

# HAM RAG



Visit our website for more club and area ham information  
In the Rockford area at <http://www.w9axd.org>

## RARA Mission Statement

A member association with common interest of public service to the community through the use of amateur radio.

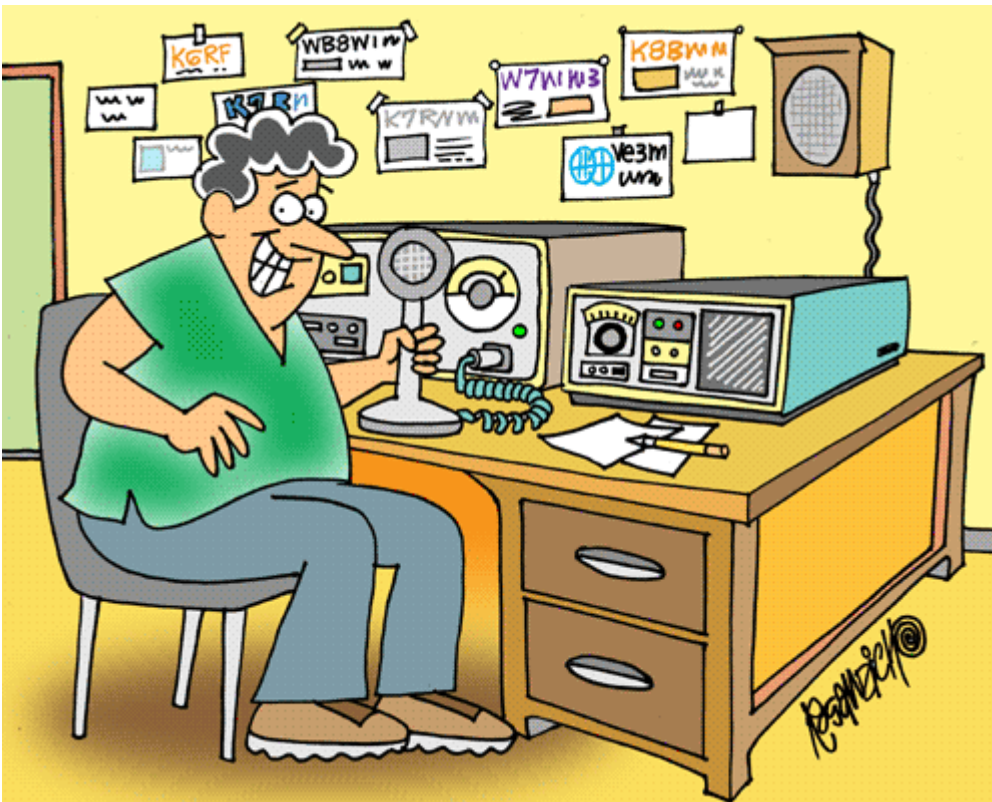
## Presidents Log

Hi every one. Christmas is fast approaching and if your like me you haven't started your shopping yet. Let alone as to what to get the family. So Ill simply wish you all a very Merry Christmas and a Happy New Year.

We will have a program for December. The title will be "Everything You Always Wanted To Know About Antennas, But Were Afraid to Ask."

See you at the meeting:

Tom N9VJU



## December 2011

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### NEXT MEETING

**FRIDAY**

**December 9, 2011.**

**Location:**

**Foundation Room**

**Saint Anthony OSF  
5666 East State Street  
Rockford, Illinois**

**Program:**

**"Everything You Want-  
ed to Know About An-  
tennas, But Were Afraid  
to Ask"**

**Happy Holidays**

Latest news and events on our web page: <http://www.w9axd.org>



## From The Treasurer

**Treasurer's Report:** For the period 25 September 2011 to 22 October 2011  
submitted to the Ham Rag by John G. Olson 2011 RARA treasurer.

Income :	\$ 0.00
Expenses:	\$ 0.00
Ending Checkbook Balance:	\$3405.25 (per check register 22 OCT 2011)
Cash deposit not yet made	\$13.00
Ending Repeater checking balance:	\$ 300.00 (per 30 SEP 2011 statement)
Ending Savings Balance	\$3219.66 (per 30 SEP 2011 statement)***
Ending total cash on hand:	\$6937.91 (net gain of \$13.83)

\*\*\* Savings account statements are issued by Alpine Bank quarterly

## AMATEUR RADIO EXAM NOTICE

\*\*\*\*\*

November 19th there were 3 applicants resulting in 2 new licensees and 1 upgrade.

New: Jeremy M Horn - Technician

Upgrades: Barry M Morris KC9KVO - General

Correction: Last month's new Extra was Jerry A Horn KC9RMJ

Amateur Radio exams are held in Rockford IL on the 3rd Saturday of every month. The next session is December 17, 2011 at 9:00 AM. Walk-ins welcome.

Location: OSF St Anthony Medical Center  
5666 E State St  
Rockford IL

Exams will be held in the St Francis Room (Main Entrance then turn right). Check-in is from 9:00 AM til 10:30 AM.

What you need to bring to a W5YI-VEC session:

1. Your original Amateur Radio license AND A COPY.
2. Any valid CSCE that you are using for exam credit AND A COPY.
3. Two forms of identification with your signature on them. One must be a picture ID (drivers license, passport, school ID, library card, credit card, etc.)
4. Test fee \$14.00 cash or check payable to W5YI-VEC.

Rusty Cordell WB9QYV  
wb9qyv@aol.com

\*\*\*\*\*

Looking for cheap LEDs for those projects? Now is the time to get them.....Christmas tree lights!!! They're cheap enough and they yield a lot of LEDs. Some are in 5 or more colors, some are the clear type with the limiting resistor already in place and some are just the LEDs without the resistor. So after Christmas cut that string of LEDs up and put them away in the parts drawer.... Rich WB9SFG

# Secretary's Report



Notes taken at the Nov. 11, 2011 RARA general meeting in the absence of John Lawrence, Secretary

The meeting was called to order by President Tom Shoulder, N9VJU at 7:08 PM.

Our meeting took place in the larger meeting room on the first floor. Apparently the hospital had another meeting scheduled for the St. Francis Room, our normal meeting place.

The treasurer's report was read by Treasurer John Olson, W9JGO. Jim Holich, AB9SX moved to accept the report as read. Robert Larson seconded the motion. It was approved unanimously.

John Olson brought the following business to the general meeting because time constraints would not allow waiting until the next board of directors meeting.

The Annual Not for Profit Corporate report to the Secretary of State (IL) was read in summary to pass the information along to the members present. No approval was required.

The Change of Registered Agent for Rockford Amateur Radio Association, Inc. was presented for vote by the board members and officers present. John Olson made the motion to accept, Robert Larson seconded the motion, A voice vote gave unanimous approval. This vote approved the change from Sharon Harlan, N9SH to Tom Shouler, N9VJU as registered agent of the corporation. This action was initiated at the request of Sharon Harlan.

Alvin Alexander, KC9GIO asked that veterans in the group stand and be recognized for Veteran's Day. A round of applause thanked the vets for their service...

Tom Shouler called Jim Miller, W4JR to the front of the group to present a plaque from the ARRL honoring his 70<sup>th</sup> anniversary as an ARRL member. Nice Plaque! It was a framed cover of the January 1941 issue of QST and a statement honoring Jim's steadfastness as a member of the ARRL. A round of applause for Jim followed the presentation.

The business portion of the meeting ended at 7:22 PM and was directly followed by an excellent presentation by Jim Holich, AB9SX titled "The Care and Feeding of Boat Anchors" Jim had the full attention of all present during his well prepared program. There were several handouts provided and several books on the subject to view.

The program ended at 8:30 PM.

The program was followed by a time of social interaction by the members.

Respectfully Submitted by John Olson, acting as secretary in the absence of John Lawrence.



**T**his month, I'm going to start out the column by taking a closer look at a product that's right here in my hand, the Baofeng UV-3R handheld transceiver, a new HT from China (photos A and B). The UV-3R is a dual-band HT that covers 136 to 174 MHz and the 400- to 470-MHz bands with 2 watts of output as well as receive-only on the FM commercial band.

### Baofeng UV-3R Handheld Transceiver

I admit to having a penchant for ultra-compact radios and I own other small HTs as well. It is amazing to me the number of capabilities they can cram into such a small package. I'm also the first to admit that the UV-3R is not going to take the place of any of the other HTs in my active collection. I bought it with a specific purpose in mind—to take to work every day so I would have something to listen to at my desk during breaks and during my lunch hour.

Since I can fit it into my pocket, it's an easy size to carry. I'm impressed with its ease of operation, its DSP receiver, and its 2 watts of power output. Most of its features are menu driven. It accepts a readily available variety of accessories and it offers some exclusive individual features as well, such as press the correct button and it becomes a bright LED flashlight.

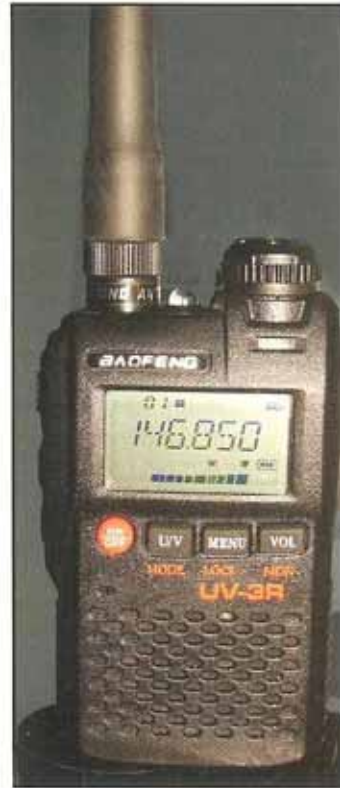
It also comes with two antennas (one for 2 meters and one for UHF), LCD menu operation, dual-band/dual-watch, wide/narrow bandwidth, its own VOX circuitry, has built-in tone (CTCSS/DCSS) circuitry, and it's even PC programmable.

When you open the box, you see the radio, the battery, a desk charger with a wall wart with plugs for U.S. AC outlets, the separate UHF and VHF antennas, a neck lanyard, and an ear piece that is also a PTT microphone. Some of the commands in the book are misleading, such as how to turn on and off the FM commercial band, but for the most part, you can trust the instructions in the user's manual as to how to set the sub-audible tones on transmit and receive, adjust the squelch, operate the LED flashlight, turn the radio on and off, adjust the offset and shift, set the scan mode, wide/narrow receive, and to turn on or off the VOX and the busy channel lock out.

Understanding the directions in order to make some of the essential settings takes a little getting used to, but that's typical with most new radios. Once you get into the user's manual and understand the control precedence, it's easy to use and easy to remember.

After a week, I did encounter a slight problem with my UV-3R. Following a night of loading mem-

*Photo A— Here is the Baofeng UV-3R that at first may look familiar if you have shopped some other micro-miniatures.*



ories into the first 20 slots and doing some local monitoring, I awoke the next morning, turned on the unit, and discovered that the radio had defaulted to its original condition and was showing only two frequencies—one on 2 meters and the other on the 440-MHz band. It seemed that whatever configuration the manufacturer uses to retain memories in the UV-3R had experienced a burp. Therefore, I reloaded the frequencies and now after a few days have passed, the radio seems to be staying in its previous condition, sitting over there on a desk, busily scanning the ham and public-service frequencies I programmed while I write this column. If I experience another burp, I'll be sure to let you know.

My personal reflections? I like the little radio, and I love the price. No, it's not something I want to try to use in a high-RF environment such as a downtown area or a repeater rooftop, and it's not the radio I expect to use to hit distant borderline repeaters, but it is one I can stuff into my pocket and take just about anywhere to stay in touch. The UV-3R is a 2-watt dual-band HT that offers attractive features and useful capabilities as well as an affordable price.

I ordered mine by mail, since we no longer have an amateur radio shop in our area, and I hated to have to wait for delivery, but the little rig was worth it. There are at least two U.S. dealers carrying this radio, including new CQ advertiser Chris

\*1870 Alder Branch Lane, Germantown, TN 38139  
e-mail: <wv5j@cq-amateur-radio.com>



*Photo B- Showing relative size compared to the GRECOM PSR 700 is the miniature UV-3R, just the right size for pocket or purse.*

Colquhoun, NH7QH, of NH7QH Radio Supplies, LLC , and Two Way 2, LLC, in Aiea, Hawaii. (Welcome aboard, Chris!)

"We are offering low cost handhelds that are Part 90 approved by FCC," Colquhoun states on the website <[www.baofang-uv3r.us](http://www.baofang-uv3r.us)>. He adds that as of August 20, he has moved sales to <[www.hamradiosales.com](http://www.hamradiosales.com)> and is currently asking \$60 for the 2-watt dual-band radio (black), which includes free shipping and handling within the 50 states. Other colors thought to be available soon include blue, red, yellow, and camouflage.

### **FRIDAY MORNING BREAKFAST**

Meets every Friday morning from 8 am until about 9:30 am. An informal gathering of ham folks, no affiliations necessary, good food and good company.

*Everyone is welcome to attend.*

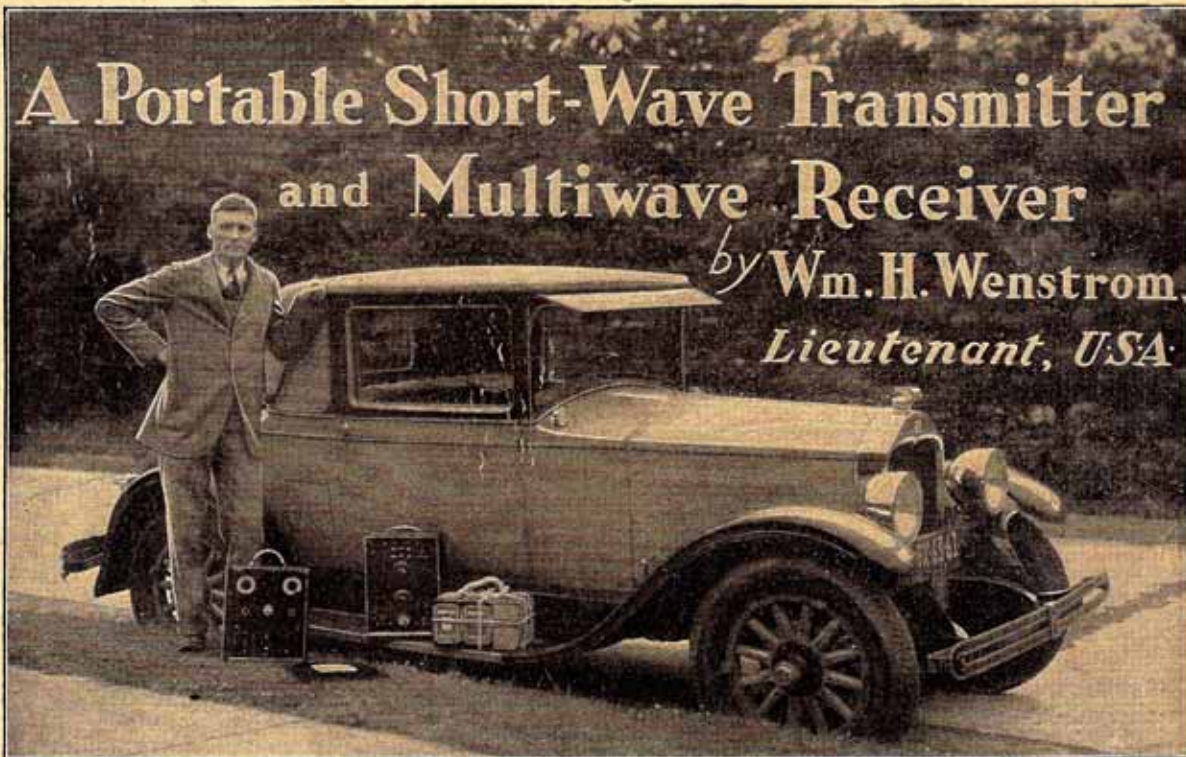
***"The Stockholm Inn"***  
***2420 Charles Street***  
***Rockford, IL 61108***











**T**HERE are finite limits to all terrestrial DX. The antipodes are only twelve thousand miles away; in time London palls and even Australia goes stale. Our morale may rise on hearing the signals of a transatlantic airplane, but it really takes a jump when we hear our friend say from the far shore of a mile-wide lake: "We reached the cove before the storm hit—everybody safe."

For such occasions, and for more prosaic work as well, this low-power portable transmitter is designed. Its reliable daylight range is two miles with phone and twenty miles with code.

Of course, "communication" is a dual affair and depends as much on the receiver as on the transmitter. The description of a suitable receiver follows this article. The transmitter's dimensions are slightly different from those of the receiver, but in general it is designed as a companion unit.

As in the receiver, one-fourth inch bakelite serves as the panel and also as the framework of the set. Though this construction is not the most compact, it has advantages. It is very easy to assemble, strong and rigid, and accessible—when the panel is tipped forward all parts are instantly exposed to view.

**Circuit Details**

The transmitter circuit is a series-fed Colpitts, often called the Hoffman split Colpitts. It is shown in Fig 1. All standard oscillator circuits are much alike in efficiency, despite the arguments of their advocates; but the Colpitts has two advantages which make it ideal for

portable use: first, one variable condenser absolutely controls the oscillator frequency over a wide range (see calibration curve, Fig. 6) with no guess work inductance clips, no flopping out of oscillation, no plate current acrobatics; second, two large condensers directly across the tube elements keep the emitted wave exceptionally steady—practically as steady as that of an oscillator-amplifier circuit. In addition, the series feed brings the plate supply and grid bias leads into the radio frequency circuit at points of low potential. A minor disadvantage of this circuit—no control of grid feedback, as evidenced by heavy plate currents—is nullified by using a high value of grid leak (around 10,000 ohms).

**The Power Supply**

After the circuit itself, the matter of power supply demands consideration. An "A" battery of dry cells may be essential

when the outfit is packed on horses or mules, but for most uses a small storage battery, which will deliver a more constant voltage, is preferable. The plate battery, however is a different matter. Dry "B" batteries are bulky enough; wet ones are out of the question. No dynamotor is made small enough for a set like this. The only trouble with the dry "B" battery is its bulk and weight; in other ways it is ideal. For any sort of economy we must use heavy-duty units, of which two or three, even though equipped with a handle, are not too easy to carry. The plate battery, then, is limited to either 90 or 135 volts—preferably 135.

We now have to find a tube that will produce some semblance of antenna amperes on the meager plate voltage of 135. It is a good deal like asking a confirmed drunkard to get hilarious at a prohibition picnic. Several UX-201As in parallel would take up too much space, but it fortunately happens that the UX-171 is

OSCILLATOR OUTPUT AND COMPARATIVE EFFICIENCY

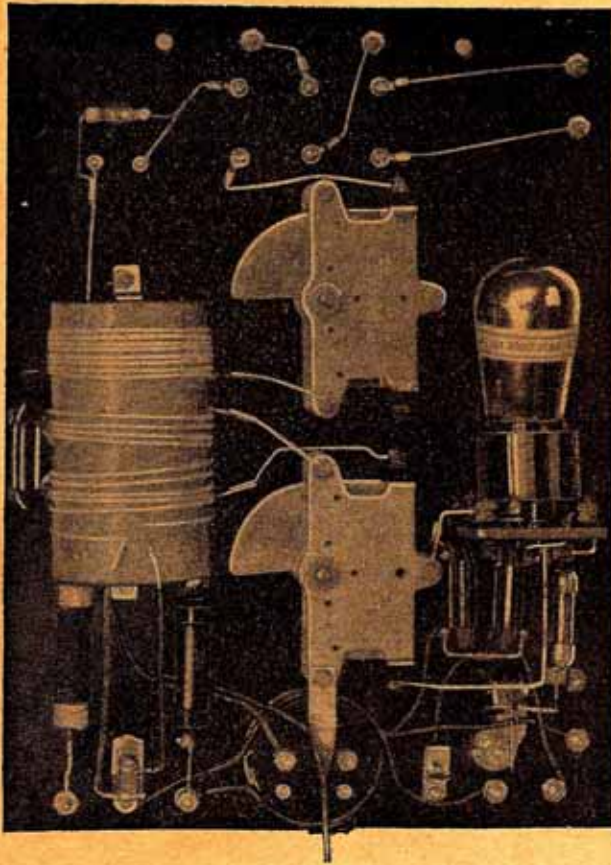
On 85 meters, antenna and counterpoise terminals shorted through r. f. ammeter

	$E_p$	$I_p$	$E_{Ip}$	R.F.	Efficiency Index*
UX-171A	96	21	2.19	.75	.34
	142	40	5.68	1.30	.23
UX-112A	96	16	1.53	.60	.39
	142	28	3.98	1.00	.25
UX-201A	96	11	1.06	.45	.42
	142	16	2.37	.60	.26
WE-216A	96	12	1.15	.50	.44
	240	42	10.01	1.40	.14

\*THE EFFICIENCY INDEX IS OF VERY DOUBTFUL VALUE, AS IT IS ENTIRELY COMPARATIVE, AND PROBABLY INACCURATE.

THE PURPOSE OF THIS TEST WAS TO GET AN IDEA OF THE PERFORMANCE OF VARIOUS TUBES IN THE PORTABLE TRANSMITTER. THE UX-171A, OR 171, WAS CHOSEN BECAUSE OF ITS HIGH R.F. OUTPUT WITH A LOW VOLTAGE PLATE BATTERY.





**S**HORT-WAVE transmitter designs are legion, and so are multi-wave receivers; but, to provide portability in both instances, is distinctly a horse of another color. And this is exactly what Lieutenant Wenstrom has done in the case of the transmitter and receiver described here.

With a conservatively rated, dependable daylight range of two miles for telephone, and twenty miles for code transmissions, the short-wave transmitter is adaptable to a wide variety of uses—some of which are suggested in the accompanying illustrations. And it is worth emphasizing, that the word "portable," in this case, is decidedly not a mere figure of speech.

The companion receiver—equally literally portable—covers a range of both short and broadcast channels and is so designed as to accommodate any type of "B" supply available. It also provides for phonograph pick-up, voice amplifier adaptation, and for the use of power audio output where (in fixed locations) the latter is at hand.

The author's particular fetish, in designing these portables, has been accessibility; a feature especially desirable in equipment which is to be used under camping or traveling conditions.

A REAR VIEW OF THE TRANSMITTER SHOWING PLACE-MENT OF PARTS

ideal. Its superiority is shown in the oscillator output table. The figures were secured with a 171A, but apply also to the 171, which is more rugged and generally satisfactory. (See page 33)

Sometimes there arises the question of code versus phone. In reality there is no such question, for a phone experimenter must, under the law, be a code man as well. This is not at all unreasonable, for really good phone work demands a higher degree of technical skill than does code. Code usually has a range ten times as great as equi-powered phone, but phone is very handy when there is a great deal to say.

In choosing the operating band for this transmitter, we must hark back to its primary purpose, which is to cover dependably the distance of an ordinary camping trip or pleasure drive. The twenty-meter and forty-meter bands are unsuitable because of their pronounced skip-distance and because they are not open to phone. Though phone is permitted in the 160-meter band, this band would require too large an antenna. Thus by elimination do we arrive at the best—the 80-meter band. Coil specifications and arrangements are shown in Fig. 5.

### Suitable Antennas

The antennas used with this set are described in some detail in the receiver article. Their exact dimensions appear in the diagram (Fig. 2), and the photographs show their construction. The spe-

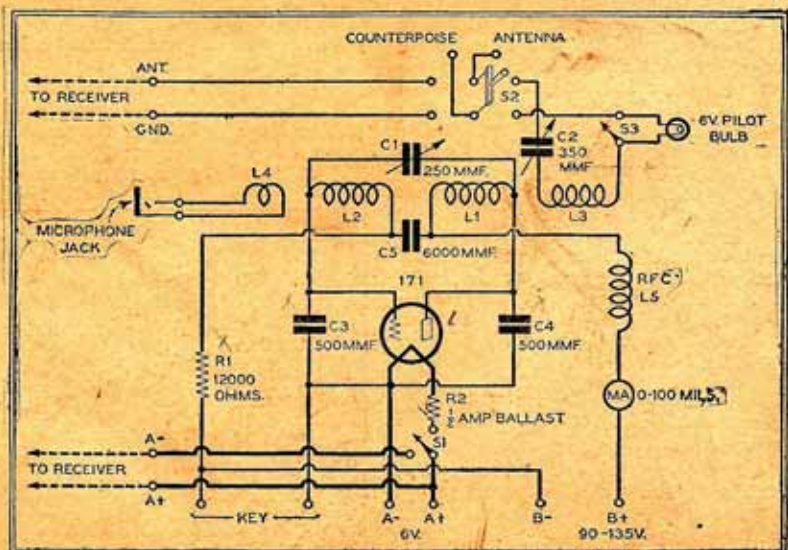
cial insulators, cut from 3/8" hard rubber rod, are worth noting.

### Constructional Details

The construction of a portable, being more exacting than that of a fixed set, should be unhurried. It might be well to start construction and preliminary tests several months in advance of actual portable use. This is particularly true of this

set, as there is no danger of its going suddenly out of date. There are very few parts, and the photographs show clearly how they are assembled and wired. Some experimenters may wish to vary the arrangement. Down the center line and at noted distances from the panel top are: the change over switch, S2, which is removed from its base and mounted directly on the panel (2 in.); the antenna condenser, C2 (5 in.); the oscillator tuning condenser, C1 (9 1/2 in.); and the milliammeter (1 3/8 in. from bottom). The coils of No. 16 D.C.C. wire (except modulating loop of No. 20) are wound on a fiber form 2 1/2 in. by 4 1/2 in. The coils are held rigidly in place by a "dope" of

FIG. 1—THE CIRCUIT DIAGRAM OF THE TRANSMITTER





celluloid dissolved in acetone. Of course any "dope" on short-wave transmitter coils is pure heresy, but in this case the most important thing is that they stay in place. The coil form is fastened to the panel by angles on the right (from panel front) of the condensers. The condenser C5 is fastened directly to the center coil ends. Above the coil, to the right of the changeover switch, is the socket for the antenna resonance bulb, mounted directly in the panel; and the shorting switch S3, also mounted in the panel. Below the coil and held by bus bars, are the grid leak R1 and the radio frequency choke, L5. The latter is about one hundred turns of No. 30 wire on a half-inch wooden cylinder. Below these parts is the microphone jack.

On the left of the condensers is the tube socket, far enough down to have its base even with the oscillator condenser. There is plenty of room above it for a UX-210 tube when the set is used at a fixed location. Directly below the socket and held by bus bar are the "Coipitts" condensers, C3 and C4, and to the left of them is the filament ballast, R2. The filament changeover switch, S1, projects through the lower left part of the panel, balancing the microphone jack on the right.

The carrying case is made of 1/2 inch white pine, nailed together with heavy brads and provided with a suitcase handle. The lumber cutting dimensions follow:

- 1 piece 11 1/8" x 15 1/8" (back)
- 2 pieces 4 1/2" x 11 1/8" (top and bottom)
- 2 pieces 4 1/2" x 14 1/8" (sides)

Though the portable receiver had a front cover this set has none, because its many binding posts do not allow one. For use in an auto, or in any place where it has a tendency to tip over, the box should be screwed to a 1 inch base of convenient size.

The key, and a small knife switch to close the key circuit for phone, are mounted on a separate board 3/4" x 5" x 10". This board is provided with a twisted pair lead long enough so that the key may be used on any convenient rest, such as the operator's knee. The micro-

phone, which may well be salvaged from an ordinary telephone, is provided with a twisted pair lead ending in a plug. To reach the microphone terminals, rather inconspicuous screws on the inner frame, the outer case must be taken apart. The A battery lead is another twisted pair, with battery clips at the far end; or the far end may terminate in a plug which fits a jack on the car dashboard. The B batteries are tied tightly with heavy clothesline into a bundle as compact as possible, and like the other units connect to the set through a twisted pair lead. There follows a list of the parts used in this set, though any parts which are mechanically and electrically similar may be used:

#### TRANSMITTER PARTS LIST

- C1—Cardwell .00025 mfd. variable condenser;
- C2—Cardwell .00035 mfd. variable condenser;
- C3, C4—2 Sangamo .0005 mfd. fixed condensers;

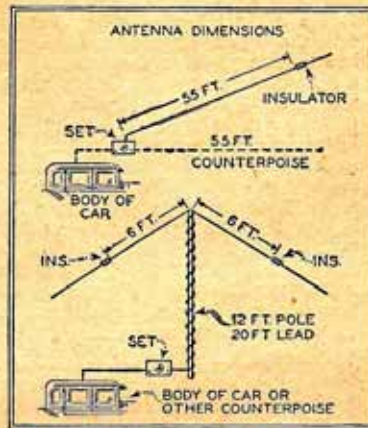


FIG. 2—SOME SUGGESTED ANTENNA SYSTEMS (ABOVE)

BELOW: THE PORTABLE RECEIVER AND TRANSMITTER READY FOR USE IN A COUPE

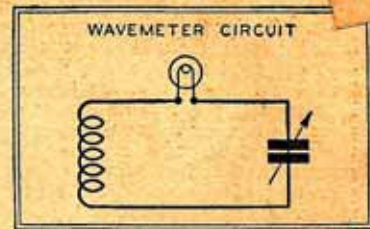
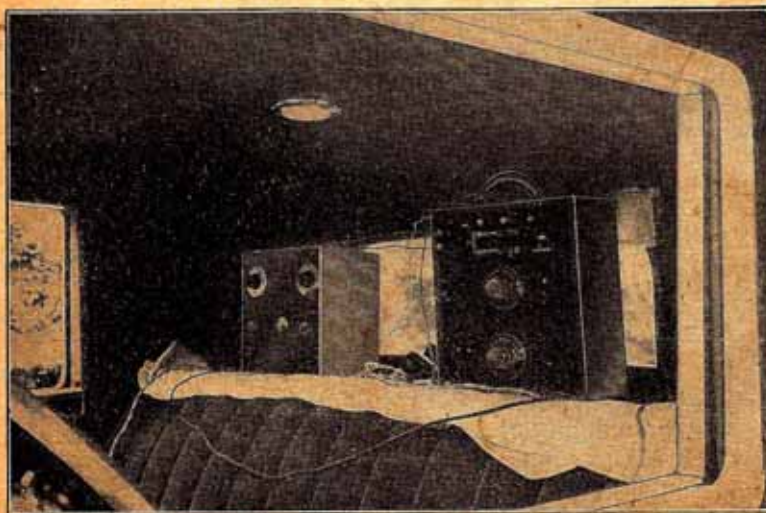


FIG. 3—A WAVEMETER, WHOSE CIRCUIT IS SHOWN ABOVE, IS HELPFUL IN CALIBRATING THE TRANSMITTER

- C5—Sangamo .006 mfd. fixed condenser;
- L1, L2, L3, L4—4 Home made coils (see coil diagram and text);
- L5—Radio frequency choke (see text);
- R1—Western Electric resistance, type 38-B (see text);
- R2—Daven 1/2 amp. ballast, with mounting;
- S1—Yaxley junior jack switch, SPDT;
- S2—Trumbull knife switch, DPDT (see text);
- S3—Midget knife switch, SPST (see text);
- 1—Benjamin spring socket, type 9040;
- 1—Weston milliammeter, type 506, 0-100 mils;
- 2—Dials, 3 inch bakelite;
- 1—Lamp socket, miniature (see text);
- 1—Bulb, 6 v. pilot;
- 12—Eby binding posts, large size;
- 1—Bakelite panel, 3/4" x 10 1/8" x 14 1/8";
- 1—Carrying box, complete.

#### OPTIONAL HEISING MODULATOR PARTS

- T1—Thordarson small type 2:1 audio transformer;
- R3—R.C.A. rheostat, type PR-535, 0-1.5 —6 ohm;
- R4—Tobe grid leak, .5 meg;
- L6—Primary of R.C.A. filament transformer, type UP-1656;
- 2—Sockets, Fahnestock clips, baseboard, etc.;
- 1—Two stage speech amplifier;
- 1—Cone speaker.

Before any operation is attempted, a wavemeter should be procured. It is simple enough to make. As shown in the diagram, Fig. 3, its parts are three: a coil, a condenser and a flashlight bulb. The bulb should be of the 1.25 volt variety, as higher voltage bulbs give too broad a reading. Once made, the wavemeter must be calibrated through the receiver from a standard one. Its use is the simplest of all: With the transmitter in operation, place the wavemeter coil near the oscillator and turn the wavemeter dial until the bulb lights brightest. Of course, one must use caution—or a plentiful supply of bulbs.

#### Operation

First of all connect the "A" battery, see that the tube lights, and check the voltage across its terminals. Then connect a 45 volt "B" battery to the set, leaving the antenna and counterpoise off and setting the oscillator condenser at about 50. When the key is closed the milliammeter should read about 5 mils. Next connect a short length of wire directly between the antenna and counterpoise binding



posts. Tuning the antenna condenser should change the millimeter reading—at one point should almost double it. This test indicates that the tube oscillates normally; but to make sure of it place the receiver across the room from the transmitter, with no antenna or ground on either. The receiver easily picks up the loud cw whistle of the transmitter. Then plug the microphone into its jack, and get someone to talk into it. The telephone signals should be clearly audible in the receiver headphones. It will be noticed at this point that plugging in the microphone lowers the wavelength about a quarter of a meter.

The set is now completely tested and ready for full-powered operation. Actual communication tests should be made from a fixed location before trying portable work. Connect the antenna and counterpoise or ground, and also the 90-135 volt B battery. With the 90 volt battery, the plate current will run somewhat as follows: Antenna detuned, 12 mils; antenna tuned to maximum, 50 mils; normal operation, 25 mils. With the 135 volt B battery; Antenna detuned, 18 mils; maximum, 80 mils (will soon ruin tube); normal operation, 40 mils. As the pilot light reaches normal brilliance at about .1 ampere, one can guess at the antenna current. With the antenna condenser tuned somewhat below the maximum for normal operation, the antenna current runs about .08 ampere for 90 volts and .12 ampere for 135 volts.

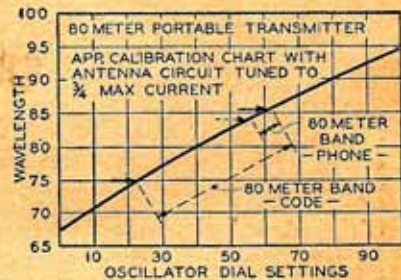
Before any real operation, the transmitter must be carefully calibrated—an easy proceeding with the flexible Colpitts circuit. Each new set should be calibrated individually, and a chart like the one in the diagram should be made up. Both the transmitter and the wavemeter may be checked against the receiver on such known wavelengths as 62 meters (KDKA) and 74.7 meters (NAA).

It is worth noting that a Federal license is required for transmission, and that an amateur must stay strictly within the prescribed bands. The 80 meter band extends from 75 to 85.7 meters (4,000—3,500 kc.) for code, and from 84.5—85.7 meters (3,550—3,500 kc.) for phone. While a few careless or deliberate amateurs operate off wave, just as a few drivers labor under the delusion that they own the highways; if every amateur fol-



THE 80 METER TRANSMITTER WITH COMPLETE ACCESSORIES. ITS SIMPLICITY AND COMPACTNESS ARE APPARENT

FIG. 6—BELOW, AN APPROXIMATE CALIBRATION CHART OF THE 80 METER TRANSMITTER



lowed suit the whole fraternity would soon be wiped out by government action.

When the transmitter is used for portable work with the Portable Multiwave Receiver, the binding posts on the left side of the panel are used. The A battery posts are connected by twisted pair to the external battery plug of the receiver, and jumpers run from the upper left binding posts on the transmitter to the antenna and ground posts on the receiver. When using the single wire antenna, a .00025 mfd. condenser is wired in the antenna jumper to change the antenna fundamental so that the 80 meter receiver coil will oscillate normally. To transmit, throw S1 and S2 to the right, lighting the transmitter filament and connecting antenna and counterpoise to the transmitter. To receive, throw both switches to the left, lighting the receiver filaments and connecting antenna and counterpoise to the receiver.

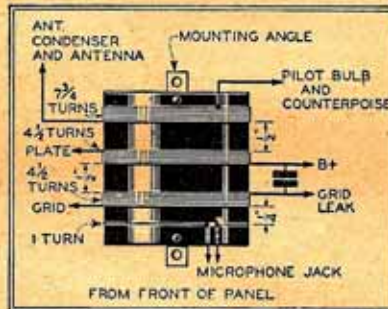


FIG. 5—DETAILS OF THE COIL CONSTRUCTION

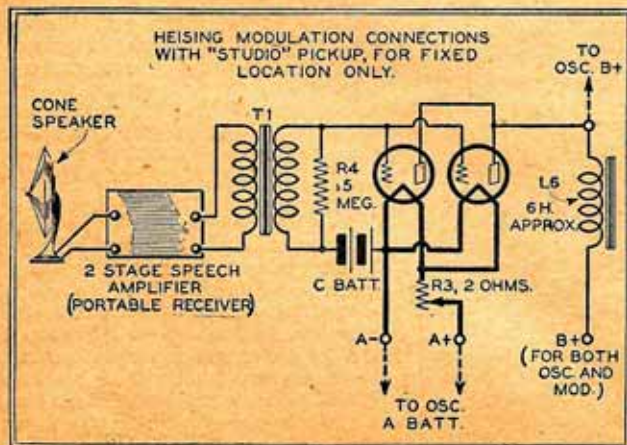


FIG. 4—IN A PERMANENT LOCATION PHONE TRANSMISSION CAN BE IMPROVED BY THE USE OF A VOICE MODULATION SYSTEM WHOSE CIRCUIT IS SHOWN AT THE LEFT

It is best to arrange the first tests with some amateur friend not over 20 miles away. When outsiders are worked later, the operator either tunes in a station calling CQ and calls him when he signs off, or himself calls CQ and searches for an answer in the form of his own call sent by some other station.

The choice of good location will greatly facilitate portable work. Hollows below the general land level and heavily wooded spots are unfavorable to transmission. Electrical conductors, good or bad, absorb radio frequency energy. This absorption is not very important in reception, but the waves should at least be given a fair start from the transmitter. Of course, nothing absolutely stops transmission—submarines transmit under water—but poor locations do cut down the range, and open spaces on water or fairly high ground are best.

When the set is used for some time in a fixed location, more complicated arrangements may be found worth while. For this work a fixed receiver, such as the National Thrill Box or Pilot Super-Wasp, may be used. The transmitter is preferably placed up out of the way in another room and operated by remote control. Since more power is available, a UX-210 can be substituted for the UX-171, and storage battery, generator d.c. or rectified, filtered a.c. may be used on the plate. The plate current runs 45 to 60 mils at plate voltages around 300 or 350. Up to 500 volts may be used if the current is kept down by detuning the antenna.

With increased power, loop modulation becomes unsuitable, and is replaced by Heising modulation. For telephone work the transmitter becomes, in effect, a miniature broadcasting plant. This sounds complicated but, as a matter of fact, the arrangements are quite simple.



In a permanent location it is inconvenient to talk into a hand microphone. A "studio" pickup which will transmit sounds that originate anywhere in the room is already in the possession of most experimenters. It is nothing more or less than a cone speaker, and its terminals are connected to the input of the speech amplifier. This arrangement makes the loudspeaker work backwards, or convert sound energy into electrical energy.

The speech amplifier is merely a two stage audio amplifier using fairly good transformers and almost any sort of tubes. It may be the audio part of the Portable Multiwave Receiver. As shown in the diagram, Fig. 4, the speech amplifier output goes through an ordinary transformer to the grids of the modulator tubes.

The modulator tubes are preferably the same type as the oscillator. One modulator tube works quite well. Two in



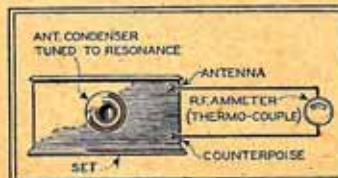
The antenna erected and ready for use.

parallel work very well indeed. Four would be still better, but a rather unnecessary and expensive refinement. The reason for more than one modulator tube is apparent when we recall how Heising modulation works. As far as audio frequency is concerned, the total current supplied to both oscillator and modulator

is held quite constant by the choke, L6. The modulator, in accordance with the audio frequency voltages impressed on its grid, draws more or less current—acts as a variable resistance across the oscillator plate-filament. For complete modulation this variable resistance should equal the fixed resistance of the oscillator plate-filament. At normal grid bias, four modulator tubes in parallel draw about the same plate current as one oscillator.

#### RESULTS

While this transmitter is conservatively rated at two and twenty miles with a 171 and five and fifty miles with a UX-210, much greater distances are often cov-



Circuit used in obtaining the oscillator output table shown at the beginning of this article.

ered. When the outfit was first set up at West Point, fifty miles north of New York City, a 210 was used with a 300 volt storage battery for plate supply. The location—in mountainous country—was none too good, and the late spring weather was thoroughly bad. In addition, the set was a rugged portable rather than a low-loss wonder resting mainly on air. In spite of these things we worked stations in Brooklyn, N. Y. (50 miles); Oneta, N. Y. (120 miles); Pottstown, Pa. (120 miles); Auburn, N. Y. (200 miles); and Greenburg, Pa. (300 miles). Heising phone was audible at a couple of hundred miles, but no verbatim phone reception was logged beyond Newburgh, ten miles away.

Then a 171 replaced the 210 for a few days' test, and the plate voltage was cut down to 100. The input was 2.7 watts, and the estimated output 1 watt. With this rather Lilliputian power we worked Newburgh easily enough; Riverside, N. J. (120 miles); Watertown, Mass. (175 miles); and actually disturbed the daylight ether at Lima, Ohio, 500 miles out—not bad for the 80 meter band. The 1 watt phone was heard weakly a

hundred miles distant, but was not checked word for word beyond a receiver in Highland Falls, two miles away. In order to see how far the phone comedy would go, we put a UX-201A in the socket and cut the B battery to 40 volts. Highland Falls still got most of our conversation.

Its laboratory tests finished, the portable was at last ready for field and highway, lake and river. It was installed on the package rest behind the seat of a coupe, and fed by the car battery and a 90 volt B battery. We then drove to an open place in the hills three-quarters of a mile from the receiving operator, and put up the umbrella antenna. Every word went through without difficulty, even when we started the car and drove slowly along the road.

The next test was on the Hudson River. The transmitter, an A battery, a 90 volt B battery and the umbrella antenna were crowded into a small rowboat. On most seagoing craft the radio installations are inadequate, but this one may be truly said to have been overruled. Our phone signals were continuously understandable at West Point up to two miles, when both the strength and good nature of the rowers gave out. At the same time, Newburgh, at eight miles, copied our code and heard the phone.

As a final test of portability, the set (provided this time with a 135 volt B battery) was placed in the car along with the receiver and driven seventy odd miles to Garden City. We expected on arrival to find all the nuts loose and half the tubes broken, but no such thing happened; both the transmitter and the receiver worked perfectly at the end of the trip. We did some satisfactory two-way code and phone work up to two miles with 2GY, Radio Broadcast's station, and with 2VM at Mitchel Field. Then we drove south to Long Beach, and set up close by the restless Atlantic. At about ten miles we worked perfect communication for an hour with 2GY, using code at first and then, to our surprise, phone.

So much for the story of the 80 meter portable transmitter—a long story, perhaps, but not without a certain amount of meat. The set will not raise Australia in the small hours, nor will it pump every last microwatt of energy into the antenna. But after banging around in a boat or car it will do its modest two and twenty without complaining. And that, after all, is what a portable is for.

## AREA Repeaters

146.610 -	ENC/DEC pl 114.8	W9AXD
147.000 +	ENC/DEC pl 114.8	W9AXD
223.880 -	ENC/DEC pl 118.8	W9AXD
<b>ATV</b> input 1250 Mhz/ 434 Mhz		W9ATN
	output 421.25 Mhz	
146.805 -	ENC/DEC pl 114.8	K9AMJ
224.440 -	ENC/DEC pl 118.8	K9AMJ
147.255 +	ENC/DEC pl 114.8	WX9MCS
444.725 +	ENC/DEC pl 107.2	WX9MCS
	Linked to FISHFAR	

## 2010 RARA Officers and Board

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## The K7RA Solar Update

SB PROP ARL ARLP047

ARLP047 Propagation de K7RA

Due to the Thanksgiving holiday tomorrow, the bulletin is coming out two days early this week. There is an overlap of one day on the data reported at the end of the bulletin. Look for another bulletin on Monday which will have more overlap, and Propagation Forecast Bulletin ARLP049 a week from Friday will have still more overlap. This is because the end of the bulletin always has seven days of data, to keep it compatible with the Solar Data Plotting Utility created by Scott Craig, WA4TTK. You can download the utility for free at <http://www.craigcentral.com/sol.asp>. The Utility can handle redundant data, but it must remain in a certain format in order for it to glean data from the bulletin automatically.

Not much in the way of solar excitement this week, except there are many sunspots, but the solar activity in terms of flares or coronal mass ejections is low. The overlapping (by one day) average sunspot numbers in this bulletin declined 21 points to 124

Expect good conditions for the CW weekend of the CQ Worldwide DX Contest, November 26-27.

The latest prediction from USAF/NOAA shows solar flux at 140 on November 23, 145 on November 24-27, 150 on November 28-29, 155 on November 30, 160 December 1-2, and 165 December 3-7. Predicted planetary A index is 5 on November 23-27, 7 on November 28-29, then 5 on November 30 to December 24.

Larry Goolsby, AA4JI of Fayetteville, Tennessee wrote on November 18: "This whole week on forty meters during the Triple H Net on 7.190 at 0700 UTC I and others have been working central Australia with strong 57 reports. Repeatedly I worked VK2NRB Bob and VK2TTP Peter using just 100 watts and a wire dipole at 30 ft. each morning, and also Europe is starting along with some Asia contacts. New Zealand has been strong along with V21N in Antigua."

If you would like to make a comment or have a tip for our readers, email the author at, [k7ra@arrl.net](mailto:k7ra@arrl.net).

For more information concerning radio propagation, see the ARRL Technical Information Service web page at, <http://arrl.org/propagation-of-rf-signals>. For an explanation of the numbers used in this bulletin, see <http://arrl.org/the-sun-the-earth-the-ionosphere>. An archive of past propagation bulletins is at <http://arrl.org/wlaw-bulletins-archive-propagation>. Find more good information and tutorials on propagation at <http://myplace.frontier.com/~k9la/>.

Monthly propagation charts between four USA regions and twelve overseas locations are at <http://arrl.org/propagation>.

Instructions for starting or ending email distribution of ARRL bulletins are at <http://arrl.org/bulletins>.

Sunspot numbers for November 16 through 22 were 126, 122, 137, 149, 101, 101, and 132, with a mean of 124. 10.7 cm flux was 142.3, 147.7, 144.4, 139.6, 139.9, 141.1, and 142.4, with a mean of 142.5. Estimated planetary A indices were 2, 3, 2, 1, 2, 5, and 6, with a mean of 3. Estimated mid-latitude A indices were 3, 2, 1, 1, 2, 5, and 7 with a mean of 3.



## 75th Anniversary of a "landmark" Rockford Ham Achievement

Eugene Hubbell, W9ERU was a Rockford (area) ham. He lived at a Loves Park address, on Rt. 73 Forest Hills Rd but his business, H&H Electronics was on Kishwaukee St. near 5th Ave. / College Ave. The business moved to Five Points (strip) shopping center in later years when the nearby Kishwaukee St. intersection was redesigned.



### USA Brings Home Gold at 2011 High Speed Telegraphy World Championships

11/05/2011

Back in September 1936, Eugene A. Hubbell, W9ERU, took home the silver trophy at what the **October 1936 issue of QST** called the first official "Amateur Code Speed Contest." Only making one error, Hubbell won first prize with his winning speed of receiving 52.2 words per minute. Held at the ARRL Central Division Convention that year, the contest required operators to decipher plain language text at two minute intervals that ranged in speed from 25 to 52.7 words per minute. [*Editor's note: You must be an ARRL member to view the link*]

But things have changed since Hubbell made history. Individuals all over the world compete in High Speed Telegraphy (HST) events where they are challenged to correctly receive and copy Morse code transmissions sent at very high speeds, upwards of 300 characters a minute. HST is very popular in Eastern Europe, but it is gaining ground all over the world, including the US.

Excerpted from QST News - 11/05/2011

#### REMEMBERING ON A 75th ANNIVERSARY

##### Flash! W9ERU Wins Code Speed Contest

EUGENE A. HUBBELL, W9ERU, of Rockford, Illinois, is winner of the Amateur Code Speed Contest held at the A.R.R.L. Central Division Convention in Chicago on September 6th. Mr. Hubbell attained an official computed speed of 52.2 words per minute! He was awarded a beautiful silver trophy. All contestants were examined on plain language text with tape transmission for two-minute intervals, ranging from 25 w.p.m. upward and at 52.7 w.p.m. W9ERU made but one error. The runner-up was John Huntoon, W9KJY. Those participating in the finals, without indication of order of merit, were W8BKM, W8SS, W9DKZ, W9ERU, W9ERS, W9HUM, W9KJY, and W9MKX. Judges were T. R. McElroy, W1JYN, holder of the world's code speed record; G. J. Maki, W9RQZ, ex-K7HV, Chairman, Code Speed Contest Committee; and F. E. Handy, W1BDI, A.R.R.L. Communications Manager.

This was the first official Amateur Code Contest ever held. Only bona-fide amateurs, holding at least an amateur operator's license, were eligible. Holders of commercial licenses were ineligible, with the following exceptions: (a) Holders of commercial licenses without experience under same. (b) Holders of commercial licenses whose duties specifically are not telegraph operating (i.e., 'phone licenses). (c) Holders of commercial licenses engaged specifically as attendants of licensed equipment, involving no telegraph operating. It was a truly amateur competition.

The congratulations of the entire amateur fraternity go to W9ERU on a remarkable performance! It is something to shoot at, gang.

—E. L. B.

(from QST, October 1936)



## Hamfest Information



# MID-WINTER HAMFEST

Ham Radio, Computers and Electronics Flea Market

Plenty of FREE Parking • Reserved Flea Market Tables • Hourly Prizes  
VE Testing for all License Classes • Forums

**Sunday, January 22, 2012**  
**Doors open at 8AM (Closes at 1PM)**  
**Kane County Fairgrounds**  
**525 S. Randall Rd., St Charles, IL**



Talk in on WCRA's 2M Repeater 145.31/ (107.2 Hz)  
or National Simplex Frequency 146.52 MHz

**Tickets:** **Flea Market:**  
**Advance, 4 raffle stubs \$8 \$25/table (\$30 day, if avail.)**  
**At the door, 1 raffle stub \$10 Electricity available for \$10**



(630) 604-0157 info@w9ccu.org www.w9ccu.org

### Advance Ticket and Flea Market Table Order Form

Name \_\_\_\_\_ Call \_\_\_\_\_ Tickets @ \$8.00 = \$ \_\_\_\_\_  
 Address \_\_\_\_\_ Table @ \$25.00 = \$ \_\_\_\_\_  
 \_\_\_\_\_  Electricity @ \$10.00 = \$ \_\_\_\_\_  
 Phone \_\_\_\_\_ Email \_\_\_\_\_ Total Amount enclosed \$ \_\_\_\_\_

Please include an e-mail address so that we can confirm your order along with an SASE for delivery of tickets.

**Mall to: WCRA, PO Box 651, Wheaton, IL 60187-1055**

**40th Annual Midwinter Swapfest**  
**West Allis Radio Amateur Club**  
**01/07/2012**

Waukesha County Expo Center Forum  
 1000 Northview Road  
 Waukesha, WI 53186  
 Public Contact: Phil Gural , W9NAW  
 S67W12944 Larkspur Road  
 Muskego, WI 53150  
 Phone: 414-425-3649  
 414-425-3649

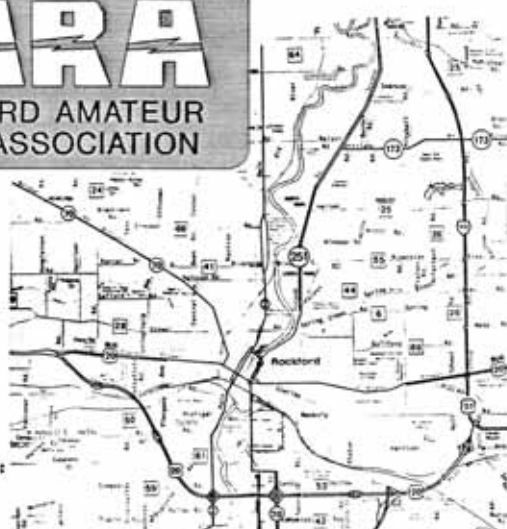
## 1993 RARA Glory Days Hamfest

# 1993 ROCKFORD HAMFEST

**April 18th**  
**At the Rockford Metro Center - 300 Elm St.**  
**Sponsored By:**



**30,000 + Sq. Ft. Arena**  
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**\* YOU MUST BRING WITH YOU FOR TESTING:**

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 Any current valid CQCE  
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**5:00 A.M. DEALER SETUP - 8:00 A.M. GENERAL ADMISSION UNTIL 3:00 P.M.**





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Website: [www.w9axd.org](http://www.w9axd.org)

E-mail: [jholich@comcast.net](mailto:jholich@comcast.net)

Nets

Monday 8 PM	RARA Info.	146.610 - 114.8
Thursday 7 PM	ARES	147.255 + 114.8
Thursday 8 PM	SATERN	146.610 - 114.8

place address label here

# December, 2011

## ROCKFORD AMATEUR RADIO ASSOCIATION MEMBERSHIP APPLICATION

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Ham Rag Via U.S. Postal Service: \$12.00 extra

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Radio Interests \_\_\_\_\_

Other Interests \_\_\_\_\_

Suggestions: \_\_\_\_\_

RETURN COMPLETED FORM TO:

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 ROCKFORD, ILLINOIS 61126