Pioneer HPM-100

From Wikipedia, the free encyclopedia

The **Pioneer HPM-100** is a high fidelity, 4-way, 4-speaker Bass-Reflex loudspeaker system designed by Bart Locanthi and his team of some of the most talented ex-JBL engineers, manufactured in Japan for the Pioneer Electronics Corporation from 1976 to 1979. It is known for its paramount sonic performance and acoustic accuracy, which even exceeds speakers today that run for thousands of dollars. Many still exist in complete working order, with all original parts, due to the speaker being engineered for endurance, and reliability, and longevity.

Pioneer HPM-100 Speakers

History

Bart Locanthi became the Vice President of Engineering at JBL in 1960. It was under his tenure that the JBL L-100 Century, the world's most popular loudspeaker in its day, was manufactured. However, JBL was bought out and Locanthi disagreed with the new direction it was taking, causing him to leave in 1970. In 1975, Pioneer North America hired him as Vice President of Development. Pioneer gave Locanthi and his team a large budget to improve on the JBL L-100 Century they had designed a few years prior. It was then that he used his expertise and experience to design, to the smallest detail, what was to become the Pioneer HPM-100. [1] The name itself bears a striking resemblance to its JBL predecessor; this was no accident, as the HPM-100 was designed to be an "improved" JBL L-100 Century.

Bart Locanthi in an advertisement for the HPM-

Pioneer designed the SX-950 through SX-1980 series receivers to match a set of these speakers. If matched with one these receivers, particularly the SX-1980, the HPM-100 is not only well-known for its excellent sound reproduction at low volumes, but also for its superior performance at higher volumes with almost no noticeable distortion or change in output sound quality. It was Locanthi's vision and genius that made it possible. Many will argue that he succeeded in his efforts in developing one of the best loudspeakers of all time.

Features

HPM stands for "Hgh Polymer Molecular", in reference to its then

newly-developed high polymer molecular film supertweeter, a design that is used to convert electrical energy into sound to a degree that had previously only been theory. It is damped by elastic materials to prevent the deterioration of its best characteristics, and eliminates excessive harmonic distortion. It is housed in a plastic case, with the film (and grille) shaped semi-cylindrically in order to project the sound all 180 degrees around the front of the speaker. The HPM super-tweeter design has no dome, magnet, voice coils, or any moving parts at all. [2] The frequency response of this driver ranges up to 25 kHz, exceeding the capacity of the human ear.

Even today, most speaker drivers are manufactured using paper cones and foam surrounds. Another revolutionary feature that the HPM-100 speakers had was carbon-fiber blended tweeters, mid-ranges, and woofers; all with greased cloth surrounds. Carbon fiber, a technology which has an unparalleled strength to weight ratio and is used in the construction of military aircraft, is lighter, more rigid, and does not rot away over time like paper and foam do. The weight of the carbon fiber, combined with cloth surrounds, allows the drivers to move and vibrate more easily, replicating sound much clearer. Compared to the usual cheap, stamped steel baskets most speakers incorporate, the three drivers also had solid aluminum die cast frames, intended to eliminate resonance and unwanted rattling and noise. These features have contributed to the endurance, reliability, and longevity of the drivers.

The size of the mid-range driver was precisely calculated at 4 inches in diameter as to match the directional characteristics of the entire speaker. Though it is small in diameter, it features a larger magnet with a lightweight cone and edgewise voice coil. It demonstrates that quality, not diameter, is more important.

The voice coil, voice coil assembly, and cone in the tweeter are bonded with an acoustically compatible epoxy resin to help increase the rigidity of the entire vibrating configuration, substantially improving transient characteristics and aiding in clean, low-distortion performance. The tweeter has a diameter of 1-3/4 inches.

The carbon fiber cone of the woofer is coated with a special resonance-damping compound to widen the frequency range and smooth out response. Because of this, it is able to respond more truthfully to low frequency impulses. The woofer has a 12 inch diameter and a 6-1/8 inch magnet with a pure copper ring, to minimize third harmonics in the mid-range. These features are intended to eliminate noticeable distortion.

The crossover was designed so that frequencies at the driver crossover level overlap, in order to prevent the separation of musical tones, and to assure the unified distribution of acoustic energy over the entire frequency range. It has crossover slopes of 6dB/oct. to avoid complicated crossover network design which could deteriorate phase characteristics. The crossovers have two potentiometers at the top front-right of the speakers, allowing the user to control the volume of both the tweeter and the mid-range drivers, the lowest being -3; 0 being the characteristic output; and +2 being the highest on the tweeter, while +3 is highest on the mid-range.

The enclosure is comprised of extremely dense particle board, using ported 1-1/4 inch baffle board and 1-3/16 inch chipboard sides, back, and top/bottom. The enclosure also has fiberglass insulation stapled to the interior, allowing minimal sound pressure to be absorbed by the cabinet itself. The outside of the cabinet is finished with a thick, fine grain, furniture-grade walnut veneer and has a removable black fabric grille. The HPM-100 weighs 58 pounds, 14 ounces. This was intentional, as the weight of the cabinet contributes to the rich sound the speaker produces. Although it is considered to be a bookshelf speaker, it is clear that it must be a floor-standing speaker with a stand, because of its immense size and weight.

Alternate Versions

Display models were manufactured that have clear Plexiglas enclosures (versus the solid wood with fiberglass enclosures) in order to demonstrate the inside of the speaker to customers in retail stores. Though they look interesting, they have a thinner, lower quality sound output compared to the wooden enclosure.

There were also two other versions with different crossovers. The original “A” crossovers accepted up to 100 watts max and were rated at 50 watts. However, later “B” and “C” models, manufactured from 1977 on, accepted 200 watts max and were rated at 100 watts. HPM-100s that were manufactured with the “B” and “C” crossovers also contained an accent ring around the air hole.

Variations of the HPM-100 were released as cheaper alternatives. The HPM-60 was a smaller speaker that scaled the woofer down from 12 inches to 10 inches. The HPM-40 has a 10 inch woofer and eliminated the mid-range driver. The HPM-40 also has a cheaper vinyl finish that mimicked veneer instead of true walnut veneer.

The HPM-150 was intended to be an improvement upon the HPM-100. It contained the exact same mid-range and tweeter drivers as the HPM-100. The supertweeter design was modified, mounted on top of the cabinet and projecting 360 degrees instead of 180. The diameter of the woofer was increased to 15 inches, but had foam surrounds, which rotted away over time. Though surround rot is not much of an issue (as drivers can be re-foamed at a low cost), re-foamed drivers are diminished in sound quality compared to original surrounds, and it is cited as an engineering inferiority when compared to the HPM-100's greased cloth surrounds with carbon fiber cones. A difference in cabinet quality was that, like the HPM-40s, vinyl was used as a finish instead of veneer.

The HPM-900, along with the HPM-700, were released a few years later. The HPM-700 was comparable to the HPM-60: a smaller HPM-900 with a 10 inch woofer. The tweeter and mid-range drivers on the HPM-900 and HPM-700 contained individual metal grills to protect the cones. These two speakers featured another new supertweeter design - one that more closely matched the 180 degree projection of the HPM-100. The woofers were constructed with graphite modulus - a stiffer composite material, and had foam surrounds. Also like the HPM-40 the cabinet was covered with vinyl instead of veneer.

There were also other speakers released in the HPM series, including the HPM 30, 50, 70, 110, 200, 300, 500, 1100, and 1500. By 1981, Pioneer had discontinued the HPM series.

Specifications

Enclosure: Bass-reflex bookshelf type
System: 4-speaker, 4-way system
Woofer: 12 inch (30 cm) carbon fiber blended cone type
Mid-range: 4 inch (10 cm) cone type
Tweeter: 1-3/4 inch (4.5 cm) cone type
Supertweeter: High Polymer Molecular Film
Nominal Impedance: 8 ohms
Frequency Range: 30 to 25,000 Hz
Sensitivity: 92.5 dB/W (at **lm** distance)
Maximum Input Power: 100 watts (“A” crossover) / 200 Watts (“B”,”C” crossovers)
Crossover Frequency: 300 Hz (Low-Mid), 4,000 Hz (Mid-High), 12,000 Hz (High-Superhigh)

Dimensions: 15-3/8(W) x 26-3/8(H) x 15-1/2(D) inches (390(W) x 670(H) x 393(D) millimeters)
Weight: 58 lb. 14 oz./26.7 kg

Pioneer HPM-100

Review 1 *of 47*

Price Paid: $100.00 from friend

Summary:
I've owned these for over 20 years now. Back in the 70's I sold a pair (I was a dealer then) to a good friend who uses them still. Mine were purchased, sans woofers, for $40.1 used a set of JBL woofers in them for 15 years until the internet allowed one to conveniently purchase vintage products. That said, I bid on at least 10 sets of OEM woofers before f won a pair at my price point ($67). Replacing the JBLs made a noticeable improvement in the sound. A previously great system became absolutely superb.

I often relate as to how, if I could have any speaker system for less than a thousand bucks...well, I already have them.

I'm a live sound engineer, ex hrfi salesman; and I've never heard speakers I'd trade for these...unless maybe someone has a spare pair of Klipshoms or Magnepans laying around.

Anybody?

Mine are a bit beat up looking and could use some veneer repair; but they sound just like 1977.

Strengths:
Carbon fiber, cast aluminum drivers. Absolutely rigid, dense enclosures. Extended bass response. Soaring highs. Bullet-proof longevity.

The stunned expressions on the faces of those to whom I demonstrate them.

Weaknesses:
Occasional harsh midrange...could be attributable to amp clipping.

Similar Products Used:
Most of them. I own several sets of speakers.

Price Paid: $50.00 from Craigslist seller

Summary:
As most people know, the Pioneer company produced the HPM-100's in the late 70's to directly compete with the JBL L-100's.Whether or not they succeeded is debatable but, most people agree that the HPM-100's were well built and could produce ear-bleeding playback levels. Some complained that their sound was too "bright" and that they were fatiguing to listen to for any length of time. WELL.. I PARTIALLY AGREE BUT THERE'S A SOLUTION TO THAT (READ ON).

As to build quality, I can tell you that these speakers and their cabinets are top notch in construction and materials. The cabinets are very heavy and this is due to the thickness of the particle board used. Additional cabinet weight comes from the use of internal braces to keep the cabinet rigid. A separate chamber for the midrange is provided as well as lots of acoustical damping material. The woofer is a monstrous 12" unit with a massive and heavy magnet, and a CAST aluminum spider housing. This woofer is held in place by thick machine screws and nuts, not just self-tapping screws. Furthermore, there will be no woofer surround rot like the JBL-L-100's foam one, BECAUSE THERE IS NO FOAM SURROUND ON THE HPM-100's WOOFER!!. Instead, the 100's use a cloth surround impregnated with an oil based preservative that is flexible but does not rot.

The woofer cone is a graphite type material and is very rigid, making it impossible to flex during vigorous woofer excursions. In summarizing the woofer construction ....the analogy of a "built like a Sherman tank" comes to mind.

Not to be forgotten is the midrange, tweeter, and super tweeter. In the case of the midrange, ifs almost like a "mini-wooferi[1] in terms of having a heavy magnet and a flexible surround, in a rigid frame assembly. Did 1 mention that it's isolated from any woofer pressure waves, by being enclosed in its own isolation chamber?

The tweeter is pretty much a standard tweeter (not a dome or exotic shape), but once again its build quality is superb.

The super tweeter represents Pioneers attempt to counter high frequencies being directional by having a curved radiating surface. The crossover frequency for the super tweeter was supposedly 10K and therefore the super tweeter for the most part is not heard until the sizzle of Cymbals and other instruments capable of this range are played. Most listeners over 30 are not going to be able to hear these higher frequencies that well, but the mere fact that they're being produced adds a "presence" to that frequency range. I personally think that this design works well and gives the 100's a very good sound stage.

So what do I think of the sound of the HPM-100's?

I've got mine placed flat on the ground eight feet apart with the end of a sofa almost (not quite) blocking the tweeter. Not the best placement or positioning.

For 30+ year old instruments of sound, and using late 1970's sound shaping EQ and crossovers , they sound very good, albeit a bit "bright" (OK, there....I've said the "B" word). The midrange is a bit overemphasized , but this was the norm in the late 1970's (and still is today) as far as factory EQ design) At high levels (not normal) they can be fatiguing , in my opinion, BUT ONLY AT HIGH LEVELS, due to this "brightness" in mid an treble ranges. The bass is strong, non-boomy, deep, and fairly accurate, with decent mid-bass reproduction. Despite my poor placement, I was initially dumb-struck by how "real "the sound stage was presented by the HPM-lOO's. NO! they do not have the sound stage (and the incredible price either!) of B&W, Celestion's, and other high end speakers, but let me tell you..., for 30+ year old speakers, they present a pleasing placement of musical instruments.

Now with the above said and done...,if., one replaces the capacitors used in the crossover with new AUDIO GRADE capacitors, they become totally different speakers. No "brightness", a sweeter, charming mid and treble, cleaner bass (which was NEVER that bad to start with) and just a noticeable overall improvement. Here is the parts list provided by poster dbFreak from AUDIOKARMA.org

Parts List - from Parts Express (for one pair of HPM-100's or two crossovers)

Qty Part Number Product
2 005-10 Mills 10 Ohm 12W Non-Inductive Resistor
2 027-419 Dayton DMPC-4.3 4.3uF 250V Polypr Cap
2 027-220 Dayton PMPC-3.0 3.0uF 250V Precis Cap
2 027-462 Jantzen 0.15uF 1200V Z-Superior Cap

An electric screwdriver helps in removing hold down screws

You access the crossover from the back (it's where the. wire connects -screw out the entire unit) Once partially out, write down how the wires are connected.. Make sure you memorize how everything is mounted. (hey! Take a picture beforehand with a digital camera). You'll need to de-solder two sets of wires, the others pull off. After removing the entire crossover try to remove (or cut) the binding contact glue that PIONEER used to anchor the original capacitors to the circuit board, then de-solder off originals and re-solder replacements.

I would also suggest that you reheat ALL solder joints, before putting crossover back into speaker cabinets. Degree of difficulty? 5 if you've got even the most basic of techno-geek skills, 7 if you think rosin is the name of a girl. OK..., that's a techie joke.. LOOK IT UP ON GOOGLE!.

In closing , let me state that the HPM-IOO's are to me the absolute best "bang for the buck" when you consider that they can be had for as little as $50.00 to as high as $300+ (still cheap) at garage sales, Craigslist (where I got mine for $50.00) or eBay. Make EBay your LAST choice. Make sure that ALL the drivers (woofer, mid, tweeter, etc) are working and that the woofer has no rattling or pops when played semi to really loud. A HPM-100 that is working property will just keep getting louder as you increase volume, if its good and you use a clean amplifier to test (if this is possible).

I kid you not, these speakers are gems. BUY THEM!

Strengths:
Quality of construction and components, sound stage an tone, Can play at high leverls.

Weaknesses:
Heavy, mid and treble can be considered "bright" (correctable with crossover mod)

Price Paid: **$0.00**

Summary:
It's perfect and valuable speaker made by Pioneer, it's nearly imposibble to find an alternative speaker even today. You may very lucky If you have HPM 100 pairs. I have been using my own HPM 100's since 1978. By the time I compared several times My HPM 100 with JBL L 100, B&W DM series and JBL LX series ,
sony SS G 3 and G 5 but none of them satisfied me enough except HPM 100. I've 2 pairs of HPM 100 and 2 pairs of HPM 60 , SA-9800, SA-8800 Pionner amp. and SX-850 receiver.

Strengths:
Very loud and impressive bas voices. Acustic control potans on the front.

Weaknesses:
None.

Price Paid: **$160.00** from **Component Warehouse**

Summary:
After buying a pair of HPM 100's and listening to them for a few weeks I figured out it might be a good idea to buy another pair to compliment what I already had. Man was I a genius!!! I bought these speakers back in 1977 and still have them today in 2008.From all the reviews I have read I can only add that if you are into hearing pure warm sound then these are the speakers to get. It seems that most of what we hear in our modem age sounds cold and plastic. Oh but of course because most of it is made of plastic. Go back in time to hear the epitomy of what music should sound like with what was and still is the very best sound of the time. The HPM 100'S will put you where you belong if you are an Audiophile. I have never had to replace a single piece on any one of these speakers. When cranking 200+ watts through them it becomes mind boggling. There is no distortion only loud pure music which as others have said can peel the paint off of wails.. The only complaint I get is from my wife who says the coffee table and floor vibrates too much upstairs. Such is life with high end components. If you own these speakers you know what I'm talking about. If you don't own them, then go out and buy a pair or more on EBAY!!

Strengths:
The A-BOMB of Speakers. Or in modem terms the MOTHER OF ALL BOMBS. Period. No further discussion needed.

Weaknesses:
If you have to haul them around-1 dropped one on my Pergo floor. The speaker sustained no damage. I can't say the same for my floor.

Similar Products Used:
JBL L-100'S. Not even Close.

Summary:
I owned a pair of HPM-60's in high scholl (late seventies) and ran them with an SX-750. It was a great set up but I had always coveted the top of the line. Thanks to ebay I was able to realize my wish.

I have 4 HPM 100's and I am driving them with a SX-1250 receiver/amp. Pure heaven. These speakers and receiver are nearly 30 years old, and sound fantastic. Put the dial to 50% and I can almost peel the paint off the walls. Bowie and Pink Floyd are back. The woofers are have the coated edges so they will never rot. Super clean bass and excellent mids and highs. You would have to spend $5000.00 today to get equiptment this good.

Strengths:
Lifetime of enjoyment
Great quality
Classic good looks

Weaknesses:
Weight and size. You'll need room for them, but they are so worth it!