

# THE REPEATER

Newsletter of the North Shore Emergency Association

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[www.NSEA.com](http://www.NSEA.com)

## FCC GMRS DATA

Total Active GMRS Licenses = 67,899  
Total Active GMRS in Illinois = 1,906  
Number Issued in March = 2,909  
Number March in Illinois = 86

## NSEA DATA

Regular Voting Members = 15  
Probationary Members = 1  
Auxiliary Members = 15  
Out-of-Area Members = 8  
Applicants = 1  
Affiliated GMRS Users on Roster = 58  
Added on Systems - Last 3 Months = 13  
Added on Systems - Last 30 Days = 8

## FOR REPEATERS PERMISSION

Click this link:

<https://nsea.com/Contact.html>

## FOR FCC RULES

Click this link:

[https://www.ecfr.gov/cgi-bin/text-idx?SID=b7b411dcef7e2b190049b5ebfc58be1c&tpl=/ecfrbrowse/Title47/47cfr95\\_main\\_02.tpl](https://www.ecfr.gov/cgi-bin/text-idx?SID=b7b411dcef7e2b190049b5ebfc58be1c&tpl=/ecfrbrowse/Title47/47cfr95_main_02.tpl)

## FOR NSEA RADIO PROCEDURE

Click here:

<https://nsea.com/Radio%20Procedure.pdf>

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## A (NOT SO) BRIEF HISTORY OF GMRS

### *The Inside Story*

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Put yourself into the time travelling DeLorean and set your dial to the mid 40's as the end of World War II was approaching. Al Gross, a leading electronics engineer from Cleveland, was designing and producing cutting edge radio communications equipment for the U.S. Army OSS (forerunner of the CIA). He was experimenting with higher and higher frequencies, and one of his successes was the "Joan and Eleanor" VHF radio system used by agents parachuted into occupied Europe.

As the end of the war approached, he began thinking how to put his advances in radio technology into use at home post war. You must realize that, before the war, there were very few uses of private radio, only a few special interest heavy industrial operations. There was no Business Band, Taxicab Radio Service, etc. Pre-war VHF had just started to be developed and UHF was unheard of. The FCC Rules and Regulations had only 18 Parts.

Given the state of technology, existing FCC frequency allocations ended in the VHF band for private 2-way radio. Al realized that, with the new advances during the war, new provisions for radio at much higher frequencies were now possible. He conceived of a new additional two-way radio service for all uses that had not already been provided for by the FCC. This meant not only general businesses, but also for individual people and families, who had no 2-way radio service to use. He called it the Citizens Radiocommunication Service.

There was a lot of new spectrum freshly available at higher, previously undeveloped, frequencies. He found a home for his new service in the 460-470 MC/s band. THE ENTIRE 460 – 470 band. At the time Al was friends with Jack Jett, then Chairman of the FCC. So, in 1945, he went to Jack and sold him on the idea of his new service. Even at that time it was considered especially novel because it included individual people and families, not just commercial activities. Look Magazine was so intrigued that it published an article about the new forthcoming radio service ("Call Me By Air").

Citizens' Radio was born when the FCC adopted a new Part 19 of their rules in 1945-46. Since the technology was so new and relatively unknown, they spent time refining the regulations. Finally, in 1947, the first license was issued – to Al Gross of course, call sign 13W0001. Initially there were no specific channels, operation could be anywhere in the 460 - 470 MHz band.

I should explain about Citizens' Radio call signs. The new Rules provided for call signs consisting of a 1 or 2 digit number of the FCC Radio District in which the applicant was located. This was followed by a letter, W if the license were issued in Washington, or A-? if issued by the local FCC Field Office. And finally followed by 4 digits. Chicago is in the 18<sup>th</sup> Radio District, call signs here thus started with 18W or 18A, 18B, etc. (I can still remember talking to a 27 MHz CB operator in Wilmette in 1961, Marv, 18B0832.) This Call Sign format changed in 1963, more on that later. (My Restricted Radiotelephone Operator's Permit in 1961 was 18N1234.)

Development of new equipment for the new band progressed slowly. Since it was cutting edge at the time, it was expensive. Most new users were larger commercial enterprises that could afford the expense. This left out the general public that Al envisioned benefiting from CRS. Something needed to be done.

In 1948 (if I remember correctly) the FCC took action to facilitate and encourage use by the general public. It created a new Class B CRS in the same band. Substantially relaxed technical requirements at lower power were thought to promote use by individuals and families. In the early 50's a company called Vocaline started producing less expensive CRS Class B radios for the general public.

Enter, in 1952, the Academy of Model Aeronautics (AMA). They needed spectrum for new remote-control model aircraft. Licenses were needed for individual people, not commercial enterprises. The natural home for such new licenses for individual people was the Citizens' Radio Service. The FCC responded by putting the AMA remote-control operation in CRS. But UHF was still cutting edge and very expensive. Many model aircraft were flown by younger children, for whom the cost of UHF would be prohibitive. Thus 27 MHz was born, and the FCC located the new Class C Citizens' Radio Service in a band where lower cost equipment was already readily available.

Even by the mid 50's the CRS 460 - 470 band remained largely undeveloped. One of the prime makers of gear was Motorola, their old U44AAV trunk mounted radios even had a plate that said "Citizens' Radio Service". But you can imagine the cost! (I tried to buy a used, refurbished one in 1968, they wanted \$783.00, and remember that was a lot in 1968 dollars!)

The FCC had numerous interests clamoring for more 2-way spectrum, including Police. A massive reallocation plan began to emerge. Whole new Radio Services, such as the Business Radio Service emerged. Other existing radio services got new allocations in the UHF Band. The spectrum had to come from somewhere, and, in 1958, it did - the Citizens' Radio Service. Over 90% was re-allocated, and specific channels were created (50 KHz spacing, +/- 15 KHz deviation). To compensate for this the Class D service was then created at 27 MHz (CB).

In 1963 someone at the FCC became concerned that CRS Call Signs did not comply with the International Telecommunications Treaty which applied. Call Signs in the United States were supposed to start with only certain designated letters, such as A, K, N, W, etc. Gulp! Citizens' Call Signs were quietly changed. Class A Call Signs now began with KAA, (and going forward), and Class B with KAZ (and going backward). (My Class B Call Sign was KAN 0682.) Class D Call Signs continued to distinguish FCC Radio Districts, different prefixes for different Districts. When I went to college in New Orleans my KPJ 1093 Call Sign instantly ID'ed me as a "foreigner". The New Orleans Police Department was KEA 2939. Later on the FCC stopped the Radio District scheme to discourage CB'ers from shooting skip.

Still it continued to become clear that many more demands for 2-way service were being unmet. As the 60's progressed the FCC pondered how to accommodate this demand. Enter "narrow banding" – and you thought this was new today, huh? In 1968 the FCC did indeed "narrow band" UHF. Channel spacing was reduced from 50 to 25 KHz. The GMRS channel 462/467.675 came into existence. Deviation was reduced to +/- 5 KHz. What was then called "narrow band" is today now called "wide band"!

But UHF Citizens' Radio continued to be used predominately by business and commercial entities. Equipment cost continued to be a major stumbling block for the general public. A few NSEA members became aware of Class A's existence, but where the heck could you buy radios? CB stores had no clue. In 1970 James Schmidt went ahead and got a license anyway, KAA 7948, but he had no equipment. For some reason he picked the frequency 462.675 MHz<sup>1</sup> . . .

I decided to wait to get my license until I found a source to buy a radio. Gradually I became aware of "Land Mobile Radio", and a local company called Motorola. Oh my God, the prices they wanted for new equipment! Impossible! Somehow I learned of the big 3: Motorola, GE and RCA, and most importantly, they sold used, factory refurbished equipment! While Motorola's used prices were no help., RCA had older tube radios from the 50's, CMU15B, that were \$150, thus within my reach! I plunked down my money and applied for my license – NSEA UHF was born! James Schmidt bought an RCA Carfone too.

The FCC license application was Form 400, an 8 ½ x 11 document with multiple carbon copies on the top 1/3<sup>rd</sup>. You had to type in the top 1/3<sup>rd</sup>, it became the actual license. One of the carbon copies was returned to the new licensee, and one went to the local FCC Field Office. I still remember going downtown to our Field Office and reviewing these green carbons to see who else was already on .675 here.

Came the day we finally had installed our trunk mounted radios, and, hold our breaths, were ready to actually go on the air! I drove toward him and he drove toward me, and eventually, we could hear each other, squelch tails and all! But wait a minute, we weren't all that far apart. Average range was only about ¾ of a mile. What the heck???

Someone at RCA told me about something called a "repeater", that's what we needed for reasonable range. And I learned about antenna height. Sure enough, RCA had a used, refurbished repeater available. It was \$800.00, but other NSEA members (James Schmidt and Jack Ferber) were willing to kick in to help. We took the plunge, getting permission from the Convent at Willow and Waukegan, for our system and antenna. Jack Ferber and Rich Casler bought RCA mobiles. I learned about DB Products antennas from an RCA Service tech. .675 went on the air in January of 1971.

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<sup>1</sup> "I chose 675 because I thought others would start at the low end of the allotted channels but I didn't want to be on the highest one due to possible interference with whatever radio service was just above Class A. Thus .675 was chosen."

Wow, that was SO COOL! Other NSEA members began finding used equipment and coming on. Local police were still on VHF direct, we outclassed them! (I knew because I had worked as a Police and Fire dispatcher at Northfield.) Pretty soon almost all NSEA members were on UHF. As agreed, I bought out James Schmidt and Jack Ferber and became the sole owner of the repeater (RCA CYLD 3, 15 watts, solid state).

When the convent became concerned about their roof leaking, I went to LGH and got written permission to relocate there. We learned about GE. We learned about de-sense and duplexers, our 1<sup>st</sup> antenna had 3 folded J's on top and 3 below, fed by separate lines (DB406ES). The DB Products catalogue was full of educational material about antenna gain, transmission line, radiation patterns, etc. LGH built a new and much higher building. The system got better and better . . . .

I became concerned about all the businesses on Class A. Material Service had a repeater on .675 in McCook. In fact they had 3 such repeaters in the Chicago area. There was a repeater in Medinah. In 1974 I wrote a paper on how to encourage personal use in Class A. That summer I finally WENT to the FCC in Washington (my first time) and presented the paper at the 2025 M Street FCC offices (Private Radio Bureau). Nothing happened.

In the early-mid 70's the FCC opened its Chicago Regional Spectrum Management Center. This was the brainchild of the Engineering Division, and took over issuing licenses in the Chicago area. Their multi-page FCC Form 425 was very complex, for example you had to calculate Effective Radiated Power (10 x log power in watts = power in dB. Subtract line loss in dB, add antenna gain in dB, etc. Divide by 10, take anti log = Effective Radiated Power in watts.) You had to describe your coverage area, taking into account antenna pattern, make a box, or circle or whatever, and provide the latitude and longitude of the center. When I first applied for a new, modified license, they refused me because I didn't have a Standard Industrial Classification Code. Wow was I mad! Definitely personal use hostile.

But I was very lucky. On one of my first trips to the FCC in Washington, I accidentally met Riley Hollingsworth in the hall at the Private Radio Bureau. When I told him of my problem he was very sympathetic. Little did I know that he would give firm orders to the Regional Spectrum Management Center that I was legally entitled to a license and they HAD to make it work for personal users!! We drove lawyer Morgan O'Brien at the Regional Spectrum Management Center in Park Ridge crazy, but he got all the problem provisions waived for personal users and we got loads of licenses for lots of new people on the repeater through that program. I learned a lot about ERP, emission designators, station classes, etc.

1976 was a huge year for Class A. I was fresh out of Law School and I saw a Notice in the Federal Register. The FCC was organizing a Congressionally chartered Personal Use Radio Advisory Committee (PURAC). They were actually asking for volunteers, including users. I signed up immediately, and went to Washington in April for their 1<sup>st</sup> meeting. Not surprisingly I met actual CB users from Washington who were in attendance. One seemed especially bright and on the ball, Jim Southworth. He was from National Capital REACT, which had over 800 members. They fed rush hour traffic information to area radio stations, I was impressed. At the 2<sup>nd</sup> PURAC meeting I met Corwin Moore, from the Michigan Emergency Patrol (MEP) in Detroit. They were also a REACT team that fed rush hour traffic information to local radio stations. Not only that, but Corwin also HAD A CLASS A REPEATER (KAB 0220)! Corwin was sharp as a tack.

PURAC was organized into 9 Task Areas, but was obviously all about Class D CB. But there were a lot of sharp users from around the country participating. Almost immediately it became obvious that this was not going to just be run by industry lobbyists. Meaningful participation by actual users seemed to shock the FCC people. By the 2<sup>nd</sup> meeting we engineered a vote to add a 10<sup>th</sup> Task Area, you guessed it, Class A!!

Jim Southworth was blown away by my HT 220. I brought a portable repeater and several mobiles and portables (loaned from Avrey Hara) with me on my next trip to Washington. I got a Class A license for REACT. Jim arranged for a temporary test on a rooftop in downtown DC. We set it up and farmed out the mobiles and portable to a few NCR team leaders and went on the air. I almost laughed myself silly at their shocked and stunned reactions! At last I was doing something to advance personal use of Class A!

I kept looking around at all the sharp REACT members from around the country at PURAC meetings and stated to think, we need to tell all these folks about getting UHF FM CB! Corwin and I decided we would organize a NATIONAL Convention of REACT members for that summer in Chicago to demonstrate a REACT Class A system in operation. While Jerry Reese, Managing Director of REACT, took over the Convention, it did take place in Deerfield, and we did showcase UHF for attendees from all over the country. Again the shocked disbelief :)

Pretty soon Nat Cap REACT had their own system up, eventually with more than 100 users. They bought a huge batch of used Milwaukee Police HT 220's. Guess what, they all had CTCSS (tone) 141.3 in them. The National Travel Tone was born. We emphasized to every REACT Team to be on this same tone and same frequency - .675. PURAC members from Dallas REACT put up their own system. Next summer the REACT national convention was in Dallas. On my trips to Washington for PURAC meetings I took the portable repeater, mobiles and portables. I demonstrated Class A to REACT Teams from Virginia to Massachusetts and in between. Next summer at the REACT National convention, we, well, you get the idea. We were transforming Class A into a PERSONAL radio service.

By the way, Al Gross attended PURAC meetings. I met him and talked with him. I'm proud we brought his dream of personal 2-way radio for the general public to fruition and he was able to see that happen.

All this development of personal systems brought more and more conflict with commercial users. In Chicago Motorola was putting hospital repeaters on Class A. There was a commercial Class A repeater on the Standard Oil Building (then 5<sup>th</sup> tallest in the world). Things were unacceptable, Class A originally was supposed to be for entities that did not have anywhere else to go. Commercial users had plenty of other options, we had none. Something had to give.

PURAC ended in 1978 but Corwin and I (and others) kept visiting the FCC staff people we now knew personally. We kept pushing for action. Finally, in 1987, it happened! The FCC ended licensing of Class A (now called GMRS) by anyone but individuals. GMRS was now truly a personal radio service. The new interstitials were created. Licensing now allowed up to 2 channels, not just one (plus .675 for everyone). The real credit goes to Corwin for his ever constant visits to the FCC Private Radio Bureau at 2025 M Street, Washington. He was there so often sometimes he was mistaken for an FCC staff member! He became very tight with FCC staff member John Borkowski, who would later produce Docket 87-265, which made GMRS a personal use only radio service.

Corwin and I founded the Personal Radio Steering Group (PRSG). Corwin was monitoring the issuance of all GMRS licenses and created our own PRSG data base. He started publishing a national GMRS Repeater Directory, with technical parameters taken from the licenses he had recorded. This was the forerunner of myGMRS today.

The next major development in GMRS was in 1998. Until that time GMRS licenses were issued for specific enumerated frequencies. Technical data such as station class, emission designator, antenna address and latitude/longitude coordinates, etc. was required. But now GMRS was firmly entrenched as a purely personal service. Licensing was simplified and users could freely operate on any GMRS frequency. Now they could change channels at any time, and their radios could now have all GMRS channels. Unique GMRS Call Sign prefixes ended with the FCC'S "Universal Licensing System". Call Signs now consisted of 4 letters and 3 numbers, same as all other Land Mobile services.

For the next 12 years little change took place. But, then, in 2010, the FCC undertook a wholesale review of Part 95. The last time this happened, in 1958, the Commission took 10 years to come to a decision. Surely this time they would not wait so long ... In record time, 7 years, the Commission announced its final decision. Due to massive user opposition de-licensing was defeated, and the Rules remained almost wholly intact. Rule numbering was changed and GMRS was now in SubPart E, instead of A. But portables 2 watts and under were made eligible for de-licensed operation in FRS. On the positive side the FCC disallowed dual certification of any radio in both GMRS and FRS.

Today GMRS is undergoing a resurgence in licensing and interest. We're fast approaching 70,000 licensees and there are several new recently certified GMRS radios. Linking, like it or not, is a new technical development. Can't you feel it, we're on the threshold of a bright new future . . . .

**Would you like to contribute to THE REPEATER? Submissions are encouraged. Send to [Randy@NSEA.com](mailto:Randy@NSEA.com).**