HENRY KLOSS: AUDIO INNOVATOR

John Begg
Aug 16, 2015

MID-ATLANTIC ANTIQUE RADIO CLUB

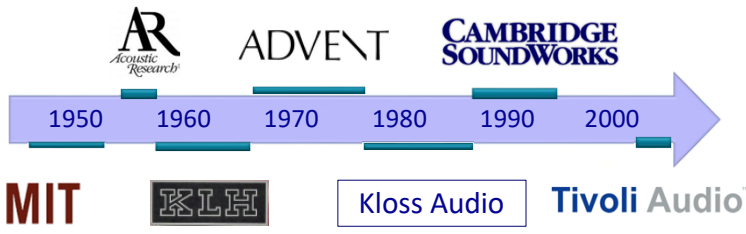
Introduction

- Henry Kloss

"It's no trick to design outstanding equipment if cost is no object. The challenge is to achieve high performance at reasonable cost."

August 2015

Kloss Corporate History



August 2015 3

Student Days at MIT

- Came from Tyrone PA in 1948
- Furniture workshop in his loft to support himself- Kloss Industries; made speakers for Baruch and Lang

August 2015

Born in 1929
Worked on radios and PAs in high school
$250 scholarship to MIT. Made money for school doing construction in 1947 with relatives in California

In the 50's, while a student at M.I.T., he worked on live broadcasts of the Boston Symphony Orchestra — he was asked to help by FM radio's inventor Major Edward Armstrong

Making cabinets for speakers at MIT
"One then learned hoe miserable the loudspeakers were, got some interest in the field."
http://www.kallhovde.com/advent/kloss-interview.pdf

In the Army Now

- In the Army in Fort Monmouth, NJ
- Night school classes at NYU
- Met Edgar Villchur, inventor of “acoustic suspension” speaker
- "This is obviously the way speakers should be built; let's build it."

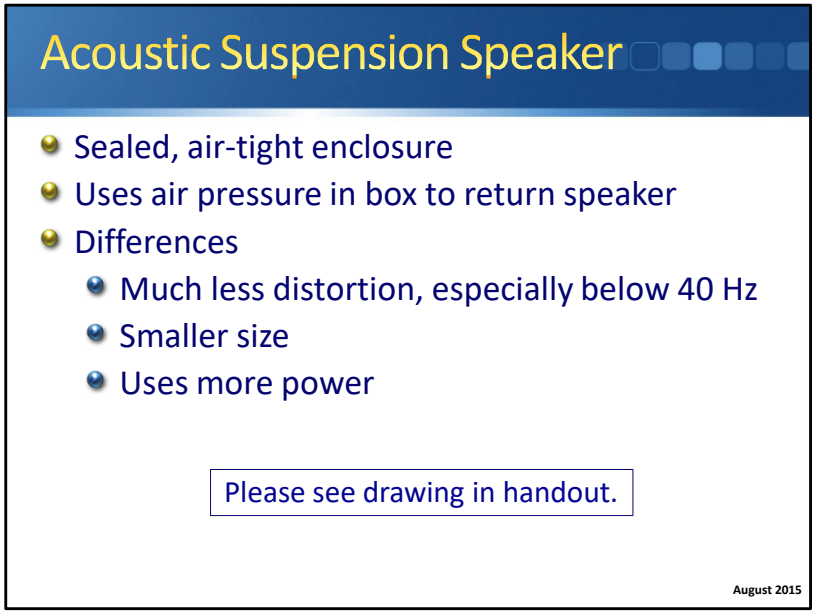
August 2015

With Milt Margolis teaching electronics at Ordnance School for Nike and Corporal missiles
Villchur taught “Reproduction of Sound” night school course (MA in Art History to be a set designer), opened a radio repair shop, self-taught audio engineering
Villchur went to two companies—Bozak? Altec?
Since the mid-1920s, virtually all speakers were based on the "hornless loudspeaker" of Chester Rice and Edward Kellogg, which used mechanical springs to pull the drivers back into place once they had fired, and provided an ultimate limit to the drivers' movements. The Rice-Kellogg model had serious problems — the limitations of the mechanical springs caused severe distortion in the low frequencies, and the design required extremely large cabinets, making them useful for places like movie theaters, but completely impractical for home use.

Using a small, sealed cabinet in conjunction with a highly compliant low-frequency speaker, Villchur had devised a small loudspeaker whose bass response blew most of the big ones away. It was heresy, but it worked. During one of the lectures Kloss came perilously close to enunciating the principle on which Villchur's prototype was based and Villchur decided to take him into his confidence. That night, the famed Advent speaker was on the way to being born. The two talked into the night, driving to Villchur's home in Wookstock to view the prototype. "We could have hired a professional loudspeaker designer," Villchur said, "instead, Henry hunkered down, disciplined himself and became one.“

Villchur self-filed apatent for acoustic suspension, got royalties. Electro-Voice countersued and won. V decided not to fight, citing Edwin Armstrong.

https://www.youtube.com/watch?v=g9mqO6PYAJ4



Reduce size of enclosure until air spring is strong enough to replace mechanical springs
Regular speaker for below 40 Hz, need 14 foot cabinet
Low sounds are usually emitted by objects large enough to generate the long wavelengths of those notes. Mr. Kloss provided extra power to the low end of the sound spectrum and designed the speakers to accommodate the extra punch without overpowering the rest of the tonal range

Kloss worked out a fixed proportion at low frequencies between the cabinet's volume and loudspeaker's efficienty.

Prior to AR's acoustic suspension design, loudspeaker technology primarily utilized some form of vented or baffled enclosure where a relatively stiff mechanical spring force was applied to the r-e=r76-cc to return it to its resting position. This spring force tended to become increasingly non-linear in its action as cone movement increased from either higher output levels, lower frequency, or both. In order to reproduce lower bass at higher output, large woofers were needed, resulting In larger cabinets. In addition, the large cones became more massive, and in order to maintain reasonable efficiency without an enormously costly magnet structure and voice coil assembly, cones had to be designed with low density. The net result was the loss of stiffness which resulted in driver "break-up" and uneven frequency response with resonance, thus trading one form of distortion for another. AR's solution was the revolutionary AR -1, the first loudspeaker to use the air compressed inside the sealed enclosure to control the excursion (movement) of the woofer. The woofer was given a very "soft" mechanical suspension, including the now legendary "half -roll" surround. The voice coil and magnet pole piece were redesigned for long excursion while a very stiff cone was fabricated for rigid, piston - like action. The woofer was then mounted in an airtight enclosure. The trapped air within the speaker cabinet exerted consistent pressure on all points of the woofer to precisely and evenly control and dampen the woofer movement. The result of this acoustic suspension design was reduced distortion and greater bass response in a substantially smaller speaker enclosure. (Story continued at your AR dealer) For the A dea er nearest you, call 1995 Acoustic Research, 535 Getty Court, Benicia, CA

Co-founded Acoustic Research (AR)

- Convinced Villchur to start business in his loft
- Capitalization $6,000
- Created AR-1 speaker in 1954

See AR article

Oldest known AR-1 speaker, SN 0074

August 2015

Villchur: We needed an audio engineer, but couldn't afford one, so Henry taught himself to be one.

AR-1 Debut at 1954 Audio Show

- Two AR-1 prototypes for Audio Show
- Julian Hirsch after show: The AR-1 “established a new industry standard for low distortion bass.” -Hi-Fi Stereo Review/Stereo Review
- High quality audio reproduction available to moderate budgets
- AR-1 priced at $185, AR-2 at $85
  - Sold 455 in first year
  - 32% of market in 1957
- In three years, AR making $750,000 per year

August 2015

Julian Hirsch of Popular Mechanics, then Hi-Fi Stereo Review (Stereo Review)
Even college students could afford ARs. They were better than the amps they could afford.
Not the best, but the best reasonably priced.

Julian Hirsch, writing in Stereo Review 35 years later stated, "When I left, I felt certain that I had heard the future of high-fidelity sound in the home—as it turned out I was right."

KLH Founded

- 1957, Cambridge, Mass
- Henry Kloss, Malcolm Low, J. Anton Hoffman
- KLH Research and Development Corp.
- Made speakers, radios, turntables, tape players
- Made most of the parts inside

August 2015

Villchur liked to stay in his home and workshop in Woodstock NY. Henry ran stuff in Cambridge. That apparently didn't work too well.

Henry Kloss, Malcolm Low (war buddy, fellow instructor at Fort Monmouth NJ US Army electronic school for Nike and Corporal missiles), J. Anton Hoffman. Mention MM

Early KLH Speakers

- Models One (two), Two, Three, Four woofers
- Tweeters fit in top shelf
  - KLH tweeters or Jensen tweeters

August 2015

Six–His First Truly Great Speaker

- Six was the standard, “got the sound right”
- Epoxied cabinet to seal it
- Vertical consolidation of production, made paper cones

August 2015

Made speakers with woofer and optional tweeter (KLH or Jensen electrostatic)

1958
10” woofer,
Mixed paper in blender. Hand-made forms to make cones
he maintained a distinctly seat-of-the-pants approach to research and development and design engineering. He continued to make many of his speaker parts in-house, sometimes employing unorthodox methods of production. With his famous Advent loudspeakers, Kloss created the cone material using (among other things), chopped up grocery bags, orange light bulb dye, and a blender! And the shape of the cone was based on a sketch he had made on the back of a napkin.

A known perfectionist, Kloss eliminated all the distortions and irregularities he could. Then he took his speaker to the first Radio Shack store, on lower Washington Street in Boston. ''In those days, hi-fi stores were run by musicians and other people who really loved music,'' Kloss recalled. He asked the clarinetist, the violinist and the English professor who ran that store to listen and to evaluate his speaker. He integrated their feedback into his design. At this level of development, Kloss says, he was concentrating on timbre, which is actually subjective and is described by terms like ''cool,'' ''warm,'' ''rich'' and ''mellow.'' Kloss has always aimed to produce a sound liked by experts he trusts, and by the sophisticated buying public. That's a sharp contrast from consensus-driven product development. Kloss points out the Japanese have made that mistake in speaker design.

Read More At Investor's Business Daily: http://news.investors.com/management-leaders-and-success/090899-359857-hi-fi-entrepreneur-henry-kloss.htm#ixzz3iYzw3Yh4
Follow us: @IBDinvestors on Twitter | InvestorsBusinessDaily on Facebook

Four and Six Ad from Radio Shack

Best-selling bookshelf speaker of the 1960's

Problem with replacing capacitors. Epoxied all around, including speaker to front baffle.

Model Eight Radio

- Seven tubes, two 3.5” speakers
- Antenna in cord
- Solid walnut cabinets

August 2015

This shows one modified by Kent Hollignsworth to accept aux input. Geekyshrink on eBay, published booklet on how to restore Model Eight, even cleats.

Model Thirteen Multiplexer

- When multiplex standards set
- All Transistors
- “MP Test”

August 2015

Hold test button for high tone, then release

Tape Deck with Dolby B, 1968

- Model Forty-One
- Phone call and trip to England
- Added to tape deck made by Nakamachi ($230)
- First problem product of KLH

August 2015

Attacks only high-freq noise (Dolby B), unlike pro units which go at all freqs (Dolby A)
Ad in High Fidelity mag said ""…the only difference was $2,900."

as many went back dead as were sold. KLH then went to litigation with Nakamichi and as part of the settlement, a dedicated team came in and rebuilt them 1 by 1 for both the mechanics where most of the problems were and the electronics that were designed and kitted by KLH for assembly. KLH ended up with a warehouse full of these rebuilt but no dealer would touch them. Creamer's bought them for $15 and sold cheap or gave as bonus with Mac.

Model Eleven Portable Phonograph

- First all-transistor phonograph
- Ad: “They laughed when we sat down to play our luggage.”

August 2015

Ported speakers??

Other KLH Products

- Music Systems

KLH Twenty Four

- Amplifiers/Receivers

KLH Twenty Seven Receiver

KLH Sixteen Amplifer

August 2015

Add my prototype Model Sixteen

Model Twenty-Plus

August 2015

Cabinet for turntable and radio is ALL walnut, speakers are walnut veneer with uncovered side on the bottom
Speakers are Model Twenty, made deeper to match depth of control cabinet

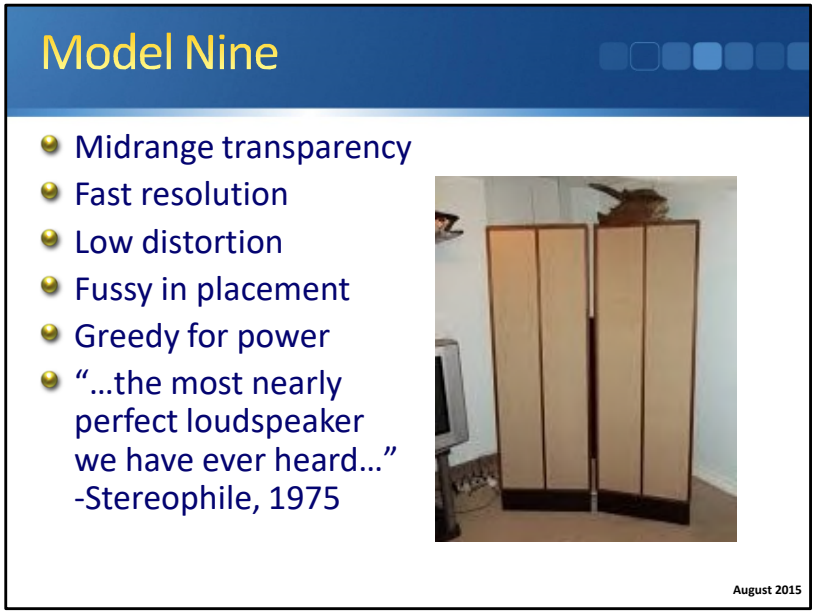
KLH Burwen Dynamic Noise Filter

- For phonos and tapes, adjust sensitivity and muting for every record
- Later version called Transient Noise Eliminator

August 2015

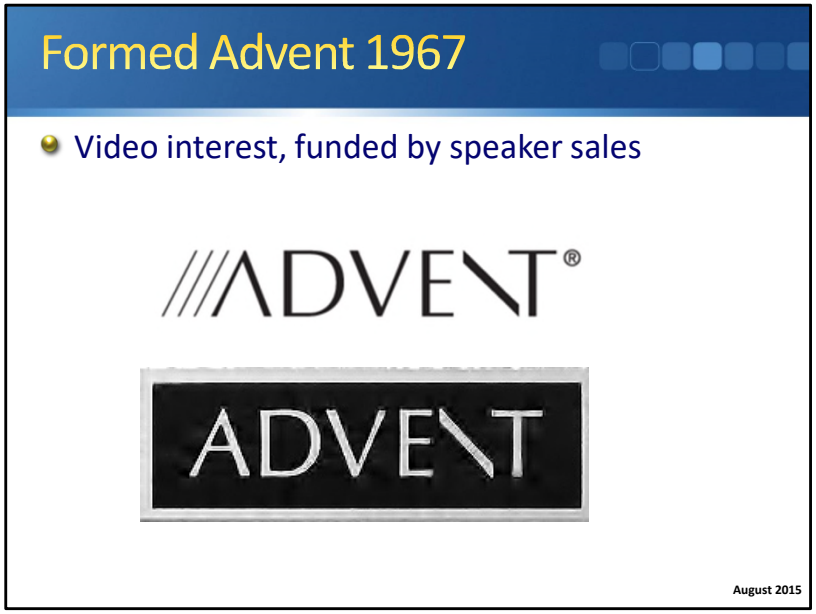
Designed by Richard Burwen as consultant to Lafayette, then commercial line bought by KLH
Later model had two knobs, instead of slider and buttons
Basically you detect very fast rise times (this is easy to do electronically) and then when this happens, mute the input. Of course there should be some kind of sophistication to do this mute in the most inaudible way, and to keep phase and freq response flat.

DNF-1201A, TNE 7000A
Adjust for every record
?? 1. You have a muting circuit to mute the signal when the transient starts.
2. You have a transient detection circuit which reads the L-R component (the vertical movement of the groove) and triggers on fast rise times (ticks)
3. There is some kind of delay circuit so the detector can mute the tick AFTER it has been detected.



9. KLH Model Nine on The Absolute Sound 12 Most Significant Speakers

More than any other electrostatic speaker of its era the KLH Model Nine was the watershed moment that proclaimed the full-range 'stat had indeed come of age. The vision of peripatetic designer and collaborator Henry Kloss (his fingerprints are also on this list's AR3a and the Double Advents), the Model Nine and its more potent iteration known by well-heeled owners as Double Nines, is significant in that it took the transcendent qualities (midrange transparency, resolution speed, and low distortion) of the parlor room-restricted Quad ESL and added properties like 40Hz bass extension and improved output. But this six-foot dipolar had an attitude—fussy about placement and greedy for power, it blew fuses with regularity. It could be beamy in the treble, too, but when all the stars aligned few cone speakers could match this naturalistic combination of liquidity, speed, and power, making it the rare companion able to capture near symphonic playback levels. The Model Nine has been the inspiration for virtually every planar-style loudspeaker since. **Neil Gader**



The Advent, that became a classic. Explaining its birth, Kloss says, "Well, the business was there, one knew how to make speakers and doing development work on television-which is really what the project was at that time—is a very expensive kind of business. One needed it to make the company go, for the money."

With $400,000 he received from the sale of his share of the second speaker company, KLH,

So, according to Kloss, the classic, revered Advent loudspeaker was an afterthought- a cash cow for the TV business, nothing else.
No wizardry or artistry was involved. "Artistry has absolutely nothing to do with it," Kloss said.
"Its purely a matter of knowing the physical laws and how the materials behave and putting it all together. And then it's not just a lot of frustrating tedious work. So what I'm doing now is the same thing I was doing in the very beginning back in the lab, back screwing drivers into little boxes. From loudspeakers to loudspeakers in 35 years—I don't know what that means."
Tyrone Daily Herald http://www.newspapers.com/newspage/13591765/

Advent Speakers

- Original Advent competed with AR3a at half the price
- 1969

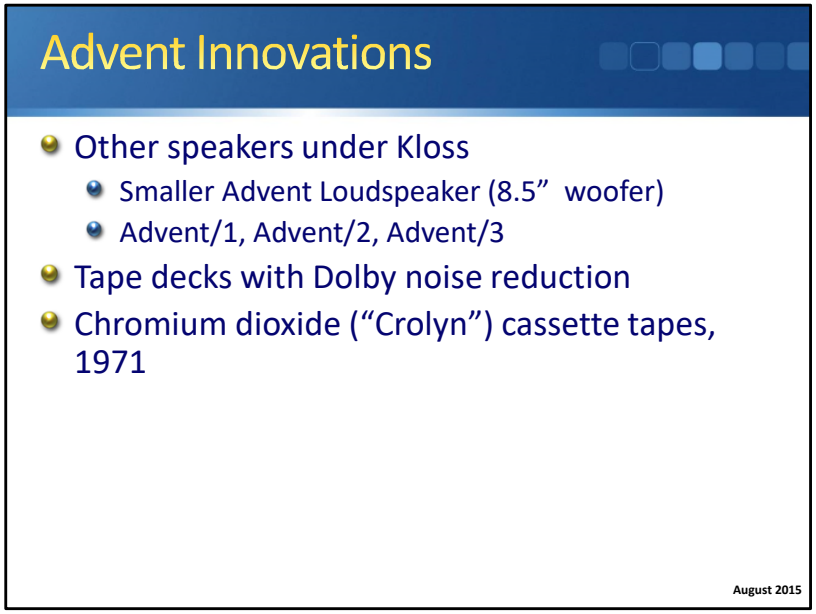
August 2015

The Advent featured a small, hard-dome tweeter and a 12" air-suspension woofer and was available in a cabinet of MDF (standard) or real wood.
Could get in real wood
Read more at http://www.stereophile.com/historical/506advent/index.html#pcxHcbFuST0VKzs1.99

Stacked Advents

August 2015

#10 in **The 12 Most Significant Loudspeakers of All Time**



First HiFi cassette decks
By early 70's five of every six speakers sold were Advents.
Kloss brought in designer Andy Kostatos to voice the smaller advent (later to found Boston Acoustics)
Advent/1 replace Smaller Advent
Advent/2 poor man's Advents had double tweeters (cheap paper), tilted in two directions. Version has plastic cabinet. Not good.
Advent/3 same tweeter as A/2, but just one. 6" woofers. Terrible efficiency (85db/watt)—power hungry and bottom out.
New Advents 1978 50 Watts for tweeter, 100 watts for woofer
Jensen bought Advent around 1989

Advent 400 FM Radio

August 2015

Tom Holman, another audio genius who later developed THX for Lucasfilm (trivia: "THX" stands for "Tomlinson Holman's eXperiment" was working on audio processing at Advent

Advent 300 Receiver

- Typical clean exterior design
- Tomlinson Holman designedhighly-regarded preamp section

August 2015

Lots of money going into the TV project.
35 steel parts in the tube
Tom Holman again

Advent Video Beam 1000

- 1972
- $2,795
- Screen 4.5’ X 5.7’

August 2015

Or 1974
Reportedly, he claimed to have never watched television before deciding to build one.

A Kodak engineer mentioned using aluminum foil in a reflective screen
Lots of money going into the TV project.
35 steel parts in the tube

Kloss forced out of Advent in October 1976

Kloss Video Corporation

- 1977
- Nova Beam
- Used his “Novatron” tube
- “One is not a tinkerer.”

August 2015

Went into his basement, set up a lab with glassworking equipment and a clean room to design a tube that was simple inside.
He made the projection mirror an integral part of the tube, its back. A glass cylinder connect the mirror to the tube’s faceplate, and Kloss put a phosphor patch on the faceplates’s inner surface. An electron beam shoot through the mirror at the back of the tube, traverses the evacuated cylinder, and paints an image on the phosphor patch. The image is reflected by the mirror through the faceplate, immensely enlarged. Advantages: fewer parts; matching curve of mirror and faceplate make them easy to align.

As if Werner von Braun, Lee Iacocca and a Tolkien hobbit had all crawled into the same body.

What has driven him, he says, is not money but the urge to create new technologies so right for the time that other companies must follow suit, verifying the importance of the designs. Whe he needed a small, high-quality speaker for Kloss Video set, they were available. Why? “Because I taught the world to make them.”

Cambridge Soundworks, 1988

- Direct mail sales to consumers
- Multimedia speakers, computer speakers

Model 88 Radio with built-in woofer, three amplifiers—$250

August 2015

A year later they had a product to sell, Ensemble, and Kloss had yet another notable achievement: the first dyal-subwoofer/satellite speaker system. The surround sound system used two sub-woofer suitcase-size boxes, which could be hidden under the couch or behind drapes because the human ear is generally incapable of detecting the location of very low frequency sounds, combined with two book-size satellite speakers.

Tivoli Audio Radios

- 2000
- MOFSET and cell phone technology

- Tivoli PAL—His final product

August 2015

Tom DeVesto again
Inputs aux
Uses tuner like phone

iPod docks after Henry

Died February, 2002

- His son said that even at the height of success:

  ''His real big thing was not to make money, ever. It was to pay the bills, and get great stereos for the masses.''

August 2015

Throughout his life, Kloss made it his mission to seek out cutting-edge technologies and use them in equipment designed for the home at prices that many could afford. In short, he wanted to create home audio equipment that sounded better than anything that came before it, and to put that great-sounding gear into as many homes as he could.

In the consumer electronics industry, he's known as a bumbling genius type: an MIT dropout who wears stained khakis and sometimes forgets to button some of his shirt buttons.

At every stage of his career, Mr. Kloss remained a tinkerer at heart, his executive offices cluttered with equipment and circuit boards and his gray hair pulled back in a ponytail.
Audiophiles idolized Mr. Kloss -- at times, to a degree that made the family uncomfortable, David Kloss said. Strangers ''would drop by the house because they bought a Model 21 25 years ago,'' he said.
''He'd always humor them,'' his son recalled. Buffs would call out of the blue saying, ''I need a knob for my Model 7,'' decades after the last one had been manufactured, David Kloss said. ''It would be, 'Hang on!' and he'd go down to the basement and bang around. He'd come back up and say, 'I've got one from a Model 21, it's a little different but would that be O.K.?' ''

Kloss, informed by his own muse and unimpressed by fashion, created boldly original, straightforward, utilitarian products that lowered the price of performance. Longevity was another criterion, in what he built and what he bought. When he retired his second Checker automobile after 14 years of use, Henry vowed to drive his new Mercedes diesel for 20.
He owned it to the end, 17 years in all. For the many people who so admired Henry Kloss, that wasn't long enough.

Read more at http://www.stereophile.com/news/11260/index.html#7ctbjt1GbaHEO6Df.99