



# ZERO BEAT

<http://hcra.org>

October 2014

## October Meeting

### Special points of interest:

- Next Meeting Friday, Nov 7th
- Visit the HCRA facebook page.
- Don't forget to check out [hcra.org](http://hcra.org)
- Visit Summits on the Air <http://www.sota.org.uk>

**Don't forget this year's raffle!**

**See Page 4 for details.**



**Join us Friday October 3rd at 7:30, in the Holyoke Medical Center Auxiliary Conference Center .**

### Local and International Fox Hunting:

#### How is it different?

Presented by: Bob Ravenstein - W1FDR

Here's what he'll cover:

Presentation will cover both fox hunting done on the local level with lots of examples and techniques used for finding fox in both auto and by foot. He will also bring in some equipment that is used to find the fox. also discussed will be ARDF (which is national and international fox hunting) and how and it is both different and similar to what we do locally; along with the techniques of using orienteering to find the fox.



### Inside this issue:

Article From The Wilbraham-Hampden Times	2
Pictures from First Meeting	3
From The Shack	4
Local Happenings, Club & VE Sessions	5
Dots & Dashes	6
Classifieds	7
Crossword Puzzle No Towers	9

For directions to The Holyoke Medical Center Auxiliary Conference Center:

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

## WOULD YOU TURN DOWN A FREE ANTENNA ANALYZER?

All you have to do is pay your membership dues before the end of the October meeting. That means there will be less than 100 tickets in the hat! The odds of you winning is less than **100 to 1!**

**Where are you going to get those kind of odds!**

You can pay them online at:

<http://www.hcra.org/membership-payment/>

Or at the October meeting.

Drawing will be held at the end of the October meeting.

For more information: <http://www.mfjenterprises.com/Product.php?productid=MFJ-266B>



# Ham Radio Operators are there when all else fails



Reprinted with permission of "The Wilbraham- Hampden Times"

By Charles F. Bennett

## Turley Publications Staff Writer

Being an amateur radio operator or a "ham" as they are affectionately called, is not all fun and games in Wilbraham, the region, or the world, for that matter.

Although they consider their activities a hobby and even a sport, they are relied on by emergency management agencies to keep communications going during disasters. Their motto is "Amateur Radio – when all else fails." Local amateur radio operators were tested during the 2011 tornado and October snow storms and Hurricane Irene that struck Wilbraham and the region. Tom Doyle of Wilbraham, the Hampden-Hampshire Counties coordinator, said Wilbraham members all belong to the Amateur Radio Relay League and have earned licenses from the Federal Communications Commission.

Amateur radio operators are often described as "first cousins to police and fire professionals" because they are also first responders in their own technical way.

When the tornado hit they all sprang into action, said Doyle. "We were asked to provide back up communication when there was no power caused by the tornado," he remembers. He said the hams, using a "net" they had set up, enabled communications between the Pioneer Valley Red Cross headquarters and shelters set up in Monson and Springfield. Doyle compares the radio net that was organized as similar to a conference call when hams dial in to a certain frequency and are able to communicate with each other.

In an emergency the hams work with the Radio Amateur Civil Emergency System, or RACES,



**Wilbraham radio operators give thumbs up when they are asked to help in emergencies. In the radio room of the Wilbraham Fire Station are (from left) Don Bourcier, John Syernala, David Isham, Tom Doyle, with Emergency Management Director Fran Nothe.**

coordinated by volunteer Charlie Dunlap in Southwick. RACES is a wider, state level service that local planners rely on. RACES almost never starts before an emergency and is active only during the emergency and during the immediate aftermath if government emergency management offices need communications support. RACES is normally shut down shortly after the emergency has cleared, according to its website.

### Portable

Their radio equipment can be large enough to sit on a desk, but can also be portable. Some radios are the same size as handsets, which enables them to travel to areas where they can send and receive a good signal. Assistant Town Information Technology Director John Sternala, one of the youngest of the group, has become an avid radio operator. "As a kid I played with Erector Sets and tried to learn Morse Code," he said. Recently Sternala took his portable unit and drove up to one of the highest elevations in town on Ridge Road, where he could do

testing because of the strong signal there.

Doyle said amateurs like to describe high elevations like Wilbraham Mountain as a 600 foot high antenna.

### 2011 Storms

Doyle, Sternala, Net Manager David Isham and hobbyist Dave Bourcier were all involved when the 2011 storms hit, which was a typical situation they responded to when disaster strikes

The tornado had slammed into the Tinkham Road area very hard. It narrowly missed the old and new Minnechaug buildings but cut a devastating swath on its way from Springfield, through the southern part of Wilbraham, up over the mountain and into Monson. Falling trees had cut power to the town.

Doyle, as area manager, received a message asking for help. He went on the air and created a net for our area, Area 3, connected to the Massachusetts Emergency Management Agency (MEMA) system. Emergency generators were fired

up at the Red Cross Office, the Wilbraham Fire Station, Town Hall and at other locations that powered the hams' radios. If generators failed or were not available, they could switch to battery power.

Relay stations, called "repeaters" also operated on generator power. Repeaters are entities that pass messages on from operator to operator. Some of the hams had to find a clear route to Monson, also hit hard by the tornado, and stationed themselves at the Monson shelter and headquarters at Quarry Hill Community School, where they provided communications between MEMA, the Red Cross and emergency workers at the scene.

Although traffic was disrupted because of the tornado damage, when road crews were told a motorist was a ham radio operator trying to get through to a shelter, they found a way to get them to their destination, said Isham.

Once the net was set up, the operators went into action. During the chaos after the storm, the only way to communicate was via ham radio.

Most messages, said Doyle, were requests for supplies at various outposts. As for the freak Halloween Eve snowstorm, it hit a much wider area than the tornado did in Wilbraham and required more amateur operators than just in Wilbraham. "We are blessed with a plethora of repeaters," said Doyle, which made communications better.

Wilbraham Fire Chief Fran Nothe, also the town's emergency management director, said he was thankful to have the hams in town. "Sometimes technology fails. MEMA went down, so the only way to communicate was with the amateurs. They were our link to the statewide system after the storms," said Nothe.

# Ham Radio Operators are there when you need them.

Continued from page 2

## Keeping Active

The hams do not need disaster communications to keep them busy, however. Original “gadget guys”, they are constantly doing practice drills. They practice every Tuesday. They usually respond to a simulated emergency often to keep their skills up and radios tuned. Every Wednesday night they go up to the Mountain to connect to what they call a “Simplex net” that they use to test their equipment. Some of the training sessions are called “Field Days.”

All contact with other radio operators are stored in a logbook or on a computer to have a record of the contact. Each person has a ham

radio station at home. Isham said the latest equipment is going digital, similar to a computer.

Bourcier said his experience in the hobby isn't as extensive as Doyle or Isham's. He lives in a Wilbraham condo and can't erect a tall tower to send out a signal. So, he strung a dipole antenna around the inside of his garage. “One day I got on the air and picked up a signal from Alaska,” he said.

All agreed that they are lucky to have the height of Wilbraham Mountain enhance to their signal, unlike in the flat topography of the Mid-West here operators have to build high towers in their backyards to send and receive.

Ham radio lore harkens back to the old Morse Code days when hams couldn't get their license

without demonstrating proficiency in the use of the dots and dashes. Nowadays most communication between the operators is by voice, but Morse is still used by some and might even be making a comeback they said.

## The Tower

Still a touchy subject, back in the 1950s a Wilbraham icon, the Tower Restaurant that sat at the top of Ridge Road, caught fire. Old timers in town still remember the day the tower burned down. The fire was blamed on ham radio operators who used its height to hold a Field Day using a borrowed generator from

the Springfield Armory there. Somehow it caught fire but to this day no one knows how it started. Isham said the hams said it was not their fault and even filed an affidavit attesting to their innocence.

Despite those long ago accusations, the hams have more than made up for any suspicion with all their good community service they provide to the town and the Pioneer Valley.

Charles F. Bennett can be reached at [cbenett@turley.com](mailto:cbenett@turley.com)

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## PICTURES FROM OUR FIRST MEETING OF THE YEAR

### SEPTEMBER 5, 2014



Ed KB1NWH & Eric W1MOR getting the meeting started.



Eric W1MOR telling us about the Royal Rangers & Field Day.



Rich KX1R & Jeff NT1K Taking membership renewals



Great turn out for our 1st meeting of the year.



Matt W1MSN & Jim KK1W giving us the results of FD & WRTC.

# FROM THE SHACK



As most of you know I was involved in EMCOMM. It is a needed aspect in the hobby. Not just VHF and UHF, but also HF and Digital HF are also a HUGE help in many disasters. Your local repeaters are pretty good for the localized storms and effected areas. But what about the BIG ones that take out infrastructures in a large area, say New England, Florida, Louisiana?

The time to learn is when the sun is shining, not when the snow drifts are 6 feet high and you can not open your door. You are next to useless to the government agencies, local agencies, and local hams if everything's not ready before IT happens.

When the power goes out you need them extra batteries for you radios of all sorts. You will probably want candles, flash light, and even a lantern. A camp stove is a good thing to have handy for coffee, cooking, coffee, hot water, coffee (did I mention coffee). Besides it gives the YL something to do.

The ARRL has a Simulated Emergency Test (SET) Nationwide that is slated this year for the October 4-5 weekend, although the window for local and regional exercises is September 1 through November 30 each year. All groups conduct their events over the course of 48 hours. The SET is a nationwide exercise in disaster response and emergency communication, administered by ARRL emergency coordinators and net managers, in which volunteers respond to a mock emergency or disaster, such as an earthquake or hurricane. Members of the Amateur Radio Emergency Service (ARES), the Radio Amateur Civil Emergency Service (RACES), the National Traffic System (NTS), SKYWARN, the ARRL Field Organization, and other groups work together to plan and develop simulated emergency and disaster scenarios, in consultation with the various served agencies that rely on radio amateurs during emergencies.

Many ARES groups across the country will be participating, and all ARES members are invited to support the national SET and their local ARES group's activity.

During this year's SET, participating ARES/NTS members can earn SET bonus points by participating in the ARRL Centennial QSO Party. During the October 4-5 SET weekend, ARES and NTS field members and appointees are encouraged to get on the air and call "CQ Centennial." The exchange is signal report, name, location, and your designator. There will be a special bonus for groups that include Centennial QSO Party participation. Each station making at least 5 contacts is worth an additional 3 points toward your group's SET score. Those taking part in a SET on another weekend may participate on the national SET weekend and count it later.

(Portions copied from the ARRL website)

Your Prez

Ed KB1NWH



## HCRA's raffle this year is going to be for a Elecraft KX3!

For a mere \$10 donation to the HCRA, you get a chance to win an assembled KX3 by Elecraft valued at around \$1000.

This is an very popular and excellent HF portable radio that has an [excellent receiver](#), low power consumption, can run on external power or 8AA batteries internally, it can transmit up to 12W and has plenty of options like an 100W amplifier, 2M module, pan adapter, ATU, Roofing filters, internal battery charger, custom CW paddle and others that can be added later.

HCRA has printed only 250 tickets and we will start selling them during field day 2014. Tickets will also be sold at meetings and other events throughout 2014 and part of 2015. The drawing will happen when all 250 tickets have been sold or during MTARA's Hamfest in March of 2015. Plenty of time to obtain your chance.

Raffle is just for the Elecraft KX3 Transceiver only. Microphone and paddles not included. Drawing Date Subject To Change.

# 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

## 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>

## 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 506 Cottage St, 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 High School (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/>

## HCRA contact list

President, Ed LaCombe KB1NWH  
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et-n1qko@juno.com  
VE Session Liaison, Dave Cote W1FAB  
w1fab@arrl.net

# DOTS & DASHES:

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

## SPECIAL EVENTS:

Our brothers to the north, The Nashua Area Radio Club will be celebrating their 35<sup>th</sup> anniversary from 0000Z on October 3<sup>rd</sup> to 2359Z October 6<sup>th</sup>. They will be operating station N1FD on SSB freqs of 28.400, 21.300, 14.285, 7.200, & 3.900. CW will be operated 30kHz from band edge. More info at: [www.n1fd.org](http://www.n1fd.org).

U.S. Navy Birthday Special Event Station NI6IW will be active from the museum radio room aboard the Museum Ship USS Midway (CV-41) on October 11<sup>th</sup> from 1600Z to 2300Z. They will be operating SSB on 14.320, 7.250; PSK31 on 14.070; D-STAR – REF1C. Send QSL reports to: USS Midway(CV-41), Museum Radio Room, 910 N. Harbor Dr, San Diego, Ca 92101

Nevada will be having it's Sesquicentennial Celebration from October 10<sup>th</sup> 1010Z to November 10<sup>th</sup> 1212Z. What's interesting about this event, 150 years ago they used Morse Code to transmit the state constitution to Washington D.C. , where it was signed by Abraham Lincoln. At the time, this was the longest message sent by code, it took several days, and numerous relays. They are planning to replicate this event. For more info: [www.snars.org](http://www.snars.org)

Jamboree on the Air (JOTA) takes place from October 17<sup>th</sup> at 0000 local time to October 19<sup>th</sup>, 2400 local time. Jamboree on the Air provides the opportunity for millions of Scouts around the world to meet on the air via Amateur Radio. For more info: <http://www.arrl.org/jamboree-on-the-air-jota>

The United States Coast Guard Auxiliary is celebrating their 75<sup>th</sup> anniversary on October 18<sup>th</sup>. There will be special events stations from Coast- to-coast, operating from 1300Z to 2300Z, in the general portions of the 20 & 40 meter bands. HAPPY BIRTHDAY AUXILIARY COASTIE'S!

Connecticut State Convention, October 12th Four Points by Sheraton, 275 Research Parkway, Meriden, Ct  
[www.nutmeghamfest.com](http://www.nutmeghamfest.com)

## INTERESTING HAM RADIO WEB SITES:

When we were studying to become Amateur's, we learned all about how the Sun affects communications. Here is a web site that provides lots of information on the Sun.

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

Submitted by Larry Krainson W1AST

## CONTESTING:

### OCTOBER STATE QSO PARTIES

October 4	New Jersey	<a href="http://www.k2td-bcrc.org">www.k2td-bcrc.org</a>
October 4-5	California	<a href="http://www.cqp.org">www.cqp.org</a>
October 11	Arizona	<a href="http://www.azqsoparty.org">www.azqsoparty.org</a>
October 11-12	Pennsylvania	<a href="http://www.nittany-arc.net">www.nittany-arc.net</a>
October 18-19	Iowa	<a href="http://www.wa0dx.org">www.wa0dx.org</a>
October 18-19	New York	<a href="http://www.nyqp.org">www.nyqp.org</a>
October 18-19	South Dakota	<a href="http://www.kb0wsw.com">www.kb0wsw.com</a>
October 18-19	US Virgin Is.	<a href="http://www.usislands.org">www.usislands.org</a>
October 19-20	Illinois	<a href="http://www.w9awe.org">www.w9awe.org</a>

### OCTOBER W1AW PORTABLE CENTENNIAL QSO PARTY

October 1 –7	W1AW/3 W1AW/6 W1AW/KL7	Washington D.C. California Alaska
October 8 - 14	W1AW/4 W1AW/0 W1AW/KH0	Virginia Missouri Tinian CNMI
October 15-21	W1AW/4 W1AW/8 W1AW/KH0	Alabama Michigan Tinian CNMI
October 22-28	W1AW/7 W1AW/8	Nevada West Virginia

Hands-Only™ CPR  
Ad Council

1

Call 911

2

Push hard and fast in the center of the chest.  
Learn more at [handsonlycpr.org](http://handsonlycpr.org)

American Heart Association  
Learn and Live

# FOR SALE:

If you have a piece of Ham Radio equipment to sell, send photo and details by the 20th of the month, to [w1mow@arrl.net](mailto:w1mow@arrl.net). All submissions will be screened for appropriateness, and content. The decision to publish is at the discretion of the ZB Editor



For sale are a set of paddles by GHD Key and sell for \$229.95 new. I'm looking for \$100 Firm. These are smooth paddles and will make your cw sending very easy. Chrome paddles with red finger grips on a marble base. In excellent conditions as can be seen from the pictures.

Also for sale is a Kenwood external speaker. Matches the size of the TS-590 and TS-570 but matches the color of the TS-570. Still looks good next to the 590 or other rigs. In excellent condition, works great, original box & manual. New is \$84.95. I am asking \$60.

Contact Larry, W1AST at 413-348-3289 or [w1dbby@comcast.net](mailto:w1dbby@comcast.net)



Specifications:	A50-3S	A50-5S	A50-6S	TEN-3
Frequency MHz	50-54	50-54	50-54	28-29.7
Number of Elements	3	5	6	3
Gain, dBi	8	10.5	11.6	8
Front to Back Ratio, dB	20	24	26	25
Side Lobe Atten. dB	25	25	25	25
SWR 1.2:1 Typical, 2:1 Bandwidth, Minr	>1	>1	>1	>1.5
Longest Element, in (cm)	117 (300)	123 (312)	119 (302)	18 (5.49)
Turning Radius, ft (m)	6' (1.8)	7.8' (2.37)	11.5' (3.5)	9.8' (3.0)
Bloom Length, ft (m)	6' (1.8)	12' (3.7)	20' (6.1)	8' (2.44)
Wind Load, ft <sup>2</sup> (m <sup>2</sup> )	1.80 (0.17)	2.9 (0.273)	4.46 (1.41)	2.0 (20)
Max. Wind Surface Area	3.22ft <sup>2</sup> (3m <sup>2</sup> )	3.22ft <sup>2</sup> (3m <sup>2</sup> )	3.22ft <sup>2</sup> (3m <sup>2</sup> )	3.22ft <sup>2</sup> (3m <sup>2</sup> )
Max. Power Watts PEP	1000W	1000W	1000W	1500W
Weight, lb (kg)	7 (3.2)	11 (5.0)	18 (8.2)	9.9 (4.45)

For Sale used Cushcraft A50-6S – 6 element 6 Meter Yagi – \$100.

ROOBZILLA NOT INCLUDED!

Call Matt Wilhelm : (413)336-4701 or [W1MSW@arrl.net](mailto:W1MSW@arrl.net)

For Sale: 90 ft 75 ohm hardline. \$10.

Gent Lam, WA1CQF [shortwrench@comcast.net](mailto:shortwrench@comcast.net)

## AREA SWAPFESTS:

Oct 5th	Queens NY	<a href="http://www.hosarc.org">www.hosarc.org</a>
Oct 10 & 11	Deerfield NH	<a href="http://www.near-fest.com">www.near-fest.com</a>
Oct 12th	Meriden CT	<a href="http://www.nutmeghamfest.com">www.nutmeghamfest.com</a>
Oct 12th	Fishkill NY	<a href="http://www.wr2abb.org">www.wr2abb.org</a>
Oct 18 & 19	Wakefield MA	<a href="http://www.phsne.org">www.phsne.org</a>
Oct 18	Longueuil PQ	<a href="http://www.ve2clm.ca">www.ve2clm.ca</a>
Oct 19	Cambridge, MA	<a href="http://www.swapfest.us">www.swapfest.us</a>
Oct 25	Gales Ferry, CT	<a href="http://www.qsl.net/tricityarc/index.html">www.qsl.net/tricityarc/index.html</a>
Oct 26	Hicksville NY	<a href="http://www.limarc.org/fest.htm">www.limarc.org/fest.htm</a>
Nov 8	Bourne MA	
Nov 29	Windsor CT	<a href="http://www.vrcmct.org">www.vrcmct.org</a>

Stephen WB2KDG 718-898-5549  
 Mike K1TWF 978-250-1235  
 John N1GNV 203-440-4973  
 Adam KC2DAA 845-849-3666  
 John 781-592-2553  
 Martin VE2DN 405-466-2810  
 Mitch 617-253-3776  
 Darryl WA1DD 860-443-7799  
 Richie K2KNB 516-694-4937  
 Ralph N1YHS 508-548-0422  
 John 860-673-0518

# PARKS ON THE AIR (POTA)

Hike in if you like... Drive in if you don't... It doesn't matter...



What does matter is that you find ways to tickle the ionosphere from the Great Outdoors.

Hundreds of parks await their initial activation. I'm talking about Parks On The Air (P.O.T.A.), though less structured and formatted than S.O.T.A. With Parks On The Air, you can still experience radio operations out into the great outdoors within many of our National, State, and even Municipal Parks. This is, without the struggle or obligation of climbing up to the top of a summit to work radio. Although some Parks qualify as both P.O.T.A. and S.O.T.A.

Dave (N1MFL) and I have been doing this for about 2 years now since my advancement into General Class. This year to date, we have worked eight POTAs in the following parks:

Mt. Holyoke Range State (MA), Sunset Rock State (CT), School St. Park (MA), Tunxis State (MA), Enders State (MA), Quabbin Reservoir State (MA) and two at Skinner State with one as our first POTA\*413 Picnic, under the club callsign of W1NY.

We learned a lot along the way since our first activation at Granville State (MA) back in the beginning of 2013, and we continue to learn with every trip. If you'd like to join us, please follow us on FACEBOOK. Look us up on POTA\*413 and like the page, and you'll be informed of our next activation.

The choice is up to you, if you find yourself wanting to operate radio portable and outdoors without the physical struggle to do so, then perhaps P.O.T.A. is for you.

Dan - KB1VWQ



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## HCRA TECHNICIANS LICENSE CLASS

We will be holding a technicians license class (with possible general and extra study groups). This would be a great chance for those who are interested in amateur radio to obtain their technicians class license. Please help spread the word

Class Dates:

Wed, Nov 19th - 6pm to 9pm    Thur, Nov 20th - 6pm to 9pm    Sat, Nov 22nd, - 9am to 3pm with VE session following  
(Date and times subject to change)

Price: Free (License Exam will cost \$15)

Location: Holyoke Hospital auxiliary conference room

The class is designed to help those who are interested in obtaining their technicians license using the study guide and help answer any questions along the way. It's up to the person to study the material needed to pass the exam at home.

Even though the class is free, It's suggested but not required that you use the current edition of the "ARRL's Ham Radio License Manual - Level 1/Technician" manual.

This class is open to the general public and anyone is welcome to join. If you are willing to attend or volunteer, please contact Jeffrey Bail (NT1K), NT1K@arrl.net, P.O. Box 0484, West Springfield MA, 01090

Information will be posted to hcra.org



### No Towers?

**Across**

- 1. Siemens, before 1971
- 4. Word with in or out of
- 9. Burn soother
- 13. Bearing
- 14. Connector
- 15. With 63-across, a multiband kind of 38 across
- 16. A W5, maybe
- 17. "QSL"
- 18. EA crazy?
- 19. Match type
- 21. Queue before Q
- 22. They hold up 38 across
- 23. Young winged hunter
- 25. FD bed, perhaps
- 26. Popular kind of 38 across
- 29. Least tight

	1	2	3		4	5	6	7	8		9	10	11	12
13					14						15			
16					17						18			
19				20		21				22				
			23		24				25					
26	27	28						29				30	31	32
33					34	35	36				37			
38				39							40			
41				42							43			
44			45						46	47				
			48				49	50						
51	52	53				54				55		56	57	58
59					60				61		62			
63					64						65			
66					67						68			

- 33. Horse coloring
- 34. F CULs
- 37. QSL routing word
- 38. This puzzle's theme
- 41. Photo, esp. digital
- 42. Maximum
- 43. Implore
- 44. Troop formation
- 46. Storm, with nor-
- 48. Non-OMs
- 49. F capital
- 51. Equipment maker Millen
- 54. Modern VFO comp.
- 55. HA composer Franz
- 59. Like AM or SSB communication
- 60. What an old capacitor does, sometimes

- 62. Away from the wind
  - 63. See 15-across
  - 64. Slacker antenna?
  - 65. "Uh-uh"
  - 66. Zulu's position
  - 67. Begali's entity
  - 68. VHF QSO party mo.
- Down**
- 1. 2-down's product
  - 2. Audio Bob
  - 3. Match maker's goal
  - 4. Part of PA, abbr.
  - 5. Possible Hispanola prefix
  - 6. Hamspeak, for example
  - 7. Trickle
  - 8. Flub
  - 9. Apportions
  - 10. Quad part
  - 11. Story starter
  - 12. They can be inflated
  - 13. Ckt. alteration
  - 20. Piercer
  - 22. It's for the birds
  - 24. Simple dwellings
  - 25. Turns measurer
  - 26. Hang
  - 27. Charged
  - 28. Word with cable or panel
  - 29. KH6 loops?
  - 30. 7x F-Open winner
  - 31. attack
  - 32. Stun gun
  - 35. Condemn
  - 36. Prefix with -tropic

- 39. Radiation pattern features
- 40. Most UA1's
- 45. Place for a lace
- 47. Be sick
- 49. Town square
- 50. Methyl, ethyl, e.g.
- 51. Check
- 52. Diva's solo
- 53. E-M cup target entity
- 54. \_\_\_ moss
- 56. Gin flavor
- 57. End-fed 26-across
- 58. Coax fitting
- 60. 75A-1 maker's middle
- 61. Short



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