



ZERO BEAT

<http://hcra.org>

March 2018

Special points of interest:

Next Meeting:

Annual Show n' Tell.

April 6th, 2017

- [Visit the HCRA facebook page.](#)
- Don't forget to check out hcra.org
- [Visit Summits on the Air](#)
- [Visit POTA413 facebook page](#)

March's Meeting

Join us Friday March 2nd at 7:30, in the Holyoke Medical Center Auxiliary Conference Center .

Vintage Radio and Communications Museum of Connecticut

John Ellsworth will talk about the history and exhibits at the museum relating to Amateur Radio.



MTARA HamFest

Saturday March 10th
Castle of Knights
Chicopee, Ma

See Page #6 for details

For directions to The Holyoke Medical Center Auxiliary Conference Center:

<http://www.hcra.org/meeting-location/>

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SHARE THE KNOWLEDGE

“Introduction to Digital Modes”

With
Jeffery Bail NT1K



Ever wanted to get started in digital modes?
Join us Saturday morning March 3rd at 9 am, at
the Holyoke Medical Center's Auxillary
Conference Center.

FROM THE SHACK

DAVE FANT WM1B



Greetings from my temporary shack here in Central Florida where the temperature has been in the mid to upper 80s for the past few weeks. We did, however have our cold spells as well.

During my time in Florida I've had the opportunity to visit with a number of hams in the area and I found out what they do in their different clubs. Also the activities that are different than what we do in our Club.

One of the biggest advantages is that most clubs here have their club shack so that, involved along with the activities, gives them the opportunity to work together In contests as well as just hang around, chew the fat and train new hams. Most of the new hams are in their 70s. (I fit right into that group)! They also have their stations open every morning so Members and guests can stop by and be a part of the group.

The biggest difference is the size of the clubs. Meetings are well attended and contain a lot of new activities. In asking why they have so many hands on new activities they responded that they are anxious to learn and try the newest technology (maybe because they are advanced in years and don't want to waste time?). But it does bring them out. I don't know how this would play at HCRA but perhaps having more hands-on activities would bring an interest to more of the new hams and some of the old timers. What do you think?

In the campgrounds I have also been able to see how different hams put antennas on their RV's. Some are very creative; HF whips rising 30 feet out of the bumpers, wires folded from front to back to front on top of the rigs to name just a couple. I have a neighbor who thinks 3AM is the time to work CW-DX without headphones. Wouldn't be bad if he wasn't almost deaf!

Over the next few months we have a number of activities, our Raffle winning ticket will be drawn at the Mt Tom flea market (can't win if you don't play!), in April our own Show-N-Tell (complete with some good prizes), and of course Field Day in June. At the Feb. BOD meeting the plans were gearing up. Bob, K1YO agreed to take the overall Chair position. At the March meeting he will be looking for members to step up and take different responsibilities so think about how YOU want to be involved. The size of our FD will be dependent on the club. Our club is dwindling in members. Field Day is our chance to tell the communities who and what we are. So let's see what we can do.

Thanks to all who have covered for me while I have been away. I look forward to being back for a great Show-N-Tell in April

Until then 73, and may the bands be open!

COMING SOON TO A DEALER NEAR YOU!

YAESU

FT-818

Avialable March 2018



The new Yaesu FT-818 incorporates all of the basic and attractive features of the ever-popular FT-817ND while providing upgrades desired by many existing owners.

The FT-818 provides 6W of solid output power with an external DC power source. The supplied Ni-MH battery pack (SBR-32MH) has been upgraded to now provide larger battery capacity - 9.6v/ 1900mAh. The recent launch of several new satellites is a certain indicator that the large global community of satellite enthusiast are going to be very delighted to learn that the FT-818 includes a Built-in TCXO-9 oscillator that gives the FT-818 fantastic frequency stability (± 0.5 ppm).

The FT-818 includes all the useful functions that are included in the FT-817ND: Dual VFOs; Split-Frequency operation; IF Shift; Clarifier "R.I.T"; IF Noise Blanker; RF Gain and Squelch control; IPO (Intercept Point Optimization); AM Aircraft reception; AM and FM Broadcast reception; VOX; Built-in Electronic Keyer; Adjustable CW Pitch; Automatic Repeater Shift (ARS); Built-in CTCSS Encoder/ Decoders; 208 memory channels with 10 memory groups; two antenna connectors; Automatic Power-Off (APO) and Time-Out-Timer(TOT) functions; and so on.

HCRA's 2017 Raffle

ONLY 250 TICKETS TO BE SOLD!

JUST \$10 EACH

- Legendary Yaesu Receiver Design
- Triple conversion with a 1st IF frequency of 69.450 MHz
- 3 kHz roofing filter equipped as standard
- Detachable Front Panel for convenient mounting and operation
- with torque adjustment
- Pop-up Menu for quick and easy operation
- Multi Function Knob
- Large Transmit/Receive indicator
- Three Programmable Front Panel Function Keys
- Specifically designed External Antenna Tuner FC-50 (option)

Winning ticket to be drawn at the MTARA

Hamfest Saturday March 10th, 2018



HF 50 MHz 100 Watt All Mode Transceiver

FT-891 & ATAS-120

Yaesu ATAS-120A 40 Meter through 70cm Auto Tune Motorized HF/VHF/UHF Antenna

A \$1000 total package!

INVERTED-L MYTHS AND REALITIES

MIKE DECHRISTOPHER, N1TA

The venerable Inverted-L is the most popular antenna for the low bands, due in large part to its simplicity. It has enabled many hams to get on 80, 160, or even lower from their city lots. Unfortunately, its ease-of-use has allowed substantial misunderstandings as to design theory.

This article will address several of the most oft-repeated myths regarding Inverted-L's for the low bands. In a future follow-up article, I will detail the construction of a 160m Inverted-L at my new QTH using the "Ten Commandments" provided below.

Myths and Realities:

"I feed my Inverted-L directly and my SWR is great."

If you feed your inverted-L without any type of matching network but you have low SWR, your antenna is probably very poor. The low SWR is due to tremendous ground losses near the feedpoint. As you improve your radial system, SWR will actually rise and will likely require additional capacitance at the feedpoint. SWR is a poor design metric.

● **"Radials reflect your signal."**

Your radial field provides a return path for RF (similar to the shield side of a dipole), but does not "reflect" your signal. The actual reflection happens several wavelengths away from the antenna and is due to something called the *pseudo-Brewster Angle*.

● **"This is a great limited-space antenna. Four radials should be fine!"**

How many radials do I need? Bad news: you need a bunch. For our poor soil conductivity, you're going to need at least thirty and they should be $\frac{1}{4}$ -wave long. I've found the length to be less important than the density near the feedpoint; for this reason, try to keep them evenly spaced, even if they are shorter in some directions. If you are extremely space limited, you can add a galvanized ground screen around the feedpoint (in addition to as many radials as possible, as long as possible). Good news: 30 radials appears to be the point of diminishing returns per tests by N6LF and others, so you will have achieved reasonable maximum performance with this setup.

● **"My vertical hears just fine."**

Verticals are noisy receive antennas. Often, my very short beverages-on-ground have been 6 or 7 S-units quieter than the Inverted-L on 160 and allowed me to make QSOs that simply wouldn't have been possible otherwise.

● **"The vertical should be a quarter-wave long."**

Your Inverted-L should actually be longer than a $\frac{1}{4}$ -wavelength. Making the antenna slightly longer will raise the current maximum in the vertical section well above the feedpoint (this is good). The trick, of course, is keeping the maximum beneath the horizontal portion; if the antenna becomes too long, the horizontal portion will act as a radiator instead of a capacitance hat (this is bad). If you've done this properly, of course, you will still need to provide some capacitance at the feedpoint. Based on modeling at my specific QTH over the years, I've found 135' to 150' lengths to be the sweet spot for 160. Again, SWR is a poor design metric -- a small L-network at the base will easily solve the problem.

● **"I don't need a feedline choke."**

Unless your ground is outstanding (think radials over saltwater), the shield of your feedline is being used as a radial. This can cause all sorts of ugly RFI in your home and, worse, your neighbors' homes. Consider using a commercially available choke (occasionally called an "isolator") or construct your own. K9YC's popular design calls for seven turns of RG-8 through five 2.4" o.d. #31 toroidal cores.

● **"The wire is just thrown over a branch. It works fine."**

Verticals are easily coupled with anything nearby, including trees. While trees aren't as bad as metallic structures, it is still best to have your vertical out in the open away from the greenery. A catenary support rope can help. Additionally, there will be substantial voltage at the end of the antenna when running high power, so be sure there is sufficient space and insulation between the endpoint and any vegetation.

● **"Feedline losses are so low on 160 that the coax doesn't matter."**

It's true that loss decreases with frequency, however most coax is inherently leaky. This means that while feedline loss isn't the primary concern on 160, intermod and mechanical considerations might be. Consider using a high quality coax like LMR-400 or hardline. This rule holds true for any antenna on any band, and especially so if you intend to operate radios on other bands at the same time. True hardline has the added benefit of direct burial and is widely available on eBay and government surplus websites.

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MOBILE DXCC?

DAN M. ROMANCHIK, KB6NU
www.kb6nu.com

A reader sent me the following the other day:

“The ARRL posted the following on February 9th, on their Web page:



ARRL this week announced a Mobile DXCC Operating Award available to radio amateurs who have contacted at least 100 DXCC entities from a working vehicle with antennas and power source capable of operating while in motion. ARRL Radiosport Manager Norm Fusaro, W3IZ, advised those pursuing the award to put safety first. “Distracted driving is a serious concern, so we hope all mobile operators exercise care when operating from a moving vehicle,” he said. Full, official details are on the Mobile DXCC Operating Award page. Read the complete announcement at <http://www.arrl.org/news/arrl-announces-mobile-dxcc-operating-award>.”

He went on to say:

“I have to question the judgement of the League. With all the problems today with distracted driving, why in the world would they be advocating a mobile DXCC award? Do they really believe voicing a cautionary statement mitigates all risks?”

I count 22 different types of DXCC awards (5 modes (Mixed, Phone, CW, Digital, and Satellite), 5BDXCC, DXCC Challenge, 12 bands (160m thru 70cm), Honor Roll, and Top of Honor Roll). Does the DX community need another DXCC award?

I am certainly going to voice my disagreement with the League, but thought this may be a good topic for either your blog or an upcoming ICQ session.

One of the hams at the office had a comment – Once the first serious accident involving a distracted DXer chasing the Mobile DXCC occurs, the term “pileup” will take on a new meaning. I will add that it is a good thing the League has \$20M in the bank, as stated by N6AA. They may need it for a court awarded judgement!”

My initial reaction is that this award shows where the League’s priorities are. My guess is that the DXCC program is a revenue source for the League, and more awards means more revenue. On the other hand, the ARRL may just be giving DXers what they want. Does anyone know if there’s a demand for this award among DXers? Is this award something that you’ll be working towards?

REMEMBER WHEN.....

FROM THE HCRA
TIME MACHINE

&

THE 1967
RADIO SHACK
CATALOG

NEW! 4-Band Shortwave Receiver!



REALISTIC®
Model DX-75
Your Ticket to
Worldwide
Listening
Excitement!

69⁹⁵
NO
MONEY
DOWN

MADE IN U.S.A.

- 4 Bands: 550 to 1600 KC; 1.6 to 4.4 MC; 4.5 to 11 MC; 11 to 30 MC!
- Separate BFO Control for CW and SSB!
- AC Transformer! Realistic “Lifetime” Tubes!
- Electrical Bandspread! Slide Rule Dial!
- Automatic Noise Limiter! Built-In Speaker!

The Realistic Model DX-75 delivers 3 times the sensitivity of comparably priced units . . . includes features you'd expect to find in sets costing \$18 more! Features separate mixer, oscillator and tube sections; a 6AQ5 output stage for increasing output; headset phone jack; separate loopstick and wire antennas; 7 working controls. Frequency Range: 550 KC to 30 MC; Sensitivity: 3.5 mv at 20 KC; Selectivity: ±4.5 KC, 6 db down; Power Supply: power transformer with silicon diode, half-wave rectifier; Filament Power supplied from a separate low voltage winding on transformer, 117 VAC, 50/60 cycles, 35 watts. Big, illuminated 12" dial. Size: 14 1/2 x 9 7/8 x 5 1/2". Vinyl clad steel cabinet. 20-125, DX-75, Shipping wt. 17 lbs. Net 69.95 Net 1.98 278-1372, Outdoor Shortwave Antenna Kit, 1 lb.



31st Annual



Amateur Radio & Electronics Hamfest

Saturday March 10, 2018

Located

Castle of Knights

1599 Memorial Drive, Chicopee, MA 01020

www.castleofknights.com

Directions

From North:

*Take I-91 South to the Mass Turnpike. Take exit 5 (Rte. 33) off the Turnpike. After the tollbooth bear to the right to the first traffic light. Turn left onto Memorial Drive and travel north for about 2 miles.

From South:

*Take I-91 North to the Mass. Turnpike. Take exit 5 (Rte. 33) off the Turnpike. After the tollbooth bear to the right to the first traffic light. Turn left onto Memorial Drive and travel north for about two miles.

From East:

*Travel on the Mass. Turnpike toward West. Take exit 5 (Rte. 33) off the Turnpike. After the tollbooth bear to the right to the first traffic light. Turn left onto Memorial Drive and travel north for about two miles.

From West:

*Travel on Mass. Turnpike toward East. Take exit 5 (Rte. 33) off the Turnpike. After the tollbooth bear to the right to the first traffic light. Turn left onto Memorial Drive and travel north for about two miles.

Castle is on the right for all of the above.

Mail- in Registration Form

Name _____

Call sign _____

Address _____

City _____ State _____ Zip _____

Phone (cell preferred) _____

Email Address: _____

of Tables _____ x \$20.00 = _____

Is 120 VAC Needed? _____

Checks payable to: MTARA
Mail to: Brian Mullarney-N1FI, 20 Spring Street,
Easthampton, MA 01027

*** The Details ***

Doors Open:

6:30 AM Vendors *only*; help available for loading and unloading
8:30 AM General Admission

Admission:

Adults: \$5.00
Children: under age 12 are *FREE!*

No Tailgating

Handicapped Parking Available

Snack Bar – hot and cold beverages, hot dogs, burgers, etc.

Raffle Prizes – six (6) tickets for \$5.00

VE Exam -10:30 AM

Bring **two** forms of positive ID; originals and photocopies of any CSCE's you hold; and if licensed, the original of your current license plus a photocopy.

Additional Information:

<http://www.mtara.org>

Talk-In on 146.94 (127.3 PL)

Table Registrations contact:

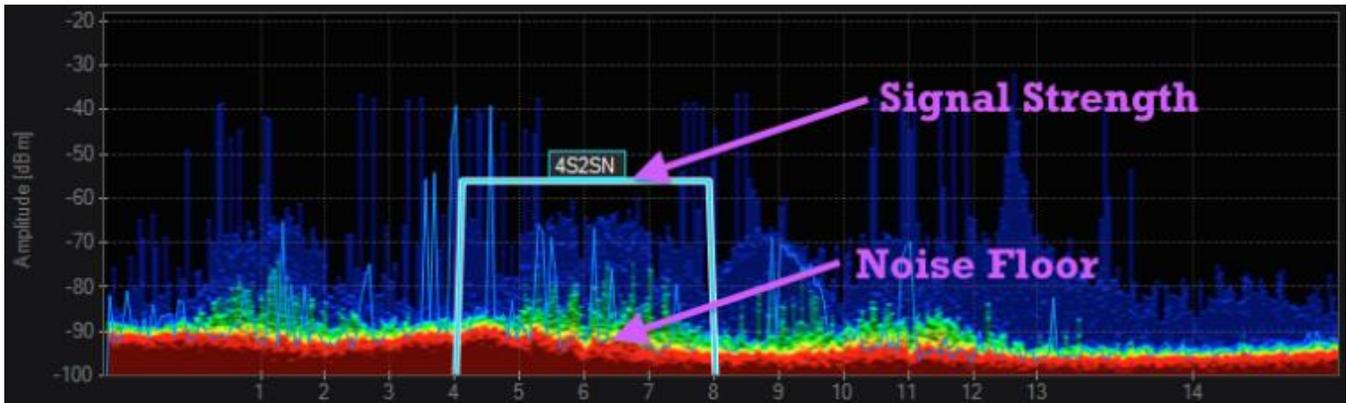
Brian Mullarney – N1FI
20 Spring Street
Easthampton, MA 01027
Tel. (860) 478-6790
N1FI@arrl.net

FCC'S NOISE FLOOR 'STUDY' ?

STEVE McDONALD VE7SL
[HTTPS://VE7SL.BLOGSPOT.CA/](https://ve7sl.blogspot.ca/)

It seems like the FCC's recent interest in doing an **in depth study** of the growing RF spectrum noise floor has taken a new twist.

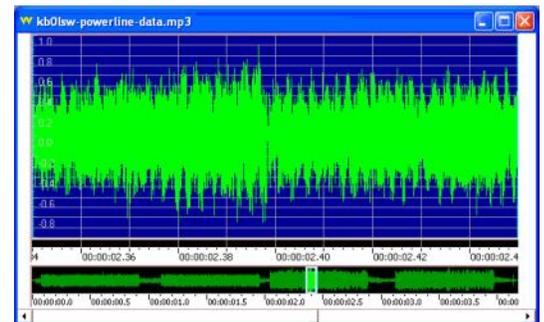
The FCC's apparent lack of real action in gathering the data needed to make serious inroads into RF noise pollution has drawn the attention of the ARRL, which voiced their concerns in a **recent ARRL Letter** as well as in their formal response to the FCC.



In response to the FCC's Public Notice (ET Docket No. 17-340) Spectrum Management proposals, the ARRL *"took the opportunity to strongly urge the FCC to reinstate a 2016 TAC noise floor study, which, ARRL asserted, apparently was terminated before it even got started."* It would seem that the proposed in-depth study never even happened and the term 'noise' has morphed into an 'interference' issue!

The FCC's paper proposed a number of guiding 'principles' in going forward with spectrum management policies, loosely based on the concept that more emphasis on eliminating 'interference' should be placed on receivers along with continued development of transmitter spectral purity and that with increased spectrum crowding, users will simply have to expect and accept certain, as yet unspecified, levels of interference!

It sounds suspiciously as if the FCC has decided that the source of any noise / interference problems have become too large to control and have passed the buck to equipment manufacturers in order to solve the growing problem for users!



"Indeed, it is difficult to imagine how the Commission can now...suggest the adoption of specific spectrum management principles, incorporating such concepts as receiver immunity, HCTs [harm claim thresholds], and interference temperature determinations without having...a firm grasp on ambient noise levels in basic RF environments and geographical areas," the League told the FCC.

In their series of guiding principles relating to 'interference realities', the FCC has issued a number of broad, somewhat ambiguous statements, that might be interpreted in any number of odd ways ...

"Principle #1 -- Harmful interference is affected by the characteristics of both a transmitting service and a nearby receiving service in frequency, space or time;

Principle #2 – All [radio] services should plan for non-harmful interference from signals that are nearby in frequency, space or time, both now and for any changes that occur in the future;

Principle #3 – Even under ideal conditions, the electromagnetic environment is unpredictable. Operators should expect and plan for occasional service degradation or interruption. The Commission should not base its rules on exceptional events;

Principle #4 – Receivers are responsible for mitigating interference outside their assigned channels;

Principle #5 – Systems are expected to use techniques at all layers of the stack to mitigate degradation from interference;

Principle #6 – Transmitters are responsible for minimizing the amount of their transmitted energy that appears outside their assigned frequencies and licensed areas;

CONTINUED ON PAGE #9

Ten Commandments for your Inverted-L

By way of summary, here are my basic design requirements for a good Inverted-L. Many of us, myself included, can't have all of them, but we should attempt *most* of them. After all, who among us is without sin?

1. Don't use SWR as a design metric
2. Make the vertical section as tall as possible
3. Use as many evenly-spaced radials as possible
4. Use a decent choke at the feedpoint
5. Avoid lossy bottom-loading
6. Place the vertical element in the open, away from trees and buildings if possible
7. Use high quality coax or hardline to feed the antenna
8. Match at the feedpoint, only use a tuner in the shack as a last resort
9. Use empirical performance tests; avoid "I snagged 3Y0 so it works fine" -statements
10. Don't use SWR as a design metric (again)

My final point is that we should never make *perfect* the enemy of *good enough*. Many of our constraints will dictate how well we can build this or any other antenna. The true test of our mettle is what we do within those constraints to maximize performance.

C U on Topband!

FCC'S NOISE FLOOR 'STUDY' ?

Principle #7 – Services under FCC jurisdiction are expected to disclose the relevant standards, guidelines and operating characteristics of their systems to the Commission if they expect protection from harmful interference;"

The ARRL response argued that:

"Requiring better performance from receivers or RF-susceptible devices is a valid, reasonable, and long overdue requirement," ARRL said, "but the major goal of doing so should be to prevent instances of interference ..."

Specifically they argue that amateurs are unique users and able to recognize harmful interference beyond their control and should not be subjected to the same restrictions (ie. get ready to accept new levels of yet undefined interference levels) as commercial users.

"That, in ARRL's view, is a big mistake," the League contended. "No system of spectrum management incorporating [harm claim thresholds] and receiver immunity levels can be accurately implemented" without the noise study data.

"That study is more important now than ever before," ARRL concluded, "and it is increasingly urgent as a prerequisite for any new spectrum management policies."

With Washington's drastic cutbacks in FCC field-office investigators and overall budget trimming, it seems that the FCC is still **relentlessly driven** to eradicate all forms of illegal (pirate) broadcasting. It's a pity that they don't display the same zeal for dealing with the illegal imports and distribution of the offshore equipment that is quickly killing our ability to hear anything on the ham bands ... without selling-off and moving to several acres in the country.



DOTS & DASHES:

Things I can't think where to put, but are interesting.

NOVICE RIG ROUNDUP

One of the most enjoyable operating events of the year is fast approaching -- the Novice Rig Roundup or 'NRR'. Technically, it is a contest, but I have the feeling that most participants think of it as just a lot of fun and a nice opportunity to hear and work some of the great old 'classics' of the past -- rigs that were used when they were teenage Novices or rigs that they could only drool about owning, back in those formative years when they each discovered the magic of radio.

The dates to remember are 0000 UTC March 3 - 2359 UTC March 11 and this multi-day opportunity is, for me, what makes the NRR so enjoyable. With a nice diversion from the usual 'contest frenzy' associated with standard weekend operating events, the NRR can be enjoyed throughout the week, whenever you choose to participate. If last year's operating patterns continue, you should find activity at any time of the day ... and even more as sunset arrives

FCC CONSIDERING LICENSING FREQUENCIES ABOVE 95 GHZ

The Federal Communications Commission has signaled its intent to look into issuing licenses for frequencies above 95 GHz with recent vote to issue a Notice of Proposed Rulemaking and Order.

“That’s GigaHertz, not MegaHertz — way up there, beyond the highest frequencies that are commonly used today, at least by the private sector,” Peter Tannenwald points out in his latest CommLawBlog entry.

Tannenwald says the commission “has proposed to authorize three types of operations: regular licensing, unlicensed systems and experimental licensing.” Also, the FCC proposes “to permit the sale of new equipment during market trials.”

He adds that this is a shift in part driven by ham radio operators, who have long been allowed to operate above 95 GHz.

This is likely good news for those concerned about the spectrum crunch, since the “amount of available bandwidth is enormous; so if the high frequencies can be used, the possibilities for ever-faster wireless broadband and backhaul speeds are significant.”

INTERESTING HAM RADIO WEB SITE:

Northern Colorado Amateur Radio club has produced a youtube video for new amateur radio operators on the basics of using a repeater. Great information for both new and experienced operators.

<https://youtu.be/TNxvfRDpwpA>

AREA SWAP/HAMFESTS:

Mar 10 MTARA HamFest	Chicopee, Ma	http://www.mtara.org/
Mar 15 Southington ARA Flea Market	Southington, Ct	http://www.chetbacon.com/sara.htm
Mar 30/31 Androscoggin ARA Convention	Lewiston, Me	http://www.w1npp.org
Apr 7 Seacoast Amateur Radio Flea Market	Hampton, NH	http://www.w1wqm.org
Apr 14 Waltham ARC HamFest	Waltham, Ma	http://www.wara64.org
Apr 29 Eastern Conn ARA Fleamarket	Thompson, Ct	http://www.qsl.net/k1muji/
May 4/5 NearFest	Deerfield, NH	http://www.near-fest.com/
May 12 East Greenbush ARA HamFest	East Greenbush, NY	http://www.w2egb.org/
May 19 So Berkshire ARC HamFest	Goshen ,Ct	http://www.sberk.org
May 20 Flea at M.I.T.	Cambridge, Ma	http://w1mx.mit.edu/flea-at-mit/
Jun 3 Mt Beacon A.R.C. HamFest	Fishkill, NY	http://www.wr2abb.org/

MARCH'S CONTESTS

Mar 3 ARRL International SSB DX Contest	http://www.arrl.org/arrl-dx	Ph
4 SARL Hamnet 40 meter contest	http://www.sarl.org.za	Ph
10 South American 10 meter Contest	http://www.sa10.com.ar	CW, Ph
Quarter Century Wireless QSO Party	http://www.qcwa.org	CW, Ph, Dig
Oklahoma QSO Party	http://www.k5cm.com/okqp.htm	CW, Ph, Dig
Idaho QSO Party	http://www.idahoarrl.info	CW, Ph, Dig
11 North American RTTY Sprint	http://www.ncjweb.com	Dig
Wisconsin QSO Party	http://www.warac.org	CW, Ph, Dig
17 Louisiana QSO Party	http://www.laqp.louisianacontestclub.org	CW, Ph, Dig
Virginia QSO Party	http://www.qsl.net/sterling	CW, Ph, Dig
24 First Class CW Ops Club QSO Party	http://www.g4foc.org/qsoparty	CW
28 SKCC Sprint	http://www.skccgroup.com.com	CW

Local happenings

Sundays: 0845: Western Mass Emergency Net 146.94, PL 127.3 - W1TOM/R

First Monday: Southwick Regional RACES Drill, 1845, 146.49 Simplex

Mondays: 1930: HCRA 10m Net 28.375

Tuesdays: 1930-2000: 146.94, PL 127.3 - W1TOM/R - Hampshire County Emergency Net

Wednesdays: 1930: MTARA Info net 146.94, PL 127.3 - W1TOM/R - includes NTS Net

2000: MTARA Swap net: 146.94, PL 127.3 - W1TOM/R

2000: MTARA Simplex Net - starts on 146.94 - PL 127.3, then goes to 146.42 direct (simplex) Usually starts immediately following the swap net.

Thursdays: 2100: Weather Net (Roger, K1PAI Net Control), 1st Thursday of every month: 147.090 MHz, All other Thursdays: 147.000, PL 127.3 - W1TOM/R

Fridays: 1200: BB's (Brown Baggers Luncheon)
Munich House
13 Center Street
Chicopee, MA 01013

Expect between 6 and 12 attendees every Friday. Good food, great company!

Club meetings & VE sessions

1st Friday of the month 7:30 PM, HCRA Club Meeting, Holyoke Hospital Auxiliary Conference Center, 575 Beech St. Holyoke MA 01040 (no meetings held in July or August.)

<http://www.hcra.org/meeting-location/>

3rd Friday of the month 7:30 PM, MTARA Club meeting, Red Cross building, [150 Brookdale Dr. Springfield, Mass.](#) (no meetings held in July or August)

4th Friday of the month 6:00 PM, Technician, General, and Extra Class License Exams, Holyoke Hospital Auxiliary Conference Center, 575 Beech Street, Holyoke, Mass. Hosted by the Western Mass VE Team (WMVET). Contact: David Cote, w1fab@arrl.net

Third Monday of the month 7:00 PM, Franklin County Amateur Radio Club meeting, Greenfield Community College. (no meetings held in July or August)

<http://www.fcarc.org/>

4th Monday of February, May, August, November 7:00 PM, FCARC VE Exams, Unitarian Church, Main Street, Northfield <http://www.fcarc.org/>

Join the ARRL or renew your membership!

ARRL members enjoy:

- QST Magazine
- Members-Only Web Services
- Technical Information Service
- Member Discounts
- Outgoing QSL Service
- Continuing Education
- ARRL as an Advocate
- Regulatory Information Branch
- Public Relations for Amateur Radio
- ARRL Field Organization
- ARRL-sponsored contests
- Operating Awards
- Local Clubs
- Amateur Radio Emergency Service
- Hamfests and Conventions
- Volunteer Examiner Coordinator Program



<http://www.arrl.org/membership>

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**Here is your exciting copy
of Zero Beat!**

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