INNOVATION. AMPLIFIED.™

Chapter 2

The Weakest Link

by
Hartley Peavey

The integral component of the production/reproduction of sound involves what engineers call a transducer. This is a device that transforms one kind of energy into another. A loudspeaker is a device that converts electrical energy into a sound pressure wave that is perceived by our ears as what we call sound. Without getting too involved in history, we should be aware that when the telegraph was invented in the mid 1800's, the "receiver" was an electromagnetic coil that attracted a metal "armature" that made a "clicking noise" when current flowed through the coils producing the familiar "click/clack" sound of the early telegraph… Even before Morse perfected the telegraph, scientists had discovered that certain materials possessed the ability to produce electricity when they are moved or bent, and when electricity is applied to them, do the reverse by producing a physical motion. These early experiments resulted in what is known as the "Piezo (pronounced "pe-a-zo," not pi-zo) Effect"… Later on, earphones and microphones using so-called "crystal elements" would come into use with so-called "crystal radio sets" and later on with phonograph pickups… While a Piezo element will produce motion with voltage applied or generate a voltage when moved, this "motion" is very small and Piezo elements can usually only be used in applications where the motion is small, either in the pickup mode such as a microphone, or output mode such as a tweeter (the Motorola Piezo tweeter, for example).

While the "Piezo Effect" has been known for a long time, its limitations re: movement necessitated the search for a better way to move more air, thus producing louder sound. The earliest electromagnetic reproducers were variations of the telegraph "sounder." The telephone was made possible by utilizing electromagnetic drivers to activate a metal diaphragm to create the first telephone "receiver." A similar technique was utilized to make headphones for the early radio receivers.

After the invention of the vacuum tube, audio amplifier companies attempted to use what were essentially "earphones with horns attached" to reproduce the sound of the (then) new AM radio. The low powered radio sets of that time drove an electrodynamic driver coupled to a fairly large horn in order to bring the level up enough to be heard in a small room… This approach was not good, not efficient, and was both cumbersome and expensive.

The "Dynamic Loudspeaker" was actually invented in Germany in the 1890's. In the early 20's, a company called Magnavox introduced the first production "dynamic loudspeaker" to the US marketplace. It consisted of a paper cone driven by voice coil that "reacted" with a fixed magnetic field generated by an electromagnet. The electromagnet consist of numerous turns of wire in a magnetic structure that created a "focused" magnetic field for the voice coil. This early "loudspeaker" was an instant hit and was immediately copied by a number of people using a number of "variations" on the electromagnetic driver theme.

What is most interesting about the loudspeaker is that while electronics has made vast improvements over the years, the so-called dynamic loudspeaker has remained very much the same. Today's speakers still use voice coils reacting with a magnetic field usually including some kind of fiber (paper) cone/diaphragm….

The very first automobile in the latter 1800's in Germany utilized rubber tires filled with air. Today, more than 100 years later, our cars still utilize air filled rubber tires. It is true that the materials and the designs of today's tires are vastly better than those used by Benz, but we are still riding on rubber tires filled with air. Likewise, most loudspeakers today operate using exactly the same principles as those early loudspeakers in the 20's, i.e. fixed magnet and a diaphragm attached to a voice coil… Like the "automobile tire analogy" mentioned above, the major difference in today's speakers using a (versus those of 90 years ago) is the better materials used in today's loudspeakers.

In the early days of audio, as well as, today, the loudspeaker was (and is) the "weakest link" in the audio system. In the early days when a 10-watt amplifier was a "big amp," power handling really wasn't a factor, but as electronics became more sophisticated, it soon became apparent there was much work to be done to improve loudspeakers.

THE MOVIE BOOM

The main driving force in coming up with large speaker systems was the advent of so called "talking pictures" in the late 20's. By that period of time, Western Electric found it necessary to design audio amplifiers for their "repeater" stations used with long distance telephone service. Interestingly, Western Electric and AT&T invented many of the vacuum tube audio circuits that are still being used today. Sound for movie theaters was a major market that was served not only by the Westrex Division of Western Electric, but also by RCA who were also involved in the movie business. With sound becoming so important, the race was on to

create better sound for movie theaters. Because of the relatively low power of amplifiers then, many of the theater sound systems were driven by very efficient horn loaded transducers. It soon became apparent that a single speaker was not adequate to cover the full sound spectrum and high frequency drivers became a part of the scene as did ever more efficient and better performing cone type speakers.

In 1936, RCA introduced the 6L6, which ushered in a whole new level of audio power. When WWII came along, audio development ceased and didn't began again until the late 40's. Using multiple 6L6's, power amps became available with 50 – 60 watts, which was a "challenge" for the high frequency drivers and cone type speakers of the day. Since high frequency drivers used smaller and more delicate voice coils, it was these delicate drivers that suffered the most. Most companies supplying high frequency drivers to the theater industry were forced to make the diaphragms "field replaceable"… A trend that continues to this day.

Cone loudspeaker designers had the option of using larger diameter voice coils and powerful alnico magnets to increase power handling and efficiency. A practical limit seemed to occur in the early 50's with the competing companies selecting slightly different voice coil diameters and magnet geometry. Altec settled on a three-inch coil while Altec's major competitor JBL settled on a four-inch diameter coil. Shortly thereafter, Electro-Voice entered the field with a 2½-inch coil, and this basic configuration continues today.

Both before, and after WWII, movies were a very important part of people's lives on both sides of the Atlantic. Demand for better sound in movies spilled over into so called" "jukeboxes" which of course generated the desire to have that quality of sound in people's homes. In the late 40's, the "hi-fi industry" was born. Interestingly about the same time, the so-called "big band" style of music had become increasingly expensive to finance both for the orchestras themselves, and in the recording of large musical groups. After the War, considerable interest developed in other kinds of popular music such as Hawaiian music, and in the South and the West so called "Country and Western" music. The electric guitar had become a requirement in most kinds of pop music and the need for louder amplifiers became more apparent after the acceptance of solid body guitars in the early 50's. At first, guitar amplifiers utilized single speakers, then, to (handle more power) multiples of speakers were used such as 2 12's or 4 10's. The speakers during that period had relatively small diameter voice coils wound on paper bobbins and speakers were assembled using cellulose based adhesives, which were notoriously heat sensitive. Overall, the trend to higher power, coupled with small diameter paper voice coils held together with cellulose adhesive, was a "recipe for disaster"…

A TURNING POINT

Makers of premium speakers (initially designed for movie theaters) provided the first speakers for high-level sound reinforcement applications. Altec's three-inch voice coil and JBL's four-inch voice coil were the leaders in high power, highly efficient loudspeakers. Because of their cost and their weight, these premium speakers were limited to only a few "upper end" applications both in sound reinforcement and guitar amps. Most loudspeakers made in the U.S. utilized relatively small diameter voice coils. One inch, 1½ inch, and the largest generally available (other than from Altec/JBL/EV) were the two inch voice coils offered by the U.S.'s largest speaker manufacturer CTS (Chicago Telephone Supply)...

By the early 1960's, adhesives had improved significantly with the introduction of epoxies, but voice coils continued to be wound on paper coil forms. With the introduction of 100-watt amplifiers, first powered by tubes, and later by transistors, loudspeaker failures started to "skyrocket." Previously, most failures were in high frequency drivers because of their light weight (and therefore delicate) construction. CTS responded by offering a laminated aluminum/paper coil form while others such as Jensen and Electro-Voice utilized a fiberglass coil form which were infinitely better than the paper coil forms of their competitors.

Bob Gault (the Chief Loudspeaker Engineer at CTS) broke away and formed the Eminence Speaker Corporation. From the beginning, Bob utilized aluminum coil forms with the latest epoxies and adhesives. Within just a very few years, Eminence had secured most of the OEM business for guitar amps and sound systems. Peavey was one of the first customers of Eminence, and that relationship has continued until today. While Bob Gault was a brilliant speaker engineer, he was reluctant to listen to what the market was asking for. Power amplifiers (now mostly solid state) were rapidly increasing in output power. Speaker failures were on the increase even with Eminence's aluminum coil forms and modern adhesives.

I begged Bob to offer a high frequency driver and speakers with larger diameter voice coils unfortunately, he refused. Peavey's first entry into high power high efficiency sound systems utilized Altec components which sounded reasonably good, but proved to be woefully inadequate in terms of reliability. We blew out so many 808-driver diaphragms that the Marketing Manager of Altec refused to supply Peavey with replacement diaphragms leaving hundreds of our customers upset and angry since Peavey couldn't supply replacement Altec diaphragms….

DESPERATION IN DECISION

In desperation, I looked for other sources and found that Electro-Voice was about to introduce a new high power high frequency driver with 3" voice coil called the DH-1012 … I placed an order for 1,000 of these drivers at $100 each… After placing the purchase order, we waited patiently for many months with no "word" from EV. One afternoon I got a call from an ex-Kustom salesman named Bob Belfield inquiring about the possibly of a job. (It is important to know that Kustom was then the exclusive distributor for EV's line of SRO speakers). In any case, Belfield advised me that "EV would not be honoring our long outstanding purchase order"…. As I hung up the phone, I wondered if this "advice" was B.S. or if indeed, Belfield knew something that I didn't. I placed a call to Electro-Voice and asked for, their OEM Marketing Manager. When he got on the phone, I asked him directly if the info that I heard was correct…. He stuttered for a moment before advising me that indeed EV would NOT honor our purchase order!.. This was a "pivotal moment" because at that instant, I decided that Peavey needed to make its own high frequency drivers and high power loudspeakers! As fate would have it, a couple of months later two ex-EV guys walked through my front door telling me that they wanted to set up a speaker factory! They called their partnership "The Spider Works." This was in the early 70's, right after we had completed the first section of the yellow building (#3) on A street. Plant 1, which had formerly housed our electronic assembly operations, was now empty and these two guys set up there to design and build our first speakers, which were called "Black Widows." The high frequency driver (which was our first product) was called the "22" because it had a two inch dome and a two inch voice coil. Shortly thereafter, the Black Widow speakers were introduced, and (at my insistence) featured "field replaceable" diaphragm/basket assemblies. The first product that this went into was our SP-1 (for Spider/ Peavey #1)!

"JUST THE FACTS"

Please remember the loudspeaker must absorb the power output of the amplifier. Numerous factors combine to make the speaker's task difficult. It should be remembered that cone type loudspeakers….(even the best of them) are very inefficient. Most cone type loudspeakers are significantly less than 4% efficient…. Because of the "law of conservation of energy," power applied to the speaker (that is not converted into sound) has to "go somewhere"….usually as HEAT! Consider this, if the loudspeaker is 4% efficient, this means that only 4% of the power applied to the speaker is converted into sound, and the remaining 96% is dissipated as heat… This isn't a problem at 10, 15, or 20 watts… At 100 watts or greater, it becomes an evermore serious problem as the power level increases. At 100 watts, 96 watts must be dissipated. At 1,000 watts, this is 960 watts of heat that must "go somewhere" or remain within the voice coil, thus causing destructive heating effects!

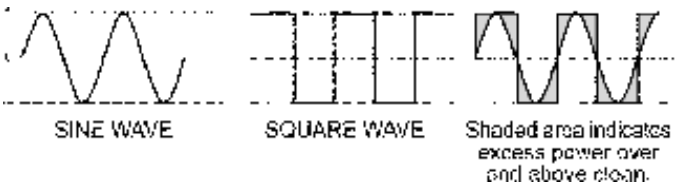
It is well known that most materials expand as heat builds up. This is true of metal, plastic, and most other materials. What isn't generally known is that, as that heat energy is absorbed by the speakers voice coil wire, its RESISTANCE tends to INCREASE, thus causing what some people call "POWER COMPRESSION"…. Simply put, as the heat rises, so does the "DC resistance of the voice coil." This is one of the factors that contributes to musicians having to "turn up their amps" after 20 or 30 minutes of playing time. Of course, as power is further increased, so does the heat, and so does the "power compression," thus "the stage is set" for loudspeaker failure.

While HEAT is the major destroyer of loudspeakers, the "waveform" fed to the loudspeaker can also be problematic. Normal sinewave type "clean" program material is what a loudspeaker usually encounters, but if the amplifier is allowed to clip (square off) then square waves are fed to the speaker, which are severely destructive in several ways. First of all, when an amplifier "clips" and delivers a "square wave" to the speaker, the portion of the waveform that is "square" represents DIRECT CURRENT (DC) which tends to heat up the voice coil very rapidly. As an additional negative, the "G forces" involved with the loudspeaker trying to follow a square wave are significant because the amp is telling the loudspeaker to move FULLY forward or backward (instantaneously) which of course is impossible for any device having mass and air resistance…

With a square wave input, the loudspeaker is subject to the two most destructive forces imaginable SIMULTANEOUSLY (i.e. maximum "G forces" that strain the structural elements of the speaker, such as the cone and its attachment points to the Spider and to the voice coil AND maximum heating caused by the square wave applying D.C. (for the majority of the "time domain") to the voice coil causing maximum heating affects… Destruction under these circumstances usually occurs within minutes with high-powered amps.

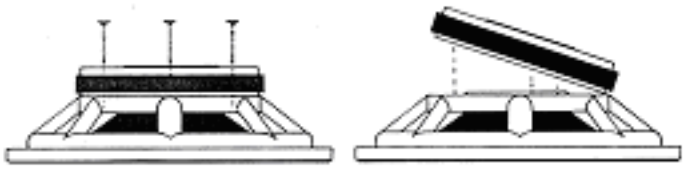
It is important to understand that loudspeakers are "rated" using a number of different methods. Even with the various methods…, the rating "TIME PERIOD" is never given (i.e.: how long the speaker can withstand its claimed "rated power"). Loudspeakers are never ever rated with a square wave input! We have seen many situations where customers "blew" a speaker rated HIGHER in power capacity than the rated OUTPUT POWER available from the amplifier.

People have a hard time understanding how a 100-watt amplifier can destroy a loudspeaker rated at 200 watts!… What seems to be a "contradiction" is really just a difference in the way that a speaker is rated versus the way amplifiers can deliver power. Amplifiers are invariably rated by their ability to deliver a "clean waveform"…. Speaker power capacity is usually rated for the speaker's ability to absorb and handle a "clean waveform." When an amp "clips," its ability to swing more voltage is inhibited and the "tops" of the waveform are literally "clipped" (squared off). If the maximum power of the amplifier is defined as a voltage with a given "limit" at the top and the bottom, then that is the maximum amount of voltage swing possible.



If you can imagine one cycle of a square wave reaching a positive and a negative "maximum" and then superimpose a sinewave over that "square wave" with its positive and negative peak approaching the upper limit, it can be seen that there is significant ADDITIONAL ENERGY "outside" the sinewave on either side of the positive waveform and the negative waveform… This excess energy accounts for the additional power a square wave delivers to the loudspeaker. A "rule of thumb" is an amplifier can deliver approximately 2½ times the power to the loudspeaker with a square wave than it can with a "clean" waveform. For example, an amp can deliver 100 watts of sinewave power is usually rated at 100 watts. However, if this same amp is driven into total clipping, this 100-watt amplifier can easily deliver well over 200 total watts and possibly significantly more depending on the regulation of its internal power supply…. This is how a "100 watt amplifier can destroy a speaker rated at 200 watts." Remember "the 2½ times rule." Whatever the clean power output, multiply it by approximately 2½ times, and that is what you will get if you drive the amp into total (square wave) distortion. Sadly, in MI amplification and sound reinforcement, these types of operating conditions can, and do happen in the real world.

The loudspeaker is (and for many years) has been the "weak link," that's why Peavey and its competitors have spent huge amounts of money improving loudspeakers. Giant strides have been made since the 40's and 50's, but loudspeakers are at a similar "state of development" as the internal combustion engine, i.e. improvements today are "incremental" rather than revolutionary.



Given the fact that loudspeakers and drivers are the weak link, it seemed to us that it was reasonable to design our premium transducers utilizing "field replaceable" diaphragm assemblies. This has been common practice with high frequency drivers since the 1930's, but amazingly, this has not been the case with cone type loudspeakers. Many customers have asked us WHY other companies DON'T make THEIR loudspeakers with replaceable diaphragms… The answer is VERY SIMPLE; it costs approximately 5 DOLLARS MORE PER UNIT to make the speakers this way! Our competition have obviously chosen not to embrace our customer friendly (field replaceable diaphragms) approach used by Peavey since the mid 70's. This field replaceable feature further enhances Peavey products that are now distributed in over 130 countries around the world. Peavey's field replaceable cones/diaphragm assemblies are a major advantage of Peavey's loudspeaker program. In comparing Features, Advantages and Benefits of any speaker (or speaker system), FIELD REPLACEABLILITY is a major advantage especially, in light of the established fact that the loudspeakers and the drivers will always be the

"weakest link" in any audio system… As I often remind people, "from a car radio to the largest concert sound system, the loudspeaker is the first thing to go should the volume be cranked up all the way (i.e. having the ability of repairability instead of being tediously "re-coned" is a huge advantage offered by Peavey).

THE RATINGS GAME

One of the most confusing issues regarding loudspeakers, drivers, and entire speaker systems revolves around how the various manufacturers "rate" their loudspeakers re: power handling. This topic is possibility the most confusing in the audio industry since, virtually every company uses different criteria to come up with "power ratings." Most suppliers of loudspeakers and drivers (as well as complete speaker systems) attach some kind of power rating, and rarely is there any additional information about how that power rating was determined. Some companies utilize sinewaves (usually at one KHz). Some companies utilize what they call a "warble tone," some use either pink or white noise, while other companies apparently just "pick a random number" and put it on the spec sheet or system nameplate…

The interesting thing you NEVER see on a loudspeaker is the TIME that a speaker will handle its "rated power"… Is it for an instant? A second? A minute? An hour or more? You will never find this listed re: speakers and in fact, you will rarely find this time period shown on POWER AMP specs either…. Almost any speaker can take a large amount of power for a fraction of a second before "meltdown." I've seen a number of relatively small voice coils with ludicrous power ratings, but of course those ratings are NEVER accompanied by information re: how LONG the unit will handle this power. All devices can handle significant overloads for a very short period of time, but TIME is where "the men get separated from the boys"… Fortunately, the "time domain" of most music is such that the average power is significantly less than the peak power and this helps somewhat as long as the power amp isn't delivering square waves to the speaker. Any waveform such as pink or white noise (or square waves) will heat up a voice coil much quicker than musical waveforms… In recognition of this, some manufacturers specify power handling as "program power"… It should be remembered that it is very difficult and/or impossible to ACCURATELY COMPARE various pieces of audio equipment by SPECIFICATIONS ALONE… Especially, when if the measuring "criteria" are NOT the same!

One of our competitors have overstated their power handling for decades claiming that their 2½" voice coil speakers will take 500 to 700 watts… They probably mean that their speaker will take this for "one thousandth of a second" before the voice coil goes "incandescent"… The long and short of what I am saying here is that power ratings on loudspeakers (power amps, too) doesn't mean a lot unless the measuring criteria AND the TIME INVOLVED are also stated. You will rarely (if ever) see time referenced in power specs re: loudspeakers and/or power amps. You will almost never see distortion specs listed for loudspeakers and/or speaker systems because the truth would be "too scary" for most soundmen to deal with. There are numerous other factors re: loudspeakers performance including the dreaded "power compression" that invariably occurs as the voice coil wire heats up and increases its resistance. Speakers are extremely complex and that's why we generally refer to the loudspeaker as the weakest link… This is why….instead of buying "off the shelf speakers" from the various OEM speaker companies… Peavey makes its own.

So far, we've discussed various "tradeoffs" attributes of speakers. Loudspeakers are engineered items that are a carefully selected combination of three basic features. They are:

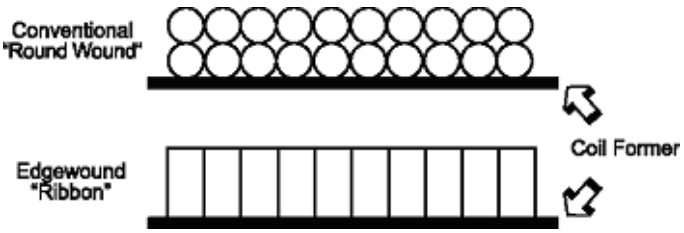
1. **Power handling**
2. **Efficiency**
3. **Frequency response-(Bandwidth)**

Most engineered products represent a "compromise" of some sort; for instance, if an engineer was asked to design the "most survivable fighter plane imaginable" he might choose to make the airplane from "tool steel"… This would indeed produce a very survivable aircraft that would certainly meet the initial design criteria, but being made from steel, it probably couldn't fly and even if it could, its performance would be severely limited by its mass… Bad "compromise" huh?

When a loudspeaker is designed, the three factors listed above must be "juggled" to produce optimal results… Having said that, we must again realize in order to get MORE of ONE of the three attributes, we must SACRIFICE ONE (or both) of the others. Since loudspeakers tend to be relatively inefficient, power handling is one of the more important elements in speaker design. High power handling usually calls for "massive components" and anything having MASS, has INERTIA and the more inertia present, the more

inefficient a speaker is simply because it takes more energy to get any mass moving. Inertia (resulting from mass) also limits frequency response so it can be seen that you can get more power handling by using larger and heavier components at the sacrifice of EFFICIENCY AND BANDWIDTH, i.e. a "design compromise." If efficiency and bandwidth are to be maximized, then moving mass must be reduced, thus sacrificing power-handling etc., etc….

Efficiency has always been an important factor in the design of loudspeakers. One of the easiest ways to make a loudspeaker more efficient is to place more wire in the speaker's magnetic gap. Most wire is ROUND and therefore, most loudspeaker voice coils are wound with ROUND WIRE! In order to maximize the number of "turns" of wire in a voice coil, designers typically use two (or more) layers of round wire… The problem with round wire is that when it is closely wound on a bobbin small "open spaces" are left between the round wires as they touch each other… Early loudspeaker designers discovered if they used an "edge wound ribbon voice coil" that approximately 23% MORE wire could be placed in the gap thus significantly increasing the speakers output efficiency (see diagram).



ROUND WIRE VS. RIBBON WIRE

Peavey's premium Black Widow® and Scorpion® loudspeakers utilize edge wound ribbon wire voice coils, ditto our 44 Driver… Edge wound ribbon also creates a much more rigid voice coil and one with fewer "thermal junctions," thus slightly increasing the heat radiating capability of the voice coil itself. Having so-called ribbon wire voice coils in our premium speakers gives Peavey a significant advantage over most of our competitors who use round wire… Incredibly, one of our competitors even runs ads claiming that his use of "round wire" in his speaker voice coils is "an advantage"!???

As I mentioned above, HEAT is the number one destroyer of loudspeakers and we have done all that, we can to allow the loudspeaker to cool itself. This is why our Black Widows have huge vents in the magnetic structure. Our Black Widows featured extremely large 4" voice coils and even our less expensive Scorpions use 2½" coils thus presenting a large "surface area" to help radiate heat away from the voice coil. The cast aluminum frames of our Black Widow® & Scorpion® speakers act as a very effective heat sink radiating significantly more heat than the conventional steel frame speakers used by most of our competitors.

DDT™

By the early '70s our amplifiers had reached a power level that the available speakers (at that time) had great difficulty in handling. The largest voice coil available from any domestic vendor (other than Altec, JBL, and EV) was 2". Peavey was one of the first companies to offer more than 100 watts in its range of bass amps and the speakers at that time were notoriously unreliable at higher power levels… Everyday the parcel post truck would pull up to our shipping dock and dump off piles of "blown" speakers. This was especially true with bass speakers and the situation was becoming very serious indeed since bass players insisted on more power, but naively assumed that the speaker system that came with the amp should be able to handle their amp's entire output power… We tried to find speakers that indeed would handle the amp's entire "clean power," but as I have explained already… An amplifier can deliver significantly more energy to the speaker than the so-called "power rating" of the amp itself (which is always rated with no clipping). Please keep in mind that when an amp goes into total overload that it can deliver about 2½ times its "clean rating," i.e. our 120-watt power amplifier could actually deliver 300 watts of square wave power to the speakers… This was more power than most players had ever experienced up until then, and although we were selling lots of bass amps; we were having lots of speaker failures too!

I discussed this problem with Jack Sondermeyer and asked him to try and come up with a method that would prevent our amps from delivering square waves into our loudspeakers and drivers… Jack immediately suggested a limiter or a compressor. He came up with a circuit that was a fairly sophisticated compressor that did in fact prevent the amplifier from clipping. The problem was that it sounded like crap! It was a very fast acting compressor that effectively removed the "dynamics" of the music… A bass note sounded like a "thud" and a cymbal crash sounded like a "wave breaking on the beach"… Simply put, Jack's compressor was "too good"… I asked him to re-think the idea and try to devise some way the compressor

would not alter the sound in any way unless the amp was in overload. We experimented with many different circuits. We discovered that the only way we could preserve the "dynamics" of the program material was to SLOW DOWN the compressor and actually let the first few pulses clip while the compressor slowly engaged so that the "compression effect" only was discernible as the amp was going into clipping. I asked that their be no adjustments and that this compressor/limiter should be totally automatic and (as much as possible) be inaudible…

Jack devised one of the most clever circuits in the audio industry. He invented a circuit that "compared" the INPUT waveform TO the OUTPUT waveform FROM the amplifier… When there was any "difference" in these two signals (other than level), the soft compressor was energized, thus creating an almost ideal method of preventing square waves from being presented to the loudspeaker/driver. This unique technology was patented and because it utilized a unique "comparator circuit" for detection of clipping, we called it "Distortion Detection Technique®" (DDT)… We made this a feature of almost all of our bass and sound reinforcement amplifiers. Our "DDT" has been a major feature of Peavey equipment for many years and it is a major reason why Peavey power amps, powered mixers and bass amps rarely (if ever) blow speakers… Jack's innovative solution to our blown speaker problem quite possibly saved the company in those early days when the power available from our amps quickly outstripped the power handling of (then) available loudspeakers.

It would be difficult to fully explain the vital importance of keeping square waves OUT of loudspeakers and high frequency drivers. These waveforms are the most destructive single factor re: the reliability of speaker systems. Our "DDT" is still the most effective system we know of in preventing speaker failure and when combined with the advanced features of Peavey speakers, produces the best record of RELIABILITY available from any company regardless of price.

The numerous features, advantages, and benefits of Peavey loudspeakers is a significant sales tool for our own sales people as well as those of our contractors and dealers, Most of all, we provide unmatched durability. Peavey is in a total CLASS OF ITS OWN regarding FIELD REPAIRABILITY of speakers. Incredibly, we have actually encountered people who ASSUMED that we made our speakers' "field replaceable" because we had so many speaker problems! Ironically, that is somewhat true, but only in a "HISTORICAL sense"… In the old days, we did have lots of speaker problems and we found out then that sending out "re-cone kits" was a useless exercise and sending entire new speakers was expensive and oftentimes impractical (especially in export markets)...

"EXPERIENCE IS THE GREAT TEACHER"

Our 41 years of experience have gone a long way in "teaching us" about loudspeakers. Especially, about what works and what doesn't and how to solve "real life" problems that our customers encounter in the field. Some say that "experience is the great teacher," if that is the case, Peavey has had over 4 Decades to learn and grow under the SAME OWNERSHIP and MANAGEMENT. I am proud to say that trend continues today and our ongoing research into loudspeakers will continue to present our dealers, distributors, contractors, as well as the end user with an evermore capable range of professional loudspeakers, drivers, and speaker systems, as well as matching electronics.

Peavey is one of the few companies that manufacturers EVERY "link" in the audio chain… We make our own microphones…including the cable (or wireless connection) to the mixer, the complete electronics through to (and including) the loudspeaker itself… There are very few companies on the planet with similar technical capabilities. We not only understand how to make every link in the chain; we have acquired a critical understanding of the INTERFACING between the various components in the audio chain. Quite often, knowledge about how the various components connect and work together is almost as important as the components themselves. Indeed, Peavey offers a unique and compelling set of features, advantages, and benefits.

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