Jim Lansing

James Bullough Lansing 1902-1949

The founder of JBL, who is said to be the “speaker’s father” and is believed to have developed the prototype of the compression driver. J.B. Lansing, Lansing Manufacturing Company, and Altec Lansing Corporation, three major speaker manufacturing companies, have developed important units. Instinctively acquired acoustic engineering, and learned wisdom and techniques and had excellent technology. General scholars arrive at the essence through numerical research and theoretical consideration, but Lansing, who had not even received higher education, had a perfect scenario in which he could see everything in his brain. He had the ability to complete it. At the same time, he had his ears listening to the distortion in the music, and was a rare existence as if he were born for a speaker.

Kenneth Decker

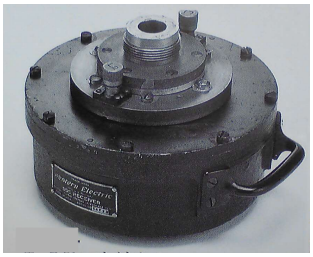
Kenneth Decker 1894-1938

Established Lansing Manufacturing Company in 1926 with Lansing, the son of a jeweler, a close friend of Mrs. Grenna’s father Andrew Peterson. Eight years older than Jim, he was in charge of sales as the company’s chief financial officer and contributed significantly to the company’s achievements. Despite being a reserve officer in the U.S. Army Air Corps, on December 10, 1938, an airplane he had piloted crashed during a practice flight and died suddenly. He freed Lansing from the messy business problems, devoted himself to engineering, and contributed to the film industry with tremendous momentum for 15 years, but the death of him immediately caused business difficulties. Therefore, the new company of ERPI was forced to acquire and merge. You can see how big his presence was for the company and Lansing.

Bartho Locanthi

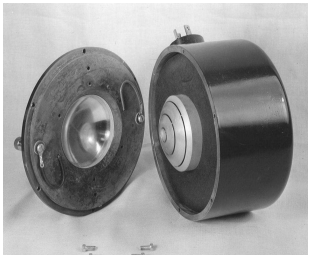
Bartholomew Nicholas Locanthi Ⅱ 1919-1994

Born in New York. He studied physics at the California Institute of Technology (CIT) in Pasadena and earned a Bachelor of Science degree in 1947. After graduation, he remains in college for research on analog computers. According to his apprentice Shozo Kinoshita, Locanthi visited JBL when Lansing was alive and said, ″Your speaker is not capable of satisfactory bass reproduction.″ Lansing replied, ″Okay, make it whatever you want.″ He seems to have been in and out of the JBL ever since. After the death of Lansing, he officially joined the company and was in charge of the development of the LE series, and later became the Vice President of Technology. After leaving the company, he worked as a consultant for Gauss and Pioneer, and was a genius engineer who developed [TD4001] at TAD. Dr. John Flein of Westlex Co., Ltd. has been recognized as a talent, and has also developed the company’s theater product [T530A].



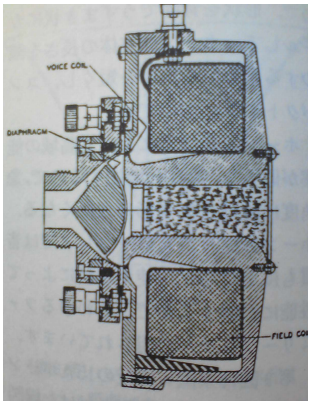
[WE555] 1926

[WE594A] 1933

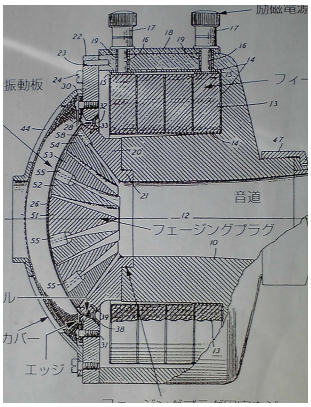


[Laising-284] 1934

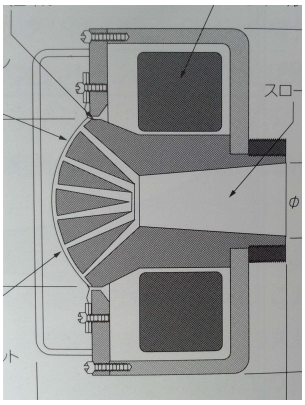
[T530A]=[375]1953



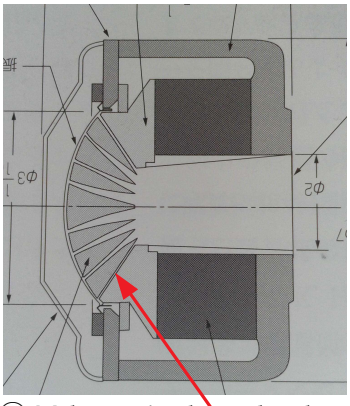
① Developed in 1926 [WE555] Electromagnet, Diaphragm diameter = 2inch, Slit: Single,″World’s first driver″



② Developed in 1933 [WE594A] Electromagnet, Diaphragm diameter = 4inch, Slit: Quadruple, ″Wide range system″

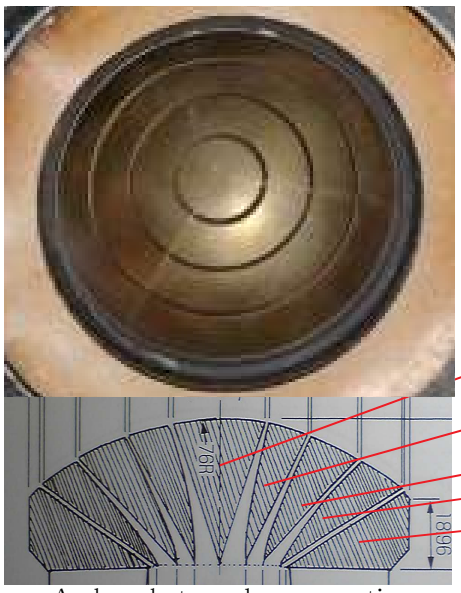


③ Developed 1934 [Lansing-284] Electromagnet, Diaphragm diameter = 3inch, Slit: Triple,″Shalahorn system″

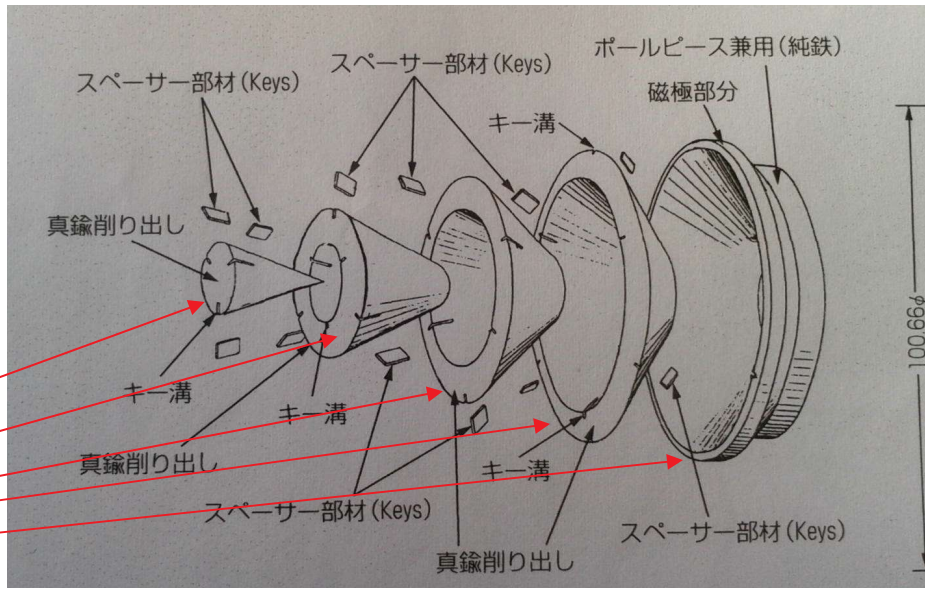


④ Make a mistake and make a straight line, Note 1[T530A] =[375] Permanent magnet, Diaphragm dia-meter = 4inch, Slit: 4 layers , ″Change WE5-94A to permanent magnet″

Note 1: ④ is quoted from ″100 years of speaker technology″, but the inner wall cross section of the pole piece is drawn as a straight line like [594 A] although [375] is originally a curved line.
This is probably because I imagined that [375] would also be a straight line because the inner wall of [WE594A] was a straight line and only the magnetic circuit was changed.

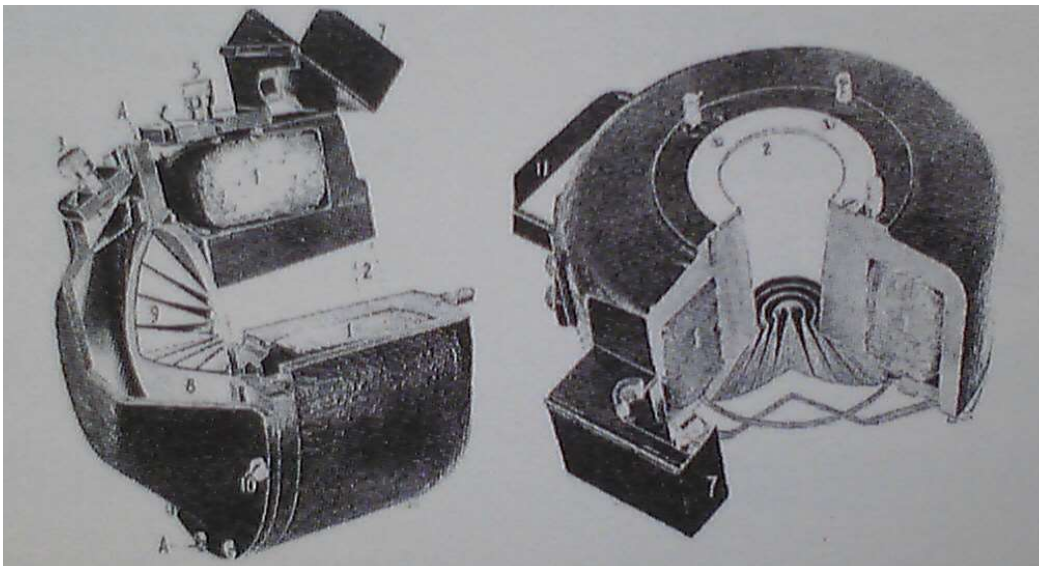


A plug photo and cross section



Exploded view of 4 slit phasing plug of W594A (from MJ radio and experiment)

In recent years JBL- [375] and Altec Lansing- [299], the phasing plug that affects the sound is made of plastic. This seems to be the purpose of reducing the manufacturing cost, but since it is the most important part for sound, it was originally made of non-magnetic brass. As a result, it was difficult to mold and it was finished by casting and turning. In the case of [WE594A], the cross section is finished with an exponential curve with a quadruple ring slit. Musical vibration generated from the diaphragm is guided from each slit to the throat, where it is compressed to about 1/10 in volume and flows to the horn. When the sound waves split for each slit merge at the throat, if the phase of the sound waves at each part goes out of order, the high-frequency characteristics are impaired, so the lengths of the slits must be exactly the same. This high-pressure airflow has a wide directivity and long reach at the stage where it is exponentially diffused and decompressed by the horn. However, since the duralumin diaphragm (diaphragm) with a diameter of 100 mm has a large area, extra vibration called split vibration is added at each part, and it is necessary to suppress the high frequency output from the distortion. At that time, the demand for high-frequency characteristics at the time of talkie reproduction was ideally around 15,000Hz, but in reality 10,000Hz was difficult. Therefore, it is common sense to use 4-inch diaphragm drivers such as [WE594A] and [375] for the mid range of 3Way with tweeter.



A phasing plug with a cut model of [WE594A] similar to [375]

The smaller the diaphragm, the better for the loudspeaker to reproduce high frequencies, but the narrower the dynamic range. On the other hand, a large voice coil or diaphragm is required to produce a loud sound. Due to these acoustic engineering principles, a small secret was required to reproduce high frequencies with a large-diameter diaphragm. The compression drive that locks the sound generated by the large diaphragm into a small room is advantageous. The person who invented this mechanism was Jim Lansing. We will not forget this crucial fact.

In the horn driver, the performance in the high range is determined by the characteristics of the driver due to the relation of distortion, and the performance in the low range is determined by the cutoff frequency of the

horn. Therefore, the driver's performance is accompanied by the problem of how to reduce distortion. In this case, when listening to music, the distortion hinders the delicate sound of a string instrument or a woodwind instrument.

Of course, it is necessary to consider the balance with the amplifier, but the developer of the transducer says that the ear that distinguishes this area is very important, but this ability is surprisingly rare. Looking back on my experience with the 5-channel multi-amplifier system, the difference between 3 Way and 5 Way seems to be different in the weak parts of classical music and the nuances of musical instruments. For example, when [T925A] that reproduces up to 40,000Hz is added, there is a clear difference in the growth of violin and cymbals. However, 3Way for the 375 series and 2Way for the 175 series are good for playing fundamental music. The same applies to the case of ultra-low frequencies. This is a problem related to this, and in high-volume reproduction, the auditory sense enters an abnormal region, so conversely, it may be advantageous to have a smaller number of units.

In the previous article, I described the comparison between [WE594A] and [375] and the driver drawn in the mysterious sketch left by Jim Lansing, but I examined it from the perspective of Lansing at that time.
In 1934, when he designed [284], according to the materials at the time, he made several drivers with different diaphragm sizes and compared them, and chose 2.84 inches. Originally, he was aware of distortion when listening to the ERPI wide-range system at the Knickerbocker Hotel, so he probably intended to design a new one without improving [WE594A] from the beginning.

However, when the Schaller horn system ended successfully, the icon of [601] also succeeded, and when the time of the hustle for manufacturing depending on the order of these playback devices passed, the [WE594A] itself again. It seems that the modification was started.

Its history was with the huge film industry, but unfortunately his fellow Kenneth Decker's sudden death in 1939 forced Lansing to focus on poor management on the verge of bankruptcy and move to Altec Lansing
Five years later, he relaunched his own company, but at some point he re-compressed the 4-inch diaphragm. His study of Compression Driver is evidenced by his ″mysterious sketch.″ And, as long as that ″mysterious sketch″ remains, it is not strange that the real thing exists. Moreover, when I hear the story of the driver Lansing made by Ross Schneider, I can not help feeling it strongly. The following is incorporated from the text.

> What emerges from this hand-drawn figure is the ongoing mystery of Jim Lansing. This speculation has been the subject of much debate in recent years. Ross Schneider made the following episode about the assembly of Ampex's first prototype of the Todd AO sound system.
> The prototype required 10 independent speaker systems, the largest of which used the just-developed [375] compression driver. Schneider remembers that Thomas could not have the required number [375] by the time the prototype was completed. As a makeshift measure, Thomas installed two large compression drivers, saying they were ″made by Jim Lansing.″Thomas thought these two drivers were very important to JBL, so if you could get a replacement from JBL, be sure to give them back to me. , I was very reminded.
> Unfortunately, nothing is known about what happened to this driver after that. Ross Schneider suspects that the two drivers may not have been returned. Other than this episode and the sketches above, there is no evidence that Jim Lansing actually made the 375's precursor driver. Therefore, it remains a dizzying fascinating mystery. (JBL 60th Anniversary 196P)

However, in the ″Kingdom of the Tube″ magazine, No. 54, a driver that seems to be the column written above was posted. Isn't this the Lansing driver that was lost?

Was it the basis of the ″mystery sketch″?

4 inch 4 slit plug

Roll edge diaphragm

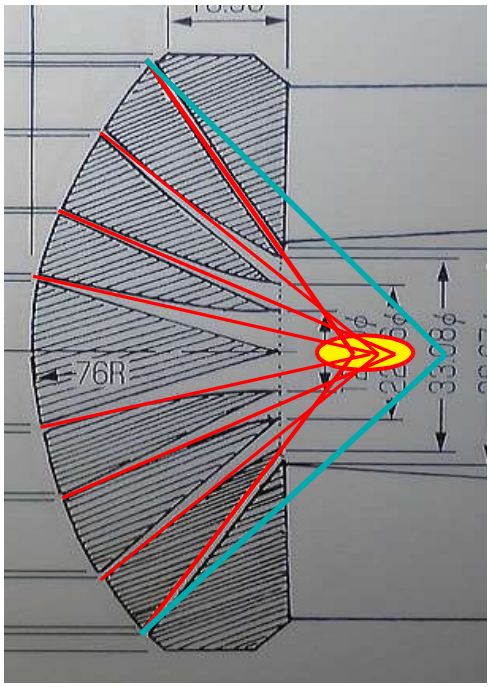
Altec Lansing [594-8C] Prototype Compression Driver ("The Kingdom of Tubes", Vol.54-Autumn 2009)
The appearance of this machine is apparently like Altech's "288-8G" driver itself, but there is a tape handwritten as "594-8C Proto Type" on the back cover, and the throat opening is 2 inches in diameter. Is becoming Also, the diaphragm contains the same 4 inch diameter as the "594A" receiver, the edge is a roll edge type, and the three bolts standing for attaching the horn are the same size as the "288" driver. However, the position is set on the outer peripheral side. This is imaginable, but I wonder if Altec tried to develop a permanent magnet version of the "594A" receiver. (Yuzo Doi)

I was wondering if the story I had imagined had taken on a fairly realistic level, but the idea that I was secretly prototyping [375] during the Altec Lansing era was denied. .. The 288-8C is 1966, so Lansing cannot be involved. But if you measure this driver and compare it to the Lansing driver I've drawn in the inches to millimeters, you might see something.
However, in the JBL era, [375] is made. Evidence of this is in the following response from JBL to the magazine's question.

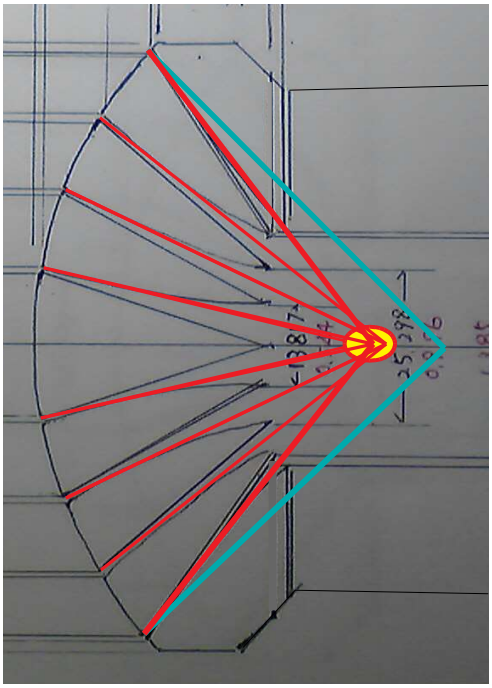
The unit that was founded in 1946 until the death of Lansing was "D130, 175, 275, 375 driver unit and D208" according to the reply from JBL.
("Sound Recopal" magazine, May 1981 issue: Explore the charm of JBL sound! 58P)

Inside the JBL in 1981, [375] was aware that Lansing made it, not Locanth's.
I would like to repost and explain the improvements in Lansing Sketch (as I mentioned in other articles)

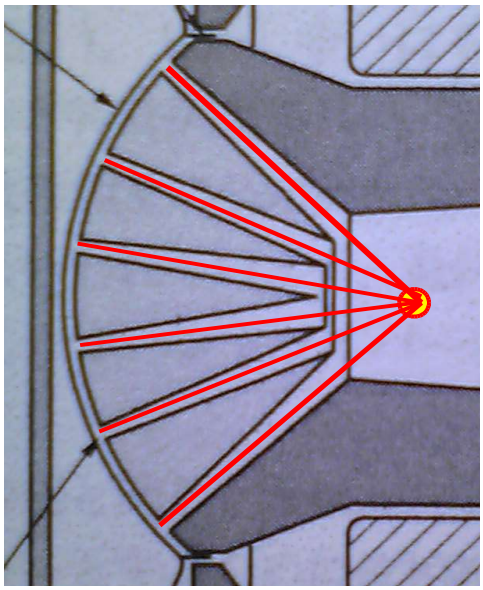
Advantages of [Lansing-284] and improved [WE594A] [375] = [Mysterious sketch]



①[WE594A] 1933
The world's first 4-inch diaphragm compression driver equipped with a modern phasing plug, but the focus of the slit is not concentrated. The angle of incidence of the slit is not perpendicular to the diaphragm (blue line is the vertical line from the diaphragm).



② Mysterious sketch = JBL- [375] 1954
The improvement from [WE594A] is that the cross section outside the slit on the 4th lap was changed from a straight line to a curved line, so the focus of the air flow that passed through the outermost peripheral slit moved to the back and became closer to other air flows. I came close to the one point. The blue line is the vertical line from the diaphragm.



③ Lansing-[284] 1934
The focus of each slit is concentrated at one point. Moreover, since the incident angle of the slit is almost perpendicular to the diaphragm and the distance of each slit is the same, it is an ideal design in which the compression is concentrated and strengthened at one point by the phase, time alignment, and sound pressure. Moreover, the distortion was banished by reducing the diaphragm diameter to 2.84 inches.

The above figure is the shape of the cross section of the annular slit of the phasing plug (phase equalizer). (1)
In the cross section of [WE594A], the incident angle becomes more slanted than the diaphragm, rather than the outer ring / slit, and the airflow spreads slightly back and forth in the throat. However, in [375] of ②, each air flow gathers closer to one point than [WE594A] because the outermost slit is made exponential. This is an improvement on Lansing in that the mysterious sketch of the roots of [375] is superior to [WE594A].
However, compared to [284] of [3], which is a one-point-concentrated type, the two do not have the same

focus. Then, it is considered that the Lancing of the Schaller horn system came to consider the coincidence of the vertical line (blue line) from each diaphragm slit and the actual focus of the air flow. It is considered that the improvement of the lancing was that the airflow from each slit was aligned to one point and that the airflow was strengthened by making the cross-sectional angle from the diaphragm into the slit vertical.

However, there was a slight mystery here. Apart from the evolution from [WE594A] to [284], Lansing chose to evolve from [WE594A] to [375]. In my guess, he tried to improve the flow of the air flow of [WE594A], but the distortion due to the large diameter does not disappear, so he should have abandoned the use of 2 way of [375]. However, in 2Way, he may have noticed that changing the cross section of the [801] phasing plug from a straight section to a curved section would be better. As a result, [D175] is born. In other words, it has become clear that Lansing left behind the [D175] series as a better driver than the [801] series.