

Headless guitar

Les was always altering his guitars. Trying to reach inside the guitar was a constant challenge. Les built his aluminum guitar with many unique features. He especially liked that the back could be completely removed for easy access to the guitar's wiring.



Capitol Records Echo Chambers

In the 1950s, Les Paul working as a consultant, provided direction on Capitol Records' network of eight echo chambers that are located under Capitol's parking lot as well as direction for the sound studios.



According to building designer Lou Naidorf, Les Paul was the primary musician who evaluated and approved the designs of the echo chambers and the studios.

While most of Les' original inventions, "inspired" current technology, the echo chambers continue to be used every day by today's top recording artists.

Hearing Technology

A major irony in Les Paul's life is that the man who spent his life chasing sound had to wear two hearing aids and he wasn't satisfied with their quality. Up until his last days, Les was working on improving the technology of hearing aids.

Sound Diffuser wall

Another example of Les' constant inventiveness is his sound diffuser wall. He designed the shape of the individual pieces. Les and his son Russ cut, stained and adhered each piece to the walls in one of his Mahwah, NJ studios. The room was totally "neutral", just the way Les wanted it to be. Segments of the wall are on display in several museums.



Learn more about

Les Paul's Inventions and Innovations by visiting the Les Paul Foundation website:

<https://sites.google.com/a/dpi.wi.gov/les-paul-study-units/other-resources>.



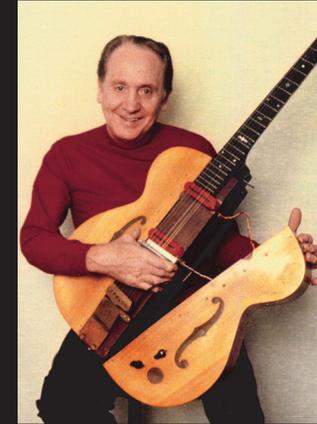
inspires innovative and creative thinking by sharing the legacy of Les Paul through support of music education, recording, innovation and medical research related to hearing.

lespaulfoundation.org

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Les Paul

A brief look at his Inventions and Innovations



Les Paul, the only person inducted into both the Rock and Roll Hall of Fame and the National Inventors Hall of Fame, often relayed that he may have spent more time inventing than he spent performing.

Les said that he invented things when he needed something that was not available. The diverse recording techniques he developed in his Hollywood garage and later in his

Mahwah, NJ home studios forever changed modern music.



Flip-able Harmonica Holder

Teenage Les invented his flip-able harmonica holder so he could play both sides of his harmonica while not putting down his guitar.

The Rail "Guitar"



Les' Rail "guitar" (left) evolved into his Log (pictured above), which evolved into the 1952 Les Paul solid body electric guitar (below.)

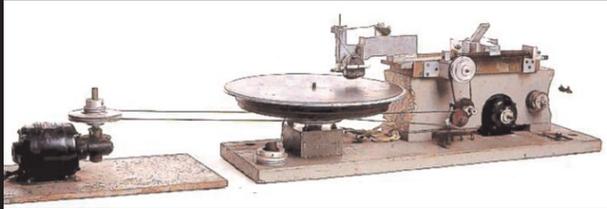
Les Paul and wife Mary Ford used their guitars Les helped design for all of their live performances.



Recording Innovations

Recording Lathe

One of Les Paul's earliest projects was creating a recording lathe so his mother could record his radio performances. The lathe had a discarded Cadillac flywheel, a dentist's continuous belt and a paring knife from the family's kitchen. The lathe recorded by cutting a groove into a disc of aluminum. Although crude in design, it worked.

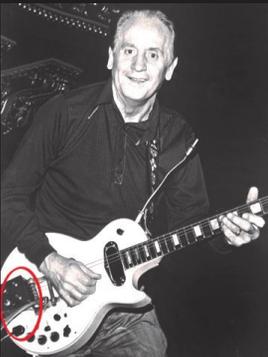


Recording Techniques

In the early 1940s guitarists increasingly were using electric guitars and all of them sounded the same. Les Paul was determined to create a unique sound. After months of experimenting in his Hollywood garage, he introduced his "New Sound." His hit records of "Lover" and "Brazil" introduced the New Sound and changed modern music with his recording techniques of **delay, phase shifting, close miking, echo, reverb, slap back** and **variable speed**.

Les Paul and Mary Ford At Home

Les Paul and Mary Ford had a regular radio show and one of America's first reality TV shows.



The Les Paulverizer

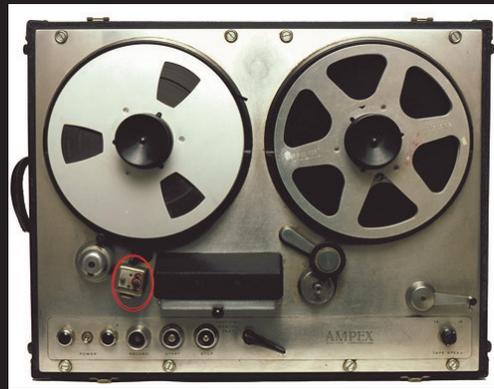
To explain the duo's multi-layered sound, Les told their audiences that he multiplied the music with his invention, the Les Paulverizer.

Although first just a gag, Les eventually built his idea. With the control box attached to his guitar, Les and Mary could create their multi-layered sounds at live performances.

Sound on Sound

In his 30s Les and his friends began to develop the idea of Sound on Sound for commercial quality multi-track recording.

Les recorded his first track of a song on a disc. Then he performed a second track as he played back the first track. He recorded both layers together on a second machine. He moved the two-layered disc to the playback machine and repeated the process with subsequent discs.

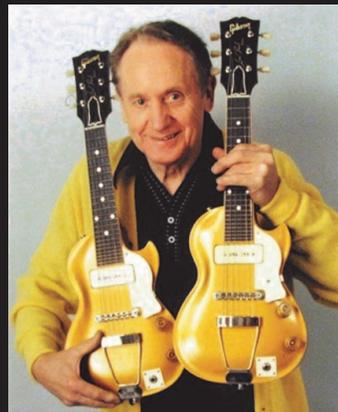


Sound on Sound Tape Recorder

One of Les Paul's most revolutionary inventions was his tape Sound on Sound recorder, which evolved using a gift from his good friend Bing Crosby. Returning World War II soldiers brought back tape recording machines the Germans had developed. Les had one of the earliest U.S.- made machines. He quickly added an additional head (circled in red) so he could produce sound on sound with tape, which was much easier than using discs and it was portable.

The mini-guitars

To prove that he could actually play the very high notes heard on his New Sound recordings, Les had Gibson make two small guitars so that when he was on stage he could pull out one of the mini guitars and play the very high notes. Only two were ever made.



The Octopus

Les created many hit songs using his sound on sound method with the early Ampex recorder.



Although recording to tape gave Les the sound he was seeking, it eliminated the ability to go back one step as he could with the two-disc system.

He decided that to record each layer separately and then combine the sounds would allow the flexibility to change one layer without destroying the others. Les contracted with

Ampex to build his idea. It took years of refinement, but the invention gave recording artists tremendous flexibility.

When W.C. Fields heard Les' Sound on Sound he said Les sounded like an octopus. Les gave his invention the moniker.

Guitar holder

Les was always creating things to meet the needs of the moment. After his infamous 1948 car accident, Les directed a friend on how to reshape a guitar stand to hold his guitar so he could play even when he was wearing a torso cast.

