

# Zero Beat

The Hampden Conty Radio Association, Inc.

Springfield, Massachusetts

ARRL Affiliated, our 38<sup>th</sup> year

## Next Meeting:

Sunday May 4<sup>th</sup>  
ELK'S Lodge  
Morgan Road  
West Springfield

## DX Callbooks for sale!

The HCRA only has a few DX 1986 call books for sale left! If you are interested please contact Ron Beauchemin, WB1ETS, at 413-739-5228. The price is \$18.00.

## HCRA Flea Market

Admission \$1.00  
Tables \$5.00

9 AM to 3 PM

For further information please contact Steve Nelson, WA1EYF at 413-596-8216. Flea market will be held rain or shine, so come on down!

## June Annual Banquet

Friday June 6<sup>th</sup>

Dave Sumner, K1ZZ, from the ARRL will be the keynote speaker. Dave will talk on the League's Novice license proposal which should interested all members! We will again have a roast beef dinner served as we did last year. Since we have a limited amount of seating available it is suggested that you get your tickets early. Contact any board member; they will also be available at the May Flea Market in West Springfield on Sunday 04-May-86. The donation is \$5.00. Doors will open at 6:30 PM, dinner at 7:00 and the annual meeting begins at 8:00. Hope to see you there!

## Message from the President Bob McCormick KA1KPH

As we finalize plans for our annual meeting I can't believe the year has almost passed. Many things, both good and bad, have occurred through my term as President. From all indications, the HCRA is the only non-NASA related club to work with the shuttle re-broadcasts. The unfortunate Challenger accident has curtailed both future shuttle missions, and our increased plans to work with ham flights of the shuttle program. But when the problems are worked out, be sure that the HCRA will again provide local information, and in expanded ways!

Jeff Duquette, K1BE, informed us at a recent board meeting that he would not be seeking another term on the board, and would like to step down as editor of Zero Beat. In addition to his long term active in the HCRA, Jeff also holds appointments in the Western Mass Section, ARRL. Jeff has done quite a bit for the HCRA, the League, and all of amateur radio.

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I certainly appreciate his efforts through the years. I remember the first HCRA meeting back in 1974 when I first moved to the area. I believe that Jeff was president then, and he's been quite active ever since in all aspects in our club's operation.

I'd appreciate it if the next time you see him you pass on a kind word of appreciation for the time he has devoted to the club.

What can I say, but thanks Jeff!

Of course, this time of year is for reviewing the accomplishments of the past year and plan for the future. One item of business is the selection of the slate of board of directors for the upcoming year. Although not widely known, a board position is a two year term (sorry, no life board members allowed!) and officers hold one year terms. Its sad

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President's Message  
continued from page one

to say, but its true: each year the board (or more formally, an election committee) has to actually go out and pound the street for individuals interested in taking an active part in the operation of the club.

This year this is even more true, with the loss of K1BE as a board member and editor of the newsletter. We need just a few good people. Where are you?

Being a board member is not easy: the HCRA board is really the backbone of the club; they are the people that get things done. You don't need a degree, nor do you have to feel you fit in (all you really need is a amateur radio license). If you are interested, please give me a call. Wouldn't it be neat if we had a real election, and not just a group simply voted in by one simple vote?

Of course, I don't expect my fone to start ringing off the hook...so a number of the current board members (myself included) will be contacting some of you about a possible position on the board. Please give it some serious consideration.

Zero Beat, the official organ of the HCRA, is also in need of some help! We need one (or more) individuals who would be willing to take over the position of editor of the newsletter. Again, as you may expect, much of the work of the editor is actually finding/writing pieces of material. If you are not interested in being the editor, maybe you can still help out by writing a short article for Zero Beat. Even if it is only regarding some expericence tallent or interest you may have, it may be well worth wile to share it with others - and what better way than through Zero Beat.

You can send any Zero Beat material to the club Post Office Box, HCRA, PO Box 482, West Springfield, MA 01090-0482. It's appreciated!

I hope you can make it to the Annual Meeting in June. We plan to have an interesting meeting for you, with Dave Sumner K1ZZ from the League speaking on the ARRL Novice proposal. I'll also share with you where we have been, and where I see the HCRA going in the future. And as always, your opinions and feelings regarding the clubs operation is always welcome!

See you at the flea market!

Bob KA1KPH

*For Sale*

A Kenwood TR-2500 synthesized handheld transciever with speaker mike and mobile stand for DC operation for \$235.00 contact Steve WA1EYF at 413 596-8216

*For Sale*

A Swan 350 with 117x power supply, \$225 or best offer. Wanted: a copy of a Mosley TA33jr instruction sheet. Contact Jim O'Brien WA1UWX, Box 145, North Hatfield, MA 01066 or 413 247-9205 evenings and weekends

*Wanted*

People to help with the HCRA Flea Market on 04-May-86 at the Elk's Lodge in West Springfield. Please contact Steve WA1EYF as soon as possible at 413 596-8216

*Desperately Needed*

The HCRA is looking for one or more individuals who would be interested in the position of Editor of Zero Beat. After many years of service Jeff, K1BE, is taking a much needed rest from this position. The pay is good, the benefits great, and we don't check references. Please contact any board member.

*Special Sale*

RG 8 A/U Coax Sale! Last of the good coax, going fast! A steal at 18 cents a foot: I'll measure and cut, you roll it up. 500 foot roll only 15 cents a foot (\$75.00). Contact Jeffrey J. Duquette, K1BE, 413 569-6739

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HCRA Zero Beat May 1986

## Repeater Sub-Group Guidelines Information

In last months Zero Beat we published the Guidelines for the Hampden County Radio Association Repeater Sub-Group. This document was approved at the March 12 board of directors meeting. The directors also approved the appointment of Ron, WB1ETS, as the chairperson of the committee, and NB1R and KA1MPS as membership representatives on the repeater committee. We would like to thank these individuals in advance for their support in devoting their time to the operation of the repeater sub-group.

The main purpose for this committee is to interface with the trustees and owners of the affiliated repeaters and the HCRA board. This will help in two areas. First, it will off load the repeater issues to a committee who's responsibility is just repeater issues, and secondly, it will ensure that the affiliated repeaters provide the best service to the repeater sub-group membership, and the amateur community.

The repeater sub-group committee will be responsible for the administration of monies for the repeaters, as collected through specific dues and donations. At no time will the repeater sub-group be entitled to any funds from the HCRA general funds, so your support is important! Money raised on behalf of the repeaters goes to expenses such as telephone lines for autopatch, expendable items such as parts, and upgrades and enhancements, which remain HCRA assets.

We would also like to thank all those members who have come forward and joined the sub-group. A special repeater sub-group information packet should be on the way to you shortly. To further enhance your control over how your money is spent, you can now designate which machine(s) your dues and contributions should be allocated to. This is effective immediately for all new memberships, membership renewals, and contributions. And please remember that the HCRA is a non-profit 501C3 corporation, which means your contributions are tax deductible! We would be glad to provide you with a written receipt for any donation.

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HOT OFF THE PRESS!  
1986-1987 ARRL  
REPEATER DIRECTORIES  
ARE AVAILABLE AT THE MAY  
HCRA FLEA MARKET

HCRA Zero Beat May 1986

The HCRA currently sponsors four communications systems. These are two FM voice repeaters: KA1JJM 147.105 mhz and KA1KPH 449.175 mhz, and ATV and packet radio systems. There are many projects currently under way so you will want to check out these machines for more information.

And of course, the members of the repeater sub-group committee and the trustees and owners of these systems would be glad to hear from you regarding any comments and suggestions you may have. Again, thank you for your support!

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## Novice ruling expected soon!

The FCC advises that they have completed their work on the Novice enhancement proceeding. The Rule Making must now be ruled on by the Commission which is expected "via the circulation route" rather than at an open Commission meeting. We could see something on this within a month - possibly in time for the Dayton Ham Vention!

from Worldradio and W5YI Report

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## Amateur Radio Call Signs

The following is a list of the last call sign in each group to be assigned in the first call area as of March 1, 1986. See §97.51 of the FCC rules for more information on the allocations.

Group A - Amateur Extra = ND1M  
Group B - Advanced = KB1WX  
Group C - Tech/Gen = N1DZU  
Group D - Novice = KA1OCP

As of January 1986 there were the following license totals. You may want to remember this as the announcement of the ARRL Novice license enhancements comes up. Novices represent a great deal of the total amateur population.

Amateur Extra = 38,624  
Advanced = 98,003  
General = 117,110  
Technician = 83,879  
Novice = 78,999  
TOTAL = 416,615

## Swapnet Citations

Twenty Florida amateurs have been issued FCC Notices of Violations for infractions of §97.3(b) which prohibits Amateur Radio station communications for business purposes. Another Amateur said the violations were for §97.112 which prohibits "communication for material compensation, direct or indirect, paid or unpaid." It could be that different Amateurs got cited for various - but somewhat similar - breaches of the Amateur Rules.

Members of the eighty-meter Florida Trader's Net which meets every Sunday morning on 3985 khz were cited by the Fort Lauderdale FCC monitoring station for using their amateur stations with a "pecuniary or business interest."

One involved amateur who did not wish to be named said the general feeling seems to be that amateur gear "swap nets" - even though by individuals - may not be legal if a selling price is suggested. The Amateurs cited apparently gave a price that they would sell their surplus gear for.

Another Amateur said he thought that perhaps some of the ones served might have been commercial dealers but "most were not. We really don't know. They very well could be. There are amateurs out there selling every week that the net is in operation..." We were told that one of the amateurs involved is an attorney who, acting as the spokesman, was getting in touch with his congressman.

from Worldradio and W5YI Report

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## W1NY and the Space Shuttle

In the summer of 1985, in conversation with KA1KPH, I expressed interest in rebroadcasting space shuttle communications on VHF frequencies. This was after the delay of Challenger caused it to be rescheduled for a date later in the month. On several occasions in the past I had expressed the same feeling to others, possibly as early as when WA3NAN began operation on or prior to the flight of STS-9, when Dr. Owen Garriot, W5LFL, was first to carry amateur radio into space aboard the shuttle Columbia.

As president of the HCRA, Bob's first question in July of 1985 was "can we do it?" My response was "I don't know." His reply was "let's try!" We did. A decision

was made to go for it. Neither of us could have predicted the following several weeks as it all unfolded and somehow, with help from many individuals (some who were not radio amateurs) the operation turned out to be a complete success!

As Bob was spending dollars on the telephone trying to get the authorizations in place as required by our FCC wavier, I was hard at work on the hardware aspects. Jim Davis of Continental Cablevision of Springfield offered us the use of their feed. He had a spare 10 metre dish to aim at a satellite that was fairly low on the horizon that had the feed called NASA Select on it. A friend provided the electronics used for the audio demodulator. It fed a borrowed VHF Yaseau Memorizer. A hardware repeater controller board was set up to fire a diode matrix ID board. The HCRA authorized the use of the club call W1NY. This *pioneering* effort was a fitting tribute to a silent key who was well known by many among us. A 60 watt Mirage amplifier was used feeding a bandpass cavity and an old gain antenna at 230 feet above sea level. A half dozen fans were used to keep the equipment cool, as it was not intended for continuous operation! The hardware worked flawlessly.

Due to the time elements involved, the complete operation was performed under local control with toothpicks to keep the eyelids up. A Motorola Pageboy II pocket pager, in conjunction with the Advanced Computer Controls RC-850 repeater controller on KA1KPH/R (449.175) was a successful alarm clock to say the very least! Thank you Robert! Tracking data was provided by John, AC1T, to be passed on to all listening amateurs over W1NY on 146.595 mhz. Considerable additional hardware and emotional support was provided by many. To those who are not mentioned here, your help and support was greatly appreciated and was helpful in guiding me through this undertaking. After the third day I was running on nervous energy and feel like it was nearly equivalent to several field day weekends in a row!

To those who listened to any of the 16 +/- hours per day, I wish to say thank you for enjoying the history of the 2nd flight of amateur radio aboard an orbiter, this time it was a NASA vehicle called Challenger as it circled the planet. The project was undertaken for all radio amateurs.

WOORE was seen and heard by many hams worldwide! The crew of mission 51F were able to see pictures from the ground through the SSTV amateur operation. It was a warm experience to step out my front door and

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look up and see Challenger go overhead in the hours just after sunset knowing that the signals of amateur radio were from that sophisticated optical reflector known more precisely as a space shuttle orbiter. The signal from the shuttle was so strong that it was not wiped out by local desense from W1NY on the 2AT handi receiver!

The flight had almost experienced a major problem as the vehicle had to "abort to orbit", which meant that they had to dump some fuel to get into orbit on liftoff. They also were not at the optimum height that they wanted to be for some of the experiments on board.

The next shuttle to go up serviced an ill satellite and the last word is that it is functioning normally! The occupants of the suits worn by the EVA crew as they worked outside were closely monitored by new hardware systems built by Hamilton Standard. This fact was not played up by the press although it was the first time that these devices were used. You may recall Norm Cournoyer, N1AFY, who brought the NASA hardware to an earlier HCRA meeting where we all got a look-see at the real thing. I asked, and then some, to see if W1NY could be on for this mission; however, the decision of the HCRA board was amateur missions only.

The next flight of Challenger carried DP0SL (the European space lab) into orbit above our home. W1NY was on, although the level of communications between shuttle and ground was considerably less than when Dr. Tony England was in the orbiter. Both of those flights of Challenger were high inclination orbits, that often brought them directly overhead.

At the last club meeting I was asked if W1NY will be on for the next mission. The decision of the HCRA board stands. I do feel that in order to do more than just amateur missions, it takes much more effort than can be accomplished by few in one club. When shuttle flights resume, and you can be sure that they will, W1NY can be on for more than just amateur missions if you the membership want it, support it, and work to create the teamwork necessary to cause it to occur as a group "team" effort. That is your decision.

The next flight of Challenger has left severe hurt for many that began milli-seconds after 11:38:73 on 28-Jan-1986 over the south east cost of America. The scientific progress of mankind experienced its most painful hurt of many a day. Seven touched the face of God as many began to shed tears. One could not measure the magnitude of hurt it was so immense.

I had wanted to have W1NY on for this mission. Being directly involved in the local amateur operation of W1NY as control operator rebroadcasting shuttle communications for the last two missions of Challenger, both carrying amateur radio, the reality of the 28th hit very hard.

It has guided me: try a little harder to "reach for the stars."

As we say seventy-three to one another on the ham bands, let us forever recall the seven of challenger and the three of Apollo-1 who tried to reach for the stars for all of mankind.

Joe WA1OCK

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## Check these out...

### *For Sale*

Heath HW101 transciever with CW filter and HP23B power supply \$300. Heath HDP121A mike \$25. Heath scope SB614 \$100. All with manuals. \$375 takes all. Call Lou WA1WTK at 413 583-2366 (Ludlow MA) after 05:30 PM weekdays, and any time on weekends.

### *For Sale*

Yaseu FT101ZD Mark III with 270 hz CW filter in immaculate mint condition \$575. Kenwood TS520SE with CW filter also in immaculate mint condition \$375. Please call Ned KB1R at 596-4625 or 785-5871 extension 6255.

### *For Sale*

Bob and Eunie Gordon's (W1KUL & W1UKR) great VHF location in Monson is for sale. 900 feet above sea level, 50 foot tower with tri-bander, 75 and 40 meter inverted vees, and 2m ringo ranger. Complete operating position can include the 2kw HF amplifier. Three bedroom cape, two car garage, finished cellar with workshop. 300 foot front by 400 foot deep lot. Call 267-9694 after May 1.

## BRIEF VISIT WITH THE OM - HIRAM PERCY MAXIM

There is so much that HPM/WLAW did for us hams, appropriately entitling him "Father of Amateur Radio", I can recount only a few highlights and personal impressions. It is, of course, well known and documented that he started the ARRL and QST with his young protege college student Tuska around 1915. It may not be so well known that, in my estimation, he and Tuska broke away from the Hartford Radio Club so that the two of them, along with Dave Moore, the 21 year old then president of the Club, could proceed on a national scale with an organization that included public service and relay concepts probably originated in an incident involving our Hampden County: an intermediate Windsor Locks Station relayed a message with his spark wireless from Maxim in Hartford to a Springfield ham who reportedly had a hard-to-come-by Audion for sale. This relay service did the trick. Maxim got the tube! The word relay, indicating use of privately owned hobby equipment for the benefit of others, was adopted in the official non-profit corporate name and has been, through the years, one of hamdom's principal survival assets, even to its present-day version of automatic relay, the 2 meter repeater.

One of the things I admired most in HPM's organizational genius was the high standards which he set for himself and fellow hams as embodied in the six requirements of the Amateur's Code: Courteous, Loyal, Progressive, Friendly, Balanced, Patriotic.

He sure was courteous and friendly to me, when as a schoolboy some 55 years ago I rang the door bell to the side entrance of his home in Hartford for an unannounced visit to WLAW. As I look back at it now, I must have had a lot of nerve to go on my bike from an immigrant's family home in the meadows of East Hartford to the home of a famous automotive pioneer off fashionable Farmington Ave in Hartford. At that time he was indeed one of the Insurance City's leading citizens, married to the daughter of a Maryland governor, but you'd never know it the way he invited me in to see "Old Betsy" his rotary spark rig which I used to hear on my crystal set and earphone

in the cellar of our house way over in East Hartford across the city and across the river, maybe 10 miles distant. Although the details are hazy now, it must have been an inspiring visit that urged me to stay on in school and pursue science, unlike most of my neighborhood chums.

When it comes to being balanced, it's hard to think of anyone more balanced than HPM toward his hobby, never letting it interfere with duties to his family, business, or community. The family movies which he also pioneered and relished show him enjoying life with the youngsters in his unique and appealing personality; kindness, sincerity and love of life abounding. He had many patents from his horseless carriage engineering career with Pope Hartford and invented noise silencers that would nowadays enshrine him as an environmentalist fighting noise pollution. As regards community and patriotism, it brings to mind my own attendance at the dedication of the municipal airport, Brainerd Field, in Hartford. The reason I went, because I read in the papers that HPM would officiate since he was Chairman of the Hartford Aviation Commission. His patriotism shone brilliantly at the outbreak of World War I. Not only did his silencer company convert wholly to munitions production, but as ARRL president he saw to it that the Navy got its first quota of 500 trained operators at once. Then 2,000 more operators were needed, and largely through HPM's efforts and organization, were immediately enlisted.



Such is the stuff of which our hobby's heritage originated. Quoting from the 50th anniversary message in 1964 of then League President W6ZH: "We must be everlastingly grateful to those old timers for handing down to us these traditions of public service, technical progress, and operating skill. Without them, ham radio would have perished long ago".

Art, W1KK - May 14, 1978

## TECHNICAL HANDLING OF SEMICONDUCTORS

By Ed White WINPL

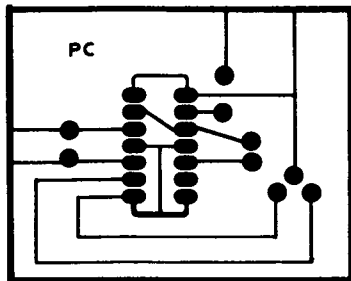
Although diodes and transistors have unlimited life expectancy in a normal and properly protected circuit, they can be quickly destroyed by misuse. Improperly using test gear or procedures damages what can be a preventable expense. Follow these simple precautions.

### Testing Procedure and Precautions:

1. Always disconnect power from equipment before removing circuit board connectors, plugs and cables.
2. Use a soldering iron of the lowest wattage that'll do the job.
3. Never use a soldering gun on solid state devices! The magnetic field generated can instantly destroy semiconductors. To observe this, turn the gun on, and stick the end into a box of tacks.
4. Do not use the "rx1" scale on your ohmmeter as the resultant forward current may be too high (up to 130 mils) for the diodes and semiconductors.
5. Do not use flashlight lamp type continuity checkers.
6. When it is necessary to remove a solid state component from a circuit, clip wires as close to the board as possible, apply heat from the iron to lead, (opposite foil side of the board, if possible) until wire is free and withdraw the lead with a minimum of twisting.

### Circuit Board Precautions:

It is inadvisable to write on circuit boards, particularly with lead pencils, as shunt paths, or worse, short circuits, may result. Avoid excessive bending of circuit boards, as this can create hairline cracks, or breaks in the continuity which are very hard to find. Skillful use of soldering irons is necessary when repairing circuit boards. If excessive heat is applied, the printed circuit foil may be melted loose from the board.



## Basic Rules to Observe When Repairing Circuit Boards:

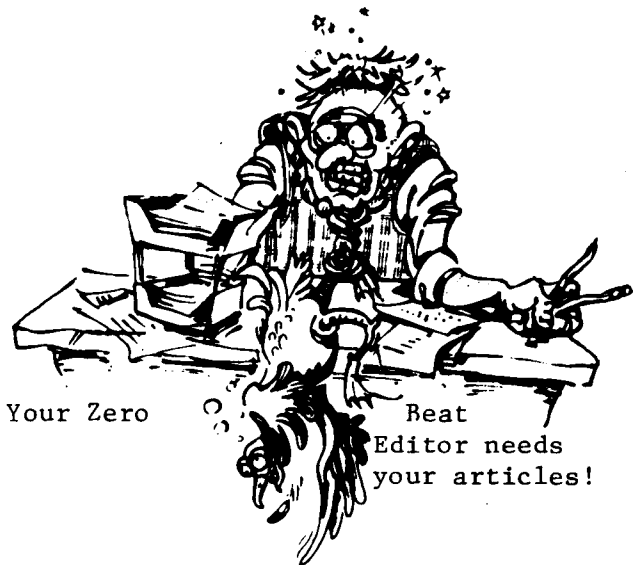
1. When installing a new component, scrape the leads to insure a good connection, then cut to the desired length.
2. Avoid excessive wiggling or twisting of the leads. Holes should be cleaned out prior to wire insertion.
3. Apply iron heat to wire (not the foil!) and let the solder run into the hole.
4. Do not leave fingerprints on the board.

### Repair of Broken Circuit Board Foil:

1. Clip any raised portion of the board.
2. Using tinned copper, approximately 20 guage, cut a length 1/2" longer than the break.
3. On foils 3/16" or wider, drill an approximate size hole through the foil, 1/32" each side of the break to install the wire. Should the foil be less than 3/16", drill a proper size hole beside the foil, enough to bond the foil with the solder.
4. Bend the wire in a U shape to span the break, with 1/8" to insert into the drilled holes and solder. Do Not Overheat!

The ultimate goal in any test and repair is to ascertain that the units are functioning efficiently. In tube circuitry, quick and direct replacement is possible. This isn't true with solid state gear. Therefore a more efficient or sophisticated test procedure is a must. The possible damage and expense can be reduced by adhering to the aforementioned precautions.

tnx, VARC from the September, 1967 issue of THE OSCILLATOR



# FLEA MARKET

## HAM RADIO / COMPUTER / ELECTRONIC

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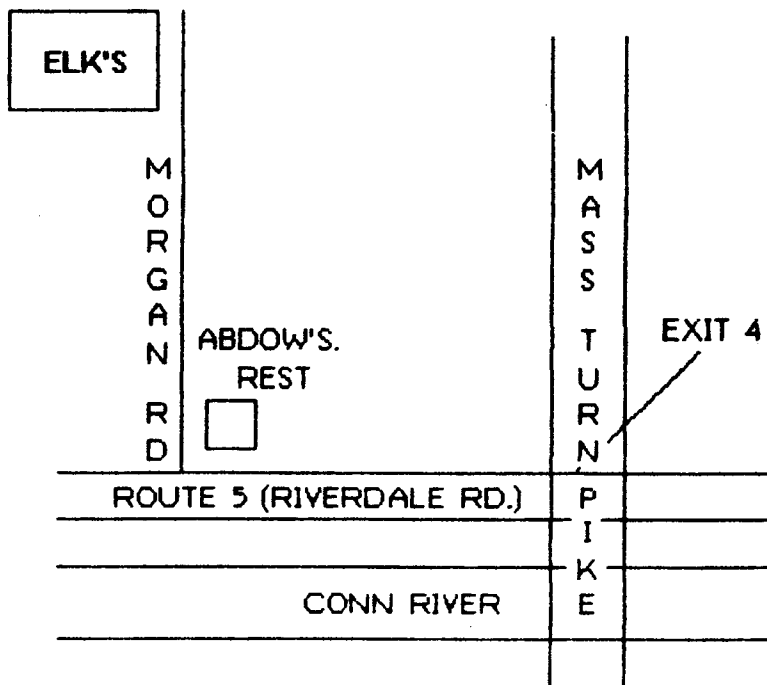
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STEVE NELSON WA1EYF

1 MARILYN DRIVE

WILBRAHAM, MASS 01095

TEL 413 596-8216





## Amateur Radio in the USSR

Any amateur operating the bands and particularly CW can't help but be impressed by the proficiency of Russian Amateur operations. They really move along with good accuracy. If an American Amateur works them, he has to move his electronic keyer's speed or get his straight key really hot to stay up with them. Although, at times, their tones may leave something to be desired, which is understandable from some of their locations, their operating ability and lack of errors should be emulated by American Amateurs.

One has to wonder: Here is a capitalistic country where we have all the advantages, how did these Amateurs get so good? Why isn't the average American operator as good? To find the answers to these questions, one has to look at the background of the average Russian Amateur and how he got his license. It is a lot harder to get a ham ticket there than here, is one of the reasons. To become a ham, a Russian must take an electronics course, join a radio club, and take a test. The applicant is then allowed to LISTEN, we emphasize, listen, on the Amateur bands and log stations and be able to send code at 10 words per minute. This may be one of the reasons that we American Amateurs receive quite a few cards through the bureau from Russian SWL's.

After six months as a SWL, a third test may then be taken. This allows 10 watts on 80 and 40 meter CW, and 10 meter phone. The next step up, the second class license is harder and permits 40 watts and CW operation on most bands. The top ticket is the first class license and requires the operator to send and receive at 18 wpm, build and design, and troubleshoot advanced radio gear. Maximum power on all bands is 200 watts. All applicants must demonstrate also an elementary knowledge of the English language. Russia does not want any "dumbkoff" operators and they must know the Q signals extremely well. One can see that by the time a Russian has received his first class ticket, he has been exposed to a lot of required operating time and particularly listening.

Another factor is the following: to make up for their personal lack of funds or access to radio equipment, every Russian town has its Amateur Radio Club where newcomers are brought up through the ranks and have the further advantage of observing experienced operators in action and offers a place to gain actual practical experience before they ever get on the air.

CONTINUED NEXT COLUMN

One can't help but wonder, would we have as many American Amateurs if such a required procedure prevailed in this country? What do you think?

Thanks to Triple States RAC, Adena, Ohio

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REMEMBER,

The HCRA will have the brand new ARRL 1986-1987 repeater directories available at the May Flea Market...

Why don't you plan to stop by and pick one up?

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## Upcoming Events

On Saturday April 26 the MARA indoor flea market will be held at the Knights of Columbus, Electric Ave., Fitchburg, MA. Doors open from 09:30 AM to 03:00 PM. Admission is \$1 and tables are \$8. For more information contact Jim KB1AY at 617-342-9847.

The one you have been waiting for.....  
On Saturday May 10, the Hoss Traders annual swapfest at the Deerfield Fairgrounds in Deerfield, NH. Friday night camping opens at 04:00 PM Friday and fees will be collected by Fair Grounds Assoc. Admission is \$2. All profits benefit the Boston Burns Unit of the Shriners' Hospital for Crippled Children. Questions can be answered by sending a SASE to Joe Dimaso K1RQG, Star Route Box 56, Bucksport, ME.

On Saturday July 12 the Mt. Beacon Hamfest at Arlington Senior High School, Poughkeepsie / Lorange, Dutchess County, NY. Admission is \$3, tailgating space is \$4 (with 1 free admission). Tables are \$6 (1 table and 1 free admission). Refreshments available. Doors open at 08:00 AM to 03:00 PM. Sellers allowed in at 07:00 AM. Auction at 02:00 PM. Talk-in 146.37/.97 and 146.52 simplex. For more info call or write Julius Jones W2IHY, RR2, Vanessa Lane, Staatsburg, NY 12580 or call 914-889-4933.

Mark this down on your callender:  
Saturday and Sunday October 18 and 19 is the ARRL New England Division Convention held at the Sheraton Boxboro, Route 111, in Boxboro, MA. Stay tuned for more info.

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Remember, you should now send your Zero Beat material to the HCRA club mailing address, P O Box 482, West Springfield, MA 01090-00482  
Thank you!

# A History of Broadcasting

In these days of satellite communications, computerized radios, and TV signals from out of this world we all often take for granted what the art of broadcasting has evolved from. In fact, Springfield played a major part in the evolution of broadcasting.

As far back at the 1860's James Maxwell, from Scotland, actually predicted that radio waves exist. Of course, we all know of Heinrich Rudolph Hertz, who proved that if electric current was rapidly varied electric waves would be projected into space. Recently the term Hertz was substituted for cycles per second in his honor. But it was not until 1895 that Guglielmo Marconi actually transmitted what we know as radio signals. In the early 1900's there were successful transmissions between North America and Europe. If you ever get a chance to visit Newfoundland, be sure to go to Signal Hill in St. Johns where the first DX QSO took place.

The first real use of radio was for communications for ships at sea. This included both ship to ship and ship to shore communications. Many of you have heard of our coastal stations, most of which have three character call signs. These were the first organized communications stations in the US. Many early broadcast stations were also assigned three character call signs, because they fell under control of the same government arm as the coastal stations. There are only a few left now, and I believe that the FCC will no longer issue the three character calls.

Actually, amateur radio would not have been an accurate term back in the beginning. Research shows that the term radio was first used around 1912. The Navy felt that the current term, wireless, was not appropriate, and chose the term radiotelegraph. Another term you may not know the origin of is broadcast(ing). The Navy used this term as their way to *broadcast* orders to their fleet.

No one is really sure of the origin of the first voice broadcast. Many people in many places have attempted to lay claim to that distinction.

Lee de Forest had an experimental transmission where live music was broadcast around 1910. In 1915 the Bell Telephone Company was testing trans-Atlantic voice transmissions. Most voice transmissions of a commercial nature did not begin until after World War I.

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AM broadcasting was the first service to evolve. Since many of the AM stations actually started from experimental efforts it is hard to pinpoint who was first. KDKA in Pittsburgh got its first broadcast license on 07-Nov-1921, although they were on the air prior to that date.

The Department of Commerce was the government arm that oversaw radio. Their records show that the first station that received a broadcast license was WBZ located in Springfield, MA, on 15-Sep-1921. Many of you may remember broadcasts from the old Westinghouse building. The two towers are still atop the buildings, and can be seen just west of I-291 near the Mass Pike intersection. Of course, we all know that WBZ is 1030 khz in Boston, and is still held by Westinghouse.

In the early twenties many AM broadcast stations came on the air. Many of which you may recognize the calls; others have been long forgotten. You just may have seen some of these on old AM radios with push buttons: WJZ (now WABC) New York, WGY Schenectady, WEAJ (now WNBC) New York, KDKA Pittsburgh, KYW Chicago (now in Philadelphia). As you can see, some stations are still with us, others have changed their calls, and other calls are now assigned to stations in different cities.

NBC, which was a subsidiary of RCA Corporation, was the first to set up a network in 1926 with 24 stations. CBS was also formed in that year. For many years NBC actually operated two networks, the Red and the Blue. Later NBC was to be forced by the FCC to get rid of one of them. RCA sold the Blue network to Edward Noble in 1943. Later it became what we now know as ABC.

Ah yes, the FCC. Well, the Wireless Ship Act of 1910 was the first act to govern radio; it was for the use of radio by ships at sea. In 1912 we saw the Radio Act of 1912 that imposed laws for the control of radio. Both operators and stations were licensed by the Secretary of Commerce and Labor.

Of course, early broadcasting was experimental, and represented what the Amateur Radio Service is today. The government allowed some stations in 1919 to operate as limited commercial stations. In 1922, the wavelength of 360 meters was assigned for "important news items, entertainment, lectures, sermons, and similar matter." Can you believe that they only had one frequency available? By the way, 360 meters is about 830 khz.

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In 1922 the first National Radio Conference was held. This resulted in many new regulations, and created what we know today as AM broadcasting. Stations must use a minimum of 500 watts, and a maximum of 1000 watts on either 750 or 833 khz. They were to shortly find out that two frequencies would not handle the growth, either!

Additional National Radio Conferences were held in 1923 and 1924 to meet the demand of the rapid development of AM broadcast radio. This is when the frequency band of 550 to 1500 khz was allocated for this purpose. The power level was also increased to 5000 watts.

By 1925 the number of AM radio stations on the dial caused so much interference to each other that another National Radio Conference was held. Here they set limitations on broadcast time and power. The Secretary of Commerce was unable to deal with the problems at hand, mainly because the Radio Act of 1912 did not provide the necessary authority. The final result that the broadcasters took things into their own hands, changing their frequencies and increasing their power at will. No regard to other stations was taken into account. In many parts of the world today if you tune into the medium wave broadcast band (our AM band) you will see the same situation!

Finally, President Coolidge went to Congress to attempt to bring this under some control. The Dill-White Radio act in 1927 was the answer to the problem.

Hence the Federal Radio Commission was born. It initially had five members, and would perform tasks such as issue licenses, allocate frequencies, assign frequencies to individual stations, and control the output power of those stations. In addition, the Secretary of Commerce was given the authority to inspect radio stations, to examine and license radio operators, and to assign call signs.

The job the commission had to do was not easy. In fact, of the 732 stations that were on the air, about 150 of them were shut down and they had to surrender their licenses!

Now enter the more familiar part. President Roosevelt in 1933 got the Secretary of Commerce to take a closer look at radio communications. The recommendation was to combine the authority of the various agencies into one. This would not only control the broadcast stations, but communications by wire, including

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telegraph and telephone. The Communications Act of 1934 created the Federal Communications Commission on July 11, 1934. The FCC had seven commissioners, who were appointed by the President, and approved by the Senate. Recently the FCC was cut back to five commissioners in June of 1983.

Since we began talking of AM broadcast stations, we will elaborate what exists today. AM stations are authorized frequencies between 535 and 1605 khz. They are authorized to utilize power levels between 250 watts and 50,000 watts.

AM stations are divided into four major classes. Class I stations operate on "clear" channels, usually with 50kw, and never less than 10kw. These stations are set up to serve both remote rural and large population centers. In the US we have 45 clear channels. There are only one or two Class I stations on each clear channel.

Class II stations are secondary stations on clear channels, operating with anywhere from 250 watts to 50,000 watts. Their purpose is the same as Class I stations, but they must not interfere with another Class I station on frequency. There are only 29 channels for Class II stations.

Class III stations share channels, and operate in a regional sense. The use between 500 and 5000 watts. There are 41 regional channels with over 2,000 stations licensed for Class III operation.

Class IV stations operate on local channels, which are shared by many other stations. Until recently, Class IV stations were authorized to use a maximum power of 1,000 watts daytime, and 250 watts night. There are only six local channels, each of which is occupied by over 150 stations.

Because of the nature of the AM broadcast band, many stations have restrictions on their power levels and antenna patterns at night. Many are licensed for daytime operation only, as to not interfere with other stations on a shared channel. All AM stations in North America, except for one on the Island of St. Pierre (near Newfoundland, prefix FP8), are allocated on 10 khz spacing.

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and world radio TV handbook

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Please support the  
H C R A

## The Back Page

The Hampden County Radio Association will sponsor ARRL VEC exams at the Wilbraham Regional High School on Main Street in Wilbraham on the following dates:

Saturday 24-May-86  
Wednesday 9-Jul-86 (nite)  
Saturday 13-Dec-86

Please contact Yorke K1BXE for more info at 413-566-3010

License classes sponsored by the HCRA will again start up in the fall. We will need a number of instructors to cover all license classes. If you can lend a hand, please contact any board member as soon as possible. Thank you!

**DON'T FORGET:**

**June  
Banquet**

**Friday June 6<sup>th</sup>**

Dave Sumner K1ZZ, Executive Vice President of the American Radio Relay League, Inc. will be our guest speaker.

Contact any board member for tickets and remember, seats are limited!

Is anyone interested in helping with a summer license class for students? We would like to hold this maybe during the day to help get interested kids into ham radio. Let us know!

Do you have JUNK to sell?  
Looking for good used gear?  
Here's a list of upcoming events:

### FLEA MARKETS

Saturday Apr 26 Fitchburg, MA  
**SUNDAY** May 4 H C R A  
Saturday May 10 Deerfield, NH  
Sunday May 18 Dalton, MA  
Sunday June 8 Newington, CT

### DX CALLBOOKS

The HCRA still has a few DX 1986 callbooks available for only \$18.00 each (shipping NOT included). Please call Ron at 413-739-5228.

Have you a notice for the BACK PAGE? If so, drop a line to the HCRA, P O Box 482, West Springfield, MA 01090-0482

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