LESLIE SPEAKERS AND HAMMOND ORGANS
RUMORS, MYTHS, FACTS, AND LORE

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1. DON LESLIE STARTED OUT AS AN ENGINEER FOR THE HAMMOND ORGAN COMPANY BUT EITHER QUIT OR WAS FIRED WHEN HE CLASHED WITH LAURENS HAMMOND.

This persistent rumor lives on but it's not true. In the mid-thirties, Don Leslie was servicing Capehart radios for the Barker Brothers Department Store in Los Angeles. He had applied for a full-time job with Hammond (at their factory agency, Birkel-Richardson), but one of his friends was hired instead. With Barker Brothers permission, Leslie got a second (part-time) job changing 50 cycle Hammond tone generators in customer's homes**.**

Don Leslie explains, "**In 1936, various areas outside the City of Los Angeles served by Edison** (electric) **were going through a 50 to 60 cycle change-over. While the main concern was the necessity of new clocks and some other electrical appliances, people with Hammond Organs had real problems because their** (50 cycle) **organs would play at a higher pitch** (when operated at 60 cycles). **Various schemes such as gear boxes were devised but the best remedy was to install a whole new generator...**"

Leslie's "Hammond job" was temporary at best. When the tone generator changeover was complete, his job was finished. Leslie's salary was paid by the electric company directly to Hammond. "**The one interesting fact was that I actually received Hammond pay checks which led to many later rumors that I had worked for Hammond full-time. At the time, I was quite taken with the possibilities of Hammond, and believed much of their propaganda...** "

Don Leslie built the first speaker in 1940 with the help of his brother Bob. He offered his invention to Hammond hoping they would hire him, but they rejected him from the start. Leslie never held an engineering or other position with Hammond and neither Laurens Hammond or his research department played any part in the development of the Leslie Speaker. Had Laurens Hammond offered Don Leslie an acceptable job in 1936, he would have owned the rights to everything Leslie invented and there never would have been a "Leslie" Speaker.

2. HAMMOND INVENTOR, LAURENS HAMMOND WAS NOT A MUSICIAN, COULDN'T PLAY THE ORGAN HE INVENTED, AND LIKELY WAS TONE-DEAF.

True. Keyboard players, especially, find it difficult to believe that the inventor of the Hammond organ was an engineer with no musical skills. Laurens Hammond was a brilliant inventor who held 110 electrical and mechanical patents by the time he retired. He received his degree in mechanical engineering from Cornell University in 1916 but had no musical ability whatsoever. Hammond always claimed he couldn’t play an instrument nor "even carry a tune."

In the early days of the Hammond Organ, Laurens Hammond sought employees with musical backgrounds to help refine his invention. In 1933, Hammond hired typist Louise Benke primarily because she could also play the organ. William Lahey, the company treasurer, was the organist at St. Christopher’s Episcopal Church in Oak Park, Illinois. Organist and electrical engineer John Hanert joined Hammond in 1934. Until his untimely death in a car crash in 1962, Hanert was responsible for most of Hammond’s early vacuum tube circuits and products. It was a poorly kept secret that John Hanert also was Laurens Hammond's "ears."

Ego and arrogance certainly were factors, but Hammond's lifelong opposition to Leslie Speakers is also attributed to his alleged inability to hear the improvement Leslie animation made in the sound of his organs.

3. THE FIRST HAMMOND ORGAN WAS SOLD TO HENRY FORD BUT LATER DESTROYED IN A FIRE AT THE FORD MUSEUM IN DEARBORN, MICHIGAN.

False. Henry Ford was Hammond's "first customer" but the Hammond Model A destroyed in the Ford Museum fire was not the original organ. In February 1934, Ford placed a pre-production order for no less than six Hammond Organs, one of which became the "museum organ." Early on, Hammond claimed George Gershwin was "the first Hammond owner." While Hammond generated much favorable publicity by identifying the new electric organ with the famous composer, Gershwin's Model A was an early production instrument but not the "first" Hammond Organ.

Hammond "serial number one" has a far less glamorous history. Built in early 1935, it was shipped to J. W. Jenkins Music Company, Hammond's agency in Kansas City. Bob Pierce, a young salesman, had the task of demonstrating it throughout the Midwest. Pierce ultimately became a successful Hammond and Steinway dealer in Long Beach, California and is the author of the Pierce Piano Atlas. He recalls in his book, "**Three of us, an organist, a maintenance man and I traveled in safari-like fashion with a van and an automobile for the next three years. We drove through Kansas, Nebraska, Oklahoma, Iowa, Arkansas, and Texas, hitting every little burg with a population over 100. We demonstrated the Model A on university campuses and radio stations, for women's clubs, in music stores and churches, and even mortuaries. The only places we avoided were the gin mills.**" When the organ was retired as a demonstrator in 1938, it was sold to the Paseo Methodist Church in Kansas City where it remained for the next eleven years. "Serial number one" is now part of the Smithsonian Institution's collection of important American " firsts" and there is little likelihood it will be destroyed by fire or other catastrophe.

Technically, even "serial number one" was not the "first" Hammond. Laurens Hammond and his engineers built the prototype organ in 1933. The prototype was used for research and as a patent model. Hammond's organ patent was granted on April 24, 1934, and production of the Model A officially began in June of 1935.

Interestingly, like Hammond Clocks, the prototype was not self-starting. Later production instruments had separate "start" motors but the prototype had to be started with a crank like an old car. (Hammond Clocks were started by spinning a thumb wheel behind the motor.)

4. SOME EARLY HAMMOND TONE CABINETS HAD MECHANICAL ROTARY TREMOLO SYSTEMS BEFORE THE FIRST LESLIE SPEAKER WAS INTRODUCED.

True. Early DX and CX series Hammond tone cabinets had small "squirrel cage" rotors in the upper section of the cabinet. The rotor varied the amplitude or intensity of the sound but produced little frequency modulation (vibrato). Hammond introduced the vibrato scanner in 1945 (which "replaced" tremolo rotors) and rotor-type cabinets were discontinued after World War Two. Early sales brochures claimed Hammond tone cabinets were free from "irritants" like "rotating mechanical tremulants" and "bass boominess," obvious references to Leslies. Factory technicians were instructed to "disable the rotor" when they serviced an "X" series tone cabinet.

Hammond also used their ill-fated rotor system in an attempt to discredit Leslie. Customers were told, "We no longer use tremolo rotors because they are unnecessary with Hammond's superior vibrato system." In reality, Hammond's rotor tone cabinets sounded nothing like Leslie Speakers and it made little difference whether the rotors worked or not.

5. LAURENS HAMMOND DIDN'T LIKE LESLIE SPEAKERS BECAUSE, BY COMPARISON, LESLIES MADE HAMMOND TONE CABINETS "SOUND BAD."

See No. 2. Laurens Hammond obviously didn't like Leslie Speakers but it's unlikely his bias was based on the "bad sound" of his tone cabinets. Years later, when asked about Leslie Speakers, Hammond's almost irrational response was, "**I never intended for my organs to sound that way.** " Evidence suggests Hammond had little concept of what "sounded good or bad." His tone generator was based on the synchronous AC clock motor he invented in 1921 and he obviously liked things that were precise.

Early Hammond Organs were promoted as "low-cost pipe organ substitutes" for churches. Pipe organs produce numerous random phase and pitch variations and are hardly precise. If anything, Leslie Speakers made the Hammond Organ sound more pipe-like. Except for reverberation, Laurens Hammond seemed oblivious to the many acoustical nuances and musical "imperfections" of pipe organs.

6. LESLIE SPEAKERS WEREN'T ALWAYS CALLED "LESLIE SPEAKERS. "

True. The original name of the Leslie Speaker was "Vibratone." Leslie Speakers were also called "Brittain Speakers." In 1941, Don Leslie formed a disastrous partnership with one Lou Brittain and early nameplates identify the manufacturer as the "Brittain Sound Equipment Co." This partnership was dissolved after the war. Leslies were also known as "Hollywood Speakers" (They were built in California near Hollywood), and "Crawford Speakers" (Organist Jesse Crawford was the first Leslie distributor in the New York area). In 1946, the name was modified again to "Leslie Vibratone" to end the confusion. However, most people simply called them "Leslies" and in 1949, Don Leslie gave in and dropped the name "Vibratone."

7. DON LESLIE NEVER ADVERTISED LESLIE SPEAKERS.

True. Leslie Speakers were so popular they literally sold themselves. Hammond's ongoing anti-Leslie propaganda actually increased interest in the speaker which improved sales. Don Leslie comments, "**I was amazed at all the publicity Hammond created for me by their continuous bad-mouthing of my product. This word-of-mouth advertising was so good that from the start until the company was sold to CBS in 1965, no advertising was ever needed and my problem was always keeping up production to match the sales.**" Only later (throughout the late sixties and seventies), did CBS place Leslie Speaker ads in music trade and organ enthusiast publications.

8. HAMMOND ORGANS CONNECTED TO LESLIE SPEAKERS COULD NOT BE SERVICED BY HAMMOND'S FACTORY SERVICE DEPARTMENT. LESLIE SPEAKERS WERE NOT ALLOWED IN HAMMOND'S PLANTS AND OFFICES.

False. In spite of Hammond's anti-Leslie propaganda, they routinely serviced Hammond Organs connected to Leslie Speakers. One of the first five Leslies built in late 1940 was shipped to the Hammond dealer in Denver who immediately reshipped it to the Hammond factory in Chicago. Over the years, Hammond engineers routinely checked out new Leslie Speaker models as they were introduced and the company was well aware of their impact on Hammond tone cabinet sales. Hammond never admitted it but after 1940, there never was a time when there were "no Leslie Speakers at the Hammond Organ Company."

9. MANY HAMMOND PEOPLE, SOME OF THEM MANAGEMENT PERSONNEL, RESPECTED DON LESLIE AND DIDN'T SUPPORT THE HAMMOND ORGAN COMPANY'S "ANTI-LESLIE" POLICY.

Absolutely true. Many Hammond employees who owned organs also owned Leslie Speakers. At least one Hammond executive had a friend buy a Leslie Speaker for him at full retail rather than have a record of the sale in his name. Don Leslie tells how Hammond people, friendly to him, would visit his exhibits at music trade shows and invite him to the Hammond display. When he arrived, other Hammond people, loyal to Laurens Hammond, would then physically eject him from the room. The Hammond Organ Company was a huge corporation and the company's hateful attitude toward Don Leslie and his comparatively small speaker business was an embarrassment to many of Hammond's more rational people.

Hammond’s own franchised dealers were easily the "world’s largest unauthorized Leslie distribution network" and most defied the company’s dictum of "no Leslie sales." Hammond artists, often under direct company sponsorship, would refuse to play concerts unless Leslie Speakers also were used. Hammond upper management’s "anti-Leslie" policy was definitely a minority position.

10. IN SPITE OF YEARS OF BITTER RIVALRY BETWEEN THE TWO COMPANIES, HAMMOND MANAGEMENT SECRETLY COVETED THE LESLIE ORGANIZATION.

History has proven this to be true. In 1980, the Hammond Corporation bought Electro Music and the Leslie name from CBS. Currently, Leslie remains part of Hammond under Hammond/Suzuki, USA . Don Leslie readily admits that, in the early years, he "**wanted so much to be part of Hammond!** " Only after Hammond rejected him and the Leslie Speaker in 1940, did he organize Electro Music as an independent company. In 1965, Leslie sold his successful, profitable company to CBS, Inc. and Electro Music became a division of CBS Musical Instruments. Part of the CBS-Leslie sales agreement was that Don Leslie stay on as a consultant for five years.

In 1966, a Hammond manager contacted CBS about using Leslie OEM modules in Hammond Organs. Hearing "Leslie," the secretary directed the call to Don Leslie. When the embarrassed caller realized who he was talking to, he said, "I don't know how to say this, but we want to buy your speaker units." Leslie replied, "**Why don't you say, 'we want to buy your <u>LESLIE</u> speaker units!**" Other organ companies had used built-in Leslie modules for years and now Hammond was finally joining the group. The joint Hammond-Leslie X-77 and other Leslie projects soon followed. After Hammond "endorsed" Leslie, they quietly stopped producing Hammond-type tone cabinets and no longer developed new organ speaker models with the Hammond name. The old craziness had come to an end.

In the summer of 1996, Hammond/Suzuki introduced the HS-1140 Single Channel Speaker and WCA-400 (Carver) amplifier. This "non-rotary" system is an adjunct to existing Leslie models and in no way, competes with, or replaces the "Leslie sound."

11. DON LESLIE AND LAURENS HAMMOND "HATED" EACH OTHER.

The rivalry between Laurens Hammond and Don Leslie prevented them from being friends but "hate" is too strong a word. Laurens Hammond was an intensely private man; there is no public record of him ever attacking Don Leslie personally. In January of 1996, Don Leslie told this author, "**I'm careful not to say too much about Laurens Hammond. After all, where would I be if it weren't for Hammond and his organ?** " In spite of the lawsuits, anti-Leslie propaganda, and other silliness, the relationship between Laurens Hammond and Don Leslie certainly was symbiotic. Leslie Speakers sold many Hammond Organs to organ users beyond the traditional church market and Don Leslie obviously needed Hammond to pro- mote his product. Leslie also developed speaker models for Wurlitzer, Conn, Gulbransen, and other organ makes but the Hammond Organ was always Leslie's primary application.

12. DON LESLIE'S PERSONAL ORGAN MUST BE A "KILLER" HAMMOND WITH A "BUNCH" OF LESLIE SPEAKERS.

Diehard B3 enthusiasts would love for this to be true but it's not. Don Leslie's personal organ is a custom-built, three manual electronic-pipe theatre organ. The console came from a Rodgers "Trio" but most of the original Rodgers electronics were scrapped. Only string voices go through rotating speakers and no conventional Leslie cabinets were used in this installation. In addition to many electronic voices, the organ also has three ranks of real air-driven pipes. Leslie Speakers may provide the "backbone" for jazz, gospel, blues, and rock organ sounds, but Don Leslie was and still is a theatre pipe organ enthusiast.

13. HAMMOND NEVER RELEASED THE MODEL B4 BECAUSE IT WAS "TOO GOOD." A PROTOTYPE B4 WAS BUILT, HIDDEN AWAY, AND IS STILL WAITING FOR SOMEONE TO DISCOVER IT.

If this is true, it's a better kept secret than the Stealth Bomber. Seriously, there never was a "Model B4." The Hammond B3 was "new" in January, 1955, but in reality it was just another refinement of the original 1934 Model A. Hammond did some new model research in the late fifties but the "B4" was never a serious consideration. By the mid-sixties, newer, cheaper to make (and thus more profitable) organs were available with more on the way. Hammond competitors were building new organs with numerous "bells and whistles" and the simplistic B3 was less popular with inexperienced and casual organ buyers.

The B3's tonewheel generator was inefficient, expensive to make, and not easily adapted to produce the many complex wave voices of fully electronic organs. The tooling used to make the generator was past its prime and there wasn't enough demand for new tonewheel organs to justify the high cost of replacement. The last B3s were assembled in 1975, mostly from left-over parts. In early 1976, Hammond closed their Melrose Park, Illinois, plant that was the final assembly point for tonewheel generators. Some dealers still had a few new B3s as late as 1978, but tonewheel organs were history.

14. THERE ARE APPARENT DISCREPANCIES IN SOME HAMMOND ORGAN INTRODUCTION DATES, PRODUCTION PERIODS, AND ACTUAL AVAILABILITY.

Longtime Hammond enthusiasts know only too well that this statement is true. The former Hammond Organ Company was not above generating large amounts of hype when it came to new models. A prototype would be built and shown to dealers at music trade shows. Other "select" groups would then get special "sneak" previews. Press releases in local newspapers, "teaser" ads in the "Hammond Times" (Hammond company magazine), plus announcements in church and enthusiast publications promoted the new model. The public often thought a new organ was available long (sometimes years) before the first production instrument was built. People were unaware that the "new organ" was little more than one or two well-traveled demonstrator instruments.

Just the opposite happened when a model was discontinued. To protect existing dealer and company inventory, no public announcement was made. Production stopped but orders were still filled from remaining stock in the warehouse. During this time, the model was still officially "in production." Only when there were no more left, was a model "discontinued." Of course dealers knew that the model was being replaced, but often, even they didn't get much notice. Old and new models could sit side-by-side in dealer showrooms for several years before the last old model was sold.

Old Hammond Serial Numbers... Current Hammond/Suzuki people speculate that Hammond did not want competitors and "outsiders" to know the actual number of organs produced, nor did they want customers "dating" organs by their serial numbers. After the Model A, Hammond apparently assigned serial numbers to some models that were not consecutive. For an example, later B3 consoles produced in 1973-74 have lower serial numbers than organs built a decade earlier.

Whatever the reason, the people who devised the numbering system are either dead or retired and it‘s unlikely the "code" will ever be fully sorted out. Also, Hammond's claims for the number of organs and tone cabinets produced at any given time is disputed in other references. As such, Hammond "factory totals" should be considered only approximate.

15. THE HAMMOND B3 IS THE "BEST" ELECTRONIC ORGAN EVER BUILT.

B3 enthusiasts embrace this "fact" with the fervor of a religious conviction but it is obviously subjective. If the B3's rugged construction, durability, model longevity, resale value, and user popularity are the standards for "best," then the statement is true. When other factors are considered, the old B3 has a few shortcomings.

In the early years, Hammond was primarily an engineering-based company. From Laurens Hammond on down, the people responsible for product design were either mechanical or electrical engineers. Accountants, marketing, and other financial types had less input and Hammond Organs were designed and built to last. Cost containment was secondary to build-quality. The B3, C3, their clones, and predecessors are easily the most rugged mass-produced organs ever made. More than 100,000 B3s were manufactured over a twenty year production run and the model is still the most popular electric-electronic organ ever built.

Long before a B3 and 122 Leslie became the "standard" for gospel music, Hammond had to compete with pipe organs and pipe-like electronic organs for church sales. In spite of company literature and independent books on how to set the drawbars to create pipe voices, the old tonewheel Hammonds were decidedly poor pipe organ imitators. Hammond competitors like Allen, Baldwin, and Conn all produced electronic organs that sounded more like pipe organs. When "pipe authenticity" is a factor, the B3 is not "best." The Hammond B3 does what it does very well but it is no match for today's digital electronic organs and keyboards that produce a wide variety of sounds, voices, and effects.

16. LAURENS HAMMOND CONTINUED TO EXERT HIS INFLUENCE AND POWER OVER THE HAMMOND ORGAN COMPANY AFTER HE RETIRED AS PRESIDENT IN 1955.

True. Laurens Hammond retired as company president in 1955 but stayed on as chairman of the board and to "do research" until 1960. Hammond is described as an eccentric and autocratic boss and no executive would have dared risk a dispute with him. He left his ideas and policies behind and it took several years before new managerial policies were in place. The company was understandably reluctant to make changes that could affect profitability and their position as number one in the industry. Moves like using Leslie modules in Hammond Organs or designing new organs that used Leslie Speakers instead of Hammond tone cabinets would not have happened under the old reign.

Laurens Hammond left the company and Chicago for good in 1960 and moved to West Cornwall, Connecticut, the home of his second wife. Hammond, a widower, married Roxana Harrison in 1955 after the death of his first wife, Mildred, in 1954. He died July 3, 1973, at age 78, survived by his wife and a daughter, Peggy. Another daughter, Polly, preceded him in death. Hammond was the youngest child and only son of William Andrew Hammond, a Chicago banker and vice president of the (now defunct) First National Bank of Illinois. Laurens Hammond has seven grandchildren but he had no sons and thus, has no direct descendants with the Hammond family name.

17. IN LATER YEARS, LAURENS HAMMOND CHANGED HIS MIND ABOUT LESLIE SPEAKERS, AGREED TO THE USE OF LESLIE MODULES IN HIS ORGANS, AND SUPPORTED JOINT HAMMOND-LESLIE PROJECTS.

See No. 16. Unfortunately, this is not true. Throughout his life, Laurens Hammond remained adamantly opposed to the use of Leslie Speakers with Hammond Organs. Only after he was gone, could projects involving Leslies be considered.

18. LAURENS HAMMOND WAS A REFINED, CULTURED MAN WHO ENJOYED THINGS LIKE BRIDGE, CHESS, AND OPERA.

True. One of Hammond's more unusual inventions was an electric bridge table that used his synchronous AC clock motor and a "rubber finger" to shuffle playing cards. He was especially fond of chess and donated $100,000 to the Chicago Park District to build an outdoor chess pavilion on Lake Shore Drive at North Avenue near Lake Michigan.

Although Hammond was born in Evanston, Illinois, in 1895, he lived in Europe from 1898 to 1909. He was multilingual, having attended primary schools in France and Germany, and traveled often to England and other European countries. Though he had no

musical talent, he acquired a taste for opera and other classical music early in his life.

19. UNLIKE HAMMOND, OTHER ORGAN COMPANIES SUPPORTED DON LESLIE AND THE USE OF LESLIE SPEAKERS WITH THEIR ORGANS.

Partially true. In spite of the fact that Leslie didn't build organs, the organ manufacturers still considered Don Leslie and Electro Music to be a competitor of sorts. Many also built tone cabinets (usually nothing more than a box with speakers and a power amplifier) and were reluctant to support the efforts of an "outsider." However, most organ companies were more pragmatic than Hammond. Leslie Speakers sold organs and they wanted no part of Hammond's nasty public dispute with Leslie.

After Hammond, Leslie Speakers were first used with Wurlitzer and Conn organs. Both companies built their own tone cabinets but tolerated Leslies. Neither did so willingly. Don Leslie convinced Conn's management that he was serious by buying a substantial block of their stock. Fearing a take-over, Conn separated string and flute voices in their "Classic" and "Artist" models to simplify Leslie installations. Wurlitzer used Don Leslie's technical skills to solve noise and cross-talk prob- lems in their early reed models but then developed an "imitation Leslie" they called the "Spectratone." Leslie countered with an inexpensive "real" Leslie (Model 125), that effectively neutralized Wurlitzer's efforts. With only one exception, no organ company was ever 100% supportive of Leslie Speakers.

The big change came in the late fifties when Dick Peterson from Gulbransen came to Don Leslie and suggested that a Leslie unit be incorporated in the new "Transistor" organ he was designing. Leslie admits that, at first, he was reluctant to support this move because it could have affected his cabinet sales. Leslie and Peterson became friends and their partnership continued for years. (The custom organ in Don Leslie's home is largely Dick Peterson's work.)

Dick Peterson also founded Peterson Electro-Musical Products in Worth, Illinois. His company currently produces organ related products and MIDI equipment for pipe consoles. Gulbransen never produced tone cabinets and the Peterson-Leslie friendship also resulted in four unique external Leslie Speaker models specifically for Gulbransen Organs.

Built-in OEM Leslies were instantly popular and most major organ companies eventually used them. Leslie modules were never more than "half a Leslie" and if anything, they helped sell external Leslie cabinets. As Leslie's patents expired, organ makers were free to develop their own rotary speaker systems but most chose not to. Leslies were so closely identified with "good organ sound," that most organ companies elected to keep the "Leslie tab" on their instruments. A major portion of Electro Music's profits after 1961 came from the sale of OEM modules to organ manufacturers.

In addition to Hammond and Gulbransen, Leslie built brand-specific speakers for Conn, Wurlitzer, and Thomas Organs. "Non-Hammond" (but not brand-specific) multichannel Leslies also were developed for Baldwin, Lowrey, and other organs. "Universal" Leslie models were used with Kimball, Rodgers, Kawai, Farfisa, Viscount, Acetone, Silvertone (Sears), Kustom, Yamaha, and Gem Organs as well as portable keyboards, synthesizers, electric pianos, and other non-organ applications.

Many manufacturers included "Leslie sockets" in their organs so external Leslie cabinets could be connected without a special hookup. Even though Hammond/Suzuki currently owns Leslie, Hammond-competitor Rodgers still factory-equips some of their latest organs (i.e. the Rodgers W-5000) for use with Leslie Speakers.

Not every organ manufacturer endorsed Leslie and some, most notably Allen, never used Leslie Speakers. Before digital equipment, Allen developed their "Gyrophonic" system which like Leslie, used mechanical rotors. Allen's rotor design was different from Leslie's which avoided infringement of Leslie patents. (Allen "Gyro" cabinets had two or three front-mounted speakers on a large plywood disk that rotated on a shaft driven by a belt and motor assembly.) Baldwin produced Leslie-type rotor systems under license from Leslie for both organs and tone cabinets. Yamaha factory-equipped seventies and early eighties vintage organs for external Leslie cabinets but also developed their own Yamaha-brand rotary speaker system.

By the late sixties, the industry's "de facto" recognition of Leslie had become real. Leslie Speakers were a respected product and most organ manufacturers stopped building their own tone cabinets. The few that didn't, avoided direct competition and the conflicts of the past.

20. LESLIE SPEAKER CABINETS ARE NO LONGER NECESSARY SINCE THE LESLIE-EFFECT CAN NOW BE CREATED ELECTRONICALLY.

For some applications this statement may be true but it does depend on the user and the Leslie "simulator." Leslie-effect devices are hardly new and have been around almost as long as the Leslie Speaker. Early systems were often out-and-out Leslie copies with

little or no savings in weight, bulk, or cost. The Wurlitzer "Spectratone" and Allen "Gyrophonic" systems were both bulky mechanical designs. The "Glentone Speaker," produced by Glen Davis in Chicago, was an early Leslie competitor. The "Sharma Speaker," manufactured by Keith Hitchcock in the UK during the seventies, was an obvious Leslie clone.

Electronic devices that produce a "Leslie-like" sound have been available since the sixties. Cheap solid state components and the need for more portable equipment led to the development of numerous "electronic Leslies" and tremolo-vibrato add-on devices. Few early Leslie simulators were authentic enough to fool even causal listeners and rarely sounded like a real Leslie Speaker. Most relied on simple phase-shift circuitry and their primary advantages were compactness and low cost. Current equipment is much improved and it's often difficult to tell the difference between a real Leslie and a simulator, especially on recordings.

All mechanical rotary tremolo systems, including Leslie's, are based on the Doppler-effect. Discovered by Austrian mathematician and physicist Christian Doppler (1803-1853) in the early nineteenth century, the Doppler-effect is the apparent variation in pitch that a stationary listener hears from a moving sound source. In practice, the loudness of the sound also appears to vary and it is this combination of frequency (vibrato) and amplitude (tremolo) modulation that give Leslie Speakers and other Doppler-effect systems their characteristic sound.

Basic Doppler characteristics are easily created electronically. However, most simulators don't reflect sound or produce the unique audio characteristics of mechanical systems. Rotating speaker elements also direct sound out the sides and back of the cabinet which is reflected off nearby walls and surfaces. The listener hears this combination of primary and reflected sound as a moving audio field. Adding a second cabinet further enhances the effect. Even when the audio source (organ) is mono, the rotating speaker elements and reflected sound create a realistic stereo effect.

In more recent times, "hybrid Leslies" have been developed using both electronic and mechanical elements. The "PRO-3" by Motion Sound and Hammond/Suzuki 300 series Leslie models use real rotary horns for treble frequencies but create the Leslie-effect for bass frequencies electronically. The result is a compact system that sounds more like a conventional Leslie cabinet without the synthetic sound of electronic devices.

Leslie cabinets are bulky and heavy, facts not lost on jobbing musicians. Simulators usually are smaller, more portable, and less expensive than real Leslie Speakers. None sound exactly like the real thing but organists often accept the sonic tradeoffs of working with hybrids and simulators rather than transport conventional Leslie Speaker cabinets.

21. LAURENS HAMMOND AND WALT DISNEY WERE RELATED.

How do these things get started? Walter Elias Disney (1901-1966), cartoon animator and film producer, was born six years after Laurens Hammond. Both were creative and imaginative men with the motivation and tenacity to be successful in unusual ventures. They admired each other's successes but were not related. Walt Disney's "Melody Time," a 1948 animated film with both cartoon characters and human performers, featured Ethel Smith and the Hammond Organ. (Donald Duck and other Disney characters danced to Ethel's popular Latin American tunes as she and the organ revolved on a turntable.)

This silly rumor probably got started because Disney and Hammond resembled each other, especially in photographs. They lived during the same time period, wore pencil mustaches, and combed their hair straight back, a style common in the thirties and forties.

22. THE ACTUAL INVENTOR OF THE HAMMOND ORGAN WAS JOHN HAYS HAMMOND, JR.

This popular but false rumor has been around for at least four decades. It is in the liner notes of a recording by organist Jesse Crawford and recently surfaced again on the Internet. Unlike the Hammond-Disney craziness, it is easy to see how the achievements of Laurens Hammond (1895-1973) and John Hays Hammond, Jr. (1888-1965) could have been confused. Besides their common surname, both were American inventor-engineers that worked on similar projects at various times in their lives.

John Hays Hammond, Jr., was an electrical engineer who invented guidance devices for military applications. In 1911 he founded the Hammond Radio Research Laboratory. His inventions include: a remote-controlled torpedo, a radio control system resistant to electronic jamming, a single-dial tuning system for early radios, and an amplifier for use in long-distance telephone lines. In 1925, Laurens Hammond (and early partner E.F. Andrews) founded the Andrews-Hammond Laboratory. Their primary project was a battery eliminator for early radios. During World War Two, Laurens Hammond built organs for the military but also developed aircraft control systems, a flight path simulator, an infrared light sensing device for bomb guidance, and other equipment for the war effort.

Laurens Hammond and John Hays Hammond, Jr., may have been aquatinted. They also could have had common ancestors in

Scotland but were not directly related. (Laurens Hammond had three sisters but no brothers.) John Hays Hammond, Jr., is not the inventor of the Hammond Organ and there is also no evidence to suggest that either man was ever involved with each other's projects.

23. LAURENS HAMMOND'S FATHER WAS A FAMOUS PIPE ORGAN BUILDER AND HE CARRIED ON THE TRADITION BY INVENTING THE ELECTRIC ORGAN.

See No. 16. Laurens Hammond's father, William Andrew Hammond (1851-1897), was a banker in Chicago. This is another one of those false persistent rumors that surface every few years. It is listed as a historical "fact" in a "Hammond information" website on the Internet.

Most 19th century pipe organ builders in the US learned their craft, or were descended from the organ "families" of Europe. Laurens Hammond's grandfathers were clergymen and, at best, superficially involved with organs. His paternal grandfather and namesake, the Rev. Henry Laurens Hammond (1815-1893) was a Congregational pastor, an abolitionist, and a vocal opponent of slavery during the Civil War era. His son, William, married Idea Louise Strong (1859-1938), the daughter of the Rev. Erastus Albert Strong, an Episcopal Pastor from Gambier, Ohio, on January 12, 1883. Besides Laurens, they had three daughters, Louise, Elizabeth, and Eunice.

When the First National Bank of Illinois in Chicago was organized in 1871, William Hammond was hired as a clerk. He rose to teller, cashier, and ultimately became the bank's second vice president. Hammond also served as director for a number of other companies including several street railway systems. His association with one of the rail systems turned out to be a conflict of interest and his personal undoing.

On December 21, 1896, the bank failed, largely because of "excessive holdings of worthless securities of the Calumet Electric Railway Company." William Hammond apparently had approved the loans and was accused of "wrecking the bank for his own advantage." Although there was evidence that the bank's failure was not entirely Hammond's fault, the matter was never resolved. In the morning hours of January 2, 1897, the distraught banker committed suicide by plunging into the icy waters of Lake Michigan.

Laurens Hammond was not yet two and he never really knew his father. In 1898, Idea Hammond sailed for Europe with her children. She became a professional painter and opened an art studio in Paris. By 1907, Mrs. Hammond was a recognized artist with a successful show at the Beaux Art Salon in France. Laurens attended primary school in Germany and France and developed an interest in science, invention, and the technical fields. By 1909, however, the social unrest in Europe that led to the first World War was becoming a problem and the family returned to the US. If William Hammond hadn't killed himself, Laurens Hammond might have become a banker and the Hammond Organ never would have been invented.