifier, I invariably work someone in Ohio. Nothing against Ohio, but once, just once, I'd like a first contact using new gear to be anywhere outside of Ohio.

My first contact using the Heil Pro 7 headset was on November 4, 2014 at 02:31Z (Z is for Zulu time or Coordinated Universal Time, UTC) on 20-meter phone with Alaska. "Woo-hoo!" Finally, I made a contact using a new piece of gear outside Ohio. Using the Pro 7, I punched through the small pile-up on the KL7 with ease.

However, the real test for the Pro 7 would be to see if I could work the Tromelin Island DXpedition, FT4TA, using this headset. Like any good DXer, I listened and I listened before transmitting. As soon as I got the DX op's rhythm down, I gave a call on 20-meter phone from central Illinois and I broke through the pileup for an ATNO (see above)! I'm not saying that the Pro 7 was the exclusive reason for my two-way with FT4TA. Using a Yagi and an amp helped, but it sure didn't hurt having that dynamic HC 7 microphone element's articulation rise to aid me in punching through the competition.

A few days later, my friend Mark, WD9HBF, hadn't worked Tromelin and he desperately wanted to put the DXpedition into his logbook. The problem was that time was running short and he wasn't able to hear the DXpedition from his QTH. In less than 48 hours, the FT4TA ops would be pulling up antennas and going QRT. Mark dropped by my QTH after work, and we heard the FT4TA ops on 17-meter phone. I had the rotatable, 17-meter dipole pointed towards Tromelin, my amp warmed up and the Pro 7 ready for Mark. He donned the headset and three calls later (I am not exaggerating), Mark broke through the pileup and was in the FT4TA log for his ATNO! We celebrated Mark's ATNO and then I went after the FT4TA an hour later, but the band had dropped out and not even the Pro 7 could change propagation, darn the luck!

I'm mostly a CW operator, but I did strike up a number of casual conversations on the air and no one complained about the audio sounding "mushy" or distorted. In fact, my audio was given many compliments. The HC 7's element is attached to a lightweight boom that is very flexible. It's not a problem to place

the HC 7 near your lips or to move it completely out of the way for CW or digital operations, *Photo D*. The ability to move this headset's microphone element boom from side to side or up and down gives it a great deal of user flexibility.

Any Other Headset Features?

As a CW operator and a DXer, the most important feature for me in a headset is its ability to immerse myself in a radio band's sounds. Immerse myself in a band's sounds? Did I read that correctly? Yes, you did. Immersing myself in a band allows me to listen to the static, but to me it just isn't static. Does the static have a little flutter to it? If it does, then that tells me there is a polar path open somewhere. Is the static constant or does it vary in intensity? Any variations indicate that the band may be opening up to another part of the globe.

These telltale audio clues are far more discernable when donning a pair of cans. A good pair of cans helps me be where the DX is and to work it before the DX is posted on a cluster. When I wear the Pro 7, I can focus more easily on CW signals or for that matter SSB signals. This headset makes working weak signals a lot less strenuous. Another benefit of the Pro 7 is its ability to let me detect weak signals, and to discern between them. Of course, the greatest filter to detect

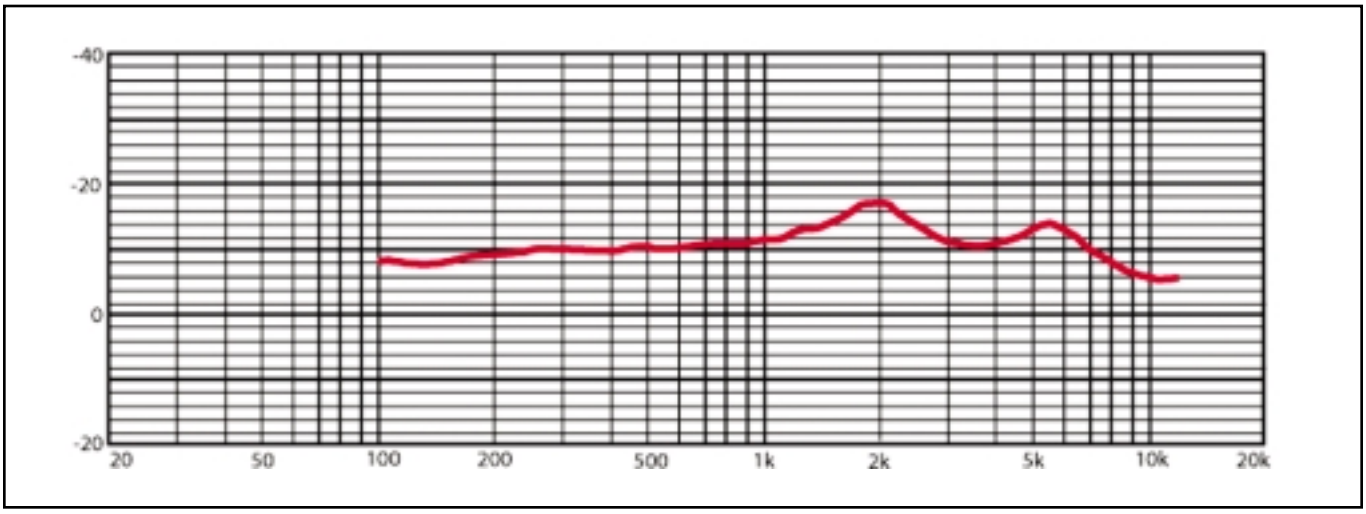

Diagram A. Receive audio frequency response chart for the Heil Pro 7. (Courtesy of Heil Sound)

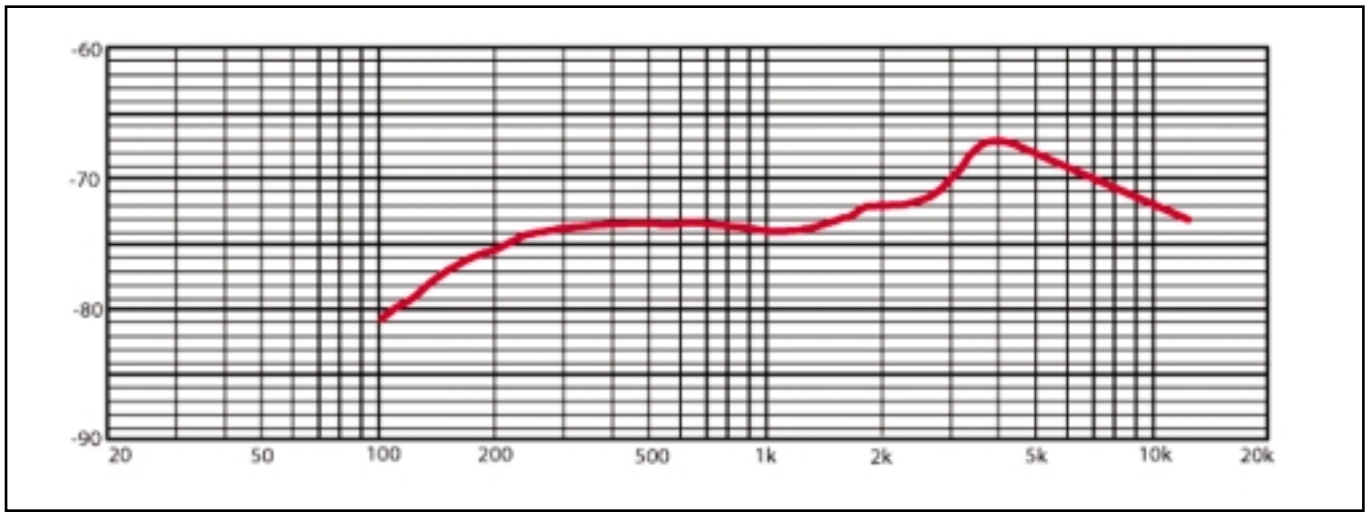

Diagram B. The Pro 7's transmit audio frequency response curve. (Courtesy of Heil Sound)

and discern signals is the organ between your ears, but the Pro 7 makes the job even easier.

Here's a case in point: I'd like to think that all hams behave well in a DX pileup, but unfortunately, that is not always the case. In a recent DXpedition, some op was on the same frequency as the DXpedition pretending to be the DXpedition operator. He would give signal reports to someone calling and that unsuspecting operator would mistakenly think that he'd just worked the DXpediton. Using the Pro 7, I could detect some subtle differences between the real DX op and the bogus op. For instance, the DX op's signal had some flutter and a little QSB (fading in and out); whereas, the impersonator (we call them pirates in ham parlance) had no flutter and no QSB. He was a distracting irritation, but because I could discern the difference, I worked the real DX operator and I was able to get my call letters into his logbook. The Pro 7 enabled me to figure that out much more easily than if I was listening to a loudspeaker.

Balance and Phase

Since we are on the topic of listening with cans, two other great features of the Heil Pro 7 headset are the balance and the phase controls. Mounted on the left earphone with the microphone boom is the balance control, *Photo E*. As the name implies, you can switch the audio balance between the two earphones, which helps to reduce operator fatigue during a long QSO or during a long contest session.

Another awesome headset feature is the phase control, located on the right earphone case. If you've haven't experienced phase reversal in a headset, then you are in for a nice treat. The switch allows you to "acoustically move" the signal, which greatly helps you to discern a signal under high-noise conditions such as in a pileup or interference from a nearby signal. In-phase signals sound normal to hear. The headset with the phase in makes the audio sound as if it is centered between my ears. Whereas, switching to "out of phase" reverses the phase, which has the effect of making the audio sound as if it is now outside of my ears. Out of phase causes the audio to arrive to each earpiece at slightly different times. This effect accentuates some signals and cancels out others, which make this feature a great tool for digging out weaker signals, *Photo I*.

PTT

PTT (Push-To-Talk) is accomplished with a truly nifty push button that has a belt clip, *Photo G*. The PTT can be attached to a belt or it can lie squarely next to your rig on the desk. I prefer hands free PTT so I use a foot switch, *Photo H*, that integrates well with the Pro 7.

Connectors

The Pro 7 has a locking 6-pin mini XLR connector on the left earphone cup with a 3-foot expandable, coiled cable terminating in a 1/8-inch mono male plug and ad a 1/8-inch stereo headphone plug which also includes a 1/8-inch to 1/4-inch adapter. To make life easier, Heil Sound has another adapter that will interface with almost any manufactured rig and the Pro 7. The AD-1 is color coded for a particular transceiver. For example, Red is for Kenwood, Alinco, and Elecraft. Yellow indicates Yaesu and Flex. ICOM, Drake, Collins, and Ten Tec radios are also supported.

Will the Pro 7 Work With My ICOM?

In addition to the standard HC7, there is the iC Electret microphone element for ICOM transceivers which will deliver the same, clear, crisp, DX punching audio as the HC 7 dynamic element.

The Boss

Heil Sound's literature calls the Heil 7, "The Boss." I feel it's a safe bet that when you don a pair of these cans, you too, will be calling it the boss. Military spec reinforced fiber cables with the XLR connector, along with speaker cones that exhibit very low distortion and superior clear, clean audio; especially in the all-important 2- to 4-kHz range, will make listening to your transceiver an even more enjoyable experience.

Combine those features with the balance and phasing controls along with an improved microphone element and you'll have a game changer in the amateur radio headset market.

Oh yes, the Pro 7 comes in four colors: Blue, black, red, and pink. And to think, just when I though no real, significant headset improvements could be made in the headset (cans) market; along, comes the Pro 7 by Bob Heil, K9EID.

Until next month, happy New Year and 73 de Ron, KOØZ