# THE NEWSLETTER OF THE KINGS COUNTY RADIO CLUB



November 2015

"Noli me vocate, ego te vocabo."

Volume 2, Issue 11

#### Next Club Meeting:

Tuesday, December 8th, 2015 at 7:30PM

#### Next Club Activities:

The next KCRC Sponsored VE Session is scheduled for November 29th, 1 PM at The Executive Dining Room of the Methodist Hospital.

Our Annual Year End Holiday Party will be this December 8th!

Further details will be posted on www.KC2RC.com and www.KingsCountyRadioClub.com as they develop.

#### Contents

- KCRC Sponsored Volunteer Exam Session
- Don't Forget The Amateur Radio Parity Act of 2015!
- The Annual Year End Holiday KCRC Party!
- Prime Time TV
   Mentions Ham Radio!
- This Aspect Of The KCRC Newsletter Is "winding down"
- Minutes of the November 2015 KCRC Meeting
- A Message From Our President
- In Search Of Your Second Radio?
- What's All The Noise About?
- Lee DeForest, Father of Radio, Grandfather of Television? Well, not really...
- Closing Comments

Tuesday on 146.730 PL 88.5 (2 Meters) at 9 PM

Our weekly Nets meet on Sunday at 11 AM on 28.380 (10 meters) and

# Like Yogi Berra used to say, "It's like déjà vu, all over again!"

## KCRC Sponsored Volunteer Exam Session

The Kings County Radio Club will be sponsoring another VE Exam Session! It will be held at the Executive Dining Room of The New York Methodist Hospital on November 29th, 2015 at 1PM. Although walk-in registrants are allowed, it would be best to contact the VE Coordinator John, WK2J, at johnsrealestate@yahoo.com to let him know that you are interested, and to get any details. Remember to bring your photo ID, your \$15 in exact change, your number 2 pencils and your wits!

# Don't Forget The Amateur Radio Parity Act of 2015!

The Amateur Radio Parity Act of 2015 is still alive and well, but IT NEEDS YOUR HELP! The congress only has 4 weeks in session left to pass it!

We need you to *politely* contact both your Congressional and Senatorial representatives and impress open them that they need to support this bill.

The ARRL has help with the form your correspondence might take, as well as a database to show how you can contact your particular representatives (don't plead with representatives that are not in your voting district—unless you are a contributors they don't really care what you think).

The ARRL site is: http://www.arrl.org/amateur-radio-parity-act Be polite, but make your thoughts known!

The Kings County Radio Club is at www.KC2RC.com or www.KingsCountyRadioClub.com
KCRC is an ARRL affiliated club (see: www.ARRL.org)

# The Annual Year End Holiday KCRC Party!

Well, it's that time again for planning our Club's Annual Year End Party. It is scheduled for December 8th, 2015 at 7:30 PM in the Executive dining Room of the New York Methodist Hospital. The price will be \$10 per person. Stay up to date by checking back on our club website, www.KingsCountyRadioClub.com.

## Prime Time TV Mentions Ham Radio!

No, I'm not talking about that abortion of a sitcom "Last Man Standing". Those manipulative so and so's aren't even bothering to bolster their ratings with Hams this year, by sticking a meaningless scene once a year into their show. You'll notice that their "Celebration For Hollywood", which was really just a bit of thinly disguised self promotion, which the FCC should have stomped out, has evaporated with that show's need to covet attention by Amateur Radio hobbyist.

No, I am writing about an episode of a show called "Limitless", a pleasant bit of well written actionadventure, slightly science fiction TV. Of course, as usual they got most of it all wrong.

The central character has to find information about a group of Pirates near Malaysia and decides that Ham Radio is the answer! The major characters quickly race to connect up a radio, a power supply, an antenna tuner and, surprisingly a wattmeter that appears not to be connected to anything else, but smartly positioned on top! There is no mention of an actual antenna in any of this.

The main character has no license, but as a duly invested consultant for the FBI, he turns his radio to 17.450MHz(?) and starts to use a fake call sign with a Geneva prefix? He contacts a nice kid somewhere near Malaysia, who doesn't give a callsign and our hero gets the information that he wanted.

By the end of the show our hero saves the girl! (What a surprise)

Not the least bit accurate, but then neither was "Last Man Standing"'s drivel.

...and Limitless didn't ask for a write-up in QST, 73, Ham Nation, etc. etc.

# This Aspect Of The KCRC Newsletter Is "winding down"

As 2015 rushes to a conclusion, we on the editorial staff of the Kings County Radio Club Newsletter are "winding down" the virtual printing press and editorial software, and making room for another intrepid Editor to take our place in 2016.

Our editorial staff is sure that, as the generous donations of time and effort by the general membership have shown to this publication, that many members will be able to pick up the reins and make this Newsletter even better in the coming years.

...And if you believe that, the Editor has a very nice, hardly used bridge, that he can let you have at cost!

# Minutes of the November 2015 KCRC Meeting,

### November 10th, 2015

The monthly meeting was called to order by our President, Howard N2GOT. Also present at tonight's meeting were Vice President Mitch N2RGA, Treasurer Richard KA2KDQ, Howard K2IGJ, Robert AB2LO, Jack KC2MGY, Zac KD2JCP, Gil KC2VME, Ed W2DEV, and Andy (no call sign yet).

Treasury Report—Our Treasurer reported that we presently have 1,989.55 in our Club treasury.

10 Meter Net—Propagation has improved a bit since earlier this fall, and weekly 10 Meter Net attendance fluctuate from 12 to 20 participants.

2 Meter Net—There was no new news regarding the 2 Meter Net.

Old Business—Our next Year End Holiday Party is scheduled for December 8th. Admission will be \$10 per person, with the Club picking up any resultant overage. Members are advised to look for any new information on our club website www.kingscountyradioclub.com.

Our Repeater amplifier seems to be failing intermittently and this needs to be investigated by volunteers.

New Business—Ed W2DEV nominated Mitch N2RGA for another term as Vice President, and Howard N2GOT for another term as President. Howard N2GOT nominated Howard K2IGJ for one of the Executive Board Member at large openings. Howard N2GOT pointed out that there were some club officers that, according to the By-Laws, have already served their maximum continuous two term limits.

Mitch N2RGA explained that the new Yaesu Club T-shirts we received for the purchase of the new Repeater only amounted to 10 shirts, and a method of fair distribution needs to be considered.

Eddie W2DEV donated his Cushcraft R5 antenna to Juan KC2QNK, which should help him a lot at 10 meters and below.

We hope to have more nominations prior to our annual Elections at our December Meeting—Year End Party.

At the end of the meeting Howard K2IGJ continued his talk on Shortwave Listening, begun the two months ago and our November meeting was closed at 9:30 PM.

# In Search Of Your Second Radio?

## So, Now What? Part XXII

By now I'm sure that you've had a lot of fun with your HT. They are small and very versatile. They can be relatively inexpensive. You can carry them anywhere. They are as good a method of giving you your first exposure to this hobby as anything else, **BUT** you can't settle down with your HT and consider this hobby of Amateur Radio fully experienced and stop progressing at that point. It would be like if you settled with your tricycle when you were four years old. How silly would you feel commuting to work every day on a tricycle?

### Like the King James Bible says:

"When I was a child, I spake as a child, I understood as a child, I thought as a child: but when I became a man, I put away childish things."

No, I'm not suggesting that you put away your HT, it will still serve you well as your hobby progresses. Trust me, Repeater discussions of the nuances of Baofeng HTs can get very tedious and repetitive after a while. It's time to move on...

#### To your second Radio!

What shall it be? I dunno. Should you have married a blonde, a redhead or a brunette? It depends...

The first thing you have to decide is *where to go from here?* If your first thought is to just get a couple more Baofeng HTs please re-read that Bible verse, and think some more. It's time for *the long pants*.

Is your next radio going to be a base station, or a mobile? Will it be only UHF/VHF? Will it be only HF, or an *All-In-One*?

A mobile VHF/UHF radio will certainly be the least expensive and the easiest if you plan to mount it into a car, and it will give you a bit more power output to work with, but it is limiting. As a Technician you have some access to the lower bands, although not much. On the 10 Meter band you can talk in the 28.300 to 28.5 MHz frequency range. If you are interested in Morse code they are CW bands you are eligible to use in 40 and 80 Meters. A UHF/VHF mobile can't take you to any of these places.

Even if you can't talk that much on the HF bands, you can certainly listen all you want. You can learn what's available on these bands and find out if it interests you or not. If it interests you all you'll need is to pass the General license exam (maybe we'll get to that subject in a future part of this series?) and a good portion of those bands will become available to you!

Will the higher power of something more potent than an HT gets you to every station you may want to go? Sorry, no. You still will need to find a good antenna that suits your circumstances, but that is a topic for a completely different series of articles (available at the usual web site).

A very common choice of new Hams is the purchase of an *All-In--One* Radio (HF/VHF/and UHF) that can operate as a portable when necessary or as a base station. There are used all-in-ones out there that are not too expensive. The brand new ones tend to go for \$1,000+, but old IC-7000, IC-706 mk II, FT-817 or FT-897 can be gotten much more inexpensively. In a way one of the problems is that there are TOO MANY choices (for radios, and especially for antennas) the options and their differing capabilities and prices can

be dizzying! My second radio was an IC-7100, but there are a lot of great models out there. There are some fanboys that are locked into a specific manufacturer. Some will speak about the better sound of a Kenwood, other's will speak of the high tech features of the Icom, other's will talk about the practicality and better value of a Yaesu (and don't forget that there are actually U.S. manufactured radios out there from such companies as TenTec, Elecraft and FlexRadio). I prefer to take each model separately and not based on their manufacturer. What do you need now? What do you think you might need later? Can you afford the "later" features today, or will you need to save up for them "later"? It's like many other hobbies - if money were no object most people would buy a professional Nikon or Canon DSLR, or better yet, a Leica upon starting a photography hobby. Others would only bother with a card-board box with a pinhole in it, to see what they could accomplish with such a handicap. In the real world most people choose somewhere "in the middle".

This is where your new hobby will help a lot. Ask everyone what they have, what they like about it, what they hate about it, and what they want to make their next radio purchase. Go to places like eHam.com reviews and careful read these reviews. Some guys are writing reviews that never used the radios, others either got a *lemon* or decided not to read the manual and found the radio daunting and not as obvious in operation as they required. It's challenging to *parse* a review to get its *kernel* of truth, but it is possible. Unfortunately, there is little opportunity to *test drive* most radios - the retail stores are far, far away, but if you find a friendly Ham with that rig nearby, chances are that he will invite you over to *twirl the dials* and try it out for a while.

Buying a used radio has its pluses and its minuses. If it comes from a reputable individual that hasn't abused their rig, such a purchase lessens the chance of getting stuck with a *lemon* and you can save yourself a significant amount of money. Then, when you decide to *trade up*, you can recoup some of the cost when you sell it to someone else. It's like used cars - some people only buy used cars, and others only buy new cars and accept the price drop the second they drive it out of the showroom. *Ya pays yer money, and ya takes yer chances!* 

If you're addicted to the bleeding edge of technology, if you have to have an iPhone 18 DoublePlus today, then used is not going to be much of an option, but for many it can be the smart way to go...

I'm sorry if you were expecting "you MUST get a Zelectro ZS-285D, nothing else will do!" It just ain't that simple (nothing ever really is)...

Don't think of this (re)search for your second radio as a pain in the arse. Think of it as a marvelous journey in this hobby. When you finally decide and make your choice, not only will you have a radio that will give you untold hours of pleasure. You will have all the knowledge that you have collected along the way on this journey.

It never ends (if you don't let it).

...And remember (all together now)....

DON'T FORGET TO HAVE FUN!

-The Editor-

# What's All The Noise About?

### A Primer On Radio Noise

Noise has always been the bane of the Amateur Radio Operator, and as our technology has developed our urban environment has become an endless source of annoying noise!

If you can somehow figure out how to "boost" the signal high enough above the background noise without producing any other noise - you've boosted the Signal to noise ratio (S/N) and your problem is solved! Trouble is, that solution is limited by many factors that may be beyond the limits of we poor urban operators. Oh, for a monobeam Yagi on a 200 foot tower!

"Noise" can be anything that isn't the signal you are interested in. It can be interference from another human being - QRM, either malicious or accidental, or it can originate from nonhuman sources (QRN), like static, or car ignition noise. QRN can have numerous causes. Many are caused by our modern technology - light ballasts, poorly designed (wall wart) power supplies, or power converters, poorly shielded internet routers. This category seems to be growing every day. Other forms of QRN noise can't be blamed on human technology - lightning, which can be happening a thousand miles away, static discharge, space based random energy. Hell, everything that isn't at absolute zero degrees Kelvin emits some amount of electromagnetic radiation noise!

The background noise created by random motion of electrons, or by thermal noise emission, is called *Gaussian Noise* and is usually perceived by us as *white noise* by the time it gets to our ears. *Impulse noise* is a different thing entirely - usually due to some man made device, with its own peculiar spectrum and interval rate.

Very often it is the *random noise* that is the most bothersome. Part of it is worsened by our antenna system, and our receiver! Those factors can be ameliorated by using the shortest, lowest loss coaxial cable possible. In some cases in the UHF range, low noise pre-amplifiers very close to the antenna have been very useful. Since *random noise* is equally distributed over the frequency spectrum, "packing" your signal in the narrowest acceptable spectrum improves your signal to noise ratio! This is one of the reasons why low power enthusiasts (QRPers) tend to use CW with its 100 Hz bandwidth rather than SSB's 2.7 KHz or worse, full bandwidth FM! Most people are well aware that using filters designed for the bandwidth of the mode they are receiving improves their S/N. Try listening to someones's SSB signal with a 4,000 Hz filter and then with a 2,700 Hz filter and hear the difference! Another important thing to remember is NOT to set your gain settings all the way UP - set it so that the background noise is less obvious while the signal is still understandable - all things in moderation! There are simple ways of lessening *random noise* and then there are much more high tech ways... but we'll get to that later.

Impulse noise is relatively easier to deal with as radio technology has developed. Initially receivers employed an extremely simple Noise Limiter - a circuit that clipped noise signals that are higher in amplitude than radio signals. It didn't so much remove this noise, as it did limit it to the same level as your received signal. Further improvements to this technology brought the Automatic Noise Limiter (ANL) which could vary the clipping by the strength of your received signal and not clip your signal along with the noise! These circuits were fine in the 1930's, but as later receivers were designed with better selectivity the noise spikes were made wider and wider by the time they got to the ANL circuits at the audio output stage and the ANL circuits were unable to "tell" the signal from the noise! With the advent of Automatic Gain Controls (AGC) the impulse noise was being detected as a received signal and causing the AGC to lower the gain on your actual signal! Another solution was necessary.

This led to the development of the *Noise Blanker* (NB). This circuit is usually designed to operate at a stage much earlier than the old ANL circuits and is unaffected by AGCs and spike widening circuits seen by ANL circuits. These NB circuits are still with us in modern receivers and usually have on/off settings as well as a *threshold* knob to tweak. Use them at the lowest acceptable setting - as with all other noise reduction, they introduce *artifacts* that can be just as annoying as the noise that they mask!

DSP notch filtering (NF) relies on QRN that has a steady carrier signal, like some Lid tuning up on the frequency that you are using, and is very good at limiting this form of intrusion. There are trainable NF's and automatic NF's. They offer a good solution to a specific problem. Learn to use them when necessary.

Random noise is much more difficult to deal with, and there's little that could be done until the advances in microelectronics that gave us powerful Digital Signal Processors (DSP) at reasonable prices!

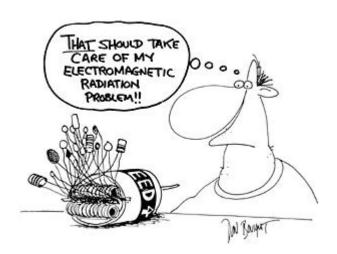
DSP based solutions seem to be the future of noise reduction (some would say that fully Software Defined Radios - SDRs - are the future of the entire hobby). Initially, receivers had relatively simple DSP chips stuck on to the audio output of their receivers. These are not unlike present options available for owners of older radios offered by external monitor speaker manufacturers, which include some rather inventive DSP algorithms to reduce random noise superimposed onto the audio signal (BHI, West Mountain, and Timewave make some very useful devices using this technology). Everyone's algorithms seem to be different, and each one lessens the noise while inserting its own type of distortions. Purchasers should make an effort to *test drive* each manufacturer's product before spending their money on one.

A far better solution is to get the DSP to work on the signal, long before it reaches the final audio stage - somewhere in the IF stage (if your receiver still has an IF stage). Most modern radios tap the signal at the IF stage and with the additional information available at that point offer a better solution to *random noise*. Again, this is NOT a complete solution - noise is lessened to a degree and distortion is introduced, to a degree. Fortunately, most times, these circuits are adjustable, and can allow you to find the best setting that you can live with.

If at all possible limit the local noise creation at its source at your shack's location and take all possible measures to feed the strongest signal to your radio. Like most things, it's much better to fix a thing *before* it becomes a problem, rather than after.

Lotsa luck, and don't forget to clean that wax out of your ears!

-The Editor-



## Lee DeForest, Father of Radio, Grandfather of Television?

## Well, not really...

## There's **History**, and then there's *History*.

Lee DeForest is a great historic figure in the history of wireless radio. History can be great with names and places most of the time, but it has a lot of problems with the nit picky details and the motivations involved. Discoveries and inventions are a particularly troublesome aspects of history, and history often seems to get them partially wrong.

The details of Lee DeForest's life are just such an example of this *problem* with history.

Most people don't care that much for history, in general. Their days in a dusty, chalk dust covered schoolroom listening to a teacher drone on about dates and places and generally boring the hell out of everyone in that class, including the teacher themselves, is enough to choke any interest in history out of any student. But, as George Santayana once said "Those who do not learn history are doomed to repeat it." (But then if you don't bother to learn your history you probably never heard of this very smart man and that very smart quotation.) It is important to know history and to learn from it, but it is also wise to doubt history.

Those people that know a bit about history and especially the history of radio, recall that Lee DeForest was the Father of Radio and the Grandfather of Television. This was not because he was either of those things, as much as he was the guy that always described himself as these things. Yes, he was the *Michael Jackson*, "The King Of Pop", of his day. His self proclaiming became a truth in many eyes.

Let's jump over his birth and education, and get into how some might perceive him as the "father" of any major technology. Lee DeForest was an inveterate tinkerer with 180 patents to his name in his long career (he made it to the age of 87). The thing that really put him in the history books was the invention of the Audion tube! You remember that one, right? The very first triode vacuum tube - the invention that made amplifiers possible and with amplification all those important electronic devices that could now follow!

Well, not really.

DeForest's invention that he first labeled The Audion Tube, was a two element diode, not a triode and was strikingly similar to another inventor's previously patented thermionic diode (the Fleming valve). Much worse than the little detail that this design was not completely original, was the fact that it was not a very good diode at all. But still, the tinkerer tinkered. He placed another electrode on the *outside* of the Audion diode (promising, but no cigar). Then he placed the outside electrode inside the tube and since it was shaped like a football gridiron, he named it the *Grid* and re-christened his invention the *Audion Grid Tube*!

With his new Audion Grid Tube in hand, Lee DeForest took about promoting the brave new world of radio broadcasting that it would enable, and if there was one thing DeForest was better at than tinkering, it was self-promotion. In a short time he had found enough investors to put on a great demonstration of his new technology. He broadcasted a local Opera to scattered receivers all around a city, for passersby to listen and marvel at. From then on, Lee was a Legend.

Well, not really.

You see, the demonstration was a disaster. His Audion Grid tube was not even meant to act as an amplifier it was merely a more sensitive diode detector of radio transmissions at first (to be fair the idea of the importance of amplification of a signal was lost on everyone else at that time, as well)! The Opera was little more than crackles of static, occasionally punctuated by the hiss of maybe someone singing something in the background. The trouble was that the Audion Grid Tube was an unmitigated technological failure. It was a failure primarily because, since Lee DeForest was a tinkerer and an inventor rather than an actual scientist, he did not have the faintest idea why a tube should work, which you would think would be a problem when it came to designing one. Lee had decided on an unproven belief that these tubes operated in low pressure air in some way, so a perfect vacuum would be anathema to him (surprisingly, to me, there are still guys with Electrical Engineering degrees that believe that thermionic vacuum tubes don't boil free electrons off their cathode but some jumble of ionized particles from the cathode that somehow don't erode it completely during this imaginary phenomena - just goes to show there are still some clueless E.E.'s out there). DeForest was famous for saying that he "didn't know why it worked, it just did". All of his designs left some air in the tube and as many of us now know, there is a very good reason why we call vacuum tubes, vacuum tubes! His resulting design produced a device that had very limited dynamic range and a nonlinear erratic characteristic. When the dust settled and threats of arresting him for mail-fraud died down, others tried to get his Audion Tube to work in a vacuum - unfortunately the design did not work well with a reasonably good vacuum. After Lee sold his patent for a song, smarter guys at AT&T redesigned the re-christened Audion Tube to operate in a decent vacuum and the true amplifying triode vacuum tube was finally born. General Electric further advanced the basic design into a useful device. Surprisingly, both people that made improvements that turned the useless thing into a historic device could not get these modifications patented!

Okay, so he didn't actually invent the first fully functional amplifying triode vacuum tube. At least he *almost did*. He still went on to do a lot of other great accomplishments. Didn't he invent the regenerative receiver?

Well, not really.

You see, years before Lee DeForest patented his idea for the regenerative receiver circuit, another guy was already writing all about it. A guy named Edwin Armstrong (the guy that invented the regenerative circuit, the super-regenerative circuit, the superheterodyne receiver and FM modulation - a brilliant Electrical Engineer, but not nearly as good a self-promoter as DeForest). DeForest seems to have been more successful in the legal system, having other people's inventions assigned to him, than actually inventing much, so he got a piece of the regenerative circuit patent rights to finance his continuing self-promotion. The man should have gone down in the history books for his wins with the Courts, rather than his re-imagining of other people's ideas.

As a college student, Armstrong had done extensive research into the workings of the Audion tube. Many years later when Armstrong and DeForest later were involved in a legal dispute over the regeneration patent, Armstrong was able to demonstrate conclusively that DeForest still had no idea how the Audion tube actually worked!

Lee DeForest then went into the vacuum tube business, selling overpriced tubes, that were required to be returned to him when they blew out! The invisible economic force of competition quickly led to this business failing too.

Lee DeForest's next area of interest was to develop optical sound-on-film for the nascent movie industry. Somewhere along the line Lee started to work with inventors Freemason Harrison Owens and Theodore Case. Not surprisingly Case kicked Lee DeForest to the curb because DeForest kept downplaying Case's contribution to the technology. Case went on to be very successful with his invention, and DeForest was reasonably successful suing Case (do you see a trend here?).

What about him being the Grandfather of Television. Well, Grandpa had this to say about television in 1929:

"While theoretically and technically television may be feasible, commercially and financially it is an impossibility, a development of which we need waste little time dreaming."

So much for dear old Grandpa!

After that, DeForest jumped around from place to place. He still held a patent to manufacture Audion tubes to a limited customer base, so he did just that. He fiddled with diathermy machines (unsuccessfully) as well as mechanically based televisions (equally unsuccessfully). He ended up being one of those guys who write angry letters to the newspapers bitching and complaining that they had taken "his baby" and reduced it to playing ragtime and boogie-woogie - he was expecting Opera. His actual contribution to the development of Television only relates to his original Audion tube invention. He did nothing to create the new television technology at all.

Here's some great quotes from *The Wizard of the Audion*:

"I do not foresee 'spaceships' to the moon or Mars. Mortals must live and die on Earth or within its atmosphere!" - 1952

"As a growing competitor to the tube amplifier comes now the Bell Laboratories' transistor, a threeelectrode germanium crystal of amazing amplification power, of wheat-grain size and low cost. Yet its frequency limitations, a few hundred kilocycles, and its strict power limitations will never permit its general replacement of the Audion amplifier." - 1952

He didn't seem to be a great fortune teller either.

Most of Lee DeForest's wealth dissolved with the great Stock Market crash of 1929. When he died on June 30<sup>th</sup>, 1961 at age 87 he had just \$1,250 in his bank account.

And so, here is the real story of a legend. The self proclaimed and self promoted Father of Radio and Grandfather of Television.

Rest in Peace Mr. DeForest.

(...and don't always believe history)

- The [Cranky] Editor -



By Dr. Le de forces

ClosstateThis noted inventor presents the many economic problems confronting the television industry.



ing ments

# (from the Editor):

Okay Guys! I give up! I surrender...

If youz guyz don't give a shite about a newsletter, then maybe I won't either.

I gotta get out of this place!

For your ideas, your thoughts, your dreams, your kind words or even your epithets, tell it to your bartender. I'm outta here!

- The Eschewing Editor - [Roy, AC2GS]



A Ham that took the hobby a wee too seriously...



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